NATIONAL ARCHIVES MICROFILM PUBLICATIONS

Microfilm Publication T1206

PROJECT BLUE BOOK

Roll 87

Project (Administrative) Files

Boxes 3(pt.) and 4

THE NATIONAL ARCHIVES
NATIONAL ARCHIVES AND RECORDS SERVICE
GENERAL SERVICES ADMINISTRATION

WASHINGTON: 1976

RETURN TO
The Albert F. Simpson
Historical Research Center
Maxwell AFB, AL 36112

PROJECT

BLUE BOOK

1 FEBRUARY 1966

1003290

PROJECT BLUE BOOK

The United States Air Force has the responsibility under the Department of Defense for the investigation of unidentified flying objects (UFOs). The name of this program, which has been in operation since 1948, is Project Blue Book. It has been identified in the past as Project Sign and Project Grudge.

Air Force interest in unidentified flying objects is related directly to the Air Force responsibility for the air defense of the United States. Procedures for conducting this program are established by Air Force Regulation 200-2.

The objectives of Project Blue Book are two-fold: first, to determine whether UFOs pose a threat to the security of the United States; and, second, to determine whether UFOs exhibit any unique scientific information or advanced technology which could contribute to scientific or technical research. In the course of accomplishing these objectives, Project Blue Book strives to identify and explain all UFO sightings reported to the Air Force.

HOW THE PROGRAM IS CONDUCTED

The program is conducted in three phases. The first phase includes receipt of UFO reports and initial investigation of the reports. The Air Force base nearest the location of a reported sighting is charged with the responsibility of investigating the sighting and forwarding the information to the Project Blue Book Office at Wright-Patterson Air Force Base, Ohio.

If the initial investigation does not reveal a positive identification or explanation, a second phase of more intensive analysis is conducted by the Project Blue Book Office. Each case is objectively and scientifically analyzed, and, if necessary, all of the scientific facilities available to the Air Force can be used to assist in arriving at an identification or explanation. All personnel associated with the investigation, analysis, and evaluation efforts of the project view each report with a scientific approach and an open mind.

The third phase of the program is dissemination of information concerning UFO sightings, evaluations, and statistics. This is accomplished by the Secretary of the Air Force, Office of Information.

The Air Force defines an unidentified flying object as any aerial object which the observer is unable to identify.

Reports of unfamiliar objects in the sky are submitted to the Air Force from many sources. These sources include military and civilian pilots, weather observers, amateur astronomers, business and professional men and women, and housewives, etc.

Frequently such objects as missiles, balloons, birds, kites, searchlights, aircraft navigation and anticollision beacons, jet engine exhaust, condensation trails, astronomical bodies and meteorological phenomena are mistakenly reported as unidentified flying objects.

The Air Force groups its evaluations of UFO reports under three general headings: (1) identified, (2) insufficient data, and (3) unidentified.

Identified reports are those for which sufficient specific information has been accumulated and evaluated to permit a positive identification or explanation of the object.

Reports categorized as Insufficient Data are those for which one or more elements of information essential for evaluation are missing. Some examples are the omission of the duration of the sighting, date, time, location, position in the sky, weather conditions, and the manner of appearance or disappearance. If an element is missing and there is an indication that the sighting may be of a security, scientific, technical, or public interest value, the Project Blue Book Office conducts an additional investigation and every attempt is made to obtain the information necessary for identification. However, in some instances, essential information cannot be obtained, and no further action can be taken.

The third and by far the smallest group of evaluations is categorized as Unidentified. A sighting is considered unidentified when a report apparently contains all pertinent data necessary to suggest a valid hypothesis concerning the cause or explanation of the report but the description of the object or its motion cannot be correlated with any known object or phenomena.

TYPES OF UFO IDENTIFICATIONS AND EVALUATIONS

There are various types of UFO sightings. Most common are reports of astronomical sightings, which include bright stars, planets, comets, fireballs, meteors, auroral streamers, and other celestial bodies. When observed through haze, light fog, moving clouds, or other obscurations or unusual conditions, the planets, including Venus, Jupiter, and Mars have been reported as unidentified flying objects. Stellar mirages are also a source of reports.

Satellites are another major source of UFO reports. An increase in satellites reported as UFOs has come about because of two factors. The first is the increase of interest on the part of the public; the second is the increasing number of satellites in the skies. Positive knowledge of the location of all satellites at all times enables rapid identification of satellite sightings. Keeping track of man-made objects in orbit about the earth is the responsibility of the North American Air Defense Command Space Detection and Tracking System. This sophisticated electronic system gathers complex space traffic data instantly from tracking stations all over the world.

Other space surveillance activities include the use of ballistic tracking and large telescopic cameras. ECHO schedules are prepared by the NASA Goddard Space Flight Center at Greenbelt, Maryland, and schedules of the South/North equator crossings are prepared by the Smithsonian Institution at Cambridge, Massachusetts. From the data produced by these agencies, satellites mistakenly reported as UFOs can be quickly identified. Some of these are visible to the naked eye.

Aircraft account for another major source of UFO reports, particularly during adverse weather conditions. When observed at high altitudes and at some distance, aircraft can have appearances ranging from disc to rocket shapes due to the reflection of the sun on their bright surfaces. Vapor or condensation trails from jet aircraft will sometimes appear to glow fiery red or orange when reflecting sunlight. Afterburners from jet aircraft are often reported as UFOs since they can be seen from great distances when the aircraft cannot be seen.

The Project Blue Book Office has direct contact with all elements of the Air Force and the Federal Aviation Agency civil air control centers. All aerial refueling operations and special training flights can be checked immediately. Air traffic of commercial airlines and flights of military aircraft are checked with the nearest control center, enabling an immediate evaluation of aircraft mistakenly reported as UFOs. However, since many local flights are not carried, these flights are probable causes of some reports.

Balloons continue to be reported as UFOs. Several thousand balloons are released each day from military and civilian airports, weather stations, and research activities. There are several types of balloons - weather balloons, rawinsondes, radiosondes, and the large research balloons which have diameters up to 300 feet. At night, balloons carry running lights which cause an unusual appearance when observed. Reflection of the sun on balloons at dawn and sunset sometimes produce strange effects. This usually occurs when the balloon, because of its altitudes, is exposed to the sun. Large balloons can move at speeds of over 100 miles per hour when moving in high altitude jet windstreams. These balloons sometimes appear to be flattened on top. At other times, they appear to be saucer-shaped and to have lights mounted inside the bag itself due to the sun's rays reflecting through the material of the balloon. The Balloon Control Center at Holloman Air Force Base, New Mexico, maintains a plot on all Military Upper Air Research Balloons.

Another category of UFO evaluations labeled Other includes missiles, reflections, mirages, searchlights, birds, kites, spurious radar indications, hoaxes, fireworks, and flares.

Aircraft, satellites, balloons, and the like should NOT be reported since they do not fall within the definition of an unidentified flying object.

CONCLUSIONS

To date, the firm conclusions of Project Blue Book are: (1) no unidentified flying object reported, investigated, and evaluated by the Air Force has ever given any indication of threat to our national security; (2) there has been no evidence submitted to or discovered by the Air Force that sightings categorized as unidentified represent technological developments or principles beyond the range of present day scientific knowledge; and (3) there has been no evidence indicating that sightings categorized as unidentified are extraterrestrial vehicles.

The Air Force will continue to investigate all reports of unusual aerial phenomena over the United States. The services of qualified scientists and technicians will continue to be used to investigate and analyze these reports, and periodic reports on the subject will be made.

The former Chairman of the House Armed Services Committee, Mr. Carl Vinson, recently commented on the conduct of the UFO program by the Air Force and stated that Congressional hearings on this subject are unnecessary.

The Air Force does not deny the possibility that some form of life may exist on other planets in the universe. However, to date, the Air Force has neither received nor discovered any evidence which proves the existence and intra-space mobility of extraterrestrial life. The Air Force continues to extend an open invitation to anyone who feels that he possesses any evidence of extraterrestrial vehicles operating within the earth's near space envelope to submit his evidence for analysis. Initial contact for this purpose is through the following address:

PROJECT BLUE BOOK INFORMATION OFFICE
SAFOI
WASHINGTON, D C 20330

Anyone observing what he considers to be an unidentified flying object should report it to the nearest Air Force Base. Persons submitting a UFO report to the Air Force are free to discuss any aspect of the report with anyone. The Air Force does not seek to limit discussion on such reports and does not withhold or censor any information pertaining to this unclassified program.

NON AVAILABILITY OF MATERIALS

The following items are for internal use only and are not available for distribution to the public. These concern internal management and procedures for forwarding UFO reports to the appropriate agency:

1. Air Force Regulation 200-2

2. JANAP 146

The Air Force has no films, photographs, maps, charts, or graphs of unidentified flying objects. Photographs that have been submitted for evaluation in conjunction with UFO reports have been determined to be a misinterpretation of natural or conventional objects. These objects have a positive identification.

The Air Force no longer possesses, and thus does not have for distribution, outdated reports on Project Sign, Project Grudge, Blue Book Special Report No. 14, and outdated Project Blue Book press releases. Non-military UFO publications should be requested from the publisher, not the Air Force.

SUGGESTED READING MATERIAL

Books listed below deal with facts and theories about our solar universe, the sun, planets, comets, meteorites, the universe, stars, constellations and galaxies; telescopes, the computation of time as it relates to astronomy, star maps and charts, and the history of astronomy.

SKY & TELESCOPE, by Sky Publishing Corporation, Harvard College Observatory, Cambridge, Mass. 02138. Monthly Magazine, 60 cents per copy.

WEATHER ELEMENTS, by BLAIR, published Prentice Hall. Has an excellent chapter on often misidentified weather phenomena.

PLANETS, STARS, AND SPACE, by CHAMBERLAIN, JOSEPH M. & NICHOLSON, THOMAS D. An illustrated, non-technical explanation of the earth, planets, stars, and the universe. Prepared in cooperation with the American Museum of Natural History.

JUNIOR SCIENCE BOOK OF STARS, by CROSBY, PHOEBE. An easy-to-read, exciting story of what scientists know about the stars, planets, the moon, and the MILKY WAY.

CHALLENGE OF THE UNIVERSE, by HYNEK, J. ALLEN & ANDERSON, NORMAN. Discusses the nature of the universe; astronomy and cosmology, published by Scholastic Press.

THE STORY OF THE STARS, by MALONEY, TERRY. An introduction to the universe; our solar system, our galaxy, and other galaxies. Many interesting illustrated analogies help build concepts of size and distance. Includes references to the Van Allen radiation belts and zodiacal light observation of 1960.

THE WORLD OF FLYING SAUCERS, by MENZEL & BOYD. A scientific examination of the classic UFO reports.

THE MOON, METEORITES, AND COMETS, Dtd 1963, by MIDDLEHURST & KUIPER. Continuous analysis of Soviet moon photos. Chapter on Siberian meteorite and photos or comets computation of various comet orbital photos.

THE NATURE OF LIGHT AND COLOR IN THE OPEN AIR, by MINNAERT, Dover Publications. This is an excellent paperback written in understandable lay language.

METEORS, by OLIVIER. Standard text by foremost authority on meteors.

PHOTOGRAPHIC HISTORY OF MARS, 1905-1961, by SLIPHER, E. C., published by Lowell Observatory.

ANATOMY OF A PHENOMENON, by VALLE, JACQUES.

FIRST MAN TO THE MOON, by VON BRAUN, WERNHER.

TOTAL UFO (OBJECT) SIGHTINGS

(Compiled 17 Jan 66)

YEAR	TOTAL SIGHTINGS	UNIDENTIFIED	SOURCE
1947	122	12	Case Files
1948	156	7	Case Files
1949	186	22	Blue Book, page 108
1950	210	27	Case Files
1951	169	22	Case Files
1952	1,501	303	Blue Book, page 108
1953	509	42	Case Files
1954	487	46	Case Files
1955	545	24	Case Files
1956	670	14	Case Files
1957	1,006	14	Case Files
1958	627	10	Case Files
1959	390	12	Case Files
1960	557	14	Case Files
1961	591	13	Case Files
1962	474	15	Case Files
1963	399	14	Case Files
1964	562	19	Case Files
1965	886	16	Case Files
	10,147	646	

STATISTICAL DATA FOR YEARS 1953-1964

TOTAL CASES BY CATEGORY

(Compiled 1 Nov 65)

	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	TOTAL
Astronomical	175	137	135	222	341	231	144	235	203	136	85	123	2167
Aircraft	73	80	124	148	218	106	63	66	77	68	73	71	1167
Balloon	78	63	102	93	114	58	31	22	37	19	28	20	665
Insufficient Data	79	103	95	132	191	111	65	105	115	94	59	99	1248
Other	62	58	65	61	120	93	75	94	77	65	58	88	916
Satellite	0	0	0	0	8	18	0	21	69	77	82	142	417
Unidentified	42	46	24	14	14	10	12	14	13	15	14	19	237
TOTAL	509	487	545	670	1006	627	390	557	591	474	399	562	6817

ASTRONOMICAL SIGHTINGS

Meteors	70	92	79	88	179	168	100	187	119	95	57	61	1295
Stars and Planets	101	44	52	131	144	56	40	45	78	36	23	55	805
Other	4	1	4	3	18	7	4	3	6	5	5	7	67
TOTAL	175	137	135	222	341	231	144	235	203	136	85	123	2167

OTHER CASES

Hoaxes, Hallucinations, Unreliable Reports and Psychological Causes	15	6	16	16	37	29	14	13	17	11	16	34	226
Missiles and Rockets	2	1	1	3	2	6	14	12	13	9	13	7	83
Reflections	4	6	4	3	2	7	11	9	3	3	0	2	54
Flares and Fireworks	1	4	8	6	8	3	5	7	4	3	3	7	59
Mirages and Inversions	3	2	4	1	5	2	4	5	6	3	0	2	37
Search and Groundlights	9	6	14	9	12	8	5	6	1	3	2	6	81
Clouds and Contrails	6	3	2	1	9	5	3	4	5	4	5	0	47
Chaff	0	2	0	1	2	6	1	4	3	5	2	1	27
Birds	4	7	2	6	1	1	0	3	2	2	2	4	34
Radar Analysis	15	7	1	8	27	3	8	6	9	0	1	2	87
Photo Analysis	1	1	2	4	1	7	4	6	3	2	3	6	40
Physical Specimens	1	6	5	3	5	10	3	7	4	15	3	8	70
Satellite Decay	0	0	0	0	0	1	0	9	3	3	4	3	23
Other	1	7	4	0	9	5	3	3	4	2	4	6	48
TOTAL	62	58	65	61	120	93	75	94	77	65	58	88	916

STATISTICS FOR 1965

(Compiled 18 Jan 1966)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
ASTRONOMICAL	10	8	11	4	2	10	27	82	30	27	22	12	245
AIRCRAFT	11	8	14	11	14	7	32	61	20	13	14	5	210
BALLOON	3	2	1	3	0	3	7	6	2	7	0	2	36
INSUFFICIENT DATA	5	4	2	4	4	2	16	24	15	5	3	1	85
OTHER	11	8	7	8	5	6	9	42	7	9	11	3	126
SATELLITE	4	5	5	5	15	5	42	41	24	3	0	3	152
UNIDENTIFIED	1	0	2	1	1	0	2	4	4	0	1	0	16
PENDING	0	0	1	0	0	0	0	2	2	6	4	2	17
TOTAL	45	35	43	36	41	33	135	262	104	70	55	28	887

ASTRONOMICAL CASES

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
Meteors	6	6	8	2	2	4	14	26	13	6	9	5	101
Stars and Planets	3	1	3	2	0	5	10	55	16	20	13	7	135
Other	1a	1b	0	0	0	1c	3d	1e	1a	1f	0	0	9
TOTAL	10	8	11	4	2	10	27	82	30	27	22	12	245

(a) Solar Image (b) Moon (c) Sun (d) Reflected Moonlight, Parhelia, Moon (e) Reflected Moonlight (f) Comet Ikeya-Seki

OTHER CATEGORY

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
Hoaxes, Hallucinations, Unreliable Reports and Psychological Causes	5	3	4	1	2	1	2	12	1	3	0	0	34
Missiles and Rockets					1			3	1	1	3	1	10
Reflections						1	1	2	1	1	1		7
Flares and Fireworks					1		1	1			1		4
Mirages and Inversions							2	3					5
Search and Ground Lights	2	1	0	1	0	0	1	2	0	0	2	0	9
Clouds and Contrails	1							1	1				3
Chaff												1	1
Birds	1	2		2				3	1	1	1		11
Physical Specimens		1c						1r	1w				3
Radar Analysis				1e		1g		3gmn		1m			6
Photo Analysis			2dl		1d	1j	2kj	5x	1j				12
Satellite Decay	0	1	1	1	0	1	0	2	0	1	0	1	8
Miscellaneous	2ab			2bf		1h		4sbbb		1h	3tuv		13
TOTAL	11	8	7	8	5	6	9	42	7	9	11	3	126

(a) Tracer Bullets (b) Misinterpretation of Conventional Objects (c) Metal Ball (d) Developer Smear (e) Anomalous Propagation (f) Kites (g) Electronic Counter Measures (h) Debris in Wind (j) No Image on Film (k) Poor Photo Process (l) Free Falling Object (m) False Targets (n) Weather Returns (p) Emulsion Flaws (r) Plastic Bags (s) Man on Ground (t) Lightning (u) Chemical Trails from Research Rocket (v) Missile Launch Activity (w) Gourd

FIREBALL REPORT

Persons observing a fireball or meteor should report the information to the American Meteor Society. The information desired is contained below.

A very brilliant meteor or fireball is reported to have passed in your vicinity on .... at the hour of ..... Will you please answer as fully as possible the following questions, which are asked on behalf of the American Meteor Society in order that permanent records of such phenomena may be obtained. When these reports are published each contributor whose report is fairly complete will be mentioned, if possible, and due credit given. It is only by the help of those who can give personal information that data can be secured for the computation of the orbits of meteors. These data are of great scientific value and all reasonable efforts should be made to obtain them. You will be unable probably to answer all questions below, but answer those you can, as they may be of the greatest importance.

(1) Give your name and address.

(2) Where were you when you saw the meteor? (If the town is small please give county as well.)

(3) Give the date, hour and minute when the meteor appeared; also kind of time used.

(4) In what direction did it appear (or in what direction was it first seen)? This is not asking in what direction it was going!

(5) In what direction did it disappear (or in what direction was it last seen)? For questions 4 and 5, simply N, E, S, or W is not accurate enough, unless these were the exact directions. If compass is used, state it; also if magnetic correction has been applied to compass reading.

(6) At what height did it appear? (Use degrees in answering.)

(7) At what height did it disappear? (Use degrees in answering.)

(8) Did it pass directly overhead (i.e., through the zenith)?

(9) If not, to which side of the zenith did it go, and how far from it? (Use degrees in answering.)

(10) Did it appear to reach the horizon? What sort of a horizon have you?

(11) What angle did the path of the meteor make with the horizon and in which direction was it then going?

(12) If you are familiar with constellations describe the path of the meteor through the sky with reference to stars.

(13) Did the meteor appear to explode?

(14) What was the duration of its flight in seconds?

(15) Describe the train if one was left. If it lasted long enough to show drift, most carefully tell in what direction train drifted. Give sketch, if possible, showing this with regard to horizon.

(16) What was the duration of the train in seconds?

(17) Did you hear any sound? How long after seeing the meteor was it before you heard this sound?

Did you hear an actual explosion? How long after seeing the explosion was it before you heard it?

(18) Of what color was the meteor?

(19) What was the size of the meteor? (Compare it with the Moon or with a planet or star.)

(20) Was more than one body seen before the explosion (if any)?

(21) What was condition of sky at time?

(22) Give names and addresses of others who saw the meteor.

(23) Please mail this reply to

Charles P. Oliver
AMERICAN METEOR SOCIETY
521 N. Wynnewood Ave
Narberth, Pennsylvania 19072

HISTORY OF PROJECT

Following the Kenneth Arnold sighting on 24 June 1947, wide news coverage of public reports of "flying discs or saucers" created sufficient concern at high military echelons to authorize AMC to conduct a preliminary investigation into these reports. Early correspondence indicates that U. S. Military Leaders were concerned that the objects reported were an aircraft configuration more advanced than those possessed by the United States Armed Forces. A letter, 23 September 1947, from Lt. General Twining of AMC to the Commanding General of the Army Air Forces, expressed the opinion that there was sufficient substance in the reports to warrant a detailed study.

On 30 December 1947, a letter from the Chief of Staff directed AMC to,... "set up a project whose purpose was to collect, collate, evaluate and distribute to interested Government Agencies and contractors all information concerning UFO sightings and phenomena in the atmosphere which can be construed to be of concern to the National Security. . ."

The Technical Intelligence Division of AMC issued Hq AMC Technical Instruction No 2185, 11 February 1948, and the project was inaugurated with a code name of "SIGN." The code name "SIGN" was changed to the code name "GRUDGE" on 16 December 1948. A report released in February 1949 covering analysis of the first 273 incidents concluded that, while no definite and conclusive evidence existed, evaluation of reports of unidentified objects was a necessary activity of Military Intelligence Agencies.

After the Project "SIGN" Report, work continued along the same lines and a Project "GRUDGE" Report was published and released in August 1949 by AMC. This report contained analysis of 244 cases and concluded that Unidentified Flying Objects reports resulted from: a) misinterpretation of conventional objects, b) mass hysteria or "War Nerves", c) hoaxes and/or d) Psychopathological persons. Based upon these conclusions AMC recommended that investigation and study of this type of report be reduced in scope. Major portions of this work were performed under contract by Ohio State University, Professor Hynek (Present Consultant to AF on Project Blue Book), The Rand Corporation, Dr. G. Valley, Dr. Paul Fitts, Air Weather Service, 3610th Electronic Section and the U. S. Weather Bureau.

Following publication of the "GRUDGE" Report, the Air Force continued to investigate sightings, inasmuch as it is an Air Force responsibility to identify and analyze Aerial Phenomena that could possibly be a menace to the United States. Much of the Scientific and Technical work during 1950 and 1951 centered around Project "Twinkle" and the Green Fireball studies of Dr. LaPaz in the Southwestern United States. Project "Twinkle" Final Report was completed on 27 December 1951. During December 1951 Colonel Kirkland and Lt. Ruppelt made a visit to [redacted] to discuss the feasability of a scientific study from the data collected since the program's inception. Thus, Project Blue Book's Special Report #14 came into being.

During the phase in which Special Report #14 was in preparation (1952 - 1954) the project attracted a Public Relations aspect that remains with it today. This came about through a National interest in reported sightings, Science-Fiction publications of alleged contacts with visitors from outer space, formation of psuedo-scientific organizations, hobby clubs, and self-appointed individuals who investigated UFO sightings. The radar sightings in Washington D. C. during July 1952 tended to give substance to UFO reports. News coverage during this period was extremely high and General Samford conducted a press conference on 29 July 1952 to explain the situation.

With the increased volume of reports pouring in, a Scientific Advisory Panel on UFO was established in late 1952. At a meeting held during 14 - 18 January 1953 all available data was examined. Conclusions and recommendations of this panel were published in an unclassified report, and made public. The panel concluded that UFO's did not threaten the National Security of the U. S. and recommended that the "Aura of mystery" attached to the project be removed.

By 1953 Air Force responsibility for the UFO program had become firmly established. It was now apparent that some directives were necessary in order to standardize investigative procedures and formulate policy. AFR 200-2 was written and the final publication was distributed in August 1954. This regulation states the purpose, investigative procedures and policies relating to release of information. Special Report #14 was completed on 17 March 1954. It concluded that on the basis of the observations reported to the Air Force it was highly improbable that any of these reports represent observations of technological developments outside the range of present day scientific knowledge. In accordance with the recommendations of the Scientific Panel and provisions for release of information outlined in AFR 200-2 the report was declassified and released to the general public on 5 May 1955.

After 1955 the project concerned itself with investigation of sightings, evaluation of the data and release of information to proper news media. This information is given to the public in the form of a news release called the "FACT SHEET". These, or similar releases have been made periodically since 1955. All data collected has been in accordance with the conclusions of the Scientific Panel in January 1953. Still, the "Flying Saucer Myth" has remained in the public eye, and has necessitated many conferences and briefings among Military, Civilian, Scientific, and Congressional members. Among the most significant of these are: a) 4 October 1956, The General Lewis Special Briefing, b) 16 September 1957, Defence Science Board Briefing, c) 31 January 1958, McClellan Sub-Committee Briefing, d) 8 August 1958, McCormack Sub-Committee Briefing, e) February 1959, Washington D. C. Policy Meetings and f) 11 - 15 July 1961, Congressional Briefing (Mr. Robert Smart).

As far back as 1952 recommendations have been made to discontinue the project or transfer it to civilian agencies or contractors. However, continuation of the project under Air Force auspices is likely. A letter from General Watson on 7 July 1955 to General Samford expressed factors that are still pertinent,". . . is the fact that complete reliance on a contractor would not reduce the responsibility of and therefore the load carried by the Air Force. . ." Also, various studies have been made to transfer the project to other organizations within the Air Force.

CURRENT SITUATION: Personnel associated with the project are engaged in receipt of UFO reports, investigation, analysis, and evaluation of these reports and maintenance of research and correspondence files. In addition, information is supplied to SAFOI-CC upon which to base a reply to the more than 2,000 letters a year from individuals requesting information on the UFO program. From 1962 - 1965 the files were reviewed and placed in a standard format. Statistics were recomputed on the bases of the actual case files. The fact sheet was revised to provide information most often requested by individuals and to disseminate the yearly statistics. Periodic case summaries on cases of public interest are released. The current AFR 200-2 is under revision. Present Project Officer is Major Hector Quintanilla, Jr..

AIR FORCE REGULATION
NO. 200–2

DEPARTMENT OF THE AIR FORCE
Washington, 20 July 1962

Intelligence Activities

UNIDENTIFIED FLYING OBJECTS (UFO)

This regulation establishes the UFO Program to investigate and analyze UFO's over the United States. Such investigation and analysis are directly related to Air Force responsibility for the defense of the United States. The UFO Program provides for the prompt reporting and rapid identification needed for successful "identification," which is the second of the four phases of air defense—detection, identification, interception, and destruction. All commanders will comply strictly with this regulation.

SECTION A—GENERAL — *Paragraph*

Explanation of Terms — 1
Objectives — 2
Responsibilities — 3
Guidance — 4
Reporting UFO Information — 5

SECTION B—PUBLIC RELATIONS, INFORMATION, CONTACTS, AND RELEASES

Maintaining Public Relations — 6
Releasing Information — 7
Exceptions — 8
Release by Non-Air Force Sources — 9
Contacts — 10

SECTION C—PREPARING AND SUBMITTING REPORTS

General Information — 11
Methods for Transmitting Reports — 12
Where To Submit Reports — 13
Basic Reporting Data and Format — 14
Negative or Inapplicable Data — 15
Comments of Preparing Officer — 16
Classification — 17
Reporting Physical Evidence — 18

SECTION A—GENERAL

1. Explanation of Terms. To insure proper and uniform usage in UFO screenings, investigations, and reportings, an explanation of the objects follows:

a. *Familiar or known objects:*

(1) Aircraft, balloons, kites, birds, searchlights, astronomical bodies (meteors, planets, stars, comets), pilotless aircraft, missiles, satellites in orbit, and others identified by the observer as normal appearing objects.

(2) Flying objects determined to be aircraft. These generally appear as a result of ADIZ violations and often prompt the UFO reports submitted by the general public. They are readily identifiable as, or known to be, aircraft, but their type, purpose, origin, and destination are unknown. Air Defense Command is responsible for reports of "unknown" aircraft, which should not be reported as UFO's under this regulation.

(3) Aircraft flares, jet exhausts, condensation trails, blinking or steady lights observed at night, lights circling or near airports and airways, and other phenomena or objects known to be emanating from, or to be indications of, aircraft. These should not be reported under this regulation, as they do not fall within the definition of a UFO.

b. *Unidentified Flying Objects.* Any aerial phenomena, airborne object or objects which are unknown or appear out of the ordinary to the observer because of performance, aerodynamic characteristics, or unusual features.

2. Objectives. Air Force interest in UFO's is three-fold. First, as a possible threat to the security of the United States and its forces; sec-

This regulation supersedes AFR 200–2, 14 September 1959, as amended.

OPI: AFCIN
DISTRIBUTION: S

ond, to determine the technical or scientific characteristics of any such UFO's; third, to explain or identify all UFO sightings as described in paragraph 1b.

a. *Air Defense.* The great majority of flying objects reported have been conventional, familiar things of no great threat to the security of the United States and its possessions. However, since the possibility exists that UFO's reported may be hostile or new foreign air vehicles of unconventional design, it is imperative to report sightings rapidly, factually, and as completely as possible.

b. *Technical and Scientific.* The Air Force will continue to collect and analyze reports of UFO's until all are scientifically or technically explained or until the full potential of the sightings has been exploited. In performing this task the following factors are of great importance:

(1) To measure scientific advances, the Air Force must have the latest experimental and developmental information on new or unique air vehicles or weapons.

(2) The possibility exists that foreign countries may develop air vehicles of revolutionary configuration or propulsion.

(3) There is need for further scientific knowledge in such fields as geophysics, astronomy, and physics of the upper atmosphere which the study and analysis of UFO's and similar aerial phenomena may provide.

(4) The reporting of all pertinent factors will have a direct bearing on scientific analyses and conclusions of UFO sightings.

c. *Reduction of Percentage of UFO "Unidentifieds."* Air Force activities must reduce the percentage of unidentifieds to the minimum. Analysis thus far has explained all but a few of the sightings reported. These unexplained sightings are carried statistically as unidentifieds. If more immediate, detailed, objective data on the unknowns had been available, probably these, too, could have been explained. However, because of the human factors involved, and the fact that analyses of UFO sightings depend primarily on the personal impressions and interpretations of the observers rather than on accurate scientific data or facts obtained under controlled conditions, the elimination of all unidentifieds is improbable.

3. Responsibilities:

a. *Reporting.* Base commanders will report all information and evidence of UFO sightings, including information and evidence received from other services, Government agencies, and civilian sources. Investigators are authorized to make telephone calls from the investigation area direct to the Foreign Technology Division (FTD), of the Air Force Systems Command, Wright-Patterson Air Force Base, Ohio (CLearwater 3-7111, ext. 69216/66378). The purpose of the calls is to report high priority findings. (See section C.)

b. *Investigation.* The commander of the Air Force base nearest the location of the reported UFO sighting will conduct all investigative action necessary to submit a complete initial report of a UFO sighting. The initial investigation will include every effort to resolve the sighting. An Air Force base other than that closest to the scene of a reported UFO sighting will refer the sighting immediately to the commander of the nearest Air Force base for appropriate action. (See paragraph 5.)

c. *Analysis.* The Air Force Systems Command Foreign Technology Division will analyze and evaluate:

(1) Information and evidence reported within the United States after the investigators of the responsible Air Force base nearest the sighting have exhausted their efforts to identify the UFO.

(2) Information and evidence collected in oversea areas.

EXCEPTION: The AFSC (FTD), independently or in participation with pertinent Air Force activities, may conduct any additional investigations necessary to further or conclude its analyses or findings.

d. *Findings.* AFSC (FTD) will prepare a final report on each sighting after collection and analysis of data, and will forward a copy of the report to HQ USAF (AFCIN).

e. *Public Relations and Information Services.* The Office of Information, Office of the Secretary of the Air Force, will be responsible for releasing information on sightings, and, in coordination with AFSC (FTD), answering correspondence from the public regarding UFO's. (See paragraphs 7 and 8.)

f. *Congressional Inquiries.* The Office of Legislative Liaison will:

(1) In coordination with the AFSC (FTD) and/or the Office of Information, when necessary, answer all congressional mail regarding UFO's addressed to the Secretary of the Air Force and Headquarters USAF.

(2) Forward those inquiries which are scientific and technical to the FTD for information on which to base a reply. The FTD will re-

turn this information to the Office of Legislative Liaison for reply to the inquiry.

(3) Process requests from congressional sources in accordance with AFR 11–7.

g. *Cooperation.* All Air Force activities will cooperate with Air Force UFO investigators to insure the economical and prompt success of investigations and analyses. When feasible, this cooperation will include furnishing air or ground transportation and other assistance.

4. Guidance. The thoroughness and quality of a report or investigation of UFO's are limited only by the skill and resourcefulness of the person who receives the initial information and/or prepares the report. The usefulness and value of any report or investigation depend on the accuracy and timeliness of its contents. Following are aids for screening, evaluating, and reporting sightings:

a. Careful study of the logic, consistency, and coherence of the observer's report. An interview with the observer by personnel preparing the report is especially valuable in determining the source's reliability and the validity of the information given. Factors deserving particular attention are the observer's age, occupation, and education, and whether his occupation involves observation reporting or technical knowledge. A report stating that a witness is completely familiar with certain aspects of a sighting should indicate his or her specific qualifications.

b. Theodolite measurements of changes in azimuth, and elevation and angular size.

c. Interception, identification, or air search, if appropriate and within the scope of air defense regulations.

d. When feasible, contact with local aircraft control and warning (ACW) units, and with pilots and crews of aircraft aloft at the time and place of sighting. Also, contact with any other persons or organizations that may have factual data on the UFO or can offer corroborating evidence—visual, electronic, or other.

e. Consultation with military or civilian weather forecasters for data on tracks of weather balloons released in the area and any unusual meteorological activity which may have a bearing on the UFO.

f. Consultation with navigators and astronomers in the area to determine whether any astronomical body or phenomenon would account for the sighting.

g. Contact with military and civilian tower operators, air operations units, and airlines to determine whether the sighting could have been an aircraft. Local units of the Federal Aviation Agency (FAA) are often of assistance in this regard.

h. Contact with persons who may know of experimental aircraft of unusual configuration, rocket and guided missile firings, or aerial tests in the area.

i. Contact with photographic units or laboratories. Usually, these installations have several cameras available for specialized intelligence or investigative work. Photography is an invaluable tool for use, where possible, in investigating and analyzing UFO sightings. (See paragraph 18).

j. Whenever possible, selecting as a UFO sighting investigator an individual with a scientific or technical background as well as experience as an investigator.

k. Submission of reports on all sightings even though identification may be assumed by the preparing officer under paragraph 16 of this regulation.

5. Reporting UFO Information. Both the Assistant Chief of Staff, Intelligence, Headquarters USAF, and the Air Defense Command have a direct and immediate interest in the facts pertaining to UFO's reported within the United States. All Air Force activities will conduct UFO investigations to the extent necessary for their required reporting action (see paragraphs 14, 15, and 16). No activity should carry an investigation beyond this point, unless the preparing officer believes the magnitude (intelligence significance or public relations aspects) of the case warrant full scale investigation. The officer may contact the FTD of AFSC (CLearwater 3-7111, ext 69216/66378) at Wright-Patterson Air Force Base, Ohio, to obtain verbal authority for continued investigation.

SECTION B—PUBLIC RELATIONS, INFORMATION, CONTACTS, AND RELEASES

6. Maintaining Public Relations. The Office of Information is responsible for:

a. In coordination with the AFSC (FTD) when necessary, maintaining contact with the public and the press on all aspects of the UFO program and its related activities.

b. Releasing information on UFO sightings and results of investigations.

c. Periodically releasing information on this subject to the general public.

d. Processing, answering, and taking action on correspondence received from the general public, pertaining to the public relations, interest, and informational aspects of the subject. (See paragraph 8.) This office will forward correspondence and queries which are purely technical and scientific to AFSC (FTD) for information on which to base a reply.

7. Releasing Information. The Office of Information, Office of the Secretary of the Air Force, will release to the public or unofficial persons or organizations all information or releases concerning UFO's, regardless of origin or nature. This includes replies to correspondence (except congressional inquiries) submitted direct to the AFSC (FTD) and other Air Force activities by private individuals requesting comments or results of analyses and investigations of sightings.

8. Exceptions. In response to local inquiries regarding any UFO reported in the vicinity of an Air Force base, the commander of the base concerned may release information to the press or the general public only after positive identification of the sighting as a familiar or known object. The commander must exercise care not to reveal any classified aspects of the sighting or names of persons making reports. (See paragraph 17.) If the sighting is unexplainable or difficult to identify, because of insufficient information or inconsistencies, the only statement to be released is the fact that the sighting is under investigation and information regarding it will be available at a later date. After completion of investigative action, the commander may release the fact that the AFSC (FTD) will review and analyze the results of the investigation. He will then refer any further inquiries to the local Office of Information.

9. Release by Non-Air Force Sources. If newsmen, writers, publishers, or private individuals desire to release unofficial information concerning a UFO sighting, Air Force activities will make every effort to assure that the statements, theories, opinions, and allegations of these individuals or groups are not associated with or represented as official information.

10. Contacts. Private individuals or organizations desiring Air Force interviews, briefings, lectures, or private discussions on UFO's will direct their requests to the Office of Information, Office of the Secretary of the Air Force. Air Force personnel, other than those of the Office of Information, will not contact private individuals on UFO cases, nor will they discuss their operations and functions with unauthorized persons unless so directed, and then only on a "need-to-know" basis.

SECTION C—PREPARING AND SUBMITTING REPORTS

11. General Information:

a. Paragraphs 6 and 7 will serve as aids and guidance to screenings, investigations, and reportings. Paragraph 14 contains an outline of the reporting format. Activities initially receiving reports of aerial objects and phenomena will screen the information to determine whether the report concerns a valid UFO within the definition of paragraph 1b. Reports not within that definition do not require further action under the provisions of this regulation.

b. To assist activities and personnel responsible for handling, screening, and processing initial, incoming UFO information, a summary follows of the general sources and types of reports:

(1) Generally, initial UFO reports originate from two sources:

(a) Civilian (airline, private, and professional pilots, tower operators, technical personnel, casual observers, and the public in general), by correspondence, telephone or personal interview;

(b) Military units and personnel (pilots, observers, radar operators, aircraft control and warning units, etc.), by telephone, electrical message, or personal interview;

(2) Generally, UFO reports received from civilian sources are of two types:

(a) Those referring strictly to an observed UFO, containing either detailed or meager information;

(b) Those referring only in part to an observed UFO, but primarily requesting information on some aspect of the UFO program.

c. Reports considered to fall primarily in a public relations or information service category (see paragraphs 7, 8, 9, and b(2)(b) above) are of primary interest to the Office of Information. UFO data sufficient for investigation and/or analysis may be extracted before referral to that office.

12. Methods for Transmitting Reports:

a. Together with any necessary screenings and investigations preparatory to reporting, report all information on UFO's promptly. Electrical transmission with a "Priority" precedence is authorized for reports under 3 days from date of sighting. Electrically transmitted reports over 3 days old should carry a "Routine" precedence.

b. Submit written reports of sightings over 3 days old on AF Form 112, "Intelligence Report,"

and AF Form 112A, "Supplement to AF Form 112" (see paragraphs 14 and 15); however, keep the use of these forms to a minimum in reporting initial sightings. The delays often involved in processing and transmitting AF Form 112 through channels may make followup investigations difficult, producing only limited usable information. This factor is a necessary consideration. Reporting by electrical means will eliminate delays. If requested by the AFSC (FTD), AF Form 112 will provide a followup and/or complete report of all sightings initially reported electrically.

13. Where To Submit Reports:

a. *Electrical Reports.* Submit multiple addressed electrical reports to:

(1) Air Defense Command, Ent AFB, Colorado

(2) Nearest Air Division (Defense) (For United States only)

(3) Air Force Systems Command, Foreign Technology Division, Wright-Patterson AFB, Ohio

(4) Headquarters, USAF (AFMIN), Wash 25 DC

(5) Secretary of the Air Force (SAFOI), Wash 25 DC

b. *Written Reports* (Basic letters and AF Form 112):

(1) ~~*Basic Letters.* Submit all letter reports~~ direct to the AFSC (FTD). The AFSC (FTD) will distribute the reports to interested Intelligence activities in the United States and to the ~~Office of Information, if necessary~~.

(2) ~~*AF Form 118.* Submit original report,~~ as prescribed in "Intelligence Collection Instruction (ICI)," June ~~1954~~, direct to HQ USAF (AFCIN) ~~Wash~~ 25 DC, and a copy to AFSC ~~(FTD)~~.

c. *Reports from Civilians.* Where possible, advise civilian sources contemplating reporting UFO's to submit the report, for processing and transmission, to the nearest Air Force base.

14. Basic Reporting Data and Format. Show the abbreviation "UFO" at the beginning of the text of all electrical reports and in the subject of written reports. Include the required data in all reports, in the order shown below:

a. *Description of the Object(s):*

(1) Shape.

(2) Size compared to a known object (use one of the following terms: Head of a pin, pea, dime, nickel, quarter, half dollar, silver dollar, baseball, grapefruit, or basketball) held in the hand at about arm's length.

(3) Color.

(4) Number.

(5) Formation, if more than one.

(6) Any discernible features or details.

(7) Tail, trail, or exhaust, including size of same compared to size of object(s).

(8) Sound; if heard, describe sound.

(9) Other pertinent or unusual features.

b. *Description of Course of Object(s):*

(1) What first called the attention of observer(s) to the object(s)?

(2) Angle or elevation and azimuth of object(s) when first observed.

(3) Angle or elevation and azimuth of object(s) upon disappearance.

(4) Description of flight path and maneuvers of object(s).

(5) How did the object(s) disappear? (Instantaneously to the North, etc.)

(6) How long (were) the object(s) visible? (Be specific, 5 minutes, 1 hour, etc.)

c. *Manner of Observation:*

(1) Use one or any combination of the following items: Ground-visual, air-visual, ground-electronic, air-electronic. (If electronic, specify type of radar.)

(2) Statement as to optical aids (telescopes, binoculars, etc.) used and description thereof.

(3) If the sighting occurred while air-borne, give type of aircraft, identification number, altitude, heading, speed, and home station.

d. *Time and Date of Sighting:*

(1) Zulu time-date group of sighting.

(2) Light conditions. (Use one of the following terms: Night, day, dawn, dusk.)

e. *Location of Observer(s).* Give exact latitude and longitude of each observer, and/or geographical position. In electrical reports, give a position with reference to a known landmark also, such as "2mi N of Deeville"; "3mi SW of Blue Lake." Typographical errors or "garbling" often occur in electrically transmitted messages, making location plots difficult or impossible.

Example: 89 45N, 192 71W for 39 45N, 102 21W.

f. *Identifying Information on Observer(s):*

(1) Civilian—Name, age, mailing address, occupation, and estimate of reliability.

(2) Military—Name, grade, organization, duty, and estimate of reliability.

g. *Weather and Winds—Aloft Conditions at Time and Place of Sightings:*

(1) Observer(s) account of weather conditions.

(2) Report from nearest AWS or U. S. Weather Bureau Office of wind direction and velocity in degrees and knots at surface, 6,000′, 10,000′, 16,000′, 20,000′, 30,000′, 50,000′, and 80,000′, if available.

(3) Ceiling.

(4) Visibility.

(5) Amount of cloud cover.

(6) Thunderstorms in area and quadrant in which located.

(7) Vertical temperature gradient.

h. *Any other unusual activity or condition,* meteorological, astronomical, or otherwise, which might account for the sighting.

i. *Interception or identification action taken* (such action is authorized whenever feasible, and in compliance with existing air defense directives).

j. *Location, approximate altitude, and general direction* of flight of any air traffic or balloon releases in the area which might possibly account for the sighting.

k. *Position title and comments of the preparing officer,* including his preliminary analysis of the possible cause of the sighting(s). (See paragraph 16.)

l. *Existence of physical evidence,* such as materials and photographs.

15. Negative or Inapplicable Data. Even though the source does not provide, or an interviewer has not asked for specific information, do not use the words "negative" or "unidentified" before exhausting all logical leads to obtain the information outlined under paragraph 14. For example, information on weather conditions in the area, as requested in paragraph 14g, is obtainable from the local military or civilian weather facility. Use the phrase "not applicable (N/A)" only when the question does not apply to the particular sighting under investigation.

16. Comments of Preparing Officer. The preparing officer will make a preliminary analysis and a comment on the possible cause or identity of the object he is reporting, together with a statement supporting his comment and analysis. He will make every effort to obtain pertinent items of information and to test all possible leads, clues, and hypotheses concerning the identity or explanation of the sighting. (See paragraph 5.) The preparing officer who receives the report initially is in a much better position to conduct an "on-the-spot" survey or followup than subsequent investigative personnel and analysts, who may be far removed from the area, and who may arrive too late to obtain vital data or the missing information necessary for firm conclusions.

17. Classification. Do not classify reports unless data requested in paragraph 14 require classification. Classify reports primarily to protect:

a. Names of sources reporting UFO's and other principals involved, *if so requested by these persons or considered necessary;*

b. Intelligence, investigative, intercept, or analytical methods or procedures;

c. Location of radar and other classified sites, units, and equipment;

d. Information on certain types, characteristics, and capabilities of classified aircraft, missiles, or devices that may be involved in the sighting.

18. Reporting Physical Evidence. Report promptly the existence of physical evidence (photographic or material). Mark all physical evidence forwarded to the AFSC (FTD) for the attention of ~~TD-E~~, Aerial Phenomena Branch.

a. *Photographic:*

(1) *Still Photographs.* Forward the negative and two prints. Title the prints and the negatives, or indicate the place, time, and date of the incident.

(2) *Motion Pictures.* Obtain the original film. Examine the film strip for apparent cuts, alterations, obliterations, or defects. In the report comment on any irregularities, particularly those received from other than official sources.

(3) *Supplemental Photographic Information.* Negatives and prints often are insufficient to provide certain valid data or to permit firm conclusions. (See AFM 200–9—a classified document receiving limited distribution.) Information that will aid in plotting or in estimating distances, apparent size and nature of object, probable velocity, and movements includes:

(a) Type and make of camera,
(b) Type, focal length, and make of lens,
(c) Brand and type of film,
(d) Shutter speed used,
(e) Lens opening used; that is, "f" stop,
(f) Filters used,
(g) Was tripod or solid stand used,
(h) Was "panning" used,
(i) Exact direction camera was pointing with relation to true north, and its angle with respect to the ground.

(4) *Other Camera Data.* If supplemental information is unobtainable, the minimum camera data required are the type of camera, and the smallest and largest "f" stop and shutter-speed readings of the camera.

(5) *Radar.* Forward two copies of each still-camera photographic print. Title radarscope photographic prints in accordance with AFR 95–7. Classify radarscope photographs in accordance with Section XII, AFR 205–1, 10 June 1960.

NOTE: If possible, develop photographic film before forwarding. Mark any undeveloped film conspicuously to indicate this fact, to avoid destruction by exposure during examinations en route through mail channels to final addressees.

b. *Material.* Each Air Force echelon receiving suspected or actual UFO material will safeguard it in a manner to prevent any defacing or alterations which might reduce its value for intelligence examination and analysis.

c. *Photographs, Motion Pictures, and Negatives Submitted by Individuals.* Individuals often submit photographic and motion picture material as part of their UFO reports. All original material submitted will be returned to the individual after completion of necessary studies, analyses, and duplication by the Air Force.

BY ORDER OF THE SECRETARY OF THE AIR FORCE:

CURTIS E. LeMAY
Chief of Staff

OFFICIAL:

R. J. PUGH
Colonel, USAF
Director of Administrative Services

☆ U. S. GOVERNMENT PRINTING OFFICE: 1962

CHANGE

AFR 200–2A

AIR FORCE REGULATION
NO. 200–2A

DEPARTMENT OF THE AIR FORCE
Washington, *30 March 1964*

Intelligence Activities

UNIDENTIFIED FLYING OBJECTS (UFO)

AFR 200–2, 20 July 1962, is changed as follows:

3d. *Findings.* AFSC (FTD) will prepare a final report on each sighting after collection and analysis of data. When final report contains information of significant intelligence value, AFSC (FTD) will forward a copy of the report to HQ USAF (AFNINDE), Wash DC 20330.

3e. Change references to paragraphs "7 and 8" to "6 and 7."

4b. Change "or" to "of."

10. *Contacts.* Private individuals or organizations desiring Air Force interviews, briefings, lectures, or private discussions on UFOs will be instructed to direct their requests to the Office of Information, Office of the Secretary of the Air Force. Air Force personnel, other than designated investigators (see paragraph 3b) and those of the Office of Information, will not contact private individuals on UFO cases, nor will they discuss their operations and functions with unauthorized persons, unless so directed, and then only on a need-to-know basis.

11a. Change references to paragraphs "2 and 5" to "1 and 4."

11c. Change references to paragraphs "7, 8, 9, and b(2)" to "6, 7, 8, and b(2)(b)."

12b. Submit reports of sightings over 3 days old by letter; however, keep the use of letter reports to a minimum in reporting initial sightings. The delays often involved in processing and transmitting correspondence through normal channels may make followup investigations difficult, producing only limited usable information. This factor is a necessary consideration. Reporting by electrical means will eliminate delays. Submit a followup and/or complete report on all sightings initially reported electrically, if so requested by AFSC(FTD).

13a(4). Change "AFCIN" to "AFNIN."

13b. *Written Reports.* Submit all letter reports (basic letters and followup or complete reports) direct to AFSC (FTD), Wright-Patterson AFB, Ohio, 45433. AFSC (FTD) will distribute the reports to interested intelligence activities in the United States and to the Office of Information, if necessary.

13b(1). Delete.

13b(2). Delete.

16. Change reference to paragraph "5" to "4."

18. Change "TD-E" to "TDEW."

BY ORDER OF THE SECRETARY OF THE AIR FORCE

CURTIS E. LeMAY
Chief of Staff

OFFICIAL

R. J. PUGH
Colonel, USAF
Director of Administrative Services

DISTRIBUTION: S

☆ U. S. GOVERNMENT PRINTING OFFICE: 1964

[redacted]

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS UNITED STATES AIR FORCE
WASHINGTON 25, D.C.

REPLY TO ATTN OF: AFBSA

22 December 1965

SUBJECT: Ad Hoc Committee on Unidentified Flying Objects (UFOs)

TO: Members of Committee

1. You are invited to attend a meeting of the USAF Scientific Advisory Board Ad Hoc Committee on UFOs at the Foreign Technology Division, Wright-Patterson AFB, Ohio, on 3 February 1966. An agenda is attached (Atch #1).

2. In 1948, the Air Force initiated Project Blue Book whose objectives were twofold: (1) to determine whether UFOs pose a threat to the security of the United States, and (2) to determine whether UFOs exhibit any unique scientific information or advanced technology which could contribute to scientific or technical research. The objectives of the Ad Hoc Committee are to review the resources, methods, and findings of Project Blue Book and to advise the Air Force as to any improvements that should be made in the program in order to carry out the Air Force's original responsibility. Correspondence from the Secretary of the Air Force Information Office relating to this meeting as well as other pertinent documentation is attached for your information. (Atchs 2, 3, and 4).

3. Quarters for attendees will be available at the Wright-Patterson Visiting Officers Quarters. Please let me know at your earliest convenience when you plan to arrive so that transportation can be provided. My phone is Area Code 202 - 697-8845/697-8404.

Harold A. Steiner

HAROLD A. STEINER, Major, USAF
Assistant Secretary
USAF Scientific Advisory Board

Atch
1. Agenda
2. SAFOI Memo 28 Sep 65
3. SAFOI Memo 16 Dec 65
4. Excerpt fr Wall Street Journal 13 Dec 65

1/ Cy to: Dr. Cacciopo

[redacted]

AD HOC COMMITTEE ON
UNIDENTIFIED FLYING OBJECTS (UFOs)

MEMBERS

Dr. Brian O'Brien (Chairman)
Dr. Launor F. Carter
Mr. Jesse Orlansky
Dr. Richard Porter
Dr. Carl Sagan
Dr. Willis H. Ware

[redacted] Only

AD HOC COMMITTEE ON
UNIDENTIFIED FLYING OBJECTS (UFOs)

AGENDA

Thursday, 3 February 1966

0800	Welcoming Remarks	Commander or Vice Commander, FTD
0805	Introduction	Dr. O'Brien, SAB
0810	Briefing on Project Blue Book	Major Quintanilla, FTD
1000	Break	
1015	Review of Selected Case Histories	FTD
1145	Lunch	
1315	Executive and Writing Session	

APPROVED:

Harold A. Steiner

HAROLD A. STEINER, Major, USAF
Assistant Secretary
USAF Scientific Advisory Board

22 December 1965

[redacted] Only

Atch #1

DEPARTMENT OF THE AIR FORCE
WASHINGTON

OFFICE OF THE SECRETARY

SEP 2 6 1965

MEMORANDUM FOR MILITARY DIRECTOR, SCIENTIFIC ADVISORY BOARD

SUBJECT. Unidentified Flying Objects (UFOs)

In keeping with its air defense role, the Air Force has the responsibility for the investigation of unidentified flying objects reported over the United States. The name of this project is Blue Book (Attachment 1). Procedures for conducting this program are established by Air Force Regulation 200-2 (Attachment 2).

The Air Force has conducted Project Blue Book since 1948. As of 30 June 1965, a total of 9267 reports had been investigated by the Air Force. Of these 9267 reports, 663 cannot be explained.

It has been determined by the Assistant Deputy Chief of Staff/ Plans and Operations that Project Blue Book is a worthwhile program which deserves the support of all staff agencies and major commands and that the Air Force should continue to investigate and analyze all UFO reports in order to assure that such objects do not present a threat to our national security. The Assistant Deputy Chief of Staff/Plans and Operations has determined also that the Foreign Technology Division (FTD) at Wright-Patterson Air Force Base should continue to exercise its presently assigned responsibilities concerning UFOs.

To date, the Air Force has found no evidence that any of the UFO reports reflect a threat to our national security. However, many of the reports that cannot be explained have come from intelligent and technically well qualified individuals whose integrity cannot be doubted. In addition, the reports received officially by the Air Force include only a fraction of the spectacular reports which are publicized by many private UFO organizations.

Accordingly, it is requested that a working scientific panel composed of both physical and social scientists be organized to review Project Blue Book -- its resources, methods, and findings -- and to advise the Air Force as to any improvements that should be made in the program in order to carry out the Air Force's assigned responsibility.

Atch # 2

Doctor J. Allen Hynek who is the Chairman of the Dearborn Observatory at Northwestern University is the scientific consultant to Project Blue Book. He has indicated a willingness to work with such a panel in order to place this problem in its proper perspective.

Doctor Hynek has discussed this problem with Doctor Winston M. Markey, the former Air Force Chief Scientist.

E. B. LeBAILLY
Major General, USAF
Director of Information

2 Attachments
1. Blue Book Report
2. AFR 200-2

UNIDENTIFIED FLYING OBJECTS

by Carl Sagan

Department of Astronomy, Harvard University;
and Smithsonian Astrophysical Observatory,
Cambridge, Massachusetts

Copyright 1963 by The Encyclopedia Americana
Reprinted for private circulation

Unidentified Flying Objects: a generic term for atmospheric phenomena, detected visually or by radar, of a nature not immediately understood. The principal interest in these objects stems from the speculation that some of them are of intelligent extraterrestrial origin, and from the psychological insights into contemporary human problems which this interpretation provides.

Current popular interest in unidentified flying objects began on June 24, 1947, when a set of rapidly-moving, glistening objects were observed from the air in daytime, near Mt. Rainier, Washington, by Kenneth Arnold, a Seattle resident, who dubbed them "flying saucers." The sighting received extensive publicity, and somewhat similar sightings have been reported ever since. The diversity of these observations, however, is as striking as the observations themselves. Unidentified flying objects (or UFOs) have been described variously as rapidly-moving or hovering; disc-shaped, cigar-shaped, or ball-shaped; moving silently, or noisily; with a fiery exhaust, or with no exhaust whatever; accompanied by flashing lights, or uniformly glowing with a silvery cast. A simple listing of the observations suggests that all UFOs do not share a common origin. In-

deed, the use of generic terms such as "UFOs" or "flying saucers" has served to confuse the issue by the implication of common origin.

Because of its air defense responsibility, the United States Air Force has undertaken to investigate all reports of unidentified flying objects over the United States. The number of sightings reported and investigated between 1947 and 1960 is shown in the accompanying Table.

Evaluation of these reports is difficult. The observations are frequently fragmentary, and reports by different observers of the same phenomenon are often dissimilar, or even irreconcilable. There is an understandable tendency for the observer to exaggerate the spectacular aspects of his observations. In many instances, statements are made concerning distance, size, and velocity which are without foundation. A small object, close by, may appear larger than a large object far away. Also, many deliberate hoaxes have been perpetrated (for example, involving double-exposure photography). After allowances are made for these possibly confusing factors, the accepted scientific procedure is to attempt an explanation of the observations in terms of natural phenomena. Only if an observation is not readily explicable in terms of known phenomena does the scientist

introduce, ad hoc, another phenomenon in explanation.

Confirmed identifications of UFOs have been made with the following: unconventional aircraft; aircraft under uncommon weather conditions; aircraft with unusual external light patterns; meteorological and other high-altitude balloons; artificial earth satellites; flocks of birds; reflections of searchlights or headlights off clouds; reflection of sunlight from shiny surfaces; luminescent organisms, including one case of a firefly lodged between two adjacent panes of glass in an airplane cockpit window; optical mirages and looming; lenticular cloud formations; ball lightning; sundogs; meteors, including the rare green fireballs; planets, especially Venus; bright stars; and the Aurora Borealis. Radar detection of unidentified flying objects has also occurred occasionally. Many of these sightings have been explained in terms of radar reflection off temperature inversion layers in the atmosphere, and other sources of radar "angels."

Considering the difficulties in tracing out the visual and radar sightings, it is remarkable that all but about 1% of the reported UFOs have been identified as naturally-occurring -- if sometimes unusual -- phenomena. In October, 1957, Sputnik I, the first earth-orbiting artificial satellite, was launched. Of the 1,178 sightings in that year, 701 occurred between October and December. There is a clear

implication that Sputnik and its attendant publicity was responsible for many "UFO" sightings.

In July, 1952, a set of visual and radar observations of unidentified flying objects over Washington, D. C. caused some public hysteria. Government concern was reflected in the establishment, by the Office of Scientific Intelligence of the Central Intelligence Agency, in November, 1952, of a special panel chaired by Professor H. P. Robertson, of the California Institute of Technology, to evaluate these reports. The Robertson panel thoroughly investigated the UFO reports to that date, and concluded that all were very probably natural phenomena, erroneously interpreted.

There have been strange objects seen in the sky ever since men first looked upwards. But the testimony of greatest reliability should be that of the professional astronomer. Professor J. L. Greenstein, of Mt. Wilson and Palomar Observatories, California Institute of Technology, has pointed out that a vehicle 100 feet in diameter, at an altitude of 50 miles, would leave a broad track on photographic plates taken of the sky with large telescopes, a track easily distinguishable from those of ordinary astronomical objects such as stars, meteors, and comets. Nevertheless, the 5,000 plates of the Palomar Sky Survey and some half-million wide-angle, fast-lens photographs taken

at Harvard College Observatory have never indicated the existence of any such object.

Repeated sightings of UFOs, and the persistence of the Air Force and the responsible scientific community in explaining the sightings away, has suggested to some that a conspiracy exists to conceal from the public the true nature of the UFOs. Might not at least a small fraction of the residual 1% of the sightings be space vehicles of intelligent extraterrestrial origin, observing the Earth and its inhabitants? Let us examine this possibility.

It now seems quite clear that the Earth is not the only inhabited planet. There is evidence that the bulk of the stars in the sky have planetary systems. Recent research concerning the origin of life on Earth suggests that the physical and chemical processes leading to the origin of life occur rapidly in the early history of the majority of planets. The selective value of intelligence and technical civilization is obvious, and it seems likely that a large number of planets within our Milky Way galaxy -- perhaps as many as a million -- are inhabited by technical civilizations in advance of our own. Interstellar spaceflight is far beyond our present technical capabilities, but there seem to be no fundamental physical objections to

it, and it would be very rash indeed to preclude, from our present vantage point, the possibility of its development by other civilizations. If each of, say, a million advanced technical civilizations in our galaxy launched an interstellar spacecraft per year (and even for an advanced civilization, the launching of an interstellar space vehicle will not be a trivial undertaking), and even if all stars in the galaxy can be explored with equal facility, then our solar system should, on the average, be visited only once every hundred thousand years.

UFO enthusiasts have sometimes castigated the skeptic for anthropocentrism. Actually, the view that the Earth is daily visited by interstellar spacecraft is far more anthropocentric. If even a small fraction of the residual UFOs are interstellar spacecraft, this would imply an overriding significance to our small planet; as if all the professional anthropologists in the world converged on one of the Andaman Islands because the fishnet had recently been invented there. Anthropologists have other interests. Only a few specialize in the cultures of the Andaman Islands. If our views on the frequency of intelligence in the galaxy are correct, there is no reason for the Earth to be singled out for interstellar visits. A somewhat greater frequency of visits

could be expected if there were another intelligent civilization within our own solar system, but at the present time there is no evidence for the existence of such a civilization on Mars or on any other nearby planet.

Related to the UFO report is the contact tale, a contemporary report of the landing of an extraterrestrial space vehicle on Earth. Unlike the UFO descriptions, these tales display a striking uniformity. The extraterrestrials are described as humanoid, differing from us only in some small characteristic such as teeth, speech, or dress. The aliens -- so the "contactees" report -- have been observing Earth and its inhabitants for many years, and express concern at "the present grave political situation." They are fearful that, left to our own devices, we will destroy our civilization. The contactee is then selected as their "chosen intermediary" with the governments and inhabitants of Earth (The contactee's qualifications for this position are not always evident.). He is taken on voyages in the spacecraft, sometimes to the visitors' home planets, but somehow the promised political or social intervention never materializes.

C. G. Jung has pointed out that the frequency and persistence of these contact tales -- not one of which has been confirmed by the slightest objective evidence -- must be of

substantial psychological significance. What need is fulfilled by a belief that unidentified flying objects are of extraterrestrial origin? It is noteworthy that in the contact tales, the spacecraft and their crews are never reported to be hostile. It would be very satisfying if a race of advanced and benign creatures were devoted to our welfare. The interest in unidentified flying objects derives, perhaps, not so much from scientific curiosity as from unfulfilled religious needs. Flying saucers serve, for some, to replace the gods that science -- for good or otherwise -- has deposed. The old mythological frameworks have evaporated, but, with their reports of distant and exotic worlds and their pseudo-scientific overlay, the contact accounts are acceptable to many people. These tales, and their attendant ritual, comprise one of the few viable contemporary cult movements of more than passing interest and local relevance. But precisely because people desire so intensely that unidentified flying objects be of benign, intelligent, and extraterrestrial origin, honesty requires that, in evaluating the observations, we accept only the most rigorous logic and the most convincing evidence.

YEAR	NUMBER OF REPORTED SIGHTINGS*	YEAR	NUMBER OF REPORTED SIGHTINGS
1947	79	1954	429
1948	143	1955	404
1949	186	1956	778
1950	169	1957	1,178
1951	121	1958	473
1952	1,501	1959	364
1953	425	1960	173

*Tabulated by Tacker, 1960.

REFERENCES:

1. E. J. Ruppelt, "The Report on Unidentified Flying Objects" (Doubleday: New York, 1956).

2. C. G. Jung, "Flying Saucers: A Modern-Myth of Things Seen in the Skies" (Harcourt Brace and Company: New York, 1959).

3. Lt. Col. L. J. Tacker, "Flying Saucers and the U.S. Air Force" (D. Van Nostrand Company: Princeton, 1960).

4. D. H. Menzel and L. G. Boyd, "The World of Flying Saucers: A Scientific Examination of a Major Myth of the Space Age" (Doubleday: New York, 1963).

AIRCRAFT

Aircraft evaluations are made on the basis of description and flight characteristics. In the majority of reports attributable to aircraft no object is observed and the evaluation is made primarily on the time-motion sequence. The lighting and visual characteristics as well as the time motion sequence may differ with the type of aircraft and/or its mission. Local military installations are contacted for flights or military aircraft operating in the area of a sighting. ACIC provides the section with maps showing low and high level air corridors and flight restricted areas. They also publish the "Flight Planning Guide" which lists all refueling areas and their control agency. Special low-level military training areas are included in this publication and a map showing the routes is distributed periodically. ASD provides support on aircraft lighting configurations and the 17th Bomb Wing provides the project with local schedules. The 922 Air Refueling Squadron at WPAFB provides information of visual characteristics of night refueling operations. SAC recently photographed a refueling mission so that the visual characteristics of a refueling operation might be observed by analysis personnel. Civilian and military agencies known to be engaged in night photography are contacted in cases of suspected photographic missions. No case is evaluated as an A/C if the reported maneuvers are not consistant with aircraft flight.

CONVENTIONAL

a) Regular scheduled airliners - Fly in air corridors, and are usually controlled by FAA. Lighting will probably be typical red and green wing lights with rotating beacon (Grimes). These A/C use landing lights on takeoff as well as while in landing pattern. Visual characteristics may include period of time reported as hovering or stationary if the aircraft is in a turn or approaching the observer. Total duration should be consistant with flight maneuvers. Not likely that duration will exceed 5 minutes unless some series of maneuvers is being performed. Most often reported at night and reported as single light (landing light blots out the red and green flashing lights). Lighting configurations are not necessarily standard. Experimental and unusual lighting effects can vary with the lighting configuration of each aircraft. (See attached letters from FAA and ARMCO.) Color most often reported as white, can be red. Those objects in straight flight at altitude can be checked against local flight corridors. FAA can be checked if there is some doubt that the object is an aircraft or if positive identification as to a specific flight is required. May or may not have sound associated with the report. If near an airport, this type of object is not regarded as a UFO since moving lights in and around airports which could be caused by aircraft are regarded as aircraft (definition included in AFR 200-2).

b) Private or non-scheduled flights - Same characteristics as conventional airliner. Speeds of light aircraft may be slower and the duration longer. Usually at lower altitude. Sound will not be heard if the wind is blowing away from the observer. Duration should not exceed 7 or 8 minutes unless maneuvers can account for additional time period. Normal flight is VFR from some local airport. Not carried on RADAR plots through FAA. Hardest type to check for positive identification. Evaluation made on flight characteristics consistent with A/C.

JET AIRCRAFT

Visual characteristics depend upon the type of mission:
a) Airliner and high altitude missions are similar to conventional flights in visual characteristics with the following exceptions: (1) The color is most often reported as red. (2) No sound is associated with the object. (3) Flight is usually straight or with one turn. Duration is about 3-5 minutes depending upon the degree of arc through which the object passes. The FAA has designated airways along which these flights are flown.

b) Special low level missions (military). - Mission flown at 2,000 ft. in known air corridors. Sighting is usually brief (one minute or less). description will consist of an object which may appear to be hovering if the approach is directly toward the observer. May include a sudden burst of speed. No sound if wind is away from observer. More than one light may be observed but object is usually reported as a single light. Flights are at night. These aircraft are not misinterpreted during the day since wings, tail, and/or other features can be noted. (Sample route attached)

c) Special tests or training missions - Characteristics will depend on the number of A/C, formation, type of A/C, etc. Can vary from a single A/C to multiple flights or major air operations. These lights can be determined by contact with local, regional, or major air commands.

d) Jet with afterburner - Afterburner operation viewed from the side may give the appearance of a short flame. Color usually reported as blue, shape tapering. If afterburner is cut off object may be reported as disappearing completely by just vanishing or the witness may believe that the object zoomed off into space. Duration usually brief. Object frequently in a climb. As viewed from the rear as the object is going away from the observer the color reported may be red or orange with some yellow and shape will not be ascribed to the object. Again disappearance may be sudden. If at high altitude may be reported as a light only, and characteristic same as for other A/C except that motion is faster.

REFUELING MISSIONS

Differ from other missions in that lights on the tanker and miltiple A/C engaged in the operation add visual characteristics not normally associated with aircraft flight. Reports are night time only since daylight operations can be recognized by the observer. May be both low and high altitude. Refueling missions involve multiple lights moving around, in formation, going on and off, etc. Flight of the basic light formation will be straight until the end of a specific run, then 180 degree turns can be made. Duration in an area may run as high as 15 minutes but each observed single pass should not run more than 4-5 minutes. Lights may appear going one way then appear on their return path at a later time. Operations are controlled and refueling is conducted in specific areas. ACIC planning guide contains the location of these areas and the agency to contact for use of the specific area. Phone calls to the controller of the area will provide information as to whether the area was in use or not. SAC at Offutt Air Force Base maintains refueling schedules for all areas used during a specific month, but these are destroyed on the first day of each month and new schedules maintained. Old records must be obtained from the squadron flying specific mission. The controller can tell which missions were flown, when, and by whom. Specific time of entry and exit must be obtained from the squadron flying the mission. The best procedure is to contact the controller and if the area was in use then contact the squadron for the number and type of A/C flown and their entry and exit times.

PHOTO AIRCRAFT

a) A/C using flare drops--More often reported as flares rather than A/C engaged in photo work.

b) A/C using strobes for illuminating the target. Can be low level or high altitude missions. Only the strobe light is visible and the A/C is reported as a series of evenly spaced flashes. Duration of these sightings usually less than two minutes, more frequently 30 seconds.

c) Infra Red--These aircraft are specially equipped with turbine generators to drive the equipment. The generator makes a noise similar to a whine and can be heard above the noise of the aircraft. Many are on classified projects and the agencies doing this work are limited. The A/C utilized are relatively slow (less than 125 mph.) Much of the work is done early in the morning and landing lights are used because of the low altitudes flown. The A/C will be low, sound will be associated with the object and the landing light should be observed. No portion of the infra red equipment will be observed.

ADVERTISING AIRCRAFT

Fall basically into two types:
a) Those towing targets or banners of some sort visible during daylight hours. Those are not usually misinterpreted unless the aircraft remains at a range sufficient for the observer to see only outlines and not details of the plane and sign being towed. Frequently reports are accompanied by drawings with the towed banner assumed to be a part of the object itself. Duration is longer than usual A/C sightings and flight generally marked by maneuvers. Frequently loud speakers are utilized but when heard the A/C should be within range for identification as a known object. Local investigators can check for these aircraft since FAA regulations require that a permit be obtained for those flights

b) Electrical lighted signs - Same essential characteristics except that normally viewed at night. On occasion these signs have been regarded as windows of a much larger craft. Flights again are relatively slow and maneuvering back and forth in one area is characteristic of the flight. An aircraft usually operates in an area for more than one day and can be viewed on successive nights, weather permitting.

HELICOPTERS

Motion slow. Flight may or may not include hovering. Should be far enough away from the observer that positive identification cannot be made during the day. May be reported as a black speck moving back and forth, up and down, etc. During the night wierd effects can be obtained from the red rotating beacon flashing through the canopy. Again motion will be erratic if the flight includes hovering. Positive identification usually simple to obtain by checking the flight schedules of military and civilian helos in the area.

A sighting is considered unidentified when a report apparently contains all pertinent data necessary to suggest a valid hypothesis concerning the cause or explanation of the report but the description of the object or its motion cannot be correlated with any known object or phenomena.

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	STEADY	[illegible]	[illegible]	[illegible]	NO	NO	NO	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	NO	NO	[illegible]

1965 RPT Feb 66

INCIDENT NO.	DATE	LOCATION (BLOCK, STREET)	BEAT (DIST., ZONE)	NO. OF LOOPS	IF (CLOSED, HOW)	CRIME (S)	NO. OF SUS.	MO (S) WEAPON	POINT OF ENTRY	DAYS
									UNKNOWN DAY	
23	1/2	[illegible]	[illegible]	ONE		[illegible]	1	200-2	LOCK	9
31	1/3	[illegible]	[illegible]	TWO	[illegible]	[illegible]	1	200-2	[illegible]	8
50	1/08	[illegible]	[illegible]	(2)	[illegible] 2 SONS (2)	[illegible]	1	[illegible] 31,	[illegible] ([illegible])	6
140	1/11	[illegible]	[illegible]	ONE	[illegible] (2)	[illegible] CLERICAL INDUSTRY SUPERVISOR	1	200-2	[illegible] ([illegible])	4
174	1/07	[illegible]	[illegible]	(3)	ADULT SON DAU	[illegible]	1	[illegible]	[illegible] ([illegible])	7
250	1/06	[illegible]	[illegible]	ONE	ADULT (F)	HOUSEWIFE	1	[illegible]	PHONE ([illegible])	5
353	1/13	[illegible]	[illegible]	ONE	YOUTH (1)20	STUDENT AGRICULTURE MISSY	1	LETTER 26, 27	PHONE ([illegible])	9
416	2/04	[illegible]	[illegible]	ONE	YOUTH (1)20	NOT REPORTED (WHO KNOWS)	1	LETTER 26,	PHONE ([illegible])	7
422	2/04	[illegible] [illegible]	[illegible]	TWO	YOUNG 2(2)	STUDENTS	1	POOR O'MILLS	PHONE ([illegible])	6
503	2/07	[illegible]	[illegible]	(4)	[illegible] (4) 2(20)	STUDENTS	1	200-2	LOCK	12
520	2/10	[illegible]	[illegible]	(3)	YOUNG (2) 16-20	STUDENTS	1	POLICE REPORT	KNOCK	7
613	2/02	[illegible]	[illegible]	(3)	ADULTS (2) 2 YOUTH	POLICE UNEMPLOYED	1	200-2	LETTERS, PHONE WRNG	56
632	2/03	[illegible]	[illegible]	TWO	ADULTS (2)	POLICE	1	LOCAL INVESTIGATION PHONE (HERMEL)		11
723	2/25	[illegible]	[illegible]	ONE	ADULT (F)	HOUSEWIFE	1	200-2 16A	PHONE (HERMEL)	7
724	2/25	[illegible]	[illegible]	TWO	ADULTS (M)(F)	DOCTOR OF PHYSICAL CHEM AND WIFE	1	200-2	KNOCK ([illegible])	11
825	11/04	[illegible]	[illegible]	(4)	LETTER (2) 3 YOUNG	CHURCH SEXT STUDENTS 12-2,	1	PHONE	KNOCK ? 2)	12

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
"	[illegible]	[illegible]	[illegible]	[illegible] SECONDS	[illegible] VIS 7KM	NO	[illegible]	[illegible]
"	[illegible]	[illegible] [illegible]	[illegible] [illegible] [illegible]	3 MINUTES	[illegible]	NOT [illegible]	[illegible]	[illegible]
"	[illegible]	[illegible] [illegible]	[illegible] [illegible] [illegible]	3-4 SECONDS	[illegible] [illegible] [illegible]	NOT [illegible]	[illegible]	[illegible]
"	3 X 3-5 DEGREES	[illegible]	[illegible]	2 MINUTES	[illegible]	NOT SEEN	[illegible]	[illegible]
"	[illegible]	[illegible]	[illegible]	[illegible] [illegible] 2 MINUTES	[illegible] [illegible]	NOT SEEN	[illegible]	[illegible]
"	[illegible]	[illegible]	[illegible]	10-15 SECONDS	CLEAR [illegible]	NOT SEEN	[illegible]	[illegible]
"	[illegible]	[illegible]	(?)	12 SECONDS	[illegible] [illegible]	NOT SEEN	[illegible]	[illegible]
"	[illegible]	[illegible]	[illegible]	16-17 SECONDS	[illegible] VISUAL & VIS 12KM	NOT SEEN	[illegible]	[illegible]
"	[illegible]	[illegible]	[illegible]	[illegible] MINUTES	[illegible] VIS 7K	NOT SEEN	[illegible]	[illegible]
"	[illegible]	[illegible]	[illegible]	[illegible] SECONDS	[illegible] REPORTED	NOT [illegible]	[illegible]	[illegible]
"	[illegible]	[illegible]	[illegible]	2 HOURS	[illegible]	YES	[illegible]	[illegible]
"	[illegible]	[illegible]	[illegible]	7-10 MINUTES	[illegible]	SURFACE 8,000 10,500	[illegible]	[illegible]
"	[illegible]	[illegible]	[illegible]	1 MINUTE	VIS 12K [illegible]	NOT SEEN	[illegible]	[illegible]
"	[illegible]	[illegible]	[illegible]	[illegible]	[illegible] VISIBILITY	6,000 10,000	[illegible]	[illegible]
"	[illegible]	[illegible]	[illegible] [illegible] 2 MINS	[illegible] SECONDS	[illegible]	NOT [illegible]	[illegible]	[illegible]

THE FOLLOWING PHYSICAL SPECIMENS WERE SUBMITTED FOR ANALYSIS OR IDENTIFICATION IN CONNECTION WITH THE UNIDENTIFIED FLYING OBJECTS PROJECT DURING THE YEAR 1965.

#	IN#	DATE	LOCATION	INVESTIGATION	ANALYSIS	DISPOSITION	EVALUATION
	57	6 Feb.	Liberty, Ohio	Local	Air Force Materials Lab	Return to Source	Metal Ball (Not Foreign)
	82	3/02	Brooksville, Fla	Local	Institute of Paper Chem	Return to Source	Paper (Lens/Stencil Tissue)
	86	3/04	Corvallis, Ore	Local	Air Force Materials Lab	(Dirt Sample)	Oil in Dirt (Not Foreign)
	190	5/25	Thailand	Local	Allegheny Ballistics Lab	To Manufacturer	Scout Rocket
	558	8/19	Cherry Creek, NY	Local	Local Analysis	(Dirt Sample)	3-1 Oil and Genitian-Violet/Vio-Stringent
	588	8/24	Fayetteville, Ark	Local	Local Analysis	In File	Plastic Bags (Garment)
	732	9/27	Reno, Penna	WPAFB	WPAFB (Section Analysis)	In File	Gourd (Plant)
	776	10/19	Vero Beach, Fla.	WPAFB	WPAFB (Section Analysis)	Returned to Source	Balloon (Cape Kennedy)
	777	10/20	Snow Hill, Md	Local	Local/WPAFB/USAF	Returned to Project	Balloon (Wallops Island)
	INFO	10/21	Greece	Air Attache	None	Sent to Manufacturer	Instrument Package

TAB	CASE	ITEM
A	Liberty, Ohio	Metal Ball (Not Foreign)
B	Brooksville, Fla	Paper (Lens/Stencil Tissue)
C	Corvallis, Ore	Oil in Dirt (Not Foreign)
D	Thailand	Scout Rocket
E	Cherry Creek, NY	3-1 Oil and Gentian Violet/Vio-Stringent
F	Fayetteville, Ark	Plastic Bags (Garment)
G	Reno, Penna	Gourd (Plant)
H	Vero Beach, Fla	Balloon (Cape Kennedy)
I	Snow Hill, Md	Balloon (Wallops Island)
J	Greece	Instrument Package

APIB (TDIW)
Wright-Patterson AFB, Ohio 45433
2 April 1965

Mr James Cannon
8405 Forney Road
New Lebanon, Ohio

Dear Sir,

The sphere that was submitted to the Air Force at Wright-Patterson AFB, Ohio was tested at the Air Force Materials Laboratory. A copy of their report is attached. While no specific identification of the object was made, tests conducted, confirmed that the object was of American origin and did not exhibit evidence of space residence. The sphere is being returned to you under seperate cover.

We appreciate your patriotic duty as an American citizen in submitting this object to the Air Force for analysis.

Sincerely,

HECTOR QUINTANILLA, Jr
Major, USAF
Chief, Project Blue Book

AIR FORCE MATERIALS LABORATORY

RESEARCH AND TECHNOLOGY DIVISION
AIR FORCE SYSTEMS COMMAND
UNITED STATES AIR FORCE
WRIGHT-PATTERSON AIR FORCE BASE, OHIO 45433

REPLY TO ATTN OF: MAAE (W. P. Conrardy)

SUBJECT: Analysis of Metallic Sphere

9 MAR 1965

TO: TDEW (Sgt Moody)

1. On 17 Feb 1965 Sgt Moody of the FTD delivered a metallic sphere to the Materials Engineering Branch for analysis. Examination of the sphere disclosed the following:

a. Consists of two hemispheres held together with 4 set-screws.

b. Approximately 9" in diameter (OD).

c. Weighs 23.99 pounds.

d. Wall thickness approximately 1".

e. Density is such that it would readily sink in water.

f. Sphere is an aluminum (195 casting alloy) casting that has been rough machined at both ends and at the equator. External finish was a black paint. Set screws are steel, 1/4 diameter, 28 threads per inch with Allen wrench head fitting, recognized as Standard American. Steel alloy is of the 4100 series type.

g. This container was apparently designed for compressive type loads. The design is such that it would not be suitable for internal gas pressures because of the relatively weak method of closure.

h. There are no external connections, hooks, eyes, entry ports or markings other than the machining tool marks.

i. There is evidence that a gasket had been used at the closure flange although no gasket material remained.

j. Internal surfaces are severely corroded, indicating a more corrosive environment internally. The lack of corrosion on the outside (even though paint was in poor condition) is indicative that the sphere had not been in a corrosive environment for very long. Analysis of the corrosion products did not provide any clue to the possible contents.

k. A survey for residual alpha, beta or gamma radiation was negative.

2. Discussion.

We have not been able to establish the intended use of this device. The following possible applications were considered but not confirmed.

a. Waste disposal container for radioactive materials. The design is such that it would sink readily if dumped at sea, and could take very high external pressures. However it would not be an efficient container from a payload point of view since only half (one hemisphere) could be loaded because of the method of closure. Discussions with the Mound Laboratory indicated that this was not comparable, to any radioactive waste containers they are familiar with.

b. Protective shell for instrumentation exposed to shock wave and blast, for example from nuclear blast. Some years ago the University of Dayton Research Institute manufactured containers something like the one now under consideration, in support of atomic tests in Nevada. However the project engineer on that program examined the sphere we now have and he discounted it as being one of the type used by them.

c. Deep submersible test device. Not a likely application since there are no external connections for anything.

3. The sphere is available for pick up if you so desire. No additional tests are contemplated without further instruction from your office.

W. P. CONRARDY, Chief
Materials Engineering Branch
Materials Applications Div

1 Atch
Photos (2)

AIR FORCE STATEMENT ON BROOKSVILLE, FLORIDA, UFO SIGHTING, 2 MARCH 1965

The alleged landing of a vehicle from outer space at Brooksville, Florida, on 2 March 1965, was apparently a hoax according to information obtained by Air Force investigators from MacDill AFB, Florida, and by Dr. C. W. Bemiss, Pan American Airways technical staff member of the Eastern Test Range, who conducted an additional investigation. The report submitted to the Air Force investigators by the alleged eyewitness contained several statements which cannot be confirmed as facts. The spacecraft allegedly took off straight up at 5000 miles per hour and was out of sight in ten seconds. It is extremely doubtful that a twenty to thirty-foot object could have been seen for more than five seconds at which time the object would have reached an altitude of 36,430 feet. The blast-off from a vehicle taking off at this speed would have disturbed the sand and soil in the immediate area. There was no evidence of any abnormal disturbance in the area. The sketch of the alleged spacecraft showed four stilt poles as the landing gear. These poles protruded from the spacecraft at an angle. The holes which were purportedly caused by the landing gear were straight and appeared to have been scooped or dug as opposed to indentations caused by an object of any sizeable weight. There was no radioactivity in the area. Two papers which contained unreadable hieroglyphics were reportedly dropped by an occupant of the spacecraft. An analysis was made of these papers by the Institute of Paper Chemistry in Appleton, Wisconsin. This analysis indicated that the paper is composed of fibers which are common worldwide. The fiber composition corresponds to that used in lens and stencil papers. The hieroglyphics on one of the papers was deciphered by means of simple substitution and was determined to be the work of an amateur. The deciphered hieroglyphics

reads as follows: "Planet Mars - Are you coming home soon - We miss you very much - Why did you stay away too long". Since no other implications were apparent, it was not feasible for the Air Force to expend further time and money in deciphering the second sheet. Based on the above, it is the opinion of the Air Force that an attempt was made to perpetrate a hoax.

'I Stared Back...'

Man Recounts Run-In With 'Saucer, Robot'

BROOKSVILLE (UPI)—"It made a whistling noise and went straight up at 5,000 miles an hour or even faster," retired longshoreman John F. Reeves said yesterday in describing a flying saucer he claims to have stumbled onto while on a walk in the woods near here.

Reeves, who admits to being "past 60," told a story Wednesday of coming onto the "flying saucer" in the woods between here and Weeki Wachee on Tuesday afternoon and of a robot-type creature that appeared to take his picture.

REEVES, WHO LIVES ALONE at a trailer park west of here, told of breaking through some bushes about a mile and three-quarters off Highway 50 at mid-afternoon and seeing the flying saucer about 700 yards away.

He said he worked his way to within about 100 feet of the object when the robot-type creature appeared and walked toward him, stopping less than 15 feet away.

Reeves said the robot wore a gray canvas-type suit with a glass dome helmet. He described it as being about 5-feet tall and stocky.

"He walked over to within 15 feet of me and looked right at me," Reeves said. "I stared back at his glass dome."

He described the creature as appearing to have dark tan flesh, and added that everything except the face was covered. He said it had eyes farther apart than a normal human's and had a more pointed chin.

"IT DIDN'T MAKE A SOUND, it just stared at me," he said.

"I couldn't even blink an eye, I was so scared."

— Reeves said the creature then lifted what he believes to have been a camera to chin level, pointed it at him and it flashed.

"He flashed again and I took off from the bushes," Reeves said.

Reeves said the creature flashed a third time and then returned and entered the machine. He said the thing that flashed was black and about six to seven inches in diameter.

The flying saucer was described as 20 to 30 feet in diameter and six feet high and stood on a four-legged landing gear.

"It was bluish-green and reddish-purple in color with two windows on top," Reeves said.

Reeves said he saw only one robot and it dropped two pieces of cloth-like paper as it headed back to the saucer. Reeves said he retrieved the paprs and they had "very queer writing" on them.

"THEY WERE FROM outer space," he said.

He said that after the robot entered the machine, some blades on the rim started to move like venetian blinds, working open and shut.

"Then the rim started going around counterclockwise," Reeves said. "It made a whistling and rumbling noise and then started straight up. It was out of sight in 10 seconds."

Reeves said he walks through the woods in this West Central Florida area often and this was the first time he had seen or heard anything unusual.

The two pieces of paper were turned over to an investigating team from MacDill Air Force Base in Tampa.

OFFICIALS AT MacDILL said the investigation is a routine one made whenever any "aerial phenomenon" is reported. The Air Force team talked to Reeves and visited the wooded area.

The base said the team will send its report directly to Project Bluebook at Wright-Patterson Air Force Base, Dayton, Ohio.

This unit investigates all reports of unidentified flying objects.

Footprints From Outer Space?

THE INSTITUTE OF PAPER CHEMISTRY
Appleton, Wisconsin
54910

April 5, 1965

Special Number 50,072

Your Ref: TDEW/UFO

Dr. J. Allen Hynek
Northwestern University
Evanston, Illinois

Dear Dr. Hynek:

The following summarizes our analyses, interpretations, and suggestions on the specimen submitted to us recently by Major Quintanilla. This is the material allegedly dropped by a visitor from outer space. Much of this information was reported previously but is included and supplemented here for the sake of completeness. We have divided our comments into several categories.

1. Composition of Fiber

The sample is composed of plant fibers from the bast or the leaf of one or more of a number of plants. A wide variety of plants of this general type grow in this country and abroad, and some species are not distinguishable from one another in fiber form. Of the more common ones, we believe the submitted sample is not jute, mitsumata, gampi, flax, or ramie; it could be fiber from abaca, sisal, kozo, hemp, or a similar but less common plant.

Exhibit A includes photomicrographs showing botanical similarities of fibers from the unknown sample and from two commercial papers (described below). It also includes photomicrographs from our files of a number of known fibers in the TAPPI Fibrary maintained as reference materials for the Technical Association of the Pulp and Paper Industry.

Although the United States paper industry is based principally on fibers derived from trees, the use of bast or leaf fibers in this country, and in foreign countries, is not uncommon, and we see no reason to believe that these fibers have any unusual origin. In foreign countries, such fibers are grown specifically for papermaking; this practice is not as common in this country, but such fibers can be imported for papermaking or can be (and are) recovered from old rope, cordage, and similar products containing fibers of this type.

2. Paper Identification

The sample itself is of the type used for lens paper or stencil tissue (sometimes called Japanese tissue). The sample submitted had a basis weight of 5.5 lbs. (for a ream of 500 sheets, 24 x 36 inches), a thickness of approximately 0.0013 inches and was soft, bulky and of open structure. Formation was very uniform, indicating a high quality operation. There was no evidence of any special treatment to impart water repellency or wet strength.

3. Possible Origin

Of the samples which were readily available to us for comparison, one approximating the unknown sample quite closely was taken from "Paper-Japan 1960" published by Japanese Paper & Pulp Association and Japan Paper Exporters Association. This sample, identified as "Machine-made Tengujo (stencil) Paper" was essentially indistinguishable from the unknown. Japanese tissues are imported into this country and it is quite probable that similar materials are available in various commercial channels, or possibly as souvenirs brought from a foreign country by an individual. Similar papers are also manufactured in this country by a number of companies; we believe that a sample matching the unknown could be manufactured by these mills but we do not know whether they actually make such materials at the present time.

A second sample similar to the unknown, identified as "Speed-O-Print Carbon Cushion Sheet No. 700", is used with mimeograph stencils and obtained from a local office supply house. Obviously this is readily available, but we do not know whether it is imported or an item of domestic manufacture.

Exhibit B includes transmitted light photographs at approximately 3.5 diameters magnification, showing similarities in structure between the unknown, the Japanese tissue and the commercial stencil tissue.

Exhibit C includes specimens of the two commercial papers for comparison with the unknown.

4. Suggestions for Further Exploration

In case additional information on the possible availability or the actual history of the specific sample is desired by the Air Force, or by some other appropriate agency, we suggest the following contacts.

A. Domestic Paper Manufacturers

There are several companies in this country which are capable of making products very similar to the unknown. We feel that discussion with these companies, including an opportunity for them to examine the sample, would be helpful in determining whether or not any of these companies do, in fact, manufacture a product identical to the unknown. Companies active in this particular segment of the paper industry would be able to comment on the present status of domestic production versus imports of products of this type and the probable channels of distribution. For primary contacts we suggest the following:

John A. Manning Paper Co., Inc., P. O. Box 328, Troy, New York (C. E. Lanyon)
C. H. Dexter & Sons, Inc., 100 Canal St., Windsor Locks, Conn. (Geo. D. Knight)
Crystal Tissue Co., Middletown, Ohio
Peter J. Schweitzer Division of Kimberly-Clark Corporation, 261 Madison Ave., New York, New York
Ecusta Paper Operations, Packaging Div., Olin Industries, Pisgah Forest, North Carolina

In turn, discussion with each of these companies may develop further contacts worth investigating.

B. Users and/or Distributors

At least two types of organizations would be interested in handling papers comparable to the unknown: for lens tissue and for use as stencil tissue. We suggest that the following be contacted as converters or distributors of paper for lens tissue:

Eastman Kodak Company, Rochester, New York
Lensclean, Inc., 123 W. 25th Street, New York, New York

Among the companies handling mimeograph supplies, we suggest the following be contacted for information on their sources of supply (whether domestic or imported) and on methods of distribution:

A. B. Dick Company, 5700 W. Touhy Avenue, Chicago, Illinois
Speed-O-Print Business Machines Company, 1801 W. Larchmont St., Chicago, Illinois
Milo Harding Company, Monterey Park, California

In addition we have recently noticed an article (House Beautiful for November, 1964) suggesting use of various papers for art work and noting that a kit of Japanese papers is available from:

Craft Studios, 118 Evans St., New Hyde Park, New York

C. Importers

In addition to general importers or specific contacts developed as a result of the above discussions, the following may be able to contribute useful information:

Nelson-Whitehead Company, New York, New York

This company is listed as a sales agent for one of the Japanese manufacturers of hand-made paper but we have been unable to locate a New York address for them. It is possible that the firm has been reorganized since issuance of the directory in which they were mentioned. The following companies, listed as paper merchants in the New York area, might or might not be related to this possible contact:

A. G. Nelson Paper Company, Inc., 420 W. Broadway, New York 12, New York
Whitehead and Alliger Company, Inc., 11 Thomas St., New York 7, New York

The following is an importer of various materials from Japan:

C. T. Takahashi Company, Inc., 220 Third Ave., South, Seattle 4, Washington
(Mr. T. M. Iwata)

The following is an importer of pulps and possibly papers of this general type:

H. Reeve Angel, Inc., 9 Bridewell Place, Clifton, New Jersey

5. Further Speculation

We have made no chemical analysis of the markings and do not intend to do so. In my previous letter I commented that brief microscopic examination had suggested the possibility that the markings were placed upon the paper by stamping or printing rather than by an instrument such as a pencil which would tend to disrupt the fiber structure. Some of my colleagues feel that the markings could have been made with a special type of pencil used in photographic touchup work and other graphic arts procedure. One example is: The Mars-Lumograph Duralar pencil made in Germany and available thru J. S. Staedtler in this country.

Further speculation about the nature of the markings brought out the comment that these markings appear to have been made by a person with skilled hands and confidence in his ability. In other words, they were not made by someone who was painstakingly and hesitatingly following a set pattern with no previous experience. This again suggests the possibility that a commercial artist, or someone with similar skills, may have been involved in preparation of the coded message, either for the incident under consideration or for some previous occasion.

If there is any way in which we can be of further assistance to the Air Force or to any agency investigating related aspects, please feel free to call on us.

Very truly yours,

T. A. Howells

T. A. Howells, Chairman
Technology Section

TAH/rl

AERONAUTICAL SYSTEMS DIVISION
AIR FORCE MATERIALS LABORATORY, RESEARCH AND TECHNOLOGY DIVISION
WRIGHT-PATTERSON AIR FORCE BASE, OHIO

MATERIALS PHYSICS DIVISION
AF MATERIALS LABORATORY

EVALUATION REPORT

Analysis of Earth Sample

REPORT NR: MAY 65-13 DATE: 14 April 1965

PROJECT NR: TYPE EVALUATION:

MANUFACTURER: SPEC NR:

SUBMITTED BY: FTD (Sgt. Moody) ITEM SERIAL NR:

I. PURPOSE

To analyze the sample for organic components that would be foreign to the sample.

II. FACTUAL DATA

A sample of dirt was submitted to the Analytical Branch and assigned Analytical Branch number #5-628.
Approximately half the sample (105 grams) was extracted with carbon tetrachloride. The solvent was evaporated and an infrared spectrum obtained of the residue. The spectrum showed the residue to be a petroleum hydrocarbon base oil. About 10 c.c. of residue was extracted from the sample showing the dirt contained an appreciable amount of oil.

III. CONCLUSION

The dirt sample was analyzed and found to contain a petroleum hydrocarbon base oil.

PREPARED BY:

W. J. Crawford

W. J. Crawford MAYA

mm:9

THIS REPORT IS NOT TO BE USED IN WHOLE OR IN PART FOR ADVERTISING OR SALES PROMOTION PURPOSES

ALLEGANY BALLISTICS LABORATORY
OPERATED BY
HERCULES POWDER COMPANY
INCORPORATED
P. O. BOX 210 · CUMBERLAND, MARYLAND 21501

TELEPHONE:
ROCKET CENTER
RIDGELEY, WEST VIRGINIA
304 RE 8-9000

September 29, 1965

In Reply
Refer to: 3698-340

Headquarters
Foreign Technology Division
Air Force Systems Command
United States Air Force
Wright-Patterson Air Force Base, Ohio

Attention: TDEW -- Colonel Eric T de Jonckheere

Dear Sir:

Components from 4th Stage Scout Recovered in Thailand

Reference your letter of 28 July 1965, Hercules Powder Company is pleased to advise that the components returned to us therewith were part of a rocket motor manufactured at the Allegany Ballistics Laboratory for the National Aeronautics and Space Administration, Langley Research Center, on Contract NAS 1-3698. Pertinent data on this rocket motor are as follows:

(1) Motor Description -- Jato 24DS-5850 X258
(2) Motor Manufacturer -- Hercules Powder Company, Allegany Ballistics Laboratory
(3) Date of Manufacture -- 13 November 1964
(4) Motor S/N -- RH-75
(5) Mission -- 4th stage propulsion on Scout Vehicle S-137, San Marco Mission
(6) Payload -- Air density
(7) Orbit -- Perigee 115 miles; Apogee 350 miles
(8) Payload Life -- Expected six months
(9) Launch Date -- 16 December 1964
(10) Launch Station -- Wallops Island, Virginia
(11) Date of Re-entry of 4th Stage Parts -- Approximately May 1964
(12) Place of Re-entry of Motor Parts -- Sisakit Province, Thailand

The subject components are presently being retained at Allegany Ballistics Laboratory.

HERCULES

If additional information on these components becomes available from the Joint Military Advisory Group in Thailand, we would appreciate receiving same.

If we can be of further assistance, feel free to call upon us.

Very truly yours,

J. L. SHROUT, MANAGER
SPACE MOTORS PROGRAM OFFICE

JLS:jrp

cc: Major Hector Quintanilla, Jr., Wright-Patterson AFB
Mr. D. D. Welder, HPC/Wilmington
Mr. D. E. Guthrie, NASA/LRC
Mr. L. B. Johnston
SMPO File

ALLEGANY BALLISTICS LABORATORY
OPERATED BY
HERCULES POWDER COMPANY
INCORPORATED
P. O. BOX 210 · CUMBERLAND, MARYLAND 21501

TELEPHONE:
ROCKET CENTER
RIDGELEY, WEST VIRGINIA
304 RE 8-9000

October 27, 1965

In Reply
Refer to: 3698-371

Headquarters
Foreign Technology Division
Air Force Systems Command
United States Air Force
Wright-Patterson Air Force Base, Ohio

Attention: TDEW -- Colonel Eric T de Jonckheere

Reference: HPC/ABL ltr 3698-340, dtd 29 September 1965

Dear Sir:

- Erratum -
Components from 4th Stage Scout Recovered in Thailand

Please make the following correction to the referenced letter:

Item (11) of the pertinent data reads, "Date of Re-entry of 4th Stage Parts -- Approximately May 1964". Change to read, "Date of Re-entry of 4th Stage Parts -- Approximately May 1965."

Very truly yours,

J. L. SHROUT, MANAGER
SPACE MOTORS PROGRAM OFFICE

JLS:jrp

cc: Major Hector Quintanilla, Jr., Wright-Patterson AFB
Mr. D. D. Welder, HPC/Wilmington
Mr. D. E. Guthrie, NASA/LRC
Mr. L. B. Johnston
SMPO File

HERCULES

CONVINCED THAT THE SIGHTING WAS NOT A HOAX OR FABRICATION. ONE TECHNICIAN REMAINED UNCONVICNCED.

PAGE 2 RUCIEKA7233 UNCLAS

3. THE OBSERVERS MAINTAINED THEIR STORY EXACTLY AS REPORTED IN THE INITIAL REPORT UNDER POLITE BUT VIGOROUS CROSSQUESTIONING. HAROLE BUTCHER MADE A ROUGH DRAWING OF THE UFO WHICH IS ON FILE AT NIAGARA AIR BASE. HE INDICATED A DISK 50' DIAMETER, 20' THICK WITH RED GLOWING STREAMERS PROJECTING DOWNWARD FROM THE ENTIRE PERIMETER PLUS A TRAIL OF RED TO YELLOW COLOR.

4. NO PHYSICAL EVIDENCE OF A VEHICLE OR LANDING WAS FOUND EXCEPT AN OILY PURPLE SUBSTANCE WHICH APPEARS TO BE A COMBINATION OF VIO STRIGENT OR GENTIAN VIOLET PLUS 3-IN-ONE OIL, WHICH IS NOT BELIEVED CONNECTED WITH THE SIGHTING.

BT

NNN

NOTE: Reference not identified in SMB.

N

CONFIDENTIAL

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 43D BOMBARDMENT WING (SAC)
LITTLE ROCK AIR FORCE BASE, JACKSONVILLE, ARKANSAS, 72077

UNCLASSIFIED

REPLY TO ATTN OF: 43DCOI/6683

30 August 1965

SUBJECT: (U) Investigation of Unidentified Flying Object

TO: 825Cmbt Spt Gp (BC)

THRU: 43DCO 52w
43C

1. (U) The following information is the result of an investigation conducted by Captain Howard D. Lowrey, A0944986, Combat Intelligence, Intelligence Division, 43rd Bombardment Wing (M), on 26 and 27 August 1965. Investigation was conducted in accordance with AFM 200-2 concerning the report of an Unidentified Flying Object (UFO).

2. (U) Description of the object: Nine (9) light blue plastic bags approximately 36 inches in length, each bearing the inscription: "WARNING! To avoid chances of suffocation keep away from babies and children. Do not use in cribs, beds, carriages or play pens. This bag is not a toy." The bags were tied together with a string that extends approximately 36 inches below the bags. Attached to the string is a mercury type battery wired to a flashlight type bulb, #605, by two wires, numbers X-228 and X-232. Enclosing the battery and bulb were pieces of cellophane colored blue, orange, green and purple. The plastic bags appear to be the type utilized by commercial cleaning establishments to enclose clothes for customers.

3. (C) Investigation information: Mr Jack E. Page, 1549 Stubblefield Road, Fayetteville, Arkansas, age 50, self-employed Asphalt Broker, reported observing the UFO approximately 0525L hours, on 24 August 1965. He had just arisen from bed and saw the object in a field approximately 150 yards back of his house. He estimated the wind to be very light from a northeasternly direction at the time of first seeing the object. Mr Page took the UFO to Mr Glenn Estes, Chief of FAA, Drake Airfield, Fayetteville, Arkansas, who in return notified Little Rock AFB officials. Subsequently Mr Estes was interviewed by a reporter from the Northwest Times newspaper of Fayetteville, Arkansas and the UFO received front page open coverage in the Northwest Times plus TV coverage in Little Rock, Arkansas.

Weather conditions at Fayetteville, Arkansas during the period from 2200L, 23 August to 0800L, 24 August was:

a. Wind - Surface calm until 0800L, 24 August

b. Ceiling - Clear

Classification Cancelled
OR Changed to UNCL
Auth: AFR 205-1
PARA 12.b
By N. G. [illegible]

UNCLASSIFIED

DOWNGRADED AT 3 YEAR INTERVALS;
DECLASSIFIED AFTER 12 YEARS.
DOD DIR 5200.10

Peace . . . . is our Profession

[redacted]

CONFIDENTIAL

UNCLASSIFIED

c. Visibility - 15 miles or better, never below 7 miles

d. Cloud coverage - None

e. Thunderstorm - Towering cumulus north with lightening in northwest

4. (U) Additional Information: Washington County Sheriff's office and Fayetteville City Police office advised there were no reports of UFO activities during the period from 22 to 24 August 1965.

5. (U) Comments of Investigation Officer: It is the belief of the investigation officer that the UFO was made by person(s) for a prank or for amateur meteorology observations. Due to the wind currents, temperatures and the unknown amount of gas in the plastic bags, it is unknown as to where this object may have been originally launched. Per telephone conversation with the Foreign Technology Division, Wright-Patterson AFB, Ohio, the UFO is being forwarded under separate cover to the FTD, TDE (UFO), Wright-Patterson AFB, Ohio.

6. (U) With the acceptance of this report under provisions of AFR 200-2, no further action is required. The above information is submitted for your information and will be retained in the files of 43DCOI.

7. (U) This letter is classified Confidential in accordance with paragraph 17a, AFR 200-2. (Gp-4)

Ralph V. Geeslin

RALPH V. GEESLIN
Lt Colonel, USAF
Chief, Intelligence Division

Classification Cancelled
OR Changed to _____
Auth: _____
_____
By _____

UNCLASSIFIED

0130 29 Sept 65

Call received from

Major Allan F Livers
Senior Director on Duty
Detroit Air Defense Sector (NORAD)
Battle Creek, Michigan

He explained that a meteor siting occured on the 28th day of Sept, and that a man,

Harold Karnes
#2 9th Street
Reno, Pennsylvania 677-5235 (Code 814 through Oil City)

and his wife had been painting a house when the object dropped near them. It frightened them, and they left the scene, returning later to find an object roughly the size and shape of a child's football. It is apparently hollow with rubbery walls approximately 1/16 inch thick. It was cracked, but all pieces were recovered. This is near Oil City, Pennsylvania.

Mr Karnes reported this to the:

662 Aircraft Control & Warning Squadron, Oakdale, Pennsylvania

and they are waiting to pick up this object for delivery to FTD if this is desired. They are going to wait for a call from FTD.

MEMO FOR RECORD:

On 7 October Major Quintanilla went TDY to Pennsylvania and obtained the object from Mr Karnes. Object was a gourd of some sort, not a meteor.

OBJECT IN PHYSICAL SPECIMEN FILE

The News Tribune
FORT PIERCE, FLORIDA

VERO BEACH BUREAU • 1002 20TH PLACE • VERO BEACH

CHARLOTTE CAFFREY
VERO BEACH BUREAU CHIEF
567-5803

Nov. 24, 1965

MISS SARA HUNT
Community Relations
SAFOI
Pentagon,
Washington, D.C.

Dear Miss Hunt:

Got my aluminum "light Bulb" back from Wright-Patterson Air Base, but no explanation of whose, from whence, whither headed, or why.

Not to mention what it is.

May I expect a report on same from your office?

Very sincerely yours,
THE NEWS TRIBUNE,
Charlotte E. Caffrey,
Charlotte E. Caffrey,

Clippings enclosed

HEADQUARTERS
FOREIGN TECHNOLOGY DIVISION
AIR FORCE SYSTEMS COMMAND
UNITED STATES AIR FORCE
WRIGHT-PATTERSON AIR FORCE BASE, OHIO

REPLY TO
ATTN OF: TDEW/UFO

DEC 2 1965

SUBJECT: Balloon, Vero Beach

TO: Hq USAF SAFOICC (Mrs Hunt)

Reference the balloon which was recovered at Vero Beach, Florida. It can be stated that the balloon was manufactured by the G T Schjeldahl Company, Northfield, Minnesota. This particular balloon was probably launched from Cape Kennedy just prior to the Gemini 6 mission. The Schjeldahl Company has supplied approximately 1,500 of these metallic mylar balloons to the Marshall Space Center for launch at the Cape. These are meteorlogical balloons which collect information on temperature, pressure, and density of the atmosphere prior to a launch. At times, some of these balloons are launched as frequently as every five minutes during the last hour of the count-down in order to obtain data on wind direction and velocity. Most of these balloons would probably end up over the water due to the prevailing winds.

FOR THE COMMANDER

Eric T. de Jonckheere

ERIC T de JONCKHEERE, Colonel, USAF
Deputy for Technology and Subsystems

YOU - THE NUCLEUS OF SECURITY!

(INFORMATION ONLY)

20 OCT Dover, Del

HEADQUARTERS
1607TH AIR TRANSPORT WING (MATS)
UNITED STATES AIR FORCE
DOVER AIR FORCE BASE, DELAWARE, 19901

REPLY TO ATTN OF: ODOTI

SUBJECT: UFO Recovered at Dover AFB, Delaware

27 October 1965

TO: FTD (TDEW) (UFO)

1. Reference Telecon between Sgt Moody and MSgt Fernandez on 25 October 1965 in which FTD requested further information on the identification and return of balloon to NASA.

2. After notifying FTD (UFO) on 21 October 1965 that the object would be sent to them for identification, we received a phone call from Mr. Robert Ladd, Washington representative of the G.T. Schjeldahl Co. of Northfield Minn. From our description, Mr. Ladd identified the object as a test balloon manufactured by the Schjeldahl Co. He requested we retain the balloon until Mr. Kenneth Witt, company engineer, arrived to make positive identification.

3. On 22 October we received a call from Mr. Bob Long of NASA Operations, Wallops Island Station, Va. Mr. Long heard of the balloon through the news media and stated NASA had launched similar ones manufactured by the Schjeldahl Co. He said a check of the winds for 20 October indicated the balloon could possibly be one launched by NASA from Wallops Island. When we informed Mr. Long that a representative from the Washington office of the Schjeldahl Co. was coming to Dover to identify the balloon, he requested we have Mr. Witt call him when he arrives. Mr. Witt arrived at Dover on the 22nd of October and positively identified the balloon as one manufactured by the Schjeldahl Co. for NASA. He called Mr. Long at NASA Operations, Wallops Island Station, Va. and coordinated the return of the balloon which was to be delivered to NASA on Monday or Tuesday of the following week.

4. Further information on the return and ownership of the balloon can be obtained by calling Mr. Bob Long at NASA, Wallops Island Station, Va. phone 703 (824-3411 ext 2354).

FOR THE COMMANDER

Charles R. Gant

CHARLES R. GANT
Major, USAF
Chief of Airlift Training

3 atch
Press Releases on UFO

THE WASHINGTON POST
WASHINGTON, DC
City and State News Section
22 October 1965
Page B-3

UFO Reclaimed

Two attaches of the Air Force base at Dover, Del., came and got the mysterious "thing" that glided last Wednesday to a secluded point landing near a hatchery operated at Snow Hill, Md., by Mrs. George Hopkins. Mrs. Hopkins said it appeared to be made of plastic with a wingspread of about 10 feet and what looked like valves of some sort, several of them 12 to 14 feet long. Anyway, it scared her chickens and the men from Dover mumbled something about it looking like a tow target and acted like it sort of scared them a little bit, too.

2—State New, Dover, Del., Monday, October 25, 1965

Martian Saucer?

AFB Officials Claim Unidentified Object

An unidentified inflatable, winged object claimed by Dover Air Force Base officials from Snow Hill, Md., resident last Thursday will be sent to Wright-Patterson Ohio, for investigation.

The valved object resembles aluminum but is plastic. It landed Wednesday in a field behind the hatchery of Mrs. George Hopkins of Snow Hill.

The object is 12 to 14 feet long and has a wingspan of 10 feet. The only marking is SN7 and the firm name of G. T. Schjeldahl Co.

Mrs. Hopkins doesn't know what it is, but suggestions made include a gunnery target or a device for training radar operators.

Maj. Robert Steele, Dover Air Force Base information officer, said it appears to be some type of test vehicle. When identification is made by Wright-Patterson officials, the information will be released, he said.

Dover officers and the National Aeronautics and Space Agency installation at Wallops Island, Va., both say it doesn't belong to them.

Two men from Dover AFB claimed the object yesterday.

Capt. Richard Young of the Office of Safety at the base said he was "not sure" of the object's origin. He said it was "some kind of tow target, I'm not sure what."

Morning News, Wilmington, Del.
6 — Fri., Oct. 22, 1965

Strange object called balloon

Md. mystery deflated

SNOW HILL, Md. — The object which fell from the sky behind a Snow Hill, Md., hatchery Wednesday afternoon may be a weather balloon, a spokesman for the manufacturer said last night.

Robert Ladd, manager of the Washington office of the G. T. Schjeldahl Co. of Northfield, Minn., said he based his theory on a description of the find—an inflatable, winged object 12 to 14 feet long, with a wingspan of 10 feet. Ladd said he would begin an investigation at once.

MRS. George Hopkins, owner of the hatchery, said the object landed in a field behind the hatchery building. The only markings were SN7 and the name of the company.

It was equipped with five valves, Mrs. Hopkins said. Four of these appeared designed to inflate it.

Mrs. Hopkins said heat appeared automatically to cause the thing to expand and when it was carried into the hatchery office it quickly floated to the ceiling.

A team from the Dover Air Force Base picked up the object and returned it to the base. A base spokesman said it will be taken to Wright Patterson Air Force Base in Ohio for positive identification.

Representatives of the National Aeronautics and Space Administration at Wallops Island, Va., said it did not originate there.

Schjeldahl was the firm that produced the Echo I satellite which cut a brilliant trail through the skies in 1960.

LADD said Schjeldahl balloons are used in tests at Wallops Island and also are used by the Army in tests in the Washington-Virginia area.

"It's entirely possible one of them got loose," Ladd said. "Balloons of various types are flying around the country all the time in various test projects."

Ladd said many of the balloons are made of aluminized plastic.

MRS. HOPKINS said the object resembled aluminum.

Throughout Wednesday afternoon and night scores of persons flocked to the scene to view the object before it was removed.

Mrs. Hopkins said many theories were expressed about its origin and use, the most prevalent being that it was a gunnery target or a device for training radar operators.

MEMO FOR THE RECORD

19 November 1965

Major Quintanilla called Mr Curtis of the G T Schjeldahl Co in reference to the balloon which was recovered in Greece. He read a message to Mr Curtis saying that a reward was to be given to the person recovering the balloon. Mr Curtis said that the message was correct. Mr Curtis referred Major Quintanilla to Mr Cliff Merrill. Major Quintanilla read the same message to Mr Merrill.

Major told Mr Merrill to address his letter to:

Exicutive Agency for Military Attache
Office of U S Army Attache American Embassy
APO New York 09223

Major told him to address the inside of the letter to the:

Office of the Air Attache
American Embassy
Athens, Greece

This pertains to the reward for the recovery of the package.

DEPARTMENT OF THE ARMY

POSTAGE AND FEES PAID
DEPARTMENT OF THE ARMY

EXECUTIVE AGENCY FOR MILITARY ATTACHES
OFFICE OF THE US ARMY ATTACHE
AMERICAN EMBASSY
APO NEW YORK 09223

OFFICIAL BUSINESS

FTD-TDACH
Wright-Patterson AFB
Ohio, 45433

D

DA label 18, 1 Apr 50 PREVIOUS EDITIONS OF THIS LABEL ARE OBSOLETE.

16—78043-1

1965 CASES CONTAINING RADAR R

#	INCIDENT	DATE	LOCATION	TYPE RADAR	SCOPE PHOTOS	VISUAL SIGHTING	NUMBER OF OBJECTS	DURATION	ELIP SIZE	MOTION	ANALYS
1.	30	1/24	ALASKA	ACW	NO	YES	1 RADAR 2 VISUAL	40 MIN	FTR A/C	24 K AT 26,500' HOVERED	LOCAL CO
2.	49	2/02	4 STATES	AIR PPI	NO	YES	1	N/R	N/R	EAST	LOCAL
3.	137	4/10-14	JAPAN	F-102 PPI ASR, ASPR	NO	NO	MULTIPLE	3 SEC TO 5 MIN	F-100	140-240 K, NO INVERSION	LOCAL AN TDEED
4.	171	5/05-07	PHILIPPINES	SPS 6-C SHIP RADAR	NO	YES	4 MAX	6 MIN		22 MI, 3,000 MPH, MANUVERED AND STATIONARY	TDEW CON
5.	207	6/08-09	TURKEY	FPS-88	NO	YES	SINGLE 8 TIMES	N/R 1 HR INTERVAL	N/R	FROM 290 MI OUT IN TO SCOPE. 3,000 MPH	TDEAM
6.	269	7/12	EAST U.S.	ACW SATELLITE TRACK	YES	YES	1	4 HOURS	BALLOON	WEST 60 K 100,000 FT	NO
7.	282	7/13	EAST U.S.	ACW, ARMY AIR DEF MISSILE	NO	YES	1-2	27 MIN	SINGLE	80 MI RANGE, HOVERING ERRATIC MOTION	TDEED
8.	335	7/25	WISCONSIN	ADA, LOW POWER	NO	NO	1	10 MIN		1,000 K, 100,000 FT.	TDEED
9.	360	7/30	EAST COAST	BACKSCATTER GD ELECTRONIC	NO	NO	1 TWICE	F/SEC	GEMINI	100 MI ALT. 200,000 (1) 100,000 RETURN	TDEED
10.	367	7/31	TINKER, OKLAHOMA	ACW	NO	YES	1		N/R	SOUTH VARIED TO 101,000'	LOCAL CO
11.	367	7/31	OKLAHOMA CITY	ACW	NO	YES				10,000 FT 205°AZ FROM 15-29 MI	TDEED
12.	367	8/02	WICHITA, KANSAS	GCI	NO	YES	MULTIPLE	SEVERAL HOURS	VARIES	MULTIPLE RETURNS	TDEED
13.	373	8/01	W. TOPEKA, KANSAS	AIR PPI	NO	NO	12-15	N/R	N/R	50 MI SCOPE, FORMATION	TDEED
14.	(INFO)	8/04	CALUMET AFS, MICH	ACW	NO	NO	NEWSPAPER CARRIED ARTICLE OF ALLEGED CONTACT. COMMANDER OF STATI				
15.	445	8/05	CHICAGO, ILL	GD ELECTRONIC SEARCH & HEIGHT	NO	NO	POSS 2	45 MIN	N/R	100,000'. SLOW. NO INVERSION	TDEED
16.	500	8/11	WHITEMAN AFB, MO.	AN/CPS 9	YES	YES	3-5	5 ½ HOURS	N/R	INVERSION	LOCAL
17.	565	8/20	PLATTSBURG, N.Y.	GCA	NO	YES	1	3-5 MIN	N/R	WEST OF SCOPE, JAMMING	LOCAL
18.	566	8/20	PEASE AFB, N.H.	CPN-18	NO	NO	ONE OR MORE	30 MIN	N/R	7 MI WEST OF TOA TO 8 MI NW	LOCAL
19.	628	8/31	TONOPAH, NEVADA WINNEMUCCA AFS, NEVADA	ACW	NO	NO	1	3 HR 15 MIN	N/R	STOPPING, STARTING, CLIMBING, FADING	LOCAL/TD
20.	727	9/26	LICKING COUNTY, OHIO	GD ELECT	NO	YES	1	3-5 MIN	N/R		LOCAL
21.	756	10/06	EDWARDS AFB, CALIF	SEARCH & HEIGHT	YES	YES	MULTI	4 1/2 HOURS	N/R	SEE SCOPE PHOTOS	TDEED
22.	258	7/09	Arlington, Texas	GCA	NO	YES	1	15 MIN	A/C	EASTERLY	LOCAL

1965 CASES CONTAINING RADAR REPORTS

#	INCIDENT	DATE	LOCATION	TYPE RADAR	SCOPE PHOTOS	VISUAL SIGHTING	NUMBER OF OBJECTS	DURATION	BLIP SIZE	MOTION	ANALYST	EVALUATION
1.	30	1/24	ALASKA	ACW	NO	YES	1 RADAR 2 VISUAL	40 MIN	FTR A/C	24 K AT 26,500' HOVERED	LOCAL CONTROLER	BALLOON
2.	49	2/02	4 STATES	AIR PPI	NO	YES	1	N/R	N/R	EAST	LOCAL	BALLOON (NCAR)
3.	137	4/10-14	JAPAN	F-102 PPI ASR, ASPR	NO	NO	MULTIPLE	3 SEC TO 5 MIN	F-100	140-240 K, NO INVERSION	LOCAL ANALYSIS TDEED	WX RETURNS A.P.
4.	171	5/05-07	PHILIPPINES	SPS 6-C SHIP RADAR	NO	YES	4 MAX	6 MIN		22 MI, 3,000 MPH, MANUVERED AND STATIONARY	TDEW CONSULTED	INSUFFICIENT DATA
5.	207	6/08-09	TURKEY	FPS-88	NO	YES	SINGLE 8 TIMES	N/R 1 HR INTERVAL	N/R	FROM 290 MI OUT IN TO SCOPE. 3,000 MPH	TDEAM	ELECTRONIC SIGNALS
6.	269	7/12	EAST U.S.	ACW SATELLITE TRACK	YES	YES	1	4 HOURS	BALLOON	WEST 60 K 100,000 FT	NO	BALLOON (ONR)
7.	282	7/13	EAST U.S.	ACW, ARMY AIR DEF MISSILE	NO	YES	1-2	27 MIN	SINGLE	80 MI RANGE, HOVERING ERRATIC MOTION	TDEED	BALLOON (ONR)
8.	335	7/25	WISCONSIN	ADA, LOW POWER	NO	NO	1	10 MIN		1,000 K, 100,000 FT.	TDEED	A/C
9.	360	7/30	EAST COAST	BACKSCATTER GD ELECTRONIC	NO	NO	1 TWICE	F/SEC	GEMINI	100 MI ALT. 200,000 (1) 100,000 RETURN	TDEED	INSUFFICIENT DATA
10.	367	7/31	TINKER, OKLAHOMA	ACW	NO	YES	1		N/R	SOUTH VARIED TO 101,000'	LOCAL CONTROL	BALLOON
11.	367	7/31	OKLAHOMA CITY	ACW	NO	YES				10,000 FT 205°AZ FROM 15-29 MI	TDEED	GROUND TARGET
12.	367	8/02	WICHITA, KANSAS	GCI	NO	YES	MULTIPLE	SEVERAL HOURS	VARIES	MULTIPLE RETURNS	TDEED	INSUFFICIENT DATA
13.	373	8/01	W. TOPEKA, KANSAS	AIR PPI	NO	NO	12-15	N/R	N/R	50 MI SCOPE, FORMATION	TDEED	FALSE TARGETS
14.	(INFO)	8/04	CALUMET AFS, MICH	ACW	NO	NO	NEWSPAPER CARRIED ARTICLE OF ALLEGED CONTACT. COMMANDER OF STATION CONTACTED. NO RETURNS.					
15.	445	8/05	CHICAGO, ILL	GD ELECTRONIC SEARCH & HEIGHT	NO	NO	POSS 2	45 MIN	N/R	100,000'. SLOW. NO INVERSION	TDEED	BALLOON
16.	500	8/11	WHITEMAN AFB, MO.	AN/CPS 9	YES	YES	3-5	5 ½ HOURS	N/R	INVERSION	LOCAL	INVERSION EFFECTS
17.	565	8/20	PLATTSBURG, N.Y.	GCA	NO	YES	1	3-5 MIN	N/R	WEST OF SCOPE, JAMMING	LOCAL	A/C W/ECM
18.	566	8/20	PEASE AFB, N.H.	CPN-18	NO	NO	ONE OR MORE	30 MIN	N/R	7 MI WEST OF TOA TO 8 MI NW	LOCAL	A/C
19.	628	8/31	TONOPAH, NEVADA WINNEMUCCA AFS, NEVADA	ACW	NO	NO	1	3 HR 15 MIN	N/R	STOPPING, STARTING, CLIMBING, FADING	LOCAL/TDEED	WX RETURNS
20.	727	9/26	LUCKEY COUNTY, OHIO	GD ELECT	NO	YES	1	3-5 MIN	N/R		LOCAL	SAC NC 105
21.	756	10/06	EDWARDS AFB, CALIF	SEARCH & HEIGHT	YES	YES	MULTI	4 1/2 HOURS	N/R	SEE SCOPE PHOTOS	TDEED	ATMOSPHERIC COND
22.	258	7/09	Arlington, Texas	GCA	NO	YES	1	15 MIN	A/C	EASTERLY	LOCAL	LIGHT A/C

PHOTOGRAPHS ASSOCIATED WITH UFO REPORTS DURING 1965

INCIDENT	DATE	LOCATION	PHOTOGRAPHER	TYPE	ANALYSIS	EVALUATION
1. 41	1/30	Mecca, Calif	Bates	C.S.	NO	ORIGINAL NOT SUBMITTED
2. 52	2/02	Spring Lake, N.J.	Hallgarth		NO	ORIGINAL NOT SUBMITTED
3. 99	3/15	Laos	Pomeroy		TDD	PART OF A/C
4. 103	3/20	Sloan, Nevada	Pierce		DPA,DPP	DEVELOPER SMEAR
5. 124	APR	Montana	Keller		NO	NEGATIVE NOT SUBMITTED
6. 197	5/30	N.Y. Worlds Fair	Lorentzen	C.S.	DPA,DPP	PROCESSING DEFECT
7. 217	6/24	Washington Is, Wisc	Weisner			NO IMAGE
8. 269	7/12	Athens, Ohio	Stewart			UPPER AIR BALLOON
9. 295	7/17	Burbank, California	Conroy		DPP	REFLECTION
10. 341	7/26	Cumberland, Md	Diehl		DPA,DPP	POOR PHOTO PROCESS
11. 354	7/28	Aquada, Puerto Rico	Hernandez		DPP	NO IMAGE ON FILM
12. 396	8/03	Santa Ana, Calif	Heflin		DPA	HOAX
13. 434	8/05	San Antonio, Texas	Frost		DPA	NO IMAGE ON FILM
14. 450	8/05	Sioux City, Iowa	Perrin		NO	NOT SUBMITTED
15. 462	8/07	San Pablo, Calif	Cardoso (18mm M.P.)		DPA,DPP	MAN, DOUBLE EXPOSURE
16. 555	8/18	Traverse City, Mich	Heller		LOCAL	BLACKED OUT, NO IMAGE
17. 570	8/21	Cape Kennedy, Fla	Peek		LOCAL	EMULSION FLAWS
18. 598	8/26	France	Greenbaum		EW (UFO)	CLOUDS
19. 368	8/29	Houston, Texas	Moore		NO	NOT SUBMITTED
20. 632	SEPT	Fayetteville, Ark	Higgins		NO	NOT SUBMITTED
21. 637	9/01	Manistee, Michigan	Modjeski		NO	NOT SUBMITTED
22. 674	9/06	Northport, N.Y.	McCabe		DPA,DPP	PROCESSING DEFECT
23. 728	9/27	Swan Lake, N.Y.	Cooper			PENDING
24. 736	OCT	Northern Hemisphere	Schuetz		EW(UFO)	COMET IKEYA-SEKI
25. 778	10/20	Oregon	Air Force		DPA	PROBABLY STAR (CAPELLA)
26. 781	10/21	New Ulm, Minnesota	Strauch		DPA	ORIGINAL NOT SUBMITTED
27. 804	10/31	Efland, N.C.	Stubblefield	Movie	DPA	STAR (CAPELLA)
28. 808	Mid Nov	Mexico	Zimmerman	Slide		PENDING
29. 824	11/05	Bellingham, Mass	Davidson		NO	NOT SUBMITTED
30. 872	12.09	Pontiac, Mich	Champine		EW (UFO)	METEOR TRAIL

THE FOLLOWING PHOTOGRAPHS WERE TAKEN AND APPEARED IN VARIOUS UFO LITERATURE OR NEWS MEDIA BUT WERE NOT SUBMITTED TO THE AIR FORCE FOR EVALUATION.

DATE	LOCATION	PHOTOGRAPHER	SOURCE	COMMENT
17 Mar	Australia	Jacobs	UFO Literature	
30 June	Hershey, Pennsylvania	Noll	News Media	(REQUEST DECLINED)
03 July	Antarctic	Chilean Station	News Media	
15 July	Bahia Blanca, Argentina	Palma	News Media	(UFO LIT)
18 July	Argentina	News Photo	News Media	(REQUESTED)
03 Aug	Sherman, Texas	Campbell	News Media	(REQUEST DECLINED)
08 Aug	Brighton, Pa	Lucci	News Media	(REQUEST DECLINED)
29 Aug	Warminster, Wiltshire, Eng	Faulkner	News Media	(UFO LIT)
28 Sep	Norwick, Connecticut	Skinner	UFO LIT	
08 Oct	South Bay, Calif	Gillis	News Media	

DEARBORN OBSERVATORY
NORTHWESTERN UNIVERSITY
EVANSTON, ILLINOIS 60201

January 13, 1966

Major Hector Quintanilla USAF
Chief, Aerial Phenomena Branch
Wright-Patterson Air Force Base
Dayton, Ohio 45433

Dear Major:

This is to report to you that Sergeant Moody and I are hard at it for these three days. I think that we will be able to clean up all of 1965.

As I go over the 900 or so cases of '65, I am once again impressed by the inadequate quality of the data upon which the evaluations must be based. In some cases the term "insufficient data" is really a misnomer; there is enough data but it is of such poor quality that the cause of the sighting is unidentifiable rather than unidentified. To use the category "insufficient data" overly much weights the statistics so that our critics then say that this is just a handy catch-all to which we put everything that we can't find a ready explanation for. On the other hand, to say the case is "unidentified" is even worse because this is interpreted by our reading public to mean that something really mysterious is going on. The reason for its being unidentified is that the data do not permit any logical explanation. I would prefer the term "unidentifiable" or, better, "unidentifiable because of poor data" to either of the terms "insufficient data" by itself, or "unidentified" by itself. I rather agree with public opinion that the term "unidentified" should be reserved for those cases which really do puzzle us even though we have reasonably good data, by which I mean largely that there was more than one observer, and that we have some time-space sequence of the reported events.

Should there ever be any official inquiry from the Pentagon about the conduct of our Project, I think it might be well to bring up the above points. I have for years, as you know, pleaded for immediate capability in the gathering of data so that evaluations could be placed on a much firmer foundation than they have been in the past, not because of any inherent incompetence in the evaluating office but simply because of the inherent paucity of the data.

Sincerely yours,

Allen

JAH:ar

Director

THE INITIAL REPORT OF THE FOLLOWING CASES DID NOT CONTAIN SUFFICIENT DATA FOR EVALUATION. REPLIES TO LETTERS REQUESTING THIS INFORMATION HAVE NOT BEEN RECEIVED AS OF THIS DATE. IF THIS INFORMATION IS FURNISHED AN ANALYSIS WILL BE PERFORMED AND AN EVALUATION CONSISTANT WITH THE DATA ASSIGNED

	INCIDENT	DATE	LOCATION	TIME	OBSERVER DATA #	AGE	SEX	OCC	#	REPORTING DATA TYPE	FOLLOW-UP	PAGES	TYPE SIGHTING	OPTICAL AIDS	EVIDENCE P.S.	RADAR	PHOTO	OBJECTS	DURATION	COMMENTS
1.	8	1/05	URBAN	DUSK	2	A	(M)	NASA PROJ ENGNR	1	200-2	LETTER	9	G/V	NO	NO	NO	NO	1	8-9 S	UFO LIT. OBJ RISING
2.	22	1/05	URBAN	NIGHT	1	Y	(M)		1	LETTER	R/164	3	G/V		NO	NO	DR	1	N/R	BRIGHT LIGHT NNE, SLIGHT TURN
3.	46	FEB	N/R	N/R	1	Y	(M)		1	LETTER	R/164	3						1		OBSR REQUESTED FORM TO REPT
4.	52	2/03	RURAL			A			1	LETTER	R/NEG	2			NO	NO	YES			NEGATIVE REQUESTED
5.	88	3/02	USAFB	NIGHT	1	A	(M)	MILITARY	1	LETTER	R/164	2	G/V	NO	NO	NO	NO	2	5 S	WHITE FAST NR AB CONTROL TOWER
6.	107	3/25	URBAN	NIGHT	1	Y	(M)		1	LETTER	R/164	3	G/V		NO	NO	NO	?	1H,25M	SOME OBJECTS, WX OVERCAST
7.	112	3/30	RURAL	NIGHT	1	A	(M)	ENGINEER (?)	1	LETTER	R/164	3	G/V	NO	NO	NO	NO	1	1.5 S	COOL WHITE OBJ,SPIRAL DIVE,GLOW
8.	123	APR	URBAN	DUSK	1	Y	(F)	8 yr OLD	1	LETTER	R/164	3	G/V	NO	NO	NO	NO	1	N/R	HOVERING,MULTI-COLOR,2 ANT
9.	124	APR	APRIL	DAY	1	A	(M)		1	LETTER	R/NEG	2			NO	NO	NO	YES	M	N/A	OBJS NOT VISIBLE TO EYE.
10.	157	4/30	S.TWN	DUSK	3	Y	(M)	BOY SCOUTS	1	LETTER	R/164	3	G/V	NO	NO	NO	NO	1	2M	SILVER OBLONG,ENE,JERKY FLIGHT.
11.	172	5/06	S.TWN	N/R		Y	(M)	FEW OBSERVERS	1	L/PRES	R/164	2								
12.	209	6/10	S.TWN	N/R	1		(M)		1	LETTER	R/164	2	G/V	NO	NO	NO	NO	1	N/R	WHITE V SHAPE BLINKING F.S.
13.	242	7/03	URBAN	DUSK	3	A	(B)	F REALTOR SON &	1	LETTER	R/164	3	G/V	NO	NO	NO	NO	1	15M +	TOP SHAPED BRIGHTLY LIGHTED
14.	243	7/04	URBAN	NIGHT	1	Y	(M)		1	PHONE	R/164	5								
15.	250	7/05	LAKE	N/R	1	Y	(M)		1	LETTER	R/164	3	G/V	NO	NO	NO	NO	1	N/R	BLINDING LIGHT SAUCER SHAPE H.
16.	255	7/06	RURAL	DAY	2	B	(M)	MAN & 8 YR SON	1	200-2	TWX R/164	7	G/V	NO	NO	NO	NO	3	2M	SLOW SW, CIGAR SILVER SIDE/SIDE
17.	270	7/12	URBAN	DUSK	1		(M)		1	PHONE	R/164	4	G/V	BX	NO	NO	NO	1	1 H	SLOW SE, COLORED LITES REVOLVE
18.	280	7/13	URBAN	NIGHT	2	Y	(M)	(UFO FAN)	1	LETTER	R/164	3	G/V		NO	NO	NO	1	15 M	MYSTERIOUS CRAFT APPEAR SUDDEN
19.	315	7/21	S.TWN		1	Y	(F)		1	CARD	R/164	1			NO	NO	NO	1	N/R	UFO VERY HIGH,INCREDIBLE SPEED
20.	327	7/25	URBAN	NIGHT	1	A	(M)	IGY OBSERVER	1	PHONE	R/164	2	G/V		NO	NO	NO	1	N/R	WEST,RISING,REFLECTED LIGHT
21.	340	7/25	URBAN	NIGHT	1	A	(M)		1	OD	PHONE/164	4	G/V		NO	NO	NO	1	5M	LIKE STAR,BLUE,10°3-4M,NORTH
22.	369	AUG	S.TWN	NIGHT	1		(F)		1	LETTER	R/164(HYNEK)	3	G/V	NO	NO	NO	NO	1	15M	STATIONARY STAR,THEN MOVED NNE
23.	370	AUG	S.TWN	NIGHT	M	Y	(B)	DRIVE-IN-MOVIE	1	LETTER	R/164	2	G/V		NO	NO	NO	2	45M	OBJ FALLING & SPLITTING.
24.	394	8/03	URBAN			Y	(M)		1	LETTER	R/164	1								THOUGHT HE SAW UFO,REQ FORM
25.	430	8/04	URBAN	NIGHT	3	A	(B)	MIL & CIV	3	PHONE	2-R/164	3	G/V					1	N/R	WHITE LIGHTS IN WEST. (FLAP)
26.	438	8/05	URBAN	NIGHT	3	Y	(M)		2	PHONE	R/164	8	G/V		NO	NO	NO	5 ?	2-M N/R	ERRATIC,HIGH IN EAST,RED FUZZY
27.	463	8/07	URBAN	DAY			(M)		1	LETTER	R/164 & NEG	6	G/V	NO	NO	NO	YES	1	20 M	SLOW THEN FAST,SQUARE,BIG W/TAI
28.	474	8/08	URBAN	NIGHT	3	B	(B)	LAWYER WIFE SON	1	L/CONG	R/164	5	G/V	TX	NO	NO	NO	1	10M	IN SW,MOVED BEHIND TREES,STAR.
29.	632	SEP	URBAN	NIGHT	1	A	(F)	NEWS REPORTER	1	LETTER	LETTER R/NEG	2	G/V		NO	NO	YES		N/R	NEGATIVE REQUESTED.
30.	633	9/01	URBAN	NIGHT	4	B	(B)		1	200-2	R/164	7	G/V	NO	NO	NO	NO	1	45M P	STAR,BEHIND TREES,TO EAST.
31.	667	9/05	URBAN	NIGHT	1	A	(M)	EX-NAVY PILOT	1	200-2	LETTER R/NEG	6	G/V	BX	NO	NO	YES	2	3M EA	5 MIN APART,WEST FADING,RD WHIT
32.	675	9/10	URBAN	NIGHT	1		(M)		1	PHONE	R/164	1								UFO FORM REQUESTED.
33.	689	9/12	URBAN	NIGHT	1	A	(F)		1	200-2	R/164	3	G/V	NO	NO	NO	NO	1	33 S	TWO CIRCLES SPINNING,COLORFUL
34.	692	9/14	STOWN	NIGHT	4	A	(B)	POLICE,H'WIFE	1	LETTER	R/164	4	G/V					1	N/R	BEAMS OF LIGHT,SILVER,OVAL
35.	700	9/18	RURAL	NIGHT	1	Y	(M)	(UFO FAN)	1	LETTER	R/164	1	G/V	NO	NO	NO	NO	3	20 S	DOTS,FORMATION,HORIZON TO HORIZ
36.	799	10/29	S.TWN	DAY	6		(F)	UFO FAN + 5	1	PHONE	R/164	3	G/V		NO	NO	NO	1	5 M	BULLET,HURT EYES SO BRIGHT,

	INCIDENT	DATE	LOCATION	TIME	OBSERVER DATA #	AGE	SEX	OCC	REPORTING DATA #	TYPE	FOLLOW-UP	PAGES	TYPE SIGHTING	OPTICAL AIDS	WX(SKY)	EVIDENCE P.S.	RADAR	PHOTO	OBJECTS	DURATION	COMMENT
72.	145	4/20	S.TWN	NIGHT	2	A	(B)	GAME WARDEN	1	LETTER	164	8	G/V	NO	CLEAR	NO	NO	NO	1	14SEC	DATA TOO POOR FOR EVALUATION
(73.)	194	5/28	RURAL	NIGHT	1	A	(F)		1	PHONE	NO	3	G/V			NO	NO	NO	1	N/R	PSYCHOLOGICAL
74.	264	7/11	URBAN	DAY	1	A	(F)	HOUSEWIFE	1	PHONE	164	5	G/V			NO	NO	DR	2	1.5 M	DATA TOO POOR FOR EVALUATION
75.	360	7/30	N/R	DAY					1	TWX	R/ANAL	5	G/R			NO	YES	NO	1		(SEE RADAR ANALYSIS)
76.	364	7/31	RURAL	NIGHT	2	Y	(B)		1	PHONE	164	4	G/V	NO	CLEAR	NO	NO	NO	3	15 M	(HYNEK)
77.	435	8/05	URBAN	DAY	1	Y	(M)	13 STUDENT	1	200-2	NO	10	G/V	NO	CLOUDY	NO	NO	YES	1	30-40S	NO IMAGE ON PHOTO
78.	508	8/12	URBAN	NIGHT	2	Y	(M)	13 STUDENTS	2	(?)	164's	11	G/V	NO	CLOUDY	NO	NO	NO	3	10 M	DATA TOO POOR FOR ANALYSIS
79.	576	8/22	URBAN	DUSK	1	A	(F)	45	1	200-2	NO	2	G/V	NO		NO	NO	NO	2	1 MIN	DATA TOO POOR FOR ANALYSIS
80.	581	8/23	RURAL	NIGHT	3	B	(M)	FARMER & SONS	1	200-2	LOCAL	3	G/V	NO		NO	NO	NO	2	4-5M	1 OBJ VENUS, 2d OBJ INSUFF.
81.	601	8/26	RURAL	DUSK	4	B			1	L/FORM	NO	1	G/V	NO	CLEAR	NO	NO	NO	1	10 MIN	(SEND FORM)
82.	655	9/04	URBAN	NIGHT	3	A	(B)	SHIIPIN CLERK	1	200-2	164	10	G/V	BX	CLEAR	NO	NO	NO	1	10 MIN	DATA TOO POOR FOR EVALUATION
(83.)	669	9/05	URBAN	NIGHT	3	A	(B)	MILITARY & WIFE	1	LOCAL	NO	7	G/V	BX	CLEAR	NO	NO	NO	1	15 MIN	(ADDRESS MISSING)
84.	781	10/21	RURAL	NIGHT	2	A	(M)	POLICE	1	LETTER	LETTER	3	G/V		CLEAR	NO	NO	YES	1	N/A	(SEE PHOTO ANALYSIS)
85.	832	11/11	RURAL	DUSK	1	A	(M)	MILL WORKER	1	200-2	NO	4	G/V	BX	RAIN	NO	NO	NO	1	20 MIN	(SEND FORM)

THE FOLLOWING REPORTS CONTAIN OBJECTS EVALUATED AS SATELLITES AND THE REPORTED OBJECT WAS CONSISTANT WITH PASSAGE OF A SPECIFIC VEHICLE. (82)

# **	INCIDENT #	DATE	LOCATION	TIME	OBSERVER DATA: NUMBER	AGE	SEX	OCCUPATION	REPORTING DATA: NUMBER	TYPE	FOLLOW-UP	PAGES	TYPE SIGHTING	OPTICAL AIDS	# OF OBJECTS	DURATION	DESCRIPTION	MOTION	OBJECT
1.	5	1/03	OCEAN	NIGHT	1	A	M	MILITARY	1	CIRVIS	NO	2	A/V	NO	1	9 MIN	SMALL, ILLUMINATED	EASTERLY	ECHO II
2.	24	1/21	A'SKA	NIGHT	4	A	M	MILITARY	1	PHONE	NO	1	G/V	NO	1	20 MIN	LIKE STAR	SE, STRAIGHT	ECHO II
3.	50	2/01	URBAN	NIGHT	1	Y	M	STUDENT	1	LETTER	164	12	G/V	NO	1	2 MIN	BLUE-WHITE LIGHT	E, STRAIGHT	ECHO I
4.	69	2/18	URBAN	NIGHT	1	A	M	MECH ENGR	1	200-2	NO	2	G/V	BX	1	10 MIN		N, STRAIGHT	ECHO II
5.	72	2/20	OCEAN	NIGHT	1	A	M	MILITARY	1	200-2	NO	1	A/V	NO	1	N/R	N/R	N/R	ECHO II
6.	84	3/04	A'SKA	NIGHT		A	M	MILITARY	1	200-2	NO	3	G/V	NO	1	5 MIN	LIKE SATELLITE	S, STRAIGHT	ECHO II
7.	92	3/10	RURAL	NIGHT	1	A	M	DELIVERER	1	200-2	NO	2	G/V	NO	1	10 MIN	LIKE STAR	S, STRAIGHT	ECHO II
8.	93	3/10	OCEAN	NIGHT	1	A	M	MILITARY	1	CIRVIS	NO	2	A/V	NO	1	N/R	1 MAG STAR	N/R	ECHO I
9.	97	3/12	URBAN	NIGHT	1	A	M	MUSICIAN	1	LETTER	NO	4	G/V	NO	2	N/R	LIKE STAR	NE, SE, STRAIGHT	ECHO I, II
10.	104	3/22	OCEAN	NIGHT		A	M	MILITARY	1	CIRVIS	NO	1	G/V	BX	1	5 MIN	BLUE-GREEN	STRAIGHT	ECHO II
11.	139	4/14	URBAN	NIGHT	2	Y	M	STUDENTS	1	LETTER	NO	1	G/V	NO	1	11 MIN	.5 MAG	SE STEADY	ECHO I
12.	151	4/28	URBAN	NIGHT	1	A	M	SALESMAN	1	200-2	NO	1	G/V	NO	1	18 MIN	BLUE-WHITE	NE, STEADY W/WAVER	ECHO II
13.	153	4/29	URBAN	NIGHT	2	Y	F	STUDENTS	1	PHONE	164	8	G/V	NO	1	4 MIN	LIKE STAR	E, ZIG-ZAG	ECHO I
14.	161	5/01	URBAN	NIGHT	1	A	M	TEACHER	1	PHONE	164	8	G/V	BX	1	6 MIN	LIKE STAR	E, STRAIGHT	PEG I
15.	162	5/01	URBAN	NIGHT	4	Y	M	STUDENTS	1	LETTER	LETTER	1	G/V	NO	1	5 MIN	VERY BRIGHT	SE, STRAIGHT	ECHO I
16.	163	5/02	URBAN	NIGHT	6	A	B	N/R	1	PHONE	OD164	6	G/V	NO	1	20 MIN	ORANGE-RED STAR	N, STRAIGHT	PEG I
17.	165	5/02	URBAN	NIGHT	2	A	F	N/R	1	PHONE	OD164	7	G/V	NO	3	30 M/T	SATELLITES	NE, ZIG-ZAG (ECHO I, II, PEGI)	
18.	166	5/03	URBAN	NIGHT	2	A	M	SELF EMP	1	200-2	NO	3	G/V	BX	1	4 MIN	RED-ORANGE STAR	160° STRAIGHT	ECHO I
19.	167	5/03	URBAN	NIGHT	3	A	F		2	PHONE	PHONE	9	G/V	NO	1	3 MIN	LIKE STAR	S, STRAIGHT	ECHO II
20.	168	5/04	RURAL	NIGHT	1	Y	F	STUDENT	1	LETTER	164	2	G/V	TX	1	10 MIN	ROUND, SHINY	CONFUSED	ECHO I
21.	180	5/10	OCEAN	NIGHT		A	M	MILITARY	1	MERINT	NO	1	G/V	NO	1	N/R	LIKE STAR	140°	ECHO II
22.	187	5/21	URBAN	NIGHT	1	A	M	N/R	1	PHONE	NO	7	G/V	NO	1	5 MIN	LIKE STAR	S, STRAIGHT	ECHO II
23.	189	5/23	URBAN	NIGHT	1	A	M	N/R	1	PHONE	PHONE	7	G/V	NO	1	8-10 MIN	LIKE STAR	S, STRAIGHT	ECHO II
24.	212	6/13	RURAL	NIGHT	1	Y	M	STUDENT	1	PHONE	OD164	7	G/V	TX	1	2 MIN	LIKE STAR	NE, STRAIGHT	PEG I
25.	223	6/27	URBAN	NIGHT	1				1	LETTER	LETTER	1	G/V	NO	1	15 SEC	LIKE STAR	E, STRAIGHT	ECHO I
26.	224	6/27	URBAN	NIGHT	1	A	M		1	LETTER	LETTER	2	G/V	NO	1	4 MIN	LIKE STAR	E, STRAIGHT	ECHO I
27.	237	7/02	URBAN	NIGHT	2	A	M	MINERS	1	FORM	NO	3	G/V	NO	1	15 MIN	LIKE STAR	E, ZIG-ZAG	ECHO I
28.	239	7/03	URBAN	NIGHT	1	A	M	N/R	1	200-2	NO	3	G/V	NO	1	22 MIN	LIKE STAR	N/R, STRAIGHT	ECHO II, (SPADATS)
29.	244	7/04	URBAN	NIGHT	1	A	M	N/R	1	PHONE	OD164	7	G/V	NO	1	15 MIN	LIKE STAR	E, JERKY	ECHO I
30.	253	7/05	URBAN	NIGHT	1	A	F	HOUSEWIFE	1	200-2	NO	1	G/V	NO	1	1 MIN	SATELLITE	E, STRAIGHT	ECHO I
31.	263	7/09	URBAN	NIGHT	2	A	B	N/R	1	PHONE	OD164	6	G/V	NO	1	5 MIN	LIKE GOLD STAR	E, STRAIGHT	ECHO II
32.	266	7/11	URBAN	NIGHT	M				2	PHONE	LETTER	14	G/V	NO	1	10 MIN	LIKE STAR	E, STRAIGHT	ECHO I
33.	271	7/12	URBAN	NIGHT	3	Y	B	STUDENTS	2	L/L	164'S	10	G/V	NO	1	30 MIN	LIKE STAR	E, STRAIGHT	ECHO I
34.	272	7/12	URBAN	NIGHT	1			N/R	1	PHONE	LETTER	1	N/R	N/R	1	N/R	LIKE STAR	SE	ECHO I
35.	284	7/14	URBAN	NIGHT	2	A	M	STUDENTS	1	200-2	NO	3	G/V	NO	1	5 MIN	LIKE STAR	E, ZIG-ZAG	ECHO I
36.	285	7/15	URBAN	NIGHT	M	B	B		4	PHONE	164'S	28	G/V	BX	1	1-30 MIN	LIKE STAR	EASTERLY, STRAIGHT	ECHO I
37.	286	7/15	URBAN	NIGHT	1	A	F	HOUSEWIFE	1	200-2	NO	5	G/V	BX	1	30 MIN	LIKE VENUS	E, ERRATIC	ECHO I
38.	296	7/17	RURAL	NIGHT	1	A	M	FARMER	1	200-2	NO	2	G/V	NO	1	10 MIN	LIKE STAR	SE, STRAIGHT	ECHO I

39.	297	7/17	URBAN	NIGHT	1	A	F	N/R	1	200-2	NO	2	G/V	BX	(2)	N/R	LIKE STAR	SE, STRAIGHT	ECHO I
40.	299	7/18	URBAN	NIGHT	1	A	M	LABORER	1	PHONE	164	7	G/V	NO	(2)	5 MIN	LIKE STAR	SE,N,STRAIGHT	ECHO I
41.	300	7/18	URBAN	NIGHT	4	A	B		1	PHONE	OD164	7	G/V	BX	1	5-10 MIN	LIKE STAR	E, STRAIGHT	PEG II
42.	302	7/18	URBAN	NIGHT	3	A	B		4	PHONE	OD164	16	G/V	NO	1	10 MIN	YELLOW-ORANGE STAR	SE, STRAIGHT	ECHO I
43.	303	7/18	URBAN	NIGHT	8	B	B		1	PHONE	OD164	7	G/V	TX	1	10 MIN	LIKE STAR	E, STRAIGHT	ECHO I
44.	305	7/19	URBAN	NIGHT	1	A	M	N/R	1	PHONE	OD164	7	G/V	NO	1	2 MIN	LIKE STAR	NE, STRAIGHT	PEG II
45.	306	7/19	URBAN	NIGHT	1	A	M	N/R	1	PHONE	OD164	7	G/V	NO	1	10 MIN	LIKE STAR	E, ZIG-ZAG	ECHO I
46.	311	7/20	URBAN	NIGHT	4	Y	M	CIVIL AIR P.	1	PHONE	OD164	6	G/V	NO	1	30 SEC	BANANA SHAPED	N/R	ECHO I
47.	331	7/25	URBAN	NIGHT	2	A	B		1	200-2	NO	3	G/V	NO	(2)	2 MIN	LIKE STAR	SE, ARC PEG I,	ECHO I
48.	332	7/25	URBAN	NIGHT	1	A	M	N/R	1	PHONE	OD164	7	G/V	NO	1	10-15M	LIKE STAR	N/R	PEG II
49.	343	7/26	RURAL	NIGHT	1	A	F	TELEPHONE OPR	1	200-2	NO	2	G/V	NO	1	15 MIN	LIKE STAR	SE, STRAIGHT	ECHO I, PEG II
50.	381	8/02	URBAN	NIGHT	1	A	M	MILITARY	1	200-2	NO	3	G/V	NO	1	3 MIN	LIKE STAR	N, STRAIGHT	ECHO II
51.	444	8/05	URBAN	NIGHT	1	A	F	NICAP MEMBER	1	PHONE	NO	1	G/V	NO	1	5 MIN	NOT STATED	NOT STATED	PEG I
52.	471	8/08	URBAN	NIGHT	2	A	M	MACHINE OPR	1	200-2	NO	2	G/V	BX	1	1 MIN	LIKE STAR	N, STRAIGHT	ECHO I
53.	473	8/08	USAFB	NIGHT	1	A	M	MILITARY	1	200-2	NO	2	G/V	BX	1	20 MIN	LIKE STAR	N, STRAIGHT	ECHO II
54.	478	8/09	URBAN	NIGHT	1	A	M	DRIVER	1	LETTER	164	5	G/V	NO	1	3-4 MIN	LIKE STAR	NE, STRAIGHT	ECHO II
55.	504	8/12	URBAN	NIGHT	1	A	F		1	200-2	NO	2	G/V	NO	1	10 MIN	LIKE STAR	NE, STRAIGHT	ECHO II
56.	515	8/12	URBAN	NIGHT	1	A	M		1	200-2	NO	4	G/V	NO	1	40-50 S	LIKE STAR	NE, STRAIGHT	ECHO II
57.	531	8/14	URBAN	NIGHT	1	A	M		1	200-2	NO	4	G/V	NO	1	4 MIN	BIG STAR	N/R	ECHO II,
58.	538	8/15	URBAN	NIGHT	3				3	PHONE	NO	1	G/V				BRIGHT	N,N,NW,STRAIGHT	ECHO II
59.	548	8/16	URBAN	NIGHT	1	A	M	CAR DEALER	1	LETTER	LETTER	3	G/V	BX	1	3-4 MIN	LIKE STAR	N	ECHO II
60.	549	8/16	URBAN	NIGHT	2	Y	M	STUDENTS	2	PHONE	OD164	8	G/V	TX	1	15 MIN	OVAL RED-GREEN	SE, STRAIGHT	ECHO I
61.	556	8/18	URBAN	NIGHT	M				3	P/TWX/200-2		6	G/V	BX	1	5-8 MIN	LIKE STAR	NE, STEADY	ECHO II
62.	559	8/19	URBAN	NIGHT	1				1	LETTER	LETTER	2	G/V					NORTH	ECHO II
63.	577	8/22	URBAN	NIGHT	M				1	200-2	NO	1	G/V	NO	1	10 MIN	BRILLIANT WHITE	N, STEADY	ECHO II
64.	587	8/23	URBAN	NIGHT	1	Y	M	STUDENT	1	200-2	NO	4	G/V	NO	1	5 MIN	BRIGHTER THAN STAR	N, STRAIGHT	ECHO II
65.	590	8/24	NFLD	NIGHT	1	A	M	MECHANIC	1	200-2	NO	6	G/V	NO	1	3 MIN	LIKE STAR	NE, STRAIGHT	ECHO II
66.	609	8/27	OCEAN	NIGHT	M	A	M	MILITARY	1	CIRVIS	NO	1	G/V	BX	1	2 MIN	WHITE		GEM V
67.	611	8/27	URBAN	NIGHT	2	A	B		1	200-2	NO	3	G/V	NO	1	1 MIN	ROUND GLOWING WHITE	NE, STRAIGHT	ECHO II
68.	613	8/28	URBAN	NIGHT	3	Y	M	STUDENTS	1	PHONE	OD164	7	G/V	NO	1	10 MIN	LIKE SATELLITE	NNW, STRAIGHT	ECHO II
69.	617	8/29	URBAN	NIGHT	2	Y	M	STUDENTS	1	PHONE	OD164	6	G/V	TX	1	3-5 MIN	YELLOW STAR	NE, STRAIGHT	ECHO II
70.	621	8/30	RURAL	NIGHT	2	A	B		1	LETTER	LETTER	2	G/V	NO	1	5 MIN	LIKE VENUS	N, STRAIGHT	ECHO II
71.	634	9/01	URBAN	NIGHT	3	Y	M	STUDENTS	1	LETTER	NO	2	G/V	NO	1	20-25M	AUTO LIGHT	N, ERRATIC	ECHO II
72.	635	9/01	URBAN	NIGHT	1	A	M	STUDENT	1	PHONE	OD164	7	G/V	NO	1	5 MIN	LIKE STAR	S, STRAIGHT	ECHO I
73.	643	9/02	URBAN	NIGHT	2	B	B		1	200-2	NO	2	G/V	NO	1	10 MIN	LIKE PLANET	N, ERRATIC	ECHO II
74.	644	9/02	URBAN	NIGHT	1	A	M	FARMER	1	200-2	NO	3	G/V	BX	1	15 MIN	CIRCULAR RED/GREEN	N, STRAIGHT	ECHO II
75.	653	9/04	URBAN	NIGHT	5	B	B		1	LETTER	LETTER	2	G/V	NO	1	10 MIN	STEADY WHITE LIGHT	NE, STRAIGHT	ECHO II
76.	666	9/05	URBAN	NIGHT	4	B	B		1	PHONE	OD164	7	G/V	NO	1	13 MIN	LIKE STAR	N, STRAIGHT, ZIG-ZAG	ECHO II
77.	673	9/06	URBAN	NIGHT	M				5	L/P/200-2 LTR		22	G/V	BX	1	3 MIN	BRIGHT STAR	NE, ERRATIC	ECHO II
78.	677	9/06	URBAN	NIGHT	1	A	M		1	200-2	NO	4	G/V	NO	1	3-4 MIN	LARGE STAR	N, STRAIGHT	ECHO II
79.	678	9/06	URBAN	NIGHT	1	A	M	DOCTOR	1	200-2	NO	4	G/V	TX	1	5-6 MIN	LIKE VENUS	N, SMOOTH	ECHO II
80.	699	9/17	URBAN	NIGHT	1		M		2	PHONE	OD164	14	G/V	NO	1	SEC'S	WHITE	N, STRAIGHT	ECHO II
81.	705	9/20	RURAL	NIGHT	M				3	PHONE	OD164	12	G/V	NO	1	10 MIN	LIKE STAR	NE, STRAIGHT	ECHO II
82.	546	8/16	URBAN	NIGHT	1	A	F		1	PHONE	OD164	3	G/V	NO	1	3 MIN	STARLIKE	SSE	ECHO II (NE)
154.	30	1/24	A'SKA	NIGHT	M	A	M	MILITARY	L	PHONE	NO	2	G/V	BX	M	N/R	SATELLITE ECHO II	SE (PASSES EVERY 1 HR 50 MIN)	

THE FOLLOWING REPORTS CONTAIN OBJECTS EVALUATED AS SATELLITES BY THE REPORTING OFFICIAL, DR. HYNEK, OR REPORTED AS SATELLITES BY THE OBSERVER (23)

83.	70	2/18	OCEAN	DUSK	4	A	M	MILITARY	1	200-2	NO	4	G/V	SX	1	1 MIN	LIKE STAR	105° STRAIGHT		HYNEK
84.	169	MAY 5-7	O'S	NIGHT	M	A	M	MILITARY	1	MERINT	NO	2	G/V	BX	N/R	N/R	LIKE SATELLITE	S, STRAIGHT		LOCAL EVAL
85.	176	5/07	URBAN	NIGHT	2	A	B	ELECT ENGR	1	LETTER	L/PHONE	3	G/V	NO	1	4 MIN	LIKE STAR	S		HYNEK
86.	177	5/07	HAWAII	NIGHT		A	M	MILITARY	1	MERINT	NO	2	G/V	NO	1	N/R	LIKE STAR	E, STRAIGHT		LOCAL EVAL
87.	279	7/13	URBAN	NIGHT	2	A	M	TOOL MAKER ,	1	L/FORM	NO	9	G/V	BX	1	15 MIN	CIGAR SHAPED	SE, STRAIGHT	(NEG E,P)	OBSERVER
88.	281	7/13	URBAN	NIGHT	2	A	B	PILOT	1	200-2	NO	3	G/V	NO	1	7 MIN	LIKE STAR	SSW (ASSUMED ERROR)		OBSERVER
89.	429	8/04	URBAN	NIGHT	M				1	PHONE	LETTER	2	G/V	NO	1	N/R	BLUISH WHITE STAR	80°	(NEG E,P)	OBSERVER
90.	561	8/19	RURAL	NIGHT	1	A	M		1	200-2	NO	4	G/V	NO	1	10 MIN	LIKE STAR	STRAIGHT	(ECHO II)	LOCAL EVAL
91.	513	8/12	URBAN	NIGHT	1	(SENT FORM NOT RET)			1	PHONE	LETTER	2	G/V	TX	3	10 SEC	SATELLITE	NNE, STRAIGHT		HYNEK
92.	567	8/20	USAFB	NIGHT	4	A	M	MILITARY	1	200-2	NO	7	G/V	BX	1	N/R	WHITE, SOME RED	SE, LEVEL		LOCAL EVAL
93.	654	9/04	URBAN	NIGHT	1	Y	M	STUDENT	1	LETTER	NO	2	G/V	BX	1	N/R	WHITE TRIANGULAR	NE, STRAIGHT		OBSERVER
94.	657	9/04	URBAN	NIGHT	2	A	B		1	LETTER	LETTER	2	G/V	NO	2	4 SEC	SATELLITE	E, LIKE SATELLITE		OBSERVER(NO E,P)
95.	889	12/29	OCEAN	NIGHT		A	M	MILITARY	1	MERINT	NO	1	G/V		1	N/R	1 MAG STAR	E, S.		LOCAL EVAL

THE FOLLOWING REPORTS CONTAIN OBJECTS CHARACTERISTIC OF SATELLITES BUT THE DATE/TIME WAS MISSING AND CHECK FOR A SPECIFIC OBJECT WAS NOT MADE (7)

96.	1	1965	URBAN	NIGHT	1	A	F	HOUSEWIFE	1	LETTER	LETTER	2	G/V	NO	N/R	N/R	LIKE STAR	UP,DOWN,SIDEWAYS		DATE MISSING
97.	156	APR/MAY	URBAN	NIGHT	1	Y	M	STUDENT	3	LETTER	LETTER	3	G/V	NO	3	15 MIN	BLUE-WHITE STAR	S, N/R, N/R		TIME MISSING
98.	260	7/08	URBAN	NIGHT	2	A	B		1	LETTER	LETTER	2	G/V	NO	1	15 MIN	LIKE STAR	NE, STRAIGHT		TIME MISSING
99.	293	7/16-17	O'S.	NIGHT	5	Y	M	STUDENTS	1	200-2	NO	2	G/V	NO	1	5 MIN	STAR W/RING	NE, ZIG-ZAG		TIME MISSING
100.	596	8/25	URBAN	NIGHT	3	A	B		1	PHONE	OD164	3	G/V	BX	2	5 MIN	N/R	N, (2d Object)		TIME MISSING
101.	631	8/31-9/7	URB	NIGHT	4				1	LETTER	LETTER	2	G/V	TX	1	15 MIN	N/R	N/R		MULTIPLE REPTS
102.	680	9/07	URBAN	NIGHT	2	A	M	MILITARY	1	200-2	NO	4	G/V	BX	2	5 MIN	STAR SHAPED	E, N, STRAIGHT		TIME GARBLED

THE FOLLOWING REPORTS CONTAIN OBJECTS CHARACTERISTIC OF SATELLITES BUT SCHEDULES FOR THAT DAY WERE NOT AVALIABLE FOR A SPECIFIC OBJECT CHECK (3)

103.	149	4/27	O'SEA	DUSK		A	M	MILITARY	1	200-2	NO	2	A/V	NO	1	4 MIN	BLUE-WHITE STAR	122° STRAIGHT		
104.	267	7/12	O'SEA	NIGHT		A	M	MILITARY	1	200-2	NO	4	G/V	NO	3	5 MIN EA	STAR LIKE	EAST, STRAIGHT		
105.	522	8/13	(FOR)	NIGHT	1	A	M	STUDENT	1	LETTER	LETTER	2	G/V	NO	1	2 MIN	2 MAG STAR	N, STRAIGHT		

THE FOLLOWING REPORTS CONTAIN OBJECTS CHARACTERISTIC OF SATELLITES. ECHO AND PEGASUS SCHEDULES FOR THE REPORTED TIME OF THE SIGHTING CHECKED NEGATIVE(49)

106.	19	1/17	O'SEA	DUSK	2	Y	B	STUDENTS	1	LETTER	164	5	G/V	NO	1.	1.5 MIN	ROUND,SMALL,RED & BLUS	EASTERLY		
107.	48	2/01	URBAN	NIGHT	3	A	M	AIR TRAFFIC C.	1		164	8	G/V	BX	1	60 SEC	LIKE STAR	EAST STRAIGHT		
108.	164	5/02	URBAN	NIGHT	2	Y	M	STUDENTS	1	LETTER	YES	10	G/V	NO	1	2.5 MIN	YELLOW STAR	SE, STRAIGHT		
109.	175	5/07	HAWAII	NIGHT		A	M	MILITARY	1	MERINT	NO	2	G/V		1	7 MIN	LIKE STAR	EAST		
110.	222	6/24	RURAL	NIGHT	2	A	F		1	PHONE	OD164	4	G/V	No	1	10 MIN	LIKE STAR	NE, STRAIGHT		
111.	230	6/29	URBAN	NIGHT	1				1	PHONE	OD164	4	G/V	NO	1	12 MIN	LIKE STAR	NE		
112.	254	7/05	URBAN	NIGHT	M	B	B		1	200-2	NO	3	G/V	NO	1	4 MIN	BLUE-WHITE STAR	NE, INCLUDE HOVER		
113.	249	7/04	URBAN	NIGHT	2	Y	B	STUDENTS	1	LETTER	LETTER	3	G/V	TX	1	3 MIN	SATELLITE	E, STRAIGHT		
114.	297	7/17	URBAN	NIGHT	1	A	F	N/R	1	200-2	NO	2	G/V	BX	(2)	N/R	LIKE STAR	SE, STRAIGHT		1st OBJ ECHO I

115.	299	7/18	URBAN	NIGHT	1	A	M	LABORER	1	PHONE	OD164	4	G/V	NO	(2)	5 MIN	LIKE STAR	SE, N (Lst OBJ ECHO II)	
116.	307	7/19	URBAN	NIGHT	1	A	M		1	LETTER	LETTER	2	G/V	NO	1	15 MIN	N/R	E, JERKY	
117.	310	7/20	URBAN	NIGHT	7	Y	B		3	PHONE	OD164	12	G/V	NO	1	5-7 MIN	ORANGE /WHITE LIGHT	E, STRAIGHT	
118.	313	7/20	URBAN	NIGHT	1	A	F	HOUSEWIFE	1	200-2	NONE	2	G/V	NO	1	6 MIN	LIKE STAR	STRAIGHT	
119.	323	7/23	RURAL	NIGHT	M	B	B		1	LETTER	LETTER	2	G/V	NO	1	N/R	SATELLITE	S, STRAIGHT	
120.	334	7/25	URBAN	NIGHT	2	Y	M	STUDENTS	1	PHONE	OD164	4	G/V	NO	1	30-40 SEC	LIKE STAR	S, STRAIGHT	
121.	336	7/25	RURAL	NIGHT	2	A	M	RANCHERS	1	200-2	NO	4	G/V	NO	1	30 MIN	LIKE STAR	ESE, STRAIGHT	
122.	337	7/25	RURAL	NIGHT	1	A	M	SYSTEMS ANAL	1	FORM	NO	4	G/V	NO	1	2 MIN	BLUE WHITE STAR	S	
123.	338	7/25	URBAN	NIGHT	5	B	B		2	PHONE	OD164	4	G/V	NO	1	15 SEC	LIKE STAR	SE, STRAIGHT	
124.	339	7/25	URBAN	NIGHT	1	A	M		1	LETTER	LETTER	3	G/V	NO	1	N/R	LIKE STAR	S, ZIG-ZAG	
125.	348	7/27	URBAN	NIGHT	1	A	M	SALESMAN	1	200-2	NO	2	G/V	NO	1	3-5 MIN	LIKE STAR	SE, STRAIGHT	
126.	357	7/28	URBAN	NIGHT	3	A	M	STUDENTS	1	LETTER	LETTER	3	G/V	TX	1	4-5 MIN	SATELLITE	N, ZIG-ZAG	
127.	363	7/30	URBAN	NIGHT	1	A	M	PROFESSOR	1	LETTER	LETTER	2	G/V	NO	1	N/R	RED-YELLOW/ORANGE STAR	S, STRAIGHT	
128.	375	8/01	URBAN	NIGHT	2	A	B	ELECTRICIAN	1	FORM	NO	4	G/V	NO	1	2 MIN	SATELLITE	NE, STRAIGHT	
129.	377	8/01	URBAN	NIGHT	3	A	M		1	200-2	NO	2	G/V	NO	1	2 MIN	LIKE STAR	N, STRAIGHT, W/ZIG-ZAG	
130.	382	8/02	URBAN	NIGHT	1	A	M	POLICE	1	200-2	NO	1	G/V	NO	1	1 MIN	LIKE STAR	S, STRAIGHT	
131.	390	8/02	URBAN	NIGHT	1	A	M	DRIVER	1	200-2	NO	5	G/V	NO	1	5 MIN	SATELLITE	SE, STRAIGHT	
132.	392	8/02	URBAN	NIGHT	1	A	M	ENGINEER	1	200-2	NO	3	G/V	NO	1	29 SEC	SATELLITE	N, STRAIGHT	
133.	425	8/04	RURAL	NIGHT	4	A	B		1	LETTER	LETTER	2	G/V	NO	1	15 SEC	LIKE STAR	N/R, STRAIGHT (FORM SENT, NOT RETURNED)	
134.	457	8/06	URBAN	NIGHT	2	A	M	ELECT ENGR	1	FORM	NO	3	G/V	NO	1	30-40 SEC	LIKE STAR	SE	
135.	530	8/14	URBAN	NIGHT	1	A	M	MILITARY	1	200-2	LETTER	5	G/V	NO	1	45-90 SEC	YELLOW ORANGE STAR	NE, ERRATIC	
136.	540	8/16	URBAN	NIGHT	1	Y	F	STUDENT	1	LETTER	LETTER	2	G/V	NO	1	1½-2 MIN	LIKE STAR	SE, ZIG-ZAG	
137.	594	8/25	URBAN	NIGHT	1	Y	M	STUDENT	1	200-2	NO	3	G/V	NO	1	5 MIN	WHITE	N, STRAIGHT	
138.	595	8/25	URBAN	NIGHT	2	Y	M	STUDENTS	1	PHONE	OD164	3	G/V	NO	1	1½ MIN	MOON REFLECTING FROM OBJ	N/R	
139.	602	8/26	URBAN	NIGHT	1	A	M	ELECTRONIC TECH	1	200-2	NO	2	G/V	NO	1	5-10 MIN	LIKE STAR	NE, STRAIGHT	
140.	640	9/02	URBAN	NIGHT	1	A	F	TELEPHONE OPR	1	FORM	NO	4	G/V	BX	1	15 MIN	YELLOW VOLLYBALL	N, STRAIGHT	
141.	642	9/02	URBAN	NIGHT	2	A	B	MILITARY	1	PHONE	OD164	4	G/V	NO	1	10 MIN	BRIGHT CLEAR LIGHT	N, ERRATIC	
142.	670	9/05	URBAN	NIGHT	1			N/R	1	200-2	NO	3	G/V	NO	1	5 MIN	LIKE STAR	NE, STRAIGHT	
143.	685	9/09	URBAN	NIGHT	2	A	B		1		164	4	G/V	NO	1	4 MIN	LIKE SPUTNIK	NORTHERLY	AMATURE ASTRONOMERS
144.	698	9/17	(FOR)	NIGHT		A	M	MILITARY	2	ELINT	NO	3	G/V	NO	2	N/R	BRIGHT WHITE LIGHT	NE, E, ERRATIC	
145.	707	9/20-21	URBAN	NIGHT	1	A	F	HOUSEWIFE	1	PHONE	NO	1	G/V	N/R	1	N/R	LIKE STAR	NORTH	
146.	709	9/21	URBAN	NIGHT	1	A	M	BUSINESSMAN	1	200-2	NO	3	G/V	BX	1	25 MIN	LIKE STAR	NE	
147.	718	9/24	USAFB	NIGHT	2	A	M	MILITARY	1	200-2	NO	1	G/V	NO	1	15 MIN	ROUND, GREEN, RED, BLUE	N, STRAIGHT	
148.	730	9/27	AFRICA	NIGHT	5	A	B		1	LETTER	LETTER	G/V		NO	3	FEW MIN	SMALL DOTS	ENE, E, WNW, STRAIGHT(SUDDEN DISAPP)	
149.	738	10/01	URBAN	NIGHT	2	Y	M	STUDENTS	2	LETTER/200-2	NO	2	G/V	NO	1	5 MIN	TWINKLING STAR	NNE	
150.	744	10/02	URBAN	NIGHT	1	A	M		1	200-2	NONE	3	G/V	NO	1	1 MIN	ROUND, TINTED BLUE	SE, STRAIGHT	
151.	749	10/04	URBAN	NIGHT	2	A	B		1	LETTER	LETTER	2	G/V	NO	1	N/R	RED NARROW	NE	
152.	862	12/01	URBAN	NIGHT	3	A	M	MILITARY	1	200-2	NO	4	G/V	NO	1	1 MIN	SPHERICAL PINK	045° STRAIGHT	
153.	875	12/11	RURAL	NIGHT	1	A	M		1	200-2	NO	4	G/V	NO	1	4 MIN	LIKE STAR	SE, STRAIGHT	

IN ADDITION TO THE ABOVE THERE WERE THIRTY-THREE OBJECTS EVALUATED AS SATELLITES ECHO I AND ECHO II IN THE MIDWEST FLAP FOLDER (ELLINGTON AFB)
THERE WERE THIRTEEN OBJECTS EVALUATED AS SATELLITES ON THE BASIS OF REPORTED CHARACTERISTICS INCLUDED IN THIS FOLDER.

Star Catalog
60 Garden Street
Cambridge
Massachusetts 02138

COPY

May 22, 1965

Dr. J. Allen Hynek
Dearborn Observatory
Evanston, Illinois

Dear Dr. Hynek:

The information which you requested regarding satellites with visual magnitudes of 3.0 or brighter is given below. All are orbiting as of this date. Many of the satellites launched in 1965, however, have magnitudes estimated from only a few observations, and thus for those objects, the magnitudes are to be considered less reliable.

