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March 5, 1987

UNCORRELATED RADAR SIGNALS

Radar data received by the FAA and used to track Japan Airlines flight 1628 on the night of the November 17, 1986, was retained by FAA. Review of this radar data by FAA experts using identical equipment at the FAA's research technical center in Atlantic City, New Jersey, revealed that the radar system was receiving what is called an "uncorrelated primary and beacon target".

This electronic phenomena is not unusual according to Steucke who said, "It is unfortunate that the uncorrelated target phenomena occurred just when a pilot was reporting seeing something outside his aircraft.

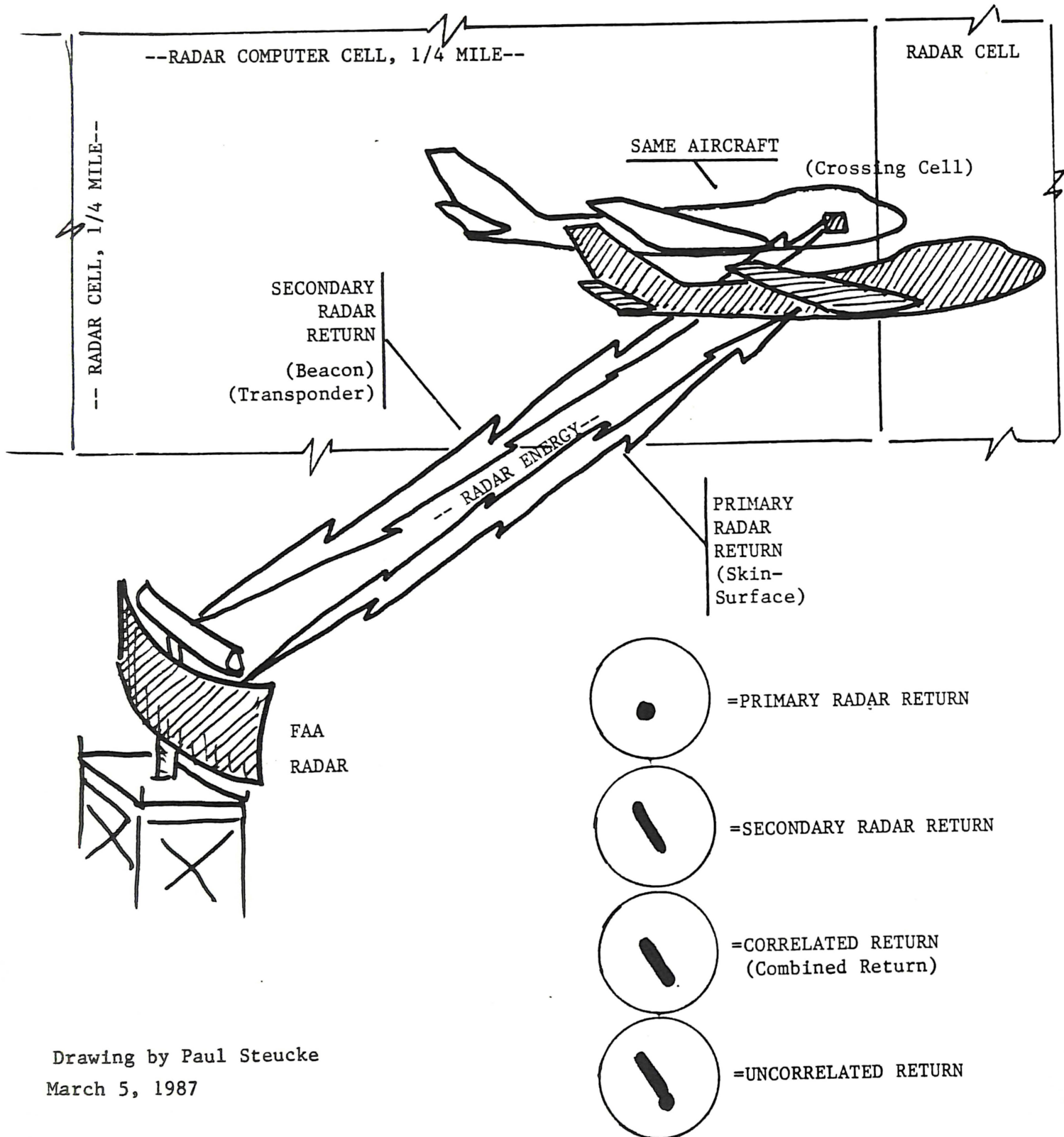
The controller's statements, released by the FAA, indicate that they thought there might be another aircraft or object in the area of the JAL flight. Steucke said, "The controllers were doing their job right because they have to work with what is right there in front of them on the screen, especially when you have a Captain that is reporting "other traffic" in his immediate area. The radar data they had was one target, moving slowly across the radar screen. They don't have the benefit of "monday morning quarterbacking" with multiple radar images as was the case in regenerating the radar data." Review of the radar data by FAA experts revealed the "uncorrelated target" phenomena.