International designation	Name	Spadats Number	Maximum Magnitude
60 Epsilon 3	Fragment Sputnik 4	36	+3
60 Zeta 1	Midas 2	43	+3
60 Iota 1	Echo 1	49	+0
60 Nu2	Rocket Courier 1B	59	+3
61 Alpha 1	Samos 2	70	+3
62 Omicron 1	Ariel	285	+2
62 Beta-Alpha 2	Rocket Alouette	426	+3
62 Beta-Kappa	None	444	+1
62 Beta-Tau 6	Debris Injun 3	520	+3
63003A	None	527	+2
63-27A	None	613	+2
63030A	Dual Tetrahedron	622	+3
63042B	None	682	+3
63047A	Centaur 2	694	+0
63049A	Rocket of unnamed	703	+3
64004A	Echo 2	740	-2
64004B	Debris of Echo 2	741	+0
64005A	Saturn 5	744	-1
64030A	Starflash	811	+2
64050B	Rocket Cosmos 42	866	+1
64053A	Cosmos 44	876	+1
64074A	S55C	924	+2
64076A	AD-1B	931	+3
64080B	Rocket Cosmos 51	948	+2
64084A	San Marco	957	+2
65004A	Tiros 9	978	-1.5
65006B	Rocket Cosmos 53	984	+2
65009A	Pegasus A	1085	+0
65009B	Command Mod.	1088	+1
65011D	Debris Cosmos 56	1092	+3
65014A	Cosmos 58	1097	+2
65016C	Grav.Grad.3	1292	+3
65027A	Snapshot	1314	+3
65027C	Fragment EGRS 4	1316	+3

SATELLITE 6402401 1965 4 A

FOR OTHER LATITUDES

EQUATOR S-N TIME (UT)	LONG. (W)	LAT.	PERC CORR.	SOUTH-NORTH LONG. CORR.	PT. (MI)	BEAR. (N-E)	TIME CORR.	WEST-EAST LONG. CORR.	PT. (MI)	BEAR. (S-E)

DECEMBER 12, 1965

1 21.2	265.20	81.5	27.5	-83.11	756	90.0*	27.5	-83.11	756	SC.0*
3 9.3	292.34	70.0	21.9	-18.69	761	24.4*	33.0	-147.53	748	155.6*
4 57.5	319.55	50.0	15.4	-6.36	758	11.0*	39.4	-159.88	728	169.0*
6 45.6	346.72	40.0	12.3	-4.11	754	8.2*	42.5	-162.14	718	171.8*
8 33.7	13.89	30.0	9.2	-2.63	749	6.7*	45.5	-163.62	708	173.3*
10 21.9	41.06	20.0	6.1	-1.59	744	5.6*	48.6	-164.65	699	174.3*
12 10.0	68.23	0.	0.	0.	738	4.9*	54.6	-166.29	684	175.1*
13 58.2	95.40	-20.0	-6.1	1.59	734	5.7*	-47.6	164.94	675	174.3*
15 46.3	122.58	-30.0	-9.1	2.65	719	6.7*	-44.6	163.88	674	173.3*
17 34.4	149.75	-40.0	-12.1	4.13	720	8.4*	-41.6	162.33	672	171.6*
19 22.6	176.92	-50.0	-15.2	6.41	702	11.0*	-38.6	160.04	672	169.0*
21 10.7	204.09	-70.0	-21.5	18.77	693	24.4*	-32.2	147.71	672	155.6*
22 58.9	231.26	-81.5	-27.0	83.23	685	90.0*	-27.0	83.23	685	SC.0*

SHADOW ENTRY LAT. 34.0 EXIT LAT. 32.6

DECEMBER 13, 1965

0 47.0	258.43	81.5	27.4	-83.11	754	90.0*	27.4	-83.11	754	SC.0*
2 35.1	285.60	70.0	21.9	-18.69	758	24.4*	33.0	-147.54	742	155.6*
4 23.3	312.77	50.0	15.4	-6.36	756	11.0*	39.4	-159.87	722	169.0*
6 11.4	339.95	40.0	12.3	-4.11	753	8.2*	42.5	-162.14	716	171.8*
7 59.5	7.12	30.0	9.2	-2.63	748	6.7*	45.5	-163.63	707	173.3*
9 47.7	34.29	20.0	6.1	-1.59	743	5.6*	48.6	-164.70	698	174.3*
11 35.8	61.46	0.	0.	0.	732	4.9*	54.6	-166.32	684	175.1*
13 24.0	88.63	-20.0	-6.1	1.59	725	5.7*	-47.6	164.93	676	174.3*
15 12.1	115.80	-30.0	-9.1	2.65	715	6.7*	-44.6	163.88	674	173.3*
17 0.2	142.97	-40.0	-12.2	4.13	710	8.4*	-41.6	162.36	674	171.6*
18 48.4	170.14	-50.0	-15.2	6.41	705	11.0*	-38.6	160.07	675	169.0*
20 36.5	197.32	-70.0	-21.5	18.76	696	24.4*	-32.4	147.76	681	155.6*
22 24.7	224.49	-81.5	-27.0	83.23	688	90.0*	-27.0	83.23	688	SC.0*

SHADOW ENTRY LAT. 35.9 EXIT LAT. 34.7

DECEMBER 14, 1965

0 12.8	251.66	81.5	27.4	-83.11	751	90.0*	27.4	-83.11	751	SC.0*
2 0.9	278.83	70.0	21.8	-18.68	756	24.4*	33.0	-147.56	741	155.6*
3 49.1	306.00	50.0	15.4	-6.36	754	11.0*	39.4	-159.88	722	169.0*
5 37.2	333.17	40.0	12.3	-4.13	751	8.2*	42.4	-162.15	714	171.8*
7 25.3	0.34	30.0	9.2	-2.63	747	6.7*	45.5	-163.64	707	173.3*
9 13.5	27.51	20.0	6.1	-1.58	742	5.6*	48.5	-164.72	697	174.3*
10 1.6	54.68	0.	0.	0.	732	4.9*	54.5	-166.33	683	175.1*
12 49.8	81.85	-20.0	-6.1	1.59	721	5.7*	-47.6	164.92	676	174.3*
14 37.9	109.03	-30.0	-9.1	2.65	716	6.7*	-44.6	163.85	675	173.3*
16 26.0	136.20	-40.0	-12.2	4.13	712	8.4*	-41.6	162.35	675	171.6*
18 14.2	163.37	-50.0	-15.2	6.40	707	11.0*	-38.6	160.06	677	169.0*
20 2.3	190.54	-70.0	-21.5	18.76	698	24.4*	-32.4	147.65	683	155.6*
21 50.4	217.71	-81.5	-27.0	83.22	690	90.0*	-27.0	83.22	690	SC.0*
23 38.6	244.88									

SHADOW ENTRY LAT. 37.9 EXIT LAT. 36.7

DECEMBER 15, 1965

1 26.7	272.05	81.5	27.4	-83.11	748	90.0*	27.4	-83.11	748	SC.0*
3 14.9	299.22	70.0	21.8	-18.69	753	24.4*	33.0	-147.55	738	155.6*
5 3.0	326.39	50.0	15.4	-6.37	752	11.0*	39.3	-159.85	721	169.0*
6 51.1	353.56	40.0	12.3	-4.10	750	8.2*	42.4	-162.10	713	171.8*
8 39.3	20.73	30.0	9.2	-2.63	746	6.7*	45.4	-163.65	704	173.3*
10 27.4	47.91	20.0	6.1	-1.58	742	5.6*	48.5	-164.71	696	174.3*
12 15.5	75.08	0.	0.	0.	732	4.9*	54.4	-166.32	683	175.1*
14 3.7	102.25	-20.0	-6.1	1.59	722	5.7*	-47.7	164.91	677	174.3*
15 51.8	129.42	-30.0	-9.1	2.65	718	6.7*	-44.7	163.84	676	173.3*
17 40.0	156.59	-40.0	-12.2	4.13	713	8.4*	-41.7	162.34	677	171.6*
19 28.1	183.76	-50.0	-15.2	6.40	709	11.0*	-38.7	160.06	679	169.0*
21 16.2	210.93	-70.0	-21.5	18.76	701	24.4*	-32.4	147.69	686	155.6*
23 4.4	238.10	-81.5	-27.0	83.22	693	90.0*	-27.0	83.22	693	SC.0*

SHADOW ENTRY LAT. 40.4 EXIT LAT. 39.2

SATELLITE 6402401 1965 4 A

FOR OTHER LATITUDES

EQUATOR S-N TIME (UT)	LONG. (W)	LAT.	PERC CORR.	SOUTH-NORTH LONG. CORR.	PT. (MI)	BEAR. (N-E)	TIME CORR.	WEST-EAST LONG. CORR.	PT. (MI)	BEAR. (S-E)

DECEMBER 16, 1965

0 52.5	285.23	81.5	27.4	-83.11	746	90.0*	27.4	-83.12	746	SC.0*
2 40.6	292.44	70.0	21.8	-18.69	751	24.4*	33.0	-147.58	730	155.6*
4 28.8	319.61	50.0	15.4	-6.37	749	11.0*	39.3	-159.91	711	169.0*
6 16.9	346.78	40.0	12.3	-4.11	749	8.2*	42.4	-162.17	711	171.8*
8 5.0	13.95	30.0	9.2	-2.64	745	6.7*	45.4	-163.65	703	173.3*
9 53.2	41.12	20.0	6.1	-1.59	741	5.6*	48.4	-164.72	695	174.3*
11 41.3	68.30	0.	0.	0.	732	4.9*	54.4	-166.33	684	175.1*
13 29.5	95.47	-20.0	-6.1	1.59	723	5.7*	-47.7	164.91	678	174.3*
15 17.6	122.64	-30.0	-9.1	2.65	717	6.7*	-44.7	163.84	676	173.3*
17 5.7	149.81	-40.0	-12.2	4.13	715	8.4*	-41.7	162.34	676	171.6*
18 53.9	176.98	-50.0	-15.2	6.41	711	11.0*	-38.7	160.05	677	169.0*
20 42.0	204.15	-70.0	-21.6	18.75	703	24.4*	-32.4	147.66	684	155.6*
22 30.1	231.32	-81.5	-27.0	83.21	695	90.0*	-27.0	83.21	695	SC.0*

SHADOW ENTRY LAT. 43.0 EXIT LAT. 41.9

DECEMBER 17, 1965

0 18.3	258.49	81.5	27.4	-83.12	744	90.0*	27.4	-83.12	744	SC.0*
2 6.4	285.66	70.0	21.8	-18.69	749	24.4*	33.0	-147.58	734	155.6*
3 54.5	312.83	50.0	15.4	-6.37	748	11.0*	39.3	-159.90	715	169.0*
5 42.7	340.00	40.0	12.3	-4.11	746	8.2*	42.3	-162.17	710	171.8*
7 30.8	7.17	30.0	9.2	-2.63	741	6.7*	45.4	-163.66	703	173.3*
9 18.9	34.34	20.0	6.1	-1.58	737	5.6*	48.5	-164.73	695	174.3*
11 7.1	61.51	0.	0.	0.	731	4.9*	54.5	-166.34	684	175.1*
12 55.2	88.68	-20.0	-6.1	1.59	727	5.7*	-47.7	164.90	679	174.3*
14 43.4	115.85	-30.0	-9.1	2.65	720	6.7*	-44.7	163.82	679	173.3*
16 31.5	143.02	-40.0	-12.2	4.13	716	8.4*	-41.7	162.33	680	171.6*
18 19.6	170.19	-50.0	-15.2	6.40	713	11.0*	-38.7	160.04	681	169.0*
20 7.8	197.36	-70.0	-21.6	18.75	705	24.4*	-32.4	147.67	688	155.6*
21 55.9	224.53	-81.5	-27.0	83.21	699	90.0*	-27.0	83.21	699	SC.0*
23 44.0	251.70									

SHADOW ENTRY LAT. 46.0 EXIT LAT. 44.8

DECEMBER 18, 1965

1 32.2	278.87	81.5	27.3	-83.11	741	90.0*	27.3	-83.11	741	SC.0*
3 20.3	306.04	70.0	21.8	-18.70	746	24.4*	33.0	-147.57	727	155.6*
5 8.4	333.22	50.0	15.4	-6.37	746	11.0*	39.3	-159.91	708	169.0*
6 56.6	0.39	40.0	12.2	-4.11	744	8.2*	42.3	-162.19	705	171.8*
8 44.7	27.56	30.0	9.2	-2.64	741	6.7*	45.3	-163.67	701	173.3*
10 32.8	54.73	20.0	6.1	-1.59	736	5.6*	48.4	-164.74	694	174.3*
12 21.0	81.90	0.	0.	0.	731	4.9*	54.5	-166.35	684	175.1*
14 9.1	109.07	-20.0	-6.1	1.59	724	5.7*	-47.7	164.89	680	174.3*
15 57.2	136.24	-30.0	-9.1	2.65	721	6.7*	-44.7	163.81	680	173.3*
17 45.4	163.41	-40.0	-12.2	4.13	717	8.4*	-41.7	162.32	681	171.6*
19 33.5	190.58	-50.0	-15.2	6.40	714	11.0*	-38.7	160.04	683	169.0*
21 21.6	217.75	-70.0	-21.6	18.75	707	24.4*	-32.4	147.67	691	155.6*
23 9.8	244.92	-81.5	-27.0	83.21	701	90.0*	-27.0	83.21	701	SC.0*

SHADOW ENTRY LAT. 49.0 EXIT LAT. 48.4

MODIFIED ORBITAL ELEMENTS FOR EARTH SATELLITE 6402401

REFERENCE TIME 1965 Y 12 M 4 D 1 H 47.36 M UT
INCLINATION 81.47 DEG.
ASCENDING NODE (LONG.) 257.23 DEG. WEST
PRIME SWEEP INTERVAL ONE DAY -7.24 MIN.
ARGUMENT OF PERIGEE 256.40 DEG.
RATE OF CHANGE -0.18725 DEG. PER PERIOD
ANOMALISTIC PERIOD 108.088 MIN.
RATE OF CHANGE -0.00006 MIN. PER PERIOD
ECCENTRICITY 0.31242
RADIUS OF PERIGEE 4613.3 MILES
RADIUS OF APOGEE 4729.3 MILES
RATE OF CHANGE -3.04 MILES PER DAY
ASCENDING NODE (R.A.) 202.38 DEG.
RATE OF CHANGE -0.83286 DEG. PER DAY
LATITUDE OF PERIGEE -73.98 DEG.
READ IN EXPECTED MAGNITUDE IS -1 TO +1

SMITHSONIAN ASTROPHYSICAL OBSERVATORY, CAMBRIDGE, MASSACHUSETTS

DECEMBER 1, 1965

SATELLITE 1964 4A, ECHO II

These predictions are based on orbital elements revised on November 29, 1965
T_o = November 30.0, times are in days, U.T.
Argument of perigee = 266.756 - 2.749465 $(t-T_o)$
Right ascension of ascending node = 205.469 - 0.83286 $(t-T_o)$

Inclination = 81.467
Eccentricity = 0.01333 - 4.11 x 10^{-6} $(t-T_o)$
Semi-major axis = 7.517957 megameters
Mean anomaly (Rev.) = 0.71756 + 13.322110 $(t-T_o)$ + 4.608 x 10^{-5} $(t-T_o)^2$

SATELLITE 6403401 1964 4 A

FOR OTHER LATITUDES

EQUATOR S-N TIME (UT)	EQUATOR S-N LONG. (W)	LAT.	TIME CORR.	SOUTH-NORTH LONG. CORR.	SOUTH-NORTH FT. (FT)	SOUTH-NORTH BEAR. (N-E)	NORTH-SOUTH TIME CORR.	NORTH-SOUTH LONG. CORR.	NORTH-SOUTH FT. (FT)	NORTH-SOUTH BEAR. (N-E)
DECEMBER 4, 1965										
0 29.9	237.78	81.5	27.5	-83.38	778	90.0*	27.5	-83.68	778	90.0*
2 18.1	264.95	70.0	21.9	-18.67	778	24.4*	33.2	-147.55	765	155.6*
4 6.2	292.12	50.0	15.4	-6.36	768	11.0*	39.6	-159.81	750	169.0
5 54.4	319.30	40.0	12.3	-4.13	760	8.3*	42.7	-162.68	739	171.7
7 42.5	346.47	30.0	9.2	-2.64	751	6.7*	45.8	-163.55	727	173.3
9 30.6	13.64	20.0	6.1	-1.58	741	5.6*	48.9	-164.62	714	174.3
11 18.8	40.81	0.	3.	0.	721	4.9	54.9	-166.21	694	175.1
13 6.9	67.99	-20.0	-6.0	1.60	722	5.7	-47.2	165.62	677	174.3*
14 55.1	95.16	-30.0	-9.0	2.66	696	6.7	-44.1	163.95	671	173.3*
16 43.2	122.33	-40.0	-12.1	4.15	687	8.4	-41.3	162.45	666	171.6*
18 31.4	149.51	-50.0	-15.1	6.44	640	11.0	-38.3	160.16	662	169.0*
20 19.5	176.68	-70.0	-21.1	18.41	670	24.4*	-32.1	147.77	662	155.6*
22 7.7	203.85	-81.5	-26.7	83.29	684	90.0*	-26.7	83.29	684	90.0*
23 55.8	231.02									

SHADOW ENTRY LAT. 60.7 EXIT LAT. -16.2

DECEMBER 5, 1965

1 44.0	258.20	81.5	27.5	-83.38	775	90.0*	27.5	-83.68	775	90.0*
3 32.1	285.37	70.0	21.9	-18.67	776	24.4*	33.1	-147.55	761	155.6*
5 20.2	312.54	50.0	15.4	-6.36	767	11.0*	39.6	-159.82	747	169.0
7 8.4	339.72	40.0	12.3	-4.15	761	8.3*	42.7	-162.69	736	171.7
8 56.5	6.89	30.0	9.2	-2.63	752	6.7*	45.8	-163.56	724	173.3
10 44.7	34.06	20.0	6.1	-1.58	742	5.6*	48.8	-164.62	712	174.3
12 32.8	61.23	0.	3.	0.	723	4.9	54.8	-166.22	692	175.1
14 21.0	88.41	-20.0	-6.0	1.59	725	5.7	-47.1	165.71	676	174.3*
16 9.1	115.58	-30.0	-9.1	2.66	697	6.7	-44.1	163.92	670	173.3*
17 57.3	142.75	-40.0	-12.1	4.15	690	8.4	-41.2	162.44	667	171.6*
19 45.4	169.92	-50.0	-15.1	6.43	644	11.0	-38.2	160.15	664	169.0*
21 33.5	197.10	-70.0	-21.1	18.45	673	24.4*	-32.1	147.76	664	155.6*
23 21.7	224.27	-81.5	-26.7	83.28	687	90.0*	-26.7	83.29	687	90.0*

SHADOW ENTRY LAT. 59.1 EXIT LAT. -13.1

DECEMBER 6, 1965

1 9.8	251.44	81.5	27.5	-83.34	772	90.0*	27.5	-83.68	772	90.0*
2 58.0	278.61	70.0	21.9	-18.67	774	24.4*	33.1	-147.55	761	155.6*
4 46.1	305.79	50.0	15.4	-6.36	766	11.0*	39.6	-159.82	744	169.0
6 34.3	332.96	40.0	12.3	-4.13	760	8.3*	42.7	-162.69	733	171.6
8 22.4	0.13	30.0	9.2	-2.64	752	6.7*	45.7	-163.57	722	173.3
10 10.6	27.30	20.0	6.1	-1.58	743	5.6*	48.8	-164.63	710	174.3
11 58.7	54.48	0.	3.	0.	725	4.9	54.8	-166.23	690	175.1
13 46.8	81.65	-20.0	-6.0	1.59	727	5.7	-47.1	165.72	675	174.3*
15 35.0	108.82	-30.0	-9.1	2.66	700	6.7	-44.1	163.92	667	173.3*
17 23.1	135.99	-40.0	-12.1	4.15	691	8.4	-41.2	162.43	667	171.6*
19 11.3	163.17	-50.0	-15.1	6.43	647	11.0	-38.2	160.14	665	169.0*
20 59.4	190.34	-70.0	-21.1	18.43	676	24.4*	-32.1	147.75	664	155.6*
22 47.6	217.51	-81.5	-26.7	83.27	690	90.0*	-26.7	83.27	690	90.0*

SHADOW ENTRY LAT. 57.4 EXIT LAT. -5.2

DECEMBER 7, 1965

0 35.7	244.68	81.5	27.5	-83.34	773	90.0*	27.5	-83.38	770	90.0*
2 23.8	271.86	70.0	21.9	-18.67	772	24.4*	33.1	-147.51	765	155.6*
4 12.0	299.03	50.0	15.4	-6.36	765	11.0*	39.6	-159.83	741	169.0
6 0.1	326.20	40.0	12.3	-4.13	759	8.3*	42.7	-162.11	730	171.6
7 48.3	353.37	30.0	9.2	-2.63	752	6.7*	45.7	-163.58	719	173.3
9 36.4	20.55	20.0	6.1	-1.58	744	5.6*	48.8	-164.64	708	174.3
11 24.6	47.72	0.	3.	0.	726	4.9	54.9	-166.24	685	175.1
13 12.7	74.89	-20.0	-6.0	1.59	731	5.7	-47.4	164.99	675	174.3*
15 0.8	102.06	-30.0	-9.1	2.66	702	6.7	-44.4	163.91	670	173.3*
16 49.0	129.24	-40.0	-12.1	4.14	696	8.4	-41.4	162.42	667	171.6*
18 37.1	156.41	-50.0	-15.1	6.43	689	11.0	-38.4	160.13	666	169.0*
20 25.3	183.58	-70.0	-21.1	18.79	679	24.4*	-32.2	147.75	667	155.6*
22 13.4	210.75	-81.5	-26.8	83.27	672	90.0*	-26.8	83.27	672	90.0*

SHADOW ENTRY LAT. 55.3 EXIT LAT. -4.2

SATELLITE 6403401 1964 4 A

FOR OTHER LATITUDES

EQUATOR S-N TIME (UT)	EQUATOR S-N LONG. (W)	LAT.	TIME CORR.	SOUTH-NORTH LONG. CORR.	SOUTH-NORTH FT. (FT)	SOUTH-NORTH BEAR. (N-E)	NORTH-SOUTH TIME CORR.	NORTH-SOUTH LONG. CORR.	NORTH-SOUTH FT. (FT)	NORTH-SOUTH BEAR. (N-E)
DECEMBER 8, 1965										
0 1.6	237.92	81.5	27.5	-83.38	767	90.0*	27.5	-83.68	767	90.0*
1 44.7	265.10	70.0	21.9	-18.67	770	24.4*	33.1	-147.51	753	155.6*
3 37.8	292.27	50.0	15.4	-6.36	764	11.0*	39.6	-159.84	736	169.0
5 26.0	319.44	40.0	12.3	-4.13	759	8.3*	42.6	-162.11	728	171.6
7 14.1	346.61	30.0	9.2	-2.63	752	6.7*	45.7	-163.58	717	173.3
9 2.3	13.79	20.0	6.1	-1.58	744	5.6*	48.7	-164.65	706	174.3
10 50.4	40.96	0.	3.	0.	728	4.9*	54.7	-166.25	687	175.1
12 38.6	68.13	-20.0	-6.0	1.59	712	5.7	-47.4	164.98	675	174.3*
14 26.7	95.30	-30.0	-9.1	2.66	705	6.7	-44.4	163.90	672	173.3*
16 14.8	122.47	-40.0	-12.1	4.14	698	8.4	-41.4	162.41	668	171.6*
18 3.0	149.65	-50.0	-15.2	6.42	692	11.0	-38.4	160.12	663	169.0*
19 51.1	176.82	-70.0	-21.4	18.79	682	24.4*	-32.2	147.74	665	155.6*
21 39.3	203.99	-81.5	-26.8	83.26	675	90.0*	-26.8	83.26	675	90.0*
23 27.4	231.16									

SHADOW ENTRY LAT. 52.0 EXIT LAT. -8.1

DECEMBER 9, 1965

1 15.6	258.33	81.5	27.5	-83.39	764	90.0*	27.5	-83.68	764	90.0*
3 3.7	285.51	70.0	21.9	-18.67	766	24.4*	33.1	-147.52	754	155.6*
4 51.8	312.68	50.0	15.4	-6.36	763	11.0*	39.6	-159.84	735	169.0*
6 40.0	339.85	40.0	12.3	-4.13	758	8.3*	42.6	-162.11	727	171.6
8 28.1	7.02	30.0	9.2	-2.63	751	6.7*	45.7	-163.59	716	173.3
10 16.3	34.19	20.0	6.1	-1.58	744	5.6*	48.7	-164.66	704	174.3
12 4.4	61.37	0.	3.	0.	729	4.9*	54.7	-166.26	684	175.1
13 52.5	88.54	-20.0	-6.0	1.59	714	5.7	-47.4	164.97	674	174.3*
15 42.7	115.71	-30.0	-9.1	2.65	707	6.7	-44.4	163.89	671	173.3*
17 28.8	142.88	-40.0	-12.1	4.14	701	8.4	-41.4	162.40	667	171.6*
19 17.0	170.05	-50.0	-15.2	6.42	695	11.0*	-38.4	160.11	665	169.0*
21 5.1	197.23	-70.0	-21.4	18.78	685	24.4*	-32.2	147.73	667	155.6*
22 53.3	224.40	-81.5	-26.9	83.25	677	90.0*	-26.9	83.25	677	90.0*

SHADOW ENTRY LAT. 47.6 EXIT LAT. 7.1

DECEMBER 10, 1965

0 41.4	251.57	81.5	27.5	-83.39	762	90.0*	27.5	-83.69	762	90.0*
2 29.5	278.74	70.0	21.9	-18.67	765	24.4*	33.1	-147.52	753	155.6*
4 17.7	305.91	50.0	15.4	-6.36	761	11.0*	39.6	-159.85	733	169.0*
6 5.8	333.09	40.0	12.3	-4.13	757	8.3*	42.6	-162.12	725	171.6*
7 54.0	0.26	30.0	9.2	-2.63	751	6.7*	45.6	-163.60	712	173.3
9 42.1	27.43	20.0	6.1	-1.58	744	5.6*	48.6	-164.67	700	174.3
11 30.2	54.60	0.	3.	0.	732	4.9*	54.6	-166.27	680	175.1
13 18.4	81.77	-20.0	-6.1	1.59	716	5.7	-47.4	164.96	674	174.3*
15 6.5	108.94	-30.0	-9.1	2.65	709	6.7	-44.4	163.88	671	173.3*
16 54.7	136.12	-40.0	-12.1	4.14	703	8.4	-41.4	162.39	667	171.6*
18 42.8	163.29	-50.0	-15.2	6.41	698	11.0*	-38.4	160.10	665	169.0*
20 30.9	190.46	-70.0	-21.4	18.79	688	24.4*	-32.2	147.72	666	155.6*
22 19.1	217.63	-81.5	-26.9	83.25	680	90.0*	-26.9	83.25	680	90.0*

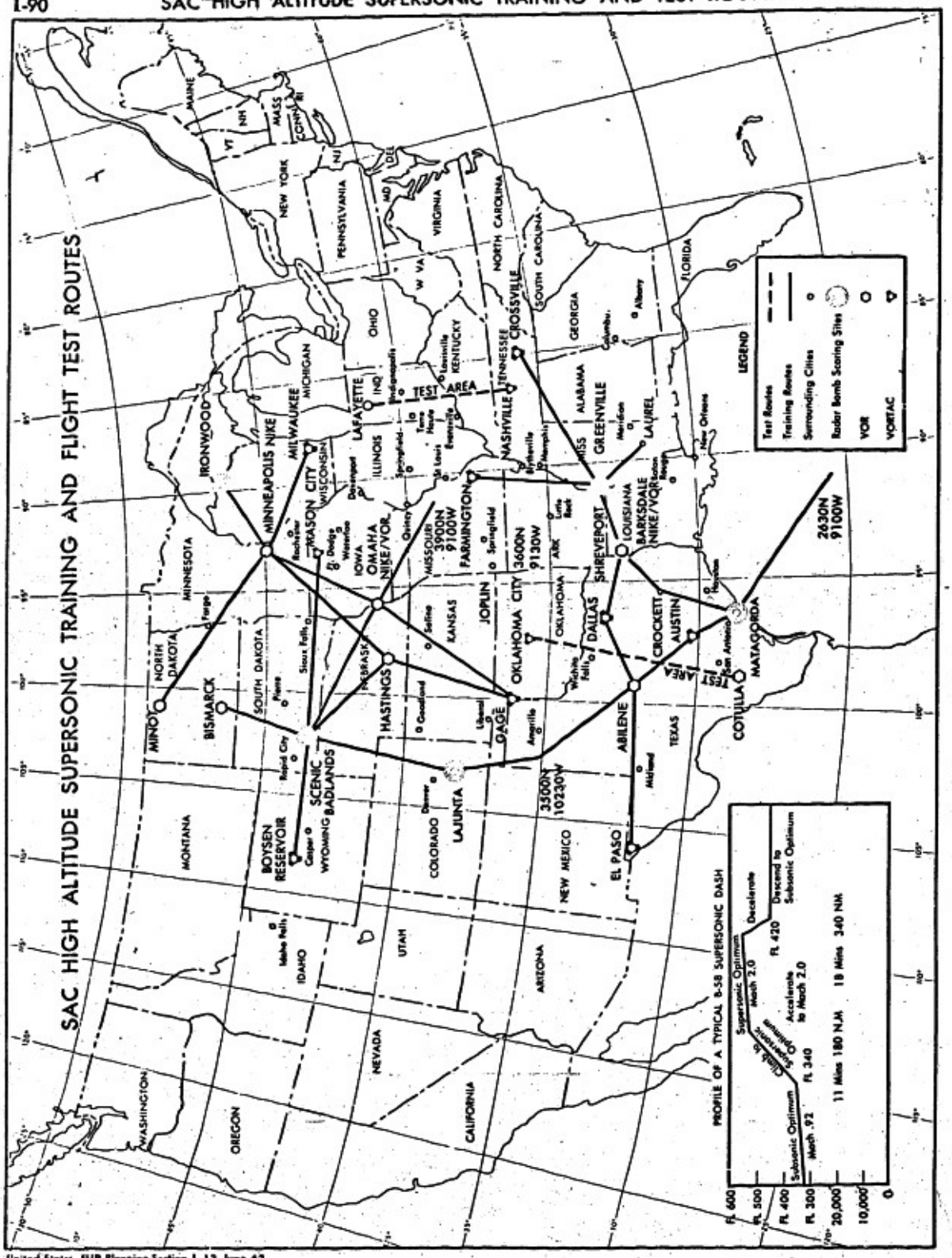
SHADOW ENTRY LAT. 40.4 EXIT LAT. 14.1

DECEMBER 11, 1965

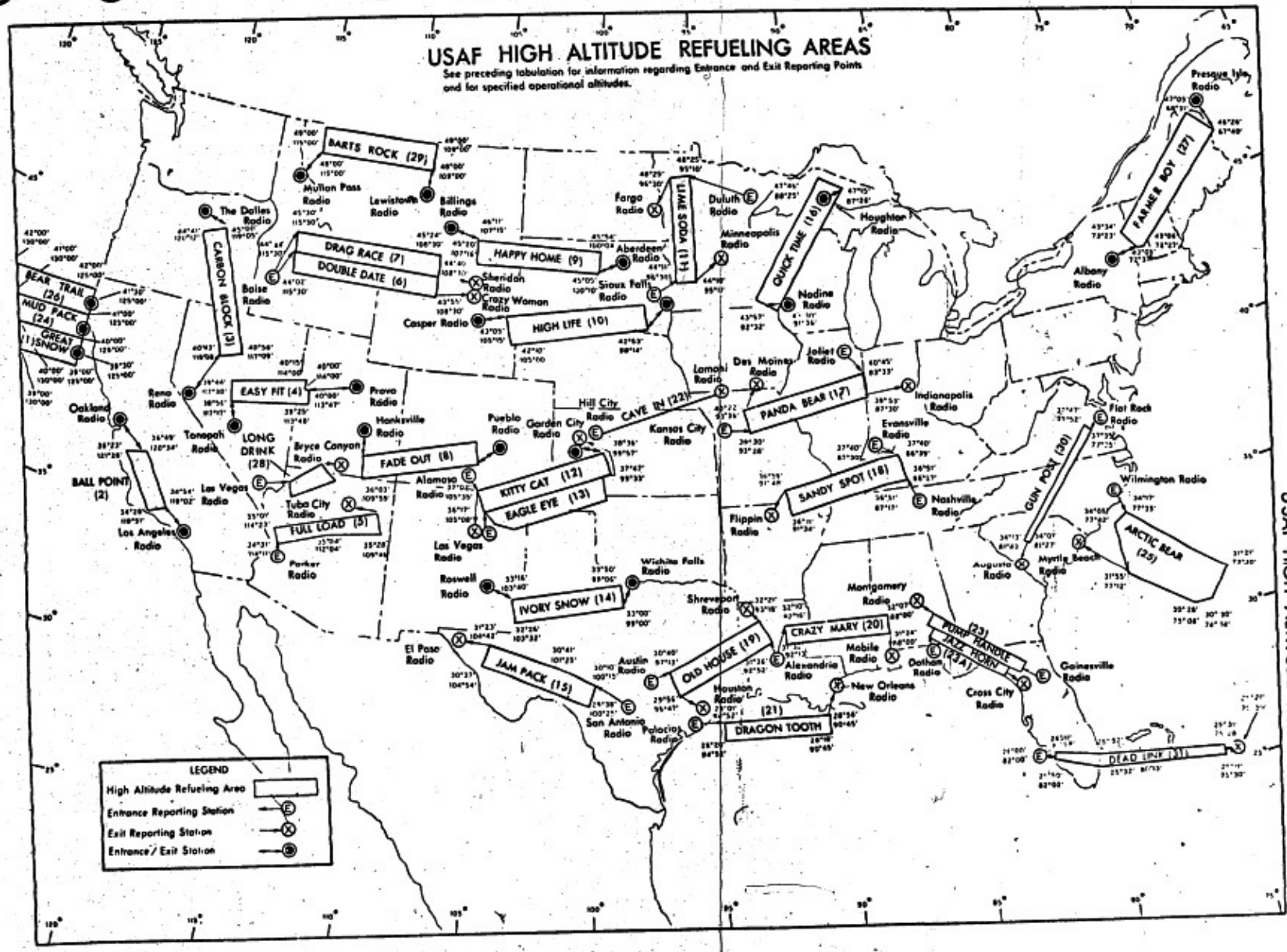
0 7.2	244.80	81.5	27.5	-83.39	759	90.0*	27.5	-83.69	759	90.0*
1 55.4	271.97	70.0	21.9	-18.67	763	24.4*	33.1	-147.53	745	155.6*
3 43.5	299.15	50.0	15.4	-6.36	760	11.0*	39.6	-159.85	730	169.0*
5 31.6	326.32	40.0	12.3	-4.13	756	8.3*	42.6	-162.13	725	171.6*
7 19.8	353.49	30.0	9.2	-2.63	750	6.7*	45.6	-163.61	714	173.3
9 7.9	20.66	20.0	6.1	-1.58	744	5.6*	48.6	-164.68	703	174.3
10 56.1	47.83	0.	3.	0.	731	4.9*	54.6	-166.28	687	175.1
12 44.2	75.00	-20.0	-6.1	1.59	717	5.7*	-47.4	164.95	677	174.3*
14 32.3	102.18	-30.0	-9.1	2.65	711	6.7*	-44.4	163.87	673	173.3*
16 20.5	129.35	-40.0	-12.1	4.13	708	8.4*	-41.4	162.38	671	171.6*
18 8.6	156.52	-50.0	-15.2	6.41	704	11.0*	-38.4	160.09	667	169.0*
19 56.8	183.69	-70.0	-21.5	18.77	694	24.4*	-32.2	147.71	668	155.6*
21 44.9	210.86	-81.5	-26.9	83.24	692	90.0*	-26.9	83.24	692	90.0*
23 33.0	238.03									

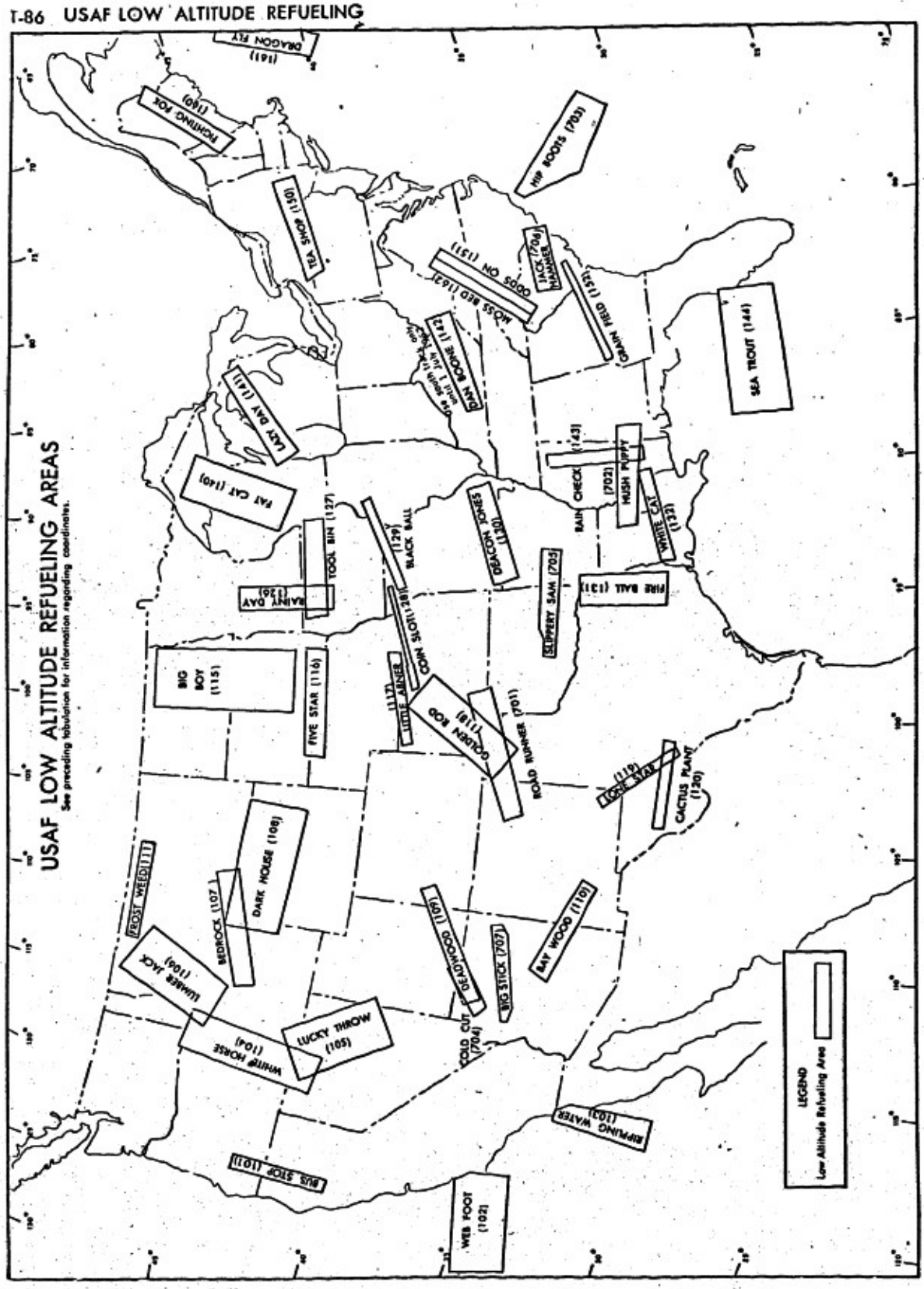
SHADOW ENTRY LAT. 32.3 EXIT LAT. 1.1

SAC HIGH ALTITUDE SUPERSONIC TRAINING AND TEST ROUTES



United States, FLIP Planning-Section 1,13 June 62.
Amendment # 1, June 1962. Page 1 of 1 Page.


USAF HIGH ALTITUDE REFUELING AREAS
See preceding tabulation for information regarding Entrance and Exit Reporting Points and for specified operational altitudes.
BARTS ROCK (29)
DRAG RACE (7)
DOUBLE DATE (6)
HAPPY HOME (9)
LIME SODA (11)
QUICK TIME (16)
FARMER BOY (27)
BEAR TRAIL (26)
MUD PACK (24)
GREAT SNOW (1)
CARBON BLOCK (3)
HIGH LIFE (10)
EASY FIT (4)
CAVE IN (22)
PANDA BEAR (17)
LONG DRINK (28)
FADE OUT (8)
KITTY CAT (12)
EAGLE EYE (13)
SANDY SPOT (18)
GUN POST (20)
BALL POINT (2)
FULL LOAD (5)
IVORY SNOW (14)
CRAZY MARY (20)
ARCTIC BEAR (25)
JAM PACK (15)
OAD HOUSE (19)
PUMP HANDLE (23)
JAZZ HORN (23A)
DRAGON TOOTH (21)
DEAD END (31)
Mullan Pass Radio
Billings Radio
Lewistown Radio
The Dalles Radio
Boise Radio
Sheridan Radio
Crazy Woman Radio
Casper Radio
Aberdeen Radio
Sioux Falls Radio
Fargo Radio
Duluth Radio
Minneapolis Radio
Houghton Radio
Presque Isle Radio
Albany Radio
Nodine Radio
Lamoni Radio
Des Moines Radio
Joliet Radio
Indianapolis Radio
Evansville Radio
Flat Rock Radio
Wilmington Radio
Nashville Radio
Myrtle Beach Radio
Augusta Radio
Oakland Radio
Reno Radio
Provo Radio
Tonopah Radio
Las Vegas Radio
Bryce Canyon Radio
Hanksville Radio
Tuba City Radio
Los Angeles Radio
Parker Radio
Hill City Radio
Pueblo Radio
Garden City Radio
Kansas City Radio
Alamosa Radio
Las Vegas Radio
Roswell Radio
Wichita Falls Radio
Shreveport Radio
Flippin Radio
Montgomery Radio
Mobile Radio
Dothan Radio
Alexandria Radio
New Orleans Radio
Houston Radio
Austin Radio
El Paso Radio
San Antonio Radio
Palacios Radio
Cross City Radio
Gainesville Radio
LEGEND
High Altitude Refueling Area
Entrance Reporting Station
Exit Reporting Station
Entrance / Exit Station


USAF LOW ALTITUDE REFUELING AREAS
See preceding tabulation for information regarding coordinates.
DRAGON FLY (161)
NORTHERN FOX (160)
TEA SHOP (150)
HIP BOOTS (703)
JACK HAMMER (704)
GRAND FIELD (132)
COOS ON (151)
MOSS RED (162)
SEA TROUT (144)
DAN BOONE (142)
LADY DAY (141)
FAT CAT (140)
TOOL BIN (127)
BLACK BALL (129)
DEACON JONES (130)
HUSH PUPPY (702)
RAIN CHECK (143)
WHITE CAT (121)
FIRE BALL (131)
SLIPPERY SAM (705)
RAINY DAY (126)
BIG BOY (115)
FIVE STAR (116)
CORN STOLL (128)
LITTLE ARMER (117)
GOLDEN ROD (118)
ROAD RUNNER (701)
LONE STAR (119)
CACTUS PLANT (120)
FROST WEED (111)
DARK HOUSE (108)
BEDROCK (107)
LUMBER JACK (106)
WHITE HORSE (104)
LUCKY THROW (105)
GOLDENROD (109)
COLD CUT (704)
BIG STICK (707)
BAY WOOD (110)
SPRING WATER (103)
BUS STOP (101)
WEB FOOT (102)
LEGEND
Low Altitude Refueling Area

USAF LOW ALTITUDE REFUELING AREAS

USAF aircraft conduct refueling operations throughout the continental United States below 24,000 feet MSL. Although these refueling operations may be conducted anywhere in the United States, they are generally confined to the areas listed below. The following points are emphasized in connection with refueling operations below 24,000 feet MSL:

(1) Refueling aircraft have right of way over other aircraft in accordance with CAR 60.14(b).

(2) Normally, these operations are conducted VFR (or VFR conditions on top); however, they may be conducted on IFR flight plans at assigned altitude/s including altitude reservation flight plans.

STRATEGIC AIR COMMAND

No.	Name	Area Coordinates
101	Bus Stop	43°16', 123°43' 43°16', 123°14' 40°00', 123°15' 40°00', 123°43'
102	Web Foot	33°42', 120°42' 35°10', 121°02' 35°27', 121°25' 34°45', 125°08' 32°59', 124°33'
103	Rippling Water	32°32', 118°00' 32°31', 117°30' 32°10', 117°10' 29°19', 117°10' 29°14', 118°26'
104	White Horse	41°21', 117°30' 41°33', 119°15' 46°17', 116°28' 46°29', 118°22'
105	Lucky Throw	38°50', 116°00' 39°52', 114°00' 41°50', 118°48' 42°55', 116°37'
106	Lumber Jack	45°00', 114°58' 45°49', 117°20' 49°07', 115°00' 48°14', 112°32'
107	Bedrock	44°50', 114°55' 46°03', 109°15' 44°03', 114°35' 45°13', 108°56'
108	Dark House	43°15', 105°20' 45°04', 105°03' 45°27', 111°50' 45°38', 111°51'
109	Deadwood	36°35', 113°48' 36°04', 113°27' 38°44', 108°50' 38°12', 108°31'
110	Bay Wood	33°50', 112°05' 34°31', 111°48' 33°12', 107°25' 32°31', 107°45'
111	Frost Weed	49°00', 113°20' 49°00', 108°00' 48°30', 106°00' 48°30', 113°20'
115	Big Bay	43°58', 97°44' 43°58', 100°37' 48°58', 97°36' 48°58', 100°47'
116	Five Star	42°40', 97°43' 43°29', 97°39' 42°40', 102°45' 43°29', 102°48'
117	Little Abner	39°31', 101°55' 39°50', 102°00' 40°04', 97°40' 40°24', 97°43'
118	Golden Rod	35°49', 101°47' 36°35', 103°07' 39°48', 100°03' 38°57', 98°41'
119	Lone Star	30°00', 101°42' 30°13', 101°24' 32°37', 104°02' 32°49', 103°44'
120	Cactus Plant	30°16', 101°07' 30°36', 101°05' 30°26', 104°46' 30°47', 104°49'
126	Rainy Day	42°33', 95°35' 42°33', 94°24' 45°51', 95°37' 45°51', 94°24'
127	Tool Bin	42°48', 91°13' 43°37', 91°12' 42°44', 95°58' 43°34', 96°02'
128	Coin Slot From 42 nm NE of Hill City VOR via V1522 to 42 nm SW of Lamoni VOR.	
129	Block Ball	41°00', 90°27' 41°20', 90°35' 39°57', 94°37' 40°15', 94°47'
130	Deacon Jones	36°00', 94°20' 36°50', 90°00' 36°50', 94°37' 37°40', 90°13'
131	Fire Ball	33°40', 95°30' 30°35', 95°30' 30°35', 94°15' 33°40', 94°15'
132	White Cat	30°19', 93°48' 30°39', 93°53' 31°00', 89°55' 31°20', 89°59'
140	Fat Cat	43°43', 89°41' 44°28', 91°48' 47°11', 87°20' 47°55', 89°33'
141	Lazy Day	43°30', 87°53' 45°08', 83°08' 45°54', 83°38' 44°14', 88°25'
142	Dan Boone Use South track only until 1 July 1962	37°27', 82°08' 36°40', 86°42' 37°27', 86°57' 38°16', 82°21'
143	Rain Check	31°14', 89°34' 31°14', 89°00' 34°41', 89°34' 34°41', 89°00'
144	Sea Trout	28°00', 83°00' 26°00', 83°00' 26°00', 88°00' 28°00', 88°00'
150	Tea Shop	41°35', 79°24' 42°24', 79°32' 42°45', 74°25' 41°55', 74°21'
152	Grain Field	33°16', 80°50' 33°01', 80°45' 31°50', 85°04' 32°04', 85°10'
160	Fighting Fox	43°37', 71°47' 44°10', 72°28' 46°35', 68°27' 46°01', 67°48'
161	Dragon Fly	40°00', 68°50' 39°38', 67°52' 43°10', 66°45' 42°47', 65°45'

TACTICAL AIR COMMAND

No.	Name	Area Coordinates
701	Road Runner	36°58', 99°10' 37°47', 99°33' 36°17', 105°08' 35°31', 104°43'
702	Hush Puppy	31°24', 88°00' 32°07', 88°00' 32°10', 92°16' 31°32', 92°13'
703	Hip Boots	31°20', 73°30' 30°06', 74°37' 31°55', 77°12' 34°05', 77°42' 34°17', 77°35'
704	Cold Cut	36°15', 114°15' 35°56', 113°50' 37°18', 112°08' 37°00', 111°45'
705	Slippery Sam	35°00', 97°44' 35°00', 96°43' 35°07', 96°30' 35°00', 93°06' 34°24', 93°08' 34°31', 96°30' 34°38', 96°44' 34°39', 97°43'
706	Jack Hammer	33°30', 79°10' 33°30', 82°00' 34°10', 82°00' 34°10', 79°10'
707	Big Stick	35°17', 114°15' 34°55', 114°15' 34°55', 113°30' 35°37', 110°12' 35°49', 109°53' 36°10', 110°00'

ROUTE TAR PAIL

EFFECTIVE 22 APRIL 1962

USAF LOW LEVEL ROUTES
OIL BURNER

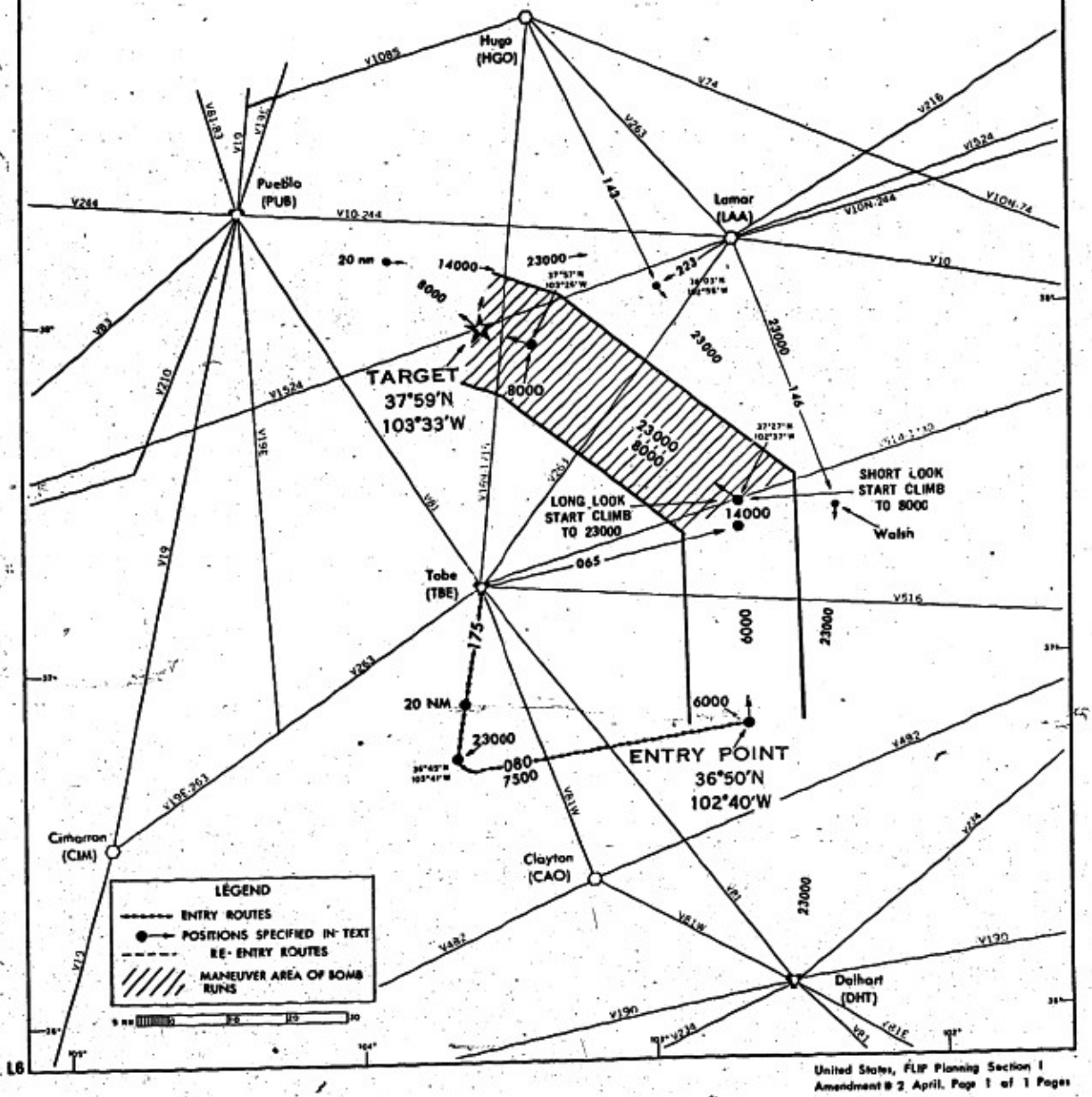
Tabe, Colorado VORTAC Entry

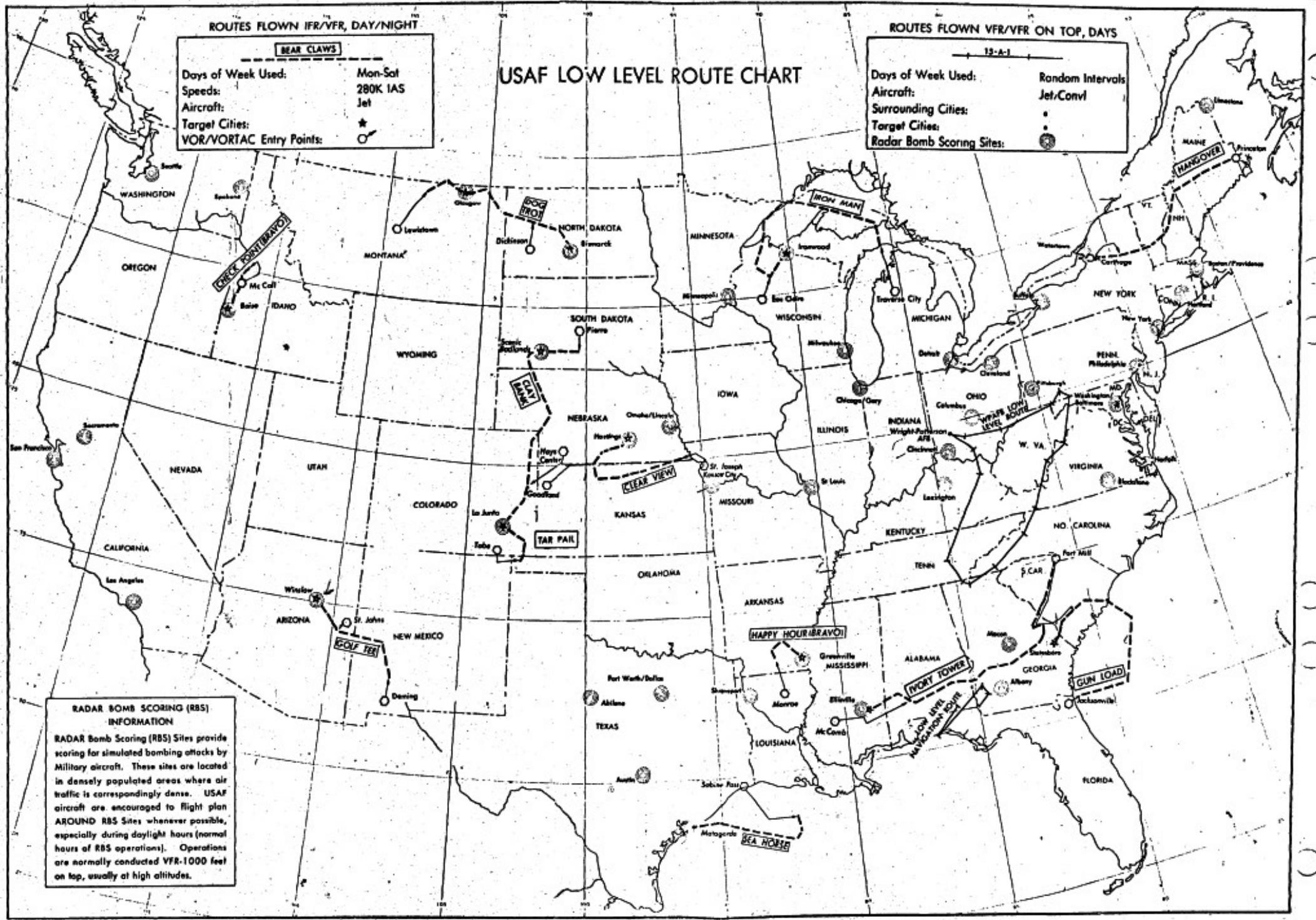
Aircraft shall enter at the Tabe VORTAC (reporting point) at assigned altitude/flight level, then proceed outbound on the Tabe VORTAC 175 radial at assigned altitude/flight level, until 20 NM south of the Tabe VORTAC, then descend outbound on the Tabe VORTAC 175° radial so as to reach 23,000' MSL or below at 36°45'N 103°41'W. At this point, aircraft shall start standard rate left descending turn to a true course of 080°, descending so as to reach 7500' MSL prior to reaching V81; aircraft shall then maintain 7500' MSL until clear of V81; then continue descent to the entry point of the low level route at 36°50'N 102°40'W at 6000' MSL maintain 6000' MSL direct to 37°27'N 102°37'W.

SHORT LOOK: After passing 37°27'N 102°37'W aircraft shall climb so as to reach 8000' MSL prior to crossing 37°57'N 103°26'W; aircraft shall then make bomb run at 8000' MSL to the target at 37°59'N 103°33'W. After leaving target aircraft shall continue on NW heading at 8000' MSL for not more than 20 NM; then make a right turn and proceed direct to 38°03'N 102°56'W (intersection of Hugo, Colo. VOR 143° radial and Lamar, Colo. VOR 223° radial) then direct to Walsh, Colo. maintaining 8000' MSL until clear of V10; then climb to maintain at or below 14,000' MSL until clear of V1524 then climb so as to reach 23,000' MSL north of V1730; then at 23,000' MSL to Walsh, Colo. (Reporting point) direct to Dalhart, Texas VORTAC.

LONG LOOK: Aircraft shall start climb from 6000' MSL immediately after crossing the Tabe, Colo. VORTAC 065° radial maintain at or below 14,000' MSL until north of V1730; then climb so as to reach 23,000' MSL prior to entering V1715 and V1524. Long Look missions shall then maintain 23,000' MSL to the target area, making right turn after bomb run direct to Lamar, Colo. VOR; then at 23,000' MSL via the Lamar VOR 146° radial to Walsh, Colo. (reporting point); then at 23,000' MSL direct to the Dalhart, Texas VORTAC (reporting point).

The hours of operation on this route are 0000 - 2359Z Mon - Sat.




USAF LOW LEVEL ROUTE CHART
ROUTES FLOWN IFR/VFR, DAY/NIGHT
BEAR CLAWS
Days of Week Used: Mon-Sat
Speeds: 280K IAS
Aircraft: Jet
Target Cities: ★
VOR/VORTAC Entry Points: ♂
ROUTES FLOWN VFR/VFR ON TOP, DAYS
13-A-1
Days of Week Used: Random Intervals
Aircraft: Jet/Convl
Surrounding Cities: •
Target Cities: •
Radar Bomb Scoring Sites:
RADAR BOMB SCORING (RBS) INFORMATION
RADAR Bomb Scoring (RBS) Sites provide scoring for simulated bombing attacks by Military aircraft. These sites are located in densely populated areas where air traffic is correspondingly dense. USAF aircraft are encouraged to flight plan AROUND RBS Sites whenever possible, especially during daylight hours (normal hours of RBS operations). Operations are normally conducted VFR-1000 feet on top, usually at high altitudes.
CHECK POINT (BRAVO)
IRON MAN
HANGOVER
SOCK IRON
CLAY MARK
CLEAR VIEW
TAR PAIL
GOLF TEE
HAPPY HOUR (BRAVO)
IVORY TOWER
GUN LOAD
SEA HORSE
WPAFB LOW LEVEL ROUTE
LOW LEVEL NAVIGATION ROUTE
WASHINGTON
OREGON
CALIFORNIA
NEVADA
IDAHO
MONTANA
WYOMING
UTAH
ARIZONA
COLORADO
NEW MEXICO
NORTH DAKOTA
SOUTH DAKOTA
NEBRASKA
KANSAS
OKLAHOMA
TEXAS
MINNESOTA
IOWA
MISSOURI
ARKANSAS
LOUISIANA
WISCONSIN
ILLINOIS
MICHIGAN
INDIANA
OHIO
KENTUCKY
TENN
MISSISSIPPI
ALABAMA
GEORGIA
FLORIDA
S CAR
NO CAROLINA
VIRGINIA
W. VA
PENN
NEW YORK
MAINE
VT.
NH
MASS
R I
CONN
N J
MD
DEL
DC
Seattle
Spokane
Lewiston
Dickinson
Bismarck
Minneapolis
Ironwood
Eau Claire
Traverse City
Milwaukee
Detroit
Cleveland
Chicago/Gary
Columbus
Pittsburgh
Buffalo
Rochester
Syracuse
Albany
Boston/Providence
New York
Hartford
Washington/Baltimore
Wright-Patterson AFB
Cincinnati
Lexington
St Louis
St. Joseph Kansas City
Omaha/Lincoln
Hastings
Hays Center
Goodland
Scenic Rockland
Pierre
Boise
Mc Call
Sacramento
San Francisco
Los Angeles
Las Vegas
Winslow
St. Johns
Deming
La Junta
Tulsa
Abilene
Fort Worth/Dallas
Shreveport
Monroe
Greenville
Meridian
McComb
Austin
Sabine Pass
Matagorda
Macon
Statesboro
Albany
Jacksonville
Fort Mill
Blackstone
Limestone
Princeton
Carthage
Watertown
Bangor
Portland
Manchester
Concord
Providence
Newport
Norfolk
Richmond
Roanoke
Charleston
Huntington
Parkersburg
Akron
Youngstown
Erie
Rochester
Toledo
Flint
Saginaw
Grand Rapids
Muskegon
Green Bay
La Crosse
Rochester
Duluth
Minneapolis
Fargo
Grand Forks
Minot
Williston
Glasgow
Great Falls
Lewistown
Billings
Miles City
Sheridan
Casper
Rock Springs
Cheyenne
Scottsbluff
North Platte
Grand Island
Lincoln
Omaha
Kansas City
Topeka
Wichita
Salina
Dodge City
Garden City
Liberal
Amarillo
Lubbock
Midland
Abilene
Waco
Dallas
Fort Worth
Tyler
Shreveport
Alexandria
Lake Charles
Houston
Galveston
Corpus Christi
Brownsville
Laredo
San Antonio
Del Rio
El Paso
Albuquerque
Gallup
Farmington
Durango
Grand Junction
Salt Lake City
Ogden
Provo
Cedar City
Las Vegas
Reno
Fresno
Bakersfield
Los Angeles
San Diego
Yuma
Phoenix
Tucson
Douglas
Roswell
Clovis
Lubbock
Amarillo
Pueblo
Colorado Springs
Denver
Grand Junction
Montrose
Cortez
Farmington
Albuquerque
Santa Fe
Las Vegas
Raton
Trinidad
Pueblo
Alamosa
Gunnison
Aspen
Vail
Steamboat Springs
Craig
Rangely
Vernal
Price
Provo
Salt Lake City
Ogden
Logan
Pocatello
Idaho Falls
Twin Falls
Boise
Ontario
Burns
Klamath Falls
Medford
Roseburg
Eugene
Salem
Portland
Astoria
Seattle
Spokane
Wenatchee
Yakima
Pasco
Walla Walla
Lewiston
Moses Lake
Ephrata
Omak
Kalispell
Missoula
Butte
Bozeman
Helena
Great Falls
Havre
Glasgow
Williston
Minot
Grand Forks
Fargo
Jamestown
Bismarck
Dickinson
Miles City
Billings
Sheridan
Casper
Rock Springs
Cheyenne
Scottsbluff
North Platte
Grand Island
Lincoln
Omaha
Kansas City
Topeka
Wichita
Salina
Dodge City
Garden City
Liberal
Amarillo
Lubbock
Midland
Abilene
Waco
Dallas
Fort Worth
Tyler
Shreveport
Alexandria
Lake Charles
Houston
Galveston
Corpus Christi
Brownsville
Laredo
San Antonio
Del Rio
El Paso
Albuquerque
Gallup
Farmington
Durango
Grand Junction
Salt Lake City
Ogden
Provo
Cedar City
Las Vegas
Reno
Fresno
Bakersfield
Los Angeles
San Diego
Yuma
Phoenix
Tucson
Douglas
Roswell
Clovis
Lubbock
Amarillo
Pueblo
Colorado Springs
Denver

FEDERAL AVIATION AGENCY
Washington 25, D.C.

MAY 2 1961

Maj. William T. Coleman, Jr., USAF
Public Information Division
Office of Information
Department of the Air Force
Washington 25, D. C.

Dear Major Coleman:

Your letter dated April 7, 1961, regarding sighting of white light rotating beacons on aircraft has been forwarded to this office for reply.

Approved anti-collision lights required for night flight on aircraft having a maximum gross weight of more than 12,000 pounds and used on many lighter aircraft are red rotating beacons.

Special Civil Air Regulation SR-392B which is scheduled to terminate February 25, 1962, provides for limited experimental use of types of lighting systems which do not comply with the relevant specifications contained in the CARs.

A number of different types of lights are being evaluated by the Federal Aviation Agency Bureau of Research and Development and various operators and manufacturers. The majority of these lights are of the strobe condenser discharge type which produce a brilliant blue-white light. One type of installation consists of "swinging" wing lights in green and red and a "bobbing" white tail light. The periodic discharge flash or the "bobbing" effect may not be distinguishable from a rotating flash at a distance, which may explain the impression that white rotating beacons have been observed.

Since approvals of experimental operation in accordance with SR-392B are granted in the field, the number and types of lights presently in operation are not readily available.

Maintaining a current list of aircraft with experimental lighting would be impractical as it is subject to frequent changes.

If we may be of additional assistance, please advise.

Sincerely,

Jack W. Hudson, Chief
Air Carrier Operations Branch
Bureau of Flight Standards

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS STRATEGIC AIR COMMAND
OFFUTT AIR FORCE BASE, NEBRASKA, 68113

REPLY TO ATTN OF: DXIP-2

15 NOV 1965

SUBJECT: Night Photography - Air Refueling

TO: AFSC (Col de Jonckheere)
Foreign Technology Division
Wright-Patterson AFB, Ohio 45433

The attached film is of a night refueling of a B-52 and a KC-135. It was photographed from a T-39 chase aircraft. Separation between subject and chase aircraft was the minimum permissible distance of 2,000'. The film shows only several lights moving on a dark background. The film was processed using the best known methods of increasing the film speed.

FOR THE COMMANDER IN CHIEF

JOHN R. RUEHLE, Lt Col, USAF
Chief, Production and Policy Division
Directorate of Information

1 Atch
Roll of film
Project Number 7-52/612
Roll Number M32D 1 & 2

FLARES USED WITH REFUELING OPERATIONS:

SOURCE: NCOIC of REFUELING SQUADRON AT WPAFB

No flares are carried for operations except on KC-97s. KC-97s carry M-4 flares for emergency use. These are used primarily when communications by radio are out or the A/C to be refueled cannot locate the tanker A/C. The normal color is a two-ball yellow and green flare fired out of the rear of the A/C. The flare looks like a roman candle and falls in an arc descending. The duration can be up to 30 seconds. Red flares are carried also, but these are used in emergency only and not for identification or refueling operations.

ARMCO STEEL CORPORATION

GENERAL OFFICES · MIDDLETOWN, OHIO 45042

WALTER C. PAGUE
MANAGER AIR TRANSPORTATION

ARMCO

November 26, 1965

Major Hector Quintanilla, USAF
Chief Project Blue Book
Wright-Patternson AFB
Ohio 45433

Dear Sir:

In reply to your letter of 15 November, 1965, with reference to your investigation of an unindentified flying object, I am submitting the following information:

The pilots aboard the Armco Steel Corporation Gulfstream -437-A were Donald Swanson and the undersigned, who are employees of the company.

a. There were no unusual lights or other aircraft observed during the approach to the airport.

b. The time of landing was 1840 EST(2340Z).

c. The approach path of the aircraft was from the northeast over the field after which a right turn was executed and the aircraft then proceeded westbound until entering a downwind leg on the southwesterly heading in preparation for landing to the northeast on the runway heading 052 degrees.

d. There is no afterburner used on the engines.

Insofar as there are wing tip and tail flashing strobe lights installed on the aircraft which we operated at the time, as well as top and bottom fuselage rotating beacons, we feel this might help in your investigation.

We hope that the above will be of some assistance to you.

Very truly yours,

E. E. Winglewich

E. E. Winglewich
Pilot

EEW;mew

(OBJECTS NOTED ORIGINALLY BELIEVED TO BE SPECIFIC AIRCRAFT OF JET OR CONVENTIONAL TYPE)

					WITNESS DATA					RECEIVER DATA						OBJECT DATA				

41.	167	4/[illegible]	[illegible]	NIGHT	1	A	M	MILITARY	1	200-2	[illegible]	12	C/V	N/A	N/A	1	3-5 MIN	RADAR RETURN	[illegible]
42.	[illegible]	[illegible]	[illegible]	NIGHT	1	A	M		1	200-2	NO	2	C/V	NO	CLEAR	1	5 MIN	CIRCULAR LIGHT [illegible]	[illegible]
43.	[illegible]	[illegible]	[illegible]	[illegible]	2	Y	M		1	[illegible]	[illegible]	4	C/V	NO	CLEAR	1	5-6 [illegible]	BALL OF LIGHT	[illegible]
44.	[illegible]	[illegible]	[illegible]	[illegible]	1	A	M	[illegible]	1	200-2	NO	4	C/V	NO	CLEAR	3	15 MIN	OVAL GOALS POST [illegible]	[illegible]

THE FOLLOWING REPORTS CONTAIN OBJECTS EVALUATED AS JET OR CONVENTIONAL AIRCRAFT. THIS EVALUATION IS BASED UPON DESCRIPTION AND [illegible]

45.	24	2/16	URBAN	NIGHT	2		F		1	LETTER	[illegible]	2	C/V	NO	N/R	1	2-3 MIN	LIKE FALLING STAR VARIED [illegible]	[illegible]
46.	27	2/22	URBAN	DUSK	1	Y	M	10 YR OLD	1	LETTER	164	7	C/V	NO	CLOUDY	1	11 MIN	OBJ W/EXHAUST TRAIL	JET W/13
47.	30	2/24	ALASKA	NIGHT	3	A	M	MILITARY	1	PHONE	NO	1	A/V	NO	CLEAR	1	35-60 S	BLINKING LIGHT NOT [illegible]	C/J
48.	32	2/25	URBAN	DUSK	1	Y	M	UFO FAN	1	LETTER	NO	2	C/V	NO	CLEAR	1	10 MIN	OVAL, METALLIC, MOTION [illegible]	C/J
49.	54	2/03	RURAL	NIGHT	1	Y	M	STUDENT	1	LETTER	LETTER	2	C/V	NO	N/R	1	N/R	FADING RED OBJ, FAST	C/J
50.	59	2/07	CANADA	NIGHT	2	A	M	PILOTS	1	200-2	NO	4	A/V	NO	CLEAR	1	1 MIN	LARGE UNSTEADY FLASHING LIGHT	C/J
51.	60	2/09	OVERSEAS	NIGHT	1	A	M	MILITARY	1	200-2	NO	6	C/V	NO	CLEAR	1	1 MIN	FLAT OBJ, LEVEL FLIGHT	C/J
52.	65	2/15	URBAN	DAY	1	Y	M	STUDENT	1	LETTER	164/LETTER	4	C/V	NO	CLEAR	1	1½MIN	SILVER-GREY, METALLIC, ERRATIC MOTION	C/J
53.	78	2/25	RURAL	NIGHT	1	A	M		1	200-2	LETTER	2	C/V	NO	CLEAR	2	25 MIN	SHINY, RED & GRN, ROUND, MANUVERED	C/J
54.	83	3/03	OCEAN	NIGHT				MILITARY	1	CIRVIS	NO	1	C/V	NO	N/R	1	6 MIN	BALL OF LIGHT, MOTION INCL HOVER	C/J
55.	85	3/04	URBAN	NIGHT	1	A	M		1	CIRVIS	NO	2	C/V	NO	CLEAR	1	6 MIN	ELLIPTICAL, FLOURESCENT, ROTATIONARY, FAST	C/J
56.	91	3/09	URBAN	NIGHT	M	B	B		1	PHONE	NO	4	C/V	NO	CLOUDY	1	10 MIN	RD, PINK, WHITE, ORANGE, ZIG ZAG	C/J
57.	98	3/13	URBAN	NIGHT	2	Y	M	STUDENTS	1	LETTER	NO	1	C/V	NO	N/R	1	N/R	GLOWING DISC, SPEED BET METEOR/SATELLITE	C/J
58.	105	3/24	URBAN	NIGHT	1	Y	M	10 YR OLD	1	LETTER	164	4	C/V	NO	CLOUDY	1	10 MIN	EGG SHAPE	C/J
59.	108	3/26	URBAN	NIGHT	1	A	M		1	LETTER	NO	1	C/V	NO	N/R	1	20 SEC	FISH SHAPED, SHARP TURNS	C/J
60.	110	3/27	URBAN	NIGHT	3	B	F		1	PHONE	NO	4	C/V	NO	CLEAR	1	5-10 MIN	LIGHT CHANGING COLOR, SHARP TURN, STOP	C/J
61.	114	3/30	RURAL	NIGHT	1	A	F	HOUSEWIFE	1	PHONE	INVES/WPAFB (F)		C/V	NO	CLEAR	1	N/A	PORTION OF COMPLEX CASE	C/J
62.	116	3/30	URBAN	NIGHT	1	A	M	PIO	1	PHONE	LETTER	4	C/V	NO	CLOUDY	1	6 SEC	RED-ORANGE LIGHT, STRAIGHT FLT	C/J
63.	117	3/30	RURAL	NIGHT	1	A	M	FARMER	1	LETTER	164	4	C/V	NO	CLEAR	1	10-12 MIN	GOLD/RED OVAL LIGHT, STRAIGHT FLT	C/J
64.	127	4/04	URBAN	NIGHT	1	A	M	STUDENT	1	200-2	TWX	5	C/V	NO	CLEAR	1	5 MIN	OVAL RED LIGHT, LEVEL FLIGHT	C/J
65.	136	4/10	RURAL	NIGHT	1	Y	M	STUDENT	1	LETTER	164	5	C/V	TX	CLEAR	1	3 MIN	SHINY, METALLIC, OVAL, ERRATIC FLT	C/J
66.	141	4/15	URBAN	NIGHT	2		M		1	LETTER	NO	1	C/V	BX	CLEAR	1	7 MIN	INTENSE POINT OF LIGHT, STRAIGHT FLT	C/J
67.	144	4/19	URBAN	NIGHT	2	Y	M	STUDENTS	1	PHONE	NO	4	C/V	TX	CLEAR	2	5 MIN	CIRCULAR WHITE LIGHTS, ZIG-ZAG	C/J
68.	147	4/25	URBAN	DAY	2	Y	M	STUDENTS	1	LETTER	164/LETTER	5	C/V	NO	CLOUDY	1	3 MIN	OVAL," SAUCERS TOGATHER, STRAIGHT ARC, HOV	C/J
69.	148	4/26	URBAN	NIGHT	1				1	200-2	NO	1	C/V	NO	CLOUDY	1	5 MIN	WHITE STAR, HIGH & CLIMBING	C/J
70.	150	4/28	URBAN	NIGHT	3	A	B	PAINTER, NURSE	1	200-2	NO	3	C/V	NO	CLEAR	1	30-60 S	FLAT TRIANGLE, WHITE, LINEAR PATH	C/J
71.	152	4/29	URBAN	DAY	1	Y	M	STUDENT	1	LETTER	LETTER	2	C/V	NO	CLEAR	2	3 MIN	SILVER, ORANGE GLOBE FLT DOWN INCR SPEED	C/J
72.	155	4/29	URBAN	DAY	1		M		1	LETTER	LETTER	2	C/V	NO	N/R	1	1 MIN	ELONGATED, GLEAMED, STRAIGHT FLT	C/J
73.	160	5/01	URBAN	NIGHT	1		M		1	LETTER	NO	1	C/V	NO	N/R	1	1 MIN	STARLIKE BLINKING LIGHT	C/J
74.	170	5/05	OCEAN	NIGHT				MILITARY	2	PHONE/MERINT/TWX		2	C/V,	G/RADAR	CLEAR	M	6 MIN	1st MAG, HIGH SPEED EVAL BY RADAR ANAL	A/C
75.	173	5/06	URBAN	NIGHT	2	A	B		1	PHONE	NO	4	C/V	NO	CLEAR	1	5 MIN	ROUND BRIGHT WHITE LIGHT, STRAIGHT FLT	C/J
76.	179	5/09	URBAN	NIGHT	1		M		1	LETTER	LETTER	2	C/V	BX	CLEAR	1	90 SEC	3rd MAG STAR	C/J
77.	181	5/13	URBAN	NIGHT	4	A	B	MILITARY INCL	1	200-2	NO	4	C/V	NO	CLEAR	1	10 MIN	2 RED LIGHTS, SPEED FAST	C/J
78.	182	5/13	URBAN	NIGHT	3	Y	M	STUDENTS	1	LETTER	164/LETTER	5	C/V	NO	CLOUDY	1	1-2 MIN	WHITE SAUCER, RED BOTTOM, SPINNING, FAST	C/J
79.	183	5/15	URBAN	DAY	1	Y	M	STUDENT	1	LETTER	NO	1	C/V	TX	N/R	1	45 SEC	LIKE F-104 ON SIDE, SILVER W/BLACK STRIPE	C/J
80.	184	5/17	URBAN	NIGHT	1	A	F	TEACHER	1	LETTER	164/LETTER	5	C/V	BX	CLEAR	1	80 SEC	CIRCULAR DISC, STRAIGHT FLT, VAPOR TR.	C/J
81.	185	5/18	URBAN	NIGHT	3	A	B		2	PHONE/164	NO	8	C/V	NO	CLEAR	3	3 MIN	LIGHTS, HORSE SHOE PATH	C/J
82.	186	5/18	RURAL	NIGHT	4	A	B	UFO FAN	1	PHONE	PHONE	5	C/V	NO	CLEAR	1	5 MIN	LIGHTS, SHARP TURN, ROAR	C/J
83.	192	5/27	URBAN	NIGHT	1	Y	M	STUDENT	1	LETTER	LETTER	3	C/V	BX	N/R	1	90 SEC	5 SPHERES IN LINE, SPINNING	C/J
84.	206	6/05	URBAN	NIGHT	2	A	B	NURSE	1	200-2	NO	4	C/V	NO	CLEAR	1	1 MIN	FLYING WING AIRLINER	C/J
85.	229	6/29	URBAN	NIGHT	1	A	F		1	200-2	NO	3	C/V	NO	CLEAR	2	3 MIN	FUNNEL SHAPE. CLOSE, IN LINE, CONTRAIL	C/J
86.	[illegible]	6/29	URBAN	NIGHT	2	A	B		1	LETTER	NO	2	C/V	NO	CLOUDY	1	SEVERAL MIN	BRIGHT RED OBJ, MANUVERED, HOVER	C/J

87.	[illegible]	7/01	URBAN	[illegible]	1	A	M		1	[illegible]	[illegible]	2	G/V	[illegible]	[illegible]	5	7 [illegible]	C/J
88.	[illegible]	7/02	[illegible]	2	A	M			1	[illegible]	[illegible]	1	G/V	NO	F/R	1	15 [illegible]	C/J
89.	[illegible]	7/03	[illegible]	3	A	M			1	[illegible]	[illegible]	1	C/V	NO	F/R	1	3 [illegible]	C/J
90.	[illegible]	7/03	[illegible]	4	A	M	[illegible]		3	200-2	[illegible]	3	G/V	NO	[illegible]	4	45 [illegible] (5) [illegible]	C/J
91.	[illegible]	7/3	[illegible]	3	Y	F			1	[illegible]	[illegible]	5	G/V	NO	[illegible]	1	5 [illegible]	C/J
92.	[illegible]	7/3	URBAN	[illegible]	2	A	B	[illegible]	2	200-2/[illegible]	[illegible]	2	G/V	[illegible]	[illegible]	2	30 [illegible] (2) [illegible]	C/J
93.	[illegible]	7/3	[illegible]	3	A	M			1	[illegible]	NO	4	G/V	[illegible]	GLARE	1	2½ [illegible]	C/J
94.	[illegible]	7/3	[illegible]	2	A	B			1	[illegible]	NO	4	G/V	NO	GLARE	1	2 [illegible]	C/J
95.	360	7/16	URBAN	NIGHT	3	A	B		2	200-2	[illegible]	12	G/V	[illegible]	HAZE	1	10-15 [illegible]	C/J
97.	370	7/16	URBAN	NIGHT	3	Y	B	IMAGINATIVE	1	PHONE	NO	4	G/V	NO	CLOUDY	1	2½ MIN	CIRC, WHITE BALL, FORMED, ERRATIC FLT C/J
96.	[illegible]	7/16	URBAN	NIGHT	5	Y	M		1	[illegible]	[illegible]	5	G/V	NO	CLEAR	2	3 MIN	[illegible] STARS, [illegible] C/J
97.	[illegible]	7/20	URBAN	DAY	1	Y	M		1	LETTER	LTR/164	5	G/V	NO	CLOUDY	1	1 MIN	BALLOON LIKE OBJ, [illegible] C/J
100.	392	7/20	URBAN	NIGHT	2	Y	M		1	PHONE	164	5	G/V	NO	CLEAR	1	3-4 MIN	LIKE STAR, YELLOW, [illegible] "O" MIN C/J
101.	396	7/[illegible]	URBAN	NIGHT	1	Y	M		1	200-2	LETTER	4	G/V	G/S	GOOD	2	2-5 MIN	TRIANGLE, WHITE [illegible] C/J
102.	402	7/22	URBAN	NIGHT	H	Y	M		1	LETTER	LETTER	2	G/V	NO	N/R	1	1-2 MIN	RD DISC W/YELLOW [illegible] C/J
103.	325	7/24	AFB	NIGHT	4	A	B	MILITARY	1	200-2	NO	3	G/V	NO	CLEAR	2	4-5 MIN	EA, ROUND LIGHT, [illegible] C/J
104.	328	7/25	URBAN	DUSK	2	Y	F	STUDENTS	2	LETTERS	LETTERS	10	G/V	NO	CLOUDY	1	FEW MIN,	RD SILVER, RUSSIA C/J
105.	330	7/25	URBAN	NIGHT	H	B	B		1	PHONE	NO	3	G/V	NO	CLOUDY	1	15 MIN	BRIGHT LIGHT, MANUVERED C/J
106.	349	7/27	URBAN	NIGHT	1	A	M	SALESMAN	1	200-2	NO	2	G/V	NO	OVERCAST	1	1 MIN	FLASHING LIGHT C/J
107.	353	7/27	RURAL	NIGHT	1	Y	M		1	LETTER	LTR/164	6	G/V	NO	CLEAR	5	2 MIN	GROUP OF STARS, FORMATION, STRAIGHT FLT C/J
108.	372	AUG	URBAN	NIGHT	5	A	B		1	LETTER	LTR/164	8	G/V	BX	CLOUDY	1	10 MIN	LIKE PITH HELMET, CONTRAIL, MANUVERED C/J
109.	383	8/02	URBAN	DAY	3	Y	M	STUDENTS	1	PHONE	164	9	G/V	NO	FOG	1	10 MIN	DARK BLUE DISC, STRAIGHT FLT C/J
110.	389	8/02	RURAL	NIGHT	1	A	M	DRIVER	1	200-2	NO	5	G/V	NO	CLEAR	1	1½-2 MIN	RD OBJ, ORANGE, STRAIGHT FLT, DBL CONTRAIL C/J
111.	400	8/03	URBAN	NIGHT	3	Y	M	STUDENTS	1	LETTER	LTR/164	12	G/V	NO	CLEAR	1	2 MIN	A/C WITHOUT WINGS, FAST, SLIGHT RISE C/J
112.	402	8/03	URBAN	NIGHT	1	A	F	TELEPHONE OPR	1	200-2	NO	4	G/V	NO	CLOUDY	1	5 MIN	ROUND, RED & BLUE, FLASHING BLUE STREAKS C/J
113.	431	8/04	URBAN	NIGHT	1	Y	F		1	FORM	NO	1	G/V	NO	CLEAR	1	N/R	ROUND FLASHING BLUE LIGHT C/J
114.	439	8/05	URBAN	NIGHT	3	A	B		1	PHONE	NO	3	G/V	NO	HZY	1	10 MIN	FLYING WING, FLASHING, HORSESHOE PATH C/J
115.	440	8/05	URBAN	NIGHT	1	A	M		1	200-2	NO	4	G/V	NO	CLEAR	1	4-5 MIN	4 LIGHTS LIKE POINTED STAR, STRAIGHT C/J
116.	442	8/05	URBAN	NIGHT	2	A	B	PHYSICIST	1	PHONE	NO	3	G/V	NO	N/R	1	25 SEC	LIKE STAELLITE, STEADY FLT, HIGH SPEED C/J
117.	449	8/05	URBAN	NIGHT	2	B	F	HOUSEWIFE	1	200-2	NO	6	G/V	NO	N/R	2	N/R	STAR LIKE FLASHING, BLINKING LIGHTS C/J
118.	458	8/06	URBAN	NIGHT	2	Y	M	STUDENTS	1	LETTER	LTR/164	5	G/V	BX,TX	CLEAR	4	10 MIN (T)	4 LIGHTS, INVERTED STREETLIGHT, C/J
119.	465	8/07	RURAL	NIGHT	3	Y	F	STUDENTS	1	200-2	NO	4	G/V	NO	CLEAR	1	5-10 MIN	SILVER CIGAR SHAPED, STRAIGHT FLT C/J
120.	470	8/08	URBAN	NIGHT	1	Y	M	STUDENT	1	FORM	LETTER	2	G/V	NO	N/R	1	1 MIN	BLUE/GREY OBJ W/RED & GREEN REVOLVE LTS C/J
121.	479	8/09	RURAL	NIGHT	2	Y	M	STUDENTS	1	FORM	LTR/164	5	G/V	NO	CLEAR	3	4½ MIN	FLOURESCENT YELLOW SAUCERS, FORMATION C/J
122.	482	8/10	AFB	NIGHT	3	Y	M	STUDENTS	1	200-2	NO	2	G/V	NO	CLEAR	1	30-40 SEC	SILVER STAR, STRAIGHT LEVEL FLT C/J
123.	484	8/10	URBAN	NIGHT	2	A	B	MANAGER	1	200-2	NO	3	G/V	NO	CLEAR	1	3-5 MIN	TRIANGLE, RED GLOW ABOVE OBJ, LEVEL FLT C/J
124.	487	8/10	RURAL	NIGHT	1	A	M	MILITARY	1	LETTER	NO	2	G/V	NO	N/R	1	45 SEC	WHITE LIGHT, MADE FIGURE "S" C/J
125.	491	8/11	URBAN	NIGHT	1	A	F	RETIRED	1	LETTER	LTR/164	7	G/V	NO	CLEAR	2	90 SEC	4 LEAF CLOVER, ONE DIPPED C/J
126.	493	8/11	URBAN	NIGHT	1	A	M	PHYSICIST(442)	1	PHONE	NO	3	G/V	NO	HAZE	1	N/R	SATELLITE, SMOOTH FLIGHT C/J
127.	495	8/11	URBAN	NIGHT	1		M		1	PHONE	LTR/164	4	G/V	TX	N/R	1	10-15 MIN	ELONGATED WHITE OBJ, FAST, JERKY, REVERSE C/J
128.	498	8/11	URBAN	NIGHT	1	A	M		1	LETTER	NO	1	G/V	NO	N/R	1	N/R	OBJ TRAVELLED VERY FAST C/J
129.	503	8/11-12	"	NIGHT	M	A	M	MILITARY	1	LETTER	LETTER/164	5	G/V	NO	CLEAR	1	2 MIN	OVAL OBJ, STRAIGHT FLIGHT C/J
130.	505	8/12	URBAN	NIGHT	1	A	M	FREIGHT ROUTER	1	FORM	NO	2	G/V	NO	CLEAR	1	90 SEC	YELLOW, TRIANGULAR, STRAIGHT FLT TURN C/J
131.	512	8/12	URBAN	NIGHT	1	Y	M	STUDENT	1	LETTER	NO	2	G/V	NO	CLEAR	1	5 MIN	WHITE STAR CIRCLING THE MOON C/J
132.	516	8/12	URBAN	NIGHT	5	Y	B	STUDENTS	1	LETTER	NO	1	G/V	TX	N/R	2	N/R	DISC WITH 5 WHITE & YELLOW LIGHTS C/J
133.	518	8/12	URBAN	NIGHT	4	Y	M	STUDENTS	1	PHONE	NO	3	G/V	NO	CLOUDY	1	15 MIN	STAR, STRAIGHT FLT, FADE & REAPPEAR C/J
134.	519	8/13	URBAN	NIGHT	1	A	M	PHYSICIST (493)	1	LETTER	LTR/164	4	G/V	NO	CLEAR	1	25 SEC	BRIGHT SATELLITE, FLIGHT TO WEST C/J
135.	526	8/13	URBAN	NIGHT	1	A	M	ELECTRICIAN	1	200-2	NO	2	G/V	NO	CLEAR	1	90 SEC	RD OBJ, STRAIGHT FLT, LOW, BIG, FAST C/J
136.	533	8/15	URBAN	NIGHT	1	A	M	UNEMPLOYED	1	FORM	NO	2	G/V	NO	CLEAR	1	5 MIN	DARK GREY SAUCER, SLOW, FLIGHT, FLASHING LTS C/J

137.	534	8/15	URBAN	DAY	1	A	F	(MULTI,PSYCH)	1	200-2	NO	5	G/V	NO	CLOUDY	1	1 MIN	SMALL,ROUND,WHITE,FAST,CIRCLED,	C/J
138.	537	8/15	URBAN	NIGHT	3	A	B		1	PHONE	164	4	G/V	NO	CLEAR	1	15 MIN	STAR,ERRATIC MOTION	C/J
139.	542	8/16	URBAN	NIGHT	2	B	B	HOUSEWIFE	1	PHONE	NO	4	G/V	NO	CLOUDY	1	SHORT TIME,	SILVER,3 WINDOWS,LOW	C/J
140.	543	8/16	URBAN	NIGHT	2	B	M		1	LETTER	NO	1	G/V	NO	N/R	2	30 SEC	WHITE SATELLITES,FORMATUON,JET SOUND	JETS
141.	545	8/16	URBAN	NIGHT	2	A	B		1	LETTER	NO	1	G/V	NO	CLEAR	1	N/R	WHITE LIGHT,ERRATIC MOTION,ZIG-ZAG	C/J
142.	547	8/16	URBAN	NIGHT	6		B		1	PHONE	164/(NOT RET)	4	G/V	NO	HAZY	1	15 MIN	DULL SILVER,CIRCLINGPERIODICALLY	C/J
143.	564	8/20	AFB	DAY	1	A	M	MILITARY	1	200-2	LETTER	5	G/V	BX	CLOUDY	1	3 MIN	RD FLAT DISC CIRCLING,RAPID ACCELER	C/J
144.	569	8/20	URBAN	NIGHT	1	Y	M	STUDENT UFO HOBBY	1	200-2	NO	3	G/V	NO	HAZY	1	25-30 SEC	ORANGE,OBLONG, 90 DEG TURN	C/J
145.	575	8/22	URBAN	DAY	1	A	M	SERVICE ENGR	1	200-2	NO	4	G/V	NO	HAZE	2	1-3 MIN, 2-1 MIN	RD WHITE, WING SHAPE,SOUND	C/J
146.	579	8/23	RURAL	DAWN	1		M		1	LETTER	LETTER	2	G/V	NO	N/R	2	4 MIN	ONE LARGE,ONE SMALL IN FORMATION	C/J
147.	583	8/23	URBAN	NIGHT	1	Y	F	STUDENT	1	200-2	NO	4	G/V	NO	CLEAR	1	15 MIN	ROUND, MOVED DOWN TO HORIZON	C/J
148.	597	8/25	RURAL	NIGHT	6	Y		STUDENTS	1	LETTER	LETTER	1	G/V	NO	N/R	1	N/R	LIKE SATELLITE, FLT TO NW	C/J
149.	604	8/26	ARMYB	NIGHT	9	A	M	MILITARY	1	200-2	NO	6	G/V	N/R	CLEAR	2	N/R	SEMI CIRCLE,FAST,JET NOISE	JETS
150.	606	8/26	ARMYB	NIGHT	M	A	M	MILITARY	1	200-2	NO	6	G/V	BX	CLEAR	2	N/R	LIKE NORTH STAR, IN FORMATION	JETS
151.	607	8/26	ARMYB	NIGHT	3	A	M	MILITARY	1	200-2	NO	6	G/V	N/R	CLEAR	1	N/R	MULTI COLORED GROUP OF LIGHTS,STR FLT	A/C
152.	608	8/27	URBAN	NIGHT	1	A	M	CLERK	1	LTR/FORM	LTR/164 (N/R)	4	G/V	NO	CLOUDY	9	10 SEC	STAR LIKE IN FORMATION (REGARDED AS ONE OBJ)	C/J
153.	610	8/27	URBAN	DUSK	1	A	M	MINISTER	1	200-2	NO	5	G/V	NO	CLOUDS	1	5-10 MIN	CIGAR SHAPED, LEVEL FLT	C/J
154.	616	8/29	URBAN	NIGHT	1	A	M		1	FORM	NO	1	G/V	BX	CLEAR	2	2 MIN EA	EGG SHAPED, HORIZON TO H, E-NW	C/J
155.	630	8/31	URBAN	NIGHT	1		M		1	LETTER	LETTER	2	G/V	TX	N/R	M	N/R	LIGHTS OVER ONE WEEK PERIOD,FAST	C/J
156.	636	9/01	RURAL	NIGHT	1	A	F		1	LETTER	LETTER	1	G/V	NO	N/R	1	N/R	TWO LIGHTS REVERSED DIRECTION(PHOTO)	C/J
157.	638	9/01	URBAN	NIGHT	1	A	M	UFO FAN	1	LETTER	LETTER	1	G/V	NO	N/R	1	FEW MIN	THREE LIGHTS TRIANGLE FORMATIONRED/G.	C/J
158.	650	9/03	URBAN	NIGHT	1	A	M	INSUREANCE AGNT	1	LETTER	LETTER	2	G/V	BX	CLEAR	1	2 MIN	ROUND CHANGED COLOR, ERRATIC, FADE	C/J
159.	662	9/05	NAS	NIGHT	1	A	M	MILITARY	1	200-2	LTR/164(N/R)	4	G/V	NO	CLEAR	1	5 MIN	ROUND OBJ, RED & WHITE	C/J
160.	676	9/06	URBAN	NIGHT	3	A	B		1	164	LTR/164	4	G/V	NO	CLEAR	1	25 MIN	LARGE,RED,PORT HOLES	C/J
161.	683	9/07	URBAN	NIGHT	1	A	F	CLERK	1	200-2	NO	5	G/V	NO	CLEAR	6	4 MIN	OVEL, WHITE, FORMATION, HUM	C/J
162.	686	9/09	URBAN	NIGHT	5	B	B	INSUREANCE AGNT	1	LETTER	LETTER	2	G/V	BX	CLEAR	5	15 MIN	DIAMOND, MULTI-COLORED,PULSATING,CIRCLING	C/J
163.	697	9/16	URBAN	DAY	3	Y	M	STUDENTS(UFO FANS)	1	LETTER	LETTER	2	G/V	BX	CLEAR	2	10 MIN	OVAL SILVER, STRAIGHT FLIGHT	C/J
164.	706	9/20	URBAN	NIGHT	2	A	M	LAB TECHNICIAN	1	200-2	NO	5	G/V	TH	CLEAR	1	3 MIN	BLUE-WHITE,ELONGATED,MADE LOOPSAURNS	C/J
165.	713	9/22	URBAN	NIGHT	1	A	F	ARTIST	1	LETTER	LTR/164	1	G/V	BX	CLEAR	1	25 SEC	ROUND MULTI-COLORED SMALL ARC	C/J
166.	715	9/23	URBAN	NIGHT	2	A	B		1	PHONE	NO	3	G/V	NO	CLEAR	2	15 MIN	ELONGATED,STRAIGHT FLT, DISAPPEAR	C/J
167.	740	10/02	RURAL	DAWN	1	A	M	MILITARY	1	200-2	NO	4	G/V	NO	CLEAR	1	4 MIN	SATELLITE, STRAIGHT FLT TO WEST	C/J
168.	742	10/02	URBAN	DAY	2	Y	M	STUDENTS	1	164	NO	4	G/V	NO	CLEAR	1	30-45 SEC	SILVER FLAT BOTTOM, STRAIGHT FLT	C/J
169.	757	10/03	URBAN	DAY	1	Y	M	STUDENT	1	LETTER	LTR/164	5	G/V	NO	CLOUDY	1	1 MIN	BRIGHT,OVAL SHAPE,STRAIGHT FLT,PERFECT	C/J
170.	761	10/10	URBAN	NIGHT	6	B	B	INSURANCE AGNT	1	LETTER	LETTER	2	G/V	NO	N/R	1	N/R	TWO LIGHTS GREEN & WHITE, FAST, TURN	C/J
171.	762	10/10	URBAN	NIGHT	3	A	B	ENGINEER	1	PHONE	NO	4	G/V	CO	CLOUDY	3	4 MIN	ORANGE,LIKE VENUS, 20 DEG TURN	C/J
172.	763	10/11	URBAN	NIGHT	1	A	F		1	FORM	LTR/164	6	G/V	NO	CLEAR	1	5 MIN	SATELLITE,ICOP,HOVERED,	C/J
173.	768	10/14	URBAN	NIGHT	1	Y	M	STUDENT	1	LETTER	LETTER	3	G/V	NO	N/R	1	N/R	[illegible],CIRCULAR,BLINKING	C/J
174.	800	10/29	URBAN	NIGHT	1	A	M	POLICE	1	PHONE	LTR/164	6	G/V	NO	CLEAR	1	15-20 SEC	DISC,STOPS,TURNS,TURN, BOWS	C/J
175.	801	10/30	URBAN	DUSK	1	A	M	[illegible]	1	[illegible]	NO	2	G/V	NO	CLEAR	1	1 MIN	[illegible] OF LIGHT, RAPID [illegible]	C/J
176.	805	10/31	URBAN	NIGHT	1	A	M	STUDENT	1	FORM	NO	2	G/V	BX	CLEAR	1	45 SEC	ROUND YELLOW,ERRATIC [illegible]	C/J
177.	810	11/02	URBAN	NIGHT	1	A	F	HOUSEWIFE	1	FORM	NO	2	G/V	NO	CLEAR	1	5 MIN	DOT [illegible] ORANGE [illegible]	C/J
178.	7	11/03	[illegible]	NIGHT	2	B	B	[illegible]	1	[illegible]	LTR/164	2	G/V	NO	N/R	2	2 [illegible]	[illegible]	
179.	3	11/05	[illegible]	[illegible]	1	A	M	[illegible]	1	[illegible]	[illegible]	2	G/V	NO	[illegible]	3	[illegible]	[illegible]	/J
180.	5	11/07	URBAN	[illegible]	[illegible]	A	B	[illegible]	1	[illegible]	NO	1	G/V	[illegible]	[illegible]	3	[illegible]	[illegible]	
181.	9	11/12	[illegible]	[illegible]	2	[illegible]	M	[illegible]	1	[illegible]	[illegible]	4	G/V	NO	[illegible]	1	[illegible]	[illegible]	
182.	2	11/13	[illegible]	[illegible]	1	A	F	[illegible]	1	[illegible]	NO	1	G/V	NO	[illegible]	1	[illegible]	[illegible]	
183.					1	[illegible]			1	[illegible]	[illegible]	4	G/V	NO	[illegible]	1	[illegible]	[illegible]	
184.					2	[illegible]			1	[illegible]	[illegible]	2	G/V	NO	[illegible]	1	[illegible]	[illegible]	
185.					2	[illegible]			1	[illegible]	NO	2	G/V	BX	[illegible]	1	[illegible]	[illegible]	

193.	6/6	10/10	RURAL	NIGHT	1	A	F	HOUSEWIFE	1	200-2	NO	2	C/V	NO	N/R	1	N/R	MEDICINE BALL SIZED			C/
194.	653	10/27	RURAL	NIGHT	3	A	M		1	LETTER	NO	4	C/V	NO	CLOUDY	1	2-5 MIN	One [illegible]			C/ (UFO)
195.	8[illegible]	10/20	RURAL	DUSK	1	A	M	MILITARY	1	200-2	NO	3	A/V	NO	CLEAR	1	10 MIN	FIXED WING [illegible]			C/

THE FOLLOWING REPORTS CONTAIN OBJECTS EVALUATED AS [illegible]

192.	28	5/20	[illegible]	DUSK	1	A	F	HOUSEWIFE	1	[illegible]	[illegible]	2	C/V	NO	N/R	1	N/R	MEDICINE BALL SIZED			[illegible]
193.	31	5/21	[illegible]	[illegible]	1	A	M	[illegible]	1	200-2	[illegible]	3	C/V	[illegible]	CLEAR	1	90 MIN	3-4 RED LIGHTS,[illegible]			[illegible]
194.	2[illegible]	7/16	URBAN	NIGHT	1	A	F		1	[illegible]	NO	3	C/V	NO	CLEAR	1	45 SEC	ORANGE LITS ON [illegible],[illegible]			[illegible]
195.	327	7/26	RURAL	NIGHT	2	B	B	HOUSEWIFE	1	[illegible]	[illegible]	3	C/V	NO	OVERCAST	1	FEW MIN	RED LIGHT,CIGAR,[illegible]			C/[illegible]
196.	335	7/28	URBAN	NIGHT	4	A	B	TEACHER	1	[illegible]	[illegible]	6	C/V	NO	CLEAR	1	15 MIN	FIESTA BALLOON,[illegible]			C[illegible]
197.	705	10/12	URBAN	NIGHT	1	Y	M	STUDENT	1	200-2	NO	4	C/V	NO	CLEAR	1	10 MIN	RED WHEEL,CIRCLE,[illegible]			3[illegible]
198.	653	9/04	RURAL	NIGHT	3	A	Y	HOUSEWIFE	1	[illegible]	[illegible]	3	C/V	NO	OVERCAST	1	FEW MIN	RED LIGHT,ERRATIC FLASHING			C[illegible]

THE FOLLOWING REPORTS CONTAIN OBJECTS EVALUATED AS AIR[illegible]AFT ON MICRO MISSIONS

195.	370	AUG	URBAN	NIGHT	1	A	M		1	[illegible]	[illegible]	2	G/V	NO	CLEAR	1	FEW MIN	SLOW A/C [illegible] LIGHT,NOISE			[illegible]
196.	748	10/03	OVSEA	NIGHT	1	A	M	MILITARY	1	200-2	NO	2	A/V	NO	CLEAR	1	300 SEC	BRIGHT FLA[illegible]ES			S[illegible]

THE FOLLOWING REPORTS CONTAIN OBJECTS EVALUATED AS AIRCRAFT ON REFUELING MISSIONS

198.	39	1/28	RURAL	NIGHT	1	A	F	HAIRDRESSER	1	200-2	NO	5	G/V	NO	CLEAR	M	1 HOUR	PERIOD BRIGHT FLASHING LIGHTS	AREA	LONDER TOWN
199.	592	8/24	URBAN	NIGHT	1	A	F		1	200-2	NO	4	G/V	NO	CLEAR	12	N/R	FORMATION OF LIGHTS SEPARATING		IVORY SIGN
200.	672	9/06	RURAL	NIGHT	1	A	M		1	LETTER	LETTER	1	G/V	NO	MIST	6	N/R	BRILLIANT LIGHTS,SHIFTING		SIMONAY

THE FOLLOWING REPORTS CONTAIN OBJECTS EVALUATED AS AIRCRAFT WITH ADVERTISING BANNERS OR TOWED LIGHTED SIGNS.

201.	344	7/26	URBAN	NIGHT	1	A	F	SECRETARY	1	200-2	NO	4	G/V	NO	HAZY	1	60-90 SEC	WHEEL WITH WHEEL AND [illegible]			BIRDS CONFIRMED
202.	464	8/07	URBAN	NIGHT	2	A	B	DRAFTSMAN	1	200-2	NO	4	G/V	NO	OVERCAST	1	3 MIN	SLOW DRIFTING SIMILAR DERIGIBLE EFFECT			"
203.	468	8/08	URBAN	NIGHT	8	B	B	HOUSEWIFE	1	200-2	NO	4	G/V	NO	OVERCAST	1	3 MIN	ROUND CIRCLED LIGHTS,BUZZING			"
204.	481	8/10	RURAL	DUSK	1	A	M	MILITARY	1	200-2	NO	2	G/V	NO	N/R	1	10 MIN	ROW OF BRIGHT LIGHTS			"
205.	563	8/20	URBAN	NIGHT	2	Y	M	STUDENTS	1	LETTER	LETTER	5	G/V	NO	N/R	6	2 HR	PERIOD MULTI COLORED LIGHTS			CHARACTERISTIC
206.	656	9/04	URBAN	NIGHT	M	B	B		1	LETTER	LTR/164	8	G/V	NO	HAZY	1	33 MIN	FERRIS WHEEL			CHARACTERISTIC
207.	807	11/06	RURAL	NIGHT	2	B	B		1	LETTER	LTR/164	6	G/V	NO	CLEAR	1	10 MIN	2 PLATES,SQUARE LIGHTS IN MID			CHARACTERISTIC
208.	811	11/02	URBAN	NIGHT	1	A	F	HOUSEWIFE	1	FORM	LETTER	2	G/V	NO	CLEAR	1	30 MIN	(T) TILTING LIGHTS BACK&FORTH			NEON CONFIRMED
209.	820	11/04	URBAN	NIGHT	1	A	M	Q C ENGINEER	1	FORM	NO	2	G/V	NO	CLEAR	1	30 MIN	(T) 10-2 PARTS FLT SQUARE PATTERN			"
210.	822	11/05	URBAN	DUSK	1	A	M	SALESMAN	2	FORM	NO	2	G/V	NO	SC CLOUDS	1	2 MIN	LIGHTS FLASHING ON&OFF			"
211.	830	11/10	URBAN	NIGHT	1	A	M	MED LAB TECH	M	LETTERS	NO	8	G/V	BK	N/R	1	20 MIN	ORANGE METALLIC LIGHTSCIRCULAR			CHARACTERISTIC

THE ELLINGTON AFB FOLDER ASSOCIATED WITH THE MIDWEST INVERSION FLAP CONTAINED FIFTY-ONE (51) OBJECTS EVALUATED AS POSSIBLE AIRCRAFT AND ONE (1) HELICOPTER REPORT NONE OF THESE ARE INCLUDED IN THE STATISTICS AS AIRCRAFT SIGHTINGS.

NASA Wallops Station
Wallops Island, Va.

February 5, 1965

Balloons Launched at Wallops

Routinely every morning Monday through Friday at about 8:00 a.m. we release a balloon which is about 6-feet in diameter (buff color) carrying a radiosonde (3" x 8" x 8") on a 50-ft. string. These balloons rise until they burst (approximately 100,000 ft. altitude). There is a paper parachute between balloon and radiosonde (which weighs a couple of pounds) that brings the radiosonde back to earth after the balloon bursts. This is a meteorological balloon which collects information on temperature, pressure, and density of the atmosphere.

Also through the day and night whenever a rocket launching is scheduled, one of these 6-ft. balloons is launched about one hour before launch. Same purpose as above.

In connection with the rocket firings, at about T-3 hours we launch one of these 6-ft. balloons carrying corner reflectors covered with silver foil (instead of a radiosonde) to determine winds aloft. These balloons may catch someone's eye occasionally due to the bright reflectors.

For special firings such as Nike-Cajuns, Aerobees, and Scouts, we launch little 3-ft. balloons (some buff color and some red) as frequently as every 5 minutes during the last hour of the countdown (no attachment), to obtain data on wind direction and velocity. As many as 30 or 40 may be released during a countdown due to holds, etc. These do not go as high as the 6-ft. balloons.

About 90 percent of the balloons released from Wallops (and Norfolk area also) end up over the water due to prevailing winds. Sometimes during the summer when prevailing winds are easterly, a few do end up over land.

-more-

Some other things launched at Wallops which may be visible to the public (probably not the Norfolk area) are:

Arcas rockets which have a 15-ft. orange and white parachute to lower the payload from an altitude in the neighborhood of 200,000 ft. Sometimes it takes 3 hours to impact in the water.

Arcas-Robin rockets which have a payload consisting of a 1-yard diameter sphere which is inflated to obtain meteorological data.

	INCIDENT	DATE	LOCATION	TIME	OBSERVER DATA: AIR	OBSERVER DATA: SEE	OBSERVER DATA: GND	REPORTING DATA: TYPE	REPORTING DATA: FOLLOW UP	PASSES	TYPE OBSERVATION	OPTICAL AIDS	SKY	WINDS	OBSERVATION	OBJECT DATA: ESTIMATED ALTITUDE	OBJECT DATA: NUMBER	OBJECT DATA: DURATION	OBJECT DATA: SHAPE	OBJECT DATA: SIZE	OBJECT DATA: COLOR	DIRECTION OF FLIGHT	SPEED	PHYSICAL EVIDENCE	RADAR EVIDENCE	PHOTO EVIDENCE	(UFO LIT)	LAUNCH SITE	COMMENT
THE FOLLOWING REPORTS CONTAIN OBJECTS EVALUATED AS UPPER AIR RESEARCH BALLOONS AND ARE ASSOCIATED WITH A SPECIFIC LAUNCH:																													
1.	49	2/02	NEAR AREA	DAY	N	A	(B)	WX OBSERVER	N	PHONE 200-2	NYAFB PHONE	4	RADAR A/C VIS	THEODOLITE	UNL VIS	12K	FROM WEST	1	145,000+	5 HOURS	CONE,BALLOON,SILVER		STRAIGHT EASTERLY	NO	YES	NO	YES	PAGE, ARIZONA (NEAR)	NEAR, PACKAGE CUT DOWN OVER ARIZONA
2.	356	2/06	(FOR)	DAY	N	A		BRITISH	1	TWX	NO	1	GD VIS	THEODOLITE	H/R	45K	FROM EAST	1	159,000 (EST)	H/R	CIRCULAR INVERTED CONE		STRAIGHT WEST 45K	NO	NO	NO	NO	INDIA (NEAR)	VISUAL OBSERVED FROM 3 LOCATIONS OR ISLAND
3.	INFO	7/09	(FOR)	DAY	N			NEWSPAPERS										1	H/R	HOURS	CYLINDRICAL,WHITE		STRAIGHT WEST	NO	NO	NO	YES	INDIA (NEAR)	TRANSPARENT PLASTIC STUFFED CLOCKS...
4.	269	7/12	FOUR STATES	DUSK DAY	N	B	(B)	MILITARY & CIVILIAN	N	PHONE 200-2	NYAFB PHONE	72	A/C VIS G/RADAR	SAT TRACK	CLEAR	60K	FROM EAST	1	100,000+	6 HRS	BALLOON W/PACKAGE		STATIONARY SLOW HOVERING, TO WEST	NO	YES	YES	YES	CHURCHILL, CANADA (CER)	PHOTO,RADAR & SATELLITE TRACKING DATA
5.	282	7/13	TWO STATE	DUSK	N	A	(B)	MILITARY & CIVILIAN	2	PHONE 200-2	NYAFB PHONE	10	A/C VIS G/RADAR	NO	CLEAR	60K	FROM EAST	1	100,000+	1 MI(T) 27 MI(R)	BALLOON W/GONDOLA		160 KNOTS TO WEST	NO	YES	NO	NO	CHURCHILL, CANADA (CER)	RADAR ANALYSIS BALLOON TRACK
6.	776	10/19	NEAR	DAY	5	Y		STUDENTS	1	LETTER	165	8	GD VIS	OBJECT RECOVERED	N/A	N/A	N/A	1	GROUND	N/A	SILVER METALLIC BALLOON,		N/A HIT POWER LINES THEN AIR AND EXPLODED	YES	NO	NO	YES	CAPE KENNEDY (MISSILE ACFT)	NFO BY G. T. SCHLEIDAHL (BALLOON RETRIEVED)
7.	777	10/20	RURAL	DAY	1	A	(F)	NOT REPORTED	1	LOCAL INV.	USAF/ NYAFB	6	GD VIS	OBJECT RECOVERED	N/A	N/A	N/A	1	GROUND	N/A	SILVER BALLOON		LANDED AT SNOW HILL ISERLAND	YES	NO	NO	YES	WALLOPS IS. NASA	NFO BY G.T. SCHLEIDAHL (BALLOON RETURNED)
8.	INFO	10/25	RURAL	N/A	1			(FOREIGN)	1	TWX	NYAFB							1	GROUND	N/A	PACKAGE FROM RESEARCH BALLOON FOUND ON GROUND IN GREECE								NOT SEEN IN REPORT.	NFO BY G.T. SCHLEIDAHL (PACKAGE TO NORTHFIELD)
THE FOLLOWING REPORTS CONTAIN OBJECTS EVALUATED AS BALLOONS (WEATHER/RADIOSONDE/RAWINSONDE) AND RATE AS THEIR ORIGIN A SPECIFIC LAUNCH.																													
9.	268	7/12	URBAN	DAY	N	B	(B)	CIVILIANS	1	C.D.	164	7	GD VIS	NO	CLEAR	YES	YES	1	VERY HIGH	20 MIN	CIRCULAR,WHITE		ERRATIC RISING TO SOUTHWEST	NO	NO	NO	NO	SULPHUROVE, MI STATION	FLIGHT CORRESPONDS TO LOCAL BALLOON LAUNCH
10.	367	7/31	URBAN	NIGHT	1	A	(M)	MILITARY	1	200-2	LOCAL	23	G/RADAR GD VIS	NO	CLEAR	YES	YES	1	26 MI	90 MIN	STAR, REDDISH-WHITE LIGHT WITH RED BASE		WITH WIND	NO	YES	NO	YES	MILL HOUSES FLD OKLAHOMA	RADIOSONDE, SEE RADAR ANALYSIS (DIDN'T FLAP)
11.	453	8/06	URBAN	NIGHT	1	A	(M)	MILITARY	1	200-2	NO	2	GD VIS	NO	CLEAR .7 CC		FROM SW	1	H/R	20 MIN	ROUND,SOFTBALL, DULL-GREEN		RISING ERRATIC TO NORTHEAST	NO	NO	NO	NO	SIDNEY CITY AB	CHP DISAPPEARED BEHIND CLOUDS
12.	505	8/12	URBAN	NIGHT	1	A	(F)	HOUSEWIFE	1	200-2	LETTER	5	GD VIS	4 X 5X	VIS 35#	YES	YES	1	H/R	15 MIN	ROUND,DIM,RED		OVERHEAD RISING	NO	NO	YES	NO	LOCAL MX SPA	NO IMAGE ON PHOTO (OTHER LOOKING FOR UFO'S)
13.	688	9/12	URBAN	NIGHT	1	A	(M)	RETIRED TV REPAIRMAN	1	200-2	NO	5	GD VIS	NO	VIS 15K G 2500	VAR	S,SW	1	H/R	15-20 MIN	FOUND,20' D, WHITE EXPANDING		HOVERED OVERHEAD FLEW TO HORIZON	NO	NO	NO	NO	LOCAL AIR BASE	BALLOON RELEASED AT TIME OF SIGHTING (PRIOR IN DA
14.	710	9/22	SMALL TOWN	DAY	1	A	(M)	MINISTER	1	164	NO	2	GD VIS	NO	CLOUDY RAIN	15-20 MPH	FROM SE	1	75 YDS	12 MIN	SPHERE,6' DIAMETER SMOKE GREY		RISING TO NNW	NO	NO	NO	NO	BENJAMI HERI AIRPORT	TIME CORRESPONDS WITH MX BALLOON LAUNCH,
15.	755	10/06	AFB	NIGHT	M	A	(M)	MILITARY	(PORTION OF COMPLEX CASE)									1	(SEE RADAR ANALYSIS FOR DETAILS)					NO	YES	NO	NO	EDWARDS AFB	TIME AND FLIGHT AGREE WITH MX BALLOON LAUNCH
16.	794	10/27	URBAN	DAY	1	Y	(M)	15 STUDENT	1	200-2	NO	2	GD VIS	6 X 30 BINOCS	VIS 15K	YES	YES	1	H/R	2-3 MIN	SAUCER,SMALL,WHITE		MADE LOOP IN NORTH AND DISAPPEARED	NO	NO	NO	NO	L.G. HANSCOM FIELD, BEDFORD	MX BALLOON RELEASED NEAR TIME OF SIGHTING.
THE FOLLOWING CASES CONTAIN REPORTED OBJECTS EVALUATED AS PROBABLE UPPER AIR RESEARCH OR WEATHER BALLOONS. EVALUATION IS BASED ON DESCRIPTION AND MOTION CHARACTERISTICS. NO SPECIFIC LAUNCH HAS BEEN IDENTIFIED.																													
17.	29	01/03	ARMY BASE	NIGHT	3	A	(M)	ARMY M.P.'S	1	ARMY REPORT	NO	9	GD VIS	NO	VIS 34# 6000 C	H/R	15°	-1	100 MPH	22 MIN	LIGHT,50" DIAMETER, SILVER-WHITE		RISING SPIRAL AND HOVERING	NO	NO	NO	NO	FIRE WEATHER BALLOON	
18.	30	01/28	RADAR SITE	NIGHT	2	A	(M)	MILITARY	1	200-2	NO	5	G/RADAR GD VIS	NO	VIS UNL	YES	FROM 160	-1	5 MI	4.5K(2) A/SLIP SONE, 31(4)	VIS AS 2 POINT SRC, SILVER		SLOWLY DISSIPATED RADAR HAVE NO-SEE	NO	YES	NO	NO	RESEARCH CHART (NYR RADAR ANALYSIS) (ALASKA FLIP FOLDER)	
19.	31	01/25	RURAL	DAY	2	A	(B)	MR EMPLOYEE HOUSEWIFE	1	200-2	NO	7	GD VIS	NO	CLEAR NO CLOUD	YES	FROM 270°	-1	1/2	3 MIN	ROUND,THICK,LIGHTED BALL,BLUISH GREEN		HOVERING(OBSERVED MAN MINUTES REPORT)	NO	NO	NO	NO	FIRE WEATHER BALLOON. POSSIBLE 25/12000 CHARLESTON M.VA. (AFRICA VIRGINIA FLAP)	
20.	40	02/26	URBAN	DAY	1	A	(F)	HOUSEWIFE	1	200-2	NO	3	GD VIS	NO	CLEAR	20K		-1	HIGHER CONTRAILS	10 MIN	LIKE A/C WITHOUT WINGS		HOVERING AND DRIFTED TWO TO THREE	NO	NO	NO	NO	FOUR MX OR UPPER AIR. REPORTED ESCAPE OF FLAP IN AREA.	
21.	94	03/10	RURAL	DAY	1	A	(M)	50 MI	1	164	NO	4	GD VIS	NO	HAZE	NO	NO	-1	SOUNDS	5 MIN	BALL, 10' D., DULL GREY COLOR,		HOVERING AND DISAPPEARED IN NIGHT FLASH	NO	NO	NO	NO	FLASH LIKE S-BEAM OF LIGHTHOUSE. POSSIBLE MX BALLOON HOVERING	
22.	130	04/05	IRAN	DAY				USN	1	TWX	NO	1	GD VIS	SEXTANT	N/R	N/R	N/R	1	UNDER 5,000 FT	2 MIN	VERTICAL CAPSULE,SILVER		HORIZONTAL,APPEARED	NO	NO	NO	NO	BROADCAST AS A CONTROLLED BALLOON BY REPORTING OFFICIALS	
23.	133	04/08	URBAN	DAY	1			N/R	1	PHONE	NO	1	GD VIS	NO	NO	NO	NO	1	VERY HIGH	MINUTES	GENERAL OBSERVER-REPORT, MANY 5' DIAMETER		CONTROLLED CIRCLING TO NORTH	NO	NO	NO	NO	POSSIBLE WEATHER BALLOON	
24.	135	04/09	URBAN	DAY	2	A	(M)	MILITARY	2	200-2	NO	4	AIR VIS	NO	CLEAR		EAST	1	OVER A/C at 44,000	30 MIN	ROUND WHITE OBJECT		STATIONARY AND TO NO-NO	NO	NO	NO	NO	PROBABLE UPPER AIR BALLOON, PILOTS REPORT OBJECT AS BALLOON. LOCATION MINNESOTA.	
25.	204	06/05	SMALL TOWN	NIGHT	1	Y	(M)		1	LETTER	NO	4	GD VIS	40 X 175 TELESCOPE	N/R	N/R	N/R	1	N/R	15-20 MIN	ROUND,SILVER,WITH 3 ANTENNAS ON BOTTOM		STATIONARY,HOVERING IN NW	NO	NO	NO	NO	POSSIBLE UPPER AIR BALLOON WITH PACKAGE	
26.	214	06/19	URBAN	DUSK	4	A	(M)	2 ENGINEERS RADIO ASN.	4	200-2	PHONE NYREX	11	GD VIS	6 X 30 BX 7 X 50 BX	CLEAR	N/R	N/R	1	N/R	20 MIN	CIRCULAR,LIKE POLEPIED CHROME		STATIONARY OVERHEAD APPARENTLY TO NW	NO	NO	NO	NO	MOST LIKELY UPPER AIR. DISAPPEARED BY MOVING ONTO RADAR'S SHADOW.	
27.	237	06/28	URBAN	NIGHT	3	A	(M)	PSYCHIATRIST USAF	1	200-2	NO	3	GD VIS	NO	CLEAR		FROM 330	1	N/R	25 MIN	ROUND SMALL STEADY LIGHT 2d MAGNITUDE,WHITE		FIGURE "8" OF 20° AMPLITUDE, TO EAST	NO	NO	NO	NO	POSSIBLE WEATHER BALLOON. DISAPPEARED BEHIND HEADLIGHTS.	
28.	242	07/03	URBAN	NIGHT	5	A	(M)	3 POWER CIR 2 CIVILIANS	1	PHONE	LETTER	21	GD VIS	TELESCOPE BX	CLEAR		N/R	1	10-15M	7 MIN	ROUND LIGHT,BRIGHTER THAN STARS		ERRATIC, CLIMBING	NO	NO	NO	NO	RED OBJECT DROPPED UFO, PROBABLE BALLOON WITH RADIOSONDE FAILED,	
29.	246	07/04	(FOR)	NIGHT	4	A	(M)	MILITARY	1	200-2	NO	4	GD VIS	NO	3500 C 8000 B	N/R	N/R	1	EXTREME	45 MIN	BRIGHT,STAR-LIKE		FROM LOW TO HIGH M, OVERHEAD,STATIONARY	NO	NO	MAP	NO	REPORT CONSISTS OF A HOVERING LIGHT. NO MAJOR ASTRO EVNT IN REPORTED POSITION.	
30.	327	07/31	URBAN	NIGHT	5	A	(B)	MAN & WIFE	1	200-2	PHONE	8	GD VIS	UNL VIS	UNL VIS	N/R	N/R	2	HIGH	45 MIN	OBLONG,SILVER, 2X AS BRIGHT AS NORTH STAR		SIO-ZAG TO SE.	NO	NO	NO	NO	2 OBJECTS CLOSE TOGETHER SEPARATING	
						Y	(B)	3 CHILDREN			164			CLEAR	CLEAR														
31.	368	08/03	URBAN	NIGHT	1	A	(M)	NOT STATED	1	LOCAL (ELLSWORTH AFB)	NO	1	GD VIS	NO	CLEAR	YES	YES	1	OVER 55,000+	30 MIN	ROUND, BASEBALL,BRIGHT RED AND YELLOW		ERRATIC, DISAPPEARS UP	NO	NO	NO	NO	WITH TIME, PALESTINE LAUNCH RUNSOE FOR. (ELLSWORTH AFB FOLDER) PROBABLY REPORTED	
32.	445	08/05	URBAN	NIGHT				RADAR	1	200-2	LETTER	7	G/RADAR	N/A	N/A	N/A	NO	NO	2	100,000+	45 MIN	SHAPE FLIP		SLOW RANDOM	NO	YES	NO	NO	BECAUSE OF FLAP. POSSIBLE MX BALLOON	
33.	539	08/16	URBAN	DAY	2	Y		15 YRS	1	200-2	NO	3	GD VIS	NO	CLOUDY	NO	NO	1	ABOVE CLOUDS	30 MIN	SILVER WITH OBJECT DANGLING FROM BOTTOM		CLIMBING TO WEST	NO	NO	NO	NO	RADAR ANALYSIS INDICATES BALLOON. UPPER AIR OR BASE OF ALTITUDE AND DURATION.	
34.	614	08/28	USAFB	NIGHT	5	A	(M)	MILITARY	1	200-2	NO	5	GD VIS	7 X 50 BX	VIS 15K		FROM WEST	1	N/R	5HOURS	ROUND,SMALL,BRIGHT SILVER COLOR		RISING S-M RANDOM	NO	NO	NO	NO	PROBABLY RADIOSONDE OR RAWINSONDE WITH TRANSMITTER, (REPORT LATE)	
35.	704	10/23	RURAL	DAY	1	A	(M)		1	200-2	NO	4	GD VIS	NO	UNL VIS	YES	YES	1	N/R	1 MIN	TUBULAR, 3-5' SILVER		INCR, HOVERING	NO	NO	NO	NO	PROBABLY MX BALLOON. OBJECT REPORTED TO BE OVER AIR BASE.	
36.	802	10/30	SMALL TOWN	DAY/ DUSK	1	A	(F)		1	LETTER	NO	3	GD VIS	7 X 50 BX	CLEAR	NO	NO	1	HIGH	PLUS H/R	ANTENNAS OR BOTTOM SMALL SILVER SPHERE		WEST TO EAST WEAVINGNO CONTINUOUSLY	NO	NO	NO	NO	POSSIBLE RADIOSONDE OR RAWIN WITH RADAR REFLECTORS.	
37.	857	12/06	SMALL TOWN	DAY	2	A	(M)	PILOT	1	200-2	NO	3	GD VIS	NO	NO	N/R	45K	FROM W	1	N/R	15 MIN PLUS	CIRCULAR SILVER DISC WITH SILVERY TINT		DESCENDINGOBJECT FROM EXPLOSION VERTICAL FLIGHT TO EAST	NO	NO	NO	NO	OBJECT DESCRIBED BY PARACHUTE. POSS UPPER AIR OR RADIOSONDE. (DIDN DRAWING)	
38.	868	12/07	RURAL	DUSK	2	A	(B)	MR & WIFE	1	PHONE	164	4	GD VIS	NO			NO	NO	1	6-15 MI	15-20 MIN	BLACK OBJECT WITH 2 ORANGE CORES BELOW		4K STATIONARY OR CLIMBING	NO	NO	NO	NO	OBSERVER REGARDS OBJECT AS SOME SORT OF BALLOON. (JOHN'S HOPKINS IN PA.?)	
THE FOLLOWING CASES CONTAIN REPORTED OBJECTS EVALUATED AS BALLOONS OTHER THAN UPPER AIR RESEARCH OR WEATHER BALLOONS																													
39.	73	02/20	RURAL	DAY	1	Y		STUDENT	1	LETTER	164	1	GD VIS	NO	N/R	NO	NO	1	H/R	5 MIN	DISC SHAPED,SIDE OF MX BALLOONS, SHINY		HOVERING ENE	NO	NO	NO	NO	CHARLESTON AFB FLIP FOLDER	
40.	455	08/05	URBAN	DAY	1	B	(F)	HOUSEWIFE CHILDREN	2	200-2	NO	5	GD VIS	NO	CLOUDY	NO	270°	1	P 00 CLOUDS	30 SEC	ROUND,SILVER, SHINY AND BRIGHT		FLIGHT TO NE	NO	NO	NO	NO	TOY BALLOON	
41.	510	09/16	URBAN	DAY	1	A	(M)	NOT REPORTED	1	PHONE	NO	1	GD VIS	NO	N/A	NO	NO	32	5 800 12	X/1	OBSERVED RESPONDED 32 10K BALLOONS TIED TOGETHER WITH 24 POLITICAL OBJECT SUSPENDED BELOW.								
42.	774	10/18	RURAL	DAY	2	A	(B)	FARMER & WIFE	1	200-2	164	8	GD VIS	NO	CLOUDY FOG	NO	NO	1	400 FT MINS	2 1/2 MIN	CONFUSED TRAY OBJECT RIGHT IN AIR TRAFFIC HAZARD. LARGE SOLID OBJECT- GREEN OBJECT,SILVER		EAST TO NW AND UP INTO CLOUDS	NO	NO	NO	NO	UNUSUAL	TRIPOD EFFORT ON BOTTOM
22.	350	(SEE CASE ABOVE) (MAY BE MANNED OR UNMANNED CONTROLLED "COUNTY FAIR" TYPE OF BALLOON)																											

#	ITEM
1	BALLOON LAUNCH LOCATION
2	EFFECTS OF SUNLIGHT ON BALLOON AT DAWN/DUSK
3	ROAB (WEATHER BALLOON)
4	WEATHER BALLOON WITH RADAR REFLECTOR
5	RADIOSONDE BALLOON
6	MOBY DICK (UPPER AIR)
7	UPPER AIR WITH ATTACHMENTS
8	PILLOW BALLOON
9	CLUSTER BALLOON
10 - 11	SCHJELDAHL MYLAR PLASTIC BALLOON
12	SCHJELDAHL MYLAR PLASTIC BALLOON WITH FINS

ASTRONOMICAL SIGHTINGS

6

ASTRONOMICAL SIGHTINGS

101 Cases contained objects evaluated as meteors. Evaluation is performed by analysis personnel within the section on the basis of description, motion, and duration. These analysis are reviewed periodically by Dr. Hynek and concurrance is mandatory for final evaluation. These reports are then forwarded to Dr. Charles P. Olivier of the American Meteor Society for whatever action he deems advisable.

135 Cases contained objects evaluated as stars/planets. These reports are evaluated by analysis personnel within the section on the basis of the reported characteristics of the object, duration, the position of the object in the sky and its motion. Again Dr. Hynek must concur with the analysis prior to evaluation of a report as astronomical in nature.

The astronomical (other) category can best be explained by an examination of those cases evaluated and placed in this category. Some of these cases are evaluated by local astronomers having a knowledge of the particular phenomena because of the locale and atmospheric conditions. Examples: Tab A - Comet, Tab C - Moonlight. The remainder are evaluated by analysis personnel within the section and the evaluation is concurred with by Dr. J. Allen Hynek (Project Consultant). Cases of sun-dogs and parhelia are forwarded to Dr. Donald Menzel because of his particular interest in these case studies.

TAB	ITEM
A.	LETTER FROM DR. OLIVIER DATED 28 DECEMBER 1965
B.	COMET
C.	MOON
D.	REFLECTED MOONLIGHT
E.	SUN
F.	PARHELIA
G.	SOLAR IMAGE (FROM GROUND)
H.	SOLAR IMAGE (FROM A/C)

UNIVERSITY of PENNSYLVANIA

PHILADELPHIA 4

Flower and Cook Observatory

1965 Dec. 28

Major Hector Quintanilla, USAF
Chief, Project Blue Book.
Wright-Patterson, AFB, Ohio.

Dear Major Quintanilla:

Thank you for your letter of Dec. 20, bringing a set of reports from Miss Ochiba. Having read them over, when you designated them as " very unscientific", you were very charitable. Nevertheless I am glad to have them for our files and did find one one definite statement about the Geminid meteors we can use. The good lady means well and I will send her Bul.17 in hopes she can get into her head what we need in a fireball report.

The large batch of reports on first six months of 1965, you kindly sent me in August, have now been gone over in detail and 17 had enough to justify their being entered on fireball cards, and one more refers to a fireball we already had a card for. The rest of the reports are too uncertain for our card file; none however need any comment of value to you, so far as I see.

Those of your reports which have the small altitude and azimuth diagrams on last page are the ones most likely to be of value in any possible computations of heights and paths. The diagrams are very good. They help visualize what one has seen and makes it easier to get the results on paper so they are intelligible.

It is a mystery to me that so many educated people can say so much on a fireball and leave out the essential data, namely where in the sky it started and where ended, giving angular coordinates. Every report would be valuable if these were given, but regretfully they are not. But extensive use of the diagrams should help greatly.

Again thanking you for your valuable help to the A.M.S. in our work, and with best wishes for 1966, I am

Sincerely yours,

Charles P. Olivier

Charles P.Olivier.

C. P. OLIVIER
AMERICAN METEOR SOCIETY
521 N. [illegible] AVE.
NARBERTH, PA
19072

PROJECT 10073 RECORD

1. DATE - TIME GROUP October 65	2. LOCATION Northern Hemisphere
3. SOURCE Multiple	10. CONCLUSION Comet (IKEYA-SEKI)
4. NUMBER OF OBJECTS One	See case file
5. LENGTH OF OBSERVATION N/A	11. BRIEF SUMMARY AND ANALYSIS
6. TYPE OF OBSERVATION Ground-Visual	
7. COURSE Stationary	
8. PHOTOS ☒ Yes ☐ No	
9. PHYSICAL EVIDENCE ☐ Yes ☒ No	

FORM
FTD SEP 63 0-329 (TDE) Previous editions of this form may be used.

UNCLASSIFIED

DEPARTMENT OF THE AIR FORCE
STAFF MESSAGE BRANCH
INCOMING MESSAGE

AF IN : 55787 (26 Oct 65) A/sah

INFO : NIN-7, XOP-1, XOPX-8, SAFOS-3, JCS/OSD/DIA-1, NSA-7, SMB-1 (29)

SMB A006#1-515ZCEJ8319

OO RUEAHQ

DE RUHLKH 779822#2

ZNR UUUUU

O 252210Z ZEL

FM 326AIR DIV KUNIA FAC HA

TO RUHLKM/PACAF HICKAM AFB HA

RUHKH/COMHAWSEAFRON

INFO RUEAHQ/CSAF

RUECW/CNO

RUECW/SECNAV

RUWGALB/CINCNORADD

RUHLHQ/CINCPAC

RUHLHS/CINCUSARPAC

RUHLHL/CINCPACFLT

RUAUAZ/COMUSJAPAN

RUAMC/COMUSKOREA

RUAGFL/COMUSTDC

RUCSC/CINSAC

RUCDSQTDEW WRIGHT PATTERSON AFB OHIO

AFHQ FORM JAN 65 0-309C

UNCLASSIFIED

UNCLASSIFIED

DEPARTMENT OF THE AIR FORCE
STAFF MESSAGE BRANCH
INCOMING MESSAGE

AF IN : 55787 (26 Oct 65)

BT

UNCLAS 326AD-CO 01164

1. CIRVIS REPORT

2. MATS 90528 AND MATS 10092

3. A. ONE

B. MATS 90528 REPORTS HE SAW WHAT APPEARED TO HIM A LARGE SEARCH LIGHT POINTING SKYWARD. MATS 10092 REPORTED SAME BUT ADVISED OBJECT WAS ABOVE THE HORIZON AND TAIL IS OUT OF SIGHT BELOW THE HORIZON.

4. A. POSITION WAS 110 DEGREES FROM 2512 NORTH 15508 EAST AT 1844Z

PAGE 2 RUHLKH 7 UNCLAS

5. 25/1829Z

6. UNKNOWN

7. UNKNOWN

8. UNKNOWN

9. MR. BRONSON OF BISHOP MUSEAUM, HONOLULU, HAWAII TENTATIVELY INDENTIFIED OBJECT AS IKEYA SEKI COMET.

BT

NNNN

NOTE: ADVANCE COPY DELIVERED TO JCS/DIA, NIN & XOPX.
CORRECTED COPY OF AF IN 55726 (26 Oct 65).
RETRANSMITTED TO CIA PER AFHQ FORM 1392#453.

AFHQ FORM JAN 65 O-309C

UNCLASSIFIED

1. DATE - TIME GROUP	2. LOCATION
8 February 65 09/0555Z	Elk Grove, Village, Illinois
3. SOURCE Civilian	**10. CONCLUSION** Astronomical (MOON)
4. NUMBER OF OBJECTS One	Regraction of setting moon.
5. LENGTH OF OBSERVATION Not Reported (Minutes)	**11. BRIEF SUMMARY AND ANALYSIS** Case used in NBC Documantary. Investigated by Dr Hynek. SEE CASE FILE.
6. TYPE OF OBSERVATION Ground-Visual	
7. COURSE Stationary	
8. PHOTOS ☐ Yes XX No	
9. PHYSICAL EVIDENCE ☐ Yes XX No	

FORM
FTD SEP 63 0-329 (TDE) Previous editions of this form may be used.

DEARBORN OBSERVATORY
NORTHWESTERN UNIVERSITY
EVANSTON, ILLINOIS 60201

June 3, 1965

Major Hector Quintanilla, Jr.
Box 9494
FTD Wright-Patterson Air Force Base
Dayton, Ohio

Dear Major:

Sighting, Elk Grove Village, Ill.
February 8, 1965

This is an account of the NBC "Documentary on UFO'S" treatment of the Elk Grove Village case. I was present throughout the entire interview and filming, although I did not take part in it. The witness was a Mrs. Patrick Crowley, who is a photogenic girl of about 26 and reasonably well self-possessed. Her story follows and then I'll give a few details of how the filming was done.

She was coming home by herself at about midnight, February 8, 1965 (Feb. 9). (NICAP report says 11:55 p.m.) She was coming from a doctor's appointment, a doctor who makes late appointments for people who can't come earlier. She lives on a curved street called Harmony Lane and as she was curving around toward her house, some four doors approximately north of it, she saw a glowing oval of light over her neighbor's house, more or less directly west of her. I determined the bearing to be 275-280 degrees, magnetic. She stopped her car and put out the lights and gazed at the "object". Although she said object, she pointed out that it was nothing more than two inter-connecting ovals of light of uniform intensity that seemed to sway back and forth. She continued toward the house in the car without turning the lights on and drove into her driveway which is in the front of the house, as it is in many suburban type homes. This temporarily blocked her view of the globe of light but she hurried over the icy sidewarlk to the left of her house. The house over which she said the light was, is just fifty to seventy-five yards from her house and she was positive that the light was directly over that house. She did not seem to get the point when I asked her how she knew that it was directly over the house. It was over the house and that's all there was to it. The house is fifty feet long and she said the object was about forty feet long and was about twenty or thirty feet above the house, although whenever she drew it, she drew the light quite close to the house, almost directly over the roof.

She said she stood at the back of her house transfixed at this sight, but not at all frightened--there was no sound--and then, instead of going directly into the house, which she could have from where she was standing, she ran around to the front of the house again, fumbled with her keys, finally got in, ran to the window, but the object was gone. She then

Elk Grove Village, February 8, 1965

dashed to the bedroom to get her husband and hauled him out to look. They both went to the window to look. At that time the object was definitely gone.

I questioned her closely on the edges of the object and she maintained that the ovals of light had a definite periphery and were not fuzzy. She drew them for the cameras many times and the best description I can give here is that they were simply two ellipses at right angles to each other, two ellipses of rather low eccentricity.

The filming of this whole episode took from about 7:00 p.m. until 1:00 a.m. - It is ridiculous the lengths to which these documentary people will go. They will do a scene over and over again, aiming for perfection. They first had her tell her story to the cameras and the mike. The story is much as I have given it above. She spoke also of not being afraid of the ridicule of neighbors. She saw what she saw and there was no point in hiding it. She said she was conscious of the fact that her husband's position, and that of her children in school, might be jeopardized by unsavory talk, but that she felt that she must report it. The girl herself is a highschool graduate and then had a year or two, I believe, of interior decorating. I would judge her a positive reporter but not a terribly good reporter. She decides on the things she is sure of and then sticks with them.

After the filming at the dining room table, with all the lights going full blast for fully half an hour or more, they had her draw the pictures for the silent cameras. Then they had her change clothes and re-enact the wintery scene of her coming in, running to the window, looking, running to get her husband and pulling him out of bed. (They did not show that portion; they showed merely his running out of the bedroom to the window in his pajamas and robe. In her desire to be extremely accurate, the young lady remarked that her husband doesn't wear pajamas, but the NBC people said they had to take some liberties in the name of decency and he wore pajamas!) As you can see, it was a rather jolly evening and I forgot to mention that two NICAP members were present, Larsen, who is President of the Chicago chapter and another man whose name temporarily escapes me, though I can get it. I maintained amicable relations with them, but in no sense coming to grips with them. In any event, they seemed a cut above the average NICAP members, or at least did seem so until I overheard them talking in the kitchen when they thought I was asleep. I might as well tell that now.

Along about midnight, I was getting rather tired and since I had a nine o'clock class the next morning, I excused myself and lay down on a couch in the living room while the NBC cameramen went outside to film the progress of her car down the street, etc. I did sleep some, but awoke

to hear the NICAP people regaling one of the NBC crew members and Mr. Patrick Crowley with some real cock-and-bull stories. They didn't know that I was listening. Along with the usual vilification of the Air Force and their secrecy, they were tossing around some real oddball stories about friends of theirs having gone to the basement of the Museum of Science and Industry in Chicago, and wandering into a forbidden region where they found "little green men", or at least models of them. They were shooed out of this "restricted" area. Then the NICAP man went on to say that "Did you know that during the war, the basement of the Museum of Science and Industry wasthe center of the security operations of the U.S.?" If those were not his exact words, that was certainly the sense of it, namely, that the basement of the museum was a super-secret "hideout". The NICAP members showed out in their usual uncritical form! Both these men, however, are basically likeable chaps and certainly fair and honest, according to their lights.

We finally got away from there at 1:30 a.m. and the next day, in thinking this over, I came upon what is probably the solution.

I asked the girl where the moon was and she stated that she did not see the moon, but that the sky was very clear. She said she knew it wasn't the moon because it was too bright and too big and that it wasn't Venus for the same reason. It wasn't the great white owl, which some neighbors said it might have been, because owls move, and this didn't. She said there were no clouds, but we should check meteorological conditions on that day. Both this case and the Elmwood Park case will cause a great deal of comment since they will be aired before approximately a million people. And the documentary is quite good, have no question on that.

Reference to the nautical almanac for February 8 (she first said February 15, which would have thrown this whole case out of court), but it now has been established that she went to the doctor on February 8. The moon was exactly at first quarter (and thus a very fine half oval) and it set in the Chicago region at 12:24 a.m. It's declination was plus 13 degrees, which would have placed the half moon with the rounded side largely pointing downward at about five or six degrees above the western horizon and slightly to the north of west. Refraction and especially the presence of a thin cirrus cloud bank could have given the impression of an inter-locking oval sitting over the neighbor's house. The directions check out exactly. The sighting bearing was 275-280 and elevation was $10^{\circ} \pm 3$. This was almost exactly the position of the moon at that time. The fact that she should have reported the moon and this globe makes it likely that she saw the setting moon. There is no question from her general demeanor that she is excitable, and most people are not aware of how the moon looks at exactly first quarter when it is setting on the western horizon. It looks at least twice as large as it normally does but generally has a deeper yellow or

orange-ish tinge than reported by Mrs. Crowley. However, in the absence of her reporting the moon, and coupled with the fact that the moon was certainly in any event within a few degrees of the reported sighting, considerable doubt must be thrown on there having been a separate globe from that produced by the setting moon.

NBC wishes me to come in at the end of this documentary to discuss these sightings. It ought to be easy, since the Barrington Hills case is almost certainly a meteor, this case is probably the moon, but the only puzzling case remaining is that of the Elmwood Park police and this is a real puzzler. It is a "Levelland" case right in our own back yard! It is unfortunate that O'Hare did not report it officially so that it could have been investigated much sooner than it has been!

Sincerely,

J. Allen Hynek

JAH:mjp

1. DATE - TIME GROUP 28 June 65 28/1100Z	2. LOCATION Trenton, Missouri
3. SOURCE Civilian	10. CONCLUSION Astronomical (SUN) Sun in position of reported object. Evaluated as a refraction of the rising sun.
4. NUMBER OF OBJECTS One	
5. LENGTH OF OBSERVATION 10 Minutes	11. BRIEF SUMMARY AND ANALYSIS Object three times size of moon on horizon in North East. So bright that witness eyes were hurt. Sky looked like it was on fire. Appeared to roll and jerk and flames shot upward. Watched for 10 minutes. Fire gradually died down.
6. TYPE OF OBSERVATION Ground-Visual	
7. COURSE Stationary	
8. PHOTOS ☐ Yes ☒ No	
9. PHYSICAL EVIDENCE ☐ Yes ☒ No	

FORM
FTD SEP 63 0-329 (TDE) Previous editions of this form may be used.

TDEW

JUL 30 1965

UFO Sighting, Trenton, Missouri, 28 Jun 65

Hq USAF SAFOIGC (Mrs Hunt)
Wash D C 20330

Reference the attached letter from Mrs H G Rains reporting an unidentified object which she observed on the morning of 28 Jun 65. The following is a suggested reply:

a. Dear Mrs Rains,

We have received your letter, in which you describe the observation of an object on the morning of 28 June 1965. On 28 June sunrise at Trenton, Missouri occurred at 449am on a magnetic heading of 060 degrees. Your letter does not mention the position of the sun with relation to the position of the object which you observed. From the information which you have submitted, the Air Force tends to agree with your son's analysis of your observation. We also believe that you saw the sun rising in the Northeast.

We have received no additional reports from this area on 28 Jun 65.

FOR THE COMMANDER

ERIC T de JONCKHEERE
Colonel, USAF
Deputy for Technology
and Subsystems

1 Atch
Ltr fm Mrs H G Rains

ORIGINATOR: TDEW/UFO Maj H Quintanilla, Jr date 30 Jul 65

OFFICIAL FILE COPY TDEW

Mrs Hunt/man/SAFOICC/72842/10 Aug 65

AUG 11 1965

Dear Mrs. Rains:

This is in reply to your letter in which you described your observation of an object on the morning of 28 June 1965.

Based on the data which you submitted, the Air Force tends to agree with your son's analysis that you saw the sun rising in the northeast even though you did not mention the position of the sun with relation to the position of the object which you observed. Sunrise occurred at Trenton, Missouri, on that date at 4:49 am on a heading of 060 degrees.

Sincerely,

JOHN P. SPAULDING
Lt Colonel, USAF
Chief, Civil Branch
Community Relations Division
Office of Information

Mrs. H. G. Rains
308 East 10th Street
Trenton, Missouri 64683

COORDINATED By (Office Symbol, Name, Grade, Date)			
SAF-OICC	SAF-OI C		

Comebk cy -
Reader cy - SAFOI-1
Activity cy - SAFOI
Stayback

Trenton , Missouri
July 25 , 1965

Project Bluebook
Wright-Patterson Air Force Base
Dayton , Ohio

This is to report a mysterious sight which I saw in the sky at 5AM Monday June 28th this year. (Since that time I have watched the papers for reports from others who might have also seen the same but just today I note mention in the Kansas City paper of various observations and a statement that you have a list of 667 sightings which are unidentified).

I will start by saying that at the time and place mentioned above I was awake but still in bed in the northeast corner upstairs room of my home at 308 East 10th Street , Trenton , Missouri (Grundy County) when a very bright light suddenly appeared on the west wall of my room. If I had been downstairs I probably would have dismissed the thought of anything only a car light shining in, but realizing that that was impossible in the upstairs room I got up and went to the east window to investigate . Directly in the northeast I saw a fiery oblong about the size of three full moons set side by side and it gave me the impression that the sky was on fire. As I watched it appeared to roll and jerk and sent what looked like flames upward . It did not move otherwise as a flying object and it was so bright it hurt my eyes to look at it. But I watched it for about ten minutes until it gradually died away as any fire would have done , but it did NOT fall to the ground , nor move from its original location.

To my knowledge no one else in this community saw this .. I did not see any account of it in our local paper nor hear of any one else seeing it. I did not call any of the neighbors as they would not yet have been up that early and my 87 year old father was the only other person in the home (my husband having left shortly before then for his work as custodian of the county court house) . And I did not wish to leave the window but to watch until it disappeared or I could decide what it might be.

If you have other reports similar or know what I may have seen I would appreciate the information. I might add that my son who lives in Cincinnati Ohio wrote that I had seen the sun rising in the northeast . But he is mistaken --- I have seen the sun rise many times and there is no comparison . (I am 67 years old).

Most sincerely ,
Mrs. H. G. (Beulah) Raines
308 East 10 Street
Trenton , Missouri 64683

PROJECT 10073 RECORD

1. DATE - TIME GROUP 11 August 65 11/0930Z	2. LOCATION Richmond, Walnut Creek, California
3. SOURCE Civilian	10. CONCLUSION Astro (REFLECTED MOONLIGHT) ✓
4. NUMBER OF OBJECTS Multiple	
5. LENGTH OF OBSERVATION 30 Minutes	11. BRIEF SUMMARY AND ANALYSIS Mr Gates, manager of the Morrison Planitarium, observed lights that had been reported as UFO's. At the time of the observation a rare and intense electrical storm was in progress with a full moon shining. Storm clouds were moving reapidly at a low level with high stationary thunderheads. Moonlight was reflecting from tops of the thunderheads through the lower layers creating an illusion of dancing lights.
6. TYPE OF OBSERVATION Ground-Visual	
7. COURSE Dancing Lights	
8. PHOTOS ☐ Yes ☒ No	
9. PHYSICAL EVIDENCE ☐ Yes ☒ No	

FORM FTD SEP 63 0-329 (TDE) Previous editions of this form may be used.

UFO 1:30 & 2:00 AM.
Oval shape 11 Aug 65
could see it easily again by looking off
bit of white light to going out
all around (on a/c)
red light on
via tail
visitors were instantly
-erratic-
going fast
went up into the clouds

2337 Walnut Blvd
Dina Graham
935-3673
+ father + sister present
WALNUT CREEK

Was excited but not unnatural

7 of 6

HEADQUARTERS
HAMILTON AIR FORCE BASE and 78TH COMBAT SUPPORT GROUP
United States Air Force
Hamilton Air Force Base, California 94935

REPLY TO ATTN OF: SGOTN-BO

23 August 1965

SUBJECT: UFO Reports

TO: AFCS (FTD)
Wright-Patterson AFB, Ohio 45433

1. Attached reports are submitted for your information and disposition. Follow-up investigations revealed no additional information or explanations. Personnel reporting subject sightings were sent thank you letters from the Base Joint Office of Information.

2. The 8mm movie film submitted by Mr Lino Cardoso, 2906 15th Street, San Pablo, California, was previewed locally and decision made to forward for purpose of your more expert evaluation. It is requested by Mr Cardoso that his film be returned when you are finished examining it.

FOR THE COMMANDER

Alfred V. Mankedick

ALFRED V. MANKEDICK, Civ
Asst Base Operations Officer

11 AUG 65 / 1400L

REF: UFO REPORTS 0130-0200L 11 AUG. 65

MORRISON PLANETARIUM @ G.G. PARK (221-5100 EXT 71) WAS PHONED FOR ANY INFO THEY MIGHT HAVE ON UFO SIGHTINGS DURING PAST 7 DAYS.

"ANYTHING DURING PAST 7 NITES OF A CELESTIAL OR ASTRONOMICAL NATURE WHICH MIGHT EXCITE THE VIEWERS IMAGINATION".....

MR. GATES, MANAGER OF PLANETARIUM, REPORTED HE PERSONALLY SIGHTED THE REPORTED LIGHTS & WAS GREATLY IMPRESSED BY THE ILLUSIONARY EFFECT WHICH WAS CREATED BY REFLECTED MOONLIGHT.

AT THE TIME OF SIGHTING A RARE & INTENSE ELECTRICAL STORM WAS IN PROGRESS & A NEAR FULL MOON WAS SHINING. STORM CLOUDS AT A LOW LEVEL WERE MOVING QUITE RAPIDLY WITH HIGHER STATIONARY THUNDERHEADS. MOONLIGHT WAS REFLECTING FROM THE TOPS OF THE THUNDERHEADS THRU THE LOWER LAYER CLOUDS – INTENSITY VARIED AS LIGHT RAYS WERE CUT OFF BY LOWER CLOUDS.-- CREATING AN ILLUSION OF 'DANCING LIGHTS'.

MR. GATES STATED HE WAS FASCINATED BY THE SPECTACULAR DISPLAY & VOICED THE OPINION THAT THERE WOULD BE NUMEROUS UFO REPORTS FORTHCOMING.

SEOTN-130

0130
11 AUG

B

UFO

(1) Jim Filippi + Wife + Brother
3027 OHIO AVE
Richmond

(2) (A) Small stars — white
(B) SMALL — HARD TO SEE
(C) WHITE
(D) Very Many — 15-20
(E) 3 in Group
(F) — N/A
(G) — NO SOUND

(3) (A) Watching storm — SAW objects
(B) 25° — From 90 AS vertical — North/W
(C) — Just Bouncing around — straight up — sideways
(D) ↗
(E) — instantaneous disappearance + appearance
(F) — 15 minutes — still visible

(4) NAKED EYE 1030 Z

1. DATE - TIME GROUP 22 July 65 22/1400Z	2. LOCATION Forbes AFB, Kansas
3. SOURCE Military	10. CONCLUSION Astronomical (PARHELIA)
4. NUMBER OF OBJECTS One	Object stationary. Position of sun in relation to reported object consistant with parhelia sighting.
5. LENGTH OF OBSERVATION 5 Minutes	11. BRIEF SUMMARY AND ANALYSIS Small elongated flat looking object estimated to be about 15 miles from observer. Shiny silver. Left side brighter than right side although sun was shining on right side. Object at 07 deg elevation in East. Stationary. Obscured by cloud bank. No motion. Witnesses familiar with celestial bodies and a/c. Max wind reported up to 50,000 was 16 knots from 050 degrees.
6. TYPE OF OBSERVATION Ground-Visual	
7. COURSE Stationary	
8. PHOTOS ☐ Yes ☒ No	
9. PHYSICAL EVIDENCE ☐ Yes ☒ No	

FORM
FTD SEP 63 0-329 (TDE) Previous editions of this form may be used.

TC		CYS
	OS	
	OSA	
	OSP	
	US	
	RR	
	IL	
	ILA	
	ILI	
	ILP	
	ILS	
	ILT	
	FM	
	RD	
	MP	
	MPP	
	MPR	
	AA	
	AAA	
	AAR	
	GC	
	OI	
	LL	
	SS	
	DSIG	

AF IN: 31173 (24 Jul65) E/cvl

ACTION: NIN-7

INFO: XOP-1,XOPX-8, SAFOS-3, DIA-1 (21)
SMB C062 HQA236ZCTJB558

PP RUEAHQ

DE RUWJELA0002 2050059

ZNR UUUUU

P 232315Z

FM 313TCW FORBES AFB KANS

TO RUWMFVA/ADC ENT AFB COLO

RUWTFLA/29ADIV ADC RICHARD GEBAUER MO

RUCDSQ/-FSC

RUEAHQ/USAF AFCIN

RUEAHQ/SECRETARY OF THE AF SAFOI

RUCMSX/SIOUX CITY AIR DEFENSE SECTOR SIOUX CITY IOWA

BT

UNCLAS 313DOI 00010 JUL 65. SUBJECT: UFO REPORT.

A. (1) THE UFO WAS ELONGATED AND FLAT LOOKING AS IF LOOKING AT THE SIDE OF A DIME.

(2) ONE-HALF (1/2) THE SIXE OF A DIME. UFO APPEARED TO BE APPROXIMATELY TEN TO FIFTEEN MILES FROM OBSERVERS LOCATION.

(3) SHINY SILVER

(4) ONE

Probably parhelium

SSGNFFTS

(5) N/A.

(6) N/A

(7) N/A

PAGE 2 RUWJELA0002 UNCLAS

(8) N/A

(9) LEFT SIDE OF UFO WAS BRIGHTER THAN THE RIGHT SIDE ALTHOUGH THE SUN WAS SHINING ON THE RIGHT SIDE.

B. (1) BOTH INDIVIDUALS HAD STOPPED TO LET A FIRE TRUCK PARK AND WERE LOOKING EASTWARD AT AIRCRAFT PARKED ON FLIGHT LINE WHEN THEY SAW OBJECT ABOVE AIRCRAFT.

(2) 7 DEGREES ABOVE HORIZON AT APPROXIMATELY 090 DEGREES.

(3) NO MOVEMENT WAS OBSERVED UNTIL A CLOUD BANK OBSCURED VIEW BY MOVIMEMX

(5) OBSCURED BY CLOUD BANK WITH NO MOVEMENT OBSERVED.

(6) FIVE MINUTES.

C. (1) GROUND VISUAL.

(2) N/A

(3) N/A

D. (1) 22/1400Z TO 22/1405Z JULY

(2) DAY.

AF IN: 31173 (24 Jul 65) Pg 3of 5

E. 1/8 MILE NORTH OF BASE OPERATIONS, FORBES AFB, KANS.

F. (1) N/A

(2) CORY, WILLIAM W., MAJOR, USAF , HQ 2AF, BARKSDALE, CHIEF

PAGE 3 RUWJELA0002 UNCLAS

PENETRATION AIDS AND MCQUAID, JOSEPH M., MAJOR, USAF, HQ 2AF

BARKSDALE, CHIEF OF SCHEDULING. BOTH OBSERVERS ARE THOROUGHLY FAMIL-

IAR WITH CELESTIAL BODIES AND AIRCRAFT.

G. (1) 2/10 CLOUD COVERAGE.

(2) WINDS:

A. SURFACE 21/10

B. 6 M 230/11.

C. 10M 190/11.

D. 16M 040/06.

E. 20M 030/09.

F. 30M 090/03.

G. 50M 050/16.

H. 80 M NOT AVAILABLE.

(3) CEILING:

A. 8 M SCATTERED.

B. 12 M SCATTERED.

C. 21 M BROKEN

(4) 7 MILES.

(5) 6/10 CLOUD COVER.

(6) NONE.

PAGE 4 RUWJELA0002 UNCLAS

(7) TEMPERATURE SURFACE 24.5C

6M 20.5C

10M 12.0C

16M -1.0C

20M -7.0C

30M -31.0C

50M -66.5C

80M NOT AVAILABLE

H. N/A

I. NONE.

J. NO WEATHER BALLOONS OR AIRCRAFT REPORTED IN AREA BY EITHER TOPEKA FAA OR FORBES BASE OPERATIONS.

K. WALLING, JAMES E., 1LT USAF, CHIEF, 313INTELLIGNECE SECTION. THERE WERE SOME SMALL RAIN SHOWERS WEST OF KANSAS CITY, KANSAS EXTENDING INTO MISSOURI, THAT DID NOT SHOW ON TOPEKA RADAR. INVESTI-

GATOR HAS NO SCIENTIFIC OR TECHNICAL BACKGROUND WHICH WOULD AID EVALUATION.

L. N/A.

BT

NNZCZCHQ0975Z

C

NOTE: ADV COPY TO DIA.

PROJECT 10073 RECORD

1. DATE - TIME GROUP 15 September 65 (Time Garbled)	2. LOCATION Pittsburgh, Pennsylvania
3. SOURCE Civilian	10. CONCLUSION Astro (SOLAR IMAGE) Reflection of sun through clouds.
4. NUMBER OF OBJECTS Seven	
5. LENGTH OF OBSERVATION 3 Seconds	11. BRIEF SUMMARY AND ANALYSIS Seven objects in stationary "W" formation. Color of full pale moon. Perfectly round circles. Exceptionaly bright. At first thought it was sun behind clouds, but thought sun should be higher at that time of day. Disappeared as clouds disappeared. Phenomena associated with position of sun and clouds. Objects like sun. Disappeared as clouds disappeared. Time garbled no relationship ~~relating to the position of~~ the sun and the clouds established. Objects at 70 deg elevation. BETWEEN.
6. TYPE OF OBSERVATION Ground-Visual	
7. COURSE Stationary	
8. PHOTOS ☐ Yes ☒ No	
9. PHYSICAL EVIDENCE ☐ Yes ☒ No	

FORM FTD SEP 63 0-329 (TDE) Previous editions of this form may be used.

15 Sep

15/0630Z
PITTSBURGH, PA

UNCLASSIFIED

DEPARTMENT OF THE AIR FORCE -
STAFF MESSAGE BRANCH
INCOMING MESSAGE

AF IN : 54321 (17 Sep 65) A/gem

ACTION: SAFOS-3 (4)
SMB B047AAAAAAAAAA

ZNR

QA441ZCEJB065

RR RUEAHQ

ZNR UUUUU ZOV RUEPDA

ZXY-4-5

EUD113BEC464

RR RUEPDA

DE RUCBOF 113 25WEEPZ

ZNR UUUUU

R 161430Z

FM 662D RDR SQ OAKDALE AI OAKDALE PA

TO RUCMEN/ADC ENT AJB COLO

RUEAKN/26AIR DIV STEWART AFB NY

RUCDSQ/FTD WPAFB OHIO

RUEPDA/HQ OSAF (AFMIN) WASH DC

RUEPDA/ OSAF (SAFOI) WASH DC

BT

UNCLAS 662 OOP 00586 SEPT 65

FOLLOWING REPORT SUBMITTED IN ACCORDANCE WITH AFR 200-2 DTD 20 JUL

TO		CYS
	OS	
	OSA	
	OSP	
	US	
	RR	
	TT	
	TT	
	TT

UNCLASSIFIED

DEPARTMENT OF THE AIR FORCE
STAFF MESSAGE BRANCH
INCOMING MESSAGE

AF IN : 54321 (17 Sep 65) Pg 2 of 2

62. A. (1) SEVEN IN A STATIONARW W FORMATION (2) SIZE OF BASKETBALL AT ARMS LENGTH (3) COLOR OF PALE FULL MOON (4) APRX SEVEN (5) STATIONARY FORMATION (6) PERFECTLY ROUND CIRCLES (7) NO TRAILS (8) NO SOUND (9) EXCEPTIONALLY BRIGHT B(1) BRIGHTNESS - FIRST THOUGHT TO BE SUN BEHIND CLOUDS AND THOUGHT SUN SHOULD BE HIGHER FOR TIME OF DAY (2) 70 DEG (3) 70 DEG CLOUDS COVERED THEM AND THEN THEY DISAPPEREAD (4) NO MOVEMENT JKTL DISAPPEARED AS CLOUDS DISAPEARED KYL THREE SECONDS. MOMENTARILY. C(1) GROUDN VISUAL (2) NALED EYE

PAGE TWO UNCLAS BOF 113 ERROR 15/1130Z ACCORDING TO POSITION OF SUN

(3) N/A D(1) 15/0630Z (2) DAY SOUTH HILLS SECTION OF PITTSBURGH (MT WASHINTON) THREE MILES SOUTH OF PITTSBURGH (3) MRS DOROTHY H. HOLLIS 711 SOUTHERN AVE ., ET WASHINGTON PITT 11 PA. FELIBILITY GOOD, G(1) N/A G(1) CLOUDY WITH HIGH WINDS (2) SURFACE WINDS 140DEG/7 K 6000 280/2 80000 UNK (3) CEILING 15000 FEET (4) VISIBILITY FIVE MILES (5) AMOUNT OF CLOUD COVER 10/10 (6) THUNDERSTORMS ONE HUNDRED MILES WNW OF PITTSBURGH (7) 2DEG PER THOUSAND FEET- NORMAL LAPSE RATE H. NONE I. WEATHER BALLOON WAS RELEASED AT 15/0600Z J. NONE K. STEPHEN R. PAQUETTE - CEM OFFICER - 1ST LT MOST LIKELY REFLECTION FROM SUN OR POSSIBLY WEATHER BALLOON. OBSERVER HAS SEEN SOME PHENOMENA BEFORE SO IT APPEARS TO BE SOME TYPE OF MATURAL PHENOMENA L. NONE.
BT

AFHQ FORM JAN 65 0-309C

UNCLASSIFIED

1. DATE - TIME GROUP	2. LOCATION
22 January 1965 22/1725Z	Elkins, West Virginia
3. SOURCE Civilian	**10. CONCLUSION** Astronomical (SUN DOG) [Solar Image] Sun-Dog if position relation with the sun could be established as 22 deg from sun. Disappearance with turn of A/C and description of object in accordance with this analysis. Sun at 190 deg azimuth 30 deg elevation.
4. NUMBER OF OBJECTS One	
5. LENGTH OF OBSERVATION 2 Minutes	**11. BRIEF SUMMARY AND ANALYSIS** Object brighter than snow on the mountains. Observed only as a pin-point of light. Shape perfectly round. Slight fuzziness. WX was clear, dry. Observation from within A/C. Observed almost directly below the plane. Believed to be between 2-8,000 ft below A/C. The sun would give the same appearance. Object paralelled the A/C until a turn was made at which time the object disappeared. Reflection of sun on ice particles below.
6. TYPE OF OBSERVATION Air-Visual	
7. COURSE Stationary	
8. PHOTOS ☐ Yes XX No	
9. PHYSICAL EVIDENCE ☐ Yes XX No	

FORM
FTD SEP 63 0-329 (TDE) Previous editions of this form may be used.

TDEW

UFO Sighting,Elkins, West Virginia, 22 Jan 65 26 Mar 65

Dr Donald H Menzel, Director
Harvard College Observatory
Cambridge 38, Massachusetts

Dear Dr Menzel,

We received a report from a passenger on an airline flight near Elkins, West Virginia. The sighting has been evaluated as Sun Dog. A copy of this report is forwarded to you because of your particular interest in this phenomena. Should you feel that this observation is not a Sun Dog observation we would appreciate your professional opinion.

Sincerely,

HECTOR QUINTANILLA, Jr
Major, USAF
Chief, Aerial Phenomena Branch

1 Atch
UFO Rpt, 22 Jan 65,
Elkins, W Va

22 JAN 65

Mrs Hunt/SAFOICC/72842/6 May 65

May 6, 1965

Dear Mr. Fitzgerald:

Reference is made to the unidentified flying object which you observed as a passenger in an aircraft on 22 January 1965 over the area of Elkins, West Virginia.

Your observation has been evaluated as a solar image by Doctor J. Allen Hynek, the Air Force civilian consultant to Project Blue Book. While rare, this unique phenomena has appeared before, and on one occasion it was photographed. This phenomena occurs only at certain angles with the sun, and the reflecting surface is a thin layer of ice crystals in the atmosphere. This layer is transparent and not visible from the aircraft.

I am enclosing a copy of the current report on Project Blue Book, the Air Force project on unidentified flying objects. I hope this report will be of interest to you.

Sincerely,

JOHN P. SPAULDING
Lt Colonel, USAF
Chief, Civil Branch
Community Relations Division
Office of Information

1 Atch
Blue Book Report

Mr. William M. Fitzgerald, Jr.
1057 Crane Drive
Falls Church, Virginia

HEADQUARTERS
FOREIGN TECHNOLOGY DIVISION
AIR FORCE SYSTEMS COMMAND
UNITED STATES AIR FORCE
WRIGHT-PATTERSON AIR FORCE BASE, OHIO

REPLY TO
ATTN OF: TDEW

SUBJECT: UFO Sighting, 22 Jan 65, Elkins, West Virginia 26 Apr 65

TO: Hq USAF SAFOI-CC (Mrs Hunt)
Wash D C 20330

1. This office is in receipt of a UFO report from William M Fitzgerald, Jr of 1057 Crane Drive, Falls Church, Virginia. His observation took place on 22 January 1965 near Elkins West, Virginia. The following information is provided in order that a reply may be made to him from your office.

a. The above observation made from an aircraft has been evaluated as a solar image by Dr J Allen Hynek, Air Force Consultant to Project Blue Book. While rare, this unique phenomena has appeared before, and one one occasion it was photographed. This phenomena occurs only at certain angles with the sun and the reflecting surface is a thin layer of ice crystals in the atmosphere. This layer is transparent and not visible from the aicraft.

FOR THE COMMANDER

Hector Quintanilla, Jr

HECTOR QUINTANILLA, Jr
Major, USAF
Chief, Aerial Phenomena

YOU - THE NUCLEUS OF SECURITY!

Fitzgerald William M. Jr.
FALLS CHURCH, VIRGINIA

27 January 1965

Dear Mr. Fitzgerald:

Major Ted Burkey requested that we send you the attached FTD Form 164 which is used for reporting a UFO observation to the Air Force. The form should be completed as fully as possible and returned to this office for analysis and evaluation. You will be advised of the conclusions reached by the Air Force upon completion of the investigation.

Sincerely,

MASTON M. JACKS
Major, USAF
Public Information Division
Office of Information

1 Atch
FTD Form 164

Mr. William M. Fitzgerald, Jr.
1057 Crane Drive
Falls Church, Virginia

phone

SUN DOG 22 JAN

U.S. AIR FORCE TECHNICAL INFORMATION

This questionnaire has been prepared so that you can give the U.S. Air Force as much information as possible concerning the unidentified aerial phenomenon that you have observed. Please try to answer as many questions as you possibly can. The information that you give will be used for research purposes. Your name will not be used in connection with any statements, conclusions, or publications without your permission. We request this personal information so that if it is deemed necessary, we may contact you for further details.

1. When did you see the object?

27 (Day) JANUARY (Month) 1965 (Year)

2. Time of day: 12:25 - 12:30 (Hour / Minutes)

(Circle One): A.M. or (P.M.)

3. Time Zone:

(Circle One): a. (Eastern) b. Central c. Mountain d. Pacific e. Other _____

(Circle One): a. Daylight Saving b. (Standard)

4. Where were you when you saw the object? PASSENGER ON BRANIFF AIRLINE JET - FLIGHT #8 FROM DALLAS, TEXAS TO WASHINGTON DC (DULLES). SIGHTED UFO ABOUT 20-25 MINUTES OUT OF DULLES AIR PORT. POSSIBLY OVER ELKINS, W. VA.

Nearest Postal Address / City or Town / State or County

WEST AND PERHAPS SOUTH OF STAUNTON/CHARLOTTSVILLE, VA.

5. How long was object in sight? (Total Duration) ___ Hours 7 Minutes ___ Seconds

a. (Certain) c. Not very sure
b. Fairly certain d. Just a guess

5.1 How was time in sight determined? ESTIMATED

5.2 Was object in sight continuously? Yes ✓ No ___

6. What was the condition of the sky?

DAY	NIGHT
a. (Bright)	a. Bright
b. Cloudy	b. Cloudy

7. IF you saw the object during DAYLIGHT, where was the SUN located as you looked at the object?

(Circle One): a. In front of you d. To your left
b. In back of you e. (Overhead)
c. To your right f. Don't remember

FORM FTD OCT 62 164 This form supersedes FTD 164, Jul 61, which is obsolete.

8. IF you saw the object at NIGHT, what did you notice concerning the STARS and MOON?

8.1 STARS *(Circle One)*:

a. None
b. A few
c. Many
d. Don't remember

8.2 MOON *(Circle One)*:

a. Bright moonlight
b. Dull moonlight
c. No moonlight – pitch dark
d. Don't remember

9. What were the weather conditions at the time you saw the object?

CLOUDS *(Circle One)*:

a. (Clear sky)
b. Hazy
c. Scattered clouds
d. Thick or heavy clouds

WEATHER *(Circle One)*:

a. (Dry)
b. Fog, mist, or light rain
c. Moderate or heavy rain
d. Snow
e. Don't remember

10. The object appeared: *(Circle One)*:

a. Solid
b. (Transparent)
c. Vapor
d. (As a light)
e. Don't remember

11. If it appeared as a light, was it brighter than the brightest stars? *(Circle One)*:

a. (Brighter)
b. Dimmer
c. About the same
d. Don't know

11.1 Compare brightness to some common object:

PIN-POINT OF SUNLIGHT WHEN PASSED THROUGH A MAGNIFYING GLASS - SNOW ON MOUNTAINS APPEARED DARKER IN CONTRAST

12. The edges of the object were:

(Circle One):
a. Fuzzy or blurred
b. Like a bright star
c. (Sharply outlined)
d. Don't remember
e. Other WITH SLIGHT FUZZINESS

13. Did the object:

	(Circle One for each question)		
a. Appear to stand still at any time?	Yes	(No)	Don't know
b. Suddenly speed up and rush away at any time?	Yes	(No)	Don't know
c. Break up into parts or explode?	Yes	(No)	Don't know
d. Give off smoke?	Yes	(No)	Don't know
e. Change brightness?	Yes	(No)	Don't know
f. Change shape?	Yes	(No)	Don't know
g. Flash or flicker?	Yes	(No)	Don't know
h. Disappear and reappear?	Yes	(No)	Don't know

14. Did the object disappear while you were watching it? If so, how?

No

15. Did the object move behind something at any time, particularly a cloud?

(Circle One): Yes (No) Don't Know. IF you answered YES, then tell what it moved behind: _____

16. Did the object move in front of something at any time, particularly a cloud?

(Circle One): Yes (No) Don't Know. IF you answered YES, then tell what in front of: _____

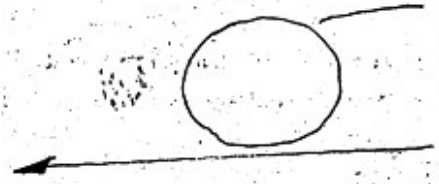
17. Tell in a few words the following things about the object:

a. Sound COULD NOT DETERMINE (IN AIRCRAFT)

b. Color BRILLIANT WHITE - TRANSLUCENT SOMEWHAT

18. We wish to know the angular size. Hold a match stick at arm's length in line with a known object and note how much of the object is covered by the head of the match. If you had performed this experiment at the time of the sighting, how much of the object would have been covered by the match head? DON'T THINK THIS METHOD IS VALID UNDER THESE CIRCUMSTANCES. A VERY SMALL PART OF THE OBJECT WOULD BE COVERED, IF PRESSED FOR AN ESTIMATE.

19. Draw a picture that will show the shape of the object or objects. Label and include in your sketch any details of the object that you saw such as wings, protrusions, etc., and especially exhaust trails or vapor trails. Place an arrow beside the drawing to show the direction the object was moving.



OBJECT SEEN LOOKING ALMOST STRAIGHT DOWN AT THE GROUND

20. Do you think you can estimate the speed of the object?

(Circle One) (Yes) No AT THE EXACT SPEED OF THE JET I WAS FLYING IN AT THE TIME

IF you answered YES, then what speed would you estimate? 400 MPH(?)

21. Do you think you can estimate how far away from you the object was?

(Circle One) (Yes) No

IF you answered YES, then how far away would you say it was? FROM 2000 TO 8000 FT

22. Where were you located when you saw the object? (Circle One):

a. Inside a building
b. In a car
c. Outdoors
(d) In an airplane (type) 720 JET
e. At sea
f. Other _____

23. Were you (Circle One)

a. In the business section of a city?
b. In the residential section of a city?
c. In open countryside?
d. Near an airfield?
e. Flying over a city?
(f.) Flying over open country?
g. Other _____

24. IF you were MOVING IN AN AUTOMOBILE or other vehicle at the time, then complete the following questions:

24.1 What direction were you moving? (Circle One)

a. North c. East e. South g. West
b. Northeast d. Southeast f. Southwest h. Northwest

24.2 How fast were you moving? _____ miles per hour.

24.3 Did you stop at any time while you were looking at the object?

(Circle One) Yes No

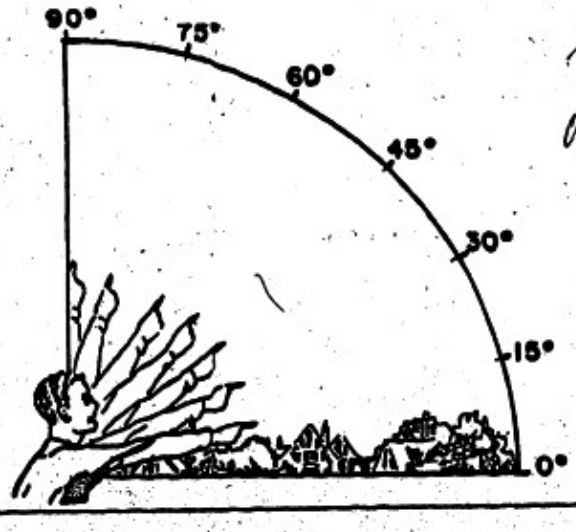
25. Did you observe the object through any of the following?

a. Eyeglasses	Yes	No	e. Binoculars	Yes	No
b. Sun glasses	Yes	No	f. Telescope	Yes	No
c. Windshield	Yes	No	g. Theodolite	Yes	No
d. Window glass	Yes	No	h. Other AIRLINER PLEXIGLAS WINDOW		

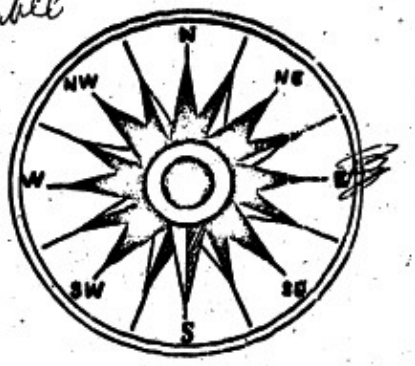
26. In order that you can give as clear a picture as possible of what you saw, describe in your own words a common object or objects which, when placed up in the sky, would give the same appearance as the object which you saw.

THE SUN

27. In the following sketch, imagine that you are at the point shown. Place an "A" on the curved line to show how high the object was above the horizon (skyline) when you *first* saw it. Place a "B" on the same curved line to show how high the object was above the horizon (skyline) when you *last* saw it. Place an "A" on the compass when you *first* saw it. Place a "B" on the compass where you *last* saw the object.



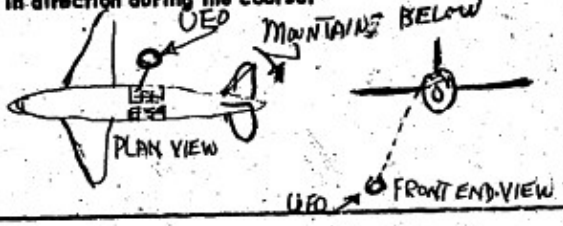
Not applicable



28. Draw a picture that will show the motion that the object or objects made. Place an "A" at the beginning of the path, a "B" at the end of the path, and show any changes in direction during the course.

DULLES AP X

EAST OR EAST NORTHEAST HEADING



29. IF there was MORE THAN ONE object, then how many were there? _____
Draw a picture of how they were arranged, and put an arrow to show the direction that they were traveling.

30. Have you ever seen this, or a similar object before. If so give date or dates and location.

No

31. Was anyone else with you at the time you saw the object? (Circle One) (Yes) No

31.1 IF you answered YES, did they see the object too? (Circle One) Yes (No)

31.2 Please list their names and addresses:

I was one of the few passengers sitting in the window seat configuration - starboard side - You had to look down at approximately 80° angle to see object.

32. Please give the following information about yourself:

NAME FITZGERALD (Last Name) WILLIAM (First Name) MICHAEL, JR. (Middle Name)

ADDRESS 1057 CRANE DRIVE (Street) FALLS CHURCH (City) ___ (Zone) VIRGINIA (State)

TELEPHONE NUMBER JE 4-2153 AGE 41 SEX MALE

Indicate any additional information about yourself, including any special experience, which might be pertinent.

Formerly a student pilot - travel by air (Commercially) quite often.

33. When and to whom did you report that you had seen the object?

26 (Day) JANUARY (Month) 1965 (Year)

MAJOR TED BURKEY
USAF - WASH. D.C.

34. Date you completed this questionnaire: 28 (Day) JANUARY (Month) 1965 (Year)

35. Information which you feel pertinent and which is not adequately covered in the specific points of the questionnaire or a narrative explanation of your sighting.

The UFO was stated by an unusual movement which raised my body exceptional light in the plane seat. The bright, round light was travelling in the same direction, and what appeared to be the same ground speed. My attention was drawn to the fact that the object, if not an unusual reflection from the aircraft or other source, was not undulating with respect to the valleys, hills, and depressions as the object passed over the mountains. Its path was straight and unwavering. It gave the impression of being translucent, but not really so at the same instant. It appeared to be very close to the ground. The pilot banked the jet to approximately 15° down on the port side, appeared to make a slight change in heading to the left, at which time the object left my view, under the tail of the jet. The object was not in view when the jet returned to straight and level flight approximately 10-15 seconds later. I did not see it again. The precise location might be determined if the airline hostess makes the announcement of descent to Dulles Airport at the same time each identical flight. My sitting occured about 2 minutes after she made this announcement. The object appeared as a flat plane, with no 3rd dimension.

W M Fitzgerald Jr

1 APRIL 1952
ATIC UFO BRIEFING

RETURN TO
USAF Historical Archives
ASI(ASHAF-A)
Maxwell AFB, Ala 36112

7-3745 - 581

1003835

SECRET

UNCLASSIFIED

RETURN TO:
Director
Aerospace Studies Inst
ATTN: Archives Branch
Maxwell AFB, Alabama

UNIDENTIFIED AERIAL PHENOMENA

A BRIEFING

BY

SMC

THE AIR TECHNICAL INTELLIGENCE CENTER

Wright-Patterson Air Force Base

Dayton, Ohio

Prepared 1 April 1952

1003835

PART 1

INTRODUCTION

_____:
(Briefing Officer)

This briefing is classified "[redacted]"

_____, Gentlemen. My name is _____. I represent the Air Technical Intelligence Center, Wright-Patterson Air Force Base, Dayton, Ohio. The Air Technical Intelligence Center is a field extension of the Directorate of Intelligence, Headquarters United States Air Force.

The mission of the ATIC, in the fewest possible words, is the prevention of technological surprise in the air. As a part of that mission, the ATIC is charged with the responsibility of investigating unidentified aerial phenomena.

PART 2

HISTORY

Aerial phenomena are not new. For some three hundred years now, men have seen in the sky, at one time or another and in one place or another, almost everything imaginable. Newspaper files are filled with reports of strange objects, lights, and other phenomena seen by reliable witnesses -- but never adequately explained -- over the years.

But let us skip lightly over a few hundreds of years, and take up our more recent experiences in the field.

The present era -- if one may call it that -- of the unidentified objects began in June of 1947 when a man named Kenneth Arnold, a business man of Boise, Idaho, reported seeing from his private plane a chain of nine saucer-like objects near Mr. Ranier in the state of Washington. Mr. Arnold's report set off a sort of chain-reaction of similar reports. I think we need not dwell here on that period -- as newspaper readers, you are all probably quite familiar with it. What I would like to review briefly, is the action taken by the Air Force and the results of it.

It was realized early that a special effort would have to be made by the Air Force to deal with the situation into which we had been plunged with such abruptness. Accordingly, the Intelligence Department of the Air Materiel Command -- from which the Air Technical Intelligence Center has since evolved -- set up a special project to handle the investigation. I should like to emphasize here that this investigation was undertaken without bias and in all seriousness. It was not "slanted", that is to say. Its object was not to either prove or disprove the existence of the phenomena, but rather to learn the truth of the matter. And, of course, if the truth were learned, to determine whether any possible hazard to the United States was involved.

It is perhaps worthy of note here that a particular effort was made to enlist the services of not only military and civilian governmental agencies, but also of civilian scientists and "disinterested" authorities. The consulting authorities were as follows:

1. Dr. J. A. Hynek, an astronomer of Ohio State University.
2. The Air Weather Service.

3. Dr. G. E. Valley, of the Scientific Advisory Board.

4. The Rand Corporation, Santa Monica, California.

5. The 3160th Electronics Laboratory, Cambridge Field Station, at that time an activity of the Air Materiel Command.

6. Dr. P. M. Fitts, of the AMC Aero-Medical Laboratory.

7. The U. S. Department of Commerce Weather Bureau.

In August 1949 an official report was published that summarized the project up to that date. It represented the final conclusions of all the agencies and individuals concerned in the investigation. This report covered some two hundred fifty separate incidents that had been reported and evaluated up to that time.

The findings stated in the August 1949 report were that the phenomena did not represent a threat to the security of the United States. This was in 1949, remember, and the report was based upon evaluation of only 250 sightings.

The general conclusions of the official report were announced publicly in December 1949, in response to a growing demand from press and public for an official Air Force statement on the subject.

PART 3

PRESENT STATUS OF THE INVESTIGATION

The original special project for the investigation of unidentified aerial phenomena was discontinued, as has been stated. However, public interest in the matter did not entirely disappear, and incidents themselves didn't stop occuring, either. So the investigation has been continued, no longer on an accelerated special project basis, but as a normal and routine part of the technical intelligence function.

This is its status today.

PART 4

LINES OF INQUIRY

It may be of interest to you to know that we by no means confine our efforts to just the analysis of reports of actual sightings that reach us. Instead, we have deliberately enlarged the scope of the inquiry to include consideration of all possible sources for these sightings, regardless of whether any actual evidence points directly toward any of them. Statements have been made that these incidents might be caused by visitors from other planets, or developments of guided missiles, or unconventional aircraft of designs unknown to us from a foreign power, or more conventional aircraft with great range or unusual power sources. We agree that these possibilities are worthy of serious consideration, so we have gone into them carefully and in some detail. We want to leave no stone unturned to get at the cause of these phenomena. In that spirit, we will discuss some of the possibilities here.

Let us first take up, as a possible explanation, the interplanetary vehicle, the space-ship. The idea of space travel is one of the most challenging ever to occur to the imagination of man. I hasten

to say that we have considered it very seriously. Seriously enough to have asked for, and received, an authoritative report on the subject from scientific sources.

This report considered as one example the possibility of space travel from the planet Mars. Mars in particular was selected because, of all the known celestial bodies, it is thought the most likely to be able to support higher forms of life.

It is quite possible that a trip from Mars to the Earth and back could be made, using a rocket-powered vehicle and assuming the employment of nuclear energy for power. It is estimated that such a vehicle would have to be a four-stage rocket, would weigh at least fifteen thousand tons, and would have to attain a velocity of roughly ninety thousand miles per hour.

It is also theoretically possible to reach the Earth from other planets. And it is by no means left out of consideration that another "race" on another planet may have evolved another power source of

which we know nothing. But at this point we enter a field of speculation so limitless that we can no longer pursue it at all.

I should perhaps also mention the space-satellite, the "artificial moon" as it is sometimes called, which involves the placing of a man-made and perhaps man-occupied object in space outside the gravitational field of the earth. Many of you may have read the article on this subject in a March 1952 issue of Collier's Magazine. It's a very good article, by the way, and scientifically sound.

The idea of the satellite also exerts a powerful pull upon man's imagination.

But, so far as our investigation is concerned, we can find no reason to believe that such a thing as a man-made satellite exists <u>now</u>. It may in the future, probably will. It <u>may</u> exist now, in the sense that anything is possible. But we can find no evidence to this effect. And lacking evidence, without <u>proof</u>,

we must disregard the satellite possibility in our investigation.

To come back at least a little closer to earth, we will discuss for a moment some of the other lines of inquiry that have been followed. I will give over now to Mr. _____, of the Aircraft and Propulsion Section, Technical Analysis Division, ATIC. Mr. _____ is an aeronautical engineer. He will give you an account of developments in other fields, again in consideration of all possibilities, however remote. Mr. _____

Mr. _____:

Let me speak first about guided missiles. The early history of the operational use of this weapon is now quite well known. Its first application was during World War II by Germany, with the launching of the 1944 V-1 or "buzz-bomb" attack on London. These missiles, although strange and fearful enough in many ways, did resemble aircraft in basic configuration. Their speed was about three hundred and fifty knots, and their range not more than one hundred and forty nautical miles.

The German V-2, a "ballistic" or bullet-like missile as contrasted to the aircraft-configuration type, was a much larger weapon. Its range also, however, was short, being about one hundred sixty five nautical miles.

In the United States, work on guided missiles has been going on with ever-increasing rapidity. The near-operational state of the MATADOR is probably well known to you all. This, a winged, non-ballistic missile, is given a range of five hundred nautical miles. Others of generally similar type, such as the SNARK and the NAVAHO, are projected for development between 1954 and 1958, and will have greatly increased ranges up to five thousand five hundred miles.

Also, in the U.S. program are rocket-powered ballistic missiles of the same general type as the V-2 but with much greater range. It is estimated that with continuing development effort we will have by 1960 a multi-stage ballistic missile capable of carrying a mass destruction warhead five thousand five hundred nautical miles.

Guided missile work is also going on in other countries, of course. The Soviets are known to have shown great interest in the German V-1

and V-2. It is estimated that Russian development of the V-2 may have increased its range to about 350 nautical miles. Some increase in range may be expected in V-1 development, but no details are known.

And the Soviets are conceded to have the capability to build missiles of the MATADOR and SNARK types, although there is no positive evidence that they are doing so. There is, however, considerable reason to believe that they are working hard on large rocket engines for missile application. And it is estimated they may have ready for use by 1957, a two-stage ballistic missile with a range of twenty five hundred miles. They very likely have, today, a rocket engine of 120 metric tons.

And now, no discussion such as this would be entirely complete without at least some mention of the Sanger rocket drive. Dr.E. Sanger, a German, performed his experiments on the rocket drive, or rocket-bomber as he himself calls it, during the period of 1939 to 1941. His is a highly theoretical and as yet unrealized proposal for a rocket of extremely long range and possessing, oddly enough, both ballistic

and aircraft characteristics. It cannot really be considered a guided missile at all, in fact. It has wings, and, moreover, is designed to carry a pilot and to be recoverable, that is, landed, at the end of its mission. And yet its range is so great and its methods of operation so unusual, that many of its design features come within the ballistic missile category.

What Dr. Sanger theorized was a vehicle powered by a rocket engine of some one hundred tons thrust, to be about one hundred feet long, with a wingspan of seventy feet, a takeoff weight of approximately one hundred tons, a takeoff speed of around twelve hundred miles per hour, and capable of attaining an altitude of one hundred miles. Its maximum volocity would be about 15,000 miles per hour. Its range is so great as to carry it more than half way around the earth. To explain its operation and rather than trust my interpretation, let me put it in Dr. Sanger's own words. He says, "...the rocket-bomber ... climbs at full motor drive to a height of fifty to one hundred fifty kilometers. At the end of

the climb the rocket motor is turned off and the aircraft, because of its kinetic and potential energy, continues on its path in a sort of oscillating gliding flight with steadily decreasing amplitude of oscillation. Because of its wings the aircraft descending its ballistic curve bounces on the lower layers of the atmosphere and is again kicked upwards, like a flat stone ricocheting on a water surface ....the initially big jumps steadily become smaller and finally go over into a steady gliding flight .... the bombs are released at a predetermined moment, and the craft returns to its starting place or some other landing field in a wide arc....during gliding flight the flight speed decreases from its high initial value to normal landing speed. It .... is completely independent of weather and time of day at the target, and of enemy counteraction, because of .... using astronomical navigation in the stratosphere and because of the height and speed of flight." End of quote.

I repeat that no working model of the Sanger rocket-bomber has ever been built so far as is known. But Dr. Sanger is still living, and still at work -- presently for the government of France.

To depart now from the missile field and discuss aircraft, let us consider the unconventional aircraft configurations. A great deal of interest has been shown by many designers in low aspect-ratio all-wing configurations as a means of obtaining compact, low-drag aircraft. The elimination of fuselage and tail surfaces in such designs would decrease the total surface area exposed to the airstream and thus lower the parasite drag. And the low aspect-ratio normally associated with an all-wing design makes it feasible to design an efficient light-weight structure.

Work in all wing configurations has been carried on by various designers in the United States since the early 1930's. Of all of these designs, the most interesting is probably the Zimmerman wing aircraft which was proposed by Chance-Vought in 1939.

The aircraft was to have a span of 23.3 feet and was to employ a Zimmerman wing (see NACA report TN No. 539). The aircraft was to be powered with two P&W engines of 1350 H.P. each which were mounted at the wing tips. The take-off distances of this aircraft were very low,

being 230 feet over a 50 foot obstacle. An experimental model of the aircraft was built for the Navy and designated XF5U-1. The rate of climb obtained during flight tests did not meet expectations due to the extremely high-induced drag inherent in low aspect ratio wings. The take-off distance did check out to be very low. The project was dropped with the advent of high speed jet aircraft.

The pure delta-wing in which many U. S. companies have shown an interest also appears to have a high induced drag factor although there is some evidence that this can be alleviated somewhat by rounding the wing tips. Convair is carrying on an active project (F-92) to determine the flying characteristics of a pure delta-wing aircraft. To date, fairly successful results have been obtained and they have been awarded a development contract for a delta-wing all-weather fighter.

Names always good for a look of interest in aeronautical circles are those of the Horton Brothers and Herr Lippisch. These two design teams began in the early thirties to build and fly various all-wing gliders in Germany.

The Horton Brothers are now separated, one of them being still in Germany and the other in South America. Lippisch has been in the U. S. since 1946. The rather unusual appearance of their designs accounts for much of the interest they arouse. Before I give you a quick run-down of the Horton all-wing aircraft series, permit me to make a few remarks regarding the general history of wing shapes.

It is a matter of fact that saucer-shaped airplanes are not quite as new as is sometimes thought. Quite a number of aircraft have been constructed and flown with wings of the ring or disc type which could well have been mistaken for saucers, hat brims, doughnuts, etc. Aeronautical engineers have always toyed with such queer wing shapes. Disc wings, for instance, permit certain disadvantages of conventional wings to be overcome.

When the sail-plane movement proved that slender wings were a necessity for soaring, designers began striving for "good" aspect ratios. A good aspect ratio for gliders would be in the neighborhood

of 10 and higher. The higher the better. A representative value would be 15 to 20.

While the glider enthusiasts were always striving for higher aspect ratios (and in that category fall the "all-wing" enthusiasts), the circular airfoil designers were dabbling with aspect ratios of 1 to 4. This so-called "battle of the aspect ratios" was decided in favor of slender wings (that is, high aspect ratios) in spite of the fact that Prandtl was eager to point out that his airfoil theory did not hold water for very small aspect ratios. That, in fact, the induced drag of disc wings was less than his theory suggested.

Some early tail-less airplanes had rather stubby wings and heavily reflected airfoil sections. A 1929 design by the Frenchman, Abrial, showed an aspect ratio of 2.88 with, however, substantial wing tip discs (which have the effect of increasing the aerodynamic aspect ratio). Wind tunnel experiments of this model indicated a creditable performance.

The Lippisch delta wing designs are very similar in their basic aerodynamic aspects to those of the SF5U. Both the disc and the delta shape make for high structural rigidity and, consequently, very thin airfoil sections can be employed in these designs. Furthermore, tests have shown that wings with high sweepback plus low aspect ratio will give safer stalling characteristics. The delta wing plan form, of course, combines both the sweep angle and the low aspect ratio feature in one package.

And now here are some illustrations.

SLIDE NO. 1

This is the XF5U-1 referred to previously.

SLIDE NO. 2

This is a table summarizing characteristics of the Horton designs.

SLIDE NO. 3

This is the glider with the two-parabola plan form, referred to previously.

SLIDE NO. 4

This is the Horton H-VIII transport. It was deisgned to carry 60 passengers in the trans-atlantic run. The facilities at Gottingen limited the wing span to 158 feet although the original plans called for a larger aircraft.

SLIDE NO. 5

The Horton H-VIII had characteristics and performance as shown on this slide:

Wing span	158 ft
Wing area	2500 ft^2
Aspect ratio	10
Sweep at leading edge	28^o
Gross weight	33,000 lbs.
Wing loading	13.2 lb/ft^2
Power plant	6 BMW engines rated at 600 hp each
Power loading	9.17 lb/hp
Cargo	60 passengers
Vmax	175 knots
Rate of climb	1000 ft/min
Service ceiling	15,000 ft
Range	2500 NM

SLIDE NO. 6

We have made a projection of the Horton design which may be of interest. Development of the Horton H-XVIII. A possible development as to performance and characteristics is shown in this slide.

Assuming an aircraft with a span of 153 feet, wing area of 4000 square feet, and a gross weight of 200,000 pounds powered with 4 x 10,000 pound thrust engines, the aircraft could have a range of approximately 5000 NM.

SLIDE NO. 7

Of the German all-wing designs, the U.S. showed the greatest interest in the Lippisch delta-wing DM-1 glider.

The DM-1 was to be used to test the flying qualities of the delta-wing planform, in preparation for construction of a supersonic fighter of that planform. The DM-1 had a span of 19.7 feet, a very low aspect ratio of 1.81, and a gross weight of approximately 1000 pounds. The pilot was housed in the root of the large vertical fin. This aircraft was to have been developed into a supersonic fighter powered with a coal fuel ram-jet.

A comprehensive wind tunnel test program was run on the DM-1 by the NACA at Langley Field. The original tests were started upon the recommendations of Theodore Von Karman in answer to a request as to whether or not it would be safe to flight test the DM-1. Considerable work was done by the NACA to find the maximum lift coefficient available for landing and to determine sinking speed of the glider.

With triangular wings of aspect ratio of about 2, maximum lift coefficients of the order of 1.2 can be obtained. The corresponding angles of attack, however, will be considerably greater than those for conventional airplanes. Furthermore, since the lift-drag ratio at high angles of attack is approaching 1, the angles of descent without power are likely to be prohibitive and airplanes using this type of wing probably will not land safely without power.

SLIDE NO. 9

The Lippisch P-12 delta wing aircraft was designed as a high performance interceptor and was to be powered by a liquid fuel ram-jet.

There is a large air intake in the projecting nose and the pilot is seated above the combustion chamber forward of the large vertical fin. The undercarriage is composed of a single central wheel with a skid projecting downward from each wing tip.

SLIDE NO. 9

The only known characteristics are as follows:

Wing span	13.2 ft
Wing area	130 sq ft
Aspect ratio	1.33
Power plant	liquid fuel ram-jet (rocket for initial acceleration)

(Note: At present, no country is known to have an operational liquid fuel ram-jet: The leading powers are conducting research and development on a limited scale; no immediate estimates on performance are available.)

SLIDE NO. 10

Results of tests conducted with the DM-1 glider were to be utilized in the design and construction of the P-13 fighter.

The P-13 incorporated a delta planform with a 60° swept-back leading edge. A ram-jet power plant was proposed but no information is available regarding its development except that several coal burning types were being considered.

This slide shows another projection, of the same kind done previously with the Horton design. It is a projection of the possible of the P-13 design.

If a development of the P-13 project were actively pursued it would probably follow along the original German thinking. Such an aircraft is estimated to have the following characteristics:

Wing span	20 ft
Wing area	220 sq ft
Aspect ratio	1.8
Sweep at leading edge	60°
Gross weight	7700 lb

SLIDE NO. 11

Assuming a typical present day installation of a 6000 lb. thrust jet engine, the estimated performance would be as follows:

Rate of climb at sea level	21,000 ft/min
Vmax	Mach No. 1.0
Endurance	30 min

Range for this aircraft would not be outstanding, probably about 300 nautical miles.

Lights on now, please.

(In-flight refueling)

Speaking as we have been of long-range possibilities, we might mention that we have also given consideration to in-flight refueling and the possibility that our aerial phenomena may be due to conventional aircraft from a foreign source, using the range extension to be gained from recent refueling techniques. It is quite true, of course, that in-flight refueling has greatly

extended the range of present-day aircraft. This applies to conventional aircraft, however, and since our reports indicating aircraft point to a highly unconventional type, it is felt that in-flight refueling as a possible explanation for the phenomena offers little promise.

(Jet Engine Development)

To complete our consideration of the field of aircraft development with special emphasis upon the possibilities of increased range, let us review for a moment the aircraft gas turbine.

It is a truism to refer to jet engine development as sensational, but I wonder if that tired word "sensational" really expresses just how remarkable that development has been. In some ten years we have gone from less than nine hundred pounds thrust to more than ten thousand. Turbojets with dry static sea level ratings of about ten thousand pounds thrust are already installed in aircraft and undergoing flight test. And we have currently in bench testing engines with thrust ratings of up to eighteen thousand pounds.

American and British developments have been about parallel. Both have gone from centrifugal flow to axial flow compressors, to performance augmentation by use of afterburners and other devices, to improved operations at ever higher altitudes. The Soviets have apparently followed much the same trend. They are now developing engines of upwards of ten thousand pounds thrust, and they have at least one, the Lyulka, that is rated at eleven thousand five hundred. And we have every reason to believe that their development program is continuing at a rapid pace.

There is no indication, however, of any radically new principles in jet propulsion that would account for the reported behavior of some of the unidentified objects as to maneuverability and acceleration rates.

_____ will take over again now.
(Briefing Officer)

PART 5

_____ Thank you, Mr. Kobernuss.
(Briefing Officer)

As we have seen from what Mr. Kobernuss has told us, there is no real evidence pointing to unconventional aircraft, range extension techniques, or developments of known power sources, as a possible explanation of the unidentified aerial phenomena. We do not say that we cannot find any evidence to support them at present.

And now as to the present operation of the investigation, specifically as to methods of collection and methods of analysis. I shall now introduce _____, an aeronautical engineer who is project officer in charge of the investigation, who has been working with it for quite some time and is thoroughly familiar with all of the operational details. _____.

PART 6

COLLECTION

_____:
(Project Officer)

To tell you how we actually operate, suppose we take a hypothetical case. We'll get a telephone call, or perhaps a wire, say from an airbase in the Middle West where a pilot or some other military personnel has seen an unidentified object in the air. If it's a telephone call, we will try to get as much information as we possibly can right then, using for that purpose a check-list of questions we have developed. If it's a wire, of course we take what we get. Or perhaps we'll put in a telephone call ourselves for more information. In any event, the first thing we try to establish is who witnessed the sighting. This determines whether or not we make a field trip. Since we cannot personally contact every observer, we attempt to evaluate the preliminary information to determine whether or not a field trip will be practical.

The preliminary report will give some point from which to start the investigation. First we attempt to eliminate the factor of mis-identification of known objects. We check the time and place of all weather-balloon launching or of any research balloons. And we use the Air Almanac to check the current locations of any exceptionally bright and easily visible planets. You must understand that this work is not at all an attempt to prove that sightings are misinterpretations of known objects -- we're simply checking, to see whether we should eliminate certain of the most obvious possibilities.

If a field trip is necessary, we take off as soon as we can and conduct a personal interview with the witness or witnesses.

In this connection, a very important thing is getting to witnesses quickly, while their experience is still fresh in their minds.

We also ask the local intelligence officer to make out a standard Intelligence Form 112 on the incident and forward it through channels. This gives us a pretty complete picture, as a rule.

Leaving our hypothetical airbase sighting case now, suppose the incident was reported not by a military person or organization but by a private citizen. In this case many of the procedures are exactly the same, but of course we don't have the support and assistance of the military, which means no Form 112 and often a lot more difficulty in finding the witness and getting him to hold still for questioning. In cases of civilian witnesses, we sometimes ask the assistance of other military agencies in making a fast check on the citizen's local standing as to reliability and so forth, to try to rule out any possible practical jokers or otherwise doubtful sources of information.

PART 7

ANALYSIS

And now, what do we do with the information when we get it? Well, we make record of it, of course. We have a cross-index system of filing now in use. And we plot sightings on maps, in different ways and for different purposes, as I'll show you in a moment. And then when we have the information organized as well as possible, we begin the analysis.

It is here that we call upon the varied talents of a considerable number of other people and other activities. The problem is passed around, so to speak, within the entire ATIC organization for everybody to have a crack at it. And since the Air Technical Intelligence Center does have a considerable number of highly qualified personnel in almost any given field relating to aircraft, the problem gets a pretty good going-over right here within our own organization.

We don't stop there, however. You will recall that when the early history of the investigation was discussed, you were told of the scientific advisors employed. The same thing is being done

now, although upon a somewhat different basis. Now, instead of dealing with individuals working apart, we have an arrangement with a civilian research institution of top standing and reputation, to handle this part of the analysis for us. This institution has a group or "panel" of scientific personnel in many differing specialities -- astronomers, physicists, chemists, even psychologists-- who work in close collaboration in considering incidents that are brought to their attention. This work is done upon a consultant contract basis. It is a relatively new departure -- one of the improved methods we are putting into operation as rapidly as possible -- and while it is not in full swing as yet, we have every reason to entertain high hopes of this analysis method.

PART 8

VISUAL ILLUSTRATIONS

You may be interested in how we make us of visual methods of analysis, as a part of our effort. I'll show you now some plots we have drawn up, and keep current. The first of these is a plot of sightings for the year of 1947 through 1951.

SLIDE NO. 12

This plot indicates only the locations of sightings during the years considered. No differentiation is made as to types of objects sighted, final evaluations, or any other consideration. The sole purpose of this and other plottings of its type, is the attempt to establish some sort of pattern as to where these things are seen, find out whether they're concentrated near key defense installations or any other significant areas. You can't tell from this map, of course, what pattern obtained for the different years, but I will tell you as I go over it. The nineteen forty-seven map showed concentrations of sightings in the Northwest. This was to be

expected, of course, since it was in that year that the phenomena first leaped into the public consciousness; during July and August of that year after Mr. Arnold's incident in June, everybody in the Northwest of the U. S., it seems, saw something similar. In 1948 the sightings were moving eastward, and were quite scattered -- that year gives us less of an indication of pattern than any other. In 1949, late in the year, and in the early part of 1950, a concentration began to show up in the Southwest. Virtually all of the indications in this area that you see on the map were put there in late 1949 and early 1950. There's a reason for this, which I will come to in a moment. In 1951 no outstanding pattern is observable, the only things of note being a continuation of the eastward movement and an increase of concentrations near centers of population. Also, during 1951 the Middle-western section of the country began to produce a greater number of sightings than previously. It is of course yet too early in 1952 for any pattern to have been established.

To go back now to the remark I made a while ago about the concentrations in the Southwest, this is as good a time as any to explain something that I believe we have not touched upon before. Ordinarily we lump all unidentified aerial phenomena together, especially necessary since there are so many variations in the size and shape and color of the objects reported seen. But there is one distinction that was made early in the investigation, and that relates especially to phenomena noted in the Southwestern part of the United States. This phenomenon is the so-called "green fireball". Occasional green fireballs have been seen for many years and in several different parts of the world, but never that we know of has there been such a concentration of them as in the Southwest in recent years, especially since late 1949 and early 1950 as stated previously. And in this phenomena, unlike other reports of unidentified objects, the description of size and shape and color and behavior is almost always pretty much the same. These "green fireballs" are similar to meteors except that they

have a definite blue-green color, appear to be much larger or lower than a common meteor, and have a horizontal trajectory. Some have been seen to explode but no pieces have ever been found. At any rate, the differences between the green fireballs and the other manifestations were so distinct that it was decided to consider the fireballs in a separate category, and have the investigation of them conducted by another organization. This job was turned over to the AF Cambridge Research Laboratories, then an activity of the Air Materiel Command and now under the Air Research and Development Command. The Air Technical Intelligence Center has accordingly had no connection with this particular investigation, although we have naturally been very interested in following it as well as possible.

I am not empowered to speak for the Cambridge Lab. and have no official knowledge of the results of their green fireball project. I wouldn't want to try to steal their thunder by talking about a project that belongs exclusively to them, anyway. But I think

I'm safe in saying that I understand informally that the project has been completed, that a report will be published soon, and that it will probably in inconclusive. I may well be wrong, but I'm afraid the green fireball phenomena is going to remain, for the time being at least, a mystery.

Now to get back to our analysis methods, as another example of how we attack the problem I'd like to show you another chart.

SLIDE NO. 13

This slide shows the frequency of sightings from 1947 through 1951. You will see that there is some regularity in the peaks. The large peak in 1947 followed the first sighting, by Mr. Arnold, mentioned before.

So far, we are unable to explain an apparent seasonal increase in sightings, which you will see occurs in the spring, in the middle summer, and along about December of each year.

SLIDE NO. 14

This shows the sort of people, within certain limits, from whom these reports of sightings come. You'll note the preponderance of civilian observers, concerning whom we have attempted no separation or classification. As to military observers, however, we did think it might be useful to classify them as you see here (ad lib from chart on different classifications)

SLIDE NO. 15

This slide shows reported shapes of objects. We had hoped to narrow down a little this matter of shapes, and learn something of real significance. But, as you see from the chart, this effort has so far not been very productive. Considering viewing angles, times of day, condition of darkness, weather, all the other factors that are involved, it is extremely difficult to establish any sort of pattern as to shape.

SLIDES 16 & 17 IN TURN

(Photos. Discuss each extemporaneously)

_____ will take over again now.
(Briefing Officer)

PART 9

DISPOSITION

(Briefing Officer):

You may well ask at this point, what do you do with all this material when you've finished with it -- what happens to it, and what good does it do? To answer my own question, a "status report" is published once a month. This report covers all incidents currently under investigation. These status reports are given a fairly wide distribution, going to many activities of the Air Force as well as to the major commands. In addition to the more formal status reports, special reports are made from time to time on individual incidents when required by higher headquarters.

And it goes without saying -- or should -- that we are set up to issue a special report at any time and on short notice, if there is any indication at all of the technological development of a possible hazard to the security of the United States.

PART 10

EVALUATIONS

And now for our evaluations to date. We have considered six hundred ninety-eight incidents, since the beginning of the investigation in 1947. The breakdown or probable causes of these incidents is as follows:

a. 237 sightings - or about 34 precent - were of celestial bodies (stars, planets, etc)

b. 70 sightings - or about 10 percent - were balloons.

c. 84 sightings - or about 12 percent - can be accounted for by aircraft, birds, airborne debris, etc.

d. 35 sightings - or about 05 percent - were rockets and flares.

e. 91 sightings - or about 13 percent - were not evaluated due to insufficient data for analysis.

f. 181 sightings - or about 26 percent - could not be evaluated and remain unexplained.

This means that counting both the 13 percent on which we had insufficient data for analysis and the 26 percent which we could not attribute to any known cause, there have been 272 sightings of which we have record that we are unable to explain.

With these -- nearly forty percent of the total -- we have run up against a completely blank wall.

We don't know what is causing this unexplained forty percent. Since we don't know, we keep trying to find out.

And that about expresses the whole philosophy of the Air Technical Intelligence Center. We keep an open mind, and we keep trying to find out. So long as there remains even a possibility that there may be something here that could develop into a hazard to the security of the United States, we will continue the investigation.

PART II

FUTURE PLANS

And now, in conclusion, let us describe our plans for the future.

The present methods of conducting the investigation will be continued, with special emphasis upon use of scientific consultants. In addition, however, we will soon establish -- are already in the process of doing so -- a new procedure involving both radar-scope and direct photography.

As to the radar-scope photography, we have made an arrangement with the Air Defense Command to maintain a special alert for aerial phenomena and to take radar-scope photos of any unidentified objects that may be sighted on radar screens. This is a one-in-a-million chance, and we are well aware that the probability of results from this method is very small. But we believe it is worth trying, especially since the ADC alert can be maintained without any interference with normal operations.

And there is another photographic procedure which we will soon put into use, again with Air Defense Command assistance. In this we will employ ordinary still cameras equipped with a special diffraction grid. Any photographs thus secured will be subjected to spectrum analysis in an attempt to analyze light source.

I believe that is all. We will remain here for as long as you like for questions. Are there any questions?

Thank you.

SLIDES

1. - XF5U-1 (Pancake)

2. - Table Summarizing Horton Designs

3. - Horton 2 - Parabola Glider

4. - Horton VIII

5. - Horton VIII Performance Figures

6. - Horton Design Projection Figures

7. - Lippisch DM-1 Research Glider

8. - Lippisch P-12 Delta Wing Design

9. - Lippisch P-12 Characteristics

10. - Lippisch Design Projection

11. - Lippisch Design Projection Performance

12. - Plot of Sightings

13. - Frequency of Sightings

14. - Sources of Reports

15. - Shapes of Objects

16. - Photograph

17. - Photograph

PRESS CONFERENCE - Gen Samford 1952

[redacted]

7-3745 - 380

1003857

RETURN TO
USAF Historical Archives
ASI(ASHAF-A)
Maxwell AFB, Ala 36112

UNCLASSIFIED

[redacted]

UNCLASSIFIED

(distribution)

DEPARTMENT OF DEFENSE

MINUTES OF PRESS CONFERENCE HELD BY

MAJOR GENERAL JOHN A. SAMFORD

DIRECTOR OF INTELLIGENCE, U. S. AIR FORCE

29 July 1952 - 4:00 p. m. - Room 3E-869, The Pentagon

Participating: Major General Roger M. Ramey
Director of Operations, USAF

Colonel Donald L. Bower, Technical Analysis Division, Air Technical Intelligence Center

Captain Roy L. James, Electronics Branch, Air Technical Intelligence Center

Captain Edward J. Ruppelt, Aerial Phenomenon Branch, Air Technical Intelligence Center

Mr. Burgoyne L. Griffing, Electronics Branch, Air Technical Intelligence Center

MR. SCHOOLEY: Ladies and gentlemen, let me remind the military that, while they are welcome here, this is a press conference and let's be sure that the press is all seated before the conference begins.

Let me introduce General Samford, Air Force Director of Intelligence, and General Ramey, Director of Operations. General Samford.

MAJOR GENERAL SAMFORD: I think the plan is to have very brief opening remarks and then ask for such questions as you may want to put to us for discussion and answer. In so far as opening remarks is concerned, I just want to state our reason for concern about this.

The Air Force feels a very definite obligation to identify and analyze things that happen in the air that may have in them menace to the United States and, because of that feeling of obligation and our pursuit of that interest, since 1947, we have an activity that was known one time as Project Saucer and now, as part of another more stable and integrated organization, have undertaken to analyze between a thousand

1003857

and two thousand reports dealing with this area. And out of that mass of reports that we've received we've been able to take things which were originally unidentified and dispose of them to our satisfaction in terms of bulk where we came to the conclusion that these things were either friendly aircraft erroneously recognized or reported, hoaxes, quite a few of those, electronic and meteorological phenomenona of one sort or another, light aberrations, and many other things.

However, there have remained a percentage of this total, in the order of twenty per cent of the reports, that have come from credible observers of relatively incredible things. And because of these things not being possible for us to move along and associate with the kind of things that we've found can be associated with the bulk of these reports, we keep on being concerned about them.

However, I'd like to say that the difficulty with disposing of these reports is largely based upon the lack of any standard measurement or any ability to measure these things which have been reported briefly by some, more elaborately by others, but with no measuring devices that can convert the thing or the idea or the phenomenon into something that becomes manageable as material for any kind of analysis that we know. We take some of these things and we try to get the best professional advice, if we can, from them, about them, and we're in much the same position of trying to bring to the good honest workmen of science a piece of material that has no utility because it doesn't have the kind of measurements on it that he can use. And, as a consequence, he has to reject these things and say, "Until you can bring me something more substantial than that, I can't make any progress."

So our need, really, is to get the measurement value on these and, in the interim, lacking sufficient measure of these things to make them amenable to real analysis, we have to say that our real interest in this project is not one of intellectual curiosity but is in trying to establish and appraise the possibility of a menace to the United States. And we can say, as of now, that there has been no pattern that reveals anything remotely like purpose or remotely like consistency that we can in any way associate with any menace to the United States.

Now, we do want to continue in the interests of intellectual curiosity or the contributions to be made to scientific measurements, but our main interest is going to

have to continue in the problem of seeing whether the things have possibility of hurt to the United States, and our present dilemma of lack of measurement that can be turned to analysis and a complete lack of pattern in any of these things which gives any clue to possible purpose or possible use, leaves us in some dilemma as to what we can do about this remaining twenty per cent of unidentified phenomena.

The volume of reporting is related to many things. We know that reports of this kind go back to Biblical times. There have been flurries of them in various centuries. 1846 seems to have had a time when there was quite a flurry of reporting of this kind. Our current series of reports goes back, generally, to 1946 in which things of this kind were reported in Sweden.

There are many reasons why this volume goes up and down, but we can't help but believe that, currently, one of the reasons for volume is that man is doing a great deal more. There's more man-made activity in the air now than there was, certainly, in Biblical times or in 1846. In addition to that, our opportunities to observe have been enhanced greatly.

The difficult part of it, as far as advancing the program is concerned, is that our ability to measure doesn't seem to have advanced in any way as well as our opportunity to observe and the greater recurrence of more disturbing things of this sort that are actually in existence from man-made air participation that we know about.

So our present course of action is to continue on this problem with the best of our ability, giving to it the attention that we feel it very definitely warrants in terms of identifying adequately the growing or possible or disappearing, if it turns out to be that, menace to the United States to give it adequate attention but not frantic attention.

Now, I think with those opening remarks I could invite questions. Question, yes, sir?

THE PRESS: Have there been more than one radar sighting simultaneously -- that is, blips from several stations all concentrating on the same area?

MAJOR GENERAL SAMFORD: You mean in the past?

THE PRESS: Yes, sir.

MAJOR GENERAL SAMFORD: Yes. That is not an unusual thing to happen to this sequence at all. Phenomenon has passed from one radar to another and with a fair degree of certainty that it was the same phenomenon. To say that there have been simultaneous sightings, the same thing by different radar, I think that we could be quite sure that that has occurred simultaneously. Now, when we talk about down to the split second, I don't know, but simultaneously in time sufficient for us to argue that there've been two mechanical observations of the same thing.

THE PRESS: Enough to give you a fix so that you can be sure that it is right in a certain place?

MAJOR GENERAL SAMFORD: That is most rare.

THE PRESS: Has there been any?

MAJOR GENERAL SAMFORD: Most rare. I don't recall that we have had one that gives us that kind of an effect.

THE PRESS: Could that be due to ionized clouds?

MAJOR GENERAL SAMFORD: There are thoughts that ionized clouds do have some influence on this. We do know that the thunderstorm activity is quite nicely identifiable by radar because we use the radar for the purposes of avoiding thunderstorms and we do have some that show the storm area that's coming in towards principal stations where protection is necessary in terms of high winds and thunderstorms.

THE PRESS: How much money would you say the Air Force spends a year tracking down these flying saucer reports?

MAJOR GENERAL SAMFORD: Well, the energy that's going into it at the present time is outside of anything except the normal reporting procedures. Most of our reports come from individuals or, we might say, I think, on the order of sixty-odd per cent comes from the civilian population straight out. I think there might be something like eight per cent come from civil airlines pilots. You might find that another percentage, in the order of twenty-five, might come from military pilots. And the effort to further analyze them and profit in going after that in a big way is going to have in some way to be related to a standard measurement that makes this material for workmen to work on.

THE PRESS: General, have you talked to your Air Intelligence Officer who is over at the National Airport when they were sighting all these bandits on the CAA screen?

MAJOR GENERAL SAMFORD: Yes, sir; I have.

THE PRESS: And have you talked to the Andrews Field people who apparently saw the same thing?

MAJOR GENERAL SAMFORD: I haven't talked to them myself, but others have.

THE PRESS: Well, could you give us an account of what they did see and what explanation you might attach to it?

MAJOR GENERAL SAMFORD: Well, I could discuss possibilities. The radar screen has been picking up things for many years that, well, birds, a flock of ducks. I know there's been one instance in which a flock of ducks was picked up and was intercepted and flown through as being an unidentified phenomenon.

THE PRESS: Where was that, General?

MAJOR GENERAL SAMFORD: I don't recall where it was. I think it might have been in Japan but I don't recall the location of that. That's just a recollection of where that sort of thing could happen and I do know that at Wright Field there was one of these things on the radar -- this was in 1950, I think -- maybe Captain James would reinforce that. Was that in 1950?

CAPTAIN JAMES: That's correct.

MAJOR GENERAL SAMFORD: -- in which the local radar produced the effect of the encircling phenomenon that caused quite a lot of concern and it was gone out and intercepted and found to be a certain kind of ice formation that was in the air in various parts of the atmosphere around Wright Field on that day.

Again, there are theories like the men who have a theory of light refraction which says that temperature inversion in the atmosphere can cause an image from somewhere else to be reflected in positions where it is not. If that is a correct theory, related to it is another oddity with respect to the ground effect that you get in radar.

We have one instance in which a night fighter with radar is reported to have locked on, as they say, to an object in flight, which, after he'd followed it beyond this curve, found that he was locked on to the ground and he had only a very few minutes to recover because the ground target had gone up and then misplaced by some phenomena, and he locked on to it in a position where he wasn't, but, following it, he eventually found himself directed toward the ground.

Now, the conditions that seem to produce these temperature inversions and possibly the same kind of thing for ground targets being misplaced in altitude -- I don't know that it is worded that they're misplaced in azimuth -- is somewhat typical of the kind of hot humid weather that we've been having here in the last three or four weeks. There's no reason to relate those phenomena to those atmospheric conditions positively, but it is a possibility.

Yes, sir?

THE PRESS: Did interceptors go up on any of the three occasions?

MAJOR GENERAL SAMFORD: Here?

THE PRESS: Yes.

MAJOR GENERAL SAMFORD: Yes, sir.

THE PRESS: What did they see on their radarscopes?

MAJOR GENERAL SAMFORD: I don't recall that they saw anything. Do you remember, Roger, whether anything was sighted on their radarscopes?

MAJOR GENERAL RAMEY: There have been no radar sightings. One or two reported (inaudible) --

THE PRESS: There have been no airborne radar sightings, General Ramey? Is that --

MAJOR GENERAL RAMEY: That's correct.

THE PRESS: On what did they report sightings?

MAJOR GENERAL SAMFORD: Lights.

MAJOR GENERAL RAMEY: In one or two instances, they reported sighting lights. In one instance, they reported locking on to an object. It is pretty clear from the discussion of the pattern of two airplanes that went out that one of them was locked on to the other one.

MAJOR GENERAL SAMFORD: Yes.

THE PRESS: General --

MAJOR GENERAL SAMFORD: Yes, sir?

THE PRESS: Back to the ionized cloud. .Were the blips picked up recently comparable to the ionized cloud or were they different in maneuvering or motion?

MAJOR GENERAL SAMFORD: Well, you're talking about a thunderstorm cloud which is one that we know enough about so that we can say, "That is a thunderstorm." In the same way we can look at something else and say, "That is No. So-and-so airplane."

THE PRESS: And these recent blips were different?

MAJOR GENERAL SAMFORD: These were different.

THE PRESS: General Samford, I understand there were radar experts who saw these sightings Saturday night or early Sunday morning. What was their interpretation of what they saw on the scope?

MAJOR GENERAL SAMFORD: They said they saw good returns.

THE PRESS: Which would indicate that these were solid objects similar to aircraft?

MAJOR GENERAL SAMFORD: No, not necessarily. We get good returns from birds.

THE PRESS: Well, you wouldn't get as large a blip from a bird as --

MAJOR GENERAL SAMFORD: No; unless it was close.

THE PRESS: Did they report that these could have been birds?

MAJOR GENERAL SAMFORD: No.

THE PRESS: Can you get a good return from a reflected ground target, General?

MAJOR GENERAL SAMFORD: I'll ask Captain James --

CAPTAIN JAMES: You can get a very large return from a reflected ground target.

THE PRESS: Just as good as you might get from an object actually in flight in the air?

CAPTAIN JAMES: Actually thicker. It depends on the amount of bending.

THE PRESS: And just as sharp on the scope?

CAPTAIN JAMES: Yes.

THE PRESS: Can you get a blip from the (inaudible) created by temperature inversion?

CAPTAIN JAMES: On the ground target, yes.

THE PRESS: In other words, something that's on the ground that's reflected off a refracted cloud bank would throw off a blip on the radar screen?

CAPTAIN JAMES: Yes, sir. That's true.

THE PRESS: Would a nearby radar set get that blip at exactly the same speed?

CAPTAIN JAMES: Not necessarily; no.

THE PRESS: In other words, you can have a light and something that lacks substance and material and still have a blip?

CAPTAIN JAMES: I don't quite understand that question.

THE PRESS: You can have a radar image that's created without the necessity of radar striking the solid object or a semi-solid, such as a cloud?

CAPTAIN JAMES: Well, eventually, it does have to strike an object.

THE PRESS: But you said it can be simply a reflection of something on the ground.

CAPTAIN JAMES: Well, an object on the ground is actually something back to the reflection by a curved path.

THE PRESS: I see.

THE PRESS: In other words, it doesn't have to be in the air.

CAPTAIN JAMES: That's correct.

THE PRESS: In the area covered by the sweep on the radar?

CAPTAIN JAMES: It has to be in the area covered by the radar set. It has to be within the range.

THE PRESS: But not in the air.

CAPTAIN JAMES: But not in the air.

THE PRESS: What sort of ground targets give these reflections?

CAPTAIN JAMES: It depends on the amount of temperature inversion and the size and shape of the ground objects.

THE PRESS: Would this reflection account for simultaneous radar sightings and visual sightings which appear to coincide on the basis of conversations between the radar operator and the observer outside?

CAPTAIN JAMES: There is some possibility of that due to the same effects.

THE PRESS: Why would these temperature inversions change location so rapidly or travel?

CAPTAIN JAMES: Well, actually, it can be the appearance or disappearance of different ground targets giving the appearance of something moving when, actually, the different objects are standing still.

THE PRESS: Would these pseudo-blips cause any difficulties in combat at all?

CAPTAIN JAMES: Not to people that understand what's going on. They do cause difficulty.

THE PRESS: Then the experienced operators really can tell the difference between --

CAPTAIN JAMES: That's correct.

THE PRESS: How about the CAA men?

CAPTAIN JAMES: I don't know.

THE PRESS: Would the disappearance or reappearance of these blips be accounted for by the movement of a cloud bank that reflected a ground target?

CAPTAIN JAMES: Well, actually, it's not a cloud bank. It's a temperature inversion of the atmosphere. You see, if warm air comes in over a cool area, you have a temperature inversion and the atmosphere can be perfectly clear, and still the rays will be bent.

THE PRESS: Would that account for the fact that these images disappeared and reappeared on these screens recently?

CAPTAIN JAMES: I'm not positive about that. There's a possibility.

THE PRESS: Captain, was there temperature inversion in this area last Saturday night?

CAPTAIN JAMES: There was.

THE PRESS: And the Saturday night preceding?

CAPTAIN JAMES: I'm not sure about the one preceding, but there was last Saturday night.

THE PRESS: Was there one last night?

CAPTAIN JAMES: I don't know.

THE PRESS: Captain, did any two sets in this area get a fix on these so-called saucers around here?

CAPTAIN JAMES: The information we have isn't good enough to determine that.

THE PRESS: You don't know whether Andrews Field and Washington National Airport actually got a triangulation on anything?

CAPTAIN JAMES: You see, the records made and kept aren't accurate enough to tie that in that close.

THE PRESS: What is the possibility of these being other than phenomena?

MAJOR GENERAL SAMFORD: Well, I'd like to maybe relieve Captain James just a minute. Your question is what?

THE PRESS: What is the possibility of these sightings being other than optical or atmospheric phenomena? In other words, what is the possibility of their being guided missiles launched from some other country, for example?

MAJOR GENERAL SAMFORD: Well, if you could select out of this mass any particular one or two and start working on them and say, "What is the possibility of them being these things?" Then you come to the point and say this one is reported to have done things which require for it to do those things either one of two conditions, absolute maximum power or no mass. If this is a thing in terms of a guided missile, it does these things that have been measured and reported. It can do those things if there is theoretically no limit to the power involved and there is theoretically no mass involved. That's one of the conditions that would say, well, if someone solved one of those problems, this could then be explained as one of those things. You find another one and it has -- it just develops into no other purpose or no other pattern that could be associated with them, a missile. Those which we might identify as being missiles will be tracked. They'll have a track to develop something that people can put a measurement to. I don't know whether that answers the question. It satisfies some of it, but maybe not all of it.

Yes?

THE PRESS: Have there been any such instances so far in which you had information that indicated that either of these two conditions were fulfilled?

MAJOR GENERAL SAMFORD: Absolute, no mass?

THE PRESS: No limit to the power.

MAJOR GENERAL SAMFORD: You know, what "no mass" means is that there's nothing there! (Laughter).

THE PRESS: How about the power?

MAJOR GENERAL SAMFORD: In terms of earthly weights and earthly value.

THE PRESS: Yes.

MAJOR GENERAL SAMFORD: And unlimited power -- that means power of such fantastic higher limits that it is a theoretical unlimited -- it's not anything that we can understand. It's like my trying to understand -- I want to be careful because I was going to say a million dollars, but I can't understand a hundred! It's one of those questions of unlimited power that just gets beyond your comprehension that has to be used to meet this.

THE PRESS: General, do you have any tentative conclusion or even a trend towards a belief of what these local radar blips are? There's been talk that you did have the heat inversions those nights. Are you all inclined to believe that's what that is?

MAJOR GENERAL SAMFORD: I think that we're learning progressively more and more about the radar and that these instances very likely are maybe good observations that the radar can make of something but not likely to be observations of the things that the radar was designed to observe (laughter). Now, (laughter) -- all right. Now, let's say -- we don't know much about -- and I'll be getting far afield technically -- we don't know much about the Northern Lights. We'd like to be able to measure that a little bit better. That is the kind of thought I was trying to express by saying radar was intended to observe aircraft for control of aircraft and to deal with aircraft. Now, you may have scientific advantages for observation that it wasn't intended for.

I wonder if you'd speak to my point on that, Captain James, whether I've gotten too far afield or something I don't know anything about.

CAPTAIN JAMES: Yes, sir; that's quite true. We find that sometimes the radar set will be formed in a manner not desirable and due to the fact that it doesn't happen every day everyone isn't familiar with those characteristics and it sometimes turns out to be a mystery.

THE PRESS: Well, getting back, if I may follow it up, on these local radar observations, then you come to the tentative conclusion that they're physical phenomena? Would you say that?

MAJOR GENERAL SAMFORD: I think so, yes.

THE PRESS: How is it we haven't had them before?

THE PRESS: Well, that's what I was going to get to. What's the history of this thing? Radar operators in the past, when you inquire of them, have they seen similar lights in the past and because they never bothered to associate them with flying saucers they've never gotten in the newspapers?

MAJOR GENERAL SAMFORD: Oh, they have associated them in the past with things that were thought desirable to intercept. I said a minute ago we've intercepted flocks of ducks and similar things. There's some history of the lack of identification of friendly aircraft which causes a lot of unnecessary interceptions in some parts of the world, being mixed up with a lot of this sort of thing too in which we've had many interceptions that went out and identified a friendly that should have been established by some other method, but mixed up with those there've been many of these attempts to identify an unknown that fizzled out in the same way that the current ones have fizzled out.

THE PRESS: In other words, it is not a rare phenomenon, this thing that happened Saturday night and the Saturday before that?

MAJOR GENERAL SAMFORD: It is not a rare phenomenon.

THE PRESS: It's not rare, and it occurs often enough so that you do have a history, and radar experts have been trying to find out what causes them; is that right?

MAJOR GENERAL SAMFORD: That is correct. Yes, sir.

THE PRESS: General Samford, has the Air Force conducted any independent research through universities or through the radar people, the Gilfillen people or whoever?

MAJOR GENERAL SAMFORD: Yes, sir. We have a number of available consultants, some contracts that have been initiated, some of them that are being thought of, but, again,

I think I'd like to go back to the point of the profit in this thing perhaps being a measurement first, an adequate measurement that can go to science. Reports of the same kind that we've been getting except for this additional mechanical asset or opportunity called the radar have been going on since the Bible times. Now, the radar gives an additional opportunity to observe something about that, but it still doesn't measure it with the kind of precision that is needed to put it into analysis.

THE PRESS: Are you getting something to do that?

MAJOR GENERAL SAMFORD: We have some hope with a camera that has on the front of it a -- will you describe what that --

CAPTAIN JAMES: It has a de-fraction grid.

MAJOR GENERAL SAMFORD: Yes, a de-fraction grid on the front of it that will be useful against lights because through that de-fraction you'll be able to say, from what substance was this light made? What gases were burning? Was it gas? Was it incandescence? and so forth. Now, those cameras -- the lens is about a $15 item, or this grid is, and the camera is about a $15 item. We have on order a small quantity, two hundred plus of those. We hope to be able to distribute those into the hands of people who might have opportunity. Now, with the great diversity of people who report it's not too easy to put your finger on who has the highest opportunity to report, into whose hands such a device should go, but we think we may learn who might be the most optimum reporters. A great volume of these cameras to scatter around to try through the shotgun approach to get reports doesn't look like too valuable a project but that is one way of trying to measure what these lights are.

THE PRESS: For what purpose -- they have had similar gadgets before, I mean, to measure or to determine the origin of what generates the light. Is this a new type?

CAPTAIN JAMES: The grid is.

MAJOR GENERAL SAMFORD: It's not new except that it hasn't been aimed specifically at these items or focused on these items as far as we know.

THE PRESS: General, the Captain mentioned a moment ago or had the thought that when there is temperature inversion

the men know who are observing radar. Is it all right to ask if the Air Force thinks that these objects the other night were a result of temperature inversion?

MAJOR GENERAL SAMFORD: Well, I'll answer that first, try to, and then ask Captain James for an opinion. I don't think that we are quite sure that the Menzel theory of temperature inversion or that scientists are sure that that is a good theory. It's supported by some people. Other people who have equal competence, it would appear, discredit it. So the gamble as to whether that is the cause or not is about a fifty-fifty proposition. It's appealing. It does satisfy certain concerns. Is that a fair statement or answer to that question?

CAPTAIN JAMES: Sir, the Menzel theory applies mainly to light rays.

MAJOR GENERAL SAMFORD: Yes.

CAPTAIN JAMES: In regard to the temperature inversion effect on radar waves that is fairly well established.

THE PRESS: There's no doubt about the latter, is there?

CAPTAIN JAMES: That's right.

THE PRESS: That's been established.

THE PRESS: And it was not --

CAPTAIN JAMES: We don't have sufficient information to say definitely that that was the cause.

THE PRESS: You said an experienced radar operator could tell the difference.

CAPTAIN JAMES: I would say so.

THE PRESS: Wasn't there a naval battle during the war in which there was a great engagement fought against an inversion of radar?

CAPTAIN JAMES: I understand that happened.

THE PRESS: You had two experts over there last Saturday night, Major Fournet and Lieutenant Holcomb, who

described themselves as radar technicians and intelligence officers. What was their opinion?

MAJOR GENERAL SAMFORD: May I try to make another answer and ask for support or negation, on the quality of the radar operator. I personally don't feel that is necessarily associated with quality of radar operators because radar operators of great quality are going to be confused by the things which now appear and may appear in a radar. The ability to use the radar for the thing it was designed for is, I believe, dependent upon the thing that they see doing a normal act. If it does a normal act, then it becomes identified as the thing that they thought it was and then it pulls itself along through this mass of indication and they say, "That one has normal processes." I think that a description of a GCA landing has some bearing on that in which to get associated with the GCA you have to make a certain number of queries and do a certain number of things and then you become identified through the fact that you obey. Other things that are in there don't obey. If you obey, then you have an identity and you can then be followed with precision. So I wouldn't like to say that this is a function of inadequate radar operations. I think it's a thing that can happen to any radar operator. If he sees something in there and says, "That one is neither behaving nor any other normal pattern." What is it? Curiosity stimulus, any other kind of stimulus can result in overemphasis at any particular time on any radarscope. These recently appear to have been much more solid returns than are ordinarily classifiable by the arguments that I have just given.

Would you address yourself to what I've just said?

THE PRESS: Yes. What do the experts think? That was the question.

MAJOR GENERAL SAMFORD: The experts?

THE PRESS: The ones that saw it last Saturday night. What did they report to you?

THE PRESS: Two of them saw it in --

THE PRESS: What did they say?

MAJOR GENERAL SAMFORD: They said they made good returns.

THE PRESS: Did they draw any conclusion as to what they were, whether they were clouds?

MAJOR GENERAL SAMFORD: They made good returns and they think that they ought to be followed up.

THE PRESS: But now you come to the general belief that it was some either heat inversions or some other phenomena without substance.

MAJOR GENERAL SAMFORD: The phrase "without substance" bothers me a little.

THE PRESS: Well, could you --

MAJOR GENERAL SAMFORD: -- say what we do think?

THE PRESS: Yes.

MAJOR GENERAL SAMFORD: I think that the highest probability is that these are phenomena associated with the intellectual and scientific interests that we are on the road to learn more about but that there is nothing in them that is associated with material or vehicles or missiles that are directed against the United States.

THE PRESS: General, you said that -- can you stop that short of the United States, sir, or the menace to the United States?

MAJOR GENERAL SAMFORD: I'm sorry --

THE PRESS: Can you stop that statement short of your menace to the United States?

MAJOR GENERAL SAMFORD: Well, that was the -- I think that is the part that I believed. Now, what was it that I would have said otherwise?

THE PRESS: Well, you said were not associated with vehicles --

THE PRESS: Materials.

THE PRESS: Missiles.

THE PRESS: Period!

THE PRESS: Material, vehicles, and missiles directed against the United States.

THE PRESS: The question whether these are hostile or not makes very little difference. What we're trying to get at is are you eliminating excluding from any consideration a missile, a vehicle, or any other material object that might be flying through the air other than sound or light or some other intangible?

THE PRESS: Somebody from this planet or some other planet violating our air space. (Laughter)

MAJOR GENERAL SAMFORD: The astronomers are our best advisers, of course, in this business of visitors from elsewhere. The astronomers photograph the sky continuously perhaps with the most adequate photography in existence and the complete absence of things which would have to be in their appearance for many days and months to come from somewhere else. It doesn't cause them to have any enthusiasm whatsoever in thinking about this other side of it.

THE PRESS: Have any astronomical laboratories reported any sightings whatsoever or any astronomers?

MAJOR GENERAL SAMFORD: I don't recall. Captain Ruppelt, do you know whether we've had reports from astronomical laboratories or observatories?

CAPTAIN RUPPELT: No, sir. None have ever had any real bearing.

THE PRESS: General, does that -- the kind of involved explanation you just gave us -- does that apply to the recent Washington sightings or upon your observations over the past years since 1946 based on all your experience with it?

MAJOR GENERAL SAMFORD: Well, our reaction to the recent Washington sightings is related to the past experience in terms of -- we have dealt with radar blips before.

THE PRESS: General, if these were vehicles or materials of our own making, they wouldn't be a menace to the United States. Do you exclude that?

MAJOR GENERAL SAMFORD: I'd exclude that, definitely.

THE PRESS: General, let's make it clear now you are excluding -- if you'll affirm that -- you are excluding vehicles, missiles, and other tangible objects flying through space, including the subhuman bodies from other planets.

MAJOR GENERAL SAMFORD: In my mind, yes.

THE PRESS: Anything material -- would that be a clear statement?

MAJOR GENERAL SAMFORD: When you deal with a scientific man, maybe he might quarrel with you by what is the real meaning of "material." With my limited knowledge of material I would say yes. In my own view the thing is excluded as being a material evidence.

THE PRESS: In other words, General, if you remove the EEI from that statement, it could apply to any missile, material, or object that is in the air, regardless of whether it's a menace to the United States or not?

MAJOR GENERAL SAMFORD: Well, yes.

THE PRESS: In other words, it just isn't there.

MAJOR GENERAL SAMFORD: I believe that, that there is no -- well, now, that is a little bit in error because a minute ago I said birds do these things. Now, a bird has substance, you see. I don't want to go out and say that these things are reflections of nothing. If they're reflections from the ground up in the air, they're reflections of something. That's why the thought of saying that this thing satisfies us in having no real pattern other than that of phenomena.

THE PRESS: General, you said there'd never been a simultaneous radar fix on one of these things.

MAJOR GENERAL SAMFORD: I don't think I wanted to say that.

THE PRESS: You didn't mean to say it?

MAJOR GENERAL SAMFORD: I meant to say that, when you talk about simultaneously, somebody will say, "Was it on 1203 hours, 24½ seconds?" and I don't know.

THE PRESS: Well, I'd like to point out this fact that the officer in charge of the radar station at Andrews

Field told me that on the morning of July 20th, which was a week from last Saturday, he picked up an object three miles north of Riverdale and he was in intercom communication with CAA and they exchanged information and CAA also had a blip three miles north of Riverdale and on both radars the same blip remained for about thirty seconds and simultaneously disappeared from both sets. Now --

MAJOR GENERAL SAMFORD: Well, their definition of simultaneous, yes. But some people won't be satisfied that that is simultaneously.

THE PRESS: Well, it is pretty damned simultaneous (laughter) for all purposes, it is satisfied by the inversion theory, Captain.

MAJOR GENERAL SAMFORD: Well, I'm talking about the split-second people who want to say you've got to prove now that this happened at such-and-such a time and they'll say your observations are delayed by half a second; therefore, you can't say it was simultaneous.

THE PRESS: And does your inversion theory explain away that situation?

CAPTAIN JAMES: It possibly could, yes.

THE PRESS: It possibly could, but could it?

CAPTAIN JAMES: We don't have the details.

THE PRESS: Is there any reason why it couldn't

THE PRESS: General, can we get this clarified?

MAJOR GENERAL SAMFORD: I believe -- I'm trying to let this gentleman ask a question. Excuse me.

THE PRESS: Isn't it true, sir, that these show a definite grouping, the sightings around atomic bomb plants or areas? Doesn't your map at Wright Field show that?

MAJOR GENERAL SAMFORD: I find no more pattern in this dispersal of sightings than I do in a radar screen. You can perhaps take distribution of sightings and say that you arrange it this way and you take this group during this period and that gives you a dispersal that may have some significance in it. But I'd like to have Captain Ruppelt develop that

because he probably knows more about what has been done to try to plot these things and say, "Does that have any meaning?" I am not satisfied that any effort we've made toward a dispersal pattern has as yet developed one shred of evidence or meaning. Would you correct me or speak to that point?

CAPTAIN RUPPELT: We've plotted these things out on a map and they do come out grouped around some of the atomic installations in the country. However, there's one point, you don't know, maybe the people in that area are a little more jumpy and, if they see a meteor, they'll report it in to the guards. If some farmer out in the middle of Iowa saw a meteor, he'd just forget about it. Now, that is one possibility that we can't eliminate. A lot of the sightings that occurred around these atomic installations have turned out to be balloons, etc., but it may be that the story has gone out that those are vital areas and more people are reporting. We don't know.

THE PRESS: What percentage of your unexplainable ones that you've got are around there?

CAPTAIN RUPPELT: A few of them.

THE PRESS: Is it the same pattern?

CAPTAIN RUPPELT: I wouldn't say that every sighting around an atomic installation is unexplained. There's really no -- I don't quite follow you.

THE PRESS: His question is what percentage of the unexplainable percentage of the sightings are grouped around atomic energy --

CAPTAIN RUPPELT: We've never broken it down.

THE PRESS: Is it uniform to the general percentages?

CAPTAIN RUPPELT: It followed the general percentages. In other words, if twenty per cent of the sightings are unexplained, twenty per cent of the sightings around Los Alamos are --

THE PRESS: Unexplained.

CAPTAIN RUPPELT: -- unexplained; right.

THE PRESS: What percentage of these have come from technical men in science at these installations?

CAPTAIN RUPPELT: It varies with the type of people. In other words, at Los Alamos most of the people are fairly technical people. However, you run the guards in a place like that. Now, that may be another factor. All those installations have guards that stay out twenty-four hours a day and those people are in a better position to observe than other people.

THE PRESS: Have many of the scientists though, for instance at Los Alamos, the scientists or technical people, reported these things?

CAPTAIN RUPPELT: Yes; they have. We have reports from very high technical people.

THE PRESS: If your reports, some of them, come from these technical people, what type of information would the Air Force like to have?

CAPTAIN RUPPELT: The Air Force would like to have -- can I answer, sir?

MAJOR GENERAL SAMFORD: Go ahead.

CAPTAIN RUPPELT: The Air Force would like to have a size, speed and altitude and what-have-you on these things.

THE PRESS: Number of men inside it? (Laughter)

THE PRESS: In view of practicalities what would an ordinary citizen do if he saw one? Would you be interested in his information? What can he do to help you?

CAPTAIN RUPPELT: Actually, we are very much interested. However, there isn't much we can do with their information. It's possible that you might get a series of sightings. In other words, if you get everybody up and down the East Coast looking, you might be able to plot a ground track from it, but the information we get from the general public or from a scientist -- there's no difference. In other words, well, let's take a meteor-like object, for example. If you're out some night and see a meteor, what can you tell me about that meteor? You don't even know in which direction it was going. Actually, it looked to you maybe like it was going across the sky from east to west, but you're not sure. You're just looking at a horizontal projection of that meteor. And a scientist the same way. Just because he's a scientist doesn't mean he's got better eyes.

THE PRESS: What about a report, for example, about one week ago from an engineer who sighted six or seven who followed a definite pattern and then all turned in the same direction and went straight up at an estimated speed -- I forget what he said it was.

CAPTAIN RUPPELT: I couldn't pick that one out from the mass and size -- I'm not familiar with that one.

THE PRESS: Have you investigated these so-called saucers here in Washington?

THE PRESS: The ones we've been seeing here on radar screens.

CAPTAIN RUPPELT: We've got the data on them.

THE PRESS: Have you investigated them yourself?

CAPTAIN RUPPELT: Well, what do you mean by that, now -- gone out and personally talked to all these people?

THE PRESS: Yes.

CAPTAIN RUPPELT: No; I haven't.

THE PRESS: Has anybody from the Air Force talked to Harry Barnes, who's the Senior Controller in the CAA radar?

CAPTAIN RUPPELT: We have a report from the CAA Controller.

THE PRESS: But nobody's interviewed him?

CAPTAIN RUPPELT: I couldn't tell you that.

THE PRESS: General, you started to say you wanted certain means of measuring these things and you mentioned this camera. Were you going to name others or is that the only thing you have in mind as a possible way of identifying and measuring these phenomena?

MAJOR GENERAL SAMFORD: Mr. Griffing is here from the Electronics Section. Would you address yourself to that, Mr. Griffing?

MR. GRIFFING: I didn't hear the question.

THE PRESS: The question was we'd ask what -- the General had said the greatest need now was to get some way of measuring these reports in terms that you can turn them over to a scientist and I asked him what was he seeking in that way, what he was getting. He mentioned this camera. I connected the question with some way of measuring the gases and lights. I asked him were there other things than that that he might mention that they're now ordering or procuring for that purpose.

MR. GRIFFING: The refraction camera should tell whether it's an incandescent source or whether it's illuminous gas. Well, that would immediately tell whether it was a meteor or reflection of a headlight, a mirage theory and it might also identify what kind of gases.

THE PRESS: What other than this camera? Are there any other tools that you're seeking now?

MR. GRIFFING: There is another proposal which also uses de-fraction grating, which is a continuously operating Schmidt telescope, and that will give a continuous record over the night.

THE PRESS: What's this?

THE PRESS: That's a telescope to photograph the entire heaven in one whole picture?

MR. GRIFFING: Yes, sir.

THE PRESS: Would you repeat that? What is this Schmidt telescope?

CAPTAIN JAMES: It's a type of telescope.

THE PRESS: What type of telescope are you talking about, Mr. Griffing?

MR. GRIFFING: The Schmidt, S-c-h-m-i-d-t, telescope is an optical system that has a wide aperture. That is, you can have a wide range or aperture, in this case, about 150 degrees, or nearer the whole hemisphere can be photographed in one plate and you can have a continual record of what happens in the sky at night, meteor trails or what-have-you and make a photographic record.

THE PRESS: Where is this being used?

MR. GRIFFING: This is a new development, this particular one, but there have been ones similar to this in use in many observatories. Palomar has a Schmidt telescope.

THE PRESS: Are you ordering a number of those for placing around the country?

MR. GRIFFING: That is a possibility.

THE PRESS: Is that a movie-camera type?

MR. GRIFFING: Not exactly. The plate is exposed for ten minutes and then is replaced with another plate and then so on through the night. That is, one can expose a photographic plate for ten minutes without overexposure, in fact, a longer time, but a continual record will be made. Any motion that can be indicated with a time exposure can be found with considerable accuracy.

THE PRESS: Does the Air Force have access to any of those right now?

MR. GRIFFING: That particular thing is not in production yet.

THE PRESS: How much does it cost?

MR. GRIFFING: Shall I go into it, General?

MAJOR GENERAL SAMFORD: Well, go ahead.

MR. GRIFFING: The cost will be between three and five thousand dollars apiece.

THE PRESS: General, has there been any indication that any of these radar sightings have been made by electronic countermeasures being used by U. S. Strategic Air Command bombers practicing?

MAJOR GENERAL SAMFORD: No; they haven't. We've investigated that and come up negative.

THE PRESS: Is that Schmidt camera telescope the only one, astronomical telescope that's capable of being used on a project like this?

MAJOR GENERAL SAMFORD: Probably not.

MR. GRIFFING: It's not the only one, but it is the most practical telescopic method. Any telescope can be used but the probability of getting a flying object is very remote. Because it has such a wide aperture it makes it more useful.

THE PRESS: Well, are you planning any other measurement tools other than this camera and telescope?

MR. GRIFFING: Well, of course, the difficulty is if we have a high-powered instrument, we can't guarantee that they'll intercept flying objects so there are other simple measurements that can be made with trained personnel. There are measurements of time. One can time the appearance and disappearance with his own watch and then check his watch. Accurate measurements of time are one thing and simple measurements of angle can be made by trained people with very crude apparatus, and they can tell whether an object is one mile or fifty miles high.

THE PRESS: Haven't we already had some trained personnel, so-called trained personnel, who timed these appearances?

MR. GRIFFING: There perhaps have -- Captain Ruppelt can answer that. The point is in any of these operations there have to be two simultaneous observers to get altitude. You can't use one observation, and it may be that two simultaneous observations have not been in the reports.

THE PRESS: General --

MAJOR GENERAL SAMFORD: I think that the gentleman here has been waiting quite awhile with a question, if you don't mind.

THE PRESS: General, you mentioned that eight per cent of the reports come from airline pilots. Some of these men have as much as twenty years' flying time, twenty years' experience in flying. What's the reaction of the Air Force to creditable observers like that who give you a detailed description?

MAJOR GENERAL SAMFORD: It's very high. We react to them as saying this is an important item.

THE PRESS: Do you classify that, some of those things, as phenomena?

MAJOR GENERAL SAMFORD: Well, what else can we call it? His terms of the statement about it are not placeable in anything else as phenomena. I have one that a friend of mine who is an Air Force officer reported from the Middle East. He said, "I thought that my mental processes were adequate to avoid seeing these things, but I did see something that didn't belong there." He was no more able to put a precise measurement on it although he had competent witnesses. He's a creditable observer. We're not trying to discredit the observers. That's the reason that I said that we have many reports from creditable observers of incredible things. They also say they're incredible.

THE PRESS: Are these phenomena capable of change of direction and speed such as has been reported?

MAJOR GENERAL SAMFORD: There is nothing else known in the world that can do those things except phenomena! (Laughter)

THE PRESS: General, while we're in this mass of areas for a minute, suppose some superintelligent creature had come up with a solution to the theoretical problem of levitation, would that not be massless in our observations either by radar or by sight? No gravity.

THE PRESS: A balloon has no gravity but its rate of movement is distinctly limited.

MAJOR GENERAL SAMFORD: Well, I don't know whether I can give any answer to that, sir, that makes any sense because I'm not a metaphysician. I think, probably, just to return to saying that -- we believe most of this can be understood gradually by the human mind.

THE PRESS: So far as we know, have any of these manifestations been reported over Russia or any of the satellites?

MAJOR GENERAL SAMFORD: Well, we don't know if there have been any reported over there, no.

THE PRESS: General Samford or perhaps General Ramey, you have described fighters over the District here in the last few weeks. Is there any kind of a policy as far as the rest of the country of the Air Defense Command on such sightings?

MAJOR GENERAL SAMFORD: I would like General Ramey to speak to that, if he will, please.

MAJOR GENERAL RAMEY: There's no special policy as a result of these reports. We have a standard operating procedure that would call for an investigation of reports that can be tracked on a reasonable assurance of some sort of intercept or some direction to (inaudible). Those instructions are standard, however, and are not especially caused by this.

THE PRESS: General, is it true that there was a two-hour delay between the sighting of these objects last Saturday night and the dispatch of the jets from New Castle?

MAJOR GENERAL RAMEY: Yes; that is true because there was never a track established. As soon as a track was established to tell the airplane the direction to go in and the authenticity of the thing was established, then the pilots got off. As long as there's a sporadic report with no identification, no track established, there's no use in sending a very short-range short-field-duration interceptor in the air because he wouldn't know where to go or what to do.

THE PRESS: In other words, it was the decision of the operations officer that occasioned the delay and not any error in transmission of the alert.

MAJOR GENERAL RAMEY: That's correct; yes, sir.

THE PRESS: General, it's been rumored that the Air Force has been picking up blips of this sort for quite awhile but waited until civilian radar picked it up. Is that true?

MAJOR GENERAL SAMFORD: I think I mentioned earlier our past experience in dealing with these things in many areas where we have had, oh, hundreds of fruitless intercept efforts in response to radar blips. It's not new with us at all.

THE PRESS: But of the same caliber as recently as the past couple of weeks, I mean, the same caliber blips. I think we've all heard about this blip, but is that the thing that you sighted before in the past by the Air Force? That's what I wanted to ask.

MAJOR GENERAL SAMFORD: Well, I can only say that I feel fairly sure that they were the same or reasonably the same. No two blips on a radar are alike.

THE PRESS: Have these been better, clearer, bigger?

MAJOR GENERAL SAMFORD: I wouldn't say better or clearer. These are good returns. Other people have said, "These are good returns."

THE PRESS: General Samford, to clear that point up, I think Captain James indicated earlier in this reference to temperature inversion you now say that these are good returns. Can you get good returns on this temperature inversion reflection?

MAJOR GENERAL SAMFORD: Yes.

THE PRESS: Can you get a return that's as sharp as the ones you get off of an aircraft?

THE PRESS: That moves.

THE PRESS: Captain James said they were sharper, larger, awhile ago.

CAPTAIN JAMES: I said it depended upon the target.

THE PRESS: I'm referring to those seen Saturday night. Were those good returns? Could the good returns have been caused by this reflection against this heat (inaudible)?

MAJOR GENERAL SAMFORD: We think so. We think that that is probable.

THE PRESS: General, do you think that's probably what they were?

MAJOR GENERAL SAMFORD: My own mind is satisfied with that, but my obligation to learn more is not. My own mind is satisfied with that explanation.

THE PRESS: General, if after six years of studying these things you're now convinced that they do not constitute a threat to the safety of the country, is the Air Force thinking about turning this over to some other scientific investigating body or something?

MAJOR GENERAL SAMFORD: Well, I think that we would want to move into it with them rather than to say turn it over.

THE PRESS: Is there any thought of that, bringing in other governmental scientific bodies perhaps?

MAJOR GENERAL SAMFORD: Yes.

THE PRESS: Have you any program along that line? You spoke in the beginning that you wanted the methods of measuring things. You mentioned two or three little things like the possibility of buying some cameras and telescopes. Is there a program being set up to go about this scientifically, and what other organization are you thinking of bringing in on it?

MAJOR GENERAL SAMFORD: I believe that Colonel Bower of the Technical Analysis Division at Dayton is here. Are you here, Bower?

COLONEL BOWER: Yes, sir.

MAJOR GENERAL SAMFORD: Would you address yourself to that point, please?

COLONEL BOWER: Our idea on that is to implement our present study with instruments wherever possible, as Mr. Griffing mentioned, the refraction grid camera and other pickups that we might get.

THE PRESS: How many of these telescopes have been ordered, the Schmidt telescope?

COLONEL BOWER: The Schmidt telescopes are not on order by us. The refraction grid camera is an item which we are --

THE PRESS: Is the Schmidt telescope project an Air Force project or --

MR. GRIFFING: Yes. Yes, sir.

MAJOR GENERAL SAMFORD: I think the point that the gentleman over here wanted to have answered is can you explain from memory the kind of structure that I know that you have in ATIC for, well, I've seen it somewhere in my memory that you have this step and this step and this step.

COLONEL BOWER: We have several steps in analyses and that might explain to you one reason why we cannot give you an instantaneous answer. I mean this requires a study just like any technical problem. First of all, we need technical data. Our first step is to collect the data and check it against other identified objects such as balloons, if aircraft or missiles or such things as meteors are following that, and it comes back and we make an analysis of it within our own groups. We have specialists in our own organizations, people on electrodynamics, physics, geophysics, and various

other specialties that would fit into this. Following that, if it is necessary, we will send it to consultants or specialists in the field. Your mention of a contractor -- we are considering that with the idea, if we can't come out with an answer, of giving it to a contractor to study it. That won't be a short-time job.

THE PRESS: Are you taking a new approach in this whole thing?

COLONEL BOWER: I would say implementing the past approach.

THE PRESS: Going at it more systematically.

COLONEL BOWER: Yes, I think that's the thing to stress. In a lot of these things you can't get technical data and without technical data you can't get a technical answer very well.

MAJOR GENERAL SAMFORD: Maybe I have a thought that might help in answering that problem. When we started to say this is an obligation we must learn more about, we thought initially that we could learn something from volume of reports. We say we want all the reports we can get and then see that through that volume maybe we can make a pattern. I think we're beginning to believe now that the things which we can sense from volume are not necessarily the things which we value. In other words, volume can come from many different things. It can come from external stimulus. It can come from an unusual opportunity. It can come from such a variety of meaningless things so that the volume of reports is not going to be our answer. We have thought we'd get thousands and thousands of reports and out of these we will develop something that has pattern. We're now becoming convinced that only through <u>better</u> reports with equipment or with a trained reporter specifically attempting to report the valuable things about these items are we likely to produce material that is suitable grist for a scientific analysis. The stuff we have now hasn't enough meat on its bones to interest scientific people.

THE PRESS: Well, General, would you say a qualified observer would be the pilot from New Castle -- I believe his name was Lieutenant Patterson -- who got within what he estimated was two miles of this object last Saturday? Have you questioned him?

MAJOR GENERAL SAMFORD: He has no measurement that you can put in scientific hands.

THE PRESS: Well, other than his eye as a pilot.

MAJOR GENERAL SAMFORD: He says -- if the quality of the observer is that of seeing something, he was a qualified observer. If the quality is measuring something, he is not a qualified observer.

THE PRESS: Well, the reason I'd implied that he'd be qualified is he was probably concentrating with all of his intensity upon this object that he was pursuing. He must have been thinking about it pretty intensely; therefore, can probably give you some pretty good information. Have you questioned him about it?

MAJOR GENERAL SAMFORD: Yes. He had motive; he had direction; he had interest; he had opportunity. But he had no measuring devices to measure this thing, or these things that need to have measurement before it can become anything other than a sighting.

THE PRESS: Well, do you explain his sighting on the basis of this heat inversion theory too, now?

MAJOR GENERAL SAMFORD: Not necessarily. That very likely is one that sits apart and says insufficient measurement, insufficient association with other things, insufficient insufficient association with other probabilities for it to do any more than to join that group of sighting that we still hold in front of us as saying no.

THE PRESS: Hasn't he admitted that that might have been a ground light that he was looking at?

MAJOR GENERAL SAMFORD: I don't recall that I --

THE PRESS: Well, have you formed any conclusion as a result of interrogating this pilot?

MAJOR GENERAL SAMFORD: None other than that this is another one of the thousand or two thousand sightings.

THE PRESS: General, this fellow that almost flew into the ground, did he go around a corner as if on a bent return? What were the circumstances of that flight?

MAJOR GENERAL SAMFORD: Did I get the information of the ground lock-on from you, James?

CAPTAIN JAMES: Yes, sir; you did.

MAJOR GENERAL SAMFORD: Would you answer the question?

CAPTAIN JAMES: I'm sorry. I didn't hear it.

THE PRESS: Did he lock on a reflected image, go around the corner, and go down to the ground? Was that the pattern?

CAPTAIN JAMES: Yes; that's true. That was the pattern, and he did that three times and each time it led him to the same point on the ground.

THE PRESS: Captain, what about the man who saw four lights, Saturday night?

CAPTAIN JAMES: Well, I'll have to ask Captain Ruppelt to explain the lights.

THE PRESS: General --

MAJOR GENERAL SAMFORD: There's this difficulty. May I make this statement? I was trying to -- let's take any one of these reports and pull it out and say, "Well, what is the meaning of that one report?" None of these things in the period of our entire experience with them has had any validity on its own. The only thing that we hope for is to find enough similarity in sequence of these things so that you can begin to pull something out. There is no validity in them as individual sightings to mean any particular thing.

THE PRESS: General, did you notice in all of your, say, twenty per cent of the inexplainable reports a consistency as to color, size, or speed, estimated speed?

MAJOR GENERAL SAMFORD: None whatsoever.

THE PRESS: None whatsoever?

MAJOR GENERAL SAMFORD: No.

THE PRESS: Have you ever tracked the speed by radar of any particular object that you can explain?

MAJOR GENERAL SAMFORD: There have been many radar reports giving speed.

THE PRESS: What did they range from, sir?

MAJOR GENERAL SAMFORD: They run from zero to fantastic speeds.

THE PRESS: General, how do you explain this case, now? The CAA, as I understand the story, after picking up these objects on the radar, also got this Capital Airlines pilot named Pierman on their radar as he was going out west and, as the Senior Controller told me, he said whenever a blip, one of the unidentified blips, appeared anywhere near Pierman's plane, he would call Pierman on the radio and say, "You have traffic at two o'clock about three miles," and Pierman, in return, would look to the given range and bearing and say, "I see it. I see the light!"

THE PRESS: Happy New Year! (Laughter)

THE PRESS: Pierman described it as a light that was zooming and all such things and this was done not once but Barnes told me he instructed him on that target three times and then, Saturday night, this past Saturday night, when they all saw all these blips, Barnes vectored at least a half dozen airline pilots and planes into these things and they all reported seeing lights.

THE PRESS: Many of them didn't see them, according to Barnes.

THE PRESS: Yes. Many of them didn't see them, but then some did.

MAJOR GENERAL SAMFORD: I can't explain that.

THE PRESS: Well, how do you explain this directing? Is that autosuggestion or --

MAJOR GENERAL SAMFORD: I can't explain it at all. I think maybe --

THE PRESS: Have you investigated that phase of this thing, this vectoring the planes into that?

MAJOR GENERAL SAMFORD: You can investigate, but the technique of investigating a process of mind-reading,

for example, or the technique of investigating the process of mesmerism. You can say will you investigate those things? I think probably we know no more about mind-reading than the technique of investigating that or the technique of investigating evidences of spiritualism than we do about these fields but for many years the field of spiritualism had these same things in it in which completely competent creditable observers reported incredible things. I don't mean to say that this is that sort of thing, but it's an explanation of an inability to explain and that is with us.

THE PRESS: General, I understand that the wavelength of the radar has something to do with what it can pick up in the way of phenomena. Were these relatively low or relatively high wavelength radar?

MAJOR GENERAL SAMFORD: I couldn't say and I don't know whether Captain James can or not, but I'd like to have him have the opportunity.

CAPTAIN JAMES: These were relatively high frequency or short wavelength. However, the same effect can be observed on long wavelength equipment with differing degrees.

THE PRESS: You say very short wavelength?

CAPTAIN JAMES: In this case, yes.

THE PRESS: They were designed for different purposes?

MAJOR GENERAL SAMFORD: Yes, sir.

THE PRESS: General, why has the Air Force refused to disclose the substance of Captain Mantell's air-ground conversations before he died? Do you remember that case?

MAJOR GENERAL SAMFORD: Well, I don't know enough about it to say what was said or what some reasons were.

THE PRESS: Well, a popular book made quite a point of that, that the Air Force was holding back on that because it told the true nature of the saucer, that he had approached it, and --

MAJOR GENERAL SAMFORD: Well, I wish that that were true, that he did say something that had enough substance in it for use. I haven't the slightest idea what he said.

THE PRESS: Are you withholding any information about these so-called --

MAJOR GENERAL SAMFORD: Are we now?

THE PRESS: Yes. Is anything --

MAJOR GENERAL SAMFORD: There is one thing that we have asked that our -- some of our informers have asked -- I don't like the word "informer" either -- reporters had asked --

THE PRESS: We don't like that word either.

MAJOR GENERAL SAMFORD: I like the word. Reporter is all right. But many people are reticent about reporting these things if their names are mentioned because they are frequently looked on by others as being publicity seekers or maybe people will avoid them and go on the other side of the street for awhile (laughter), so they ask us to not say who made this report and sometimes information is received that deals with the credibility of a reporter saying he's drunk all the time or he never did do anything but lie. (Laughter). Well, those things we get are not revealed, but in so far as the statement of what they saw, when and where they saw it, the measurements that they took, such as they were, we are not withholding any of that data.

THE PRESS: How about your interpretation of what they reported?

MAJOR GENERAL SAMFORD: Well, we're trying to say as much as we can on that today and admit that the barrier of understanding on all of this is not one that we break.

THE PRESS: General, have you ever said flatly that these are not machines that the United States has made or is developing?

MAJOR GENERAL SAMFORD: What was that?

THE PRESS: Have you said this afternoon that these are not machines or weapons that the United States is developing?

MAJOR GENERAL SAMFORD: I would say that these that we have been speaking about in this locality are definitely not. However, many reports that we have received and we've been able to correlate and put in their place we have been able to do so

through association with an activity we had somewhere, a jet aircraft line, a missile, certain balloons. We could say, well, the report probably was associated with this thing which we've done, but in so far as what you are thinking about in this locality --

THE PRESS: These are not missiles or rockets?

MAJOR GENERAL SAMFORD: -- there is nothing.

THE PRESS: Well, General, could you turn that over a little bit? A lot of people keep saying that all this talk is a cover-up and that saucers are really the result of some experiments the United States, either the Air Force or Atomic Energy, is carrying on. Can you make a flat statement and say that these unexplained flying saucer manifestations are not the result of any American weapon or other experimentation or test?

MAJOR GENERAL SAMFORD: I'd say that those that we categorize as unexplained or unidentified have gone through the process of trying to associate them with something we were doing and when we fail to associate them with something we're doing, we say that is one other clue that ran to nothing. Now, to say that sightings everywhere are -- none of them could possibly be associated with what the United States is doing, isn't quite true because we know that a particular jet fighter has been flying in a certain area; somebody has reported thus and thus and thus, and we get those two things together and we say something that we were doing caused that report. As General Ramey said a minute ago, there is a fair degree of probability that two fighters locked on each other and saw and received senses. That was certainly something we were doing that caused those two reports.

THE PRESS: What I was aiming at was this popular feeling --

MAJOR GENERAL SAMFORD: Of mystery?

THE PRESS: -- of mystery, of something, that it's some very highly secret new weapon that we're working on that's causing all this.

MAJOR GENERAL SAMFORD: We have nothing that has no mass and unlimited power! (Laughter)

THE PRESS: General, somebody asked you before how much money you'd spent on this investigation since the start. How much have you spent on it?

MAJOR GENERAL SAMFORD: It's very slight. I don't know.

THE PRESS: General, in connection with withholding information, I'd like to ask General Ramey a question. That is, how many times have fighter planes been brought down over the Washington area in the last couple of weeks to investigate reports of flying objects?

MAJOR GENERAL RAMEY: That's a matter of record -- three, I believe. I think two flights one night and one flight Saturday night. I don't remember the night the other two were up. I think there have been six sorties.

THE PRESS: One flight the first Saturday night and two flights --

MAJOR GENERAL RAMEY: In this immediate area, yes. We have airplanes that investigate various reports all over the country or places where we have these fighters, but --

THE PRESS: I thought the Air Force had said that it couldn't send any fighters up because it didn't have them.

MAJOR GENERAL RAMEY: No. I don't believe it said that.

THE PRESS: The first night.

THE PRESS: How about [illegible] last night, General?

MAJOR GENERAL RAMEY: No; there were no fighters up last night.

THE PRESS: Were there fighters sent in here from New Castle on both those Saturday nights in question?

MAJOR GENERAL RAMEY: That's right; yes.

THE PRESS: Last night, was that because of lack of a track?

MAJOR GENERAL RAMEY: Lack of a track.

THE PRESS: General, are sightings from military personnel made public generally, or are they --

MAJOR GENERAL SAMFORD: There's no reason why they shouldn't be.

THE PRESS: Thank you, General. Thank you.

. . . The conference was concluded at 5:20 p. m. . .

* * *

(#377-Hedges)

X1

CONFIDENTIAL

COVER SHEET

SUSPENSE

ORIGIN OF BASIC

UNCLASSIFIED

DATE

ASSIGNED BY

DATE

TYPE

Director

RETURN TO:
Aerospace Studies Inst
ATTN: Archives Branch
Maxwell AFB, Alabama

SUBJECT: AFCIN Request for Transcript, General Samford's Press Conference July 1952 and Other Data

ROUTING

Initial "IN" column to denote review prior to action. Initial "OUT" column to denote review of completed action. (X for action; ✓ for coordination.)

IN	OFFICE	OUT	IN	OFFICE	OUT	IN	OFFICE	OUT	IN	OFFICE	OUT	IN	OFFICE	OUT
	OIN-1			OIN-2			OIN-3			OIN-4			AFOIN	
	OIN-1X			OIN-2X			OIN-3X			OIN-4X			AFOIN-X	
													AFOIN-X	
													AFOIN-X1	
													AFOIN-X2	
													AFOIN-X3	
													AFOIN-X4	
													AFOIN-X5	
													AFOIN-Z	
													CABLES	
												M & R	FILE	
													DISPATCH	

TO: AFCIN-X1

DATE: 9 OCT 1957

FROM: AFCIN-4

COMMENT NO.

COMMENTS *(Use reverse, if necessary)*

4E4/Capt G.T. Gregory/wm/6922

1. In accordance with telephone conversation between your office and Captain Gregory, AFCIN-4E4, attached are the following requested items:

a. Transcript of subject press-TV conference.

b. Copy, teletype UFO Report, and conclusions - UFO sighting, FEAF, 17 December 1956.

c. Six (6) copies, standard UFO questionnaire, Forms 164 and 164A.

d. Copy, letter regarding action taken on Hopkinsville "Little Green Men" case with sketch.

2. Reference your request that this Center consider declassifying the "Special UFO Briefing for General Lewis" given last October, to permit its release to the general public. Action has been initiated to review and revise the briefing in this regard.

3. Specific reference is made to the FEAF UFO case, par. 1c. above. This incident has just hit the press and news services (copy attached) through the efforts of NICAP.

DOWNGRADED AT 3 YEAR INTERVALS
DECLASSIFIED AFTER 12 YEARS
DOD DIR 5200.10

UNCLASSIFIED

Copy 1 of 4 copies
Page 1 of 2 pages

T57-2784

CONFIDENTIAL

AFHQ FORM 7 MAY 56 0-86 PREVIOUS EDITIONS OF THIS FORM ARE OBSOLETE

GPO 908344

RECEIVED
15 OCT 1957
ACS/INT
HQ USAF

CONFIDENTIAL
UNCLASSIFIED

AFIC O-86, Subj: AFCIN Request for Transcript, General Sanford's Press Conference, July 1952 and Other Data

In our opinion, this case was properly evaluated, considering the fact that strictly side type of detailed UFO investigations cannot be performed by some people half way around the world. What is of concern is the fact that the report of this incident, as may be noted, is classified.

4. The question arises how did Keyhoe obtain the report? If USAF personnel involved in the sightings are indiscreetly providing this organization with classified information, then the matter takes a serious turn. As an agitator, Keyhoe's "method of operation" is now well known: through the press, a demand to the Air Force for an explanation of some controversial UFO incident; the press' statement that the Air Force had "no immediate comment," as in this case; and the twisting of the Air Force's comment to NICAPs advantage.

5. It is not necessary to state that time is generally required for press queries to move through military channels for data upon which to base a reply, a fact that NICAP is undoubtedly aware.

CHESTER H. LONG
Lt Colonel, USAF
Executive

4 Incls
1. Cy, memo, 8-1-52, re briefing w/1 incl (U)
2. Cmt #2, DF, undtd, Subj: Radar & Visual UFO Reported by FEAF (C) (T56-29475-A-2) (1-3p) w/3 incls Inds 1 & 3 uncl, Incl 2, Cy incoming TT FFIRQ-A-9605, 18 Dec 56 (T56-29475-3) (1-5p) (C)
3. ATIC Fms 164 & 164A (sex)
4. Cy ltr, 29 Aug 57, Subj: Req for Info - Hopkinsville Incident (Uncl)
5. Navy Ltr, 1 Oct 57 w/6 incls

UNCLASSIFIED
CONFIDENTIAL

Copy 1 of 4 copies
Page 2 of 2 pages

T57-27184

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS UNITED STATES AIR FORCE
WASHINGTON 25, D. C.

AFOIN

1 August 1952

MEMORANDUM FOR: ALL DIRECTORS OF INTELLIGENCE, MAJOR AIR COMMANDS
ALL AIR ATTACHES
COMMANDING OFFICER, 1142D SPECIAL ACTIVITIES SQUADRON

SUBJECT: Protection Against Public Release of Sensitive Subject Matter

1. Reference is made to:

a. Directorate of Intelligence Policy Letter No. 205-1, dated 17 July 1952.

b. Directorate of Intelligence Policy Letter No. 205-2, dated 22 July 1952.

2. On 29 and 30 July personnel of various Air Force intelligence activities participated in public press conferences and radio broadcasts to answer questions relative to unidentified aerial phenomena.

3. This participation, contrary to stated AFOIN policy, was directed by competent authority, for competent reasons. It does not indicate any change in the policy stated in references a and b above.

BY COMMAND OF THE CHIEF OF STAFF:

JOHN A. SAMFORD
Major General, USAF
Director of Intelligence

COPY FOR: INTELLIGENCE DIVISION, AIR MATERIEL COMMAND

For Air Force Files
(Permanent retention)

24 JANUARY 1953
CAPTAIN RUPPELT ADC BRIEFING

[redacted]

7-3748 - 386
1003836

RETURN TO
USAF Historical Archives
ASI(ASHAF-A)
Maxwell AFB, Ala 36112

[redacted]

UNCLASSIFIED

SECRET

[redacted]

UNCLASSIFIED

[redacted]

UNCLASSIFIED

RETURN TO
USAF - Historical Archives
ASI(ASHAF-A)
Maxwell AFB, Ala 36112

SMC

PROJECT BLUE BOOK

SPECIAL BRIEFING FOR AIR DEFENSE COMMAND

MARCH 1953

DOWNGRADED AT 12 YEAR INTERVALS;
DECLASSIFIED AFTER 12 YEARS.
DOD DIR 5200.10

UNCLASSIFIED

[redacted]

1003836

[redacted]

UNCLASSIFIED

4671st G.O.C. Sq report To 30th at Willow Run.

PROJECT BLUE BOOK BRIEFING FOR AIR DEFENSE COMMAND

This briefing has been prepared specially for Air Defense Command units. Its purpose is to present all aspects of Project Blue Book so ADC personnel will have a better understanding of the goals of the project, be able to more accurately evaluate reports of unidentified flying objects, and increase the quality of those reports that are forwarded. 50% of U.A.O. forwarded to ATIC came from ADC units. 150, 1953 reports 70 from A.O.C. A copy of this briefing will be given to each ADC unit and should be given wide distribution.

As you have been told, this briefing is about Unidentified Flying Objects or "flying saucers" if you insist. We don't like the name "flying saucers" and only rarely use it because it seems to represent wierd stories, hoaxes, etc., sort of a joke.

We don't take "flying saucers" too seriously either, but we do take the problem of Unidentified Flying Objects seriously. The definition of an Unidentified Flying Object is any airborne object that by performance, aerodynamic characteristics or unusual features does not conform to any presently known type of aircraft or missile, or which cannot be identified as a known object or phenomenon.

The mission of the Air Defense Command is such that you are in a position to be recipients of the best reports of Unidentified Flying Objects. For that reason this briefing is being presented today. Three main points will be covered in this briefing.

a. The general aspects of Project Blue Book to clear up any misconceptions that anyone may have.

[redacted]

[redacted]

b. How reports can be evaluated in the units.

c. How to increase the quality of reports that are forwarded.

Security Classification

First of all I would like to tell you about the security of this project. The majority of the information is currently being carried as Restricted. This is merely to protect the names of the people who have given us reports, it is not any attempt to cover up any information that we have. The required security classification for admittance to this briefing is Secret, however. The reason for this is that in some instances we may get into a discussion of classified equipment, classified locations, or classified projects during the question and answer period that follows this briefing. When the project was first started, it was classified as Top Secret. This is probably the reason for the rumors that the Air Force has Top Secret information on this subject; it does not. The only reason for the original classification was that when the project first started the people on the project did not know what they were dealing with and, therefore, unknowingly put on this high classification.

We release all information to the press that they ask for, except the names of persons involved in the sighting, methods used to obtain information when this involves intelligence methods and anything else such as locations of radar sites, types of radar sets, performance of aircraft, etc., that may be classified.

The Air Technical Intelligence Center

Many people are not familiar with the Air Technical Intelligence Center. The Air Technical Intelligence Center was at one time part of Air Materiel Command, however, in mid 1952 the command was changed and it is now a field activity of the Directorate of Intelligence, Headquarters Air Force. Our chief, Brigadier General Garland, is directly responsible to Major General Samford, the Director of Intelligence, Headquarters USAF. The prime function of the Air

[redacted]

[redacted]

UNCLASSIFIED

Technical Intelligence Center is not to investigate "flying saucer" reports, it is charged with the prevention of technological surprise by a foreign country. This means that all enemy aircraft, guided missiles, etc., and any equipment related to these articles, is studied at the Air Technical Intelligence Center. Project Blue Book - 4 officers, 2 airmen, 2 times as compared to 500 people in ATIC, — ATIC's scientific help us. Also Contractor

ATIC "gets into the act" not in an attempt to protect the United States, that is the function of ADC. Our function is to tell you what you're protecting against. If Russia, for example, flew some totally unheard of new type of aircraft across the California coast, you would go up to intercept then ATIC would begin a study to tell you what you had intercepted, so that if you run into this aircraft again you'll know more about it. To come more to the point, let's use any Unidentified Flying Object. Say, for example, one of your radars picks up a target traveling 1500 mph, fighters are scrambled, vectored into the target, they see a light and chase it. If they don't intercept the light and identify it, it is unknown. ADC has accomplished their mission by attempting an intercept. It is now the mission of the intelligence officer to gather all the facts on the incident and forward them to ATIC to be studied. If in collecting the facts the intelligence officer identifies the reported object, fine, it is no longer an unidentified object and we are not interested. However, if he is not able to identify the reported object, a complete report shall be forwarded. It may be that the radar picked up some type of weather effect and vectored the aircraft toward it. About that time, the pilots saw an exceptionally bright star and gave chase. It has happened more than once. If we knew that every "light" that couldn't be intercepted was a star there wouldn't be any necessity for this project, but unfortunately that is not true. If the light hadn't been a star, we would very well want every scrap of information we could get and, as far as anyone knew, until the report was investigated,

[redacted]

UNCLASSIFIED

[redacted]

it was not a combination of a freak radar return and a star. ATIC's mission is not quite finished with an explanation. We'd like to know enough about the appearance of some of the more frequent objects that are reported, so if a real article even appears it can be immediately recognized. If the "whistle should ever blow" and someone sees two streaks of fire in the sky, which one is a slow-moving meteor and which one is a ram-jet powered missile? Possibly we can learn enough from your reports to be sble to definitely point out the difference.

History of the Project

To give you a brief history of this project, it started in 1947, when on 24 June 1947 a Mr. Kenneth Arnold sighted several disc-like objects near Mt. Rainier in the state of Washington. From that time until August 1949, 375 reports were collected and analyzed. In August 1949, a report was written on these 375 incidents and it was concluded that all sightings were due to:

a. Mass hysteria or war nerves.

b. Hoaxes or persons seeking publicity.

c. Psychopathlogical persons.

d. Misinterpretation of known objects.

These conclusions have been given a great deal of study and it is now concluded that the vast majority of the reports received are not due to hysteria, war nerves, hoaxes, publicity seekers, psychopathlogical persons, etc., but they are reports made by persons who have definitely seen something that they themselves could not explain at the time of the sighting and have very sincerely made their report to the Air Force. This does not mean that these reports could not have been misinterpretations of known objects, as not all of us are familiar with the many different ways known objects can appear under various conditions.

In the Summer of 1951 the project was reviewed at the request of Headquarters USAF and Project Blue Book was established. Between 1949 and 1951 the project had

[redacted]

not been dropped, but it was being carried on a low priority basis. The reason for the renewed interest in the project was that between 1949 and 1951 very little publicity had been given this subject, however, reports continued to come in. These reports were mainly from military personnel, and could be classed as good reports. I would like to stop here a minute and explain what we mean by a good report. To us, a good report is one in which several people were involved and the motives of these people in making the report cannot be questioned. They have made comparatively careful observations and have reported everything that they observed. Very few, if any, of the reports in ATIC files could be classed as an excellent report, since everyone is familiar with the frailties of human powers of observation and with the necessity for obtaining readings by instruments to get exact calculations.

After reorganization of the project in the summer of 1951, reports continued to come in at the rate of about ten a month. In the spring of 1952 there was an increase in the number of reports and they hit a peak of 70 per day in July 1952. At the present time they have dropped off to about five a week. There is no doubt that the emphasis placed on this subject by the press caused this big up-sweep in reports.

Current Situation

It can be stated now that as far as the current situation is concerned, there are no indications that the reported objects are a direct threat to the United States nor is there any proof that the reported objects are any foreign body over the United States or, as far as we know, the rest of the world. This always brings up the question of space travel. We have gone into this with many people and it is the opinion of most scientists or people that should know that it is not impossible for some other planet to be inhabited and for this planet to send beings down to the earth. However, there is no, and I want to

[redacted]

emphasize and repeat the word "No", evidence of this in any report the Air Force has received. I would like to go back over that once more for the sake of the record. We have no evidence in any of our reports that the earth is being visited by any people or beings from outer space.

We have arrived at the conclusion that these reported objects are no direct threat to the United States for several different reasons. One, we have never picked up any "hardware". By that we mean any pieces, parts, whole articles, or anything that would indicate an unknown material or object. We have received many pieces of material to be analyzed but in every case there was no doubt as to what this material was.

Photographs

We have photographs of some unusual things, but in all of those that show any amount of detail, there is a varying amount of doubt as to their authenticity. Still photographs are very easy to fake, without retouching the negative. Our files contain many photos that were submitted in good faith. Some have turned out to be flaws in the negative, light flares or photos of some relatively rare known natural phenomena. We have some that cannot be readily explained since they are merely "blobs" of light and could be various things. None of the photos on file that cannot be explained show any detail in the object Tremonton or are cause for any undue speculation.

Statistical Study

We have made a statistical study of the data that we have collected in order to attempt to determine whether or not there is any common pattern in the sightings but we have had no success in finding any such pattern. The statistical study made by ATIC was made on cross-index cards with 16 items, such as a reported shape, a reported direction, color, etc., being cross-indexed in an attempt to find a pattern, but we found none. In order to make a more detailed

[redacted]

[redacted]

UNCLASSIFIED

study, and since it is very difficult to handle ~~2,000~~ 3,000 reports on cross-index cards, an IBM study is now being made. In this study approximately 80 items will be placed on the IBM cards. These items will be cross-correlated and any patterns should be apparent. This has not yet been completed. The results we will obtain will possibly help us in the future planning for the project.

A Few Statistics

Two points that are of interest but are not in themselves greatly significant are plots of the distribution of our unknown sightings and a plot of the frequency of reports. A definition of the term "unknown" will be given later.

#1 (Slide of Location of Unknowns)

You will notice that the unknown reports do tend to cluster around critical areas in the United States. One explanation might be that the people in these areas are aware of the fact that they are in a critical area and are more aware of unusual things.

#2 (Slide on Frequency of Reports)

A plot of the frequency of reports shows a series of peaks in July of each year. We cannot account for this. Some people have offered the explanation that there is better weather in July, more clear skies. We have checked this and there seems to be no correlation; other months also have clear skies. The fact that July nights are warmer and more people are outdoors has also been advanced, this doesn't appear to have any bearing on the problem either.

You might be interested in a breakdown of our reports for 1952. In breaking down these reports, we use several degrees of certainty under each category. We'll take balloons, for example. We will classify them as a known balloon, a probable balloon, or a possible balloon. A known balloon means that we were definitely able to correlate the facts of the sighting with the data on a balloon track and there is no doubt that the object was a balloon. Probably a balloon

[redacted]

UNCLASSIFIED

[redacted]

means that we were not able to correlate all the data, but there is no doubt in our minds but what the reported object was a balloon. A possible balloon is where we check the report with balloon data and cannot find a correlation yet we still believe the object was a balloon. This factor accounts for "lost" balloons, that is, balloons that may have developed slow leaks and floated great distances. In all our categories of balloons, aircraft, and astronomical bodies, we use these three breakdowns.

(Slide showing Breakdown of Conclusions)

In analyzing 1021 reports, for 1952 and those are reports that have been received through military channels and do not include several hundred reports from civilians direct to ATIC, the following is the breakdown of conclusions as of 22 Dec 52:

Balloons		18.51%
	Known 1.57	
	Probable 4.99	
	Possible 11.95	
Aircraft		11.76%
	Known 0.98	
	Probable 7.74	
	Possible 3.04	
Astronomical Bodies		14.20%
	Known 2.79	
	Probable 4.01	
	Possible 7.40	
Other (Ducks over drive-in movies, searchlights on clouds, etc.)		4.21%
Hoaxes	low with →	1.66%
Radar (Explanation not proven)		6.84%
Insufficient Data to Evaluate		22.72%
Unknown		20.1 %

[redacted]

[redacted]

UNCLASSIFIED

This leaves a balance of 20.1% of the reports which are classified as unknown. At this point, a definition of the term "unknown" is in order. Usually there is more than one source or observer. Again, this does not mean that just because a person is alone, sees something he cannot explain to himself and reports it, his account of what he saw is laughed off. Normally one person just cannot supply the necessary data. For this reason, we dwell more on reports where the data can be substantiated by others. To go a step further, in a report we classify as unknown there can be no doubt as to the reliability of the persons making the observation. If the report contains a relatively good amount of data, it is then checked against the location of known objects, phenomena, etc. If none of these explain the sighting, it is classed as unknown. It might well be that if we had more data on the sighting, it could easily be explained.

(Slide of Locations of Unknowns)

As you will note on this slide we have plotted all of our reports we classify as "unknown". They tend to concentrate around Albuquerque, Washington, D. C., San Francisco, and San Antonio, with Albuquerque presenting the greatest area of concentration. It may be that the people there are more aware of the vital nature of their industry and are more alert to report things they see in the air.

Why Continue The Project?

The question now arises, "If most of these reports can be explained, why continue the project?" I might state now that the project will be continued and the subject will continue to be treated seriously. There are several reasons why the project will be continued.

a. There are reports we cannot explain. We believe we can explain all but about 20%, but if you noted the breakdown of conclusions, we only can positively identify about 7%. With the world situation what it is and with the present advances in science, it behooves the Air Force to have a system whereby

[redacted]

UNCLASSIFIED

[redacted]

they can receive reports of, evaluate, and determine the identity of objects reportedly flying over the United States.

b. There is no assurance that at some future date some foreign power could not develop some object that by present day standards is unconventional in appearance or performance. Due to the fact that the term "flying saucer" has become almost a household word for anything that cannot be identified as a conventional object, it might be reported as a flying saucer. The Japanese paper balloons of World War II are an example of this.

c. The third reason is related to the first. The Air Force is responsible for the aerial protection of the United States. It is our responsibility to assure ourselves and the public that these continuing reports, and we believe they will continue, are not a threat.

~~Operations of the Project~~ AFL 200-5

To give you a little better idea of the project, I would like to tell you how we operate. Air Force Letter 200-5 is the basis for our operation. It states that the Air Technical Intelligence Center is responsible for analyzing all reports of unidentified flying objects and that each Air Force unit is responsible for forwarding reports that they receive to the Air Technical Intelligence Center. It further states that all reports will be forwarded by wire then followed up within three days by a written AF Form 112. ~~If AF Form 112's are not available, the report can be made in letter form.~~ Hereafter only TWX and ATIC will ask for 112 if it seems right important enough. This reporting requirement in AFL 200-5 does not mean that the officer receiving the report from the source or the observer does not have the prerogative to make his own evaluation and determine whether or not the observation is worth forwarding. He may do this in two ways. He may be able to identify the object, if he does, it is no longer an unidentified flying object, and therefore, does not have to be forwarded. Secondly, he may evaluate the report according to source and content and determine that it

WADF = 100 reports per month not true.

[redacted]

pidgeon - voted because they are just "flying saucer" reports - not good!

would be of no value as far as analysis is concerned. To break this last point down further, the officer receiving the report may believe the source is of doubtful character or it may be obvious that the source did not make careful observations. In general, a report from only one inexperienced observer is not too helpful. This is not because we doubt the observer's word as to what he saw; it is because most people have difficulty estimating time, angles, relative size, etc. If several people make an observation their estimates can be arranged and the results are a little more accurate. It is a good idea, however, to at least note the name and address or telephone number of such sources since it might be that their observation would tie in with others and it would be necessary to contact them again.

Very probably some of you have forwarded reports of unidentified flying objects to ATIC and have wondered what happened to them. Project Blue Book is set up to receive and analyze all such reports. The T.O. calls for 4 officers, 2 airmen and 2 civilians. Like any other organization, the actual strength fluctuates. In addition to these full-time personnel, the Center has many specialists, mostly engineers in many fields, and these people are called upon to aid in analysis as they are needed. To supply people with specialties not available at ATIC, ATIC has a contract with a large research organization which employs people in many fields. These include physicists, nuclear physicists, metallurgists, psychologists, an astronomer, and almost any other field you can name. These people can be called upon if they are needed. The astronomer is frequently consulted.

In going over the operation of Project Blue Book, I will tell you how we check reports. You can use these same processes to make your own evaluations and as was stated before, if you are convinced that the object was a conventional

[redacted]

object, don't forward it as an unidentified flying object. To be very frank about this subject, ATIC receives many reports that are obviously known objects. This only clogs up channels of communication and at times has approached being serious. It is obvious that the intelligence officer did not make any effort to determine whether or not there were any balloons in the area, etc. We realize that in some cases a wire was sent immediately upon receiving the report like "shoot and then ask questions". This is the only way to proceed if the report looks like that". However, in many other cases there was plenty of time between the time of the sighting and the time the wire report was sent to pick up a phone and check with the tower, CAA radio, the weather station, radar, etc.

Evaluating the Source

As in all intelligence matters, the source is extremely important. We know psychology is a strong element in this project. Although we maintain that almost everyone who reports actually has seen something, at times they unconsciously let their imagination twist the facts. It is very difficult, if not impossible, to set down any rule to use in evaluating a source. Sometimes you can talk to a person and learn that they are very imaginative. We go a lot on the person's background, age and sex. An airline pilot may see a vapor trail but to a housewife it is a flying saucer, possibly enhanced by the fact that she just read "Amazing Stories". This does not mean all housewives are poor sources, but category for category, commercial airline pilots are more reliable than housewives simply because they have seen a larger variety of things in the air and are naturally more prone to be conservative in reporting.

Balloons

When we receive a report, the first thing that we check it for is the possibility of its being a balloon, aircraft or astronomical body because these three objects give us the most trouble. To go into each of them a little more specifically, we will start with balloons.

[redacted]

[redacted]

UNCLASSIFIED

There are two different general categories of balloons. One is the research type balloon. These balloons vary in shape and size and are released from various points in the United States depending upon what projects are being conducted and are not launched at any scheduled time. They may be small like weather balloons, they may be clusters of these weather balloons, or they may be large polyethylene balloons that are 100' in diameter. With the present emphasis on cosmic ray study many different types of balloons are being launched in the United States.

#7 Balloon Tracks

The other category is the regularly launched weather balloons. These are launched from known locations in the United States at definite times.

Project Blue Book gets data on the large research type balloons either through Hq ADC or, if necessary, direct from the launching agency. Due to the nature of this problem, ATIC is familiar with most of the agencies in the country who are launching research balloons and can go directly to these people to get information on their balloon tracks. Since the launch sites are changed frequently, this requires constant liaison.

It is possible that now or in the near future your division or Force will get data on all launches of research type balloons. It is definitely worth a try to contact the division or Force. If they do not have the tracks, they may know of a launch program. Normally these large balloons travel great distances and it may be difficult to get data without going to Hq ADC.

On the regularly scheduled weather balloon launches, Blue Book has data on all launch sites and knows the approximate time of launch each day. We have 400 mb, the authority to directly to these stations to obtain data on their balloons or, if the time element is not critical, to go through Air Weather Service to get it from their central files. Fortunately, many of these balloons are tracked, either by radar or by radio DF and it is possible to get the exact tracks of the balloons.

[redacted]

UNCLASSIFIED

[redacted]

These balloons are scheduled to be launched at 0300Z, 0900Z, 1500Z and 2100Z each day, but can be launched plus or minus 30 minutes of this time. from 400 different airbases (A.W.S.) FAA stations, Naval Air stations. Nearly every airbase and civilian airport servicing a scheduled airline releases some type of weather balloon, either the small piball that is tracked visually or the instrument carrying type that is tracked by radio or radar. Although these balloons can develop a slow leak and float for long distances, they normally will not get more than 30 miles from their release point. To be safe use a distance of 50 miles.

If you get a report of an object you believe to be a balloon, check with your weather officer. at A.W.S. He will know what stations in your area launch balloons and from the general wind conditions at the time of the sighting tell you where the balloon probably came from. You can then get the plot of balloon tracks and definitely establish whether the object was a balloon. If there are several launch locations in your area, you may have to check them all. Many times a call to the unit launching the balloon will suffice as they can tell you the location of their balloon at a given time.

~~(Slide of Weather Balloon Launch Sites)~~

Balloons do not give us any trouble when they look like balloons, it is when they don't look like balloons that they give us trouble and they can take on many odd appearances. In the daytime a balloon will appear to be a very bright star in the sky. What is happening is that the sun's rays are diffusing into the balloon and causing it to glow. Under ideal conditions, a balloon can be seen as high as 90,000', but under more adverse conditions a balloon possibly cannot be seen over 4,000' to 6,000'. It depends a great deal on the haze. During the daytime a balloon at very high altitude will appear to be stationary or traveling very slowly. At night balloons that are lighted will appear to be a radically moving light. This light may even appear to change color, due to

[redacted]

atmospheric conditions. The balloon will change direction with wind and will appear to be on a jerky, zig-zaggy course. Since most people observing these balloons do not have any reference point in the sky, the balloons appear to be moving very much faster than they really are. At dawn or dusk a balloon can appear to be a fiery red, circular shaped object in the sky. The reason for this is that the balloon is picking up the slanted rays of the sun, exactly the same as a cloud will pick up the sun's rays in a sunset. It may be that if the balloon is high enough, it can be dark on the ground but it will be sunset at altitude.

Some balloons carry radar reflectors or metallic loads capable of giving a radar return. The clue to this is that they will be traveling with and at the same speed as the wind at their altitude.

Aircraft

Aircraft, as aircraft, do not give us a great deal of trouble, it is when they are high and reflecting sunlight or leaving a vapor trail that they are most often misrecognized. Similar to the situation with balloons, a vapor trail will appear to glow at dawn or dusk. Many times the aircraft leaving the vapor trail cannot even be seen, however, the vapor will appear to be a bright fiery red streak of flame in the sky. Formations of aircraft reflecting the sunlight can very often appear as a formation of disc-shaped objects. At times the reflection will suddenly diminish causing the objects to look like they were either moving rapidly out of sight or just disappearing.

ATIC does not have a satisfactory system for checking aircraft. This is because Flight Service and CAA does not keep a permanent record of aircraft flights very long after the aircraft has landed. Therefore, it is up to the officer receiving the report from the observer to thoroughly check aircraft movements immediately. He may check these through the control tower, through Flight

[redacted]

Service, through CAA radio stations, radar, or many various ways, but he should check thoroughly to see whether or not there were any aircraft flights in the area of the sighting. ADC units have a distinct advantage here, because if the report is received soon enough, radar can be checked.

Astronomical Bodies

As far as astronomical bodies are concerned, ATIC has a professional astronomer under contract to review sightings that they believe to be caused by astronomical bodies. By astronomical bodies we mean bright stars, planets, or meteors. The most valuable information in the analysis of an unidentified flying object that is suspected of being an astronomical body is the bearing, the azimuth, and the time. From this we can check back through almanacs and determine the locations of certain bright stars. Stars that give us trouble are Venus, Jupiter, Capella and several others. You can check stars by obtaining the approximate time, azimuth and elevation of the reported object and grabbing the nearest navigator.

Meteors are not too difficult to evaluate because they seem to have a standard description. If someone reports an object similar to a rocket going across the sky at high speed and leaving a trail behind it, chances are it is a meteor. However, in certain instances we have had very unusual meteors reported. We have found that there are certain classes of meteors that astronomers call fireballs. These are so rare that there is a good chance that you may see only one in your life, if any. This has probably accounted for many reports by pilots who state that they met a huge ball of fire coming directly at their aircraft and at times have even racked up the aircraft to get out of its path. Many times these are reported as missiles. We have had pilots who have complained to the Air Force about shooting rockets, or experimental missiles, through the airways and endangering their aircraft. This is a rather foolish statement,

[redacted]

however, when you get to thinking about it. One, if a missile appeared anywhere outside the proving grounds chances are it would be enemy. However, if you have studied missiles you will note that the burning time, or the time before fuel cut-off, is only a relatively short period during the missile's flight. If we would say, hypothetically, a rocket was shot from some foreign country into the United States, chances are very good that the fuel shut-off point would have come long before the rocket ever reached the United States and it would not be emitting a flame.

You can check meteors by looking for accounts of them in the newspaper, or consulting local astronomers.

Other Causes of Reports

Naturally balloons, aircraft and astronomical bodies do not account for all the sightings. We have a smaller percentage of other things, such as ducks flying over drive-in theaters at night, searchlights on clouds, blimps, pieces of paper caught in an updraft, and many other things that cause reports. These are very difficult to check and to check them we normally go back to old sightings. For example, sometime back, approximately a year ago, the city of Fargo, North Dakota, was somewhat disturbed by glowing objects that flew over the city on various nights. Finally, some of the more enterprising souls in the city took enough interest in the subject to attempt to determine what they were. All it was were flocks of ducks or geese reflecting the city's lights. We will take a case like this and mentally file it. When we come across a similar report, we'll go back and compare the two reports. If they are similar enough, we will write the new report off as being the same thing. This is about the only method we have of checking such things.

Radar Sightings

Since ADC has the vast majority of the radar that is operating 24 hours

[redacted]

per day, we receive many reports from them. ADC Regulation 200-5 covers such reporting. This regulation states what information is to be forwarded. ATIC uses a very similar questionnaire. It was designed after the one in ADC Regulation 200-5, but contains a few more items.

We receive quite a few radar sightings and are well aware of the fact that weather and interference between two radars can cause wierd effects. Our problem is to determine methods of more positively establishing the cause of certain effects and even being able to predict when these effects may be more noticeable. Naturally, you people are also very much interested in this.

We understand that ADC has already published their latest material on how to check for interference and weather, so I will not go into this.

When reporting a radar sighting, the weather data are extremely important. Plots of the temperature and moisture vs. altitude should always be reported.

There are no reports of radar sightings in our file whose authenticity cannot be questioned to some degree. In none of the cases of erratic or high speed (above Mach 1) that we have on file can it be shown that the track was actually that of a material object. One rare exception to this is when radars have happened to track meteors. More of our unknown high speed tracks might be meteors but unless we get reports of a meteor track to correlate with the radar track, it is difficult to separate out these reports. Lightning is another possibility but a very vague one.

Radar Scope Photos

A large number of Air Defense Command radar stations are equipped with radar scope cameras. ADC Regulation 200-5 authorizes the use of these cameras for photographing abnormal returns. These scope cameras should be ready to operate at all times since scope photos are an absolute necessity for the accurate evaluation of reports involving radar. In addition, they give valuable

[redacted]

data for the study of weather and interference effects. ~~In this connection, Visibility~~ Cameras, etc.

Simultaneous Radar Visual Sightings

Reports of simultaneous visual reports that supposedly correlate with unusual, high speed or erratic radar tracks, with the rare exceptions of meteors and lightning, are a different story. No presently known phenomena or condition will give this situation. If it can be shown that the object sighted visually and the radar track are the same, the report warrants a detailed investigation. ~~So far, this has not happened in any of our unknown cases.~~ We have good reports of simultaneous visual-radar sightings of U.A.O.'s but again there are always factors that shed varying degrees of doubt as to whether or not the observations involved the same object.

The first factor in establishing a correlation is to check the flight path or location of the visually observed object with that shown on radar. If this correlates closely the next step is to establish that the time was the same, sometimes a difficult task. Other checks can also be made but these two are basic.

Other Simultaneous Sightings - triangulation

Any report of an object seen from two separated locations is relatively important. These include two locations on the ground, from the ground and air, etc. Of these, the best way to gather very accurate data is to utilize two theodolites or a theodolite combined with a plain visual sighting. The use of a theodolite is considered an instrumental observation. For those who are not familiar with the term, a theodolite is a device for accurately measuring the azimuth and elevation angles during weather balloon flights. Nearly every air base and large civilian airport has one. It can be put into use by merely calling the weather station and requesting that they try to observe the reported object. The data needed are the time, elevation, and azimuth at one minute

[redacted]

intervals for as long as the object is in view or for at least 20 minutes if it appears to be hovering. If an adjacent air base can be contacted and requested to do the same, preferably at the same time, you've hit the jackpot as far as good data are concerned.

No ~~(Show Triangulation Slide).~~

Cross Check With The GOC

Another ready source of possible information that may shed some light on a report of an unidentified flying object is the Ground Observer Corps. The GOC can be used in two ways, they may make reports and they can cross-check reports.

If one GOC post calls in a report as they are directed to do in ADCR 55-31 a nearby post can be contacted by the filter center to see whether they can see the reported. If they can, there is a beautiful set up for triangulation. The observers can estimate the elevation and azimuth. Posts equipped with angle measuring devices could make very accurate readings.

If a report should come in from a source other than the GOC, they could be contacted and possibly identify the reported object. It might be that they have seen and positively identified a balloon, meteor, or aircraft, while a pilot flying in the area observed the object from a different angle and could not make an identification.

Summary on Report Evaluations

It would be impossible to give you all the checks that can be made on reports since each report requires a different approach. I've given you a few ideas and you can undoubtedly think of more. One thing we do ask is that when you make a check on a report you obtain enough data to substantiate your conclusion. Just because someone reported four objects near a city and there were four aircraft in formation near the same city, don't quickly assume they were

[redacted]

[redacted]

UNCLASSIFIED

one and the same. Get some information on the location of the reported object, the time and course, then check this against the flight of the aircraft. If it correlates to a reasonable degree, they were very probably the same thing.

~~(Slide Showing Possible Checks)~~

Reporting Solutions

If, during an investigation of a sighting, after a TWX has been sent reporting the incident, the investigating officer should identify the reported object, ATIC should be immediately notified as to the solution.

Popular Theories

Many theories have been advnaced that all of the reports are due to mirages, sun dogs, ice clouds and what-have-you. Some of our reports are caused by such things. We have received excellent photos of sun dogs and descriptions of mirages. These are definitely in the minority, however, and cause only a small percentage of the sightings.

Another popular solution is that all "flying saucers" are "skyhook" balloons. To check this a study of about ~~25~~ 55 cross-country balloon tracks were made. To remove any doubt, the tracks were taken of flights made during July and August 1952 when reports were coming in at the rate of 50 per day. These balloons were seen and reported as "flying saucers" at only 8 points.

No ~~(Slide Showing Typical Balloon Tracks)~~

Questionnaires

We are continually being asked, "What information do you want in a report?" ~~This is a rough question because each report is unique in that questions will come up that have never been encountered before.~~ There are, ~~however,~~ certain items that pertain to every sighting. These are briefly listed in AFL 200-5, but are not given in any great detail. and what is A.D.C.'s procedure in submitting a report?

Up till now Two types of reports are required by AFL 200-5, a report by wire and a written report on an AF Form 112. The wire report should just contain enough data Hereafter only the wire a complete case based on 200-5 [redacted] to ATIC on T.W.X.

Will ask for addit 112's if sight. looks good

WEAOP — 100 reports from each site. not being turned in, not being evaluated.

UNCLASSIFIED

[redacted]

to give a description of the sighting and the source. This includes the date, time, location, description of the object, its apparent course, and the source's name and occupation. Any other details that will help clarify the sighting should be reported.

To aid the intelligence officer in collecting data for the written report, Blue Book has compiled lists of questions that pertain to nearly every sighting. These questions have been arranged in the form of a questionnaire. Two questionnaires, one for radar and one for visual sightings, have been completed and are now in use. Two others, one for sightings made from the air and one for general background data, are in the process of being developed. These questionnaires are designed to require a minimum amount of work on the part of the intelligence officer and will insure that all available data are included in the report.

The Ground Observers Data Sheet (presently called USAF Technical Information Sheet) is to be filled out by the observer. It can be handcarried or mailed. The "Electronics Data Sheet" is to be filled out by the intelligence officer at the AC&W Squadron with the assistance of a technician, if he is not a technician. The "Aerial Observer's Data Sheet", that will be published soon, is to be filled out by the pilot of the aircraft from which the observation was made. The forthcoming "Supporting Data Sheet" will be filled out by the intelligence officer making the report.

These questionnaires have been made up after a great deal of study. Approximately a year ago, ATIC arranged to have a group of scientists and professional people to design a questionnaire. These people studied all questionnaires that had been previously used in this project, they studied our file of sightings, and arrived at a tentative version of our present questionnaire. This tentative questionnaire was used for a period of approximately three months, the results

[redacted]

[redacted]

UNCLASSIFIED

analyzed, revisions made, and a final questionnaire was made up.

AFL 200-5 specifies that the written report be submitted on an AF Form 112 and that certain data be included. The questionnaires cover all the required data. To comply with the requirement for submitting a Form 112 the questionnaires may be attached as inclosures using Part A of the Form 112 as a cover sheet or letter of transmittal. Doing this saves a great deal of typing on the 112.

Extra copies of these questionnaires should be available soon. It has been tentatively agreed that they will be distributed through ADC channels.

To further aid in reporting, a manual "How to Make Flying Object Reports" will soon be distributed.

We hope that by using the questionnaire and guidance material that is furnished to intelligence officers, the quality of the reports will improve. Some reports are satisfactory but very few contain enough data to make a good analysis. Many highly qualified scientists have reviewed our files of reports in the past two years and they always comment on the fact that additional data were available and should have been reported.

Be Sure to Include Angles

One item that is habitually left out of reports is the position of the object in the sky. If a person is familiar with the location of stars, such as a navigator or an astronomer, he can locate the path of the object relative to these bodies. An easier way, however, is to use angles. The elevation and azimuth at the point of initial sighting and at the point of disappearance can be given. A short word description can describe the flight path between the two points.

A pilot observing a light in the sky while he is airborne can establish its position by pointing the nose of the a/c toward it, reading his compass,

[redacted]

UNCLASSIFIED

[redacted]

and estimating the elevation while flying straight and level. When reporting any angle, it should be stated whether it is true or magnetic.

Videon Cameras

You may have heard about a camera that has been modified for use on this project. At the present time, we have 100 of these cameras. They are a commercial model stereo camera with one lens fitted with a diffraction grating. The grating serves as a prism to separate the light source into its various components. Any light source that is made up of an element or combination of elements has a distinctive spectrum. This spectrum is similar to a finger print. A file of the spectra of known objects, stars, meteors, etc., is being assembled and this file spectra can be compared to the spectra obtained from photos from the cameras. These cameras will be placed in control towers and a few selected radar stations throughout the United States. We are having some difficulty with the gratings on these cameras, however, and consequently have not put them out in the field. The grating is a rather touchy piece of equipment and we are having trouble getting it to stand up under certain conditions.

We realize that this is not a fool-proof measure. These cameras are not a piece of highly developed scientific equipment, but we do hope that we may be able to obtain some information.

~~(Slides of Videon Camera)~~

~~(Slide on How the Videon Operates)~~

Other Instrumentation - Videon Cameras, Questionnaires, Elect. Data sheet

The possibilities of more extensive instrumentation has been discussed in detail. Many suggestions for more complete cameras, special aircraft instrumentation, and other detection devices have been studied. It is possible that a study contract for such instrumentation may be let, but no actual program will be started now. The cost of such a program would out-weigh the results.

[redacted]

[redacted]

UNCLASSIFIED

Sample Incidents

You might be interested in some of the reports we get. I'll give you a brief description of two or three.

On the night of 13 May 1952 about 10 P.M. four amateur astronomers were making observations through a small telescope on a college campus. All of a sudden they noticed four oval shaped objects in a diamond-shape formation. The objects appeared nearly overhead and disappeared at an angle of 12° above the horizon in about 3 seconds. The objects or lights were reddish brown in color and about the size of a half dollar, quarter turned, at arm's length.

Our evaluation of this was unknown. It could possibly have been ducks or geese reflecting light, except the observers pointed out that they had purposely set up their telescope in an area that was completely dark so that there would be no ground lights to hinder their observations.

Another interesting sighting occurred at Patrick AFB in July 1952. Seven people, all AF personnel, observed five different lights near the base during a period of 15 seconds. The first one was hovering in the west, three traveled very swiftly over the base on a west to east heading, and the fifth light came over the base from the west, made a turn, and went back to the west. All of the lights appeared to be much brighter than a star and amber-red in color and there was no sound. No aircraft were in the area.

A balloon had been launched prior to the sighting and could account for the hovering light. It is possible that the three fast-moving lights were meteors, although to see three meteors all traveling the same direction only seconds apart is doubtful. The fifth light that was observed is the one that makes the sighting interesting, no meteor comes in, makes a 180° turn, and departs.

On 14 July 1952 at 2012 EST two Pan American pilots flying on a heading of 60° near Norfolk, Virginia, observed eight objects over Chesapeake Bay near

[redacted]

UNCLASSIFIED

[redacted]

Old Point Comfort, Virginia. The DC-4 aircraft was at 8,000'. When the aircraft was about 20 to 25 miles out on the NE leg of the Norfolk beam, six objects in trail were observed below and coming toward the DC-4. When they reach a point under and slightly below the aircraft, they appeared to roll on edge and without any radius of turn, shoot off on a heading of about 270° rolling back into a flat position. Immediately after the change in direction the formation was joined by two other objects.

When first seen the objects were glowing on the top side with an intense amber-red light, many times more brilliant than the lights of the city below, they resembled a glowing red hot coal. They appeared circular. As they approached the DC-4 they appeared to decelerate just before they changed direction. During their approach they held a good formation but just before the turn, they appeared to tend to overrun the leader. With the deceleration the glow seemed to dim. Immediately after turning and flattening out, the glow disappeared entirely. They reappeared at once, glowing brilliantly again. As the began to climb, the lights went out one by one.

They were in view long enough for the pilot to get out of the left seat after he first observed the objects, cross the cockpit, pick them up just as they completed their turn and watch them disappear. It was estimated that this was between 10 and 20 seconds.

The only "clue" as to a possible identification of the objects is a part of the initial report that stated that there were five jet aircraft in the vicinity of Langley AFB, Va., at the time of the sighting. (Note: The incident took place about 10 miles NE of Langley AFB.) Efforts to obtain more data on these jets were unsuccessful.

Since aircraft were in the area it is possible that they were observed. The in-trail formation could have been a "rat race" although doing this in jet,

[redacted]

[redacted]

UNCLASSIFIED

at night, below 8,000', is difficult to believe. The almost instantaneous turn could have been some type of an illusion. The diminishing light could have been the jets pulling off power before the turn. This again is a doubtful point since there is no data available on the appearance of the tailpipe of a jet head-on from above.

Since there were jet aircraft in the area, it is possible that the two Pan American pilots saw these jets. Therefore, we have written this off as "possibly aircraft".

Conclusion

In concluding this briefing, it can again be stated that in none of the reports so far received are there any indications that the reported objects are a direct threat to the United States, nor is there any proof that any of the reports received have been reports of any radically new unknown material object. We admit we cannot explain every report, but we believe we know enough about the unknowns to say they are not anything to invoke undue speculation.

The project will be continued. Even if a system for the fool-proof explanation of every sighting is developed, it will continue because ~~you never know what may happen in the future.~~ it is intelligence's job to be on the alert for unidentified flying objects and to guard against mysteries. By assuring the public we've the psychological problem and Russia's conducting an attack with it, we'll something. ~~a "wolf, wolf" situation.~~ Some people take an exceedingly "dim view" of such reports and use no logic in trying to explain them. We do not want to clutter communications channels with worthless reports. If you can logically explain a report, fine, there is no need to waste your time and effort forwarding it. All we ask is that you do use logic in writing off a report as a "flying saucer" report. U.F.O. reports. But, if you believe you have a report that merits the attention of Hq USAF, it should be a complete report. ~~Top to ATIC, who will ask for further info or AIC if deems~~ The only way we will continue to learn more about necessary reports of unidentified flying objects is to receive and analyze accurate detailed reports.

[redacted]

UNCLASSIFIED

ROUTING

JOINT MESSAGEFORM

COMMUNICATIONS CENTER NO.

SECRET
AUTH: CG, ATIC
BY: R.J. RUPPELT
Capt, USAF
DATE: 23 Dec 52

UNCLASSIFIED

SPACE ABOVE FOR COMMUNICATIONS CENTER ONLY

FROM: (Originator)

CG ATIC

TO: CG AIR DEFENSE COMMAND ENT AFB COLO

INFO:

DATE-TIME GROUP 231400Z DEC 52	SECURITY CLASSIFICATION [redacted]
PRECEDENCE FOR: ACTION ROUTINE	INFORMATION
☐ BOOK MESSAGE	☒ ORIGINAL MESSAGE
☐ MULTIPLE ADDRESS	CRYPTOPRECAUTION ☐ YES ☐ NO
REFERS TO MESSAGE:	
IDENTIFICATION	CLASSIFICATION

DOWNGRADED AT [illegible] INTERVALS;
DECLASSIFIED [illegible] YEARS.
DOD DIR [illegible]

FROM: AFOIN-ATIAA FOR DCS/I

ATIA-5 File

Reference telephone call from Maj Sadowski to Capt Ruppelt on 22 Dec 52. Proposed tour to brief your forces and divisions has been postponed and is tentatively scheduled to start in late January or early February . Postponement was necessary due to time being taken up by meetings with and preparing data for CIA. CIA has made survey of some of the sightings in the ATIC file and has arranged for a panel of several top U.S. scientists to review them. Although plans are not completely firm, this meeting is tentatively scheduled to take place in early January. CIA's interest is from standpoint of reports similar to present reports of unidentified flying objects being used as psychological warfare and to aid confusion in possible attack. They believe a system for rapidly sorting out false reports or reports of known objects and phenomena should be established. Referenced briefing tour is being given high priority and you will be notified as soon as it can be started and of the planned itinerary.

T52-20434

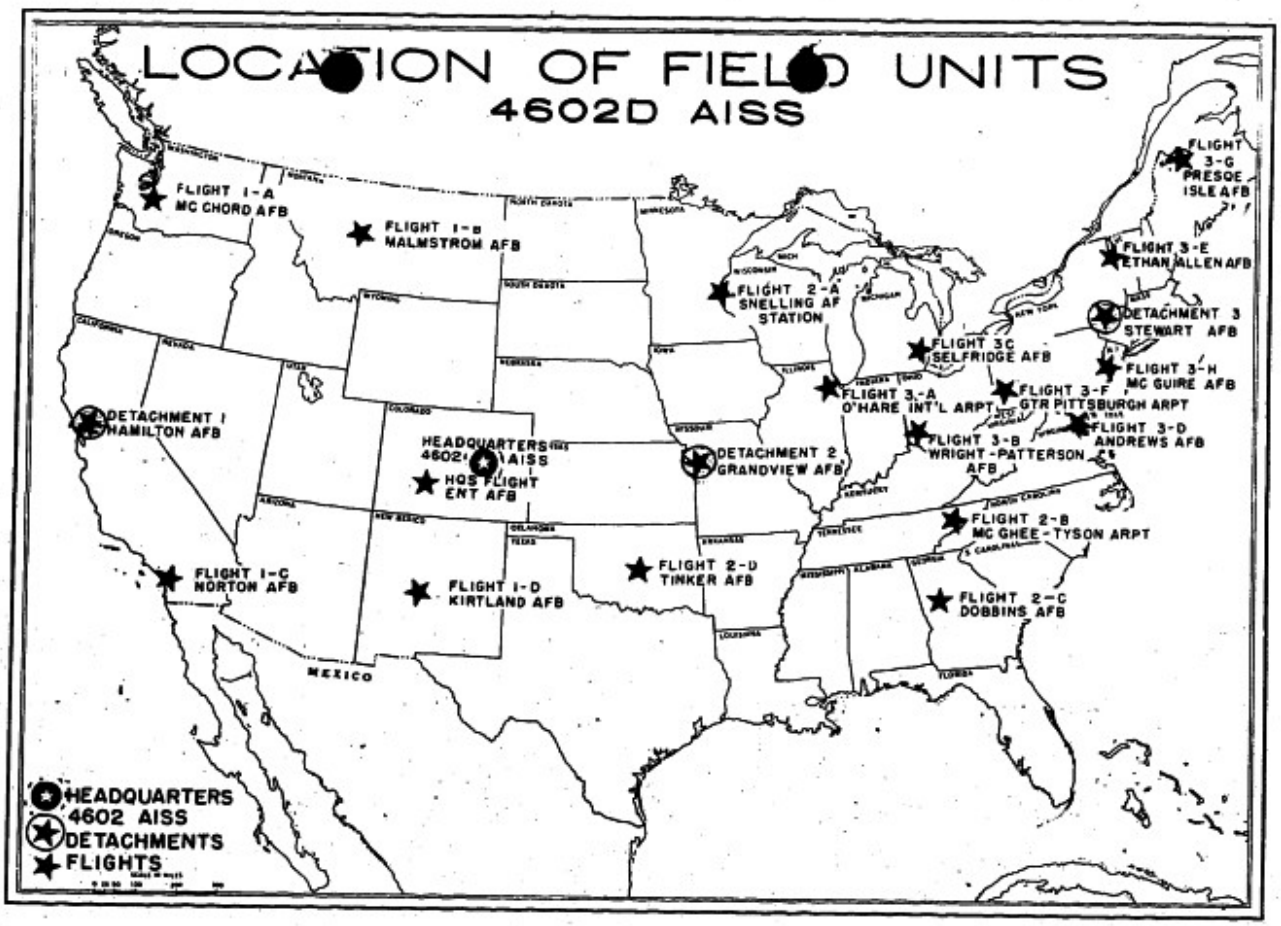
UNCLASSIFIED

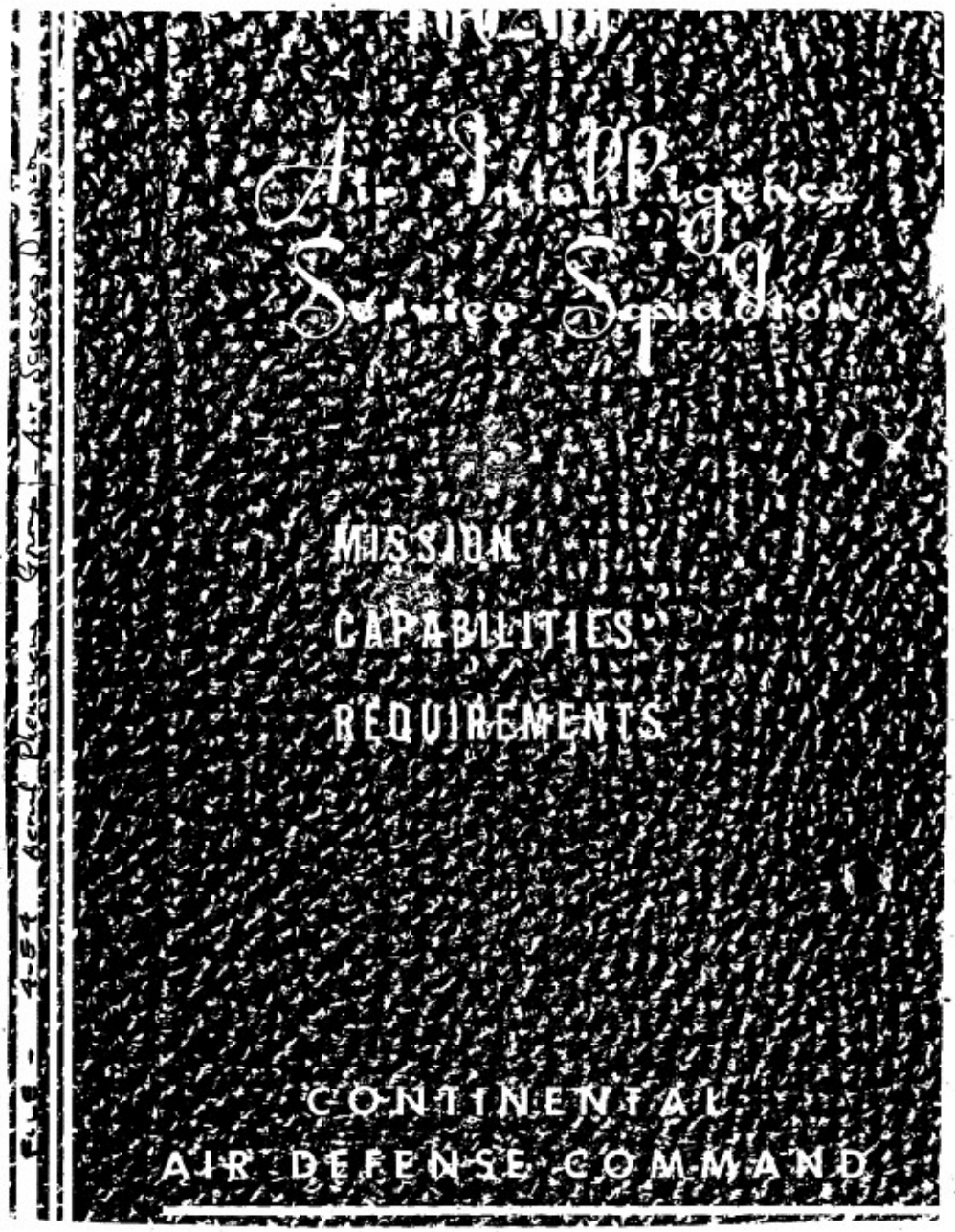
SECURITY CLASSIFICATION [redacted] PAGE 1 OF 1 PAGES

DRAFTER'S NAME (and signature, when required) CAPT R.J. RUPPELT	RELEASING OFFICER'S SIGNATURE
SYMBOL ATIAA-5 / TELEPHONE 65365	OFFICIAL TITLE ROBERT E. KENNEDY, MAJOR, USAF AIR ADJUTANT GENERAL

DD FORM 173 REPLACES WD AGO FORM 11-188, 15 JUN 1945, AND WD AGO FORM 0990, [redacted] BE USED.

16—69229-2 ☆ U. S. GOVERNMENT PRINTING OFFICE : 1953—O-875946


LOCATION OF FIELD UNITS
4602D AISS
FLIGHT 1-A
MC CHORD AFB
FLIGHT 1-B
MALMSTROM AFB
FLIGHT 2-A
SNELLING AF
STATION
FLIGHT 3-G
PRESQE
ISLE AFB
FLIGHT 3-E
ETHAN ALLEN AFB
DETACHMENT 3
STEWART AFB
FLIGHT 3C
SELFRIDGE AFB
FLIGHT 3-H
MC GUIRE AFB
FLIGHT 3-A
O'HARE INT'L ARPT
FLIGHT 3-F
GTR PITTSBURGH ARPT
FLIGHT 3-D
ANDREWS AFB
FLIGHT 3-B
WRIGHT-PATTERSON
AFB
DETACHMENT 1
HAMILTON AFB
HEADQUARTERS
4602d AISS
HQS FLIGHT
ENT AFB
DETACHMENT 2
GRANDVIEW AFB
FLIGHT 2-B
MC GHEE-TYSON ARPT
FLIGHT 1-C
NORTON AFB
FLIGHT 1-D
KIRTLAND AFB
FLIGHT 2-D
TINKER AFB
FLIGHT 2-C
DOBBINS AFB
MEXICO
HEADQUARTERS
4602 AISS
DETACHMENTS
FLIGHTS


Air Intelligence
Service Squadron
MISSION
CAPABILITIES
REQUIREMENTS
CONTINENTAL
AIR DEFENSE COMMAND

9 FEBRUARY 1953
STANDARD BLUE BOOK BRIEFING

7-3745-385

1003827

RETURN TO
USAF Historical Archives
ASI(ASHAF-A)
Maxwell AFB, Ala 36112

SMIC

RETURN TO:
Director
Aerospace Studies Inst
ATTN: Archives Branch
Maxwell AFB, Alabama

SECRET

Standard Project Blue Book Briefing

This is the standard briefing that is given on Project Blue Book, the project for the investigation of reports of Unidentified Flying Objects. The briefing touches on all aspects of the project including a brief history, current situation, analysis, and reporting. In instances where certain of these aspects are of no interest to the audience it is modified to eliminate these unwanted portions.

9 February 1953

100[illegible]

Standard Project Blue Book Briefing

Security Classification

First of all I would like to tell you about the security of this project. The majority of the information is currently being carried as ~~Restricted~~ UNCLASSIFIED. This is merely to protect the names of the people who have given us reports, it is not any attempt to cover up any information that we have. The required security classification for admittance to this briefing is Secret, however. The reason for this is that in some instances we may get into a discussion of classified equipment, classified location, or classified projects during the question and answer period that follows this briefing. When the project was first started, it was classified as Top Secret. This is probably the reason for the rumors that the Air Force has Top Secret information on this subject; it does not. The only reason for the original classification was that when the project first started the people on the project did not know what they were dealing with and, therefore, unknowingly put on this high classification.

We release all information to the press that they ask for, except the names of persons involved in the sighting, methods used to obtain information when this involves intelligence methods and ~~anything else~~ OTHER THINGS such as locations of radar sets, types of radar sets, performance of aircraft, etc., that may be classified.

The Air Technical Intelligence Center

Many people are not familiar with the Air Technical Intelligence Center. The Air Technical Intelligence Center was at one time part of Air Materiel Command, however, in mid 1952 the command was changed and it is now a field activity of the Directorate of Intelligence, Headquarters Air Force. Our chief, Brigadier General Garland, is directly responsible to Major General Samford, the Director of Intelligence, Headquarters USAF. The prime function of the Air Technical Intelligence

Center is not to investigate "flying saucer" reports, it is charged with the prevention of technological surprise by a foreign country. This means that all enemy aircraft, guided missiles, etc., and any equipment related to these articles, is studied at the Air Technical Intelligence Center.

Definitions

We normally do not like to use the term "flying saucer" in conjunction with this project although it does seem to be an internationally recognized term. The official term for these reported objects is Unidentified Flying Objects. They are defined as being anything that by performance, aerodynamic characteristics or unusual features does not conform to any presently known type of aircraft or missile, or which cannot be identified as a known object.

History of the Project

To give you a brief history of this project, it started in 1947, when on 24 June 1947 a Mr. Kenneth Arnold sighted several disc-like objects near Mt. Rainier in the State of Washington. From that time until August 1949, 375 reports were collected and analyzed. In August 1949, a report was written on these 375 incidents and it was concluded that all sightings were due to:

a. Mass hysteria or war nerves.

b. Hoaxes or persons seeking publicity.

c. Psychopathlogical persons.

d. Misinterpretation of known objects.

These conclusions have been given a great deal of study and it is now concluded that the vast majority of the reports received are not due to hysteria, war nerves, hoaxes, publicity seekers, psychopathlogical persons, etc., but they are reports made by persons who have definitely seen something that they themselves could not explain at the time of the sighting and have very sincerely made their

report to the Air Force. This does not mean that these reports could not have been misinterpretations of known objects, as not all of us are familiar with the many different ways known objects can appear under various conditions.

In the summer of 1951 the project was reviewed at the request of Headquarters USAF and Project Blue Book was established. Between 1949 and 1951 the project had not been dropped, but it was being carried on a low priority basis. The reason for the renewed interest in the project was that between 1949 and 1951 very little publicity had been given this subject, however, reports continued to come in. (These reports were mainly from military personnel, and could be classed as good reports. I would like to stop here a minute and explain what we mean by a good report. To us, a good report is one in which several people were involved and the motives of these people in making the report cannot be questioned. They have made comparatively careful observations and have reported everything that they observed. Very few, if any, of the reports in ATIC files could be classed as an excellent report, since everyone is familiar with the frailties of human powers of observation and with the necessity for obtaining readings by instruments to get exact calculations.)

After reorganization of the project in the summer of 1951, reports continued to come in at the rate of about ten a month. In the spring of 1952 there was an increase in the number of reports and they hit a peak of 70 per day in July 1952. At the present time they have dropped off to about five a week. There is no doubt that the emphasis placed on this subject by the press caused this big up-sweep in reports.

Current Situation

It can be stated now that as far as the current situation is concerned, there are no indications that the reported objects are a direct threat to the United States nor is there any proof that the reported objects are any foreign body over the United

States or, as far as we know, the rest of the world. This always brings up the question of space travel. We have gone into this with many people and it is the opinion of most scientists or people that should know that it is not impossible for some other planet to be inhabited and for this planet to send beings down to the earth. However, there is no, and I want to emphasize and repeat the word "No", evidence of this in any report the Air Force has received. I would like to go back over that once more for the sake of the record. We have no evidence in any of our reports that the earth is being visited by any people or beings from outer space.

We have arrived at the conclusion that these reported objects are no direct threat to the United States for several different reasons. One, we have never picked up any "hardware". By that we mean any pieces, parts, whole articles, or anything that would indicate an unknown material or object. We have received many pieces of material to be analyzed but in every case there was no doubt as to what this material was.

Photographs

We have photographs of some unusual things, but in all of those that show any amount of detail, there is a varying amount of doubt as to their authenticity. Still photographs are very easy to fake, without retouching the negative. Our files contain many photos that were submitted in good faith. Some have turned out to be flaws in the negative, light flares or photos of some relatively rare known natural phenomena. We have some that cannot be readily explained since they are merely "blobs" of light and could be various things. None of the photos on file that cannot be explained show any detail in the object or are cause for any undue speculation.

Statistical Study

We have made a statistical study of the data that we have collected in order

to attempt to determine whether or not there is any common pattern in the sightings but we have had no success in finding any such pattern. The statistical study made by ATIC was made on cross-index cards with 16 items, such as a reported shape, a reported direction, color, etc., being cross-indexed in an attempt to find a pattern, but we found none. In order to make a more detailed study, and since it is very difficult to handle 2,000 reports on cross-index cards, an IBM study is now being made. In this study approximately 80 items will be placed on the IBM cards. These items will be cross-correlated and any patterns should be apparent. This has not yet been completed. The results we will obtain will possibly help us in the future planning for the project.

Why Continue the Project

Two points that are of interest but are not in themselves greatly significant are plots of the distribution of our unknown sightings and a plot of the frequency of reports. A definition of the term "unknown" will be given later.

(Slide of Location of Unknowns)

You will notice that the unknown reports do tend to cluster around critical areas in the United States. One explanation might be that the people in these areas are aware of the fact that they are in a critical area and are more aware of unusual things.

(Slide on Frequency of Reports)

A plot of the frequency of reports shows a series of peaks in July of each year. We cannot account for this. Some people have offered the explanation that there is better weather in July, more clear skies. We have checked this and there seems to be no correlation.

The question arises then, why does the Air Force continue this project? I might state now that the Air Force is continuing this project, is taking a great

deal of interest in it, and treating the subject seriously. There are several reasons why it is being continued. One, there are reports that we cannot explain. With the world situation what it is and the present advances in science, it behooves the Air Force to have a system whereby they can receive reports of, evaluate, and determine the identity of everything that is flying over the United States.

Two, there is no assurance that at some future date some foreign country may not develop some object that by present day standards is unconventional. It may be unconventional in appearance or performance. Due to the fact that the term "flying saucer" has become almost a household word, it is possible that these objects, if they should be developed, come across the United States and be seen, would be reported as a "flying saucer". The Japanese balloons of WW II are an example of this. We realize that Air Defense Command has the prime responsibility for the detection and interception of any foreign intruders, but it would be the function of ATIC to determine the nature and characteristics of such intruders.

The third reason is related to the first in that the Air Force is responsible for the aerial protection of the United States and it is our responsibility to assure ourselves and the public that these reported incidents, and we feel that they will continue to be reported, are not a threat.

Operations of the Project

To give you a little better idea of the project, I would like to tell you how we operate. Air Force Letter 200-5 is the basis for our operation. It states that the Air Technical Intelligence Center is responsible for analyzing all reports of Unidentified Flying Objects, and that each Air Force unit is responsible for forwarding reports that they receive to the Air Technical Intelligence Center. It further states that all reports will be forwarded by wire then followed up within three days by a written AF Form 112. If AF Form 112's are not available, the

report can be made in letter form. This reporting requirement in AFL 200-5 does not mean that the officer receiving the report from the source or the observer does not have the prerogative to make his own evaluation and determine whether or not the observation is worth forwarding. He may do this in two ways. He may be able to identify the object, if he does, it is no longer an unidentified flying object, and, therefore, does not have to be forwarded. Secondly, he may evaluate the report according to source and content and determine that it would be of no value as far as analysis is concerned. To break this last point down further, the officer receiving the report may believe the source is of doubtful character or it may be obvious that the source did not make careful observations. In general, a report from only one unexperienced observer is not too helpful. This is not because we doubt the observer's word as to what he saw; it is because most people have difficulty estimating time, angles, relative size, etc. If several people make an observation their estimates can be arranged and the results are a little more accurate. It is a good idea, however, to at least note the name and address or telephone number of such sources since it might be that their observation would tie in with others and it would be necessary to contact them again.

Project Operations

When we receive a report, the first thing that we check it for is the possibility of its being a balloon, aircraft or astronomical body because these three objects give us the most trouble. To go into each of them a little more specifically, we will start with balloons.

Balloons: There are two different general categories of balloons. One is the research type balloon. These balloons vary in shape and size and are released from various points in the United States depending upon what projects are being conducted and are not launched at any scheduled time. They may be small like weather balloons,

they may be clusters of these weather balloons, or they may be large polyethylene balloons that are 100 ft. in diameter. With the present emphasis on cosmic ray study many different types of balloons are being launched in the United States.

The other category is the regularly launched weather balloons. These are launched from known locations in the United States at definite times.

Project Blue Book gets data on the large research type balloons either through ADC or, if necessary, direct from the launching agency. Due to the nature of this problem, ATIC is familiar with most of the agencies in the country who are launching research balloons and can go directly to these people to get information on their balloon tracks.

On the regularly scheduled weather balloon launches, Blue Book has data on all launch sites and knows the approximate time of launch each day. We have the authority to go directly to these stations to obtain data on their balloons or, if the time element is not critical, to go through Air Weather Service to get it from their central files. Fortunately, many of these balloons are tracked, either by radar or by radio DF and it is possible to get the extact tracks of the balloons.

(Slide of Weather Balloon Launch Sites)

Balloons do not give us any trouble when they look like balloons, it is when they don't look like balloons that they give us trouble and they can take on many odd appearances. In the daytime a balloon will appear to be a very bright star in the sky. What is happening is that the sun's rays are diffusing into the balloon and causing it to glow. Under ideal conditions a balloon can be seen as high as 90,000 ft, but under more adverse conditions a balloon possibly cannot be seen over 4,000 to 6,000 ft. It depends a great deal on the haze. During the daytime a balloon at very high altitude will appear to be stationary or traveling very slowly. At night balloons that are lighted will appear to be a radically moving light. This light may even appear to change color, due to the atmospheric conditions.

The balloon will change direction with wind and will appear to be on a jerky, zig-zaggy course. Since most people observing these balloons do not have any reference point in the sky, the balloons appear to be moving very much faster than they really are. At dawn or dusk a balloon can appear to be a fiery red, circular shaped object in the sky. The reason for this is that the balloon is picking up the slanted rays of the sun, exactly the same as a cloud will pick up the sun's rays in a sunset. It may be that if the balloon is high enough, it can be dark on the ground but it will be sunset at altitude.

Some balloons carry radar reflectors or metallic loads capable of giving a radar return. The clue to this is that they will be traveling with and at the same speed as the wind at their altitude.

Aircraft

Aircraft, as aircraft, do not give us a great deal of trouble, it is when they are high and reflecting sunlight or leaving a vapor trail that they are most often misrecognized. Similar to the situation with balloons, a vapor trail will appear to glow at dawn or dusk. Many times the aircraft leaving the vapor trail cannot even be seen, however, the vapor will appear to be a bright fiery red streak of flame in the sky. Formations of aircraft reflecting the sunlight can very often appear as a formation of disc-shaped objects. At times the reflection will suddenly diminish causing the objects to look like they were either moving rapidly out of sight or just disappearing.

ATIC does not have a satisfactory system for checking aircraft. This is because Flight Service and CAA does not keep a permanent record of aircraft flights very long after the aircraft has landed. Therefore, it is up to the officer receiving the report from the observer to thoroughly check aircraft movements immediately. He may check these through the control tower, through Flight Service, through CAA radio

stations, or many various ways, but he should check thoroughly to see whether or not there were any aircraft flights in the area of the sighting.

Astronomical Bodies

As far as astronomical bodies are concerned, ATIC has a professional astronomer under contract to review sightings that they believe to be caused by astronomical bodies. By astronomical bodies we mean bright stars, planets, or meteors. The most valuable information in the analysis of an unidentified flying object that is suspected of being an astronomical body is the bearing, the azimuth, and the time. From this we can check back through almanacs and determine the locations of certain bright stars. Stars that give us trouble are Venus, Jupiter, Capella and several others.

Meteors are not too difficult to evaluate because they seem to have a standard description. If someone reports an object similar to a rocket going across the sky at high speed and leaving a trail behind it, chances are it is a meteor. However, in certain instances we have had very unusual meteors reported. We have found that there are certain classes of meteors that astronomers call fireballs. These are so rare that there is a good chance that you may see only one in your life, if any. This has probably accounted for many reports by pilots who state that they met a huge ball of fire coming directly at their aircraft and at times have even racked up the aircraft to get out of its path. Many times these are reported as missiles. We have had pilots who have complained to the Air Force about shooting rockets, or experimental missiles, through the airways and endangering their aircraft. (This is a rather foolish statement, however, when you get to thinking about it. One, if a missile appeared anywhere outside the proving grounds chances are it would be enemy. However, if you have studied missiles you will note that the burning time, or the time before fuel cut-off, is only a relatively short period during the missile's flight. If we would say, hypothetically, a rocket was shot from some

foreign country into the United States, chances are very good that the fuel shut-off point would have come long before the rocket ever reached the United States and it would not be emitting a flame.

Other Causes of Reports

Naturally balloons, aircraft and astronomical bodies do not account for all the sightings. We have a smaller percentage of other things, such as ducks flying over drive-in theaters at night, searchlights on clouds, blimps, pieces of paper caught in an updraft, and many other things that cause reports. These are very difficult to check and to check them we normally go back to old sightings. For example, sometime back, approximately a year ago, the city of Fargo, North Dakota, was somewhat disturbed by glowing objects that flew over the city on various nights. Finally, some of the more enterprising souls in the city took enough interest in the subject to attempt to determine what they were. All it was were flocks of ducks or geese reflecting the city's lights. We will take a case like this and mentally file it. When we come across a similar report, we'll go back and compare the two reports. If they are similar enough, we will write the new report off as being the same thing. This is about the only method we have of checking such things.

Radar Sightings

We receive quite a few radar sightings and we are very aware of the fact that weather effects and interference between the two radars can give many odd returns. In some cases we are definitely able to show how these radar signals occurred, other times we are not able to definitely show how it happened. We hope that as more study is put on the subject of radar anomalies that more and more of our reports will be explainable.

There are no reports of radar sightings in our file that cannot be questioned to some degree. In none of the cases of erratic or high speed (above Mach 1) that

we have on file can it be shown that the track was actually that of a material object. One rare exception to this is when radars have happened to track meteors. More of our unknown high speed tracks might be meteors but unless we get reports of a meteor track to correlate with the radar track it is difficult to separate out these reports. Lightning is another possibility but a very vague one.

Radar Scope Photos

A large number of Air Defense Command radar stations are equipped with radar scope cameras. ADC Regulation 200-5 authorizes the use of these cameras for photographing abnormal returns. These scope cameras should be ready to operate at all times since scope photos are an absolute necessity for the accurate evaluation of reports involving radar. In addition, they give valuable data for the study of weather and interference effects.

Simultaneous Radar Visual Sightings

Reports of simultaneous visual reports that supposedly correlate with unusual, high speed or erratic radar tracks, with the rare exceptions of meteors and lightning, are a different story. No presently known phenomena or condition will give this situation. If it can be shown that the object sighted visually and the radar track are the same, the report warrants a detailed investigation. So far, this has not happened in any of our unknown cases. We have good reports of simultaneous visual-radar sightings but again there are always factors that shed varying degrees of doubt as to whether or not the observations involved the same object.

The first factor in establishing a correlation is to check the flight path or location of the visually observed object with that shown on radar. If this correlates closely the next step is to establish that the time was the same, sometimes a difficult task. Other checks can also be made but these two are basic.

Other Simultaneous Sightings

Any report of an object seen from two separated locations is relatively important. These include two locations on the ground, from the ground and air, etc. Of these the best way to gather very accurate data is to utilize two theodolites or a theodolite combined with a plain visual sighting. The use of a theodolite is considered an instrumented observation. For those who are not familiar with the term a theodolite is a device for accurately measuring the azimuth and elevation angles during weather balloon flights. Nearly every air base and large civilian airport has one. It can be put into use by merely calling the weather station and requesting that they try to observe the reported object. The data needed are the time, elevation, and azimuth at one minute intervals for as long as the object is in view or for at least 20 minutes if it appears to be hovering. If an adjacent air base can be contacted and requested to do the same, preferably at the same time, you've hit the jackpot as far as good data are concerned.

(Show Triangulation Slide)

Reporting Solutions

If, during an investigation of a sighting, after a TWX has been sent reporting the incident, the investigating officer should identify the reported object, ATIC should be immediately notified as to the solution.

Popular Theories

Many theories have been advanced that all of the reports are due to mirages, sun dogs, ice clouds and what-have-you. Some of our reports are caused by such things. We have received excellent photos of sun dogs and descriptions of mirages. These are definitely in the minority, however, and cause only a small percentage of the sightings.

Another popular solution is that all "flying saucers" are "skyhook" balloons. To check this a study of about 25 cross-country balloon tracks were made. To

remove any doubt, the tracks were taken of flights made during July and August 1952 when reports were coming in at the rate of 50 per day. These balloons were seen and reported as "flying saucers" at only _____ points.

(Slide - show typical balloon tracks)

Questionnaires

To increase the efficiency of the collection of data, ATIC has devised several different types of questionnaires. One of these questionnaires is for use by ground observers, or people who sight something from the ground, one is for people who sight things from the air, one for radar sightings, and one for general background information. These questionnaires have been made up after a great deal of study. Approximately a year ago, ATIC arranged to have a group of scientists and professional people to design a questionnaire. These people studied all questionnaires that had been previously used in this project, they studied our file of sightings, and arrived at a tentative version of our present questionnaire. This tentative questionnaire was used for a period of approximately three months, the results analyzed, revisions made, and a final questionnaire was made up.

It is believed that these questionnaires will accomplish two things: (1) if the officer in the field receiving the report will use it, it will give him a better idea as to what data is wanted and will make his collection much more efficient and faster. These questionnaires can be attached to an AF Form 112 as an inclosure or attached to a letter report. Although AF Letter 200-5 states what information will be sent, it does not mean that this will be the only information sent. If you are familiar with this letter, you will note that it says that all information pertaining to the sighting will be sent. The questionnaires contain all of the required data plus other, so it is legal to use them. Copies of these questionnaires can be reproduced in your own unit, obtained from your headquarters, or from ATIC.

Statistics

You might be interested in a breakdown of our reports for 1952. In breaking down these reports, we use several degrees of certainty under each category. We'll take balloons, for example. We will classify them as a known balloon, a probable balloon, or a possible balloon. A known balloon means that we were definitely able to correlate the facts of the sighting with the data on a balloon track and there is no doubt that the object was a balloon. Probably a balloon means that we were not able to correlate all the data, but there is no doubt in our minds but what the reported object was a balloon. A possible balloon is where we check the report with balloon data and cannot find a correlation yet we still believe the object was a balloon. This factor accounts for "lost" balloons, that is, balloons that may have developed slow leaks and floated great distances. In all our categories of balloons, aircraft, and astronomical bodies, we use these three breakdowns.

(Slide showing Breakdown of Conclusions)

In analyzing 1021 reports, and those are reports that have been received through military channels and do not include several hundred reports from civilians direct to ATIC, as of 22 December 1952 a total of 18.51% of all our reports were balloons. A further breakdown of this: 1.57% of the total were known balloons; 4.99% of the total were probably balloons; and 11.95% were possible balloons. As far as aircraft is concerned, 11.76% of all the reports were aircraft. Of these .98% were known to be aircraft; 7.74% were probably aircraft; and 3.04% were possibly aircraft. Of the reports, 14.2% were analyzed as being astronomical bodies. Of these 2.55% were known; 7.4% were probable and 4.01% were possible astronomical. In the "other" category, which includes ducks over drive-in's, paper in an updraft, etc., accounted for 4.21% of the total reports, hoaxes were 1.67% - now by hoaxes we mean those reports where the persons purposely set out to perpetrate a hoax, 6.84% were radar

cameras, however, and consequently have not put them out in the field. The grating is a rather touchy piece of equipment and we are having trouble getting it to stand up under certain conditions.

We realize that this is not a fool-proof measure. These cameras are not a piece of highly developed scientific equipment, but we do hope that we may be able to obtain some information.

(Slides of Videon Camera and how it operates)

Other Instrumentation

The possibilities of more extensive instrumentation has been discussed in detail. Many suggestions for more complete cameras, special aircraft instrumentation, and other detection devices have been studied. It is possible that a study contract for such instrumentation may be let, but no actual program will be started now. The cost of such a program would out-weigh the results.

Conclusion

In concluding this briefing it can again be stated that in none of the reports so far received are there any indications that the reported objects are a direct threat to the United States, nor is there any proof that any of the reports received have been reports of any radically new unknown material object. We admit we cannot explain every report but we believe we know enough about the unknowns to say they are not anything to invoke undue speculation.

The project will be continued. Even if a system for the fool proof explanation of every sighting is developed it will continue because you never know what may happen in the future.

The one threat that could come out of this problem of "flying saucers" is a "wolf, wolf" situation. Some people take an exceedingly "dim view" of such reports and use no logic in trying to explain them. We do not want to clutter

reports that we could not definitely establish the cause, and 22.72% of our reports were classified as having insufficient data and were not analyzed.

This leaves a balance of 20.1% of the reports which are classified as unknown. At this point a definition of the term "unknown" is in order. Usually there is more than one source or observer. Again, this does not mean that just because a person is alone, sees something he cannot explain to himself and reports it, his account of what he saw is laughed off. Normally one person just cannot supply the necessary data. For this reason, we dwell more on reports where the data can be substantiated by others. To go a step farther, there can be no doubt as to the reliability of the persons making the observation. If the report contains a relatively good amount of data, it is then checked against the location of known objects, phenomena, etc. If none of these explain the sighting, it is classed as unknown. It might well be that if we had more data on the sighting, it could easily be explained.

(Slide of Locations of Unknowns)

Videon Cameras

You may have heard about a camera that has been modified for use on this project. At the present time, we have 100 of these cameras. They are a commercial model stereo camera with one lens fitted with a diffraction grating. The grating serves as a prism to separate the light source into its various components. Any light source that is made up of an element or combination of elements has a distinctive spectrum. This spectrum is similar to a finger print. A file of the spectra of known objects, stars, meteors, etc., is being assembled and this file spectra can be compared to the spectra obtained from photos from the cameras. These cameras will be placed in control towers and a few selected radar stations throughout the United States. We are having some difficulty with the gratings on these

communications channels with worthless reports. If you can logically explain a report, fine, there is no need to waste your time and effort forwarding it. All we ask is that you do use logic in writing it off a report as a "flying saucer".

18 - 19 February 1957
INDOCTRINATION D/I REPRESENTATIVES

7-3745 -387

1003838

RETURN TO
USAF Historical Archives
ASI(ASHAF-A)
Maxwell AFB, Ala 36112

SECRET

RETURN TO:
Director
Aerospace Studies Inst
ATTN: Archives Branch
Maxwell AFB, Alabama

UFO INDOCTRINATION FOR D/I REPRESENTATIVES

Maj. Byrne and Mr. Sanderson
18-19 February 1957
To Be Held in 4E Conference Room

Monday, 18 Feb	0900-0930	Welcome by Mr. Arcier, Scientific Advisor
	0930-1030	Basic Briefing in two parts:
		I. History, background, problems (Will be based primarily on Gen Lewis Briefing, 4 Oct 1956)
		II. Approaches to reporting, investigation and analysis of UFO channels, procedures.
	1030-1200	Typical UFO Reports
		I. Simple types
		II. Complex types
		III. Criteria for placing in "Unknown", Insufficient data, other categories.
		(Blackboard diagrams to demonstrate approach and procedures, if necessary)
		1. Detailed review of report, basic evaluation based on logic and knowledge of known activities in UFO area.
		2. Checks used:
		a. A/C and Radar Units
		b. Weather Stations
		c. Test and research operations
		d. Balloon facilities
		e. Missile sites
		f. Use of all ATIC technical personnel and facilities
		g. Use of contractors (only as "last resort", or as necessary

1003838

	1200-1245	Lunch
	1300-1400	Examples of private correspondence, problems, and typical replies: 1. Valid UFO reports 2. Criticism of AF, with request for comments and reply. 3. Request for detailed information on specific cases, classified material, reports, etc. 4. Requests for AF comments on "Flying Saucer" theories, etc. 5. Crackpots, fanatics, eccentrics, hoaxes, etc.
	1410-1500	UFO Societies and self-styled "UFO Experts" 1. Typical publications 2. Influence on public mind, and correspondence with governmental officials. 3. Example: Mr. Stringfield, UFO Director, constant barrage of criticism, nuisance to UFO unit, etc.
	1500-1600	Discussion Period
Tuesday, 19 Feb	0900-1030	Demonstrations how analysis performed: Checks and Contacts; use of astro material, mathematical and scientific calculations, optical computations for testing validity of UFO photos, etc.
	1030-1230	Detailed survey and use of UFO files. Particular reference to correspondence from member of Congress, evaluation data, and the necessity for constant maintenance and referral to "old case" files. Reason: The majority of the 20 or so UFO books are based on the old cases, circa 1947-1953.
	1230-1330	Lunch
	1330-1600	Open period for discussions, conference, plans, proposals, etc.

GEORGE T. GREGORY
Captain, USAF
UFO Unit

31 JANUARY 1958
MCCLELLAN SUB-COMMITTEE MEETING

7-3745 - 363

1003839

RETURN TO
USAF Historical Archives
ASI(ASHAF-A)
Maxwell AFB, Ala 36112

DEPARTMENT OF THE AIR FORCE
WASHINGTON

OFFICE OF THE SECRETARY

RETURN TO
Director
Aerospace Studies Inst
ATTN: Archives Branch
Maxwell AFB, Alabama

MEMORANDUM FOR DIRECTOR OF INFORMATION SERVICES

SUBJECT: McClellan Subcommittee Statement Concerning Air Force Handling of UFO Reports

1. Reference is made to your memorandum of 28 February 1958, subject as above.

2. The reason for the delay in my reply is that considerable exploratory work has been done with the Committee and the staff relative to your suggestion. However, the general attitude of the Committee is that while they feel that it is not worthwhile to invest further time and money in this area, plus the fact that the Air Force is conducting its own investigation, they will not make a release to this effect at this time.

3. In cases of this type, we have found that Congressional Committees are not prone to commit themselves in the way you suggest. Therefore, while the Committee's attitude now is that they are not going to pursue this matter further, they have indicated that they would not so commit themselves publicly for if the situation should change at a later date they would not want to be shackled by a press release indicating that they had no further interest in the matter.

Joe W. Kelly

JOE W. KELLY
Major General, USAF
Director, Legislative Liaison

1003829

SAFIS-3/Maj Tacker/jmd/73328/25 Feb 58

FEB 28 1958

MEMORANDUM FOR DIRECTOR OF LEGISLATIVE LIAISON

SUBJECT: McClellan Subcommittee Statement Concerning Air Force Handling of UFO Reports

1. Investigators for the McClellan Subcommittee (the Senate Committee on Investigating Government Operations) recently held informal discussions (31 January 1958) with us concerning the advisability of conducting public hearings on the Air Force's position regarding unidentified flying objects. The thing they were concerned with most was the charge that the Air Force was withholding information on this subject. I am sure we convinced them that this was not the case, as they have since indicated there is no need for hearings on this subject.

2. In view of these findings, based upon their preliminary informal investigation, this office would like to see the McClellan Subcommittee issue a statement certifying that a preliminary investigation by the Committee proved that the Air Force is properly conducting its investigation of unidentified flying objects and is not withholding information on this subject from the public. If possible, the statement should include that the Air Force has a definite public information plan in effect concerning unidentified flying objects.

3. Request SAFLL review the possibility and/or feasibility of obtaining such a statement from the McClellan Subcommittee.

ARNO H. LUEHMAN
Major General, USAF
Director of Information Services

COMEBACK-SAFIS-3
READER-SAFIS-1
STAYBACK-SAFIS-3

FEB 3 1958

MEMORANDUM FOR DEPUTY DIRECTOR OF INFORMATION SERVICES, SAFS

SUBJECT: Congressional Public Hearings - Unidentified Flying Objects

1. Major Donald Keyhoe of the National Investigation Committee on Aerial Phenomena has been badgering the members of the McClellan Subcommittee, the Senate Committee on Investigating Government Operations, to hold open hearings on the question of the existence of unidentified flying objects.

2. In this regard investigators for the subcommittee contacted SAFLL and a meeting was held on 31 January 1958 at 1000 hours in Mr. Horner's office on the Air Force's position regarding possible hearings. Members of the committee attending this meeting were:

Mr. William Weitzen, Deputy for Research & Development Operations

Lt. Colonel William R. Kelzo, SAFRD

Major Joseph E. Boland, SAFLL

Major James F. Byrne, AFCIN

Major Lawrence J. Tacker, SAFIS

Mr. Donald O'Donnell, FBI (Committee Investigator)

Mr. Jack Healey, FBI (Committee Investigator)

3. The committee's investigators simply asked if the Air Force desired such hearings. Mr. Weitzen stated that he did not see the need for it but would cooperate in every way possible if the committee thought the hearings necessary. Mr. Jack Healey stated they wanted a definite Air Force position. Mr. Weitzen said he would have to wait until Mr. Horner returned but thought Mr. Horner would agree with his statement that we would cooperate in every way. The two investigators were invited to visit ATIC at Wright-Patterson Air Force Base for background information. They said they would do so if hearings developed.

SAFIS-3/Maj Tacker/jmd/74966/3 Feb 58

4. There will be a meeting of this group again this week when Mr. Horner returns and gives his views.

5. Major Tacker pointed out during the discussions that OIS was providing the publicity at the present time on this subject at the request of AFCIN. He stated we would continue to do so and would cooperate in every way with the staff agencies concerned or with the congressional committee if hearings are held.

GLEN W. CLARK
Colonel, USAF
Chief, Public Information Division
Office of Information Services

2 COMEBACK-SAFIS-3
READER-SAFIS-1
STAYBACK-SAFIS-2

20 JUNE 1958 BRIEFING
REPRESENTATIVE HENDERSON

UNCLASSIFIED

[redacted]

7-3745 - 362

1003840

RETURN TO
USAF Historical Archives
ASI(ASHAF-A)
Maxwell AFB, Ala 36112

UNCLASSIFIED

[redacted]

UNCLASSIFIED

Maj. Byrne / CIN/X1A
June 23, 1958

SAFIS

MEMORANDUM FOR RECORD

SUBJECT: Briefing of Representative Henderson and Colleagues on the Air Force Unidentified Flying Object (UFO) Program

1. On 20 June 1958, Major Boland, SAFLL and Major Tacker, SAFIS, assisted by Mr. Arcier, AFCIN-4X1, and Major Byrne, AFCIN-X1A, briefed the following House members, in the Capitol chamber of Representative John E. Henderson, Ohio.

Rep. Henderson, Ohio
Rep. Cramer, Florida
Rep. Magnuson, Washington
Rep. (Mrs.) Walker, Washington
Mr. Mongel (Adm. Aid--Henderson)
Mr. Bachelor (Adm. Aid--Cramer)
Mr. Tely (Adm. Aid--Mr. Magnuson)
Mr. Gordon (Adm. Aid--Griffen, Mich.)

RETURN TO:
Director
Aerospace Studies Inst
ATTN: Archives Branch
Maxwell AFB, Alabama

2. The briefing was prepared in response to a personal request by Rep. Henderson who had previously submitted a series of questions on UFO's. AFCIN prepared the answers to these questions and supplied the necessary briefing material.

3. Members of Congress are constantly besieged by constituents regarding UFO's, by letter, telephone and personal visits. With rare exception, such requests are forwarded to SAFLL for answer. The lack of information on UFO's professed by the Congressman causes a certain amount of professional embarrassment. As a result, a great number of Congressmen and their administrative aids have indicated an interest in first-hand information on UFO's. SAFLL, on the urging of SAFIS and AFCIN, siezed this opportunity to prepare a number of briefing kits, containing reproductions of statistical information, charts and graphs, individual case histories, and such other related material that would give the reader a rather comprehensive knowledge of the subject. These kits were submitted at the time of the subject briefing. It is expected that additional requests will be made for kits as word travels regarding their availability.

4. The Congressional audience was favorably impressed by the presentation. One apparent dedicated skeptic, at the conclusion of the briefing, professed his complete faith and confidence in the Air Force's handling of UFO's. Several members indicated that they were now prepared to deal directly with their constituents without calling on SAFLL.

MEMORANDUM FOR RECORD

5. The subject briefing, scheduled for one hour, lasted the full morning, which attests to the Congressional interest in the subject. The following is believed to have accrued from the briefing, with members expressing:

a. Confidence in the Air Force U.F.O program.

b. An understanding of the problems the Air Force faces in administering the program.

c. Acceptance of responsibility to personally advise their constituents on UFO matters.

d. Agreement that it would be unwise to give the subject undue publicity, particularly in an open or closed formal Congressional hearing.

e. Distrust in private organizations and authors, as giving undue impetus to the existance of "flying saucers" and stimulating unfavorable public hysteria.

6. Mr. Arcier addressed the group as a technical consultant, Maj. Byrne, in the capacity as administrative consultant, clarified certain answers given by the CAFLL representative, to preclude possible misunderstanding on how the UFO program is administered Air Force wide.

7. The excellent briefing material prepared by AFCIN-4 and the personal attendance of Mr. Arcier, who impressed the group with his profound council, deserve special note as reason for success of the briefing.

8. Classified portions of the UFO Scientific Panel Report of 1953 were made available to and receipted for by the Congressmen present.

Rep. Cramer, Florida

Rep. Henderson, Ohio

Rep. Mognuson, Washington

Rep. Mongel Asst. to Henderson

Rep. Gorden Asst. to Griffen, Michigan

Rep. Bachelor Asst. to Cramer

Rep. Telz Asst. to Mognuson

Rep. Walker Asst. to Tollesson, Washington

Rep. Bass New Hampshire

Rep. Alger Texas

Rep. May Connecticut

Lindbergh Briefing

- would be more impressed by the efforts of Soviet Communication if the effort were not so [illegible]
- [illegible] is wrong's brilliant
- little item from Vienna are undoubtedly [illegible]
- Secret class: an original Rpt Feb. 1949.
- Unknown items I & IV were from highly reliable observers - Nos II & III were from unreliable observers - all from ground.
- Unknown item V was from reliable observer & from the air

all Rpts rec'd from Russian controlled unquestionably true - by Naval type [illegible]

Hundreds Rpts not rec'd by AF at all so late that all possible trace or evidence has disappeared

Child -

- Auto pilot
- Constitution statement by Smith

1st Reel of "Gunther" presentation

- 10000 case files
- 88 min. tape
- discussion of cases
- 1 case procedure throughout
- Act with. discriminate
- UFO = Flying Saucers" to public
- AF does not deny UFO
  " does Flying Saucers.
- 2 last Releases to Press.
- Sky gazing definition expec. night sky
- Ground and Water as well as Sky.
- Ghosts more frequent than UFOs.
- UFO Rpts sent direct to ATIC or rec. to AF nearest base. Rpts to White House

Screening of

Rpt location
Interview using form
Navy data etc on land strip.

Give me part from Bugg on take.
to
Late reports when no evidence remains

- 1st response of ACS/I is to advise NSC of any threat to US
- Possible anti-USAF feeling in some places
- Profit-motive in people who rake up excuses for publicity

[redacted]

UNCLASSIFIED

PARAGRAPH NOT RELEASED EXCEPT PRIOR TO
PRIOR TO DECLASSIFICATION

184

TO SECRETS [illegible]

[redacted]

REFERENCE FORTHCOMING [illegible]
FOR [illegible]
ATTENDANCE OF AN ARMED [illegible]
MAY BE, PARTICULARLY [illegible]
[illegible]
JOINT, NOT IN THE NATURE OF [illegible]
OF ELECTIONS AT ATIC BEING [illegible]
ASSD, FOR FURTHER ASSIGNMENT.

4

45 1634Z JUN LJEPRO

[redacted]

[redacted]

UNCLASSIFIED

FILE CLASS:_____
OFFICIAL FILE COPY

_____OFFICE OF RECORD

COORDINATION

AFCIN-4

1947 - 1957 UFO Statistics and Data Requested by Congressman Henderson

AFCIN-4X2b

AFCIN-4X2c

AFCIN-4X3

AFCIN-4X4

AFCIN-4X5

AFCIN-SAFIS-3, Attn: Major Tacker 23 May 58

AFCIN-4E4

1

AFCIN-4E4/Capt. Gregory/ko
69216

AFCIN-4B

1. Reference telephone conversations between your office and this Center on 22 and 23 May 1958, and our teletype message, dated 23 May 1958 regarding the preparation and transmission of subject matter.

AFCIN-4C

AFCIN-4D

2. Attached document reflects the various breakdowns of UFO evaluations and statistics, as requested by Mr. Henderson. Also included, are detailed statistical and other related data extracted from the USAF Project "Blue Book" Special Report Nr. 14. This should fulfill all requirements on the matter.

AFCIN-4E4

H. K. Miley 26 May 58

Incls:
Document, UFO Statistics
and Data (Uncl)

for H. K. GILBERT
Colonel, USAF
AFCIN-4E

AFCIN-4E Official File

OTHERS

H. Tacker 26 May 58

PERM	
TEMP	
90 DAYS	
INITIAL	

AF FORM 144 (REV 10 SEP 57) ROUTING AND COORDINATION SHEET

FILE CLASS:
OFFICIAL FILE COPY

OFFICE OF RECORD

AFCIN-4
AFCIN-4X2R
AFCIN-4X2c
AFCIN-4X3
AFCIN-4X4
AFCIN-4A5
AFCIN-4A
AFCIN-4B
AFCIN-4C
AFCIN-4D
AFCIN-4E
OTHERS

Copies - Correspondence Re Congressman Henderson Request to DOD for UFO Data and Statistics

AFCIN-X1, Attn: Major Byrne — 23 May 1958

AFCIN-4E4 — 1

AFCIN-4E4g/Capt Gregory/kmo/69216

Forwarded for your information and retention, in accordance with existing policies that your office be kept informed of actions of this type.

H. K. GILBERT
Colonel, USAF
AFCIN-4E

3 Incls:
1. Cy Ltr to DOD dtd 8 May 58
2. Cy, Ltr SAFIS, dtd 20 May 58
3. Cy, TT Msg, ATIC dtd 23 May 58

PERM	
TEMP	
90 DAYS	
INITIAL	

AF FORM 144 (REV 10 SEP 57) ROUTING AND COORDINATION SHEET

DEPARTMENT OF THE AIR FORCE
WASHINGTON

OFFICE OF THE SECRETARY

Letter from Rich
8 May

Letter to ATIC 20 May 1958
Suspense 27 May 58 in Pentagon

Dear Mr. Arcier:

Here is a letter from Congressman Henderson of the 15th District, Ohio, concerning UFO's.

He asks many questions and we desire to have complete answers to each one in response to his letter.

He also wants ten of the best sightings in the last five years which have been classified as "unknowns". Please oblige to the best of your ability.

Major Boland and I intend to hand-carry the reply to Mr. Henderson and brief him on the entire project as Boland did Chairman Vinson and we intend to show him the minutes of the Panel meetings leading to their Formal Report.

I suspect the letter was inspired by a constitutent in Ohio but, since the Congressman uses first person, we must handle as a personal congressional inquiry.

I need this information in my office no later than 27 May 1958. Note!
Sorry for the time element but their suspense to me is the next day.

Sincerely,

LAWRENCE J. WACKER
Major, USAF
Executive Officer
Public Information Division
Office of Information Services

Inclosure
a/s

Mr. A. F. Arcier
Air Technical Intelligence Center
Wright-Patterson Air Force Base
Ohio

Requirements for ATIC:
1. 16 specific questions submitted to Mr. McEbon to answer by ATIC
2. Story Summaries of 10 UFO cases
3. Detailed Sketches for 1947 thru 1953

ATCH #1

COPY

JOHN E. HENDERSON
15th District Ohio

COMMITTEE:
Banking and Currency

CONGRESS OF THE UNITED STATES
HOUSE OF REPRESENTATIVES
WASHINGTON, D.C.

May 8, 1958

Hon. Neil H. McElroy
Secretary of Defense
Department of Defense
Washington 25, D.C.

Dear Mr. Secretary:

I have read with considerable interest the book, "The Report on Unidentified Flying Objects," by Edward J. Ruppelt, telling of the work of Project Blue Book.

In order to be brought up to date with respect to information developed since Ruppelt left the project, I should appreciate having the answer to several questions. Briefly, these questions are outlined below.

1. Is Project Blue Book, or some similar project, still in operation to receive, investigate and evaluate UFO reports?

2. Have reports of UFO's still continued to come in? 3. If so, how many since 1953? 4. How are these distributed by year and month? 5. How many have been classified as "unknowns" by year and month?

6. Have any efforts been made to get more scientific data on UFO's than is provided by visual sightings by ground or air observers, or by visual observance of radar equipment? 7. For example, have any films been made or radar screens when a UFO is picked up? 8. Have any efforts been made accurately to track and triangulate UFO's so as to give more accurate information on speed, size and altitude? 9. Have any tests been conducted to ascertain whether there is any connection between background radiation and the presence of a UFO? 10. Have spectrometers been used to try to analyse the light emitted by UFO's? 11. Have films been taken of UFO's? 12. In addition to knowing if any of the above or similar efforts have been made, I should appreciate knowing if any of the above or similar experiments have been planned.

13. Could you furnish me reports on say ten of the best sightings in the last five years which have been classified as "unknowns"?

COPY

Atch #2

COPY

5. Has any regular procedure been established to exchange UFO information with our allies? 6. Have any of our allies issued official reports on UFO's?

Sincerely yours,

John E. Henderson

JEH:mh

copy

JOINT MESSAGEFORM

SECURITY CLASSIFICATION: Unclassified

SPACE BELOW RESERVED FOR COMMUNICATION CENTER

23 May 58 23 04z

PRIORITY

PRECEDENCE		TYPE MSG (Check)			ACCOUNTING SYMBOL	ORIG. OR REFERS TO	CLASSIFICATION OF REFERENCE
		BOOK	MULTI	SINGLE			
ACTION	PRIORITY			X	AF		
INFO							

FROM:
COMDR, ATIC

SPECIAL INSTRUCTIONS

TO:
SECY OF AIR FORCE, OIS
ATTN: SAFIS-3, Major Tacker

UNCLASSIFIED/AFCIN-4E4

5-1032-E

A. Ref Ltr to Secy of Defense from Congressman Henderson, and your urgent request just rec'd by ATIC for extensive info, statistics, UFO cases and answers to questions requested by Mr. Henderson, and required for personal briefing to be given him, Tues. 27 May 58.

B. Confirming our telecony. Impossible to provide large mass of info required by Monday, 26 May. Based on similarly imposed requirements in the past. Per our agreement, will transmit info and data desired by TT Msg here, and send summary and 1947-1958 statistics to your office by Monday afternoon.

C. Before answering questions or providing info, in order which they appear in ltr to Mr. McElroy, a few facts concerning Ruppelt and his book should first be given, inasmuch as it appears to be basis for congressional request to Dept of Defense.

DATE	TIME
23	1600
MONTH: MAY	YEAR: 58

WRITER

SYMBOL: AFCIN-4E4g

TYPED NAME AND TITLE (Author of Message): GEORGE T. GREGORY, CAPT USAF

PHONE: 69216 | PAGE NR. 1 | NR. OF PAGES 5

SECURITY CLASSIFICATION: Unclassified

RELEASER

SIGNATURE: Frank E. Gregory

TYPED (or stamped) NAME AND TITLE:
Capt USAir Force
Staff Duty Officer

DD FORM 1 MAY 55 173 REPLACES DD FORM 173, 1 OCT 49, WHICH WILL BE USED UNTIL EXHAUSTED

ATCH # 3

JOINT MESSAGEFORM - CONTINUATION SHEET | SECURITY CLASSIFICATIO Unclassified

FROM:

COMDR, ATIC

D. As with any free-lance author, Mr. Ruppelt's Theories, opinions, and conclusions are his own, and not necessarily those of the Air Force. His book was reviewed and passed on by Hqs USAF from a security viewpoint only. While most of the statements in his book are factual, the inferences and implications that he attempts to leave are definitely questionable. As project officer of UFO program, Ruppelt had good knowledge and appreciation of various technical and scientific fields; competent in monitoring investigations, studies; collecting and correlating data for analyses, and conclusions. However, he was not an expert in highly specialized fields such as astrophysics, meteorological optics, psychological influences, etc., for which Air Force has relied on many scientists and specialists, whose conclusions are considered more valid.

E. Answers and info in order of questions submitted in Mr. McElroy's letter: (1) Project Blue Book is a continuous Air Force project; is directly related to Air Force responsibility of defense of Air Space over U.S.; and rigidly prescribed by a standing directive, AFR 200-2, for the detection, identification and analysis of things in the air that may be a threat to U.S. (2) Yes, Reports still continue to come in. (3) Since 1953 a total of 2764 reports have been received, for an average of slightly over 550 per year.

SYMBOL	PAGE NR	NR OF PAGES	SECURITY CLASSIFICATION	INITIALS
AFCIN-4E4g	2	5	Unclassified	

DD FORM 1 MAY 55 173-1

☆ U. S. GOVERNMENT PRINTING OFFICE: 1955—352130

(4) Distribution by year and month (Statistics to be hand-carried your office) (5) Unknowns by year and month (to be handcarried) (6) Yes (7) Yes. Numerous times, and often involve very experienced radar operators. This is standing requirement for radar operators when object considered UFO and photo equipment available. Examples: Some time ago Navy rushed to ATIC approximately 3000 ft of radar film of UFO observed in Far East (3rd) ~~[illegible]~~. Also, a B-36 radar operator with 11 yrs experience photographed exceptionally sharp UFO's showing on his screen while flying over the South Atlantic. Analysis confirmed the identity of the UFO's: (8) Yes. Tracking has been done through Theodolite, radar and other instruments. Triangulation is a part of the standard analysis technique, and is utilized where two or more observers report the same object from separate locations. (9) Yes. Results negative. For example, Geiger Counter sweeps of some aircraft involved with alleged UFO's at high altitudes shows a slightly higher radioactivity than normal. Reason: Aircraft receive a greater dosage of cosmic rays at high altitudes. Example: Mantell Case, (which apparently prompted this query). (10) Yes. Specialized combination spectrographic - stereo-camera instruments are located in approximately 60 strategically located sites in the U.S. Results: negative. Only conventional objects in those few spectrographic photos taken.

Former wire ships, sea clutter and radar equipment interference; the latter a destroyer and surfaced submarines

☆ U. S. GOVERNMENT PRINTING OFFICE: 1955—932136

FROM: COMDR, ATIC

(11) Yes. Those not found to be hoaxes, photographic flaws, mistaken identification, and optical illusions caused by adverse weather, light exposure or other conditions, are at best, only large and small indeterminate spots of light. (12) In order to improve its investigative, detection and analytical techniques and capabilities, the Air Force is continuously testing and experimenting in this field. For example, the world-wide "Moonwatch" facilities are often called upon for data to assist in identifying reported unidentified aerial objects. The services of all ~~professional~~ astronomical observatories are at the Air Forces disposal, and also ~~including~~ the FBI, OSI, ONI and others where needed. (13) Ten best "Unknowns" of the last five (5) years (Re telecon between Maj. Tacker and Capt. Gregory 1330 hrs, Fri. 23 May 58. The conclusion was that this requirement could not be fulfilled during time ~~was repeat was without interim~~ period, and that interview with Mr. Henderson could cover subject.) (14) The Air Force is advised of foreign sightings by various U.S. government agencies and personnel overseas. Until recently very few foreign UFOs reported. Definitely established increase is proportionate to number of Flying Saucer and UFO books distributed overseas. (15) Only a very small percentage of UFO reports officially issued by foreign governments or our allies. The majority generally qualify them with opinion that objects are probably aircraft ~~or other airborne (man-made) vehicles.~~

JOINT MESSAGEFORM - CONTINUATION SHEET | SECURITY CLASSIFICATION: Unclassified

FROM:
CONDR, ATIC

F. Recommend that the "Air Force Semi-Annual UFO Report" recently submitted by this Center, be brought to both Senator Saltonstall's and Congressman Henderson's attention, particularly para B.6, which proves that concerted, wide-scale campaign now under way to contact all members of Congress to pressure Air Force re UFO's.

COORDINATION:

Dr. Miley - AFCIN-4E4 Henry L. Miley

Col. Gilbert - A FCIN-4E - H. K. Gilbert Col USAF 5/23/51

Mr. Arcier - AFCIN4X JJ Ercier

Copy To:
Maj. Byrne - AFCIN-X1

SYMBOL	PAGE NR	NR OF PAGES	SECURITY CLASSIFICATION	INITIALS
AFCIN-4E4g	5	5	Unclassified	

DD FORM MAY 55 173-1

☆ U. S. GOVERNMENT PRINTING OFFICE: 1955—951236

8 AUGUST 1958
MCCORMACK SUB-COMMITTEE BRIEFING

7-3745 - 361

1003841

RETURN TO
USAF Historical Archives
ASI(ASHAF-A)
Maxwell AFB, Ala 36112

SAFLL-3/Major Brower/mr/76041/5D924/11 August 1958

13 AUG 1958

RETURN TO:
Director
Aerospace Studies Institute
ATTN: Archives Branch
Maxwell AFB, Alabama

MEMORANDUM FOR THE UNDER SECRETARY OF THE AIR FORCE

SUBJECT: Air Force Briefing for the Subcommittee on Atmospheric Phenomena, House Select Committee on Astronautics and Space Exploration on Unidentified Flying Objects

1. At the request of the Subcommittee Chairman, the Air Force presented a briefing at 1400 hours, 8 August 1958, to members of the Subcommittee on Air Force activities in dealing with UFO's. This presentation was made by Mr. A. F. Arcier, Scientific Advisor, Air Technical Intelligence Center and Captain George Gregory, UFO Project Officer, who presented a brief history of the Air Force actions in this field, procedures used in handling and classifying each reported observation and a statistical breakdown of all observations reported to date.

2. The Subcommittee was advised of the extensive efforts of the Air Force to apply all possible scientific methods of analysis and how this approach used in a timely fashion has reduced the number of citings characterized as "unknown" to approximately 3 percent of the total observations. It was also stressed that the Air Force, contrary to claims of many professional UFO organizations, has not and will not suppress any evidence which would indicate that UFO's constitute a threat to the security of the United States. In addition, the Subcommittee was advised of the number of civilian organizations engaged in UFO activities has risen to a total of 60 and that the activities of these organizations and spectacular news reporting has caused the greatest problems in this field. The Subcommittee asked several questions regarding Air Force methods of categorizing various citings as either aircraft, balloons, insufficient data, unknown, etc. and they were advised of certain specific cases which fell in these various categories.

3. Mr. Arcier and Captain Gregory presented a very well prepared briefing to the Subcommittee and were highly commended for their efforts at the close of the briefing. The Subcommittee members seemed to be definitely pleased with the Air Force approach to this problem and were apparently satisfied with our results to date. During the course of the briefing, Chairman McCormack, House Select Committee on Astronautics and Space Exploration, stressed the point that the Subcommittee was not holding formal hearings on unidentified flying objects but was merely

SAFLL-3 SAFLL

obtaining evidence data for their files, which at a later date would be considered and, if desirable, utilized by the full Committee for further investigation and/or hearings. Mr. Sheldon indicated at the close of the briefing that no further witnesses would be called by the Subcommittee and that in view of the satisfactory manner in which the Air Force was dealing with this problem, it was his feeling that the Committee would take no further interest in this matter.

Signed

W. P. FISHER
Major General, USAF
Director, Legislative Liaison

Copy to:
SAFIS (Maj. Tacker)
SAFRD
SAFGC
AFCIN-K1 (Maj. Byrnes)

12 August 1958

MEMORANDUM FOR RECORD

SUBJECT: Hearings on Unidentified Flying Objects (UFO)

1. On 8 August 1958, 1400 to 1600, AFCIN presented a briefing on the Air Force UFO program to the Subcommittee on Atmospheric Phenomena, House Select Committee on Astronautics and Space Exploration (Space Committee).

2. The AFCIN UFO briefing was presented in response to a memorandum from the Director, Legislative Liaison (SAFLL) subject as above, dated 6 August 1958 (~~see attached memoranda~~).

3. Participating were:

Mr. Arcier, AFCIN-4X, principal witness

Capt Gregory, AFCIN-4E, witness

Major Best, AFCIN-4E, technical consultant (geophysicist)

Major Byrne, AFCIN-X1, staff team chief

Major Brower, SAFLL, Legislative Project Officer

Major Tacker, SAFIS, public relations consultant

4. In attendance were:

Representative McCormack, Chairman of Space Committee

Representative Hatcher, Chairman of Sub-committee (Dy. D)

Representative Sisk, Member, (Calif. D)

Representative Keating, Member, (N.Y. R)

Representative McDonaugh, Member (Calif. R)

Representative Metcalf, Member (Montana, D)

Dr. Shelton, Scientific Staff Member

5. Opening remarks by Representative McCormack made it clear that the Air Force UFO program was not under investigation, rather the Committee

was seeking additional information on upper space that would be helpful to the appropriate executive agency. The hearing was in closed secret session, unrecorded, names of witnesses to be held in confidence (this cannot be guaranteed since Congressman are apt to inadvertently publicly reference witnesses' statements).

6. Mr. Arcier as chief spokesman reviewed the ten year history of the UFO program and Captain Gregory gave a detailed explanation of the analyses techniques applied by ATIC in evaluating UFO cases. In addition, delineation of responsibility for the UFO program in the Air Force, Air Force Public Relations, and private UFO organizations, clubs, books, etc., were discussed. All questions asked were promptly and adequately answered. Throughout the hearing proper protocol was maintained, the members were polite and pleasant, and the atmosphere was well suited to an ultimate expression of confidence by the committee. Captain Gregory is to be especially commended for excellent performance; his store of related scientific data had great impact on the members.

7. The hearings, which began 7 August, will continue through the week of 11 - 15 August. Additional witnesses from public life will be called in, possibly Dr. Mendgal, Harvard, Mr. Dryden, CAB, Major Kehoe, (Ret.), National Investigative Committee on Aerial Phenomena, Captain Ruppelt, (Res.), former ATIC UFO Project Officer. AFCIN may be required to return to answer questions posed by public witnesses.

8. It is anticipated that AFCIN will benefit by the subject hearings. Due to approaching House elections, the committee members may produce a public statement of vote of confidence in the Air Force, ensuring the public that the Air Force is not hiding any information on UFO's.

JAMES F. BYRNE
Major, USAF

UFO file

SAFLL-3/Major Brower/mr/76813/5D924/6 August 1958

File: 48-589-B

MEMORANDUM FOR THE ASSISTANT CHIEF OF STAFF, INTELLIGENCE

SUBJECT: Hearings on Unidentified Flying Objects

1. This memorandum is being written in accordance with the provisions of HOI 11-57.

2. Attached herewith is a copy of a memorandum addressed to the Under Secretary of the Air Force advising him of hearings by the Subcommittee on Atmospheric Phenomena, House Select Committee on Astronautics and Space Exploration on the subject of unidentified flying objects. These hearings will commence at 1400 hours, 7 August 1958 and will continue approximately three to four days. The Air Force has been asked to testify on 8 August 1958. All hearings will be in executive session and the Subcommittee has specifically requested that no publicity be given to the hearings.

3. It is requested that your office designate an individual to serve as Staff Team Chief for these hearings as required by paragraph 4a(2) of HOI 11-57. In this connection, this office has worked in the past with Major James F. Byrne (AFCIN-A1). Major James Brower, extension 76813 will be the SAFLL representative.

[illegible] P. FISHER
Major General, USAF
Director, Legislative Liaison

Copy to:
SAFRD
SAFIS (Maj. Lawrence Tacker)
SAFOC

SAFLL-3 SAFLL

MEMORANDUM FOR THE UNDER SECRETARY OF THE AIR FORCE

SUBJECT: Hearings on Unidentified Flying Objects

1. This office has received informal notification that the Subcommittee on Atmospheric Phenomena, House Select Committee on Astronautics and Space Exploration, will commence hearings on 7 August 1958 at 1400 hours on the subject of Unidentified Flying Objects. The Air Force has been requested to suggest witnesses who can testify on this subject.

2. It is understood that these hearings will continue for approximately three to four days during which time representatives from CIA and other organizations having an interest in this matter will be called to testify. These hearings will be conducted in executive session and the Subcommittee has specifically requested that no publicity be given to the hearings.

3. I have asked Assistant Secretary Horner to assume substantive responsibility for the development and presentation of the Air Force position in this matter to the Subcommittee.

W. P. FISHER
Major General, USAF
Director, Legislative Liaison

UFO PROGRAM

1. A brief history of the Unidentified Flying Object program would, I think, help you to understand some of its problems and determine its status.

2. The program started in 1947 when on 27 June of that year a private civilian flyer named Kenneth Arnold sighted what looked to him like several disc shaped objects near Mt. Rainier in the state of Washington. He described them as "flying saucers", a term that was forceably and with much sensationalism brought to the publics attention by the press. As a result, the Air Force was given the responsibility of investigating and analyzing such phenomena. This project was called "Project SIGN".

3. From this date, June 1947, to February 1949 when the name of the program was changed to "Project GRUDGE", approximately 375 UFO reports were collected and analyzed. In August 1949, a report on the results was submitted to the authorities. The average proportion of sightings which could not be explained, in other words unknowns, for this period was approximately 20%. It was concluded that these unknowns were due primarily to:

First, misinterpretation of conventional objects such as aircraft, balloons, astronomical bodies, also atmospheric phenomena, radar misfunctions and anomalies, etc.

Second, residual war nerves, mass suggestion and hysteria (Orson Wells case).

Third, Hoaxes and publicity seeking.

Fourth, the actions of psychopathic persons.

4. In December 1949, these findings were released to the public by the Department of Defense and were given wide publicity by the press.

5. From February 1949 to mid-1951 the project was carried on a low priority basis due to the economy policy of that time. However, in late 1951 renewed public interest and an increase in the number of sightings were reported. This increase in activity was due to the emphasis placed on UFO's by the press and publicity, and possibly due to the Ground Observer Corps program. In the summer of 1951 the project was again reviewed and "Project BLUE BOOK" established to

replace "Project GRUDGE".

6. The peak year of the UFO program was 1952 when an average of over 100 reports per month was received. This compares with 10 per month for 1951. The publicity fanfare given to the UFO controversy by the press, publishers, writers and others, reached a high pitch during 1952 and developed a tendency on the part of the public to question the Air Force's handling of the alleged "menace" presented by flying saucers. This came to a climax in late July 1952 during the much publicized Washington Flying Saucer sightings which purported to show flying saucers over the Capitol but which were in reality blips on radar scopes created by quite unusual atmospheric conditions. As a result of this, General Samford (the then Director of Intelligence) a few days after the sighting held a press conference which was televised nationally. His explanation and assurance that the UFO phenomena seen were not of interplanetary origin and did not constitute a threat to the United States were not only received with skepticism but were in fact totally rejected by a large number of writers, so called UFO experts.

7. Following this, General Samford asked the CIA to set up a panel of scientists to review the UFO program and the Air Force's handling of the situation.

8. This panel was formed; it consisted of sixteen of the most distinguished scientists and authorities in the fields of physics, radar, geophysics, atomic energy, astronomy, rockets, guided missiles, scientific and technical intelligence, propulsion and photo interpretation, in the country. Their conclusions were that UFO's (a) held no direct physical threat; (b) were not foreign developments capable of hostile acts on the United States; and (c) were not unknown phenomena requiring the revision of current scientific concepts.

Their recommendations were:

a. First, that the UFO program be de-emphasized because it interfered with the normal operation and mission of many governmental services and agencies, particularly the Air Defense Command, which was compelled to use its radar, communications, air intercept and other units in investigating the overwhelming number of sightings brought to its attention. All to the detriment of its normal mission.

b. Second, that every effort be made to strip the UFO program of its air of mystery in the mind of the public, with the view of restoring the publics confidence in the Air Force and relieving the public of quite unwarranted anxiety.

9. The correlation which exists between the type of treatment given the UFO matter by press and publishers, and the number of reports received, is important and is shown by this chart.

CHART 1 - Frequency of UFO Reports

This chart illustrates the effect of the conservative, scientific approach of Life and Look magazines on UFO reports for that period, in contrast to the newspapers' treatment of the Washington Radar "Flying Saucer" incidents and General Samford's press conference. The New Yorker's "middle-of-the-road" treatment and its effect on sightings is also interesting to note.

10. Under Project BLUE BOOK, it became apparent that if reporting, investigation and analysis procedures were improved, the percentage of unsolved sightings would decrease. Accordingly, the following procedures were adopted:

First, the 4602d Air Intelligence Services Squadron (Headquarters, Air Defense Command) (now 1006th) was directed to carry out all field investigations and preliminary evaluations of UFO sightings. This organization has units deployed throughout the U.S., and they are so highly mobile that they can arrive "on the spot" within a very short time after a UFO report is received. This

supplies the most important of all factors -- timeliness, and leaves the Air Technical Intelligence Center free to perform final analysis and evaluation.

Second, the issuance of a special directive (Air Force Regulation 200-2) which spells out details and responsibilities of Air Technical Intelligence Center, Air Defense Command and other Air Force units reporting investigation and analysis of UFO sightings. Combining spectrographic and stereo devices.

Third, the use of a special camera known as "Videon camera". This breaks down the light received from any object into its components, thus permitting the determination of the elements of which the object is composed. Seventy-five of these cameras were placed in radar stations and control towers throughout the U.S.

Fourth, the submission of all UFO data collected since 1947 to scientists in and out of the Air Force to determine whether or not a trend or pattern existed to indicate the nature or existence of the so-called flying saucers. This program was handled by the Battelle Memorial Institute.

11. These four procedures resulted in the following:

The AISS units contributed to the decrease in the number of unknowns, approximately from 10% to 3%. Next, the new regulation

greatly improved reporting and it emphasized the importance of cooperation by all Air Force units. Next, the use of Videon cameras, while not wholly successful due to the lack of operating personnel, produced no results to indicate anything but conventional airborne objects. Finally, the Battelle effort produced Project BLUE BOOK, Report No. 14 which in October 1955 was declassified by the Secretary of the Air Force and released in summary by the Department of Defense. This study, which covered 8 years of sightings concluded that:

First, there is a total lack of evidence that these unknowns were inimical or hostile or a threat to the security of the country.

Second, there is a total lack of evidence that these unknowns were interplanetary space ships.

Third, there is a total lack of evidence that these unknowns represented technological developments or principles outside the range of our present-day scientific knowledge.

Fourth, there is a total lack of any physical or material evidence -- not a piece - scrap - or a minute fragment of these so-called "flying saucers" was ever found. It is our belief that if more immediate, detailed objective observational data could have been obtained on the "unknowns" most of these too, would have been satisfactorily explained.

You may be interested in the rise and fall of UFO reports through the years, and to see the course of the unknowns which are obviously the prime concern of the Air Force.

CHART 2 - UFO Statistics for Calendar Year 1947 to recent past.

Note the peak year 1952 and subsequent decline.

CHART 3 - UFO Evaluation by Percentage 1955-1956

12. On this chart we show the categories of our UFO evaluations, for example 1955 and 1956 by percentage. You will note that the group which includes hoaxes, psychopaths, etc., has been cut in half, and the "unknowns" from 3% to 2.2%. This has roughly held to the present. (The group marked "insufficent data" has regrettably risen from 7% to 9.9%, possibly because of increased sky watching activities - sale of telescopes have risen over 200% since Sputnik I)

13. It is apparent, as previously stated, that, as prompter investigation becomes possible, as more experience in UFO investigation and analysis procedures is gained, and as better utilization of the services of scientists is made, the percentage of "unknowns" decreases.

14. At the present time, the UFO project organization, known as the "Aerial Phenomena Group," is part of the Air Sciences Division of the Air Technical Intelligence Center, Deputy for Science and Components. The project monitor is Captain Gregory and a small staff. However, as the Air Sciences Division consists primarily of scientists, such as Major Best, their services, as well as those of the engineering specialists throughout the Center, are available to the UFO project. The prime UFO scientist-consultant is Dr. Hynek, who is Professor of Astrophysics and Astronomy, Ohio State University, Secretary of the American Astronomical Society, and Director of the IGY Satellite Tracking Program. We are fortunate to have him. Other scientific personnel, outside the Air Force, are utilized on an "as needed" basis.

15. During the last two years, an increase in UFO reports has been noted. Paralleling this increase there has been a great increase in the number of private UFO organizations, books, motion pictures, and TV presentations on the subject. The advent of sputnik undoubtedly contributed.

16. Two years or so ago, there was only a handful of these self-appointed research organizations dedicated to investigation and analysis of UFO's. As of this date, there are more than fifty such organizations

of which we have knowledge, and they are increasing monthly.

17. In early 1955, five books written on "Flying saucers" were published. To date, over 30 have been published and have received wide circulation here and abroad.

18. Up to now, six motion pictures in circulation having "flying saucers" as their theme have been produced. One such motion picture was released in May 1956 and is still receiving some publicity. The main plot of this movie is centered around two colored film strips of so-called "flying saucers." These film strips were previously submitted to the Air Force for examination, and consist primarily of moving spots of light against a blue sky. Our conclusions were that the objects in one film were aircraft; and in the other, sea gulls. These conclusions were corroborated by an independent study made by the research organization of an aircraft manufacturer of very high standing, as well as by the CIA scientific panel which I previously mentioned.

19. With very few exceptions, both these self-appointed organizations and the books published, have been highly critical of the Air Force's handling of the UFO matter. They all exhibit a

desire to embarrass the Air Force. A number of these private organizations have written directly to President Eisenhower, to General White, to the Secretary of Defense and to important members of the Legislative Branch of Congress, requesting or demanding hearings, briefings, or discussions with UFO project officials.