FAA electronic technicians explained that an "uncorrelated primary and beacon target" on the radar screen occurs when the radar energy that is sent up toward the aircraft, (primary signal) returns to the radar receiver along with the aircraft transponder (beacon) signal and the two do not match up as being at the same exact location.

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UNCORRELATED RADAR SIGNALS

An "uncorrelated primary and beacon(secondary) return on a radar screen occurs when the radar energy that is sent up toward the aircraft (primary signal) returns off the surface of the aircraft at a slightly different moment than the beacon (secondary) transponder signal and the two do not match up as being at the same place or same computer radar cell.



Drawing by Paul Steucke
March 5, 1987



U.S. Department
of Transportation
**Federal Aviation
Administration**

Memorandum

Subject: INFORMATION: Description of Radar Split Image;
AAL-5 Memo of 2/5/87

Date: FEB 27 1987

From: Manager, Airway Facilities Division, AAL-400

Reply to
Attn. of:

To: Public Affairs Officer, AAL-5

This letter transmits our analysis of the radar targets associated with JAL flight 1628, on November 17, 1986, and supplements discussions we have had regarding what has been referred to as "split images".

We concur with the interpretation provided to you by the Alaskan Region Air Traffic Division.

The attached Analysis of Uncorrelated Primary and Beacon Targets by Dennis Simantel covers the subject in more detail, and addresses the questions raised in your letter.

Paul, I appreciate the team approach you have taken to more fully understand a complex issue. The issue is an excellent example of how "interdependent" we are. If we can provide any more information, please do not hesitate to call.

David F. Morse

Attachment

27 FEB 87 14 25
RECEIVED

ANALYSIS OF UNCORRELATED PRIMARY
AND BEACON TARGETS
(JAL-1628, 11/17/86 AKST)

Approximately 61 minutes of data was extracted from the EARTS CDR printouts relating to the November 18 incident involving JAL-1628 and the alleged UFO sighting.

Review of the data involving this incident did not show any abnormalities that could be associated with any type of target as indicated by the pilot of JAL-1628.

Radar returns from the aircraft and surrounding terrain vary with the different segments of the flight, but are considered normal for the area.

Returns relating to the incident can be categorized as three types: primary radar reinforced by a beacon reply (primary radar returns and beacon returns are both evident in the same 1/4 mile range cell), beacon only reply and beacon with an associated radar reply. Seventy-two percent of the replies were radar with beacon reinforcement (same range cell) which is normal for the Murphy dome radar system.

Approximately 25 percent were beacon only and of those that registered as beacon only, 90 percent of those had a primary only reply within 1/8 of a mile, either ahead or behind the beacon target (~~5~~⁶ behind, ~~12~~¹³ ahead).

3/3/87

These uncorrelated primary returns are not uncommon, due to the critical timing associated with the delay adjustments in the aircraft transponder for beacon systems and the target correlation circuitry within the radar equipment.

When an aircraft is being interrogated as it passes through the beginning of adjacent range cells the intricate timing between the two systems very often is off just enough to declare both a beacon and a radar target in different range cells, resulting in uncorrelated radar replies.

The data derived from the JAL-1628 flight is representative of the data from another aircraft in the same general area and is considered normal.

February 25, 1987

D.S.
Dennis R. Simantel
ZAN-AAL-ARTCC

CONCUR: David F. Morse, AAL-400