20. We have written detailed letters to Senator Knowland, Senator Byrd, Senator Chase, and Representative Moss, Representative Henderson, Tollefson, to name a few, regarding aspects of the UFO program, which have been brought to their attention by so-called "UFO specialists."

21. Although these UFO organizations include sincere, well-meaning members, our experience in discussions with sponsors of such organizations has shown that any Air Force explanations or statements are either totally unacceptable or are met, at the least, with calculated skepticism. Our explanations and statements are either misinterpreted, misquoted, exaggerated or used out of context, all to the detriment of the Air Force in general, and the ACS/I in particular. I think we would be more impressed by all this were it not so profitable.

22. A few words are necessary, I think, on the extent and character of the public participation in the UFO program. The subject has seized

UFO PROGRAM

A brief history of the Unidentified Flying Object program would, I think, help you to understand some of its problems and determine its status.

2. The program started in 1947 when on 27 June of that year a private civilian flyer named Kenneth Arnold sighted what looked to him like several disc shaped objects near Mt. Rainier in the state of Washington. He described them as "flying saucers", a term that was forceably and with much sensationalism brought to the publics attention by the press. As a result, the Air Force was given the responsibility of investigating and analyzing such phenomena. This project was called "Project SIGN".

3. From this date, June 1947, to February 1949 when the name of the program was changed to "Project GRUDGE", approximately 375 UFO reports were collected and analyzed. In August 1949, a report on the results was submitted to the authorities. The average proportion of sightings which could not be explained, in other words unknowns, for this period was approximately 20%. It was concluded that these unknowns were due primarily to:

Hearing by the "House Select Committee on ~~Atmospheric Phenomena~~ astronautics & Space exploration" Subcommittee on Atmospheric Phenomena - on the Unidentified Flying Object Program Fri 8 Aug 58 2PM. House of Representatives

~~First~~, misinterpretation of conventional objects such as aircraft, balloons, astronomical bodies, also atmospheric phenomena, radar misfunctions and anomalies, ~~etc.~~ a lack of proper categorization.

Second, ~~residual~~ war nerves, mass suggestion and hysteria (Orson ~~Wells case~~).

Since then better methods have been developed as will be shown later,

~~Third, Hoaxes and publicity seeking.~~

Fourth, ~~the actions of psychopathic persons.~~

4. In December 1949, these findings were released to the public by the Department of Defense and were given wide publicity by the press.

5. From February 1949 to mid-1951 the project was carried on a low priority basis due to the economy policy of that time. However, in late 1951 renewed public interest and an increase in the number of sightings were reported. This increase in activity was due to the emphasis placed on UFO's by the press and ~~publicity~~, and possibly due to the Ground Observer Corps program. In the summer of 1951 the project was again reviewed and "Project BLUE BOOK" established to

replace "Project GRUDGE".

6. The peak year of the UFO program was 1952 when an average of over 100 reports per month was received. This compares with 10 per month for 1951. The publicity fanfare given to the UFO controversy by the press, publishers, writers and others, reached a high pitch during 1952 and developed a tendency on the part of the public to question the Air Force's handling of the alleged "menace" presented by flying saucers. This came to a climax in late July 1952 during the much publicized Washington Flying Saucer sightings which purported to show flying saucers over the Capitol but which were in reality blips on radar scopes created by quite unusual atmospheric conditions. As a result of this, General Samford (the then Director of Intelligence) a few days after the sighting held a press conference which was televised nationally. His explanation and assurance that the UFO phenomena seen were not of interplanetary origin and did not constitute a threat to the United States were not only received with skepticism but were in fact totally rejected by a large number of writers, so called UFO experts.

7. Following this, General Samford asked the CIA to set up a panel of scientists to review the UFO program and the Air Force's handling of the situation.

8. This panel was formed; it consisted of sixteen of the most distinguished scientists and authorities in the fields of physics, radar, geophysics, atomic energy, astronomy, rockets, guided missiles, scientific and technical intelligence, propulsion and photo interpretation, in the country. Their conclusions were that UFO's (a) held no direct physical threat; (b) were not foreign developments capable of hostile acts on the United States; and (c) were not unknown phenomena requiring the revision of current scientific concepts.

Their recommendations were:

a. First, that the UFO program be de-emphasized because it interfered with the normal operation and mission of many governmental services and agencies, particularly the Air Defense Command, which was compelled to use its radar, communications, air intercept and other units in investigating the overwhelming number of sightings brought to its attention. All to the detriment of its normal mission.

b. Second, that every effort be made to strip the UFO program of its air of mystery in the mind of the public, with the view of restoring the publics confidence in the ~~Air Force~~ Russell and relieving the public of quite unwarranted anxiety.

9. The correlation which exists between the type of treatment given the UFO matter by press and publishers, and the number of reports received, is important and is shown by this chart.

CHART 1 - Frequency of UFO Reports

This chart illustrates the effect of the conservative, scientific approach of Life and Look magazines on UFO reports for that period, in contrast to the newspapers' treatment of the Washington Radar "Flying Saucer" incidents and General Samford's press conference. The New Yorker's "middle-of-the-road" treatment and its effect on sightings is also interesting to note.

10. Under Project BLUE BOOK, it became apparent that if reporting, investigation and analysis procedures were improved, the percentage of unsolved sightings would decrease. Accordingly, the following procedures were adopted:

First, the 4602d Air Intelligence Services Squadron (Headquarters, Air Defense Command) (now 1006th) was directed to carry out all field investigations and preliminary evaluations of UFO sightings. This organization has units deployed throughout the U.S., and they are so highly mobile that they can arrive "on the spot" within a very short time after a UFO report is received. This

supplies the most important of all factors -- timeliness, and leaves the Air Technical Intelligence Center free to perform final analysis and evaluation.

Second, the issuance of a special directive (Air Force Regulation 200-2) which spells out details and responsibilities of Air Technical Intelligence Center, Air Defense Command and other Air Force units reporting investigation and analysis of UFO sightings. Combining spectrographic and stereo devices.

Third, the use of a special camera known as "Videon camera". This breaks down the light received from any object into its elements, thus permitting the determination of the elements of which the object is composed. Seventy-five of these cameras were placed in radar stations and control towers throughout the U.S.

Fourth, the submission of all UFO data collected since 1947 to scientists in and out of the Air Force to determine whether or not a trend or pattern existed to indicate the nature or existence of the so-called flying saucers. This program was handled by the Battelle Memorial Institute.

11. These four procedures resulted in the following:

The AISS units contributed to the decrease in the number of unknowns, approximately from 10% to 3%. Next, the new regulation

greatly improved reporting and it emphasized the importance of cooperation by all Air Force units. Next, the use of Videon cameras, while not wholly successful due to the lack of operating personnel, produced no results to indicate anything but conventional airborne objects. Finally, the Battelle effort produced Project BLUE BOOK, Report No. 14 which in October 1955 was declassified by the Secretary of the Air Force and released in summary by the Department of Defense. This study, which covered 8 years of sightings concluded that:

First, there is a total lack of evidence that these unknowns were inimical or hostile or a threat to the security of the country.

Second, there is a total lack of evidence that these unknowns were interplanetary space ships.

Third, there is a total lack of evidence that these unknowns represented technological developments or principles outside the range of our present-day scientific knowledge.

Fourth, there is a total lack of any physical or material evidence -- not a piece - scrap - or a minute fragment of these so-called "flying saucers" was ever found. It is our belief that if more immediate, detailed objective observational data could have been obtained on the "unknowns" most of these too, would have been satisfactorily explained.

You may be interested in the rise and fall of UFO reports through the years, and to see the course of the unknowns which are obviously the prime concern of the Air Force.

CHART 2 - UFO Statistics for Calendar Year 1947 to recent past.

Note the peak year 1952 and subsequent decline.

CHART 3 - UFO Evaluation by Percentage 1955-1956

12. On this chart we show the categories of our UFO evaluations, for example 1955 and 1956 by percentage. You will note that the group which includes hoaxes, psychopaths, etc., has been cut in half, and the "unknowns" from 3% to 2.2%. This has roughly held to the present. (The group marked "insufficent data" has regrettably risen from 7% to 9.9%, possibly because of increased sky watching activities - sale of telescopes have risen over 200% since Sputnik I)

13. It is apparent, as previously stated, that, as prompter investigation becomes possible, as more experience in UFO investigation and analysis procedures is gained, and as better utilization of the services of scientists is made, the percentage of "unknowns" decreases.

14. At the present time, the UFO project organization, known as the "Aerial Phenomena Group," is part of the Air Sciences Division of the Air Technical Intelligence Center, Deputy for Science and Components. The project monitor is Captain Gregory and a small staff. However, as the Air Sciences Division consists primarily of scientists, such as Major Best, their services, as well as those of the engineering specialists throughout the Center, are available to the UFO project. The prime UFO scientist-consultant is Dr. Hynek, who is Professor of Astrophysics and Astronomy, Ohio State University, Secretary of the American Astronomical Society, and Director of the IGY Satellite Tracking Program. We are fortunate to have him. Other scientific personnel, outside the Air Force, are utilized on an "as needed" basis.

15. During the last two years, an increase in UFO reports has been noted. Paralleling this increase there has been a great increase in the number of private UFO organizations, books, motion pictures, and TV presentations on the subject. The advent of sputnik undoubtedly contributed.

16. Two years or so ago, there was only a handful of these self-appointed research organizations dedicated to investigation and analysis of UFO's. As of this date, there are more than fifty such organizations

of which we have knowledge, and they are increasing monthly.

17. In early 1955, five books written on "Flying saucers" were published. To date, over 30 have been published and have received wide circulation here and abroad.

18. Up to now, six motion pictures ~~in circulation~~ having "flying saucers" as their theme have been produced. One such motion picture was released in May 1956 and is still receiving some publicity. ~~The main plot of this movie is centered around two colored film strips~~ of so-called "flying saucers." These film strips were previously submitted to the Air Force for examination, and consist primarily of moving spots of light against a blue sky. Our conclusions were that the objects in one film were aircraft; and in the other, sea gulls. These conclusions were corroborated by an independent study made by the research organization of an aircraft manufacturer of very high standing, as well as by the CIA scientific panel which I ~~previously mentioned~~.

19. With very few exceptions, both these self-appointed organizations and the books published, have been highly critical of the Air Force's handling of the UFO matter. ~~They [illegible]~~

~~desire to embarrass the Air Force~~. A number of these private organizations have written directly to President Eisenhower, to General White, to the Secretary of Defense and to important members of the Legislative Branch of Congress, requesting or demanding hearings, briefings, or discussions with UFO project officials.

20. We have written detailed letters to various Senators & Reps. ~~Senator Knowland, Senator Byrd, Senator Chase, and Representative Moss, Representative Henderson, Tollefson, to name a few~~, regarding aspects of the UFO program, which have been brought to their attention by so-called "UFO specialists."

21. Although these UFO organizations include sincere, well-meaning members, our experience in discussions with sponsors of such organizations has shown that any Air Force explanations or statements are either totally unacceptable or are met, at the least, with calculated skepticism. Our explanations and statements are either misinterpreted, misquoted, exaggerated or used out of context, all to the detriment of the Air Force in general, and the ACS/I in particular. I think we would be more impressed by all this were it not so profitable.

22. A few words are necessary, I think, on the extent and character of the public participation in the UFO program. The subject has seized

the imagination of the public, and, accordingly, the enthusiasm of the press. The unscrupulous have profited by it, and the publicity seekers have pursued it. Some organizers of public UFO groups have attempted to use membership in the GOC or other agencies as a means to endow their organizations with a quasi-official character, thereby increasing their appeal to the public. Some have actually obtained declassified reports from Air Force sources and reporduced them for sale. The subject is a boon to writer of sensational fiction or even popular science and the producer of pseudo-scientific movies. Any controversy on the subject is grist to their mill. It has become a subject for humor. This if unfortunate, for it is no joke. It is costing the Government a great deal of money; it is taking the time of valuable people, time which can't be spared. It could even be a potential weapon of psychological warfare, reducing as it does the confidence of the public in the Air Force. There are many other aspects of the public participation in the UFO program and, as far as the Air Force is concerned, they are nearly all bad.

23. There are, therefore, two distinct parts to the UFO program. The first is, of course, to improve operations with the object of reducing the number of "unknowns" to as near zero as possible. The

warfare, reducing as it does the confidence of the public in the Air Force. There are many other aspects of the public participation in the UFO program and, as far as the Air Force is concerned, they are all bad.

23. There are, therefore, two distinct parts to the UFO program. The first is, of course, to improve operations with the object of reducing the number of "unknowns" to as near zero as possible. The second is to cope with the growing problem of public participation in the program. We feel confident that the solution of the first will greatly help in solving the second. The first problem is wholly ours and is being so handled. The number of "unknowns" is being steadily reduced although as I said before it can never reach zero because of the fact that the reporting is invariably based on the impressions of individuals and are hardly ever based on controlled measurements. There appears to be little difference between the usefulness of reporting by qualified trained observers such as professional and pilots and those of lay observers.

24. The second problem involves matters of public relations, and the cooperation of the press, the education of the public, and of legal resources.

25. We will be glad to attempt to answer your questions.

PROPOSED HEARING 1961
(INCLUDING MR HINE'S VISIT)

7-3745 - 374

1003842

RETURN TO
USAF Historical Archives
ASI(ASHAF-A)
Maxwell AFB, Ala 36112

OFFICIAL FILE COPY
TD-E

TD-E/Major Friend/vw/69216
Unidentified Flying Objects

DRAFT

4 December 1961

TD-E (Colonel Wynn)

1. On 30 November 1961 Dr. J. Allen Hynek, consultant to the UFO project, and Major Robert J. Friend, TD-E, appeared on the Wayne State University TV program "Searchlight" (WUBG--Detroit). The program was generally conducted as an interview of the participants concerning the United States Air Force's unidentified flying objects program. Another show, conducted in the manner of the Mike Wallace interview, was put on tape for showing on or about 15 February 1962. Major Coleman, SAFOI-3c, coordinated the appearance of Air Force personnel on these programs. The program reached an audience of approximately 100,000 people.

2. Regarding the proposed Congressional hearing on the USAF UFO program, Major Coleman, SAFOI-3c, advised Major Friend, TD-E, that Congressman Karth stated to Mr. Richard Slawsky, Science Editor of the "New York World-Telegram", that the hearing would not be held. The events which led to Mr. Slawsky contacting Congressman Karth were a story written by the reporter about 15 November 1961 concerning UFO's and the great amount of mail which resulted. As a result of the indicated public interest, Mr. Slawsky contacted Major Coleman, SAFOI-3c, and Major Donald E. Keyhoe of the National Investigations Committee on Aerial Phenomena, a private UFO group. Major Coleman presented the Air Force view, and Major Keyhoe advised the reporter of the proposed hearing. Mr. Slawsky then contacted Congressman Karth and was advised by that worthy gentleman that he would not be a part of Major Keyhoe's cheap scheme to discredit the United States Air Force, and that there would be no hearing.

ROBERT J. FRIEND
Major, USAF
Chief, Aerial Phenomena Group

1003842

OFFICIAL FILE COPY
TD-E

TD-G (TD-E/Major Friend/vw/69216)

Congressional Committee Staff Member Visit 25 AUG 1961

AFSC (SCGF)

1. Mr. Richard P. Hines, staff member of the House Science and Astronautics Committee (Congressman Overton Brooks, Louisiana, Chairman), visited the Foreign Technology Division on 14 and 15 August 1961. The purpose of Mr. Hines' visit was to gather background information on Project Blue Book (Unidentified Flying Objects) for a hearing on this subject which is scheduled to take place early in 1962.

2. Project Blue Book (UFO) has been an active Air Force project since June 1947. The objectives of the project are to determine: (a) If unidentified flying objects are a threat to the security of the United States, (b) if any new, unique, or revolutionary technical or scientific aspects or developments are involved in the phenomena, and (c) to identify and/or explain all sightings. The directives which are applicable to this program are AFR 200-2 dated 14 September 1959 and JANAP 146D dated February 1959. FTD responsibilities, defined in paragraph 4c of AFR 200-2, require analysis and evaluation of reports of sightings of unidentified flying objects and overall monitorship of the program. The Office of Information, Office of the Secretary of the Air Force, is responsible for releasing information on sightings and for answering public correspondence regarding UFO's. The Office of Legislative Liaison is responsible for handling all Congressional interests in the program.

3. Mr. Hines was thoroughly briefed on our method of conducting the program and of the Air Force and Government-wide facilities which have been used to provide data and/or assist with the analyses. He also visited some of the facilities of the Aeronautical Systems Division which have been used to support the program. Dr. J. Allen Hynek, Director of the Dearborn Observatory, Northwestern University, consultant to Project Blue Book (UFO), was present and assisted with the briefing of Mr. Hines.

4. Mr. Hines indicated that Congressional interest in the UFO program resulted from pressures of undisclosed sources which were brought to bear on Congressman John W. McCormack, Massachusetts (Majority Leader). Discussion resulted in the collective opinion that Major Donald E. Keyhoe, U. S. Marine Corps Retired, and present Director of the National Investigation Committee of Aerial Phenomena, a private UFO organization, was probably behind the effort. This opinion is substantiated by the

facts that Major Keyhoe was behind previous efforts which resulted in Congressional briefings during August 1958 and July 1960; that present NICAP literature urges the members to write to their Congressmen and request that there be a hearing on UFO's; and that Major Keyhoe has, on his many television and radio appearances, spoken out for Congressional hearings.

5. It was indicated that Congressman Joseph E. Karth, Minnesota, will be the chairman at the hearing. The hearing will last approximately five days, four days for testimony of witnesses and the last day for an executive session. The Air Force will be required to provide witnesses, and I suggest that Dr. J. Allen Hynek and Major Robert J. Friend be among the persons appointed to attend. Dr. Hynek is the project consultant and Major Friend is the present chief of the Aerial Phenomena Branch.

6. Mr. Hines indicated he was favorably impressed with our handling of the program. I invited him to call on us for any future assistance which he might need in preparing for the hearing. I also indicated that it was desirable to have Dr. Hynek and Major Friend meet with Congressman Karth prior to the hearing, a view with which Mr. Hines readily concurred.

ARTHUR J. PIERCE
Brigadier General, USAF
Commander

COORDINATION: TD-E Robert J. Friend DATE 18 Aug '61
Major Robert J. Friend

TD-E Edward H. Wynn DATE 18 Aug 61
Colonel Edward H. Wynn

Congress of the United States
House of Representatives
COMMITTEE ON
SCIENCE AND ASTRONAUTICS
WASHINGTON, D. C.

OFFICIAL BUSINESS—FREE

WASHINGTON AUG

M. C.

Major Robert J. Friend
Chief, Aeriel Phenomena
Foreign Technical Director FFTD
Wright Patterson Air Force Base
Dayton, Ohio

RECEIVED
23 AUG 1951

OVERTON BROOKS, LA., CHAIRMAN
GEORGE P. MILLER, CALIF.
OLIN E. TEAGUE, TEX.
VICTOR L. ANFUSO, N.Y.
JOSEPH E. KARTH, MINN.
KEN HECHLER, W. VA.
EMILIO Q. DADDARIO, CONN.
WALTER H. MOELLER, OHIO
DAVID S. KING, UTAH
J. EDWARD ROUSH, IND.
THOMAS G. MORRIS, N. MEX.
BOB CASEY, TEX.
WILLIAM J. RANDALL, MO.
JOHN W. DAVIS, GA.
WILLIAM FITTS RYAN, N.Y.
JAMES C. CORMAN, CALIF.
JOHN W. McCORMACK, MASS.
JOSEPH W. MARTIN, JR., MASS.
JAMES G. FULTON, PA.
J. EDGAR CHENOWETH, COLO.
WILLIAM K. VAN PELT, WIS.
PERKINS BASS, N.H.
R. WALTER RIEHLMAN, N.Y.
JESSICA MC C. WEIS, N.Y.
CHARLES A. MOSHER, OHIO
RICHARD L. ROUDEBUSH, IND.
ALPHONZO BELL, CALIF.

COMMITTEE ON SCIENCE AND ASTRONAUTICS
HOUSE OF REPRESENTATIVES
WASHINGTON, D.C.

CHARLES F. DUCANDER
EXECUTIVE DIRECTOR AND
CHIEF COUNSEL

DR. CHARLES S. SHELDON II
SPENCER M. BERESFORD
PHILIP B. YEAGER
JOHN A. CARSTARPHEN, JR.
FRANK R. HAMMILL, JR.
EARL G. PEACOCK
RICHARD P. HINES
RAYMOND WILCOVE
C. OTIS FINCH
JOSEPH FELTON

August 21, 1961

Major Robert J. Friend
Chief, Aeriel Phenomena
Foreign Technical Director FFTD
Wright Patterson Air Force Base
Dayton, Ohio

Dear Bob:

We have finally returned from the wars to home base. The trip back was a bit wearisome and accomplished under considerable tension since my youngster developed a splendid case of tonsillitis which drove his temperature to 103 and better. As you can imagine this can be quite trying, but fortunately we found a Doctor who promptly shot the little lad in that well known area with penicillin. This did the job and he is now as chirpy as a squirrel.

Please accept my thanks, Bob, for your unstinting assistance and help during my stay in Dayton.

I have not as yet had an opportunity to discuss with Mr. Karth the results of my trip, but I am certain that previous decisions have not been changed. Today the Chairman confirmed his previous decision that no hearings will be held on UFOs during this session of Congress and no specific date can be or will be set for next year. For this I am sure both you and I breathe a deep sigh of relief. However, as you can imagine, the "plantiffs" have begun their clamor, stimulated by notices in the press of our committee's interest in UFOs.

If anything new develops I shall let you know.

Cordially,

Richard P. Hines
Staff Consultant

OFFICIAL FILE COPY
TD-E

TD-E /Major Friend/vw/69216

16 AUG 1961

Congressional Committee Staff Member Visit

SAFLL

1. Mr. Richard P. Hines, staff member of the House Science and Astronautics Committee, visited the Foreign Technology Division, Air Force Systems Command, Wright-Patterson Air Force Base, Ohio, on 14 and 15 July 1961.

2. The purpose of Mr. Hines' visit was to gather background information on Project Blue Book (Unidentified Flying Objects) for a hearing on this subject which is scheduled for early 1962.

3. There were no deficiencies indicated, nor was any corrective action taken or recommended.

EHW 8-15-61
EDWARD H. WINN
Colonel, USAF
Deputy for Science
and Components

COORDINATION: TD-E Robert J. Friend DATE 15 Aug 61
Major Robert J. Friend

HEADQUARTERS
FOREIGN TECHNOLOGY DIVISION
AIR FORCE SYSTEMS COMMAND
UNITED STATES AIR FORCE
WRIGHT-PATTERSON AIR FORCE BASE, OHIO

REPLY TO
ATTN OF: TD-X2e

SUBJECT: Visitors

11 AUG 1961

TO: Deputies and Staff Office Chiefs

The following individuals will visit Foreign Technology Division during the period 14 - 18 August 1961:

NAME	GRADE	ORGANIZATION	FTD OPI	FTD CONTACT	DAY
BEARD, James W.	GS-14	Washington, D.C.	TD-D	Mr. Herman	14-15
DUVALL, Gorjon L.	GS-13	Washington, D.C.	TD-D	Mr. Herman	14-15
STANFORD, Floyd B.	Capt	Washington, D.C.	TD-D	Mr. Herman	14-15
HINES, Richard		Congress of U.S.	TD-E	Maj. Friend	14-15

Paul F. Schwab

PAUL F. SCHWAB
Captain, USAF
Security Officer

TO: Colonel Wynn

SUBJ: Congressional Investigation of the UFO Program

1. At approximate 1515 hours 31 July Colonel Mullins of AFLC called Project Blue Book office reporting that he had been in contact with Colonel Boland's office, Legislative Liason, [Secretary of Tac A.F.] concerning Congressional Committee investigation of the Air Force UFO Program. He further stated that a staff investigator for the House Science and Astronautics Committee (Congressman Overton Brooks, Los Angeles, Chairman) Mr Dick Hines, was going to visit FTD in about a week to 10 days from 3 Aug 61 and Col. Bolin suggested that we prepare for his visit. Col. Mullins was given Major Friends leave phone number, and was going to give ~~this~~ same to Col. Boland, as it is felt that it would be much to our advantage to have Major Friend at FTD when Mr. Hines makes his visit.

James O. Baker
Tsgt NCOIC

~~43376~~
~~56905~~
77660

14 or 15 August
Call Carlisle

NOTIFICATION OF OFFICIAL VISIT

1. Date: 3 August

2. To: AFCIN-4X -4X2

3. From: TD-E

4. Dates of Visit: 14 August 1961

5. List of Visitors

Rank	Name	Job Title	Organization	Security Clearance
	Richard Hines	Technical Assistant, House Committee on Science & Astronautics		

6. Purpose of Visit:

Detailed briefing on the operation of the Air Force UFO Program

7. Arrival				8. Departure		
Place	Time	Date	Via	Time	Date	Via
FTD	0900	14 Aug 61	UNK		UNK	

9. Billeting Requirements: UNK

10. Office of Primary Interest	11. Project Officer	Office Ext.	Home Phone
	Maj. Robert J. Friend	69216	HA 5-7209

12. Meeting Location: Hdg. 828

13. Proposed Agenda Attached: ___Yes X No

14. REMARKS:

Mr. Hines will be arriving from Colorado Springs, Colorado. Mode of transportation is unknown.

15. Name, Grade & Title of Initiating Officer

EDWARD H. WINN Colonel USAF
Dep. for Science & Components

16. Signature

PROTOCOL ARRANGEMENTS (To be completed by AFCIN-4X)

17. ATIC Escort Officer	Office Ext.	Home Phone	18. Courtesy Call: Does visitor wish to visit any base personnel at home or office? Note in 14.

19. Social Activity

ATIC FORM JAN 61 5

Attachment 1 to ATICOI 12-1

HEADQUARTERS
FOREIGN TECHNOLOGY DIVISION
AIR FORCE SYSTEMS COMMAND
UNITED STATES AIR FORCE
WRIGHT-PATTERSON AIR FORCE BASE, OHIO

REPLY TO
ATTN OF: TD-E

SUBJECT: Congressional Investigation of the UFO Program

3 August 1961

TO: General Pierce
TDG

1. Reference our memo dated 14 July (copy attached) information was received on 1 August from Lt Colonel Joseph E. Boland, Legislative Liaison Office, Secretary of the Air Force, that a congressional investigation of the UFO program is definitely on the books. Mr. Richard Hines expects to arrive at WPAFB 0900, 14 August. Mr. Hines is the Technical Assistant for the House Committee on Science and Astronautics. Congressmen John McCormick (Mass.), Overton Brooks (Calif.), and Joseph Karth (Minn.) are behind the investigation.

2. I have alerted Major Friend, the Project Officer on the UFO Program, who is presently on leave, to report back to WPAFB in time to allow at least one-half day for discussion prior to arrival of the Committee. I have also alerted the contractor, Dr. Hynek, to be prepared to report to WPAFB on the selected date of reported investigation.

3. I propose to receive Mr. Hines and provided you agree, bring him to your office for introduction, and then conduct the discussions in my office. OK

4. I propose to conduct the investigation along the following lines:

a. FTD explores all reports and incidents concerning UFO items. Our objective is to get the facts, to analyze these facts, and to explain as clearly as possible the results of the analyses.

b. We seek no publicity on our part, nor embarrassment of any individuals involved in reporting UFO incidents. As a matter of fact we try to protect, to the maximum, the individuals concerned.

c. We have funds and personnel to investigate, on the spot, all incidents which appear to warrent such investigation. We utilize our own FTD facilities, and those of AFSC to make investigations and analyses.

d. We call upon the entire resources of the USAF to assist in the investigations of UFO incidents. Where a satisfactory explanation can be found by the local organization or units of the USAF these organizations are utilized to the fullest.

e. We give great consideration for quick reaction to all UFO incidents where conditions permit.

f. All public information aspects of the UFO Program are handled by the Secretary of the Air Force, Office of Information, Hq USAF.

5. I will keep you posted of any further developments.

Edward H. Wynn

EDWARD H. WYNN
Colonel, USAF
Deputy For Science and Components

664

HEADQUARTERS
FOREIGN TECHNOLOGY DIVISION
AIR FORCE SYSTEMS COMMAND
UNITED STATES AIR FORCE
WRIGHT-PATTERSON AIR FORCE BASE, OHIO

REPLY TO
ATTN OF: TD-E

SUBJECT: Congressional Investigation of the UFO Program 14 July 1961

TO: TDG(General Pierce)

1. An article appeared in the 3 July 1961 issue of Newsweek, stating the possibility of a congressional investigation of the USAF UFO Program. Contact with the Secretary of Air Force, Legislative Liaison Office(SAFLL) revealed that there was no official information concerning such an investigation. However, SAFLL pointed out that unofficially there were indications that such an investigation would take place.

2. Unofficial sources (SAFLL) have it that Congressman Joseph E. Karth, Minnesota, of the House Science and Astronautics Committee (Congressman Overton Brook, Los Angeles Chairman) would head the investigating team. The investigation to be directed toward determining generally how the USAF is handling the UFO Program and specifically the capabilities of FTD in the analysis and investigation areas.

3. SAFLL's present efforts are directed toward heading off the investigation or, if it is to occur, having it take place in Washington D. C. with Dr. J. Allen Hynek, Consultant to the UFO Program and Major Robert J. Firend, Aerial Phenomena Branch TD-E in attendance.

4. If the investigation is carried out at FTD I intend to handle it within the Deputy unless otherwise directed.

Edward H. Wynn

EDWARD H. WYNN
Colonel, USAF
Deputy for Science and Components

Good
AF
EHW

V

AEROSPACE TECHNICAL INTELLIGENCE CENTER
UNITED STATES AIR FORCE
WRIGHT-PATTERSON AIR FORCE BASE
OHIO

REPLY TO ATTN OF: AFCIN-4E/Major Friend/vw/69216

SUBJECT: Congressional Investigation

28 JUN 1961

TO: AFCIN-4E (Colonel Wynn)

Major Friend contacted Lt. Colonel Tacker, SAFOI-3d, concerning the article about Congressional Investigation of the Air Force UFO program. Colonel Tacker indicated that there was no official information on the subject; however he had contacted the office of Lt. Colonel Boland, SAFLL, regarding the article and would inform ATIC of any information which he received.

Robert J. Friend

ROBERT J. FRIEND
Major, USAF
Aerial Phenomena Branch

The Periscope

Periscoping the Nation

Rusk vs. Bowles
More on Flying Saucers
De Gaulle's New Problem
Peking Hospitality

Headlines to Come

STATE DEPARTMENT — Behind-the-scenes friction is building up between Secretary Rusk and his No. 2 man, Chester Bowles. Rusk is upset by the freewheeling Bowles' penchant for going directly to the White House with his ideas —ideas that Rusk sometimes hasn't even seen.

NEW YORK CITY — Putting Negroes into high posts on the New Frontier has played hob with the top echelon of the National Association for the Advancement of Colored People. The NAACP has lost almost as many top men as Harvard. Along with its chairman, Robert Weaver (housing chief), went a roomful of its top legal brains. Now the NAACP hears it may lose another: Thurgood Marshall (who argued the school-integration case before the Supreme Court) is in the running for a Federal judgeship.

HOUSE CLOAKROOM — Flying saucers are back. A special three-man House group will soon start a probe of "unidentified flying objects," officialese for saucers. Its first job will be to study Air Force UFO reports (which have scotched theories that they come from outer space).

The Inside Story

GETTYSBURG, PA. — Public speculation to the contrary, Ike's intimates insist the former President is giving no consideration to proposals that he run for the Senate or for the governorship of Pennsylvania. "He'll remain active in public affairs as a Republican leader," says one friend, "but he won't go through another campaign under any circumstances now conceivable."

NEWPORT NEWS, VA. — The aircraft carrier Enterprise, due to put to sea in December, may have to be a ship without a port. With eight atomic power plants, the huge ship will be kept out of major harbors by the Navy's own safety rules, and may be forced to anchor far from shore or use secondary ports.

NASHVILLE, TENN. — Here's the story behind that flurry of rumors and denials about Supreme Court Justice Hugo Black retiring and Tennessee's Sen. Estes Kefauver replacing him. Tennessee Gov. Buford Ellington, who'd like to name himself to the Senate before his term runs out next year, started the Kefauver talk and a Washington newsman tossed Black's name into the rumor mill.

Rounding Out the News

PEACE CORPS HQ — Sargent Shriver's recruiters have a new headache: What about wiser, older hands to head up the task forces of eager young volunteers? A new drive is in the works to round up "mature" candidates from such groups as Boy Scout leaders, schoolteachers, 4-H Club supervisors. They would, incidentally, draw higher pay than the younger recruits and would skip the five-and-a-half-hour "entrance exam."

HOUSE CLOAKROOM — JFK's man-on-the-moon project may have to conquer more than gravity. Democratic Rep. Clarence Cannon, chairman of the House Appropriations Committee, already has asked the President to scale down the project, calling it "a fantastic waste of money." His argument: What good is an American on the moon if Russians take over the earth?

PENTAGON — A new and fiendishly ingenious anti-guerrilla weapon is being tested by the Navy. It's a delayed-action liquid explosive, squirted from a flame-thrower-like gun, that seeps into foxholes and bunkers. Seconds later, fed by oxygen from the air, it blows up with terrific force.

Where Are They Now

MADISON, N.J. — When the Soviet pincers closed to starve the Western Powers out of Berlin thirteen years ago this week, man-on-the-spot for American Military Governor Gen. Lucius Clay was a tough, fast-talking, curly-haired Irishman,

(No part of The Periscope may be reproduced without written permission)

Brig.-Gen. **Frank L. Howley**, commander of the Berlin garrison. Today, Howley, whom the Russians cursed as the "Beast of Berlin" and West Berliners hailed as the savior of their city, is vice president of New York University. He returned to NYU (from which he was graduated in 1925) in 1952, three years after he left the Army. A former adman, art student (at the Sorbonne), and a horseman of international renown, Howley, now 57, lives here in a house described by his wife, Edith, as "middle-aged, like ourselves." They have a 17-year-old daughter and three sons, one an Army first lieutenant stationed at Fort Bragg, the other two college students (at NYU, naturally). Howley, who led the first ground party into Berlin, rides horseback as often as possible and is a tireless world traveler. His wife says of his comings and goings (he just got back from a month-long trip to Africa and Europe): "It's the story of my life."

WARE NECK, VA. — Lt. Gen. **William H. Tunner**, the coldly efficient commander of the massive airlift that kept West Berlin alive during the eleven-month Red blockade, is out of the Air Force and down on the farm. It's a 100-acre spread—mostly corn—in this waterfront town in southeastern Virginia. His house is a white-frame Colonial, built in 1820, where he lives with his wife, Ann, daughter Suzanne, 8. (Son William, 27, is a doctor; Joseph, 21, is a student at the University of Virginia.) A stern taskmaster (his nickname was "Willie the Whip"), Tunner pioneered big-scale airlifts with the memorable "Hump" operation in World War II, and retired last year after a tour as MATS chief. Now 54, he's a director of several companies, including Seaboard World Airlines, but spends most of his time "trying to keep the farm running," fishing, and writing a book—on airlifts. The current Berlin crisis? "It isn't my business."

Periscoping the World

World Whispers

UNITED NATIONS — Buried in the mass of figures in that experts' report on divvying up U.N. posts on the basis of population, was this worrisome fact. If Red China, with 650 million people, should be admitted to the U.N., Peking would rate no less than 32 posts—six more than the U.S., U.K., France, and Canada combined.

PARIS — Charles de Gaulle's troubles with the army may not be over. With 214 officers jailed (and nearly 1,000 slated for purge or resignation) for taking part in the army revolt in Algeria, the French high command has been forced to fill key African posts with officers taken out of Algeria because of right-wing leanings.

EMBASSY ROW — Westerners will get their first look at Yuri Gagarin's spaceship next month. The occasion: A mammoth airshow to be held at Tushino airport just outside Moscow. And no one will be too surprised if the Kremlin shows off the 800,000-pound-thrust missile that rocketed Gagarin into space, plus important new military equipment. This hardware display would, of course, be part of the war of nerves over Berlin.

Diplomatic Pouch

CONAKRY, GUINEA — Here is confirmation that Premier Sekou Touré is not so solidly in the Kremlin camp as may be thought: He is hopping mad at the Soviet Union and other satellite countries for failing to deliver commercial orders on time And plans for a big iron-ore development here call for financing by a group of West European bankers.

PEKING — The Red Chinese are moving to woo more of the world's Reds out of Moscow's orbit. Visiting Reds from Indonesia, Japan, and India are being royally wined and dined here and at the same time they are being urged to reorganize their thinking along Peking's death-to-the-capitalists line.

VIENNA — Is a highly touted front-runner in the who'll-succeed-Khrushchev sweepstakes fading? Dmitri Polyanski, boss of the Russian Republic, was conspicuously absent from three recent important gatherings of Soviet brass. He missed a parley of party leaders in the Bolshoi Theater, a space-and-rocketry award-giving session, and last week's Kremlin gala marking the start of the Soviet-Nazi war.

LONDON — Britain's admirals now are thinking of a big carrier program, to include at least three 50,000-tonners and four smaller "commando" types. The reason: Land bases in areas like Southeast Asia and the Indian Ocean will lose their usefulness as more British colonies become independent nations—and as Red China gets closer to joining the nuclear club.

EMBASSY ROW — It wasn't all cha-cha-cha during Indonesian President Sukarno's recent Moscow visit. While singing and dancing, Sukarno firmly rebuffed all attempts to woo him into giving up U.S. grants of more than $500 million.

OFFICIAL FILE COPY
4E

AFCIN-4E/Major Friend/vw/69216

Congressional Hearings (UFO) 17 May 1961

AFCIN-4E (Colonel Evans)

1. On 17 May 1961 Major Coleman, SAFOI-3c, called and informed me that the pressure was on for a congressional hearing on unidentified flying objects. He indicated that it was the opinion of SAFLL that we would be before Congress prior to December 1961.

2. Major Coleman stated that most of the present pressure was from Congressman Downing of Virginia, as evidenced by a nine page letter from the Congressman which requires a paragraph by paragraph answer.

ROBERT J. FRIEND
Major, USAF
AFCIN-4E

Joseph E. Karth
4th District, Minnesota

CONGRESS OF THE UNITED STATES
HOUSE OF REPRESENTATIVES
Washington, D. C.

Committee on
Science and Astronautics

August 28, 1961

RETURN TO:
Director
Aerospace Studies Inst
ATTN: Archives Branch
Maxwell AFB, Alabama

Major Donald E. Keyhoe
U.S.M.C. (Ret.)
Director, NICAP
1526 Connecticut Avenue, N.W.
Washington, D. C.

Dear Sir:

I have read with interest the copy of your letter to Chairman Overton Brooks including suggested "hearing plans."

Perhaps I have been misled in this whole business of UFO. However, it was my belief that you, your organization and others like it, actually had proof that UFO's did in fact exist and that you would be prepared to prove this during the course of the hearing. And further that UFO's were not merely the result of space or atmospheric phenomena, but actually were craft (of sorts) from other planets.

I was sadly disappointed as I read your proposed plan, suggestions and viewpoints. I cannot help but feel after so reading, that your primary if not sole objective, is to 'be-little', 'defame', 'ridicule' (with the least possible publicity, you say) and thereby cause the U.S. Air Force embarrassment unless they bare to you and others, all information you seek, including such information that may well involve our Nation's security. I too am opposed to unnecessary secrecy. However, unnecessary or unwarranted secrecy is nothing more than a matter of opinion. And so even though you and I are opposed to such, we may well disagree on extent and content. As a former military officer, you in your judgment and knowing all the facts, in all probability withheld from the public, knowledge I would not have considered "secret." I repeat - I have opposed and will continue to oppose unwarranted secrecy. At the same time I will not support a proposition smelling of sour grapes in disguise.

Your letter to Chairman Brooks (including your proposed plan) concerned itself almost totally, in my opinion, with evident dislike and malicious intent toward a great branch of the military. In fact it sounded to me like nothing more than cheap service rivalry. Now I hasten to add that I could be wrong, but I have read many plans and proposals in my day and must say I recognize a little prejudice and/or dislike when I see it. If you are not in a position to "make a good case" that UFO's are some kind of foreign craft, I'm not even interested in holding hearings. This I thought to be your purpose. Certainly I'm

not interested in listening to headline making accusations (prompted it seems by past gripes) in open debate between you and the Air Force.

It was my every intention to have the Air Force and organizations of good repute, testify on different days so as to get all the facts. This is the custom and the protocol of Congressional hearings. And I might say - I'm not worried about public alarm - I'm much more concerned about grandstand acts of a rabble rousting nature where accusations may be made THAT COULDN' BE ANSWERED BY ANYONE - the Air Force or NICAP. It's apropos to point out that under your plan you wouldn't be answering many questions if any - you'd just be asking them. Anyone can make someone else look bad under these conditions, and I am not a captive of the Air Force, I assure you.

As I have said, I suffered extreme disappointment as I read your plan. Talk about secrecy! In paragraph A of your letter to Chairman Brooks you propose "the Air Force representatives will be directed by the subcommittee to answer all of NICAP officials' questions in regard to specific UFO sighting, reports and to all phases of the Air Force investigation."

However, in paragraph B of the same letter you propose "...and the NICAP representatives will answer full, except for revealing names and certain details of a few reports given to NICAP confidentially." (Emphasis added). What kind of honesty, forthrightness and fairness is that? You demand that a military service of this nation is to divulge everything to you, BUT YOU IN TURN cannot give "certain details" because it is confidential (secret)? Oh, yes, I have also read paragraph C of your proposals ("It is also agreed that the Air Force may withhold names similarly, where witnesses insisted on this, and also, such minor items as classified radar techniques, aircraft speeds and other relatively unimportant points not bearing on this main questions at issue.) (Emphasis added).

Personally I don't feel I need to elaborate on the generosity equivocated by your language in paragraph C. However, no one interested in justice could refrain completely. First of all, what witness honestly interested in the security of his nation, is going to insist to the Air Force he remain anonymous? (Or to your organization for that matter). Secondly, you generously grant the Air Force the privilege of withholding "relatively unimportant points not bearing on the main questions at issue." Very generous, indeed. If you have information which the Air Force is keeping secret, but does not involve national security, I suggest you release it to the newspapers. They'll love it.

Honestly and sincerely, I make this confession;before I had received copies of your letter (and terms) to Chairman Brooks, I was vitally concerned and interested in what positive and factual information you had on UFO's and the assistance you might give to the Committee. You dispelled any hopes I had relative thereto in the language heretofore

cited. I also could not overlook your language on page three: "The chief concern of NICAP Board members and officials is the increasing secrecy dangers - NOT, at this time, final conclusions about the UFO's. Undoubtedly, I have been misinformed on the purpose of NICAP. I was erroneously led to believe you had factual evidence of some kind about UFO's

If I have anything to say about it, your terms, conditions and suggestions will not be accepted.

Very truly yours,

Joseph E. Karth

cc: Hon. Overton Brooks, Chairman
Hon. John McCormack, Majority Leader
Subcommittee members

JEK:eb

11-15 July 1960
Congressional Briefings (Mr R. Smart)

7-3745 - 372
1003843

RETURN TO
USAF Historical Archives
ASI(ASHAF-A)
Maxwell AFB, Ala 36112

SMC

d 17 Mar 61

ROUTING / COORDINATION

AFCIN-4
AFCIN-4X3
AFCIN-4X4
AFCIN-4X5
AFCIN-4X6
AFCIN-4X7
AFCIN-4A
AFCIN-4B
AFCIN-4C
AFCIN-4D
AFCIN-4E
AFCIN-4F
OTHERS

SMC

AFCIN-4E2x

ATIC UFO Investigation Capability

SAFOI-3d (L/Col Tacker)

1. During July 1960, ATIC participated in a briefing on the Air Force UFO Program for members of several Congressional sub-committees. Following the briefing Mr Robert Smart of the House Armed Services Sub-Committee made several recommendations directed at improving the capability of the Air Force to investigate significant sightings.

2. All of the recommendations that were made with reference to improving the UFO Program have been effected with one exception, the assignment of an additional officer to the UFO Branch to assist with the investigation of reports.

3. ATIC has accomplished what we feel is a better solution to the problem. Rather than utilize one officer full time, a group of four officers have been made available on a priority, on-call basis to assist with the problem. The UFO investigation requirement is cyclic and erratic; therefore, a group of officers can handle the task on a much more expeditious basis than one officer. Further, the officers selected for this duty have backgrounds in physics, chemistry, and electronics, and can be assigned to cases on the basis of apparent educational requirements.

4. It is requested that Mr Robert Smart be advised of this latest action to implement his recommendations.

FOR THE COMMANDER:

Philip G. Evans

PHILIP G. EVANS
Colonel, USAF
Deputy for Science and Components

COORDINATION:

AFCIN-4E2x Robert J. Friend Major Date 17 March 61

AFCIN-4E

CLASS: ____
OFFICIAL FILE COPY
AFCIN-4E2x
OFFICE RECORD
20 MAR 1961

RETURN TO:
Director
Aerospace Studies Inst
ATTN: Archives Branch
Maxwell AFB, Alabama

100343

ATIC FORM 144 (Rev 25 Sep 58) ROUTING AND COORDINATION SHEET

AFCIN-4

Unidentified Aerial Phenomena

HQ, USAF
(AFCIN)
Washington 25, D. C.

1. On 8 December 1960, B/Gen LeBailly, SAFOI, arranged a meeting with Col Hall, Deputy, ACS/I, to discuss recommendations made to the U. S. Air Force by Mr Robert Smart, House Armed Services Sub-Committee. These recommendations were concerned with the investigation of significant sightings of unidentified aerial phenomena. Following the meeting Col Hall instructed Major Friend, AFCIN-4x2x, to prepare a short summary of the Unidentified Aerial Phenomena Program, and to outline generally what would be required to bring the program in line with Mr Smart's recommendations. This correspondence is a result of those instructions.

2. For the past 13 years, the United States Air Force has been charged with the responsibility for investigating and analyzing reports of sightings of unidentified aerial phenomena.

3. Air Force Regulation 200-2, dated 14 September 1959, charges ATIC with overall program responsibility as well as specific responsibility for analysis. SAFOI is charged with the associated public relations and SAFLL satisfies Congressional interests. The Air Force base nearest the location of a specific sighting is responsible for reporting and investigation.

4. In the United States there are more than 50 private unidentified flying object (UFO) organizations. Collectively, these organizations boast more than 500,000 members. For the most part, persons belong to these organizations for either financial gain, religious reasons, pure emotional outlet, ignorance, or possibly to use the organization as a "cold war" tool. The principal claims of these organizations are that unidentified flying objects are interplanetary visitors and that the Air Force is withholding information it has concerning them.

5. The most active and influential of these organizations is the National Investigation Committee on Aerial Phenomena (NICAP). This organization is headed by Major Donald E. Keyhoe, U. S. Marine Corps (Ret). NICAP also claims such men as Vice Admiral R. H. Hillenkoetter, U.S.N. (Ret), formerly of CIA, and Rear Admiral H. B. Knowles, U.S.N. (Ret) as members of its Board of Governors.

6. Strenuous efforts by Major Keyhoe and others to discredit the Air Force's handling of the UFO Program have resulted in two Congressional

briefings. The first briefing was in the summer of 1958, and the second took place on 15 July 1960. The latter briefing was given to members of the House Armed Services Sub-Committee, House Space and Astronautics Sub-Committee, CIA, and representatives from the Office of the Secretary of the Air Force.

7. During the course of the 15 July 1960 briefing Mr Robert Smart of the Armed Services Committee stated that the investigative capability of the Air Force Bases, as currently provided, is limited to routine cases. He further stated that the Air Force should have both sufficient people and funds provided to permit investigation in depth in cases having special significance. Mr Smart requested that he and the other committeemen be kept advised of progress toward this end. He also requested that summaries of all significant cases be forwarded to his office.

8. During the period 12-20 August 1960, a rash of sightings occurred in the Red Bluff, California area. These sightings were handled in a routine manner by the Air Force, but apparently the conclusions did not satisfy the UFO public. In November 1960, these Red Bluff sightings came to the attention of Mr Smart. While querying SAFLL concerning the California sightings, Mr Smart also requested information concerning Air Force progress toward strengthening the UFO Program as proposed during the July briefing. SAFLL advised Mr Smart that the suggested changes had yet to be accomplished.

9. The following resources are available to ATIC for carrying out the UFO mission:

a. The Aerial Phenomena Group monitors the overall program and maintains the project files.

b. The scientific and technical capabilities of ATIC, and in addition, the facilities of ARDC, NASA, FBI and the Bureau of Standards provide assistance with the analysis of reports of sightings of unidentified aerial phenomena.

c. Special source information such as missile firing schedules, satellite data, balloon release schedules, special flight information, and weather data is available from the appropriate agency.

d. ATIC contracts the services of Dr J. Allen Hynek, Head of the Department of Astronomy of Northwestern University and Director of its Dearborn Observatory, as scientific consultant for the Unidentified Aerial Phenomena Program. Dr Hynek's services cost $3000 per year.

10. To satisfy the proposal outlined by Mr Smart, the following would be required:

a. Assignment of one additional officer to the Aerial Phenomena Group. Present strength is one commissioned officer and one non-commissioned officer.

b. An increase in the services of Dr Hynek at an estimated additional cost of $1000 per year.

c. Additional travel funds in the amount of $3000 per year.

d. Procurement of a polaroid camera and geiger counter for field investigation work.

11. ATIC is attempting to fulfill the responsibilities assigned by AFR 200-2. The proposed increase in scope of UFO investigation and analysis, however, can be adequately accomplished only by the increase of resources as stated.

RSK
12-27-66

2

3

OFFICIAL FILE COPY

AFCIN-4E2x/Maj Friend/amc/69216/typed 29 July 60

ATIC Capability for Investigating Sightings of Unidentified Aerial Phenomena

AFCIN-Pla (L/Col Sullivan)

1. A briefing on the Air Force Unidentified Aerial Phenomena Program was held for members of the House Armed Services Committee, House Space and Astronautics Committee and CIA on 15 July 1960. During the ensuing discussion Mr Robert Smart of the House Armed Forces Committee stated that due to the usually limited technical capability of the Air Force bases, ATIC should conduct the investigations on those cases which give indication of having special significance.

2. The ATIC Aerial Phenomena Group is presently staffed with one commissioned officer and one non-commissioned officer. To adequately conduct the additional function of investigation of significant sightings, this office requires the assignment of an additional officer.

3. It is estimated that it will cost $3000.00 per year travel funds to implement this capability.

4. The necessary action has been initiated at this level to obtain both the additional personnel and funds required to carry out this operation.

PHILIP G. EVANS
Colonel, USAF
Deputy for Science and Components

COORDINATION:

AFCIN-4E2x Robert J Friend Maj Date 29 July 60

AFCIN-4E2 _____ Date _____

COP COPY COPY

DEPARTMENT OF THE AIR FORCE
WASHINGTON

OFFICE OF THE SECRETARY Aug 2 1960

MEMORANDUM FOR ASSISTANT CHIEF OF STAFF, INTELLIGENCE

SUBJECT: Unidentified Flying Objects

1. On Friday, 15 July, in Secretary Sharp's Conference Room, members of this Directorate, AFCIN and SAFLL briefed the following Congressional Committees on the Air Force's UFO program: the Preparedness Sub-Committee of the US Senate, the Science and Astronautics Committee of the House, and the Armed Services Committee of the House.

2. In addition to personnel from each of these Committees and this headquarters, Dr. Hynek of Northwestern University (our civilian consultant on UFO's) and Major Friend of ATIC attended this briefing.

3. The Congressional Committees involved wanted reassurance from the Air Force concerning our position on unidentified flying objects because they have received a great deal of pressure from constituents advocating public hearings on this subject.

4. All personnel attending the briefing were pleased with the results and the general concensus is that no public hearings will be held in the near future.

5. However, this meeting and the informal discussions which followed revealed the fact that ATIC (Major Friend's office) must have immediate mobility to investigate specific UFO sightings which generate instantaneous press, public and Congressional interest. This mobility will, of course, involve TDY funds for Major Friend or other investigative personnel to visit the scene of a specific sighting and could, I am told, involve the assignment of additional personnel to Major Friend's office. SAFOI, SAFLL, Dr. Hynek and AFCIN-P-1a all concur in this need for immediate mobility in investigating certain specific sightings.

6. Therefore request your office support this recommendation and action be taken as soon as possible to implement this requirement.

ARNO H. LUEHMAN
Major General, USAF
Director of Information

cc: Maj Gen Musgrave, SAFLL
Colonel Sullivan, AFCIN-P-1a
Major Friend, ATIC

COPY COPY COPY

AFCIN-4E

17 AUG 1960

ATIC Capability for Investigating Citings of Unidentified Aerial Phenomena

AFCIN-P

1. During the week of 11-15 July 1960, meetings were held at Department of Defense (SAFOI-3d, SAFLL, and AFCIN-P1A) concerning status of the Air Force program for investigating and reporting on Unidentified Aerial Phenomena. During the course of these meetings, briefings were given to staff members of the Senate and House Committees concerned with this problem.

2. At a briefing on 13 July 1960, Mr. Stuart French of the Senate Committee on Preparedness pointed out that ATIC should have a capability to investigate those cases which give an indication of having a high intelligence or scientific potential, and also, those which generate an unusual amount of public interest. During the course of a joint briefing of members of the House Armed Services Committee, the House Sciences and Astronautics Committee, CIA, and Office of Secretary of the Air Force on 15 July 1960, Mr. Robert Smart of the Armed Services Committee stated that the investigative capability of Air Force Bases, as currently provided, is limited to routine cases. He further stated that the Air Force should have both the numbers and capability to conduct the UFO operation. This was taken to mean that the Aerial Phenomena Group of ATIC should investigate outstanding cases. An indication of the high priority assigned is the fact that for an interim period, financing of travel in connection with this program was authorized to be made directly from the Office of the Secretary of the Air Force.

3. This additional function is estimated to involve 12 to 15 cases each year requiring investigation and subsequent reporting. This represents an outlay of resources not originally programmed and not within the present capability of the Aerial Phenomena Group of ATIC, which is currently staffed with one commissioned officer and one non-commissioned officer. Performance of the function properly would necessitate the assignment of an additional officer and would cost approximately $3,000 in travel funds.

4. It is requested that the additional personnel and funds be authorized. This request is being routed to AFCIN-P, since the representative at the meetings, Lt. Colonel Sullivan, expressed a willingness to coordinate in securing the additional resources necessary. The officer selected for the

AFCIN-4 OFFICIAL FILE COPY

Memo, AFCIN-4E, ATIC Capability for Investigating Citings of Unidentified Aerial Phenomena

assignment should be a rated officer and have a scientific background (preferably physics or astronomy). The combined experiences and talents represented by an officer possessing these qualifications would be beneficial to this group in the investigative and analysis phases.

BARTON S. PULLING, Colonel, USAF
Chief of Staff, Aerospace Technical
Intelligence Center

COORDINATION:

Robert Friend Major 4 Aug 60
MAJOR FRIEND, AFCIN-4E2,

R R Shoop Col. 4 Aug 60
COLONEL R.R.SHOOP, AFCIN-4E2

4 Aug 60
COLONEL P. G. EVANS, AFCIN-4E

See comments attached.
LT. COLONEL PRICE, AFCIN-4X4

9 Aug 60
COLONEL NORMAN N. PERLBERG, AFCIN-4X

Altho I concur, wish to point out that possibly this could result in "yes, we agree, and then direct the space be withdrawn from some other ATIC area". Lt Col Price

JOINT MESSAGEFORM

SECURITY CLASSIFIC/
UNCLASSIFIED

SPACE BELOW RESERVED FOR COMMUNICATION CENTER

PRECEDENCE	TYPE MSG (Check)			ACCOUNTING SYMBOL	ORIG. OR REFERS TO	CLASSIFICATION OF REFERENCE
ACTION ROUTINE	BOOK	MULTI	SINGLE	AF	OR IG	
INFO						

FROM:
ATIC W-P AFB

TO:
AFCIN-R

SPECIAL INSTRUCTIONS

UNCLAS/AFCIN-4E2x

ATTN COL PATTESON. ATIC HAS BEEN NOTIFIED BY L/COL TACKER, SAFOI-3d, OF A REQ BY MR ROBERT SMART, HOUSE ARMED SERVICES SUB-COMMITTEE, FOR INFO CONCERNING ATIC CAPABILITY TO CONDUCT UFO INVESTIGATIONS. TELECONS WERE USED DUE TO THE URGENCY OF THE REQ. AT A BRIEFING ON 15 JULY 60, MR SMART RECOMMENDED THAT ATIC HAVE BOTH THE NUMBERS AND THE CAPABILITY TO CONDUCT UFO INVESTIGATIONS. PRESENT AT THIS BRIEFING WERE REPRESENTATIVES FR THE OFFICE OF THE SEC OF THE AIR FORCE, SAFOI, SAFLL, AFCIN-P, AND ATIC. FOLLOWING THE JULY BRIEFING, ATIC PREPARED A LTR TO AFCIN-P, SUBJ: "ATIC CAPABILITY FOR INVESTIGATING SIGHTINGS OF UNIDENTIFIED AERIAL PHENOMENA," DTD 17 AUG 60. THIS LTR STATED THE RQMTS NECESSARY TO MEET THE RECOMMENDATIONS OF MR SMART. ATIC WAS INFORMED BY A LTR FR AFCIN-R, SUBJ: "INVESTIGATIONS OF UNIDENTIFIED FLYING OBJECTS," DTD 21 SEP 60, THAT NO ADDITIONAL PERSONNEL OR FUNDS COULD BE AUTHORIZED, AND THAT INVES-

DATE	TIME
26	0925
MONTH JAN	YEAR 1961

WRITER

SYMBOL: AFCIN-4E2x

TYPED NAME AND TITLE (Signature, if required): Major Robert J. Friend

PHONE: 69216 | PAGE NR. 1 | NR. OF PAGES 2

SECURITY CLASSIFICATION: UNCLASSIFIED

RELEASER

SIGNATURE

TYPED (or stamped) NAME AND TITLE

DONALD M. WACKWITZ
Colonel, USAF
Chief of Staff (AFCIN-4X)

DD FORM 1 MAY 55 173 REPLACES DD FORM 173, 1 OCT 49, WHICH WILL BE USED UNTIL EXHAUSTED

JOINT MESSAGEFORM - CONTINUATION SHEET | SECURITY CLASSIFICATION: UNCLASSIFIED

FROM: ATIC W-P AFB

TIGATIONS MUST BE MADE WITH CURRENTLY AVAILABLE PERSONNEL AND RESOURCES. DUE TO THE COMMITMENT OF ASSIGNED PERSONNEL TO CURRENT INTELLIGENCE EFFORTS, ATIC HAS BEEN UNABLE TO AUGMENT THE UFO EFFORT WITH ADDITIONAL PERSONNEL. INVESTIGATION OF UFO SIGHTINGS OF EXTREME SIGNIFICANCE, AND CLOSE TELEPHONE MONITORSHIP OF THE INVESTIGATIONS OF IMPORTANT CASES CONDUCTED BY THE AF BASES, IS THE EXTENT TO WHICH ATIC HAS INSTITUTED THE RECOMMENDATIONS OF MR SMART. ACTION HAS BEEN INITIATED TO PROGRAM ADDITIONAL FUNDS TO ALLOW THE INVESTIGATION OF OUTSTANDING CASES DURING FY62. UNDER THE CURRENT MANNING DOCUMENT NO INCREASE OF PERSONNEL IS ANTICIPATED FOR THE UFO EFFORT IN FY62. IT IS REQUESTED THAT, WITH THE CONCURRENCE OF YOUR OFFICE, THE INFO PERTAINING TO ATIC'S COMPLIANCE WITH THE RECOMMENDATIONS OF MR SMART BE PROVIDED TO L/COL TACKER, SAFOI-3d, FOR FORWARDING TO MR SMART.

SYMBOL	PAGE NR	NR OF PAGES	SECURITY CLASSIFICATION	INITIALS
APCIN-4E2x	2	2	UNCLASSIFIED	

DD FORM 1 MAY 55 173-1

☆ U. S. GOVERNMENT PRINTING OFFICE: 1955—382356

1. PPT Nr.

TASK ACTIVITY REPORT

2. Title

3. Monitor
4. Symbol

5. Phone

6. Card Nr. 2
7. Date

8. NATURE OF REQUEST OR ACTION: ☐ Engineering Analysis (4D1); ☐ Graphics (4D2); ☐ Product Coordination (4E); ☐ Schedule Change (4X7); ☐ Program Change (4X5); ☐ Collect Support (4A); ☐ Staff Digest (4X2a); ☐ Contract Status (4X6)

_____ ACTION _____ INFORMATION _____ REPORTED _____ REQUESTED

9. Narrative:

10. ADDITIONAL RESOURCES REQUIRED: Originator : Support

11. NEXT COURSE OF ACTION OR REFERENCES:

12. COORDINATION & APPROVAL:

Lt Col Robert J. Friend

Card Nr. _____

PPT Nr. _____
Item 9 (Cont)

ATIC TEST FORM JUN 60 46a

TASK ACTIVITY REPORT (Page)

PPT Nr. [illegible] Card Nr. _____

Item 9 (Cont)

[illegible]

[illegible]

[illegible]

PPT Nr. 577102 Card Nr. 60-1

Item 9 (Cont)

COMMENT NR. 2

TO: AFCIN-4 Thru: 4X1

The attached trip report of Major Friend's is forwarded as a matter of information to alert management to do the job requested by the House and Senate Committees to investigate UFO reports which appear to have intelligence scientific or public relations potential. AFCIN-4E will initiate a memorandum to go to AFCIN-P, Colonel Sullivan, requesting the necessary additional funds and personnel. (Reference page 5 of the trip report.)

/s/ Evans
PHILIP G. EVANS
Colonel, USAF
Deputy for Science
and Components

COPY

PPT Nr.

TASK ACTIVITY REPORT

2. Title	3. Monitor 4. Symbol	5. Phone	6. Card Nr. 7. Date

8. NATURE OF REQUEST OR ACTION: ☐ Engineering Analysis (4D1); ☐ Graphics (4D2); ☐ Product Coordination (4E); ☐ Schedule Change (4X7); ☐ Program Change (4X6); ☐ Collect Support (4A); ☐ Staff Digest (4X2a); ☐ Contract Status (4X6)

_____ ACTION _____ INFORMATION _____ REPORTED _____ REQUESTED

9. Narrative:

10. ADDITIONAL RESOURCES REQUIRED: Originator : Support

11. NEXT COURSE OF ACTION OR REFERENCES:

12. COORDINATION & APPROVAL:

	H E Martin		
Maj Robert J. Friend	for Col R. P. Shoop		

PPT Nr. 5/710

Card Nr.

Item 9 (Cont)

4. Friday - 16 July 2100. [illegible]

AFCIN-1E (Cy 2)

ATIC TEST FORM JUN 60 46a

PPT Nr.

TASK ACTIVITY CARD

ATIC Test Form 46-B, Apr 60

PPT Nr.

TASK ACTIVITY CARD (Page 2)

ATIC Test Form 46-B, Apr 60

Item 9 (Cont)

Card Nr.

ATIC TEST FORM JUN 60 46b

OFFICIAL FILE COPY

AFCIN-4E2x/Maj Friend/amc/69216/typed 26 July 60

UFO Case Summaries

SAFOI-3d (L/Col Tacker)

1. Attached are summaries of the following UFO cases:

   a. Lubbock, Texas, 25 August 1951

   b. Washington, D. C., 19/20 - 26/27 August 1952

   c. Levelland, Texas, 2, 3, and 4 November 1957

   d. Redmond, Oregon, 24 September 1959

2. The summaries of these cases were requested by Mr Stuart French of the Senate Committee on Preparedness and Mr Robert Smart of the House Armed Forces Committee. This request was made at a briefing on UFO's which was given to these committees during the week of 11-15 July 1960.

FOR THE COMMANDER:

Nicholas Post 7/27/60
for PHILIP G. EVANS
Colonel, USAF
Deputy for Science and Components

4 Atch:
1. Lubbock, Texas summary
2. Washington, D. C. summary
3. Levelland, Texas summary
4. Redmond, Oregon summary

COORDINATION:

AFCIN-4E2x Robert J. Friend Maj Date 26 July 60

AFCIN-4E2 H E Martin Date 7/27/60

OFFICIAL FILE COPY

AFCIN-4E2g/Maj Friend/69216

ATIC Capability for Investigating Sightings of Unidentified Aerial Phenomena

20 July 1960

AFCIN-4X6 THRU: AFCIN-4E

1. On 15 July 1960, a briefing was held at the Department of Defense for members of the House Armed Forces Committee, House Science and Astronautics Committee and CIA. The subject of the briefing was the Air Force Unidentified Aerial Phenomena Program, and resulted from a recent increase in Congressional interest on the subject. This recent surge of interest is due in part to private UFO organizations complaining that the Air Force investigations of UFO sightings left something to be desired.

2. Mr Robert Smart of the Armed Forces Committee stated that the Air Force should have both the numbers and the capability to properly conduct the program, particularly the area of investigation. This was subsequently pointed out to mean that the Aerospace Technical Intelligence Center should investigate those cases which give indication of having high intelligence or scientific potential, and also those which have an unusual amount of public interest.

3. It is estimated that 12-15 cases each year would require investigation by ATIC. It is further estimated that the cost of investigating these sightings will average $200.00 each, or approximately $3000.00 per year. It is hoped that utilization of space available military aircraft will reduce the cost of this operation or allow us an extended capability.

4. Investigating these significant cases of sightings of unidentified aerial phenomena, from the standpoint of qualified personnel, is within the capability of AFCIN-4E.

5. It is requested that the necessary action be initiated to make $3000.00 available to AFCIN-4E for the purpose of investigating significant cases of sightings of unidentified aerial phenomena.

6. At the briefing it was decided that ATIC would be provided with an interim capability directly from the office of the Secretary of the Air Force. Appropriate accounting symbols to be requested by telephone.

CC to: AFCIN-4X7

RICHARD R. SHOOP
Colonel, USAF
AFCIN-4E2

OFFICIAL FILE COPY

AFCIN-4E2/Maj Friend/amc/69216/typed 11 July 60

UFO Briefing

11 July 1960

AFCIN-4E

4E2

1. L/Col Tacker, SAFOI-3d, telephoned Major Friend at 1530, Friday, 8 July 1960, and informed him that an UFO briefing would be held in the AFCIN briefing room at 1400, Wednesday, 13 July 1960. Col Tacker indicated that Mr Stu French and Mr Bob Smart, House Armed Services Committee, Mr John Carstorigan, House Science and Astronautic Committee, Gen Walsh, AFCIN, Gen Kingsley, SAFLL, and Gen LeBaily, SAFOI, will be present. Col Tacker also requested that Major Friend contact Dr Hynek, Air Force Consultant, and Mr Arcier, Scientific Advisor, AFCIN, to insure their presence.

2. Contact was made with Mr Arcier's office, and it was determined that he will be on leave until 25 July 1960.

RICHARD R. SHOOP
Colonel, USAF
AFCIN-4E2

14 June 1960

MEMORANDUM FOR RECORD

SUBJECT: Congressman Heistand

1. On 13 June 1960, Col Tacker called Major Friend to inform him that he had been requested to brief Congressman Heistand on the Air Force's UFO program. The reason for the briefing was that Congressman Heistand had a scheduled interview with Mr Harold Salkin. Mr Salkin is one of the two gentlemen who visited ATIC during the week of 30 May as "supposed" representatives of ARGOSY magazine.

Mr Salkin requested the interview to gather information for an article on the UFO subject which is to appear in an early edition of McCALLS magazine.

ROBERT J. FRIEND
Major, USAF
AFCIN-4E2

MEMO FROM OFFICE OF THE COMMANDER

TO: General Dougher Date 9 June

Col Evans left his copy of Major Friend's memo to him for your info. He said Col Shoop is on top of this, but tho't you should be aware of it.

ivy

Col Shoop

AEROSPACE TECHNICAL INTELLIGENCE CENTER
UNITED STATES AIR FORCE
WRIGHT-PATTERSON AIR FORCE BASE
OHIO

REPLY TO ATTN OF: AFCIN-4E2

SUBJECT: Possible Congressional Hearing

7 June 1960

TO: AFCIN-4E (Col Evans)

THRU: AFCIN-4E2 (Col Shoop)

Major Tacker, SAFOI-3d, Hq, USAF, Washington, D. C. called Major Friend 7 June and advised him that there is a very strong possibility that a Congressional hearing will be called on UFO. The particular area of concern is with the lack of adequate investigation. Major Tacker indicated that during Major Friend's next trip to Washington it might be profitable to sit down with L&L and discuss the situation. The specific incident which was probably the cause for this concern was a case which was brought to the attention of a Virginia Congressman, and had not been reported to ATIC by Langley AFB. Langley AFB was contacted by phone and they gave their reason for not reporting the incident as the fact that the witness was a chronic reporter of UFO's and they did not feel that the case was worthy of investigation.

ROBERT J. FRIEND
Major, USAF
AFCIN-4E2

...BRIEFING BY MR. HYNE
27 APR 1960

1

7-3745 -37/
1003844

RETURN TO
USAF Historical Archives
ASI(ASHAF-A)
Maxwell AFB, Ala 36112

JWS

UFO's 1960

(A written version of the talk presented by J. A. Hynek to the Hypervelocity Impact Conference Banquet at Eglin Air Force Base, April 27, 1960)

RETURN TO:
Director
Aerospace Studies Inst
ATTN: Archives Branch
Maxwell AFB, Alabama

I find it intriguing that at such a distinguished gathering as this I, an astronomer, should be asked to address you, not on the subject of satellite tracking—my work for the past four years—nor on stellar spectroscopy, stellar evolution, nor on the expanding universe—all topics to which I could do some manner of justice—but on Unidentified Flying Objects. Not that I am not qualified to speak on this topic. Perhaps, if I may be permitted to say so without incurring the charge of immodesty, I am uniquely qualified in all except one way to speak to you—and that exception is simply that I have never seen a UFO. But I have had as much experience, I daresay, as perhaps almost anyone with UFO's on their own plane of existence. And on that plane they are as real as rain. That plane is that of reports—for as far as any of us here are concerned—unless some of you in the audience have had personal experience—they exist for you and me simply as reports.

-MORE-

1003844

Some years ago the Air Force did me the honor of adopting--at least semi-officially--my definition of Flying Saucers. "A Flying Saucer is any aerial sighting or phenomenon that remains unexplained long enough for someone to write a report about it."

My acquaintance with Flying Saucers, as reports, goes back twelve years when, as an astronomer at Ohio State, and hence quite close to Wright Field and the Air Technical Intelligence Center--I was asked to review some 200 reports to see how many could be explained on an astronomical basis. Most unfortunately, the really interesting ones could not be. There were many meteors and fireballs, and occasionally the planets, as in one case where Jupiter and its four bright satellites was reported as a mother space ship and its brood of small craft. But the real lulus, silver disks that sped across the sky, lights that wandered about the sky at night, luminous objects that landed and from which emerged little men, or as in the case of two FBI operatives I interviewed (quite a switch--usually they interview me) who were scared witless (the word is witless) by a large version of a child's Christmas toy top that buzzed them on a lonely road in South Carolina at 4:00 a.m.--none of these reports had, at least in my mind, a ready explanation.

-MORE-

Now mind you. I'm not saying that these things happened. I'm saying that they were reported to have happened—a very, very great difference. And the central problem to which I address myself tonight, and on which I want you to be the judge and jury, is simply—what on earth (or perhaps I should say, what not on earth) could be the stimuli that gave rise to these reports.

This is the problem which concerns me—largely as a matter of curiosity—because in our times there has been no more bizarre phenomenon, that attracted the attention of so many, than that of the waves of flying saucer reports that have from time to time occurred in the U. S., in France, in Brazil, Italy and lately, I hear also, in the USSR. It chills me to think that our Russian colleagues, if they address themselves to this problem, might come up with an answer before we do—that is, an answer to the problem of report generation.

In what field of human endeavor might the answer lie? In physics, in psychology, in meteorology, in optics, in ESP, or finally in astronomy, or in the province of astronomy? It must lie somewhere—perhaps in many of these fields. (I mean the answer to where the stimuli for the reports lie.) The reports are real, and their cause must be real—even if the cause is mass hallucination, it is still a real cause.

What generated these reports? Here are a few things. (At this point in the talk slides of fireballs, illuminated cirrus clouds, balloons, artificial earth satellites were shown along with a number of cartoons from the popular press.)

What generated the others? What others?

Let us now grant that the great majority of reports are generated because people are simply not good observers, because they are easily mistaken in what they see, because they do not understand mirages, meteors, and strange meteorological phenomena. And also let us grant that some are generated because many people are downright superstitious, and what is more, because a great many people are wishful thinkers and, if the truth be known, lonesome. It might surprise us to realize how many people desperately want there to be other life in the universe and to be able to communicate with it. And hence these people will swallow any cock and bull story that by the remotest chance might be credible.

The universe of the astronomer today is a vast and frightening place. It was one thing when man had reason to believe that he was the king-pin in the universe and that he and the earth were the center of creation. But today, in his most uncertain world, frought with ICBM's and the threat of annihilation, there are many of us who would like to think that we are not alone, that we can be

friends with someone in the cold outside universe, and that perhaps through them make rapid strides in our science and even in our politics. There are some who believe that if we could turn our attention to something absorbing away from the earth perhaps our fears of nuclear warfare among ourselves would diminish, and perhaps that this new focus of attention might even lead to the solution of all of our hard problems as inhabitants of this tiny earth. For it is tiny. May I digress for a moment and speak as an astronomer rather than as a UFO investigator, to summarize for you the astronomical situation, for it is a very necessary backdrop to our story.

The world's largest telescope is the 200-inch Hale telescope on Mt. Palomar; it can see out into space several billion light years. The light year in itself is hard to visualize, but perhaps it can be attempted if one imagines a string going around the earth's equator 236 million times. The length of that string would be one light year. It is important to remember that the nearest star to the sun is four and one half light years away.

The distances are so vast that it is only natural that we try to condense them and make a model of things to aid our own thinking. Suppose we were to try to make a model, to scale, of everything that is visible through the world's largest telescopes. Let us give our imagination

full play and assume that we could use the entire area of the United States on which to construct our model—a sort of supercosmic Disneyland. If we did this we should discover to our amazement that even in such a stupendous model the earth would be completely invisible, even through a microscope. Yes, indeed, even through an electron microscope. Faced with such a universe in which to live, it is no wonder that man as a sub submicroscopic speck feels isolated and alone, and afraid of the Russians, and perhaps it is understandable that he might be desirous of seeking out and finding some understanding intelligence elsewhere. Indeed, there are few scientists, and particularly astronomers, who would not welcome bonafide evidence that intelligent beings did exist elsewhere and that there was a possibility of communication with them. (Think of the increased appropriations for scientists--and for UFO investigators!) Only our military friends, justly cautious, warn us, if this be the case, not to try to communicate first, lest our "friends" in space prove hostile and annihilate or at least exploit us. Perhaps we should be content to be alone in space!

(At this point in the talk a number of representative slides were shown depicting objects in the solar system, in our galaxy, The Milky Way, and clusters of galaxies out to the limit of the visible universe.)

-MORE-

Now we are through with our cosmic digression. I leave it for you to figure out for yourself how grossly probable it is that other life exists in the universe—somewhere in the countless other solar systems that, it would seem, statistically must exist—yet how improbable it is for such life to travel to us, and to communicate with us, unless it originates somewhere in our own solar system, or at very best, around some of the very nearest stars to us. There is, of course, always the outside possibility that other beings have invented means of extremely rapid transport, allowing them to travel with nearly the velocity of light. In this case, relativity points out that their time scale would be so short relative to ours, that to them it would appear as though they made a journey of many light years in just a few years. Although theoretically possible, this is yet too much in the realm of science fiction for us to consider seriously.

And now, with this stage setting, let us examine the reports—and again I emphasize that we shall be examining just reports, reports whose generating stimuli many of us would most dearly like to discover, for there may indeed be some very good physics hidden in them. Something caused these reports to be made. What was it? Were the causes related, or did one set of things generate one set of reports, say in France, and another in Brazil? Do Italian flying saucers bear the same stamp as those of the U. S. or of France? Let us examine the evidence.

I would now like to describe for you some French flying saucers. It appears that for about two months in France, from the middle of August to the middle of October, 1954, France was peppered with a barrage of UFO reports. Like mushrooms they spouted all over France and likewise some in Italy and some in Germany. The reports of these, however, came in largely through the medium of French provincial newspapers. And it was only through the work of Aime Michel, an enthusiastic investigator in France, that these reports were collated, plotted, and compared. The compilation of these reports appears in a book by Michel, "Flying Saucers and the Straight-Line Mystery." The "Straight-Line Mystery" in the title refers to the fact that when Michel plotted the reports for any one day on a very large-scale map, the reports had a devastating way of forming straight-line patterns on the map, most difficult to explain by chance.

I would not, of course, accept anything I read in a book without knowing something of the author. It chanced that I happened to be in Paris on other business and took two days off on my own to seek out Michel and talk with him. He lives with his wife and small son in a small modest Paris suburb apartment. He is a radio engineer and, what I was particularly anxious to find out of calm, rational department, quite unlike the typical enthusiast or crackpot with whom it has been my lot to come in contact from time to time. I went over with Michel many of his

stacks of newspaper clippings, which he had purchased at his own expense, and his maps, and I, at least, am convinced that the reports are real; that is, that the reports do exist as such in various French newspapers on those dates. I firmly believe that hoax and a deliberate attempt to concoct a cock and bull story must be ruled out. It would save us much bother and worry if we could take this way out, namely to say that Michel manufactured the reports out of thin air and wrote the book just to make money. From the returns he has had, I might say in passing that his labors must have been done at coolie wages.

In any event I feel reasonably certain that some stimulus existed in France—whether political, scientific, extra-terrestrial, meteorological, or psychological—that in the space of two months generated several hundreds of reports, reports which show a definite thread of pattern.

So, with this preamble, let us travel to France, in the late summer, 1954. The curtain apparently went up on this fantastic show on August 23, at 1:00 a.m., 40 miles northwest of Paris. A businessman had just put his car away, and as he came out of the garage he was surprised to see a pale light illuminating the town which had been in complete darkness a little while before. The night was completely clear and the moon was at last quarter, and hence

was rising at about that time.

Looking at the sky, he saw a huge, silent, motionless luminous mass, apparently suspended above the north bank of the river some 300 yards away. "It looked," he said, "like a gigantic cigar standing on end. I had been watching this amazing spectacle for a couple of minutes when suddenly from the bottom of the cigar came an object like a horizontal disk, which dropped at first in free fall, then slowed, and suddenly swayed and dived horizontally across the river toward me, becoming very luminous. For a very short time I could see the disk full-face; it was surrounded by a halo of brilliant light."

A few minutes after it had disappeared behind him, going southwest at prodigious speed, a similar object came from the cigar and went through the same maneuvers. A third object, and then a fourth—and finally a fifth detached itself from the cigar which was still motionless. This last disk dropped lower than the earlier ones, to the level of the new bridge, where it remained still for an instant, swaying slightly. At that time he could see very clearly its circular form and its red luminosity—more intense at the center, fading out at the edges—and the glowing halo surrounding it. After a few second's pause, it wobbled like the first four, and took off like a flash toward the north, where it was lost in the distance as it gained altitude. During this time the luminosity of the cigar had

faded, and the gigantic object, which may have been 300 feet long, had sunk into darkness. The spectacle had lasted about 3/4 of an hour.

Unbeknown to him, this observer reportedly had witnesses. Two policemen making their rounds at 1:00 a.m. also observed the phenomenon, as had an army engineer southwest of the town of Vernon.

The case was briefly described in the Paris newspaper, LIBERATION. Nothing more was done about it, except that Michel conducted his own investigation.

Speaking of policemen: if those same two policemen had reported that they had seen two thugs beat up a victim and take to the woods, their testimony might be sufficient to send someone to the chair; but when something violently unusual comes up, like this, or if they had seen the angel Gabriel riding along on a nine-legged octupus, no one would, of course, believe them.

Oddly enough, policemen have figured in many sightings. I remember back in 1947, a policeman in Oregon who was feeding pigeons in back of the station house, observed some flying disks. It was 1:00 p.m. on the Fourth of July, just two weeks after Kenneth Arnold had reported the first real newspaper case in the U. S., on June 24, 1947—the classic case from whence sprang the name flying saucer. He reported having seen "saucer-like objects' flying over Mt. Rainier.

-MORE-

To get back to France: How does one even begin to explain the first of the remarkable series of French reports? Well, if this case stood alone it would have little significance. Science cannot deal with an individual case. There must be repetition, and pattern.

Three weeks later, September 14, there was a repetition—in broad daylight, and observed by hundreds of witnesses in a half dozen villages in the general area 250 miles S.W. of Paris. Only one newspaper mentioned it, and only by chance did it get investigated. Witnesses were mostly farmers and a few priests and schoolteachers. One witness reported:

"It was about five in the afternoon. Emerging from the thick layer of clouds that looked like a storm coming up, we saw a sort of luminous blue violet mist, of a regular shape something like a cigar or a carrot. Actually the object came out of the layer of clouds in an almost horizontal position, slightly tilted toward the ground and pointing forward, like a submerging submarine.

"This luminous cloud appeared rigid. Whenever it moved, its movements had no connection with the movement of the clouds, and it moved all of a piece, as if it were actually some gigantic machine surrounded by mists. It came down rather fast from the ceiling of clouds to an altitude which we thought was perhaps a half a mile above us. Then it stopped, and the point rose quickly until the object was in a vertical position, where it became motionless.

-MORE-

"During this time the dark clouds went on scudding across the sky, dimly lighted from underneath by the violet luminosity of the object. It was an extraordinary sight, and we watched it intently. All over the countryside other farmers had also dropped their tools and were staring up at the sky like us.

"All at once white smoke exactly like a vapor trail came from the lower end of the cloud. At first it pointed to the ground but finally rose up to describe around the vertical object an ascending spiral. While the rear of the trail was dissolving in the air and being carried off by the wind, the source of the trail went up to the very top of the vertical object and then started to come down again, turning in the other direction. Only then, after the smoke trail had vanished entirely, could we see the object that was sowing it—a little metallic disk, reflecting in its rapid movements flashes of light from the huge vertical object. The little disk then stopped turning around the luminous cloud and went down toward the ground again, this time moving away. For quite a few minutes we could see it flying low over the valley, darting here and there at great speed, sometimes speeding up, then stopping for a few seconds, then going on again, flying in every direction between the villages that were four miles apart. Finally, when it was almost a mile from the vertical object it made a final dash toward it at headlong speed and disappeared like a shooting star into

the lower part where it had first come out. Perhaps a minute later the carrot leaned over as it began to move, accelerated and disappeared into the clouds in the distance. The whole thing lasted about a half an hour."

It would take us too long to quote from the other witnesses—about a hundred in all—but their stories were about the same.

At this point are you probably saying to yourselves, "Is this a serious scientist in front of us telling us a tall tale just to be entertaining? Could it be that he possible believes this stuff?" Well, certainly, if it is a tall tale, it is not consciously told as such. It is told, remember, as far as we are concerned, as a report. We are all somewhat in the fix, perhaps, of members of an aboriginal tribe attempting to evaluate the report of a fellow member who had, in some unaccountable way, an encounter with a helicopter, a device totally unknown to his fellow tribesmen. A tall tale, or did he really see something? Our only basis of judgment would be his past record of credibility, or the records of all those who reported having seen the helicopter. There would certainly be no scientific way of judging their story. The easy way out, of course, would be simply to regard it as just that—a story. It would absolve his fellow tribesmen from the necessity of doing any serious thinking about it.

In our own case, and in the cases shortly to be before us, we can vouch only for the fact that the reports do exist, and that whatever stimulus generated them, it generated them for a number of observers rather than a single individual.

Let us go on with a few more French saucers and then sample a few from this country and elsewhere. Let me capsulate a few:

September 7 at Amiens, 7:15 a.m.: "...my eyes were caught by a sort of mound, two hundred yards away in a field. It looked something like an unfinished haystack, with an upside down plate on top.

"That's a queer color for a haystack," I said to Yves,"look at it." All of a sudden I noticed that the haystack was moving a little, with a slight swing back and forth, like an oscillation. We both rushed toward the mysterious object. When we got close the object took off on a slant, traveled diagonally upward for about fifty feet, and then began to go straight up. We watched it for three minutes. The object was about 30 feet in diameter."

September 18: "...an object arrived at high speed over the horizon, stood still several minutes over the town, and then disappeared into the zenith."

September 19: "A circular object appeared suddenly in the north. It was flat gray and appeared to be metallic; it slowed, stopped, and remained motionless for about 30 seconds, during which time it swayed back and forth slightly. After a half minute it went off again in a northwest direction."

-MORE-

Same day, night: "A bright light crossed the sky, slowed down and landed. It seemed to be the size of a small bus. After staying on the ground for about 40 seconds, the light became reddish and rose vertically, and like a red ball, went off toward the southeast."

September 22: Under the clouds a huge, luminous ball hung motionless. Reddish and surrounded by a sort of moving smoke, also luminous. Watched for half an hour. Then suddenly from the lower part of the ball there emerged another, much smaller luminous ball; after a few seconds of free fall it slowed, turned obliquely and disappeared at high speed. A moment later dropped and went off—and then a third, and a fourth. Just then an airplane appeared in another part of the sky; it seemed on a collision course with the ball. The ball abruptly changed position and rose into the clouds and disappeared. The show was over.

September 26: The little dog began to bark and howl miserably. She saw it standing in front of something that looked like a scarecrow. But going closer she saw that the scarecrow was some sort of a small diving suit, made of translucent plastic material. Behind the blurred transparency of the helmet, two large eyes were staring out at her; the suit began moving toward her with a kind of quick, waddling gait.

She uttered a cry of terror and took to the fields. Looking back she saw a big metallic object, circular and

rather flat, rise up behind nearby trees, move off nearly level with the wheat field, and then took off toward the northeast with considerable speed, gaining altitude as it did so.

Neighbors gathered quickly and at the spot where the aircraft had risen, they found a circle, ten or so feet in diameter where the shrubs had been crushed. Trees at the edge of this imprint had some branches broken and the bark rubbed off, and the wheat in the direction of take-off was flattened out in radiating lines.

In this last cited report, the original witness was found in a state of nervous collapse. She was put to bed where she remained for two days with a high fever.

Likewise: September 28: A tramp locomotive was running on a railway line from Nantes to Vannes. In the marsh close to the tracks a circular, flat machine was in rapid flight just above the ground. Luminous, dark red, tinged with violet. It soon reached the locomotive, flying only a few yards above it, and then followed it. Then it accelerated and disappeared toward the west at a terrific speed. For a few seconds the clouds continued to be illuminated by a violet light. The fireman, bewildered, was trembling so much that his place had to be taken until they reached the station. He had to be helped to his bed and for several days he suffered from nervous shock.

The climax of the French wave came on September 30 and October 1, 1954, a wave which was over by October 18. But

on those two days, hundreds of reports flooded in. But there was no mechanism whatever to handle them. No scientist would touch this tricky subject, and their official Air Force team began sorting reports by tossing out the "obviously incredible reports." They latched onto those cases in which they could foresee a natural explanation, a most human and understandable reaction.

This French wave of stories is reminiscent of another wave of strange stories that flooded France a century and a half ago—stories of stones that fell from heaven. Persistent stories came in, in waves, from time to time, of stones that fell from the sky. Now, how credulous can one get—stones falling from the sky, indeed!

But in due course the French Academy of Sciences appointed a committee to study the subject, and after a full examination of the stories, reported back to the Academy that there was nothing to it—the stones in question had not fallen from the sky but had been hit by lightning! This despite their much greater density and obvious difference from surrounding stones. When a group of people don't want to admit something, there's nothing quite as hard headed as a scientific committee, on which each man has his scientific reputation to protect and going out on a limb is certainly not the way to do it.

The great irony of it—and I choose the word irony with care—came just a few years later when the little town of L'Aigle France was literally peppered with iron meteorites.

-MORE-

This time the French scientist Biot alone undertook the investigation, and in the face of incontrovertible evidence he and his colleagues finally were convinced. Since the year 1803 a meteorite can land in France with the full permission of the French Academy of Sciences.

Lest you think that all the cases I have are French, I will pass on to others, after just one more which bears some resemblance to a case which was reported from Louisiana, which, of course, was originally French territory.

It is October 4 and we are at Poncey. "It was about 8:00 p.m.," Mrs. Fourneret said, "and it had already been dark for some time. About 20 yards from the house, in the meadow, a luminous body was balancing itself lightly in the air, to the right of the plum tree, as if preparing to land. As well as I was able to judge, the object was about three yards in diameter and seemed elongated, horizontal, and orange colored. I was beside myself with fright and seized the boy, running with him to Mme Boullier's house where we closed the door tight."

The neighbors armed themselves, the report continues, and went out to investigate. Nothing was there, but they said they found an area over a yard and a half long, 27-inches wide at one end, 20 at the other, where the ground appeared to have been sucked up. On the fresh soil of this hole they said white worms wriggled, and the earth that had been torn out was

scattered all around the hole in clods ten or twelve inches across over a radius of about four yards. On the inner edge of the hole similar clods hung down; the earth had been pulled out in such a way that about half way down the hole was wider than at ground level.

They reported further that the little roots and rootlets in this fertile soil were intact everywhere on the inner sur face of the hole and that not one had been cut, as would have been the case if the excavation had been made in the normal way. At the center of the hole, they said, lay a plant with a long root, still attached by the end of the root to the soil at the bottom of the hole, with all its rootlets exposed to the air, completely undamaged. In short, if we are to accept this report made in concert by a small crowd and investigated by Michel, it looked just as if the mass of earth spread over the surrounding grass had been sucked out by a gigantic vacuum.

The report stated further that while the villagers still crowded around the edge of the hole, a lad arrived on his bicycle, not knowing anything of what had been going on. "What a fright I just had," he said, "I saw some kind of a luminous object that was going toward the southeast and climbing. It was like an airplane without any wings, nothing but the fuselage. And the faster it went, the greener it was."

Time does not permit me to continue these tales. There were also a number of cases during this interval involving encounters with occupants of the craft that had landed. Descriptions from all over France were remarkably alike. Small men, in diving suit-like costumes—all non-hostile but ready to protect themselves. Frequently it was reported that automobile motors and lights went out when the object was nearby, and promptly came back into normal operation when the object had left.

This brings to mind the famous Hopkinsville case in Kentucky, investigated by a chap who was, quite inadvertently and unbeknown to me at the time of his hiring, employed by me in the satellite tracking project. As time went on I got the full story from him and indeed I could have spent the entire hour tonight telling this talke, a tale so incredible that no sober scientist would care to be caught within ten feet of it. Yet it is one of the reports-and I stress again, reports, because my friend saw nothing himself, but merely interrogated, he having been at that time the announcer at their local radio station.

I have here some drawings that my friend composed from the descriptions given to him, independently, by the highly untutored people who reported they had had this outlandish experience. This brings to mind the report of Father Gill in New Guinea in which he stated that he waved to some creatures in a flying saucer and that they waved back!

By luck I seem to have known a number of people who were directly concerned with UFO cases, though unfortunately (or perhaps I should say fortunately!) I have never had any personal experience with a UFO. There was the dozing passenger in the famous Chiles-Whitted case in Alabama about 10 years ago, and there is the balloonist, Charles Moore, who recently took the observations that established the presence of water on Venus. Speaking of balloonists, I happen also to know personally the man who launched the first Sky Hook balloon, in the days when these things were supersecret, and which particular balloon happened to cause Captain Mantell's death when on that fateful day he blacked out in attempting to identify it.

The Charles Moore case is of some interest in itself because of the high technical qualifications of the observer. He was preparing a site for the launching of a large test balloon at White Sands on April 24, 1949. He was checking on cross-winds in the valley between two mountain ranges and had launched a small weather balloon, watching it in a theodolite, keeping it on the cross-hairs. He had a new chap on the team who wanted experience in tracking balloons; and so Moore turned the theodolite to him, cautioning him to keep it on and not lose it, because Moore didn't want to waste a balloon. Shortly after, Moore looked up to check the balloon by unaided eye and thought he saw it moving off to the east. He yelled at the chap that he had lost the balloon, but the chap said,

By luck I seem to have known a number of people who were directly concerned with UFO cases, though unfortunately (or perhaps I should say fortunately!) I have never had any personal experience with a UFO. There was the dozing passenger in the famous Chiles-Whitted case in Alabama about 10 years ago, and there is the balloonist, Charles Moore, who recently took the observations that established the presence of water on Venus. Speaking of balloonists, I happen also to know personally the man who launched the first Sky Hook balloon, in the days when these things were supersecret, and which particular balloon happened to cause Captain Mantell's death when on that fateful day he blacked out in attempting to identify it.

The Charles Moore case is of some interest in itself because of the high technical qualifications of the observer. He was preparing a site for the launching of a large test balloon at White Sands on April 24, 1949. He was checking on cross-winds in the valley between two mountain ranges and had launched a small weather balloon, watching it in a theodolite, keeping it on the cross-hairs. He had a new chap on the team who wanted experience in tracking balloons; and so Moore turned the theodolite to him, cautioning him to keep it on and not lose it, because Moore didn't want to waste a balloon. Shortly after, Moore looked up to check the balloon by unaided eye and thought he saw it moving off to the east. He yelled at the chap that he had lost the balloon, but the chap said,

"Nope--it's still on the cross-wires." Moore looked and confirmed this, and then rapidly switched the theodolite to the strange object, catching it after it had "passed through" the sun. It was elliptical, two or three times as long as it was wide, moving along its major axis, and covered the entire sky from the southwest to the northeast in 60 seconds. Five others saw it and confirmed Moore's sighting. Moore checked his refocus of the theodolite and found it had been focused for infinity. In my talks with him, he has completely ruled out the possibility of aircraft, particularly since it covered the sky in 60 seconds. It went down to an elevation of 25 degrees and then just before it disappeared, which it seemed to do quickly, it rose in elevation by 5 degrees, as checked by the theodolite.

This sighting has been classified as a mirage by some "experts" but the physics in this case certainly escapes me. Moore then launched another balloon and tracked it throughout its course to 90,000 feet. At no level were the winds from the southwest, so a balloon is ruled out.

I like to talk with and size-up reporters of reports. I have talked with Adamski, and find him an out-and-out fraud, despite the fact that Queen Wilhelmina gave him a special audience. He is the gentleman who professes to have regular consort with saucers and their inhabitants, and even to have taken a trip in a saucer. Long years of experience with people who come to the observatory, or write in about their

theories—which I file in my file called novel ideas to avoid the possible libel implications of crackpot—have taught me how a typical fraud or crackpot chooses his words and phrases. Among other things, he cannot conduct a rational discussion, but resorts to constant repetition; he won't listen to the other person and cannot answer questions rationally or intelligently.

I have never, however, attended a saucerian convention. The Sixth Interplanetary Spacecraft Convention was held in Yucca Valley, California, on last May 31 and June 1, with 10,000 in attendance. It was here that one newsman was wandering, bewildered, trying to find someone sane to talk to, and entered into conversation with one young woman who appeared to have sense; and so he discussed with her his interest in Mars, pointing out that he had a small telescope and often observed Mars. The young lady listened intently, making an intelligent comment occasionally, but the budding friendship ended most abruptly when she said, "How interesting—and when did you last visit Mars?"

At another convention, a saucer enthusiast distributed packets of hair clipped from a 385-pound Venusian dog. It's things like this that give saucers a bad name!! Scarce wonder that the whole subject—which undoubtedly has some scientific paydirt in it—is so easily tossed aside by responsible people. And, oh yes, at another convention one could buy a book

entitled, "My Saturnian Lover," photographs of saucers, the moon seen from an approaching saucer, moon scenery, and could buy a record of Saturnian music; and, if they stayed up late enough, the conventioneers would see mysterious blue lights at play and observe a balloon-shaped saucer that rose opportunely from behind the barn.

We have gone from the sincerely attested reports, made by people highly respected in their communities, to sheer charlatanism—but one must take care to step carefully to distinguish the daisies from the cow dung.

I have three more items to place before you, the jury.

"Last Monday night, about 10:30," Hamilton said, " we were awakened by a noise among the cattle. I arose, thinking that perhaps my bulldog was performing some of his pranks, but upon going to the door saw to my utter astonishment an airship slowly descending over my cow lot, about 40 rods from the house. Calling my tenant, Gid Heslip, and my son Wall, we seized some axes and ran to the corral.—Meanwhile, the ship had been gently descending until it was not more than 30 feet above the ground, and we came within 50 yards of it. It consisted of a great cigar—shaped portion, possibly 300 feet long, with a carriage underneath. The carriage was made of glass or some other transparent substance alternating with a narrow strip of some material. It was brilliantly lighted within and everything was plainly visible—it was occupied by six of the strangest beings I ever saw. They were jabbering together, but we could not understand a word

they said.

"Every part of the vessel which was not transparent was of a dark reddish color. We stood mute with wonder and fright, when some noise attracted their attention and they turned a light directly upon us. Immediately on catching sight of us they turned on some unknown power, and a great turbine wheel, about 30 feet in diameter, which was slowly revolving below the craft began to buzz and the vessel rose lightly as a bird. When about 300 feet above us it seemed to pause and hover directly over a two-year old heifer, which was bawling and jumping, apparently fast in the fence. Going to her we found a cable about a half-inch in thickness made of the same red material, fastened in a slip knot around her neck, one end passing up to the vessel, and the heifer tangled in the wire fence. We tried to get it off but could not, so we cut the wire loose and stood in amazement to see the ship, heifer and all rise slowly, disappearing in the northwest. We went home, but I was so frightened I couldn't sleep. Rising early Tuesday I started out by horse, hoping to find some trace of my cow. This I failed to do but coming back in the evening found that Link Thomas, about three or four miles west of Leroy, had found the hide, legs and head in his field that day. He, thinking someone had butchered a stolen beast, had brought the hide to town for identification, but was greatly mystified in not being able to find any tracks in the soft ground. After identifying the hide by my brand, I went home; but every time I would drop to sleep I would

-MORE-

see the cursed thing, with its big lights and hideous people. I don't know whether they are devils or angels, or what; but we all saw them, and my whole family saw the ship, and I don't want any more to do with them."

Hamilton has long been a resident of Kansas and is known all over Woodson, Allen, Coffey and Anderson counties. He was a member of the House of Representatives. He staked his sacred honor upon the truth of his story. An affadavit follows: As there are now, always have been and always will be skeptics and unbelievers whenever the truth of anything bordering on the improbable is presented, and knowing that some ignorant or suspicious people will doubt the truthfulness of the above statement, now, therefore we, the undersigned, do hereby make the following affadavit: That we have known Alexander Hamilton from one to thirty years, and that for truth and veracity we have never heard his word questioned, and that we do verily believe his statement to be true and correct.

signed--E. V. Wharton, state oil inspector; M. E. Hunt, Sheriff; W. Lauber, Deputy Sheriff; H. H. Winter, Banker; H. S. Johnson, Pharmacist; J. H. Stitcher, Attorney; Alexander Stewart, Justice of the Peace; F. W. Butler, Druggist; James W. Martin, Registrar of Deeds; and H. C. Rollins, Postmaster.

SUBSCRIBED AND SWORN TO BEFORE ME THIS 21st DAY OF APRIL, 1897

-MORE-

This sighting was but one of a great many that took place during the great airship episode of 1897—the ship that was sighted and its progress watched all the way from San Francisco to Virginia. A look at the newspaper files of that day will recount the events.

Let us come to more recent times: Again—let me remind you that as before we are dealing at the level of reports. These are nothing but reports I bring before you—and on their level of existence, they are real--that is--real reports.

November 2, 1957, Levelland, Texas: At 10:50 the police station received a call from a local farmhand and part-time barber, Pedro Saucedo (a symbolic name), and his companion Joe Salaz. The story: We first saw a flash of light in the field to our right, and we didn't think much about it—then it rose up out of the field and started toward us, picking up speed. When it got nearer, the lights of my truck went out and the motor died. I jumped out and hit the deck as the thing passed directly over the truck with a great sound and a rush of wind. It sounded like thunder, and my truck rocked from the blast. I felt a lot of heat. Then I got up and watched it go out of sight toward Levelland.

Saucedo said the object was torpedo shaped—like a rocket—and estimated it as 200 feet long. Afraid to return to Levelland for fear of encountering it again, the two men drove on to Whiteface, ten miles west of Levelland, where they phoned in their report. Although Saucedo sounded terrified, the

officer on duty did not at that time take the report seriously.

But an hour later the police got another telephone report. Jim Wheeler, about four miles east of Levelland, had seen a blazing 200-foot egg-shaped object sitting on the road ahead of him. At the same time, his car lights went out and his motor died. The object rose and disappeared. A few minutes later came a call from Witharral, ten miles north-northeast of Levelland; Jose Alvarez reported that his lights and motor had gone dead as he drove near a bright, egg-shaped object on the road. At 12:15 a.m. Frank Williams of Kermit, Texas, reported a similar encounter in the same area. While the officials were out investigating—and, incidentally, reporting strange lights themselves—the police station received a call from James Long, who reported that at 1:15 a.m. he had been driving on a farm road five miles N.W. of Levelland when he came upon a 200-foot-long, egg-shaped mass that glowed like a neon sign. His engine coughed and died, and his lights went out. As he got out and approached the object, which was less than a hundred yards away, it suddenly took off straight upwards. After the object was gone, his engine started easily.

These engine stoppings, we remember, also occured in the French incidents. The next day two more witnesses reported to the police that they had encountered a UFO. Texas Freshman was approaching Levelland at 12:05 a.m. when he noticed his ammeter jump to discharge and back—then his motor quit as if

it were out of gas—and the lights went out. He got out and looked under the hood but could find nothing wrong. Turning around he saw on the road ahead an egg-shaped object with a flattened bottom—like a loaf of bread and glowing not as bright as neon. No portholes or propellers were visible. Frightened, Wright got back into his car and tried to start it, but without success. After a few minutes, the egg rose almost straight up, veered slightly to the north and disappeared from view in a "split instant." After it was gone, the car started normally.

And now, let us come up almost to the present. This month (April at LaCamp, Louisiana, there was a sighting which bears some relation to those in France. There was, unfortunately, only one visual witness but several auditory witnesses. The object or object—but witness says one object—came silently out of the north, and the attention of the witness was first attracted by loud explosions and a bright firey red light at ground level about two or three hundred yards away. Witness stated that the object and light combined had the size of a nickel held at arm's length and that it appeared to circle, bounce, then turned and went off into space after it had made a number of momentary contacts with the earth. The entire phenomenon lasted only two or three seconds, but when daylight was available again pictures were taken of the impact points. On five of these, paint or metallic substance had scraped off but no other physical evidence

was found. The area was searched by helicopter and on foot for a quarter of a mile radius, but no hardware was found. Five craterlets were formed, each about 10 inches deep, 18 inches wide, and 30 inches long, which were fresh. Although the territory of impact was unimproved, the evidence seems clear that the marks were actually made at the time of the explosion. Close to one of the impact marks the bark had been scraped off a tree, one branch had been broken, presumably by the object, and leaves were torn off the top portion of the tree.

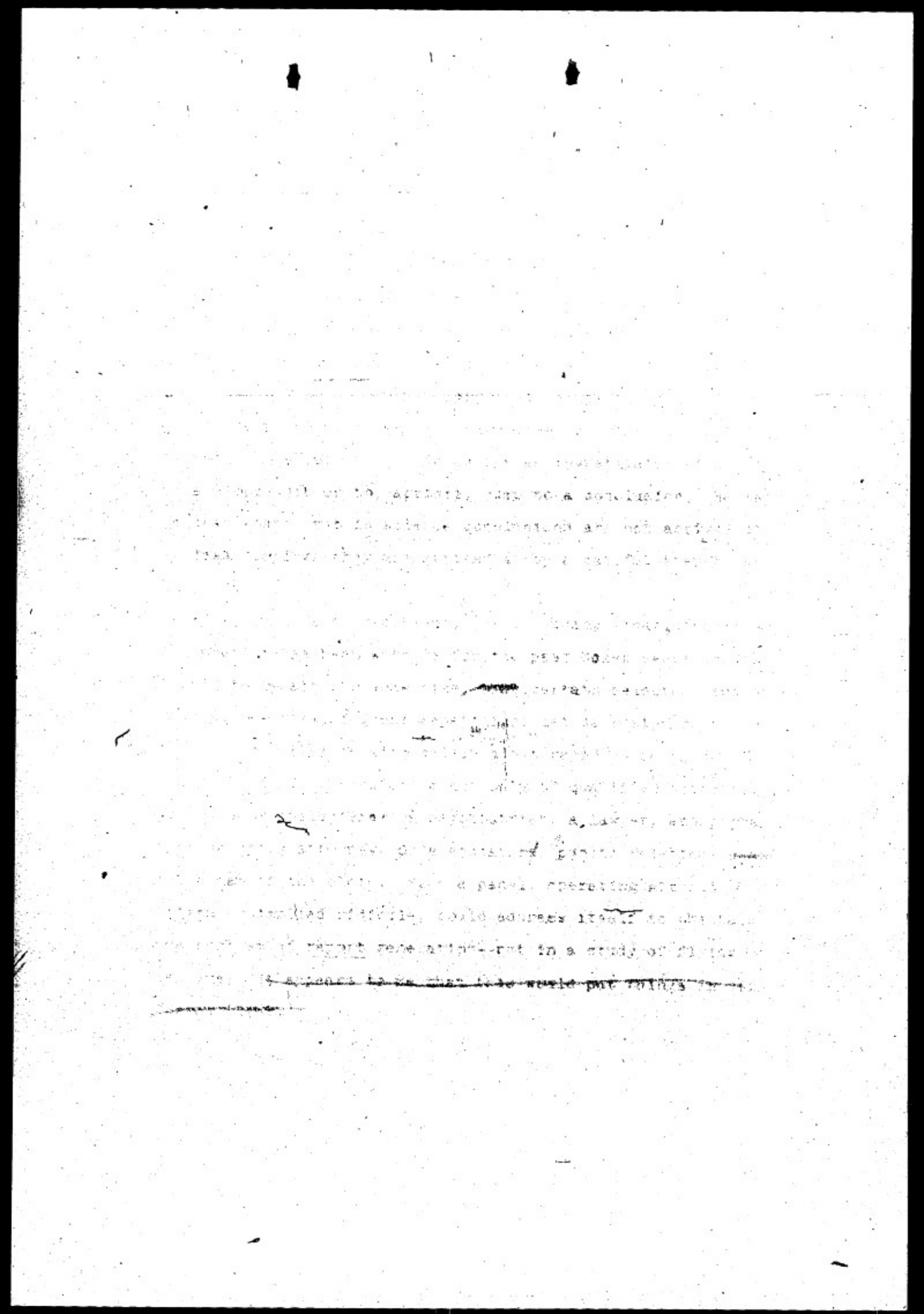
The investigation completed so far indicates that there was no aircraft whatever in the area and further that there had been no sounds previous to the time of contact. No aircraft

We still must address ourself to the task of evaluating what were the stimuli that gave rise to the typical examples I have outlined to you. I should say the typical unknown, [illegible] perfectly familiar objects or phenomena that have been misidentified by the person making the report. We might [illegible] phenomena that require [illegible]

[illegible] perceptible [illegible] [illegible] [illegible]

[illegible] Venus is an accepted phenomenon. Venus is known to be there and the people in charge at the present were all highly reputable scientists of adviable past records. None of these conditions ~~obtained~~ prevail in the matter of the UFO. We have not the slightest notion that "Venus" is there in any case, and it seems highly unprofitable to expend vast amounts of energy and the time of scientists and engineers who might more profitably employed otherwise. In attempting to find an answer to the question What ~~was~~ were the stimuli that gave rise to these reports?

[illegible] yet when this "noisy signal" has been coming in for the past dozen years at least and occasionally it seems to be a "blip" which rises well above the noise level, as in the case of some of the French sightings, one does indeed wonder whether the time has come to pay some attention to it. The role of the Air Force in the problem of the UFO in the past dozen years has been in line with its avowed mission, namely that of determining the potential hostility of any action in the air that cannot be immediately explained. Their verdict to date has been that whatever the stimuli for



BRIEFING AFIT BY LTCOL FRIED
9 FEB 1961

RETURN TO
USAF Historical Archives
ASI(ASHAF-A)
Maxwell AFB, Ala 36112

7-3768 - 376
1003845

SECRET

INSTITUTE OF TECHNOLOGY
Air University
United States Air Force
Wright-Patterson Air Force Base, Ohio

SMC

REPLY TO ATTN OF:

SUBJECT: Request for Briefing

January 19

RETURN TO:
Director
Aerospace Studies Inst
ATTN: Archives Branch
Maxwell AFB, Alabama

TO: Commander
Aerospace Technical Intelligence Center
Attn: Col Jackwitz
Wright-Patterson AFB, Ohio

1. Request a briefing be given by ATIC on UFO programs and problems to an audience of approximately 50 to 75 members of the Institute of Technology student body and faculty. This briefing will be sponsored by the Institute's chaper of Tau Beta Pi and be one of a monthly series of lectures on topics of general technical interest.

2. The time desired for the briefing is 1110 hours on Thursday, 9 February, in the Institute of Technology Auditorium, Building 125. A total of 50 minutes will be allocated for the presentation with possibly 35 minutes for lecture and 15 minutes for a question-answer period.

3. I have discussed this matter informally with Major Friend and Mr. Hieatt.

William J. Wilson

WILLIAM J. WILSON
Captain, USAF
Vice President, Ohio Eta of Tau Beta Pi
Box 3336, Institute of Technology

1003845

Unidentified Flying Objects - UFO's

As a term in military parlance, means any air-borne object, usually aircraft, which fails to identify itself to, or to be identified by, trained ground or air-borne visual or radar crews. In such cases it is the duty of the U. S. Air Force, charged with the protection of the nation from possible attach from the air, to secure identification of the UFO and to take appropriate action.

Since 1947, owing to a sequence of bizarre circumstances, UFO has become an omnibus term connoting any object or optical phenomenon, usually aerial, which the observer cannot readily explain. Lacking scientific or technical training, a witness may ascribe unwarranted properties and origin to the UFO. "UFO" is frequently used interchangeably with "flying saucer," a term coined in 1947 as a result of the reported sighting by a civilian pilot, Kenneth Arnold, of a series of disc-like objects which reportedly cavorted about the mountain ridges in the vicinity of Mt. Rainier. This prototype sighting was followed by a wave of reports of unidentified objects of various types (colors, shapes, maneuvers) by observers in various parts of the U.S.A. and in other countries also.

Since then, many such reports of sightings have been made through official channels to the Air Force, which holds the responsibility for the identification of UFO's. Observations have generally occurred in waves, but on the average, since 1947, they have numbered better than one a day. If one notes that many reported sightings are not made through official channels, but to newspapers and to civilian groups interested in the phenomena of UFO's, it can be estimated that the rate of observations may be as high as two or three a day in this country, over a period of a dozen years. France, Italy, England and a number of Latin American countries have also experienced minor waves of UFO reports.

The official Air Force tally of reported sightings follows:

1947	79
1948	143
1949	186
1950	169
1951	121
1952	1501
1953	425
1954	429
1955	404
1956	778
1957	1178
1958	590
1959	364
1960	423
Total	6790

The steady stream of reports has been the cause of concern to the Air Force and detailed investigations have been made to discover the stimuli that give rise to such reports. The Air Force objectives have been to determine (1) whether the reported UFO's constituted a threat to the nation, (2) whether the phenomena had any intrinsic scientific value, and(3) the role UFO's may play as a factor in the sky surveillance program. It has been concluded over the many years of UFO investigations that: (1) the phenomena bore no hostile purport and did not constitute a security threat, (2) there was no compelling reason to believe that the great majority of sightings arose from anything other than misidentification of natural objects and phenomena, and that the real cause of these sightings generally lies in the conditions under which an object or phenomenon is seen, and (3) the continued evaluation of UFO reports is of scientific value and, especially, necessary in the evaluation of the military sky surveillance problem.

It has been established that many sightings have arisen from the viewing of frequently startling natural objects for the first time, e.g., of very bright meteors, high altitude scientific balloons (which when caught in the jet stream can attain high velocity), flocks of migrating birds, and especially distant

terrestrial or celestial objects seen under unusual meteorological conditions, such as those that produce mirages, which can distort, displace, and animate objects seen visually or by radar. Such meteorological conditions, some thoroughly understood (mirages) and some poorly understood (as ball lightning) can easily cause even an experienced observer to ascribe the light he sees to a tangible, nearby, self-propelled object, obviously unidentified.

Indeed, it is not at all surprising that, with so many more people turning their attention skyward, many experience an aerial phenomenon they cannot readily explain. Initial experiences with unusual events have often challenged scientifically trained men.

Virtually all the reports received by the Air Force have been highly subjective, lacking such objective data as pictures, material fragments, spectroscopic analysis of lights seen, or precise technical data on trajectories, distances, accelerations, etc. As the course of investigation, over the years, of subjective reports often containing emotionally charged impressions, progressed it became clear that the majority of reports could be correlated with the appearance of aircraft, birds, celestial objects, balloons, etc., under special conditions.

As the experience of the Air Force in the analysis of UFO reports grew, the percentage of unexplained cases fell from more than 10% to as little as 2 or 3%. It is readily admitted that this small residue-as reported-defies logical explanation. For none of the extraordinary "unknowns," however, has there been scientific data on which to base a valid, definitive investigation.

The early difficulties in coming to grips with the successive waves of sightings, coupled with concern that UFO reports, often made by pilots, might constitute a threat to the national security (and the consequent, and unfortunate

air of secrecy imposed in the early years of UFO reports), had an electrifying effect on the imaginations and emotions of a surprising fraction of the populace. It led to an inordinate interest in UFO's. Indeed, a logical, albeit scientifically unsupported "theory" of UFO's arose. This concept was abetted by the possibility of life elsewhere in the universe which modern astronomy envisions, and by a strong, often unconscious, desire on the part of many people to believe in the possibility of visitors from outer space, and, unfortunately, to confuse possibility with probability.

This theory of UFO's, mainly because of its strong emotional appeal, sometimes bordering on religious conviction, deserves mention: It is logical to assume that we on earth are not the only intelligences in the universe; so it follows that those civilizations on other planets, perhaps planets in other solar systems, far more advanced than ours, might express an interest in visiting this planet periodically, as we might make periodic checks on the social progress of a tribe of aborigines. The earth has been visited many times in the past by explorers from other worlds (attested to, the theory continues, by historical accounts, long before 1947, of strange apparitions in the sky) but such visits have been greatly increased since the advent of the A- and H-bombs, a "tampering" with nature that has caused concern to other intelligence in space. This increase in visitation was signalled by the wave of incidents that started in June 1947, one of which was the now famous Arnold case.

It is for the psychologist and the sociologist more than for the physical scientist to comment on the widespread emotional appeal of this concept, and on the persistent attempts to link reported UFO sightings with visitations from space in the face of the continued lack of scientific evidence for such.

It is amply evident that UFO's and "flying saucers" exist as <u>reports</u>. This has led to the serious quip that "a flying saucer is any aerial sighting or

phenomenon which remains unexplained long enough for someone to write a report about it." It is the problem of the serious investigator to probe for the stimuli that give rise to the reports.

The U. S. Air Force investigators have long accepted the fact that most of the originators of UFO reports are sincere people, interested in the welfare and security of the country, and that they are honestly puzzled by the sightings that they report. Their frequent readiness to ascribe a UFO to extraterrestrial sources, their emotional attachment to this explanation, and their reluctance to take into account the failure of the continuous and extensive surveillance of the sky by trained observers, both military and civilian (such as the professional and volunteer (Moonwatch) artificial satellite observers), to produce UFO sightings is surprising. It hardly appears credible that spacecraft should frequently announce themselves readily to casual observers and craftily avoid detection by the constant professional military and civilian surveillance of the sky.

Nonetheless, it must be recognized that our knowledge of the universe and its contents, and of the physics of our atmosphere, is still imperfect, and that there may be "more things in Heaven and earth, Horatio, than are dreamt of in your philosophy." UFO sightings, so long as they continue, deserve serious study, and may lead to not only advances in physical knowledge, but in the area of human behavior as well.

UFO BRIEFING -TROY OHIO
14 March 1961

7-3745 - 377

1003846

RETURN TO
USAF Historical Archives
ASI(ASHAF-A)
Maxwell AFB, Ala 36112

The Gummed Products Company

TROY, OHIO

DIVISION OF St.Regis PAPER COMPANY

February 16, 1961

SMC

Department of the Air Force
Washington 25, D. C.

Attention: Lawrence J. Tacker
Lt. Col., USAF
Chief, Magazine & Book Branch

Dear Sir:

Last Friday I received a phone call from Dr. J. A. Hynek, Director, Dearborn Observatory, Northwestern University, Evanston, Illinois. We have agreed upon the mutually satisfactory date of April 4th, the earlier dates suitable to Dr. Hynek having already been finalized.

I earnestly want to convey to you my sincere thanks for your very excellent assistance in arranging for Dr. Hynek's appearance in Troy and, speaking for our entire Rotary group, extend to you an invitation to visit us as our guest whenever you are in our area. In fact, if you could advise me before hand, we would be very pleased to reserve a date for you to appear on our program schedule. We would be most interested in hearing from you about your work or on any other subject of your preference. Should you be in the area on April 4th in particular, I would be most pleased to have you join us.

Thank you again for the discerning interest you have given to our request.

Sincerely yours,

THE GUMMED PRODUCTS COMPANY

H. L. HEISE,
Research Director

HLH/ic

TROJAN QUALITY PRODUCTS

Director
Aerospace Studies Inst
ATTN: Archives Branch
Maxwell AFB, Alabama
RETURN TO

ZCZCSQP011CZCSQC604ZCJYA039

PP RJEDSQ

DE RJEZHQ 855

ZNR

P 161831Z

FM HQUSAF WASHDC

TO ATIC WRIGHT PATTERSON AFB OHIO

BT

UNCLAS FROM SAFOI-3D 86457

ATTENTION 4X3, MR. TED HEIATT. THIS MESSAGE CONFIRMS APPROVAL FOR DR. ALLEN J. HYNEK AS CIVILIAN CONSULTANT ON UFO PROGRAM TO SPEAK BEFORE THE TROY, OHIO ROTARIANS ON 14 MARCH 1961. DR HYNEK AS CIVILIAN SCIENTIST WILL ADD WEIGHT AND PRESTIGE IN SUPPORTING THE AIR FORCE AND THE DEPARTMENT OF DEFENSE POSITION ON THIS SUBJECT.

BT

16/1852Z FEB RJEZHQ

NNNN

RECEIVED
17 FEB 61 07 48
ATIC

16 FEB 61 20 21Z

PRIORITY

1 4X3
2 4E2
3
4X2A

NORTHWESTERN UNIVERSITY
DEARBORN OBSERVATORY
EVANSTON, ILLINOIS

January 30, 1961

Lt. Colonel Lawrence J. Tacker
Office of the Secretary of the Air Force
Pentagon
Washington 25, D. C.

Dear Colonel Tacker:

This is in reply to your letter of 9 January. I am sure that you would agree that I could hardly afford the time to make a special trip from Chicago to Troy for the purpose of a noon luncheon. Even were there a very handsome honorarium, I would still hesitate taking that much time from my professional life for these public relations purposes. However, should it so happen that Major Friend calls me for consultation on one of those dates, and if this requested talk were considered a part of my consulting service, I expect it could be arranged.

As I recollect, Troy is not too far from the base and if transportation could be supplied from the base to Troy and back again to the base, I would be happy to be of service to you and to the Rotarians.

I am sure that you understand my position; I simply could not justify in my own conscience spending that much time solely for the purpose of giving a popular talk.

Sincerely yours,

Allen

J. Allen Hynek

JAH/mdp

P.S. apologies for the lateness of this reply. I dictated this a long time ago and my s....t!! secretary mislaid the back. JAH

SAFOI-3d/LtCol Tacker/mhb/72291

9 January 1961

Dear Mr. Heise:

This is to acknowledge and thank you for your letter of 4 January requesting a speaker for the Troy Rotary Club during the month of February on the subject of unidentified flying objects.

I am endeavoring to obtain a suitable speaker for you on this subject for one of the open dates mentioned in your letter, and I will let you know as soon as possible.

Sincerely,

Mr. H. L. Heise
Research Director
The Gummed Products Company
Troy, Ohio

Comeback OI-3d
Reader OI-1

SAFOI-[redacted] LtCol Tacker/mhb/72291

9 January 1961

Dear Doctor Hynek:

I am inclosing a letter from the Troy, Ohio Rotary Club requesting a speaker in February on the subject of unidentified flying objects.

If you can possibly do so, I would like to have you speak to this group. As a University scientist supporting the Air Force position, I think you would carry a great deal more weight than some member of the Air Force.

If you can handle this one, would you contact Mr. Heise direct and let me know?

Sincerely,

Tacker

Inclosure

Dr. J. Alan Hynek
Northwestern University Observatory
Evanston, Illinois

cc: Major Friend

Comeback OI-3d
Reader OI-1

The Gummed Products Company

St. Regis

Lt. Col. Lawrence J. Packer
Chief of Magazines and Books Branch
Office of Secretary of The Air Force
Washington 25, D. C.

Dear Sir:

Last summer I saw a television program while I was vacationing in Michigan, which emanated from Lansing, Ann Arbor or Kalamazoo, Michigan and which dealt with the subject of unidentified flying objects. This was a filmed presentation and was issued as an official Government release, I believe under the auspices of the Air Force for public information. It was extremely interesting and a portion of the account included the observation of our own Wright-Patterson A.F. Base Personnel. The Project was referred to as Project "Blue Book".

I have contacted the "field" in Dayton on this subject and have been referred to you by Technical Sergeant Bolidu. As Program Chairman of our local Rotary Club for February, I had hoped to be able to line up a speaker - with or without films - to talk to us about this subject. Last year we were given a very interesting account of the SAC operation and Sgt. Bolidu indicated that he would be able to advise us or assign someone from Dayton to speak to us on this subject. The open dates are February 14th, 21st or 28th. It is a luncheon meeting at 12:00 o'clock noon, with the program starting at approximately 12:40 and lasting on the average of 45 minutes, more-or-less, but usually more. As a rule there are about 90 - 100 Rotarians and guests in attendance from this area.

May I have an early reply and please be assured that we will appreciate your assistance in this matter or a suggestion for a program of this nature from Wright-Patterson A.F. Base.

Yours truly,

THE GUMMED PRODUCTS COMPANY

H. L. HEISE,
Research Director

HLH/ic

ATIC
FEB 14 10
RECEIVED

TROJAN QUALITY PRODUCTS

UFO Briefing
Training School

58/00/00-63/01/06

RETURN TO
USAF Historical Archives
ASI(ASHAF-A)
Maxwell AFB, Ala 36112

UNCLASSIFIED

7-3745 - 38 4

1003847

1

1

SMC

Case includes one (1) 9¼" x 7½" photograph and one (1) 8⅛" x 6" photograph.

Removed

1003847

RETURN TO:
Director
Aerospace Studies Inst
ATTN: Archives Branch
Maxwell AFB, Alabama

UFO BRIEFING

I. History of Project

In June of 1947, a civilian pilot named Kenneth Arnold reported that he had observed "nine" unidentified objects flying in the vicinity of Mt. Rainier, Washington. The press, in describing Arnold's observation, referred to the objects as "flying saucers" and thus was created the era of unidentified flying objects or UFOs. The Air Force was assigned the responsibility for investigating reports of sightings and identifying the objects. This project was initially designated as "Project Sign"; but, subsequently, the name was changed to "Grudge," then to "Blue Book" its present designation.

II. Objectives of Program

The project has three objectives--

1. To determine if UFO's constitute a threat to our national security,

2. To determine if any information of a technical or scientific nature is available from UFO's, and

3. To provide data with which to evaluate possibly the causes of sightings to dispel any public concern that may result from them.

III. Report Requirements, Responsible Officers

AFR 200-2 which is the Air Force Directive governing UFOs, assigns the responsibility for investigating and reporting UFO sightings to the Air Force base nearest the sighting. The Base Commander normally assigns the "Intelligence" officer this function; therefore, many of you may find yourselves involved in this project after graduation.

AFR 200-2 spells out the specific requirements for UFO reports. The elements of the report format is also a good guide as to what facts must be determined when investigating a sighting.

A good investigator will gather as much data as possible and at the same time, gather information which will enable him to

include a good evaluation of the data in his report. Unwarranted guesswork from the investigation of many of the good cases indicates that the following areas are some of those which an investigator should consider.

1. Witness indicates that the object was in sight only a second, but he describes it in great detail. The investigator should determine if the witness is capable of estimating time accurately.

2. The witness reports speeds many times that of sound, but reports that the object was in the area for an hour or so.

3. Many witnesses report that the object was moved in a specific direction or moved in some specific direction. The investigator should familiarize himself with the area, have the witness point out the direction in which the object was seen, and determine the direction for himself.

4. The ability of the witness to estimate angles should be determined. Most people tend to overestimate angles measured from the horizon. To prove this point to yourselves, have a friend raise his arm to what he thinks is 45 degrees elevation and then measure it.

5. Some witnesses may be color blind and others may have a color weakness of which they are not aware.

6. Many witnesses are under some type of mental stress prior to experiencing sightings of UFO's. Careful interrogation will in many instances bring this to light.

7. Many witnesses have special qualifications which should be exploited by the investigator. For instance, if the witness is scientifically trained, it is probably better to let him prepare a report than question him regarding any data which is omitted.

There are many more things which can be brought out regarding investigation techniques, but those mentioned above should prompt your thinking in the proper direction. Above all, remember to obtain and retain the confidence of the witness: do not under any circumstances ridicule the incident being reported, for it may be important and only appear foolish or unimportant because of the flourishes put on it by an over-imaginative witness.

Many of the incidents which occur each year and are reported as UFO's are observed by scientists in the areas in which the

incidents occur. Investigators should check with local observatories, universities, and if possible ascertain if any known occurrence could account for the sighting.

In many instances, checking with local radio or the local weather station will reveal the release of a balloon or some other object which could account for the sightings.

UFO reports should contain the best possible weather data. This data should not be obtained from the witness, but rather from the nearest weather station. However, any impression which the witness has regarding the weather should also be included in the report.

IV. Major Causes of UFO's and How to Identify Them

The attached chart is a breakdown of the sightings for the year 1960. This chart is typical of the last few years.

1. Meteors

The object reported most frequently as a UFO is the meteor. You are all familiar with so called shooting stars, and no doubt many of you have seen some that penetrated close to the Earth. Some of you may have been fortunate enough to witness a "fireball" or a "bolide."

Here are the characteristics of this type of sighting.

a. The duration is USUALLY extremely short. Varying from a "flash" to several seconds. Anything over several seconds falls into the doubtful category although there have been unconfirmed reports of meteors observed lasting several minutes.

b. The color may be red, white, green, blue--almost any color. However, the tendency is toward the greens and whites. Some meteors have tails or trail while others don't. The tail may be a different color from that of the meteor.

c. The flight path will almost always be straight. There are cases where the path has changed slightly. Report the position of initial observation and the final position where the object burned out or disappeared.

d. The speed, of course, will be associated with the duration. It may vary from as low as 6.5 miles per second to 43.5 miles per second, depending upon whether the meteor is overtaking the Earth or meeting it head-on.

e. The brightness may vary from faint to giant "fireballs" that cast shadows. On 18 April 1962, a meteor over Eureka, Utah was bright enough to trip the photo electric cell that regulates the street lights.

f. Meteors have been observed during the day as well as at night. Trails of smoke have been left during the day, but this is not always the case.

g. Bolides are a class of meteor that are either heard or seen to explode. If accompanied by sound, the sound may be a whirring, whooshing, humming or any descriptive word that the observer decides to use. The sound may be faint or loud. The exploding bolide usually breaks up into a small number of pieces which continue without a major change in course; although, on rare occasions a change of direction may be noted for several of the pieces. There may or may not be an accompanying change in color.

2. Stars and Planets

Venus, Mars, Jupiter, and even the moon and stars (under a variety of circumstances) have been reported as UFO's. Again we limit the characteristics to the most frequent reports. The sighting will be of the brightest planets, or stars. Any object that has an extremely long duration with little motion is likely to fall into this category. A good check is to have the observer look for the object at the same time on succeeding nights. Reports of short duration do not rule out stars or planets, particularly if they are low on the horizon and generally to the west. As the object rises or sets, refraction, the bending of the light as it passes through the atmosphere, causes the object to appear to do strange things just before setting. It may give the impression of rising at tremendous speed to elevations of 30 or 40 degrees and disappear. Inversions, layers of air where the temperature increases with altitude, enhances the chances of distortion due to atmospheric conditions.(atmospheric optics).

3. Other Causes

Ball lightening, mirages, parhelia and paraselenae, and comets and aurora are some other phenomena which may be misidentified and reported as UFO's. In addition to these, many aircraft, balloons, rockets, satellites, condensation trails, etc. are often viewed under unusual circumstances and reported as an UFO.

4. The Photographs

a. Comets are often confused with meteors. The meteor is a tiny object visible for a few seconds only while in the

b. [illegible] with mountain waves [illegible] secondary wave. These clouds are [illegible] base, and are stationary in [illegible] factors probably contribute to the [illegible] clouds.

c. [illegible]

d. Aircraft flying at high speed in a moist [illegible]

e. Aurora.

f.-g. [illegible]

h.-i. [illegible]

j. [illegible]

k. [illegible]

AIR FORCE REGULATION
NO. 200–2

DEPARTMENT OF THE AIR FORCE
Washington, 20 July 1962

Intelligence Activities

UNIDENTIFIED FLYING OBJECTS (UFO)

This regulation establishes the UFO Program to investigate and analyze UFO's over the United States. Such investigation and analysis are directly related to Air Force responsibility for the defense of the United States. The UFO Program provides for the prompt reporting and rapid identification needed for successful "identification," which is the second of the four phases of air defense—detection, identification, interception, and destruction. All commanders will comply strictly with this regulation.

SECTION A—GENERAL — *Paragraph*

Explanation of Terms 1
Objectives 2
Responsibilities 3
Guidance 4
Reporting UFO Information 5

SECTION B—PUBLIC RELATIONS, INFORMATION, CONTACTS, AND RELEASES

Maintaining Public Relations 6
Releasing Information 7
Exceptions 8
Release by Non-Air Force Sources 9
Contacts 10

SECTION C—PREPARING AND SUBMITTING REPORTS

General Information 11
Methods for Transmitting Reports 12
Where To Submit Reports 13
Basic Reporting Data and Format 14
Negative or Inapplicable Data 15
Comments of Preparing Officer 16
Classification 17
Reporting Physical Evidence 18

SECTION A—GENERAL

1. Explanation of Terms. To insure proper and uniform usage in UFO screenings, investigations, and reportings, an explanation of the objects follows:

a. *Familiar or known objects:*

(1) Aircraft, balloons, kites, birds, searchlights, astronomical bodies (meteors, planets, stars, comets), pilotless aircraft, missiles, satellites in orbit, and others identified by the observer as normal appearing objects.

(2) Flying objects determined to be aircraft. These generally appear as a result of ADIZ violations and often prompt the UFO reports submitted by the general public. They are readily identifiable as, or known to be, aircraft, but their type, purpose, origin, and destination are unknown. Air Defense Command is responsible for reports of "unknown" aircraft, which should not be reported as UFO's under this regulation.

(3) Aircraft flares, jet exhausts, condensation trails, blinking or steady lights observed at night, lights circling or near airports and airways, and other phenomena or objects known to be emanating from, or to be indications of, aircraft. These should not be reported under this regulation, as they do not fall within the definition of a UFO.

b. *Unidentified Flying Objects.* Any aerial phenomena, airborne object or objects which are unknown or appear out of the ordinary to the observer because of performance, aerodynamic characteristics, or unusual features.

2. Objectives. Air Force interest in UFO's is three-fold. First, as a possible threat to the security of the United States and its forces; sec-

This regulation supersedes AFR 200–2, 14 September 1959, as amended.

OPI: AFCIN
DISTRIBUTION: S

ond, to determine the technical or scientific characteristics of any such UFO's; third, to explain or identify all UFO sightings as described in paragraph 1b.

a. *Air Defense.* The great majority of flying objects reported have been conventional, familiar things of no great threat to the security of the United States and its possessions. However, since the possibility exists that UFO's reported may be hostile or new foreign air vehicles of unconventional design, it is imperative to report sightings rapidly, factually, and as completely as possible.

b. *Technical and Scientific.* The Air Force will continue to collect and analyze reports of UFO's until all are scientifically or technically explained or until the full potential of the sightings has been exploited. In performing this task the following factors are of great importance:

(1) To measure scientific advances, the Air Force must have the latest experimental and developmental information on new or unique air vehicles or weapons.

(2) The possibility exists that foreign countries may develop air vehicles of revolutionary configuration or propulsion.

(3) There is need for further scientific knowledge in such fields as geophysics, astronomy, and physics of the upper atmosphere which the study and analysis of UFO's and similar aerial phenomena may provide.

(4) The reporting of all pertinent factors will have a direct bearing on scientific analyses and conclusions of UFO sightings.

c. *Reduction of Percentage of UFO "Unidentifieds."* Air Force activities must reduce the percentage of unidentifieds to the minimum. Analysis thus far has explained all but a few of the sightings reported. These unexplained sightings are carried statistically as unidentifieds. If more immediate, detailed, objective data on the unknowns had been available, probably these, too, could have been explained. However, because of the human factors involved, and the fact that analyses of UFO sightings depend primarily on the personal impressions and interpretations of the observers rather than on accurate scientific data or facts obtained under controlled conditions, the elimination of all unidentifieds is improbable.

3. Responsibilities:

a. *Reporting.* Base commanders will report all information and evidence of UFO sightings, including information and evidence received from other services, Government agencies, and civilian sources. Investigators are authorized to make telephone calls from the investigation area direct to the Foreign Technology Division (FTD), of the Air Force Systems Command, Wright-Patterson Air Force Base, Ohio (CLearwater 3-7111, ext. 69216/66378). The purpose of the calls is to report high priority findings. (See section C.)

b. *Investigation.* The commander of the Air Force base nearest the location of the reported UFO sighting will conduct all investigative action necessary to submit a complete initial report of a UFO sighting. The initial investigation will include every effort to resolve the sighting. An Air Force base other than that closest to the scene of a reported UFO sighting will refer the sighting immediately to the commander of the nearest Air Force base for appropriate action. (See paragraph 5.)

c. *Analysis.* The Air Force Systems Command Foreign Technology Division will analyze and evaluate:

(1) Information and evidence reported within the United States after the investigators of the responsible Air Force base nearest the sighting have exhausted their efforts to identify the UFO.

(2) Information and evidence collected in oversea areas.

EXCEPTION: The AFSC (FTD), independently or in participation with pertinent Air Force activities, may conduct any additional investigations necessary to further or conclude its analyses or findings.

d. *Findings.* AFSC (FTD) will prepare a final report on each sighting after collection and analysis of data, and will forward a copy of the report to HQ USAF (AFCIN).

e. *Public Relations and Information Services.* The Office of Information, Office of the Secretary of the Air Force, will be responsible for releasing information on sightings, and, in coordination with AFSC (FTD), answering correspondence from the public regarding UFO's. (See paragraphs 7 and 8.)

f. *Congressional Inquiries.* The Office of Legislative Liaison will:

(1) In coordination with the AFSC (FTD) and/or the Office of Information, when necessary, answer all congressional mail regarding UFO's addressed to the Secretary of the Air Force and Headquarters USAF.

(2) Forward those inquiries which are scientific and technical to the FTD for information on which to base a reply. The FTD will re-

turn this information to the Office of Legislative Liaison for reply to the inquiry.

(3) Process requests from congressional sources in accordance with AFR 11–7.

g. *Cooperation.* All Air Force activities will cooperate with Air Force UFO investigators to insure the economical and prompt success of investigations and analyses. When feasible, this cooperation will include furnishing air or ground transportation and other assistance.

4. Guidance. The thoroughness and quality of a report or investigation of UFO's are limited only by the skill and resourcefulness of the person who receives the initial information and/or prepares the report. The usefulness and value of any report or investigation depend on the accuracy and timeliness of its contents. Following are aids for screening, evaluating, and reporting sightings:

a. Careful study of the logic, consistency, and coherence of the observer's report. An interview with the observer by personnel preparing the report is especially valuable in determining the source's reliability and the validity of the information given. Factors deserving particular attention are the observer's age, occupation, and education, and whether his occupation involves observation reporting or technical knowledge. A report stating that a witness is completely familiar with certain aspects of a sighting should indicate his or her specific qualifications.

b. Theodolite measurements of changes or azimuth, and elevation and angular size.

c. Interception, identification, or air search, if appropriate and within the scope of air defense regulations.

d. When feasible, contact with local aircraft control and warning (ACW) units, and with pilots and crews of aircraft aloft at the time and place of sighting. Also, contact with any other persons or organizations that may have factual data on the UFO or can offer corroborating evidence—visual, electronic, or other.

e. Consultation with military or civilian weather forecasters for data on tracks of weather balloons released in the area and any unusual meteorological activity which may have a bearing on the UFO.

f. Consultation with navigators and astronomers in the area to determine whether any astronomical body or phenomenon would account for the sighting.

g. Contact with military and civilian tower operators, air operations units, and airlines to determine whether the sighting could have been an aircraft. Local units of the Federal Aviation Agency (FAA) are often of assistance in this regard.

h. Contact with persons who may know of experimental aircraft of unusual configuration, rocket and guided missile firings, or aerial tests in the area.

i. Contact with photographic units or laboratories. Usually, these installations have several cameras available for specialized intelligence or investigative work. Photography is an invaluable tool for use, where possible, in investigating and analyzing UFO sightings. (See paragraph 18).

j. Whenever possible, selecting as a UFO sighting investigator an individual with a scientific or technical background as well as experience as an investigator.

k. Submission of reports on all sightings even though identification may be assumed by the preparing officer under paragraph 16 of this regulation.

5. Reporting UFO Information. Both the Assistant Chief of Staff, Intelligence, Headquarters USAF, and the Air Defense Command have a direct and immediate interest in the facts pertaining to UFO's reported within the United States. All Air Force activities will conduct UFO investigations to the extent necessary for their required reporting action (see paragraphs 14, 15, and 16). No activity should carry an investigation beyond this point, unless the preparing officer believes the magnitude (intelligence significance or public relations aspects) of the case warrant full scale investigation. The officer may contact the FTD of AFSC (CLearwater 3-7111, ext 69216/66378) at Wright-Patterson Air Force Base, Ohio, to obtain verbal authority for continued investigation.

SECTION B—PUBLIC RELATIONS, INFORMATION, CONTACTS, AND RELEASES

6. Maintaining Public Relations. The Office of Information is responsible for:

a. In coordination with the AFSC (FTD) when necessary, maintaining contact with the public and the press on all aspects of the UFO program and its related activities.

b. Releasing information on UFO sightings and results of investigations.

c. Periodically releasing information on this subject to the general public.

d. Processing, answering, and taking action on correspondence received from the general public, pertaining to the public relations, interest, and informational aspects of the subject. (See paragraph 8.) This office will forward correspondence and queries which are purely technical and scientific to AFSC (FTD) for information on which to base a reply.

7. Releasing Information. The Office of Information, Office of the Secretary of the Air Force, will release to the public or unofficial persons or organizations all information or releases concerning UFO's, regardless of origin or nature. This includes replies to correspondence (except congressional inquiries) submitted direct to the AFSC (FTD) and other Air Force activities by private individuals requesting comments or results of analyses and investigations of sightings.

8. Exceptions. In response to local inquiries regarding any UFO reported in the vicinity of an Air Force base, the commander of the base concerned may release information to the press or the general public only after positive identification of the sighting as a familiar or known object. The commander must exercise care not to reveal any classified aspects of the sighting or names of persons making reports. (See paragraph 17.) If the sighting is unexplainable or difficult to identify, because of insufficient information or inconsistencies, the only statement to be released is the fact that the sighting is under investigation and information regarding it will be available at a later date. After completion of investigative action, the commander may release the fact that the AFSC (FTD) will review and analyze the results of the investigation. He will then refer any further inquiries to the local Office of Information.

9. Release by Non-Air Force Sources. If newsmen, writers, publishers, or private individuals desire to release unofficial information concerning a UFO sighting, Air Force activities will make every effort to assure that the statements, theories, opinions, and allegations of these individuals or groups are not associated with or represented as official information.

10. Contacts. Private individuals or organizations desiring Air Force interviews, briefings, lectures, or private discussions on UFO's will direct their requests to the Office of Information, Office of the Secretary of the Air Force. Air Force personnel, other than those of the Office of Information, will not contact private individuals on UFO cases, nor will they discuss their operations and functions with unauthorized persons unless so directed, and then only on a "need-to-know" basis.

SECTION C—PREPARING AND SUBMITTING REPORTS

11. General Information:

a. Paragraphs 2 and 5 will serve as aids and guidance to screenings, investigations, and reportings. Paragraph 14 contains an outline of the reporting format. Activities initially receiving reports of aerial objects and phenomena will screen the information to determine whether the report concerns a valid UFO within the definition of paragraph 1b. Reports not within that definition do not require further action under the provisions of this regulation.

b. To assist activities and personnel responsible for handling, screening, and processing initial, incoming UFO information, a summary follows of the general sources and types of reports:

(1) Generally, initial UFO reports originate from two sources:

(a) Civilian (airline, private, and professional pilots, tower operators, technical personnel, casual observers, and the public in general), by correspondence, telephone or personal interview;

(b) Military units and personnel (pilots, observers, radar operators, aircraft control and warning units, etc.); by telephone, electrical message, or personal interview;

(2) Generally, UFO reports received from civilian sources are of two types:

(a) Those referring strictly to an observed UFO, containing either detailed or meager information;

(b) Those referring only in part to an observed UFO, but primarily requesting information on some aspect of the UFO program.

c. Reports considered to fall primarily in a public relations or information service category (see paragraphs 7, 8, 9, and b(2) above) are of primary interest to the Office of Information. UFO data sufficient for investigation and/or analysis may be extracted before referral to that office.

12. Methods for Transmitting Reports:

a. Together with any necessary screenings and investigations preparatory to reporting, report all information on UFO's promptly. Electrical transmission with a "Priority" precedence is authorized for reports under 3 days from date of sighting. Electrically transmitted reports over 3 days old should carry a "Routine" precedence.

b. Submit written reports of sightings over 3 days old on AF Form 112, "Intelligence Report,"

and AF Form 112A, "Supplement to AF Form 112" (see paragraphs 14 and 15); however, keep the use of these forms to a minimum in reporting initial sightings. The delays often involved in processing and transmitting AF Form 112 through channels may make followup investigations difficult, producing only limited usable information. This factor is a necessary consideration. Reporting by electrical means will eliminate delays. If requested by the AFSC (FTD), AF Form 112 will provide a followup and/or complete report of all sightings initially reported electrically.

13. Where To Submit Reports:

a. *Electrical Reports.* Submit multiple addressed electrical reports to:

(1) Air Defense Command, Ent AFB, Colorado

(2) Nearest Air Division (Defense) (For United States only)

(3) Air Force Systems Command, Foreign Technology Division, Wright-Patterson AFB, Ohio

(4) Headquarters, USAF (AFCIN), Wash 25 DC

(5) Secretary of the Air Force (SAFOI), Wash 25 DC

b. *Written Reports* (Basic letters and AF Form 112):

(1) *Basic Letters.* Submit all letter reports direct to the AFSC (FTD). The AFSC (FTD) will distribute the reports to interested Intelligence activities in the United States and to the Office of Information, if necessary.

(2) *AF Form 112.* Submit original report, as prescribed in "Intelligence Collection Instruction (ICI)," June 1954, direct to HQ USAF (AFCIN) Wash 25 DC, and a copy to AFSC (FTD).

c. *Reports from Civilians.* Where possible, advise civilian sources contemplating reporting UFO's to submit the report, for processing and transmission, to the nearest Air Force base.

14. Basic Reporting Data and Format. Show the abbreviation "UFO" at the beginning of the text of all electrical reports and in the subject of written reports. Include the required data in all reports, in the order shown below:

a. *Description of the Object(s):*

(1) Shape.

(2) Size compared to a known object (use one of the following terms: Head of a pin, pea, dime, nickel, quarter, half dollar, silver dollar, baseball, grapefruit, or basketball) held in the hand at about arm's length.

(3) Color.

(4) Number.

(5) Formation, if more than one.

(6) Any discernible features or details.

(7) Tail, trail, or exhaust, including size of same compared to size of object(s).

(8) Sound; if heard, describe sound.

(9) Other pertinent or unusual features.

b. *Description of Course of Object(s):*

(1) What first called the attention of observer(s) to the object(s)?

(2) Angle or elevation and azimuth of object(s) when first observed.

(3) Angle or elevation and azimuth of object(s) upon disappearance.

(4) Description of flight path and maneuvers of object(s).

(5) How did the object(s) disappear? (Instantaneously to the North, etc.)

(6) How long (were) the object(s) visible? (Be specific, 5 minutes, 1 hour, etc.)

c. *Manner of Observation:*

(1) Use one or any combination of the following items: Ground-visual, air-visual, ground-electronic, air-electronic. (If electronic, specify type of radar.)

(2) Statement as to optical aids (telescopes, binoculars, etc.) used and description thereof.

(3) If the sighting occurred while air-borne, give type of aircraft, identification number, altitude, heading, speed, and home station.

d. *Time and Date of Sighting:*

(1) Zulu time-date group of sighting.

(2) Light conditions. (Use one of the following terms: Night, day, dawn, dusk.)

e. *Location of Observer(s).* Give exact latitude and longitude of each observer, and/or geographical position. In electrical reports, give a position with reference to a known landmark also, such as "2mi N of Deeville"; "3mi SW of Blue Lake." Typographical errors or "garbling" often occur in electrically transmitted messages, making location plots difficult or impossible.

Example: 89 45N, 192 71W for 39 45N, 102 21W.

f. *Identifying Information on Observer(s):*

(1) Civilian—Name, age, mailing address, occupation, and estimate of reliability.

(2) Military—Name, grade, organization, duty, and estimate of reliability.

g. *Weather and Winds—Aloft Conditions at Time and Place of Sightings:*

(1) Observer(s) account of weather conditions.

(2) Report from nearest AWS or U. S. Weather Bureau Office of wind direction and velocity in degrees and knots at surface, 6,000′, 10,000′, 16,000′, 20,000′, 30,000′, 50,000′, and 80,000′, if available.

(3) Ceiling.

(4) Visibility.

(5) Amount of cloud cover.

(6) Thunderstorms in area and quadrant in which located.

(7) Vertical temperature gradient.

h. *Any other unusual activity or condition,* meteorological, astronomical, or otherwise, which might account for the sighting.

i. *Interception or identification action taken* (such action is authorized whenever feasible and in compliance with existing air defense directives).

j. *Location, approximate altitude, and general direction* of flight of any air traffic or balloon releases in the area which might possibly account for the sighting.

k. *Position title and comments of the preparing officer,* including his preliminary analysis of the possible cause of the sighting(s). (See paragraph 16.)

l. *Existence of physical evidence,* such as materials and photographs.

15. Negative or Inapplicable Data. Even though the source does not provide, or an interviewer has not asked for specific information, do not use the words "negative" or "unidentified" before exhausting all logical leads to obtain the information outlined under paragraph 14. For example, information on weather conditions in the area, as requested in paragraph 14g, is obtainable from the local military or civilian weather facility. Use the phrase "not applicable (N/A)" only when the question does not apply to the particular sighting under investigation.

16. Comments of Preparing Officer. The preparing officer will make a preliminary analysis and a comment on the possible cause or identity of the object he is reporting, together with a statement supporting his comment and analysis. He will make every effort to obtain pertinent items of information and to test all possible leads, clues, and hypotheses concerning the identity or explanation of the sighting. (See paragraph 5.) The preparing officer who receives the report initially is in a much better position to conduct an "on-the-spot" survey or followup than subsequent investigative personnel and analysts, who may be far removed from the area, and who may arrive too late to obtain vital data or the missing information necessary for firm conclusions.

17. Classification. Do not classify reports unless data requested in paragraph 14 require classification. Classify reports primarily to protect:

a. Names of sources reporting UFO's and other principals involved, *if so requested by these persons or considered necessary;*

b. Intelligence, investigative, intercept, or analytical methods or procedures;

c. Location of radar and other classified sites, units, and equipment;

d. Information on certain types, characteristics, and capabilities of classified aircraft, missiles, or devices that may be involved in the sighting.

18. Reporting Physical Evidence. Report promptly the existence of physical evidence (photographic or material). Mark all physical evidence forwarded to the AFSC (FTD) for the attention of TD-E, Aerial Phenomena Branch.

a. *Photographic:*

(1) *Still Photographs.* Forward the negative and two prints. Title the prints and the negatives, or indicate the place, time, and date of the incident.

(2) *Motion Pictures.* Obtain the original film. Examine the film strip for apparent cuts, alterations, obliterations, or defects. In the report comment on any irregularities, particularly those received from other than official sources.

(3) *Supplemental Photographic Information.* Negatives and prints often are insufficient to provide certain valid data or to permit firm conclusions. (See AFM 200-9—a classified document receiving limited distribution.) Information that will aid in plotting or in estimating distances, apparent size and nature of object, probable velocity, and movements includes:

(a) Type and make of camera,
(b) Type, focal length, and make of lens,
(c) Brand and type of film,
(d) Shutter speed used,
(e) Lens opening used; that is, "f" stop,
(f) Filters used,
(g) Was tripod or solid stand used,
(h) Was "panning" used,
(i) Exact direction camera was pointing with relation to true north, and its angle with respect to the ground.

(4) *Other Camera Data.* If supplemental information is unobtainable, the minimum camera data required are the type of camera, and the smallest and largest "f" stop and shutter-speed readings of the camera.

(5) *Radar.* Forward two copies of each still-camera photographic print, Title radarscope photographic prints in accordance with AFR 95–7. Classify radarscope photographs in accordance with Section XII, AFR 205–1, 10 June 1960.

NOTE: If possible, develop photographic film before forwarding. Mark any undeveloped film conspicuously to indicate this fact, to avoid destruction by exposure during examinations en route through mail channels to final addressees.

b. *Material.* Each Air Force echelon receiving suspected or actual UFO material will safeguard it in a manner to prevent any defacing or alterations which might reduce its value for intelligence examination and analysis.

c. *Photographs, Motion Pictures, and Negatives Submitted by Individuals.* Individuals often submit photographic and motion picture material as part of their UFO reports. All original material submitted will be returned to the individual after completion of necessary studies, analyses, and duplication by the Air Force.

BY ORDER OF THE SECRETARY OF THE AIR FORCE:

CURTIS E. LeMAY
Chief of Staff

OFFICIAL:

R. J. PUGH
Colonel, USAF
Director of Administrative Services

☆ U. S. GOVERNMENT PRINTING OFFICE: 1962

1961	ASTRO	AIRCRAFT	BALLOON	INSUFF.	OTHER	SATELLITE	UNIDENTIFIED	TOTAL
JANUARY	25	9	0	8	3	1	0	47
FEBRUARY	23	1	2	15	7	6	1	59
MARCH	18	3	2	14	6	3	0	46
APRIL	10	2	4	6	5	2	1	30
MAY	12	6	5	15	6	13	1	58
JUNE	13	8	0	10	9	4	1	45
JULY	19	8	5	11	7	15	4	69
AUGUST	10	13	8	9	8	12	1	61
SEPTEMBER	26	7	7	9	8	3	1	61
OCTOBER	14	7	2	10	7	1	0	41
NOVEMBER	16	5	2	5	4	6	2	40
DECEMBER	8	1	0	4	4	3	1	21
TOTAL	199	70	37	116	74	69	13	578

There were 13 cases where sufficient information was presented for evaluation and no conclusion as to the cause was reached. These are the 13 Unidentified's for 1961. No evidence available indicated that the object or objects in these cases were interplanetary or that they constituted a threat to the security of the United States.

ASTRO CASES	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Meteors	15	15	13	9	6	4	13	5	11	10	13	4	118
Planets & Stars	9	13	5	1	6	8b	4	5	14	3	3g	4h	75
Other	1a	0	0	0	0	1c	2d	0	1e	1f	0	0	6
Total	25	28	18	10	12	13	19	10	26	14	16	8	199

a)Moon b)Including 1 Occultation of Regulus c)Moon d)1 case sunspot and 1 case Wilson's Comet e)Aurora f)Parhelia g)Including Occultation of Regulus
h)Including Occultation of Regulus

OTHER CASES Hoax's, Hallucinations, Unreliable Reports and Psychologically attributed cases	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
	1	0	2	3	2	1	3	1	0	2	1	0	16
Missiles	1	2a	0	1	0	0	0	3	2b	0	2	1	12
Radar Analysis	0	1	2	0	2	1	0	0	2	0	0	0	8
Mirages and Inversions	0	1	0	0	0	2	0	0	1	2	0	0	6
Flares and Fireworks	0	0	0	0	0	1	2	1	1	0	0	0	5
Reflections	1	0	0	0	0	1	0	1	1	0	0	0	4
Reflections (Photographic)	0	0	0	0	0	0	0	0	0	1	0	1	2
Satellite Decay	0	1	1	0	0	0	0	0	0	0	0	1	3
A/C Contrails	0	0	0	0	0	0	0	0	1	1	0	1	3
Chaff	0	1	0	0	0	2	0	0	0	0	0	0	3
Birds	0	0	0	0	1	0	0	1	0	0	0	0	2
Lenticular Clouds	0	0	0	0	1	1	0	0	0	0	0	0	2
Ball Lightning	0	0	0	0	0	0	1	0	0	1	0	0	2
Searchlight	0	0	0	0	0	0	1	0	0	0	0	0	1
Poor Photo Process	0	0	0	0	0	0	0	1	0	0	0	0	1
Physical Specimen (Other than Chaff)	0	1	1	1	0	0	0	0	0	0	1	0	4
TOTAL	3	7	6	5	6	9	7	8	8	7	4	4	74

a)Including Venus Probe b)Including NASA Sodium Shot

1960	Astro	A/C	Balloon	I/Data	Other	Satellite	Un/Iden.	Total
JANUARY	9	2	1	2	8	0	0	22
FEBRUARY	7	2	1	5	7	0	1	23
MARCH	10	0	1	6	5	0	3*	25
APRIL	17	4	1	4	9	0	3	38
MAY	10	3	4	16	7	0	0	40
JUNE	19	6	3	5	8	0	0	41
JULY	32	8	4	6	4	0	1	55
AUGUST	20	8	0	12	6	7	2	55
SEPTEMBER	51	13	1	16	20	3	1	105
OCTOBER	20	7	3	11	7	1	1	50
NOVEMBER	13	5	0	5	3	2	2	30
DECEMBER	22	2	2	13	4	7	0	50
Total	230	60	21	101	88	20	14	534

* (Including one ice fall with source unknown)

There were 14 cases where sufficient information was presented for evaluation and no conclusion as to the cause of the sighting was reached. These represent the Unidentified's for 1960. No evidence presented during the year or preceding years indicated that any object or objects were interplanetary, or that they constituted a threat to the security of the United States.

ASTRO CASES:	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Meteors	9	6	9	17	7	17	24	13	37	17	9	16	183
Planets & Stars	0	1	0	0	3	2	7	7	13	3	4	4	44
Other	0	0	1a	0	0	0	1b	0	1c	0	0	2	3
Total	9	7	10	17	10	19	32	20	51	20	13	22	230

a) Sub-sun b) Moon c) Aurora

OTHER CASES:

Hoax's, Hallucinations, Unreliable Reports, & Psychologically attributed cases	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
	2	1	0	1	2	1	2	1	3	0	0	0	13
Missiles	2	0	0	0	0	2	2	1	3	2	1	0	13
Reflections	1	1	1	2	2	1	0	0	0	0	2	1	11
Satellite Decay	0	0	1	2	0	0	0	0	4	1	0	1	9
Mirages & Inversions	0	1	1	0	0	0	0	1	3	1	0	0	7
Radar Analysis (Anam Prop WX)	1	0	0	0	0	0	0	0	4	0	0	0	5
Flares	1	0	1	0	1	1	0	1	1	0	0	0	6
Birds	0	1	0	2	0	0	0	0	0	0	0	0	3
Photo (Lens Aberration, Refl)	0	0	0	1	0	2	0	0	0	1	0	0	4
Photo Emulsion Flaw	0	1	0	1	0	0	0	0	0	0	0	1	3
Clouds	1	0	0	0	1	0	0	0	0	0	0	0	2
Miscellaneous	0	2ab	0	0	0	0	0	0	0	2jk	0	1L	5
Physical Objects	0	0	1c	0	1d	1e	0	2fg	2hi	0	0	0	7
Total	8	7	5	9	7	8	4	6	20	7	3	4	88

a) Ceilometer b) Navy illumination exercise c) Chaff d) Piece of iron
e) Furnace slag f) Water beacon g) Sonobouy h) Furnace slag i) Parachute
j) Shotgun blast k) Contrail l) Rotating beacon

1959 STATISTICAL CHART

(Compiled 1 Oct 1962)

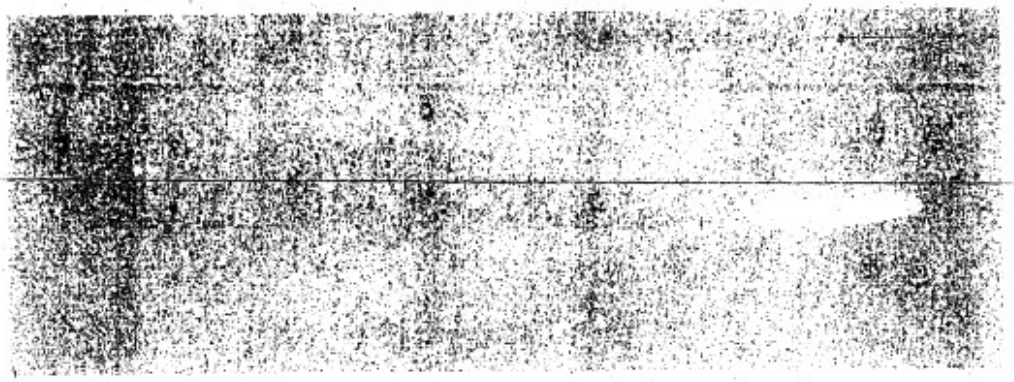
1959	ASTRO	A/C	BALLOON	INSUFF D.	OTHER	SATELLITE	UNIDENT.	TOTAL
JANUARY	21	3	0	5	6	0	0	35
FEBRUARY	12	8	3	3	6	0	0	32
MARCH	15	4	1	6	7	0	1	34
APRIL	12	4	3	4	3	0	0	26
MAY	12	3	3	4	7	0	0	29
JUNE	11	10	2	4	5	0	2	34
JULY	5	14	1	7	11	0	1	39
AUGUST	9	6	7	8	6	0	1	37
SEPTEMBER	17	6	1	7	7	0	2	40
OCTOBER	16	2	4	8	11	0	3	44
NOVEMBER	12	2	3	5	2	0	2	26
DECEMBER	2	2	1	4	1	0	0	10
TOTAL	144	64	29	65	72	0	12	386

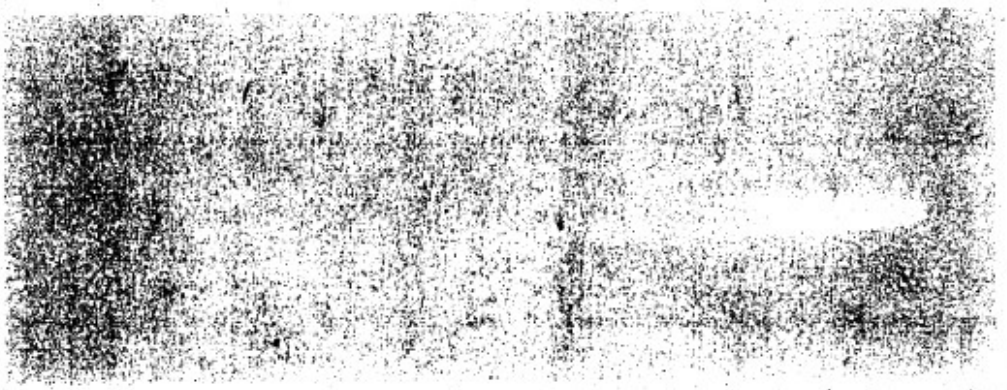
ASTRO CASES:	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
Meteors	11	8	10	8	11	9	4	9	11	9	9	2	101
Planets & Stars	7	4	5	3	1	2	1	0	6	7	3	0	39
Other	3abc	0	0	1d	0	0	0	0	0	0	0	0	4
Total	21	12	15	12	12	11	5	9	17	16	12	2	144

a) Sunspot b) Parhelia c) Moon d) Aurora

OTHER CASES: Hoax's, Hallucinations, Unreliable Reports, & Cases attributed to Psychological Causes:	January	February	March	April	May	June	July	August	September	October	November	December	Total Other
	1	2	0	0	0	2	1	1	2	3	1	0	13
Missiles	3	1	0	0	0	0	2	2a	1	3b	1	1	14
Reflections	2	2	3	1	0	0	0	1	1	0	0	0	10
Spotlights, Searchlights	0	0	0	1	1	0	2	0	0	0	0	0	4
Mirages and Inversions	0	0	0	0	0	0	2	0	0	2	0	0	4
Radar Analysis	0	0	2cd	1e	1f	1g	1h	1i	1j	0	0	0	8
PhotoAnalysis	0	0	1k	0	2mn	1p	0	0	1q	0	0	0	5
Physical Specimens	0	0	0	0	0	0	2rs	1t	0	0	0	0	3
Miscellaneous Causes	0	0	0	0	2uv	1w	0	0	0	3xyz	0	0	6
Flares	0	1	1*	0	1	0	1#	0	1	0	0	0	5
Total	6	6	7	3	7	5	11	6	7	11	2	1	72

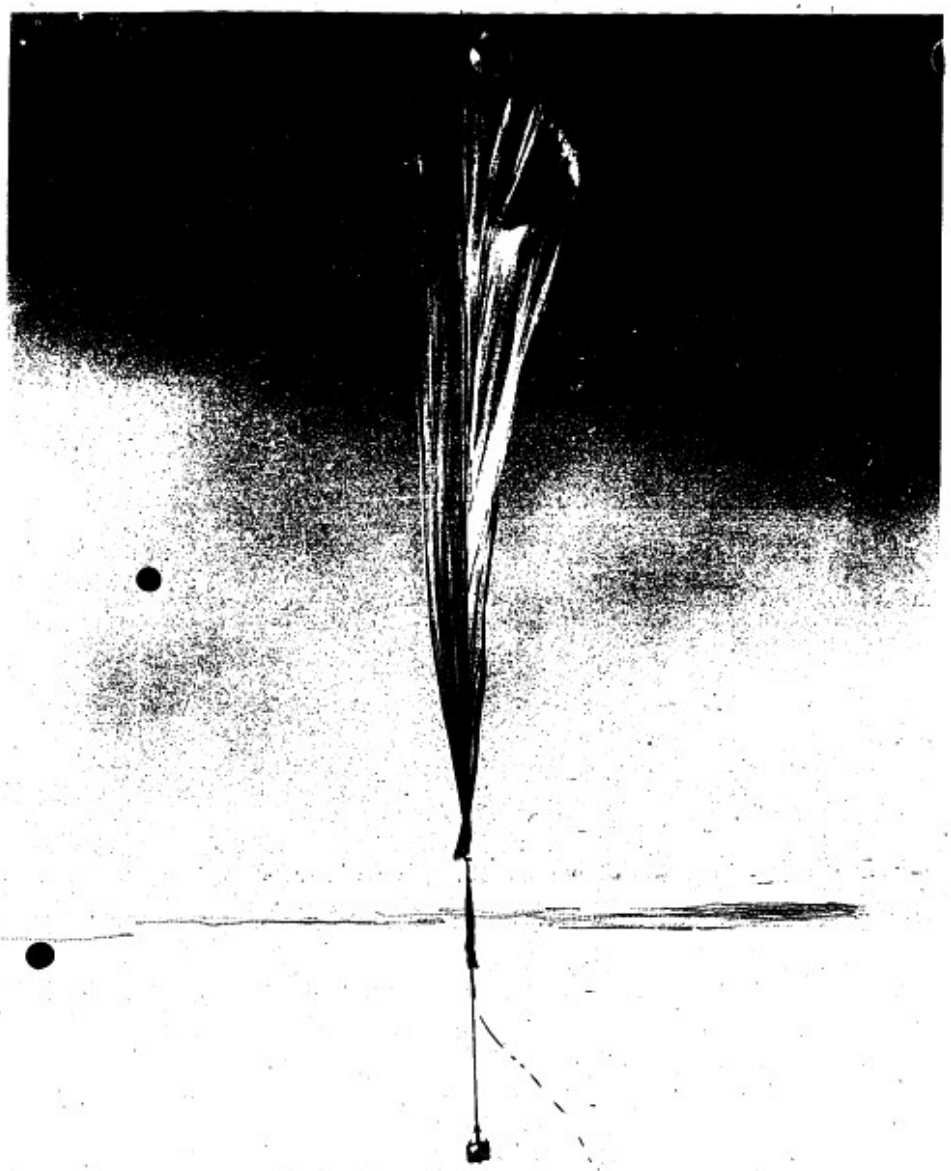
a) NASA Sodium shot b) NASA Balloon Rocket c) Equipment Malfunction d) ECM
e) Anomolous Propogation f) False Targets g) Surface ships h) Surface ships
i) Anamolous Propogation j) Weather Interference k) Static Electricity
m) No image on print n) Developing Flaw p) Sun glare on lens q) Flaw in film
r) Anode s) Furnace slag t) glass u) Chaff v) Ball lightning w) Haze layer
x) Lenticular cloud y) Cloud seeding z) Ice fall *) Photo Flashbomb #) Smokelight



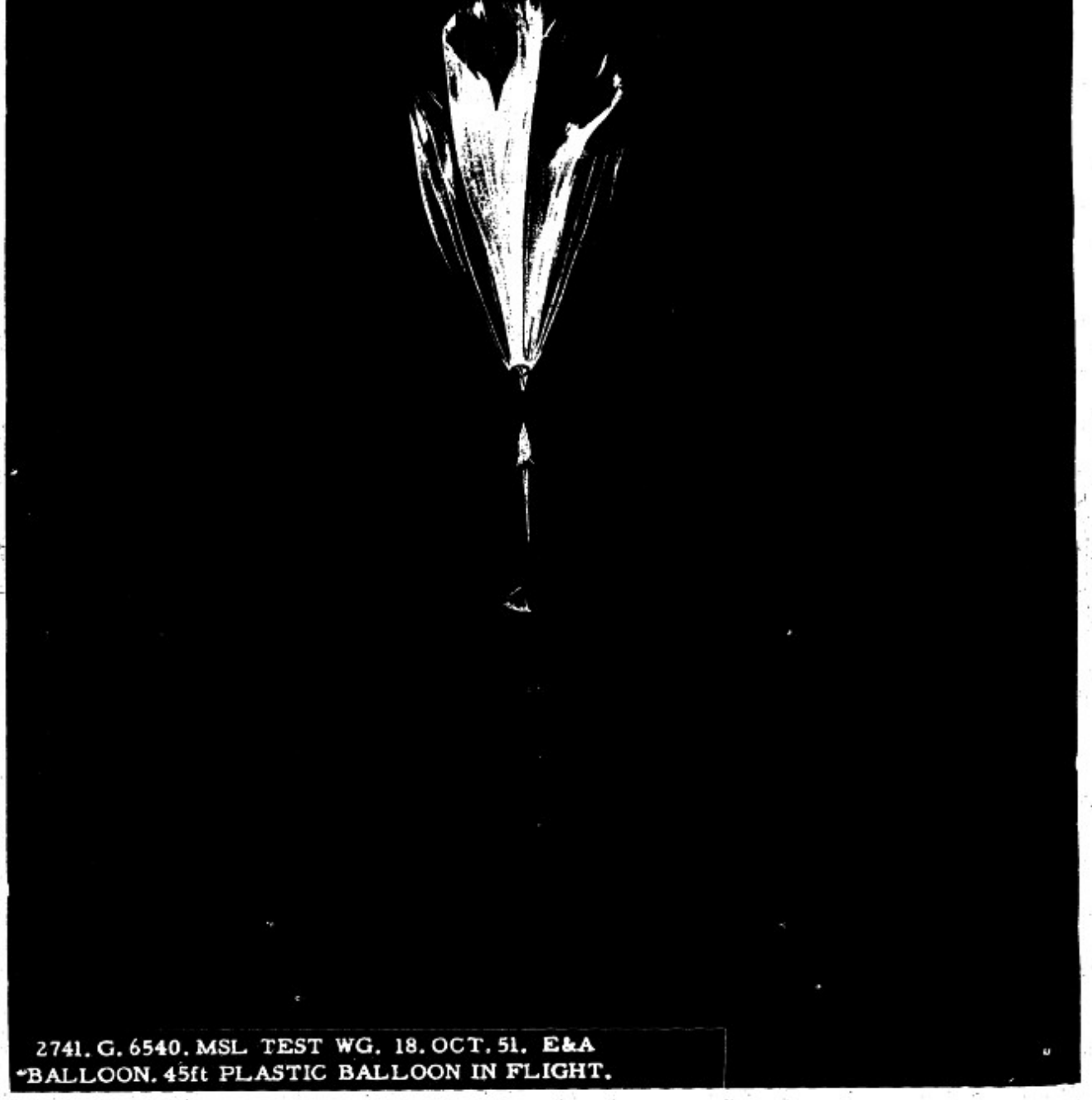


C

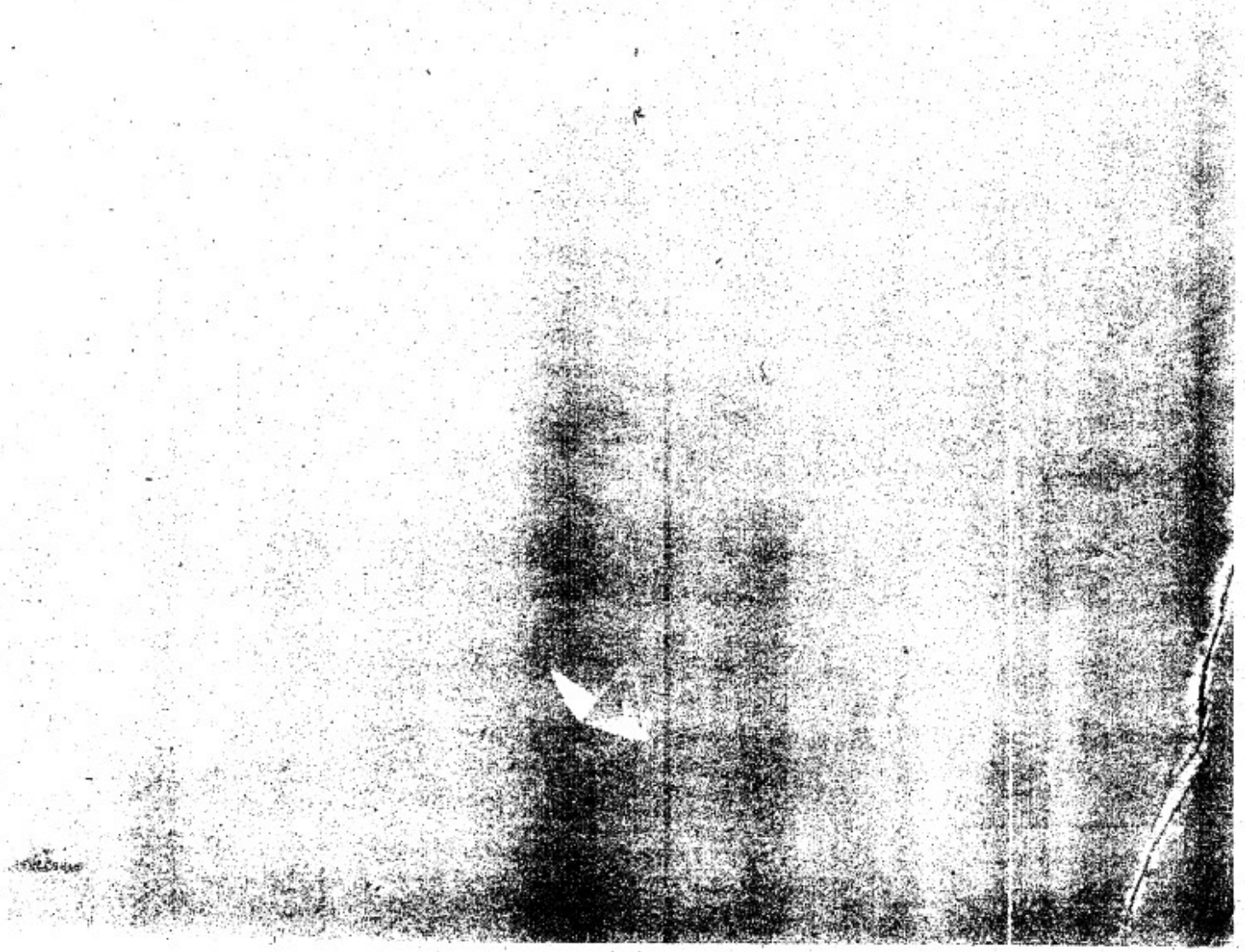
B



[illegible] TEST [illegible] BALLOON
BOY DICK S-24. 73' PLASTIC [illegible] LAUNCHING.



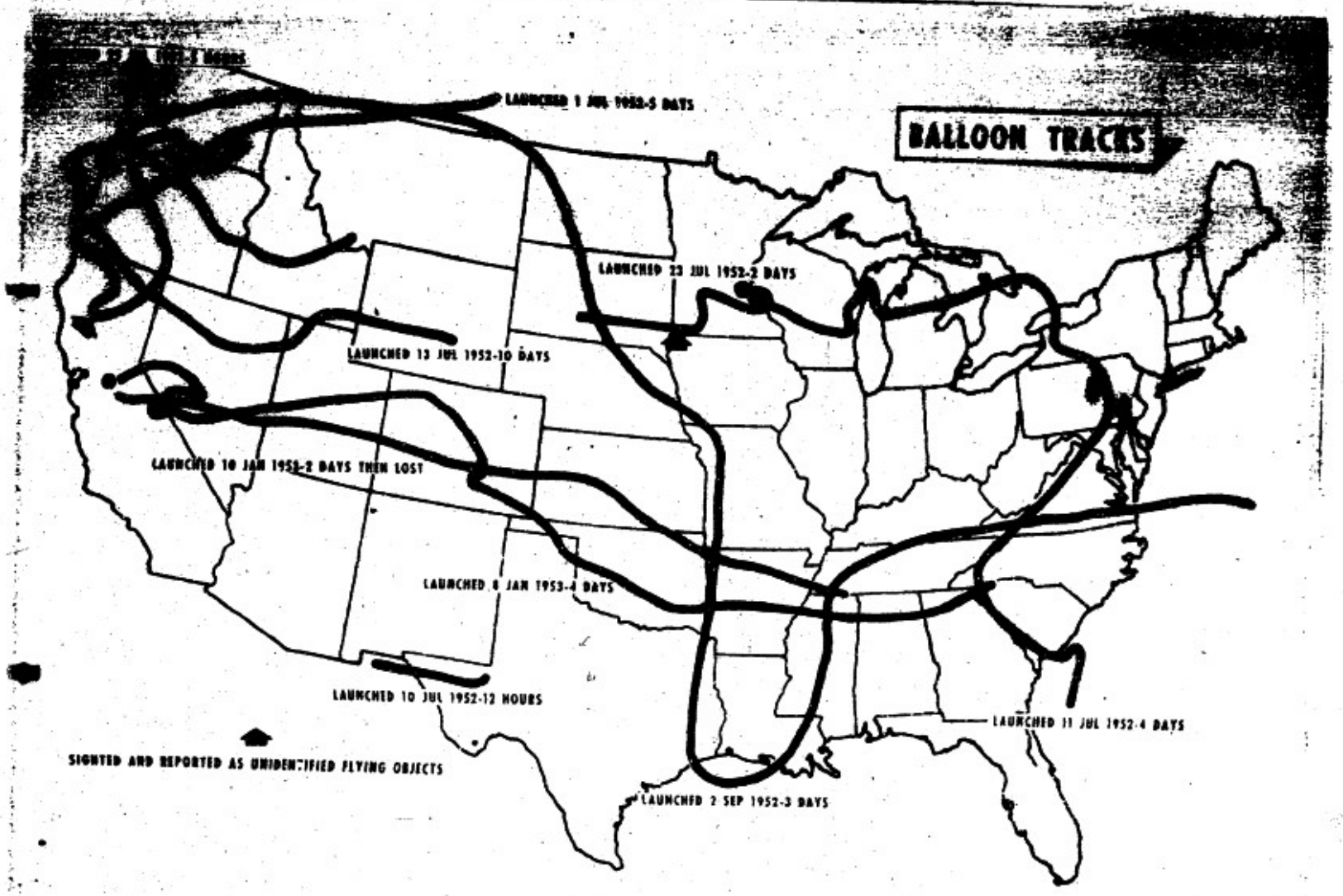
2741. G. 6540. MSL TEST WG. 18. OCT. 51. E&A
"BALLOON. 45ft PLASTIC BALLOON IN FLIGHT.



RADIOSONDE MODULATOR
AND TRANSMITTER WITH
LIGHT ATTACHED.

DAY PHOTOGRAPH

Sketch purposely exaggerated to emphasise


BALLOON TRACKS
LAUNCHED 1 JUL 1952-5 DAYS
LAUNCHED 23 JUL 1952-2 DAYS
LAUNCHED 13 JUL 1952-10 DAYS
LAUNCHED 10 JAN 1953-2 DAYS THEN LOST
LAUNCHED 8 JAN 1953-4 DAYS
LAUNCHED 10 JUL 1952-12 HOURS
LAUNCHED 11 JUL 1952-4 DAYS
SIGHTED AND REPORTED AS UNIDENTIFIED FLYING OBJECTS
LAUNCHED 2 SEP 1952-3 DAYS

HISTORY OF PROJECT

Following the Kenneth Arnold sighting on 24 June 1947, wide news coverage of public reports of "flying discs or saucers" created sufficient concern at high military echelons to authorize AMC to conduct a preliminary investigation into these reports. Early correspondence indicates that U. S. Military Leaders were concerned that the objects reported were an aircraft configuration more advanced than those possessed by the United States Armed Forces. A letter, 23 September 1947, from Lt. General Twining of AMC to the Commanding General of the Army Air Forces, expressed the opinion that there was sufficient substance in the reports to warrant a detailed study.

On 30 December 1947, a letter from the Chief of Staff directed AMC to,... "set up a project whose purpose was to collect, collate, evaluate and distribute to interested Government Agencies and contractors all information concerning UFO sightings and phenomena in the atmosphere which can be construed to be of concern to the National Security. . ."

The Technical Intelligence Division of AMC issued Hq AMC Technical Instruction No 2185, 11 February 1948, and the project was inaugurated with a code name of "SIGN." The code name "SIGN" was changed to the code name "GRUDGE" on 16 December 1948. A report released in February 1949 covering analysis of the first 273 incidents concluded that, while no definite and conclusive evidence existed, evaluation of reports of unidentified objects was a necessary activity of Military Intelligence Agencies.

After the Project "SIGN" Report, work continued along the same lines and a Project "GRUDGE" Report was published and released in August 1949 by AMC. This report contained analysis of 244 cases and concluded that Unidentified Flying Objects reports resulted from: a) misinterpretation of conventional objects, b) mass hysteria or "War Nerves", c) hoaxes and/or d) Psychopathological persons. Based upon these conclusions AMC recommended that investigation and study of this type of report be reduced in scope. Major portions of this work were performed under contract by Ohio State University, Professor Hynek (Present Consultant to AF on Project Blue Book), The Rand Corporation, Dr. G. Valley, Dr. Paul Fitts, Air Weather Service, 3610th Electronic Section and the U. S. Weather Bureau.

Following publication of the "GRUDGE" Report, the Air Force continued to investigate sightings, inasmuch as it is an Air Force responsibility to identify and analyze Aerial Phenomena that could possibly be a menace to the United States. Much of the Scientific and Technical work during 1950 and 1951 centered around Project "Twinkle" and the Green Fireball studies of Dr. LaPaz in the Southwestern United States. Project "Twinkle" Final Report was completed on 27 December 1951. During December 1951 Colonel Kirkland and Lt. Ruppelt made a visit to Battelle Memorial Institute to discuss the feasability of a scientific study from the data collected since the program's inception. Thus, Project Blue Book's Special Report #14 came into being.

During the phase in which Special Report #14 was in preparation (1952 - 1954) the project attracted a Public Relations aspect that remains with it today. This came about through a National interest in reported sightings, Science-Fiction publications of alleged contacts with visitors from outer spece, formation of psuedo-scientific organizations, hobby clubs, and self-appointed individuals who investigated UFO sightings. The radar sightings in Washington D. C. during July 1952 tended to give substance to UFO reports. News coverage during this period was extremely high and General Samford conducted a press conference on 29 July 1952 to explain the situation.

With the increased volume of reports pouring in, a Scientific Advisory Panel on UFO was established in late 1952. At a meeting held during 14 - 18 January 1953 all available data was examined. Conclusions and recommendations of this panel were published in an unclassified report, and made public. The panel concluded that UFO's did not threaten the National Security of the U. S. and recommended that the Aura of mystery attached to the project be removed.

By 1953 Air Force responsibility for the UFO program had become firmly established. It was now apparent that some directives were necessary in order to standardize investigative procedures and formulate policy. AFR 200-2 was written and the final publication was distributed in August 1954. This regulation states the purpose, investigative procedures and policies relating to release of information. Special Report #14 was completed on 17 March 1954. It concluded that on the basis of the observations reported to the Air Force it was highly improbable that any of these reports represent observations of technological developments outside the range of present day scientific knowledge. In accordance with the recommendations of the Scientific Panel and provisions for release of information outlined in AFR 200-2 the report was declassified and released to the general public on 5 May 1955.

After 1955 the project concerned itself with investigation of sightings, evaluation of the data and release of information to proper news media. This information is given to the public in the form of a news release called the "FACT SHEET". These, or similar releases have been made periodically since 1955. All data collected has been in accordance with the conclusions of the Scientific Panel in January 1953. Still, the "Flying Saucer Myth" had remained in the public eye, and has recessitated many conferences and briefings among Military, Civilian, Scientific, and Congressional members. Among the most significant of these are: a) 4 October 1956, The General Lewis Special Briefing, b) 16 September 1957, Defence Science Board Briefing, c) 31 January 1958, McClellan Sub-Committee Briefing, d) 8 August 1958, McCormack Sub-Committee Briefing, e) February 1959, Washington D. C. Policy Meetings and f) 11 - 15 July 1961, Congressional Briefing (Mr. Robert Smart).

As far back as 1952 recommendations have been made to discontinue the project or transfer it to civilian agencies or contractors. However, continuation of the project under Air Forces auspices is likely. A letter from General Watson on 7 July 1955 to General Samford expressed factors that are still pertinent,". . . is the fact that complete reliance on a contractor would not reduce the responsibility of and therefore the load carried by the Air Force. . ." Also, various studies have been made to transfer the project to other organizations within the Air Force.

CURRENT SITUATION: Personnel associated with the project are engaged in receipt of UFO reports, investigation and analysis of these reports and maintenance of research and correspondence files. In addition, information is supplied to SAFOI-CC upon which to base a reply to the more than 2,000 letters a year from individuals requesting information on the UFO program. From 1962 - 1965 the files were reviewed and placed in a standard format. Statistics were recomputed on the basis of the actual case files. The fact sheet was revised to provide information most often requested by individuals and to disseminate the yearly statistics. Periodic case summaries on cases or public interest are released. The current AFR 200-2 is under revision. Present Project Officer is Major Hector Quintanilla, Jr.

U F O

Air Force Regulation 200-2 establishes the UFO program to investigate and analyze UFOs over the United States. Such investigation and analysis are directly related to Air Force responsibility for the defense of the United States.

OBJECTIVES

Air Force interest in UFOs is three fold:

1. To determine if UFO phenomena presents a threat to the security of the United States.

2. To determine if the UFO phenomena exhibits any technological advances which could be channeled into Research and Development.

3. To explain or identify the stimulus which caused the observer to submit his report as an unidentified flying object.

EXTRACT

AFR 200-2

14. Basic Reporting Data and Format. Show the abbreviation "UFO" at the beginning of the text of all electrical reports and in the subject of written reports. Include the required date in all reports, in the order shown below:

a. Description of the Object(s):

(1) Shape.

(2) Size compared to a known object (use one of the following terms: Head of a pin, pea, dime, nickel, quarter, half dollar, silver dollar, baseball, grapefruit, or basketball) held in the hand at about arm's length.

(3) Color.

(4) Number.

(5) Formation, if more than one.

(6) Any discernible features or details.

(7) Tail, trail, or exhaust, including size of same compared to size of object(s).

(8) Sound; if heard, describe sound.

(9) Other pertinent or unusual features.

b. Description of Course of Object(s):

(1) What first called the attention of observer(s) to the object(s)

(2) Angle or elevation and azimuth of object(s) when first observed.

(3) Angle or elevation and azimuth of object(s) upon disappearance.

(4) Description of flight path and maneuvers of object(s).

(5) How did the object(s) disappear? (Instantaneously to the North, etc.)

(6) How long (were) the object(s) visible? (Be specific, 5 minutes, 1 hour, etc.)

c. Manner of Observation:

(1) Use one or any combination of the following items: Ground-Visual, air-visual, ground-electronic, air-electronic. (If electronic, specify type of radar.)

(2) Statement as to optical aids (telescopes, binoculars, etc.) used and description thereof.

(3) If the sighting occurred while air-borne, give type of aircraft, identification number, altitude, heading, speed, and home station.

d. Time and Date of Sighting:

(1) Zulu time-date group of sighting.

(2) Light conditions. (Use one of the following terms: Night, day, dawn, dusk.)

e. Location of Observer(s). Give exact latitude and longitude of each observer, and/or geographical position. In electrical reports, give a position with reference to a known landmark also, such as "2mi N of Deeville"; "3mi SW of Blue Lake." Typographical errors or "garbling" often occur in electrically transmitted messages, making location plots difficult or impossible.

Example: 89 45N, 192 71W for 39 45N,,102 21W.

f. Identifying Information on Observer(s):

(1) Civilian-Name, age, mailing address, occupation, and estimate of reliability.

(2) Military-Name, grade, organization, duty, and estimate of reliability

g. Weather and Winds-Aloft Conditions at Time and Place of Sightings:

(1) Observer(s) account of weather conditions

(2) Report from nearest AWS or U.S. Weather Bureau Office of wind direction and velocity in degrees and knots at surface, 6000', 10,000', 16,000', 20,000', 30,000', 50,000', and 80,000', if available.

(3) Ceiling.

(4) Visibility.

(5) Amount of cloud cover.

(6) Thunderstorms in area and quadrant in which located.

(7) Vertical temperature gradient.

h. Any other unusual activity or condition, meteorological, astronomical, or otherwise, which might account for the sighting.

i. Interception or identification action taken (such action is authized whenever feasible, and in compliance with existing air defense directives).

j. Location, approximate altitude, and general direction of flight of any air traffic or balloon releases in the area which might possibly account for the sighting.

k. Position title and comments of the preparing officer, including his preliminary analysis of the possible cause of the sighting(s). (See paragraph 16.)

l. Existence of physical evidence, such as material and photographs.

OFFICIAL FILE COPY

TD-E /Lt Col Friend/mb/69216

UFO Program and Briefing

30 January 1963

3750th Technical School, USAF (ATC)(TS-A-3, Mr. Glisson)
Sheppard Air Force Base, Texas

1. Reference your letter of 23 January 1963 concerning your interest in Dr. Hynek as a guest speaker on the subject of Unidentified Flying Objects.

2. In arranging for Dr. Hynek's services, please forward to TD-E, at least two weeks in advance, the dates of your choice. Also, it would be appreciated if quarters could be arranged for Dr. Hynek during his stay.

3. Dr. Hynek is available to you at no cost.

FOR THE COMMANDER

Robert J. Friend Lt Col 30 Jan 63

for ERIC T. de JONCKHEERE
Colonel, USAF
Deputy for Science and Components

OFFICIAL FILE COPY

HEADQUARTERS
3750TH TECHNICAL SCHOOL, USAF (ATC)
SHEPPARD AIR FORCE BASE, TEXAS
Department of Intelligence Training

REPLY TO ATTN OF: T3-A-3 (Mr. Glisson) 23 January 1963

SUBJECT: UFO Program and Briefing

TO: FTD (TD-E/LtCol Friend)
Wright-Patterson AFB, Ohio

1. Thank you for your letter concerning Dr. J. Allen Hynek and his availability as a guest speaker. However, we cannot schedule guest speakers at this time due to the pending move of our training activity to Lowry AFB. We are interested in Dr. Hynek and will need to know the arrangement procedure for future planning. Please forward us this information including cost factors.

2. We appreciate your sending the UFO material.

Lawrence J. Smith

LAWRENCE J. SMITH
LtCol, USAF
Director

Tech Trng Cen (TS-A-3)
Sheppard AFB, Texas

UNITED STATES AIR FORCE
OFFICIAL BUSINESS

POSTAGE AND FEES PAID

FTD (TD-E/LtCol Friend)
Wright-Patterson AFB, Ohio

OFFICIAL FILE COPY

TD-E/Lt Col Friend/mb/69216
UFO Program

8 January 1963

Tech Tng Cen (TS-A-1) (Mr. W. Glisson)
Sheppard AFB Tex

1. Dr. J. Allen Hynek, USAF consultant to the Air Force UFO Project since 1948, is available to give a briefing on this subject to the students of your Intelligence Officer Course.

2. Dr. Hynek is available during two periods. These occur during the summer between June 15 and September 1 and during the winter quarter between January and March.

3. If this service is desired by your organization, arrangements can be made by contacting FTD (TD-E Lt Col Friend) and indicating those possible dates which would conform with your schedule.

FOR THE COMMANDER

for Robert J. Friend Lt Col 7 Jan 63

ERIC T. de JONCKHEERE
Colonel, USAF
Deputy for Science and Components

OFFICIAL FILE COPY

OFFICIAL FILE COPY

TD-E/Lt Col Friend/mm/69243

UFO Program

19 December 1962

Technical Training Center (TS-A-1 Mr. W. Glisson)
Sheppard AFB, Texas

Attached is the material on the USAF Unidentified Flying Objects program requested by you for use in your training course for intelligence officers.

FOR THE COMMANDER

/s/ E. J. Friend Lt Col 19 Dec 62

EDWARD H. WYNN
Colonel, USAF
Deputy for Science
and Components

2 Atch
1. UFO Briefing
2. Supplemental Information

OFFICIAL FILE COPY

Air Intelligence Branch
Department of Intelligence Training
3750th Technical School, USAF (ATC)
Sheppard Air Force Base, Texas

29 October 1962

FTD (TD-E2B)
Attn: Major Howard F. Greene
Wright-Patterson AFB, Ohio

Enclosed are two copies of the syllabus for the FTD course that we discussed on 27 September with Col Wynn and you. My apologies for its being late, we just received it from the printers yesterday.

We are still anticipating the "Cross Check" question run when you get it and the UFO pictures from LtCol Friend.

Steven R. Schell
STEVEN R. SCHELL
2nd Lt, USAF

1 Atch
OTS8000-6 Syllabus (2 cys)

MEMO ROUTING SLIP

NEVER USE FOR APPROVALS, DISAPPROVALS, CONCURRENCES, OR SIMILAR ACTIONS

	INITIALS	ACTION
1 TO COL WEBB		CIRCULATE
[illegible]	DATE	COORDINATION
2 MR. DOLAN		FILE
MISS LLOYD		INFORMATION
MRS. CLAUSS		NOTE AND RETURN
3 MISS SHERIN		PER CONVERSATION
1/SGT HAGER		SEE ME
MRS. HUEY		SIGNATURE
4 LT COL FRIEND ✓		
2/SGT MOODY		
MRS. MORRIS		

REMARKS

SUSPENSE

TD-P1

TD-P2

TD-P3

I have done my part. Have you sent the UFO pix yet?

FROM

TD-E Rol

DATE 6 Nov

PHONE

DD FORM 1 OCT 60 95 Replaces DD Form 94, 1 Feb 50 and DD Form 95, 1 Feb 50 which will be used until exhausted.

☆ GPO 1961 : O—596758

7-3745 - 413

1003848

RETURN TO
USAF Historical Archives
ASI(ASHAF-A)
Maxwell AFB, Ala 36112

EXTRA COPIES

ACTION

BACKGROUND MATERIAL

OFFICIAL FILE COPY

10038-48

RETURN TO
USAF Historical Archives
ASI(ASHAF-A)
Maxwell AFB, Ala 36112

SMC

FOREIGN TECHNOLOGY DIVISION

COMMAND SECTION

CORRESPONDENCE ACTION FOLDER

STAFF SUMMARY SHEET

TO	ROUTE	DESIRED ACTION	SIGNATURE	DATE
TDG	1	Signature		18 July 1963
				OFFICE OF PREPARATION
				TDE
				GRADE - SURNAME: Col de Jonckheere — PHONE: 72111

SUBJECT: Congressional Correspondence on the U.S. Air Force UFO Program, Congressman Carl Vinson

SUMMARY

1. Congressional correspondence on UFO's received by this Deputy is routine; however, I believe that this letter to AFNIN from Congressman Carl Vinson requires your personal attention since it suggests the possibility of a Congressional hearing.

2. There have been two Congressional briefings on the program, one in the summer of 1958 and the other in the summer of 1960. During the summer of 1961, we were successful in preventing a hearing by briefing Mr. Richard P. Hines, a staff member of the House Space and Astronautics Committee, on our method of handling the program and our findings. Mr. Hines was visiting FTD to gather background information on the program for Congressman Joseph Karth, a member of the committee. As a result of Mr. Hines' report, Mr. Karth recommended to Chairman Overton Brooks that there be no hearings.

3. Earlier this year an article on unidentified flying objects was prepared for the Encyclopaedia Britannica by Dr. J. Allen Hynek of Northwestern University, consultant to our UFO program, and Lt Col Robert J. Friend. Mr. A. Francis Arcier made many suggestions and approved the final article which is to appear in the next edition of the Encyclopaedia Britannica. Mr. Arcier decided that the article should be prepared by Dr. Hynek to prevent unnecessary publicity for FTD and to gain the prestige which Dr. Hynek's name carries. I suggested to AFNIN that a copy of this article be attached to the letter to Mr. Vinson.

4. If you approve my proposed reply to Congressman Vinson, I will send information copies to SAFOI and to AFSC(SCFA).

5. The background section of this folder contains the following:
   a. AFNIN letter to FTD
   b. Copies of the documents which established the UFO project
   c. Documents related to Mr. Hines' visit to FTD
   d. Congressman Karth's letter to Major Keyhoe
   e. UFO article which will appear in Encyclopaedia Britannica

6. If you desire any further information, Lt Col Friend and I will be available.

Do not forward to Command Section until this block has been signed and dated by the appropriate OPI. This block, when signed, signifies completed coordination and that the OPI is aware of concurrence, non-concurrence and either resolution of difference or why the non-concurrence should be overridden.

Signature: Nicholas Fort — Date: 7/18/63

AFSC FORM SEP 61 149 — PREVIOUS EDITION OF THIS FORM MAY BE USED.

A

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS UNITED STATES AIR FORCE
WASHINGTON 25, D.C.

REPLY TO ATTN OF: AFNIN

SUBJECT: Unidentified Flying Objects

10 JUL 1963

TO: Commander
FTD
Wright-Patterson AFB Ohio

1. The attached correspondence is forwarded for the preparation of a draft of a proposed reply to Honorable Carl Vinson.

2. Also attached for your investigation and analysis is a letter from John P. Speights relative to unidentified flying objects.

3. The suspense to AFNIN must be by 21 July 1963.

FOR THE CHIEF OF STAFF

DONALD M. DESSERT
LTCOL, USAF
Office, Assistant Chief of Staff
Intelligence

2 Atch
1. Ltr Carl Vinson, July 8
2. Ltr John P. Speights, July 2

Copy furnished:
AFSC (SCF) Andrews AFB

B

C

REPLY TO
ATTN OF: TD-3

SUBJECT: Congressional Investigation of the UFO Program

TO: TDG(General Pierce)

1. An article appeared in the July 1968 issue of Newsweek, stating the possibility of a congressional investigation of the USAF UFO Program. Contact with the Secretary of Air Force, Legislative Liaison Office(SAFLL) revealed that there was no official information concerning such an investigation. However, SAFLL pointed out that unofficially there were indications that such an investigation would take place.

2. Unofficial sources (SAFLL) have it that Congressman Joseph E. Karth, Minnesota, of the House Science and Astronautics Committee (Congressman Overton Brook, Los Angeles Chairman) would head the investigating team. The investigation to be directed toward determining generally how the USAF is handling the UFO Program and specifically the capabilities of FTD in the analysis and investigation areas.

3. SAFLL's present efforts are directed toward heading off the investigation or, if it is to occur, having it take place in Washington D. C. with Dr. J. Allen Hynek, Consultant to the UFO Program and Major Robert J. Friend, Aerial Phenomena Branch TD-E in attendance.

4. If the investigation is carried out at FTD I intend to handle it within the Deputy unless otherwise directed.

EDWARD H. WYNN
Colonel, USAF
Deputy for Science and Technology

664

D

OFFICIAL FILE COPY

TDG

Unidentified Flying Objects 18 JUL 1963

AFNIN (Lt Col Dessert)

1. Attached is a proposed reply to Congressman Carl Vinson's request for information on the U.S. Air Force Unidentified Flying Objects program. This action is in response to your letter to me on the UFO subject, dated 10 July 1963.

2. Strenuous efforts by Major Keyhoe, a self-styled UFO investigator, and others like him to discredit the Air Force's handling of the UFO program have resulted in two Congressional briefings and numerous queries for information from the members of Congress. The first briefing was in the summer of 1958 and the second took place during the week of 10 July 1960. The latter briefing was given to members of the Senate Preparedness Sub-Committee, the House Armed Services Sub-Committee, the House Space and Astronautics Sub-Committee, CIA, and representatives from the Office of the Secretary of the Air Force.

3. A later effort of Major Keyhoe's to instigate a hearing on UFO's by the House Space and Astronautic Committee during the summer of 1961 was unsuccessful. Congressman Joseph Karth of this committee sent Mr. Richard P. Hines, a staff consultant to FTD to collect background information regarding the Air Force's handling of the program. From Mr. Hines' report, Mr. Karth determined that the Air Force's approach to the program was proper and that Major Keyhoe's charges of mishandling were without grounds. A copy of Congressman Karth's letter to Major Keyhoe is attached.

4. Since it is apparent from Mr. Speights' letter that Major Keyhoe and others are attempting to force further Congressional hearings on the UFO program, it is my opinion that this rather long letter to Mr. Vinson is justified.

OFFICIAL FILE COPY

5. I suggest that a copy of the UFO article by Dr. J. Allen Hynek which is to appear in the next edition of the Encyclopaedia Britannica be attached to Congressman Vinson's letter.

ARTHUR J. PIERCE
Major General, USAF
Director

5 Atch
1. Ltr Carl Vinson, 8 Jul 63.
2. Ltr J.P. Speights, 2 Jul 63.
3. Proposed reply to C. Vinson.
4. 2 cy ltr Rep Karth to Maj Keyhoe, 28 Aug 61.
5. 2 cy exerpt fm Encyclopaedia Britannica.

COORDINATION:

TDE — Col Eric T. de Jonckheere — Date 7/18/63

TDEW — Mr. Fred P. Van Dame — Date 18 July '63

TDEW — Lt Col Robert J. Friend — Date 18 July 63

Dear Mr. Chairman:

I refer to your letter of 8 July 1963 requesting the latest Air Force position on unidentified aerial phenomena.

The Air Force's principal interest in these objects/phenomena is in determining if they are in any way a threat to our national security or if they are a source of new scientific or technical information. Further, the Air Force attempts to determine the cause of each sighting in order to allay public anxiety resulting from an incident involving unidentified aerial phenomena.

Better than 90 per cent of the more than 7500 cases investigated since 1947 have been attributed to the misidentification of such familiar objects as balloons, aircraft, and satellites, and such unfamiliar phenomena as parhelia and mirages. A small percentage of cases remains unidentified due, for the most part, to the limited nature of the report. To date there has been no evidence from any case to indicate that these objects/phenomena are any type of space craft other than earth satellites or space probes of the Soviet Union or of the United States.

In the United States there are more than fifty private unidentified flying object (UFO) organizations. Collectively, these organizations boast more than 500,000 members. During the 1960 Presidential election, the members of these organizations actually nominated their own candidate who allegedly threw his

support to President Kennedy during the final hours. The principal claims of these organizations are that unidentified flying objects are interplanetary space craft and that the Air Force is withholding the information.

The most active and influential of these organizations is the National Investigation Committee on Aerial Phenomena (NICAP). This organization is headed by Major Donald E. Keyhoe, U.S. Marine Corps (Ret).

NICAP, through its publication the "UFO Investigator," has made constant appeals to its members to write to their congressman requesting a hearing to investigate the Air Force's handling of the UFO program. It is our opinion that this appeal prompted Mr. Speights' letter to you.

Mr. Speights, a youth of about 19, has written to us on two previous occasions and has received an answer to each of his two letters. From comparison of the language in his previous letters with that in the letter to you it is obvious that Mr. Speights has had assistance with the majority of the information contained in this most recent letter. It is probable that he copied it from some NICAP publication.

Following are some observations regarding statements in Mr. Speights' letter.

The Air Force has no record of the number of attempts which have been made by our pilots to intercept UFO's; however, such action is not unusual nor does it prove that these objects/phe-

nomena are anything other than as claimed by the Air Force. The Air Force attempts to intercept any object which is unidentified and has prescribed performance parameters.

In many instances the pilot, upon returning to the ground, realizes that he has been attempting to close on some common object such as a planet. The Ryan case which occurred in the state of New York on 8 April 1956 was due to the misidentification of the planet Venus. Our records reveal that Captain Ryan was not directed by the Air Force to investigate the object and that, according to his own statement, he did not deviate from course for this or any other purpose. The fact that Captain Ryan arrived at Schenectady, his destination, on schedule tends to substantiate the claim that he did not deviate from course.

Scientists and engineers, though expert in their own field, can temporarily misidentify some object or phenomena thus reporting it as an unidentified flying object. It is, in fact, possible for a scientist to be fooled by an occurrence closely associated with his specialized field as evidenced by the experience of Dr. Donald H. Menzel of Harvard, a noted astronomer. Dr. Menzel was fooled for a time by the refracted image of the star Sirius. This experience is related in Chapter IV, page 60 of his forthcoming book, THE WORLD OF FLYING SAUCERS, published by Doubleday.

There are sightings in the Air Force files which indicate ball lightning or some similar electromagnetic phenomena as the probable cause. Due to the infrequent occurrence and the transient nature

of ball lightning, it is impossible to have good documented reports on this phenomena. In most of these cases, witnesses have reported interference with vehicle ignition, lights, radio, etc. Such interference, if actually occurring, could be due to the presence of the lightning or to the fact that the witness in his excitement may accidentally stall the car. Because ball lightning usually occurs immediately following a severe thunder storm, such factors as wet ignition, atmospheric static, etc., may be the cause for the reported trouble.

The Air Force has taken geiger counter readings immediately after sightings but has yet to find any readings which vary significantly from the normal background of the area tested.

Radar sightings are often supported by visual sightings because the same atmospheric conditions which produce visual anomalies may also effect radar.

It is Air Force policy to provide news media with information regarding UFO sightings which reach national prominence and to provide information to individuals in response to their specific requests. Further, the next edition of the Encyclopaedia Britannica will carry an article on unidentified flying objects. This article, approved by the Air Force, was prepared by Dr. J. Allen Hynek, Chairman of the Department of Astronomy as Northwestern University, who has served as Air Force consultant to the UFO program since 1948.

In order that the public be provided with as much information as possible, every effort is made to keep UFO sightings unclassified.

Supporting information indicates the classification of a sighting and not the sighting itself. Since 1959, 184 cases of 2167 are classified and only 4 of the 53 unidentified cases for this period are classified.

The number of foreign reports that have come to our attention do not differ measurably from those originating in the U.S. neither in the presentation of the data nor in the determined probable cause.

The Air Force has no knowledge of a 1948 document by ATIC which states that UFO's are interplanetary space ships. One of the original documents establishing the project states that an objective would be to determine if any evidence from sightings suggests that UFO's are of interplanetary origin. It is possible that the meaning of this document was misinterpreted. The Air Force's open minded attitude still persists, and investigators and analysts have no preconceived notion as to the cause for a sighting but rather form their conclusions from the evidence. To date no evidence has been found to lead us to even suspect that these objects are interplanetary space ships.

Unidentified aerial phenomena constitute only a part of the noise which our defense detection systems must take into account in preventing accidental war. Scientific studies too extensive to be discussed here, are being conducted to determine the extent and nature of this noise for integration into our defensive network.

It is hoped that this information answers all of your questions regarding the Air Force's Unidentified Aerial Phenomena Program. We stand ready to give you any further cooperation which you deem necessary.

Speights

OFFICIAL FILE COPY

TDEW

Request for UFO Information(John P. Speights) 1 August 1963

Hq USAF SAF-OI 3b (Mrs. Wells)
Wash 25 DC

1. Reference the attached letter from Pvt John P. Speights requesting information on unidentified flying objects. This letter is forwarded to your office for whatever action you deem necessary.

2. The unidentified flying objects in the photographs taken at Salem, Massachusetts on July 16, 1952 have been evaluated as light reflections on the window through which the photos were taken.

FOR THE COMMANDER

1/C Robert J. Friend, 1 Aug 63

ERIC T. de JONCKHEERE
Colonel, USAF
Deputy for Technology and Subsystems

1 Atch
Ltr fm Pvt J.P. Speights, dtd 8 Jul 63.

OFFICIAL FILE COPY

OFFICIAL FILE COPY

TDEW

22 July 1963

Unidentified Flying Objects

Hq USAF SAF-OI 3b (Mrs. Wells)
Wash 25 DC

1. Congressman Carl Vinson requested information from the USAF regarding the Unidentified Flying Objects program. Attached is a copy of the proposed reply to Congressman Vinson which we forwarded to AFNIN for passing to SAFLL.

2. Mr. Vinson's letter was prompted by an appeal for a Congressional hearing which was made to him by John Peurifoy Speights of 2811 Bedford Avenue, Raleigh, North Carolina. Mr. Speights requested information on UFO's from the Air Force on two previous occasions and was promptly answered each time.

3. Apparently Major Keyhoe's appeal to the members of NICAP, through the organization bulletin "UFO Investigator," to write to their Congressman requesting hearings has at least one response. We believe that the SAFLL staff should be appraised of this and previous attempts by Major Keyhoe to discredit the USAF and bring about Congressional hearings on the UFO program.

FOR THE COMMANDER

ERIC T. de JONCKHEERE
Colonel, USAF
Deputy for Technology and Subsystems

1 Atch
Cy ltr fm FTD(TDG) to AFNIN(Lt/Col Dessert) dtd 18 Jul 63, Subj: UFO, w/atch 3 only.

OFFICIAL FILE COPY

OFFICIAL FILE COPY

TDEW

Unidentified Flying Objects

22 July 1963

AFSC(SCFA)
Andrews AFB, Md.

1. Attached is a copy of our proposed response to a request for information on the USAF Unidentified Flying Objects program from Congressman Carl Vinson. This proposed reply was sent to AFNIN for forwarding to SAFLL.

2. Partly due to the efforts of private UFO organizations there have been two briefings on the UFO program for Congressional sub-committees. One was held in the summer of 1958; the other, during the week of 10 July 1960. A hearing was averted during the summer of 1961 when we briefed Mr. Richard P. Hines of the House Space and Astronautics Committee during his visit to FTD. Mr. Hines was gathering background information for Congressman Joseph Karth a member of the committee. As a result of Mr. Hines' report, Congressman Karth recommended there be no hearings. A copy of Mr. Karth's letter to Major Keyhoe of the National Investigations Committee on Aerial Phenomena, a private UFO organization, stating the Congressman's position regarding a hearing is attached.

3. Also attached is a copy of an article which will appear in the next edition of the Encyclopaedia Britannica. The article was written by the consultant of the UFO program, Dr. J. Allen Hynek of Northwestern University, and approved by the Air Force. Dr. Hynek has been consultant to the UFO program since 1948. We have suggested that a copy of this article accompany the letter to Congressman Vinson.

FOR THE COMMANDER

R.J.F. 22 July 63

for ERIC T. de JONCKHEERE
Colonel, USAF
Deputy for Technology and Subsystems

3 Atch
1. Cy proposed reply to Congressman Carl Vinson.
2. Cy ltr Rep Karth to Maj Keyhoe, 28 Aug 61.
3. Cy exerpt fm next ed Encyclopaedia Britannica.

OFFICIAL FILE COPY

[illegible]

1. [illegible] [illegible] [illegible]

Dear Mr. Chairman:

I refer to your letter of 8 July 1960 requesting the latest Air Force position on unidentified aerial phenomena.

The Air Force's principal interest in these objects/phenomena is in determining if they are in any way a threat to our national security or if they are a source of new scientific or technical information. Further, the Air Force attempts to determine the cause of each sighting in order to allay public anxiety resulting from an incident involving unidentified aerial phenomena.

Better than 90 per cent of the more than 7500 cases investigated since 1947 have been attributed to the misidentification of such familiar objects as balloons, aircraft, and satellites, and such unfamiliar phenomena as parhelia and mirages. A small percentage of cases remains unidentified due, for the most part, to the limited nature of the report. To date there has been no evidence from any case to indicate that these objects/phenomena are any type of space craft other than earth satellites or space probes of the Soviet Union or of the United States.

In the United States there are more than fifty private unidentified flying object (UFO) organizations. Collectively, these organizations boast more than 500,000 members. During the 1960 Presidential election, the members of these organizations actually nominated their own candidate who allegedly threw his

support to President Kennedy during the final hours. The principal claims of these organizations are that unidentified flying objects are interplanetary space craft and that the Air Force is withholding the information.

The most active and influential of these organizations is the National Investigation Committee on Aerial Phenomena (NICAP). This organization is headed by Major Donald E. Keyhoe, U.S. Marine Corps (Ret).

NICAP, through its publication the "UFO Investigator," has made constant appeals to its members to write to their congressman requesting a hearing to investigate the Air Force's handling of the UFO program. It is our opinion that this appeal prompted Mr. Speights' letter to you.

Mr. Speights, a youth of about 19, has written to us on two previous occasions and has received an answer to each of his two letters. From comparison of the language in his previous letters with that in the letter to you it is obvious that Mr. Speights has had assistance with the majority of the information contained in this most recent letter. It is probable that he copied it from some NICAP publication.

Following are some observations regarding statements in Mr. Speights' letter.

The Air Force has no record of the number of attempts which have been made by our pilots to intercept UFO's; however, such action is not unusual nor does it prove that these objects/phe-

nomena are anything other than as claimed by the Air Force. The Air Force attempts to intercept any object which is unidentified and has prescribed performance parameters.

In many instances the pilot, upon returning to the ground, realizes that he has been attempting to elope on some common object such as a planet. The Ryan case which occurred in the state of New York on 8 April 1950 was due to the misidentification of the planet Venus. Our records reveal that Captain Ryan was not directed by the Air Force to investigate the object and that, according to his own statement, he did not deviate from course for this or any other purpose. The fact that Captain Ryan arrived at Schenectady, his destination, on schedule tends to substantiate the claim that he did not deviate from course.

Scientists and engineers, though expert in their own field, can temporarily misidentify some object or phenomena thus reporting it as an unidentified flying object. It is, in fact, possible for a scientist to be fooled by an occurrence closely associated with his specialized field as evidenced by the experience of Dr. Donald H. Menzel of Harvard, a noted astronomer. Dr. Menzel was fooled for a time by the refracted image of the star Sirius. This experience is related in Chapter IV, page 60 of his forthcoming book, THE WORLD OF FLYING SAUCERS, published by Doubleday.

There are sightings in the Air Force files which indicate ball lightning or some similar electromagnetic phenomena as the probable cause. Due to the infrequent occurrence and the transient nature

of ball lightning, it is impossible to have good documented reports on this phenomena. In most of these cases, witnesses have reported interference with vehicle ignition, lights, radio, etc. Such interference, if actually occurring, could be due to the presence of the lightning or to the fact that the witness in his excitement may accidentally stall the car. Because ball lightning usually occurs immediately following a severe thunder storm, such factors as wet ignition, atmospheric static, etc., may be the cause for the reported trouble.

The Air Force has taken geiger counter readings immediately after sightings but has yet to find any readings which vary significantly from the normal background of the area tested.

Radar sightings are often supported by visual sightings because the same atmospheric conditions which produce visual anomalies may also effect radar.

It is Air Force policy to provide news media with information regarding UFO sightings which reach national prominence and to provide information to individuals in response to their specific requests. Further, the new edition of the Encyclopaedia Britannica will carry an article on unidentified flying objects. This article, approved by the Air Force, was prepared by Dr. J. Allen Hynek, Chairman of the Department of Astronomy as Northwestern University, who has served as Air Force consultant to the UFO program since 1948.

In order that the public be provided with as much information as possible, every effort is made to keep UFO sightings unclassified.

Supporting information indicates the classification of a sighting and not the sighting itself. Since 1950, 104 cases of 3137 are classified and only 4 of the 58 unidentified cases for this period are classified.

The number of foreign reports that have come to our attention do not differ measurably from those originating in the U.S. neither in the presentation of the data nor in the determined probable cause.

The Air Force has no knowledge of a 1948 document by ATIC which states that UFO's are interplanetary space ships. One of the original documents establishing the project states that an objective would be to determine if any evidence from sightings suggests that UFO's are of interplanetary origin. It is possible that the meaning of this document was misinterpreted. The Air Force's open minded attitude still persists, and investigators and analysts have no preconceived notion as to the cause for a sighting but rather form their conclusions from the evidence. To date no evidence has been found to lead us to even suspect that those objects are interplanetary space ships.

Unidentified aerial phenomena constitute only a part of the noise which our defense detection systems must take into account in preventing accidental war. Scientific studies too extensive to be discussed here, are being conducted to determine the extent and nature of this noise for integration into our defensive network.

It is hoped that this information answers all of your questions regarding the Air Force's Unidentified Aerial Phenomena Program. We stand ready to give you any further cooperation which you deem necessary.

Joseph E. Karth
4th District, Minnesota

CONGRESS OF T'E UNITED STATES
HOUSE OF REPRESENTATIVES
Washington, D. C.

Committee on
Science and Astronautics

August 28, 1961

c
o
p
y

Major Donald E. Keyhoe
U.S.M.C. (Ret.)
Director, NICAP
1526 Connecticut Avenue, N.W.
Washington, D. C.

Dear Sir:

I have read with interest the copy of your letter to Chairman Overton Brooks including suggested "hearing plans."

Perhaps I have been misled in this whole business of UFO. However, it was my belief that you, your organization and others like it, actually had proof that UFO's did in fact exist and that you would be prepared to prove this during the course of the hearing. And further that UFO's were not merely the result of space or atmospheric phenomena, but actually were craft (of sorts) from other planets.

I was sadly disappointed as I read your proposed plan, suggestions and viewpoints. I cannot help but feel after so reading, that your primary if not sole objective, is to 'be-little', 'defame', 'ridicule' (with the least possible publicity, you say) and thereby cause the U.S. Air Force embarrassment unless they bare to you and others, all information you seek, including such information that may well involve our Nation's security. I too am opposed to unnecessary secrecy. However, unnecessary or unwarranted secrecy is nothing more than a matter of opinion. And so even though you and I are opposed to such, we may well disagree on extent and content. As a former military officer, you in your judgment and knowing all the facts, in all probability withheld from the public, knowledge I would not have considered "secret." I repeat - I have opposed and will continue to oppose unwarranted secrecy. At the same time I will not support a proposition smelling of sour grapes in disguise.

Your letter to Chairman Brooks (including your proposed plan) concerned itself almost totally, in my opinion, with evident dislike and malicious intent toward a great branch of the military. In fact it sounded to me like nothing more than cheap service rivalry. Now I hasten to add that I could be wrong, but I have read many plans and proposals in my day and must say I recognize a little prejudice and/or dislike when I see it. If you are not in a position to "make a good case" that UFO's are some kind of foreign craft, I'm not even interested in holding hearings. This I thought to be your purpose. Certainly I'm

not interested in listening to headline making accusations (prompted it seems by past gripes) in open debate between you and the Air Force.

It was my every intention to have the Air Force and organizations of good repute, testify on different days so as to get all the facts. This is the custom and the protocol of Congressional hearings. And I might say - I'm not worried about public alarm - I'm much more concerned about grandstand acts of a rabble rousting nature where accusations may be made THAT COULDN' BE ANSWERED BY ANYONE - the Air Force or NICAP. It's apropos to point out that under your plan you wouldn't be answering many questions if any - you'd just be asking them. Anyone can make someone else look bad under these conditions, and I am not a captive of the Air Force, I assure you.

As I have said, I suffered extreme disappointment as I read your plan. Talk about secrecy! In paragraph A of your letter to Chairman Brooks you propose "the Air Force representatives will be directed by the subcommittee to answer all of NICAP officials' questions in regard to specific UFO sighting, reports and to all phases of the Air Force investigation."

However, in paragraph B of the same letter you propose "...and the NICAP representatives will answer full, except for revealing names and certain details of a few reports given to NICAP confidentially." (Emphasis added). What kind of honesty, forthrightness and fairness is that? You demand that a military service of this nation is to divulge everything to you, BUT YOU IN TURN cannot give "certain details" because it is confidential (secret)? Oh, yes, I have also read paragraph C of your proposals ("It is also agreed that the Air Force may withhold names similarly, where witnesses insisted on this, and also, such minor items as classified radar techniques, aircraft speeds and other relatively unimportant points not bearing on this main questions at issue.) (Emphasis added).

Personally I don't feel I need to elaborate on the generosity equivocated by your language in paragraph C. However, no one interested in justice could refrain completely. First of all, what witness honestly interested in the security of his nation, is going to insist to the Air Force he remain anonymous? (Or to your organization for that matter). Secondly, you generously grant the Air Force the privilege of withholding "relatively unimportant points not bearing on the main questions at issue." Very generous, indeed. If you have information which the Air Force is keeping secret, but does not involve national security, I suggest you release it to the newspapers. They'll love it.

Honestly and sincerely, I make this confession; before I had received copies of your letter (and terms) to Chairman Brooks, I was vitally concerned and interested in what positive and factual information you had on UFO's and the assistance you might give to the Committee. You dispelled any hopes I had relative thereto in the language heretofore

cited. I also could not overlook your language on page three: "The chief concern of NICAP Board members and officials is the increasing secrecy dangers - NOT, at this time, final conclusions about the UFO's. Undoubtedly, I have been misinformed on the purpose of NICAP. I was erroneously led to believe you had factual evidence of some kind about UFO's"

If I have anything to say about it, your terms, conditions and suggestions will notbe accepted.

Very truly yours,

Joseph E. Karth

cc: Hon. Overton Brooks, Chairman
Hon. John McCormack, Majority Leader
Subcommittee members

JEK:eb

UNIDENTIFIED FLYING
OBJECT (UFO)

by

J. Allen Hynek

ENCYCLOPAEDIA
BRITANNICA

1963
Copyright under International Copyright Union
All Rights Reserved under Pan American and Universal Copyright
Conventions by Encyclopaedia Britannica, Inc.
Printed in U.S.A.

WILLIAM BENTON, *Publisher*

the large upper tusks almost suggest the earliest proboscidean types but the most remarkable peculiarity is found in the molar teeth, each of which consists of a closely packed cluster of cylindrical columns of circular cross-section.

Perissodactyla.—*See* PERISSODACTYLA.

Artiodactyla.—The Artiodactyla may be an offshoot of some forerunner of the mesonychid family of the creodonts, while the Perissodactyla may be related remotely to the Cretaceous ancestors of the condylarths.

Recent studies by Miss H. S. Pearson on the skull structure of the earliest artiodactyls have revealed that at a very early date the order was already subdivided into two series, one the amastoid series, in which the mastoid region of the periotic bone was completely covered by the squamosal and adjacent elements (as in the suines and their extinct relatives), and the other, the mastoid series, in which the mastoid was well exposed on the outer side, as in the Eocene Dichobunidae and all the ruminant artiodactyls. *See* also ARTIODACTYL.

BIBLIOGRAPHY.—W. H. Flower and R. Lydekker, *Mammals, Living and Extinct* (1891); H. F. Osborn, *The Age of Mammals* (1910); W. B. Scott, *History of the Land Mammals in the Western Hemisphere* (1937); W. K. Gregory, *Bull. Amer. Mus. Nat. Hist.* (1910); G. G. Simpson, *Bull. Amer. Mus. Nat. Hist.*, vol. 85 (1946).

(W. K. G.; X.)

UNICORN, a fabulous beast, usually having the head and body of a horse, the hind legs of an antelope, the tail of a lion (sometimes horse's tail), sometimes the beard of a goat, and as its chief feature a long, sharp, twisted horn, similar to the narwhal's tusk, set in the middle of its forehead. The earliest description is that of Ctesias, who states that there were in India white wild asses celebrated for their fleetness of foot, having on the forehead a horn a cubit and a half in length, coloured white, red and black; from the horn were made drinking cups which were a preventive of poisoning. Aristotle mentions two one-horned animals, the oryx, a kind of antelope, and "the so-called Indian ass." In Roman times Pliny mentions the oryx, the Indian ass, and an Indian ox as one-horned; Aelian, quoting Ctesias, adds that India produces also a one-horned horse and says that the *Monoceros* was sometimes called *Carcazonon*, possibly a form of the Arabic *Carzadân*, rhinoceros.

The medieval conception of the unicorn as possessing great strength and fierceness is perhaps due to the fact that in certain passages of the Old Testament the Hebrew word *R'em*, now translated in the Revised Version "wild ox," was translated in the Septuagint *monoceros*, in the Vulgate *unicornis* or *rhinoceros*, and in the Authorized Version "unicorn," though in Deut. xxxiii. 17 it obviously refers to a two-horned animal. Isidore xii, 2, 12 tells how the unicorn had been known to worst the elephant in combat.

As a decoration on drinking cups, it symbolized the ancient belief in the efficacy of the unicorn's horn against poison, which in England remained, even in the time of Charles II, though Sir E. Ray Lankester mentions that a cup made of rhinoceros horn was then handed over to the Royal society for experiment, with the result of entirely disproving the superstition.

In the court ceremonial of France as late as 1789 instruments of "unicorn's" horn were still used for testing the royal food for poison.

In heraldry the unicorn was sometimes used as a device (*see* HERALDRY), but oftener as a supporter, and subsists in modern times as the left-hand support of the royal arms. This position it assumed at the Union, the Scottish royal arms having been supported by two unicorns. When the unicorn became a supporter of the royal arms both of England and Scotland, a royal crown was added on the head of the unicorn, in addition to the crown with chain and ring round its neck, but this crown was removed after the Hanoverian succession. In England after the Union the unicorn became the left-hand supporter, but in Scotland, as late as 1766, it was still put on the right.

UNICORN PLANT (*Proboscidea jussieui*), a North American plant of the family Martyniaceae, called also proboscis flower and devil's-claw, native from Indiana to New Mexico and southward to Mexico, cultivated for its abundant foliage, peculiarly shaped flowers and oddly formed fruiting pods. It is a coarse, sticky-hairy, half-prostrate annual, with thick, roundish leaves; large violet or purple flowers, 1¼ in. long; and hanging, hornlike, woody pods, with a thick body 3 in. to 4 in. long, ending in a curved beak of equal or greater length. When dry, the beak splits into two opposed hooklike or clawlike appendages.

ROCHE

UNICORN PLANT (PROBOSCIDEA JUSSIEUI) SHOWING FLOWERS, HORNLIKE FRUITING POD AND LEAVES

UNIDENTIFIED FLYING OBJECT (UFO), in military parlance, means any aerial object that fails to identify itself to, or to be identified by, trained ground or air-borne crews using visual or electronic detection methods. Since 1947, owing to a sequence of bizarre circumstances, UFO has become an omnibus term connoting any object or optical phenomenon, usually aerial, that the observer cannot readily explain. UFO frequently is used interchangeably with "flying saucer," a term coined in 1947 as a result of the reported sighting by a civilian pilot, Kenneth Arnold, of a series of disk-like objects over the mountain ridges in the vicinity of Mt. Rainier, Washington. As a result of the wide publicity given to this sighting, there followed a wave of reports of unidentified objects by observers in various parts of the U.S., as well as in other countries.

First regarded by many as a bizarre, peculiarly American psychological phenomenon that would quickly fade away, the UFO instead showed an amazing tenacity over more than a dozen years, and the U.S. air force was officially charged with investigating the reports. Often several reports were made to the air force in one day, and reports came also from France, Great Britain and other countries. Indeed, account is taken of the smaller area of some of the countries and the greater percentage of cloudy weather they experience, the sightings "per square mile per day" often were more frequent there than in the U.S.

The UFO should not be regarded as something that came into being in 1947, even though the phenomenon burst suddenly upon the public consciousness in that year. History is full of references to strange sights in the sky. In ancient and medieval times a comet was a dramatic and terrifying sight, as was an aurora, and it would be impossible to say whether the pattern of sightings in those days was the same as in the 20th century. Certainly, in some respects it must have been different. There were no "sky-hook" research balloons, unusual types of aircraft or re-entering missiles or artificial satellites. A comet, though described in terms recognizable to us, was often regarded as a true visitation.

It is easy to imagine that there were many UFO's in those times, many scores of strange sightings in the sky; but since communication was poor and record-keeping almost nonexistent, such sightings became part of the underbrush of local folklore and old wives' tales. Certainly, in times when people believed that a woman could give birth to dogs and pigs, that witches could levitate and fly about, and when credulity ran high, it would be not at all surprising to find a similarly uncritical attitude toward ordinary—and today well-understood—aerial phenomena.

Reports since the birth of the "modern" UFO in 1947 generally occurred in waves, but on the average, during the period of the U.S. air force study, they numbered more than one a day. If consideration is taken of the fact that many reported sightings were not made through official channels, but to newspapers and to civilian groups interested in the phenomena, the rate of observations may have been as high as two or three a day in the U.S. over a period of a dozen years. France, Italy, England and a number of Latin American countries also experienced minor waves of UFO reports.

The steady stream of sightings became a cause for concern to the air force, and detailed investigations were made to discover

TABLE.—*Reported Sightings,* 1947–61*

Year	Number	Year	Number
1947	79	1955	401
1948	143	1956	778
1949	186	1957	1,178
1950	169	1958	590
1951	121	1959	364
1952	1,501	1960	514
1953	425	1961	488
1954	429	Total	7,169

*U.S. air force reported sightings during the 15-year period of the official study.

reasons for such reports. The objectives were to determine (1) whether the reported UFO's constituted a threat; (2) whether the phenomena had any intrinsic scientific value; and (3) what role UFO's might play as a factor in the sky surveillance program. It was concluded after the many years of investigation that: (1) the phenomena bore no hostile purport and did not constitute a security threat; (2) there was no compelling reason to believe that the great majority of sightings arose from anything other than misidentification of natural objects and phenomena, and that the real cause of these sightings generally lay in the conditions under which an object or phenomenon was seen; and (3) the continued evaluation of UFO reports is of scientific value, especially in relation to the military sky surveillance problem.

It was established that many sightings arose from seeing startling natural objects for the first time; *e.g.*, very bright meteors, high-altitude scientific balloons (which can attain high velocity when caught in the jet stream) and especially distant terrestrial or celestial objects seen under such unusual meteorological conditions as those that produce mirages, which can distort, displace and animate objects detected visually or by radar. Such meteorological conditions, some thoroughly understood (mirages) and some poorly understood (ball lightning), can easily cause even an experienced observer to ascribe what he sees to a tangible, nearby, self-propelled object.

Indeed, it is not at all surprising, with so many more people turning their attention skyward, that many (including the scientifically trained) are confronted with an aerial phenomenon they cannot readily explain.

Virtually all the reports received by the air force were highly subjective, lacking such verification as pictures, material fragments, spectroscopic analysis of lights seen or precise technical data on trajectories, distances, accelerations, etc. As the investigation progressed, it became clear that most reports could be correlated with the appearance of aircraft, birds, celestial objects, balloons, etc., under special conditions, and the number of unexplained cases fell from an early value of more than 10% to as little as 2% or 3%. It was readily admitted that this small residue—*as reported*—defied logical explanation. For none of the extraordinary "unknowns," however, were there scientific data on which to base valid, definitive investigations.

The early difficulties in coming to grips with the successive waves of sightings, coupled with concern that UFO reports, often made by pilots, might constitute a threat to military security (and the consequent, unfortunate air of secrecy imposed in the early years of UFO reports), had an electrifying effect on the imaginations and emotions of a surprisingly large number of people. It led to an inordinate interest in UFO's and a logical, albeit scientifically unsupported theory of UFO's, encouraged by the real possibility of life elsewhere in the universe, as well as by a strong, often unconscious, desire on the part of many people to believe in the probability of visitors from outer space.

This theory of UFO's, with its strong quasi-religious emotional appeal, holds it not only logical to assume that other intelligent beings exist in the natural universe, but that superior extraterrestrial civilizations might visit here periodically, as if to make periodic checks on a tribe of aborigines. The theory is seen to have support throughout history in accounts of strange apparitions in the sky, suggesting to some that the earth could have been visited many times in the past. Some believe such visits became more frequent as atomic and hydrogen bombs increased extraterrestrial concern.

In the face of continued lack of empirical evidence, persistent attempts to link UFO reports with visitations from space merit socio-psychological study.

It is amply evident that UFO's and "flying saucers" exist as *reports*. This has led to the quip that UFO's are any aerial sightings that remain unexplained long enough for the preparation of written reports about them. It is the problem of the serious investigator to probe for stimuli that give rise to the reports.

U.S. air force investigators long recognized that most originators of UFO reports are sincere, interested in the welfare and security of their country and honestly puzzled by the sightings they report. Their frequent readiness to ascribe a UFO to extraterrestrial sources, their emotional attachment to this explanation and their reluctance to take into account the failure of continuous and extensive surveillance by trained observers to produce such sightings is surprising. It appears unreasonable that spacecraft should announce themselves to casual observers while craftily avoiding detection by trained observers.

Nonetheless, it is recognized that knowledge of the universe and of the physics of our atmosphere is still imperfect. UFO sightings, as long as they continue, will merit serious study and may lead to advances not only in physical knowledge but in the area of human behaviour as well. (J. A. H.)

UNIFIED FIELD THEORY attempts to extend the general theory of relativity (*q.v.*) to electromagnetic forces and the forces between nuclear particles. General relativity incorporates the gravitational field into the structure of four-dimensional space time, and in this sense gravitation becomes part of geometry. Unified field theory has attempted to extend this treatment to the other forces mentioned and if this were achieved, all the fundamental forces of nature would be described by the geometry of space time. It was also hoped that a unified field theory would overcome certain difficulties in electromagnetism and atomic theory; *e.g.*, in classical electromagnetism there is no explanation of how elements of like charge, which must repel each other, can cohere to form an electron or other fundamental charged particle; and in atomic theory the occurrence of probability as a fundamental notion was thought unsatisfactory, especially by Albert Einstein and Erwin Schrödinger. There was also a more philosophical reason. Physical reality is supposed to consist of particles of matter and fields of force. Einstein believed that it should be possible to eliminate the notion of a particle and to represent the whole of physical reality by means of a field, so that matter becomes nothing more than a region of high field intensity.

General relativity is a highly developed field theory which still contains the idea of a particle because there are regions of space time where the field equations break down, and these "singular regions" must be supposed to represent particles. In an entirely successful field theory there would be no singular regions, and every physical situation would be completely described by the field alone.

Of the many unsuccessful unified field theories put forward there were three main types. The gauge-invariant geometry of Hermann Weyl (1918) extended the class of transformations to which the geometrical quantities characterizing space time must be invariant: he could thus introduce four quantities identifiable with the potentials in classical electromagnetism. This theory is unsuitable because it leads to field equations of the fourth differential order, whereas there is reason to believe that the correct equations are of the second order. The second important class of theories, stemming from work of T. Kaluza (1921), are those using five-dimensional spaces, and although they achieved a formal unification of the fields, they did not solve any outstanding physical problems nor lead to important new ideas of physical significance. The generalized theory of gravitation, or nonsymmetric unified field theory, was independently developed by Einstein (1945) and by Schrödinger (1943). In this the fundamental tensor g_{ik} of general relativity is allowed to be nonsymmetric, which introduces an antisymmetric tensor of the second rank presumably identifiable with the electromagnetic field variables. The investigations of the theory seem to show that it does not agree with experiment since it does not predict correctly the observed motion of charged particles in an electromagnetic field. However,

SAF-LLV/LtCol Galligan/cab/53346/5D-980/30 July 63/Revtm 31 July
Revtm SAF-LL Lt Col Campbell/sre/74142

Dear Mr. Chairman:

This is in reply to your recent letter inquiring about unidentified flying objects (UFO's).

I am inclosing the Air Force position together with two allied attachments which refute Mr. John P. Speights' allegations. There has been no evidence uncovered to the contrary which would alter the original Air Force statements concerning UFO's.

I hope this information will clarify the Air Force position but if there should be further doubts concerning this subject, I would be pleased to arrange for an Air Force representative to discuss it with you personally at your convenience.

Sincerely,

PERRY M. ROBINSON, II
Major General, USAF
Director, Legislative Liaison

CCORD.
COMEBACK
SAFLLV, L/C Galli
SAFOI
AFRIR
OSDLA, 3E-

Attachments

Honorable Carl Vinson
Chairman, Committee on
Armed Services
House of Representatives

There are sightings in the Air Force files which indicate ball lightning or some similar electromagnetic phenomena as the probable cause. Due to the infrequent occurrence and the transient nature of ball lightning, it is impossible to have good documented reports on this phenomenon. In most of these cases, witnesses have reported interference with vehicle ignition, lights, radio, etc. Such interference, if actually occurring, could be due to the presence of the luminous ball. Most of the witnesses in the sightings may accurately report that a brief ball lightning would occur immediately following a nearby thunderstorm, such factors as wire ignition, atmospheric static, etc., may be the cause for the reported trouble.

The Air Force has taken every possible precaution to investigate every sighting and to give to the public every reasonable explanation consistent with the national interest.

It is Air Force policy to provide persons with information regarding UFO sightings which have national prominence and to provide information to individuals in response to their specific requests. A copy of the most recent summary of UFO data for the years 1947 through 1952 is enclosed. Further, the next edition of the Encyclopedia Britannica will carry an article on unidentified flying objects. This article, also attached, has been approved by the Air Force, and was prepared by Dr. J. Allen Hynek, Chairman of the Department of Astronomy at Northwestern University, who has served as Air Force consultant to the UFO program since 1948.

2

In order that the public be provided with as much information as possible, every effort is made to keep UFO sightings unclassified. Supporting information which states the classification of a sighting and not the sighting itself. Since 1952, 124 cases of UFO are classified and only four of the 53 unidentified cases for this period are classified.

The number of foreign reports that have come to our attention do not differ measurably from those originating in the U. S. either in the presentation of the data or in the determined probable cause.

The Air Force has no knowledge of a 1948 document by ATIC which states that UFO's are interplanetary space ships. One of the original documents establishing the project states that an objective would be to determine if any evidence from sightings suggests that UFO's are of interplanetary origin. It is possible that the meaning of this document was misinterpreted. The Air Force's open minded attitude still persists, and investigators and analysts have no preconceived notion as to the cause for a sighting but rather form their conclusions from the evidence. To date no evidence has been found to lead us to even suspect that these objects are interplanetary space ships.

Unidentified aerial phenomena constitute only a part of the noise which our defense detection systems must take into account in preventing accidental war. Scientific studies too extensive to be discussed here, are being conducted to determine the extent and nature of this noise for integration into our defensive network.

The UFO Program to the American Society of Newspaper Editors 22 Apr67

7-3745 - 390

1003849

RETURN TO
USAF Historical Archives
ASI(ASHAF-A)
Maxwell AFB, Ala 36112

RETURN TO:
Director
Aerospace Studies Inst
ATTN: Archives Branch
Maxwell AFB, Alabama

THE
UNIDENTIFIED FLYING OBJECT PROGRAM

SMC

presented to the

American Society of Newspaper Editors

on

22 April 1967

by

Major Hector Quintanilla, Jr.

1003849

THE AIR FORCE BECAME INTERESTED IN THE UFO PHENOMENON AS A PROJECT IN 1947. DURING THIS PERIOD, A POLICY LETTER WAS WRITTEN BY THE CHIEF OF STAFF WHICH DIRECTED THE COMMANDER, AIR MATERIAL COMMAND, TO SET UP A PROJECT WHOSE PURPOSE WAS TO COLLECT, COLLATE, EVALUATE, AND DISSEMINATE TO INTERESTED GOVERNMENT AGENCIES AND CONTRACTORS ALL INFORMATION REGARDING UFO SIGHTINGS. INITIALLY THE PROJECT WAS CLASSIFIED, HOWEVER, THIS SECURITY CLASSIFICATION WAS DROPPED IN MARCH 1952. THE UFO PROJECT HAS BEEN UNCLASSIFIED SINCE THAT TIME.

DURING THE PERIOD 1948 TO 1955, THE AIR FORCE MADE THREE COMPREHENSIVE STUDIES OF THE UFO REPORTS WHICH HAD BEEN SUBMITTED TO THEM. THESE REPORTS ARE KNOWN AS THE "SIGN" REPORT WHICH WAS PUBLISHED IN FEBRUARY OF 1948, THE "GRUDGE" REPORT WHICH WAS PUBLISHED IN AUGUST OF 1948, AND THE PROJECT "BLUE BOOK" REPORT WHICH WAS PUBLISHED IN MAY 1955. THE REPORTS CONCLUDED THAT "THE PHENOMENA PRESENTED NO THREAT TO THE SECURITY OF THE UNITED STATES AND THAT THE VAST MAJORITY OF SIGHTINGS WERE MISINTERPRETATIONS OF CONVENTIONAL OBJECTS." THEY ALSO CONCLUDED THAT "IT WAS CONSIDERED TO BE HIGHLY IMPROBABLE

THAT ANY OF THE UFO REPORTS EXAMINED IN THE STUDIES REPRESENTED TECHNICAL DEVELOPMENTS OUTSIDE THE RANGE OF PRESENT DAY SCIENTIFIC KNOWLEDGE. THIS WAS IN 1955, AND SINCE THAT TIME, PROJECT BLUE BOOK HAS CONCERNED ITSELF WITH THE INVESTIGATION OF THE SIGHTINGS, EVALUATION OF THE DATA, AND RELEASE OF THE INFORMATION TO THE NEWS MEDIA. THIS INFORMATION IS GIVEN TO THE PUBLIC IN THE FORM OF NEWS RELEASES AND BLUE BOOK BROCHURES.

TODAY, THE OPERATIONAL PORTION OF THE PROJECT IS STILL LOCATED AT WRIGHT-PATTERSON AIR FORCE BASE. THE OBJECTIVE OF THE PROJECT IS STILL THE SAME TODAY AS IT WAS IN THE BEGINNING, AND THAT IS TO DETERMINE IF UFO'S PRESENT A THREAT TO THE SECURITY OF THE UNITED STATES.

I WOULD EMPHASIZE AT THIS POINT THAT, ALTHOUGH WE GO TO GREAT LENGTHS TO COLLECT ALL AVAILABLE INFORMATION ON A SIGHTING AND TO REACH A CONCLUSION AS TO WHAT STIMULUS CAUSED THE SIGHTING, SUCH AN EXPLANATION IS WHOLLY SUBORDINATED TO THE PRIMARY FUNCTION OF BLUE BOOK -- THE DETERMINATION IN EACH CASE WHETHER THERE IS A THREAT TO OUR NATIONAL SECURITY.

MY OFFICE IS THE FOCAL POINT FOR ALL UFO REPORTS WHICH ARE REPORTED TO THE AIR FORCE. EACH AIR FORCE BASE COMMANDER THROUGHOUT THE COUNTRY APPOINTS AN OFFICER TO BE THE UFO INVESTIGATING OFFICER FOR HIS AREA OF RESPONSIBILITY. THE INVESTIGATING OFFICERS COLLECT INFORMATION FROM OBSERVERS AND CONDUCT A PRELIMINARY EVALUATION OF THE SIGHTING, ACCORDING TO THE SCIENTIFIC DISCIPLINES WHICH ARE AVAILABLE TO THEM AT THE BASE LEVEL. THE INFORMATION AND THE PRELIMINARY EVALUATION ARE SUBMITTED TO THE WRIGHT-PATTERSON OFFICE VIA TELETYPE OR THROUGH LETTER REPORTS. THESE REPORTS ARE THEN PLACED IN CATEGORIES ACCORDING TO THEIR CHARACTERISTICS. IF A UFO REPORT EXHIBITS AIRCRAFT CHARACTERISTICS, WE GO DIRECTLY TO THE FAA, LOCAL AIRPORTS, SAC HQS AND ITS SUBORDINATE UNITS, AND TO THE AIR DEFENSE COMMAND AND ITS SUBORDINATE UNITS. UFO REPORTS WHICH EXHIBIT BALLOON CHARACTERISTICS CAN BE CHECKED BY CONTACTING THE U.S. WEATHER STATIONS, LOCAL AIRPORTS, AIR FORCE WEATHER STATIONS, THE HOLLOMAN BALLOON CONTROL CENTER, THE NATIONAL CENTER FOR ATMOSPHERIC RESEARCH, AND VARIOUS INDUSTRIAL COMPANIES WHICH ARE PRESENTLY ENGAGED IN BALLOON RESEARCH ACTIVITIES.

IN CHECKING REPORTS WHICH EXHIBIT SATELLITE CHARACTERISTICS WE GO DIRECTLY TO THE SPACE DETECTION CENTER AT COLORADO SPRINGS. THEY HAVE THE RESPONSIBILITY FOR TRACKING ALL SATELLITE ACTIVITY. WE ALSO GO TO THE SPACE DETECTION CENTER FOR INFORMATION REGARDING SATELLITE DECAYS.

FOR REPORTS WHICH WE SUSPECT WERE CAUSED BY MISSILE FIRINGS WE GO DIRECTLY TO CAPE KENNEDY, VANDENBERG, POINT MUGU, WALLOPS ISLAND, EGLIN, GREEN RIVER, AND OTHER MILITARY UNITS WHICH MIGHT BE ENGAGED IN SPECIAL ACTIVITIES.

FOR ANALYSIS OF RADAR REPORTS WE USE AN ORGANIZATION AT WRIGHT-PATTERSON OR CAN USE OTHER ORGANIZATIONS WHICH ARE ENGAGED IN TYIS TYPE OF ACTIVITY.

FOR PHOTO ANALYSIS WE USE ONE OF THE ORGANIZATIONS AT WRIGHT-PATTERSON.

FOR PHYSICAL SPECIMENS WHICH ARE SUBMITTED TO THE PROJECT OFFICE, WE HAVE USED THE SERVICES OF THE AIR FORCE MATERIEL LABORATORY, BATTELE MEMORIAL, PURE FOOD AND DRUG ADMINISTRATION, LIBBY OWENS AND CORNING GLASS, THE NORTHWESTERN GEOLOGY DEPARTMENT, AND THE INSTITUTE OF PAPER CHEMISTRY.

FOR SUSPECTED ASTRONOMICAL SIGHTINGS WE USE THE SERVICES OF DR. J. ALLEN HYNEK, ASTRO-PHYSICIST AND PROJECT BLUE BOOK CONSULTANT, ALSO DR. CHARLES P. OLIVIER, HEAD OF THE AMERICAN METEOR SOCIETY, AND DR. ROBINSON, AN ASTRONOMER FROM WRIGHT-PATTERSON AFB. WE ALSO, FREQUENTLY REFER TO OPEN LITERATURE SUCH AS SKY & TELESCOPE FOR CURRENT INFORMATION ON COMETS, METEORS, AND AURORAL DISPLAYS.

ALTHOUGH MY OFFICE STAFF IS SMALL, WITHIN THE WRIGHT-PATTERSON AFB COMPLEX, I HAVE THE SERVICES OF PHYSICISTS, CHEMISTS, ASTRONOMERS, METEOROLOGISTS, AERODYNAMIC ENGINEERS, AND PHOTO ANALYSISTS. THESE PEOPLE ARE AVAILABLE TO THE PROJECT WHENEVER THEY ARE NEEDED.

I WOULD ALSO LIKE TO ADD, THAT I HAVE RECEIVED EXCELLENT ORGANIZATIONAL AND ADMINISTRATIVE SUPPORT FROM ALL ECHELONS IN THE AIR STAFF. THE SECRETARY OF THE AIR FORCE AND THE CHIEF OF STAFF ARE INTERESTED IN THIS PROGRAM.

I WOULD LIKE TO POINT OUT THAT THE AIR FORCE MUST EVALUATE SUBJECTIVE INFORMATION WHICH CANNOT BE DUPLICATED IN A LABORATORY. WE ARE EVALUATING AN OBSERVER'S INTERPRETATION OF AN EXPERIENCE OR EVENT. WITH THE EXCEPTION OF METEORITES, WE HAVE NEVER RECOVERED ANYTHING TANGIBLE OF EXTRA-TERRESTRIAL ORIGIN.

I AM SURE THAT MOST, IF NOT ALL, OF YOU ARE AWARE OF THE AIR FORCE CONTRACT SIGNED LAST YEAR WITH THE UNIVERSITY OF COLORADO. THIS CONTRACT, VALUED AT APPROXIMATELY $300,000, IS BETWEEN THE AIR FORCE OFFICE OF SCIENTIFIC RESEARCH AND THE UNIVERSITY.

IT CALLS FOR AN 18-MONTH STUDY UNDER THE DIRECTION OF DR. EDWARD U. CONDON, FORMER DIRECTOR OF THE NATIONAL BUREAU OF STANDARDS AND NOW A PROFESSOR OF PHYSICS AT THE UNIVERSITY OF COLORADO.

I WANT TO MAKE ONE POINT VERY CLEAR IN CONNECTION WITH THIS CONTRACT. THE ONLY INVOLVEMENT OF PROJECT BLUE BOOK WITH THE COLORADO CONTRACT IS TO PROVIDE THEM DUPLICATES OF ALL CURRENT UFO REPORTS AND SUCH MATERIAL FROM OUR FILES AS THEY MAY ASK FOR. AS A MATTER OF INTEREST, TO DATE I HAVE SUPPLIED THEM WITH AT LEAST 400 CASE HISTORIES.

DR. CONDON IS CONDUCTING A TOTALLY INDEPENDENT STUDY.

IN CONCLUSION I WANT TO READ TWO PARAGRAPHS FROM THE CURRENT PROJECT BLUE BOOK REPORT:

"TO DATE, THE FIRM CONCLUSIONS OF PROJECT BLUE BOOK ARE: (1) NO UNIDENTIFIED FLYING OBJECT REPORTED, INVESTIGATED, AND EVALUATED BY THE AIR FORCE HAS EVER

GIVEN ANY INDICATION OF THREAT TO OUR NATIONAL SECURITY; (2) THERE HAS BEEN NO EVIDENCE SUBMITTED TO OR DISCOVERED BY THE AIR FORCE THAT SIGHTINGS CATEGORIZED AS UNIDENTIFIED REPRESENT TECHNOLOGICAL DEVELOPMENTS OR PRINCIPLES BEYOND THE RANGE OF PRESENT DAY SCIENTIFIC KNOWLEDGE; AND (3) THERE HAS BEEN NO EVIDENCE INDICATING THAT SIGHTINGS CATEGORIZED AS UNIDENTIFIED ARE EXTRATERRESTRIAL VEHICLES.

"THE AIR FORCE WILL CONTINUE TO INVESTIGATE ALL REPORTS OF UNUSUAL AERIAL PHENOMENA OVER THE UNITED STATES. THE SERVICES OF QUALIFIED SCIENTISTS AND TECHNICIANS WILL CONTINUE TO BE USED TO INVESTIGATE AND ANALYZE THESE REPORTS, AND PERIODIC REPORTS ON THE SUBJECT WILL BE MADE.

"THE AIR FORCE TAKES NO STAND ON WHETHER OR NOT EXTRATERRESTRIAL LIFE COULD OR DOES EXIST. SCIENTISTS BELIEVE THAT IT IS ENTIRELY POSSIBLE THAT THE UNIVERSE CONTAINS LIFE ON PLANETS OTHER THAN OUR OWN. THE AIR FORCE CONTINUES TO EXTEND AN OPEN INVITATION TO ANYONE WHO FEELS THAT HE POSSESSES ANY EVIDENCE OF EXTRATERRESTRIAL VEHICLES OPERATING WITHIN THE EARTH'S NEAR SPACE ENVELOPE TO SUBMIT HIS EVIDENCE FOR ANALYSIS."

ROBERT C. NOTSON
PORTLAND OREGONIAN
PRESIDENT

MICHAEL J. OGD[illegible]
PROVIDENCE JOURNAL-BULLETIN
1ST VICE PRESIDENT

VINCENT S. JONES
GANNETT NEWSPAPERS
2ND VICE PRESIDENT

NORMA[illegible] ISAACS
COURIER-JOURNAL & LOUISVILLE TIMES
SECRETARY

NEWBOLD NOYES, JR.
WASHINGTON STAR
TREASURER

AMERICAN SOCIETY OF NEWSPAPER EDITORS

OFFICE OF THE PROGRAM CHAIRMAN
NEWBOLD NOYES, JR.
WASHINGTON STAR
WASHINGTON, D. C. 20003

May 3, 1967

Major Hector Quintanilla, Jr.
TDET/UFO
Headquarters FTD (AFSC)
Wright-Patterson AFB, Ohio 45433

Dear Major Quintanilla:

I was out of the office all last week; hence the unconscionable delay in getting this letter off to you. But I (all of us) do want you to know how very much we appreciate your appearance before the American Society of Newspaper Editors.

I'm sure you must have been able to sense the great interest of the editors in what you had to say. I myself heard many favorable comments on your performance.

As we had anticipated, the scientists got what little heat there was from the questioners. But it meant a great deal to me as producer of the show to have that handsome Air Force uniform up there on the platform, and you were a good sport to take part and give us the official word.

Once again, thank you very much for taking time out of your busy schedule to help educate the press. You did us much good.

Faithfully yours,

Newbold Noyes

Newbold Noyes

THE BOARD OF DIRECTORS CONSISTS OF THE OFFICERS AND THE FOLLOWING:

CHARLES L. BENNETT, OKLAHOMAN & TIMES
CREED C. BLACK, CHICAGO DAILY NEWS
JOHN H. COLBURN, WICHITA EAGLE AND BEACON
ARTHUR C. DECK, SALT LAKE TRIBUNE
WILLIAM B. DICKINSON, PHILADELPHIA BULLETIN
J. Q. MAHAFFEY, TEXARKANA GAZETTE
C. A. McKNIGHT, CHARLOTTE OBSERVER
SYLVAN MEYER, GAINESVILLE (GA.) TIMES
J. EDWARD MURRAY, ARIZONA REPUBLIC
EUGENE PATTERSON, ATLANTA CONSTITUTION
VERMONT ROYSTER, WALL STREET JOURNAL

ROBERT C. NOTSON
PORTLAND OREGONIAN
PRESIDENT

MICHAEL J. OGD[redacted]
PROVIDENCE JOURNAL-BULLETIN
1ST VICE PRESIDENT

VINCENT S. JONES
GANNETT NEWSPAPERS
2ND VICE PRESIDENT

NORMA[redacted] ISAACS
COURIER-JOURNAL & LOUISVILLE TIMES
SECRETARY

NEWBOLD NOYES, JR.
WASHINGTON STAR
TREASURER

AMERICAN SOCIETY OF NEWSPAPER EDITORS

OFFICE OF THE PROGRAM CHAIRMAN
NEWBOLD NOYES, JR.
WASHINGTON STAR
WASHINGTON, D. C. 20003

April 12, 1967

Major Hector Quintanilla, Jr.
TDET/UFO
Headquarters FTD (AFSC)
Wright-Patterson AFB, Ohio 45433

Dear Major Quintanilla:

Just a line to suggest that if you have a text of your prepared remarks for the ASNE next week, and can get it mimeographed, it would be helpful to have a dozen or so copies for the press room at the Shoreham.

Not necessary, but it does insure that if the reporters want to quote you they will do so accurately.

Faithfully yours,

Newbold Noyes

NN:gcg

THE BOARD OF DIRECTORS CONSISTS OF THE OFFICERS AND THE FOLLOWING:

CHARLES L. BENNETT, OKLAHOMAN & TIMES
CREED C. BLACK, CHICAGO DAILY NEWS
JOHN H. COLBURN, WICHITA EAGLE AND BEACON
ARTHUR C. DECK, SALT LAKE TRIBUNE
WILLIAM B. DICKINSON, PHILADELPHIA BULLETIN
J. Q. MAHAFFEY, TEXARKANA GAZETTE
C. A. McKNIGHT, CHARLOTTE OBSERVER
SYLVAN MEYER, GAINESVILLE (GA.) TIMES
J. EDWARD MURRAY, ARIZONA REPUBLIC
EUGENE PATTERSON, ATLANTA CONSTITUTION
VERMONT ROYSTER, WALL STREET JOURNAL

MEMO ROUTING SLIP.	Never Use for Approvals, Disapprovals, Concurrences or Similar Actions	ACTION.
1 TO: TDC	INITIALS	CIRCULATE
	DATE	COORDINATION
2		FILE
		INFORMATION
3		NOTE AND RETURN
		PER CONVERSATION
4		SEE ME
		SIGNATURE

REMARKS

Maj. Quintiello UFO
News Paper Editors
request file.

FBH

FROM	DATE 7 April
	PHONE

DD FORM 1 OCT 60 95 Replaces DD Form 94, 1 Feb 50, and DD Form 95, 1 Feb 50, which will be used until exhausted. 648—16—78279-2 GPO

FOREIGN TECHNOLOGY DIVISION

Date 17 Apr 67

MEMO TO: Dr. Cacioppo

Tony -

Think it might be useful for you to monitor session 20 - 21.

Let's look at the briefing I want for LeBailley on this.

RAYMOND S. SLEEPER, Colonel, USAF

Reference attached

SUSPENSE:

FOREIGN TECHNOLOGY DIVISION

Date _____

MEMO TO: _____

SUSPENSE: 20 Apr 67

FOREIGN TECHNOLOGY DIVISION

Date _____

MEMO TO: _____

SUSPENSE:

ROBERT C. NOTSON
PORTLAND OREGONIAN
PRESIDENT

MICHAEL J. OGDEN
PROVIDENCE JOURNAL-BULLETIN
1ST VICE PRESIDENT

VINCENT S. JONES
GANNETT NEWSPAPERS
2ND VICE PRESIDENT

NORMAN E. I[illegible]CS
COURIER-JOURNAL AND L[illegible]VILLE TIMES
SECRETARY

NEWBOLD NOYES, JR.
WASHINGTON STAR
TREASURER

AMERICAN SOCIETY OF NEWSPAPER EDITORS

OFFICE OF THE PROGRAM CHAIRMAN
NEWBOLD NOYES, JR.
WASHINGTON STAR
WASHINGTON, D. C. 20003

cc Jacks.
OX-55809
57793
Col. Stanley
SAPO
0930

March 6, 1967

Major General Eugene B. LeBailly
Director of the Office of Information
Department of the Air Force
Washington, D. C. 20330

Dear General LeBailly:

As program chairman for this year's meeting of the American Society of Newspaper Editors, which takes place here at the Shoreham April 20-21-22, I am trying to organize a serious seminar on the subject of UFOs.

I've been discussing the problem with Dr. Condon, Dr. Hynek, Dr. Menzel and the like, and trying to keep Major Keho[illegible]e and his gang at arm's length. I'm wondering whether it might be possible to have one of the Air Force's Project Blue Book officers, preferably Major Quintinella, take part in such a session.

What I hope to come up with is a non-kooky, balanced panel representing both total- and not-so-skeptics, and to have Dr. Condon act as moderator and also talk briefly about the problem of the press in handling this sort of material. He has indicated an interest in taking part if I can work out such a presentation.

If you think this is a possibility, I can of course approach Major Quintinella directly, but thought I'd better sound you out first.

As you probably know, the ASNE is composed of about 700 newspaper editors from all over the country, about 500 of whom (including all the important ones) will be at this meeting. It provides one of the major forums for serious public discussion by interesting people in and out of government, and the proceedings are of course very widely reported.

THE BOARD OF DIRECTORS CONSISTS OF THE OFFICERS AND THE FOLLOWING:

[illegible]ARLES J. BENNETT
CREED C. BLACK
JOHN H. COLBURN
ARTHUR C. DECK
WILLIAM B. DICKINSON
PHILADELPHIA BULLETIN

I do think it would be a good thing for this influential group to get some reasonable perspective on this, after all, rather puzzling business.

Faithfully yours,

Newbold Noyes

NN/gcg

DEPARTMENT OF THE AIR FORCE
OFFICE OF THE SECRETARY

MEMORANDUM

Maj Quintanilla

WPAFB

DEPARTMENT OF THE AIR FORCE
WASHINGTON 20330

OFFICE OF THE SECRETARY

Dear Mr. Noyes:

We appreciate your invitation of March 6 to participate in a UFO panel as part of the annual ASNE meeting to be held this year at the Shoreham, April 20-22. We believe having an Air Force representative take part in such a panel before such a distinguished audience could be of great benefit to us, and we will be happy to work with you toward this end.

While we have no objection to making Major Quintanilla available, his job is administering the UFO reports made to the Air Force, and he has limited dealings with the press. Our offices here shoulder the brunt of dealings with the press and public on this subject and you might wish to consider having one of our people on the panel in addition to Major Quintanilla.

Another man you might like to consider adding to the panel, particularly since the theme of the panel centers on press problems, is Herb Strentz, a teacher at Bakersfield College, California. He did an article for the fall 1966, COLUMBIA JOURNALISM REVIEW, on how different papers in the same locale cover the same story -- in this case, two Detroit and four Chicago newspapers' coverage of the 1966 southern Michigan UFO sightings. We're sending along a copy of this article for your information.

We look forward to working with your people on this panel and ask that you contact Lt Colonel Jacks of our Public Information Division to work out further details. He, or Capt Rhoads in his absence, can be reached on 695-5809 or 695-7793.

Sincerely,

[Signed]

E. B. LeBAILLY
Major General, USAF
Director of Information

Mr. Newbold Noyes, Jr.
WASHINGTON STAR
Washington, D.C. 20003

Atch
Article

360/607

29 MAR 67 23 49Z

PRIORITY

WPA 146

PTTU JAW RUEDHQA 1829 0882237-UUUU--RUEDFIF.

ZNR UUUUU

P 292234Z MAR 67

FM OSAF

TO RUEDFIF/FTD COMDR WPAFB OHIO

INFO RUEDTAA/AFSC

RUEDFIF/FTD TDET WPAFB OHIO MAJ QUINTANILLA

BT

UNCLAS SAF-OIPC 75716 MAR 67.

FOR CMDR AND IO. WE HAVE APPROVED REQUEST OF THE AMERICAN SOCIETY OF NEWSPAPER EDITORS TO HAVE MAJOR QUINTANILLA APPEAR ON A PANEL BEFORE THIS DISTINGUISHED GROUP TO DISCUSS THE UNIDENTIFIED FLYING OBJECT PHENOMENON. MENZEL, HYNEK, CONDON AND LIKE PERSONNEL ASSOCIATED WITH UFO ARE EXPECTED TO PARTICIPATE. THE NATIONAL MEETING WILL BE HELD AT THE SHOREHAM IN WASHINGTON, D.C., 20-22 APRIL, WITH EXACT DATE AND TIME OF PANEL YET TO BE DETERMINED. REQUEST MAJOR QUINTANILLA BE PLACED ON TDY TO WASHINGTON, D.C. FOR TIS PERIOD, REPORTING TO THE PUBLIC INFORMA-

no action req

2-GC-3

1-G

2-ETR

PAGE 2 RUEDHQA 1829 UNCLAS

TION DIVISI, SAF-OI, PENTAGON, ROOM 4C922, THE DAY PRIOR TO PANEL PRESENTATION FOR DISCUSSION OF PROGRAM. NEWBOLD NOYES OF WASHINGTON STAR IS ASNE PROGRAM CHAIRMAN AND WILL CONTACT MAJOR QUINTANILLA WITH FURTHER DETAILS. MAJOR GEN LEBAILLY, DIRECTOR OF INFORMATION APPROVES THIS REQUEST.

BT

MAR 31 1967

Dear Dr. Hynek:

Confirming our recent conversation with Lt Colonel Jacks [illegible] we have initiated arrangements for Major Quintanilla of Project Blue Book appear on the National Academy of Newspaper Editors panel to discuss the unidentified flying object phenomenon.

We would appreciate it if you would contact Major Quintanilla directly at the following address to do details:

Major Hector Quintanilla, Jr.
TDET/UFO
Headquarters FTD (AFSC)
Wright-Patterson AFB, Ohio 45433

Also, I would like Lt Colonel Jacks to continue working with you so we may keep abreast of such developments as date, time, place, and fellow panelists.

Sincerely,

[Signed]

C. D. Bahnsen
Major General, USAF
Director of Information

Dr. Donald Hynes
Washington Star
Washington, D.C. 20003

RESUME OF TELEPHONE CONVERSATION BETWEEN: 4 April 1967

COLONEL STANLEY (in Col Jack's office, SAFOI)
COLONEL HOLM

Col Stanley said he had talked to General Giller whose concern simply was that Major Quintanilla would get caught in cross-fire. General Giller had told him that both he and Col Jacks had discussed the problem with Col Holm.

Col Stanley stated that Dave Noyes is President of the Washington Story. He is going to have this panel whether or not the Air Force participates. Participation on a panel of this sort is a departure for SAFOI. They are aware of the pitfalls, but the SAFOI staff has taken action to reduce the dangers of getting involved.

Col Stanley said Major Quintanilla will be given the same treatment as many others who have gone on a press conference, such as Dr. Brown, for instance. The decision to have him participate was not an accident. Two colonels with 30 years' experience in the information business will be holding his hands. They will work him over--ask him every leading dirty question he might get. He will be ready for them. It has got to be Hector. (Blue book style) Panel meeting won't last more than 1-1 1/2 hrs with questions.

Hector has two things going for him:

(1) As stated, he will be brainwashed thoroughly before he goes on. We are not going to throw Quintanilla out in the cold pool by himself.

(2) Man named Phil Class will be on the panel, also. He is utterly convinced that UFO's are electromagnetic [illegible]. He has a book in Random House and is anxious to be on the panel to promote his book, and will be eager to debate with MacDonald. SAFOI figures Major Quintanilla will probably be able to just sit back and listen to them debate.

Another thing, MacDonald wrote to Dr. Price in AFOAR saying that he will be in Washington on the 17th and has an appointment with Naval Research on the 18th. Told them they dare not turn him down. MacDonald will have talked to Price. Hector will have the argument, "Dr. MacDonald, you had an entire afternoon to present any information you had to AFOAR." Think we have him fireproofed.

Col Stanley says Air Force has had three things this past year in its favor:

1. Contract with Condon. Want to be able to say that man is free.
2. Movement of Blue Book out of vaulted area.
3. Situation has developed to point where a number of newsmen are taking a real hard-nosed look at the problem.

Col Stanley would like to hear from Col Sleeper ASAP on Friday, 7 April.

April 3

He advised me to call

Gen. Giller – I am very much disturbed by the request for Maj. Quintanilla to appear on Board of News Editors Panel. – April –

~~For instance Mr. Noyes~~

Guys like Dr. McDonald will crucify him.

Not Blue suit job on this firing line

If Contract Personnel cannot appear – it really shouldn't be done. –

Congdon don't believe they are deep enough into this problem yet. –

ROBERT C. NOTSON
PORTLAND OREGONIAN
PRESIDENT

MICHAEL J. OGDEN
PROVIDENCE JOURNAL-BULLETIN
1ST VICE PRESIDENT

VINCENT S. JONES
GANNETT NEWSPAPERS
2ND VICE PRESIDENT

NORMAN E. ISAACS
COURIER-JOURNAL AND LOUISVILLE TIMES
SECRETARY

NEWBOLD NOYES, JR.
WASHINGTON STAR
TREASURER

AMERICAN SOCIETY OF NEWSPAPER EDITORS

OFFICE OF THE PROGRAM CHAIRMAN
NEWBOLD NOYES, JR.
WASHINGTON STAR
WASHINGTON, D. C. 20003

April 4, 1967

Major Hector Quintanilla, Jr.
TDET/UFO
Headquarters FTD (AFSC)
Wright-Patterson AFB, Ohio 45433

Dear Major Quintanilla:

I am delighted to hear from General LeBailly that you will be able to appear before the American Society of Newspaper Editors on Saturday, April 22, when we present a panel discussion of the UFO problem.

First, as to the physical arrangements, the meeting is at the Shoreham Hotel here in Washington, and this Saturday morning session will be in the Empire Room. We will get under way with your panel at 9:30 a.m. If you have not been previously contacted by a member of our program committee, the rendezvous point for speakers is something called the Directors' Room. I think it would be wise if you and other panelists were there by 9 a.m., so that we can meet one another, have a cup of coffee, and proceed to the meeting room in plenty of time.

Please let me know whether you want us to arrange accommodations for you at the Shoreham for the night of April 21. We will be glad to do so at our expense, if that is proper in the circumstances, and also to reimburse you for expenses you may incur personally in connection with the trip.

At present, we are certain of three panelists. The other two are Dr. Donald Menzel of Harvard, and Dr. James McDonald of the University of Arizona. Dr. Condon, I'm sorry to say, has reported that he feels he should not take part in the discussion, although he's much interested and has given me several ideas as to procedures. He might show up at the last minute, if he's in the East.

I am still working on a possible fourth person for the program. This would be a non-kooky citizen who thinks

THE BOARD OF DIRECTORS CONSISTS OF THE OFFICERS AND THE FOLLOWING:

CHARLES L. BENNETT
OKLAHOMAN & TIMES

CREED C. BLACK
CHICAGO DAILY NEWS

JOHN H. COLBURN
WICHITA EAGLE AND BEACON

ARTHUR C. DECK
SALT LAKE TRIBUNE

WILLIAM B. DICKINSON
PHILADELPHIA BULLETIN

J. O. MAHAFFEY
[illegible]

C. A. McKNIGHT
CHARLOTTE OBSERVER

SYLVAN MEYER
GAINESVILLE (FLA.) TIMES

J. EDWARD MURRAY
ARIZONA REPUBLIC

EUGENE PATTERSON
ATLANTA CONSTITUTION

VERMONT ROYSTER
[illegible]

he has seen a saucer, and who (if we can get him) would simply open the program with a ten-minute description of what he thought he saw. There is no intention that this "sighting" should become the whole focus of the discussion -- merely that it could provide an example of the sort of thing we are contending with to which the other panelists could refer to the extent that they found it useful.

I am trying to line up, for this job, a man named William C. Powell, a pilot for the Sears Roebuck company, who reported a UFO incident last May 21. Perhaps you may know of it. If not, I attach a copy of a report I received from NICAP. I do not know whether Mr. Powell will agree to appear -- if not, I think we will simply go ahead with the present three panelists.

The main burden of the "debate" on this issue should be borne, I'm sure you'll agree, by our two scientists. As I envision the program, we will open with a statement of about ten minutes from Powell, if he's available. Second (or first if Powell is out) we'll have Dr. McDonald, the man who believes UFOs are there, and are of extra-terrestrial origin -- about 20 minutes. Then we'll follow with Dr. Menzel, who thinks all UFO sightings can be explained by natural phenomena -- another 20 minutes, roughly. Then you, to describe how Blue Book works, and add any comments you might care to make -- 10 minutes or so. Then questions and comments exchanged between panelists. We have to wind up by 11:15.

The panelists will be introduced, and the proceedings moderated, by J. Q. Mahaffey, editor of the Texarkana Gazette and Daily News. He is a very amusing and good-natured fellow, and I hope will be able to keep the discussion from becoming too heated -- which I understand is something of a problem with both Menzel and McDonald!

If you have any problems or questions in regard to all this, please call me. In any event, we'll look forward to seeing you on the 22d.

Faithfully yours,

Newbold Noyes

Newbold Noyes

HISTORY OF PROJECT

Following the Kenneth Arnold sighting on 24 June 1947, wide news coverage of public reports of "flying discs or saucers" created sufficient concern at high military echelons to authorize AMC to conduct a preliminary investigation into these reports. Early correspondence indicates that U. S. Military Leaders were concerned that the objects reported were an aircraft configuration more advanced than those possessed by the United States Armed Forces. A letter, 23 September 1947, from Lt. General Twining of AMC to the Commanding General of the Army Air Forces, expressed the opinion that there was sufficient substance in the reports to warrant a detailed study.

On 30 December 1947, a letter from the Chief of Staff directed AMC to,... "set up a project whose purpose was to collect, collate, evaluate and distribute to interested Government Agencies and contractors all information concerning UFO sightings and phenomena in the atmosphere which can be construed to be of concern to the National Security. . ."

The Technical Intelligence Division of AMC issued Hq AMC Technical Instruction No 2185, 11 February 1948, and the project was inaugurated with a code name of "SIGN." The code name "SIGN" was changed to the code name "GRUDGE" on 16 December 1948. A report released in February 1949 covering analysis of the first 273 incidents concluded that, while no definite and conclusive evidence existed, evaluation of reports of unidentified objects was a necessary activity of Military Intelligence Agencies.

After the Project "SIGN" Report, work continued along the same lines and a Project "GRUDGE" Report was published and released in August 1949 by AMC. This report contained analysis of 244 cases and concluded that Unidentified Flying Objects reports resulted from: a) misinterpretation of conventional objects, b) mass hysteria or "War Nerves", c) hoaxes and/or d) Psychopathological persons. Based upon these conclusions AMC recommended that investigation and study of this type of report be reduced in scope. Major portions of this work were performed under contract by Ohio State University, Professor Hynek (Present Consultant to AF on Project Blue Book), The Rand Corporation, Dr. G. Valley, Dr. Paul Fitts, Air Weather Service, 3610th Electronic Section and the U. S. Weather Bureau.

Following publication of the "GRUDGE" Report, the Air Force continued to investigate sightings, inasmuch as it is an Air Force responsibility to identify and analyze Aerial Phenomena that could possibly be a menace to the United States. Much of the Scientific and Technical work during 1950 and 1951 centered around Project "Twinkle" and the Green Fireball studies of Dr. LaPaz in the Southwestern United States. Project "Twinkle" Final Report was completed on 27 December 1951. During December 1951 Colonel Kirkland and Lt. Ruppelt made a visit to a private industrial firm to discuss the feasability of a scientific study from the data collected since the program's inception. Thus, Project Blue Book's Special Report #14 came into being.

BRIEFING 7 JUL 67 to GEN GARLAND

7-3745 - 391

1003850

RETURN TO
USAF Historical Archives
ASI(ASHAF-A)
Maxwell AFB, Ala 36112

JMC

RETURN TO:
Director
Aerospace Studies Inst
ATTN: Archives Branch
Maxwell AFB, Alabama

UNIDENTIFIED FLYING OBJECTS

Presented by

1st Lt. William F. Marley, Jr.

on

7 July 1967

SMC

1003850

INTRODUCTION

An examination of Project Blue Book's history and obtainable benefits both from a public and scientific standpoint has been made. This briefing will cover the findings and recommend a re-orientation of the project.

PROBLEM

Public opinion surveys indicate that over fifty million Americans believe in the existence of UFOs today.

For the past twenty years over 11,000 UFO sightings have been reported and examined by FTD. Yet, no positive evidence has been found that UFOs pose any threat to the security of this country. In addition, the evidence examined denies the existence of flying saucers from outer space, or any similar phenomenon popularly associated with UFOs.

Since FTD is an intelligence organization, the fifty million people who believe in UFOs also believe FTD and the Air Force are withholding information from them. This has simply resulted in a greater demand for information (which does not, in fact exist) and this in turn has further discredited FTD and the Air Force. If fifty million Americans believe in UFOs, it is to the interest of the Air Force to capitalize on this belief.

HISTORY

Unidentified flying objects do not constitute a new phenomena. UFOs have been reported by historians since 593 B.C. At this time, Ezekial recorded a whirlwind to the north which appeared as a firey sphere. In 1254 at Saint Abans Abby, when the moon was eight days old, there appeared in the sky a ship elegantly shaped, well equipped, and of marvelous color. In 1520 there appeared in France a round shaped object with rotating lights and two firey suns. In 1874, over Texas, a farmer reported seeing a dark flying object in the shape of a disc cruising in the sky at a wonderful speed. Many, many more observations have been recorded by historians throughout ancient and modern history.

The modern era of UFOs had its beginning on 24 June 1947. I say the modern era, because, national news coverage on UFOs up to this period was virtually non-existent. Mr. Kenneth Arnold's observation and subsequent news reporting of his UFO sighting, swayed the public into believing that our planet had been visited by unknown vehicles from outer space. The Arnold sighting and subsequent publicity on flying saucers started an avalanche of reports. The Air Force began receiving reports from people of all walks of life.

During the period, June through December 1947, there was no specific organization responsible for investigating and evaluating UFO reports. At this time everyone had an expert opinion. Even within the military structure, there were those who expressed their own feelings and beliefs as to what UFOs actually represented.

The wide news coverage of public reports of "flying discs or saucers" created sufficient concern at high military echelons to authorize the Air Material Command to conduct a preliminary investigation into these reports. Early belief was that the objects reported were of aircraft more advanced than those possessed by the U. S. Armed Forces.

A letter, 23 September 1947 from Lt General Twining of AMC to the Commanding General of the Army Air Forces, expressed the opinion that there was sufficient substance in the reports to warrant a detailed study.

On 30 December 1947, a letter from the Chief of Staff directed AMC to establish a project whose purpose was to collect, collate, evaluate, and disseminate all information concerning UFO sightings and phenomena in the atmosphere to those interested agencies. The project was assigned the code name "Sign." The responsibility for "Project Sign" was delegated to the Air Technical Intelligence Center which was then part of the AMC.

In February 1949, "Project Sign," completed its evaluations of the 243 UFO reports which had been submitted to the project. The report concluded that: "No definite and conclusive evidence is yet available that would prove or disprove the existence of these UFOs as real aircraft or unknown and unconventional configuration."

"Project Sign" was changed to "Project Grudge" on 16 December 1948 at the request of the Director of Research and Development. Project Grudge completed their evaluations of 244 reports in August 1949. The conclusions of the Grudge reports were as follows:

> "Evaluations of reports of UFOs to date demonstrate that these flying objects constitute no threat to the security of the United States. They also concluded that reports of UFOs were the result of misinterpretations of conventional objects, a mild form of mass hysteria of war nerves, and individuals who fabricate such reports to perpetrate a hoax or to seek publicity."

Project Grudge also recommended that the investigation and study of reports of UFOs be reduced in scope, as had the Project Sign Report.

The UFO project continued on a reduced scale and in December 1951 the Air Force entered into a contract with a private industrial organization for another detailed study of the UFO cases on file.

The report which was completed 17 March 1954 is commonly referred to as Special Report #14. Reports one through thirteen were progress reports dealing with administration. Special Report #14 reduced and evaluate all UFO data held in Air Force files. Basically, the same conclusions were reached that had been noted in both the preceeding Sign and Grudge Reports.

It was during the early 1950's that the national interest in reported sightings increased tremendously. With the increased volume of reports, a Scientific Advisory Panel on UFOs was established in late 1952. At a meeting held during 14 - 18 January 1953, all available data was examined. Conclusions and recommendations of this panel were published in a report, and made public. The panel concluded that UFOs did not threaten the national security of the United States and recommended that the aura of mystery attached to the project be removed.

In March 1952 Project Grudge became known as Project Blue Book. From this time to the present, the project concerned itself with investigation of sightings, evaluation of the data, and release of information to proper news media through the Secretary of the Air Force, Office of Information (SAFOICC).

A memorandum dated 28 September 1965 from Major General LeBailly requested that a working scientific panel composed of

both physical and social scientists be organized to review Project Blue Book. The product of this request was the Special Report of the USAF Scientific Advisory Board Ad Hoc Committee. Their primary conclusion was that the present program could be strengthened by providing the opportunity for an in-depth scientific study of selected UFO sightings.

In July 1966, the Commander of FTD initiated a CRC request through Project White Stork to provide an in-depth evaluation of some fifty UFO cases for the purpose of identifying procedural changes that should be made in Blue Book methodology. In addition, it was decided with sponsor approval, that the investigating group include an assessment of the entire UFO situation. Results of the evaluation of selected cases did not reveal any evidence of extraterrestrial vehicles nor anything that might be considered beyond the range of present day scientific knowledge. The most probable explanation for the unidentified cases would have to be cast in terms of man made objects, natural phenomena, or psychological causes. Of their recommendations they stressed the fact that immediate steps should be taken to educate the public to the sensational but insidious exploitation of UFO reports, by releasing official books, reports, and news items. Also, the extent of public concern and opinion regarding UFOs

for use in determing long range requirements should be determined. If results should indicate that public concern has been over-estimated, then consideration should be given to dropping all official (government) interest in UFOs.

The history of Project Blue Book alone has shown that the UFO phenomena is mainly that of a public relations problem. The fringe of believers in extraterrestrial visitation continues to grow. UFO hobby clubs are a constant critic of Air Force policies -- the majority of these clubs profess to be studying the phenomena scientifically.

However, it should be recognized that the public could be expected to accuse the Air Force of withholding information on UFOs since their investigation has been assigned to Air Force Technical Intelligence.

for use in determing long range requirements should be determined. If results should indicate that public concern has been over-estimated, then consideration should be given to dropping all official (government) interest in UFOs.

The history of Project Blue Book alone has shown that the UFO phenomena is mainly that of a public relations problem. The fringe of believers in extraterrestrial visitation continues to grow. UFO hobby clubs are a constant critic of Air Force policies -- the majority of these clubs profess to be studying the phenomena scientifically.

However, it should be recognized that the public could be expected to accuse the Air Force of withholding information on UFOs since their investigation has been assigned to Air Force Technical Intelligence.

U. S. SCIENTIFIC OPINIONS

Many leading astronomers have expressed their ideas on the possibilities of extraterrestrial life. There is evidence that the bulk of the stars in the sky have planetary systems. Recent research concerning the origin of life on earth suggests that the physical and chemical processes leading to the origin of life occur rapidly in the early history of the majority of planets. The selective value of intelligence and technical civilization is obvious, and it seems likely that a large number of planets within our Milky Way galaxy, perhaps as many as a million, are inhabited by technical civilizations in advance of our own. Interstellar space flight is far beyond our present technical capabilities, but there seems to be no fundamental physical objections to it, and it would be very rash indeed for anyone to preclude, from our present vantage point, the possibility of its development by other civilizations.

Dr. Carl Sagan, of Harvard University, for one, has often expressed his views that the earth is not the only inhabited planet. His work has produced the logic that if a million advanced technical civilizations in our galaxy launched an interstellar spacecraft per year, and even if all stars in the galaxy can be explored with equal

facility, then our solar system should, on the average, be visited only once every hundred thousand years.

If even a small fraction of the UFOs are interstellar spacecraft, this would imply an overriding significance to our small planet. If our views on the frequency of intelligence in the galaxy are correct, there is no reason for the earth to be singled out for interstellar visits.

Dr. Charles Smiley, of Brown University, has recently undertaken an interesting attempt to answer the question as to the possibility of UFOs being from Mars or Venus. A logical approach to this problem would be to consider favorable launch windows. It is well known the importance of selecting a favorable launch time so that a vehicle will travel along a minimum energy orbit, arriving at the path of Mars (or Venus) just as that planet comes to the same point, and for each of these launching times there would be a corresponding arrival time at intervals of about 584 days for Venus and about 780 days for Mars.

Dr. Smiley found that there was no evidence to indicate that Martians and Venusians have been arriving in large numbers, if at all. When one examines the direction from which the UFOs arrived, we find not a single case of the UFO coming from the proper direction to indicate that it had originated on Mars or Venus.

Dr. Menzel, of Harvard College Observatory, and author of several books, has stated that of the many astronomical observatories in the United States and abroad, none have ever photographed an object that remotely resembled a spaceship. Since 1957, hundreds of members of Moon Watch teams throughout the world have watched the skies, but no Moon Watch team has yet reported the presence of a spaceship. An important point is that the Space Detection and Tracking System would certainly detect an interloper from beyond our planet that would join the parade of some thousand objects now in orbit. To date, SPADATS has never given any indication that they believe an extraterrestrial vehicle has ever orbited earth. Project Ozma, an early U.S. attempt to establish contact with extraterrestrial life, was unsuccessful. No "intelligent" radio signals were noted, during its one year operational program.

Dr. Menzel stands behind his belief that human beings now are on the threshhold of space. Visits to and from other worlds may occur in the future, bringing new facts and new interpretations of reality that we cannot now imagine. No evidence yet found indicates that such visits have begun. No fact so far determined suggests that a single UFO has originated outside our own planet.

The leading Soviet astronomers have voiced similar opinions regarding extraterrestrial life. It is believe that approximately

one thousand light years is the maximum distance at which interstellar communications have any meaning at all, and from both U. S. and USSR work in the area, the existence of only one similar civilization at most can be expected.

One major factor agreed by both is the high improbability of our planet being visited by extraterrestrial life from another solar system. Even the nearest stars that resemble our own sun in age and type are about ten to eleven years distant. Such a round trip from a distant neighboring solar system would encompass over twenty years, traveling at speeds approaching the speed of light. Astronomers of both countries postulate that a high probability for extraterrestrial life exists. To date, though, there has been no confirmation of the theory.

DETERMINATION OF EXTRATERRESTRIAL LIFE

The only positive proof that extraterrestrial life exists is the establishment of contact with another civilization.

The earliest U.S. attempt to establish such contact was initiated with Project Ozma. The project was established in 1959 and consisted of an 85 foot steerable antenna, which was located at the National Radio Astronomy Observatory at Green Bank, West Virginia. As the first step in a systematic search, the astronomers began to listen for possible radio signals from the neighborhood of certain stars. Tau Ceti and Epsilon Eridani were chosen as the first targets because they lie within the range of our radio telescopes, ten to eleven light years distant, and because they resemble our own sun in age and type and therefore might have planetary systems like our own.

It was calculated that signals from planets near the selected stars should be observable with the 85 foot disk if they were generated by a million watt transmitter operating through a 600 foot antenna. To be detected under these circumstances, the signals would have to be concentrated within a very narrow band of frequencies.

Signals to the target stars were sent in the hydrogen line from the observatory in May - July 1960. But if these signals are

received, analyzed, and re-transmitted the results, if any, will not be known until 1982.

No information about any operational programs can be found in the Soviet literature; however, the Soviets do possess several radio telescopes which could be utilized by the Soviets to search for radio emissions from intelligent civilizations.

Meteorites are the only bodies of extraterrestrial origin that are available for a study in our laboratories. In connection with the problem of extraterrestrial life, a large number of mineralogists, physicists, biologists, etc., everywhere are studying meteorites. The proof of the existence of organic substances in meteorites not of earth origin would support the existence of life outside the earth, no matter what the ultimate origin of meteorites might be. But in this problem as in all other problems concerning extraterrestrial life, there is not a single answer and no existing proof of the existence of life. The problem has recently been reviewed at the Institute of Microbiology, Academy of Sciences, USSR, where many investigations of such nature are being carried out.

U.S. and USSR efforts to establish contact with extraterrestrial life have been about equal in terms of theoretical discussions. The Soviets have quoted the Ozma project in their literature and the project appears to be one of their fundamental information

sources. It is not known whether the Soviets have ever attempted a similar program.

No integrated program in either country is currently underway as far as known from available sources; however, both countries have the necessary equipment for such a program.

SUMMARY AND RECOMMENDATIONS

The USAF/UFO program has represented a modest but continuous effort since 1947. The program has been well organized although the resources assigned to it have been quite limited. The program has undergone personnel, attitude, and procedural changes and because of problems and pressures has been periodically reviewed by external consultants, scientists, and more recently a congressional committee.

At present, the firm conclusions of Project Blue Book are:

(1) No unidentified flying object reported, investigated, and evaluated by the Air Force has ever given any indication of threat to our national security;

(2) There has been no evidence submitted to or discovered by the Air Force that sightings categorized as unidentified represent technological developments or principles beyond the range of present day scientific knowledge;

(3) There has been no evidence indicating that sightings categorized as unidentified are extraterrestrial vehicles. Scientific panels and committees previously reviewing the UFO situation, have repeatedly reached the same conclusions even though their recommendations have concentrated on the symptoms, not the cause of the UFO problem.

Initial classification of the UFO project and continuous association with the intelligence community has contributed to constant public criticism. The major criticism, that of withholding information, could be expected because of Blue Book's long intelligence association. With continued government involvement, the Air Force must announce and maintain a standard policy of releasing information to the public. The public must be continually informed of all matters regarding the UFO phenomena.

A recent nationwide Gallup survey of the American people on the UFO subject, revealed that more than five million Americans claim to have seen something they believed to be a "flying saucer." Nearly half of the U.S. adult populus believe that these frequently reported flying objects, while not necessarily "saucers," are real -- 29 per cent of the populus believe them to be a product of the imagination.

This represents quite a change in public attitudes toward the creditability of "flying saucers" since a Gallup survey conducted almost twenty years ago revealed that forty per cent of the populus called the saucers either a hoax or the product of the imagination.

What can be the reasons for this public belief? We can attribute this to several things:

(1) There is, of course, the individuals will and want to believe that this planet is being watched

(2) Religious beliefs that others (extraterrestrial) exist are apparent due to the existence of numerous religious cults throughout the country.

(3) Present U.S. space efforts enable many to believe

(4) People are definitely uneducated in the physical environment

(5) The extraordinary publicity since the late forties.

The unfortunate combination of the social climate at the time of the inception of the UFO era and official government recognition were leading factors that contribute to public concern. These factors coupled with national ignorance of the appearance and behaviour of astronomical and atmospheric phenomena provided the populus the opportunity for the release of latent feelings concerning UFOs. These factors reinforced by mass communication media exploitation, has created a situation wherein public interest may be the most important consideration in the entire UFO controversy.

Our American public believes in the existence of UFOs. It is incumbent upon the Air Force to respond, in kind, to this anchored public attitude. We feel we can be responsive through the adoption of the following recommendations:

(1) The Air Force should capitalize on the belief of 50 million Americans in the existence of UFOs.

(2) Announce and maintain a scientific investigation policy to satisfy public interest.

(3) Initiate positive programs oriented at establishing contact with extraterrestrial life.

We must establish a new image for Project Blue Book and we believe this can be done by acceptance of these recommendations.

28 JUL 1967

Brig Gen William C. Garland
Deputy Director of Information
Department of the Air Force
Washington, D. C. 20330

Dear General Garland

Our 7 July 1967 briefing to you and members of your staff on the subject of "Unidentified Flying Objects" stressed the fact that fifty million Americans now believe in the existence of the phenomenon. It was concluded that the Air Force respond to this anchored public attitude by: announcing and maintaining a scientific investigation program for UFO's; keeping the public well informed at all times; and initiating positive programs in such scientific areas as extraterrestrial communications.

The discussion initiated by the briefing was responsive and your offer to support action required to energize R&D community interest was much appreciated.

Enclosed for your use is a written version of the briefing. To permit maximum utilization of the briefing summary, a few paragraphs were re-written to keep the entire document UNCLASSIFIED.

Recommendations which you and your staff have for redirecting the focus of the UFO problem towards greater involvement by the scientific community would be appreciated. We are pleased to serve your office and will continue to provide that support solicited of us.

RAYMOND S. SLEEPER, Colonel, USAF
Commander

w/o
1 Atch
Uncl UFO briefing

TDE/UFO OFFICE FILE COPY

FOREIGN TECHNOLOGY DIVISION

Date _____

MEMO TO: _____

Cy sent to Col Sleyer 26 Jul 67

SUSPENSE:

DEPARTMENT OF THE AIR FORCE
WASHINGTON 20330

OFFICE OF THE SECRETARY

August 2, 1967

Dear Ray:

I appreciate the copy of Lt. Marley's briefing, and we sincerely appreciate your interest and response to our public affairs problem with UFO. I think we are a long way from getting a handle on this problem.

I have thought about the problem many times since your briefing here. I am more convinced than ever that a positive program in extraterrestrial life or communications studies should not be tied to the UFO problem. I know you don't agree with this and I am not sure Bill Doolittle does either; however, I am convinced that we would really open the flood gates on UFO problems if the public thought that the Condon group was about to involve in extensive research on extraterrestrial activities. I realize that Condon must address this subject, but this is different from conducting active research. I think research in this area should be accomplished by an entirely unrelated activity.

Please pass on any ideas you have and keep us alerted in any way that we might help.

Sincerely,

Bill

WILLIAM C. GARLAND
Brigadier General, USAF
Director of Information

Colonel Raymond S. Sleeper
Commander
Foreign Technology Division (AFLC)
Wright-Patterson Air Force Base, Ohio 45433

AUGUST 1952
AID ARTICLE (RUPPELT)

7-3746 - 383

1003852

RETURN TO
USAF Historical Archives
ASI(ASHAF-A)
Maxwell AFB, Ala 36112

SMC

UNCLASSIFIED

UNCLASSIFIED

DRAFT OF ARTICLE FOR AUGUST AIR INTELLIGENCE DIGEST

SAFIC

Ruppelt 1952

((It is suggested that items inclosed in double parenthesis be omitted from the article in order that it might be declassified from restricted to unclassified. In this manner the article could be used as press release if necessary.))

RETURN TO:
Director
Aerospace Studies Inst
ATTN: Archives Branch
Maxwell AFB, Alabama

I. IN THE WILD BLUE YONDER -- WHAT?

No recognition manual prints the picture of a blinding orange light or a whirling disc, yet reports of the sightings of these strange flying objects come in with increasing regularity.

Many times in recent months, the question has been asked: "Why has the USAF renewed its interest in unidentified aerial objects?" The project was dropped as a special priority project in 1949, but it has continued since then as a normal intelligence function. USAF intelligence has nothing to sell except facts, and to pin down the facts in this matter is like pinning down Kilroy.

It is quite understandable why a great many people take a dim view of the study of "flying saucers". The whole subject is so fantastic that anyone studying the pattern of the reports received by the USAF soon finds himself in an atmosphere of "Alice in Wonderland" fantasy. And yet, facts do exist: reports are coming in with increasing frequency, and the persons who see these objects are sincere and in most cases mature and competent people. The sighters are, generally speaking, convinced beyond the shadow of a doubt that what they have seen is real. However, they are sometimes sensitive about discussing the matter, for fear of being thought to be off their rocker. This regrettable attitude on the part of the public has been engendered largely by the fanciful, and occasionally sarcastic, coverage

1003852

that has been given the subject in the public press. Fantastic or not, it is desirable that USAF personnel report aerial objects that they can not identify. Such reports are considered important and are always given serious consideration.

"But why", you ask again, "is the Air Force interested in a subject so ethereal?" The ether is the natural habitat of the Air Force, which is charged with the control of the air in the defense of the United States. Hence it becomes imperative that, until such time as all sightings can be explained, alertness is maintained. Of the more than 1200 reports now on file at the Air Technical Intelligence Center, 15% cannot be satisfactorily explained or identified. This does not mean that 85% of the objects reported can be unquestionably identified. Some can be. Others can be identified well enough to be put in the "very probably identified" category. Others are disregarded, due to the nebulous nature of the information received. The unexplained 15% have been examined, the sources and contents of the reports have been evaluated and, to date, no explanation has been found for them. It may be that as more experience is gained, solutions will be found. In addition to the ATIC analysts already charged with evaluating these reports, negotiations are being completed to obtain the services of consultants in the fields of physics, nuclear physics, astronomy, and psychology to assist in the analysis of the reports.

The truth is that objects are flying over the United States which have not been identified. Strange things in the air have been reported for centuries, but this does not preclude the fact that the object reported yesterday or 2000 years ago may have been a mirage, while tomorrow's object may be a new weapon. These objects may be natural phenomena, balloons, high-flying

friendly aircraft// or, since they are as yet unidentified, planet missiles or space ships from another planet.//

It should be stressed that USAF intelligence has no indications that any foreign nation has a super-weapon capable of flying anywhere in the world at will, nor that craft from outer space are coming near our planet Earth. It would be foolish, however, to say that either is impossible, no matter how highly improbable it may sound. Fifteen years ago, the atomic bomb was highly improbable.

((The impact of the atom bombs on the entire world is well known, and it immediately posed a problem to any nation that held dreams of conquest. It would seem natural for a nation with the apparent plans of the Soviet Union to use any means possible to negate the leadership strength that possession of the bomb has given the U. S.))

((It is possible to suppose that UAOs might be a Soviet propaganda weapon, in which case, they could be either 1) planted fakes or 2) a clever use of natural phenomena designed to create mass hysteria. If this be true, it has been as miserable a failure as the balloons upon which the Japanese placed so much reliance during World War II.))

((If UAOs are being used for propaganda, it would be reasonable to assume that the USSR would choose first to frighten pro-American nations in Europe with the appearance of a radically new weapon, to compensate for the atom bomb. To support this theory, it will be remembered that strange objects appeared over the Scandinavian countries in 1946. The objects observed there were reported to have unusual range and unusual performance characteristics.

When these incidents subsided, strange objects were reported to be flying over the U. S. The hypothesis here is that the Soviets could be attempting to frighten both the European nations and the U. S. by a new device that they hope will be construed to mean that the Soviets are far ahead of the rest of the world in technical know-how.))

The above theory, however, runs into one big stumbling block. If these objects are weapons or advanced types of aircraft, they are, of necessity, man-made. How is it then possible that, in the four years that the USAF has been studying UAOs, not one has crashed? Man-made devices are not infallible.

To recapitulate, the USAF will maintain an open mind and study all UAO reports until enough information has been gathered to explain the unexplained 20% 15%. By continually receiving reports, devising further methods of evaluating them, and collating them with other reports, a continual watch is being kept.

II. <u>UAOs over USA</u>

United States Air Force Headquarters continues to receive an increasing number of reports about weird objects in the sky. These reports - carefully checked at the Air Technical Intelligence Center, and when possible, evaluated - range from balloons to unidentified aerial objects of all conceivable shapes, sizes, speeds, and motions.

The dramatic scope of the subject of unidentified aerial objects has piqued America's interest for years. In this atomic age there is fascination in the weird and unknown, since man's inventions themselves approach the incredible. The public press has nurtured and sustained our interest in UAOs ((whenever it could find the slightest excuse to keep the story alive.))

Since the USAF has been keeping books, over 1200 UAO sightings have been reported. Many of these reports have come from trained and experienced U. S. Weather Bureau personnel, USAF rated officers, well-qualified civilian pilots, technicians associated with various research projects, and, in one case, a group of professors from a Texas university.

Of these sightings, ehough remain that cannot be explained by any known cause to justify the USAF in continuing to pursue its investigations.

On 24 June 1947, Kenneth Arnold, a businessman of Boise, Idaho, reported seeing a chain of nine saucer-like objects whipping in and out of mountain peaks at 1,200mph, near Mount Rainier in the state of Washington. Mr. Arnold, who was flying his private aircraft that day, was so impressed that he contacted the press and the incident was played up across the country. Because of the wide publicity this sighting received, many persons consider this the first UAO sighting. (Nothing could be further from the truth.*)

Sightings

There can be no attempt, in this article, to cover all the sightings on file at the Air Technical Intelligence Center. Generally speaking, the configuration of these objects fall into three categories: 1) balls of fire, 2) disc-shaped, 3) roughly cigar-shaped.

Naturally, the most important thing that could possibly happen would be for the USAF to come into possession of one of these objects, if objects they be, but next to this in importance is pictorial coverage of the sightings. Few pictures are available, with the exception of obvious hoax shots, for most people do not go about with a camera cocked to catch a breath-taking flash in the sky.

---

*See the article "Pre-1947 UAO Reports", beginning on page _____.

One of the best pictures was taken in 1947. On 7 July, William Rhoads of Phoenix, Arizona, saw a disc circling his locality just at sunset, and took two pictures. These pictures, showing a disc-like object with a round front and a square tail, have been examined by experts, who state that they are true photographic images and do not appear to be caused by dirty lenses or imperfections in the emulsion. (See page _____.)

On 10 July 1947, Woodruff, a Pan-American Airways mechanic, reported a circular object flying at a high velocity, paralleling the earth's surface and leaving a trail which appeared as the "burning-up" (Mr. Woodruff's words) of a cloud formation. The sighting occurred near Harmon Field, Newfoundland. Two other persons also saw the trail, which remained in the sky for about an hour, and it was photographed by another PAA employee. The resulting photographs support Woodruff's observation as far as the long-lasting vapor trail is concerned. See page _____.

Death rode on a "saucer" when, on 7 January 1948, a National Guard pilot, Capt Thomas Mantell, was killed while attempting to chase an unidentified object up to 30,000 feet. While it is presumed that this pilot suffered anoxia, resulting in a crash, his last message to the control tower was: "It appears to be a metallic object . . . of tremendous size . . . directly ahead and slightly above . . . I am trying to close for a better look . . ." This sighting was at Godman Air Force Base in Kentucky and was one of the first to be reported from that area.

Lubbock lights

Skipping years and many sightings, we arrive at one of the most puzzling cases to date: a series of sightings over Lubbock, Texas. The high

professional standing of the persons who made these observations makes this case especially worthy of note. The observers were all professors of the Texas Technical College at Lubbock: W. I. Robinson, Ph. D., in Geology, but also well versed in all fields of science; A. G. Oberg, Ph. D., professor of Physics; and Prof. W. L. Ducker, head of the Petroleum Engineering Department.

On the evening of 25 August 1951, these men were sitting in Dr. Robinson's garden. It was a clear, mid-summer night, and the men were scanning the skies, counting and discussing meteors as they flashed into view, when suddenly there appeared, in the northeast, a swiftly moving semi-circle of lights. The savants were astounded by the phenomena and decided they would watch carefully for another appearance of this object or objects, and, if it occurred, would attempt to analyze its characteristics.

In about an hour, their watch was rewarded. This time they were ready. One man looked while the others acted as timers. The bluish-green lights were clearly and plainly visible but not brilliant. The individual lights varied in intensity, and each was somewhat larger in appearance than a star. Each of the two flights that night consisted of a series of lights in an accurate V formation which covered about 10^0 in the sky. The men estimated that the two flights were identical in size, shape, velocity, and course. There was no sound associated with either ghostly passage.

During the week following the first sighting, the original group witnessed five flights between the hours of 9 and 12 p.m. By this time the story had hit the newspapers, and several other people had reported similar

sightings. The most startling incident occurred when the Lubbock Morning Avalanche printed pictures of the flying "What-Is-Its". These pictures were taken by Carl Hart Jr., an amateur photographer and freshman at Texas Tech. ((The negatives have been examined by experts of the Photo Laboratory at Wright Air Development Center and cannot be disproved or declared a hoax.))

Through the week, the men had discussed their experiences. Several characteristics seemed to them outstanding. Perhaps the most amazing was the apparent schedule upon which the objects were operating. The first appearance each night was so close to 9:20 p.m., that observers spoke of it, in railroad parlance, as "old 9:20". The lights never gradually came into view or gradually disappeared. They were suddenly there -- then, just as suddenly, gone.

The group was confident that the angular velocity of the object was 30° a second -- this they determined from measurements of several flights. Stop watches and protractors were used to measure time and angles.

On 1 September 1951, the original group of three met again in Dr. Robinson's garden and were joined by E. R. Heineman, professor of mathematics, and Dr. E. F. George, professor of Chemical Engineering.

Once again, at about 9:20 p.m., a flight came over. It was similar to previous flights, but rather more irregularly grouped. On through the evening, at fairly regular intervals, four more flights moved across the sky from North to South. And then at 12:17 a.m., the most unusual sighting was observed. This flight passed directly overhead, flying very low, in the general direction of North to South, and was seen by everymember of the group.

Dr. Robinson observed that in the case of this flight, an irregularly shaped yellow light appeared in the rear. The formation included dark diffuse areas, and the arc itself quivered or pulsated in the direction of its travel.

Each object had an angular magnitude that would be the equivalent of 12 inches across at a distance of 30 or 40 feet, and in violent agitation.

This was the first sighting that Mr. Heineman, who had been skeptical about the whole thing, made. The sighting was so low and so spectacular that he was really jolted, and apparently showed it, for the group jokingly dubbed it "Heineman's Horror". The flight had the appearance of a group of 12 to 15 pale objects in the shape of a quadrant of a circle, producing a pale-yellow blinking light and moving noiselessly.

The professors claim 12 "official sightings." This is their own term, as they would not recognize any sighting that was not witnessed by at least two of their group. They do not completely accept the photographs taken by Carl Hart, and state that, had they felt it possible, they would have made every effort to take photographs themselves, but that the objects moved too fast. They have also taken into consideration the aerial activity that was taking place over the SW United States at that time -- the much publicized "Green Fireballs". They attempted to tie up the two, but could find no association between the fireballs and the flying objects that they had seen.

((How green are the fireballs?))

((The reported green fireballs that flashed across the skies of SW United States in great numbers during 1948, '49, and '50 are still a matter

of great conjecture. They were thought by some scientists to be meteors. Dr. J. Kaplan of the Scientific Advisory Board is one such scientist, but he qualified his belief: "The daytime 'fireball' incidents are completely baffling. No meteor would persist for as long as thirty minutes. (EDITOR'S NOTE: The daytime incident of 27 March 1949 lasted more than half an hour. This duration is much longer than any recorded genuine meteoric incident.) The characteristics of the nocturnal green fireballs, of relatively the same height and having no sound, are ones which are difficult to observe without very careful instrumentation as to their (height).))

((Dr. Lincoln La Paz, director of the Institute of Meteorites, University of New Mexico, Albuquerque, made a comprehensive study of the fireballs and felt that they were not meteors. Dr. La Paz stated: "Most of the reports of 'green fireballs' state that they appear to move in horizontal paths, throughout its entire extent, to the plane of the horizon. Such persistent horizontality stands in the sharpest contrast to the downwardly concave paths traversed by genuine meteorites, when these penetrate deeply into the atmosphere of the earth.))

((("In the case of genuine meteorite falls, with luminous paths terminating even at heights considerably greater than those at which the real paths of the green fireballs are situated, the observed luminous phenomena are always accompanied by extraordinarily violent noises. No noises whatever have been observed in connection with any one of the horizontally-moving green fireballs.))

((("The anomalous greenish luminous phenomena show a curious association with well-known meteor showers, although none of these annual meteor showers normally produce extremely bright green fireballs. The relationship cited

might indicate an attempt to render the green fireballs less conspicuous by causing them to appear only when there is a background of considerable natural meteoric activity."))

Now "Blue Book"

The study of unidentified aerial objects by the USAF was first assigned the name of Project Sign; this was later changed to Project Grudge; recently the name Project Blue Book has been assigned to it. In order to support Project Blue Book, several conferences have been held with members of a research organization. The highly qualified members of this organization were given access to the USAF files on the project. After a study of the information available, they decided that there are enough reports that cannot be explained to warrant a detailed investigation. Several other engineers and scientists have been contacted and their opinions are much the same.

Still they fly

And so the unidentified aerial objects remain in the realm of the unidentified. There remain practically armed camps of opinion: those who say it is all silly witch-hunting; those who keep an open mind; and those who will fight to the death to defend the validity of "those things that fly." The answer, if there is one, will eventually materialize, and the USAF will not be caught napping. Until that time, it places itself in the "open mind" category.

BOX

Flying pie-pan

UAO hoaxes have been almost non-existent in recent years, but Air Force files still contain records of some of the early hoaxes. A typical

incident took place in Shreveport, Louisiana, in July 1947. The papers played the story big, and it was a two-day sensation. Mr. H———, of Shreveport, decided that he would stop by a used-car lot on his way home from work and try to find a bargain car. As he stood looking over the prospects, he heard a loud whirring and, looking up, saw a bright, silvery disc, which appeared to him to be spitting fire and smoke. It dropped, with a crash, in the street. He rushed over, retrieved the object, then contacted Barksdale AFB.

The thing was crudely made and so obviously a hoax that Barksdale personnel were able to thank Mr. H——— and assure him that it was the work of a practical joker. The next day a very red-faced gentleman admitted that he was the maker of the saucer. He was employed by an electrical firm whose building was next door to the used-car lot. The saucer-maker had planned the episode as a joke to be played on his boss. He had launched the thing from the roof of the building and, true to plan, it had actually landed near his employer's car. The pay-off was that his boss paid no attention to it, but Mr. H—— did and the joke backfired.

IS THERE A SIMPLE, NATURAL EXPLANATION?

Astronomical, meteorological, and light phenomena, or simply failure of observers to recognize familiar objects in the air for what they really are, may explain many reported UAO sightings.

It is midnight. A luminous body, seemingly as bright as the sun, streaks across the sky. It emits sparks and puffs of smoke, and trails what appears to be a long, fiery exhaust. The object then disappears with a series of flashes, and, shortly after, a fearful roar and earth-shaking explosions are heard. Only one man witnesses this event. Never having observed anything so awesome in the skies before, he is convinced that he must have seen an interplanetary space ship.

Perhaps he has. It will never be possible to say with absolute certainty that he cannot have seen an extra-terrestial vehicle. There are no other witnesses to the incident and, therefore, by the rules of evidence, no one competent to controvert conclusively his conviction that he has seen space travelers in transit. ~~Chances are~~ Probably, however, if he were more familiar with astronomical phenomena, he would identify his UAO as a more conventional visitor from space — a meteorite. What he has seen and heard tallies very closely with the frequently observed and startling phenomena of light and sound that often accompany the fall of meteorites. Over 100 million meteors fall daily

One hundred million or more meteors come racing into the earth's atmosphere daily at speeds of 100,000 miles per hour, to meet their doom under the force and tremendous frictional resistence encountered at such

velocities. Those which partly survive the friction of the earth's atmosphere and fall to the ground, frequently with the startling light and sound effects reported by our observer, are called meteorites. Unusually brilliant meteors are called fireballs. These often leave luminous trains that may persist as long as an hour after the fireball itself has disappeared. Daylight meteors frequently do not appear luminous, but do leave a trail, and often no noise is heard. Sometimes meteors explode in mid-air. These are called bolides.

Of the meteors which fall daily, about 25 million are visible to the naked eye, most of them appearing as the familiar "shooting stars" that occasionally dart across the sky at night. Yet very few of these are ever found, for it is probable that most meteors are a body no larger than a pinhead. One no larger than a golf ball may appear as bright as the full moon. Small wonder, then that meteors and their derivatives suggest themselves as likely explanations of many UAO sightings.

Another astronomical phenomenon which may provide an answer to some of these sightings is the recurrent brilliance of our nearest planet, the familiar morning and evening star -- the planet Venus. It outshines all celestial bodies except the sun and the moon, and, near the times of its greatest brilliancy, it is plainly visible to the naked eye even at midday, when attention is directed to it. It outshines Sirius, the brightest star, by fifteen times. Venus, when as bright as this, and shining through interstices in the clouds, could easily give the effect of a flaming object with a tail -- a description featured in many UAO reports. So could Mercury, or the red planet Mars.

Scientific analysis of all UAO reports received to date indicates that almost 40% may be attributed to failure of the observer, for one reason or another, to identify such astronomical phenomena. Additional astronomical and other phenomena of the skies which may be included in this category, although, at most, they explain only an occasional sighting are: 1) zodiacal light (the glow along the zodiac of sunlight reflected by meteoric material); 2) zodiacal light's counterglow, known as gegenschein; 3) the ghostly beams and curtains of light of the aurora borealis and aurora australis, seldom seen in our latitudes, but which are common enough near the magnetic poles; 4) illusory effects of clouds and light in connection with such familiar celestial bodies as the sun and the moon; and 5) ball lightening.

Nothing mysterious about many UAOs

Another 35% of UAO sightings may be attributed to misinterpretation of objects no more mysterious than weather balloons, aircraft, and even commonplace things like birds and wind-borne bits of paper. All normal, intelligent people from time to time mistake some more or less familiar object for another object. These errors arise chiefly from inability to estimate size, speed, and distance. It is not possible to estimate accurately such characteristics of small bright objects against the sky unless the object is first identified. This is doubly true at night. Small objects may occasionally be borne to great heights by strong winds. It would be impossible to estimate the distance, size, and speed of such objects, and it would be easy to fail to recognize them.

The best guesses as to the non-astronomical objects which elicit many UAO reports include reflections of the sun from distant aircraft, running lights on aircraft, searchlights on clouds, flares, and the previously mentioned wind-borne objects. Best guess of all in this category, however, is balloons - weather, research, and even old-fashioned carnival balloons.

More than 10% of UAO reports may reasonably be put down to balloons which are released on routine synoptic ascents by the Air Weather Service, the Navy Aerological Service, or the United States Weather Bureau. In addition, U. S. Army units and other public and private institutions, such as universities, make weather balloon observations.

Pibals are released for observation of winds aloft at almost every airport in the United States that has regular military and airline traffic. They rise at about 600 feet per minute, and because of their comparatively small size, just 30 inches in diameter, they are difficult to see above feet. Therefore, they probably account for only a few UAO sightings. RAOBS look like discs at 85,000 feet

More likely stimuli to UAO reports are instrument-carrying balloons — rawinsonde and radiosonde (RAOBS). RAOBS are six feet in diameter at release, but they inflate to twenty to twenty-five feet before they burst at altitudes ranging up to 90,000 feet. If weather conditions are ideal, they can be seen with the naked eye at altitudes up to 85,000 feet. At this altitude, they can definitely take on the appearance of flying discs. All the sites in the United States where scheduled instrument balloon releases are made are shown on the map on page _____.

RAOBS carry lights at night, a fact which may account for some instances when pilots attempted to chase UAOs during hours of darkness. Such conditions could have produced a loss of orientation on the part of the observer. Movement is always relative. If the only outside point of reference is a point of light, and both the object and the observer are moving, it is practically impossible for the observer to separate the two motions. It is difficult enough to fly a good pursuit curve on another aircraft in broad daylight, for example, let alone to close on a solitary, moving light at night.

Another type of balloon figuring in the UAO picture is the kind used in connection with Project Skyhook. These weird plastic bags, which ascend to heights of over 100,000 feet, are shown in the photo at right. They are flown from mobile launching sites, sometimes singly and sometimes in clusters. Ballasted to float at fixed altitudes, they carry radio transmitters so that they may be tracked by means of very-high-frequency direction-finding equipment for the duration of their flight over the United States, or until either their ballast or their batteries are expended. However, these, as well as the less spectacular balloons, may be lost and wind up in the UAO files.

It has been suggested that some UAOs, especially those where the object was described as cigar-shaped, might actually be guided missiles. This appears to be an unlikely explanation. These missiles are launched at only three locations throughout the United States: 1) Point Mugu, north of Los Angeles, Calif.; 2) White Sands, Ariz.; and 3) Patrick AFB, Cocoa, Fla.

Firing is conducted out to sea and over controlled test ranges. Since all unauthorized persons are shooed out of the area, there would be no one likely to turn in a UAO report.

After eliminating UAO sightings attributable to the astronomical and the non-astronomical phenomena considered in this article, together with the hoaxes, discussed on page _____, plus those reports lacking sufficient evidence for investigation -- after all this, approximately 15% of UAO sightings remain bona fide UAOs. That is, the evidence suggests no ready explanation.

Trick of temperature - inversion and refraction?

One possible explanation has been advanced by the Harvard astrophysicist, Dr. Donald H. Menzel. (See Look, June 17, 1952, pp. 35-39.) As summarized by Time, June 9, 1952, pp. 54-56, the kernel of Dr. Menzel's hypothesis follows:

"Normally, the atmosphere grows cooler as altitude increases, but under some conditions it may contain layers of warm air with cold air below them. These are called 'inversions.' They occur in all climates but are commonest in deserts, where both the ground and the air get very hot in daytime. As soon as the sun sets, the ground cools off, radiating its warmth into the sky. The air for a few feet up grows cool by contact with the cool earth, but the air a little higher stays warm. . . The warm air overhead turns downward the light from bright objects, such as street lights or auto headlamps."

Temperature inversion and refraction, as propounded by Dr. Menzel, is familiar to most of us as motorists when we see the mirage which looks like shining water in the road ahead. Other inversions occur when a warm layer of air hangs several thousand feet up. A pilot flying just above this

layer, especially if its power to divert light is increased by dust, may see below him the displaced image of the sun, the moon, or even a brightly lighted cloud. The image may be distorted by waves in the inversion, and a whole formation of objects may then appear to be in rapid motion.

Reflection and refraction theories as natural explanation of UAO reports are questioned by authorities like Dr. Ronald Ives, the Cornell geophysicist, who is an outstanding authority on mirages. Dr. Ives points out that the reflectivity of temperature disperities in the air is so slight that it reduces the intensity of the light source to a negligible degree -- far less bright than the brilliantly luminous objects that have been so frequently seen.

Most UAOs can be explained with some degree of certitude. Dr. Menzel or someone else may have the answer to all, some, or none of the unexplained 15%.

OTHERS MIGHT BE SPACE SHIPS

CRAFT FROM OUT YONDER COULD BE DISCS, SPHERES, OR BIG V-2s WITH WINGS

It is just possible that some of the unidentified objects may be space ships from another planet. The idea of space travel is no longer the fantastic subject it was in the years before World War II. In the USAF's study of unidentified objects, space ships have been given serious consideration.

Although we do not know what a space ship from another planet will look like, we do know approximately what a space ship built on Earth will look like.

Willy Ley, the rocket expert, says the ship will look like a large rocket — like a V-2, but taller. Its height will be 10 to 12 times its largest diameter. It will have short wings, placed far back. The wings will be either sharply swept back, or will have a delta configuration. Such a ship will have an atomic power plant. Thrust for take-off will be provided by a chemical booster, to avoid making the take-off area radioactive, and the atomic power will be used shortly afterward.

However, a transport from another planet might have the shape of a sphere, or a disc. For travel through the Earth's atmosphere, the sphere would not be nearly as efficient as a thin disc. The sphere could have tremendous strength, but its aerodynamic characteristics would not match those of the disc. In the vacuum of outer space, however, the shape of a space ship would not affect its space at all.

If the unidentified objects are space ships from outside the Earth's orbit, the strange behavior of some of them (hovering, flying in jerky

bursts of speed, changing direction at high speed, spinning, and accelerating suddenly to high speeds) can be explained only by 1) a source of power unknown to Earthlings; 2) materials possessing greater strength and greater ability to resist heat than any now known on Earth; 3) physically superior beings or robots capable of withstanding enormous G forces --or; 4) a new, radical means of overcoming or screening gravity.

Two possibilities: Mars and Venus

Space ships could come here from either Mars or Venus. Other planets in the solar system are considered poor prospects for life to exist. Because of the climatic and atmospheric conditions believed to exist on Mars, it is thought by astronomers that a race of intelligence beings would be more likely to be found on that planet than on Venus. Mars has a rare atmosphere, nearly devoid of oxygen and water, and its nights are much colder than our Arctic winters. The atmosphere of Venus appears to be cloudy, and apparently consists mainly of carbon dioxide with deep clouds of formaldehyde droplets. Venus seems to have little or no water.

Despite these environmental characteristics, it is possible that intelligent beings exist on both planets. Such beings could be types whose body chemistry, size, appearance, and basic requirements for maintenance of life are entirely difference from our own.

When Mars is nearest Earth, it is about 35,000,000 miles away. When Venus is nearest Earth, it is about 26,000,000 miles away. Venus is nearly as large as Earth; Mars is smaller than Venus.

Space ships might come from other solar systems

Arguments such as those applied to Mars and Venus need not necessarily apply to planets orbiting stars other than our sun, according to J. E. Lipp, of the Rand Corporation.

Many planets outside our solar system may have the environmental characteristics of Earth. The existence of life on planets which have the "right conditions" is not only possible, Lipp firmly believes, but inevitable. He assumes, for the sake of his argument, that man is "average", and thus that half the beings on such planets are ahead of us in knowledge, and have reached various levels of space travel experience. Conceivably, as Lipp suggests, among the myriads of other solar systems in space, one or more races of intelligence beings on planets far removed from our solar system HAVE discovered methods of travel that we could regard only as fantastic. Yet, the greater the astronomical distances that would have to be traversed by space travelers to reach our Earth from outside our solar system, the slighter the chance that space travelers would ever find this planet. The galaxy we are in has a diameter of about 100,000 light years, and a total mass of about 200 billion times that of our sun. Other galaxies, at distances up to billions of light years, have been photographed, numbering several hundred million and each containing millions of individual stars. A race of superior intelligence, unless it occurs frequently in outer space, would not be likely to stumble upon Planet III of Sol, a fifth-magnitude star in the outskirts of our local, or Milky Way, galaxy.

CAPTIONS for SOME OTHERS MIGHT BE SPACE SHIPS

BREAKING ELLIPSES. Space ship coming to Earth might execute several ellipses as shown in order to reduce speed for landing. Drawing is to scale, except that atmosphere (broken circle) is four times too deep.

VII PRE-1947 UAO REPORTS

Early--meaning pre-1947--reports are rich and varied, and fall consistently, like modern sightings, into three categories: luminous balls; saucer-shaped objects; cigar-shaped objects.

EDITOR'S NOTE: TIME, in a recent article, mentioned the celebrated "airship" reported seen in 1896-97 by thousands of people from Oakland, Calif., to Chicago, and printed part of a clipping about it from the New York HERALD of 11 April 1897. READERS DIGEST, in an article in its July 1952 issue, "Flying Saucers Are New in Name Only," mentioned reported UAO sightings in 1913, 1904, 1897 (the same one mentioned by TIME), 1882, and 1870. These references gave a superficial impression that TIME and READERS DIGEST had extensively researched the subject of early UAO sightings. These eminent magazines, however, for all their reputations for thoroughness and their large research staffs, barely scratched the surface of this rich and extraordinarily interesting subject.

It is rather widely believed that the now-famous "Arnold Report" of 24 June 1927* was the first UAO report. Actually, reported UAO sightings go way, way back--well over a century and possibly to Old Testament days. Almost all "early sightings," as they have been short-titled by the Air Force, fall into the same main categories that the modern sightings fall into: luminous balls, saucer-shaped objects, or cigar-shaped objects.

The AIR INTELLIGENCE DIGEST requests its readers to make their own evaluations of these early reports. Were they - as many modern sightings have turned out to be - illusions, mistaken identifications, or hoaxes?

* See third paragraph of the article, "UAOs over USA," page _____.

Or were they real, and of terrestrial origin? Or real, and of celestial origin, possibly transplanetary or even transstellar?

There are many hundreds of reported early sightings on record, but, after careful screening, the DIGEST has selected for presentation only those discussed and/or reproduced (see accompanying artwork) in this article.

A large percentage of the early reports were in the form of letters to such sober and reputable journals as the London Times; Scientific American; Nature; American Meteorological Journal; U. S. and Canada Monthly Weather Review; l'Astronomie; Astronomische Nachrichten; London, Edinburgh, and Dublin Philosophical Magazine and Journal of Science; The Observatory—Monthly Review of Astronomy; etc. This proves, if it proves nothing else, that the witnesses were deeply moved and excited by what they saw — or thought they saw. M. Lincoln Schuster wrote in his introduction to the book, "A Treasury of the World's Great Letters": "When any person has a soul-shaking experience, he usually can—and frequently does—write a letter about it."

"Ezekial Saw de Wheel,"

Zechariah saw a "roll"

The AIR INTELLIGENCE DIGEST will not quarrel with readers who dismiss as far-fetched any interpretation of the Biblical quotations below as references to 1) a disc-shaped UAO and 2) a cigar-shaped UAO. These quotations are presented solely for whatever significance, if any, that DIGEST readers may read into them.

The wording of the well-known reference in Ezekial is: " . . . a whirlwind came out of the north . . . a fire unfolding . . . and a brightness was about it, out of the midst thereof as the color of amber . . . it sparkled like the color of burnished brass . . . like burning coals of fire, and like the appearance of lamps . . . the appearance of the wheels was like unto the color of a beryl (greenish-blue) . . . as it were a wheel in the middle of a wheel".

Less familiar is a passage in Zechariah: "Then I turned, and lifted up mine eyes, and looked, and beheld a flying roll . . . the length thereof (was) twenty cubits, and the breadth thereof (was) ten cubits." "Roll," in Biblical terminology, usually meant the parchment rolls then used for books. In some translations, the phrase "flying book" is substituted for "flying roll" in the foregoing passage. Converting cubits into feet, Zechariah's "flying roll" measured 30 by 15 feet.

12 January 1838

Extensive controversies raged among astronomers during the 1700s about numerous small objects observed near Venus. Were they optical illusions? Satellites of Venus? A planet between Venus and Mercury? These telescopically observed objects probably have no connection with UAOs, although some commentators, notably Charles Fort, have tried to establish such a connection. We are possibly on firmer ground in quoting a brief reference in the 1877 Report of the British Association for the Advancement of Science, " . . . a report that at Cherburg, France, on 12 January 1838, was seen a luminous body, seemingly two-thirds the size of the moon. It seemed to rotate on an axis. Central to it there seemed

to be a dark cavity". The similarity of this earliest dated UAO report to many modern sightings is immediately apparent.

Nature: 1880, 1893

The magazine Nature, subtitled A Weekly Illustrated Journal of Science, reported an unusually interesting sighting in its 20 May 1880 issue. The item on "remarkable phenomenon observed at Kattenau, near Trakehnen (Germany)" described "an enormous number of luminous bodies" which "rose from the horizon and passed in a horizontal direction from east to west. They moved through space like a string of beads, and shone with a remarkably brilliant light." Some were estimated to the "the size of a walnut," others resembling "sparks from a chimney," and, in connection with these estimates of size, it is important to bear in mind that apparent size and real size are two very different things, especially as applied to celestial phenomena.

In the 25 May 1893 issue of Nature appeared the much-quoted sighting report of the "unknown lights of Japan". This stated that "the globes altered in their formation . . . and . . . took the form of a crescent or diamond, or hung festoon-fashion in a curved line".

See, and compare, the material on the modern "Lubbock Lights" sightings, on page _____ of the article, "UAOs over USA."

London Times

On page _____ are reproduced some of the more interesting letters and news items about UAOs that appeared in the great Times of London from 1848 to 1869. An 1870 letter to the Times is our cover picture this month.

Why UAO reports, in all their varied, strange, and sometimes wildly extravagant forms should have poured in on the ultra-conservative Times ("The Thunderer") is a mystery as challenging as that of the UAOs themselves. The serious treatment the Times gave these reports, however, is gratifying to look back on, since, in the 1800s, they must have been even more incredible--seeming than they are in today's age of supersonic flight, radar contact with the moon, and atomic fission.

Here are some selected quotations from Times UAO reports:

"There they shone with a bright flickering light until about 10 o'clock, when they moved, making a slight curve westward. The speed with which they migrated was prodigious." (1848).

". . . a most extraordinary appearance in the sky this evening, which has quite frightened the superstitious here. At 7:20 a brilliant red light appeared to the sough by east, about half-way between the zenith and horizon . . . its shape was oblong . . . in about 15 minutes it rose to the zenith." (1859).

"This (to me) extraordinary object . . . floated steadily away, northwest by north . . . threw no rays in any direction . . . and was in my sight, from first to last, about three minutes." (1867).

"A falling star would never have remained so long visible in the telescopic field." (1870).

Philosophical Magazine to
Monthly Review of Astronomy

The so-called "Auroral Beam of November 17th, 1882," was the subject of a 20-page article in The London, Edinburgh, and Dublin Philosophical Magazine and Journal of Science, and one of the 26 observers of this

amazing phenomenon was none other than the Astronomer Royal. It was described by various observers as "spindle-shaped," "a cigar-ship," "torpedo-like," "weaver's shuttle," and, more specifically, "a bar of yellowish light, with a 'dark something' before the bar and a dark streak where it passed". The compiler and collater of the observations, Mr. J. Rand Capron, wrote: "A primary question is whether the 'beam' was really and truly a part of the auroral display, or a 'meteor,' 'meteoroid,' 'cometary body,' or something allied to any of these, in contra-distinction to an 'auroral beam'". The Observatory - Monthly Review of Astronomy, commenting on the Capron article, spoke of the phenomenon as "unusual and striking, not to say awe-inspiring," but the Observatory editor, Dr. E. W. Maunder, Fellow of the Royal Academy of Science, held that it was an auroral, rather than a meteoric, manifestation. In other words, nobody, not even the best scientists of the day, could figure it out.

"That airship"

Unquestionably, the most famous and most baffling American UAO was the "airship" which, first reported over Oakland, Calif., on November, 1896, finally appeared, according to thousands of observers, including many reputable scientists, over Chicago. The Oakland Tribune of 23 November 1896 led off its goggle-eyed story: "That a huge airship has been hovering over Oakland for the last few nights has, in the minds of many, been conclusively proven". The dispatch said further: "The ship resembled a huge bird in its outlines and seemed to rise and fall in its course." In its 11 April 1897 issue the New York Herald in a dispatch headlined "THAT AIRSHIP NOW AT CHICAGO", wrote: "For weeks, reports have been coming in from various points

between here and California regarding an airship . . . men of unquestioned veracity declare the moving object was an airship . . . some declare they saw two cigar-shaped objects and great wings . . . Chicago and her suburbs are intensely interested, and the subject is almost the sole topic of conversation."

Monthly Weather Review: 1904, 1907

The U.S. Weather Bureau's Monthly Weather Review, in its issues of, respectively, March 1904 and July 1907, printed two of the most mystifying early- sighting reports on record. They were headed "Remarkable Meteors" and "A Possible Case of Ball Lightning".

The author of the 1904 report was Lt. Frank H. Schofield, U.S.N., who stated that he saw "three somewhat remarkable meteors" at 35° 58' North—128° 36' West, which "appeared near the horizon and below the clouds, travelling in a group from northwest by north (true) directly toward the ship . . . As they approached the ship, they appeared to soar. . ." (EDITOR'S NOTE: To call meteors which soar "somewhat remarkable" was the understatement of the century.)

The 1907 report was by William L. Alexander, official weather forecastor of Burlington, Vt., who wrote about an "explosion so sudden, so unexpected, and so terrific that it startled practically the entire city of Burlington." He quoted Bishop John S. Michaud who, at the time of the incident, was standing in conversation with ex-Governor Woodbury of Vermont at the corner of Church and College Streets. Bishop Michaud, after describing the "most unusual and terrific explosion," said: "I observed a torpedo-shaped body some 300 feet away, stationary in appearance and suspended in the air about 50 feet above the tops of the buildings. Although stationary

when first noticed, this object soon began to move, rather slowly . . ."

Mongolia: 1927

In the book "Altai-Himalaya," by Nicholas Roerich, painter, traveller, and mystic, the author wrote that, in Mongolia in 1927, his party saw "something big and shiny reflecting the sun, like a huge oval moving at great speed. Crossing our camp, it changed its direction from south to southwest. We even had time to take out field glasses and saw quite distinctly an oval form".

Interesting . . .

HQ USAF evaluates with only one word these early sightings which it has carefully searched out, sifted, and presented here for your inspection. They are, undeniably, interesting. No other evaluation is, in fact, possible, from knowledge now available. Perhaps only the UAO future - -if and when it finally brings us comprehension of this great, challenging mystery in our skies --will enable us to correlate the UAO present with the UAO past.

CASE HISTORY OF A UAO

Investigators at ATIC first check to see if a UAO is 1) an aircraft, 2) an astronomical body, 3) a balloon; after this routine, each sighting requires a separate and unique course of action.

In mid-July, as this is written, Air Technical Intelligence Center at Wright-Patterson Air Force Base is being swamped with UAO sightings. Reports are coming in at the rate of double that of a year ago. In the two weeks preceding this writing, ATIC's Aerial Phenomena Branch has received 60 such

reports. The reports include such interesting ones as that from two Pan American Airways pilots who reported seeing "eight-glowing red-orange discs" flying 1,000 miles an hour over Norfolk, Va.

There is no doubt that UAO publicity - now increasingly widespread in the public press - has resulted in many of these reports. Project Grudge in 1949 pointed to a correlation between publicity and the number of UAO reports. Today, the same trend is apparent. It's a snowball effect. A sighting receives wide publicity; this results in more reports; these receive publicity; they result in still more reports.

Publicity can be good

Perhaps some of these reports are, as Project Grudge hinted, a "mild form of mass hysteria," sparked by publicity. Yet, the officer in charge of the Aerial Phenomena Section feels that the current large number of reports can be viewed in another light. He believes that in the past some qualified observers who have sighted UAOs failed to report them, due to fear of ridicule. Many of the current reports, he believes, simply reflect a knowledge that the Air Force is genuinely and seriously interested in anything and everything that goes on in the atmosphere above us. This new attitude has also come about through publicity. He also believes that intelligence officers should know the investigative procedure at ATIC, so that they will understand that their reports are given serious consideration. A typical investigation can be summed up in the story of a typical sighting:

At about eight o'clock on the morning of 3 April 1952, four civilian Air Force pilot instructors stood at the airport at Benson, Ariz., observing a cadet cross-country flight. One of the instructors noticed a

"star-like" object motionless in the sky and called it to the attention of the other instructors. They immediately took steps to secure data with the equipment at hand. They wheeled a T-6 around to head toward the UAO. This gave them the magnetic bearing. Sitting in the cockpit, a pilot sighted over the canopy to get a rough-and-ready estimate of the elevation.

One instructor then took off in a T-6. He climbed to 12,000 feet, but the relative size of the object did not change. This indicated that the object was very high. Then, after 52 minutes, the object suddenly disappeared.

When ATIC received the "FLYOBRT" report on this sighting, an officer first checked to see if any other reports correlated with this one. Occasionally, ATIC receives a number of reports on, say, a meteor or fireball and the various reports fit together like a jigsaw puzzle (this explains why ATIC wishes intelligence officers to send in all reports).

First-phase investigation

In this case, there were no other reports. The officer then began his investigation's first phase: to check whether the object could have been 1) a high flying aircraft, 2) an astronomical body, 3) a balloon. He found that B-36s had been flying in the area at the time of the sighting, but he quickly eliminated them as an explanation. Mathematics showed him that a B-36, even flying high enough so that it could not be recognized, would have flown through such a wide arc in 52 minutes that the change in bearing would have been readily apparent.

ATIC is staffed with highly-qualified engineers and scientists. The Center also has an "on-call" contract with scientists and engineers representing such fields as nuclear physics, metalurgy, psychology, mathematics, and chemistry. The investigating officer in this case asked the consulting astronomer for Project Blue Book to determine whether an astronomical body could have caused the sighting. The astronomer concluded that no astronomical body which could have been seen in daylight had been in the portion of the sky where the object has been seen. Venus, a previous offender, had been too near the sun to have been seen.

A likely possibility

While the astronomer was checking, the officer began his study of balloons, a likely possibility for any object that remains stationary for from five to 60 minutes. He knew that he would be able to check this possibility with reasonable accuracy. "Piball" balloons that are not tracked are seldom reported as UAOs, because of their small size. Large, instrument-carrying balloons are tracked.

The officer checked his map (see page _____.) of U. S. locations where such balloons are launched. He wired stations near Benson AFB asking whether they had a balloon in the air at the time, and, if so, the general path the balloon took, the bearing from the station, and the altitude at which it had burst. His replies were negative, except from Davis-Monthan AFB, at Tucson,____ nautical miles _____ of Benson. The Davis-Monthan balloon had travelled southeast of Tucson, had reached calm air at about _____ feet altitude, then had risen vertically until it had burst at _____(time.

The officer plotted the location of his balloon during the last part of its flight. The bearing of this plot from Benson Airfield was the same as the bearing the pilot instructors had reported. The angle of elevation was within 10 degrees of that estimated by the observers - close enough when you remember the rough-and-ready method used by the instructors.

EVALUATION: This UAO was marked down to reflection of the sun from Rawinsonde balloon flying _____slant miles away from the observers.

Intelligence officers can quickly see, from this story of the UAO sighting at Benson, the value of requested information (see inside front cover). In some instances, for example, a balloon-launching station might lose contact with a balloon. If the reporting officer includes winds aloft as high as they are recorded, it speeds up the investigation. The possibility of the UAO being identified as an aircraft is dependent on the data in the wire from the reporting officer. It is difficult to obtain data on aircraft flights in the area of the sighting several days after a report is made. The "fix" on an object at the beginning and end of its flight is among the data that the astronomer uses.

A report of an unidentified radar return is handled as a special case. All such sightings are referred to the electronics branch of ATIC. The officers at ATIC look forward to receiving radar scope pictures with reports of radar sightings. A special electronics questionaire is in the mill.

Some are not so easy

The sighting at Benson was comparatively easy to solve. Others are not. The now-famous case of the Lubbock Lights* was investigated for weeks

* See page _____, in article "UAOs over USAF"

and was submitted to several scientists and specialists for comments. The case is still open, the investigation still continuing.

Each UAO that does not yield a tangible result is handled as a special case. It requires a separate and unique course of action. The only SOP is that the investigating officer must dig.

AVRO CAR

FOLDER

7-3745 -389

1003860

RETURN TO
USAF Historical Archives
ASI(ASHAF-A)
Maxwell AFB, Ala 36112

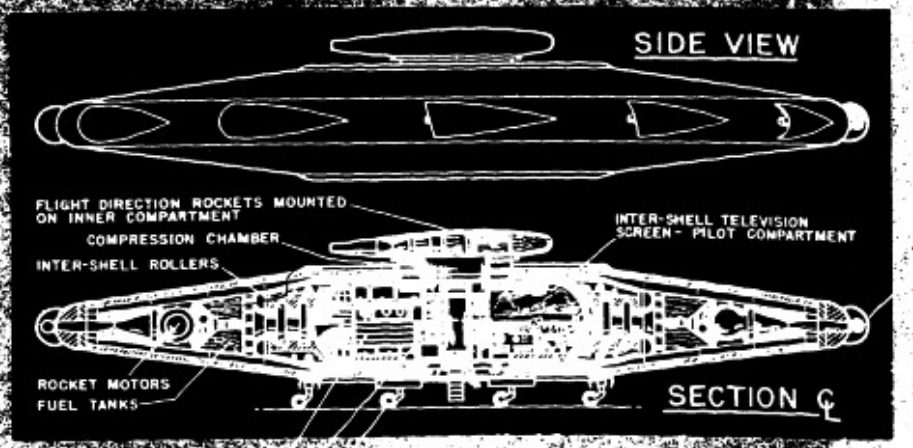
SMC

Airmen of Vision
DESIGN COMPETITION

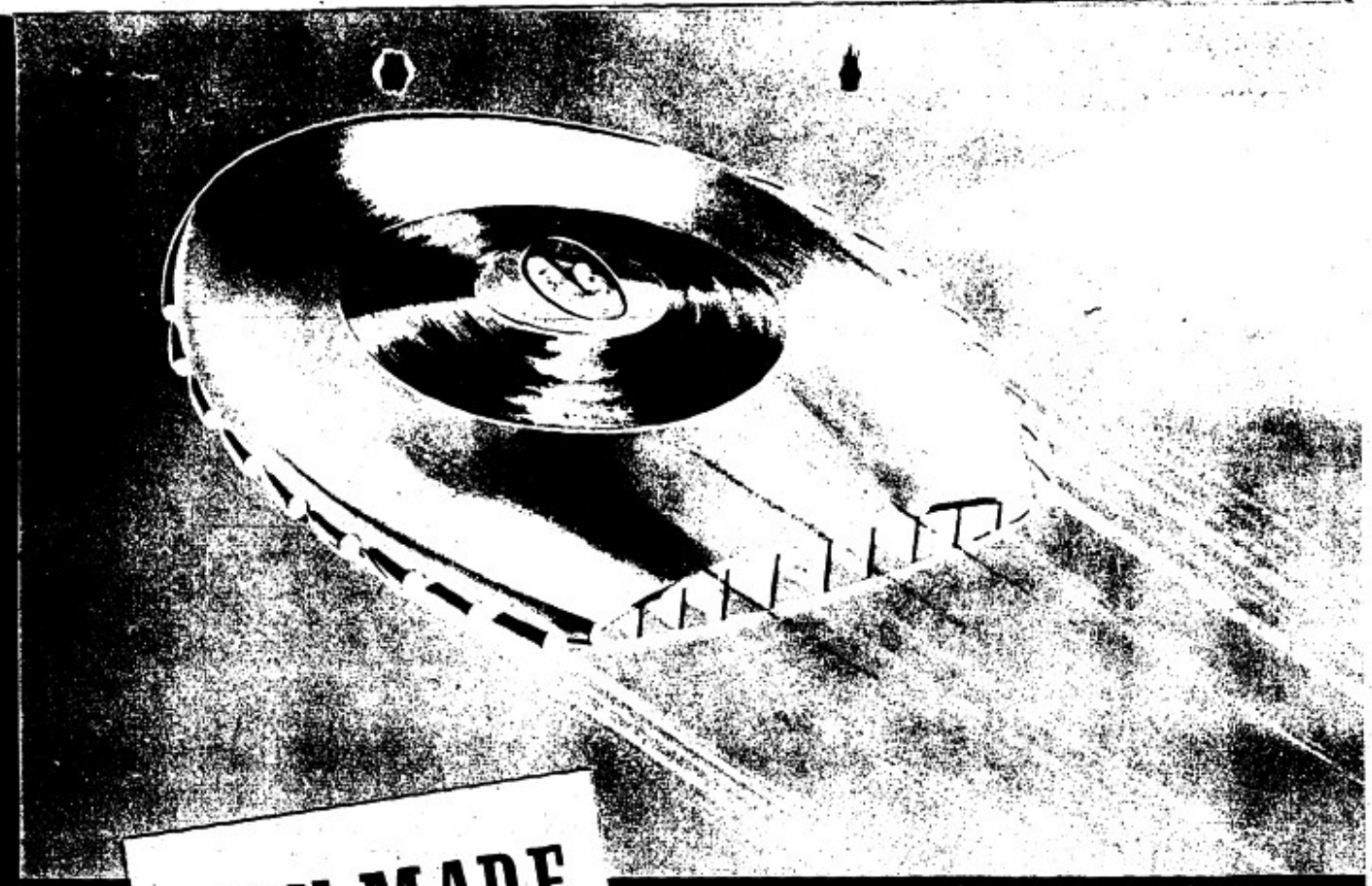
With Flying Saucer excitement still sky-high, we present our readers' ideas of these mysterious gadabouts.

RETURN TO

● First prize by John S. Feller III, a rocket-propelled Flying Disk, suitable for space travel. Revolving outer shell is powered by 12 rocket units. Disk diameter is 90 ft., height 20 ft. 6 in. Cabin diameter 30 feet, height 9 feet. Outer shell rotates against inner one at varying speeds. Rocket nozzles swivel for change of flight direction.



HALF PLAN



With acknowledgement Toronto Daily Star

MAN-MADE FLYING SAUCER

Reports say that a Canadian aircraft company is building a forty-foot-diameter flying saucer which will fly at 1500 m.p.h. Here's the full story . . .

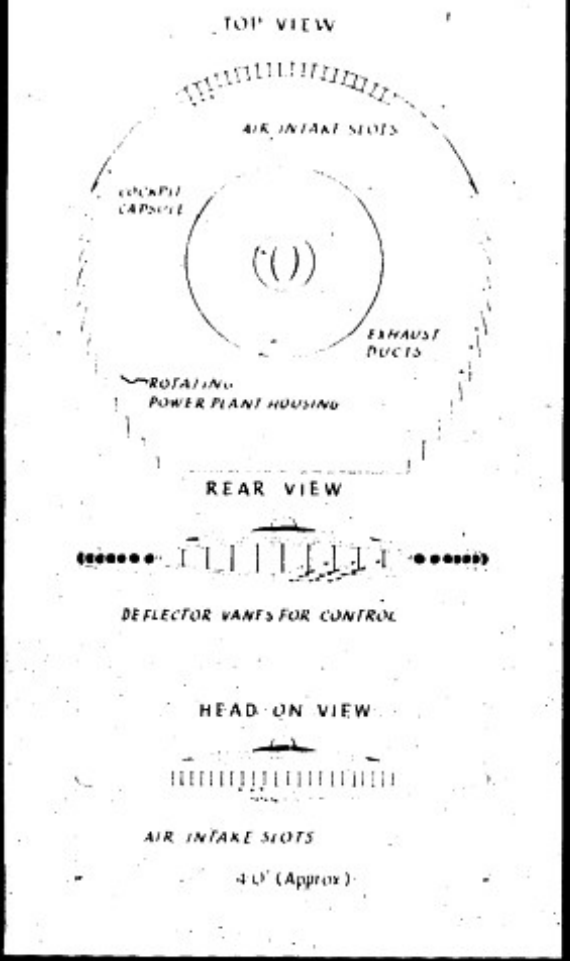
REPORTS of mysterious disc-shaped or saucer-like objects in the skies are no longer news. Electronic phenomena, cosmic balloons, hallucinations and specks on the lenses of the observers' eyes have been included among the multiplicity of theories advanced to account for the "flying saucer." But despite all such explanations the mystery remains unsolved. No conclusive evidence has been brought forward to prove or disprove that these celestial saucers are real aircraft of terrestrial *or extra-terrestrial* origin. The remarkable capabilities attributed to them, such as tremendous speed and the ability to hover, and ascend and descend with virtually no forward speed, remain little more than the roseate pipe dreams of the earthly designer.

But although the existence of the phenomena popularly known as "flying saucers" is in doubt, the circular-disc or saucer-shaped aircraft is *undoubtedly a practical proposition*; aircraft of such unorthodox shapes may well hold the key to the next stage in supersonic flight. The saucer-shaped aircraft possesses qualities permitting some of the disadvantages of more conventional planforms to be overcome. Moreover, it is common knowledge that aircraft designers throughout the world are devoting increasing attention to "flying saucers" when considering flying speeds of more than twice that of sound.

But this design trend is essentially a military development and, as such, progresses behind a close-knit security curtain. In view of this, the revelations contained in a recent issue of the Canadian *Toronto Daily Star* are rendered the more surprising.

CONTINUED NEXT PAGE

AVRO FLYING SAUCER: SECTIONAL DIAGRAM



A PROTOTYPE FLYING SAUCER IN TWO YEARS?

A disc-wing aircraft of near-saucer appearance possessed of many of the flight characteristics associated with its ethereal ancestor. *Such is said to be already in an advanced design stage in Canada.* So revolutionary that when it flies all other types of supersonic aircraft will become obsolescent, the Canadian "flying saucer" has been designed by A. V. Roe, Canada, Limited, manufacturers of the CF-100 all-weather fighter, and a wooden mock-up is said to repose behind tarpaulin screens in the closely-guarded experimental hanger of the company's Malton plant, near Toronto.

The Avro Canada design team are not alone in the development of such revolutionary aircraft, for saucer-shaped aircraft have been considered by aircraft manufacturers both in Great Britain and the U.S.A. And it is feasible that Russian engineers, who have for long evinced interest in low aspect ratio aircraft, have been working on similar lines and carried such developments to a more advanced stage.

But the description of the Canadian project given by the *Toronto Daily Star*—and upon which the accompanying illustrations are based—is the first to suggest the form that the next generation of supersonic aircraft is likely to follow.

Claimed to be independent of prepared runways and taking-off vertically from a tripod-type launching chasis, the Avro Canada *Saucer* is said to be designed to attain level speeds of the order of 1,500 m.p.h.—more than twice that of the latest swept-wing fighters. Although quite a number of aircraft featuring circular-disc-shaped or annular wing forms have been built *and flown*, the aerodynamics of such shapes cannot yet be considered as fully established, and the design problems facing the young Avro Canada design team in bringing this revolutionary project to fruition are of considerable magnitude.

Apart from the planform of this aircraft, the most revolutionary feature of the project is the use made of the gyroscopic effect of a revolving power plant to acquire stability. The power plant housing rotates inside a stationary wing of near-circular planform whereas hitherto it had been assumed that such an aircraft would employ a swiftly rotating *wing*.

The pilot of the *saucer* is seated in a central plastic capsule, which presumably can be ejected should the aircraft find itself in difficulties, and a gas turbine power plant of unconventional design revolves around this capsule at several hundred revolutions per minute. Surrounding the rotating power plant housing and forming the "rim" of the *saucer* is the stationary wing, a series of slot intakes in the leading edge of which feed air to the turbine. Part of the intake of air is compressed and fed to combustion chambers in the wing and ejected through a series of exhaust orifices lining the outer rim of the disc. The remainder of the airflow appears to be fed over a series of vertical deflector vanes in the "flattened" trailing edge of the aircraft for control purposes.

INDEPENDENT OF PREPARED RUNWAYS . . .

A tripod-type launching gear is planned to enable the machine to take-off vertically. For take-off the *saucer* will rest in a sharply inclined position on the tripod gear, booster rockets presumably supplementing the gas turbine. The initial take-off stage will be aided by one of the remarkable properties of the circular disc-shaped wing; the lift force is actually increased at high angles of incidence. The Avro Canada *saucer* will therefore be capable of operating from small clearings in the densely-forested Far North—in the path of enemy bombers that could attack North American industrial centres over the polar regions—where the construction of large airfields suitable for to-day's heavy all-weather fighters is a near impossible construction task.

The method of landing is more obscure. It is known that the launching tripod will be left behind at take-off and it is possible that the *saucer* will pancake on to a small flexible deck or platform such as has been tested in this country as a means of simplifying the landing-on of carrier-borne aircraft.

Because of its near-circular shape, the aircraft is described as having diameter rather than wing span, measuring approximately forty feet across. Apart from the claim that the *saucer* will effect 180-degree turns in flight without changing attitude, few other details are available. It is not believed that construction of a prototype has yet commenced and, in view of the complexity of the problems involved, an estimate that two years would be needed to complete and fly a prototype would seem to be somewhat fallacious.

However, there are very real design reasons for adopting saucer-like shapes. When speeds of the order of twice the velocity of sound are considered, drag is primarily dependent upon the thickness/chord ratio of the wing and the circular disc offers an acceptable solution to the problems involved. Since in theory, at least, the *saucer* is practical, the Avro Canada project is of major significance and may be destined to bring an aircraft designer's pipe dreams a step nearer to reality.—D. G.

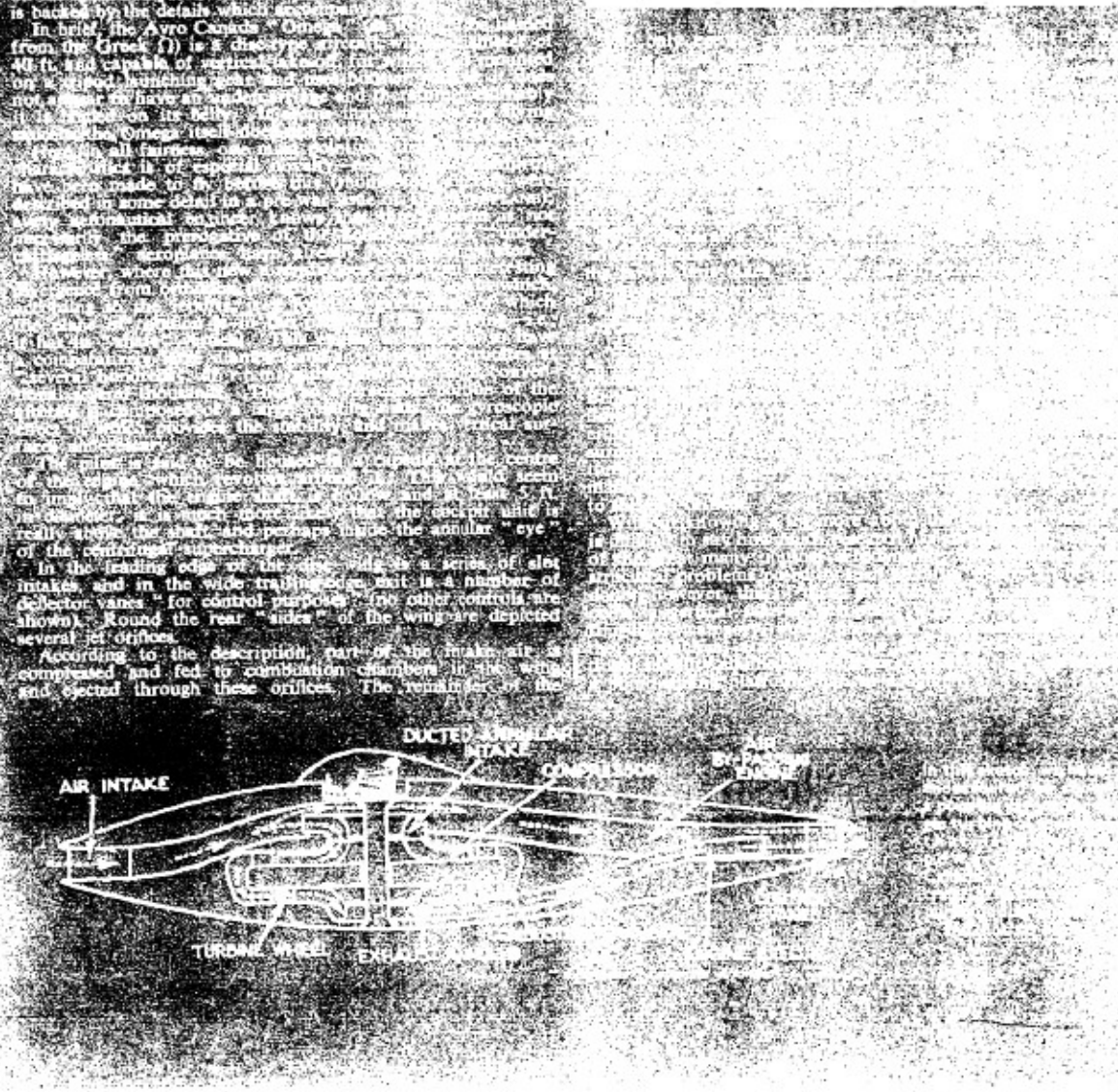
* * *

NOTE: None of the facts or opinions expressed in this article should be read as having been confirmed by Air Ministry.

* * *

. . . AND IN YUGOSLAVIA

Man-made flying saucers skimmed over the rooftops of Belgrade recently. They were experimental models made by the Yugoslav Air Force. Weighing just over 4lb., these miniature saucers are 40 inches in diameter, have a top speed of 31 m.p.h., and were controlled by radio.


AIR INTAKE

27 Jun. 53

Sunday 27 June 1953

NEW YORK HERALD TRIBUNE, SUNDAY, JUN

Jet Aircraft Like a Top

Canada Is Developing 'A Real 'Flying Saucer'

By Ansel E. Talbert

OTTAWA, June 27.—A "flying-saucer" aircraft, embodying revolutionary principles of flight, is under development in Canada. It has excited widespread interest among scientists and military strategists in both the United States and Great Britain.

The aircraft is a huge jet-powered gyroscopic top, forty feet in diameter, and is intended to fly at supersonic speeds and make rapid changes of direction without the wide banking turns required by conventional high-speed aircraft. It is called the Omega and when looking at it from above or below it has the outline of a disk with one side flattened, similar to the shape of the Greek letter.

The craft's appearance bears a resemblance to some of the sketches drawn from descriptions of so-called flying saucers, although it could not possibly have been the source of any of these reports.

A. V. Roe Canada, Ltd., the manufacturer, officially will not give any information about its Omega project or confirm its existence. Data concerning the project's general dimensions are available from British scientific publications. In a recent memoir, Air Marshal Sir Robert Saundby, senior air staff officer of the British Bomber Command during World War II, reveals that the flying disk's pilot will sit in a pressurized plastic capsule in the center of a nearly circular wing.

According to Air Marshal Saundby, a jet engine of considerable diameter has been designed to revolve in the plane of the flying disk, apparently around a vertical engine shaft.

This unusual jet engine would supply the thrust needed for high-speed forward flight. Through its vibrationless revolutions hundreds of times a minute it also would set up a gyroscopic action which has a powerful stabilizing force during flight.

The leading edge of the saucer-shaped wing has a series of intakes for air and the flattened trailing edge has vanes and control surfaces to be operated by a pilot. Numerous jet exhausts protrude from both rearward sides of the wing adjoining the flattened rear section.

A portion of the intake air flow will be compressed by the revolving engine and thrust out of the side-wing orifices with terrific speed; the remainder will by-pass the engine and flow through the flying disk to give "bite" to its control surfaces.

Like a Praying Mantis

The existing mock-up's spindly undercarriage, which points the leading edge of the new aircraft upward at a sharp angle for take off, gives the entire craft somewhat the appearance of a praying mantis.

Take-off operations would be aided by rocket units similar to those used by the United States military and naval flight services to get heavily loaded aircraft off the ground. An ingenious seat has been designed to swivel the pilot automatically into the most comfortable position in all attitudes of flight. Landings would be made without the take-off gear on skids through use of the British Navy air arm's so-called "flexible flight deck," similar to a giant spring mattress, which was shown at Farnborough two years ago.

No flight tests except those in wind tunnels as yet have been conducted with the Omega.

Field Marshal Viscount Montgomery of Alamein, one of Britain's chief military planners, in April made a special visit to the Avro factory near Toronto, where the project originated, to view the full-size "mock-up" or replica already constructed and watch tests with the powered wind-tunnel models. Prime Minister Louis St. Laurent of Canada visited the factory on Friday.

As a result of Lord Montgomery's impressions, John Frost, designer of the saucer-shaped aircraft, is now in England for full discussion of the project with scientists at Farnborough, center of British air research.

Mr. Frost, a British-born aircraft engineer, is a disciple and former co-worker with Sir Frank Whittle, inventor of the jet engine.

Joint Model Likely

A wind-tunnel model of Mr. Frost's fantastic aircraft is to be sent to the United States soon for tests at Air Force laboratories. If future trials show the Omega project to be as important as many scientists think, a full-sized piloted prototype may be constructed jointly by the United States, Britain and Canada.

The project is called "scientifically feasible" by many qualified airmen in Canada and this country. This, incidentally, was the evaluation of Canada's Defense Research Board, and of United States Department of Defense experts who were asked for a preliminary and unofficial opinion.

Some scientists concur in theory, but question whether aviation is sufficiently advanced to perfect such a flying machine to a degree where it would have real defense value.

One reason for the considerable interest among Allied military circles has been several sightings in the Far East during the last eighteen months by Air Force pilots and crew members of more "unidentified flying objects." One of the objects in question "seemed to have an internal churning movement like flames or fiery gases" in the words of an official report. Another had "a rapidly pulsating gaseous type of exhaust trail" which in the opinion of several observers was "three times the length of the flying object, with both the tail blast and the object bluish in color" like the exhaust of a jet engine.

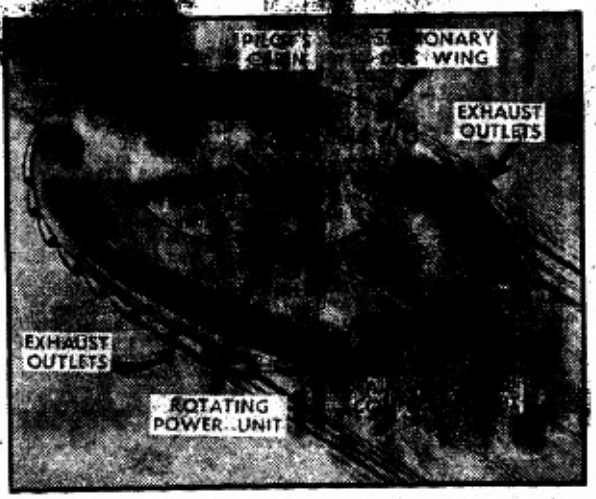
THE OTTAWA JOURNAL
Monday, 21 September 1953

Mon. Sept. 21, 1953

SAUCY-EYE-VIEW OF TRENTON—To commemorate Air Force Day, the National Air Show at Toronto and Battle of Britain Sunday, this model of a flying saucer was built by No. 6 Repair Depot of the RCAF at Trenton, Ont. Believed to resemble that being built by the A. V. Roe (Canada) Limited, plant at Malton, Ont., the model was photographed and superimposed on an air view of Trenton. The model itself doesn't fly. —(CP Photo.)

This article appeared in the 23 April 1953
DAILY HERALD (English Newspaper)

So there is a FLYING SAUCER



And, it is claimed, its speed will be 1,500 m.p.h.

A revolutionary disc-wing aircraft which could be the answer to many of the flying saucer stories of the past months is said to have reached an advanced stage of design at the Avro Canada works near Toronto.

This startling development in flying is discussed by William Towler, *Daily Herald* Science Editor, on Page Four.

LAST—A L FLYING SAUCER

A GENUINE "flying saucer", is nearing reality, at least at the V. Roe Canadian near Toronto.

Details have been publ in the *Toron* the *Royal* discusses revolutionary months

This does that the Air way

The pi

ACCORDI details so far rel disc-wing plane off across speed more than twice the speed of the fastest swept-wing plane. The pilot sits in the centre of the disc and his part can be ejected if the machine gets into difficulties.

By William Towler
Science Editor

Around ... power plant ... unusual design, which whizzes round at high speed.

This, in effect, ... gyroscope and gives ... stability.

Then comes the ... the saucer, with ... its sides.

Tarpaulin hides wooden model

BOOSTER-ROCKETS will help the take-off, which will be made with the machine at a sharply inclined angle.

Though no prototype has been made, or is likely to be made for a couple of years, the design is said to have reached an advanced stage.

A wooden model is believed to be hidden behind a tarpaulin screens at the Canadian Avro experimental station.

On the front are air-intake slots to feed the turbine, and along the short ... back are vanes ... which air can be fed to control flight.

This disc plane, as at present contemplated, cannot take off from a ... but will rise straight up ... tripod landing gear.

It will have to make a gentle ... landing on a flexible deck or platform.

power-house beat them all

... and if the saucer ... to the air, its sponsors believe it will be so revolutionary that all other types of supersonic aircraft will become obsolete.

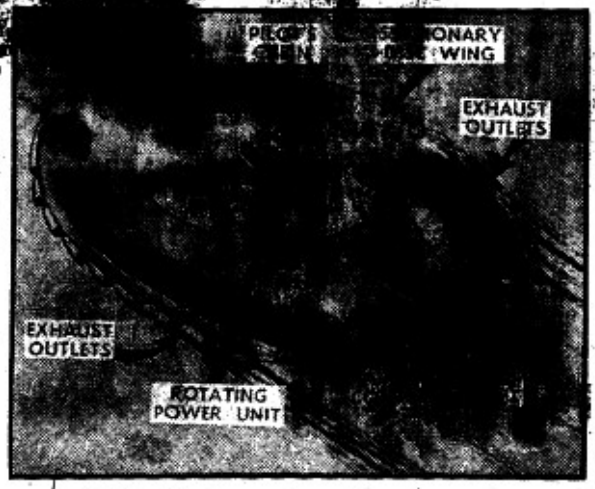
Experts in aerodynamics with whom I discussed the machine yesterday were reluctant to comment on its feasibility before knowing much more detail.

Circular-wing planes have been designed and flown in the past. A notable experiment was the Lee Richards annular monoplane (the "Flying Flatiron" of World War I), a model of which is in the Science Museum at South Kensington.

But this present flying revolving powerhouse project outstrips all that has been thought of since then.

So there is a

NG SAUCER



This article appeared in the 23 April 1953
DAILY HERALD (English Newspaper)

AT LAST—A REAL FLYING SAUCER

A GENUINE "flying saucer" is nearing reality, it was revealed at least at the V. Roe—Canadian near Toronto.

Details have been publ in the *Toron* the *Royal* discusses revolutionar month is

This does that the Air way

The pi

ACCORDI so far rel disc-wing plane across speed more than twice the speed of the fastest swept-wing plane

pilot sits in the centre of the saucer. This part can be ejected if the machine gets into difficulties.

William Towler
Science Editor

Around the saucer's circumference is a ring of power plates which produce the lift. The design, which whizzes round at high speed,

This in effect gyroscope and gives stability.

comes the the saucer, with its sides.

Tarpaulin hides wooden model

BOOSTER-ROCKETS will help the take-off, which will be made with the machine at a sharply inclined angle.

Though no prototype has been made, or is likely to be made for a couple of years, the design is said to have reached an advanced stage.

A wooden model is believed to be hidden behind tarpaulin screens at the Canadian Avro experimental station.

On the front are air-intake slots to feed the turbine, and along the short stubby back are vanes through which air can be fed to control flight.

This disc will, as at present contemplated, cannot take off from a runway but will rise straight up on its tripod landing gear.

It will have to make a gentle pancake landing on a flexible deck or platform.

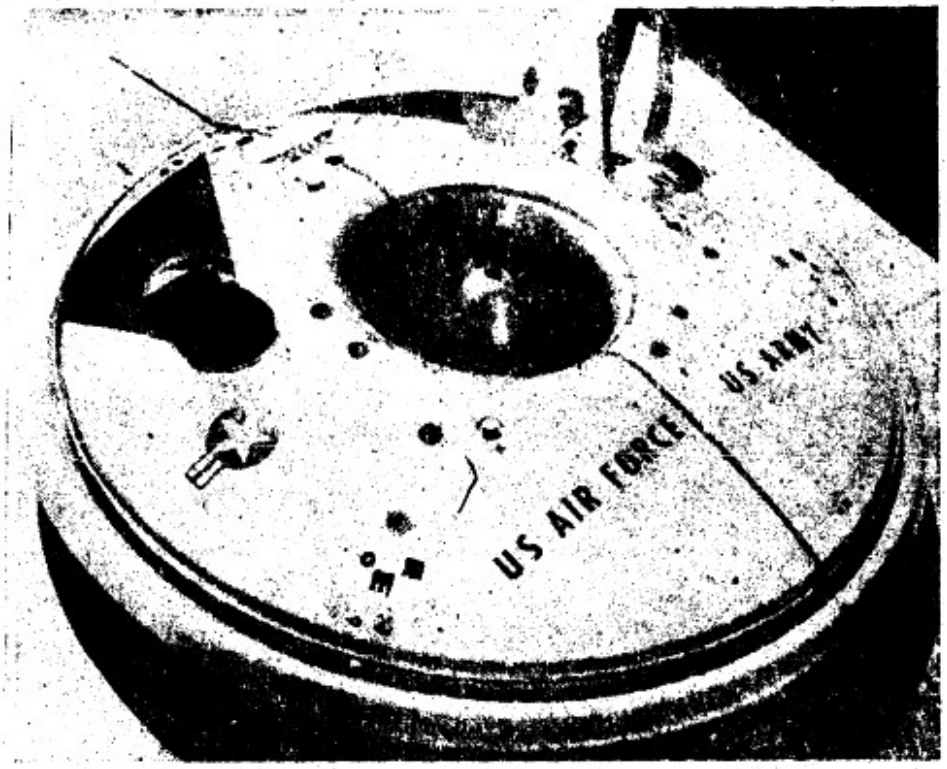
power-house beat them all

and if the saucer to the air, its sponsors believe it will be so revolutionary that all other types of supersonic aircraft will become obsolete.

Experts in aerodynamics with whom I discussed the machine yesterday were reluctant to comment on its feasibility before knowing much more detail.

Circular-wing planes have been designed and flown in the past. A notable experiment was the Lee Richards annular monoplane (the "doughnut" of World War I), a model of which is in the Science Museum at South Kensington.

But this present flying revolving powerhouse project outstrips all that has been thought of since them.



Don't Believe In Flying Saucers, Eh?

WASHINGTON—The Air Force may have to revise its thinking about flying saucers once this research aircraft gets off the ground. The craft, jointly sponsored by the AF and the Army, is being built in Canada. It is designed to take off and land vertically, using the air cushion principle. Once in the air, however, it will fly like a winged airplane. (AP wirephoto)

7-3745 -368
1003828

RETURN TO
USAF Historical Archives
ASI(ASHAF-A)
Maxwell AFB, Ala 36112

Captain Arcy AEAF

RETURN TO:
Director
Aerospace Studies Institute
ATTN: Archives Branch
Maxwell AFB, Alabama

MEMORANDUM FOR RECORD

SUBJECT: Unidentified Flying Object Conference

1. A meeting was held at the Department of Air Force, AFCIN, at 1330 on 17 Feb 1959, for the purpose of discussing the Air Force philosophy toward and policy regarding the Unidentified Flying Objects Program. The following persons associated with the program were present:

Mr. A. Francis Arcier, AFCIN-4
Col L. T. Glaser, AFCIN-4E4
Dr. J. Allen Hynek, Air Force Scientific Consultant UFO Program
Mr. B. L. Griffing, AFCIN-4E4
Maj J. F. Byrne, AFCIN-X1A
Maj L. J. Tacker, SAFIS-3
Maj J. E. Boland, SAFLL
Maj R. J. Friend, AFCIN-4E4g

2. Brief on Dr. Hynek:

Dr. J. Allen Hynek, Astrophysicist, Ohio State University, presently on leave of absence to act as Associate Director of the Satellite Tracking Program for the Smithsonian Institute.

Dr. Hynek has been the Air Force's scientific consultant on the UFO Program for ten years and has been invaluable in this capacity.

Dr. Hynek suggested this meeting to allow him to air some of his views on the UFO Program and his personal problem of adverse publicity. (Letters and publications intimating his only interest in the UFO Program was for financial gain.)

Dr. Hynek indicated that he felt the Air Force had done a good job of handling a very difficult program with the limited resources available. The purpose of the meeting being to improve on these resources and other facets of the program in an effort to improve on our job.

3. The agenda is attached as TAB-A

4. Discussion, Conclusions and Suggestions:

a. Official Name of the Program:

It was concluded that the present name of "Unidentified Flying Objects" was not appropriate and that a name change was desirable. However, it was felt that this was not the proper time for a change due to the possibility of supplying the UFO fanatics with ammunition for a new attack. This subject is to be given further consideration. In this connection it was decided to no longer identify the unsolved cases as "unknowns" but rather as "unidentified."

FOR OFFICIAL USE ONLY
(AFR 205-16)

b. Dr. Hynek's Problem of Adverse Publicity:

Several solutions for Dr. Hynek's problem of adverse publicity were proposed, the most drastic of which was to have Dr. Hynek withdraw from his present position as scientific consultant for one or two years. It was the consensus of opinion that any solution which cost the services of Dr. Hynek would be unsuitable due to his immense value to the program. The course of action decided upon to attempt to correct this problem was to omit the use of Dr. Hynek's name in any of the official release on the UFO subject. Further Dr. Hynek is to forward all letters received by him on the UFO subject to SAFIS-3 for reply. Dr. Hynek to maintain his present status until it can be determined if the new positive and more scientific approach to the program would reduce if not eliminate his problem of adverse publicity. The release of Dr. Hynek to be only a last resort solution.

c. Education of the Public:

It was concluded that the Air Force should direct positive efforts toward taking full advantage of all favorable publicity associated in any way with the UFO Program. That specific efforts should be made toward producing information which would educate the public and be advantageous to the UFO Program. Pictures and/or descriptions of the phenomena or objects determined as being probably responsible for a sighting should accompany the news releases. It was decided that a collection of such pictures should be made and filed for this purpose.

d. Rapid Processing of Information to SAFIS:

In all instances SAFIS should be notified as soon as possible what the probable Air Technical Intelligence Center's analysis will be and particularly in the case of those sightings which are being given the "full blower" technique by the press. It helps the Air Force's position if SAFIS can give positive information that the investigators are at the location of the sighting and the official investigation underway.

e. Investigation and Reporting:

It was decided that the Air Force's investigation and reporting processes in connection with the UFO Program needed revamping. The conclusions were that the investigations should be more scientific, faster and more complete. In order to accomplish this improvement in investigation techniques, it was decided that AFR 200-2, dated 5 Feb 1958, which outlines the responsibilities and requirements of the Air Force Agencies responsible for these investigations be revised. This revision to outline more specifically responsibilities, also to outline the desired qualifications of selected investigators, and to list equipment with which each investigation team should be supplied. Further, a suggested training course which should be given to all personnel selected as investigators should be supplied (See TAB-B). It was also suggested that the investigators from the 1006th AISS be brought to ATIC for an

indoctrination course outlining those factors of investigation peculiar to UFO cases.

f. Analysis and Evaluation:

It was felt that in the past many cases were given an unscientific and "fast brush" treatment in an effort to get them filed. It was decided that the approach should be more scientific and positive. Unless the analyst could be sure of his conclusions beyond doubt, then a statement in the vein of the following should summarize his analysis:

> "There is no evidence available to indicate that the object sighted in this case was not a meteor" or "In view of all the available evidence, the object of this sighting was probably a meteor."

It was also suggested that a panel of qualified men, in diversified fields be formed and used for consultation. The men on this panel to be qualified in the following areas:

Sociology
Astronomy
Psychology
Physics
Public Relations

This panel to be used on an "on-call" basis, but to meet at least once each month; at which time a summary of the months activities will be presented to them. The purpose of this panel is to review some of the more troublesome cases, spot trends in the program and make suggestions as to the future outlook. The formation of this panel to be given further consideration by the ATIC.

g. Re-evaluation of Old Cases:

Many UFO organizations have been constantly reopening the more sensational of the old cases to the further embarrassment of the Air Force. It was decided that the Aerial Phenomena Group, AFCIN-4E4g, would review these old cases, which in view of greater scientific knowledge and experience, may be removed from the "unknown" category and reclassified as a "probable."

h. Claims of UFO Organizations:

In many instances the private UFO organizations, or their sponsors, have made claims that some individual, usually a person held in high esteem by the public, has made some statement sympathetic with the views of the organization. It was decided that SAFIS-3 would write letters to each person so quoted and ask for corroboration or denial, and for further detail if in the affirmative.

5. Summary:

a. That the Air Force needs to take a more positive approach toward the UFO Program.

b. The Air Force investigations be more scientific and thorough.

c. The analysis be scientific and thorough.

d. The public be kept more abreast of the UFO Program by an approach of pre-education.

e. An expansion be made of the resources available to the ATIC to help with the overall analysis of the program.

Prepared by:

Robert J. Friend

ROBERT J. FRIEND
Major, USAF

FOR OFFICIAL USE ONLY

(AFR 190-13)

AGENDA FOR UFO POLICY MEETING

1. Introduction.

   a. Purpose of meeting - to discuss the Air Force philosophy toward and policy regarding the UFO Program, with an aim toward correcting deficiencies.

   b. Statistics.

   c. Cost and manpower estimates for January 1959.

2. Areas of Interest.

   a. Public Relations.

      (1) Unidentified Flying Objects a misnomer, possibility of using Unidentified Aerial Phenomena as official name.

      (2) Dr. Hynek's problem of adverse publicity.

      (3) Education of public - advantage taken of all favorable publicity.

      (4) Rapid processing of information on reported cases to prevent possible "snow-balling" at SAFIS.

3. Attacking the Problem.

   a. Reporting.

      (1) Speed.

      (2) Accuracy and completeness.

   b. Investigations.

      (1) Speed.

      (2) Completeness.

   c. Analysis and evaluation of reports.

   d. Suggested changes to AFR 200-2, dated 5 February 1958, and change thereto.

   e. Re-evaluation of old cases catalogued as "unknown" when bringing "Blue Book" up to date. The "unknown" cases, especially the more sensational, are being exploited over and over by organizations and individuals with some specific axe to grind.

f. Possible investigation of UFO Organizations and key personnel that have proved the most troublesome.

g. Conclusions.

4. Future Outlook.

a. What appears to be the normal extension of the "Flying Saucer" craze?

b. What can we do to lessen the impact of this new problem?

c. Conclusions.

5. Summary.

AFR 200-2 DATED 5 FEBRUARY 1958,
AND CHANGE THERETO DATED 31 JULY 1958

1. This regulation as it stands serves well the purpose for which it was written. However, the Air Force investigators are doing little more than meeting the minimum requirements of this document, and in many instances require prompting by the Air Technical Intelligence Center to deliver even this minimum data.

2. The shortcomings of the UFO investigation procedures probably are due mostly to the Air Bases assigning inexperienced and/or unqualified people to this task, and also to lack of interest in the Program. It is difficult to become fired up over a Program in which the boss shows little or no interest.

3. The ATIC proposes the following as a solution to the problems associated with UFO investigation.

a. Assignment of competent persons as investigators.

b. Short training program for the personnel proposed for use as investigators. The length of this training program should depend upon the basic qualifications of the personnel selected. However, it is suggested that such a training program not exceed twenty (20) hours. In all instances the program should include hours of instruction on the following:

(1) History and philosophy of the UFO Program.

(2) Introduction to Astronomy (Basic terminology and description of the more common astronomical bodies).

(3) Methods of interrogation.

(4) Use of equipment.

(5) Reporting.

FOR [illegible]
(AFR [illegible])

c. The following is a list of equipment with which every UFO investigation team should be supplied:

(1) Geiger Counter

(2) Camera

(3) Tape recorder

(4) Binoculars

(5) Magnifying glass

4. The investigating teams should be authorized to make phone calls directly to the Air Technical Intelligence Center from the investigation area for the purpose of reporting high priority findings or preliminary conclusions.

FOR [illegible]
(AFR [illegible])

VFO Mtg. 17 Feb 59. Wash. Rm 4S105

Berne, Hynek, Boland, Tacker & Griffin
Glaser Sweet.

- Three aircraft = 100 ft
- Better RDR train detail? from Brazil also
  (if so select those which can & compare
  100 units to give better distribution)
- What happened Lt Griffith = Corporal United
  (Nothing could not aid article)
- Use "unidentified" not "unknown"

Index

Agenda - Tab A

Statistics - Tab B

Letter to Dr. Hynek - Tab C

Commercial Press Releases - Tab D

Suggested Changes to AFR 200-2 - Tab E

List of Private UFO Organizations - Tab F

Letter from Mr. Haber - Tab G

General Conclusions and Recommendations of Scientific Advisory Panel - Tab H

1. [illegible]

a. Purpose of meeting - [illegible] Air Force [illegible] Project Blue Book and [illegible] [illegible] [illegible] [illegible] [illegible].

b. Statistics.

c. Cost and manpower estimates for January 1958. All attempts made from now on...

2. Areas of Interest.

a. Public Relations.

(1) Unidentified Flying Objects a misnomer, possibility of using Unidentified Aerial Phenomena as official name. mistake to call this case alien / known

(2) Dr. Hynek's problem of adverse publicity.

(3) Education of public - advantage taken of all favorable publicity.

(4) Rapid processing of information on reported cases to prevent possible 'snow-balling' at SAFIS.

3. Attacking the Problem.

a. Reporting.

(1) Speed.

(2) Accuracy and completeness.

b. Investigations.

(1) Speed.

(2) Completeness.

c. Analysis and evaluation of reports.

d. Suggested changes to AFR 200-2, dated 5 February 1958, and change thereto.

e. Re-evaluation of old cases catalogued as 'unknown' when bringing 'Blue Book' up to date. The 'unknown' cases, especially the more sensational, are being exploited over and over by organizations and individuals with some specific axe to grind.

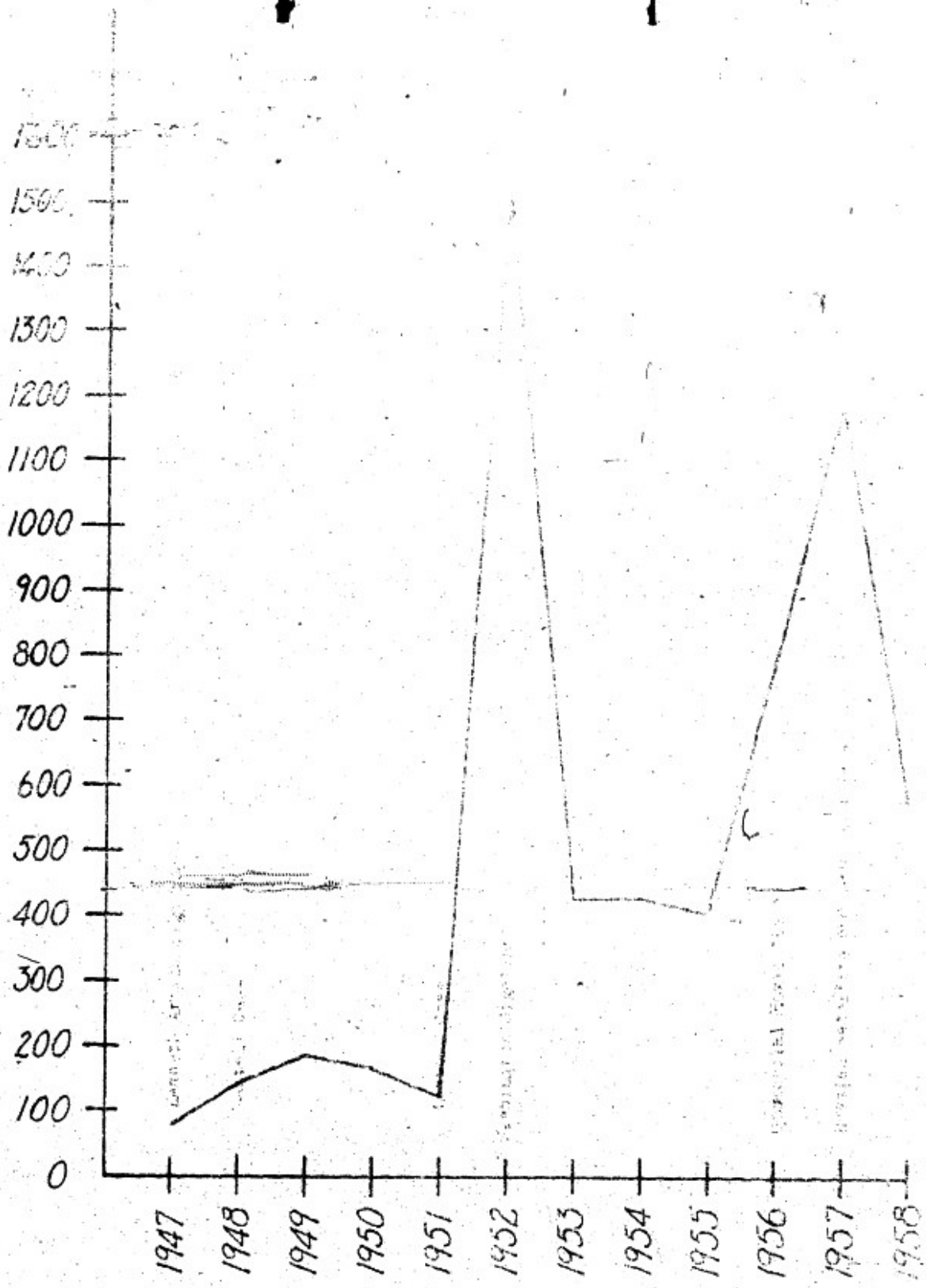
SECRET SECURITY

YEAR	OBJECTS OBSERVED AND REPORTED
1947	79
1948	143
1949	186
1950	169
1951	121
1952	1501
1953	425
1954	429
1955	404
1956	778
1957	1178
1958	573
11½ years	5986

It appears that some incident is usually responsible for touching off a rash of sightings -

1952 - Washington Sighting
1956 - Commercial Movie "UFO"
1957 - Russian Satellite

The satellite was launched in October and 701 of the total 1178 sightings for the year took place in the last three months.


1300
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
1947
1948
1949
1950
1951
1952
1953
1954
1955
1956
1957
1958

	1947-1952	1953 & '54	1955	1956	1957	1958	TOTALS	%
ASTRONOMICAL	21.6% 479	25.0% 214	21.0% 85	26.3% 205	27.7% 326	30.4% 176	1485	24.8%
AIRCRAFT	21.5% 474	20.0% 170	26.7% 108	24.6% 192	24.2% 286	21.0% 120	1350	22.6%
BALLOONS	15.4% 339	16.0% 137	27.0% 109	26.0% 203	17.7% 209	11.0% 63	1060	17.7%
INSUFFICIENT INFORMATION	10.9% 240	17.0% 145	8.2% 33	14.1% 109	14.4% 169	17.4% 99	795	13.3%
OTHER	10.3% 233	13.0% 111	14.7% 59	6.8% 52	14.3% 168	18.7% 108	731	12.2%
UNKNOWN	19.7% 434	9.0% 77	2.4% 10	2.2% 17	1.7% 20	1.3% 7	565	9.4%
TOTALS	2199	854	404	778	1178	573	5986	

Dear Dr. Hynek

My name is Gordon Cooper. I am the associate director of the International Society for Unidentified Flying Objects, with headquarters in Oklahoma City. The purpose of this organization is to study and investigate [illegible]

NEWS RELEASE
PLEASE NOTE DATE

DEPARTMENT OF DEFENSE
Office of Public Information
Washington 5, D.C.

Fact Sheet — November [illegible], 1957 — No. 1083-58
Tel 5-6700 Ext. 79131

Air Force's 10 year Study of Unidentified Flying Objects

In response to queries as to results of previous investigation of Unidentified Flying Object reports, the Air Force said today that after 10 years of investigation and evaluation of UFO's no evidence has been discovered to confirm the existence of so-called "FLYING SAUCERS".

Dr. J. Allen Hynek, professor of Astrophysics and Astronomy at Ohio State University is the Chief Scientific Consultant to the Air Force on the subject of Unidentified Flying Objects.

THE REPORT CONCLUDES WITH THIS PUBLIC PROMISE:

The Air Force, assigned the responsibility for the Air Defence of the United States, will continue to investigate, through the Air Defence Command all reports of of unusual aerial objects over the U.S. including objects that may become unidentified flying objects. The services of qualified scientists and technicians will continue to investigate and analyze these reports, and periodic public statements will be made as warrented.

----- END -----

THE SPACE-CRAFT DIGEST charges that this is outright falsehood. Such an investigation is NOT being carried on as promised. Instance after instance of UFO violation of the air-space of US has gone uninvestigated such as these we have noted on the preceding pages. But more than that---Dr. HYNEK who is on the public payroll to do a job doesn't even answer a query from our radio stations concerning the UFO problem. His secretary wrote, but from the "feather-bedding" doctor there is no reply because he apparently is one of the Ph. D's hired by the Air Force to produce a "public whitewash" of this fantastic world-wide phenomena.

As a former Naval Radar-radio officer, a graduate electrical engineer the editor realizes that these charges are serious. BUT--at the same time--the possibility that the USSR or Red China discovering the secret of electrical flight is also serious. While the giant armed forces budget fools with rockets to the bankruptcy of this nation some voice must speak out. The least the fumbling military can do is to stop ignoring those who do fly in space with the vain hope that "they might go away".

FOR: AFJIN - 4E4

ATTACHED IS A PIECE OF THE MATERIAL FOUND WHERE SOME OBJECT BURNED AND/OR EXPLODED AND FELL TO THE GROUND ABOUT 2130C FEB.7, 1959 ABOUT 1 MILE SOUTH OF JACKSON, TENN. YOU REQUESTED THROUGH MEMPHIS AIR TRAFFIC CONTROL, THAT THIS BE FORWARDED TO YOU.

PUBLIC REPORTS TODAY, INDICATE THAT IT WAS THE WORK OF A PRANKSTER WHO INFLATED A BALLOON WITH SOME EXPLOSIVE GAS AND ATTACHED A FUSE. THE BURNING FUSE PROBABLY APPEARED TO BE A MOVING LIGHT, AND WHEN THE FIRE REACHED THE BALLOON -- IT EXPLODED WITH A FLASH.

FEDERAL AVIATION AGENCY
ATCS R/2
MCKELLAR AIRPORT
JACKSON, TENNESSEE

WA2

BY JOSEPH L. MYLER 1459

UNITED PRESS INTERNATIONAL

WASHINGTON, JAN. 27--(UPI)--PEOPLE ARE SEEING FEWER FLYING SAUCERS, AND A PSYCHIATRIST HERE THINKS MAYBE SAUCERS ARE GOING OUT OF FASHION.

IF THEY ARE, HOWEVER, DR. ADDISON M. DUVAL IS SURE "SOMETHING ELSE WILL COME INTO STYLE."

DUVAL, DEPUTY DIRECTOR OF WASHINGTON'S FAMOUS ST. ELIZABETHS HOSPITAL, TOLD UNITED PRESS INTERNATIONAL THAT SEEING THINGS WHICH DON'T EXIST IS A COMMON RESULT OF ANXIETY GENERATED BY FEAR OF THE UNKNOWN.

AND THE TIMES AREN'T GETTING ANY LESS ANXIOUS OR THE FUTURE ANY LESS UNCERTAIN.

OF COURSE, NOT EVERYBODY WHO SEES WHAT THE AIR FORCE CALLS AN UNIDENTIFIED FLYING OBJECT (UFO) IS MENTALLY SICK. BUT SOME SIGHTERS, DUVAL BELIEVES, ARE SUFFERING FROM DELUSIONS OR HALLUCINATIONS.

THE AIR FORCE REPORTED LAST WEEK THAT UFO REPORTS FELL OFF 14 PER CENT IN THE SECOND HALF OF 1958 TO A TOTAL OF 256. MOST OF THESE WERE SUBSEQUENTLY IDENTIFIED AS REAL THINGS--PLANES, BALLOONS, SHOOTING STARS, PLANETS, AND EVEN EARTH SATELLITES.

THE AIR FORCE FOUND THAT FOUR OF THE 256 UFO'S WERE ARTIFICIAL MOONS SIGHTED AS THEY WINKED THEIR WAY ACROSS THE SKY. IT LISTED FEWER THAN ONE PER CENT OF THE TOTAL AS "UNKNOWN"--MEANING THAT THE AIR FORCE COULDN'T FIND OUT WHAT THE THING REPORTED ACTUALLY WAS.

AS FOR NON-RATIONAL UFO SIGHTINGS, DUVAL SAID "WE SHOULD HAVE BEEN ABLE TO PREDICT" THE FLYING SAUCER CRAZE. WHENEVER SOMETHING CAPTURES THE INTEREST OF PEOPLE GENERALLY, HE SAID, IT USUALLY SHOWS UP IN DELUSIONS OF THE MENTALLY ILL.

DUVAL RECALLS A PERIOD WHEN A LOT OF PEOPLE THOUGHT THEY WERE PART OF THE "AMOS 'N' ANDY" RADIO TEAM.

IF THE FLYING SAUCER DELUSION IS ON THE DECLINE, ONE REASON MAY BE THAT SAUCERS ARE GETTING "TOO MUCH COMPETITION FROM REAL THINGS--SATELLITES, LUNAR PROBES, SUN ROCKETS," DUVAL SAID. AFTER A WHILE ANY WIDELY SHARED DELUSION TENDS, HE SAID, "TO GET OUT OF STYLE."

R

HE THINKS THE NEXT DELUSION MAY BE AN ELABORATION OF THE SPACE-TRAVEL MOTIF. BUT JUST WHAT FORM IT WILL TAKE HE COULDN'T GUESS.

S921A

WASHINGTON, FEB. 10.--(UPI)--MAJ. GEN. WILLIAM W. DICK JR., ARMY SPECIAL WEAPONS CHIEF, WAS ASKED IF HE HAD INFORMATION TO SUBSTANTIATE FLYING SAUCER REPORTS.

"I ANSWER THAT QUESTION WITH FEAR AND TREPIDATION," THE GENERAL REPLIED, "BECAUSE MY WIFE BELIEVES IN FLYING SAUCERS."

HOWEVER, THE ARMY MISSILE EXPERT SAID YESTERDAY HE HIMSELF DID NOT--ESPECIALLY AFTER CHASING ONE ONCE ONLY TO FIND OUT IT WAS A FLOCK OF BIRDS.

-0-

WA GA

WA4

WASHINGTON, JAN. 22.--(UPI)--THE AIR FORCE INDICATED TODAY THAT THERE AREN'T AS MANY "FLYING SAUCERS" AS THERE USED TO BE.

IT DID NOT PUT IT JUST THAT WAY, OF COURSE, BECAUSE IT HAS NEVER ACKNOWLEDGED THAT THERE WAS SUCH A THING AS A FLYING SAUCER. IN FACT, THE AIR FORCE HAS SAID THERE IS NO SUCH THING.

WHAT THE SERVICE DID WAS TO ISSUE A NEW REPORT ON UNIDENTIFIED FLYING OBJECTS (UFO) IN WHICH IT SAID THAT THE NUMBER OF "UNKNOWN" CASES HAD BEEN REDUCED TO A FRACTION OF ONE PER CENT AFTER INVESTIGATION OF SIGHTINGS.

IN THE LAST HALF OF 1958, THE AIR FORCE ANALYZED 296 UFO REPORTS AND CATALOGUED ONLY TWO AS CASES OF "UNKNOWNS".

THE BREAKDOWN:

23 BALLOONS, 60 AIRCRAFT, 96 ASTRONOMICAL PHENOMENON, 4 SATELLITES, 50 "OTHER" SUCH AS HOAXES, LIGHTS AND BIRDS, 61 IGNORED BECAUSE OF INSUFFICIENT DATA SUPPLIED BY PERSONS REPORTING SIGHTINGS.

SATELLITES BECAME A NEW UFO CATEGORY IN 1958.

JD1152A..

AFR 200-2 DATED 5 FEBRUARY 1958,
AND CHANGE THERETO DATED 3 JULY 1958

1. This regulation as it stands serves well the purpose for which it was written. However, the Air Force investigators are doing little more than meeting the minimum requirements of this document, and in many instances require prompting by the Air Technical Intelligence Center to deliver even this minimum data.

2. The shortcomings of the UFO investigation procedures probably are due mostly to the Air Bases assigning inexperienced and/or unqualified people to this task, and also to lack of interest in the Program. It is difficult to become fired up over a Program in which the boss shows little or no interest.

3. The ATIC proposes the following as a solution to the problems associated with UFO investigation.

a. Assignment of competent persons as investigators.

b. Short training program for the personnel proposed for use as investigators. The length of this training program should depend upon the basic qualifications of the personnel selected. However, it is suggested that such a training program not exceed twenty (20) hours. In all instances the program should include hours of instruction on the following:

(1) History and philosophy of the UFO Program.

(2) Introduction to Astronomy (Basic terminology and description of the more common astronomical bodies).

(3) Methods of interrogation.

(4) Use of equipment.

(5) Reporting.

c. The following is a list of equipment with which every UFO investigation team should be supplied:

(1) Geiger Counter

(2) Camera

(3) Tape recorder

(4) Binoculars

(5) Magnifying glass

4. The investigating teams should be authorized to make phone calls directly to the Air Technical Intelligence Center from the investigation area for the purpose of reporting high priority findings or preliminary conclusions.

[illegible] ORGANIZATIONS AND CLUBS IN THE DETROIT AREA

1. Aerial Phenomena Research Organization
   [illegible]

2. Confederation of Mass Research Investigators
   Supposedly non-profit. Has bi-monthly publication.

3. Celestial Objects Investigation Committee
   Little known re this organization.

4. Civilian Research Interplanetary Flying Objects
   Publication 50¢ monthly. Claims 5000 members.
   (Kenneth Arnold's organization)

5. Civilian Saucer Investigators
   Membership $1.00. Dues 10¢ for bulletin

6. Civilian Saucer Investigation
   Quarterly bulletin - 50¢ per copy

7. College of Universal Wisdom
   Religious fanatical. Bi-monthly publication $1.50 per copy.

8. Cup and Saucer Net
   Little known re this organization.

9. Detroit Astronomical Society
   Little known re this organization.

10. Essenes of Detroit
    Religious fanatical. Monthly report 50¢ per copy.

11. Extra-Terrestrial Research Organization
    Claims to be non-profit.

12. Fate Magazine (Club)
    Monthly magazine 25¢ per copy.

13. Flying Saucer Club of Detroit
    Claims membership of over 2000.

14. Flying Saucer Investigative Associates
    Little known re this organization

15. Flying Saucer International
    Los Angeles organization. Claims 10,000 membership.
    Monthly report 25¢

[illegible]

[illegible]

10. Flying Saucer Research Society
Little known as only organization

19. Norwegian Society
Oldest society. Anthropological and metaphysical.

20. Gravity Foundation
Little known, but active.

21. Great Lakes Air Association
Little known. Interested in negative matter

22. Holloway School of Philosophic Health and Religion
5 publications from [illegible] to date

23. International Flying Saucer Bureau
Very little known.

24. Interplanetary News Digest
South California group. Little known.

25. Library Research Group
Little known, but active

26. Little Listening Post
Little known

27. Organo Energy Institute (Dr. Bender Foundation)
Director now before Supreme Court for defrauding Government.

28. The 72 Research Association
Headed by individual claiming trip in flying saucer.

29. Saucer and Unexplained Celestial Events Research society
Little known

30. Saucer Research Foundation of Los Angeles
Little known

31. Saucer Phenomena and Celestial Enquiry
Little known

32. Saucer Sentinel
Little known

33. [illegible]
[illegible]

34. [illegible]
[illegible]

35. [illegible]
[illegible]

36. [illegible]
[illegible]

37. [illegible]
[illegible]

38. Space Observers League
[illegible]

39. Flying Saucer Council of America
Global UFO Members

40. Amarillo Flying Saucer Sighting Center
Newly formed

41. Saucer Research Bureau
Little known re this organization

42. Telonic Research Center
Quarterly bulletin 50¢ issue

43. Satellite Universe
Membership $2.50 per year

44. Investigation of Interplanetary Crafts & Intercourse
The director of this organization, Orfeo Angelucci
is not a scientist but a night waitress

45. [illegible]
[illegible]

46. [illegible]
[illegible]

47. Publish Inquiry monthly. Founder and Director -- Gordon Allen
Publishes "Spacecraft Digest"

48. National Committee for Investigation of UFO's
Director -- Mr. T. Wilson

49. Saucer Investigation Bureau of Jacksville Center, No. 7.

RFD #3
Mansfield, Ohio
2/6/[illegible]

ATIC,
Wright-Patterson, O. [illegible]

Dear Sirs,

In a renewed attempt to secure factual information concerning UFO's in general and, in particular, the events concerning the Olden Moore sighting of a UFO on Oct. 18, near Mansfield and Lucasville Ohio, Nov. 5, '57, I am [illegible] Air Force's request that I again write your offices. I do so reluctantly, as I have found the ATIC adept at giving evasive answers or deliberate falsehoods to those who ask factual questions concerning UFO's.

You have received my reports on this case as well as many other reports. You know that the official O.D. report has been released. You know that the case was broadcast over television, radio and the press. You know that even Aime Michel gave a fair report of the case in his French text," Flying Saucers and the Straight-Line Mystery." Too, you know that dozens of government agents were on the landing spot soon after the craft is said to have reported by Olden Moore.

I mention these facts as I do not wish to be embarrassed by Herr Goebbels-like-statements that you know nothing about the Olden Moore Sighting or, that the facts are too sketchy!

Specifically, how do you explain the foot or shoe prints and the deep markings left by the craft and its occupants? More important, what caused the craft to leave a mild degree of radioactivity?

This latter and most important question is most important as a friend of mine (among others) has been [illegible]ly suffering for almost two years after viewing a UFO at close range and for a long period of time. [illegible], this is a matter of civilian defense and I consider it [illegible] of serious consideration.

Your answers to these questions will help me and others to help our fellow men who [illegible] still believe that UFO's are harmless, or who are deluded by your and others propaganda that they do not exist.

Dr. Carl G. Jung, noted psychiatrist once stated, "If it is true that the AAF (American Air Force) withholds vitalitating facts then one can only say this is the most unpsychological and stupid policy one could possibly invent. The public ought to be told the truth."

Sirs, UFO's have inflicted death and damage to many Americans. Some of this death and damage could have been avoided had Americans been given the truth concerning UFO's. You can give the Americans this truth if you are interested in civilian Americans. Hence, I again ask for specific answers to the specific questions in paragraph four. If you cannot give this are you brave enough to specify the specific governmental office and the specific persons responsible for keeping the UFO truths from a former free people?

Sincerely,

Dan S. Gaber

On 14, 15 and 16 January 1953, a panel of the Director of Intelligence of the Air Force's Scientific Advisory Board was established.

The general conclusions reached by the panel were that unidentified flying objects:

a. Held no direct physical threat.

b. were not foreign developments or the product of secret arms of the U. S.

c. Were not unknown phenomena requiring the revision of current scientific concepts.

The panel further concluded that unless de-emphasized, UFOs did constitute a threat to the orderly functioning of the protective units of the body politic, because:

a. Unwarranted mass of irrelevant reports could clog vital channels of communications.

b. Skillful hostile propaganists could induce national hysterical behavior and harmful distrust of duly constituted authority.

c. Continued false reports might hide indications of a genuine hostile action.

As a result, the panel made the following basic recommendations:

a. That [redacted] UFOs [redacted] the Air Force [redacted] agency when they [redacted] and [redacted] the public of the total lack of evidence of [redacted] behind the phenomena.

b. That investigating and reporting personnel be trained to recognize and reject false indications quickly and effectively.

CIRCA 1957
ATI SCHOOL LECTURE (GREGORY)

7-3745 - 392

1003856

RETURN TO
USAF Historical Archives
ASI(ASHAF-A)
Maxwell AFB, Ala 36112

SMG

UNCLASSIFIED

AIR TECHNICAL INTELLIGENCE BRIEFING

RETURN TO
USAF Historical Archives
ASI(AFSHAF,A)
Maxwell AFB, Ala 36112

ATI SCHOOL TRAINING PICTURE

" THE UFO PROGRAM "

(For two one-hour class periods)

AIR TECHNICAL INTELLIGENCE CENTER
WRIGHT-PATTERSON AIR FORCE BASE
OHIO

IUU2P[illegible]

1. Information conflicting with or pertinently affecting that contained in this publication should be forwarded by the recipient directly to:

Commander
Air Technical Intelligence Center
Wright-Patterson Air Force Base, Ohio

This in no way abrogates or alters responsibility for sending such information or any pertinent intelligence data through already established intelligence collection channels of the various services or agencies of the U.S. government.

2. WARNING: This document contains information affecting the national defense of the United States within the meaning of the Espionage Law, Title 18, U.S.C., Sections 793 and 794. Its transmission or the revelation of its contents in any manner to an unauthorized person is prohibited by law.

to determine that there is a certain amount of work that must be done each day, which does not mean suspense slip items...was explained to you.

Therefore, I feel that I must take this informal means in requesting some help. It is difficult for one man to be Project Officer, analyst, administrator, policy planner, speech and brief preparer, lecture writer and a host of a million other things which are not apparent even to others sitting nearby.

The attached example which had to be accomplished within 2 days in the midst of other high priority and interrupting things is the sort of a thing that cannot be done week after week, by one man.

Again I should like to apologize, but I feel this matter has reached a stage where I must ask for help.

Capt Gregory

MEMO ROUTING SLIP

NEVER USE FOR APPROVALS, DISAPPROVALS, CONCURRENCES, OR SIMILAR ACTIONS

1 NAME OR TITLE	INITIALS		CIRCULATE
Dr. Miley			
ORGANIZATION AND LOCATION	DATE		COORDINATION
2			FILE
			INFORMATION
3			NECESSARY ACTION
			NOTE AND RETURN
4			SEE ME
			SIGNATURE

REMARKS Doctor, I hate to burden you with my troubles as you have plenty of your own. However, here is one reason why I have been working Saturdays and Sundays for the last 4 months.

As you know, General Lewis' 30 minute briefing, which used only 3 slides shook the place up for 3 days in order to prepare it. This lecture is for 2 one hour ATI class periods and utilizes almost a half a hundred slides. Generally, something of this order requires weeks of preparation. I was given the requirement from Col Ericson, thru Major Zimmerman less than a week ago. It had to be given Monday afternoon - which it was.

I am at my desk, as you know, practically from 7 to 5:30 every day, and the majority of the time I do not take the required half hour for lunch, to carry out the work of this branch. All remarks to the effect that I take it easy or to "stop worrying" (generally from people who do not know or will not take time out (over)

FROM NAME OR TITLE	DATE
ORGANIZATION AND LOCATION	TELEPHONE

DD FORM 1 FEB 50 95 Replaces DA AGO Form 895, 1 Apr 48, and AFHQ Form 12, 10 Nov 47, which may be used.

16—48487-4 GPO ☆

to determine that there is a certain amount of work that must be done each day, which does not mean suspense slip items...was explained to you.

Therefore, I feel that I must take this informal means in requesting some help. It is difficult for one man to be Project Officer, analyst, administrator, policy planner, speech and brief preparer, lecture writer and a host of a million other things which are not apparent even to others sitting nearby.

The attached example which had to be accomplished within 2 days in the midst of other high priority and interrupting things is the sort of a thing that cannot be done week after week, by one man.

Again I should like to apologize, but I feel this matter has reached a stage where I must ask for help.

Capt Gregory

LECTURE ON

THE UFO PROGRAM

FOR THE ATT SCHOOL

GENERAL:

I consider it a distinct privilege to be able to speak to you today and to have the opportunity of meeting a class which has members that will become part of an organization upon which so much depends with regard to the Air Force's UFO project.

Unidentified Flying Objects, or "UFOs" are referred to as "Flying saucers" by the general public and by the majority of nontechnical writers and publishers on the subject. We don't like the name "flying saucers", not because only a very small amount of the objects are reported as saucer shaped - but because it represents weird stories, many of which are purposely calculated to frighten the general public. The Air Force definition of UFOs is "any airborne object which, by performance, configuration, aerodynamic characteristics or unusual features, does not conform with any presently known or projected aircraft or missile" - - more generally, we think of them as anything airborne which cannot be identified as known or explainable objects.

The general purpose of this briefing is to give you some background, the status and progress, and the general operations of the UFO program as well as to provide you with some guidance for the part that you may play in this highly controversial field.

BACKGROUND:

At this point a brief background and history of the UFO program should help to determine the progress and status of the program , and to understand some of its problems and complexities.

The program started in 1947, when on 27 June of that year, a private civilian flyer named Kenneth Arnold, sighted several disc-like objects near Mr. Rainier in the State of Washington. He described them as "flying saucers", a term which was forcibly, and with much sensationalism brought to the public's attention. The writer's and newspapers somehow picked it up. There was a considerable amount of speculation, theory, conjecture, and assumption as to the nature and existence of this phenomena. As a result, the Air Force was given the responsibility of investigating and analyzing these phenomena, and given the name of Project "Sign".

From June 1947 to February 1949, when the name of the program was changed to "Project Grudge", approximately 375 UFO reports were collected and analyzed. In August 1949, a report on the results was submitted to the Directorate of Intelligence. The average number of unexplained sightings or "unknowns" for this period was approximately 20%. It was concluded that these reports were due, primarily, to:

(1) Misinterpreation of conventional objects, aircraft, balloons, astronomical bodies, etc.

(2) War nerves or mass suggestion and hysteria (e.g. the Orson Wells case)

(3) Hoaxes and publicity seeking persons

(4) Psychopathic persons

In December 1949, these findings were released to the public by the Department of Defense, and were given wide comment and circulation by the Press.

From February 1949 to mid-1951, the project was carried on a low-priority basis. In late 1951, there was suddenly a renewed public interest and an increase in the number of sightings was reported. A review of the situation made at this time seemed to indicate that this was due to the emphasis placed on UFOs by the Press. In the summer of 1951, the project was reviewed by the Directorate of Intelligence, Hq, USAF, and Project Blue Book was established, with the recommendations that reporting, investigating, and analytical procedures be improved where possible. This was complied with as we shall show later.

The "peak year" in the UFO program was 1952, when a monthly average of over 100 reports per month were received. This compares with approximately 10 per month for 1951. The publicity and fanfare given to the UFO controversy by press, publishers, writers and others reached a high pitch during 1952 and developed a tendency on the part of the public to question the Air Force's handling of the alleged "menace" presented by "flying saucers".

From 1947 to the present time, we have investigated and analyzed thousands of UFO cases of every imaginable variety. During these eight years or so, the Air Force was repeatedly accused of withholding vital "flying saucer" information from the public; that UFO's were Soviet aircraft of such advanced design and fantastic speeds that they could traverse the skies of America and return to Russia in a matter of hours; that they were space-ships manned by super-intelligence beings from another galaxy which were drawn to the earth by the atomic tests set off by the U.S. and Russia; that the UFO's represented the Lord's advance scouts preparatory to the Judgement Day; and, unfortunately, by some people high in influential positions, that they were our own experimental aircraft, which, through some conspiracy in top AF echelons, were purposely allowed to roam our skies at night, calculated to frighten our people into thinking they were Soviet aircraft, in order to procure larger appropriations for the Air Force.

During this trying period - without fanfare, ballyhoo or undue publicity, the Air Technical Intelligence Center went quietly, solemnly and seriously about the business of investigating and

analyzing this large mass of UFO data. As we got deeper into the matter, it was found that ATIC investigators and analysts alone could not do the job of attempting to evaluate and explain this phenomena. Other fields of science were involved. Therefore, we solicited the aid of some of the best scientists and technical people in the country, in the field of astronomy, meteorology, aerodynamics, physics, and yes, psychology, to name a few. For example, the prime UFO scientist-consultant is Dr. Hynek, who is Professor of Astrophysics and Astronomy, Ohio State University, Secretary of the American Astronomical Society, and Director of the IGY Satellite Tracking Program. Other scientific personnel, outside of the Air Force, are utilized on a "as needed" basis. This portion of the project to improve the over-all UFO program was under "Project Stork".

It became apparent that if reporting and investigative procedures could be improved, the percentage of unsolved sightings would decrease. Accordingly, ~~the following procedures were adopted:~~ in late 1952 →

~~(1)~~ The 4602d Air Intelligence Services Squadron (Headquarters, Air Defense Command) was directed to carry out all field investigations and preliminary evaluations of UFO sightings. This organization has units deployed throughout the U.S. and they are so highly mobile that they can arrive "on-the-spot" within a very short time after a UFO report is received. This would supply the most important of all factors - timeliness, and would leave ATIC free to perform final analyses and evaluations.

(Slide 1 - Location of 4602d Field Units)

We now had, in our opinion, the best investigative and analytical tools to do the job of identifying or explaining UFOs. Let us see what effect the 4602d and the use of scientists and specialists had on the UFO program.

(Slide 2 - UFO Statistics - ~~1947 to date~~)

The drop in both the percentage of "unknowns" as well as the total reports should be noted. As may be noted from this chart, the percentage went from 22% to 13% to 9% and now to approximately 3%. It became apparent as more prompt investigations, and as we acquired more experience in UFO analysis and appraisal procedures, and better utilized the services of scientists, the percentage of "unknowns" would drop. However, notice the sudden rise of UFO reports since early 1956. This is significant and is one of the reasons for this briefing.

EFFECTS OF PUBLICITY:

Before we proceed in the matter concerning the sudden rise of UFO reports, a few words should be devoted to the effects that certain types of publicity has on the UFO Program, which, in turn, can effect both the top people in the Department of Defense, as well as the investigators in some field unit. As an example, within two weeks in July of 1952, radar scopes in the Washington Airport

showed certain unidentified blips. Aircraft were sent up to intercept and identify these objects. They found nothing. The press somehow picked it up. Within a matter of hours, headlines not only in Washington, but in other parts of the country screamed that "flying saucers" were hovering over our capital. The next slide will show you an example of this newspaper sensationalism.

(Slide 3 - "Jets alerted for saucers"

UFO reports in great numbers started pouring in at the Center. Both the Department of the AirForce and ATIC were beseiged with demands for explanation or comment. As a result, on 29 July 1952, General Samford held a press conference which was televised nationally. A review of the statements made by both the press and public indicated that General Samford's explanations and assurances that the phenomena were not of interplanetary origin and did not constitute a threat to the United States were not only received with some skepticism generally, but were, in fact, totally rejected by a large number of writers and so-called UFO "experts". As a matter of note, the much publicized "Washington Flying Saucer Sighting", which purported to show flying saucers hovering over the capital, but which were in reality clips on radar scopes created by unusual atmospheric conditions, was a major item of issue during this conference.

The correlation between the type of publicity given to UFO sightings by the press and the publishers, and the affect it has on the number of reports received is shown by this slide.

(Slide 4 - Effects of Publicity on UFO Reports)

Note the effect of the conservative and scientific approach of "Life" and "Look" magazines on UFO reports for that period, in contrast to the newspapers' treatment of the Washington Radar "Flying Saucer" incidents and General Samford's press conference. The New Yorker's "middle-of-the-road" treatment, and its effect on sightings is also interesting to note.

During the last six months, an increase in UFO reports has been noted. In August alone, for example, 125 reports were received by ATIC, the largest number since the peak year of 1952. Of some concern, and paralleling the increase of UFO reports, is the fact that during this time, there has been a great increase in the number of private UFO organizations, as well as books, motion pictures, and TV presentations on this subject.

A year or so ago, there were only a handful of these self-appointed research organizations, dedicated to investigation and analysis of UFO's. As of this date, there are more than forty such organizations of which we have knowledge, and they are increasing monthly.

In early 1955, five books on "flying saucers" were published. To date approximately twenty have been published, and have received wide circulation here and abroad.

There are now six motion pictures in circulation having "flying saucers" as their theme. One motion picture which was released in May of this year, and which is still receiving considerable publicity uses as its main characters former UFO Project Officials and personnel. Its technical advisor is a former UFO Project Officer. The main plot is centered around two colored film strips of so-called "flying saucers". These film strips were previously submitted to the Air Force for examination, and consist primarily of moving spots of light against a blue sky. Our conclusions were that the objects in one film were aircraft and in the other sea gulls. These conclusions were corroborated by an independent study made by the research organization of an aircraft manufacturer of very high standing.

With very few exceptions, buth these self-appointed organizations and the books published have been highly critical of the Air Force handling of the UFO matter. They all show a desire to embarrass the Air Force. A number of these private organizations have written directly to President Eisenhower, to General Samford and to members of Congress, requesting or demanding hearings, briefings, or discussions with UFO project officials.

During the last five months, we have prepared detailed letters to Senator Knowland, Senator Byrd, and Representative Moss regarding aspects of the UFO program which have been brought to the attention of these gentlemen by so-called private "UFO specialists".

Although these UFO organizations include some sincere, well-meaning members, our experience in discussions with sponsors of such organizations has shown that any Air Force explanations or statements are either totally unacceptable or are met, at the least, with skepticism. Our explanations and statements are either misinterpreted, misquoted, exaggerated or used out of context, all to the detriment of the Air Force in general, and the Directorate of Intelligence in particular.

UFO OPERATIONS

To give you a little better idea of the project, I would like to tell you how we operate. Air Force Letter 200-2 is the basis for our operations * [This AF Regulation] states that the ATIC is responsible for analyzing all reports of unidentified flying objects and that each Air Force unit is responsible for cooperating with the Air Defense Command in the investigation of UFOs and in forwarding reports that they receive to ATIC. It further states that, if possible, all reports will be forwarded by wire then followed up within three days by a written AF Form 112. If AF Form 112's are not available the report can be made in letter form. This reporting requirement does

* Insert: By "our operations" is meant all the units and personnel involved in the UFO program. Therefore, from this point on, it should be understood that the method of operations and preliminary analyses, means the 4602nd AISS, as well as ATIC... and is the "meat" of this training lecture.

not mean that the officer receiving the report from the source or the observer does not have the prerogative to make his own evaluation and determine whether or not the sighting is worth forwarding. In fact, we should like to insist on it. He may do this in two ways. He may be able to identify the object, if he does, it is no longer an unidentified flying object, and therefore, does not have to be reported. Secondly, he may evaluate the report according to source and content and determine that it would be of no value as far as a follow-up investigation or analysis is concerned. To break down this last point further, the officer receiving the report or the person investigating may believe the source is of doubtful character or it may be obvious that the source did not make careful observations or that he was unreliable, or trying to perpetrate a hoax. The more observers to a specific sighting, the better. If several people make an observation their estimates can be arranged and the results are a little more accurate. It is a good idea, however, to at least note the name and address or telephone number of such sources since it might be that their observation would tie in with others and it would be necessary to contact them again.

EVALUATING THE SOURCE:

As in all intelligence matters, the source is extremely important. We know psychology is a strong element in this project, although we maintain that almost everyone who reports actually has seen something. At times they unconsciously let their imagination twist the facts. It should be pointed out that, as stated in Project Blue Book's special UFO report, in the majority of cases we are dealing not with facts, but with the observer's impressions or interpretations of the UFO sighted. It is very difficult, if not impossible, to set down any rule to use in evaluating a source. Sometimes you can talk to a person and learn that they are very imaginative. We go a lot on the person's background, age and sex. An airline pilot may see a vapor trail but to a housewife it is a flying saucer, possibly enhanced by the fact that she just read a "flying saucer" story. This does not mean all housewives are poor sources, but categorically, commercial airline pilots are more reliable than housewives simply because they have seen and can identify a larger variety of things in the air and are naturally more prone to be conservative in reports. As field investigators you may encounter what we term "complex sightings". We have recently prepared and disseminated to all 4602d Units, a solution to the problem, and will show it to you at the end of this briefing.

BASIC CHECKS TOWARDS IDENTIFYING UFOs

Balloons:

When you receive a report, the first thing that you should check for is the possibility of its being a balloon, aircraft or astronomical body because these three objects give us the most trouble. We also go through this same procedure as part of our analysis of your report. To go into each of them a little more specifically, we will start with balloons.

There are two different general categories of balloons. One is the research type. These balloons vary in size, shape and are released from various points in the U.S. depending upon what projects are being conducted and are not launched at any scheduled time. They may be small like weather ballons, there may be clusters of these weather balloons, or they may be large plastic balloons that are 100 feet in diameter. With the present emphasis on cosmic ray study many different types of ballons are being launched, in the U.S. every day.

The other category is the regularly launched weather balloons. These are launched from known locations in the U.S. at definite times. On the regularly scheduled weather ballonn launchings, your unit should have data on all launch sites and know the approximate time of launching each day for the area under your jurisdiction. You have the authority to go directly to these stations to obtain data on their balloons or, if the time element is not critical, to go through Air Weather Service to get it from their central files. Fortunately, many of these balloons are tracked optically, by radar, or by radio DF and it is possible to get the exact tracks of the balloons.

If you get a report of an object you believe to be a balloon, check with your weather officer. He will know what stations in your area launch balloons and from the general wind conditions at the time of the sighting tell you where the balloon probably came from. You can then get the plot of ballonn tracks and definitely establish whether the object was a balloon. If there are several launch locations in your area, you may have to check them all. Many times a call to the unit lauching the balloon will suffice as they can tell you the location of their balloon at a given time.

Balloons do not give us any trouble when they look like balloons, it is when they don't look like balloons that they give us trouble and they can take on many odd appearances. In the daytime a balloon will appear to be a very bright star in the sky. Under ideal conditions, a balloon can be seen as high as 60,000 feet. This depends a great deal on weather conditions. During the daytime a balloon at very high altitude will appear to be stationary or traveling very slowly. At night balloons that are light will appear to be a radically moving light. This light may even appear to change color, due to atmospheric conditions. The balloon will change direction with wind and will appear to be a jerky, zig-zaggy course. At dawn or dusk a balloon can appear to be a fiery red or orange, circular-shaped object inthe sky. The reason for this is that the balloon is picking up the slanted rays of the sun, exactly the same as a cloud will pick up the sun's rays in a sunset.

Some balloons carry radar reflectors suspended some distance below the balloon to give a radar return. The clue to this is that they will be traveling with and at the same speed as the wind at their altitude, and may present a weird appearance under some conditions. Let us see why balloons make up a large number of our UFO evaluations.

(Slide 5 - Balloon locations)
(Slide 6 - Balloon tracks)
(Slide 7 - Balloons reported as UFO's)
(Slide 8 - Weather ballon with radar reflector)
(Slide 9 - Radar reflectors)

Aircraft:

With the large air traffic criss-crossing the skies over America, day and night, it is difficult to check aircraft. This is because Flight Services and CAA do not keep a permanent record of aircraft flights very long after the aircraft has landed. Therefore, it is up to the officer receiving the report from the observer to thoroughly check aircraft movements immediately. He may check these through the control tower, through Flight Service, through CAA radio stations, radar, or many various ways, but he should check thoroughly, to see whether or not there were any aircraft flights in the area of the sighting. ADC units have a distinct advantage here, because if the report is received soon enought, their radar units can be checked.

(Slide 10 - Canberra in fog)
(Slide 11 - Marianna film scene)
(Slide 12 - Marianna film scene)

Astronomical Bodies:

Many UFO sightings are caused by astronomical bodies. By astronomical bodies we mean bright stars, planets, or meteors. The most valuable information in the analysis of an UFO that is suspected of being an astronomical body is the bearing, the azimuth, angle of elevation, and the time. From this we can check back through almanacs and navigation tables and determine the locations of certain bright stars. Bodies that give us trouble are Mars, Venus, Jupiter, Capella and several others. You should check stars by obtaining the approximate time, azimuth and elevation of the reported object and grabbing the nearest navigator. Remember, however, that the average layman cannot give exact degrees of elevation or bearings.

Meteors are not too difficult to evaluate because they seem to have a standard description. If someone reports an object similar to a rocket going across the sky at high speed, without change of course, zig-zagging or sudden change of altitude, and leaving a trail behind it, chances are it is a meteor. A meteor is seldom observed for more than 10 seconds, horizon to horizon. Six seconds is the average. However, in certain instances we have had very unusual meteors reported. We have found that there are certain classes of meteors that astronomers call fireballs. These are so rare that there is a good chance that you may see only one in your life, if any. Many times these are reported by pilots as missiles. We have had pilots who have complained to the Air Force about shooting rockets, or experimental missiles through the airways and endangering their aircraft. This is a rather illogical statement, when you get to thinking about it. One, if a missile appeared anywhere outside the proving grounds chances are it would be an enemy missile. However, if you have studied missiles you will note that the burning time, or the time before fuel cut-off, is only a relatively short period during the missile's flight. If we would say, hypothetically, a rocket was shot from some foreign country into the U.S., chances are very good that the fuel shut-off point would have come long before the rocket ever reached the U.S. and it would not be emitting a flame or a long trail.

You can check meteors by looking for accounts of them in the newspaper, or consulting local astronomers. This next slide, through the courtesy of our friend Walt Disney, emphasizes the number of meteors hitting our atmosphere every day.

(Slide 13 - Target Earth.

Radar Sightings:

Since ADC has the vast majority of the radar that is operating 24 hours per day, we often receive UFO reports from them. ADC Regulation 200-2 covers such reporting. This regulation states what information is to be forwarded. ADC uses a well designed questionnaire, specifically for radar UFOs.

Although relatively new as a cause of UFO sightings, we are well aware of the fact that certain weather conditions and interference between two radars can cause wierd effects. Our problem is to determine methods of more positively establishing the cause of certain effects and even being able to predict when these effects may take place.

When reporting a radar sighting, the exact weather data are extremely important. Plots of the temperature, pressure and moisture vs. Altitude should always be reported.

Radar Scope Photos:

A large number of ADC radar stations are equipped with special radar scope cameras. ADC Regulation 200-2 authorizes the use of these cameras for photographing abnormal returns. These scope cameras should be ready to operate at all times since scope photos are an absolute necessity for the accurate evaluation of reports involving radar. As intelligence field units, you should insist that they use these cameras whenever they verbally report unidentified blips doing wierd things on their radar scopes.

(Slide 14 thru 21 - Examples of radar scope returns - anamolous propagation)

Other Causes of Reports:

Naturally balloons, aircraft and astronomical bodies do not account for all the sightings. We have a smaller percentage of other things, such as ducks and geese flying over drive-in theaters at night, searchlights on clouds, unusual cloud formations, blimps, pieces of paper caught in an updraft, and many other things that cause reports. These are very difficult to check and to check them we normally go back to old sightings. For example, sometime back, a certain Western city was somewhat disturbed by glowing objects that flew over the city on various nights. Finally, after considerable investigations, interviews and scientific study of the phenomena, it was determined that it was flocks of ducks or geese reflecting the city's newly installed lights. We will take a case like this and file it, both mentally and physically. When we come across a similar report, we will go back and make a comparative

analysis of the two reports. If they are substantially alike we will evaluate the new report accordingly. This is about the only method we have of checking such difficult-to-identify sightings.

(Slide 22 - Richmond sighting)
(Slide 23 - New Zealand sighting)
(Slide 24 - Lubbuck sighting)

Hoaxes:

One phase of UFO operations which takes so much time and effort, not to say unlimited patience, is the constant flow of sightings found to be, or strongly believed to be, deliberate hoaxes. The Air Force does not take personal issue with individuals who go out of their way to embarrass or cross-up the Air Force. Public relations must be maintained; we cannot, nor do we desire to initiate legal charges. Many of these hoaxes are crude, others are devilishly clever. I should like to present only a few examples from our files - with a few comments regarding each:

(Slide 25 - Brazilian UFO)
(Slide 26 - Brazilian UFO)
(Slide 27 - Brazilian UFO)
(Slide 28 - Garbage can lid)
(Slide 29 - Emulsion flaw)
(Slide 30 - Emulsion flaw)
(Slide 31 - Time exposure of moon)
(Slide 32 - Fragments of "flying saucer")
(Slide 33 - Crashed "flying saucer")
(Slide 34 - "India Ink" saucer)
(Slide 35 - Professor Adamski's saucer)
(Slide 36 - Reproduction of Adamski's saucer)
(Slide 37 - Hampton Bay, L.I. sighting)
(Slide 38 - " " ")
(Slide 39 - " " ")
(Slide 40 - " " ")
(Slide 41 - THE DONOHUE SIGHTING)
(Slide 42 - Hopkinsville "Little Green Men" case)

VIDEON CAMERAS:

As part of our efforts to scientifically approach and explain the aerial phenomena under discussion, we have designed and placed in selected locations throughout the U.S. specialized cameras, referred to as Videon cameras. These special cameras combine the stereo-camera and the spectrographic principle. The Videon camera will break down the light received from any object into its various components. This permits the determination of the element or combination of elements of which the object is composed. At the present time they are placed in approximately 70 selected radar stations and control towers. To date their use has not indicated anything unknown to man.

(Slide 43 - Videon camera)
(Slide 44 - Test photo, Videon camera

PROJECT BLUE BOOK SPECIAL UFO REPORT:

At this point in the briefing, a number of you probably may feel that we are strongly anti-saucer, or that our findings were not scientific, objective or conclusive. To assure both ourselves, and the people of the United States who we have sworn to protect, we undertook another step towards this end.

In May of 1955, a large panel of distinguished scientists, under the monitorship of Project White Stork, produced a very extensive study, the Project Blue Book Report Nr. 14, entitled, "Analysis of Reports of Unidentified Aerial Objects". This report represented the critical analysis of every UFO report submitted to the Air Force since 1947. In October 1955, this report was declassified by the Secretary of the Air Force, and a public release of the summary of this study was made by the Department of Defense a few days later.

The conclusions of this study, which covered almost 8 years of UFO sightings, were that:

(1) There is a total lack of evidence that these unknowns were inimical or hostile

(2) There is a total lack of evidence that these unknowns were interplanetary space ships.

(3) There is a total lack of evidence that these unknowns represented technological developments or principles outside the range of our present-day scientific knowledge.

(4) There is a total lack of evidence that these unknowns were a threat to the security of the country.

Further, there was a total lack of any physical or material evidence - - not a piece - scrap - or a minute fragment - of these so-called "flying saucers" was ever found. As emphasized by the Project Blue Book Report, it is our belief that if more immediate, detailed, objective observational data could have been obtained on the "unknowns" -- these, too, would have been satisfactorily explained.

In conclusion, I should like to emphasize that regardless how low the percentage of "unknowns" may reach; regardless how well we may perfect our investigative and analytical procedures; and regardless how adept we may become in explaining UFOs, we must, in fact, investigate and analyze every reported incident. Even if a foolproof system of identifying all aerial phenomena was developed we must remain on the alert. We do not know what developments may take place in the future. That is our part of our Air Force mission.

Thank you.

(At this point - "Bluebook" Special Reports Nr. 14, will be passed among the class for group discussion.)

Prepared by Capt [illegible] Project
[illegible] a 12 hour period.
[illegible]
[illegible] as necessary.

EXAMPLES OF " HAND-OUT " MATERIAL

TO BE GIVEN TO THE

ATI SCHOOL STUDENTS FOR STUDY

AND DISCUSSION

(UNCLASSIFIED)

AIR FORCE REGULATION
NO. 200–2

DEPARTMENT OF THE AIR FORCE
WASHINGTON, 12 AUGUST 1954

INTELLIGENCE

Unidentified Flying Objects Reporting (Short Title: UFOB)

	Paragraph
Purpose and Scope	1
Definitions	2
Objectives	3
Responsibility	4
Guidance	5
ZI Collection	6
Reporting	7
Evidence	8
Release of Facts	9

1. Purpose and Scope. This Regulation establishes procedures for reporting information and evidence pertaining to unidentified flying objects and sets forth the responsibility of Air Force activities in this regard. It applies to all Air Force activities.

2. Definitions:

a. *Unidentified Flying Objects (UFOB)*—Relates to any airborne object which by performance, aerodynamic characteristics, or unusual features does not conform to any presently known aircraft or missile type, or which cannot be positively identified as a familiar object.

b. *Familiar Objects*—Include balloons, astronomical bodies, birds, and so forth.

3. Objectives. Air Force interest in unidentified flying objects is twofold: First as a possible threat to the security of the United States and its forces, and secondly, to determine technical aspects involved.

a. *Air Defense.* To date, the flying objects reported have imposed no threat to the security of the United States and its Possessions. However, the possibility that new air vehicles, hostile aircraft or missiles may first be regarded as flying objects by the initial observer is real. This requires that sightings be reported rapidly and as completely as information permits.

b. *Technical.* Analysis thus far has failed to provide a satisfactory explanation for a number of sightings reported. The Air Force will continue to collect and analyze reports until all sightings can be satisfactorily explained, bearing in mind that:

(1) To measure scientific advances, the Air Force must be informed on experimentation and development of new air vehicles.

(2) The possibility exists that an air vehicle of revolutionary configuration may be developed.

(3) The reporting of all pertinent factors will have a direct bearing on the success of the technical analysis.

4. Responsibility:

a. *Reporting.* Commanders of Air Force activities will report all information and evidence that may come to their attention, including that received from adjacent commands of the other services and from civilians.

b. *Investigation.* Air Defense Command will conduct all field investigations within the ZI, to determine the identity of any UFOB.

c. *Analysis.* The Air Technical Intelligence Center (ATIC), Wright-Patterson Air Force Base, Ohio, will analyze and evaluate: All information and evidence reported within the ZI after the Air Defense Command has exhausted all efforts to identify the UFOB; and all information and evidence collected in oversea areas.

d. *Cooperation.* All activities will cooperate with Air Defense Command representatives to insure the economical and prompt success of an investigation, including the furnishing of air and ground transportation, when feasible.

5. Guidance. The thoroughness and quality of a report or investigation into incidents of unidentified flying objects are limited only by the resourcefulness and imagination of the person responsible for preparing the report. Guidance set forth below is based on experience and has been found helpful in evaluating incidents:

a. Theodolite measurements of changes of azimuth and elevation and angular size.

b. Interception, identification, or air search

*This Regulation supersedes AFR 200–2, 26 August 1953, including Change 200–2A, 2 November 1953.

action. These actions may be taken if appropriate and within the scope of existing air defense regulations.

c. Contact with local aircraft control and warning (AC&W) units, ground observation corps (GOC) posts and filter centers, pilots and crews of aircraft aloft at the time and place of sighting whenever feasible, and any other persons or organizations which may have factual data bearing on the UFOB or may be able to offer corroborating evidence, electronic or otherwise.

d. Consultation with military or civilian weather forecasters to obtain data on: Tracks of weather balloons released in the area, since these often are responsible for sightings; and any unusual meteorological activity which may have a bearing on the UFOB.

e. Consultation with astronomers in the area to determine whether any astronomical body or phenomenon would account for or have a bearing on the observation.

f. Contact with military and civilian tower operators, air operations offices, and so forth, to determine whether the sighting could be the result of misidentification of known aircraft.

g. Contact with persons who might have knowledge of experimental aircraft of unusual configuration, rocket and guided missile firings, and so forth, in the area.

6. ZI Collection. The Air Defense Command has a direct interest in the facts pertaining to UFOB's reported within the ZI and has, in the 4602d Air Intelligence Service Squadron (AISS), the capability to investigate these reports. The 4602d AISS is composed of specialists trained for field collection and investigation of matters of air intelligence interest which occur within the ZI. This squadron is highly mobile and deployed throughout the ZI as follows: Flights are attached to air defense divisions, detachments are attached to each of the defense forces, and the squadron headquarters is located at Peterson Field, Colorado, adjacent to Headquarters, Air Defense Command. Air Force activities, therefore, should establish and maintain liaison with the nearest element of this squadron. This can be accomplished by contacting the appropriate echelon of the Air Defense Command as outlined above.

a. All Air Force activities are authorized to conduct such preliminary investigation as may be required for reporting purposes; however, investigations should not be carried beyond this point, unless such action is requested by the 4602d AISS.

b. On occasions—after initial reports are submitted—additional data is required which can be developed more economically by the nearest Air Force activity, such as: narrative statements, sketches, marked maps, charts, and so forth. Under such circumstances, appropriate commanders will be contacted by the 4602d AISS.

c. Direct communication between echelons of the 4602d AISS and Air Force activities is authorized.

7. Reporting. All information relating to UFOB's will be reported promptly. The method (electrical or written) and priority of dispatch will be selected in accordance with the apparent intelligence value of the information. In most instances, reports will be made by electrical means: Information over 24 hours old will be given a "deferred" precedence. Reports over 3 days old will be made by written report prepared on AF Form 112, Air Intelligence Information Report, and AF Form 112a, Supplement to AF Form 112.

a. *Addressees:*

(1) *Electrical Reports.* All electrical reports will be multiple addressed to:

(a) Commander, Air Defense Command, Ent Air Force Base, Colorado Springs, Colorado.

(b) Nearest Air Division (Defense). (For ZI only.)

(c) Commander, Air Technical Intelligence Center, Wright-Patterson Air Force Base, Ohio.

(d) Director of Intelligence, Headquarters USAF, Washington 25, D. C.

(2) *Written Reports:*

(a) Within the ZI, reports will be submitted direct to the Air Defense Command. Air Defense Command will reproduce the report and distribute it to interested ZI intelligence agencies. The original report together with notation of the distribution effected then will be forwarded to the Director of Intelligence, Headquarters USAF, Washington 25, D. C.

(b) Outside the ZI, reports will be submitted direct to Director of Intelligence, Headquarters USAF, Washington 25, D. C. as prescribed in "Intelligence Collection Instructions" (ICI), June 1954.

b. *Short Title.* "UFOB" will appear at the beginning of the text of electrical messages and in the subject of written reports.

c. *Negative Data.* The word "negative"

in reply to any numbered item of the report format will indicate that all logical leads were developed without success. The phrase "not applicable" (N/A) will indicate that the question does not apply to the sighting being investigated.

d. *Report Format.* Reports will include the following numbered items:

(1) Description of the object(s):
- (a) Shape.
- (b) Size compared to a known object (use one of the following terms: Head of a pin, pea, dime, nickel, quarter, half dollar, silver dollar, baseball, grapefruit, or basketball) held in the hand at about arms length.
- (c) Color.
- (d) Number.
- (e) Formation, if more than one.
- (f) Any discernible features or details.
- (g) Tail, trail, or exhaust, including size of same compared to size of object(s).
- (h) Sound. If heard, describe sound.
- (i) Other pertinent or unusual features.

(2) Description of course of object(s):
- (a) What first called the attention of observer(s) to the object(s)?
- (b) Angle of elevation and azimuth of the object(s) when first observed.
- (c) Angle of elevation and azimuth of object(s) upon disappearance.
- (d) Description of flight path and maneuvers of object(s).
- (e) Manner of disappearance of object(s).
- (f) Length of time in sight.

(3) Manner of observation:
- (a) Use one or any combination of the following items: Ground-visual, ground-electronic, air-electronic. (If electronic, specify type of radar.)
- (b) Statement as to optical aids (telescopes, binoculars, and so forth) used and description thereof.
- (c) If the sighting is made while airborne, give type aircraft, identification number, altitude, heading, speed, and home station.

(4) Time and date of sighting:
- (a) Zulu time-date group of sighting.
- (b) Light conditions (use one of the following terms): Night, day, dawn, dusk.

(5) Locations of observer(s). Exact latitude and longitude of each observer, or Georef position, or position with reference to a known landmark.

(6) Identifying information of all observer(s):
- (a) Civilian—Name, age, mailing address, occupation.
- (b) Military—Name, grade, organization, duty, and estimate of reliability.

(7) Weather and winds-aloft conditions at time and place of sightings:
- (a) Observer(s) account of weather conditions.
- (b) Report from nearest AWS or U. S. Weather Bureau Office of wind direction and velocity in degrees and knots at surface, 6,000′, 10,000′, 16,000′, 20,000′, 30,000′, 50,000′, and 80,000′, if available.
- (c) Ceiling.
- (d) Visibility.
- (e) Amount of cloud cover.
- (f) Thunderstorms in area and quadrant in which located.

(8) Any other unusual activity or condition, meteorological, astronomical, or otherwise, which might account for the sighting.

(9) Interception or identification action taken (such action may be taken whenever feasible, complying with existing air defense directives).

(10) Location of any air traffic in the area at time of sighting.

(11) Position title and comments of the preparing officer, including his preliminary analysis of the possible cause of the sighting(s).

(12) Existence of physical evidence, such as materials and photographs.

e. *Security.* Reports should be unclassified unless inclusion of data required by d above necessitates a higher classification.

8. Evidence. The existence of physical evidence (photographs or materiel) will be promptly reported.

a. *Photographic:*

(1) *Visual.* The negative and two prints will be forwarded, all original film, including wherever possible both prints and negatives, will be titled or otherwise properly identified as to place, time, and date of the incident

(see "Intelligence Collection Instructions" (ICI), June 1954).

(2) *Radar.* Two copies of each print will be forwarded. Prints of radarscope photography will be titled in accordance with AFR 95–7 and forwarded in compliance with AFR 95–6.

b. *Materiel.* Suspected or actual items of materiel which come into possession of any Air Force echelon will be safeguarded in such manner as to prevent any defacing or alteration which might reduce its value for intelligence examination and analysis.

9. Release of Facts. Headquarters USAF will release summaries of evaluated data which will inform the public on this subject. In response to local inquiries, it is permissible to inform news media representatives on UFOB's when the object is positively identified as a familiar object (see paragraph 2b), except that the following type of data warrants protection and should not be revealed: Names of principles, intercept and investigation procedures, and classified radar data. For those objects which are not explainable, only the fact that ATIC will analyze the data is worthy of release, due to the many unknowns involved.

BY ORDER OF THE SECRETARY OF THE AIR FORCE:

N. F. TWINING
Chief of Staff, United States Air Force

OFFICIAL:

K. E. THIEBAUD
Colonel, USAF
Air Adjutant General

DISTRIBUTON:
S; X:
ONI, Department of the Navy 200
G–2, Department of the Army 10

☆ U. S. GOVERNMENT PRINTING OFFICE: 1954

HEADQUARTERS 4602D AISS
Ent Air Force Base
Colorado Springs, Colorado

GUIDE TO IDENTIFICATION

Unidentified Flying Objects

Paragraph

Purpose - - - - - - - - - - - - - - - - - 1

Definitions - - - - - - - - - - - - - - - 2

Objective - - - - - - - - - - - - - - - - 3

Guidance- - - - - - - - - - - - - - - - - 4

Identification Criteria - - - - - - - - - Inclosure

1. PURPOSE: This publication is designed for the use of Ground Observer Corps personnel and is published to familiarize observers with common phenomena which are sometimes misinterpreted as Unidentified Flying Objects (UFOB's).

2. DEFINITIONS:

a. Unidentified Flying Object (UFOB)-- Relates to any airborne object which by performance, aerodynamic characteristics, or unusual features does not conform to any presently known aircraft or missile type, or which cannot be positively identified as a familiar object.

b. Familiar Objects-- Include balloons, astronomical bodies, birds, etc.

3. OBJECTIVE: Due to the prolonged observation of the sky during both daylight and night time hours, familiar objects such as meteors, aircraft, balloons, astronomical bodies, searchlights, birds, etc., will be frequently observed by GOC personnel. Due to atmospheric conditions (temperature inversions, dust, clouds, etc.,), reflections, sound (or

3. OBJECTIVE (Contd):

lack of sound), speed, position, etc., common phenomena may sometimes be misinterpreted as UFOB's. It is highly desirable that all UFO phenomena be identified or explained. In this respect, the observer requires some "rule-of-thumb" to assist him in this identification.

The object of this publication is to familiarize the Ground Observer with the appearance(s) of common objects under one or more of the circumstances listed above.

4. GUIDANCE: Attached is a list of common phenomena to which Ground Observers may be exposed during their tours of duty. It is recommended that you become thoroughly familiar with these criteria, as they may enable you to identify objects with a greater degree of accuracy.

BALLOONS

1. Shape: Round, cigar, pinpoint, or bowling pin.
2. Size: Balloons up to a hundred feet will generally appear from pinpoint to size of a pea held at armslength.
3. Color: Silver, white or many tints. It may possibly appear dark as when projected against the clouds. Sometimes transparent.
4. Speed: Large scale erratic speed ruled out. In general hovering to slow apparent speed.
5. Formation: Single to cluster.
6. Trail: None.
7. Sound: None
8. Course: Straight with a general gradual ascent, unless falling.
9. Time in Sight: Generally long. Note: Balloon may suddenly burst and disappear.
10. Lighting Conditions: Night or day but especially at sunset or sunrise.

AIRCRAFT

1. Shape: From conventional to circular or elliptical.
2. Size: Pinpoint to actual.
3. Color: Silver to bright yellow (night - black or color of lights). Jet exhaust yellow to red. Under certain conditions aircraft too far distant to be visible to the naked eye, will reflect sunlight from wings or fuselage.
4. Speed: Generally only angular speeds can be observed. This depends on distance but small objects crossing major portion of sky in less than a minute can be ruled out. Aircraft will not cross major portion of sky in less than a minute whereas a meteor certainly will.
5. Formation: Two to twenty. Numbers greater than 20 more likely birds than aircraft.
6. Trails: May or may not have (vapor and exhaust).
7. Sound: Zero to loud shrill or low depending on altitude and winds aloft. Under certain conditions, aircraft may be observed at high altitudes, without making any sound.
8. Course: Steady, straight or gently curving (not erratic - may appear still if approaching head-on). Right angle turns and sudden reversals, abrupt changes in altitude ruled out.
9. Time in Sight: More than 15 seconds, generally of the order of a minute or two.
10. Lighting Conditions: Night or Day.

METEOR

1. Shape: Round to elongated.
2. Size: Pinpoint to size of moon.
3. Color: Flaming yellow with red, green or blue possible.
4. Speed: Crosses large portion of sky in few seconds except if coming head-on.
5. Formation: Generally single - can break into shower at end of trajectory. Occasionally (but rare) small groups.
6. Trail: At night almost always a luminous train which can persist as long as a half hour (rarely). Daytime meteors are much less frequently observed. In daytime, leaves a whitish to dark smoke trail.
7. Sound: None
8. Course: Generally streaking downward, but not necessarily sharply downward. Can on rare occasion give impression of slight rise.
9. Time In Sight: Longest reported about 30 seconds, generally less than 10.
10. Lighting Conditions: Day or Night. Mostly night.
11. Other: An exceptionally bright meteor is called a fireball. These are rare but extremely spectacular and on occasion have been known to light surroundings to the brightness of daylight.

STARS OR PLANETS

GENERAL

The planets, Venus, Mars, Jupiter, and Saturn are generally brighter than any star, but they twinkle very much less (unless very close to horizon). Stars twinkle a great deal and when near the horizon can give impression of flashing light in many colors.

1. Shape: Pinpoint - starlike.
2. Size: Never appreciable.
3. Color: Yellow with rainbow variations.
4. Speed: Stars apparent speeds carry them from east to west in the course of the night but they are often reported as erratic. The effect is psychological, most people being unable to consider a point as being stationary. Occasionally turbulence in the upper atmosphere can cause a star to appear to jump (rare) but somehow twinkling gives the impression of movement to many people.
5. Formation: There are no clusters of very bright stars but faint stars are grouped in their familiar constellations.
   Note: A report of 4 or 5 bright clustering lights would rule out stars.
6. Trail: None.
7. Sound: None.
8. Course: Always describe 24 hour circle around pole or sky from east to west.
9. Time In Sight: When clear, stars are always visible. Most stars rise or set during the course of the night. Stars low in western

SEARCHLIGHTS

1. **Shape:** Round to elliptical.
2. **Size:** Pea at arms length to large luminous glow, dependent upon cloud height.
3. **Color:** White fluorescent.
4. **Speed:** Stationary to fantastic.
5. **Formation:** Usually only one but occasionally two or three.
6. **Trail:** None
7. **Sound:** None
8. **Course:** Circling, straight, stationary or erratic. **Note:** Scattered clouds can give impression of object disappearing and reappearing in a different portion of the sky in a few seconds.
9. **Time in Sight:** Generally long.
10. **Lighting Conditions:** Night

OPTICAL PHENOMENA

GENERAL

This can cover a multitude of things.

Optical phenomena which have been reported as UFOBs run from reflections on clouds and layers of ice crystals (sundogs) to the many types of mirages. No one set of optical phenomena can be set down as representation for the whole class.

There is no limit to the speed of optical phenomena. Reflections can travel from incredible speed, as in the case of a search-beacon on high clouds to stationary.

1. Shape: Generally round but can be elliptical or linear.
2. Size: Starlike to large luminous glow.
3. Color: Generally yellow
4. Speed: Stationary to fantastic.
5. Formation: Any.
6. Trail: None.
7. Sound: None.
8. Course: Any.
9. Time In Sight: Any.
10. Lighting Conditions: Day and night.
11. Other: One of the standard types is the "sundog". In this a large luminous halo is seen around the sun with one to four images of the sun placed along the halo circle at intervals of 90 degrees. Another report often has to do with a bright planet or even the moon shining through a light overcast. Mirages reflections are said to occur frequently when temperature inversions exists in the atmosphere.

sky set within an hour or two. Stars in east, always go higher in sky.

10. Lighting Condition: Night - Twilight.

U. S. AIR FORCE TECHNICAL INFORMATION SHEET

This questionnaire has been prepared so that you can give the U. S. Air Force as much information as possible concerning the unidentified aerial phenomenon that you have observed. Please try to answer as many questions as you possibly can. The information that you give will be used for research purposes, and will be regarded as confidential material. Your name will not be used in connection with any statements, conclusions, or publications without your permission. We request this personal information so that, if it is deemed necessary, we may contact you for further details.

1. When did you see the object?

_____ Day _____ Month _____ Year

2. Time of day: _____ Hour _____ Minutes

(Circle One): A.M. or P.M.

3. Time zone:

(Circle One): a. Eastern
b. Central
c. Mountain
d. Pacific
e. Other _____

(Circle One): a. Daylight Saving
b. Standard

4. Where were you when you saw the object?

_____ Nearest Postal Address _____ City or Town _____ State or Country

Additional remarks: _____

5. Estimate how long you saw the object. _____ Hours _____ Minutes _____ Seconds

5.1 *Circle* one of the following to indicate how certain you are of your answer to Question 5.

a. Certain
b. Fairly certain
c. Not very sure
d. Just a guess

6. What was the condition of the sky?

(Circle One):
a. Bright daylight
b. Dull daylight
c. Bright twilight
d. Just a trace of daylight
e. No trace of daylight
f. Don't remember

7. IF you saw the object during DAYLIGHT, TWILIGHT, or DAWN, where was the SUN located as you looked at the object?

(Circle One):
a. In front of you
b. In back of you
c. To your right
d. To your left
e. Overhead
f. Don't remember

ATIC FORM NO. 164 (13 OCT 54)

8. IF you saw the object at NIGHT, TWILIGHT, or DAWN, what did you notice concerning the STARS and MOON?

8.1 STARS *(Circle One)*:

a. None
b. A few
c. Many
d. Don't remember

8.2 MOON *(Circle One)*:

a. Bright moonlight
b. Dull moonlight
c. No moonlight — pitch dark
d. Don't remember

9. Was the object brighter than the background of the sky?

(Circle One): a. Yes b. No c. Don't remember

10. IF it was BRIGHTER THAN the sky background, was the brightness like that of an automobile headlight?:

(Circle One) a. A mile or more away (a distant car)?
b. Several blocks away?
c. A block away?
d. Several yards away?
e. Other

11. Did the object: *(Circle One for each question)*

a. Appear to stand still at any time?	Yes	No	Don't Know
b. Suddenly speed up and rush away at any time?	Yes	No	Don't Know
c. Break up into parts or explode?	Yes	No	Don't Know
d. Give off smoke?	Yes	No	Don't Know
e. Change brightness?	Yes	No	Don't Know
f. Change shape?	Yes	No	Don't Know
g. Flicker, throb, or pulsate?	Yes	No	Don't Know

12. Did the object move behind something at anytime, particularly a cloud?

(Circle One): Yes No Don't Know. IF you answered YES, then tell what it moved behind: _____

_____

13. Did the object move in front of something at anytime, particularly a cloud?

(Circle One): Yes No Don't Know. IF you answered YES, than tell what it moved in front of: _____

_____

14. Did the object appear: *(Circle One)*: a. Solid? b. Transparent? c. Don't Know.

15. Did you observe the object through any of the following?

a. Eyeglasses	Yes	No	e. Binoculars	Yes	No
b. Sun glasses	Yes	No	f. Telescope	Yes	No
c. Windshield	Yes	No	g. Theodolite	Yes	No
d. Window glass	Yes	No	h. Other _____		

16. Tell in a few words the following things about the object.

a. Sound _____

b. Color _____

17. Draw a picture that will show the shape of the object or objects. Label and include in your sketch any details of the object that you saw such as wings, protrusions, etc., and especially exhaust trails or vapor trails. Place an arrow beside the drawing to show the direction the object was moving.

18. The edges of the object were:

(Circle One):
a. Fuzzy or blurred
b. Like a bright star
c. Sharply outlined
d. Don't remember
e. Other _____

19. IF there was MORE THAN ONE object, then how many were there? _____.
Draw a picture of how they were arranged, and put an arrow to show the direction that they were traveling.

20. Draw a picture that will show the motion that the object or objects made. Place an "A" at the beginning of the path, a "B" at the end of the path, and show any changes in direction during the course.

21. IF POSSIBLE, try to guess or estimate what the real size of the object was in its longest dimension.
_____feet.

22. How large did the object or objects appear as compared with one of the following objects *held in the hand* and at about arm's length?

(Circle One):

a. Head of a pin
b. Pea
c. Dime
d. Nickel
e. Quarter
f. Half dollar
g. Silver dollar
h. Baseball
i. Grapefruit
j. Basketball
k. Other _____

22.1 *(Circle One* of the following to indicate how certain you are of your answer to Question 22.

a. Certain
b. Fairly certain
c. Not very sure
d. Uncertain

23. How did the object or objects disappear from view? _____

_____

_____

24. In order that you can give as clear a picture as possible of what you saw, we would like for you to imagine that you could construct the object that you saw. Of what type material would you make it? How large would it be, and what shape would it have? Describe in your own words a common object or objects which when placed up in the sky would give the same appearance as the object which you saw.

25. Where were you located when you saw the object? *(Circle One):*

a. Inside a building
b. In a car
c. Outdoors
d. In an airplane
e. At sea
f. Other _____

26. Were you *(Circle One)*

a. In the business section of a city?
b. In the residential section of a city?
c. In open countryside?
d. Flying near an airfield?
e. Flying over a city?
f. Flying over open country?
g. Other _____

27. What were you doing at the time you saw the object, and how did you happen to notice it?

_____

_____

_____

28. IF you were MOVING IN AN AUTOMOBILE or other vehicle at the time, then complete the following questions:

28.1 What direction were you moving? *(Circle One)*

a. North
b. Northeast
c. East
d. Southeast
e. South
f. Southwest
g. West
h. Northwest

28.2 How fast were you moving? _____ miles per hour.

28.3 Did you stop at any time while you were looking at the object?

(Circle One) Yes No

29. What direction were you looking when you first saw the object? *(Circle One)*

a. North
b. Northeast
c. East
d. Southeast
e. South
f. Southwest
g. West
h. Northwest

30. What direction were you looking when you last saw the object? *(Circle One)*

a. North
b. Northeast
c. East
d. Southeast
e. South
f. Southwest
g. West
h. Northwest

31. If you are familiar with bearing terms (angular direction), try to estimate the number of degrees the object was from true North and also the number of degrees it was upward from the horizon (elevation).

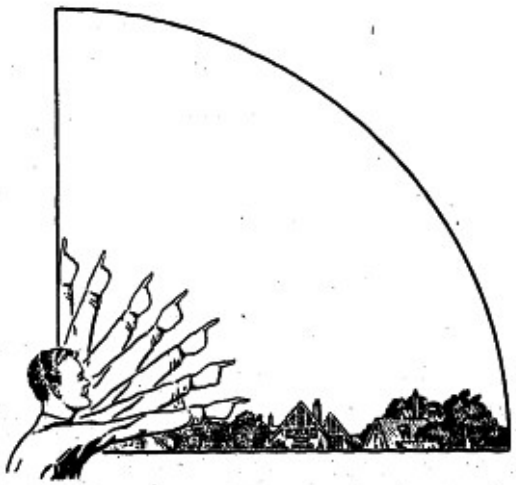
31.1 When it first appeared:

a. From true North _____ degrees.
b. From horizon _____ degrees.

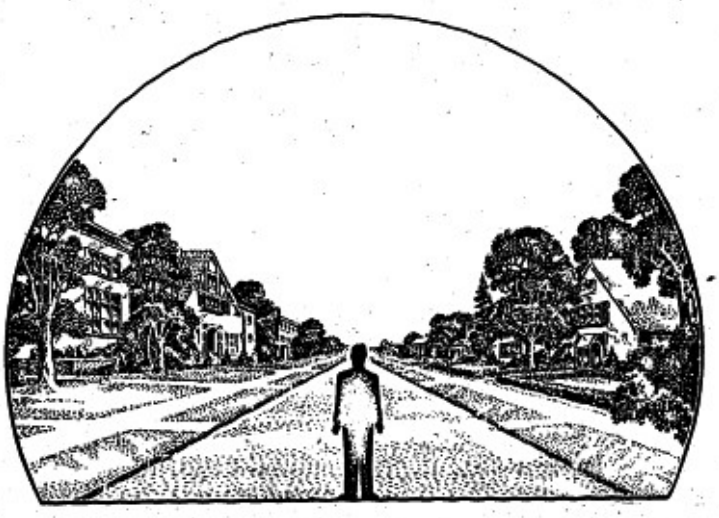
31.2 When it disappeared:

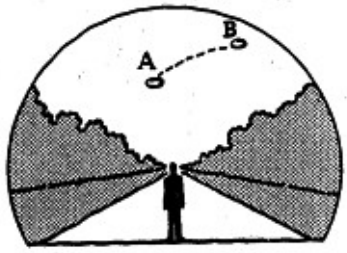
a. From true North _____ degrees.
b. From horizon _____ degrees.

32. In the following sketch, imagine that you are at the point shown. Place an "A" on the curved line to show how high the object was above the horizon (skyline) when you *first* saw it. Place a "B" on the *same* curved line to show how high the object was above the horizon (skyline) when you *last* saw it.



33. In the following larger sketch place an "A" at the position the object was when you *first* saw it, and a "B" at its position when you *last* saw it. Refer to smaller sketch as an example of how to complete the larger sketch.





34. What were the weather conditions at the time you saw the object?

34.1 CLOUDS *(Circle One)*

a. Clear sky
b. Hazy
c. Scattered clouds
d. Thick or heavy clouds
e. Don't remember

34.2 WIND *(Circle One)*

a. No wind
b. Slight breeze
c. Strong wind
d. Don't remember

34.3 WEATHER *(Circle One)*

a. Dry
b. Fog, mist, or light rain
c. Moderate or heavy rain
d. Snow
e. Don't remember

34.4 TEMPERATURE *(Circle One)*

a. Cold
b. Cool
c. Warm
d. Hot
e. Don't remember

35. When did you report to some official that you had seen the object?

_____ Day _____ Month _____ Year

36. Was anyone else with you at the time you saw the object?

(Circle One) Yes No

36.1 IF you answered YES, did they see the object too?

(Circle One) Yes No

36.2 Please list their names and addresses:

37. Was this the first time that you had seen an object or objects like this?

(Circle One) Yes No

37.1 IF you answered NO, then when, where, and under what circumstances did you see other ones?

_____

_____

_____

_____

38. In your opinion what do you think the object was and what might have caused it?

39. Do you think you can estimate the speed of the object?

(Circle One) Yes No

IF you answered YES, then what speed would you estimate? _____ m.p.h.

40. Do you think you can estimate how far away from you the object was?

(Circle One) Yes No

IF you answered YES, then how far away would you say it was? _____ feet.

41. Please give the following information about yourself:

NAME _____ (Last Name) _____ (First Name) _____ (Middle Name)

ADDRESS _____ (Street) _____ (City) _____ (Zone) _____ (State)

TELEPHONE NUMBER _____

What is your present job? _____

Age _____ Sex _____

Please indicate any special educational training that you have had.

a. Grade school _____
b. High school _____
c. College _____
d. Post graduate _____
e. e. Technical school _____
(Type) _____
f. Other special training _____
_____

42. Date you completed this questionnaire: _____ (Day) _____ (Month) _____ (Year)

U. S. AIR FORCE TECHNICAL INFORMATION SHEET

(SUMMARY DATA)

In order that your information may be filed and coded as accurately as possible, please use the following space to write out a short description of the event that you observed. You may repeat information that you have already given in the questionnaire, and add any further comments, statements, or sketches that you believe are important. Try to present the details of the observation in the order in which they occurred. Additional pages of the same size paper may be attached if they are needed.

NAME _____
(Please Print)

SIGNATURE _____

DATE _____

(Do Not Write in This Space)

CODE:

UFO OBSERVERS INSTRUCTION SHEET
(Sky Diagram)

1. GENERAL:

a. The diagram represents all of the sky normally visible to the observer, who is pictured standing under the center of the "dome" of the sky. It is designed to show a three-dimensional view of the area centered around the observer at the time of the UFO sighting.

b. The position of any object in the sky can be described by giving its elevation, or angle upward from the horizon, and its bearing or angle along the horizon, eastward from north.

(1) Illustrations:

(a) Elevation is 0 degrees for an object on the horizon, and 90 degrees for the point directly over the observer (zenith). Thus, an object half-way up from the horizon to the zenith has an elevation of 45 degrees.

(b) Bearing (or "azimuth") is the angle along the horizon, starting from north and moving clockwise eastward. Thus, an object directly toward the east, no matter what its elevation is above the horizon, has a bearing of 90 degrees, an object in the south has a bearing of 180 degrees; toward the west, 270 degrees and so on. North is, of course, zero.

EXAMPLE: An object is seen in the northeast and one-third way up from horizon to overhead. Thus, the object has a bearing of 45 degrees, and elevation of 30 degrees. Similarly, an object having a bearing of 180 degrees and an elevation of 60 degrees would be seen directly south and two-thirds of the way up from the horizon.

2. PLOTTING THE COURSE OF AN OBJECT ON THE SKY DIAGRAM:

a. The path of an object across the sky can be shown completely on this diagram simply by connecting with a curved or straight line the various positions the object successively occupies (see example sheet). To aid visualization, the path on the western side of the sky is represented by broken lines; the eastern side in solid lines. Direction of the object is indicated by arrows. The duration of the sighting can be shown by indicating the time at the position, where the object was first and last observed. Where possible, the time at various intermediate positions occupied by the object should also be shown.

b. The diagram can be made a more effective investigative and analytical tool by making the lines (showing the path of the object) thicker or thinner to indicate any varying brightness of the object observed. This is especially valuable when the object appeared only as a moving light at night. Thus, if a light becomes brighter and then gradually fades, it can be represented by a line becoming increasingly thicker and then gradually thinning out to nothing.

c. Use of colored pencils is especially recommended if the object changes color or hue during the sighting.

ATIC FORM 164a
(25 July 56)

3. EXAMPLE OF DIAGRAM USE:

a. Verbal Description of Example Sighting: Object was first sighted in the southeast, about half-way up from the horizon to overhead, at 10:45 PM local time. Its shape or outline was hazy, but appeared round and about the size of a pea (at arm's length) from where observed. It was dim at first but brightened considerably as it got higher in the sky. Its color at this point was bluish white. After about two minutes it crossed to the western part of the sky a little to the north of overhead (zenith) and continued its flight toward the west. At this point its color appeared yellowish white. The light went dim when it got two-thirds of the way to the horizon. It then stopped and hovered for about one minute and then climbed rapidly, going toward the southwest and getting brighter. In less than thirty seconds, it had climbed to an elevation of approximately 60 degrees, and then the light went out abruptly.

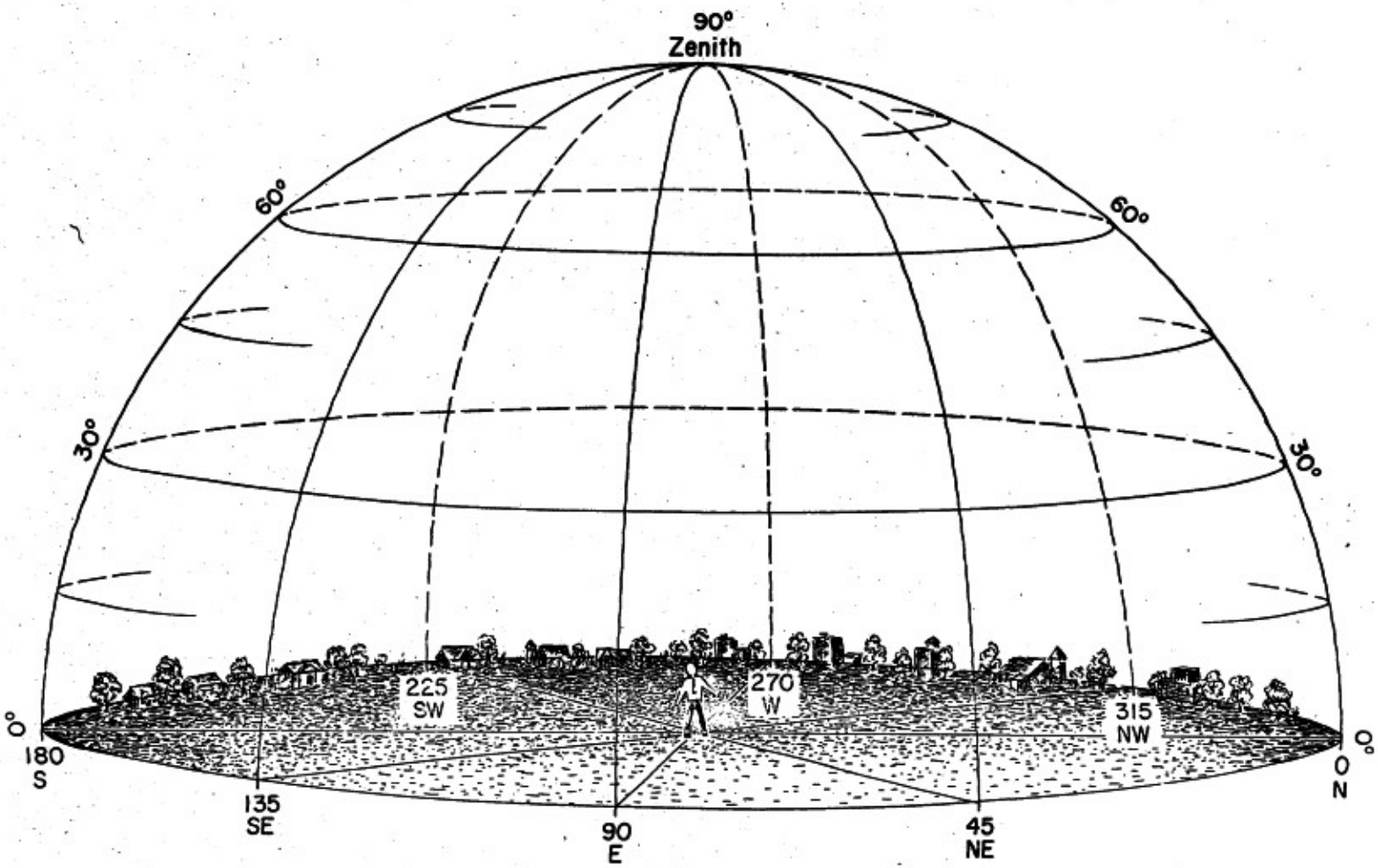
b. Pictorial Description of the Sighting: By referring to the example sheet, notice how simply the above sighting can be portrayed and described, without words, on the example diagram attached here. Note the starting point at bearing 135 degrees (southeast) and elevation 45 degrees (half-way up from the horizon) at 10:45 PM (military time, 2245), and the arrow marking direction of flight. Note also the varying thickness of the line to denote changes in brightness, and the use of the dotted line to indicate its path in the western part of the sky. The "time indications" along the path - 2 minutes to get to the meridian (the north-south overhead line), the hovering for 1 minute, and the ascent in 30 seconds to its complete disappearance, are all shown with a few lines. Thus, the entire sighting can be represented easily on one diagram.

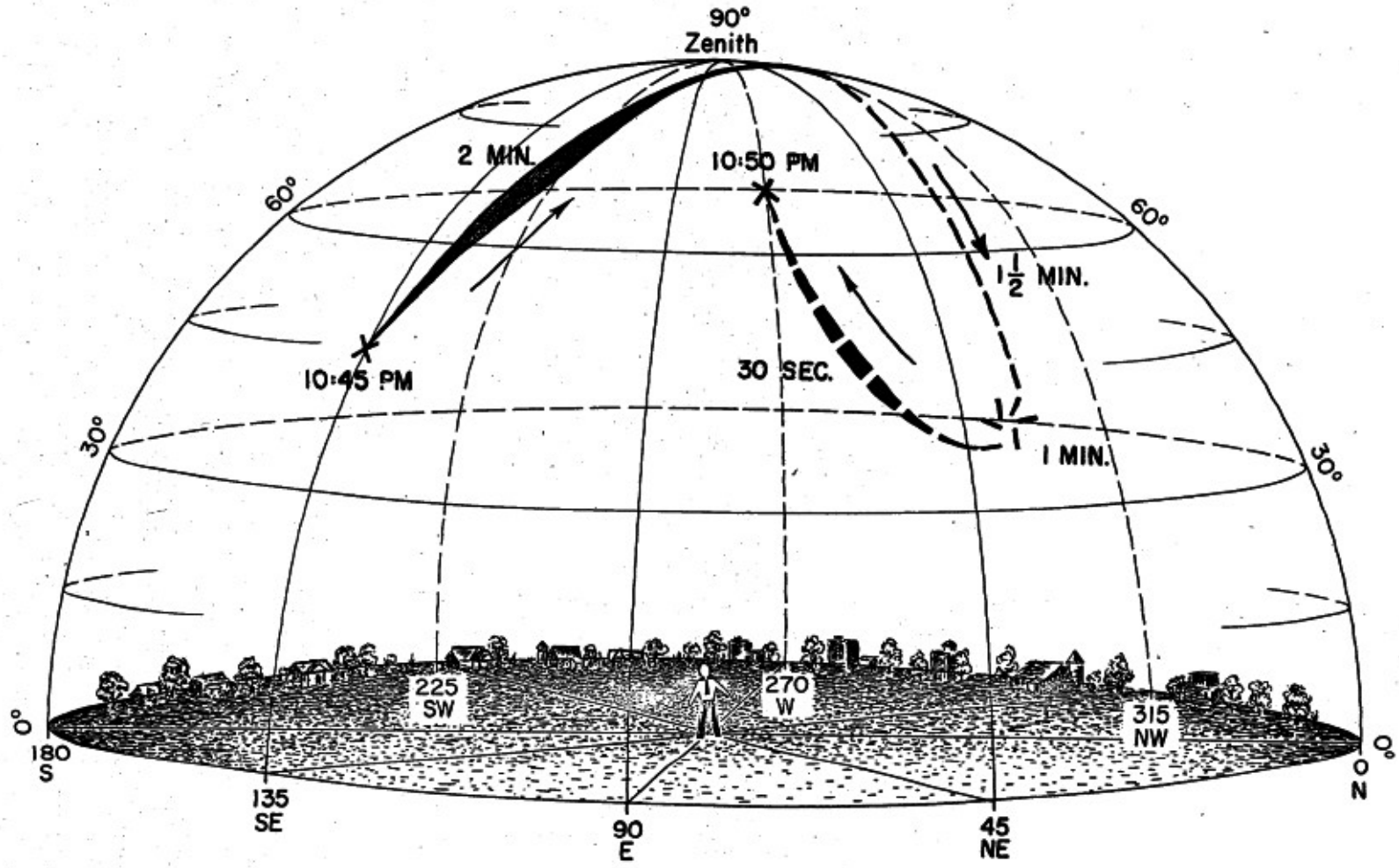
4. FURTHER INSTRUCTIONS AND INFORMATION:

a. Relatively complex trajectories can easily be shown on a diagram of this type. A number of objects sighted can also be indicated, as can any changing formation. The apparent size and shape of the object should be drawn in, preferably by the observer. In the case of an object changing shape or color, this likewise can be drawn in. As previously pointed out, the use of colored pencils to indicate change of color is very desirable.

b. The landscaping in the sky diagram is placed there to help visualization. If any prominent landmarks such as known mountains, buildings, water towers, or specific installations, trees, etc., are part of the sighting area, they should be incorporated into the drawing. These landmarks may later prove to be invaluable as location, plotting or reference points.

c. If you are familiar with the constellations or other heavenly bodies, indicate if possible, the relationship (and movements) of the object with respect to these bodies. This can be sketched on either page 6, item 33 or pages 9-10 of "Summary Data" sheet. Typical examples that can be easily illustrated: "...The object seemed to pass very slowly between the two bottom stars on the handle of the Big Dipper, which was in a vertical position, with the handle pointing down," or "...Object was about the size of a tennis ball -- and remained slightly below and about 15 degrees to the left of the moon."


90°
Zenith
60°
60°
30°
30°
0°
180
S
135
SE
225
SW
90
E
270
W
45
NE
315
NW
0°
0
N



(EXAMPLE SHEET)

INVESTIGATORS INSTRUCTION SHEET
(Sky Diagram)

A. General:

1. The diagram represents all of the sky normally visible to the observer, who is pictured standing under the center of the "dome" of the sky. It is designed to show a three-dimensional view of the area centered around the observer at the time of the UFO sighting.

2. The position of any object in the sky can be described by giving its elevation, or angle upward from the horizon, and its bearing or angle along the horizon, eastward from north.

3. Illustration: Elevation is 0 degrees for an object on the horizon, and 90 degrees for the point directly over the observer (zenith). Thus, an object half-way up from the horizon to the zenith has an elevation of 45 degrees.

4. Bearing (or "azimuth") is the angle along the horizon, starting from north and moving clockwise eastward. Thus, an object directly toward the east, no matter what its elevation is above the horizon, has a bearing of 90 degrees, an object in the south has a bearing of 180 degrees; toward the west, 270 degrees and so on. North is, of course, zero.

5. Example: An object is seen in the northeast and one-third way up from horizon to overhead. Thus, the object has a bearing of 45 degrees, and elevation of 30 degrees. Similarly, an object having a bearing of 180 degrees and an elevation of 60 degrees would be seen directly south and two-thirds of the way up from the horizon.

B. Plotting the Course of an Object on the Sky Diagram:

1. The path of an object across the sky can be shown completely on this diagram simply by connecting with a curved or straight line the various positions the object successively occupies (see example sheet). To aid visualization, the path on the western side of the sky is represented by broken lines; the eastern side in solid lines. Direction of the object is indicated by arrows. The duration of the sighting can be shown by indicating the time of the position where the object was first and last observed. Where possible, the time at various intermediate positions occupied by the object should also be shown.

2. The diagram can be made a more effective, investigative and analytical tool by making the lines (showing the path of the object) thicker or thinner to indicate any varying brightness of the object observed. This is especially valuable when the object appears only as a moving light at night. Thus, if a light becomes brighter and then gradually fades, it can be represented by a line becoming increasingly thicker and then gradually thinning out to nothing.

3. Use of colored pencils is especially recommended if the object changes color or hue during the sightings.

C. Example of Diagram Use:

1. Verbal Description of Example Sighting: Object was first sighted in the southeast, about half-way up from the horizon to overhead, at 10:45 PM local time. Its shape or outline was hazy, but appeared round and about the size of a pea (at arm's length) from where observed. It was dim at first but brightened considerably as it got higher in the sky. Its color at this point was bluish white. After about two minutes it crossed to the western part of the sky a little to the north of overhead (zenith) and continued its flight toward the west. At this point its color appeared yellowish white. The light went dim when it got two-thirds of the way to the horizon. It then stopped and hovered for about one minute and then climbed rapidly, going toward the southwest and getting brighter. In less than thirty seconds, it had climbed to an elevation of approximately 60 degrees, and then the light went out abruptly.

2. Pictorial Description of the Sighting: By referring to the example sheet, notice how simply the above sighting can be portrayed and described, without words, on the example diagram attached here. Note the starting point at bearing 135 degrees (southeast) and elevation 45 degrees (half-way up from the horizon) at 10:45 PM (Military time, 2245), and also the arrow marking direction of flight. Note also the varying thickness of the line to denote changes in brightness, and the use of the dotted line to indicate its path in the western part of the sky. The "time indications" along the path - 2 minutes to get to the meridian (the north-south overhead line), the hovering for 1 minute, and the ascent in 30 seconds to its complete disappearance, are all shown with a few lines. Thus, the entire sighting can be represented easily on one diagram.

D. Further Instructions and Information:

1. Relatively complex trajectories can be shown easily on a diagram of this type. A number of objects sighted also can be indicated, as can any changing formation. The apparent size and shape of the object should be drawn in, preferably by the observer. In the case of an object changing shape, this likewise can be drawn in. Together with the detailed information and data from the "UFO Tech Sheet," both the investigator and analyst will now have a better, detailed picture of what took place. It is clear here that one picture-diagram is worth many words.

2. It will be found that the use of sky diagrams will provide an excellent means of making confirmations, and checking discrepancies or contradictions in reports from two or more observers of the same sighting. A glance at the several drawings will serve to show whether the various observer's stories are consistent or support each other, a matter which is much more difficult to determine by attempting to compare numerous written statements.

3. It is recommended that the actual observer make the drawings, unless circumstances such as physical inability or other reasons make this impossible or difficult. The investigator should not influence the observer's drawing in any way, and should provide assistance only on those points which are not clear to the observer. However, if the observer fails to grasp the idea of the diagram

(itself some indication of his value as a reliable observer), the investigator or interrogator should make the drawing from the observer's verbal description. The completed diagram should always be given to the observer to check and approve.

4. In some cases where the investigator makes the drawing for the observer, it may be advisable for the investigator to deliberately make a mistake or two in the drawing, to see whether the observer is sure of his facts to catch the error when given the diagram to check. This "reliability check" should be used with tact and discretion.

5. The landscaping in the sky diagram is placed there to help visualization. If any prominent landmarks such as known mountains, buildings, water towers, or specific installations and trees, etc. are part of the sighting area, they should be incorporated into the drawing. They may later prove to be invaluable as location, plotting or reference points in subsequent investigations of the area or sighting in question.

6. Where the observer has some familiarity with the constellations or other heavenly bodies, he should indicate, if possible, the relationship (and movements) of the object with respect to these bodies. This can be sketched on either page 6, item 33 or pages 9-10 of "Summary Data" sheet. Typical examples that can be easily illustrated: "...The object seemed to pass very slowly between the two bottom stars of the handle of the Big Dipper. The Big Dipper was in a vertical position, with the handle pointing down," or "...Object was about the size of a tennis ball - and remained stationary slightly below about 15 degrees and to the left of the moon."

7. The sky diagram is not meant to replace written statements or reports, but to supplement them, aiding the investigator to visualize the sighting and the observer to recall the original circumstances.

NEWS RELEASE
PLEASE NOTE DATE

DEPARTMENT OF DEFENSE
OFFICE OF PUBLIC INFORMATION
Washington 25, D. C.

IMMEDIATE RELEASE OCTOBER [illegible]955 LI 5-6700, Ext 75131

AIR FORCE RELEASES STUDY ON UNIDENTIFIED AERIAL OBJECTS

The results of an investigation begun by the Air Force in 1947 into the field of Unidentified Aerial Objects (so-called flying saucers) were released by the Air Force today.

No evidence of the existence of the popularly-termed "flying saucers" was found.

The report was based on study and analysis by a private scientific group under the supervision of the Air Technical Intelligence Center at Dayton, Ohio. Since the instigation of the investigation more than seven years ago, methods and procedures have been so refined that of the 131 sightings reported during the first four months of 1955 only three per cent were listed as unknown. (A summary of the report is attached.)

Commenting on this report, Secretary of the Air Force Donald A. Quarles aaid: "On the basis of this study we believe that no objects such as those popularly described as flying saucers have overflown the United States. I feel certain that even the unknown three per cent could have been explained as conventional phenomena or illusions if more complete observational data had been available.

"However, we are now entering a period of aviation technology in which aircraft of unusual configuration and flight characteristics will begin to appear.

"The Air Force and the other Armed Services have under development several vertical-rising, high performance aircraft, and as early as last year a propeller driven vertical-rising aircraft was flown. The Air Force will fly the first jet-powered vertical-rising airplane in a matter of days. We have another project under contract with AVRO Ltd., of Canada, which could result in disc-shaped aircraft somewhat similar to the popular concept of a flying saucer. An available picture, while only an artists' conception, could illustrate such an object. (Photograph is available at Pictorial Branch, Room 2D780, Ext. 75331).

"While some of these may take novel forms, such as the AVRO project, they are direct-line descendents of conventional aircraft and should not be regarded as supra-natural or mysterious. We expect to develop airplanes that will fly faster, higher and perhaps farther than present designs, but they will still obey natural laws and if manned, they will still be manned by normal terrestrial airmen. Other than reducing runway requirements we do not expect vertical-rising aircraft to have more outstanding military characteristics than conventional types.

MORE

"Vertical-rising aircraft capable of transition to supersonic horizontal flight will be a new phenomenon in our skies, and under certain conditions could give the illusion of the so-called flying saucer. The Department of Defense will make every effort within bounds of security to keep the public informed of these developments so they can be recognized for what they are."

Mr. Quarles added: "I think we must recognize that other countries also have the capability of developing vertical-rising aircraft, perhaps of unconventional shapes. However we are satisfied at this time that none of the sightings of so-called 'flying saucers' reported in this country were in fact aircraft of foreign origin."

E N D

Attachment

SUMMARY

(Analysis Of Reports Of Unidentified Aerial Objects)

Reports of unidentified aerial objects (popularly termed "flying saucers" or "flying discs") have been received by the U.S. Air Force since mid-1947 from many and diverse sources. Although there was no evidence that the unexplained reports of unidentified objects constituted a threat to the security of the United States, the Air Force determined that all reports of unidentified aerial objects should be investigated and evaluated to determine if "flying saucers" represented technological developments not known to this country.

In order to discover any pertinent trend or pattern inherent in the data, and to evaluate or explain any trend or pattern found, appropriate methods of reducing these data from reports of unidentified aerial objects to a form amenable to scientific appraisal were employed. In general, the original data upon which this study was bases consisted of impressions and interpretations of apparently unexplainable events, and seldom contained reliable measurements of physical attributes. This subjectivity of the data presented a major limitation to the drawing of significant conclusions, but did not invalidate the application of scientific methods of study.

The reports received by the U.S. Air Force on unidentified aerial objects were reduced to IBM punched-card abstracts of data by means of logically developed forms and standardized evaluation procedures. Evaluation of sighting reports, a crucial step in the preparation of the data for statistical treatment, consisted of an appraisal of the reports and the subsequent categorization of the object or objects described in each report. A detailed description of this phase of the study stresses the careful attempt to maintain complete objectivity and consistency.

Analysis of the refined and evaluated data derived from the original reports of sightings consisted of (1) a systematic attempt to ferret out any distinguishing characteristics inherent in the data of any of their segments, (2) a concentrated study of any trend or pattern found, and (3) an attempt to determine the probability that any of the UNKNOWNS represent observations of technological developments not known to this country.

The first step in the analysis of the data revealed the existence of certain apparent similarities between cases of objects definitely identified and those not identified. Statistical methods of testing when applied indicated a low probability that these apparent similarities were significant. An attempt to determine the probability that any of the UNKNOWNS represented observations of technological developments not known to this country necessitated a thorough re-examination and re-evaluation of the cases of objects not originally identified; this led to the conclusion that this probability was very small.

MORE

The special study which resulted in this report (Analysis of Reports of Unidentified Aerial Objects, 5 May 1955) started in 1953. To provide the study group with a complete set of files, the information cut-off date was established as of the end of 1952. It will accordingly be noted that the statistics contained in all charts and tables in this report are terminated with the year 1952. In these charts, 3201 cases have been used.

As the study progressed, a constant program was maintained for the purpose of making comparisons between the current cases received after 1 January 1953, and those being used for the report. This was done in order that any change or significant trend which might arise from current developments could be incorporated in the summary of this report.

The 1953 and 1954 cases show a general and expected trend of increasing percentages in the finally identified categories. They also show decreasing percentages in categories where there was insufficient information and those where the phenomena could not be explained. This trend had been anticipated in the light of improved reporting and investigating procedures.

Official reports on hand at the end of 1954 totaled 4834. Of these, 425 were produced in 1953 and 429 in 1954. These 1953 and 1954 individual reports (a total of 854), were evaluated on the same basis as were those received before the end of 1952. The results are as follows:

Balloons	16 per cent
Aircraft	20 per cent
Astronomical	25 per cent
Other	13 per cent
Insufficient Information	17 per cent
Unknown	9 per cent

As the study of the current cases progressed, it became increasingly obvious that if reporting and investigating procedures could be further improved, the percentages of those cases which contained insufficient information and those remaining unexplained would be greatly reduced. The key to a higher percentage of solutions appeared to be in rapid "on the spot" investigations by trained personnel. On the basis of this, a revised program was established by Air Force Regulation 200-2, Subject: "Unidentified Flying Objects Reporting" (Short Title: UFOB), dated 12 August 1954.

This new program, which had begun to show marked results before January 1955, provided primarily that the 4602d Air Intelligence Service Squadron (Air Defense Command) would carry out all field investigations. This squadron has sufficient units and is so deployed as to be able to arrive "on the spot" within a very short time after a report is received. After treatment by the 4602d Air Intelligence Service Squadron, all information is supplied to the Air Technical Intelligence Center for final evaluation. This cooperative program has resulted, since 1 January 1955, in reducing the insufficient information cases to seven percent and the unknown cases to three percent of the totals.

MORE

The period 1 January 1955 to 5 May 1955 accounted for 131 unidentified aerial object reports received. Evaluation percentages of these are as follows:

Balloons	26 per cent
Aircraft	21 per cent
Astronomical	23 per cent
Other	20 per cent
Insufficient Information	7 per cent
Unknown	3 per cent

All available data were included in this study which was prepared by a panel of scientists both in and out of the Air Force. On the basis of this study it is believed that all the unidentified aerial objects could have been explained if more complete observational data had been available. Insofar as the reported aerial objects which still remain unexplained are concerned, there exists little information other than the impressions and interpretations of their observers. As these impressions and interpretations have been replaced by the use of improved methods of investigation and reporting, and by scientific analysis, the number of unexplained cases has decreased rapidly towards the vanishing point.

Therefore, on the basis of this evaluation of the information, it is considered to be highly improbable that reports of unidentified aerial objects examined in this study represent observations of technological developments outside of the range of present-day scientific knowledge. It is emphasized that there has been a complete lack of any valid evidence of physical matter in any case of a reported unidentified aerial object.

E N D

DEPARTMENT OF THE AIR FORCE
Office of Public Information
Washington 25, D. C.

U. S. Air Force Summary of Events and Information
Concerning the Unidentified Flying Object Program

The Air Force feels a very definite obligation to identify and analyze things that happen in the air that may have in them menace to the United States and, because of that feeling of obligation and pursuit of that interest, the Air Force established an activity known as the Unidentified Flying Object Program.

This program was established in 1947 when unidentified flying objects were being reported in various parts of the United States. The reports of sightings reached a peak of 1,700 in 1952 and dropped to a total of 429 in 1953.

From a survey of the volume of sightings received by the Air Force, it has been determined that over 80 percent are explainable as being known objects. Generally, sighted objects fall in the category of: balloons, aircraft, astronomical bodies, atmospheric reflections, and birds. All reports of unidentified flying objects result from either radar or visual sightings.

Explanations pertaining to sightings reported from military and civilian radar facilities are as follows:

1. Temperature inversion reflections can give a return on a radar scope that is as sharp as that received from an aircraft. Speeds of these returns reportedly range from zero to fantastic rates. The "objects" also appear to move in all directions. Such sightings have resulted in many fruitless intercept efforts.

To possibly bear out the theory of temperature inversion reflection is an incident which occurred in January 1951 near Oakridge, Tennessee. Two Air Force aircraft attempted to intercept an unidentified "object" and actually established a radar "lock" on the object. Their altitude at the time was 7,000 feet. The unidentified object, according to their radar, appeared to be at an elevation of 10 to 25 degrees from this altitude. Three passes were made in an attempt to close on the object. In each instance the pilots reported that their radar led them first upward and then down toward a specific point on the ground. (One scientific theory holds that light can be similarly reflected from a layer of warm air above the earth. If this proves to be correct, many visual night sightings could be accounted for.)

2. Ionized clouds have caused some unidentified radar returns. Thunderstorms are identifiable by radar and radar returns have also been received from ice formations in the air, balloons, ground reflections, frequency interference between other radar stations, and windborn objects. Obviously, such returns are very difficult to identify, especially when they occur during darkness.

more

3. The radar screen has picked up birds and in one case a flock of ducks. Flight interceptions proved these phenomena.

An explanation of known types of visual sightings are as follows:

1. Present-day jet aircraft, flying at great speeds and high altitudes, are often mistaken for unknown objects by the untrained observer. Sunlight reflections from the polished surfaces aircraft can be seen plainly even when the aircraft itself is too distant to be visible. The exhaust of jet aircraft emits a trail and often this is seen rather than the aircraft itself.

2. Weather balloons account for a substantial number of sightings. These balloons, sent to altitudes of 40,000 feet and higher, are launched from virtually every airfield in the country. They are made of rubber or polyethylene, swell as they gain altitude, have very good reflective qualities, carry small lights when launched after dark, and can be seen at very high altitudes.

3. In addition to the ordinary weather balloon, huge 90-foot balloons, which sometimes drift from coast to coast, are used for upper air research. These balloons also have a highly reflective surface and are visible at extreme altitudes.

4. Frequently, unusually bright meteors and planets will cause a flurry of reports, sometimes from relatively experienced observers. At certain times of the year, Venus, for instance, is low on the horizon and will appear to change color and move erratically due to hazy atmospheric conditions. Since the stars are charted and most of their characteristics known, many cases are traced to them. Meteors on the other hand are of rapid single-direction movement and are only visible for a few seconds. Meteor activity is more common at certain times of the year than others, and reports of UFO's have shown a tendency to increase during these periods.

5. Some cases arise which, on the basis of information received, are of a weird and peculiar nature. The objects display erratic movements and phenomenal speeds. Since maneuvers and speeds of this kind cannot be traced directly to aircraft, balloons, or known astronomical sources, it isbelieved that they are reflections from objects rather than being objects themselves. For example: suppose we would hold a mirror in hand under a light, causing a reflection on the ceiling. Only a slight, quick movement of the hand would result in erratic movements and phenomenal speeds of the reflected beam. Reflections may be projected to clouds and haze both from the ground and air. Many things which are common to the sky have highly reflective qualities, such as balloons, aircraft, and clouds. Accurate speeds are also difficult to determine due to the inability of the reporter to judge distance, angles, and time.

6. Brilliant flashing lights that sometimes appear red and white in color have been reported by observers. This type has been traced to a new lighting system of commercial airlines and military aircraft. Atop the tail section of these aircraft highly reflective red and white flasher type lights have been installed and are many times misinterpreted by the ground observer.

In the analysis and investigation of the radar and visual sightings described, there are some yardsticks which have been established from experience and trends to measure and attempt to determine the source of UFO's. Some of these are general in nature and are subject to change as new scientific and factual information is received. It should be remembered that any object viewed from a great distance appears to be round. Nearly all the sightings reported are described as round and would tend to indicate that most of the objects are at a greater distance from the observer than is generally estimated.

Another misconception centers about photographs of unidentified flying objects. At best the majority of photographs have proven non-conclusive as evidence to this program mainly due to type cameras used. Also, it might be mentioned that because still photographs can be so easily faked, either by using a mock-up or model against a legitimate background, or by retouching the negative, they are worthless as evidence. Innumerable objects, from ashtrays to wash basins, have been photographed while sailing through the air. Many such photos have been published without revealing the true identity of the objects.

More attention is given to moving pictures of unidentified flying objects since they are more difficult to retouch. However, only a very few movie-type films have been received by the Air Force and they reveal only pinpoints of light moving across the sky. The Air Force has been unable to identify the source of these lights because the images are too small to analyze properly. Since ownership of these films remains with the persons taking them, the Air Force is not in a position to give them out.

The difficulty of evaluating reports of all types is based largely upon the lack ofbasic data surrounding the sightings. The drop in sightings during 1953 is largely due to the increased accuracy and the completeness of reports being received. To be of value, a report should include such basic data as size, shape, composition, speed, altitude, direction, and the maneuver pattern of the objects. Without such information, it is almost impossible to establish the identity of the object sighted. In addition, a recent study has shown a direct correlation between the number of sightings reported and the publicity given to "saucers" by the nation's press.

The Air Force took a further step in early 1953 by procuring Videon cameras for the purpose of photographing this phenomenon. These cameras were distributed to various military installations. This type camera has two lenses, one of which takes an ordinary photograph, and the other has a diffraction grating which separates light into its component parts. This aids in determining the composition of the object photographed. A small number of photographs have been received from this camera; however, only light spots of no detail have been indicated in the photos to date. As more photographs are taken by these observers, it is believed that a great deal of the mystery will be lifted from the program.

The Air Force would like to state that no evidence has been received which would tend to indicate that the United States is being observed by machines from outer space or a foreign government. No object or particle of an unknown substance has been received and no photographs of detail have been produced. The photographs on hand are, at best, only large and small blobs of light which, in most cases, are explainable.

NCJE

It may be concluded from the above and from past experience that no new significant trends have developed out of these cases. There was an increase in public interest which occurred simultaneously with the publication of various books and articles on the subject; however, this trend has been noted several times previously.

In order to overcome the lack of basic data, and to standardize all reports, a detailed questionnaire is now submitted to each person reporting an unidentified aerial object. It is felt that the information thus obtained will lower still more the number of unexplained sightings.

For observers who wish to report unidentified aerial objects, the Air Force would welcome the infomation. Attached to this report is a brief basic summary form. It would be appreciated if observers would send the completed form to the nearest Air Force base.

If and when new developments turn up in this program, the Air Force will keep the public informed.

PLEASE SEND TO YOUR NEAREST AIR FORCE BASE

DATE: _____

TIME OF SIGHTING: _____

SIZE: _____

SHAPE: _____

COMPOSITION: _____

SPEED: _____

ALTITUDE: _____

DIRECTION OF TRAVEL: _____

MANEUVER PATTERN: _____

COLOR: _____

SOUND: _____

LENGTH OF TIME OBSERVED: _____

SKY CONDITIONS: _____

VISIBILITY: _____

GROUND DIRECTION OF WIND: _____

NAME, AGE, MAILING ADDRESS OF OBSERVER: _____

_____

REMARKS: (General description of what you saw) (use back if necessary)

_____

_____

_____

_____

_____

_____

_____

_____

MEMO ROUTING SLIP

NEVER USE FOR APPROVALS, DISAPPROVALS, CONCURRENCES, OR SIMILAR ACTIONS

	INITIALS		CIRCULATE
1 NAME OR TITLE: Dr. Miley			
ORGANIZATION AND LOCATION: 4E4	DATE		COORDINATION
2 Col. Gilbert			FILE
4E			INFORMATION
3			NECESSARY ACTION
			NOTE AND RETURN
4			SEE ME
			SIGNATURE

REMARKS

1. Under the circumstances (3 days to prepare a training course on UFOs), I believe this draft will fulfil the general requirements
2. Beside techniques and guides to investigation and identification, background, so-called UFO clubs and self-appointed flying saucers were also covered.
3 Liberal visual aids and hand-out material, as in the case, a must. Will

FROM NAME OR TITLE: Capt. Gregory — DATE: Revised

ORGANIZATION AND LOCATION: Project Officer - UFO — TELEPHONE

DD FORM 1 FEB 50 95 Replaces AGO Form 895, Apr 48, and AFHQ Form 12, 10 Nov 47, which may be used.

16—68187-1 GPO ☆

ARMSTRONG CIRCLE THEATER
22 January 1958

[redacted]

7-3745 - 360

1003862

RETURN TO
USAF Historical Archives
ASI(ASHAF-A)
Maxwell AFB, Ala 36112

[redacted]

[redacted]

REVISED
1/15/58

RETURN TO:
Director
Aerospace Studies Inst
ATTN: Archives Branch
Maxwell AFB, Alabama

ARMSTRONG CIRCLE THEATRE

#46

JANUARY 22, 1958

"UFO: THE ENIGMA OF THE SKIES"

* * * * * * * * * * * * * * * *

WRITTEN BY: IRVE TUNICK

DIRECTED BY: WILLIAM CORRIGAN

PRODUCED BY: ROBERT COSTELLO

1003852

"UFO: THE ENIGMA OF THE SKIES"

FADE IN: CLOCK (SET 6 SEC. BEFORE 9:30)

SUPER: EDWARDS

EDWARDS:

Good evening everybody, coast to coast. This is Douglas Edwards. Tonight the Circle Theatre goes after a most unusual story: the riddle of the Flying Saucers. Because of the nature of the problem ... and the controversy involved ... we will depart from our usual format. Instead of dramatizing an adventure, we will share one. Instead of merely observing, we ask you to participate. Are UFO ...Unidentified Flying Objects real or imagined? If these so-called Flying Saucers are real ... where do they come from? Are they secret weapons being tested by our own or foreign governments ... or are they ... as many believe ... spacecraft from other planets, invading our atmosphere, observing life on earth?

EDWARDS: (Cont'd)
Tonight we're going after this story ... we're going to the government files ... to experts on both sides of the issue. We're going after facts ...
In just a few minutes ...

DISSOLVE TO: ART CARD
("UFO: THE ENIGMA OF THE SKIES")

SUPER FILM FOR 6 SEC.
... on the Armstrong Circle Theatre!

(GO THRU TO FILM LINE OPENING)

FADE IN:

TELOP ARMSTRONG CIRCLE THEATRE.

DISSOLVE TO:

(EDWARDS AT HIS DESK)

EDWARDS:

Let me restage a moment of history for you. The time: 1492. The place: the port of ...

DISSOLVE TO: ARTCARD #1

(COLUMBUS' FLEET)

... Palos, Spain. Three tiny ships slip their moorings..and the great voyage begins! What lay ahead for the fleet of Columbus? There were many who ...

DISSOLVE TO: ARTCARD #2

(OF DRAGONS, ETC.)

...prophesized calamity. The fleet would surely sail off the rim of the earth ... great dragons

EDWARDS: (Cont'd)

rise from the deep to devour them ... they would be sucked into a mighty whirlpool and never be heard of again. No one knew.

(CUT BACK TO EDWARDS)

Today we stand in precisely the same position.

Already ...

DISSOLVE TO:

(FILM: ROCKET TAKING OFF...THEN SHOT OF EARTH TAKEN FROM ROCKET)

...with our giant rockets and man-made satellites...we are reaching out to the incredible vastness of outer space. President Eisenhower has stated ... we are at a 'decisive moment of history'. What lies beyond our atmosphere? There are those who claim that space is not the emptiness we have long believed.

EDWARDS: (Cont'd)

They say that intelligently-guided objects, originating from the moon, or the planets, or even from far-off galaxies, already are in space ... some have even penetrated our own atmosphere to observe life on earth.

True...false? We don't know... but we intend to find out.... we intend to ..

DISSOLVE TO:

(FILM. ASTRAL EFFECT...SLOW MOVEMENT OF CAMERA THROUGH SIMULATED GALAXIES)

...get the facts...as, together, we probe into the intriguing puzzle of UFO ... Unidentified Flying Objects...better known as Flying Saucers.

(SUPER: CRAWL)

1. TIRLE
2. COSTELLO
3. CORRIGAN

EDWARDS: (OVER)

What do we know of the universe? A vastness beyond human conception ...distances that defy measurement, literally paralyze the imagination!

DISSOLVE TO: ARTCARD #3
(OF GALILEO)

It is a bare 350 years since Calileo invented his telescope ...aagainst the measure of man's existence, this is a mere blink of time.

DISSOLVE TO: ARTCARD #3A
(MODERN TELESCOPE)

In this 350 years...always probing...always studying...this is what man has come to know of his universe:

DISSOLVE TO: ARTCARD #4

(OF EARTH AND ITS MOON)

EDWARDS:(Cont'd)

The earth spins on its axis ... coupled with its one natural satellite ... the moon.

DISSOLVE TO: ARTCARD #5

(OF SOLAR SYSTEM)

We know that our earth is one of nine planets circling about our sun.

DISSOLVE TO: ARTCARD #6

(OF OUR GALAXY)

We know that our sun is only a single star in a galaxy containing 100,000 million stars ....

DISSOLVE TO: ARTCARD #7

(OF HEAVENS SHOWING VARIOUS NEBULAE)

EDWARDS: (Cont'd)

...and we know that there are some 2,000 million galaxies such as ours swirling through space.

(DISSOLVE TO: EDWARDS)

We know this much about the universe ... and we know little else ... for sure...

Is there life on other planets? Intelligent life ... substantially like our own?

Scientists tell us that to believe our earth alone can sustain life is an absurd conclusion. Among the billions of planets in the millions of galaxies, there must be many that sustain some type of living creatures.

EDWARDS:

Dr. Harlow Shapley, former director of the Harvard Observatory, tells us that there must be 100 million planets in the universe where intelligent beings...not necessarily like our earthly brand...live and multiply and think.

And some authorities have claimed actual evidence that this type of life does exist on other planets. Here's an example of the evidence they offer.

DISSOLVE TO: ARTCARD #3

(OF MARS SHOWING CANALI)

This is Mars. Telescopes reveal strange geometric lines criss-crossing its surface. 40 years ago, Percival Lowell, a distinguished American astronomer stated that these lines .... the canali ...are true evidence of intelligent life on Mars.

(CUT BACK TO EDWARDS)

EDWARDS:

He said Mars was a dying planet ...dying from lack of water ... and the lines were irrigation canals the Martians had dug to bring water from the melting polar ice-caps into their parched planet. The moon is our nearest neighbor in space...

CUT TO: ARTCARD #9

(OF MOON)

...and the only one our powerful telescopes can carefully survey.

DISSOLVE TO: ARTCARD #10

(OF MOON DETAIL)

For years, astronomers have been mapping its surface. Some have seen strange things indeed.

CUT TO: ARTCARD #11
(OF GEOMETRIC PATTERNS ON MOON - JESSUP, Pg. 172)

EDWARDS:

Here, for example, is a rough sketch that was supposed to show streets and avenues in a region of the moon known as Schroeter's Valley.

DISSOLVE TO: ARTCARD #12
(OF MOON STREETS - JESSUP 194)

Another rough sketch of what was claimed to be highways or aqueducts, near the region known as Gassendi's crater.

(CUT BACK TO EDWARDS)

And just recently a report was made...and confirmed...that a

EDWARDS:

gigantic bridge now stretches across a region of the moon known as the Mare Crisium.
Scientists charted this region many years ago...and no such bridge was in evidence then. But reliable experts claim it is there now...and that it appeared literally almost overnight.
If it is a natural bridge... created by natural forces of erosion as we know them on earth ...it would take millions of years to form. And its presence would have been noted long before 1953.
If it is a natural object...why wasn't it seen before?

If it is not a natural object... then what can it be?

There are those who claim that its construction proves the existence of intelligence on the moon ... not necessarily moon-people...but beings from outer

EDWARDS:

space who are using the moon as a space-station for their observation of earth.

(EDWARDS CROSSES AWAY FROM ARTCARDS OF PLANETS AND GALAXIES)

How can we find out about this? Where do we start?

(EDWARDS APPROACHES TABLE CONTAINING BOOK DISPLAY)

We start with background...history. Here, collected for us by the editors of the Encyclopedia Americana, is a selected list of books covering the ...

CUT TO:

(BOOKS AND PAN ACROSS TO SHOW TITLES)

...whole field of celestial phenomena ... from ancient sightings...to the latest UFO reports...

(CUT TO EDWARDS. HE TAKES ONE BOOK FROM THE COLLECTION)

EDWARDS:

For make no mistake about it ... Unidentified Flying Objects are nothing new. The Bible gives us a report of a sighting ...

CUT TO: ARTCARD #13

(OF EZEKIEL'S WHEEL)

... by the - Prophet Ezekiel ... a "signe" in the Heavens...large, brilliantly colored, in the shape of a wheel within a wheel.

CUT TO: ARTCARD #14

(OF FIREBALL, MENZEL, PAGE 257)

In 1554...this mysterious object flashed across the sky near St. Chamas, France.

CUT TO: ARTCARD #15

(OF ESSECK - MENZEL PAGE 257)

EDWARDS:

In 1697 ... This molten mass of roaring flame terrified the populace of Esseck, Germany ...

CUT TO: ARTCARD #16 -

(NECCADO)

In 1708 ... a flock of strange phenomena invaded the skies over Europe ...

(CUT BACK TO EDWARDS)

Today, science explains most of these ancient sightings in terms of natural phenomena...such as fireballs, meteors, shooting stars, comets...or unusual auroral displays. But not so easily explained are some occurrences of not too long ago ...

CUT TO: ARTCARD #17

(OAKLAND TRIBUNE, NOV. 23, 1896)

EDWARDS:

November 23, 1896. Oakland, California! A mysterious object sailed across the sky! First sighted in the San Francisco Bay area, a strange cigar-shaped object, reportedly witnessed by thousands, sailed across the sky. Moving slowly, gathering headlines....

DISSOLVE TO: ARTCARD #18

(NEW YORK HERALD, APRIL 11, 1897)

...the UFO was reported from Salt Lake City...Denver...Omaha.... Kansas City...and...finally... Chicago...where it sailed off the front page...into the unknown.

(CUT BACK TO EDWARDS)

The first few decades of the

EDWARDS:

20th Century brought few sightings...possibly because the UFO took a dim view of the newly-invented earthly airplane suddenly trespassing its private domain. But in 1947 ... Year II of the Atomic Age...the real UFO story began ...

CUT TO:

(ILLUSTRATED MAP OF NORTHWEST - #19)

It began here..the Pacific Northwest...the spectacular country lorded-over....

DISSOLVE TO: ARTCARD #20

(OF MT. RAINIER)

...by the hulk of Mt. Rainier. Here ... one June morning ten years ago, a C-46 Marine Transport plane crashed. Among the volunteer

EDWARDS:
civilians who aided the military searchers was ...

DISSOLVE TO:

(PHOTO OF KENNETH ARNOLD - ARTCARD #21)

...Kenneth Arnold, a bush pilot who had logged thousands of hours of flying in the area! What he saw ... and reported...made international news!

ARNOLD: (VOICE OVER)
It was while I was searching for this ...

(DISSOLVE TO: ARNOLD LIVE)

...crashed plane that I noticed a terrific blue flash go past thru my airplane. I noticed that the flash came from very peculiar-looking objects that were approaching Mt. Rainier at about 107 degrees. The objects were headed towards a saddle between these

ARNOLD: (Cont'd)
peaks. They were about 9 in number. They looked something like this....

CUT TO:

(SKETCH OF WHAT ARNOLD HAS SEEN - ARTCARD #22)

This is an artist's concept of what I saw, based on my description. I assumed, at the time, that they were a formation of some new type of jet.

(CUT BACK TO ARNOLD)

But it baffled me because they did not seem to have any tails. I judged their wing-span to be about 100 feet across. I watched them for several minutes. They were traveling from north to south, flying in reversed echelon formation...and as they flew they weaved in and out between the mountain peaks. They had a kind

ARNOLD: (Cont'd)
of a skipping motion as they sailed along.

EDWARDS: (VO)
After the sighting, you landed and reported the incident to the local representative of the CAA...The Civil Aeronautics Administration ...

ARNOLD:
That's right. I didn't make too much of the incident...as I said, I thought they were jets. I said they fluttered like... well, like boats on very rough water...I said they flew like you took a saucer and skimmed it across water. Well, the papers printed a real garbled version. They quoted me as saying they looked like saucers. I didn't say that at all. I said they flew in a saucer-like fashion.

EDWARDS: (VO)
That was an historic misquote.

ARNOLD:

I guess so. Because that's how the name 'Flying Saucers' came to be.

EDWARDS: (VO)

Have you ever seen these so-called Flying Saucers since?

ARNOLD:

Yes I have. I've seen strange objects in the sky on at least three different occasions. And I know some regular airline pilots who have made more than a dozen sightings. But we don't talk much about it. Making a Flying Saucer report is like opening your living room to a bob-cat. You get clawed, scratched and spit on. You're either a real fruitcake or you're out to get publicity by spreading lies. I saw what I saw...and I reported it to the proper authorities.

EDWARDS: (VO)

Well...let's get your own personal opinion of what you saw....

ARNOLD:

The Air Force investigated at the time and said no jets were flying near that area that day. I feel that if these objects were not made by our science and flown by our Air Forces, then I'm inclined to believe that you've got to say they were of extra-terrestrial origin.

EDWARDS: (VO)

Extra-terrestrial...from another world, another planet?

ARNOLD:

That's right.

EDWARDS: (VO)

That's saying a lot.

ARNOLD:

I know it. I'll tell you this much. All of us who have made sightings...I'm not talking about crackpots now...but reliable people who can be depended on ...well, none of us have appreciated being laughed at. We made our reports because we

ARNOLD: (Cont'd)

believed it was our duty to do so. I don't know what's going on in the sky. I don't think it's anything for people to get hysterical about. But there's something going on besides Sputnik, I'm sure of that. It's something we see but we can't explain. Now that's my frank opinion!

(CUT BACK TO EDWARDS)

(EDWARDS HOLDS THE DRAWING OF THE OBJECTS ARNOLD HAS SEEN)

EDWARDS:

Kenneth Arnold's sighting of objects he claimed looked something like this ...

(TURNS SKETCH TO CAMERA)

... was the beginning...June 24, 1947 ... Mt. Rainier, Washington. And it may have been quickly forgotten...a news oddity...except that within the next 30 days, there were 53 more reports of so-called Flying Saucers. There was the usual quota of crackpots climbing on the bandwagon.

EDWARDS:

A Chicago housewife saw one ...

CUT TO: ARTCARD #23

(CARTOON SAUCER WITH LEGS)

HOUSEWIFE: (VO)

I was out hanging the wash. It was Monday, y'know. And there I saw it ... big... with legs!

CUT TO: ARTCARD #24

(CARTOON OF FLYING WASHTUB)

EDWARDS: (VO)

A Spokane woman...

WOMAN: (VO)

It wasn't exactly round...or flat...it was... well, it was like a washtub.

CUT TO: ARTCARD #25

(CARTOON - SAUCERS PARADING THROUGH YARD)

EDWARDS: (VO)

And a remarkably calm Midwest observer...

MAN:(VO)

I don't know why everybody's getting so excited. They came through our yard all the time.

(CUT BACK TO EDWARDS)

EDWARDS:

But...making all allowances for illusion, delusion, hoax and hallucination...there remained enough incredible reports by credible observers to set people ... many people...thinking. They came from every section of the country.

CUT TO: MAP #26

(OF UNITED STATES - SAN FERNANDO VALLEY OF CALIFORNIA.)

EDWARDS:

San Fernando, California. A commercial airline pilot ... saw an elongated object, with port-holes along its side.

(PAN TO: BOULDER CITY, COLO.)

Boulder City, Colorado. A Superintendent of Schools ... spotted a strange cigar-shaped object that moved at incredible speed.

(PAN TO: WASHINGTON D.C.)

Washington, D.C. A Signal Corps Intelligence Officer ... saw this spherical object flowing in the sky.

(PAN TO: GREENWICH POINT, L.I.)

Greenwich Point, Long Island ... a management sales consultant reported ... a round object with jet pods underneath ...

(CUT BACK TO EDWARDS)

EDWARDS:

And if anyone was less than serious

EDWARDS:

about Flying Saucers...the tragic Mantell incident at Godman Field, Ft. Knox, Kentucky, gave them real cause to reflect.

On January 7th, 1948, early in the afternoon Kentucky State police reported an unidentified flying object, circular in appearance, moving westward 'at a good clip'.

DISSOLVE TO:

(FILM: CONTROL TOWER - GODMAN AIR BASE)

Godman checked, found no experimental aircraft in the neighborhood The UFO was sighted by the Commanding Officer of the field.

(FILM - F-51s)

Just at this time a flight of F-51s headed from Marietta, Georgia to Louisville, Kentucky neared the field. The flight ...

DISSOLVE TO: ARTCARD #27

(OF MANTELL)

....under the command of Captain Thomas Mantell, a veteran combat pilot was immediately vectored in on the strange spherical-shaped object.

(CUT BACK TO EDWARDS)

What happened then depends upon what version you read. There were seven witnesses in Godman Tower...and their accounts differ in many details. But this is sure. Captain Mantell...by radio...reported sighting the object above him. He said it was "Metallic and of tremendous size". Mantell's plane was not equipped with Oxygen...

DISSOLVE TO:

(FILM - P-51 ZOOMING UPWARD)

EDWARDS:

...yet he headed upward. One of his wingmen broke off as the climb began. The remaining two stayed with him to 15,000 feet, then broke off. Mantell was in a maximum climb at 22,500, his plane under perfect control.

(CUT BACK TO EDWARDS)

From this point on, there is nothing but mystery. Transmission was garbled and attempts to contact Mantell went unanswered.

Mantell's plane began to level off at 30,000 feet...began a gradual turn to the left...then it nosed downward...and....at full power....began to dive. Between 10 and 20 thousand feet, the plane literally tore apart.

CUT TO: ARTCARD #28

(OF MANTELL CRASH)

EDWARDS:

Mantell was killed. Parts of his plane were found more than half a mile from the central wreckage.

(CUT BACK TO EDWARDS)

There are questions that must be answered about this tragic incident. Why did an experienced pilot like Mantell break one of the cardinal rules of flying: never go above 10,000 feet without oxygen? What did he see that forced him to throw caution to the winds?

After the Mantell crash, UFO reports continued to pile in. During January and February of 1948 the sightings took on an international flavor. "Balls of Fire, traveling slowly across the sky" were reported from Norway, Denmark, Sweden and Germany. Then Southern

EDWARDS:

Europe chimed in ... then South America.

On July 21, a report came in from Holland of a UFO, rocket-shaped, with two rows of windows along the sides. This might have been fast forgotten, except for what happened just one week later.

On July 24, 1948, a commercial ...

CUT TO:

(MAP - SOUTH EASTERN U.S. - #29)

...airliner flying from Houston, Texas to Atlanta was 20 miles southwest of Montgomery, Alabama. At the controls: Clarence S. Chiles and his co-pilot John B. Whitted.

(CUT BACK TO EDWARDS)

At 2:45 in the morning these veteran flyers saw a light, dead ahead, and closing in fast.

EDWARDS:

Traveling at a speed estimated between 500 and 700 miles an hour, the light bore in on them. The object was brilliantly lighted... it appeared to have two sets of windows..and underneath, from the belly of the ship, there was a sort of blue flourescent glow.

As they watched fascinated, the object flashed by about 700 feet to their right.

On landing, Chiles and Whitted reported the incident to the proper authorities and then each drew a sketch of what he saw.

CUT TO: ARTCARD #30 -

(CHILES SKETCH)

This is the Chiles' sketch. Double windows, in size about twice the diameter of a B-29.

CUT TO: ARTCARD #31 -
(WHITTED SKETCH)

EDWARDS:

And this is the sketch drawn by co-pilot Whitted. Same general shape ... double row of what appear to be windows....no wings...

(CUT BACK TO EDWARDS)

What was it? To this day...according to the two pilots involved... no logical explanation offered by scientists, by experts...fits the bill. People may argue about what they saw...but they can't deny that they saw something... something that these men with thousands of hours of flying experience had never seen before ..and haven't seen since!

Is there an explanation...a reasonable, natural explanation

EDWARDS:

for the mysterious objects seen
by so many credible observers
over the past 10 years?

CUT TO: #30 and #31

For this ...

CUT TO: #22

For this ...

CUT TO: #28

... or this?
To get the official Air Force
point-of-view, we're going directly
to the source...directly to the
Air Force files that have been
thrown open to us.
Can every sighting be reasonably
explained...or must we accept

EDWARDS:

the proposition, the fact...that at least some of these objects originate in outer space...and that our earth is now being observed by creatures from another world?

FADE OUT

FADE IN FLIP A.C. THEATRE

EDWARDS: (VO)

In just a moment, we will return to "UFO...THE ENIGMA OF THE SKIES" on the ARMSTRONG CIRCLE THEATRE.

FADE OUT

FADE IN: COMMERCIAL

ACT TWO

FADE IN:

(EDWARDS - WORK AREA)

EDWARDS:

Rarely a day passes but that sightings of flying saucers are reported. These reports ...

CUT TO:

(THREE SIGHTING PHOTOS - ARTCARDS #32, #33, #34)

EDWARDS:

come from every corner of the country ... sightings of strange, disc-like shapes ... From Italy ... New Zealand ... Brazil ... from virtually every country on the globe.

CUT BACK TO EDWARDS

EDWARDS:

People are seeing something .. something is there!

The idea that Flying Saucers are

EDWARDS: (Cont'd)

some type of mass hallucination ... a delusion ... cannot be accepted.

People are seeing objects in the sky ... unidentified ... but real!

CUT TO: ARTCARD #35

THICK RUDDERED SAUCER.

An employee of a supersonic laboratory saw a thick-rudderd object shaped like this ....

CUT TO: ARTCARD #36

SAUCER WITH LIGHTED PORTHOLES.

A round object, with portholes and flashing lights was spotted by two airline pilots.

CUT TO: ARTCARD #37

WINGED SAUCER.

EDWARDS: (Cont'd)

A naval aviation student, his wife, and several others attending a drive-in movie saw a winged saucer surrounded by a deep red glow.

CUT TO: LUBBOCK LIGHTS PHOTO - ARTCARD #38

A group of college professors in Lubbock, Texas saw lights like these ...

CUT BACK TO EDWARDS

World reaction to these sightings ranged from the cynical to the sensational ... from attempts at calm appraisal...

CUT TO BATCH OF MAGAZINES

... to excursions into fantasy,

EDWARDS:

many calculated to create hysteria and confusion ... to humor ...

CUT TO CARTOON - ARTCARD #39

CUT BACK TO EDWARDS

And charges have flown thick and fast as the Saucers.
Authorities have been accused of dropping a paper curtain on the problem ... issuing statements hiding the true facts from the public. On the other hand, the proponents of Flying Saucers ... those who say they truly exist ... have been labeled sensationalists, hoaxers ... and downright liars.
What are the facts? Where is the evidence? Where do we go for our story?

DISSOLVE TO: FILM

EST. SHOT WRIGHT-PATTERSON AIR-BASE, DAYTON, OHIO.

EDWARDS:

... Wright-Patterson Air Force Base, Dayton, Ohio ... Location of the Air Technical Intelligence Center ... Collecting point for all UFO sighting reports ... the outfit charged with the responsibility of analyzing all Flying Saucer data ... Project Bluebook.

CUT BACK TO EDWARDS:

Since January, 1953, the investigation work of Project Bluebook has had the services of the 4602nd Air Intelligence Service Squadron (Air Defense Command) ... a highly trained field investigation outfit with ...

CUT TO LOCATION OF FIELD UNITS OF AISS - ARTCARD #40

... field units scattered around the country so deployed that they

EDWARDS: (Cont'd)

can arrive "on the spot" almost immediately after a sighting is reported to them.

CUT BACK TO EDWARDS

This is the Air Forces setup ... and here's why they're in business ...

CUT TO CHART SHOWING UFO SIGHTINGS BY YEAR SINCE 1947 - ARTCARD #41

... over 6,000 reported Flying Saucer sightings since 1947 ... each sighting investigated and analyzed by specialists and top-notch military and non-military scientific personnel.

CUT BACK TO EDWARDS

At Wright-Patterson, we get the promise of full cooperation from the Air Force. Doors are open to us ... files, many of which were hitherto classified are thrown open to us ...

EDWARDS: (Cont'd)

And ... to explain the meaning of these files ... explain how the Air Force reaches certain conclusions on certain sightings ...

CUT TO SHOT OF COLONEL WHEDON

... the Air Force has detailed to us Lt. Colonel Spencer Whedon, Chief of the Air Intelligence Office, Air Technical Intelligence Center.

(EDWARDS CROSSES TO COL. WHEDON AND TO TABLE CONTAINING THE FILES)

Here are the raw files ... just as they existed in the office of the ATIC in Layton ...

(HE PICKS UP ONE OF THE FILES)

~~Captain~~ Colonel ... this is the complete file on the Mantell case ... the tragic incident we talked about before where a Kentucky National Guard pilot crashed to his death while in pursuit of an alleged UFO.

WHEDON:

That's right.

EDWARDS:

Originally, I believe, it was reported that Mantell might have mistaken the planet Venus for a UFO ... flown too high ... blacked out and crashed. But the Air Force no longer holds to that opinion ..

WHEDON:

No, we don't. We still believe that he blacked out from lack of oxygen and crashed ... and this is supported by the findings of the Air Force Accident Investigators, an outfit completely independent of Project Bluebook. But we are now sure that this is what he was chasing ...

CUT TO FILM OF SKYHOOK BALLOON

WHEDON: (Cont'd)

This is a skyhook balloon ... a giant 100-foot balloon used to gather information about the upper

WHEDON: Cont'd

west for a while as it climbed. At about 35,000 feet, the balloon would have entered the wind jet-stream flowing south. It would move rapidly south, still climbing. At a point somewhere south or southwest of Godman Field ... here ... it would have climbed through the jet stream into a calm belt ... and then it would slowly drift south or southeast ... directly over the area where the UFO was spotted.

CUT BACK TO EDWARDS AND WHEDON

EDWARDS:

You believe it's possible for trained observers ... pilots like Capt. Mantell ... to see a balloon and not recognize it as such?

WHEDON:

Certainly ... in a period when balloons of that size were rare ...

CUT TO FILM OF BALLOON IN NEAR HORIZONTAL POSITION.

WHEDON: (Cont'd)

Strong wind currents can send a balloon into an almost horizontal position.

Visibility can play tricks. During the day a balloon can look ...

CUT TO PHOTO OF BALLOON IN DAY - ARTCARD #43

... like this. The same balloon at twilight or dawn can look ...

CUT TO PHOTO OF BALLOON AT TWILIGHT - ARTCARD #44

... like this.

Angle of vision is important.

CUT TO PHOTO OF BALLOON FROM GUN CAMERA - ARTCARD #45

WHEDON: (Cont'd)

This was a reported sighting from over Minneapolis. An F-86 fighter took this picture with its gun camera.

CUT BACK TO WHEDON AND EDWARDS

WHEDON:

Before we had our investigation techniques worked out, we were often stymied because we had no report of any balloons launched in the vicinity of reported sightings. We now know that balloons ... skyhooks particularly ... can appear thousands of miles from the original launching area.

CUT TO MAP POLAR-PROJECTION NORTHERN HEMISPHERE INKED IN ROUTE FROM JAPAN TO ATLANTIC - ARTCARD #46

here's a balloon that was launched in Japan .. tracked by government

WHEDON: (Cont'd)

facilities all the way across the Pacific ... it meandered all over the country before it finally sailed off into the Atlantic. This resulted in literally dozens of UFO reports.

CUT BACK TO EDWARDS

EDWARDS:

On that basis, then, some large percentage of Flying Saucers/ reports are actually nothing but balloons.

WHEDON:

Right.

CUT TO MASTER CHART OF TABULATED UFO REPORT. IT NOW SHOWS: "BALLOONS - 26.4%"

Figures show that balloons account for 26.4% of all recent UFO sightings!

CUT BACK TO EDWARDS AND WHEDON.

EDWARDS:

Let's take another case, Colonel.

EDWARDS: (Cont'd)

(HE REACHES ON TABLE AND PICKS UP FILE AND OPENS IT) (HE READS)

Three objects observed. Round-shaped, steady white light. No trail or exhaust. Moving slowly well above horizon, southwest of Macon, Georgia. Sightings reported from approximately 2045 hours to 2145 hours ...

(HE LOOKS UP)

Translated ... that's 8:45 to 9:45 P.M. (HE READS AGAIN) ... on May 7 and May 8. Weather clear and visibility unlimited. No meteorological activity believed accountable for sightings observed. Photographs made and available. No interception or identification action taken. No air traffic in general area at time of sighting.

(HE LOOKS AT WHEDON)

Solve this one, Colonel?

WHEDON:

Very quickly. First thing we did was to get a map ...

CUT TO MAP OF AREA AROUND MACON, GEORGIA - ARTCARD #47

WHEDON: (Cont'd)

Here's West Macon, Georgia ... and here's Ft. Benning. We immediately established that training operations were being conducted at Benning on the nights of May 7th and 8th.

CUT BACK TO EDWARDS AND WHEDON

Part of the operation was the dropping of parachute flares from aircraft ... as well as jet-support for ground operations.

We obtained the photographs mentioned in the report.

Enlargements of the black-and-white pictures gave us no clues.

But we also had received some color slides. Using a new photo-analysis technique, we managed to get some surprising results.

CUT TO MACON SIGHTING (SMALL) -
ARTCARD #48

WHEDON: (Cont'd)
The first slide showed little more than two bright dots ... with some indefinite green shading around them.

CUT TO MACON SIGHTING (LARGE) -
ARTCARD #49

But ... on further enlargement .. the wings and body of jets come into view. The bright object is the flame from the jet's afterburner.

CUT TO EDWARDS AND WHEDON.

Case solved.
Conventional aircraft often seem to be what they are not.
Here's an example.

CUT TO JET IN FOG - ARTCARD #50

WHEDON: (Cont'd)

This is a jet flying at high-speed in a fog-shrouded sky. The speed causes a moisture condensation around the wings which gives the appearance of a disc or saucer.

Planes of unorthodox configuration ... swept-wing or delta-jobs ... or ...

CUT TO FLYING PANCAKE - ARTCARD #51

... this radar plane called the Flying Pancake ... give rise to many UFO sightings.

CUT BACK TO EDWARDS AND WHEDON

EDWARDS:

What's the percentage figure, Colonel?

WHEDON:

Well, the Air Force figures it pretty high ...

CUT TO MASTER CHART TABULATED UFO REPORT. NOW ADD "AIRCRAFT 28.8%"

WHEDON: (Cont'd)

... based on our latest reports, the cases where aircraft have been reported as UFO is 28.8%.

CUT BACK TO EDWARDS AND WHEDON.

(EDWARDS TAKES ANOTHER FILE FROM PILE AND FLIPS IT OPEN)

EDWARDS:

Direct from the files of the Air Technical Intelligence Center ... another case. Date: March 9, 1957. A commercial airliner flying between New York and San Juan, Porto Rico had an extraordinary experience. Flying at 19,000 feet it sighted a large, bright object that appeared to be coming directly towards the liner. It was described as "a magnesium-flash" in color with a pale green tint. The pilot had to swerve his plane violently to avoid collision.

(EDWARDS LOOKS UP)

(MORE)

EDWARDS: (Cont'd)

This sighting caused quite a newspaper stir.

WHEDON:

It did.

EDWARDS:

Well, what does the Air Force have to say about it now?

WHEDON:

A check of military positions in the area ruled out any unusual plane or missile activity. However, CAB ... the Civil Aeronautics Board did report six other commercial flights over approximately the same area at the time of the sighting. Five of the six planes reported similar sightings. So we plotted out their positions on a map ...

CUT TO MAP OF OCEAN SHOWING PLANES - ARTCARD #52

WHEDON: (Cont'd)

The plane involved ... Flight 257 was 347 miles southwest of Bermuda ... 705 miles east of Jacksonville. The other planes are grouped around it ... the furthest plane that reported a sighting was 175 miles away.

CUT BACK TO WHEDON

The major clues we had to work on were the color, the trajectory and the fact that three of the planes reported that the object seemed to split apart in the air.

This description coincides with the known features of what are ~~known as~~ called ...

CUT TO SKETCH OF A BOLIDE - ARTCARD #53

... "bolides" or "fireballs" ... a rather rare astronomical phenomenon ... but reported from time to time, especially from the Southwest.

EDWARDS:

So the Air Force attributes the sighting to a "fireball" ...

WHEDON:

It was ~~not~~ nt only our findings. We submitted all the data to a member of the Smithsonian Astrophysical Observatory who confirmed our conclusions completely.

EDWARDS:

Do these astronomical phenomena play a large part in the UFO story?

WHEDON:

~~Quite a bit.~~ Pretty large. The moon and the planets, observed through haze, light fog or moving clouds can play optical tricks. And then there are the rarer celestial sights: mirages, auroral displays ... or, how about this ...

CUT TO AERIAL PHOTOGRAPH OF SUBSUN - ARTCARD #54

WHEDON:

... a beautiful flying disc caught by an Air Force photographic mission near Richmond, Indiana.

EDWARDS:

And actually ...

WHEDON:

A subsun effect ... a rare aerial phenomenon caused by the reflection of the sun's rays on suspended ice-particles.

CUT BACK TO WHEDON AND EDWARDS

Strange or unusual weather tricks not only fool the eye ... but such supposedly foolproof mechanical marvels as radar.

CUT TO SHOT OF RADARSCOPE SHOWING BLIPS CAUSED BY TEMPERATURE INVERSION - ARTCARDS #55 & #56

Temperacure inversion ... where a mass of cold air collides with a layer of warm air ... or even thunderclouds ... sometimes come

WHEDON: (Cont'd)

up on the radarscope as blips. Even the most experienced radar operator can be fooled by these...

CUT BACK TO EDWARDS AND WHEDON

The Air Force now feels certain that the well-publicized UFO radar sightings at the Washington airport during 1952 were caused by this type of unusual radar echo.

EDWARDS:

What percentage of UFO sightings does the Air Force attribute to so-called astronomical phenomena, Colonel?

CUT TO MASTER CHART.

WHEDON:

We attribute 24.4% of current UFO sightings to astronomical phenomena.

CUT BACK TO EDWARDS AND WHEDON

EDWARDS:

All right ... we'll move on to another case.

EDWARDS:

(EDWARDS TAKES A FILE FROM THE TABLE)

The date: August, 1955. The place: Kentucky. Now ... according to press reports and a coast-to-coast radio broadcast ... an entire family in a little village was beseiged for an entire night by goblin-like creatures reported to have emerged from a Flying Saucer that landed nearby.

(HE LOOKS UP)

And ... to make it all more binding ... here is a sketch of one of these extra-terrestrial visitors drawn by a local artist and sworn to as accurate by the family.

CUT TO LITTLE GREEN MAN - ARTCARD #57

EDWARDS:

One of your investigators didn't get to interview him, by any chance?

WHEDON:

No ... but we did interview the family. They had spent the evening ...

CUT BACK TO WHEDON AND EDWARDS.

attending a spirited meeting, they had all undergone a tremendous emotional experience which, quite possibly, might account for the incident.

The Kentucky creature, by the way ...

CUT TO BEARDED SPACEMAN - ARTCARD #58

... has a cousin in our files.

CUT BACK TO WHEDON AND EDWARDS

EDWARDS:

I suppose this whole UFO situation is complicated by the crackpots, publicity-seekers and hoaxers who insist on getting into the act.

WHEDON:

It definitely is. One of the roughest areas involves the so-called

WHEDON: (Cont'd)

"contact" sightings. People who claim to have spoken to creatures from Flying Saucers ... some who claim to have ridden in them ... and one, at least, who was whooshed off to Venus and there married into Venusian royalty. A whole cult has grown up around these "contact" incidents ... and woe to him ~~that~~ who dares to question.

EDWARDS:

Doesn't the Air Force question?

WHEDON:

Air Force policy is merely to examine the stories for evidence that might be construed as representing a threat to the national security. So far, we have no such evidence. And we don't brush these things ~~by~~ off ... we really go into them.

CUT TO ARTCARD #59

Now this is an Air Force photo. (PAUSE) It's not unlike many of the

WHEDON: (Cont'd)

pictures we see that purport to be Flying Saucers. But it's not...

CUT BACK TO WHEDON

What it is ... very simply ... is a gadget we photographed made from the top of a tobacco humidor ...

CUT BACK TO ARTCARD #59

... three ping-pong balls ... and tne nipple from a baby's bottle.

CUT BACK TO EDWARDS AND WHEDON

We never go on the assumption that anything is a fraud. We put all material sent to us through the analysis mill.

Cleverness knows no ~~one~~ end in this Flying Saucer business.

Here's a beauty ...

CUT TO LAMP SAUCER - ARTCARD #60

WHEDON:

Enlargement reveals ...

CUT TO ENLARGEMENT OF LAMP SAUCER - ARTCARD #61

... strange lines coming from the object ...

CUT TO FURTHER ENLARGEMENT OF LAMP SAUCER - ARTCARD #62

... and further enlargement show these lines to be part of the corner-ceiling of a room. The saucer ~~turning~~ turned out to be a light fixture.

CUT BACK TO EDWARDS AND WHEDON.

We get all kinds of pranks.

CUT TO FLYING HAT - ARTCARD #63

WHEDON:

Here's a Flying Saucer that turned out to be a flying hat.

(HE REACHES UNDER TABLE AND BRINGS UP THE COPPER BALL)

Here's a lulu ... supposedly a UFO picked up by a science teacher. This had pretty good newspaper and TV coverage ...

EDWARDS:

Looks very formidable. A genuine sputnik, Colonel?

WHEDON:

Afraid not. Whoever made it went to a lot of trouble trying to letter Russian words on the inside ... but they got the letters wrong and forgot to remove the name of the New Jersey manufacturer from the tube. Inside, there's nothing but a hodge-podge of wires ... no real circuits anyplace. To finish it off, to give the effect of this thing having hurtled through space, a blow-torch was used to scorch the sides.

EDWARDS:

Still ... a rather neat job ... for those of us not up on our Sputniks.

WHEDON:

The important thing here is that this type of hoax besides being a violation of federal law, ~~it's~~ it's a rather expensive joke. A single UFO investigation may well cost the government $10,000. The perpetrators of these childish pranks might think twice about it when they remember it's their own tax money that's being wasted ... money that could go into ... should go into the serious research so badly needed at this time.

EDWARDS:

In the total picture, Colonel, what percentage of current UFO reports does the Air Force classify as hoaxes?

WHEDON:

We lump this category into a general heading, along with sightings

WHEDON: (Cont'd)
that turn out to be birds, search-lights, and so on ...

CUT TO MASTER CHART. ADD "OTHER - 6.4%"

... and they add up to 6.4%.

CUT BACK TO EDWARDS AND WHEDON

EDWARDS:
And can ATIC solve all UFO reports referred to it?

WHEDON:
No. Many sightings come to us with insufficient data ...pertinent items of information missing ... Without precise description of size, shape or color of the object ... without knowing direction and altitude ... time and location ... wind and weather conditions ... we cannot reach a valid conclusion based on legitimate evidence. The Air Force provides every observer of a UFO with a detailed questionnaire. This

Suggest change to: "The Air Force has a very detailed questionnaire for observers of UFOs. ....." Ltr.

No! Tech. Sgt. ... questionnaire ... a quick sheet when a sighting is phoned in; when observers write to ATIC and when a ... initial interrogation. Then to ... when ...

WHEDON: (Cont'd)

is kept in confidence if it is so desired. But we must have full information if a sighting is to get a complete analysis.

EDWARDS:

In this category ... let's call it "Insufficient Information" ... you fit what percentage of your reports?

CUT TO MASTER CHART. ADD "INSUFFICIENT INFORMATION ... 12.1%"

WHEDON:

Insufficient Information accounts for 12.1% of all current UFO reports.

CUT BACK TO EDWARDS AND WHEDON

(EDWARDS PICKS UP A DUPLICATE OF MASTER CHART THAT HE HAS ON DESK. HE ALSO PICKS UP A GREASE PENCIL.)

EDWARDS:

Let's do a little arithmetic, Colonel. Adding these percentages

EDWARDS: (Cont'd)

together ... if my mathematics works out ... comes to ... let's see ... 98.1%.

(EDWARDS PENCILS IN "98.1%")

That's a large percentage ... but it's not 100%.

WHEDON:

No. The 1.9% remainder represents the cases the Air Force classifies as "Unknown".

EDWARDS:

And this category is different from "Insufficient Information".

WHEDON:

Yes.

EDWARDS:

In what way ...

WHEDON:

Well, take the Chiles sighting you mentioned earlier ... two commercial pilots reported a cigar-shaped object, glowing, ... with what appeared to be windows along the side.

This case has all the elements

WHEDON:

we require for investigation. Yet ... after the most careful study and analysis, we cannot fit it into any of our regular categories. It doesn't appear to have been a balloon ... a plane of any kind ... nor does it fit the circumstances of an astronomical phenomenon. In view of this .. sufficient data but no logical explanation ... we classify it as a true "Unknown". This doesn't happen often ... but when it happens, we don't dodge the issue. It's an "unknown" ... and so listed.

EDWARDS:

Thanks, Colonel Whedon.

WHEDON:

Glad to have been able to be here.

(MOVE IN ON EDWARDS. HE POINTS TO 1.9% FIGURE)

Not too high a figure ... little less than 2%. Two out of a hundred. (HE PUTS THE CHART DOWN)

EDWARDS:

Yet if even only one in a hundred represented an object of inter-planetary origin ... we still would have to call this the biggest news of this or any century.

What about the remaining 2% ... what's the opinion of those who believe in Flying Saucers about that 2% ... or, for that matter ... what about their opinion of the Air Force anaylsis program .. Project Bluebook?

There are two sides to every story ... you've heard one.

FADE OUT.

FADE IN: FLIP: A.C. THEATRE.

EDWARDS: (V.O.)

We will return in a moment with the final act of "UFO: THE ENIGMA OF THE SKIES" on the ARMSTRONG CIRCLE THEATRE.

FADE OUT

FADE IN COMMERCIAL

...ERS (TED)
...JAN. 2 (...KINS)--A MYSTERY WITHIN AN ENIGMA ...
...DAY TO THE INTERNATIONAL FLYING SAUCER GUESS...
...OUT OF A SUDDEN STILLING OF THE VOICE OF MAJOR ...
...C, RET., DURING A CBS-TV PROGRAM LAST NIGHT ...
...RATION OF THE HISTORY OF FLYING SAUCERS, AND ...
...SIGHTINGS OF UFO'S (UNIDENTIFIED FLYING OBJECTS ...
...YEARS INVOLVED MACHINES FROM OUTER SPACE.
...PROGRAM PROVIDED TWO SIDES TO THE QUESTION--THE AI... EMPHATIC NO! AND MAJOR KEHOE'S EQUALLY EMPHATIC YES! THE ... THEN WAS LEFT TO DECIDE FOR HIMSELF.
...BUT AN UNEXPECTED ELEMENT ENTERED THE PROGRAM WHEN KEHOE STARTED TO SAY THAT HE WAS GOING TO "REVEAL SOMETHING WHICH HAS NEVER BEFORE BEEN REVEALED TO THE AMERICAN PUBLIC."
...HE CONTINUED SPEAKING, WITH REFERENCE TO A "SECRET" SENATE COMMITTEE HE SAID HAD BEEN INVESTIGATING UFO'S FOR SIX MONTHS, VOICE FADED OUT. CBS LATER DISCLOSED IT HAD CUT OFF THE AUDIO BECAUSE KEHOE WAS DEPARTING FROM AN AGREED-UPON PREPARED SCRIPT.
...INCIDENT IMMEDIATELY LED TO SPECULATION ABOUT THE PURPORTED SENATE INVESTIGATION. ACCORDING TO KEHOE, THE SENATE SEEKS TO DETERMINE WHETHER, AS HAS BEEN CHARGED, PILOTS HAVE BEEN "MUZZLED" AND FORBIDDEN TO TALK PUBLICLY ABOUT SIGHTED "SAUCERS."
KEHOE, WHO HAS WRITTEN BOOKS ON THE SUBJECT, SAYS HE REMAINS CONVINCED--DESPITE ALL OFFICIAL DENIALS--THAT SOME OF THE SIGHTED MYSTERY OBJECTS HAVE BEEN INTERPLANETARY SPACESHIPS.
HY952AES

SAFOI-3d/LtCol Tacker/mnb/72291

5 January 1961

Dear Mr. Chapman:

This is to acknowledge your request of 31 December 1960 for a copy of the Armstrong Circle Theater program entitled "UFO: The Enigma of the Skies."

I regret that we do not have copies of this script for distribution. However, we do have a file copy on hand and you are welcome to visit this office to read or copy it in whole or in part.

In addition, I am inclosing the latest Department of Defense fact sheet on the general subject of UFOs. This clearly states the position of the Air Force and the Department of Defense.

Sincerely,

Inclosure

LAWRENCE J. TACKER
Lt. Colonel, USAF
Public Information Division
Office of Information

Mr. J. Chapman
23 Donna Drive
Albany 5, New York

Comeback OI-3d
Reader OI-1

Script - Press Release + file this letter

23 Donna Drive
Albany 5, New York
December 31, 1960

Major Lawrence J. Tacker
Office of Public Information
United States Air Force
Washington 25, D.C.

Dear Sir:

On January 22, 1958, the Armstrong Circle Theater presented a program which dealt with the unidentified flying object. The program was entitled "UFO: The Enigma of the Skies" and was supposed to present both sides of the UFO controversy. The show apparently did not proceed according to plan as some of the individuals scheduled to appear did not-specifically Edward J. Ruppelt, Kenneth Arnold, and Captain C.S. Chiles. The most dramatic segment of the program occured when Donald E. Keyhoe was cut-off in the middle of a paragraph.

In June of 1958, I sent a letter to Talent Associates requesting a copy of the script used on the program. On July 31, 1958, I received a letter from Mr. C.O. Hess saying that the supply of scripts had been "exhausted". It is indeed hard to believe that the requests for these scripts had so far exceeded the supply that the Armstrong Company did not have a single copy left in their whole organization.

Since the CBS program appeared, a number of articles have appeared concerning 'censorship' of the script for this program and especially in regard to Mr. Keyhoe's section of the show. The way in which my request for a copy of the script was denied by Mr. Hess only supports this charge made by Mr. Keyhoe and others.

I would greatly appreciate it if you could tell me where I could obtain a copy of said script.

Thank you.

Sincerely,

J. Chapman

J. Chapman

[redacted]

[redacted]

Mr. [redacted] Staff Member [redacted] House Committee on [redacted] has received a considerable number of letters [redacted] with the Air Force investigation of unidentified flying objects. These inquiries were stimulated by the [redacted] television show of 22 January [redacted]. Mr. [redacted] has requested that the Committee be advised of the Air Force position in this matter.

It was unfortunate that the producers of this show felt [redacted] Major Keyhoe off of the air when he began to depart from the script which he had beforehand agreed to adhere to. From the producers point of view, however, this was necessary in order to protect the network from possible law suits. The Air Force regrets that the producers were forced to take such action because by so doing they enhanced rather than detracted from Major Keyhoe's position concerning his sensational and unsupported claims that Unidentified Flying Objects are real, and that the Air Force is withholding from the public critical information on the subject. People are prone to remember such sensational claims as this rather than the responsible statements of the qualified scientists who disclaimed such charges on the same program.

The allegation that the Air Force has withheld critical information on Unidentified Flying Object reports is entirely [redacted] We are interested in the facts concerning reported sightings and [redacted] aware of our obligation to keep the public informed [redacted] Many persons who report sightings to the Air Force do so in confidence and do not want their names, the names of associated witnesses or even the circumstantial details made public. Since this information is not considered critical or necessary for proper evaluation, their wishes in this regard are respected.

The Air Force is compelled to deal scientifically and objectively with the facts developed during an investigation of an Unidentified Flying Object sighting. We feel certain that the analysis and evaluation of these facts by our qualified scientific personnel are thorough, sound and adequate. Because we have this firm conviction, the Air Force stands ready to give its wholehearted cooperation to any Congressional Committee desirous of holding public hearings on this subject.

DISTRIBUTION:
AFCIN-XI
(Maj Byrne)
OFF OF SIG
SAFIS
SAFS FILES

SAFLL-3 SAFLL AFCIN-XI SAFRD SAFIS(See memo dtd 25 Feb Sgd Maj L.J.Tacker w/draft)

602-[redacted]

For your information, I am inclosing the latest Department of Defense fact sheet on Unidentified Flying Objects, dated 5 November 1957. You will note that paragraph 18 of the fact sheet should be modified to include Air Force participation in the Armstrong Circle Theater presentation on 22 January 1958.

If I can give you any further aid or assistance in this matter, please feel at liberty to call upon me.

Sincerely yours,

Inclosure As stated above

Honorable Lyndon B. Johnson
Chairman, Preparedness Investigating
Subcommittee
Committee on Armed Services
United States Senate

M/R: Cong req for info frm SLO dtd 20 Feb 58; recd LL 21 Feb 58; LL-3 recd memo dtd 25 Feb frm SAFIS w/draft of proposed reply in ans to tele req from LL-3; LL-3 prep & fwd fnl rep to the Chm 28 Feb 58

SAFLL-1/Mr LaVecchia/ss/77695/12 Mar 58
SAFLL-

SAFAO CASE

Dear Mr. Wigglesworth:

You recently requested information concerning Air Force investigations of unidentified flying objects.

The allegation that the Air Force has withheld critical information on unidentified flying object reports is entirely in error. We are interested in the truth concerning reported sightings and are fully aware of our obligation to keep the public informed on such matters. Many persons who report sightings to the Air Force do so in confidence and do not want their names, the names of associated people, or some of the circumstantial details made public. Since this information is not considered critical or necessary for proper evaluation, their wishes in this regard are respected.

The Air Force is compelled to deal scientifically and objectively with the facts developed during an investigation of an unidentified flying object sighting. We feel certain that the analysis and evaluation of these facts by our qualified scientific personnel are thorough, sound and adequate. Because we have this firm conviction, the Air Force stands ready to give its wholehearted cooperation to any Congressional Committee desirous of holding public hearings on this subject.

For your information, I am inclosing the latest Department of Defense fact sheet on unidentified flying objects, dated 5 November 1957. You will note that paragraph 1d of the fact sheet should be modified to include Air Force participation in the Armstrong Circle Theater presentation on 22 January 1958.

Sincerely yours,

M/R: Recd SAFLL 12 Mar; Notack or fwded; F/L prep/fwded 12 Mar based on info obtained fr M&O files and AF Policy; memo fr AFABF w/incl

cc: CCOMD
AFCVC
SAPS FILE
CFC OF SI
COMEBACK
SAFIS
AFCIN
AFABF
STAYBACK

2 Inclosures 1. Ltr fr Const to Rep W. 2. Fact Sheet re UFO's dtd 5 Nov 57

Honorable Richard B. Wigglesworth

House of Representatives

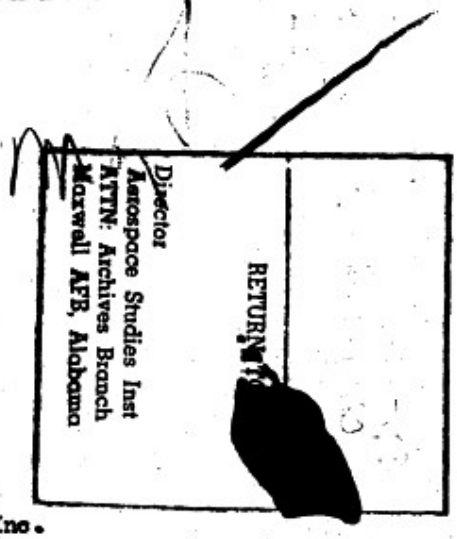
7-3745 - 373

1003858

RETURN TO
USAF Historical Archives
ASI(ASHAF-A)
Maxwell AFB, Ala 36112

FOR RELEASE: 9 PM. EST. Tuesday, December 20, 1960

SMC



" WASHINGTON VIEWPOINT "

PRODUCED BY

The Washington News Bureau

of

The Westinghouse Broadcasting Co., Inc.

GUEST: Lt. Col. Lawrence J. Tacker
Chief of the Magazine & Book Branch of the
Air Force Office of Information.

INTERVIEWED BY: Ann Corrick
Assistant Chief, WBC Washington News Bureau
Sid Davis
Washington Correspondent

"WASHINGTON VIEWPOINT" is heard in Washington at 9 PM., EST, Tuesday, December 20, 1960, over radio station WWDC

1625 K Street, N. W.
Room #206
Washington 6, D. C.

STerling 3-0907

1003858

FOR RELEASE: 9 PM., EST, Tuesday, December 20, 1960

"WASHINGTON VIEWPOINT"

CORRICK: Good evening. This is Ann Corrick with Sid Davis at the Pentagon in Washington. Washington Viewpoint tonight is concerned with a curious controversy -- flying saucers. Are they real or are they imagined?

Our guest on Washington Viewpoint has devoted many years of study to this question. He is Lieutenant Colonel Lawrence J. Tacker, a war combat veteran and master navigator with the United States Air Force. Colonel Tacker currently is Chief of the Magazine and Book Branch of the Air Force Office of information. His long-time interest in reports of flying saucers, or unidentified flying objects as they're called, led him to publish a book earlier this month which describes just what the Air Force is doing about persistent reports that some one somewhere has actually spotted flying saucers. The title of Colonel Tacker's book, by the way, is Flying Saucers and the U. S. Air Force, published by Van Nostrand, and it represents the official Air Force position on the question of whether they are real or imagined.

Well, Colonel, just what is the official Air Force position; are there actually little people from a celestial culture flying around spying on us?

COLONEL TACKER: Definitely not, Ann. The official Air Force position on flying saucers or space ships from other planets is that we do not deny the possibility that life could exist out there some place and that a visit from outer space could happen. What we say is that to date it has not happened. That is, we have no evidence on hand to prove the existence of space ships or the fact that space travel in reverse is fait accompli.

CORRICK: And yet a lot of people who are intelligent and alert people claim that they actually have seen what must be a space ship from some other planet.

COLONEL TACKER: Well, if they believe this, Ann, it's as a pure act of faith. Actually the Air Force does not deny the fact that many solid citizens have seen objects or phenomena in the sky which have mystified them for a time. In most instances when they reported these sightings to the Air Force we have been able to identify the object or the phenomena that they viewed and in most instances the reporting persons are satisfied with our interpretation.

CORRICK: Sid Davis.

DAVIS: Colonel, in your book you say "there are just not any manned space ships yet." How are you so sure?

COLONEL TACKER: Because to date, Sid, there is no evidence to substantiate such a fantastic claim.

DAVIS: Well you have a lot of reports that are unexplained and this is the way you list them in your book. What about the unexplained ones, the unknown ones?

COLONEL TACKER: Well, the unknown or unexplained cases in the last few years have run about two per cent of the total number of sightings; and in most of these instances the Air Force feels that if more immediate data had been gathered initially at the scene of the sighting, these too could have been explained.

However, we can't go along with the theory of the UFO groups and many of the persons associated with these groups that because we have not come up with a definite answer in a very few cases, that this is an argument for the existence of space ships.

CORRICK: Well Colonel Tacker, what do most of these sightings turn out to be?

COLONEL TACKER: Well, in most cases, Arm, they are either conventional objects seen under extenuating circumstances like high-flying aircraft under odd lighting conditions or in unusual cloud formations, or aircraft seen through a mist or rain, or they are aerial phenomena or astrophysical phenomena such as a mock sun or a bolide, or fireball, meteor, or a planet seen by refraction due to a temperature inversion -- something along these lines.

CORRICK: What is the source of most of these reports? What kind of people call them in to you?

COLONEL TACKER: Oh, a great many people call them in. As I said before, the great majority of these people are patriotic and honest citizens who are mystified by what they see initially and they make their reports to the Air Force to try to find out, number one, I think most of them are motivated, as I said, patriotically -- try to help us. You must remember that the UFO Program, or the Flying Saucer Program, as some people prefer to call it, is a small integral part of our overall air defense mission. By law the U.S. Air Force is charged with the air defense of the United States; and when we get a report of a sighting visually, maybe at some town a few miles away from an air base or on a radar scope, and we do get returns on radar scopes now and then that look as though they are actual objects in the sky; we might scramble an aircraft. By "scramble" I mean get it off immediately, it's an aircraft that's on fighter alert and it goes up to investigate.

In all instances they come back either with a known identification of an airliner or a balloon, or they come back with a negative result, that is they found nothing. Well this is where the UFO program begins, and the technical intelligence people begin at this point and try to identify or come up with an answer for what caused the sighting; either to the observer on the

ground or what caused the return on the radar scope.

DAVIS: Colonel, what about all the charges and speculation that the Air Force has secret documents on file that are conclusions to the UFO situation and refuses to release the information?

COLONEL TACKER: This is pure rubbish, Sid. There are no such documents. I've gone through the files, I've looked thoroughly for any such an Air Force conclusion. I've never found anything to this effect and I'd like to add that the Air Force regulation on this subject, 200-2, paragraph 18 to be exact, cites specifically that UFO sightings will not be classified.

DAVIS: What other countries have frequent flying saucer reports?

COLONEL TACKER: Well, just from my experience and reading many of the reports from our own Aero-Space Technical Intelligence Center, I would say that, really, the countries that have most of the reports would be Australia, New Zealand, England and the South American or Spanish-speaking countries.

DAVIS: What about Russia?

COLONEL TACKER: That's a difficult question. We have received on occasion through our own sources over there, people stationed within Russia at various times, second-hand reports of the fact that UFO's or flying saucers have been seen there, but naturally we receive no direct result from Russian authorities on this subject.

DAVIS: Well, do Russian scientists tell you anything about their investigations of these things? Do they do anything about these reports in Russia that you know of?

COLONEL TACKER: Not that I know of, Sid; no.

CORRICK: Colonel Tacker, since the Air Force has begun investigating these sightings have these reports increased or decreased?

COLONEL TACKER: Well I'd say they've been definitely on the decrease, Ann. We had a couple of peak years, as I pointed out in the book, fifty-two and fifty-seven. In 1952 we quite a rash of sightings that seemed to start with the famous Washington, D. C. sightings, in 1952, and in 1957 we had a tremendous rash of sightings all over the country right after Sputnik I was launched.

CORRICK: I see. Well, how many have you had, say this year, as compared to last year?

COLONEL TACKER: Well --

CORRICK: A great decrease, a great increase?

COLONEL TACKER: I'd say a great decrease. I believe to date we've had under two hundred reports for this year.

CORRICK: Earlier you mentioned that the unexplained sightings ranged in the two per cent area...

COLONEL TACKER: Approximately two per cent for the last four or five years. Let me go out -- this is a claim, really, of some of the UFO groups in claiming that the Air Force withholds information on this subject. They say that we give an erroneous figure when we give two per cent and I have been very careful to stress that that is in the last five years. Initially in the program, I'd say that UFO unknowns ran as high as twenty per cent back in the 1940's. Again this was due to the fact that it was an entirely new area to explore, our investigative techniques weren't up to what they are now, we didn't have facilities at our disposal then like -- let me give you a real good example: the National Space Surveillance Center at Bedford, Massachusetts which can tell you on the first orbit if Russia or the United States has put something up. And certainly this unit at Bedford would be able to

tell us if space ships were in our skies.

DAVIS: Colonel, you're very positive about your feeling that if there's no evidence to substantiate these sightings, there is no such thing. This two per cent figure -- isn't it entirely possible that life on other planets has progressed beyond ours, and that perhaps they have invented a space ship that is possible of coming to planet earth and of zooming around here and then going back? Isn't this in the realm of possibility?

COLONEL TACKER: It is absolutely possible, Sid, that life exists on other planets; it's also possible that it could be of a higher order of intelligence than our own; but the last point you make about them visiting our atmosphere and zooming around and looking us over, I'd say again it's not possible up to now; that is, we have no evidence to date. And let me reiterate that that's the problem -- not if it could happen or in the future, definitely we can see that it could, that there definitely is a possibility of life out there. What we say that is up until now we have no evidence to say we have been visited from other planets.

CORRICK: Well Colonel, there have been many clubs and organizations established of people who really and honestly believe that there are these space ships zooming around, as Sid says. I'm sure you're familiar with most of them. Who are these people, who are the believers?

COLONEL TACKER: Well, Dr. Allen Heinick, our civilian consultant on this subject, and he happens to be the head of astrophysics at Northwestern University and the head of the observatory there, he calls them "cosmic romantics" and I think that's a good name. I think it's a fascinating subject myself; and as Dr. Heinick says, he'd like to see a space ship show up and be able to announce it. And there again I feel that if this did happen

the Government would announce it immediately. In fact, an event of this significance I feel positive that one agency in the Government, like the Air Force, could not repress such information. I feel that it would be in the public domain almost immediately if an event of this significance did take place.

As to the people that make up these groups, a lot of them are people like you and I that are interested in this technological age of ours. I was talking to Willy Ley, the famous rocket researcher, the day before yesterday and he pointed out that we have over thirty-three pieces of hardware circling the earth right now, which is a tremendous number of artifacts to be up there whirling around. They're not all satellites; some of them are second-stage, third-stage pieces of rockets, but they're up there. And I think the public itself is getting very used to this type of thing. That's why I prophesized in the book that the flying saucer era itself is coming to an end.

CORRICK: How do you mean that?

COLONEL TACKER: Well, I believe, really, that the flying saucer era is similar to the great accent on spiritualism which took place at the turn of the century; and I believe that the public will find some other romantic subject to become imbued in and go on to it, rather than flying saucers. We're becoming used to space and it looks as though we're going to put a man into space real soon and I think this will really signify the end of the so-called saucer era.

DAVIS: Can we get back to the flying saucer clubs, et cetera? What's in it for people who become avid fans of the UFO? The people who promote the reports, the people who constantly write you letters?

COLONEL TACKER: Well, I believe, Sid, that there's a big dollar-sign involved in this subject. I think that -- well I know -- that many books and many articles are written on this subject; dues are paid to these clubs; although most of the clubs do say that they are nonprofit in nature, that they are simply dedicated to public knowledge, really, getting the information out. The groups themselves, as I said, are composed to a large extent of interested people like you and I in this scientific age that we happen to be in.

DAVIS: Some of these people, some of these so-called flying saucer buffs, or fans, or fanaticists, have tape-recordings, they have statements that they've talked to people on Venus -- Mars -- they make lectures saying that they've seen lovely women up there; what about these people? Are you going to use the term "crackpot" to describe them?

COLONEL TACKER: Oh, I think there are crackpots involved, Sid, as there are in any belief of this nature; but here's a real interesting fact about these groups. They're strongly divided between the so-called "contactees", the people that actually rush off and visit Venus and Mars at the drop of a hat, and the so-called "euphologists", the people who say that they've had no contact to date but they're sure that there are space ships from other planets looking us over. These groups even fight amongst themselves and the euphology group, the groups that investigate flying saucers, actually call the contactees crackpots. It's real interesting.

CORRICK: Colonel Tacker, just exactly what is the objective of these groups, these people? What do they want the Government to do?

COLONEL TACKER: Well, that's hard to say. They say that there's been a great deal of secrecy in Government; they absolutely overlook the need

for intelligence, intelligence classification in Government; and they feel that really we could be in great danger from space ships, maybe a greater danger than any that exists on earth.

Actually at this point I guess I should say again what I've said many times -- that there is nothing in the Air Force files, either classified or unclassified, which proves or tends to prove the existence of space ships from other planets.

CORRICK: Do you think the Air Force -- or this Government -- is now doing everything it possibly can to track down this controversy?

COLONEL TACKER: I'm absolutely positive in my own mind that our Government is doing everything it can and as an instance let me cite the vast scientific resources that the Government itself has at its disposal and by this I'm talking about the Air Research and Development Command which would include our basic research laboratories, the Air Materiel Command, scientific consultants from many different laboratories of our colleges and universities, industrial laboratories, instantaneous communications world-wide; anywhere in the world that there is a sighting, we can be talking to them in a matter of minutes.

And then compare this, really, to the really pathetic effort of a small group of euphologists who have a typewriter and read a newspaper account of the thing, and -- you see you can't really compare. It's an extreme contrast, really. And the Government does go out and investigate these things in meticulous detail; it gives its answers; and of course here's where we're questioned in our interpretation by these groups who are convinced that they're space ships. I'm sure we're not going to change the mind of a person who believes in space ships and we don't want to necessarily try. We do want to

convince them that the United States Government and the Air Force is not withholding any information on the subject.

DAVIS: Right now we're sitting in the Pentagon. Now supposing I leave here, I go outside, and I see something that looks like a cigar up in the sky. What happens? I run back inside here and I tell somebody. What do you do?

COLONEL TACKER: Well, if you came back into the Pentagon and reported it to us, I would immediately report it to the nearest air base, which is the initial course of action that any citizen should take. The air base will conduct a preliminary investigation and if in the preliminary investigation they cannot identify the object, it will be referred immediately to the Air Defense Command and the Aero Space Technical Intelligence Center, where it will be run down eventually by their investigators.

DAVIS: What prompts a scramble, then? If I'm the only person that saw this, would there be a scramble just on the basis of what I saw?

COLONEL TACKER: No; not on the basis of just one individual sighting. The air base would be alerted immediately, as I said, the nearest air base. And they in turn would immediately ascertain if many people had seen it.

DAVIS: How long does it take to run something like that down? A matter of minutes -- hours, days? Weeks?

COLONEL TACKER: Well, I'd say the initial preliminary investigation would be done very quickly; in this particular case, in this area, it would be a matter of minutes. Because we probably have many aircraft in the air over Washington both from Andrews Air Force Base and Bolling Air Force Base; possibly some of our interceptors would be up on a training mission and could be

diverted very quickly to the area; we could probably pin this down in a matter of minutes.

CORRICK: Is there any particular time of year, Colonel Tacker, when these sightings are more frequent?

COLONEL TACKER: Well, yes, Ann; in the gold spring and summertime when people are outside and are looking up. I don't imagine we had many reports on this Eastern seaboard in the last two or three days because most people have been inside next to their fires.

CORRICK: Is there any particular area of the country that you get greater numbers of reports...?

COLONEL TACKER: No, it seems to be rather evenly spread throughout the country.

CORRICK: I know we've had quite a few stories from our station in Cleveland, Ohio; and it seems to me they are seeing an awful lot of flying saucers in Cleveland.

COLONEL TACKER: I don't think Cleveland is more guilty than any of the other cities. Cleveland and Akron do have rather active UFO groups out there which are probably stressing again and again, and again, the fact that space travel in reverse is an accomplished fact. But I don't think we could take any one section or one city and pin it down and say that they reported more UFO's than anybody else.

DAVIS: What about phases of the moon? Does that have any effect on reports of UFO's?

COLONEL TACKER: Not noticeably, Sid. This has been looked into.

DAVIS: Is that right?

COLONEL TACKER: Yes, Sir.

DAVIS: You've examined the effect of --

COLONEL TACKER: Yes Sir. When I say the Aero Space Technical Intelligence Center, I'm talking about technical intelligence and technical services across the board. And this includes the psychological aspects of a thing like this.

CORRICK: Colonel Tacker, you're checked out as a pilot; you're checked out in jets;

COLONEL TACKER: I'm a master navigator.

CORRICK: Are you...

COLONEL TACKER: Yes, Ma'am.

CORRICK: At any rate you know the potential of things to come;

COLONEL TACKER: I'm qualified in current jet aircraft; multi-engine jets, yes ma'am.

CORRICK: Well do you honestly believe that we ever will put a man on the moon, a man into space?

COLONEL TACKER: I'm sure of it, Ann. I'm sure we'll put a man into space and eventually on the moon. I think it's our new frontier.

CORRICK: Someone else has picked up that phrase too, lately. Well do you believe personally that there is life on other planets? Aside from your official Air Force position?

COLONEL TACKER: I believe there's a strong possibility that there's some type of life out there, either vegetable or otherwise, Ann, and I think we'll probably discover it some day.

CORRICK: How did you get interested in this project of UFO's?

COLONEL TACKER: Well, it wasn't a matter of getting interested in it, Ann; when I was assigned in the Pentagon this was one project that was given to

ns. Incidentally, there's one little phase of this where some of the UFO people say we do withhold information; they will go to an individual air base or someplace else and ask for given details on a specific case; and they're referred up to this office, where we have the big picture. We know that ATIC is working on it out in Ohio -- Aero Space Technical Intelligence people -- we know that the air base is doing something, and we know what investigative group is on it. And they're referred up here mainly because we have the big picture.

DAVIS: Colonel, you're a man that does a lot of flying, and the airlines pilots do a lot of flying, and these are competent people;

COLONEL TACKER: Absolutely!

DAVIS: --serious people; a lot of airline pilots have made statements in the past that they are convinced that they saw something that might have come from another planet, that was an object flying -- not a mirage, not a refraction of any kind, not a sky-hooked balloon. Now how do you answer these questions?

COLONEL TACKER: Well I'm convinced that they saw something, Sid; but I'm also convinced they didn't see a space ship as yet; many things enter into a pilot's way of life. Some fatigue, vertigo -- that type of thing. Many of them have seen lights which they couldn't identify for the moment, and a moment later they were identified as a light on the ground.

CORRICK: Colonel Tacker, I'm sorry to interrupt, but our time is up. Thank you for providing a Washington viewpoint about flying saucers. Our guest on Washington Viewpoint tonight has been Colonel Lawrence J. Tacker, Chief of the Magazine and Book Branch of the United States Air Force Office of Information. This program originated tonight in Colonel Tacker's office in the Pentagon. This is Ann Corrick with Sid Davis.

RETURN TO
USAF Historical Archives -
ASI(ASHAF-A)
Maxwell AFB, Ala 36112

SMG

Left side:
1. Committee on Science and Astronautics
2. U. S. Congress - Committee of the House

Right side:
1. Overton Brooks
2. Joseph Edward Karth
3. John W. McCormack

Pocket:
1. Committee on Science and Astronautics, Hearing
2. Committee on Science and Astronautics, Staff Study

7-3745 - 373
IOC3865

[COMMITTEE PRINT]

4 JUL 2 5 1960
Copy

PROJECT MERCURY

SECOND INTERIM REPORT

STAFF STUDY

OF THE

COMMITTEE ON SCIENCE AND ASTRONAUTICS
U.S. HOUSE OF REPRESENTATIVES
EIGHTY-SEVENTH CONGRESS
FIRST SESSION

[Serial h]

MAY 26, 1961

Printed for the use of the Committee on Science and Astronautics

U.S. GOVERNMENT PRINTING OFFICE
WASHINGTON : 1961

70258 O

COMMITTEE ON SCIENCE AND ASTRONAUTICS

OVERTON BROOKS, Louisiana, *Chairman*

GEORGE P. MILLER, California
OLIN E. TEAGUE, Texas
VICTOR L. ANFUSO, New York
JOSEPH E. KARTH, Minnesota
KEN HECHLER, West Virginia
EMILIO Q. DADDARIO, Connecticut
WALTER H. MOELLER, Ohio
DAVID S. KING, Utah
THOMAS G. MORRIS, New Mexico
BOB CASEY, Texas
WILLIAM J. RANDALL, Missouri
JOHN W. DAVIS, Georgia
WILLIAM F. RYAN, New York
JAMES C. CORMAN, California
JOHN W. McCORMACK, Massachusetts

JOSEPH W. MARTIN, Jr., Massachusetts
JAMES G. FULTON, Pennsylvania
J. EDGAR CHENOWETH, Colorado
WILLIAM K. VAN PELT, Wisconsin
PERKINS BASS, New Hampshire
R. WALTER RIEHLMAN, New York
JESSICA McC. WEIS, New York
CHARLES A. MOSHER, Ohio
RICHARD L. ROUDEBUSH, Indiana
ALPHONZO BELL, California

CHARLES F. DUCANDER, *Executive Director and Chief Counsel*
Dr. CHARLES S. SHELDON II, *Technical Director*
SPENCER M. BERESFORD, *Special Counsel*
PHILIP B. YEAGER, *Special Consultant*
JOHN A. CARSTARPHEN, Jr., *Chief Clerk*
FRANK B. HAMMILL, Jr., *Counsel*
RICHARD P. HINES, *Staff Consultant*
HOWARD J. SILBERSTEIN, *Staff Consultant*
RAYMOND WELCOME, *Staff Consultant*
C. OTIS FINCH, *Assistant Clerk*
JOSEPH FELTON, *Publications Clerk*

LETTER OF TRANSMITTAL

HOUSE OF REPRESENTATIVES,
COMMITTEE ON SCIENCE AND ASTRONAUTICS,
Washington, D.C., May 26, 1961.

HON. OVERTON BROOKS,
Chairman, Committee on Science and Astronautics.

DEAR MR. CHAIRMAN: There is forwarded herewith for committee consideration a report entitled "Project Mercury—Second Interim Report."

This report on this country's only man-in-space program has been prepared as an aid to the Congress and the public. The report summarizes the current status of Project Mercury and assesses the accomplishments to date which have culminated on May 5, 1961, with the successful ballistic flight of Comdr. Alan B. Shepard, USN, the first U.S. astronaut to experience the environment of outer space.

This report was prepared under the supervision of Mr. Howard J. Silberstein, who wrote the introductory summary, the conclusions, and edited the report. The bulk of the information was provided by the Office of Space Flight Programs, National Aeronautics and Space Administration. Information on military support of the project was provided by the Department of Defense.

The report has been given proper staff review prior to its submittal to you for consideration.

CHARLES F. DUCANDER,
Executive Director and Chief Counsel.

CONTENTS

	Page
Introduction	1
Background	2
Project Mercury major rocket tests (table I)	2
Ground instrumentation plan for Project Mercury (table II)	3
Personnel Manning requirements, Mercury worldwide tracking and communications network (table III)	4
Department of Defense support of Project Mercury	5
Estimated costs of DOD support of Project Mercury (through MR-7 and MR-8) (table IV)	6
Project Mercury funding summary	6
Why man in space	7
Origin of program	8
Summary of progress to date	9
Future goals	11
General Description	12
The Mercury Manned Capsule System	16
Basic capsule structure and heat shielding	16
Retrograde rockets	20
Escape system	20
Landing and recovery system	20
Environmental control system	21
Attitude control system	21
Pilot support and restraint	23
Communications (onboard)	23
Instrumentation system	25
Electrical power supplies	25
Capsule deliveries	26
Flight Program	26
Little Joe	29
Big Joe	30
Beach abort flight	32
Mercury Atlas-1	32
Mercury Atlas-2	32
Mercury Atlas-3	34
Mercury Redstone-1	34
Mercury Redstone-2	34
Mercury Redstone booster development test	37
Mercury Redstone-3	37
Future flight programs	37
Tracking and Communications Network	40
General	40
Station capability (table V)	43
Major functions of each station	44
Ground communication system	48
Station phasing and implementation progress	51
Computations for Project Mercury flights	52
Network checkout procedures	53
Operations	54
Hangar checkout of capsules	54
Launch vehicle checkout	55
Checks during mate of booster and capsule	55
Flight Safety Review Board	57
Prelaunch countdown	57
Mercury Control Center	57
Flight simulation	63
Operational procedures during mission	63
Operational procedures near orbit insertion	63
Recovery	65

	Page
Astronaut Program	67
Flight simulators	67
Pilot activities during flight	74
Program Management and Support Organization	75
Project Mercury Funding	78
Conclusions	79
Appendix	81

PROJECT MERCURY—SECOND INTERIM REPORT

Introduction

The Honorable Overton Brooks, Chairman of the Committee on Science and Astronautics, during the second session of the 86th Congress, submitted to the U.S. House of Representatives the First Interim Report on Project Mercury, dated January 27, 1960. Almost 1½ years have passed since the issuance of that report. This committee report described the goals, the research and development program underway to achieve the program goals and the training program for the Astronauts. The purpose of this report is to summarize the current status of the Mercury project, to assess accomplishments to date and acquaint the Congress and the public with a feel for the tremendous complexity of the problem of putting a man into Earth orbit, sustaining his life in a space environment and recovering him safely.

Project Mercury is currently this Nation's effort to place a man in space at the earliest possible time. Since its inception, both the National Aeronautics and Space Administration and the Department of Defense have mapped out more comprehensive manned space flight programs. However, these later projects, named Apollo and Dyna-Soar, must depend upon the successful development of larger space boosters such as Saturn, Titan II, Atlas G, or perhaps a newly conceived large solid rocket arrangement. Because Apollo and Dyna-Soar depend upon as yet unflown, larger boosters and are designed to project more than one man into Earth orbit, it is not expected that either of these projects will be capable of placing manned paylonds in orbit for 6 to 8 years. Project Mercury is expected to provide many answers for these future manned space programs—answers which must be obtained concerning manned space flight environment, and man's ability to perform a useful function in space as soon as possible. Consequently, Project Mercury is being prosecuted by NASA, assisted by the DOD, with the utmost sense of urgency. Mercury enjoys top national priority as approved by the President of the United States. It carries DX priority rating.

Project Mercury represents the Wright Brothers phase of space flight. It is sure to appear as crude and daring-do to future generations as the clumsy wood and cloth "kits" of aviation's bygone era. Both represent major phases in man's technological development. Both have experienced controversial criticism on the one hand and admiration for the courage, dedication and vision of the men who strive for achievement on the other hand.

Background

Project Mercury is now 2½ years old. Since its inception, an extensive wind tunnel and flight test program has been carried out, involving hundreds of wind tunnel and airplane drop tests and 12 successful major rocket launchings, including the first manned suborbital flight with Astronaut Alan B. Shepard, out of 15 attempts. The box score is contained in table I. The Mercury production capsules have been designed, engineered and tested. A major network of communications and tracking stations is nearing completion (table II), and training exercises of both the systems and the astronauts are progressing. Table III contains the current manning level requirements for the worldwide tracking and communications network.

TABLE I.—*Project Mercury major rocket tests*

Booster vehicle	Objectives		Purpose of test
	Achieved	Not achieved	
Little Joe I	X		Test launch vehicle.
Little Joe II	X[1]		Test capsule escape system.
Little Joe III	X		High altitude abort and capsule stability.
Little Joe IV	X		Repeat of Little Joe II.
Little Joe V		Capsule did not separate.	Capsule abort test under severe conditions.
Little Joe V–A	X[1]		Production capsule qualification test.
Little Joe V–B	X		Repeat of Little Joe V–A.
Atlas Big Joe	X		Validation of ablation heat shield and capsule dynamic stability during hypersonic reentry.
Mercury Atlas I		Atlas destroyed	Maximum reentry heat test.
Mercury Atlas II	X		Repeat of Mercury Atlas I.
Mercury Atlas III		Atlas destroyed	Unmanned orbital attempt.
Mercury Redstone I	X		Capsule qualification under normal ballistic flight conditions.
Mercury Redstone II	X		Test of capsule life support system with chimpanzee "Ham."
Mercury Redstone Booster Development	X		Flight quality booster control system changes.
Mercury Redstone III	X		First manned suborbital flight with Astronaut Shepard.

[1] Partially achieved.

TABLE II.—*Ground instrumentation plan for Project Mercury*

Station name	Coverage, revs	Radar S	Radar C	Telemetry reception	Command (capsule)	Communication control	Acquisition FA	Acquisition SA	Acquisition M	Ground communications Voice	Ground communications TTY	Ground communications SSB (voice)	Ground communications Timing
Canaveral	1, 2 and 3	(X)	X	X	X	X	X	(X)	X	X	X		AMR
Grand Bahama	1, 2 and 3		(X)	X	X	X	X		X	X	X	X	AMR
Bermuda	1, 2 and 3	X	X	X	X	X	X		X	X	X	X	X
Atlantic ship	1, 2 and 3			X	X								X
Grand Canary Island	1 and 2	X		X	X	X	X	X		X	X	X	X
Kano, Nigeria	1 and 2												
Zanzibar	1 and 2												
Indian Ocean ship	1 and 3			X	X						X		X
Woomera, Australia	1, 2 and 3	X		X	X	X	X			X	X	X	X
Canton Island	1 and 2		X	X	X		X			X	X	X	X
Kauai Island, Hawaii	1 and 2												
Point Arguello, Calif	2 and 3		X	X	X	X	X			X	X	X	X
Guaymas, Mexico	2 and 3												
White Sands, N. Mex	1, 2 and 3	X	X	X	X	X	X			X	X	X	X
Corpus Christi, Tex	1, 2 and 3												
Eglin, Fla	1, 2 and 3	X	X	X	X	X	X			X	X	X	X
Goddard Space Flight Center[1]	1, 2 and 3	(X)											

[1] MPQ–31.

Site functions: FA—fully automatic; SA—semiautomatic; M—manual; SSB—single sideband.

[1] Ground communications

TABLE III.—*Permanent manning requirements, Mercury worldwide tracking and communications network*

Site	M and O personnel	Organization responsible
Cape Canaveral	34	DOD-AMR.
Grand Bahama	4	Do.
Grand Turk	3	Do.
Bermuda	40	NASA-Contract.
Atlantic Ship	10	DOD-AMR.
Canary Islands	24	NASA-Contract.
Kano	20	Do.
Zanzibar	20	Do.
Indian Ocean Ship	10	DOD-AMR.
Muchea, Australia	26	WRE[1]
Woomera, Australia	23	Do.
Canton Island	23	DOD-PMR.
Hawaii	27	Do.
West Mexico	26	NASA-Contract.
California	23	DOD-PMR.
White Sands	7	DOD-WSMR.
Texas	23	Do.
Eglin	7	DOD-ARDC.

[1] WRE—Weapons Research Establishment, Woomera, Australia.

The project has now crossed the threshold of a major flight test program of short- and long-range ballistic flights, leading first to unmanned, and later on to manned orbital flights late in 1961 if all goes well.

Project Mercury is being pursued with the greatest sense of urgency. This urgency stems from the fact that the project will supply answers to many questions that must be answered before one can proceed with the next step in the manned space flight program. Before future programs can go very far downstream, much must be learned about man's capabilities in space and about the general technology of manned spaceflight.

As mentioned previously, Mercury carries a national DX priority rating. But a DX priority rating alone does not assure that a project will move forward with great speed. The implementation of a project such as Mercury demands, on a continuing basis, boundless energy, enthusiasm, and determination. Work on Project Mercury, both at the contractor's facilities at St. Louis, Mo., and the Mercury facilities at Cape Canaveral, is proceeding on a three-shift, 7-day-a-week basis. All members of the Mercury team, be they in NASA, DOD, or in private industry, are making every effort to meet the goals established for them.

It must be recognized, however, that Project Mercury is a research and development program, and therefore, does not lend itself to the firm type of scheduling that typifies a production program. Instead, it is only possible to establish target dates with the full recognition that such target dates must be changed as new knowledge is gained or the complexity of the problems confronting the development become more clearly defined and schedules reoriented to overcome them. After all, if there were no problem to overcome, there would be no need for a research and development program.

In Project Mercury, target dates have been established for every facet of the operation. These include target dates for delivery of components, subsystems and complete capsules. Also included are target dates for capsule preparation sequences and launch periods

for all flight tests. As is always the case in a complex research and development program, some of these target dates have been met ahead of schedule, others on schedule and some behind schedule. Setbacks in the flight test qualification program have become apparent and should come as no surprise since this is the most critical point in any development program. All of the major missile and aircraft programs have experienced them. This is a natural result of the bringing together into an integrated system all of the many new developments which go into the makeup of the project. The proof of the design is in the flight test program, and target dates are not predicated upon failure, but upon success.

Perhaps the most important target date in the overall Mercury schedule is that for achievement of manned orbital flight. Dr. Dryden, Deputy Administrator of NASA, in congressional testimony in 1958, implied that this mission could be accomplished sometime in 1961. If no setbacks are encountered during the flight qualification program, it is possible that this target date may be met. However, as stated earlier in this report, the critical period in the flight test program is just now upon us, and Dr. Dryden's statement must be considered as a project target goal to be strived for and not a hard statement of fact.

Department of Defense support of Project Mercury

The Department of Defense provides a very broad range of support to Project Mercury. The Air Force Ballistic Missiles Division supplies and launches Atlas vehicles. The Air Force also provides air rescue service aircraft for capsule search and recovery operations, mapmaking services of the Aeronautical Chart Information Center, the loan of aircraft for network station checkout, and astronaut normal flight and zero-g training, Atlantic Missile Range launch facilities, control center facilities, medical support at Cape Canaveral and remote stations, and the use of existing network facilities and manpower at several Mercury network stations. The Aerospace Medical Center of the Air Force has also given assistance in astronaut training and has supplied animal test packages for use during the Mercury flight test program.

The Army has loaned tracking equipment to NASA, has made White Sands Missile Range ground facilities available for network use, and will provide a substantial share of DOD medical support to Project Mercury; has supplied communications equipment and amphibious vehicles for use in possible launch site recovery operations. The Army Redstone launch vehicle will be used for unmanned and manned ballistic flights.

The Navy has been given and accepted the responsibility for the Mercury spacecraft recovery operations. The Navy recovery commander will have elements of the Atlantic Fleet and Air Rescue Service at his command for effecting rapid recovery of the capsule. Destroyers, landing ships, dock, miscellaneous service vessels, Marine helicopters, patrol aircraft, and early warning aircraft will all be utilized for search and recovery operations.

The Navy is also providing assistance in the construction of the Canton Island network station, has loaned commander transmitter equipment to NASA, and has given a number of tracking radars to NASA.

The Naval Air Materiel Center, Naval Air Development Center, Naval parachute facility and Naval medical units all have given substantial support to NASA. In addition, the Pacific Missile Range, under Navy management, is aiding in the operation of the Canton Island, Hawaii, and southern California tracking stations.

Supports by units of the Department of Defense has, in general, been formalized through a series of agreements between NASA and the particular military service concerned. As a rule, these agreements call for reimbursement by NASA for any support or services rendered over and above normal military operations. Estimated costs of DOD support are contained in table IV.

TABLE IV.—*Estimated costs of DOD support of Project Mercury (through MR–7 and MA–8)*

[Thousands of dollars]

DOD unit/command	Estimated total costs	Portion reimbursed by NASA	Balance absorbed by DOD [1]
AFMTC	3,188	1,500	[2] 1,688
AFBMD	54,350	[3] 53,900	450
ADOC	130	8	122
ACIC	185	[4] 185	
WSMR	693	503	190
PMR	1,532	1,192	[5] 340
Air Rescue Service	5,396	[6] 1,396	
Navy recovery forces	18,833	5,135	[6] 13,698
Bioinstrumentation:			
Operational	560	100	460
R. & D.	1,425	496	929
U.S. Army, LARC Supply	114	34	80
GEEIA	158	152	306
NASA space task group	200	200	
Total	89,347	64,794	17,553

[1] These estimated costs are not supported by or obtained from any accounting system. They are assembled by estimating the cost of effective man-days effort which is applied to Project Mercury by DOD personnel who would have been employed by DOD whether or not Project Mercury were supported.

[2] Includes $688,000 to construct a building to replace Telemetry-3 Building, which is being used as Mercury control center. Includes estimated cost of range support of Mercury.

[3] The AFBMD reimbursable costs are based on a 14-booster, 18-launch Mercury program. These estimated costs were prepared as of July 31, 1960, in conjunction with the development plan covering AFBMD support of Project Mercury. As such, they are subject to current and future negotiation, refinement, and/or approval by NASA. This is a continuing process as the program develops and as the requirement for boosters and/or launches changes.

[4] Appropriate action to obtain reimbursement is in process of negotiation.

[5] Includes nonreimbursed cost of Navy Construction Battalion work at Canton, and cost of general purpose range support of Project Mercury.

[6] Cost of operations and maintenance of Navy Recovery Forces are being reimbursed by NASA in accordance with agreement between CNO/NASA (STG) dated Mar. 23, 1960.

Overall coordination of Department of Defense support for Project Mercury operations is arranged between Maj. Gen. Leighton I. Davis, USAF, Department of Defense representative for Project Mercury operations, and Mr. Walter C. Williams, Associate Director of Project Mercury.

Project Mercury funding summary

Initial funding for Project Mercury was provided in fiscal year 1959, when $46,416,330 was obligated for Mercury research and development, and $2,425,000 for construction and equipment.

In fiscal year 1960, the obligation for research and development totaled $84,328,370, and for construction and equipment, $35,795,000. The fiscal year 1960 figures include supplemental funding of $12,200,000 for research and development, and $6,800,000 for construction and equipment.

Early in fiscal year 1960, Congress was advised that NASA intended to transfer $15 million from research and development appropriation to construction and equipment for construction of the Mercury network. The fiscal year 1960 figures reflect this funding transfer.

For fiscal year 1961, the current allocation of funds is $110,051,000 for research and development, and $15 million for construction and equipment. A request for $74,245,000 is currently contained in the NASA authorization request for fiscal year 1962. The section on Project Mercury funding projects a total funding requirement through fiscal year 1962 of $368 million. The validity of this figure is subject to the success of meeting the flight test target dates and could go as high as $500 million in the estimation of the committee staff.

Why man in space?

In the past, man's scientific and technical knowledge was limited by the fact that all of his observations were made either from the Earth's surface, or from within the Earth's atmosphere. Now, man can send his measuring equipment on satellites beyond the Earth's atmosphere, and into space beyond the Moon or lunar and planetary probes. The benefits to man that have been derived from these initial ventures into space are too numerous to be recounted here; but the exploration of space, in its truest sense, will begin only when man himself can participate directly in this exploration.

Man is destined to play a vital and direct role in the exploration of the Moon and the planets. In this regard, it is not easy to conceive that instruments can be devised that can effectively and reliably duplicate man's role as an explorer, a geologist, a surveyor, a photographer, a chemist, a biologist, a physicist, or any of a host of other specialists whose talents would be needed. In all of these areas, man's judgment, his ability to observe and to reason, and his decision-making capabilities are required. Only man can cope with the unexpected; and the unexpected, of course, is the most interesting.

The search for extraterrestrial life, for instance, is a problem of formidable difficulty for pure instrumentation systems, that is much more easily within the scope of man's abilities. Even in more prosaic endeavors such as photography, it is extremely challenging to duplicate man's ability to select pertinent subject matter and optimum photographic methods, to focus and choose the most profitable instant for exposure, to recognize that his view is obstructed, or even to note that the lens has become dirty.

Closer to Earth, man's special abilities would be employed in manned orbiting space laboratories, or space stations. Man's observational, analytical, and functional capabilities can provide an advantage in the conduct of a range of meteorological, communication, broadcasting, mapping, and search activities in orbiting vehicles. Orbiting laboratories will also permit the investigation and proof testing of vehicular components and operating techniques required for the development of other advanced space vehicles and missions. Of note in this area are the evaluation of micrometeorites and radiation damage to space materials, the development of space propulsion systems, the study of spacecraft erection and construction, the investigation of rendezvous

techniques, and the detailed assessment of the long-duration capabilities of man in a weightless environment.

The initial step in providing the capabilities for the manned exploration of space is Project Mercury. This project is designed to put a manned satellite into an orbit more than 100 miles above the Earth's surface, let it circle the Earth three times, and bring it back safely. From Project Mercury we expect to learn how man will react in a space environment, what his capabilities will be, and what must be provided in future manned spacecraft to allow man to function usefully. Such knowledge is vital before man can participate in other, more difficult, space missions.

But the determination of man's capabilities in a space environment is only one of the benefits that will be derived from Project Mercury. Of equal importance is the technical knowledge being gained during the design, construction, and operation of the first vehicle specifically engineered for manned flight in space. The accomplishment of Project Mercury will mark a tremendous step forward; man's venture into space will immeasurably extend the frontiers of flight. The speed of flight will be increased by a factor of eight over present achievements, and the altitude by a factor of five; the environment encountered in space flight will be one that heretofore has not even been approached. This extension of the flight envelope has required major technical advancements in many diverse fields including aerodynamics, biotechnology, instrumentation, communications, attitude control, environmental control and high-speed parachute development, to mention only a few. By its very advanced nature, therefore, Project Mercury has opened the door for future manned space-flight programs.

Origin of program

The genesis of the Nation's manned space-flight program dates back to research and study efforts carried out in 1956, 1957, and 1958. In those years, studies were made by the National Advisory Committee for Aeronautics, predecessor of the National Aeronautics and Space Administration, and by each of the military services. A detailed description of these early study programs can be found in House Report No. 1298, entitled "Project Mercury—First Interim Report, a Staff Report of the Committee on Science and Astronautics."

In August 1958, the President assigned the responsibility for the manned flight program to NASA, which by that time had been established by law, though it had not yet become an operating agency. At that time, the early work on the capsule concept, the painstaking analysis, design, development, and testing of shapes, had progressed to the point where on August 1, 1958, Dr. Hugh L. Dryden, then Director of NACA and now Deputy Administrator of NASA, was ready to present to the Select Committees of the Congress on Astronautics and Space Exploration, a program which he called technology of manned space-flight vehicles. Dr. Dryden's testimony included the following statement: "This program that we are talking about will lead to a man in space in something of the order of 2 to 3 years, depending on how much luck you have with it."

Although the responsibility for the manned space-flight program was assigned, in 1958, to the National Aeronautics and Space Administration, the project has continued to be a team effort on a national scale that involves, in addition to NASA, facilities and personnel of all the military services, U.S. industry, and research institutions. The degree of cooperation between NASA, DOD, industry, and other institutions will become apparent in the body of this report.

In September 1958, a joint NASA–ARPA Manned Satellite Panel was established. This panel, with the aid of detailed studies by staff members of the NASA Langley and Lewis Research Centers, and with the advice and assistance of the military services, formulated specific plans for a program of research leading to manned-space flight. The specific plans derived by the Manned Satellite Panel were presented to the Director of the Advanced Research Projects Agency and to the Administrator of the National Aeronautics and Space Administration on October 3 and 7, 1958, respectively. Upon the approval by the Administrator of the NASA on October 7, 1958, a space task group was organized from personnel of the NASA Langley and Lewis Research Centers and immediately began operations at Langley Field, Va. The space task group was given direct responsibility for implementing Project Mercury.

Summary of progress to date

In January 1959, McDonnell Aircraft Corp. was selected as the prime contractor to design and construct the Mercury capsules. The selection was based on an industrywide competition: 12 firms submitted proposals based on NASA specifications for the satellite capsule. After a thorough evaluation of these proposals, the contract was awarded to McDonnell.

The compressed time-phasing of the project, between inception and scheduled flight, has required that research, development, design, and fabrication be undertaken simultaneously. Thus, while the McDonnell Aircraft Corp. was implementing the initial design phases of the Mercury production capsules, a broad research and development program was being carried out. This program included scientific and engineering investigations using a wide variety of technical equipment to determine a suitable shape for the manned satellite capsule.

Following these investigations, a flight program was initiated to develop and qualify the various components of the capsule. This flight program included airplane drop tests in which full-scale capsule models were dropped from large cargo aircraft at high altitude. The tests were used to develop a highly reliable parachute system and to determine procedures to be used in recovery operations. In other tests, vehicles were released from fighter aircraft at supersonic speeds to develop and qualify the capsule's drogue parachute. The escape system was perfected by launching full-scale capsules with the escape rocket as the only means of propulsion.

Rocket-boosted flight tests were required to check the capsule and its components over a range of speeds and altitudes. A solid propellant rocket booster, nicknamed "Little Joe" was designed and fabricated especially for Project Mercury. This booster, which develops one-fourth million pounds of thrust at takeoff, was used on a number of occasions to further aid in the qualification of the all-important emergency escape system.

The validity of the Mercury design concept was demonstrated in the fall of 1959, during an Atlas-boosted capsule test nicknamed "Big Joe." In that test a capsule was made to reenter the Earth's atmosphere after being accelerated to nearly orbital speed. The Big Joe capsule, which survived the scorching heat of reentry, was later recovered many hundreds of miles from Cape Canaveral.

To date more than 100 wind-tunnel tests of the Mercury capsule have been performed; and about 150 capsule models have been dropped from airplanes in the parachute development program. The escape system has been tested four times in simulated off-the-pad abort maneuvers, and seven more escape system tests were performed in connection with the Little Joe flights. Mercury escape systems were also activated on two Redstone and Atlas flights when booster performance was abnormal. The excellent condition of the capsule after these escape tests, several of which were unusually severe, increased the confidence in the Mercury escape system. Small monkeys were carried in two of the Little Joe flights and a chimpanzee was flown in a Redstone flight to exercise the life-support system and gain further information on the effects of space flight.

All of the early flight tests were made with so-called boilerplate capsules. These capsules simulate the shape and weight of the Mercury capsules but do not contain many of the systems and subsystems that will be required for manned operation. Boilerplate capsules are of simple construction, utilizing heavy welded sheet metal.

Concurrent with this research and development effort, the design and fabrication of the Mercury capsules was proceeding at McDonnell. Modifications to the design, arrangement, and structure were made during the conduct of the program, as requirements for such changes became evident as a result of the research and development tests. Nevertheless, a structural prototype capsule was delivered in January 1960, and the first production capsule was delivered during March 1960, a scant 13 months after the contract was initiated; such rapid delivery of a device as complex as the Mercury capsule is without precedence. Twelve capsules were delivered by the end of April 1961.

Requirements for the Redstone and Atlas launch vehicles, used in the Mercury program, were also firmed up early in 1959. Continuing cooperation between NASA and the military services has been required to assure compatibility between the Mercury capsules and the launch vehicles.

Four Atlas flights have been launched. Two of these flights provided verification that capsule heat protection was sufficient for the most severe reentry heating conditions. Although the remaining two flights did not achieve the planned objectives, capsule pressure integrity during an inflight booster explosion was demonstrated on one flight, and the spacecraft escape system was successfully demonstrated on the other.

Four Mercury-Redstone boosters were successfully launched. Three of the flights involved production spacecraft and one was a booster development test with a dummy spacecraft.

A highly successful qualification of the man-Mercury spacecraft-booster combination occurred on May 5, 1961, when Astronaut Alan Shepard flew the first manned Mercury-Redstone mission.

The implementation of the orbital phase of Project Mercury will require the use of a global network of tracking and data acquisition stations. A total of 18 such stations will be required at the following locations: Cape Canaveral; Grand Bahama; Grand Turk; Bermuda, a ship in the Atlantic Ocean; Canary Islands; Kano, Nigeria; Zanzibar, a ship in the Indian Ocean; western Australia; Woomera, Australia; Canton Island; Hawaii; southern California; west Mexico; White Sands, N. Mex.; south Texas; and at Eglin Air Force Base. In July 1959, the Western Electric Co. was selected as the contractor to construct and install the equipment at the Mercury network stations. To date, agreements with foreign countries have been finalized, the sites have been prepared, and construction at all sites is complete. The installation of equipment at these sites has also been completed. Nine of the network stations and the two network ships will be maintained and operated by the Department of Defense and its contractors.

Capsule recovery will be effected by the U.S. Navy. Recovery plans were formulated jointly by NASA and the Navy and numerous exercises have been conducted in order to establish the best search and recovery patterns. Realistic tests of these methods were achieved during the successful recoveries following Little Joe, Redstone, and Atlas tests.

Early in 1959, the seven Mercury astronauts were selected. Since that time they have participated in an intensive training program which has now progressed to the point where the men are ready for the first manned ballistic flights. This training program employed NASA simulators, in addition to facilities of the military services. A team of aeromedical monitors has been detailed to NASA from the military services and from the Public Health Service. During future flight operations, these monitors will determine the condition of the astronaut as he passes over each of the network stations and will participate in the recovery and postrecovery activities.

Future goals

Project Mercury is a continuing program of concurrent efforts in research, development, engineering, manufacturing, test, and training, all aimed at the focal point of successful manned orbital flight at the earliest possible time.

Project Mercury is being pursued with the greatest sense of urgency. This urgency stems from the fact that the project will supply answers to many questions that must be answered before one can proceed with the next step in the manned space flight program. Before future programs can go very far downstream, much must be learned about man's capability in space and about the general technology of manned space flight. This, basically, is why it is most important to do Project Mercury, and to do it soon.

Project Mercury has been endorsed by the National Aeronautics and Space Council, and approved by the President, as a program of top national priority. Consequently, it carries a DX priority rating. But a DX priority rating alone does not assure that a project will move forward at a great rate of speed. The implementation of a project such as Project Mercury demands, on a continuing basis, great energy, great enthusiasm, and great determination. Work on Project Mercury, both at the McDonnell plant and at Cape Canaveral, is pro-

70258 O—61——3

ceeding on a three-shift, 7-day-a-week basis. All members of the Mercury team, be they in NASA, in DOD, or in private industry, are making every effort to meet the goals established for them.

It must be recognized, however, that Project Mercury is a research and development program, and, therefore, does not lend itself to the firm type of scheduling that can be maintained on a typical production job. Instead, it is only possible to establish target dates with the full recognition that such target dates must be changed as new knowledge is gained.

In Project Mercury, target dates have been established for every facet of the operation. These include target dates for deliveries of parts, components, subassemblies, systems, and complete capsules; they also include target dates for capsule preparation sequences and launch periods for all flight tests. As is always the case in a complex research and development program, some of these target dates have been met ahead of schedule, others on schedule, some behind schedule. Yet, there is always sufficient flexibility in this type of program to allow for some adjustment of schedules. For example, if a certain subassembly is not received from a vendor on time, work can proceed on the installation of another subassembly; and if the target date for a given flight test is missed, other tests might proceed ahead of schedule.

Perhaps the most important target date in the overall Mercury schedule is that for the achievement of manned orbital flight. As was mentioned earlier, Dr. Dryden in congressional testimony in 1958, implied that this mission could be accomplished sometime during 1961. If no setbacks are encountered during the flight qualification program, it is likely that this target date will be met.

General Description

The Mercury program consists of a number of phases, the culminating phase being manned orbital flight for a period of 4½ hours, or three times around the Earth. Prior to the manned orbital flights, detailed design, research and development, and qualification programs must be pursued. The design phase of the program was largely completed during 1959; however, as a result of the continuing research and development program, many design refinements and design changes have been made in the basic configuration. The largest part of the research and development phase will be completed and the qualification phase of the program was started during 1960. The culminating phase of manned orbital flight should, if all goes well, occur before the end of 1961; this event will be preceded by additional manned ballistic flights in Redstone-launched capsules and unmanned orbital flights, using the Atlas launch vehicle.

Let us now examine the manned orbital mission. The capsule will rest atop an essentially unmodified Atlas launch vehicle as shown in figure 1. The launch will take place at Cape Canaveral, Fla., and will be in a northeasterly direction toward the island of Bermuda. Initial ascent will be almost verticle; as the velocity increases, however, the flight path inclines and, long before the vehicle is over Bermuda, it will be traveling parallel to the surface of the Earth at orbital velocity. The point at which orbital velocity is achieved is called injection.

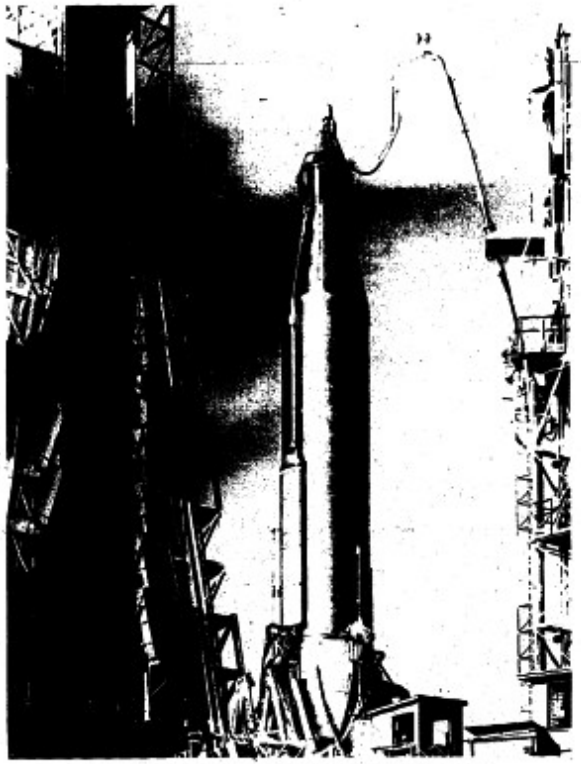


FIGURE 1.—Atlas launch vehicle with development capsule.

At this point the manned capsule, or spacecraft, will be separated from the Atlas launch vehicle and will be traveling at a velocity of about 17,500 miles per hour. Small rocket jets carried on the capsule will then rotate the capsule to orient it in the desired direction in space—that is, with the blunt capsule face forward and with the astronaut's feet pointing toward Earth. The manned spacecraft will then circle the earth three times at latitudes varying from approximately 32° north to 32° south. As the capsule nears the end of its third orbit and is traveling overhead between the islands of Hawaii and the California coast, a retrorocket system will be fired to slow the capsule slightly below orbital velocity. This deceleration from an orbital velocity of about 17,500 miles per hour to the suborbital velocity of approximately 17,150 miles per hour, will cause the capsule to descend earthward; as the capsule descends from its nominal orbital altitude of about 100 miles, it will encounter the denser atmosphere. The aerodynamic drag forces in the atmosphere will rapidly slow the capsule further until it is at a subsonic velocity of approximately 350 miles per hour over the Atlantic Ocean not far from the island of Puerto Rico. At this point, a small stabilizing parachute will be deployed; later, at an altitude of 10,000 feet, deployment of a large 63-foot diameter cargo parachute will take place and the capsule will be gently lowered to the surface of the ocean.

While the capsule is circling the Earth, near-continuous radio contact will be maintained with the astronaut. As the capsule is lowered to the surface of the ocean, location aids such as Sofar bombs will be ejected and direction-finding radio signals will be sent out to aid in rapid location of the capsule. Ships and aircraft in the planned recovery area will then home on the direction-finding signals. Aircraft will guide the recovery surface vessels to the scene of capsule impact.

To this point, a normal mission has been considered, with the assumption that everything goes as planned. As in the case of a manned aircraft with ejection seats and pilot parachutes, provision must be made for unplanned emergencies. Next, some of these provisions that have been made to handle such emergencies as might occur will be considered. First of all, as shown in figure 2, a separate rocket propulsion system, called an escape or abort system, is provided. This will carry the capsule to safety, should the Atlas malfunction while on the launch pad or during the early phases of ascent. The abort system may be energized automatically or by ground control, or by the astronaut himself.

Should an abort or emergency landing be necessary, it is apparent that the capsule will land in other than the planned recovery area. Therefore, provisions must be made for retrieval of the capsule from emergency areas. If the emergency should occur while the capsule and launch vehicle are on the launch pad, the capsule, after firing the escape rocket system, would land within a short distance of the launch pad, and emergency recovery provisions can readily be implemented. Should an emergency condition occur fairly early in the flight while the vehicle is well below orbital velocity, the capsule would land in the area between Florida and Bermuda. This area will be covered with aircraft and surface vessels for possible emergency recovery purposes. If an abort should be required at near-

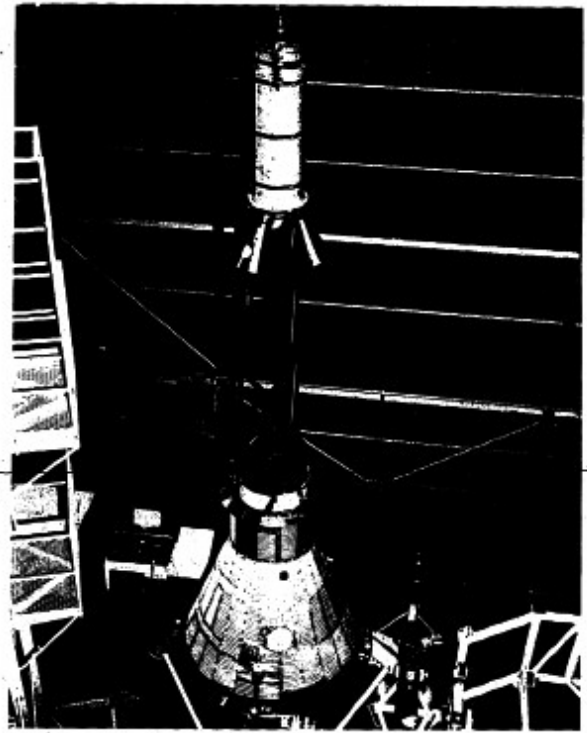


FIGURE 2.—Mercury capsule with escape tower.

orbital velocity, the capsule could land anywhere over a substantial portion of the Earth's surface unless some corrective action is taken. Under such circumstances, the retrorockets of the capsule will be utilized to control the emergency landing point to within one of several planned landing areas in the Atlantic Ocean. These recovery areas will be thoroughly patrolled by aircraft and surface vessels. Recovery forces will also be provided within the landing area that would be reached by ending orbital flight after the first or second orbits.

Within the time period of Project Mercury activities, it is apparent that the reliability of large liquid rockets, such as the Atlas, cannot approach that of conventional manned aircraft systems. Therefore, it is essential that the reliability of the escape system be of a high order. Hence, a major effort is going into the development and qualification of the emergency abort system.

The Mercury Manned Capsule System

A detailed description of the Mercury capsule or spacecraft and associated systems is presented in House Report No. 1228, published in January 1960. Hence, a brief description of each system will be presented in the present report; in addition, recent developments and the current status of the various systems will be discussed.

In considering the status of the capsule and its systems, it is important to remember the compressed timetable on which the Mercury capsule development has proceeded. Concurrent design, development, and production have, of necessity, been undertaken in order to make the most rapid progress possible. Under such conditions, it was inevitable that retrofit and redesign of certain components of the system were necessary as associated research and development programs progressed. The most sophisticated of theoretical analyses and analytical designs cannot anticipate all developmental problems that might arise, and those modifications that might be required. Only experimental investigations of actual prototype hardware can, in many cases, confirm satisfactory equipment operation. In many instances, system deficiencies show up only under actual full-scale flight conditions, even though the most extensive ground testing possible has been carried out.

Basic capsule structure and heat shielding

The Mercury spacecraft, figure 3, has a 74.5-inch maximum diameter with an 80-inch spherical radium heat shield. The afterbody consists of a cone frustum which surrounds the pilot's pressure vessel, a 32-inch-diameter cylinder which contains the parachutes and onboard recovery systems, and a cone frustum which forms a communication antenna and contains the drogue parachute and horizon scanners.

The heat of reentry will be dissipated by a large rounded heat shield. Early Redstone-launched Mercury flights will utilize a beryllium heat sink for this heat shield, whereas later orbital flights will use an ablation heat shield material.

At the time the original Mercury specification was written, the heat sink approach was within the state of the art, while there was no experience with ablation materials for the case of reentry from satellite orbit.

The decision was made, therefore, to design the Mercury capsule so that it could safely reenter the atmosphere with a beryllium heat sink. It was recognized that a vehicle of a shape designed specifically for a heat sink could be fitted, at a later date, with an ablation heat shield.

The approach used, therefore, was a conservative one. If ablation techniques were found to be applicable to satellite reentry, the Mercury capsule could use such materials. On the other hand, if ablation did not prove to be adequate, the Mercury capsule could, without change, accept a beryllium heat sink. As a result of the Big Joe development flight tests made in September 1959, and subsequent analysis of results, a firm decision to go ahead with the use of an ablation heat shield for all the orbital flights was reached. The recovered Big Joe capsule is shown in figure 4. The previously ordered beryllium heat sinks were designated for use in Redstone ballistic flights.

The Big Joe flight test also showed unexpectedly high afterbody heating under the most critical reentry conditions. Although hundreds of wind tunnel tests had been made on the afterbody heating problem, none had been able to duplicate fully the actual full-scale reentry conditions and thus, it took the actual full-scale flight to uncover this problem. In order to withstand this higher heating, the thickness of the external skin on the conic afterbody has been increased, and the construction of the cylindrical part of the afterbody has been changed to beryllium plate in place of the formerly used light-gage metal.

During the Mercury capsule research and development program, it was found that the impact load sustained during a landing on the ground, such as would occur in an off-the-pad abort, could exceed human tolerance limits under certain wind conditions. Therefore, the impact-alleviating or cushioning device, shown on the MR–3 capsule in figure 5, was developed. The cushioning effect is obtained by use of a collapsible skirt which is located between the heat shield and the capsule structure. At the time of parachute deployment, the heat shield is disconnected from the capsule and suspended about 4 feet below the capsule with the collapsible skirt extended. With the heat shield so suspended, the volume between the heat shield and the capsule structure fills with air. Upon impact, the entrapped air escapes through holes in the sidewall of the skirt, thereby acting as a pneumatic shock absorber. Some strengthening of the capsule lower bulkhead structure was found necessary to withstand the loads transmitted by the skirt upon landing impact.

Extensive tests have been made to confirm that the installation will attenuate land impact loadings to levels acceptable to human occupants.

The installation of the impact attenuation skirt allowed removal of four inflatable flotation bags which were located in the upper section of the capsule. These bags were to be inflated on impact and were to serve the purpose of keeping the top end of the capsule out of the water during astronaut egress through the top emergency hatch. With the skirt installed, the space between the heat shield and the capsule structure will fill, after impact, with some 8,000 pounds of water. In this manner the impact bag assembly acts as a sea anchor, thus preventing the capsule from capsizing during astronaut egress.

CAPSULE INTERNAL ARRANGEMENT

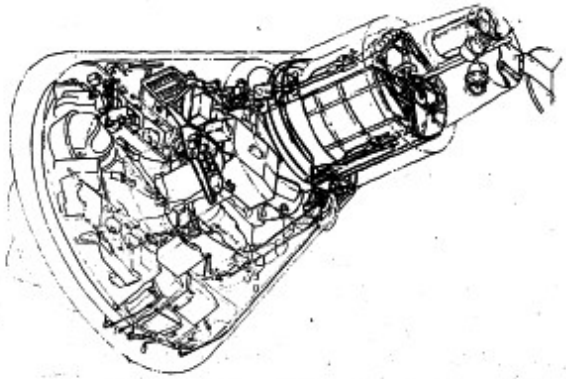


FIGURE 3.—Mercury capsule internal arrangement.

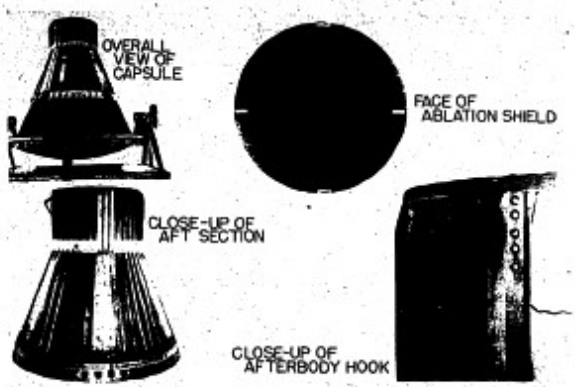


FIGURE 4.—Detailed photographs of recovered Big Joe capsule.

FIGURE 5.—MR-3 capsule with extended impact bag.

Retrograde rockets

The return of the capsule from orbit is initiated by the firing of a retrorocket system which slows the capsule from orbital velocity to approximately 350 miles per hour below orbital velocity. Three separate rockets are used, and each of the three has its own prime and reserve ignition system, so that utmost reliability can be assured. In an emergency any two of the three retrorockets would bring about reentry, although for expeditious recovery, all three are used.

Development of the retrorockets has been completed. During development, 40 motors were fired at the Thiokol factory and additional motors were fired under simulated space conditions at the U.S. Air Force Tullahoma facility and the NASA Lewis Research Center Altitude Facility. Qualification tests of the retrorocket motors have also been completed.

Escape system

As has been mentioned previously, provision is made within the Mercury capsule system to terminate the mission and escape from the vicinity of the launch vehicle in case of malfunction. The escape maneuver is carried out by use of the escape rocket up to the time of booster cutoff. In order to provide rapid separation of the capsule from the launch vehicle, the escape rocket has a high level of thrust over a short period of time. Because of its location on the tower extending ahead of the capsule, the escape rocket motor utilizes a triple nozzle with the three nozzles canted outward so that the exit flow does not impinge upon the capsule structure.

It is important that the magnitude and direction of the resultant thrust vector of the three nozzles be controlled to close limits and that the direction of action be known precisely. In this way, the capsule can be forced away forward and to one side of the booster during an escape maneuver, without setting up a tumbling motion.

Development and qualification tests of the escape motor have been completed. A total of 59 motor firings was performed during the development and qualification tests. In addition to tests performed by the manufacturer, one escape motor was vacuum-test fired at the U.S. Air Force Tullahoma facility, four escape motors were vacuum-tested at the NASA Lewis Research Center, and three Little Joe and two beach abort tests at Wallops Island were made, all successfully.

Landing and recovery system

The Mercury capsule utilizes parachutes to achieve a safe descent and landing. Altogether, four parachutes are installed in the capsule. The drogue parachute has a 6-foot diameter, conic, ribbon-type canopy with approximately 6-foot-long ribbon suspension lines, and a 30-foot-long riser made of dacron to minimize the elasticity effects during deployment. The drogue parachute is packed in a protective bag and is ejected by a mortar. This parachute provides a backup stabilization capability for the capsule in the event of failure of the reaction control and stabilization system and also serves to slow the capsule to approximately 200 miles per hour before main parachute opening shock.

The main parachute is a 63-foot diameter ring-sail cargo-type parachute. Throughout the test program, this parachute has shown extremely favorable opening characteristics, as well as good stability after opening. The reserve parachute is identical to the main parachute. It is deployed by a flat circular-type pilot parachute. The main parachute is deployed automatically by means of sequencing and altitude sensing devices; however, should the automatic system malfunction, the pilot can manually deploy either parachute.

The flight test program of the landing system was completed August 11, 1960. The final qualification program consisted of 56 drops of a boilerplate capsule, equipped with the landing system components. These drops were made from Air Force C–130 aircraft up to 30,000-foot altitudes, or from a Marine HR2S helicopter at low altitude in order to simulate off-the-pad abort conditions.

Environmental control system

The environmental control system shown schematically in figure 6 must provide an acceptable atmosphere for the astronaut throughout the period of capsule occupancy. The system is designed to provide a sufficient supply of oxygen to sustain life for 40 hours and to maintain cabin pressurization under emergency conditions. Carbon dioxide content, gas temperature, and humidity are maintained within acceptable limits. Oxygen is stored in two spherical containers at very high pressures. A water cooling system, designed to operate in weightless flight, is used to dissipate the heat generated by electronic equipment and by the astronaut. Activated charcoal and lithium hydroxide are used for odor and carbon dioxide removal.

A qualification program for the environmental control system has been completed. Manned tests of the system were begun on June 20, 1960. The test program included a number of 4-hour tests which demonstrated the system operation in all modes including simulation of system failures. A 28-hour mission simulation and a 12-hour duration postlanding test have also been made. Many components of the environmental control system were installed during centrifuge tests at the U.S. Navy Johnsville human centrifuge (AMAL) in October 1960. These components operated very satisfactorily under the simulated flight conditions of the Redstone launched flights.

Attitude control system

The attitude control system must provide for automatic or manual attitude sensing and control of the capsule throughout the flight. Attitude sensing is accomplished through a combination of horizon scanner and gyroscopic equipment. The location of the capsule in the pitch, roll, and yaw planes is controlled by a reaction jet system which uses hydrogen peroxide as a monopropellant. While in orbit, the control forces required are very small and a low thrust mode of operation of the reaction jets is sufficient. During retrorocket firing and during atmospheric reentry, a high-level thrust is required. In order to produce this dual level of thrust, two sets of reaction thrust chambers are provided in the automatic system. In order to increase overall mission reliability, provision is also made for the pilot to sense and control the capsule's attitude. A periscope and window are used for visual attitude reference by the astronaut. A third set of reaction jets, activated by the pilot's control stick, is provided.

Qualification and reliability testing programs have been completed on the horizon scanner, periscope, automatic stabilization and control system, and rate stabilization and control system.

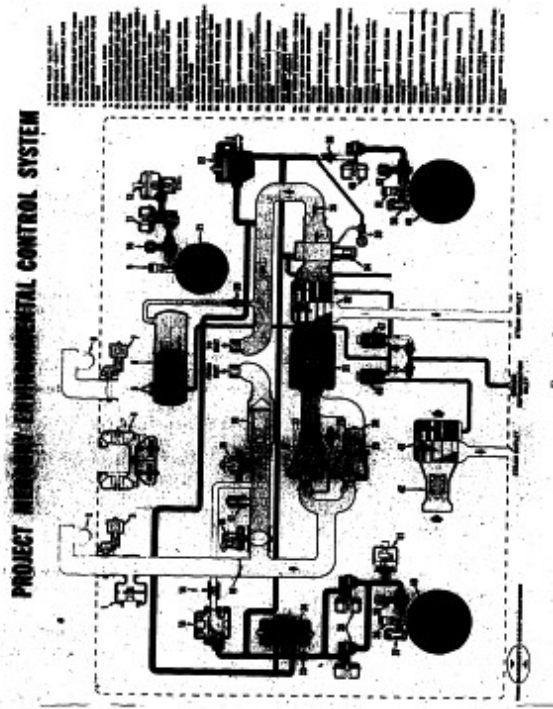


FIGURE 6.

The automatic reaction control system uses solenoid valves for on-off control. The manual reaction control system utilizes either mechanical actuated valves with direct mechanical linkages to the pilot controller or solenoid valves.

A thrust chamber evaluation program at the NASA Lewis Research Center was completed early in 1960. Since that time, the qualification tests of the reaction thrust chambers and the associated equipment have been completed.

Pilot support and restraint

Production of individually fitted couches for the astronauts has now been completed (fig. 7). These couches were used during simulated Redstone flights run on the centrifuge in October 1960. Although experience with the body restraint harness indicated it was acceptable for the flight mission, experience with the egress trainer has indicated that the pilots should be able to release the harness positively and rapidly. It had been necessary to unthread the knee and chest buckle on the original harness; however, a revised harness, currently in use, carries quick release fittings. The original head restraint system has been removed. It was felt that this locked the head so firmly that any shoulder or body movement might injure the neck. Consequently, the current configuration provides lateral restraint only and permits the head to move upward and forward. Tests which were conducted on the Air Force deceleration sled at Holloman Air Force Base demonstrated the adequacy of the modified system.

Communications (onboard)

The Mercury capsule communication system is designed to provide two-way voice communication, position tracking capability, air-to-ground physical and biological data transmission, ground control of vital capsule events and postlanding search and recovery assistance.

The communication system is made up of the following equipment:

(1) A 2-watt UHF voice transmitter-receiver. This unit is designed to provide two-way voice communication for the entire mission including continuous radio carrier for direction finding after main parachute deployment.

(2) A ½-watt UHF voice transmitter-receiver which provides backup for the 2-watt system and serves identical functions, once selected by the astronaut.

(3) A 5-watt HF voice transmitter-receiver. This unit is designed to provide extended range for two-way voice communications, backup for UHF voice circuits for emergency use, or for normal use when orbital path is beyond line of sight range.

(4) A 1-watt HF rescue voice transmitter-receiver. This unit is designed to provide two-way voice communications with beyond line-of-sight range capability. It will be energized only after impact, as a backup for UHF voice communication during the recovery phase.

(5) A 3.3-watt telemetry receiver (high frequency). This unit is designed to provide for biological and physical data transmission to ground-range stations; a backup for onboard instrumentation data tape recorder; verification of events transmitted to or programed within the capsule; and emergency telegraph transmission in the event of complete voice-communication failure.

FIGURE 7.—Project Mercury molded couches.

(6) A 3.3-watt telemetry transmitter (low frequency). This unit is designed to perform the same function as the high frequency telemetry transmitter and provides redundancy of flight safety data transmission.

(7) Command receivers. Two identical 20-channel receivers with parallel outputs are provided to enable ground control of (*a*) capsule abort, (*b*) retrotimer reset, and (*c*) retrofire.

(8) C-band and S-band radar beacons for tracking by ground radars.

(9) UHF/HF rescue beacons (SARAH) for search and recovery aid after capsule impact.

(10) Auxiliary UHF rescue beacon (super-SARAH) for redudant search and recovery aid.

System development tests have been performed to determine mutual compatibility of communications systems components with each other and with other capsule systems equipment. As a result of these tests, a number of equipment alterations were made to alleviate problems uncovered. Among these corrective actions were internal filtering and repackaging of the rescue beacon, internal powerline filtering in the command receiver, addition of powerline filters to the telemetry transmitter, and redesign of the telemeter transmitter power supply. These were problems that did not appear until all equipment was working together within the actual capsule structure.

Instrumentation system

The instrumentation system monitors the physical condition and environment of the astronaut, capsule characteristic and condition and operation of capsule controls. This information is supplied to telemetry transmitters and to a tape recorder to provide data for analysis and evaluation. Cameras are installed to observe and record the astronaut's facial expressions and the capsule's instrument panel. The instrumentation system also provides program control power to operate instrumentation and other system components.

Electrical power supplies

The basic electrical power supply system for orbital capsules consists of three 3,000-watt-hour and three 1,500-watt-hour silver-cell 28-volt batteries connected so as to provide three independent systems called main, standby and isolated d.c. supplies. Although the supplies are normally independent, circuitry is provided for automatic combination of the standby and main batteries in the event of depletion of the main supply. In addition, manual switching will interconnect all three supplies into one common system at astronaut option. This arrangement permits utilization of all installed batteries if found necessary, in flight. The normal mission requires less power than that supplied by the main battery complement. The reserve power in the standby and isolated sources, therefore, is completely available for unforeseen emergencies or unanticipated power utilization.

The d.c. battery power is converted to a.c. by means of static inverters. As in the case of the batteries, independent inverters are provided.

All batteries, inverters, and other electrical system components to be used aboard the Mercury capsule have successfully completed their

qualification test program. Qualification tests have included the general requirements for performance, humidity, salt spray, fungus, immersion, sand and dust sealing, contact drop, radio noise, overload capacity, electrical rupture, endurance, operating force mechanism operation, short-circuit characteristics, and actuation forces as applicable to the specific device. Special testing such as air leakage through bulkhead connectors, temperature cycling, low and high temperature, vibration, shock, acoustic noise, pressure altitude, power input requirements, electrical efficiency, oxygen environment, etc., are also conducted in accordance with the specific Mercury conditions.

Capsule deliveries

The first McDonnell capsule was delivered to NASA on January 27, 1960, less than a year after the contract with McDonnell was signed. This capsule was essentially only a structural shell, however, and did not contain most of the internal systems that would be required for a manned flight.

The second MAC capsule (fig. 1), was delivered to NASA on March 14, 1960, and the third and fourth were delivered in the last week of July. The third delivered capsule, scheduled for the first Redstone flight, is the first capsule that contains most of the systems and subsystems that will be needed for manned orbital flight. Twelve capsules had been delivered by the end of April 1961.

On August 16, 17, and 18, 1960, a McDonnell capsule, completely equipped for manned flight, was subjected to a development engineering inspection at the McDonnell factory. The purpose of this inspection was to insure that the capsule, as engineered and manufactured, was safe for manned flight. Representatives of NASA, MAC, USAF, Space Technology Laboratories, and Convair participated. This inspection was typical of those which are required during aircraft development programs. It focused the attention of a large group of engineers, of various backgrounds and interests, on capsule system details and operational procedures. Following this inspection, the capsule entered a period of capsule system functional checks at the McDonnell factory, before being shipped to Cape Canaveral, Fla., for preflight activity.

The delivery schedule for capsules subsequent to April 1961, will depend largely on results from orbital flight tests. Should major difficulties be encountered during these tests, production of subsequent capsules will, of course, need to be interrupted for design changes and retrofit. As has been described before, such actions are inherent in high-priority advanced development programs which must undertake simultaneous development and production in order to compress the overall program timetable.

Flight Program

The rocket-boosted Mercury flight program consists of a research and development phase and a qualification phase, as well as the manned orbital phase. Most of the research and development flights have been accomplished. The qualification phase began late in 1960.

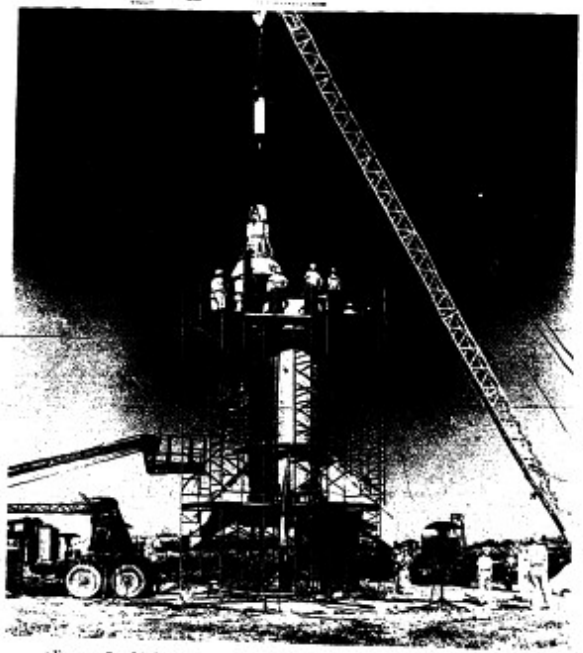


FIGURE 8.—Little Joe launch vehicle during capsule mating operations.

70238 O—61——6

FIGURE 9.—Little Joe launch from Wallops Island, Va.

Little Joe

The Little Joe launch vehicle was used primarily during the research and development phase of project Mercury. Little Joe, which was developed especially for project Mercury, is a fin-stabilized launch vehicle which is propelled by four solid-fueled Castor rockets and four Recruit rockets. Launch weight is approximately 20 tons, and launch thrust is ¼-million pounds. Prelaunch preparations at Wallops Island are shown in figure 8. A photograph of a Little Joe launch is shown in figure 9. To date, the following Little Joe tests have been performed:

(*a*) *Little Joe I, October 4, 1959.*—A first Little Joe vehicle was flown with a dummy capsule which was not separated from the launch vehicle. The flight was for the purpose of testing the launch vehicle rather than the capsule. This flight proved the stability and integrity of the launch vehicle and provided a successful test of the destruct system at maximum range.

(*b*) *Little Joe II, November 4, 1959.*—The primary objective of this flight was to check the operation of the escape system for the combination of mach number and altitude which causes the maximum dynamic pressure during launch. The escape rocket igniter fired at maximum dynamic pressure; however the major portion of the propellant did not ignite until 10 seconds later. Because of this delayed burning, the capsule did not separate from the booster until the dynamic pressure had decayed to one-fifth of the design value. All the other capsule functions occurred as programed and the capsule landed in the Atlantic Ocean about 6 miles offshore at Wallops Island.

(*c*) *Little Joe III, December 4, 1959.*—The objectives of this flight were to determine the motions of the capsule after a high-altitude abort for a capsule with no active control system. The escape rocket fired as planned at 96,000 feet and accelerated the capsule to a mach number of 6. The capsule was boosted to an apogee of 280,000 feet and impacted, as programed, 200 statute miles from the launch site. A monkey was included on the flight and suffered no adverse physiological effects. All the flight instrumentation functioned properly and showed that the capsule was sufficiently stable to permit safe deployment of the parachute.

(*d*) *Little Joe IV, January 21, 1960.*—This was a repeat of the Little Joe II in an attempt to achieve a valid abort test at maximum dynamic pressure. All test objectives were successfully achieved; the escape maneuver was initiated at 36,000 feet and at a predetermined maximum dynamic pressure. The capsule demonstrated sufficient aerodynamic stability at this severe flight condition.

(*e*) *Little Joe V, November 8, 1960.*—All the previous Little Joe flights were accomplished with research and development boilerplate-type capsules. On November 8, 1960, Little Joe V carried a production capsule manufactured by McDonnell Aircraft Corp. Due to a malfunctioning switch assembly, the escape rocket fired prematurely during the launch phase. As a result of the premature firing, the capsule clamp ring did not release and the capsule failed to separate from the booster.

This flight was to have checked the operation of the capsule escape system during an abort at maximum aerodynamic loading. The capsule for this flight was previously subjected to an acoustical vibration

test program at the NASA Langley Research Center. It successfully withstood acoustical vibration levels in excess of 145 decibels. A pilot occupied the capsule during these tests in which the noise levels were typical of levels which will be encountered during an Atlas launch. It was encouraging to find that the capsule structure attenuated the noise sufficiently to enable the pilot to communicate, using his standard radio equipment.

(*f*) *Little Joe V–A, March 18, 1961.*—This was the second attempt to qualify a production capsule at the maximum dynamic pressure condition. The flight was only partially successful because the sequence system malfunctioned and caused an abort at the improper time. The test did show, however, that the capsule would withstand parachute opening shock loads in excess of the design loads.

(*g*) *Little Joe V–B, April 28, 1961.*—The capsule flown in the previous test was recovered in good condition and reflown in another attempt to attain the flight objectives of Little Joe V. The Little Joe V–B flight provided an unexpected severe test of the capsule escape system. Due to the fact that one of the booster motors fired 5 seconds late, the booster pitched over more rapidly than planned and flew a low-altitude trajectory. The peak altitude was only 14,000 feet and the dynamic pressure at the time of abort was 1,800 pounds per square feet; approximately twice as high as planned. All capsule events and recovery were normal. Capsule postflight condition was good.

Big Joe

Big Joe was the name given to the research and development Mercury capsule which was flown on an Atlas launch vehicle and is shown in figure 10. The flight was conducted on September 9, 1959, with the following primary objectives:

(*a*) Validation of the adequacy of the ablation heat shield.

(*b*) Determination of capsule dynamic stability during hypersonic reentry.

The Atlas guidance was preprogramed to provide a duplication of a normal entry from orbit; however, the Atlas booster engines failed to separate from the launch vehicle and the added weight caused the Atlas to burnout at a lower speed and a higher flight-path angle than scheduled. These burnout conditions resulted in a steep reentry with the same maximum reentry heating rates as expected during orbital reentry; however, the total heat input was lower than expected. The excellent postflight condition of the heat shield verified that the design would be satisfactory for the Mercury capsule. The reentry was accomplished without the aid of a reaction control system. Although the capsule entered the atmosphere at an angle of attack greater than 90°, the amplitude of the angle of attack oscillations decreased to nearly 10° at maximum reentry dynamic pressure. Because of the steep reentry angle, reentry deceleration was 12g, 50 percent greater than expected during reentry from orbit.

An unexpected but important result of the flight was the high degree of heating on the conic and cylindrical afterbody portions of the capsule. The high heating rates resulted from unpredictable shock wave interaction and shock wave impingement on the capsule afterbody. As a result of the high afterbody temperatures, the external shingle material on the McDonnell production capsules was

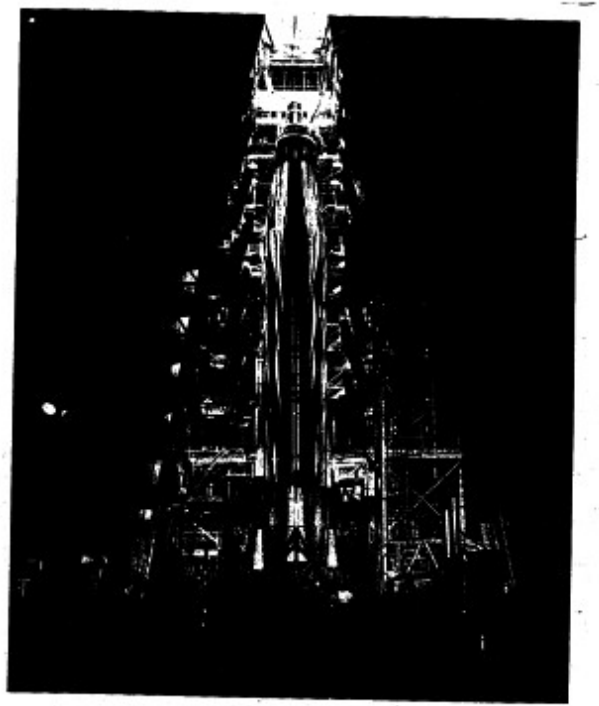


FIGURE 10.—Big Joe atlas gantry.

changed from a cobalt alloy to a nickel alloy. The material on the cylindrical parachute canister was changed from a cobalt alloy to beryllium.

Beach abort flight

The first McDonnell production capsule was flown on a simulated off-the-pad abort trajectory at Wallops Island on May 9, 1960. The production capsule was mounted on an Atlas-type adapter with a production capsule-to-adapter clamp ring. Launch, from a simple support, was vertical. The thrust eccentricity was set so as to carry the capsule toward the water. A photograph of the launch is shown in figure 11. The high thrust level of the escape rocket caused peak acceleration of approximately 15g, as planned. The sequencing system worked as expected; the capsule attained a maximum altitude of 2,500 feet and the parachute lowered the capsule into the water 3,000 feet from the launch site. Capsule recovery was successfully effected by helicopter.

Mercury Atlas–1

The first Atlas-launched McDonnell capsule was flown July 29, 1960. The Atlas guidance system was programed to cause the capsule to reenter along a trajectory which would cause maximum afterbody temperatures. The reentry would also result in maximum reentry deceleration. The primary objective of this test was to qualify the capsule structure and afterbody heat protection. The flight progressed normally until approximately 1 minute after launch; at that time a malfunction occurred which resulted in destruction of the launch vehicle. The capsule, which was internally pressurized, maintained pressurization and transmitted telemetry records until it impacted in the ocean. The capsule did not carry an escape tower; consequently, the sequencing system was not programed to deploy the parachute after a malfunction which occurred early in the launch trajectory. The capsule sank after the high velocity impact; however, nearly all of the components were recovered from the ocean floor approximately 5 miles from the launch pad. Fluctuating pressures caused by the Mercury spacecraft resulted in a structural failure at the booster-capsule interface. Modifications to the booster and the adapter were made prior to subsequent flights.

The previously mentioned pressure fluctuations are unique to the capsule payload and do not exist for the normal Atlas ICBM configuration.

Mercury-Atlas–2

The second Mercury-Atlas, which was flown February 21, 1961, closely matched the desired trajectory. The flight was programed to produce maximum capsule afterbody temperatures and maximum reentry loads. All test objectives were satisfied. The capsule landed 1,425 statute miles downrange, 13 miles short of the precomputed impact point.

The postflight condition of the capsule shingles and ablation heat shield was excellent. Maximum temperatures measured on the shingles and the antenna canister were lower than expected.

The Mercury-Atlas–2 booster was modified by the addition of an 8-inch-wide band at the top of the liquid oxygen tank. This band

FIGURE 11.—Beach abort test of the Mercury escape system.

was installed to reduce the stress concentrations in the weld joint immediately below the adapter attachment flange. The adapter was also strengthened by the addition of reinforcing rings. Figure 12 shows the static test firing of the booster at Cape Canaveral.

Mercury-Atlas-3

Mercury-Atlas-3, which had been scheduled as an orbital flight, was launched April 25, 1961; however, because of a failure in the Atlas autopilot programer, the booster roll and pitch program was not activated and 40 seconds after lift-off the range safety officer sent a booster destruct command which cut off the fuel to the engines and concurrently initiated the capsule abort sequence. An automatic delay system destructed the booster 3 seconds after capsule abort. The capsule abort occurred at 14,000-feet altitude. The capsule was carried to an altitude of 24,000 feet and landed 600 feet offshore. All capsule systems appeared to work satisfactorily. The capsule was recovered in good condition and will be reflown.

Mercury-Redstone-1

The Redstone launch vehicle shown in figure 13 is used as an intermediate range test vehicle in the Mercury program. The first Mercury-Redstone flight occurred December 19, 1960. It attained a maximum speed of 4,300 miles per hour and a maximum acceleration of 6g. The MR-1 capsule reached a peak altitude of 135 miles, a range of 225 miles, and encountered 5½ minutes of zero-gravity flight. The flight was successful in every respect. The capsule control system, retrorockets, separation rockets, communications equipment and recovery equipment functioned properly. The capsule was recovered soon after landing by a helicopter, which was dispatched from the aircraft carrier *Valley Forge*.

The purpose of the Redstone flights is to qualify the capsules during short-range ballistic flights prior to the orbital flights. Manned Redstone flights will be accomplished after a series of unmanned flights when the capsule systems have proven sufficiently reliable. The Redstone flights will provide an excellent opportunity to fully qualify the capsule control system and retrorocket system in flights which will not require these systems for the completion of a successful and safe mission. These flights will also serve to develop pilot procedures and ground control procedures which can be used in the orbital flights.

Mercury-Redstone-2

The second Mercury-Redstone was successfully flown January 31, 1961. Because the booster engine operated at higher than normal thrust, the Redstone burned out at approximately 400 miles per hour higher velocity than planned. Engine fuel depletion, which occurred sooner than expected, triggered the booster automatic abort sensing system and aborted the capsule with the escape rocket.

The resultant high capsule velocity produced an apogee of 156 statute miles and a range of 421 miles: 116 miles farther than expected. The capsule experienced 6.6-minutes duration at zero-gravity and encountered accelerations during escape rocket firing and reentry of 17g and 14.6g, respectively.

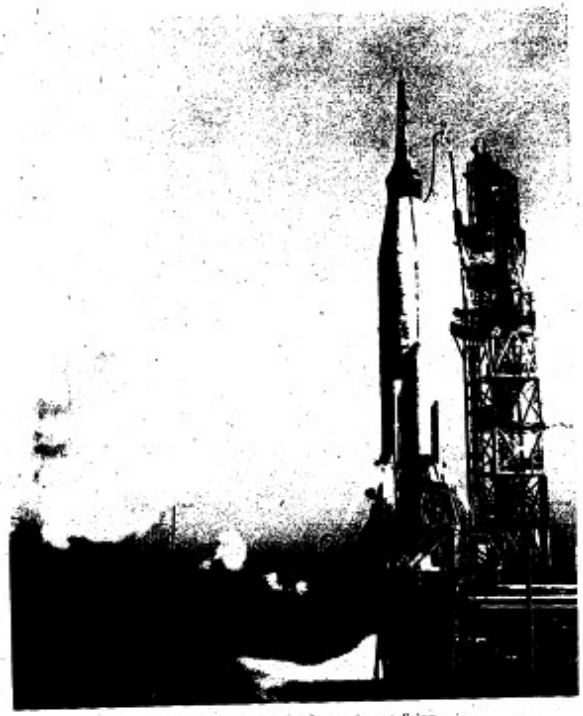


FIGURE 12.—Mercury-Atlas static test firing.

70258 O—61—6

FIGURE 13.—Mercury-Redstone.

Visual observations from recovery aircraft revealed that the capsule floated upright for approximately 2½ hours, then heeled over when the heat shield dropped away. Postflight examination showed that the impact bag had fatigued due to severe wave action. Future capsules will utilize anchor chains which will prevent loss of the heat shield after landing.

The chimpanzee, which was aboard this flight, successfully performed his psychomotor tasks and was recovered in good health.

Mercury-Redstone booster development test

Because of the malfunction on the previous flight and because of a change in the control system, another booster was launched to qualify modified components prior to manned flight. This test was flown on March 24, 1961, with a boilerplate nonseparating capsule mounted on the booster. The launch was successful in every respect.

Mercury-Redstone–3

On May 5, 1961, Astronaut Alan B. Shepard flew a Mercury-Redstone mission. The flight attained an apogee of 117 statute miles and a range of 302 miles; duration at zero-gravity was 5 minutes. No unforeseen problems were encountered during the flight. Shepard reported that the angular motions of the capsule in response to the manual control system were identical to those of the flight simulators in which he trained. Manual control during retrofiring was unexpectedly easy, indicating that retrorocket thrust misalinement was small. He felt that the launch and reentry accelerations were identical to those which he had experienced many times on the human centrifuge. No difficulty was encountered with respect to zero-gravity.

Shepard also felt that because more visual, acceleration, and audio cues were present during flight than in the simulators, he had postive assurance of events such as capsule separation, escape tower jettison, retrofire, retropack jettison, and parachute deployment.

After a mild landing, Shepard opened the side hatch and was raised into a hovering helicopter (fig. 14). The helicopter then flew to the waiting aircraft carrier *Lake Champlain*. Figure 15 shows Shepard and the capsule aboard the carrier.

Future flight program

Manned Mercury-Redstone flights will continue in 1961. The purpose of additional Redstone flights is to qualify a modified capsule configuration and determine the reaction of various pilots to a space environment.

Additional unmanned Atlas-orbital flights will be attempted prior to manned orbital flight. The ability of the Atlas guidance system to vector the Mercury-Atlas to the correct altitude, velocity, and flight path angle must be demonstrated; the capsule systems must be qualified in a prolonged vacuum and zero-g environment; and the network must demonstrate its ability to track the capsule and monitor the capsule systems.

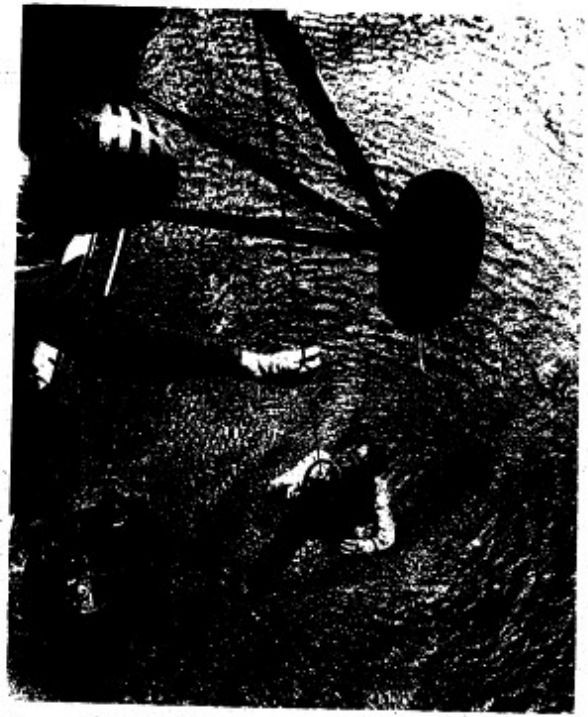


FIGURE 14.—Helicopter recovery after Mercury Redstone-3.

FIGURE 15.—Shepard and recovered Mercury Redstone capsule.

Tracking and Communications Network

General

In the Mercury mission, man and machine together will, for the first time, be subjected to a space and weightless environment. It will, therefore, be desirable to keep the number of orbits on initial flights to a minimum. On the other hand, it will be highly desirable to allow sufficient time for precision orbit determination in order to specify the correct retrofire point for a landing within the desired area. With these criteria in mind, a maximum of three orbits was chosen for the first manned orbital flight.

A number of considerations were taken into account to determine the most desirable launching azimuth. These were:

(1) Use of existing ground support instrumentation stations throughout the world.

(2) Use of the Atlantic Missile Range as the launch area and the impact area after the third orbit.

(3) An orbit which remained over the continental United States for a considerable portion of its flight, allowing continuous tracking, both during the orbital flight and during reentry.

For these reasons, a northeast launch from Cape Canaveral was chosen. The northeast launch which was selected results in an orbital inclination of 32½°.

By following the map (fig. 16), it is seen that the first orbit passes just south of Bermuda, south of the Canary Islands, across Africa, over the Indian Ocean, and over the Australian Missile Range at Woomera. The track then passes across the Solomon and Phoenix Islands. The orbit then intersects the Mexican and southern California coast, passing over the southern United States where a number of available instrumention sites already exist, such as the Pacific Missile Range, the White Sands Missile Range, the Eglin Air Force Base, as well as the Cape Canaveral complex. The third orbit passes within close proximity of Hawaii, a very desirable location for radar tracking and command of the retrotimer, since direct hard-line communication is available from Hawaii to the continental United States.

In making the choice of the number and location of the various ground instrumentation stations, a number of other criteria were established. These include:

(1) The desire to have continuous tracking from Cape Canaveral through Bermuda for accurate orbital determinations and to have real-time telemetry and continuous voice contact during this time.

(2) The ability to reset the retrotimer conveniently on each orbit, as well as having direct ground command of the retrofiring during each orbit.

(3) The need for continuous contact with the capsule during launch and a reasonable length of time following orbital insertion.

(4) A desire to maintain frequent voice and telemetry contact with the capsule.

(5) The need for continuous impact prediction in case of an early abort requiring impact in the Atlantic Ocean, or during an early reentry if an emergency should occur after orbit injection.

FIGURE 16.

All of these and many other requirements, based on practical and economic limitations, resulted in a network of stations as indicated in table V. The stations transmit tracking data to a central computing facility located near Washington, D.C. The operation control center is located at Cape Canaveral.

Because of the critical period during launch and orbital insertion, additional computing facilities, other than those at Washington, are required at Cape Canaveral and at Bermuda. The General Electric Co. guidance and the Burroughs computing systems will be the primary source of information for the Cape Canaveral control center, since it is this system which performs the guidance function of the Atlas missile. These data will be used to calculate the launch trajectory and orbital insertion parameters which are to be displayed. Also, since this is the critical phase of the mission, the Azusa and FPS–16 radar systems at Cape Canaveral will provide backup information for the same displays in the control center should a malfunction of the Atlas ground guidance system occur. This redundancy is necessary since information on the capsule position and velocity will be required in order to make the proper abort decisions if a guidance failure occurs.

A very high reliability radio communications system between Cape Canaveral, Washington, and Bermuda must be provided to transmit real-time trajectory data. However, because of the inability to provide a 100 percent reliability factor and the absolute necessity of making important command decisions at Bermuda, it is necessary to provide redundant computing facilities at that site.

The ground instrumentation system for Project Mercury will consist of 18 stations, a computing and communications center, and a control center. Of the 18 ground stations, 11 will be equipped with long-rage precision radars and will comprise the tracking system. Sixteen of the stations will be equipped with telemetry receivers. All stations will be linked with the computing and control centers by a communications network. Major equipment at the individual station is listed in table V.

Eight of the eighteen stations and the control center will be located on military tracking ranges where use is made of existing radars and other facilities. At these locations, a major part of the required equipment, including most of the tracking radars, is now in existence and will be made available for this project. (These locations involve the Department of Defense test facilities and the Commonwealth of Australia.) NASA will arrange for the use of this equipment. The scope of Department of Defense participation in the support of Project Mercury operations is given in the "Overall Plan, DOD Support for Project Mercury Operations," dated January 15, 1960.

TABLE V.—*Station capability*

Station name	Coverage, passes	Radar: S	Radar: C	Tele-metry recep-tion	Com-munication (sup-plied)	Com-mand control	Acquisition: FA	Acquisition: SA	Acquisition: M	Ground communications: Voice	Ground communications: TTY	Ground communications: SSB radio	Timing
Canaveral	1, 2, and 3	(X)	X	X	X	X	X	(X)	X	X	X	X	X
Grand Bahama	1, 2, and 3		(X)	X	X	X	X	X		X	X	X	X
Grand Turk	1, 2, and 3		X	X	X	X	X	X		X	X	X	X
Bermuda	1, 2, and 3	X		X	X	X	X	X		X	X	X	X
Grand Canary Island	1 and 2	X		X	X	X	X	X		X	X	X	X
Kano, Nigeria	2 and 3			X	X	X	X	X		X	X	X	X
Zanzibar	2 and 3			X	X	X	X	X		X	X	X	X
Muchea, Australia	1, 2, and 3	X		X	X	X	X	X		X	X	X	X
Woomera, Australia	1, 2, and 3		X	X	X	X	X	X		X	X	X	X
Canton Island	1 and 2			X	X	X	X	X		X	X	X	X
Kauai Island, Hawaii	1 and 2		X	X	X	X	X	X		X	X	X	X
Point Arguello, Calif.	1, 2, and 3	X		X	X	X	X	X		X	X	X	X
Guaymas, Mex.	1, 2, and 3		X	X	X	X	X	X		X	X	X	X
White Sands, N. Mex.	1, 2, and 3	X		X	X	X	X	X		X	X	X	X
Corpus Christi, Tex.	1, 2, and 3		X	X	X	X	X	X		X	X	X	X
Eglin, Fla.	1, 2, and 3		X	X	X	X	X	X		X	X	X	X
Goddard Space Flight Center	1 and 2	*			X								

[1] Ground communications.

Site functions: FA, fully automatic; SA, semiautomatic; M, manual; SSB, single side band; *, MPQ–31.

Major functions of each station

1. *Functions of tracking and ground instrumentation system.*— The tracking and ground instrumentation systems will provide all the functions necessary for ground control and monitoring of all phases of the flight. Thus, it will provide continuous prediction of the location of the capsule; will monitor the status of the vehicle and occupant; and will permit the exercise of the command functions necessary for the mission. An artist's sketch of a typical command station is shown in figure 17.

The functions of tracking and ground instrumentation systems are completed when the capsule has landed and the best possible information on the location of landing point has been supplied to a recovery team.

2. *Major functions of stations.*—

(*a*) Cape Canaveral, Grand Bahama Island, and Grand Turk Island: The functions to be performed at these stations, as discussed herein, involve several locations in the AFMTC complex for tracking, telemetry, and vehicle communications. It is necessary to utilize equipment at Cape Canaveral, Grand Bahama Island, and Grand Turk Island. The use of Cape Canaveral and Grand Bahama is required during launch because of look angle problems and the associated capsule antenna patterns. Grand Turk is needed to provide coverage during the final phase of reentry where altitude limits the range of the stations.

From prelaunch through insertion, continuous telemetry, voice communications, and command capability will be provided to the control center and tracking data will be transmitted to the computing center.

(During this same period other data will be made available to the Mercury control center and will provide tracking data from the Atlas guidance system and FPS–16 to the computing center. These data are separate from the function of the station as discussed herein.)

During successive passages, the station will provide tracking, telemetry, and voice communication coverage. Command capability is also necessary in order to permit resetting the retrofiring programer and to furnish command backup of certain internally programed events during reentry and landing.

(*b*) Bermuda: The Bermuda station will determine if the capsule has been placed into an acceptable orbit and effect an emergency landing in one of the major recovery areas if the trajectory is not acceptable. Tracking, computing, telemetry, and command equipment will be provided with the capability to perform this function essentially independent of data from the launch site.

Other functions may be as follows:

(1) To command an abort at the direction of the control center in the event of serious capsule equipment failure or pilot difficulty late in the launch phase.

(2) To command an abort as directed by the control center for impact in a major recovery area in the event of certain propulsion or guidance system malfunctions.

(3) If the flight is normal, tracking and data transmission to the computing center will be required.

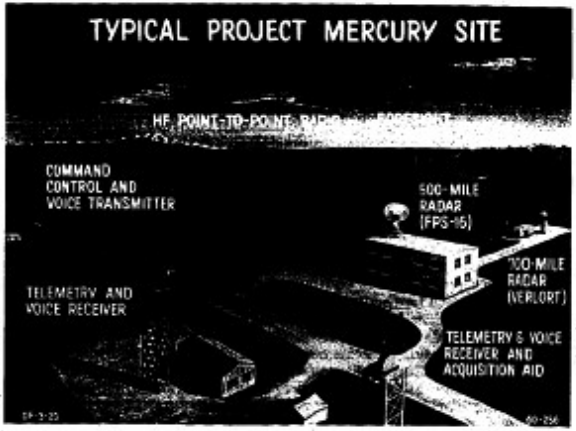


FIGURE 17.—Typical Project Mercury network station.

(4) If the flight is not normal, the impact point will be computed for use by the search and recovery group.

After a successful insertion, the Bermuda station must provide normal tracking and vehicle communications on successive passes. The station must also transmit commands to reset the retrofiring timer as directed by the control center. In the event of an emergency landing at the end of the first or second passage, tracking and computation of the landing point are required.

(*c*) Atlantic ship: This station will provide telemetry and voice communication coverage in the area of the mid-Atlantic on all three passes.

The equipment required for this station will be placed aboard a Government-furnished C1–M–AV1 ship.

(*d*) Grand Canary Island: This station will provide normal tracking, telemetry, and voice communications coverage for the first and second passes in the general area of northwest Africa. In the event the mission is aborted near the insertion point, the station will provide reentry tracking and landing point location. This station will provide data on landing location directly to the local recovery team.

(*e*) Kano, Nigeria: This station will provide normal telemetry and voice communications coverage on passes 1 and 2 in the general area of central Africa.

(*f*) Zanzibar: This station will provide normal telemetry and voice communications coverage on passes 1 and 2 in the general area of east-central Africa.

(*g*) Indian Ocean ship: This station will provide telemetry and voice communications coverage in the area of the mid-Indian Ocean on all three passes. The equipment required for this station will be placed on board a Government-furnished C1–M–AV1 ship.

(*h*) Muchea, Australia: This station will provide tracking, telemetry, and voice communications coverage on all three passes of a normal mission and transmit command functions as required. Tracking data obtained at this point in the orbit, which is approximately 180° from the point where insertion data are obtained, will lead to the most accurate orbit determination.

If an emergency landing is required at the end of the first orbit, the Australian station will be instructed from the control center to reset the capsule timer for firing of retrorockets at the proper time to initiate reentry and landing into a prepared recovery area off the east coast of the United States.

(*i*) Woomera, Australia: The Woomera location will provide C-band tracking, telemetry, and voice communication coverage on orbits one and two. The NASA will make arrangements with the Weapons Research Establishment of Australia for operation and use of an FPS–16 radar located at Woomera.

(*j*) Canton Island: This station will provide normal telemetry and voice communications coverage on passes one and two.

(*k*) Kauai Island, Hawaii: The function of this station is to provide tracking, telemetry, and voice communications on passes two and three and to transmit command functions as required. This station also maintains voice communications with the control center.

(*l*) Point Arguello, Calif.: The function of this station is to provide tracking, telemetry, and voice communication coverage for passes two and three, and to transmit command functions as required. The station also maintains voice communications with the control center. This station provides the first tracking data after reentry initiation on passes two and three. Telemetry data received will indicate whether the retrorockets have been fired at the programed time. If not, this station will command retrofiring to initiate reentry.

(*m*) Guaymas, Mexico: The function of this station is to provide tracking, telemetry, and voice communications coverage for passes one and two and to transmit command functions as required. The station also maintains voice communications with the control center. This station provides the first tracking data after reentry on pass one should this be required. Telemetry data received will indicate whether the retrorockets have been fired at the programed time. If not, this station will command retrofiring to initiate reentry.

(*n*) White Sands Missile Range, N. Mex.: This station contributes to the continuous tracking coverage in the United States on all three orbital passes, using an existing FPS–16 radar at White Sands.

(*o*) Corpus Christi, Tex.: The station in southern Texas provides tracking, telemetry, and voice communication for all three passes and contributes to continuous coverage of the reentry trajectory.

(*p*) Eglin Air Force Base, Fla.: The function of this station is to contribute to continuous tracking coverage in the United States on all orbital passes. Data transmission is required from Eglin to AFMTC to extend the reentry trajectory plot at the Mercury Control Center. Teletype tracking data will be sent to the computing center. NASA will use an existing FPS–16 C-band radar and MPQ–31 S-band radar at this station.

(*q*) Computing and Communications Center, Goddard Space Flight Center: The computing and communications center is located at the Goddard Space Flight Center, Greenbelt, Md. The primary functions of the computing and communications center will include:

(1) During orbital flight, the center will compute and transmit to the required stations the following information:

(*a*) Parameters describing the trajectory.

(*b*) The predicted location of the capsule.

(*c*) The predicted location of impact for emergency reentry.

(*d*) Time to fire retrorockets to land in next recovery area.

(*e*) Time to fire retrorockets to accomplish a normal landing.

(2) During reentry, the center will provide and transmit to the control center continuous prediction of the landing point on essentially a real-time basis.

(3) Throughout the entire operation, the center will provide acquisition information to all field sites.

(4) The center will serve as the main communications terminal for the Mercury operations. Communications to all field sites will pass through the center's communication area, and the appropriate switching and monitoring facilities will be provided.

(*h*) During launch and insertion the computing center will receive tracking data from the Cape Canaveral tracking systems including the GE Burroughs Guidance System. Using these tracking data in combination with selected telemetry data, the center

will compute and send data for displays at the control center suitable for the following functions:

(*a*) Monitor the launch to determine if the orbit achieved is satisfactory.

(*b*) If the orbit is not acceptable, determine times of retrofire to land in several designated recovery areas.

(*c*) Determine capsule landing point and present position.

(*r*) Control Center, Cape Canaveral: An existing building at AFMTC is used for the NASA Mercury Control Center.

The function of the control center will be to provide control and coordination of all activities associated with the Project Mercury operation. The necessary communications, displays, and control equipment will be provided to perform the following basic functions:

(1) Coordination with the blockhouse and central control during launch, including monitoring of vehicle propulsion and guidance, and assistance on range safety.
(2) Control of all stations outside Cape Canaveral.
(3) Monitoring of pilot and capsule systems.
(4) Instructions to pilot.
(5) Inflight trajectory monitoring.
(6) Commands to capsule equipment.
(7) Initiate emergency aborts during launch and insertion.
(8) Initiate emergency landing at completion of first or second passage.
(9) Initiate normal reentry and landing.
(10) Supply landing location information for search and recovery team.

3. *Function of the demonstration site.*—Existing NASA buildings and land at the NASA Wallops Station, Va., are being used to establish a temporary station consisting of selected items of equipment identical to that used at remote sites. This equipment has been installed and tested to determine performance characteristics and suitability for the Mercury mission. Field modifications and test procedures are being developed at this site. The technical information developed at this site will be applied to the remote Mercury sites to bring all sites up to the performance required for the Mercury mission.

Ground communication system

The purpose of the Mercury ground communication system is to provide a communications network connecting 18 range stations around the world with the Goddard Space Flight Center at Greenbelt, Md., and the Mercury Control Center at Cape Canaveral, Fla., as shown by the accompanying world map and circuit layout (figs. 18 and 19). The system will carry telephone, teletypewriter, and high-speed data information. Electronic computers at Goddard will process incoming data and provide as its output, acquisition messages and other related information to all range stations. Teletypewriter information, into and out of Goddard, will be handled by an automatic teletypewriter switching system. A significant portion of the traffic over the system will be information generated automatically by the radars or computers and transmitted at teletypewriter speeds. Generally, 60 words per minute transmission will be employed. For high

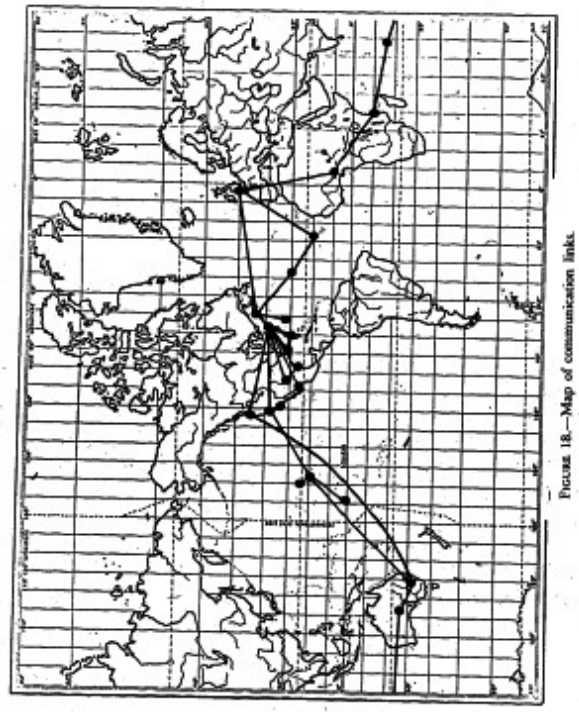


FIGURE 18.—Map of communication links.

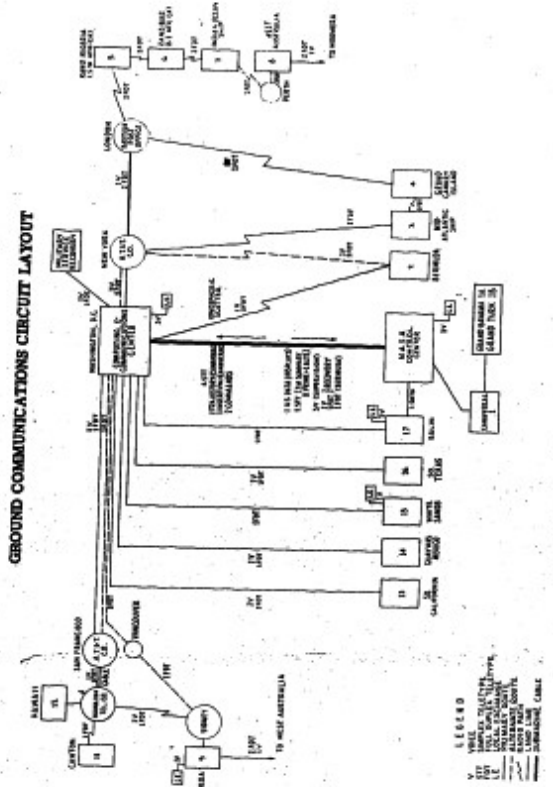


FIGURE 19.—Ground communications circuit layout.

priority traffic between Goddard and Cape Canaveral, teletypewriter circuits capable of transmitting 100 words per minute will be provided. High-speed data circuits between the computers at Goddard and Cape Canaveral will be provided to handle the large volume of data flowing between these two points.

The communication system for Project Mercury comprises approximately 125,000 circuit miles (about 88,000 miles of teletypewriter circuits; 32,200 miles of telephone circuits and 4,800 miles of high-speed data circuits). The design of this system has been geared to provide a reliable communication network that can be expanded economically as the need arises. Propagation studies have been made to select the most reliable radio routes for both primary traffic and for backup use. Backup facilities were provided for those routes where it appeared economically feasible and necessary.

One of the requirements in setting up the ground communication system was that leased facilities would be utilized wherever possible. To this extent, negotiations have been carried out and are continuing, with communication carriers at home and abroad, outlining the requirements for Project Mercury. The importance of safeguarding the system against any foreseeable interruptions has been stressed and a suitable program set up with the carriers for handling Mercury traffic, particularly with respect to the oversea radio links.

Within the North American Continent, practically all the circuit facilities will be provided by the operating companies of the Bell System and independent carriers. Outside the North American Continent the communication facilities will be a combination of leased and constructed radio and wire circuits. The following organizations are participating in supplying communications for Project Mercury:

American Telephone & Telegraph Co. Long Lines Department.
Bermuda Telephone Co.
British Columbia Telephone Co.
Cable & Wireless, Ltd.
Compania Telefonica National de Espana, Canary Islands.
Canadian Overseas Telecommunication Corp.
External Telecommunications Executive, General Post Office.
Federal Aviation Agency.
Hawaiian Telephone Co.
Overseas Telecommunications Commission, Australia.
Postmaster General, Department of Supply, Australia.
Radio Corp. of America.
Telefonas de Mexico.
Transradio Espanola, S.A., Canary Islands.
Department of Defense.

Station phasing and implementation progress

The network as described in the foregoing material is being implemented through a prime contract with the Western Electric Co., Inc.

Western Electric heads a team of subcontractors consisting of the following:

1. Burns and Roe, Inc., responsible for architectural and engineering design of the stations as well as construction phases of station development.

2. The Bendix Corp., responsible for the design, fabrication and installation of most of the electronic subsystems such as the telemetry equipment.

3. International Business Machines Corp., responsible for computation equipment, programing and operation.

4. Bell Telephone Laboratories, Inc., responsible for such items as simulation equipment and operational sequence procedures including system checkout routines, communication traffic studies, etc.

Western Electric not only serves as system manager and in the function of system integration, but also is responsible for network communications.

As an example of specific progress and to provide a report on how the implementation of the network has proceeded, milestones will be given for the Kauai Island, Hawaii, station:

Event	Completion date
1. Site survey	Dec. 30, 1959
2. Site design	May 15, 1960
3. Instrumentation equipment on site	Nov. 5, 1960
4. Site construction	Nov. 5, 1960
5. S-band tracking system installed	Jan. 30, 1961
6. C-band tracking system installed	Jan. 17, 1961
7. Telemetry equipment installed and tested	Feb. 1, 1961
8. Vehicle-ground communication equipment installed and tested	Feb. 8, 1961
9. Ground-ground communication equipment installed and tested	Jan. 28, 1961
10. Station support equipment on site	Nov. 7, 1960
11. Station dynamic tests	Mar. 20, 1961
12. Ground-ground communications integrated with communications center	Dec. 5, 1960
13. Station operational	Mar. 4, 1961

Computations for Project Mercury flights

There are three major computer installations associated with the Project Mercury flight computations; they are located at:

1. Cape Canaveral, Fla.
2. Bermuda.
3. Greenbelt, Md. (Goddard Space Flight Center).

At Cape Canaveral and Goddard, computations are made which concern the launch and injection into orbit phase of flight. The GE Burroughs computing system, in addition to performing its usual Atlas guidance function, will feed data by telephone line to Goddard. At Goddard, two IBM 7090 computers will determine, in real time, whether or not the launch trajectory and the predicted orbit are acceptable. This information will then be sent back to the Mercury Control Center, where it will be displayed. A backup display is provided through the Cape Canaveral Azusa or FPS-16 radar system, together with an IBM 709 computer installation.

If the real time orbit predictions indicate an acceptable orbit [Go decision], the capsule will be permitted to go into orbit. If the orbit is definitely unacceptable [No-Go decision], the mission will be terminated. If the decision is questionable at Cape Canaveral, the final decision to abort will be turned over to Bermuda.

At Bermuda, an IBM 709 computer installation is utilized to accomplish the following computations:

1. Monitors launch to ascertain a "Go" or "No-Go" decision depending on whether or not an acceptable orbit is achieved. This decision is to be accomplished within 30 seconds after the sustainer engine cuts off. This is a backup function to Cape Canaveral.

2. Computes the time to retrofire to permit the capsule to land in a preselected landing area in case the orbit is unacceptable.

3. Performs the reentry computation and predicts the impact point in case of an early abort.

4. Performs necessary computation and preparation for transmission of radar data to Goddard during second and third passes of capsule over the Bermuda area.

At Goddard, computations are accomplished on the two IBM 7090 installations, one acting as a backup for the other. The following functions are performed:

1. Determination of orbit, in conjunction with Cape computers.
2. Processing of all radar inputs from remote sites.
3. Defining and refining orbit.
4. Sending acquisition data to remote sites.
5. Providing data to the Mercury Control Center at Cape Canaveral, including information on time to fire retros.
6. Calculates and updates final impact point during reentry.

Network checkout procedures

The Mercury network is the most complex and extensive set of ground-support instrumentation implemented thus far in space programs. To properly test each subsystem and then the integrated system, both statically and dynamically, various checkout procedures will be employed.

Static component and subsystem tests are first accomplished. This includes the individual units and subsystems, such as the telemetering receiving equipment, the ground-to-capsule communications equipment, command control, C-band tracker, S-band tracker, acquisition aid equipment, to mention only a few. This type of testing is accomplished as installation proceeds and largely employs standard electronic test equipment as well as some specially designed apparatus.

As the subsystems are installed and successfully pass their static tests, there begins mutual radio frequency interference testing to detect and guard against troublesome stray energy that manifests itself as malfunctioning equipment. This is actually the beginning of full-station testing.

All subsystems are operated together in static-station testing. Dynamic testing begins against actual targets. The test targets are aircraft that execute "fly by" tests, or dynamic tests at each station throughout the entire network. These aircraft are outfitted with equipment identical to the electronic gear in the Mercury capsule, thereby allowing the station to determine electrical and mechanical difficulties in a near-operational situation. This type of testing also represents excellent training for the station operators.

Network tests represent the final step prior to an actual mission. Magnetic tapes are prepared in advance for each station. These tapes contain signals for the operators, the tracking radars are given simulated target information, simulated telemetry data is "received," simulated "conversations" are held with the simulated astronaut.

Commands can be issued from the station since emergency situations can be contained on the tapes. Each station has its own tape. The station's part is timed to happen in the exact same sequence from launch that an actual capsule pass would occur at the station. In short, an entire three-orbit mission can be simulated on the network as often as necessary to check out the net and to train operators without ever actually launching a mission. It is to be further noted that the capsule trainer discussed elsewhere can be part of the station dynamic tests and, thus, have capsule, astronaut, and network tested together in the final way the missions will actually progress.

Such dynamic network tests are currently being programed on tape. Subsystem and station static tests are now being accomplished.

Operations

Hangar checkout of capsules

The Mercury capsules are airlifted from the McDonnell plant at St. Louis, Mo., to Cape Canaveral, Fla. After the capsule arrives at the Cape Canaveral airstrip, it is trucked to the NASA capsule checkout area in hangar "S". Although a completed capsule receives a preliminary systems checkout at the factory, the final detailed systems check is made at the Cape. After an initial inspection check, the capsule is placed in a specially constructed building in which the hydrogen peroxide reaction control system is activated and functional checks are accomplished. Because of the fire hazards accompanying a hydrogen peroxide spill, this building is fully equipped with a water sprinkler system and a remote console for the test conductors. All persons handling the plumbing connections for the concentrated hydrogen peroxide must wear goggles, plastic caps, coveralls, boots, and gloves. Initially, both the peroxide and helium storage tanks within the capsule are filled, and differentially pressurized, with helium. They are then capped off and the pressure decay is monitored. This procedure is used to check the hydrogen peroxide and the helium plumbing systems for leaks and, in particular, the flexible bladder which will separate the peroxide from the helium. The system is then filled with the hydrogen peroxide and a 24-hour decomposition test is performed. If the system is compatible with the peroxide, there will be only a low rate of pressure increase. After this check, the peroxide valves are remotely actuated and thrust reaction time is monitored by measuring the temperature rise in the nozzles.

Following the reaction control system tests, the capsule is returned to a clean air-conditioned enclosure in the hangar and detailed checks are made on: (1) the d.c. and a.c. electrical systems; (2) the sequencing system which automatically controls all the capsule events from launch through capsule separation, tower jettison, capsule attitude, retrofiring control system modes, parachute deployments, and recovery beacon activation; (3) the communications system which includes the high frequency and ultrahigh frequency radios, command receivers, telemeter transmitters, FPS–16 and Verlort Radio beacons, and recovery beacons; and (4) the automatic stabilization and control system which involves attitude sensing limits for the horizon scanners, gyro-erection and precession, relays and logic circuits. The capsule then undergoes a simulated flight test where all capsule systems are programed as "in flight" and their performance is monitored. Upon completion of this test, all onboard capsule data recording equipment—film and tapes—are processed and evaluated. A critical portion of the Cape checkout is performed in an altitude chamber which creates a near-vacuum environment for subsystem functional checks and establishes the pressure integrity of the capsule. As the simulated altitude is lowered, the barostatically actuated capsule landing system will be functionally checked out.

One of the final hangar operations is an elaborate weight and balance check. Because the capsule aerodynamics are critically dependent upon the capsule center-of-gravity location, extreme care must be taken to maintain the center-of-gravity at a prescribed point. The thrust axes of the escape and retrorockets are also accurately alined at this time.

Capsule checkout operations require a large quantity of complex ground checkout equipment. This gear must support capsule preflight operations in the hangar and at each of the launch pads. Most of the monitoring and calibration equipment is contained in full-size trailers. Connecting cables are strung to the various checkout sites. To check the automatic control system, for instance, the capsule is installed in a two-axis test fixture and a heating element is used to simulate the Earth's horizon. The capsule is sequentially rotated in all three axes at various rates and attitudes. Signals from the gyro signal amplifiers are monitored and recorded on strip charts in the trailer. Calibrations of the telemetry system are also made while the capsule is installed in the test fixture.

The last operations in the hangar involve installation of the various rockets, explosive bolts, SOFAR bombs, and other pyrotechnics. The environmental control system is charged with high-pressure oxygen and the flight batteries are installed at this time.

Launch vehicle checkout

Concurrent with the capsule hangar checkout, the appropriate Redstone or Atlas launch vehicle is erected at the launch site and the numerous plumbing and electrical connections are accomplished. Functional checks are performed on the vehicle monitoring instrumentation, the automatic abort sensing equipment, the guidance and control equipment, the emergency destruct package, and the pressure integrity of the fuel and liquid oxygen tanks.

Checks during mate of booster and capsule.

In addition to determination of mechanical compatibility, the installation of the capsule on the booster provides an opportunity to check the capsule ground support equipment within the blockhouse and launch gantry. Figures 10 and 13 show the gantry arrangements and the capsule systems checkout trailers which are used during capsule and booster checks at the launch pad. Figure 20 shows several of the capsule monitoring consoles in the blockhouse. This support equipment will enable personnel in the blockhouse and in the Mercury control center to monitor the pilot and capsule systems when the capsule is on the launch pad. During this period, the capsule radios, telemetry, and beacons are energized simultaneously with booster telemetry and beacons. Radio frequency interference checks are accomplished at this time.

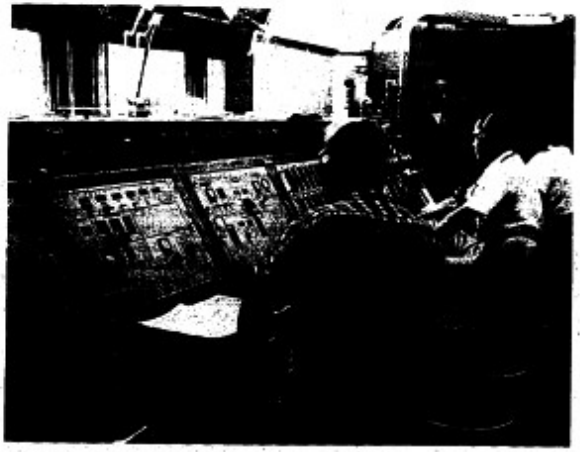


FIGURE 20.—Typical console installation in the blockhouse.

Flight safety review board

A flight safety review board will convene and evaluate the records of the launch vehicle and capsule tests. At this time, any difficulties which occurred during booster and capsule checkout will be discussed, and must be resolved to the satisfaction of everyone on the board. The board members will include representation from the launch vehicle contractors, the capsule contractor, the astronauts and other NASA operations personnel.

Prelaunch countdown

The prelaunch countdown is divided into two parts: the first portion starting 30 hours prior to launch and continuing for 4 hours. The final portion begins the following midnight and continues until the scheduled launch time of 7 a.m. This split count arrangement allows the launch crews a rest period in the midst of a long countdown. During the first 2-hour period, detailed capsule systems checks will be accomplished from the remote monitoring consoles in the blockhouse. During this initial 2-hour countdown period, the world-wide network of communications and tracking stations is alerted and routine tests are made on the telemetry, radar, the voice radio communications, and the command radio. Concurrently, the Mercury control center communications, telemetry, abort commands, and trajectory displays are activated and checked out. Seven hours prior to launch, the second half of the countdown is begun. A carefully designed sequence of launch vehicle fueling and LOXing, capsule, rocket and pyrotechnic arming, and radio frequency interference checks are accomplished. Extreme care must be taken to be certain that no stray voltages are applied when the pyrotechnics and rockets are being armed. Care must also be taken to maintain radio silence on certain critical frequencies. Approximately 4 hours before launch, the Navy recovery ships arrive on station in the impact area and approximately 2 hours prior to launch, local launch site surface vessels are called on station. The launch site helicopters and the search aircraft are phased-in just prior to launch. During manned shots, the pilot will enter the capsule approximately 2 hours prior to launch and will play an active part in the capsule check and countdown.

Mercury control center

Overall control of the Mercury missions is conducted from the Mercury control center at Cape Canaveral. A photograph of the control center building is shown in figure 21. This complex also serves as a telemetry receiving station: the large dish-shaped antenna will receive telemetered information from the capsule subsystems. The primary function of the center is to actively control the flight phase of the Mercury missions. Figure 22 is a block diagram of the flight control organization. The operations director is in charge of the mission and also serves as chairman of the Flight Safety Review Board. Immediately subordinate to the operations director is the flight director who actively participates in the countdown, coordinates the input from the systems controllers, and is responsible for making the decision to abort the mission if a malfunction should

FIGURE 21.—Mercury control center at Cape Canaveral.

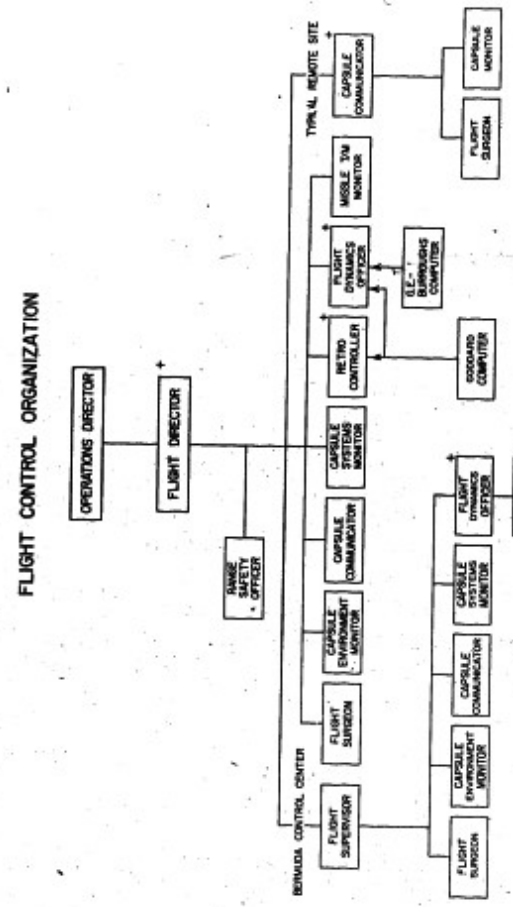


FIGURE 22.—Flight control organization.

occur during flight. The system controllers advise the flight director as the flight progresses and perform the following functions:

(1) The flight surgeon monitors the aeromedical displays of the pilot's EKG, respiration, and temperature. He also monitors the pilot's voice transmissions.

(2) The capsule environment monitor has telemeter instrumentation displays of the oxygen quantity, cabin pressure, suit pressure, and system temperatures.

(3) The capsule communicator relays information to the pilot and receives voice reports from the pilot. His station console is equipped with a sequence panel which indicates the occurrence of capsule events such as escape tower separation and retrofiring.

(4) The capsule systems monitor observes the capsule attitude and the amount of fuel remaining in the hydrogen peroxide control systems, and the status of the capsule electrical system.

(5) The retrocontroller panel displays the retrofiring times for normal reentry, end of each orbit, and emergency landing areas. These retrofiring times are calculated at the Goddard Computing Center. The retrocontroller keeps the capsule's clock synchronized with the optimum retrofiring time which is continually being refined by calculations based on the latest tracking information. Changes in the capsule retrofire clock setting can be accomplished through voice instruction to the astronaut or by radio commands from the retrofire controller's panel.

(6) The flight dynamics officer has the responsibility of evaluating the capsule orbital parameters at the end of the launch phase. He will use four plot boards which display flight path angle, velocity, capsule position, and impact prediction. Based on predetermined limits for these parameters, the flight dynamics officer will recommend that the capsule be permitted to continue orbital flight (go decision) or, if the capsule has not attained orbital velocity and flight path angle, he will request immediate retrofire to bring the capsule down in a planned recovery area (no go decision).

(7) The missile telemeter monitor will observe telemeter displays of critical launch vehicle parameters such as acceleration, engine chamber pressure, electrical and hydraulic system performance, and vehicle attitude. By observing these parameters, he can anticipate possible abort situations. The flight director can then take action to bring the capsule down in a planned recovery area.

Figure 23 shows some of the flight controller consoles and the network status map in the Mercury control center.

The functions of the systems monitors in the Bermuda control center are similar to those at Cape Canaveral; however, the flight dynamics officer at Bermuda will make an orbit "go" or "no go" decision only if the Cape control center cannot make a decision. The remote site stations are equipped with only three consoles: capsule communicator, aeromedical monitor, and capsule systems monitor. Figure 24 shows the communicator's console which is installed at the remote stations. A mockup of the capsule control panel is included to aid the communicator when he discusses panel displays with the pilot. This console includes command radio capability at six of the remote sites; that is, the communicator will be able to command changes in the retrotimer and command retrofire. Some of these communicators will be astronauts.

FIGURE 23.—Flight controller consoles at control center.

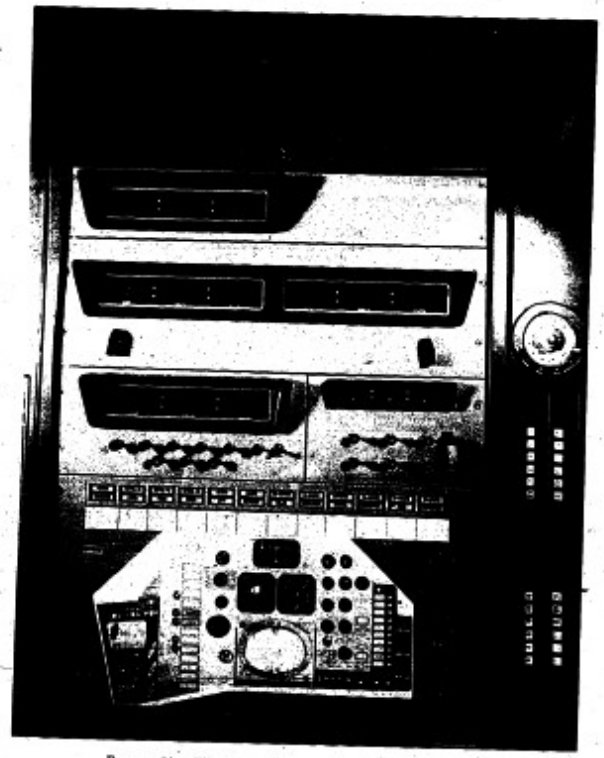


FIGURE 24.—Flight controller console at remote station.

Flight simulation

An important phase in the checkout of the equipment and in the familiarization for the flight controllers is the simulation training which precedes a flight. Because of the need to coordinate the network, recovery forces, capsule and launch procedures, and the Goddard and Cape computers, it was found necessary to provide advance operational experience. Figure 25 is a photograph of simulation consoles and shows the capsule procedures trainer used in the simulation room at the control center. By using this simulation equipment in conjunction with the Goddard computer, the Mercury missions are simulated and procedures are developed which will be utilized during the various phases of the operation.

Operational procedures during mission

During the prelaunch phase, flight control is delegated to the launch blockhouse. At lift-off, control passes back to the Mercury operations director at the control center. The pilot determines that his elapsed time clock starts at lift-off, thereby synchronizing capsule time with ground elapsed time. During the launch, the pilot reports pitch angle and acceleration to the ground. As the capsule rises through an altitude of 11,000 feet, the capsule internal pressure will start to vent overboard. A differential pressure regulator will maintain the capsule pressure 5 pounds per square inch above surrounding atmospheric pressure. The pilot notes that the cabin pressure does not decrease below 5 pounds per square inch. When a guidance command shuts the engine down, the pilot manually actuates an override switch and separates the capsule if automatic capsule separation does not occur. He also checks that the capsule attitude indicators display predetermined values. If the capsule gyros have drifted excessively during launch, the automatic control system will be inaccurate and he will manually control the capsule using his periscope and window for attitude reference. The capsule should be either automatically or manually turned to the retrofire position so that retrorockets can be fired in the correct direction if a rapid reentry is found desirable.

Operational procedures near orbit insertion

One of the most critical points in the Mercury orbital mission is at orbital insertion when the Mercury capsule is separated from the Atlas launch vehicle. At this point, it is necessary to determine whether the mission should be allowed to continue, or an abort should be executed so that the capsule will land near a previously established recovery area. An acceptable orbit is considered to be one which will insure the capability of a safe recovery at the end of the first orbit; that is, the lifetime must be sufficient so that the retrorockets can be fired within range of a command station near the end of the first orbit in order to land in the planned recovery area. In addition, the heating conditions must fall within acceptable limits in the region of perigee, and the reentry loads must be within given tolerances. It has been assumed that if the conditions existing at orbit insertion are such that the capsule completes one and one-half orbits, an adequate margin of safety will have been attained. Therefore, any acceptable combination of insertion conditions should guarantee the opportunity

FIGURE 25.—Procedures trainer console installation.

to command retrofiring, thus controlling the landing point, at any time during at least the first complete orbit.

The problem is then reduced to finding as accurately as possible the orbital conditions that will permit the capsule to complete one and one-half orbits. When these conditions are defined completely in the ranges of velocity, flight path angle, and altitude, the actual orbital conditions obtained may be compared to the established limiting conditions in order to decide whether the mission should be allowed to proceed.

After a successful orbit has been achieved, the pilot will report to the remote stations as he passes overhead, telemetry signals will be received, and tracking data will be recorded. The remote site information will be sent back to the Mercury control center, by way of the Goddard Communications Center. Tracking acquisition information is calculated at the Goddard Computing Center and is sent out to the remote sites. It will be an objective of the control center to keep the remote sites as fully informed on the current situation as possible. Thus, in the event of a breakdown in communications, they may be better able to make decisions independently if a critical situation develops. The various times of retrofire will be continuously computed on the basis of new information as it becomes available, and it is imperative that remote sites be kept up to date on these items.

As the time of reentry is approached, the control center will be supplied with tracking data from the computers at Goddard and the presentation of impact prediction will be given in real time. The main function of the control center at this time is to keep the recovery forces up to date on impact prediction.

Recovery

The probability of capsule landing locale varies throughout the different phases of a flight and is a major factor in establishing the recovery requirements. The basic philosophy of recovery in the Mercury program is to provide a rapid recovery capability (1) in the normal landing area; (2) in those areas where landings would occur in case of an abort during the early phase of flight; and (3) once each orbit. "Rapid recovery" implies that location and retrieval vehicles are on station in these areas during orbital flight to assure recovery within a specified time that is in the order of from 3 to 6 hours. All of the recovery areas resulting from this recovery philosophy are located in the North Atlantic Ocean. The probability of containing all landing points within these areas is very high.

The planned recovery areas are shown in figure 26. In addition to the nine areas depicted, a launch site recovery area exists at Cape Canaveral in the event an abort occurs during the final countdown or early in the boost phase of flight. The launch site recovery forces will have the capability to effect recovery for a capsule on land or in shallow water.

Should an unsatisfactory condition develop during launch, a mission will be aborted so that landings from such conditions will be contained in areas one through six. If the orbital parameters at insertion are satisfactory and if the capsule systems are functioning properly, the capsule will be permitted to continue in orbital flight. In case of "no-go" decision at orbital insertion, the abort procedures will be such that all landings will be contained in areas five or six.

FIGURE 25.—Procedures trainer console installation.

to command retrofiring, thus controlling the landing point, at any time during at least the first complete orbit.

The problem is then reduced to finding as accurately as possible the orbital conditions that will permit the capsule to complete one and one-half orbits. When these conditions are defined completely in the ranges of velocity, flight path angle, and altitude, the actual orbital conditions obtained may be compared to the established limiting conditions in order to decide whether the mission should be allowed to proceed.

After a successful orbit has been achieved, the pilot will report to the remote stations as he passes overhead, telemetry signals will be received, and tracking data will be recorded. The remote site information will be sent back to the Mercury control center, by way of the Goddard Communications Center. Tracking acquisition information is calculated at the Goddard Computing Center and is sent out to the remote sites. It will be an objective of the control center to keep the remote sites as fully informed on the current situation as possible. Thus, in the event of a breakdown in communications, they may be better able to make decisions independently if a critical situation develops. The various times of retrofire will be continuously computed on the basis of new information as it becomes available, and it is imperative that remote sites be kept up to date on these items.

As the time of reentry is approached, the control center will be supplied with tracking data from the computers at Goddard and the presentation of impact prediction will be given in real time. The main function of the control center at this time is to keep the recovery forces up to date on impact prediction.

Recovery

The probability of capsule landing locale varies throughout the different phases of a flight and is a major factor in establishing the recovery requirements. The basic philosophy of recovery in the Mercury program is to provide a rapid recovery capability (1) in the normal landing area; (2) in those areas where landings would occur in case of an abort during the early phase of flight; and (3) once each orbit. "Rapid recovery" implies that location and retrieval vehicles are on station in these areas during orbital flight to assure recovery within a specified time that is in the order of from 3 to 6 hours. All of the recovery areas resulting from this recovery philosophy are located in the North Atlantic Ocean. The probability of containing all landing points within these areas is very high.

The planned recovery areas are shown in figure 26. In addition to the nine areas depicted, a launch site recovery area exists at Cape Canaveral in the event an abort occurs during the final countdown or early in the boost phase of flight. The launch site recovery forces will have the capability to effect recovery for a capsule on land or in shallow water.

Should an unsatisfactory condition develop during launch, a mission will be aborted so that landings from such conditions will be contained in areas one through six. If the orbital parameters at insertion are satisfactory and if the capsule systems are functioning properly, the capsule will be permitted to continue in orbital flight. In case of "no-go" decision at orbital insertion, the abort procedures will be such that all landings will be contained in areas five or six.

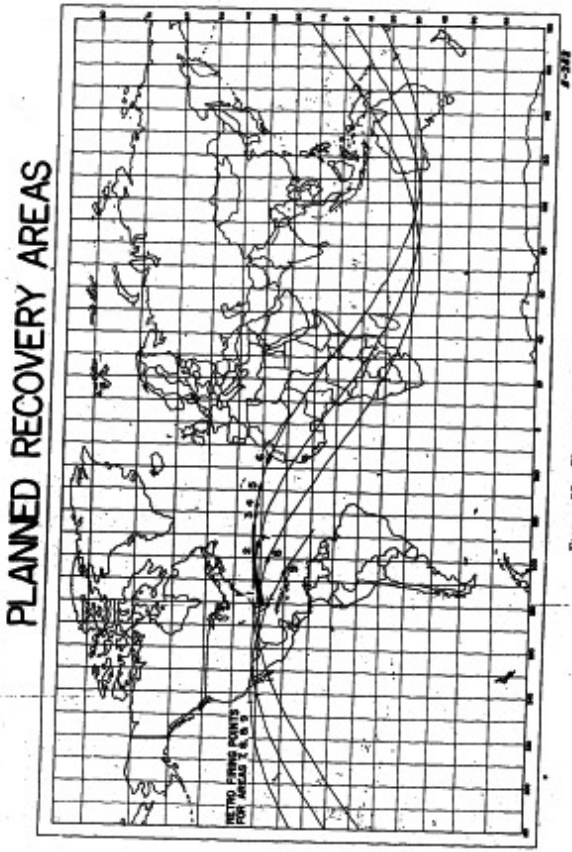


FIGURE 26.—Planned recovery areas.

If a "go" decision at insertion is made, the capsule is committed to the completion of at least one orbit before a landing in a planned area is possible. Planned recovery areas seven through nine afford the capability to abort or terminate the mission once each orbit. Retrorocket firing points for landing in these three areas are located approximately 300 miles off the west coast of the United States. After passing the retrofiring points for area six, approximately 70 minutes of orbital flight time are required to reach the retrofiring point for area seven. Approximately 90 minutes of flight time elapsed in progressing from retrofiring point seven to eight and eight to nine. Thus, once the "go" decision is made at insertion, the capsule is committed to a comparatively long flight time before landing in an area where short-term recovery capability exists.

Backup and redundant systems have been provided for all basic capsule systems such that the probability of a malfunction occurring in orbit is considered remote and the standard operating procedure will be to terminate the mission by landing in a planned area if at all possible. However, a planned course of action for effecting the recovery in a low-probability contingency area is also required. In addition to the recovery forces in the Atlantic Ocean several standby ships and aircraft stationed under the orbital flight paths will be alerted for possible contingency recovery operations.

Astronaut Program

The seven Mercury pilots participated in numerous training activities during the past year. They also helped to establish many of the Mercury operating procedures and subsystems design details. Each is an engineer and has been assigned to work in a specialty area. Each man is intensely interested in the program and has a sincere desire to be chosen for manned flight. The astronaut biographies were presented in House Report No. 1228.

Flight simulators

To familiarize the pilots with the capsule and the various normal and emergency operational aspects of the Mercury flight, the following simulators and facilities were among those utilized during the past year:

1. *Procedure trainer.*—McDonnell has provided two procedures trainers for Project Mercury. The interior arrangement of these trainers is identical to that of the capsule. The displays within the trainer are operated by high-speed computers. One of the trainers is located at the space task group and is used to familiarize the astronaut with operation of the capsule system. It is also used in conjunction with a remote network station console to provide training for the capsule systems and aeromedical monitors. The second trainer is located at Cape Canaveral and is used to provide mission simulation training for the astronauts and the flight controllers. It also aids in the checkout of the computer circuits in the Goddard Computing Center and the trajectory display equipment at the Mercury control center. Figure 27 shows the instructor's console for the procedures trainer and the astronauts' capsule simulator in the background.

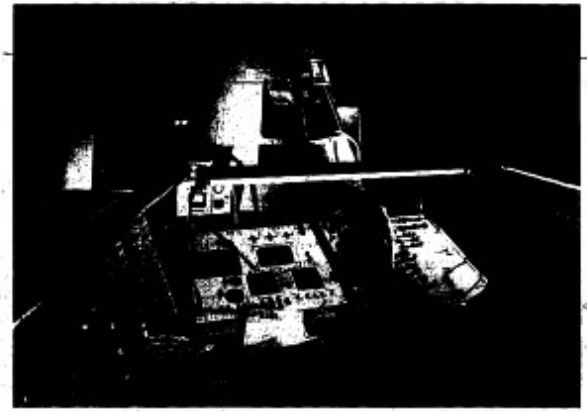


FIGURE 27.—Procedures trainer, instructor station.

2. *Johnsville centrifuge.*—The Navy centrifuge at Johnsville, Pa., has also been a valuable training simulator. The Mercury pilots have undergone three training sessions at this facility; the last session was a realistic simulation of the Redstone prelaunch activities and in-flight control procedures. These tests also provided an opportunity for some of the range stations aeromedical monitors to observe the displays of biomedical instrumentation during acceleration. The centrifuge gondola arrangement is shown in figure 28 and the closeup of an astronaut within the gondola is shown in figure 29.

3. *Zero-gravity flights.*—The pilots have had three opportunities to participate in weightless flying research programs. Air Force C–31, C–135, and F–100F aircraft were used. By flying zero-gravity parabolas, these aircraft achieved periods of weightlessness of 10 seconds, 30 seconds, and 60 seconds, respectively. Astronaut Shepard experienced 5 minutes of weightlessness during the MR–3 flight. No adverse effects were realized.

4. *Multiaxis simulator.*—The multigimballed simulator at the NASA Lewis Research Center was used for pilot indoctrination at high values of angular acceleration and rotation. This facility was operated at 30 revolutions per minute about all three angular axes. The pilot used a manual reaction control system (compressed nitrogen) to stop the rotations. The pilots successfully maintained orientation at angular accelerations far in excess of any which will be encountered in Project Mercury. A picture of this facility is shown in figure 30.

5. *Egress training.*—Although the pilot would normally stay within the capsule until it had been placed aboard ship, there is a possibility that he might desire to climb out after a water landing. Egress might be desirable to facilitate rapid rescue, in the event of high temperatures within the capsule, or if the ventilation system were not functioning properly. To accomplish egress training under realistic sea conditions, an egress capsule was taken to Pensacola, Fla. The egress capsule is a boilerplate model manufactured by McDonnell Aircraft Corp. Weight and hydrodynamic characteristics are identical to that of the flight version. The interior mockup is identical to the flight version and affords the same degree of egress restriction. To leave through the top of the capsule, the pilot must first release his restraint harness, communications, oxygen hoses, and bioinstrumentation connectors. He then raises partially out of the couch and removes the 3-foot-diameter bulkhead from the top of the pressurized compartment. Next he must push the empty parachute container out of the cylindrical neck of the capsule and work himself out the top. He then inflates his liferaft and ties it to the capsule to maintain the capsule adjacent to the liferaft and take advantage of the capsule recovery beacons. A photograph of one of the pilots emerging from the egress trainer capsule is shown in figure 31.

For normal helicopter recovery a procedure has been developed whereby a hovering helicopter lowers two lines; one attaches to the capsule and holds it erect while the second line lowers a sling near the side hatch. The pilot then crawls through the side hatch into the sling and is lifted into the helicopter. This is the procedure that was used after Alan Shepard's Redstone flight.

Under emergency conditions, much more rapid egress is possible through the capsule's side hatch.

FIGURE 28.—Human centrifuge at U.S. Navy, AMAL, Johnsville, Pa.

FIGURE 29.—Mercury astronaut in the AMAL centrifuge cabin.

FIGURE 30.—Multiaxis motion simulation at Lewis research center.

FIGURE 31.—Mercury astronaut undergoing training in capsule egress procedures.

Pilot activities during flight

Although the capsule is only 6 feet in diameter and 10 feet high, it contains a complex array of subsystems and manual controls. The attitude control system is an example of a capsule subsystem with many modes of operation available to the pilot. The control system consists of a manual system and an automatic system; however, each of these contains several modes which can be used at the discretion of the pilot. He can select the direct manual mode in which, by means of a hand-control stick, he moves a mechanical linkage which is attached to valves in the hydrogen peroxide lines. The valves can then be opened proportionately to the amount of thrust he desires. By throwing a switch he can augment his manual input with electrically operated valves which are controlled by a separate set of gyroscopes. This additional gyro input tends to stop any capsule motion which exists. He can select a purely automatic mode in which special horizon sensing photocells send signals to stabilize a set of attitude gyros which in turn send signals to electrically operated peroxide valves. He can uncouple the attitude gyros in the automatic system so that the reaction jets are activated by angular rate gyros rather than attitude position gyros. The capsule can be manually flown on the automatic system by electrically linking the hand-control stick to the peroxide valves. During the retrofiring maneuver, the pilot would normally choose to augment the automatic system by the use of the manual system. If a valve in the automatic system were to fail in the open position, the pilot would shut off that particular axis of the automatic system and manually control the capsule attitude about that axis. The pilot would normally use the automatic mode while in orbit, thereby permitting full attention to ground and sky observations and to reporting the behavior of the various capsule systems. In all, the pilot can select any of 20 different modes for the capsule control system.

The attitude control system is only one of the capsule subsystems. Also controllable by the pilot in a number of different modes are the electrical, communications, life support, retrofiring, landing, and recovering systems. In addition to these, he can manually actuate the normal automatic sequential operations such as escape rocket firing, capsule separation, and tower separation. By providing the pilot with complete control over the capsule operation, a high degree of safety has been built into the Mercury concept.

During Shepard's flight in MR–3, the manual control system was used during all the critical maneuvers after capsule separation. The retrofire maneuver was accomplished by using the manual control system and observing the rate and attitude indicators. Shepard reported that the rocket thrust misalinement was small and caused relatively low torques on the capsule. He felt that the actual angular acceleration imparted to the capsule provided motion cues which made attitude control easier than in the fixed-base simulators.

Shepard's flight proceeded very much as planned. He did, however, notice a mild vibration during launch as the capsule progressed through the transonic speed range and continued until the maximum dynamic pressure region had been encountered. He felt that, although his vision was somewhat blurred during this 10-second vibration period, he could have improved his vision by raising his head from the couch. These vibrations were caused by aerodynamic turbulence downstream from the capsule-to-adapter clamp ring. Subsequent flights will incorporate special clamp ring fairings which should reduce the turbulence and resultant vibrations.

Physiologically Shepard's performance was very similar to that observed during his training sessions on the centrifuge. His heart rate, as monitored on EKG traces, did not exceed 135 and his respiration rate was normal. Zero-gravity caused no difficulty: in fact, the 5-minute duration of weightlessness was hardly noticeable because his attention was occupied with capsule control duties and visual observations through the periscope and windows.

Results of the MR–3 flight indicate that the pilot performed as expected and that the pilot should increase the probability of success for the orbital mission.

Program Management and Support Organization

The program management structure for Project Mercury is shown in figure 32. The Space Task Group (fig. 33), at Langley Field, Va., has the responsibility for overall project direction.

Space Task Group is under the direction of Mr. Robert R. Gilruth, and his two associates, Mr. Charles J. Donlan and Mr. Walter C. Williams.

Within the NASA organization, project support is provided by the Langley, Ames, Lewis, and Flight Research Centers. The Marshall Space Flight Center of NASA has the responsibility for providing and launching Redstone launch vehicles.

The Mercury capsules or spacecraft are produced to NASA specifications by the McDonnell Aircraft Corp. and associated subcontractors. In addition to producing the capsules, McDonnell Aircraft Corp. provides personnel services for preparation and launch of the spacecraft, associated ground support equipment, research and development hardware, flight simulators, and other training equipment.

Major subcontractors to McDonnell are as follows:

Minneapolis-Honeywell: Automatic stabilization and control system.
AiResearch: Environmental control system.
Bell Aircraft Corp.: Hydrogen-peroxide control system.
Food Machinery Corp.: Backup hydrogen-peroxide control jets.
Eagle-Picher Co.: Batteries.
Collins Radio: Communications system.
Cincinnati Testing Laboratories: Ablation heat shield.
Brush Beryllium: Beryllium heat shield.
Radiophone Division of Northrop: Landing system.
Grand Central Rocket Co.: Escape rocket.
Thiokol Chemical Corp.: Retro and posigrade rockets.
Perkin-Elmer Co.: Periscope.
Barnes Instrument Co.: Horizon scanner.

The Atlas launch vehicles for Project Mercury are produced by Convair Astronautics and associated contractors under the management of the Air Force Ballistic Missiles Division and its associated management contractor, Aerospace Corp. Launch of the Atlas vehicle is the responsibility of USAF–BMD.

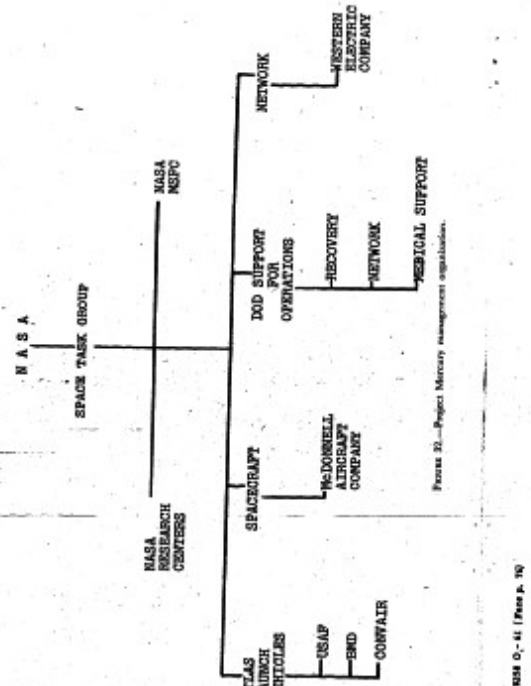


FIGURE 32.—Project Mercury management organization.

(Text p. 76)

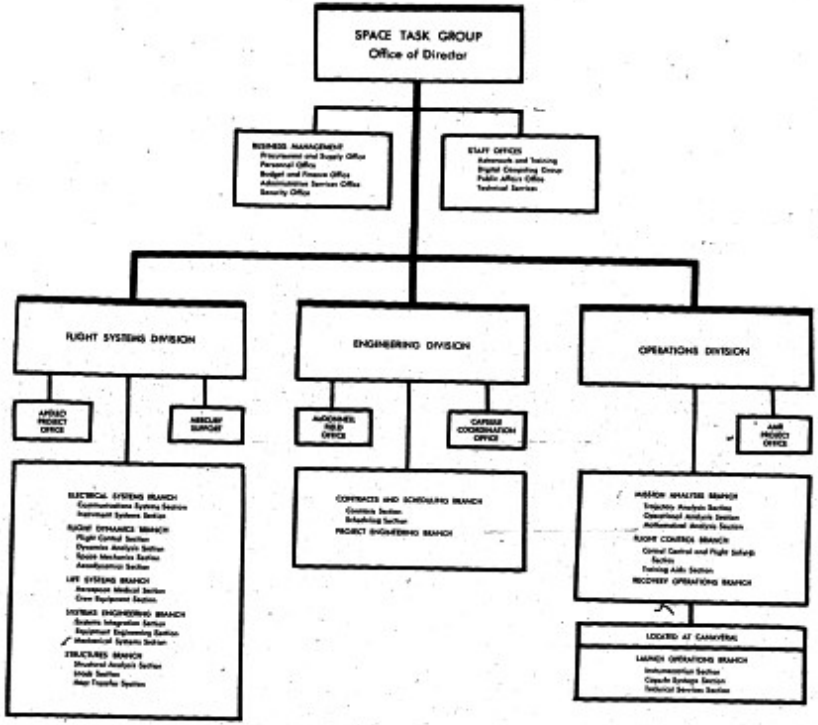


FIGURE 33.—NASA space task group organization.

The Atlas launch vehicles differ from standard missile launching models in areas of guidance, instrumentation, structural attachment of the capsule, and in the provision of automatic in-flight failure sensing equipment for escape system actuation.

Little Joe launch vehicles and rockets were produced by the North American Aviation Co. and Thiokol Chemical Co. to specifications formulated by the NASA Langley Research Center. Launch of Little Joe vehicles and beach abort tests are the responsibility of the Wallops Island Station of NASA.

The NASA Langley Research Center is responsible for the planning and implementation of the Project Mercury ground tracking and communications network. The MIT Lincoln Laboratories have provided technical assistance in the network planning and the Western Electric Co. has been given prime contract responsibility for design and construction of the network system. Major subcontractors to Western Electric are listed on pages 51 and 52.

In addition to planning and making contractual arrangements for the network construction, the Langley Research Center has arranged with the Department of Defense representatives for use of existing range facilities and has participated in arrangements with foreign governments to establish Mercury stations and leasing foreign communications facilities.

The Department of Defense provides a very broad range of support to Project Mercury. Already mentioned is the part played by the Air Force Ballistic Missiles Division in supplying and launching Atlas vehicles. The Air Force also provides Air Rescue Service aircraft for capsule search and recovery operations, map-making services of the Aeronautical Chart Information Center, loan aircraft for network station checkout, and astronaut normal flight and zero-g training, AMR launch facilities, control center facilities, medical support at Cape Canaveral and remote stations, and use of existing network facilities and manpower at several of the Mercury network stations. The Aerospace Medical Center of the Air Force has also given assistance in astronaut training and has supplied animal test packages for use during the Mercury flight test program.

The Army has loaned tracking equipment to NASA, has made the White Sands Proving Ground facilities available for network use, will provide a substantial share of DOD medical support to Project Mercury, has supplied communications equipment, and has supplied, amphibious vehicles for use in possible launch site recovery operations. The Army Redstone launch vehicle will be used for unmanned and manned ballistic flights.

The Navy has been given responsibility for the Mercury spacecraft recovery operations. The Navy recovery commander will have elements of the Atlantic Fleet and Air Rescue Service at his command for effecting rapid recovery of the capsule. Destroyers, LSD's, miscellaneous service vessels, Marine helicopters, patrol aircraft and early warning aircraft will all be utilized for search and recovery operations.

The Navy is also providing assistance in the construction of the Canton Island network station, has loaned command transmitter equipment to NASA, and has given a number of tracking radar to NASA.

The Naval Air Material Center, Naval Air Development Center, Naval Parachute Facility, and Naval Medical Units, all have given substantial support to NASA.

Pacific Missile Range, under U.S. Navy management, is aiding in the operation of the Canton Island, Hawaii, and the southern California tracking stations.

Support by units of the Department of Defense has, in general, been formalized through a series of agreements between NASA and the particular military service concerned. As a rule, these agreements call for reimbursement by NASA for any support or services rendered over and above normal military operations.

Overall coordination of Department of Defense support for Project Mercury operations is arranged between Maj. Gen. Leighton I. Davis, USAF, Department of Defense representative for Project Mercury operations, and Mr. Walter C. Williams, Associate Director of Project Mercury.

In addition, scores of working-level committees and coordinating groups have been organized, to effect day-by-day coordination between NASA, the military services, and industry.

Project Mercury Funding

Initial funding for Project Mercury was provided in fiscal year 1959, when $46,416,333 was obligated for Mercury research and development, and $2,425,000 for construction and equipment.

In fiscal year 1960, the obligation for research and development totaled $84,328,370, and for construction and equipment $35,795,000. The fiscal year 1960 figures include supplemental funding of $12,200,000 for research and development, and $6,800,000 for construction and equipment.

Early in fiscal year 1960, Congress was advised that NASA intended to transfer $15 million from the research and development appropriation to construction and equipment for construction of the Mercury network. The fiscal year 1960 figures reflect this fund transfer.

For fiscal year 1961, the current allocation of funds is $109,525,000 for research and development and $15 million for construction and equipment.

Total Project Mercury funding obligations for fiscal year 1959 and 1960, and current allocation for fiscal year 1961, is, therefore, as follows:

Research and development:	
Fiscal year 1959	$46,416,333
Fiscal year 1960	84,328,370
Fiscal year 1961	110,051,000
Total	240,795,703
Construction and equipment:	
Fiscal year 1959	2,425,000
Fiscal year 1960	35,795,000
Fiscal year 1961	15,000,000
Total	53,220,000
Total through fiscal year 1961	294,015,703
Proposed "Research and development", fiscal year 1962	74,245,000
Proposed "Construction of facilities", fiscal year 1962	none
Grand total through fiscal year 1962	368,260,703

Conclusions

Project Mercury is a tremendously complex undertaking. It involves concurrent efforts in research, development, engineering, manufacturing, test, and training. It is a team effort on a national scale, directed by the National Aeronautics and Space Administration, and supported by the Department of Defense, industry, and research institutions.

Project Mercury is one of the most comprehensive research and development programs ever undertaken in this country with respect to manned flight. A major problem is the necessity to attempt to "man rate" the Redstone and Atlas rocket vehicles which were not designed for manned reliability. The reliability of these two vehicles is the ultimate key to the success of Mercury. The first manned Redstone, a major Mercury milestone, was successfully achieved May 5, 1961.

Project Mercury is actually two research and development programs joined together by the capsule—the ballistic flight program utilizing Redstone, and the orbital program utilizing Atlas. The suborbital and orbital phases of Mercury each have different complex problems to solve and each contribute equally to achieving the ultimate goal of manned-orbital flight.

Project Mercury is progressing satisfactorily. Some slippage has occurred, but it is not out of line when considering the complexity of the development and past history of other large research and development programs.

Project Mercury will make a valuable pioneering contribution to followon manned-space flight programs, such as the NASA-Apollo and the DOD Dyna-Soar projects.

DOD-NASA coordination in the prosecution of Project Mercury is outstanding in every respect. Both organizations are dedicated to the success of this country's only current man-in-space program.

The cost of successfully completing Project Mercury could exceed one-half billion dollars, dependent upon the success of meeting the flight-test target goals as presently scheduled. Again, consideration must be given to the fact that Project Mercury is, in fact, two parallel research and development programs joined by the space capsule development. Booster reliability will be the key to increased program costs.

Some critics of Project Mercury believe that it is being overtaken by advancing technology; however, it appears that the state of the art provides no categorical indication that such is the case. The Air Force, NASA, and the Navy are learning together in the X–15 program as we progress in our approach to manned-space flight. The Discoverer program is providing valuable data for future space endeavor. DOD and NASA participation in numerous missile and space programs indicates no technological advancements that would negate the value of Project Mercury. Although decisions for the configuration of the capsule and the boosters were made several years ago, technology has not advanced to the extent of overtaking the basic Mercury concept which is to achieve an early capability for orbiting man in space.

Project Mercury is now 2½ years old. Since its inception, an extensive wind tunnel and flight-test program has been carried out, involving hundreds of wind tunnel and airplane drop tests, and 15 major rocket launchings; the Mercury production capsules were designed, engineered, and tested—12 were delivered by the end of April 1961; a major network of communications and tracking stations was completed; and training exercises of both the systems and the astronauts are progressing. A major flight-test program has begun, involving manned and unmanned-ballistic flights, leading to manned-orbital flight.

Project Mercury continues to move forward in an atmosphere of confidence apparent to all concerned. Morale is high, hours are long, the astronauts are busy and fit. The team is dedicated to a single goal—the achievement of successful manned-orbital flight.

APPENDIX

	Page
NASA-DOD agreements:	
Air Proving Ground Center—NASA space task group	82
Air Force Missile Test Center (AMR)—NASA space task group	83
Chief of Naval Operations—NASA space task group	85
NASA-Foreign government agreements	87

Agreement Between the Air Proving Ground Center and the NASA-Space Task Group

Concerning principles governing reimbursement of costs

(1) *Purpose.*—A DOD–NASA agreement, signed November 12, 1959, by Deputy Secretary of Defense Gates and NASA Administrator Glennan, under the provision of section 203(b)(6) of the National Aeronautics and Space Act of 1958, set forth the general principles governing the reimbursement of costs incurred by DOD or NASA in providing for use by the other of its service, equipment, personnel, and facilities and in transferring equipment and supplies. The DOD–NASA document is the authority and basic reference under which this agreement is established.

(2) *Agreement.*—It is agreed that the Air Proving Ground Center (EAFB) will bill the NASA-Space Task Group for cost of support peculiar to Project Mercury which is in addition to common range support. Common range support is defined, for the purposes of this agreement, to include but is not limited to: APGC services as a test range for satellites, space probes, missiles, drones, and related equipment, and supporting tests and training organizations. Evaluation of test results determined by data acquisition and reduction.

(A) *Common range support—nonreimbursable.*—Common range support is that normally provided as part of the range service, common to the majority of range users. It will be programed, budgeted, and funded by APGC on a nonreimbursable basis. The cost of operating existing stations will, in general, be nonreimbursable.

(1) Examples of nonreimbursable items:

(*a*) Salaries of radar operators at existing stations.

(*b*) Range time used during normally scheduled periods.

(B) *Support peculiar to Project Mercury—reimbursable.*—Support peculiar to Project Mercury is that support which would not otherwise be required to be provided by the range except for Project Mercury requirements.

(1) Examples of reimbursable support are:

(*a*) Total operating costs of new stations established for Project Mercury.

(*b*) Travel, transportation of things, per diem, and communication costs incurred on behalf of Project Mercury.

(*c*) Direct increased cost of operating existing stations.

(C) *Differences.*—Conflicts or inconsistencies in billings, or any special cases which arise, will be brought to the attention of the DOD representative whose group will establish an appropriate position for NASA consideration.

(D) *Budget estimates and financial administration.*—

(1) Two copies of the fiscal year 1962 budget estimates for Project Mercury and fiscal year 1961 financial plan for Project Mercury and

two copies of future budget estimates and financial plans will be submitted to NASA at the time of normal submission to Headquarters ARDC. NASA reimbursable costs will be reflected therein. Note: The initial fiscal year 1960 and 1961 estimates from all ranges were submitted to NASA through AFMTC (AMR) for review of format and content. (Flash estimate.)

(2) *Service order and billings.*—NASA Space Task Group will issue an order requesting range services and authorizing billings therefore based on range estimates. In accordance with this policy, APGC will submit monthly billings on S.F. 1080 showing actual costs broken down in the same way as estimates were prepared directly to:

NASA—Space Task Group
Budget and Finance Office
Langley Field, Va.

(3) *Effective date and duration of agreement.*—This agreement is effective immediately, but the provisions may, by mutual agreement, be revised at any time based upon experience of the two organizations.

Robert R. Gilruth,
Director of Project Mercury.
Joe W. Kelly,
General USAF.

April 11, 1960.

Agreement Between the Air Force Missile Test Center (AMR) and the NASA—Space Task Group

Concerning principles governing reimbursement of costs

(1) *Purpose.*—A DOD–NASA agreement, signed November 12, 1959, by Deputy Secretary of Defense Gates and NASA Administrator Glennan, under the provision of section 205(b)(6) of the National Aeronautics and Space Act of 1958, set forth the general principles governing the reimbursement of costs incurred by DOD or NASA in providing for use by the other of its services, equipment, personnel, and facilities and in transferring equipment and supplies. The DOD–NASA document is the authority and basic reference under which this agreement is established.

(2) *Agreement.*—It is agreed that the Air Force Missile Test Center (AMR) will bill the NASA–Space Task Group for cost of support peculiar to Project Mercury which is in addition to Common Range Support. Common Range Support is defined, for purposes of this agreement, to include but is not limited to: AFMTC (AMR) services as a test range for satellites, space probes, missiles, drones, and related equipment, and supporting tests and training organization; evaluation of test results determined by data acquisition and reduction; utilities, security, and fueling of missiles on pad.

A. *Common range support—nonreimbursable.*—Common Range Support is that normally provided as a part of the range service, common to majority of range users. It will be programed, budgeted, and funded by AFMTC (AMR) on a nonreimbursable basis. The costs of operating existing stations will, in general, be nonreimbursable.

(1) Examples of nonreimbursable items:
(*a*) Salaries of radar operators at existing stations.
(*b*) Range time used during normally scheduled periods.

(B) *Support peculiar to Project Mercury—reimbursable.*—Support peculiar to Project Mercury is that support which would not otherwise be required to be provided by the range except for Project Mercury requirements.

(1) Examples of reimbursable support are:
(*a*) Total operating costs of new stations established for Project Mercury.
(*b*) Travel, transportation of things, per diem, and communication costs incurred on behalf of Project Mercury.
(*c*) Operating costs of Atlantic Ocean and Indian Ocean ships. Port facility expenses for the Atlantic Ocean ship will be nonreimbursable, since it will be based at Trinidad where AFMTC (AMR) facilities already exist as common use support. Port facility expenses for the Indian Ocean ship will be reimbursable since AFMTC (AMR) has no available Indian Ocean port facilities.

(C) *Differences.*—Conflicts or inconsistencies in billings or any special cases which arise will be brought to the attention of the DOD representative whose group will establish an appropriate position for NASA consideration.

(D) *Budget estimates and financial administration.*—(1) Two copies of the fiscal year 1962 budget estimates for Project Mercury and fiscal year 1961 financial plan for Project Mercury and two copies of future budget estimates and financial plans will be submitted to NASA at the time of normal submission to Headquarters ARDC. NASA reimbursable costs will be reflected therein. Note: The initial fiscal year 1960 and 1961 estimates from all ranges were submitted to NASA through AFMTC (AMR) for review of format and content. (Flash estimate).

(2) *Service order and billings.*—NASA Space Task Group will issue an order requesting range services and authorizing billings therefor based on range estimates. In accordance with this policy, AFMTC (AMR) will submit monthly billings on S.F. 1080 showing actual costs broken down in the same way as estimates were prepared directly to:

NASA—Space Task Group
Budget and Finance Office
Langley Field, Va.

(3) *Effective date and duration of agreement.*—This agreement is effective immediately, but the provisions may, by mutual agreement, be revised at any time based upon experience of the two organizations.

ROBERT R. GILRUTH,
Director of Project Mercury.

March 28, 1960.

DONALD W. YATES,
Major General, USAF.

AGREEMENT BETWEEN THE CHIEF OF NAVAL OPERATIONS AND THE NASA SPACE TASK GROUP

Subject: Principles governing reimbursement of costs incurred in conjunction with recovery operations.

Reference: (*a*) Section 203(b)(6), National Aeronautics and Space Act of 1958.
(*b*) Agreement between the Department of Defense and National Aeronautics and Space Administration, dated September 14, 1959.

1. *Background.*—Reference (*a*) authorizes the National Aeronautics and Space Administration to use, with their consent, the services, equipment, personnel, and facilities of other Federal agencies with or without reimbursement and requires such agencies to cooperate fully with NASA in such regard. Reference (*b*), sets forth the general principles governing the reimbursement of costs incurred by DOD or NASA in providing for use by the other of its services, equipment, personnel, and facilities and in transferring equipment and supplies.

2. *Purpose.*—It is the purpose of this agreement to—

a. Outline the elements of cost incident to Navy participation in recovery operations, outside the scope of the mutuality of interest provision of reference (*b*), and therefore subject to reimbursement by NASA.

b. Outline the general procedures for such reimbursement.

c. Provide a sound basis for budgetary planning and to insure that the additional costs involved are adequately funded.

3. *Definitions.*

a. Recovery operations include, but are not necessarily limited to, positioning of ships, craft, and aircraft of various types at predetermined bases or areas in relation to the particular mission, search and pickup of the payload, and delivery to an agreed location; training of personnel and development of recovery techniques.

b. Direct support includes, but is not necessarily limited to, ship days and/or aircraft hours devoted to direct participation in recovery operations or in operations whose sole objective is in support of Project Mercury endeavors.

4. *Basis for reimbursement and allowable costs.*

a. Ship days and aircraft hours, utilized in direct support of Project Mercury operations (and therefore subject to reimbursement) can most logically be determined by the fleet commander (or his designated representative(s)) of the operating force(s) involved. In computing the ship days and aircraft hours subject to the foregoing reimbursement, it is recognized that a portion of the days steamed or a portion of the total hours flown, incident to direct support of Project Mercury may, in some instances, be properly allocable to unique Navy effort such as training and other activity contributory to fleet readiness. Such portion is funded in regular Navy programs and is not subject to reimbursement by NASA and the determination thereof shall be made, as above, by the fleet commander or his designated representative(s).

b. Based upon prevailing Bureau of Ships and Bureau of Weapons cost factors, the following elements shall be included in arriving at

the cost of a ship day and aircraft hour, by type vessel and aircraft, which are subject to reimbursement by NASA:

(1) Ships:

(*a*) Nonscheduled repairs, based on current experience, by type, calculated on a ship-day basis.

(*b*) Supplies and equipage (consumables and spare parts), based on current consumption by ship type, calculated on a ship-day basis.

(*c*) Fuel, based on average barrels consumed per hour underway X24X current Navy stock fund price per barrel.

(*d*) Costs of overhauls are excluded.

(2) Aircraft—average hourly cost, by type, to include:

(*a*) Fuel.

(*b*) Lube oil.

(*c*) Consumable supplies and spare parts.

(*d*) Prorated cost of airframe rework and engine overhaul.

c. Special equipment, including cost of installation and removal, as applicable, purchased by the Navy for direct support of Project Mercury. Title to such equipment will be held by NASA.

d. Cost on installation and removal of NASA furnished equipment.

e. Travel, per diem, telephone costs, photography, and other additional out of pocket expenses.

f. Special costs incidental to aircraft deployment for Mercury support.

5. *Budget estimates and financial administration.—a. Estimates.*—Fiscal year 1960 and fiscal year 1961 budget estimates of the cost of support of Project Mercury and future budget estimates will be submitted to NASA as required. NASA space task group will issue, to each cognizant Navy bureau, reimbursable Government orders based on the above estimates. It is recognized that these estimates are not limitations. Accordingly, both estimates and orders are subject to amendment based on changing operational requirements.

b. Billings.—(1) Charges for actual ship days and aircraft hours, subject to reimbursement, plus other costs, subject to reimbursement, financed from funds available to fleet activities will be billed quarterly by BuWeps and BuShips on S.F. 1080, showing actual costs, broken down in the same way as estimates are prepared.

(2) Charges for costs incurred by a field activity of the Shore Establishment will be billed by the field activity concerned on a funded basis. S.F. 1080 will be prepared as outlined above but will be submitted monthly.

(3) Billings on S.F. 1080 will be submitted to: NASA-Space Task Group Budget and Finance Office, Langley Field, Virginia.

ROBERT R. GILRUTH,
Director of Project Mercury.
JAMES S. RUSSELL,
Admiral, U.S. Navy,
Vice Chief of Naval Operations.

Dated March 30, 1960.

DEPARTMENT OF STATE

DIVISION OF LANGUAGE SERVICES

(Translation)

LS NO. 49406
T-32/R-NIX
Spanish

MINISTRY OF FOREIGN AFFAIRS,
Madrid, March 18, 1960.

No. 191.

His Excellency W. PARK ARMSTRONG,
Chargé d'Affaires ad interim of the United States of America, Madrid.

EXCELLENCY: I have the honor to acknowledge the receipt of your note No. 1097, dated March 11, the Spanish translation of which reads as follows:

"EXCELLENCY: I have the honor to refer to recent discussions between our two Governments concerning the proposal that my Government be authorized to establish and operate jointly with the Government of Spain, for scientific non-military purposes, a facility for space vehicle tracking and communications on Grand Canary Island. Such a facility is required by the United States as part of a world-wide tracking range being established in connection with its manned satellite program, known as Project Mercury, under which the United States plans to place a manned earth satellite into orbital flight and to recover it.

"The Government of Spain, desiring to cooperate with the United States in this scientific program, and thereby to contribute to the knowledge of man's spatial environment and its properties, has authorized the establishment of a tracking and communications facility on the Island of Grand Canary. Accordingly, the two Governments agree on the following general principles and procedures:

"1. The Government of Spain shall furnish land areas and rights-of-way for use by the National Aeronautics and Space Administration (hereinafter referred to as NASA) needed for the establishment and operation of the facility to be located at the southern end of the Island of Grand Canary. The specific site of the facility and quantity of land shall be as agreed upon by the authorized representatives of our two Governments. The United States Government shall be represented by NASA. The Government of Spain shall be represented by the Instituto Nacional de Técnica Aeronáutica, hereinafter referred to as INTA.

"2. The Government of the United States, for its part, shall construct, at its expense, the station that is the object of this agreement. All cost of installing, equipping and operating the facility shall also be borne by the Government of the United States, including the cost of constructing the necessary highways and access roads. The foregoing activities shall be carried out in accordance with applicable Spanish laws and the provisions of Article 9 relating to the ownership of property.

"3. The facility shall consist of installations for an S-Band radar, telemetry, a ground-to-air transmitter, and a ground receiver; subject to agreement by both governments, installations necessary for point-to-point communications to the extent that communications

requirements cannot be met by local telephone and telegraph facilities; and necessary supporting buildings and structures for offices, storage, housing, sanitation, and other purposes deemed necessary. Buildings will generally be of a standard prefabricated type, transportable in sections.

"4. Power for the facility shall be generated at the site by equipment to be installed as a part of the facility.

"5. Upon the request of the United States and subject to Spain's obligations under international conventions, the Government of Spain shall authorize the use of radio frequencies required for the purposes of the facility. However, the high frequency channel required for ground-to-air communication with the space vehicle shall be determined by the Government of the United States. All radio operations shall be conducted so as not to cause interference with Spanish installations.

"6. By agreement of the two Governments, a United States contractor has been engaged to construct the facility. The contractor shall employ, to the maximum extent feasible, available local subcontractors and labor to perform the required work. Materials and supplies available locally shall be used as much as possible. The Government of Spain shall, upon request of the contractor, assist him in the local procurement of goods, materials, supplies, and services required for the construction of the facility.

"7. The special electronic equipment and related equipment required for the facility shall be United States-type equipment and shall be installed by United States technicians.

"8. The Government of Spain shall, upon request, take the necessary steps to facilitate the admission into Spain of material, equipment, supplies, goods or other items of property furnished by the Government of the United States for the purposes of the facility. Spanish authorities shall be informed in advance through INTA of the contents of such shipments. No tax, duty or charge shall be levied or assessed, either by the Government of Spain or by any other Spanish authorities, on material, equipment, supplies, goods or property brought into or procured in Spain, for use in the operation of the facility on the Island of Grand Canary.

"9. Title to all materials, equipment or other items of movable property used in connection with the facility shall remain vested in the Government of the United States. Title to all other property shall continue to be vested in the Government of Spain or other Spanish owners. Material, equipment and property of the Government of the United States at the facility may be removed free of taxes or duties by the Government of the United States at any time.

"10. The facility shall be operated by NASA, either directly or by contract with a United States firm. To the maximum extent feasible, qualified Spanish personnel shall be utilized in connection with the operation and maintenance of the facility, in addition to United States technicians and specialists assigned by NASA or the contracting firm. NASA and INTA shall cooperate closely to ensure full access by INTA to the facility in order to make possible a full exchange of information concerning both the techniques employed and the uses to which the facility is being put.

"11. (a) The Government of Spain shall take the necessary steps to facilitate admission to the Island of Grand Canary of such United States personnel as may be assigned to visit the facility or participate in its operation. Such personnel shall not exceed that necessary for the construction and effective use of the station. Their names and other related information shall be promptly communicated to the Government of Spain.

"(b) Personal and household effects of United States personnel (including personnel of NASA's contractors and subcontractors) may be brought into and removed from Spain free of all taxes and duties; such effects shall not be sold or otherwise disposed of in Spain except under conditions approved by the Government of Spain.

"(c) The presence on Grand Canary of United States personnel, personnel of NASA's contractors and subcontractors, in connection with the establishment or operation of the facility shall not constitute either residence or domicile and shall not, of itself, make such subject to taxation, either on income or property. However, such personnel shall not be exempt from indirect taxes on goods or services purchased by them in Spain.

"12. (a) The United States anticipates that the facility will be required for use until July 1, 1963. The Government of Spain agrees that the facility may be operated under the general principles and procedures provided herein until that date, and for such additional period as the two Governments may agree upon.

"(b) Should changed conditions alter the requirement of the Government of the United States for the facility prior to July 1, 1963, the Government of the United States shall have the right to terminate its use of the facility by giving ninety days' advance notice to the Government of Spain.

"(c) If, upon terminating its use of the facility, the United States Government should desire to dispose of all or part of the materials, equipment or other items of property to which it holds title on the Island of Grand Canary, the two Governments shall enter into consultation as soon as possible prior to the date of termination of use in order to make the necessary arrangements. The Spanish Government shall have a preferential right in the purchase of such material, equipment and other items of property.

"13. Supplementary arrangements between NASA and INTA shall be made from time to time as required for the carrying out of the purposes and provisions of this Agreement.

"14. It is understood that to the extent the implementation of this Agreement will depend on funds appropriated by the Congress of the United States, it is subject to the availability of such funds.

"If the foregoing general principles and procedures are acceptable to Your Excellency's Government, I have the honor to propose that this note and Your Excellency's note in reply to that effect shall constitute an Agreement between our two Governments on this matter which shall enter into force on the date of your note in reply."

On informing you of the Spanish Government's acceptance of the foregoing, I request, Sir, that you accept the assurances of my high consideration.

(Signed) FERNANDO CASTIELLA.

○

INFLATABLE STRUCTURES IN SPACE

4 JUL 2 5 1960
Copy

HEARING

BEFORE THE

COMMITTEE ON SCIENCE AND ASTRONAUTICS U.S. HOUSE OF REPRESENTATIVES

EIGHTY-SEVENTH CONGRESS

FIRST SESSION

MAY 19, 1961

[No. 12]

Printed for the use of the Committee on Science and Astronautics

U.S. GOVERNMENT PRINTING OFFICE
70468 O WASHINGTON : 1961

COMMITTEE ON SCIENCE AND ASTRONAUTICS

OVERTON BROOKS, Louisiana, *Chairman*

GEORGE P. MILLER, California
OLIN E. TEAGUE, Texas
VICTOR L. ANFUSO, New York
JOSEPH E. KARTH, Minnesota
KEN HECHLER, West Virginia
EMILIO Q. DADDARIO, Connecticut
WALTER H. MOELLER, Ohio
DAVID S. KING, Utah
THOMAS G. MORRIS, New Mexico
BOB CASEY, Texas
WM. J. RANDALL, Missouri
JOHN W. DAVIS, Georgia
WILLIAM FITTS RYAN, New York
JAMES C. CORMAN, California
JOHN W. McCORMACK, Massachusetts

JOSEPH W. MARTIN, Jr., Massachusetts
JAMES G. FULTON, Pennsylvania
J. EDGAR CHENOWETH, Colorado
WILLIAM K. VAN PELT, Wisconsin
PERKINS BASS, New Hampshire
R. WALTER RIEHLMAN, New York
JESSICA McC. WEIS, New York
CHARLES A. MOSHER, Ohio
RICHARD L. ROUDEBUSH, Indiana
ALPHONZO E. BELL, Jr., California

CHARLES F. DUCANDER, *Executive Director and Chief Counsel*
Dr. CHARLES S. SHELDON II, *Technical Director*
SPENCER M. BERESFORD, *Special Counsel*
PHILIP B. YEAGER, *Special Consultant*
JOHN A. CARSTARPHEN, Jr., *Chief Clerk*
FRANK R. HAMMILL, Jr., *Counsel*
RICHARD P. HINES, *Staff Consultant*
HOWARD J. SILVERSTEIN, *Staff Consultant*
RAYMOND WELGOVE, *Staff Consultant*
C. OTIS FINCH, *Assistant Clerk*
JOSEPH FELTON, *Publications Clerk*

CONTENTS

Statements of—	Page
Loftin, L. K., Jr., Technical Assistant to Director, Langley Research Center, National Aeronautics and Space Administration	5
Madden, Robert T., manager of astronautics sales, Goodyear Aircraft Corp., Akron, Ohio	31
O'Sullivan, William J., Space Vehicle Group, Langley Research Center, National Aeronautics and Space Administration	9
Quie, Hon. Albert H., Representative from Minnesota, U.S. Congress	1
Richardson, Robert W., vice president, Goodyear Aircraft Corp., Akron, Ohio	24
Ross, Dr. Robert T., manager, aeromechanics research and development department, Goodyear Aircraft Corp., Akron, Ohio	25, 40

INFLATABLE STRUCTURES IN SPACE

FRIDAY, MAY 19, 1961

HOUSE OF REPRESENTATIVES,
COMMITTEE ON SCIENCE AND ASTRONAUTICS,
Washington, D.C.

The committee met at 10 a.m., Hon. Overton Brooks (chairman) presiding.

The CHAIRMAN. The committee will come to order.

Mr. KING. Mr. Chairman, could I mention that we have with us the distinguished Congressman from Minnesota, Mr. Albert Quie, who is here by virtue of the fact that Echo I was fabricated in Northfield, Minn., which is in the district of the gentleman from Minnesota.

I think the record should show that he is here as a visitor.

Mr. HECHLER. I would like to join in welcoming my colleague, Mr. Quie, to the committee.

The CHAIRMAN. We are happy to have you this morning, Mr. Quie.

This morning we open a 1-day hearing on the matter of the potential uses, problems and funding, and research and development on "Inflatable Structures in Space."

We have a good many witnesses this morning. I think it is entirely proper that we follow the hearings that we have had by this one on "Inflatable Structures in Space."

We have, of course, our distinguished colleague. We want to hear from him in just a moment.

We have Mr. L. K. Loftin, Jr., Technical Assistant to the Director of the Langley Research Center of NASA; Mr. William J. O'Sullivan, Space Vehicle Group, Langley Research Center, NASA; Mr. Robert W. Richardson, vice president, Goodyear Aircraft Corp.; Dr. Robert S. Ross, Goodyear Aircraft Corp., and Mr. Robert T. Madden, Goodyear Aircraft Corp., also.

We are glad to have these gentlemen here with us this morning.

Mr. Quie, I know of your interest, because I just talked to you.

It is customary for the committee to hear the Members of Congress first. If you have a statement you would like to give us on this, we would be glad to have it at this time.

Following that, we will be glad to have you come up and sit with the committee and stay with us as long as you like.

Mr. QUIE. Thank you, Mr. Brooks.

STATEMENT OF HON. ALBERT H. QUIE, A REPRESENTATIVE IN CONGRESS FROM THE FIRST DISTRICT OF THE STATE OF MINNESOTA

Mr. QUIE. My name is Albert H. Quie, Congressman from the First District of Minnesota.

I appreciate the opportunity to appear before the committee.

I will have to decline from accepting your invitation to stay with you this morning, since our Education and Labor Committee is meeting and we have some problems confronting us there, as you so well know.

In Minnesota and in my congressional district we are indeed proud of the work that is being done by one company in Northfield. So often out in the Midwest—and I come from a little farming community next to Northfield, Minn.—we tend to think of space exploration that is being done some distance away, a long ways away, and people have wondered if they would see anything like that accomplished in their little community. We were indeed proud when the Schjeldahl Co. in Northfield, Minn., played such an important part in the construction of Echo I and now Echo II. The community is really enthused about what is being done. They feel the old pioneer spirit and their esprit de corps in these space endeavors would surely ignite one's faith in America; these people, no matter what their job is in the part of fabrication, are so enthusiastic that when called on they have been willing to practically work around the clock.

As we read of this person, Commander Shepard—people had kind of lost faith with the Americans, and he renewed their faith in themselves.

I think if you could come out there and see that company, too, you would have a renewed faith in the American people.

I feel inadequate, speaking here upon such a technical subject, because I have no technical experience, myself. For that reason I was glad I was able to speak first, because I would surely feel inadequate after hearing some of these other men like Mr. O'Sullivan, whom I have heard so much about, not only read about, since Mr. Schjeldahl speaks of him in glowing terms.

We in Minnesota and that area are indeed proud of the work being done.

At this time, I would like to include in the testimony a statement by Mr. G. T. Schjeldahl—the head of the G. T. Schjeldahl Co.:

Erectable and Inflatable Structures in Space

By G. T. Schjeldahl Co., Northfield, Minn., May 24, 1961

Having already ventured briefly into space, man is developing a host of vehicles and capsules to propel him and protect him as he soars into the interplanetary void. Highly complex rocket systems and compact and efficient space capsules will of course play the major role in helping man leave this Earth for parts unknown.

Yet man, as he plans for his most epic voyage, is turning his attention to the same spectacular device that enabled his predecessors to leave the ground some two centuries ago—the balloon and its modern counterpart, the inflatable satellite, or "satelloon."

THE INFLATABLE STRUCTURE IS ALREADY IN ORBIT

On August 12, 1960, the National Aeronautics and Space Administration shot into the heavens the largest volume satellite ever thrust into orbit—Echo I. This 100-foot diameter plastic sphere, designed and manufactured by the G. T. Schjeldahl Co. of Northfield, Minn., is still in orbit—a visible symbol of American creativity for all the world to see.

The Schjeldahl Co. is already at work on other space inflatables. These include the forthcoming Echo II on which successful inflation tests have been concluded by NASA, Langley Research Center, and Project Rebound in which several inflatable satellites will be launched in orbit from a single rocket carrier.

All these inflatable satelloons have a common ancestor—the balloon. But while the balloon is designed to go up and come down again within a very short period of time, the satelloon is so constructed that it will remain in orbit for extremely long periods—perhaps many years.

The inflatable satellite, such as Echo I and Echo II and other satellites developed by the Schjeldahl Co., must be precisely engineered and sealed by means of a super adhesive that will withstand the hostile environment of space. The Schjeldahl Co. has developed such an adhesive—called "Schjel-Bond 301," which has held Echo I together for nearly a year despite the ravages of extreme temperatures, radiation and low vacuum.

AN EFFICIENT AND ECONOMICAL DEVICE

The inflatable space satellite is an efficient and economical device that can be packed—uninflated—in a small canister, shot by rocket into space and then inflated to become a massive satellite, perhaps 100,000 times its uninflated volume. It can be prefabricated in an unlimited variety of shapes and sizes to perform specific functions, such as reflecting electronic signals, gathering solar energy, providing safe shelter for man in space and for storing gases and fuels in space.

Up to the present time, inflatable space structures have been used mainly to reflect electronic signals. Man's first space balloon, the Robin (*Rocket Balloon Instrument*), is a one-meter diameter Mylar sphere with a built-in corner reflector for ground radar tracking. Robin was designed, developed and built by the Schjeldahl Co. for meteorological purposes. More than 200 of these unique devices have been shot by the U.S. Air Force to altitudes of about 50 miles, inflated and allowed to drift back to Earth. The radar plots of their corner reflectors yield such meteorological information as wind direction, wind speed, air density and air temperature.

PASSIVE SATELLITES

Robin is an example of a "passive" communication satellite. "Active" communication satellites carry into space a radio receiver and transmitter so that they can receive signals from one point and relay them to another point. The active satellite must carry its own power or possess the means of deriving power from external sources. It has certain inherent disadvantages: (1) it cannot be repaired in space if something goes wrong and (2) its signal can be jammed.

The passive communications satellite is in effect one or a series of electronic "mirrors" in space which reflect signals beamed to it from the ground. Such signals, since they are beamed, cannot be jammed.

This Earth's only orbiting passive communication satellite is Echo I, launched by the National Aeronautics and Space Administration August 12, 1960, from Cape Canaveral and still circling the globe 1,000 miles out in space. Echo I was manufactured by the Schjeldahl Co.

Echo I's chief disadvantage as a passive communication device is the low ratio of power of the reflected signal to that of the projected signal. This low response is due to the fact that it is spherical. Although Echo I is 100 feet in diameter, the effective reflective "disc" is only a foot or so in diameter, because the surface of the satelloon is extremely shiny.

Echo II, 135 feet in diameter, which only recently was subjected to successful ground inflation tests at Weeksville, N.C., has a duller surface than Echo I and will present a much larger reflective surface and hence will provide a greater ratio of response to input signal.

ECHO II 50 TIMES STRONGER THAN ECHO I

This material in Echo II is 50 times more rigid than the material used in Echo I. It is a laminate consisting of two layers of aluminum foil only 18 hundred-thousandths of an inch thick bonded to a center sheet of Mylar 35 hundred-thousandths of an inch thick. The rigidized spheres will weigh about 500 pounds each.

When Echo II is inflated in space, the folds and wrinkles it receives as a result of packing will disappear. When the sphere is punctured by meteorites, releasing its inflation agent, it will not deform, for it will not "remember" the folds and wrinkles it incurred in its "fetal" position within the rocket's canister.

At the present time, the Schjeldahl Co. is working with the Goddard Space Flight Center of NASA in developing a 200-foot diameter inflatable plastic sphere for rebounding signals from one satellite to another. Goal of the project—called Rebound—is to produce a new light weight material that compares in strength to the material of Echo II. This will be accomplished by chemically "milling" out a pattern of circular "windows" from the aluminum, leaving the Mylar membrane intact. The network of aluminum arches remaining will preserve the rigidity with an accompanying—and desirable—reduction of weight amounting to about 30 percent.

SEVERAL SATELLOONS IN ONE ROCKET VEHICLE

Project Rebound will concentrate on placing three inflatable satellites in a circular orbit from one rocket vehicle. These will be spaced at predetermined intervals in order to test their effectiveness in bouncing radio signals from one satellite to another, thereby extending the range of radio wave propagation far beyond that of a single satellite, such as Echo I and Echo II.

Launching of the first three Rebound satellites is scheduled during the first quarter of 1963. A launching of six Rebound satellites from a single rocket to form a "string of beads" around the Earth will occur sometime in 1964.

In a move to increase the signal response and directionalize it, the Schjeldahl Co. is proposing through the Wright Air Development Division to create a new and different series of inflatable passive satellites. This new inflatable will be comparable to a chandelier in space, containing a multitude of small reflective units which will vastly increase the strength of the reflected signal. Moreover, by maintaining a specific attitude with respect to the Earth's surface as it orbits, the satellite will project a "cone" with signal strength maximum at the perimeter. Thus, a passive satellite in synchronous orbit—with its orbital speed the same as the Earth's daily rotation—would project its strongest signal to the horizon. Since synchronous orbits require high altitudes—approximately 22,500 miles—the "horizon" would be perhaps 6,000 miles away. Such a device would become a tactical nonjammable communications device.

INFLATABLES TO AID ACTIVE SATELLITES

The role of inflatables is by no means confined to passive satellites. They promise to be important to active satellites as well. Huge inflatable antennae, precisely constructed on the ground, will burgeon out in space to enable maximum propagation of the active satellite's signal.

The inflatable concept also will be applied in building all types of space structures. Present thinking at Langley Research Laboratories favors a "marriage" of inflatables and erectables so that combinations of rigid members can be folded into compact forms and "married" to an inflatable object in space. Such a method shows great promise in the problem of creating space stations in which men can survive the space environment. Similarly, inflatable components of various structural devices will be rocketed into space and inflated and rigidized. The economy and efficiency of such a method of erecting devices in space are obvious.

NEW MATERIALS BEING DEVELOPED

At the present time, the Schjeldahl Co. is conducting research in developing new materials to withstand the space environment for prolonged periods. These include combinations with mineral fibers that promise to be as strong as the strongest steels. Other investigations planned are for the development of plastic materials that will not burn—even in the searing blast of a plasma torch.

We believe that inflatables will assume a constantly increasing role in the unfolding drama of the space age. Their economy and their ratio of collapsed size to inflated size command their continued application.

LIMITLESS NUMBER OF MISSIONS

Leonard Jaffe, chief of NASA's communications satellite program, emphasizes that inflatables can be designed and constructed to perform an almost limitless number of missions.

"The feasibility of using a passive satellite as a communications reflector has been established," he says. "The fact that Echo I did not completely collapse upon loss of its internal pressurization material has indicated that the thin wall structure is almost structurally sound enough to withstand the space environment, and that only a nominal increase in rigidity will provide long-life structures."

APPENDIX A

The attached photographs pictorially illustrate a NASA/Langley Research Center conceptual design of an erectable space station. [The pictures in question were not of reproducible quality and have been placed on file.] Note the incorporation of an optimum combination of pneumatically and mechanically erectable segments. This combination incorporates the best advantages of each type component. The rigid sections contain all on-board apparatus. The pneumatically erectable sections made possible the deployment and interconnection of the rigid sections in a ready-to-use condition in a matter of minutes with no requirement to bolt together the parts.

As with project Echo, the G. T. Schjeldahl Co. is following carefully the evolvement of the research done in the Langley Laboratory. Development of materials with which to accomplish this task is an area where GTSCo will make a contribution. Fabrication techniques to translate the concept into an actual test vehicle are under study by the company.

This is an excellent example of the close teamwork between industry and the government-sponsored laboratories, which should lead us forward in man's conquest of space.

The CHAIRMAN. That was a great achievement. I think the people of Northfield should feel justified pride in their contribution to this major accomplishment in space.

We are happy to have you here this morning, and we will give your statement our careful consideration.

Mr. QUIE. Thank you.

The CHAIRMAN. The next witness we have this morning is Mr. L. K. Loftin, Jr., Technical Assistant to the Director of Langley Research Center, NASA.

Mr. Loftin, do you have a prepared statement?

Mr. LOFTIN. No, sir.

The CHAIRMAN. You came up to testify on this subject. So I am sure you are familiar with it. We will be glad to have whatever statement you care to give the committee on this subject.

Mr. LOFTIN. I only learned yesterday morning that I would be expected to discuss inflatable structures today, so I have no prepared statement, and I must apologize for not having any large charts which you can see. I do have some proofs which I might pass around. [NOTE.—The committee placed its request with NASA six days before the scheduled day of the hearing.]

STATEMENT OF L. K. LOFTIN, JR., TECHNICAL ASSISTANT TO THE DIRECTOR OF LANGLEY RESEARCH CENTER, NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Mr. LOFTIN. In speaking of inflatable structures, I think it might be appropriate first to point out why it is we should be interested in these things, anyway.

Basically, there are two reasons:

First of all, it takes many, many pounds of propellant to put one pound of payload in orbit. We all know this. So that anything we can do to make the payload light is all to the good. This is one reason that we are interested in inflatables.

Another reason, which is perhaps not quite so well understood, is this: There are many applications in space for which we would like to have a craft in orbit which is large in volume, such as a space sta-

tion, or large in area, such as a passive communications satellite. However, when one looks at the launch problem, it becomes obvious that a very real difficulty exists in trying to mount a very large payload on the end of a rocket. This difficulty is associated with the fact that the rocket must go through the atmosphere before it reaches orbit, and with this very large area on the front, we encounter an aerodynamic instability which is quite large, depending on the size of the thing we put on. You can, of course, lick this by putting on fins or something of this sort, but this is heavy. Even more importantly, even if you put the fins on, you are encountering very large bending moments in the missile, itself, so it has to be redesigned.

So that, in a nut shell, what we want to do for these large payloads is to squeeze them down into a small package on top of the boost vehicle, get it into orbit, and then in some fashion allow it to blossom into its desired shape.

There have been many applications proposed for inflatable vehicles. Perhaps I should really say erectable for one can have such vehicles either by inflation or by some means of mechanical erection or some combination thereof. This is really what we are talking about.

Things such as communication satellites, solar collectors, corner reflectors of one sort or another, reentry vehicles, space stations, have been proposed to employ inflatable-type structures or erectable structures. Rather than go through the many applications that one might conceive of, in which an erectable structure would be applicable, I thought you might find it of some interest if we would discuss with you some of the specific work which the NASA has done on inflatable, erectable structures.

First, I would like to describe to you briefly some of the exploratory research which we have done at Langley Research Center, aimed at an attempt to find and clarify some of the problems which one would have to overcome in applying the erectable concept to a manned vehicle. We have not been developing a manned vehicle. As I say, we have been studying what we would consider to be salient or pertinent problems which would have to be solved.

Secondly, Mr. O'Sullivan, who is sitting on my right here, will discuss with you some of the work which we have done and some of the experience which we have had in actually applying the erectable technique to unmanned space vehicles such as Echo.

To talk now about the manned space station, we at Langley started thinking about the use of inflatables for such a vehicle about 2 years ago. In order to try to fix what the problem areas were that we should be looking at, it was necessary to arrive at some sort of a concept of what the vehicle might look like.

I have some photographs here of an early version. These pictures were—this model was designed and constructed not as a proposal for a space vehicle, as I say, but rather to permit us to fix on what kind of problems you would run into with something like this and what studies we should make.

If I could pass these around. They are in sequence. They start by showing what the vehicle would look like on top of the rocket. Then as you pass down the group of pictures you will see this craft slowly blossoming out. The toroidal shape, which is in the form of sausage links in this case, would be the living quarters of the crew.

The apparatus which looks like an umbrella is a solar collector, which would supply power to the power plant.

The various other pieces of apparatus on there are sun seekers, star seekers, various guidance and stabilization systems.

In looking at this there were several problems that were apparent to us that we should study. One of the most obvious ones was that of the material, itself, that we can construct this toroid out of. It has to withstand the space environment. This means that it will be subjected to various type of radiation. It will be subjected to high vacuum. It will be subjected to temperature cycling, and we don't know the effects of these phenomena on the material as to its brittleness; does it become brittle with time? Does it tend to evaporate or boil away? We don't know what the micrometeorite problem is here. We don't want to puncture this thing. Finally, we did not want a material which would outgas in such a way as to provide poisonous or noxious odors inside.

We undertook a study of material properities. The Goodyear Aircraft Co. undertook a set of studies. They provided us with some samples, and we more or less worked in cooperation on this. At the present time we have subjected many samples of materials to a vacuum environment which is about 10^{-6} of mercury. We have subjected it to radiation, and to temperatures up to about 300 degrees, Fahrenheit.

The things we have found out are these: We have found materials that do deteriorate, which one would not use for such application. On the other hand there are other materials one can use. What it boils down to is the material problem is not a critical one in the sense that it does not require any fundamental technological breakthrough. I think we can find the material. We may have to search some. But it looks like something we can do.

With regard to the micrometeorite problem, we haven't done too much on this. We are making some experiments now. In that connection I would like to show you another group of pictures here of a somewhat different concept of an orbital space station which involves some inflatable elements and some mechanically erectable elements.

As you look at this sequence, I think you will see that what this really is is a series of cams that are actually rigid. These unfold and are connected by inflatable components. This system has a number of advantages. One of these is that large portions of this erectable structure are in fact rigid and can be protected from micrometeorites. It is not an unusual problem. So you could put air-lock-type doors at the ends of these compartments and close them up. And then when you wanted to go around this toroid you could open them and go through the inflated portions. This is another concept of the way one might do it.

I have a couple of samples of the kinds of materials that we have studied. They actually look pretty much like pieces of rubber. These I believe were provided by Goodyear. They are three-ply with nylon cords, and they have a butyl elastomer—this is the rubber-like material that sticks it together. It weighs about six-tenths of a pound per square foot.

Talking about these materials, another area which we have looked into and are looking into is that of how best should you make the inflatable portion of the vehicle. One way of doing it is to make plies

of material very much like this, three-ply material. Another way of doing it is to make a sort of network-like cage and inflate the rubber portion within it. But there are other ways, too. We at present have some studies underway under a contract of a technique or a concept which is referred to by the name of Isotensoid. I don't know who really cooked this name up. It is a different way of putting the cords in and reputedly this system would allow you to develop a strength, the required strength for a much lower weight. Whether it will in fact turn out this way we don't really know. We have a model which has been built and which we are going to do studies on to determine whether there is really anything in this method of construction.

Another area we have looked at is that of dynamics. If one rotates one of these space stations to provide artificial gravity, which may or may not be required, then there is an interesting dynamics problem. We have done analytical studies using analog computers and things of this nature, in which we put in effect masses representing men in different parts of the vehicle, and although they have no weight in orbit, they do have mass. When a man walks from one part of the vehicle to another, he changes the mass distribution. The analog computer study shows that one can then experience some wobbling motion, various types of perturbations of the vehicle. We have done some work on what is called a wobble damper, a possible scheme for getting around this problem. Perhaps more importantly, we are looking to see whether there is really a problem. We have built a 10-foot diameter elastically scaled model of this craft. For such a model the mass distribution is correct. It has the correct stress characteristics, and you would put the correct pressure in it. We intend to rotate it on a free mount with different distributions of mass within the vehicle to determine what the motions are and to determine the coupling between the overall body motions of the vehicle and any vibration modes which may develop in the inflatable structure, itself. This model has just been completed. We should get underway with this fairly soon.

Another model which is under design deals with the thermal balance of the vehicle. You have the vehicle in orbit with the Sun on one side, the reflection from the Earth on the other side; you have power plants and things of that nature in it. There is a question of what is the temperature distribution in this vehicle and how do we have to paint it. Do we make it black so it absorbs radiation or do we make it silver to reflect and in what proportions and this sort of thing, to obtain an environment within the vehicle which is suitable not only for the occupants but also for the equipment which we are required to operate.

This is a model which is under design. It is not a terribly easy model to design because of the scaling laws, but we are working on this.

One further type of model, and this is a fairly large one—it is 24 feet in diameter—is being constructed for us by Goodyear. This is a mutual arrangement. I believe we are funding about half of it and Goodyear about half of it. This again is a research model. What we hope to do there is to learn something about how you package one of these things. You talk about squeezing it into a small bundle, but you don't just pick up and squeeze it. It has to be done in a fairly exact way.

To give you an idea of what I am talking about, I again have some photographs.

This is a small model that we made, which shows it fully inflated, and then the various sequences that you must put the thing through in finally folding it up into a small package.

When we get this rather large model, this is the kind of work which we will be doing with it.

There are also some other questions of internal arrangement, and so on.

To summarize our feeling on this, I think we can say something like this:

So far as we know, so far as we have gone at the present time, we don't see that there is required any fundamental scientific breakthroughs that are required in order to design one of these things. However, we have not undertaken at the Langley Research Center a detailed engineering research design study. If such a study were undertaken, you might run into some problems that we haven't been smart enough to think about that are fundamental. I don't know if you would, but you could.

In such a careful engineering design, this is a long-term proposition. We are not really sure when you got all done whether you would have something you really want or not. This is something that can only be found by a careful developmental design.

I think this is about the status of our feeling on it at this time.

This concludes what I have to say about space stations.

Mr. O'Sullivan can talk to you some about the actual experience we have had in developing actual inflatable satellites, two of which are now in orbit.

The CHAIRMAN. To save time, we will hear from you at this time, Mr. O'Sullivan.

After that we would like to ask both of you questions.

STATEMENT OF WILLIAM J. O'SULLIVAN, SPACE VEHICLE GROUP, LANGLEY RESEARCH CENTER, NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Mr. O'SULLIVAN. I, too, must apologize for not having time to what I consider adequately prepare for this hearing, because yesterday I was at Weeksville, N.C., participating in a structural test upon what we hope will in time become the Echo II satellite, which would be a prototype of an operational version, rigidized operational version of a long-range communications satellite of the passive type.

I came by the laboratory and I picked up some samples yesterday of the materials that we are employing in connection with this rigidized version of the communications satellite, because they illustrate some of the problems that we are faced with in trying to build erectable structures that can survive the environment of space. These samples I believe will illustrate ways in which we have found solutions to these problems.

I have here some photographs, which unfortunately are not large because they were taken yesterday with a Polaroid camera, and I brought them with me in my pocket, showing the test of the Echo II satellite.

I will pass these around.

This satellite is 135 feet in diameter. The test that we were performing was for the purpose of proving that structurally it is strong enough to withstand being pneumatically erected after being transported into space, and we were quite fortunate in proving that.

We have designed it such that it will encounter, due to the internal pressure used to inflate it, a stress within its skin of approximately 4,000 pounds per square inch. We inflated the satellite to a pressure such as to produce this stress within the skin, and we held it there yesterday for 4½ hours without even the faintest sign of failure.

To determine the factor of safety that we have in the design, we then increased the pressure inside of the satellite until we reached the point of rupture of the satellite. We found that it ruptured yesterday at a skin stress of 18,000 pounds per square inch. This means that we have a factor of safety of four and one-half. The satellite is capable of withstanding a pressure four and one-half times that which will be the maximum required for inflating it in orbit.

I have here some material of which this satellite is constructed. It has been made of a laminate that consists of a plastic film whose thickness is .35 mil, that is, .35 thousandths of an inch thick.

Into each side of this has been bonded an aluminum foil of two-tenths of a mil thick. This gives a three-ply laminate.

This concept of a material which could be compactly folded for transport into orbit and there pneumatically erected to shape is one of our ideas that we developed in the NASA of how we can build this erectable structure.

I would like to pass some samples of this material around.

This illustrates one of the ways of solving the space environment problems.

Let's consider first the problem of compactly folding and transporting into orbit.

We can fold this satellite, which is 135 feet in diameter, into an approximately spherical container which is only about 40 inches in diameter, transport it up through the Earth's atmosphere and there erect it after it has gotten into space. This avoids the first problem that Mr. Loftin mentioned, namely, the problem of the stability of our launching vehicles. If we have a great big object, we can not place it on the front end of the launching vehicle because it causes aerodynamic instability. The concept of having an erectable structure overcomes this difficulty.

The next problem that we have to face in space, after it has been pneumatically erected, is the problem of rigidization, in the case of the communications satellite.

Here in the case of a space station we are faced with some such problem as that, too. The problem comes about because of the cosmic dust which will undoubtedly cause puncturing of our space station or our satellite.

In the case of this Echo II satellite, the skin has been made sufficiently stiff and rigid so that once it has been drawn out and set into spherical shape, we no longer require the internal pressure to hold it spherical. It can be punctured by micrometeorites and it will not change its shape; it will not collapse. We know this is so from our tests.

In the case of the Echo I satellite, which is now in orbit around the Earth, we designed it not as a rigid structure but merely as one which

was to last a short time, retaining its spherical shape by means of an internal pressure. We believe that it lost its internal pressure approximately two to three weeks after it was placed in orbit. Yet it has not greatly changed its shape. It is still essentially spherical. This is because the forces that tend to deform it are quite small and because even the skin of the Echo I satellite is almost sufficiently stiff to retain its spherical shape.

With the skin that we are employing on this larger Echo II satellite we are quite confident it will retain the desired shape so it is a good high quality communications satellite.

We think the same concept of a material that can be folded for transporting into orbit and then stretched out pneumatically, set into shape, can be employed with regard to space stations. The problem of protecting the material against a harsh environment of space is also accomplishable in this manner with such material as this.

We know, as Mr. Loftin has mentioned, many materials in the very hard vacuum of space will evaporate. In the case of the samples that we have passed out we have aluminum foil on each side of the plastic film. This forms an excellent vapor barrier so that the plastic can not evaporate.

We can also by choice of the plastic material select those which have large molecules and by the treatment of polymerization, make the large sections of the vehicle into what the polymer chemists would call one very large molecule. The importance of that is this:

The material evaporates in space only by virtue of its vapor pressure, that is, the pressure of the gas that it generates as it evaporates. The larger the molecule we employ, the lower the vapor pressure at any given temperature. By this process of polymerization we can produce molecules not of the ordinary size that we encounter in chemistry but of sizes tens and hundreds of thousands of times bigger. Their vapor pressure becomes so fantastically low that we do not have instruments capable of measuring it.

This prevents also evaporation in space.

To protect against ultraviolet radiation we have run tests which tell us that by employing a very thin metal covering over our materials, we can shut out the ultraviolet radiation. We have subjected polymers to a radiation under ultraviolet lamps for long periods of time. We find that without such protection as this they do degenerate in time and become somewhat embrittled. By the simple process of using a thin metal foil we can prevent this.

With regard to the problem of thermal balance, we have in our research discovered that we can put layers, coatings, on this material which are so thin that they have the thickness of only a few molecules. Yet we can by this process adjust the ratio of the absorbtivity of the surface such that we can bring the temperature balance of our satellites or space stations to that which will not be too hot nor too cold, and the materials will survive in space, virtually indefinitely.

There are a number of other problems that we have found solutions to in this manner. I would like to point out the facilities of the NASA are as yet too few and meager in number to be able to carry out all the basic ideas of how to build space stations or satellites that we have been able to discover. We have been compelled to call on industry to follow out the exploration of these ideas, and recently we placed a

contract with the Hughes Aircraft Co. to investigate approximately a dozen concepts of producing rigidized materials in space that could be compactly folded, transported into orbit and there caused, after erection, to shape, to become rigid.

This exploratory work has resulted in some very promising, although not yet ready for use materials, and this gives us great hope in this field.

In this field further work is required.

I think that Mr. Loftin is quite correct in stating that we have not as yet encountered any fundamental barrier to the ability to produce long lifetime satellites or space stations; that, however, there is a considerable amount of engineering work required in order to translate this exploratory research that has been done in the laboratories into actual usable hardware or materials, fabrication of materials that would be suitable for employment in space stations.

I thank you gentlemen.

If I could answer any questions that may have come to your mind, I would be delighted to do so.

The CHAIRMAN. Thank you very much.

I think we all have a good many questions. I would like to ask you this, for instance:

A man in one of those stations goes up in the capsule, doesn't he? How do you get him from the capsule to that circular station?

Mr. LOFTIN. There has to be a passageway, a really inflatable passageway that would lead from the capsule into the toroidal portion of the space station.

I didn't make this clear. The toroidal space station does not reenter the atmosphere. When the crew gets ready to come home, they go back through the passageway into the capsule, close up to the capsule, disengage from the toroid and leave that in orbit and reenter the capsule. The toroid itself is not suitable for a reentry-type vehicle.

The CHAIRMAN. You are just going to allow that to float around in space?

Mr. LOFTIN. This is one possibility.

Another thing you might do, depending on what size of operation you are talking about, is to develop the capability of rendezvousing what you might call a space ferry, a reentry-type vehicle, with the space vehicles, so that as one capsule left to take one crew home, another one could come up, perform a rendevous maneuver and transfer a new crew in. This is a much more sophisticated-type operation. Ultimately something like this could perhaps be worked out.

The CHAIRMAN. You state the body up there in space will not have weight; that they will have mass. What effect will the mass have on the materials which you use for the station?

Mr. LOFTIN. I think the thing we have to worry about with regard to mass, as I pointed out, is the dynamics of the situation, that is, when this thing rotates and you move mass from this part to this part, you are changing the center of gravity—this is a bad word to use because we don't talk about gravity up there—you are changing the center of mass of the station so it will tend perhaps to rotate around a new center or oscillate in some way. I think this is the context in which we need to talk about mass.

It doesn't really affect the materials except perhaps in this way: If the man in some way propels himself from one side of the station to the other, propels himself hard enough, we want this material to be strong enough so he doesn't break through and go out on the other side.

The CHAIRMAN. He still has momentum?

Mr. LOFTIN. Yes, sir.

The CHAIRMAN. To offset the momentum, you have to have a material sturdy enough to resist it?

Mr. LOFTIN. That is correct.

The CHAIRMAN. You will substitute for the gravity the use of centrifugal force?

Mr. LOFTIN. This is a possibility. We don't really know whether this is necessary. If in future manned space operations it is found desirable to have some simulation of gravity, although perhaps not the full one *g*, perhaps a quarter of a *g*, it would be possible to rotate this thing such that the centrifugal force would simulate, as far as the man knows, the effect of gravity. You would have to be a little careful about this. There are some effects—as I understand it, and I am not too familiar with this subject—on the inner ear that come into play if the radius of the space station is too small and it rotates at too high an rpm, there are some secondary effects that are supposed to occur which can result in nausea or something of this nature.

The CHAIRMAN. Like seasickness?

Mr. LOFTIN. Yes.

I am certainly not a medical expert, so I don't think I can speak with much authority on this.

The CHAIRMAN. Any questions?

Mr. KARTH. What would the primary function of this so-called space station be?

Mr. LOFTIN. It could have many functions. We are not really proposing a space station. What we are doing here is saying if you want one, we would like to look into the problems of how you might make it. If you ask the question, though, what could you do with it, there are a few ideas that come to mind.

For example, if ultimately we want to send a man on a long space journey that takes weeks at a time, such as journeys of such a nature that once he is committed to this, once the rocket is finally burned out, he is going to make that journey and he can't come back until he has gone around to where he is going to go and then he is going to come back, before we do this, one might say it would be desirable to have a space station in orbit where we could put men, materials, different kinds of mechanisms, we could put them up there for weeks at a time and see if there are any undesirable effects that we have not foreseen. If these effects crop up, then you bring the man back. You could get him back from there. This is one possibility, one way in which you could use this.

Mr. KARTH. You are talking about long distance space flights then, much longer than from here to the Moon?

Mr. LOFTIN. Yes. You might even call it a space laboratory.

Suppose you wanted to know the effect of long-term space exposure on certain kinds of materials. We can simulate it only to a certain

extent on Earth. It would be nice to go up in the environment you are going to have to be in to do your experiments.

Mr. KARTH. Are we proceeding with the actual construction of a vehicle of this type?

Mr. LOFTIN. No, sir.

Mr. KARTH. Do you have any plans?

Mr. LOFTIN. We at Langley have been studying this particular concept as a research problem to try to see what the problems are. If a space station is a thing that is desired, then I think this concept as well as other concepts should be subjected to the most careful engineering evaluation to determine which way in fact do you really want to do this job. This is one way of doing it.

Mr. KARTH. Could it have any communications capability?

Mr. LOFTIN. Yes, I suppose scientific observations of some sort. Perhaps a telescope or something of this nature. There are various missions that one can think of that would make desirable a station in orbit around the Earth. The question of how you build this station, whether you use an inflatable or erectable technique or use some other technique, depends on what you want the station to do, how big it is going to be, and a detailed engineering study of the thing. You can't just, on the basis of some research explorations of particular problems, say this is really the thing you want. It has to be subjected to a very detailed engineering evaluation of various concepts.

Mr. KARTH. We are talking about something that is in its very infancy of research?

Mr. LOFTIN. It has only been in the past two years that we have worked on this concept. I believe the kind of thing that Mr. O'Sullivan talks about, the communications satellite, and so on, I believe that goes back maybe five years, something like this, is that right?

Mr. O'SULLIVAN. Yes.

Mr. KARTH. Let's talk about this big inflatable balloon that you passed the picture around on.

This would be a passive communications satellite, is that correct?

Mr. O'SULLIVAN. That is correct. It would be a prototype of an operational version, in that it is designed to be capable of withstanding the space environment for a period of 5 to 10 years.

I might suggest, since you asked the question, could a manned space station be of value with respect to, say, communications, I think it definitely could.

One of the studies that we have made at our research center has been a comparison between passive and active communications satellites. It is quite readily shown if you can postulate that the tubes and all the components of a receiver and of a re-transmitter could continue to operate for a period of 5 or 10 years without attendance, then it would be very desirable to have an active type of communications satellite.

I would like to recall that I believe 15 to 20 years of research was required before it was possible to have amplifiers of sufficient reliability that it was practical to put them in trans-Atlantic cables where they couldn't be readily hauled up and serviced. This is somewhat the situation that we are in at the present moment with respect to communications satellites. I think that you can show that definitely there would be great advantages to an active type of satellite, that is, the kind that receives the signal and re-transmits it.

Mr. KARTH. How much work has——

Mr. O'SULLIVAN. The problem is that we do not yet know how to build sufficiently reliable components, and we cannot be certain that the environment to which we subject them here on the ground is the same that they will encounter in space.

A space station might be employed in part as a research tool for the development of active communications satellites.

Mr. KARTH. From what you say, I assume NASA has made, shall we say, baby steps in the direction of active comunications satellites systems?

Mr. O'SULLIVAN. Yes. We are pursuing that.

Mr. KARTH. You are very much in the state of infancy? The reason I ask is because some of the groups of the comunications industry who have been before the committee have indicated that they have the capability to go ahead and construct an active communications satellite and have it in orbit on an experimental basis within a year.

Would you care to comment on that?

Mr. O'SULLIVAN. I think we can put up an active communications satellite in a period of a year or two that would be quite serviceable with respect to research on how to build one that would have the capability of lasting for a period of 5 to 10 years. I think if we go into the economics of the matter, it is necessary to have satellites that do not have to be serviced over a period of, say, 5 years.

Mr. KARTH. When you say "we" could do this in a year or two, do you mean NASA or industry or a combination?

Mr. O'SULLIVAN. A good combination of NASA and the industry. I think we have many good ideas that could be contributed to the matter that would be of great assistance, and I think industry does, too.

Mr. KARTH. If NASA worked on an active communications satellite system with the idea that they were going to themselves do the job, how long would it take NASA to, shall we say, develop an active communications satellite system?

Mr. O'SULLIVAN. I think that is a very difficult question to answer, because we do not know what are the problems that we are going to face in trying to make one that is sufficiently reliable that it is worth being placed in orbit on a commercial basis.

That is the reason why we have pursued first the passive satellite, because we could see our way clear to making something that had the capability of lasting 5 to 10 years in orbit without service.

You know, it is a bit difficult to get up there and put in a new tube when one burns out. But in time this will be accomplished.

One of the reasons that it is quite important to do so is because, for example, if we wish to have television communications, then we must have a quite wide band width, as we call it technically, in order to be able to transmit our pictures. This means——

Mr. KARTH. This can not be done by a passive satellite system, can it?

Mr. O'SULLIVAN. It could be done with a passive satellite system where it is large enough in diameter and where the transmitter on the ground is sufficiently powerful and the receiver at the other end of the link is sufficiently sensitive.

Mr. KARTH. Is this a capability that you see in Echo II, for example?

Mr. O'SULLIVAN. I think in Echo II, on the basis of our tests of Echo I, we will be able to perform what I would class as initial steps in television communications by means of the Echo II satellite because of its larger size and the lower altitude at which we will fire it.

Mr. KARTH. What would that altitude be?

Mr. O'SULLIVAN. We have tentatively in mind an altitude of approximately 700 miles.

Mr. KARTH. We have capable boosters, we have boosters capable of achieving this right now?

Mr. O'SULLIVAN. Yes.

Mr. KARTH. What booster would be used?

Mr. O'SULLIVAN. We tentatively have scheduled for the orbital launching the Thor-Agena B vehicle.

Mr. KARTH. Thank you.

The CHAIRMAN. Further questions?

Mr. VAN PELT. With reference to Echo I and what you have said about the debris that is in outer space that might puncture a vehicle, how long will Echo I withstand that? Is there a possibility of complete disintegration?

Mr. O'SULLIVAN. No. Echo I will not disintegrate in orbit. It was designed for research on communications to confirm or disprove that we could do what we thought was theoretically possible, namely, send a signal from the surface of the Earth up through the Earth's ionosphere to a satellite in space, reflect it off this satellite, back through the Earth's ionosphere and receive it and have a signal which did not fade out, did not undergo polarization or have other things happen to it which would destroy its usefulness. This was proven with Echo I. Since that was its purpose, it was designed only to last in orbit a sufficient length of time to accomplish this research objective. As such, it was not designed as a permanent satellite but one that was held spherical and a good reflector of radio signals merely by retention of its internal pressure. We calculate it was punctured at the rate of about 14 square inches of hole area in it each day due to the micrometeorites that impinge upon it. This caused the loss of its internal gas that inflated it and held it drawn out into a nice, smooth sphere. Our measurements of the radar cross-section of it indicate it retained its spherical shape nicely for a period of about 2 weeks.

Our second step now with Echo II is the building and verifying that we can build a satellite which is not dependent on the retention of its internal pressure for maintaining itself as a good reflector of radio signals. We think that Echo II, on the basis of our present knowledge, should have the capability of lasting in space for a period of between 5 and 10 years. However, the orbit that we plan to put it in will not cause it to remain in orbit that long because of the minute amount of aerodynamic resistance that it encounters. This will bring it down much sooner than any 5 to 10 years.

The reason for not using a higher orbit is because we would have to employ a much larger satellite than 135 feet in diameter if we were to conduct television—exploratory television communication tests over a distance, say, as great as across the Atlantic Ocean. If we were to put the Echo II into an orbit, say, as high as 2 to

3,000 miles, then it would definitely last, I am quite sure, 5 to 10 years as a good reflector of radio signals.

Mrs. WEIS. Didn't Echo I stay up longer than you anticipated it would, Mr. O'Sullivan?

Mr. O'SULLIVAN. It will stay in orbit, I think, approximately another year, but it is not the high-quality reflector of radio signals that it was when we first put it up.

Mrs. WEIS. Is it useful at all?

Mr. O'SULLIVAN. Yes, it is still quite useful. We are very happy about that. It has proven much better than we really anticipated. We thought by now it would have degenerated quite badly, but it seems to be withstanding the space environment much better than we had anticipated.

Mrs. WEIS. That was my impression, that it had functioned better.

Is there any instrumentation on this or is it simply the globe? Is this purely a reflecting operation?

Mr. O'SULLIVAN. It is purely a reflecting operation, just like a mirror. One of the great advantages of that over, say, an active communications satellite is that the mirror does not care how many signals bounce off it, what their frequencies are, what language is employed, or what the band width is. It reflects them all just as well. There is no maintenance.

Mrs. WEIS. It has no instrumentation or other things?

Mr. O'SULLIVAN. That is right. The only instrumentation that is aboard the Echo I satellite were two radio tracking beacons. These had nothing to do with the communications. They did not receive any signals and retransmit them. They were merely markers, beacons, so that we could track the satellite by means of the Minitrack system, so we would know where it is.

Mrs. WEIS. Are those outside?

Mr. O'SULLIVAN. They are mounted on the skin of the satellite.

Mrs. WEIS. I was interested in this model on display.

The CHAIRMAN. That is the Goodyear. That is what I am going to get to.

Mrs. WEIS. I think the question would go for any of it. If you have your instrumentation in any of these things, the man and instruments has to stay in the nose cone, there is nothing but pressure in what is being inflated?

Mr. LOFTIN. The men stay in the reentry capsule or the command module, whatever you want to call it, until it is inflated, and then they enter. It is possible that certain instrumentation could be carried in the inflated portion as it is folded up. It is a detail of engineering.

Mrs. WEIS. You could put some——

Mr. LOFTIN. You could. This is a matter of detailed design of how in fact you put it together.

The CHAIRMAN. Before I recognize the next member for questioning, I would like to ask the Goodyear people about how long would your presentation require? We have three witnesses from Goodyear.

Mr. RICHARDSON. I think our presentation we would like to give you would take somewhere around 50 minutes.

The CHAIRMAN. I will recognize Mr. King, and then if there is no objection——

Mr. KING. I yield to Mr. Hechler on the ground of seniority.

Mr. HECHLER. A number of advantages have been cited for inflatable vehicles. It rather makes me shudder to think of the total amount we have to spend on the entire space program. I think it is our obligation, of course, to make sure we expand the economy that can support the expenditures that we feel are necessary.

I think one advantage of inflatable structures is their smaller cost. I wondered if you could present any comparable figures that will serve to drive that point home.

Mr. O'SULLIVAN. I am sorry that I am ill-prepared to quote any comparable cost figures. I know it has been our experience in constructing the Echo I and the Echo II satellites and also the Explorer IX satellite, which we now have in orbit, all three of which are erectable structures, that the cost has been surprisingly low. I think this has been in large measure due to the working out and the solution of many of the problems in the laboratory so that we had a clear idea of how to proceed. This is one way that costs can be cut down.

Mr. HECHLER. If I may interrupt a second, I am surprised that you are surprised. I would assume the cost of the inflatable structure would be considerably less than that of a different type.

Mr. LOFTIN. I would like to make a comment on that. I can't answer your question with regard to the numbers.

One thing that I want you tokeep in mind on——

The CHAIRMAN. Could you talk a little louder?

Mr. LOFTIN. Yes, sir.

I can't answer your question as to the comparative costs. I would make this comment, that in the development of any new system, whether it be an inflatable space station or reentry vehicle or what have you, a very large part of the cost is in the R. & D. that has to go into the thing.

Although, again, I can't give you numbers, I would guess this is relatively large as compared to the cost of the actual metal or fabric or what have you that is cut to make the thing out of.

Mr. HECHLER. I would suggest maybe that Goodyear might want to volunteer to help you out on the R. & D. cost.

The CHAIRMAN. Mr. King, I recognized you.

Mr. KING. I will pass. I don't want to cut into Goodyear's presentation.

The CHAIRMAN. Unless there is an urgent question, let's ask these two witnesses to stand aside for awhile while we give Goodyear an opportunity to put on its case.

Goodyear has a motion picture.

Mr. KARTH. For a matter of comparison, from the witnesses in the communications industry who were here, they estimated all the way from $400 to $600 million for a 25 or 30 active satellite communication system.

Could you estimate the cost for approximately that many passive satellites at the 2,000- or 3,000-mile level so their duration would be from 5 to 10 years; could you give me a figure on that or could you not at this time?

Mr. O'SULLIVAN. I am sorry that I am not in a position to try to give you a figure on that.

Mr. KARTH. Would you try to prepare one and give it to the committee for the record?

Mr. O'SULLIVAN. I think we could do that.

(The information requested is as follows:)

The question was asked for the comparative cost of a 25 to 30 passive communications satellite system to a system incorporating an equal number of active communications satellites.

NASA has engaged the Rand Corp. under contract NASr-21, a copy of which is attached, to study passive and 24-hour active communications satellite systems. The Rand Corp. will develop information which will help determine the practical and economic benefits and the cost consideration related to satellite communications systems. When the information is developed we shall be happy to make it available to the committee.

ECONOMIC AND TECHNICAL STUDIES ON COMMUNICATIONS SATELLITES FOR THE YEAR DECEMBER 1, 1960–NOVEMBER 30, 1961

The studies described below are proposed to be initiated during the coming year. It is expected that the study of passive systems can be essentially completed during the year and a good start made on the study of 24-hour active systems.

We expect, however, that during the course of these studies other technical problems will arise which cannot be foreseen now or may become of special interest as the development of the communication satellite technology progresses. We propose that study of such problems be undertaken when deemed desirable after appropriate consultation between NASA and Rand.

1. Passive Systems

As a first step, a parametric study of those systems containing spherical reflectors as orbiting elements will be made for the purpose of evaluating their economic potential. The main variables are:

A. *Reflector.*—The size, weight, and useful lifetime of the reflectors are of importance. The lifetime as a function of weight is presently least understood. Therefore, at first, it will be necessary to assign a range of reasonable lifetimes for a given weight. As the study progresses we should be able to refine this. Close contact will be maintained with groups studying the problem of stiffening the reflectors and consideration will also be given to reflector shapes other than spherical.

B. *Orbital altitude and configuration.*—The orbital configuration influences the capacity of the system, the circuit outages in terms of total fractional outage time and also the duration of outages. Other important factors are the number of reflectors and the launch vehicle. Tradeoffs among system capacity (desired to be large), outage time, and the number of launches required to place the system in orbit (both desired to be small) will be investigated. These tradeoffs depend in part on the great circle distance between terminals and on their locations relative to the poles. As a consequence, it will be necessary to make assumptions about the locations of the ground terminals.

C. *Ground environment.*—It is necessary to develop solid information on the present state of the art of high effective radiated powers and the projected state of the art a few years hence, including the properties of large tracking antennas. In the course of the Echo experiment, certain tracking difficulties were encountered. This raises the question whether in an operational system each ground terminal would catalog the orbital parameters of each individual reflector, whether a central station could perform this function, etc.

Variations in the parameters mentioned above will be studied to determine their effect on costs, and to see what general system design now appears most promising.

For the same antenna size, receiver temperature, and transmitter power at the ground installation and equal payload in orbit the number of channels in an active system is much higher than in a passive system, when a single link is considered. However, in a passive system the number of participating ground stations can be increased, subject only to the restrictions imposed by the availability of frequencies. Thus, a passive system may become competitive with active systems when the number of participating stations becomes large, particularly if the stations tend to concentrate in some geographical areas. This possibility will be examined as part of the passive satellite study.

II. Active Systems

A thorough analysis of 24-hour communications satellites will be undertaken. While results of some aspects of this analysis will be reported during the coming year, it is currently anticipated that this study will extend beyond November 30, 1961.

As noted in the special advisory report, by using a more advanced repeater design a capacity increase of a factor about four seems quite feasible over what is now planned in the Advent program. A different approach to the 24-hour system is a smaller (lighter weight) satellite which could be launched by a smaller vehicle than Atlas-Centaur or several smaller satellites launched simultaneously by a large vehicle. A study will be made of the economic potential of such a 24-hour system based on the following technical studies:

A. *System implications.*—The system implications of a few small 24-hour satellites as contrasted with a single big satellite will be investigated. The frequency requirements in the two cases differ drastically provided the smaller satellites are separated in excess of one beamwidth as viewed from the ground. Also, replacement considerations are different as are a number of other system characteristics.

B. *Booster possibilities for 24-hour orbit.*—Booster data will be needed as background information in varying the other parameters of 24-hour systems.

C. *Orbital and attitude control subsystems.*—The principal objective of this investigation will be the determination of the relationship between fuel requirements and useful lietime in orbit for a specified payload or payloads. Possible byproducts might be performance specifications for the orbital and attitude control systems and a discussion of possible system mechanizations. The study will include investigation of orbital perturbations, orbital control, and attitude control.

The orbital perturbation analysis will include, for example, investigation of the perturbations of the orbit due to gravitational effects of the Sun, Moon, and the Earth's bulget to determine the length of the time permissible between orbital corrections. If a sizable antenna is involved the effects of disturbing forces due to radiation pressure from the Sun on orbital and attitude control processes may become significant.

The orbital control investigation will include, for example, investigation of the accuracy with which the desired orbit could be established, single and multistage orbit correction processes from the standpoint of fuel economy and accuracy, the effect of the attitude reference performance on the orbit control process, and probable fuel requirements to compensate for gravitational perturbations of the initial orbit.

The attitude control investigation will include, for example, consideration of possible attitude reference system mechanizations, performance specifications of the attitude reference system based on antenna and orbital control requirements, and energy requirements for attitude control systems.

D. *Repeater electronics.*—A 24-hour satellite may use a single high power output tube, a number of lower power tubes or a still larger number of low power solid state devices. The satellite antenna system may consist of only a pair of Earth coverage antennas or may include a number of highly directive antennas. The amount of directivity desirable depends on such factors as ground station distribution, the degree of attitude stabilization, and the type of power output device. The state of the art in output devices, antennas, and other satellite components as well as the interrelationships will be examined to define advantageous systems, e.g., choice of frequency, output device, number and type of antennas, design techniques.

Out of the voluminous work being carried out on auxiliary power systems, space environment and reliability, items of particular significance to active communications satellites will be studied.

E. *Quasi-fixed ground antennas.*—Only relatively small diurnal motions of the antenna beam directions are needed in 24-hour systems, so that the necessity for tracking antennas is eliminated. We propose to investigate what antenna arrangements might be most attractive.

Cost estimate, economic and technical studies on communications satellites—Estimated costs and fee for the year Dec. 1, 1960–Nov. 30, 1961

Direct salaries	$77,700
Overhead, at 85.68 percent	66,600
Publications	2,500
Staff travel	9,250
Consultants, fees, and travel	7,000
Computing machine rental	10,200
Total estimated cost	173,250
Fixed fee	10,400
Total estimated cost and fixed fee	183,650

ECONOMIC AND INTERNATIONAL POLICY QUESTIONS ASSOCIATED WITH SPACE ACTIVITIES FOR THE YEAR DECEMBER 1, 1960–NOVEMBER 30, 1961

Studies planned on the economic and international policy questions associated with space activities fall into three broad areas: those dealing with communications satellites, those dealing with meteorological satellites, and consideration of the impact of the "space race" on other countries. Proposed programs of research in each of these areas are described below. The studies described are proposed to be initiated during the coming year and it is expected that substantial progress can be made on all of them. However, during the course of these studies, other problems may arise which cannot be foreseen now or may become of special interest. We propose that study of such problems be undertaken when deemed desirable after appropriate consultation between NASA and Rand.

1. Communications Satellites

Three studies are planned on the economic and international policy questions associated with communications satellites: a study of economic and social benefits stressing possible growth of new kinds of demands for long-distance communications; a study of economic policy issues; and a study of the pros and cons of internationalized development and operation of communications satellites.

A. *Economic and social benefits.*—Though most of our future work in connection with analyzing the economic benefits of communications will be done in close connection with the technical studies described separately, one aspect of these studies is of general interest, and is proposed to be continued more or less independently of the detailed economic and technical analyses. This study will further examine the new kinds of demands for long-distance communications that may emerge in the future; especially demands for data transmission, facsimile devices, closed-circuit TV, and commercial TV. The economic promise of communications satellites undoubtedly will be substantially affected by how rapidly these new types of demand emerge.

B. *Economic policy issues.*—The study of economic policy issues will involve three considerations: a short-term study (several months) of licensing the use of Government launching facilities and two longer term studies (something like a year), one dealing with the frequency allocation problem and the other with the ratemaking problem.

The analysis of the economic policy problems involved in working out a scheme for licensing private contractors to use government launching facilities will include consideration of the kinds of licensing arrangements the AEC has worked out and an examination of alternative formulas for determining what rates should be charged for the use of government launch facilities as well as for the launching vehicles.

The study of the frequency allocation problem will be directed to finding ways for insuring efficient utilization of the frequency spectrum in the light of increased demands on spectrum space brought on by communications satellites. The study will include, for example, consideration of the following items: (*a*) An examination of prevailing practices in allocating and assigning frequencies, and how these practices will affect the availability of spectrum for space purposes; (*b*) an examination of the effectiveness of the current procedures for allocating frequencies. How well do they take into account the value of the rights that are assigned for particular purposes? How well do they insure that adequate atten-

tion will be given for finding ways for conserving on the use of the spectrum? How well do they facilitate adjustments in spectrum use as technology advances?; (c) an examination of the proposals that have been made for improving the efficiency of the allocative process. Among those that will be seriously examined from a practical viewpoint is the suggestion that a market be established for the purchase and sale of frequency assignments.

The analysis of the ratemaking problem will include, for example, consideration of the following subjects: (a) A systematic examination of how communications rates are presently determined with the view of developing an explanation in terms understandable to the layman; (b) an inquiry into how international rates are determined both in the communications field and in the airlines field; (c) an analysis of the consequences present policies are having in allocating resources; (d) a discussion of the kinds of changes in ratemaking policies that appear necessary if the benefits of communications satellites, or other kinds of new technology, are going to be fully exploited.

C. *Internationalized development or operation.*—A communications satellite system is by definition "international" in that it provides a communication service between countries and probably on a global scale. Ground links would be located in various countries and international arrangements would have to be made accordingly. The United States may decide to develop and operate the system *essentially* as a U.S. enterprise (public or private) and to work out political arrangements and technical details on a bilateral basis with the user-participants. The Special Advisory Report of September 15, 1960, recommended such an approach, for reasons cited on pages 73–75.

However, insufficient analysis has been given the question already raised by U.S. officials and businessmen: Why not develop, or at least operate the system under some sort of international auspices? Development, ownership, or operation might be vested in a specialized agency of the United Nations; or in some international technical group; or in a consortium; in a public or private corporation in which shares are held by governments, private concerns, or other groups; etc.

We propose to study this problem to identify and assess the worth of a *variety* of possible "internationalized" arrangements; their advantages, risks, and drawbacks, and the longer term implications and consequences for U.S. national interests. Several case studies of analogous or pertinent international ventures would be undertaken (e.g., International Atomic Energy Agency) in order to assess the precedents and to establish a factual footing for future projections.

This study will follow through on present Rand work for NASA, nearing completion, on some of the political problems and opportunities in the field of cooperation and international regulation and control of space activities. It will be pursued in close association with the planned project on "The Impact of the 'Space Race' on Other Countries" (see description below).

II. Meteorological Satellites

Two studies of the economic implications of meteorological satellites are planned. The first treats the value of improvements in storm warning and the second considers how information derived from meteorological satellites might be used to improve the hurricane warning system.

A. *Economic value of improvements in storm warning.*—Over the next few months, work on the economic and social value of better weather information will focus on the problem outlined in section V of RM–2820–NASA: the determination of the value of improvements in storm warning, particularly hurricane warning. A model of the sequential decisionmaking problem involved in the efficient use of storm advisories is being developed. When it is completed, which is expected to be in the near future, an attempt will be made to apply it in some situations where the economic significance of better warning may be expected to be considerable. One particularly interesting opportunity for a case study has come to our attention: when a hurricane threatens at Cape Canaveral a decision must be made as to whether launching vehicles should be taken down and gantries secured against the high winds. Such action may be costly both in terms of the direct costs of taking protective action and the resulting delays in the testing program; on the other hand, failure to take such action when it is needed will result in expensive damage. It is hoped that the analysis will both point the way to optimal use of the existing possibilities for warning and indicate what sorts of improvements might have the greatest value. Subsequent to the analysis of the Cape Canaveral problem, we propose to undertake other case studies of the use of hurricane warning, but the particular situations to be studied have not yet been decided upon.

B. Possible improvements to the hurricane warning system.—A study is planned to indicate specifically some improvements in the hurricane warning system which might be obtained by using meteorological satellite observations. In particular, we will seek to determine what improvements would result simply from having the information on the position of the hurricane which the satellites would make available, and compare the costs of obtaining position data in this way with the costs of obtaining it by aircraft reconnaissance. Because the long-range contribution of the weather satellite program to improvements in forecasting techniques and to the science of meteorology cannot be estimated with precision, our conclusions in this area will have to be regarded as providing lower bounds to the benefits obtained rather than expected value estimates.

III. Impact of the "Space Race" on Other Countries

Currently nearing completion is a study of Soviet cold war objectives in space, and the Soviet conception of U.S. objectives and space programs. The impact of the Soviet technical program and political strategy, and the impact of U.S. efforts need to be assessed for their effects on in-between nations. Such a study is proposed, on a limited scale, in order to provide an empirical basis for positive proposals and initiatives which the United States might undertake in the future—initiatives for consolidating and building international support for U.S. space activities, both technical and political.

In order to make realistic assessments of the support the United States can expect from other countries and to guide future U.S. actions, an analysis will be made of the views and positions already entertained in key countries as expressed in their own space programs and interests; in their stand at the United Nations, COSPAR, ITU; their attitudes toward space aspects of arms control negotiations; etc. Much of the present knowledge on the impact of the space competition is based on casual impression or episodic public opinion polling. The proposed study will attempt to develop a more objective synthesis of existing source materials and might be followed up with field studies on a pilot scale.

Cost estimate, economic and international policy questions associated with space activities—Estimated costs and fee for the year Dec. 1, 1960–Nov. 30, 1961

Direct salaries	$133,300
Overhead at 85.68 percent	114,200
Publications	4,900
Staff travel	15,900
Consultants, fees, and travel	63,650
Computing machine rental	3,800
Total estimated cost	335,750
Fixed fee	20,150
Total estimated cost and fixed fee	355,900

Mr. O'SULLIVAN. In regard to a question I believe you asked a moment ago, I have some further information; namely, to the effect that RCA was selected yesterday to conduct notions to construct an experimental active communications satellite. That is a relay type. It is to test out the satellite components in the space environment. We are proceeding in that direction.

The CHAIRMAN. $3 million?

Mr. O'SULLIVAN. I think so.

The CHAIRMAN. If there is no objection, we will go ahead now and hear the witnesses from Goodyear.

Mr. Richardson, you are vice president of Goodyear Aircraft Corp.

Could you take over your presentation, and you can introduce the witnesses, Dr. Ross and Mr. Madden, and you can put your motion picture on at the proper time and place in the testimony.

Mr. RICHARDSON. Thank you, Mr. Chairman.

STATEMENT OF ROBERT W. RICHARDSON, VICE PRESIDENT OF GOODYEAR AIRCRAFT CORP., AKRON, OHIO, ACCOMPANIED BY DR. ROBERT S. ROSS AND ROBERT T. MADDEN, OF GOODYEAR AIRCRAFT CORP.

Mr. RICHARDSON. We are very pleased to be here today.

We think the subject of inflatable structures or, as we call them, expandable structures, I think to put it in context, we all mean the same thing. So when you hear the difference in words, we are all talking about things that you make small on the launch pad and make large as you get into orbit.

We are very delighted to be here, primarily to acquaint you with a new technology.

I think Mr. Loftin and Mr. O'Sullivan have done a good job, and NASA is to be commended on the Echo and the communication satellite programs.

We would like to carry the discussion into some other areas that haven't been covered, which I hope you will find of interest.

It is obvious, as pointed out by Mr. Loftin, that in an expandable structure you can fold it up on the launch pad. It basically has light weight, and through that utilizes only medium size or smaller boosters therefore not requiring the large boosters to put large structures in space.

At Goodyear Aircraft we have been interested in this subject and have done active research work for a number of years.

The state of the art is coming along well. We don't know all the answers as yet, but it is all very feasible, and there is very definitely a big world ahead of us in this country in the use of expandable structures for many space applications.

I think in the interest of conserving time, we should get ahead with our presentation.

We are going to have to ask you, Mr. Chairman, to bear with us. We have some slides and motion pictures. We have a blackboard and we are going to try to work between them so we may have a little problem of turning lights on and off this morning.

The CHAIRMAN. We will help you. We have until noon. That will give you 40 minutes.

Mr. RICHARDSON. We will do the best we can to be finished by noon.

There are two gentlemen with me from our organization, Dr. R. S. Ross and Mr. Robert T. Madden, who are going to participate in our presentation this morning. I hope you will find it very interesting.

We will be most happy to answer any questions when we are through.

With your permission, I would like to turn our presentation over to Dr. R. S. Ross.

STATEMENT OF DR. ROBERT S. ROSS, MANAGER, AEROMECHANICS RESEARCH AND DEVELOPMENT DEPARTMENT, GOODYEAR AIRCRAFT CORP., AKRON, OHIO

Dr. Ross. We are going to show you a few slides of some of the subjects that we think we can make out of the inflatable or expandable structures. I have some movies here——

The CHAIRMAN. Just a moment. Some of us can't see the slides.

Dr. Ross. Some call them inflatable, expandable, erectable, or pliant structures. They all involve the same thing, the basic function; they can be folded up into a small compact package at one time and opened up into a very large one at another time.

FIGURE 1

Figure 1 shows that what Goodyear has been doing for the last 30 years has been tied up with this type of structure. We can go all the way back to the beginning of, you might say, the Wright Brothers, way back in 1909, we started working with fabrics that went on airplanes. Actually the tires that went on the airplanes, too, and that we ride on today, are of that type of structure, up through the balloons and airships.

Back in 1949, we found we could see through some of this material with radar, and we made fabric radomes.

In 1955 we found we had a breakthrough. We built the inflatable plane at that time.

Today we are looking at space applications that could be space stations or different kinds of re-entry vehicles.

We will try to tell you about some of these today.

Why do we really look at expandable structures in the first place. There are four major advantages as shown on Figure 2.

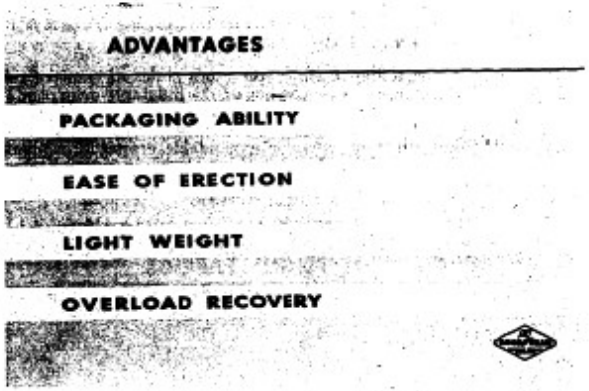


FIGURE 2

First of all, as has been mentioned several times, the packaging ability. We have a million hinges built into it and we haven't had to pay for them. Normally, when we make a hard structure, if you put a hinge in, it costs you extra weight. We don't need any kind of actuators or cams or anything like that. You put the gas to it and it erects. This is simplicity and results in reliability. What we are talking about is space reliability because we aren't up there to see it usually.

Light weight. This is one of the factors that usually surprises most people. In the aircraft field where weight is such a problem, it is usually very difficult to do anything that will save 5 percent in weight. In our applications sometimes we talk about saving 90 percent. This is a very large factor and an important one.

There is nothing magic or secret about it. We aren't varying any basic fundamentals. The reason that we can usually go to these extra light weights is that we can make practical structures of very very small dimensions which are not possible out of normal sheet metals. If you got the metals down to those dimensions, they would be foils so delicate that they would be hard to fabricate.

The last factor, overload recovery, is the kind of thing that is helpful to the engineer who works in this field. Any time a man designs a structure, he has to anticipate how big the loads are going to be that he is going to encounter. Nature doesn't always play in his favor, and once in a while he encounters a load that is greater than what he anticipates.

In normal structures, if you get a load that is too large, the structure will collapse. In an expandable structure what happens is, instead of collapsing, you get what we call an excessive deflection, it bends. When the load is taken off, it can straighten out and be as good as new.

These are our advantages with this type of structure.

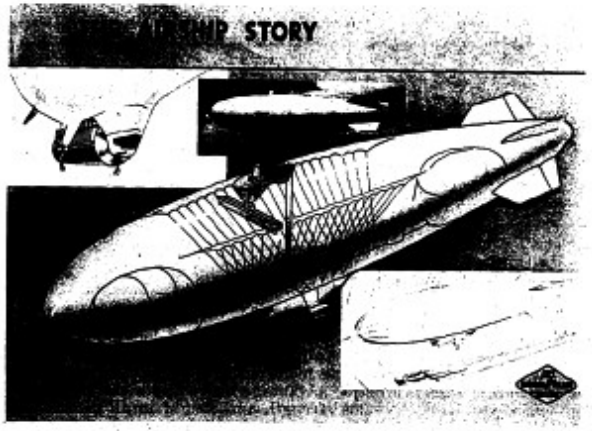


FIGURE 3

The reason for showing the picture (Figure 3) of the airship, which is not necessarily a space item but could be related to it in that we have already examined this for carrying very large boosters and find you can do this with an airship-type vehicle. Another reason for showing this is that size is not really a difficult problem with an expandable structure.

The car that you see underneath the airship is about the size of a good size airplane. You can see how much larger the envelope, which is an expandable structure, is.

When we talk about space, we are talking about applications that usually requires very large structures. And when we talk about an expandable structure, a large structure shows great advantages.

Let's show the movie here of a typical airship in flight. This will be the first of several brief moving picture examples of expandable structures.

(Movie shown of airship being moved from air dock and in flight.)

TAILORED EXPANDABLE STRUCTURE

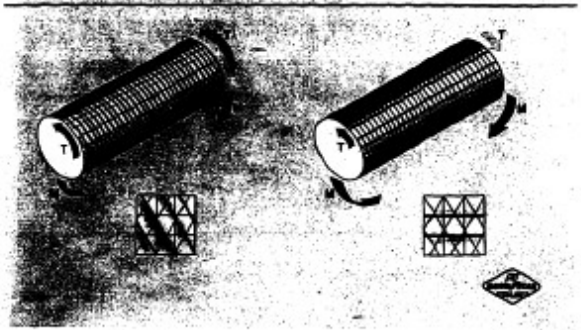


FIGURE 4

Dr. Ross. Leaving the airship for a moment and looking at one of the basic characteristics of expandable structures, Figure 4, shows that we put the cords that these materials are made of in the direction we want. This is a major advantage over sheet metal construction where you have the same strength and weight in all directions, whether required or not. If we have a big load in one direction, we can put lots of cords or heavy ones in. If we have a small load in this direction, we can put few cords. This gives us the advantage of only putting into the material the material you actually need to carry the load. Don't carry anything you don't need. It gives us the opportunity of making these light weights that we talked about.

Also, everybody knows if you make a sphere, a pressurized structure, where you have pressure in the center and carry all the material around the outside, this is one of the lightest structures you can possibly make.

The airship is a body of revolution of this type.

We attach the car to the bottom and distribute its load into the envelope by catenaries attached to the top. Actually, you will find that we have pulled down on the envelope in those areas to take the high load.

If we carried that over a wide span, you would find we could pull very hard on the top and bottom and get to the shape shown in the lower part of Figure 5, and have what you might consider a flat airship.

Let's consider that you might take this and put an infinite number of connections in there, and you obtain a pressurized structure that has what we call drop threads. This gives you flat structures so you don't have to be limited to round structures, cylinders, or torus-type.

EXPANDABLE STRUCTURAL FORMS

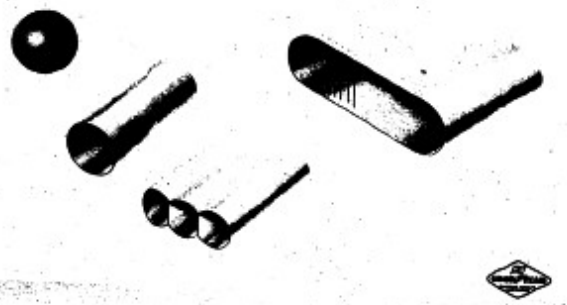


FIGURE 5

One of the breakthroughs we had was the development of a material called Airmat, which is made out of this flat structure as shown in the upper right side of Figure 5. This is a typical flat panel with the number of threads in between it. When you put pressure in it, it doesn't go to a sphere but is flat. We call this Airmat. When you put pressure into them, the threads prevent the pieces of cloth separating more than the dimension of the threads.

We were able also to take these and actually shape the structure, that is, change the lengths of the drop threads so when you inflated this body you would have an air foil-shaped device. See Figure 6.

This shows how we went from the catenary-type arrangement on the airship and to the drop thread.

Frankly, the samples we are showing you are nothing but pieces of carpet, made on a carpet loom and normally they make these outside surfaces very close together. To make carpet they cut the drop threads to make the plush surface. In our applications, we coat the surfaces to make them gas tight, seal the edges and pressurize internally to make a rigid structure. This is nothing more than an I-beam, if you might visualize it, as shown in Figure 6. With pressure, you get tension in the surfaces and you have an I-beam with the web of the I-beam essentially weighing nothing.

It is difficult to get material lighter than this. This is why we look at it as one of the world's lightest structural materials. It will remain still and hard as long as you maintain pressure in it.

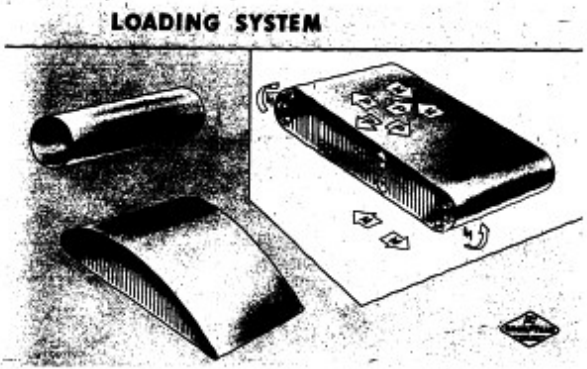


FIGURE 6

As I mentioned earlier, we actually were able to make an airfoil shaped body on these looms. We set the looms with special gauge blocks in them and instead of carpet, and we said, "We want a specified number of yards of NACA 0015 wing structure."

To show that we could do things and make them useful in this way, we actually, in working with the Navy, ONR, decided we would make a rescue-type vehicle as shown in Figure 7.

The idea behind this was that we would try to make it as small as possible. If a pilot is down in some hostile territory, you could fly over, drop this package to him, and some dark night he could turn a valve and he would inflate, start the engine and fly back to his own base.

To make an airplane like this, we had to make what you would call breakthroughs in the state of the art of structures. We were able to make wings of this airplane of one-tenth of the weight of a conventional structure.

We have a short movie now of one of these little airplanes so you can get some idea of its design and flight characteristics.

We made this one-place plane for the Navy. The Army asked us to make a two-place plane for them.

(Movie shown of Inflatoplane being unpacked and flown.)

Dr. ROSS. The next slides cover some of our work on space stations. Since this field covers everything from underneath the sea to in the air and off into space and the space field is what we are talking about today, we have divided our expandible structures into three areas: Those that require large strengths-light weight, such as a space station, those items that encounter high temperatures such as something you would use for re-entry into the atmosphere, and finally those items that are very very light in weight, but don't have to take any big loads. Usually, you want the light weight structures very accurate in shape, such as a gigantic solar collector.

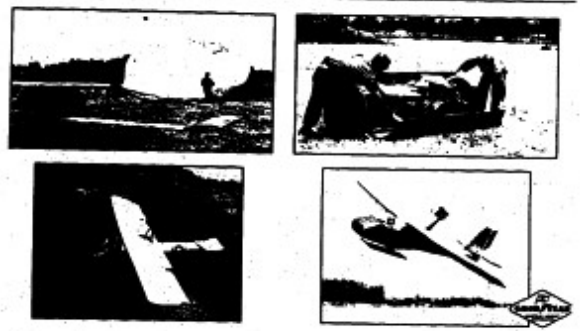


FIGURE 7

At this time, I would like to introduce Mr. Madden, who will give you a little discussion on this particular type of space station. Then I will return to cover the other two structures fields of applications.

STATEMENT OF ROBERT T. MADDEN, MANAGER, ASTRONAUTICS SALES, GOODYEAR AIRCRAFT CORP., AKRON, OHIO

Mr. MADDEN. Figure 8 shows what we might consider an advanced space vehicle, a large toroidal arrangement, three tier-type construction.

Figure 9 shows a configuration which is more representative of the type of work that we are doing today with the Langley Research Center, which Mr. Loftin reviewed earlier.

You can see here we have taken a look in our configuration evaluations at two possibilities of how expandable structures might be used in a space vehicle, and in the upper left hand side for comparison have shown a configuration which might be a metallic cylinder, possibly the final stage of a booster.

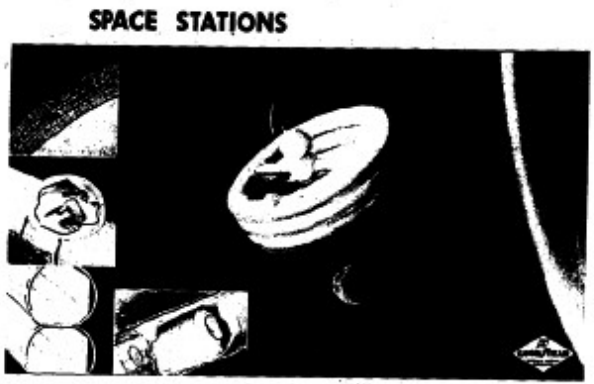


FIGURE 8

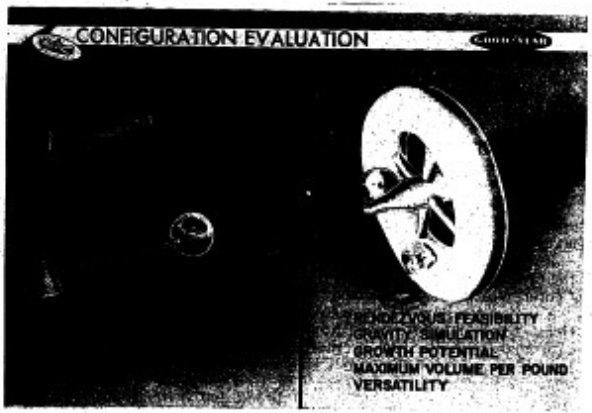


FIGURE 9

Our studies have shown that the problem of gravity simulation, if this is an area of concern, can probably be best handled with a toroidal arrangement and that this type of structure, using some of the principles that Dr. Ross explained, can be made a minimum weight for the desired volume. The research work that we are presently doing with the Langley Research Center is being directed at getting the optimum type of material for this type of configuration.

On Figure 10, we show a comparison of some of the expandable space station configurations that we have been investigating.

The first is a one-man 24-foot diameter configuration, identically that configuration that Mr. Loftin described and as represented by our model which I want to describe a little later.

BOOST WEIGHT DATA

STATION	MISSION (DAYS)	WEIGHT BREAKDOWN (LB)			
		CAPSULE	TORUS *	POWER +	LAUNCH TOTAL
1-MAN (24 FT)	14	3,344	3,432	1005	7,781
3-MAN (50 FT)	14	3,500	3,090	1,000	7,590
10-MAN (100 FT)	35	6,596	6,018	7,500 †	22,114
10-MAN (200 FT)	35	6,596	9,128	6,300 †	22,024
10-MAN (400 FT)	35	6,596	10,796	5,100 †	22,494

* INCLUDES MISSION, LIFE SUPPORT, AND ELECTRONIC EQUIPMENT.
+ INCLUDES LAUNCH AIRFRAME WEIGHT.
† 25 KW ELECTRICAL SYSTEM.

FIGURE 10

We have also looked at a three-man, 50-foot diameter space station. I think an important thing to note here is that the total launch weight of these vehicles is of the order of 7,500 to 8,000 pounds, which is well within the anticipated capability of the Centaur booster.

The concept in the first instance would utilize the Mercury capsule as the re-entry vehicle, and you can see it is identified as a one-man station.

Looking at later capabilities, we also show 100-foot diameter, 200-foot diameter, and 400-foot diameter stations.

It may be of interest that for the exact simulation of gravity that we have here on Earth, a 400-foot diameter space station, rotating at approximately 4 rpm gives the one g simulation.

Figure 11 shows a concept of a three-man station, using again the same principles of an inflated torus.

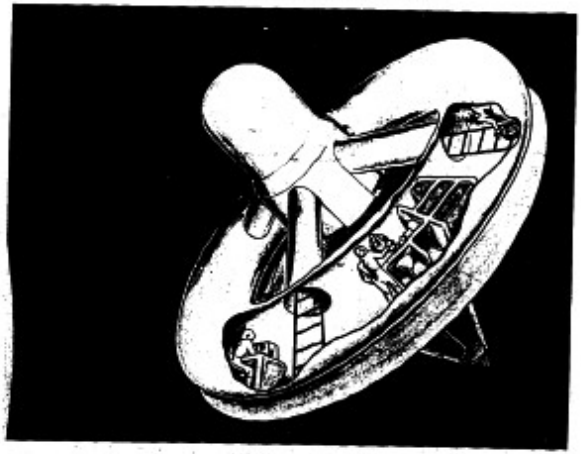


FIGURE 11

Here a ballistic-type nose cone and re-entry vehicle would also be the center hub and, as brought out in some of the earlier discussion, the space station would be boosted in the packaged configuration within the nose cone, as an integral unit. After deployment of the space station in the space environment, the crew could move out through the spokes into the working structure.

Figure 12 shows the typical deployment sequence for this type of vehicle.

As you can see, in the lower left-hand side, completely packaged, the inflatable components mate nicely with the booster configuration. After deployment, the pressurized space station assumes the toroidal shape. After completion of the mission, the capsule can be separated and programmed for re-entry and recovery in this instance, much like that recently accomplished with the Mercury capsule.

Figure 13 shows the launch configuration, which is perhaps better described by a movie which we can show now of the buildup of an expandable configuration.

(Movie shown of space station model launch and deployed configurations.)

Mr. MADDEN. Starting with the basic Atlas booster, as shown here, then comes an interstage fairing, the attachment of the Centaur stage, and finally on top of this the mission module, as we term it, which would enclose the packaged inflatable space station. This is attached to the Mercury capsule configuration, much as it is presently designed today.

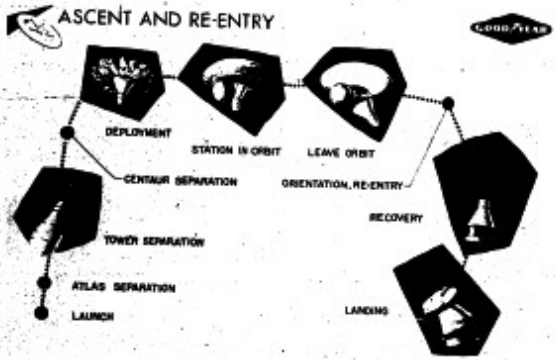


FIGURE 12

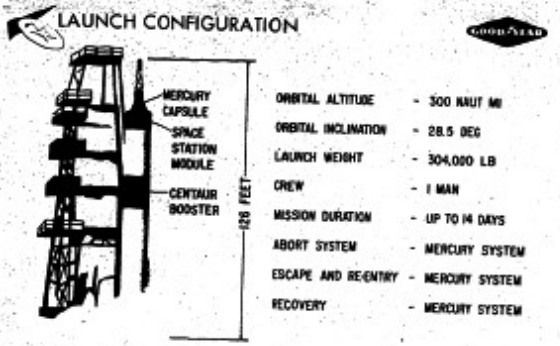


FIGURE 13

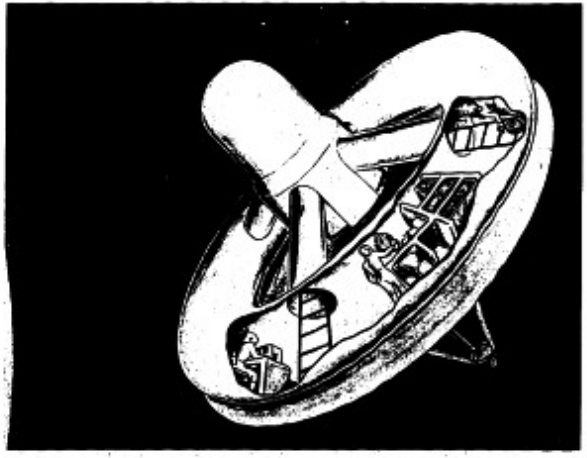


FIGURE 11

Here a ballistic-type nose cone and re-entry vehicle would also be the center hub and, as brought out in some of the earlier discussion, the space station would be boosted in the packaged configuration within the nose cone, as an integral unit. After deployment of the space station in the space environment, the crew could move out through the spokes into the working structure.

Figure 12 shows the typical deployment sequence for this type of vehicle.

As you can see, in the lower left-hand side, completely packaged, the inflatable components mate nicely with the booster configuration. After deployment, the pressurized space station assumes the toroidal shape. After completion of the mission, the capsule can be separated and programmed for re-entry and recovery in this instance, much like that recently accomplished with the Mercury capsule.

Figure 13 shows the launch configuration, which is perhaps better described by a movie which we can show now of the buildup of an expandable configuration.

(Movie shown of space station model launch and deployed configurations.)

MR. MADDEN. Starting with the basic Atlas booster, as shown here, then comes an interstage fairing, the attachment of the Centaur stage, and finally on top of this the mission module, as we term it, which would enclose the packaged inflatable space station. This is attached to the Mercury capsule configuration, much as it is presently designed today.

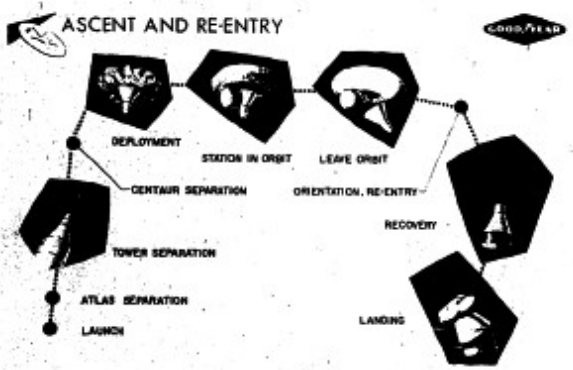


FIGURE 12

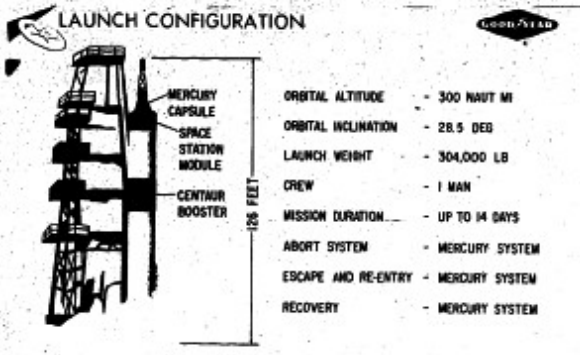


FIGURE 13

Our studies of this configuration have shown that the payload of the packaged space station and the re-entry vehicle are well within the limits of the Centaur booster, that is, the payload CG position, and the total weight are compatible with the booster capability.

For that reason we have no redesign on the booster to put such a space vehicle into orbit.

Perhaps I can describe this better by going actually to the model. Can we have the lights, please?

Here we have the model that you saw in the movie. (See figure 14.)

You can see that the mission module and Mercury capsule would be launched in this configuration.

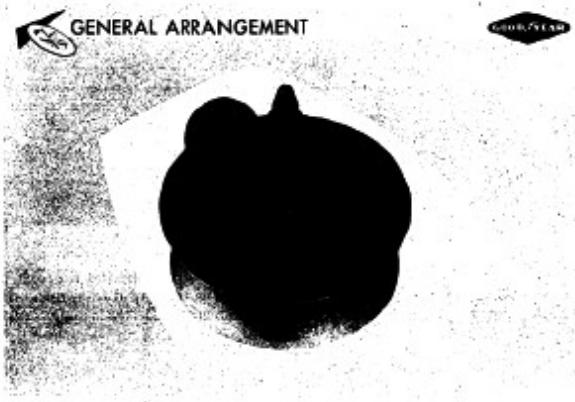


FIGURE 14

Then going to a slightly different scale—excuse my back, please—the Mercury capsule would be integrated with the center hub and then this section inflated. In this instance the 24-foot diameter unit would come out of the space station packaged module.

I think it is significant that the type of construction that we are using here is a rather recent development in that we have gone to the filament cage that Mr. Loftin touched on earlier, and it has given us the capability of going to virtually unlimited diameters in the torus construction without any real concern for the tooling problem.

We have here a paper model which shows this, although simple, in fairly vivid terms, in the type of arrangement that we can go to with a filament cage.

The filament cage would be basically designed to hold the toroidal structure that is required for the design pressure.

Figure 15 is a photograph of the bladder internal construction, which would be then the pressure-sealing member of the structure.

FIGURE 15

It is important to note in this configuration many of the components, such as bunks, and other required equipment; work tables, work stands could also be of the inflatable type of construction. And these then lend themselves to similar packaging and light-weight capability in the launch configuration.

Of course there is the question asked, what do we see in looking at the early availability of a space vehicle?

Figure 16 summarizes some of these. We feel the approach we are discussing here with the torus configuration lends itself directly to studies of artificial gravity simulation. It gives us a working laboratory where we can investigate, as on a test-bed basis, the performance of life-support systems, auxiliary power, attitude controls, and it provides a very natural test-bed for such programs as the earth orbiting laboratory that is one of the considerations in the Apollo planning, as well as the Military Test Space Station which the Air Force is now considering.

Figure 17 shows a picture of the center hub of a 30-foot diameter unit that we are building on corporate funds at Goodyear. This unit will be assembled with the 30-foot torus shown in Figure 15.

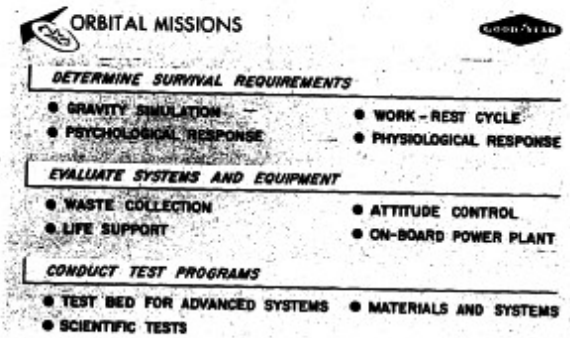


FIGURE 16

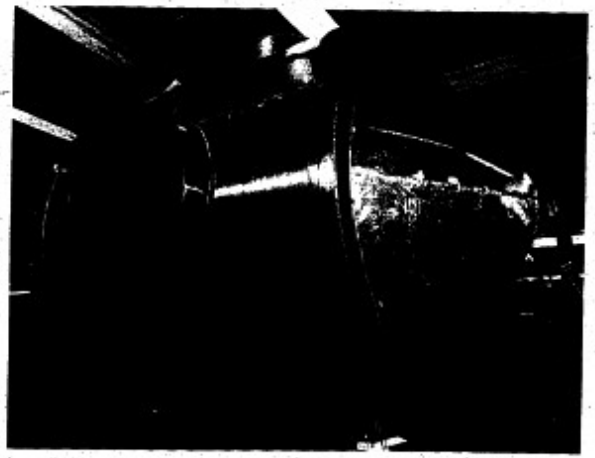


FIGURE 17

Figure 18 shows a development plan which we feel is feasible, based on our current work in house at Goodyear, and that with the Langley Research Center and with the Air Force.

As Mr. Loftin and Mr. O'Sullivan pointed out, we too agree that there are no major technical breakthroughs required to work toward an operational system of this type in approximately 3 years.

This is not to say certainly that we have the answers to the coating problems in terms of radiation, thermo-balance and a number of other areas, but we do feel the education we are getting now in the structural design of these full scale units does give us a firm basis in this area.

Our plan here would be to work toward vertical shots and then the fabrication of three orbital full-scale prototype units, two of which would be unmanned, the third manned, and as previously mentioned, would utilize the Mercury capsule for the re-entry of, in this instance, a one-man crew.

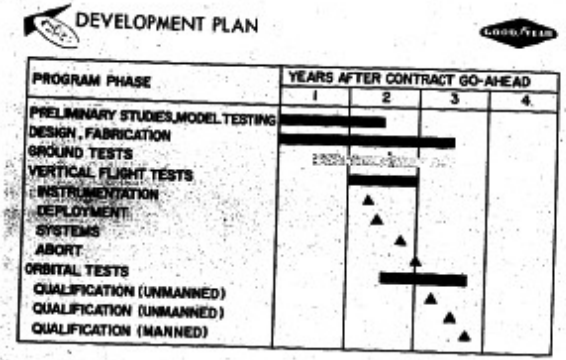


FIGURE 18

This completes my portion of the presentation.

Mr. RICHARDSON. One other thing I would like to point out, that I think Mr. Madden overlooked, is it allows the man to get out of his space suit, to take it off after he comes out into the space station, and to work in a normal atmosphere in the space station.

Things like this we have to learn as we go on into space.

STATEMENT OF DR. ROBERT S. ROSS, DIRECTOR, AERONAUTICAL RESEARCH AND DEVELOPMENT DEPARTMENT, GOODYEAR AIRCRAFT CORP., AKRON, OHIO (Continued)

Dr. Ross. I think the next things we want to tell you are as we got up into space, we started to realize there are other problems such as high temperature. We wanted to find out if we could make these materials that normally go to 200 degrees Fahrenheit, so they can take the high temperatures.

Looking through all the different types of metals that are available, we found that materials like some of the stainless steels or René-41, for instance, as one sophisticated type of material, has a very good temperature strength curve. Actually, you can get up to 1,500 or 1,800 degrees Fahrenheit and still retain strength.

The problem was to get this material drawn down into fibers so we could weave it into cloths. We found we could do this. We had it continually drawn down and drawn down until we got some of the fibers to a third of a human hair.

We took some that were more practical to use, and we made woven materials out of them.

Here are some samples of stainless steel drawn down to one-thousandth of an inch and woven into cloth.

You may find it difficult to get some of these materials in flat sheets that are uniform in characteristics. If we can get it to wire and then weave into cloth, we find it is a flexible sheet, and it can be used as a structural vehicle that is going to be operated at high temperatures.

Then you have to do something about making it gastight.

The next problem was to develop an elastomer that would be able to withstand the kind of temperatures that we are going to encounter. We don't feel we have the answer to this problem yet. We do feel we have been making some headway in this particular direction.

I think if we can go to the movie I would like to show you one of our high-temperature tests.

Since we are not in the space environment, it is very difficult to evaluate some of these materials on Earth. So we have to attempt to simulate conditions as closely as possible. We try to do these in altitude chambers using high temperature lamps to apply heat on these materials. Such tests do not show the problem as you come through the atmosphere and have the air rushing over the material, itself, so we developed a little hydrogen and oxygen rocket. We put a little material in the blast of this rocket and try to evaluate what takes place here.

(Movie shown of High Temperature Material Test.)

Dr. Ross. We have this piece of material, similar to what you have in your hands, in a frame in a hydrogen-oxygen rocket blast. You will notice when the hot gas hits the piece of material, it will start to glow and it will actually get red hot there. It still retains most of its properties.

This is just a simulated type of test. As I say, it is the type that we are using to try to screen the different kinds of materials that we would need for high-temperature re-entry.

There are two basic types of re-entry that we can encounter. One is the ballistic type, where you have some type of vehicle to let you use drag.

The second type is the lifting type, where you come in with wings and can fly in the atmosphere.

With these expandable type of structures, we find both of these types of units can be put on a launch pad in a small package.

Figure 19 will show you what we call our Ballute, which is a combination of balloon and parachute.

Working with the Air Force and NASA, using their laboratories, we found that you can make a balloon-type vehicle, which you can see at the left here, with a torus-type ring around it, which can be attached to a re-entry vehicle or escape capsule.

DECELERATION BALLOONS

FIGURE 19

This item, when opened up in the high altitudes, is actually positively inflated by the gas inside so we don't have the problem of a parachute, trying to open when there is no air. As it comes through the atmosphere it has to go through the speed ranges, and this particular type of vehicle can do it.

It inflates behind the body, makes it act like a shuttle-cock, and comes down through the atmosphere.

This is used on the Cree missile to bring back about a 500-pound weight.

I would like to show some movies of this in the NASA tunnels at 3½ times the speed of sound.

(Movie shown of Ballute in supersonic wind tunnel.)

Dr. Ross. You will have to watch it closely. It inflates in two-tenths of a second.

This is 3½ times the speed of sound.

After it is opened, we let it reel aft on a cord, and this changes the drag again. It increases it by getting it beyond the interference of the body in the front.

The trailing string that you saw was the means of preventing it going down the tunnel if anything broke loose.

Notice how steady it is.

This is the Cree missile that this unit was put on. The Ballute is folded in a package between the missile and the booster. When this booster is fired after the booster is dropped off, this Ballute, about a 9-foot diameter balloon-shaped body, comes out and decelerates the body and lets it come back to Earth.

This was the first of two shots on that particular project.

As far as we can tell, everything was successful. We don't know what to change on the next one. This has been a very successful program.

We are going to make some of these to operate at 10 times the speed of sound. We have been working with the Air Force and NASA using their equipment to test these out before we get to the full-scale unit.

The other type of re-entry that we might want to discuss is what can you do about coming from outer space and flying down to a predetermined landing space?

This would mean we would have to build a vehicle up in space. It would have to be all packaged into the launch nose. When it gets up into space, it would have to open up to the vehicle that we are talking about.

Figure 20 is a typical example of this. The booster would carry it on up into space. There it would open up into a vehicle with wings and now come down and fly in from outer space.

FIGURE 20

Why do we think we can do this now?

I think if we can go on through the slides, I think I can show you a little bit of what we can do.

Figure 21 shows how the entire thing could be packaged into a small 5-foot by 10-foot nose cone.

These parts that you see here, that are indicated by cylinders and spheres, show the approximate volume of the hard structures, the instrumentation, the gas supply, the controls, and so on, as they would fit.

The space around here is taken up by the flexible structure. When you get that into space, it opens to this size vehicle.

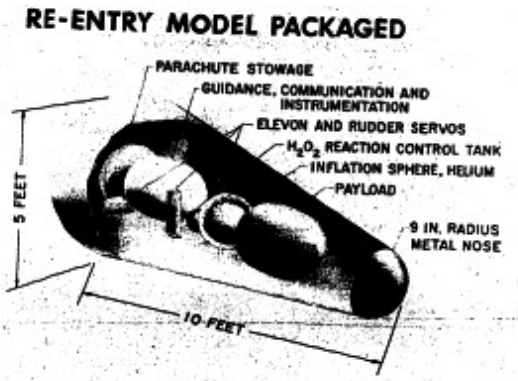


FIGURE 21

Figure 22 shows how small it is when it starts and how large it is when opened up. You notice the little parts in here are the same parts that we had on the package and how they are distributed to where they are needed in the vehicle.

Figure 23 is another view of the flight configuration.

This is a typical type of re-entry ship. It has the same aerodynamics as any other hard structure. The inflated structure material is made out of a metal and has the same kind of properties as any hard structure.

I believe this slide will show it as clearly as any the reason we think we can do more things with this approach than with some of the hard structures; that is, we can go to a lighter weight vehicle that could fly in the atmosphere at high altitudes.

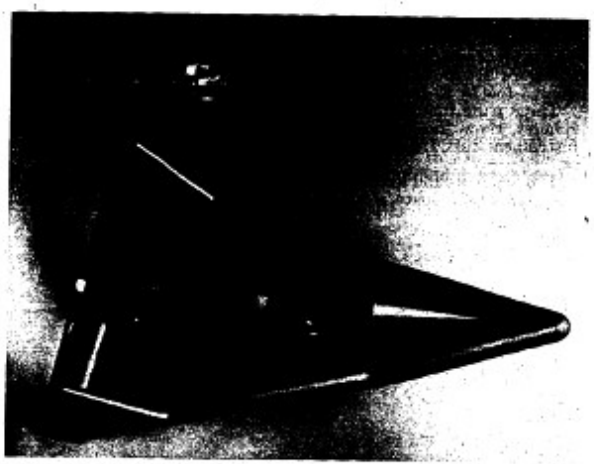


FIGURE 22

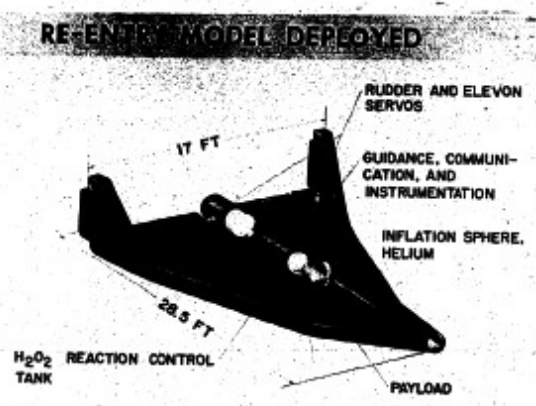


FIGURE 23

Figure 24 is a typical curve that shows the altitude and velocity. And this shaded area that you see is what we call the re-entry corridor. This is where most vehicles will have to fly when they come in from outer space.

Normally, each square foot of the wing surface must carry somewhere around 25 pounds per square foot. By going to this inflatable, light weight structure, we can probably divide that by 10 and have each square foot take maybe only 2½ pounds per square foot. This means you don't have to come down to the dense air to fly. You can actually come in and fly at the high altitude.

These upper lines here indicate the altitude at which you could probably fly with this vehicle and the lower region of this plot is where a conventional hard structure would operate.

These lines drawn on here are basically temperature lines. The bottom of this curve is the temperature through which you cannot carry a hard structure because it would burn up.

The upper line is the aerodynamic line. With our vehicle, you can see we would have lower temperatures.

So you see the whole thing is raised up. We can come in and fly at higher altitudes. Because of that, we do not have the high temperatures. This temperature may be around 1,500 degrees, where with conventional structure this is 3,000 degrees. We don't have to develop materials to go to such high temperatures as a hard structure. This is why if we can develop coatings and finishes to take 1,500 degrees, you can have a winged vehicle to fly in to a predetermined landing site. If you were just going to make a suborbital flight from Canaveral, Figure 25 shows you the footprint of your maneuvering capability. If you sent it up, you could pick any place in that area and

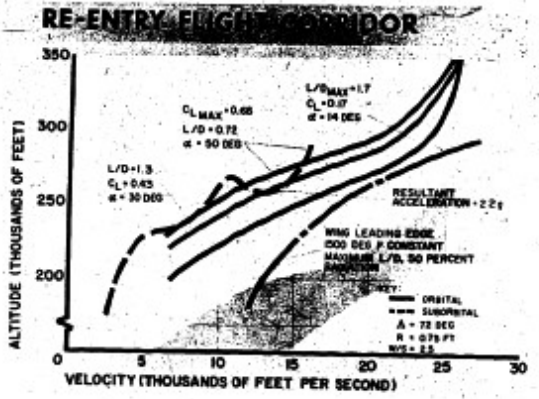


FIGURE 24

land on it. You might say, "I want to land on Island 9–A." and you would fly in as a conventional airplane. When it gets to the low altitudes, it is traveling at such a low velocity that it would operate much like a Piper Cub.

If you were going to put it into orbit, Figure 26 is looking down on the top of the world. This is firing out of some place like Vandenberg. You see, if this is the footprint of its maneuvering capability, you could pick almost any place in the United States and land there. You do not have to pick a particularly large field. Because of the light wing loading, you don't need a very large field to land in.

I think now I might show you a movie of one of these units assuming that this is the unit on the launch pad. This would normally be standing this way. The entire inflated structure is in this hard cover, and you can see the way it opens.

(Movie of Inflated Re-entry Glider.)

Dr. Ross. It opens up and goes to the predetermined shape. When it opens, it opens to that shape and you now have a lifting type of vehicle. It doesn't go to a sphere. It goes to the aerodynamic shape to which it was fabricated.

Then it can maneuver just like any other type of vehicle. The work that we are doing in our house now is to try to develop the materials that are needed to withstand the re-entry conditions that we will encounter on that kind of vehicle. As soon as that is done, we will be able to fly in from outer space.

(Movie shown of wing structure opening in tunnel.)

Dr. Ross. Here is an example of what would happen—you know in the suborbital shot we showed you, there might be some thought of it coming in where there was some atmosphere and you would have to open the wings in that atmosphere.

The next shot is in a wind tunnel and trying to open the wings with air going by. You will find that this thing is going to be tested at about 50 times the air load that we would normally encounter on one of these suborbital shots. There is air blowing by at this time.

There are four shots here. This thing opens in about a second or so.

The next one we put it at a high angle to see whether it would affect it. It looks like this is a very promising area. We should be able to go on to look for re-entry vehicles of both the lifting and drag type.

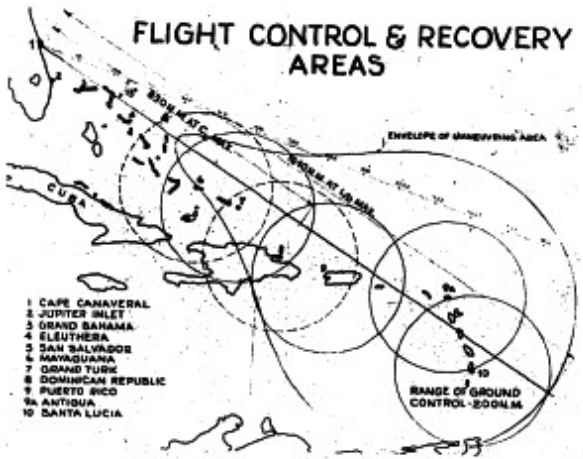


FIGURE 25

FIGURE 26

I mentioned there was one last type of structure that you might be interested in. That is one that we might want to have as a very large structure, but it doesn't have to have a high load-carrying ability, such as for instance a solar collector. Figure 27 illustrates here a typical example of how this is done.

FIGURE 27

It is collapsed in a small package. We put it in space. We inflate it and then we actually foam onto the back end of the unit so we have rigidized it so when it is punctured by micro-meteorites it doesn't change shape. I will show you a movie here and how it can be done at high altitudes.

(Movie shown of foaming in altitude chamber.)

Dr. Ross. This is in an altitude chamber. This is a body that is inflated here. The solar concentrator is the portion on the end. This is a large unit that will collect the sun's rays and change it into electricity.

Here we have some of the foaming process taking place. Once it is foamed, a high temperature wire burns off the part we don't need. The Sun's rays can strike the mirror and be collected and with an energy converter would change it into electrical energy.

This is an example of a typical unit you can see there. We put a piece of paper there, and you can see how it concentrates the energy in a small source. In the unit that we have made for the Air Force on this, we have found a tremendously accurate ability here. We have measured 3,600 points on it. We have come within 98 percent of what would be theoretically possible.

It looks like this system could go into extremely large structures and make them into a reliable dimension that can do a job for us in space. This thing of course is made out of films and foils and can also be used for Earth applications.

(Four foot diameter collector model displayed.)

Dr. Ross. This was in a little package that was inflated and rigidized in space. I think this gives us an idea of the things we can do. If we go back to the slides now, I will show you what we are basically doing in-house.

Figure 28 shows that in order to use this material you have to consider everything from the basic material and coatings all the way down through to the actual application. Each one of these things as I mentioned before, have to be considered in designing the final vehicle. You can't just take a piece of material off the shelf. You have to design each of the structures for the specific application.

RESEARCH AND DEVELOPMENT PLAN

- BASE MATERIAL
- COATINGS
- INTEGRATION OF BASE MATERIAL WITH GAS BARRIER COATING
- DETAILED ESTABLISHMENT OF SPACE ENVIRONMENT CONDITIONS
- EFFECT OF SPECIFIC ENVIRONMENT ON BASE MATERIAL AND COMPOSITE STRUCTURAL PRODUCT
- FABRICATION AND MANUFACTURING TECHNIQUES FOR SPECIFIC MATERIALS AND APPLICATIONS
- QUALIFICATION TESTS
- INFLATION METHODS
- DEPLOYMENT
- ASSEMBLY AND STATION EXPANSION AND IN-SPACE REPAIR

FIGURE 28

Figures 29 and 30 show that in-house we are defining three areas, those having to do with astronautics, aeronautics and the third area, which is the tough one here, getting into the theories and experiments that are necessary to prove out what you can do. The thing that is different about this and hard structures, is that we now have to develop equations and consider some things that we didn't have in conventional hard structures.

In a hard structure, once it is deflected beyond a certain point, you forgot about equations. We have to set up some new formulas and things that we can use.

GAC DEVELOPMENT PROGRAM

A. ENVIRONMENTAL MATERIAL

ASTRONAUTICS

LITERATURE SURVEY—EFFECTS OF SPACE ENVIRONMENT ON MATERIAL

TEST PROGRAM—HIGH VACUUM, ULTRAVIOLET, AND TEMPERATURE EFFECTS ON SELECTED MATERIALS

AERONAUTICS

RE-ENTRY—ADVANCE DEVELOPMENT OF PRESENT MATERIALS AND COATINGS

LIGHTWEIGHT MATERIALS—CLOTH-FILM FABRIC DEVELOPMENT, POLYURETHANE ELASTOMER DEVELOPMENT

FIGURE 29

GAC DEVELOPMENT PROGRAM (CONT)

B. DESIGN THEORY

INITIAL BUCKLING

STRESS, STRAIN, AND CREEP (CORD-TYPE FABRICS)

POST BUCKLING

STRUCTURAL DAMPING FACTOR

EMPIRICAL FACTORS AND PROOF OF THEORY

FIGURE 30

A typical example, Figure 31 shows some of the formulas that you find in use in sheet metals. You see the constants that you normally have in some of them change to variables in the new formulas. They might even change from one direction to another because we can change the material that way too.

STRESS-STRAIN EQUATIONS

ISOTROPIC (METAL SHEET, FILM, FOIL, etc.)

$$\epsilon_x = \frac{1}{E}(\sigma_x - \mu\sigma_y)$$

$$\epsilon_y = \frac{1}{E}(\sigma_y - \mu\sigma_x)$$

$$\gamma_{xy} = \tau_{xy}/G$$

ORTHOTROPIC (FABRICS)

$$\epsilon_x = \frac{1}{E_x}(\sigma_x - \mu_{xy}\sigma_y)$$

$$\epsilon_y = \frac{1}{E_y}(\sigma_y - \mu_{xy}\sigma_y)$$

$$\gamma_{xy} = \tau_{xy}/G$$

FIGURE 31

Figure 32 is a typical example for a curve for a metal (left side). On the right side is a typical fabric. There is nothing wrong with having it non-linear as long as you know what it is and use it accordingly. A property we use on the airship is shown by the lowest part of the figure. We find some of these materials are—you put a load on a piece of material and let it hang for a period of time and it might eventually break. If you can predict it in advance, you can take advantage of it.

If you have these occasions once in a while where you have a very high load that you are anticipating and encounter, you can increase the pressure or increase the strength of your structure while you are flying and bring it back down to the normal pressure. You don't get it for nothing. You give up some of the life of the material.

You might cut it from 100 to 10 years. This gives you a rough idea, hurried brief background of a subject that we think has tremendous potential. It appears with this ability of folding up things in a small package and putting them on a launch pad, using the type of boosters that are planned today, we should be able to use space by opening them up into large structures that can do all types of work from the space station type, solar type. We in the R. & D. area feel this is one of the areas that offers great potential challenge and you can see we have had some great successes in our work in it.

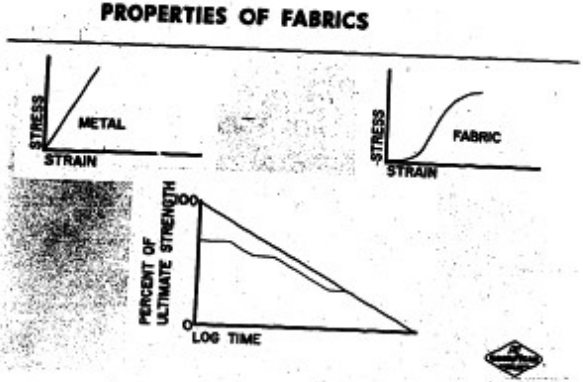


FIGURE 32

The CHAIRMAN. One question was asked about the cost. It is probably too early, isn't it, to give any definite idea about the cost?

Mr. RICHARDSON. I would like to try to answer that question, Mr. Chairman. Yes, it is pretty difficult to pin out exactly the cost of all of these things.

However, I think it is very evident that when you make a structure like this, we have it fully made on the ground, we don't have a lot of rivets and actuators and things like that and the cost element is bound to be much lower than making similar types of metal structures.

Also, there are a lot of things that we can do with structures such as this that can't be done with metal structures. I think to come out and name a dollar for such and such an item is quite a difficult thing to do at this time, because all of them involve, what is the mission, what are boosters required, what are the experiments that are to be carried out, or what is the final application of the equipments that have to go into it, and all of those get into the answer of cost.

We are very certain that the costs of vehicles like this will be much lower than comparable metal vehicles.

The CHAIRMAN. Thank you very much.

If there are no questions, I want to thank these gentlemen first from NASA, and then secondly from the Goodyear Aircraft Corp. for some very interesting and very valuable hearings that we have had this morning. Our membership has appreciated it very much and we have gotten a lot of information.

Mr. RICHARDSON. Thank you very much, Mr. Chairman. We appreciate the opportunity to come because we think it is a subject that as the weeks, months and years come on ahead of us, it is one you are going to hear more of in the space effort of our country.

The CHAIRMAN. Without objection, we will place in the record at this point the statement of the Goodyear Aircraft Corp. and the biographies of Mr. Richardson and his staff.

I am satisfied of that fact that you mentioned, Mr. Richardson.

If there is no further business, the committee will adjourn, subject to call.

(The biographies and statement referred to are as follows:)

R. W. RICHARDSON

GOODYEAR AIRCRAFT CORP., AKRON, OHIO

Robert W. Richardson, vice president for Goodyear Aircraft Corp. since November 1954, was first associated with the Goodyear organization in 1934 as a member of the production squadron of Goodyear Tire & Rubber Co.

He was transferred from the squadron the following year to take a position with Goodyear Service in Brooklyn, N.Y., and later was associated with the Goodyear store in Boston, Mass. In 1936, he returned to Akron to join the Mechanical Goods Sales Department (now Industrial Products), of Goodyear Tire & Rubber Co.

Subsequently, Richardson held sales positions with the Industrial Products division in Chicago and Buffalo and in 1941 was appointed district manager of Goodyear's Aviation Products division at Dayton, Ohio. He returned to Akron in 1944 as assistant manager of the Industrial Products manufacturers' sales organization.

He served as manager of the Aviation Products division from 1945 until 1951, when he was appointed assistant to the vice president in charge of manufacturers' sales.

In 1952, he left Akron to assume the post of assistant to the president of Kelly-Springfield Tire Co., a Goodyear subsidiary. In February 1954, he was appointed vice president of that company.

Richardson returned to Goodyear in July, 1954, when he was appointed sales manager of the company's North-central division at Chicago, Ill. He was named to his present position at Goodyear Aircraft four months later. Born in Seattle, Wash., Richardson was graduated from Culver Military Academy and attended Purdue University. He is a member of the Wings Club, New York City, and holds a private pilot's license.

He resides with his wife and three children, Thomas, Frances, and John, in Hudson, Ohio.

R. S. ROSS

GOODYEAR AIRCRAFT CORP., AKRON, OHIO

Robert S. Ross is now manager of aeromechanics research and development department at the Goodyear Aircraft Corp. He has been with Goodyear since July, 1949, and is responsible for all aeromechanics projects of a research and development nature in the undersea, surface, atmospheric and space field.

Previous to his position at Goodyear Aircraft, Dr. Ross was Technical Director of the Daniel Guggenheim Institute, Akron, Ohio. He also taught at the University of Akron as Associate Professor and at the Case Institute of Technology, as Special Lecturer.

Born May 31, 1920 in Lorain, Ohio, he earned his Bachelor of Science, Master of Science, and Doctor of Philosophy degree at Case Institute of Technology in 1942, 1943, and 1945, respectively.

Dr. Ross has been active in the field of aeronautics since 1942 and has worked on lighter-than-air, and heavier-than-air projects including airships, balloons, helicopters, convertaplanes, airplanes, and missiles. The Inflatoplane and Convoplane were two of his projects. He has also been responsible for subsystem development such as jet engine reversers and supersonic escape capsules.

He is a member of the Aircraft Research and Testing Committee of the Aerospace Industries Assoc. and was chairman of that committee in 1959. He is an Associate Fellow of the Institute of Aeronautical Sciences, and a member of Sigma Xi.

He holds a professional engineers license in Ohio, is a licensed pilot, has authored many technical articles and holds several patents in the aeronautical field.

He is married to the former Betty I. Bailey and they reside at 4270 Hickory Lane, Cleveland, Ohio.

R. T. Madden

GOODYEAR AIRCRAFT CORP., AKRON, OHIO

Robert T. Madden, manager of astronautics sales at Goodyear Aircraft Corp., is responsible for programs concerning space and re-entry vehicles, recovery equipment, structural components for outer space applications, as well as astronautics research and development programs.

Madden joined Goodyear Aircraft in 1952 as an Engineering Specialist in the firm's Research and Development Department. He moved into the Sales organization in 1956 and handled the sale of escape capsules for supersonic aircraft and re-entry vehicles before transferring to astronautics sales in 1959.

Prior to his association with Goodyear Aircraft, Madden spent 4½ years with the National Advisory Committee for Aeronautics conducting research on supersonic aircraft and ram jet propulsion systems. He also worked in the aircraft industry as a missile systems engineer and as an ignition applications engineer for turbine engines.

A 1943 graduate of the University of Notre Dame with a Bachelor of Science degree in Aeronautical Engineering, he also took courses in high speed aerodynamics at Stanford University in 1948.

Madden spent 3½ years with the United States Navy during World War II as an aircraft squadron engineering officer. At the time of his separation from the Navy in 1946, he was aircraft overhaul inspection officer at Naval Air Station, Alameda, Calif.

A member of the American Rocket Society, Madden resides with his wife, the former Helen Marie Gallagher, and five sons in Hudson, Ohio.

Summary Presentation on Expandable Structures

By

GOODYEAR AIRCRAFT CORP., AKRON, OHIO

The utility of lightweight, packagable fabric structures in considerations of current and future engineering designs has led to a relatively new technology—broadly identified as expandable structures.

This structural approach permits the designer to select and orient filaments and elastomers to best suit a specific application in the anticipated operational environment. This ability to create lightweight structures when combined with packagability looks very promising, particularly for vehicles and components to be used in space and re-entry applications.

Although expandable structures have been considered for many types of undersea and earthbound uses, space vehicle applications can be classified in three major categories.

I. High strength expandable structures for use in orbital and space vehicles, such as manned and unmanned space stations.

II. High temperature, high strength expandable structures for use in manned and unmanned re-entry vehicles.

III. Lightweight expandable structures with possible foam rigidization for use in solar concentrators, antennae, unmanned satellites, and so forth.

In each application for expandable structures, the vehicle remains folded on the launch pad and the desired geometrical shape of the configuration is established by inflation with a suitable gas, once the vehicle arrives at its operational altitude.

As noted above, in some application, after erection, the shape may be maintained by lightweight foam or other rigidizing techniques. By "patterning" or weaving the fabric structure in the desired final configuration, it is possible to produce virtually any size or shape.

One of the big advantages of this type of structure is the ability to assembly and inspect the entire configuration in the fabrication area before the unit is deflated and packaged into a canister for efficient handling as a ground transport or booster payload.

Shapes such as spheres, ellipsoids, paraboloids, cylinders, and other bodies of revolution can be readily fabricated in single wall structures by pattern design, or "goring" to develop the desired inflated geometry. For those applications where specialized shapes are desired, dual wall structures are formed of a Goodyear product called Airmat (Goodyear Tire & Rubber TM). This development has evolved from the process of weaving simultaneously the two wall fabrics with interconnecting filaments, the length of these filaments accurately establishing the wall spacing.

Using this technique, it is possible to create almost any desired shape in the form of a pressurized expandable structure. Further developments in the basic fibers and elastomers permit the utilization of high temperature metals and glasses which result in structures capable of withstanding the heating of specific re-entry applications.

It has become apparent that the need for larger space payloads has resulted in the development of boosters which are dimensionally impossible to carry on our existing highways or railroads. New means of transporting these from the source of manufacture to the launch site must be developed.

A review of airship capabilities for handling large missile boosters indicates that this is one of the most feasible methods yet devised for effectively handling this problem.

The airship's ability to operate from extremely small areas and to travel anywhere in the world with a cargo that will encounter less than a one-half g load has been established in feasibility studies. Within the state-of-the-art, it is possible to utilize airships for performing the mobility function of all anticipated boosters. Attached is an illustration of a typical airship configured to handle a large booster.

The need for developing a lightweight structure of high structural integrity for use in a space environment has resulted in the investigation of the ability of expandable structures to be utilized in a manned space station application.

Here it is necessary to provide a large volume in the space environment while the vehicle size must be compatible with an existing nose cone on the launch pad.

The ability to fold an entire space station into existing nose cone dimensions permits the utilization of current boosters to place a manned space station and recovery vehicle in orbit at an early date.

Once in space, the station can be expanded to its full dimensions and the man move at will from his recovery vehicle into the station and back again. This arrangement eliminates the need for a rendezvous between the manned vehicle and the space station which would be required if each were sent up individually.

After performing a mission in space, the man could utilize his re-entry capsule to return to Earth leaving the space station in orbit. Feasibility studies have been made of this concept utilizing a Mercury type re-entry capsule and an expandable torus type space station which would permit the performance of a two week manned space mission while utilizing available planned boosters as launch vehicles.

Methods for constructing the expandable portions of the space station are now being evaluated by NASA and GAC and a 30-foot diameter portion of one is pictured under construction at GAC. An artist's concept of how this unit will look in space is also shown.

Expandable structures have been investigated as re-entry vehicles, both of the ballistic type, which primarily uses drag forces to decelerate it and of the lifting type which would permit flying in from space to a predetermined landing area, much as the conventional airplane.

Attached is a photo of a typical ballistic type decelerating system, generally known as Ballute which utilizes a large lightweight inflated balloon for developing drag forces required for controlled re-entry. This GAC-developed system has already been tested in supersonic wind tunnels and on the Cree missile up to speeds of Mach 3.5 and programs are now underway which will evaluate its use at ten times the speed of sound. This is an extremely simple and reliable system and has been a very successful Air Force program.

The feasibility of lifting type re-entry vehicles utilizing expandable structures is now being investigated and it appears that the utilization of this principle will permit the erection of light wing loading vehicles that could enter the earth's atmosphere at very high altitudes and maneuver to a predetermined landing site.

This type of re-entry vehicle would not encounter the high temperatures re-

quired by conventionally constructed units, thus providing decreased problem areas in all the vehicle's subsystems. Investigations are now being made of the types of materials as well as the manufacturing methods required.

The utilization of this concept should permit the development of lifting type re-entry vehicles which can operate from existing boosters. A typical re-entry vehicle in both the launch pad configuration—completely folded and the space and re-entry configuration are shown on an attached photograph.

The requirement for power systems in space with consideration of the Sun as a source of energy. In order to collect this energy and transform it into useful electrical power, it is ordinarily necessary to provide a large solar concentrator to focus the Sun's energy into an absorber.

Expandable structures provide an ideal means for making collectors of high dimensional accuracy which can be folded up into small packages on the launch pad and expanded in space. A means has already been developed for rigidizing these structures so that they can be counted on for use as reliable orbital and space subsystems components. These are usually made of films and foams and are extremely light in weight.

This type of structure also lends itself ideally to all types of large space antennae. A typical rigidized solar concentrator made by GAC for the Air Force is shown in an attached photograph.

The use of expandable structures for space applications requires fundamental work on materials, manufacturing methods, and application analysis, some of which is planned by NASA and the Air Force. However, engineering feasibility studies and tests conducted to date indicate that these large structures can be used with existing boosters to perform missions which ordinarily would have to wait for the development of larger launch vehicles. The application of this technology now should not only provide a new immediate space capability but also a tremendous potential for future systems.

(Whereupon, at 12:10 p.m. the committee adjourned, to meet again on Tuesday, May 23, 1961, on another subject.)

O

Property of
Aerospace Studies Institute
ATTN: Archives Branch
Maxwell AFB, Alabama
RETURN TO:

COMMITTEE ON SCIENCE AND ASTRONAUTICS

Overton Brooks, Louisiana, Chairman

JOHN W. McCORMACK, Massachusetts
GEORGE P. MILLER, California
OLIN E. TEAGUE, Texas
VICTOR L. ANFUSO, New York
B. F. SISK, California
ERWIN MITCHELL, Georgia
JAMES M. QUIGLEY, Pennsylvania
DAVID M. HALL, North Carolina
LEONARD G. WOLF, Iowa
JOSEPH E. KARTH, Minnesota
KEN HECHLER, West Virginia
EMILIO Q. DADDARIO, Connecticut
WALTER H. MOELLER, Ohio
DAVID S. KING, Utah
J. EDWARD ROUSH, Indiana

JOSEPH W. MARTIN, Jr., Massachusetts
JAMES G. FULTON, Pennsylvania
GORDON L. McDONOUGH, California
J. EDGAR CHENOWETH, Colorado
FRANK C. OSMERS, Jr., New Jersey
WILLIAM K. VAN PELT, Wisconsin
A. D. BAUMHART, Jr., Ohio
PERKINS BASS, New Hampshire
R. WALTER RIEHLMAN, New York

CHARLES F. DUCANDER, Executive Director and Chief Counsel
Dr. CHARLES S. SHELDON II, Technical Director
SPENCER M. BERESFORD, Special Counsel
PHILIP B. YEAGER, Special Consultant
HARNEY S. BOGAN, Jr., Staff Consultant
JOHN A. CARSTARPHEN, Jr., Counsel
RICHARD P. HINES, Staff Consultant
Lt Col PAUL B SCHUPPENER, Staff Consultant
RAYMOND WILCOVE, Staff Consultant

THE COMMITTEE ON SCIENCE AND ASTRONAUTICS, House of Representatives, is for the advanced research projects in the Defense Department. The committee is to see that this Nation has a defense research and engineering program superior to that of any other nation. The research and engineering programs of the Army, Navy, Air Force and the Advanced Research Projects Agency are supervised by the Department of Defense. The job of the Office of the Secretary of Defense is to see that the competition between the military services is kept within reasonable bounds and that only the most promising development programs are permitted to go into the costly production phase.

To conduct the review of the research, development, test and engineering program there is a staff of professional personnel who have engineering and scientific background. In addition to reviewing the program date thus submitted the Department of Defense staff carries on almost constant communication with their opposite numbers in the military departments who know the most about specific programs and projects; they make visits to military installations such as test ranges, proving grounds and laboratories to observe the work going on at firsthand and also visit the plants of defense contractors who are performing research and engineeing work for the DOD.

1003865

The Air Force is the largest and includes such additional items as systems planning studies; considerable effort on flight medicine and related environmental studies; the operations and logistics studies conducted by Rand; and the technical information exchange represented by ASTIA. The advanced research work of ARPA in the field of propellants and other work related to space programs and the research and testing programs of DASA are also included under this activity. DASA means Defense Atomic Support Agency and this group runs the nuclear weapons tests and the weapons effects experiments.

DOD research and engineering effort is closely coordinated with the other research programs of the Federal Government wherever appropriate. The work is carried on closely with that of the Atomic Energy Commission on all research, engineering, and testing concerned with application of atomic energy to military uses.

There is a constant liaison and coordination with the Department of State in the mutual weapons development program and applicable NATO activities. There is a close working relationship with the Federal Aviation Agency on research and development pertaining to communication systems related to air navigation. There is a close coordination between the medical research programs of the Department of Health, Education and Welfare and the Department of Defense.

The Department of Defense is interested in the Maritime Administration programs of transportation and logistics, including cargo-handling research. Almost all areas of basic research conducted by the National Science Foundation are of interest to the Department of Defense, and the DOD has participated in many studies and programs conducted by the National Science Foundation, including of course, the Internation Geophysical Year program.

There are other Government agencies doing or sponsoring work which relates in varying degrees to the defense effort. Private industry is also spending increased sums for research and engineering in many fields where the results can be used for military as well as for civilian purposes.

U. S. Congress - Committees of the House

Standing Committee of the House

Government Operations

William L. Dawson, of Illinois
Chet Holifield, of California
John W. McCormack, of Mass.
Jack Brooks, of Texas
L. H. Fountain, of North Carolina
Porter Hardy, Jr., of Virginia
John A. Blatnik, of Minnesota
Robert E. Jones, of Alabama
Edward A. Garmatz, of Maryland
John E. Moss, of California
Joe M. Kilgore, of Texas
Dante B. Fascell, of Florida
Martha W. Griffiths, of Michigan
Henry S. Reuss, of Wisconsin
Overton Brooks, of Louisanna
Elizabeth Kee, of West Virginia
Kathryn E. (Mrs. William T.) Granahan, of Penn.
John S. Monagan, of Connecticut
Neal Smith, of Iowa

Clare E. Hoffman, of Michigan
R. Walter Riehlman, of New York
George Meader, of Michigan
Clarence J. Brown, of Ohio
Florence P. Dwyer, of New Jersey
Robert P. Griffin, of Michigan
George M. Wallhauser, of New Jersey
Odin Langen, of Minnesota
John B. Anderson, of Illinois
Richard S. Schweiker, of Pennsylvania
F. Bradford Morse, of Mass.

Christine Ray Davis, Staff Director

The work of preparing and considering legislation is done largely by committees of both Houses of Congress. The personnel of the standing committees of each house is chosen by a vote of the entire body. All bills and resolutions are referred to the appropriate committees, which may report a bill out in its original form, vote against it in committee, make changes, or allow the proposed legislation to die in committee . - U. S. Government Organization Manual, 1960-1961.

OVERTON BROOKS - Democrat, Shreveport, Louisiana. Born in East Baton Rouge Parish, Louisiana, 21 December 1897; son of Claude M. Brooks, deceased, and Mrs Penelope (Overton) Brooks, living; has four sisters and one brother. Married Miss Mollie Meriwether on 1 June 1933 and they have one daughter, Laura Ann.

Education - Attended public schools of East Baton Rouge Parish, completing the 4-year high school course in 3-1/2 years. Entered Louisiana State University, taking the Arts and Sciences course. Left the University to enlist in the 1st Division United States Army, July 1918. Returned to Louisiana State University and graduated from the Law School 10 April 1923 with honors, 8 months before the end of the regular term. Has LL.B degree and lacks one hour credit for masters degree.

Law Practice - Admitted to practice law before State Supreme Court and began practice at Shreveport, Louisiana 1923. Became United States Commissioner on 1 September 1925 and as such served for 10 years. Delegate to National Democratic Convention in Chicago, Illinois in 1952 and at Los Angeles, California in 1960. Elected to the 75th and to the twelve succeeding Congresses.

Military Service - Enlisted in the 1st Division, United States Army in July 1918 and was honorably discharged on 1 September 1919. Served in France, Belgium and Germany.

Organization Membership - Member Episcopal Church; is a 32d degree Mason, Shriner; member of Elks, American Legion, Veterans of Foreign Wars, Louisiana Farm Bureau Federation, Shreveport Bar Association, Louisiana Bar Association, Kiwania Club, and Forty and Eight Organization.

Committees - President of National Rivers and Harbors Congress for 5 years and now chairman of the board of this organization. Member of Government Operations Committee. In January 1959 was made chairman of Major House Committee on Science and Astronautics and and reappointed to this chairmanship in 1961

Adresses - Home - 614 Linden Street

Office - Federal Building, Shreveport La.

Kerth, Joseph Edward,

Born: August 26, 1922 in New Brighton, Minnesota.

Educated in Ramsey County elementary schools and North St. Paul High School. Attended the University of Nebraska - School of Engineering for 2 years of college courses in engineering - education was interrupted by a call to Combat Duty. Served in E. T. O. - received a recommendation for a Battlefield Commission.
Employed by Minnesota Mining and Manufacturing Co.; International Representative of the OCAW-AFL-CIO for 10 years. Member of the Minnesota House of Representatives from 1950 to 1958. and during the special session of 1958 was voted "Outstanding Legislator". Elected to 86th Congress on Nov. 4, 1958.
Military Experience: Listed Above.

Organizations
V. F. W.
American Legion
Indianhead Council of the Boy Scouts
First Presbyterian Church - White Bear Lake, Minnesota
Married the former Charlotte Nordgen and they have two sons.
Party;: Democrat in Congress and Democrat-Farmer-Labor in Minnesota.

Congressional Committees:

Committee of the House: Science and Astronautics: Member

Home Address: 2334 East County Road, St. Paul 9, Minnesota

Office: House Office Building; Washington 25, D. C.

McCormack, John W.

Born: December 21, 1891 in Boston, Mass. the son of Joseph H and Mary E.(O'Brien) McCormack. Married M. Harriet Joyce in 1920.

Educated in the Public Schools. Admitted to Mass. Bar in 1913 and is a member of the law firm of McCormack and Hardy.

Mass. Constitutional Convention: 1917-1918
Mass. State House of Representatives: 1920-1922.
Mass. State Senate: 1923-1926 (Democratic Leader)

U. S. Congress:House of Representatives: 70th Congress - from the 12th Mass. District. (Majority Leader)

Military experience: None

Organizations:
South Boston Citizens Association
American Legion
Knights of Columbus
Elk
Moose
Catholic Order of Foresters
Ancient Order of Hiberians
Democratic Party
Hon. Degrees: LL.B. conferred by Boston University and Holy Cross College and Villanova College, Tufts College, Catholic University of America and many others.

Honors: Knight of Malta, First Class; Peace Metal of the 3rd order of St. Francis; Knight Commander, Order of St. Gregory the Great with Star; Legion of Honor, Republic of the Philippines.

Congressional Committees:

Franklin Delano Roosevelt Memorial Commission (Created by Public Law 372, 84th Congress)
Committee of the House on Government Operations: Member

Officers of the House: Office of Majority Leader - Floor Leader: John W. McCormack.

Home Address:
726 Columbia Road, Boston, Massachusetts
Office: Post Office Building, Boston, Mass

7-3745 - 415
1003855

RETURN TO
USAF Historical Archives
ASI(ASHAF-A)
Maxwell AFB, Ala 36112

UG 633

RETURN TO:
SP 109
Director
Aerospace Studies Inst
ATTN: Archives Branch
Maxwell AFB, Alabama

THE LIBRARY OF CONGRESS
LEGISLATIVE REFERENCE SERVICE

FACTS ABOUT UNIDENTIFIED FLYING OBJECTS

Robert L. Chartrand
Specialist in Science and Technology
Science Policy Research Division

Assisted By:
William F. Brown
Analyst in Science and Technology
Science Policy Research Division

May 5, 1966

Washington, D.C.

7-3745 - 5/66
1003855

TABLE OF CONTENTS

	Page
SUMMARY	1
INTRODUCTION	4
THE UNIDENTIFIED FLYING OBJECT	4
Description of Various Types of UFO's	5
Trends in UFO Activity	5
Historical Sightings of Aerial Phenomena	7
Identification of Flying Objects (versus UFO's)	7
U. S. GOVERNMENT MONITORING OF UFO ACTIVITY	9
Air Force Establishes a Special Project	10
Special Studies of UFO's	14
Special Briefings on UFO Activity	23
PUBLIC REACTION TO UFO's	25
FOOTNOTES	27
APPENDICES	
A - Air Force Regulation 200-2	
B - U. S. Air Force Technical Information	
C - Biographical Information	
D - Unidentified Flying Objects: Selected Bibliography	

SUMMARY

For almost two decades, there has been high public interest in the reported sightings of many kinds of mysterious objects in the sky. These aerial phenomena have been called "flying saucers" or "Unidentified Flying Objects" (UFO's) both in the public press and in official documentation.

A series of sightings early in 1966 caused renewed interest in the subject, and the Secretary of the Air Force was requested 1/ to provide information concerning Air Force activities in the area of reported UFO's to the Armed Services Committee of the U. S. House of Representatives. The essential elements of his report are included in this study, together with an historical perspective and details regarding the development of reporting and evaluation procedures for handling UFO sighting information.

Public awareness of unusual flying objects commenced in 1947, now considered to be the beginning of the "modern era" of sightings, and has continued with periodic "waves" of activity to the present. Of the 10,147 cases investigated 2/ by the U. S. Air Force project established to analyze such reports, 9,501 objects have been identified officially as bright stars and planets, comets and meteors, satellites, balloons, aircraft, and other known causes. This study is concerned with those sightings in which the flying object remained unidentified; i.e., in which the information available to the investigators is not adequate for analysis, or for which the existing information suggests a hypothesis but the object or phenomenon explaining it

SUMMARY

For almost two decades, there has been high public interest in the reported sightings of many kinds of mysterious objects in the sky. These aerial phenomena have been called "flying saucers" or "Unidentified Flying Objects" (UFO's) both in the public press and in official documentation.

A series of sightings early in 1966 caused renewed interest in the subject, and the Secretary of the Air Force was requested 1/ to provide information concerning Air Force activities in the area of reported UFO's to the Armed Services Committee of the U. S. House of Representatives. The essential elements of his report are included in this study, together with an historical perspective and details regarding the development of reporting and evaluation procedures for handling UFO sighting information.

Public awareness of unusual flying objects commenced in 1947, now considered to be the beginning of the "modern era" of sightings, and has continued with periodic "waves" of activity to the present. Of the 10,147 cases investigated 2/ by the U. S. Air Force project established to analyze such reports, 9,501 objects have been identified officially as bright stars and planets, comets and meteors, satellites, balloons, aircraft, and other known causes. This study is concerned with those sightings in which the flying object remained unidentified; i.e., in which the information available to the investigators is not adequate for analysis, or for which the existing information suggests a hypothesis but the object or phenomenon explaining it

cannot be proven to have been present or taken place at the recorded time of the sighting.

Late in 1947, the Department of the Air Force was designated as the official mechanism of the United States Government for investigating and evaluating reports on unexplained flying objects and of determining any latent threat to the national security. The organization then established, known for many years as Project Blue Book, is charged with monitoring, investigating, documenting and evaluating alleged UFO sightings within the continental United States.

In addition to Air Force in-house efforts to document and analyze the broad spectrum of sightings, special non-government consultant panels periodically have been formed to review investigatory procedures and findings of the best documented UFO cases. Also, an industrial consultant firm was directed to conduct an exhaustive examination of the procedures adopted for reducing sighting data to a form useable in later statistical manipulation and graphic depiction.

The published findings of the study efforts, both by the Air Force and independent consultants, contain five major points:

1. UFO's do not pose a threat to the nation;
2. UFO's do not represent developments or principles beyond present-day scientific knowledge;
3. There is no evidence of extraterrestrial vehicles under the control of an intelligent being;
4. There is no evidence of physical matter left behind by a reported UFO;
5. Some small fraction of total sightings remain "unidentified."

Today, numerous unofficial organizations exist which collect information and publish news on UFO sightings. Many of these groups allege that the Air Force is not revealing all of the truth about unidentified flying objects. No evidence of such concealment has been developed. However, to strengthen its investigatory capability, the Air Force has announced that a new "blue ribbon" panel of scientists has been appointed to conduct an independent, comprehensive study of data pertaining to sightings that so far have been denoted as "Unidentified."

INTRODUCTION

Shortly after the end of the Second World War, the inhabitants of various countries reported observing unusual aerial phenomena. The news media publicized many of these sightings -- including opinions as to their possible extraterrestrial origin -- and a high degree of public interest developed. Although numerous reports of unexplained flying objects were reported throughout Europe in 1946,[3] attention in the United States was focused on the subject as the result of businessman Kenneth Arnold, flying his private plane on June 24, 1947, reporting that he had seen "a chainlike formation of disc-shaped objects"[4] near Mount Rainier, Washington. Due to the wide circulation of this story, and the use of the descriptive phrase "flying saucers", nationwide interest quickly developed and was sustained by numerous other alleged sightings of unidentified flying objects.

"Unidentified flying objects," the terms used in all official and most popular references to the subject today, are defined by the United States Air Force as "any aerial object which the observer is unable to identify."[5] Dr. Carl Sagan of the Department of Astronomy, Harvard University, prefers to consider "UFO" as a "generic term for atmospheric phenomena, detected visually or by radar, of a nature not immediately understood."[6]

THE UNIDENTIFIED FLYING OBJECT

It is not possible to state that there is a "typical" UFO but, as discussed later, such aerial phenomena may be separated into several categories. The numerous reports on sightings, which number more than

10,000 in the United States alone for the period 1947 through 1965, have been described by Dr. Donald H. Menzel, Director of the Harvard University Observatory, as "a heterogeneous collection of facts, fiction, and guesses." 7/ The Air Force indicates that reports of unfamiliar objects in the sky have been made by a wide range of observers: military and civilian pilots, amateur astronomers, housewives, etc.

Description of Various Types of UFOs

Descriptions of UFOs often are inadequate for subsequent explanation due to the conditions under which the sighting was made, the qualifications of the observer, or the difficulty of translating the elements of the sighting into meaningful terms. Basic descriptive data usually are expressed in these categories (with examples):

Shape (cigar, propeller, aircraft, disc)
Size (varies widely)
Color (red, green, white, etc)
Motion (hovering, supersonic, vertical, zigzag)
Means of propulsion (unknown -- flaming exhaust or none; various noises or silent)
Incidence (day or night; seldom over water or touching the earth)
Structure (unknown: apparently solid to "invisible")
Purpose (unknown) 8/

Trends in UFO Activity

Experience derived from nearly twenty years (post-1947) of UFO sighting activity indicates that activity may be reported in "waves" of observations, sometimes in a localized area. The activity in Europe in 1946, in the United States in 1952, and the high number of sightings in 1957 after the launching of Sputnik reflect such patterns (see Figure 1). In the aftermath of the Sputnik I launching in October of 1957, official

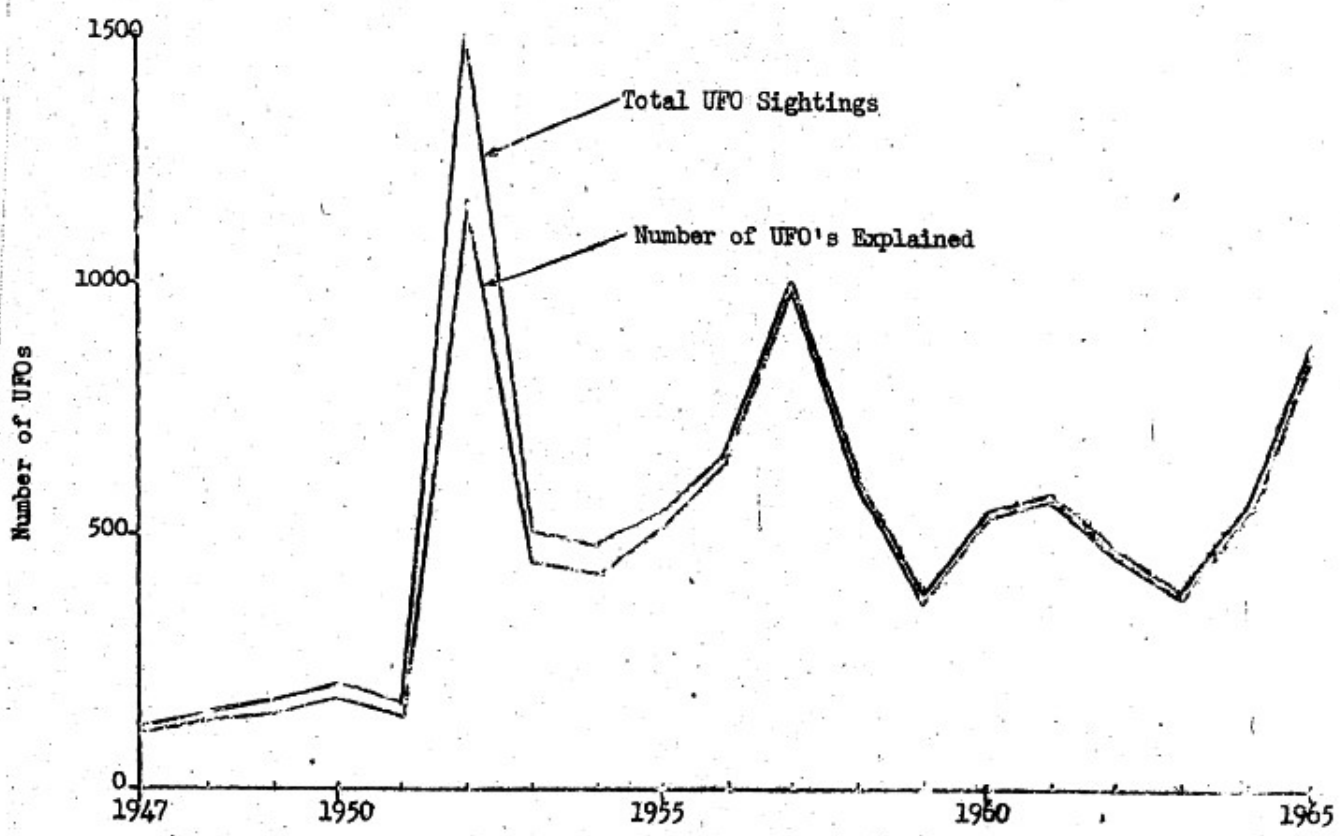


FIGURE 1 UFO Sightings by Year

records show that 701 sightings were recorded between October and December of that year.[9]

Historical Sightings of Aerial Phenomena

Prior to the so-called "modern era" (i.e., post-1947) of UFO activity, unexplained flying objects were reported less frequently. Peaks of activity are discernible in the 1882-1886 period, as well as in 1887, 1906 and 1909 (see Figure 2). Written sources, ranging from ancient manuscripts to noted newspapers tell of pre-twentieth century UFO sightings; Jacques Vallee, author of Anatomy of a Phenomenon, has assembled a file of more than 300 such reports for that period.[10]

After 1800, sightings became more numerous and were better documented, both in the public and professional press. The explanations of such phenomena involved much conjecture, but observers increasingly sought rational criteria against which to test observations.

> The great lesson of western civilization is that such a relation, between natural phenomena, cannot be adequately understood on the basis of introspection, speculation or superstition, but requires investigation. The methods and techniques of investigation are what we mean by science. [11]

Identification of Flying Objects (versus UFOs)

To evaluate UFO sightings, the Air Force has established categories of identification,[12] based upon previous experience that usually permits conversion of an unidentified flying object to an identifiable one:

> Aircraft -- evaluations are made on the basis of description and flight characteristics. Essential performance elements are delineated for conventional, jet, photo, and advertising aircraft; helicopters, and refueling missions.

YEARLY NUMBER OF UFO REPORTS -- 1815-1915

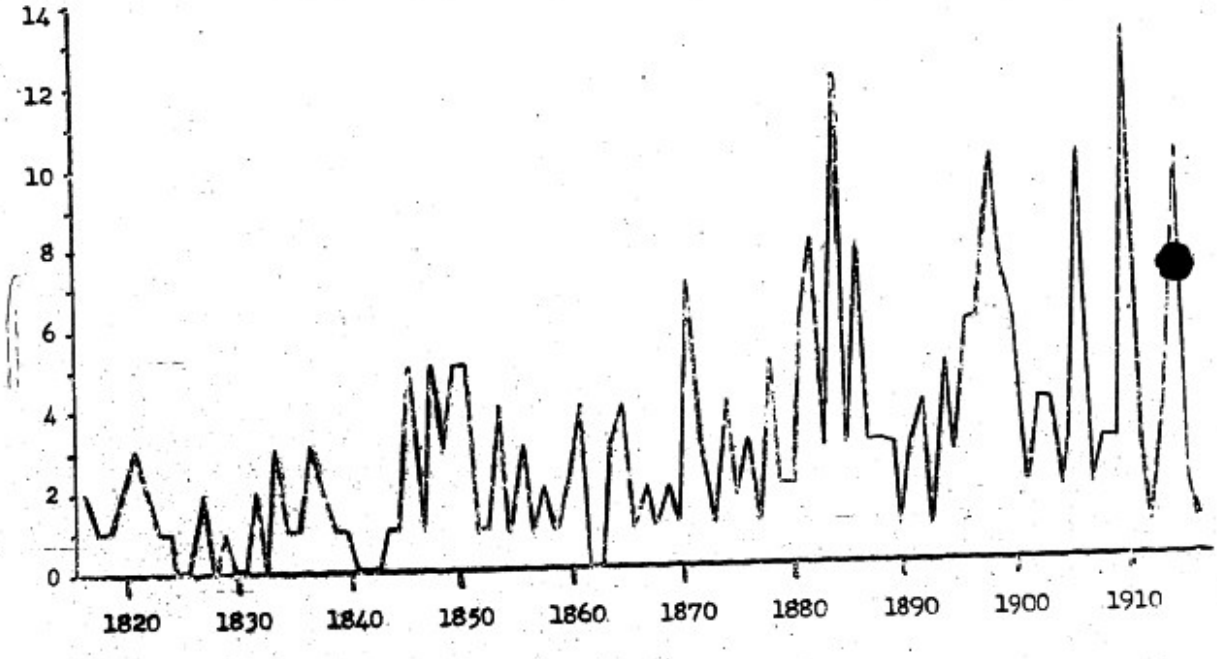


Figure 2

Chart reproduced with permission of Henry Regnery Company, from Anatomy of a Phenomenon by Jacques Vallee (Chicago, 1965), following p. 116.

Balloons -- evaluations are made on the basis of description and flight characteristics. Essential performance elements are delineated for weather (low level) balloons, upper research balloons, other research balloons (e.g., pillow, cluster, mylar), and miscellaneous (toy, "hot air") balloons.
Astronomical sightings -- bright stars, planets, comets, fireballs, meteors, auroral streamers, etc.
Satellites -- evaluation will be based on four elements of data: time of sighting, description of object, direction of flight, and duration of sighting.
Other -- missiles, reflections, mirages, searchlights, birds, kites, spurious radar indications, fireworks, flares.

Those UFO reports which are not relegated to one of the "Identified" categories (above) are designated either under "Insufficient Data" or as "Unidentified". Reports categorized as "Insufficient Data" lack one or more elements of critical information; every effort is made to obtain this data in order to perform a meaningful analysis.

A sighting is considered to be "Unidentified" when "a report apparently contains all pertinent data necessary to suggest a valid hypothesis concerning the cause or explanation of the report but the description of the object or its motion cannot be correlated with any known object or phenomenon." 13/

The role of the analyst who must evaluate the sighting reports is especially demanding because:

> The attempted identification of the phenomena observed is generally derived from human impressions and interpretations and not from scientific devices or measurements. 14/

The French student of UFO's, Vallee, agrees, but cautions that "We must analyze the evidence already gathered in such a way that we neither presuppose nor preexclude any possible conclusion." 15/

U.S. GOVERNMENT MONITORING OF UFO ACTIVITY

As the result of the flurry of sightings throughout the United States following Arnold's observation of several disc-shaped objects, a letter

was sent September 23, 1947 by Lt. Gen. Nathan Twining, Commander of the Air Materiel Command, to the Office of Chief of Staff of the U. S. Air Force, expressing the opinion that there was "sufficient substance to the reports to warrant detailed study."[16] On December 30, 1947 the Chief of Staff, Gen. Carl Spaatz, directed Gen. Joseph T. McNarney, Chief of the Air Materiel Command, to establish a special project for the purpose of collecting, collating, evaluating, and distributing information concerning UFO sightings. Thus, "Project Sign" came into being on February 11, 1948.[17]

Air Force Establishes a Special Project

In February of 1949, the Project Sign report was published, stating that on the basis of 243 of the "best documented" reports studied, "no definite evidence was available to confirm or disprove the actual existence of unidentified flying objects as new and unknown types of aircraft."[18]

On December 16, 1948, the project name was changed to "Grudge"; the conclusions reached after studying 244 reports (best documented) was that the phenomena presented no threat to the security of the United States and that the vast majority of sightings were misinterpretations of conventional objects.[19] The newly formed Department of the Air Force, then, was designated as the Federal Government's instrument for "investigating reports on unidentified flying objects and of evaluating any possible threat to our national security that such objects might pose."[20]

In March, 1952, the Air Force project name became "Project Blue Book", which remains its current official designation.

> The objectives of Project Blue Book are twofold: first, to determine whether UFOs pose a threat to the security of the United States; and second, to determine whether

UFOs exhibit any unique scientific information or advanced technology which could contribute to scientific or technical research." 21/

Investigatory Procedures

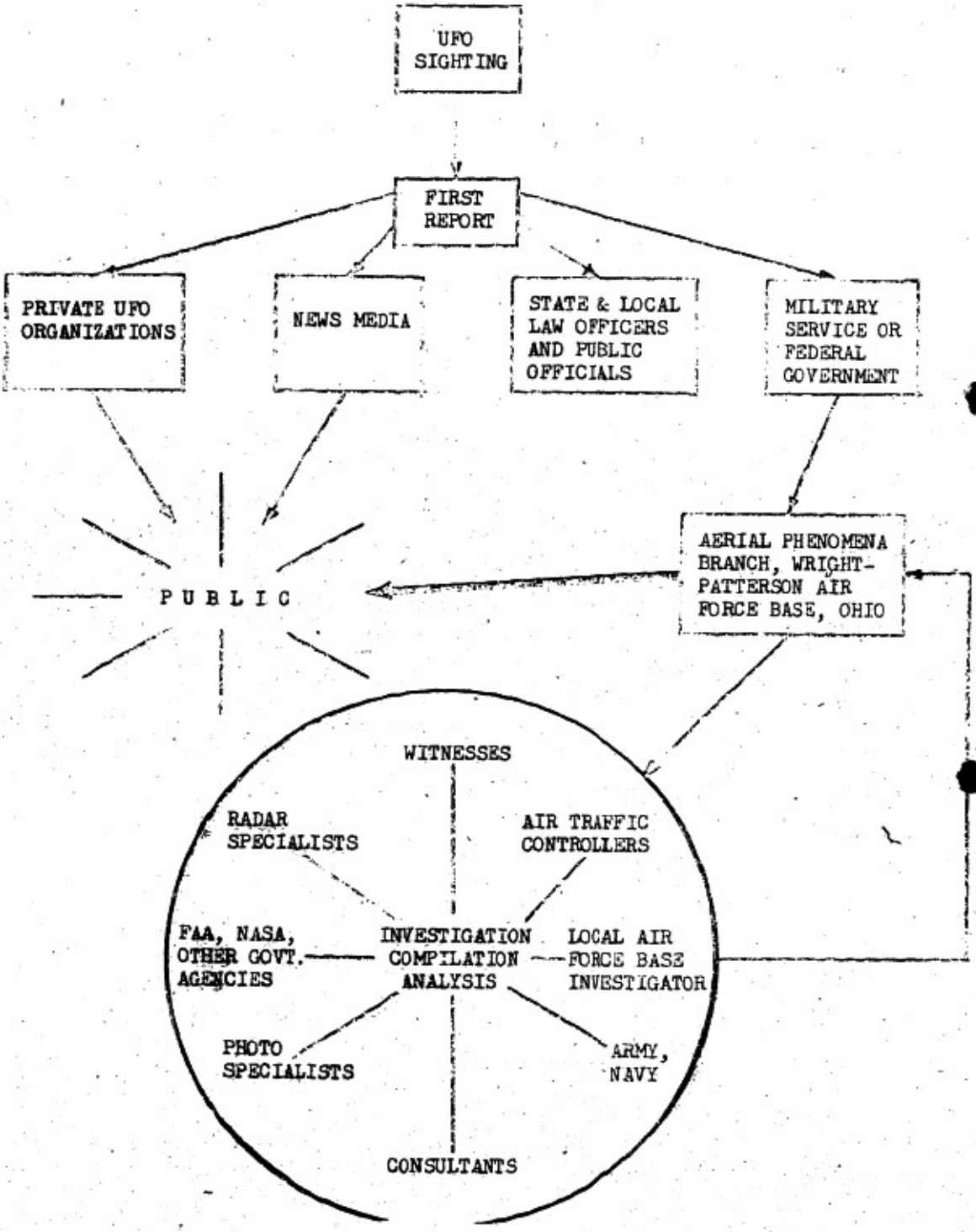
When a sighting is reported, it is the responsibility of the air base commander closest to the scene to investigate the occurrence, interview the witness(es), and complete the requisite form. The documentation (FTD Form 164) is forwarded to the Aerial Phenomena Branch, Foreign Technology Division, Air Force Systems Command, at Wright-Patterson Air Force Base, Ohio. There it is carefully reviewed by Project Blue Book personnel, and a check is made, as appropriate, with the cognizant specialty groups noted below If a second investigation is deemed necessary, either Air Force or consultant personnel visit the scene of the incident, and submit a further report.

Since 1955, Project Blue Book continues to investigate only those sightings which are reported either directly to the Air Force, or via some law enforcement agency. Only sightings within the continental United States are included in these investigatory efforts. 22/ Information is prepared by the USAF Office of Information for the general public in the form of news releases and "Fact Sheets".

Consultants Provide Expertise in Many Areas

In the day-to-day treatment of UFO sightings, the Air Force team utilizes the expertise of many organizations and individuals (see Figure 3). 23/ For astronomical sightings, such scientists as Dr. J. Allen Hynek, Dr. Charles P. Olivier, and Dr. Donald Menzel are used; also, the staffs of scientific magazines (Sky and Telescope, etc.) are

Figure 3: REPORTING, INVESTIGATING, AND ANALYZING UFO SIGHTINGS



queried. In the case of suspected aircraft sightings, contact is made with the Air Defense Command, the Strategic Air Command, local airports, and the Federal Aviation Agency.

Balloon sightings are referred to one or more of the following: Balloon Control Center (Holloman AFB), U.S. Weather Bureau (Ashville, N.C.), local airports and weather stations, and various industries (e.g., General Mills) and universities which are conducting balloon research activities. Satellite information is checked by reference to printed ECHO (the large reflector satellite) schedules, NASA satellite reports, Smithsonian North and South Equatorial Crossings, and the Space Detection and Tracking Systems (SPADATS). Missile information is obtained by contacting Cape Kennedy (Fla.), Vandenberg AFB (Calif.), Point Magu (Calif.), Wallops Island (Va.), or military units involved in special exercises.

Special Air Force analytical groups, and on occasion Eastman Kodak Co., handle the technical aspects of radar sightings and most photographic reports. Physical specimens suspected of connection with the sightings are processed by such groups as Battelle Memorial Institute (ceramics), the Air Force Materiel Laboratory, the U.S. Food and Drug Administration, Libby Owens and Corning Fibreglass companies (glass), and certain academic groups (e.g., Northwestern University Department of Geology).

Special Studies of UFOs

In addition to in-house studies, the Air Force contracted with an industrial consultant in 1951 for an independent analysis leading to: Special Report No. 14 (Analysis of Reports of Unidentified Aerial Objects), dated May 5, 1955. The methodology use in the preparation of this report is discussed below.

Concurrently with this independent study, the Air Force appointed a Scientific Advisory Panel chaired by the late Dr. H. P. Robertson (California Institute of Technology). This five-man panel met during the week of January 14, 1953, and examined 75 of the best documented UFO cases. The panel concluded that the phenomena presented no threat to the security of the United States. It further recommended that the Air Force deprive the project of its special status, which would aid in decreasing the mystery attached to the subject. News releases and all matters dealing with the public would be handled by the Office of Information at the Secretary level. 24/

Air Force Regulation 200-2

In 1953, Air Force Regulation 200-2 (see Appendix A) was issued, which established the responsibility and procedures for reporting information and evidence on UFO's, and for releasing information to the general public.

> This regulation established the UFO Program to investigate and analyze UFO's over the United States. Such investigation and analysis are directly related to Air Force responsibility for the defense of the United States. 25/

A questionnaire (see Appendix B) was prepared for use in documenting sightings of unidentified aerial phenomenon, entitled "U. S. Air Force

Technical Information" (FTD Form 164). The essential elements of information to be reported by observers include such items as time and place of sighting, weather conditions, object size and motion, and location of observer.[26] Procedures were established -- JANAP 146, Cirvis, Merint -- to guide the other military services in reporting UFO sightings.

Special Report No. 14

Throughout the period of preparation of Special Report No. 14 by the industrial consultant study team, emphasis was placed on a step-by-step, rational analysis of sighting data, and care was taken to place the reports in a standardized, carefully structured form. A procedure then was developed for reducing the data to useable form, to be accomplished in four major steps:

1) a systematic listing of the factors necessary to evaluate the observer and his report, and to identify the unknown object observed
2) a standard scheme for the transfer of data to a mechanized computation system
3) an orderly means of relating the original data to all subsequent forms
4) a consistent procedure for the identification of the phenomenon described by the original data. [27]

A questionnaire form and a coding system with appropriate work sheets were designed and a serial numbering system was established for sighting data. Key terminology then was agreed upon, with the term "Unit Sighting" referring to the actual sighting, and "Object Sighting" referring to the assumed number of phenomena.[28]

Evaluation of sighting reports in preparation of data for later statistical treatment has been considered to be critical. The standardized procedure in Special Report No. 14 featured:

1) the deduction of discrete facts from data which depended on human impressions rather than scientific measurements
2) the rating of the observer and his report as determined from available information
3) the determination of the probable identification of the phenomenon observed. 29/

Categories of identification included: balloon, astronomical, aircraft, light phenomenon, birds, clouds (dust, etc.), insufficient information, psychological manifestations, unknown, and other. 30/ Identifications were performed in two phases, first by the individual who first made the transcription of the sighting data, and second, by a conference of four persons (two from the Air Force, two from an outside consultant group) in order to maximize objectivity and thoroughness in the handling of this data.

Thus, the study team worked to ensure that the collection, collation, and interpretation of sighting data were performed according to the proper procedures. The relationship between the observed fact per se and the subsequent interpretation is noted by Menzel and Boyd:

> In the study of UFO phenomena this question of 'evidence' is crucial. The careful investigator tries always to distinguish sharply between an observed fact, which is evidence, and an interpretation of that fact, which is not evidence no matter how reasonable it may seem. 31/

Vallee, in his discussion of report handling, goes one step further in urging that "the two operations -- maintaining a file of reports in accordance with official regulations, and doing research on the information contained in the reports -- should be very clearly separated, and separate codes should be used." 32/

To best analyze sighting data on unidentified aerial objects, Special Report No. 14 declares that the Air Force should engage in a "systematic

sorting and tabulation program to give frequency and percentage distributions of the important characteristics of sightings."[33] In this way, sorting, counting, and tabulating of information from the punched card abstracts could be executed, and further, any emerging patterns or trends might be identified and used in future, more sophisticated treatment using statistical methods.

Attempts to Create a "Flying Saucer" Model

An attempt to discern meaningful trends and patterns in UFO sightings then was made by analyzing the descriptions of the physical appearance, flight characteristics, and other significant attributes of various classes of UFOs. Of the 434 object sightings identified as "Unknowns", only 12 were described in enough detail that they could serve as the basis for the creation of a "flying saucer model".[34] Other sighting data did, however, sometimes coincide with certain features of the reported UFOs in these four categories.

These 12 sightings[35] could be placed in four categories on the basis of their shapes:

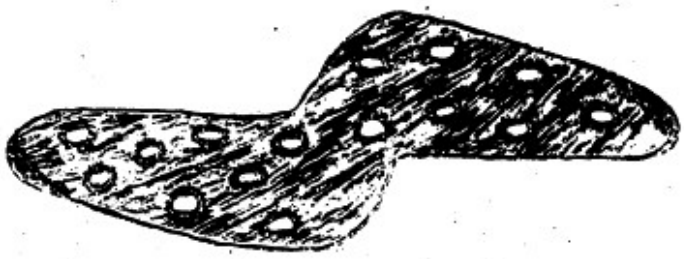


Figure 4 - Propeller Shape

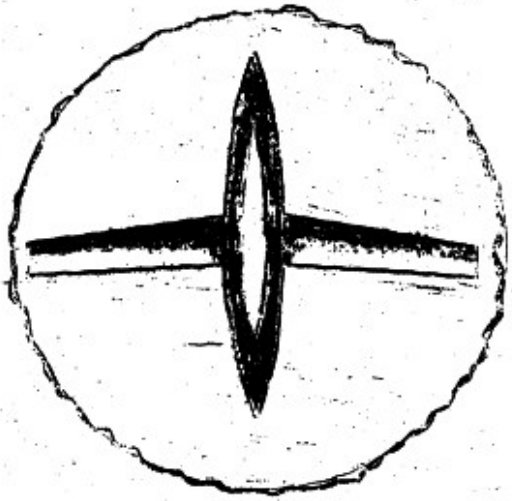


Figure 5

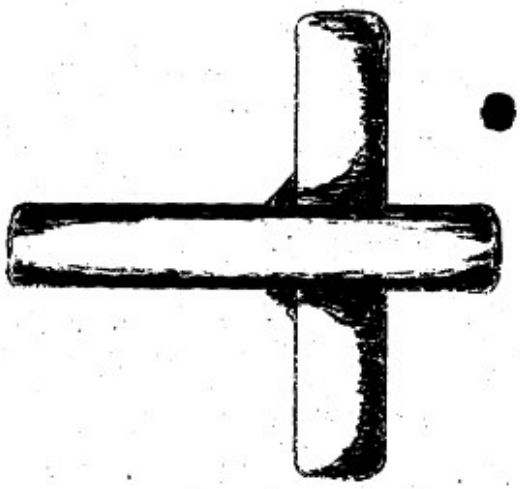


Figure 6

Aircraft Shapes

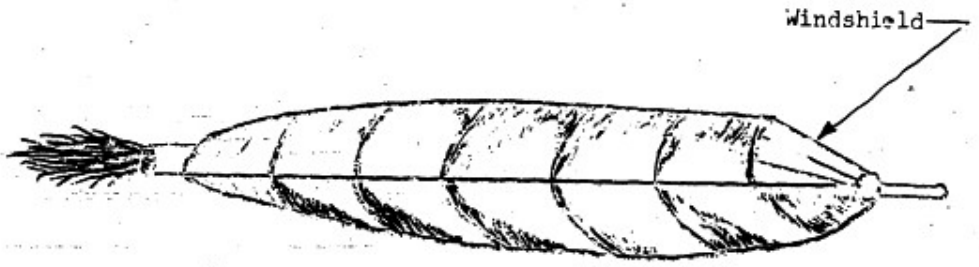


Figure 7

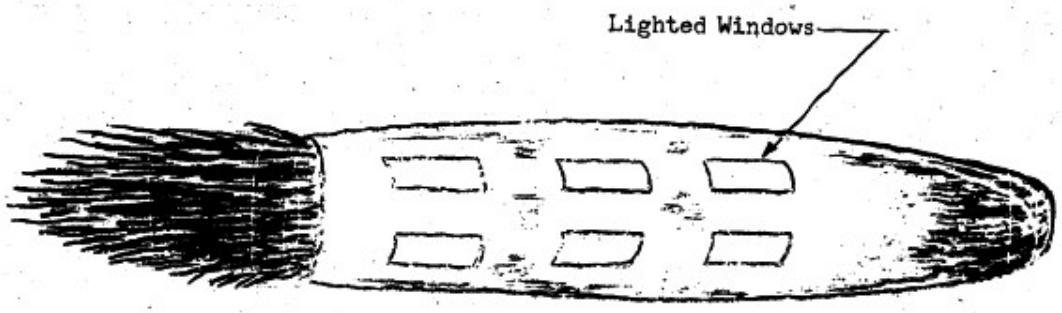


Figure 8

Cigar Shapes

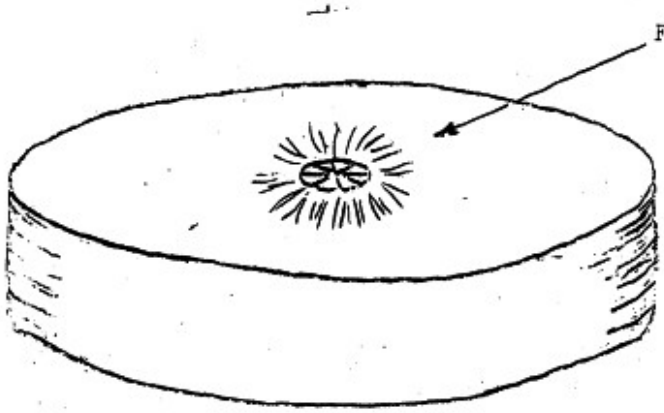


Figure 9

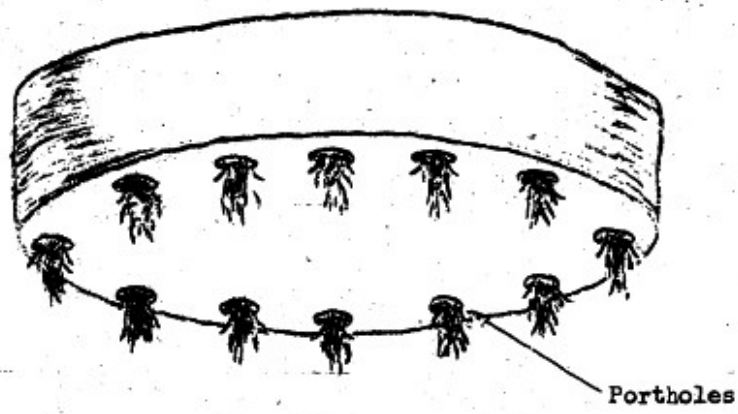
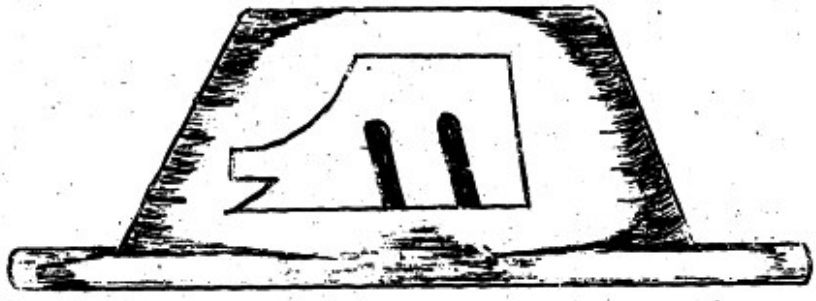


Figure 10

Elliptical or Disc Shapes

Figure 11



(Side View)

Figure 12

Elliptical or Disc Shapes

As a result of studying intensively the 12 subject cases, the study team was unable to develop a verified model of a "flying saucer". However, the four categories of reported flying objects (as shown in Figures 4 through 12) did evolve and could be used for future references.

The conclusions contained in Special Report No. 14 noted that:

> it is considered to be highly improbable that reports of unidentified aerial objects examined in this study represent observations of technological developments outside of the range of present-day scientific knowledge. It is emphasized that there has been a complete lack of any valid evidence of physical matter in any case of a reported unidentified aerial object. 36/

Ad Hoc Committee of USAF Scientific Advisory Board

Early in 1966, an ad hoc committee of the USAF Scientific Advisory Board reviewed the resources and methods of investigation prescribed by Project Blue Book, at the request of Maj. Gen. E. B. LeBailly, Secretary of the Air Force Office of Information. 37/ After reviewing the findings of the 1953 Robertson panel, and hearing briefings by Air Force Project Blue Book personnel, the committee then reviewed selected case histories of UFO sightings.

The committee felt that it was significant that in spite of thousands of hours of astronomical observation and photographic coverage, "not a single unidentified object has been reported as appearing on any of these plates or been sighted visually in all these observations." 38/ Finally, it was concluded that "in the 19 years since the first UFO was sighted there has been no evidence that unidentified flying objects are a threat to our national security." 39/ However, in order to reduce the number of reported flying objects classified as "Unidentified", the reports included recommendations for strengthening the project staff, contracting with a

few selected universities to assist in UFO investigations, initiation of studies in depth of selected cases, an expanded form (questionnaire) for reporting, and wider distribution of UFO official literature.[40]

It was announced on April 21, 1966 by Rep. Gerald R. Ford[41] that the United States Air Force has contracted with a group of scientists to perform an independent study of UFOs. This "in depth" analysis will commence after July 1, and will concentrate on some of the reports which remain unexplained after investigation through established Air Force procedures.

Special Briefings on UFO Activity

Periodically, the attention given to UFO activity by the public and news media has caused various high level military and civilian requests for special briefings. In October, 1956, a briefing was given by Project Blue Book personnel for Maj. Gen. Millard Lewis, Director of Air Force Intelligence (DCS/Operations). Less than a year later, on September 16, 1957, the Defense Science Board was briefed on the status of UFO activity.[42]

In the period following the launching of Sputnik I, the number of reported UFO sightings rose spectacularly. A special briefing was conducted during January, 1958, for the Senate Committee on Government Operations (Hon. John L. McClellan, chairman).[43] In August of the same year, a briefing was held for the Subcommittee on Atmospheric Phenomena of the House Select Committee on Astronautics and Space Exploration (Hon. John W. McCormack, chairman).[44]

The next request for a special briefing was not recorded by Project Blue Book until July, 1961, when Robert Smart, "chief counsel", to Congressman Joseph E. Karth, was given a status report on the UFO program.[45]

On April 5, 1966, Dr. Harold Brown, Secretary of the Air Force, accompanied by Dr. J. Allen Hynek and Maj. Hector Quintanilla, Jr., UFO project officer, appeared before the House Committee on Armed Services. Dr. Brown assured the Committee that:

> Although the past 18 years of investigating unidentified flying objects have not identified any threat to our national security, or evidence that the unidentified objects represent developments or principles beyond present-day scientific knowledge, or any evidence of extra-terrestrial vehicles, the Air Force will continue to investigate such phenomena with an open mind and with the finest technical equipment available. 46/

Later in the testimony, various Committee members raised questions regarding UFOs sighted on radar, or photographed. Dr. Hynek estimated that "only about 1 percent, or less" 47/ of the cases reported to the Air Force have included photographs. When asked what percentage of the reported incidents in the United States have been viewed on radar screens, Maj. Quintanilla indicated "about 1.5 percent", and later noted that "We have no radar cases which are unexplained." 48/

It has been shown that several groups -- Congressional, senior military, and scientific -- have taken an interest in and examined evidence related to UFO sightings. The great majority of UFOs have been identified as known objects or natural conditions. In no instance has the Air Force or any other official group purported to have the answer regarding the existence of life in outer space. Lt. Col. Lawrence J. Tacker, author of Flying Saucers and the U. S. Air Force, emphasizes this:

> It is important to state once again that the United States Air Force does not deny the possibility that life could exist on other planets or in other solar systems, or that conditions for life as we know it on earth could not exist somewhere out in space. 49/

PUBLIC REACTION TO UFO'S

For nearly two decades, people throughout the world have evinced a strong, though cyclical interest in UFOs. The reported presence of aerial phenomena has held psychological significance for some, quasi-scientific importance for others, and a religious connotation for yet others. In general, there are two main groups of persons who study UFO's:

1. 'UFOlogists' -- serious, scientific students of the exciting phenomena now taking place in our heavens ...among such intellectually curious students are numbered today many outstanding aviators, space scientists, engineers, radar experts, college professors, ministers, high-ranking officers of the armed services, and others.

2. 'contactees' or saucerians -- many of these people purport to have made contact with those whom they call the space people -- either by physical means or utilization of mysterious and mystical techniques which are never subject to objective scientific analysis or other kinds of demonstrable proof. 50/

Dr. Carl Jung, the psychologist, points out that despite the mass of observational data which has been accrued, "the physical reality of UFOs remained a problematical matter."

> The longer the uncertainty lasted, the greater became the probability that this obviously complicated phenomenon had an extremely important psychic component as well as a possible physical basis. 51/

The psychological significance of the UFO, then, is a factor to be considered. Sagan states that "the interest in unidentified flying objects derives, perhaps, not so much from scientific curiosity as from unfulfilled religious needs." 52/ Whatever the significance of UFOs to various persons, dozens of organizations have been organized throughout the world "to collect UFO reports and publish 'the truth' allegedly suppressed by government sources." 53/ Some of these groups maintain extensive data files,

disseminate news on UFO sightings, and send their own investigators to interview citizens who have seen unidentified aerial objects.

A literature has developed on the subject, ranging from the serious to the remotely relevant. Many of the civilian organizations feel that the Air Force effort to document and evaluate sightings is inadequate, and that a full Congressional inquiry on the subject should be held. Menzel and Boyd state that "most UFO organizations cling to the belief that a conspiracy exists to conceal the existence of extraterrestrial vehicles, but they disagree on its precise composition."[54/]

The Air Force steadfastly has stated that it "does not seek to limit discussion on such reports and does not withhold or censor any information pertaining to this unclassified program."[55/] Recommendations to expand the Air Force project now are under consideration[56/] and a consultant group, as noted above, soon will undertake an intensive, comprehensive study of selected facets of UFO activity.

FOOTNOTES

1. U. S. Congress. House Committee on Armed Services. Unidentified Flying Objects. Hearing by the Committee on Armed Services. (89th Cong., 2nd sess., April 5, 1966), p. 5991.

2. Ibid., p. 5992.

3. Jacques Vallee, Anatomy of a Phenomenon (Chicago, Henry Regnery Co., 1965), pp. 39-48.

4. Project Blue Book, Special Report No. 14 (Analysis of Reports of Unidentified Aerial Objects), (Wright-Patterson Air Force Base, Ohio: Air Technical Intelligence Center, May 5, 1955), p. 1.

5. Project BLUE BOOK (February 1, 1966), p. 1.

6. Carl Sagan, "Unidentified Flying Objects," reprint from The Encyclopedia Americana (copyright 1963), p. 1.

7. Donald H. Menzel and Lyle G. Boyd, The World of Flying Saucers (New York: Doubleday & Company, 1963), p. 6.

8. Ibid., pp. 7, 9.
Sagan, op. cit., p. 1.

9. Sagan, op. cit., p. 3.

10. Vallee, op. cit., p. 5.

11. Lee Loevinger, "Jurimetrics--The Next Step Forward," Minnesota Law Review, 1949, 33:455, p. 478.

12. Project BLUE BOOK, op. cit., pp. 1-3.
Special Report No. 14, op. cit., p. 10.

13. Project BLUE BOOK, op. cit., p. 2.

14. Lt. Colonel Lawrence J. Tacker, Flying Saucers and the U.S. Air Force (Princeton, N.J.: D. Van Nostrand Company, 1960), p. 154.

15. Vallee, op. cit., p. 81.

16. "The Unidentified Flying Object Program," U.S. Air Force summary outline prepared by Project BLUE BOOK, p. 2.

17. Ibid., p. 2.

18. Ibid., p. 2.

19. Ibid., p. 2.

20. Department of the Air Force, Office of the Secretary, Dr. Harold Brown letter to Hon. L. Mendel Rivers, Chairman, Committee on Armed Services, House of Representatives, U.S. Congress (Washington, D.C.) April 5, 1966, p. 1.

21. Project BLUE BOOK, op. cit., p. 1.

22. Ibid., p. 4.

23. "The Unidentified Flying Object Program," op. cit., pp. 4-6.

24. "The Unidentified Flying Object Program," op. cit., pp. 2-3.

25. Department of the Air Force, Air Force Regulation No. 200-2A (Washington, D.C.: March 30, 1964), p. 1.

26. Department of the Air Force, U.S. Air Force Technical Information (FTD Form 164), October 1962, pp. 1-5.

27. Special Report No. 14, op. cit., p. 4.

28. Ibid., pp. 6, 9.

29. Special Report No. 14, op. cit., p. 10.

30. Ibid., p. 10.

31. Menzel and Boyd, op. cit., p. 4.

32. Vallee, op. cit., p. 103.

33. Special Report No. 14, op. cit., p. 14.

34. Ibid., pp. 76-78.

35. Ibid., pp. 78-91.

36. Special Report No. 14, op. cit., p. ix.

37. Dr. Brien O'Brien and others, "Special Report of the USAF Scientific Advisory Board Ad Hoc Committee to Review Project 'Blue Book,'" March 1966, p. 1.

38. Ibid., p. 2.

39. Ibid., p. 2.

40. Ibid., pp. 2-4.

41. "UFO Sightings Study Ordered" (headline), The Washington Post, April 22, 1966, p. A4.

42. "The Unidentified Flying Object Program," op. cit., p. 3.

43. Ibid., p. 3.

44. Ibid., p. 3.

45. Ibid., p. 4.

46. U.S. Congress. House Committee on Armed Services, Unidentified Flying Objects, op. cit., p. 5992.

47. Ibid., p. 6072.

48. Ibid., pp. 6072-6073.

49. Tacker, op. cit., p. 47.

50. Hon. Edgar W. Hiestand, The Congressional Record, July 15, 1959 (quoting George Todt), op. cit., p. A6833.

51. C. J. Jung, Flying Saucers, A Modern Myth of Things Seen in the Skies (London: Routledge & Kegan Paul, 1959) p. xiii.

52. Sagan, op. cit., p. 8.

53. Menzel and Boyd, op. cit., p. 275.

54. Ibid., p. 278.

55. Project BLUE BOOK, op. cit., p. 4.

56. Ibid., pp. 2-4.

AIR FORCE REGULATION
NO. 200–2

DEPARTMENT OF THE AIR FORCE
Washington, 20 July 1962

Intelligence Activities

UNIDENTIFIED FLYING OBJECTS (UFO)

This regulation establishes the UFO Program to investigate and analyze UFO's over the United States. Such investigation and analysis are directly related to Air Force responsibility for the defense of the United States. The UFO Program provides for the prompt reporting and rapid identification needed for successful "identification," which is the second of the four phases of air defense—detection, identification, interception, and destruction. All commanders will comply strictly with this regulation.

SECTION A—GENERAL

	Paragraph
Explanation of Terms	1
Objectives	2
Responsibilities	3
Guidance	4
Reporting UFO Information	5

SECTION B—PUBLIC RELATIONS, INFORMATION, CONTACTS, AND RELEASES

Maintaining Public Relations	6
Releasing Information	7
Exceptions	8
Release by Non-Air Force Sources	9
Contacts	10

SECTION C—PREPARING AND SUBMITTING REPORTS

General Information	11
Methods for Transmitting Reports	12
Where To Submit Reports	13
Basic Reporting Data and Format	14
Negative or Inapplicable Data	15
Comments of Preparing Officer	16
Classification	17
Reporting Physical Evidence	18

SECTION A—GENERAL

1. Explanation of Terms. To insure proper and uniform usage in UFO screenings, investigations, and reportings, an explanation of the objects follows:

a. *Familiar or known objects:*

(1) Aircraft, balloons, kites, birds, searchlights, astronomical bodies (meteors, planets, stars, comets), pilotless aircraft, missiles, satellites in orbit, and others identified by the observer as normal appearing objects.

(2) Flying objects determined to be aircraft. These generally appear as a result of ADIZ violations and often prompt the UFO reports submitted by the general public. They are readily identifiable as, or known to be, aircraft, but their type, purpose, origin, and destination are unknown. Air Defense Command is responsible for reports of "unknown" aircraft, which should not be reported as UFO's under this regulation.

(3) Aircraft flares, jet exhausts, condensation trails, blinking or steady lights observed at night, lights circling or near airports and airways, and other phenomena or objects known to be emanating from, or to be indications of, aircraft. These should not be reported under this regulation, as they do not fall within the definition of a UFO.

b. *Unidentified Flying Objects.* Any aerial phenomena, airborne object or objects which are unknown or appear out of the ordinary to the observer because of performance, aerodynamic characteristics, or unusual features.

2. Objectives. Air Force interest in UFO's is three-fold. First, as a possible threat to the security of the United States and its forces; sec-

This regulation supersedes AFR 200–2, 14 September 1959, as amended.

OPI: AFCIN
DISTRIBUTION: S

ond, to determine the technical or scientific characteristics of any such UFO's; third, to explain or identify all UFO sightings as described in paragraph 1b.

a. *Air Defense.* The great majority of flying objects reported have been conventional, familiar things of no great threat to the security of the United States and its possessions. However, since the possibility exists that UFO's reported may be hostile or new foreign air vehicles of unconventional design, it is imperative to report sightings rapidly, factually, and as completely as possible.

b. *Technical and Scientific.* The Air Force will continue to collect and analyze reports of UFO's until all are scientifically or technically explained or until the full potential of the sightings has been exploited. In performing this task the following factors are of great importance:

(1) To measure scientific advances, the Air Force must have the latest experimental and developmental information on new or unique air vehicles or weapons.

(2) The possibility exists that foreign countries may develop air vehicles of revolutionary configuration or propulsion.

(3) There is need for further scientific knowledge in such fields as geophysics, astronomy, and physics of the upper atmosphere which the study and analysis of UFO's and similar aerial phenomena may provide.

(4) The reporting of all pertinent factors will have a direct bearing on scientific analyses and conclusions of UFO sightings.

c. *Reduction of Percentage of UFO "Unidentifieds."* Air Force activities must reduce the percentage of unidentifieds to the minimum. Analysis thus far has explained all but a few of the sightings reported. These unexplained sightings are carried statistically as unidentifieds. If more immediate, detailed, objective data on the unknowns had been available, probably these, too, could have been explained. However, because of the human factors involved, and the fact that analyses of UFO sightings depend primarily on the personal impressions and interpretations of the observers rather than on accurate scientific data or facts obtained under controlled conditions, the elimination of all unidentifieds is improbable.

3. Responsibilities:

a. *Reporting.* Base commanders will report all information and evidence of UFO sightings, including information and evidence [illegible] other services, Government agencies, and [illegible]ian sources. Investigators are authorized to make telephone calls from the investigation area direct to the Foreign Technology Division (FTD), of the Air Force Systems Command, Wright-Patterson Air Force Base, Ohio (Clearwater 3-7111, ext. 69216/66378). The purpose of the calls is to report high priority findings. (See section C.)

b. *Investigation.* The commander of the Air Force base nearest the location of the reported UFO sighting will conduct all investigative action necessary to submit a complete initial report of a UFO sighting. The initial investigation will include every effort to resolve the sighting. An Air Force base other than that closest to the scene of a reported UFO sighting will refer the sighting immediately to the commander of the nearest Air Force base for appropriate action. (See paragraph 5.)

c. *Analysis.* The Air Force Systems Command Foreign Technology Division will analyze and evaluate:

(1) Information and evidence reported within the United States after the investigators of the responsible Air Force base nearest the sighting have exhausted their efforts to identify the UFO.

(2) Information and evidence collected in oversea areas.

EXCEPTION: The AFSC (FTD), independently or in participation with pertinent Air Force activities, may conduct any additional investigations necessary to further or conclude its analyses or findings.

d. *Findings.* AFSC (FTD) will prepare a final report on each sighting after collection and analysis of data, and will forward a copy of the report to HQ USAF (AFCIN).

e. *Public Relations and Information Services.* The Office of Information, Office of the Secretary of the Air Force, will be responsible for releasing information on sightings, and, in coordination with AFSC (FTD), answering correspondence from the public regarding UFO's. (See paragraphs 7 and 8.)

f. *Congressional Inquiries.* The Office of Legislative Liaison will:

(1) In coordination with the AFSC (FTD) and/or the Office of Information, when necessary, answer all congressional mail regarding UFO's addressed to the Secretary of the Air Force and Headquarters USAF.

(2) Forward those inquiries which are scientific and technical to the FTD for information on which to base a reply. The FTD will re-

APPENDIX A

CHANGE

AFR 200-2A

AIR FORCE REGULATION
NO. 200-2A

DEPARTMENT OF THE AIR FORCE
Washington, 30 March 1964

Intelligence Activities

UNIDENTIFIED FLYING OBJECTS (UFO)

AFR 200–2, 20 July 1962, is changed as follows:

3d. *Findings.* AFSC (FTD) will prepare a final report on each sighting after collection and analysis of data. When final report contains information of significant intelligence value, AFSC (FTD) will forward a copy of the report to HQ USAF (AFNINDE), Wash DC 20330.

3e. Change references to paragraphs "7 and 8" to "6 and 7."

4b. Change "or" to "of."

10. *Contacts.* Private individuals or organizations desiring Air Force interviews, briefings, lectures, or private discussions on UFOs will be instructed to direct their requests to the Office of Information, Office of the Secretary of the Air Force. Air Force personnel, other than designated investigators (see paragraph 3b) and those of the Office of Information, will not contact private individuals on UFO cases, nor will they discuss their operations and functions with unauthorized persons, unless so directed, and then only on a need-to-know basis.

11a. Change references to paragraphs "2 and 5" to "1 and 4."

11c. Change references to paragraphs "7, 8, 9, and b(2)" to "6, 7, 8, and b(2)(b)."

12b. Submit reports of sightings over 3 days old by letter; however, keep the use of letter reports to a minimum in reporting initial sightings. The delays often involved in processing and transmitting correspondence through normal channels may make followup investigations difficult, producing only limited usable information. This factor is a necessary consideration. Reporting by electrical means will eliminate delays. Submit a followup and/or complete report on all sightings initially reported electrically, if so requested by AFSC(FTD).

13a(4). Change "AFCIN" to "AFNIN."

13b. *Written Reports.* Submit all letter reports (basic letters and followup or complete reports) direct to AFSC (FTD), Wright-Patterson AFB, Ohio, 45433. AFSC (FTD) will distribute the reports to interested intelligence activities in the United States and to the Office of Information, if necessary.

13b(1). Delete.

13b(2). Delete.

16. Change reference to paragraph "5" to "4."

18. Change "TD-E" to "TDEW."

BY ORDER OF THE SECRETARY OF THE AIR FORCE

CURTIS E. LeMAY
Chief of Staff

OFFICIAL

R. J. PUGH
Colonel, USAF
Director of Administrative Services

DISTRIBUTION: S

☆ U. S. GOVERNMENT PRINTING OFFICE: 1964

Reproduced by Library of Congress, Legislative Reference Service May 1966

turn this information to the Office of Legislative Liaison for reply to the inquiry.

(3) Process requests from congressional sources in accordance with AFR 11–7.

g. *Cooperation.* All Air Force activities will cooperate with Air Force UFO investigators to insure the economical and prompt success of investigations and analyses. When feasible, this cooperation will include furnishing air or ground transportation and other assistance.

4. Guidance. The thoroughness and quality of a report or investigation of UFO's are limited only by the skill and resourcefulness of the person who receives the initial information and/or prepares the report. The usefulness and value of any report or investigation depend on the accuracy and timeliness of its contents. Following are aids for screening, evaluating, and reporting sightings:

a. Careful study of the logic, consistency, and coherence of the observer's report. An interview with the observer by personnel preparing the report is especially valuable in determining the source's reliability and the validity of the information given. Factors deserving particular attention are the observer's age, occupation, and education, and whether his occupation involves observation reporting or technical knowledge. A report stating that a witness is completely familiar with certain aspects of a sighting should indicate his or her specific qualifications.

b. Theodolite measurements of changes or azimuth, and elevation and angular size.

c. Interception, identification, or air search, if appropriate and within the scope of air defense regulations.

d. When feasible, contact with local aircraft control and warning (ACW) units, and with pilots and crews of aircraft aloft at the time and place of sighting. Also, contact with any other persons or organizations that may have factual data on the UFO or can offer corroborating evidence—visual, electronic, or other.

e. Consultation with military or civilian weather forecasters for data on tracks of weather balloons released in the area and any unusual meteorological activity which may have a bearing on the UFO.

f. Consultation with navigators and astronomers in the area to determine whether any astronomical body or phenomenon would account for the sighting.

g. Contact with military and civilian tower operators, air operations units, and airlines to determine whether the sighting could have been an aircraft. Local units of the Federal Aviation Agency (FAA) are often of assistance in this regard.

h. Contact with persons who may know of experimental aircraft of unusual configuration, rocket and guided missile firings, or aerial tests in the area.

i. Contact with photographic units or laboratories. Usually, these installations have several cameras available for specialized intelligence or investigative work. Photography is an invaluable tool for use, where possible, in investigating and analyzing UFO sightings. (See paragraph 18).

j. Whenever possible, selecting as a UFO sighting investigator an individual with a scientific or technical background as well as experience as an investigator.

k. Submission of reports on all sightings even though identification may be assumed by the preparing officer under paragraph 16 of this regulation.

5. Reporting UFO Information. Both the Assistant Chief of Staff, Intelligence, Headquarters USAF, and the Air Defense Command have a direct and immediate interest in the facts pertaining to UFO's reported within the United States. All Air Force activities will conduct UFO investigations to the extent necessary for their required reporting action (see paragraphs 14, 15, and 16). No activity should carry an investigation beyond this point, unless the preparing officer believes the magnitude (intelligence significance or public relations aspects) of the case warrant full scale investigation. The officer may contact the FTD of AFSC (CLearwater 3-7111, ext 69216/66378) at Wright-Patterson Air Force Base, Ohio, to obtain verbal authority for continued investigation.

SECTION B—PUBLIC RELATIONS, INFORMATION, CONTACTS, AND RELEASES

6. Maintaining Public Relations. The Office of Information is responsible for:

a. In coordination with the AFSC (FTD) when necessary, maintaining contact with the public and the press on all aspects of the UFO program and its related activities.

b. Releasing information on UFO sightings and results of investigations.

c. Periodically releasing information on this subject to the general public.

d. Processing, answering, and taking action on correspondence received from the general public, pertaining to the public relations, interest, and informational aspects of the subject. (See paragraph 8.) This office will forward correspondence and queries which are purely technical and scientific to AFSC (FTD) for information on which to base a reply.

7. Releasing Information. The Office of Information, Office of the Secretary of the Air Force, will release to the public or unofficial persons or organizations all information or releases concerning UFO's, regardless of origin or nature. This includes replies to correspondence (except congressional inquiries) submitted direct to the AFSC (FTD) and other Air Force activities by private individuals requesting comments or results of analyses and investigations of sightings.

8. Exceptions. In response to local inquiries regarding any UFO reported in the vicinity of an Air Force base, the commander of the base concerned may release information to the press or the general public only after positive identification of the sighting as a familiar or known object. The commander must exercise care not to reveal any classified aspects of the sighting or names of persons making reports. (See paragraph 17.) If the sighting is unexplainable or difficult to identify, because of insufficient information or inconsistencies, the only statement to be released is the fact that the sighting is under investigation and information regarding it will be available at a later date. After completion of investigative action, the commander may release the fact that the AFSC (FTD) will review and analyze the results of the investigation. He will then refer any further inquiries to the local Office of Information.

9. Release by Non-Air Force Sources. If newsmen, writers, publishers, or private individuals desire to release unofficial information concerning a UFO sighting, Air Force activities will make every effort to assure that the statements, theories, opinions, and allegations of these individuals or groups are not associated with or represented as official information.

10. Contacts. Private individuals or organizations desiring Air Force interviews, briefings, lectures, or private discussions on UFO's will direct their requests to the Office of Information, Office of the Secretary of the Air Force. Air Force personnel, other than those of the Office of Information, will not contact private individuals on UFO cases, nor will they discuss their operations and functions with unauthorized persons unless so directed, and then only on a "need-to-know" basis.

SECTION C—PREPARING AND SUBMITTING REPORTS

11. General Information:

a. Paragraphs 2 and 5 will serve as aids and guidance to screenings, investigations, and reportings. Paragraph 14 contains an outline of the reporting format. Activities initially receiving reports of aerial objects and phenomena will screen the information to determine whether the report concerns a valid UFO within the definition of paragraph 1b. Reports not within that definition do not require further action under the provisions of this regulation.

b. To assist activities and personnel responsible for handling, screening, and processing initial, incoming UFO information, a summary follows of the general sources and types of reports:

(1) Generally, initial UFO reports originate from two sources:

(a) Civilian (airline, private, and professional pilots, tower operators, technical personnel, casual observers, and the public in general), by correspondence, telephone or personal interview;

(b) Military units and personnel (pilots, observers, radar operators, aircraft control and warning units, etc.), by telephone, electrical message, or personal interview;

(2) Generally, UFO reports received from civilian sources are of two types:

(a) Those referring strictly to an observed UFO, containing either detailed or meager information;

(b) Those referring only in part to an observed UFO, but primarily requesting information on some aspect of the UFO program.

c. Reports considered to fall primarily in a public relations or information service category (see paragraphs 7, 8, 9, and b(2) above) are of primary interest to the Office of Information. UFO data sufficient for investigation and/or analysis may be extracted before referral to that office.

12. Methods for Transmitting Reports:

a. Together with any necessary screenings and investigations preparatory to reporting, report all information on UFO's promptly. Electrical transmission with a "Priority" precedence is authorized for reports under 3 days from date of sighting. Electrically transmitted reports over 3 days old should carry a "Routine" precedence.

b. Submit written reports of sightings over 3 days old on AF Form 112, "Intelligence Report,"

and AF Form 112A, "Supplement to AF Form 112" (see paragraphs 14 and 15); however, keep the use of these forms to a minimum in reporting initial sightings. The delays often involved in processing and transmitting AF Form 112 through channels may make followup investigations difficult, producing only limited usable information. This factor is a necessary consideration. Reporting by electrical means will eliminate delays. If requested by the AFSC (FTD), AF Form 112 will provide a followup and/or complete report of all sightings initially reported electrically.

13. Where To Submit Reports:

a. *Electrical Reports.* Submit multiple addressed electrical reports to:

(1) Air Defense Command, Ent AFB, Colorado

(2) Nearest Air Division (Defense) (For United States only)

(3) Air Force Systems Command, Foreign Technology Division, Wright-Patterson AFB, Ohio

(4) Headquarters, USAF (AFCIN), Wash 25 DC

(5) Secretary of the Air Force (SAFOI), Wash 25 DC

b. *Written Reports* (Basic letters and AF Form 112):

(1) *Basic Letters.* Submit all letter reports direct to the AFSC (FTD). The AFSC (FTD) will distribute the reports to interested Intelligence activities in the United States and to the Office of Information, if necessary.

(2) *AF Form 112.* Submit original report, as prescribed in "Intelligence Collection Instruction (ICI)," June 1954, direct to HQ USAF (AFCIN) Wash 25 DC, and a copy to AFSC (FTD).

c. *Reports from Civilians.* Where possible, advise civilian sources contemplating reporting UFO's to submit the report, for processing and transmission, to the nearest Air Force base.

14. Basic Reporting Data and Format. Show the abbreviation "UFO" at the beginning of the text of all electrical reports and in the subject of written reports. Include the required data in all reports, in the order shown below:

a. *Description of the Object(s):*

(1) Shape.

(2) Size compared to a known object (use one of the following terms: Head of a pin, pea, dime, nickel, quarter, half dollar, silver dollar, baseball, grapefruit, or basketball) held in the hand at about arm's length.

(3) Color.

(4) Number.

(5) Formation, if more than one.

(6) Any discernible features or details.

(7) Tail, trail, or exhaust, including size of same compared to size of object(s).

(8) Sound; if heard, describe sound.

(9) Other pertinent or unusual features.

b. *Description of Course of Object(s):*

(1) What first called the attention of observer(s) to the object(s)?

(2) Angle or elevation and azimuth of object(s) when first observed.

(3) Angle or elevation and azimuth of object(s) upon disappearance.

(4) Description of flight path and maneuvers of object(s).

(5) How did the object(s) disappear? (Instantaneously to the North, etc.)

(6) How long (were) the object(s) visible? (Be specific, 5 minutes, 1 hour, etc.)

c. *Manner of Observation:*

(1) Use one or any combination of the following items: Ground-visual, air-visual, ground-electronic, air-electronic. (If electronic, specify type of radar.)

(2) Statement as to optical aids (telescopes, binoculars, etc.) used and description thereof.

(3) If the sighting occurred while air-borne, give type of aircraft, identification number, altitude, heading, speed, and home station.

d. *Time and Date of Sighting:*

(1) Zulu time-date group of sighting.

(2) Light conditions. (Use one of the following terms: Night, day, dawn, dusk.)

e. *Location of Observer(s).* Give exact latitude and longitude of each observer, and/or geographical position. In electrical reports, give a position with reference to a known landmark also, such as "2mi N of Deeville"; "3mi SW of Blue Lake." Typographical errors or "garbling" often occur in electrically transmitted messages, making location plots difficult or impossible.

Example: 89 45N, 192 71W for 39 45N, 102 21W.

f. *Identifying Information on Observer(s):*

(1) Civilian—Name, age, mailing address, occupation, and estimate of reliability.

(2) Military—Name, grade, organization, duty, and estimate of reliability.

g. *Weather and Winds—Aloft Conditions at Time and Place of Sightings:*

(1) Observer(s) account of weather conditions.

(2) Report from nearest AWS or U. S. Weather Bureau Office of wind direction and velocity in degrees and knots at surface, 6,000′, 10,000′, 16,000′, 20,000′, 30,000′, 50,000′, and 80,000′, if available.

(3) Ceiling.

(4) Visibility.

(5) Amount of cloud cover.

(6) Thunderstorms in area and quadrant in which located.

(7) Vertical temperature gradient.

h. *Any other unusual activity or condition,* meteorological, astronomical, or otherwise, which might account for the sighting.

i. *Interception or identification action taken* (such action is authorized whenever feasible, and in compliance with existing air defense directives).

j. *Location, approximate altitude, and general direction* of flight of any air traffic or balloon releases in the area which might possibly account for the sighting.

k. *Position title and comments of the preparing officer,* including his preliminary analysis of the possible cause of the sighting(s). (See paragraph 16.)

l. *Existence of physical evidence,* such as materials and photographs.

15. Negative or Inapplicable Data. Even though the source does not provide, or an interviewer has not asked for specific information, do not use the words "negative" or "unidentified" before exhausting all logical leads to obtain the information outlined under paragraph 14. For example, information on weather conditions in the area, as requested in paragraph 14g, is obtainable from the local military or civilian weather facility. Use the phrase "not applicable (N/A)" only when the question does not apply to the particular sighting under investigation.

16. Comments of Preparing Officer. The preparing officer will make a preliminary analysis and a recommendation on the possible cause or identity of the object he is reporting, together with a statement supporting his comment and analysis. He will make every effort to obtain pertinent items of information and to test all possible leads, clues, and hypotheses concerning the identity or explanation of the sighting. (See paragraph 5.) The preparing officer who receives the report initially is in a much better position to conduct an "on-the-spot" survey or follow-up than subsequent investigative personnel and analysts, who may be far removed from the area, and who may arrive too late to obtain vital data or the missing information necessary for firm conclusions.

17. Classification. Do not classify reports unless data requested in paragraph 14 require classification. Classify reports primarily to protect:

a. Names of sources reporting UFO's and other principals involved, *if so requested by these persons or considered necessary;*

b. Intelligence, investigative, intercept, or analytical methods or procedures;

c. Location of radar and other classified sites, units, and equipment;

d. Information on certain types, characteristics, and capabilities of classified aircraft, missiles, or devices that may be involved in the sighting.

18. Reporting Physical Evidence. Report promptly the existence of physical evidence (photographic or material). Mark all physical evidence forwarded to the AFSC (FTD) for the attention of TD-E, Aerial Phenomena Branch.

a. *Photographic.*

(1) *Still Photographs.* Forward the negative and two prints. Title the prints and the negatives, or indicate the place, time, and date of the incident.

(2) *Motion Pictures.* Obtain the original film. Examine the film strip for apparent cuts, alterations, obliterations, or defects. In the report comment on any irregularities, particularly those received from other than official sources.

(3) *Supplemental Photographic Information.* Negatives and prints often are insufficient to provide certain valid data or to permit firm conclusions. (See AFM 200-9—a classified document receiving limited distribution.) Information that will aid in plotting or in estimating distances, apparent size and nature of object, probable velocity, and movements includes:

(a) Type and make of camera,
(b) Type, focal length, and make of lens,
(c) Brand and type of film,
(d) Shutter speed used,
(e) Lens opening used; that is, "f" stop,
(f) Filters used,
(g) Was tripod or solid stand used,
(h) Was "panning" used,
(i) Exact direction camera was pointing with relation to true north, and its angle with respect to the ground.

(4) *Other Camera Data.* If supplemental information is unobtainable, the minimum camera data required are the type of camera, and the smallest and largest "f" stop and shutter-speed readings of the camera.

(5) *Radar.* Forward two copies of each still-camera photographic print. Title radarscope photographic prints in accordance with AFR 95–7. Classify radarscope photographs in accordance with Section XII, AFR 205–1, 10 June 1960.

NOTE: If possible, develop photographic film before forwarding. Mark any undeveloped film conspicuously to indicate this fact, to avoid destruction by exposure during examinations en route through mail channels to final addressees.

b. *Material.* Each Air Force echelon receiving suspected or actual UFO material will safeguard it in a manner to prevent any defacing or alterations which might reduce its value for intelligence examination and analysis.

c. *Photographs, Motion Pictures, and Negatives Submitted by Individuals.* Individuals often submit photographic and motion picture material as part of their UFO reports. All original material submitted will be returned to the individual after completion of necessary studies, analyses, and duplication by the Air Force.

BY ORDER OF THE SECRETARY OF THE AIR FORCE:

CURTIS E. LeMAY
Chief of Staff

OFFICIAL:

R. J. PUGH
Colonel, USAF
Director of Administrative Services

☆ U. S. GOVERNMENT PRINTING OFFICE: 1962

U.S. AIR FORCE TECHNICAL INFORMATION

This questionnaire has been prepared so that you can give the U.S. Air Force as much information as possible concerning the unidentified aerial phenomenon that you have observed. Please try to answer as many questions as you possibly can. The information that you give will be used for research purposes. Your name will *not* be used in connection with any statements, conclusions, or publications without your permission. We request this personal information so that if it is deemed necessary, we may contact you for further details.

1. When did you see the object?

_____ Day _____ Month _____ Year

2. Time of day: _____ Hour _____ Minutes

(Circle One): A.M. or P.M.

3. Time Zone:

(Circle One): a. Eastern
b. Central
c. Mountain
d. Pacific
e. Other _____

(Circle One): a. Daylight Saving
b. Standard

4. Where were you when you saw the object?

_____ Nearest Postal Address _____ City or Town _____ State or County

5. How long was object in sight? (Total Duration) _____ Hours _____ Minutes _____ Seconds

a. Certain
b. Fairly certain
c. Not very sure
d. Just a guess

5.1 How was time in sight determined? _____

5.2 Was object in sight continuously? Yes ____ No ____

6. What was the condition of the sky?

DAY	NIGHT
a. Bright	a. Bright
b. Cloudy	b. Cloudy

7. IF you saw the object during DAYLIGHT, where was the SUN located as you looked at the object?

(Circle One): a. In front of you
b. In back of you
c. To your right
d. To your left
e. Overhead
f. Don't remember

FORM FTD OCT 62 164 This form supersedes FTD 164, jul 61, which is obsolete.

Reproduced by Library of Congress, Legislative Reference Service

May 1966

8. IF you saw the object at NIGHT, what did you notice concerning the STARS and MOON?

8.1 STARS *(Circle One)*:

a. None
b. A few
c. Many
d. Don't remember

8.2 MOON *(Circle One)*:

a. Bright moonlight
b. Dull moonlight
c. No moonlight – pitch dark
d. Don't remember

9. What were the weather conditions at the time you saw the object?

CLOUDS *(Circle One)*:

a. Clear sky
b. Hazy
c. Scattered clouds
d. Thick or heavy clouds

WEATHER *(Circle One)*:

a. Dry
b. Fog, mist, or light rain
c. Moderate or heavy rain
d. Snow
e. Don't remember

10. The object appeared: *(Circle One)*:

a. Solid
b. Transparent
c. Vapor
d. As a light
e. Don't remember

11. If it appeared as a light, was it brighter than the brightest stars? *(Circle One)*:

a. Brighter
b. Dimmer
c. About the same
d. Don't know

11.1 Compare brightness to some common object:

_____

12. The edges of the object were:

(Circle One):
a. Fuzzy or blurred
b. Like a bright star
c. Sharply outlined
d. Don't remember

c. Other _____

13. Did the object:

	(Circle One for each question)		
a. Appear to stand still at any time?	Yes	No	Don't know
b. Suddenly speed up and rush away at any time?	Yes	No	Don't know
c. Break up into parts or explode?	Yes	No	Don't know
d. Give off smoke?	Yes	No	Don't know
e. Change brightness?	Yes	No	Don't know
f. Change shape?	Yes	No	Don't know
g. Flash or flicker?	Yes	No	Don't know
h. Disappear and reappear?	Yes	No	Don't know

30. Have you ever seen this, or a similar object before. If so give date or dates and location.

31. Was anyone else with you at the time you saw the object? *(Circle One)* Yes No

31.1 IF you answered YES, did they see the object too? *(Circle One)* Yes No

31.2 Please list their names and addresses:

32. Please give the following information about yourself:

NAME _____ (Last Name) _____ (First Name) _____ (Middle Name)

ADDRESS _____ (Street) _____ (City) _____ (Zone) _____ (State)

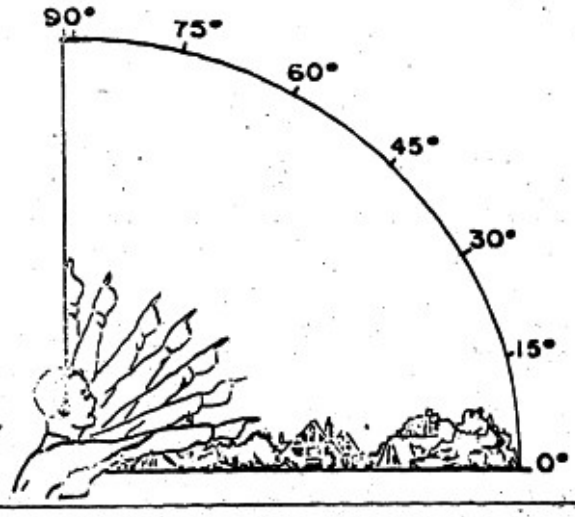
TELEPHONE NUMBER _____ AGE _____ SEX _____

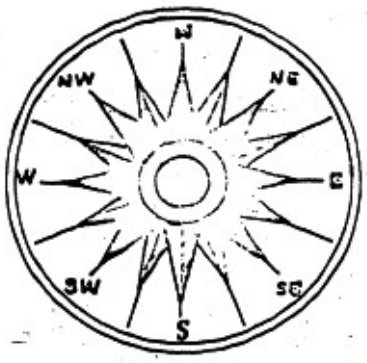
Indicate any additional information about yourself, including any special experience, which might be pertinent.

33. When and to whom did you report that you had seen the object?

_____ (Day) _____ (Month) _____ (Year)

27. In the following sketch, imagine that you are at the point shown. Place an "A" on the curved line to show how high the object was above the horizon (skyline) when you *first* saw it. Place a "B" on the same curved line to show how high the object was above the horizon (skyline) when you *last* saw it. Place an "A" on the compass when you *first* saw it. Place a "B" on the compass where you *last* saw the object.





28. Draw a picture that will show the motion that the object or objects made. Place an "A" at the beginning of the path, a "B" at the end of the path, and show any changes in direction during the course.

29. IF there was MORE THAN ONE object, then how many were there? _____
Draw a picture of how they were arranged, and put an arrow to show the direction that they were traveling.

20. Do you think you can estimate the speed of the object?

(Circle One) Yes No

IF you answered YES, then what speed would you estimate? _____

21. Do you think you can estimate how far away from you the object was?

(Circle One) Yes No

IF you answered YES, then how far away would you say it was? _____

22. Where were you located when you saw the object? (Circle One):

a. Inside a building
b. In a car
c. Outdoors
d. In an airplane(type)
e. At sea
f. Other _____

23. Were you-(Circle One)

a. In the business section of a city?
b. In the residential section of a city?
c. In open countryside?
d. Near an airfield?
e. Flying over a city?
f. Flying over open country?
g. Other _____

24. IF you were MOVING IN AN AUTOMOBILE or other vehicle at the time, then complete the following questions:

24.1 What direction were you moving? (Circle One)

a. North c. East e. South g. West
b. Northeast d. Southeast f. Southwest h. Northwest

24.2 How fast were you moving? _____ miles per hour.

24.3 Did you stop at any time while you were looking at the object?

(Circle One) Yes No

25. Did you observe the object through any of the following?

a. Eyeglasses Yes No e. Binoculars Yes No
b. Sun glasses Yes No f. Telescope Yes No
c. Windshield Yes No g. Theodolite Yes No
d. Window glass Yes No h. Other _____

26. In order that you can give as clear a picture as possible of what you saw, describe in your own words a common object or objects which, when placed up in the sky, would give the same appearance as the object which you saw.

14. Did the object disappear while you were watching it? If so, how?

15. Did the object move behind something at any time, particularly a cloud?

(Circle One): Yes No Don't Know. IF you answered YES, then tell what it moved behind: ____

16. Did the object move in front of something at any time, particularly a cloud?

(Circle One): Yes No Don't Know. IF you answered YES, then tell what in front of: ____

17. Tell in a few words the following things about the object:

a. Sound ____

b. Color ____

18. We wish to know the angular size. Hold a match stick at arm's length in line with a known object and note how much of the object is covered by the head of the match. If you had performed this experiment at the time of the sighting, how much of the object would have been covered by the match head?

19. Draw a picture that will show the shape of the object or objects. Label and include in your sketch any details of the object that you saw such as wings, protrusions, etc., and especially exhaust trails or vapor trails. Place an arrow beside the drawing to show the direction the object was moving.

34. Date you completed this questionnaire: ____ Day _____ Month _____ Year

35. Information which you feel pertinent and which is not adequately covered in the specific points of the questionnaire or a narrative explanation of your sighting.

APPENDIX C -- BIOGRAPHICAL INFORMATION

Dr. Joseph Allen HYNEK. Ph.D. in astrophysics from the University of Chicago. Director of Dearborn Observatory, and Chairman of the Department of Astronomy, Northwestern University, Evanston, Illinois. Consultant to the Air Force since 1948 on the problem of Unidentified Flying Object phenomena.

*

Dr. Donald Howard MENZEL. Ph.D. in astrophysics from Princeton University. Director of the Harvard Observatory and Professor of Astronomy, and Paine Professor of Practical Astronomy. Consultant to the Air Force on UFO cases involving Sun Dogs and Parhelia.

*

Dr. Charles Pollard OLIVIER. Ph.D. in astronomy from Vanderbilt University. Formerly Director of Flower Observatory and Professor, University of Pennsylvania. President, American Meteor Society.

Edward J. RUPPELT. (Deceased) Formerly head of Project Blue Book, Aerial Phenomena Branch, Foreign Technology Division, Air Force Systems Command, Wright-Patterson Air Force Base, Dayton, Ohio. Research engineer for Northrop Aircraft Company.

*

Dr. Carl SAGAN. Ph.D. in astronomy and astrophysics from the University of Chicago. Department of Astronomy, Harvard University, and Smithsonian Astrophysical Observatory, Cambridge, Massachusetts. Member of the panel on extraterrestrial life, U.S. Air Force and National Research Council.

Lawrence J. TACKER. Formerly Lt. Col. USAF. Chief of Magazine and Book Branch, Office of Information, Office of Secretary of the Air Force.

Jacques VALLEE. Born and educated in France. University degree in mathematics and astronomy. Consultant on NASA "Mars Map" project.

* Biographical data from American Men of Science, edited by Jacques Cattell. Tempe, Arizona: Jacques Cattell Press, 10th edition, 1960. pp. 1939, 2742, 3030, 3516.

APPENDIX D

UNIDENTIFIED FLYING OBJECTS: SELECTED BIBLIOGRAPHY

Davidson, Leon. Flying saucers; an analysis of the Air Force project blue book special report no. 14. With an appendix consisting of a photo-offset copy of the full text of the Air Force project blue book special report no. 14, dated May 5, 1955 and some of the important tables and figures from that report. White Plains, N. Y., 1956. 83 p.

Hall, Richard H., ed. The UFO evidence (unidentified flying objects). Washington, D. C., National Investigations Committee on Aerial Phenomena (NICAP), May 1964. 184 p.

Jung, Carl Gustav. Flying saucers, a modern myth of things seen in the skies. New York, Harcourt, Brace, and Co., 1959. 186 p.

Keyhoe, Donald Edward. Flying saucers: top secret. New York, Putnam, 1960. 283 p.

_____. The flying saucer conspiracy. New York, Holt, 1955. 315 p.

Menzel, Donald. Flying saucers. Cambridge, Harvard University Press, 1953. 319 p.

Menzel, Donald and Lyle G. Boyd. The world of flying saucers; a scientific examination of a major myth of the space age. Garden City, N. Y., Doubleday & Co., 1963. 302 p.

Michel, Aime. The truth about flying saucers. Translated from the French by Paul Selver. New York, Criterion Books, 1956. 255 p.

_____. Flying saucers and the straight-line mystery. New York, Criterion Books, 1958. 284 p.

Miller, Max B. Flying saucers, fact or fiction? Twelve-year research of U.F.O.'s in our skies revealed by the top scientists, astronomers, Airforce personnel and technical observers. Los Angeles, Trend Books, 1957. 128 p.

Project Blue Book. Special report no. 14 (analysis of reports of unidentified aerial objects). Wright-Patterson Air Force Base, Ohio, Air Technical Intelligence Center, May 5, 1955. 316 p.

Ruppelt, E. J. The report on unidentified flying objects. New York Doubleday & Co., Inc., 1956. 215 p.

Sagan, Carl. Unidentified flying objects. Reprint from the encyclopedia Americana, copyright 1963. 9 p.

Tacker, Lawrence J. Flying saucers and the U. S. Air Force. Princeton, N. J., Van Nostrand, 1960. 164 p.

U. S. Congress. House. Committee on Armed Services. Unidentified flying objects. Hearing by the Committee on Armed Services. 89th Cong., 2nd sess., April 5, 1966. pp. 5991-6075.

U. S. Department of Defense. Office of Public Information. Air Force's 10-year study of unidentified flying objects. Washington, D. C., 1957. 4 p. (Fact sheet no. 1083-57).

U. S. Department of the Air Force. Office of Public Information. U. S. Air Force summary of events and information concerning the unidentified flying object program. Washington, D. C., 1954. Unpaged.

Vallee, Jacques. Anatomy of a Phenomenon. Chicago, Illinois, Henry Regnery Co., 1965. 210 p.

U. S. Congress. House. Committee on Armed Services. Unidentified flying objects. Hearing by the Committee on Armed Services. 89th Cong., 2nd sess., April 5, 1966. pp. 5991-6075.

U. S. Department of Defense. Office of Public Information. Air Force's 10-year study of unidentified flying objects. Washington, D. C., 1957. 4 p. (Fact sheet no. 1083-57).

U. S. Department of the Air Force. Office of Public Information. U. S. Air Force summary of events and information concerning the unidentified flying object program. Washington, D. C., 1954. Unpaged.

Vallee, Jacques. Anatomy of a Phenomenon. Chicago, Illinois, Henry Regnery Co., 1965. 210 p.