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## Hughes Airwest DC-9 vs. U.S. Marine Corps F-4B

### **Introduction:**

On June 6<sup>th</sup>, 1971 at approximately 18:11, a McDonnell Douglas DC-9-31 passenger aircraft collided midair over the San Gabriel Mountains near Duarte, California with a United States Marine Corps F-4B Phantom II. All 44 passengers, the 5-man crew of the commercial aircraft, and the U.S. Marine Corps pilot were killed. What caused this accident to happen, and was there any way to prevent it? The investigation performed by the National Transportation Safety Board assisted by the Federal Aviation Administration, Marine Corps, Hughes Airwest, and the Airline Pilots Association has revealed what took place that fateful day.



Artist impression of N9345

flew.

### **DC-9:**

The Douglas DC-9 is a twin-engine, single-aisle jet airliner. It was first manufactured in 1965 and designed for frequent, short flights. It has two rear fuselage-mounted Pratt & Whitney JT8D turbofan engines, relatively small, efficient wings, and a T-tail. The plane can seat between 80 and 135 passengers, depending on the version and how the seating is arranged. In August of 1966, the first DC-9 Series 30, produced in passenger version only, flew.

**F-4B:**

In comparison, the Douglas F-4B Phantom II is a tandem, two-seat, twin-engine, all-weather, long-range supersonic jet interceptor fighter/fighter-bomber that was originally developed for the United States Navy by McDonnell Aircraft in 1960 which was later adopted by the U.S. Marine Corps and the U.S. Air Force. The Phantom is capable of traveling with a top speed of over Mach 2.2, twice the speed of sound, and can carry over 18,000 pounds of armament.



A U.S. Marine Corps F-4B Phantom II similar to the one involved

**Flight Histories:**

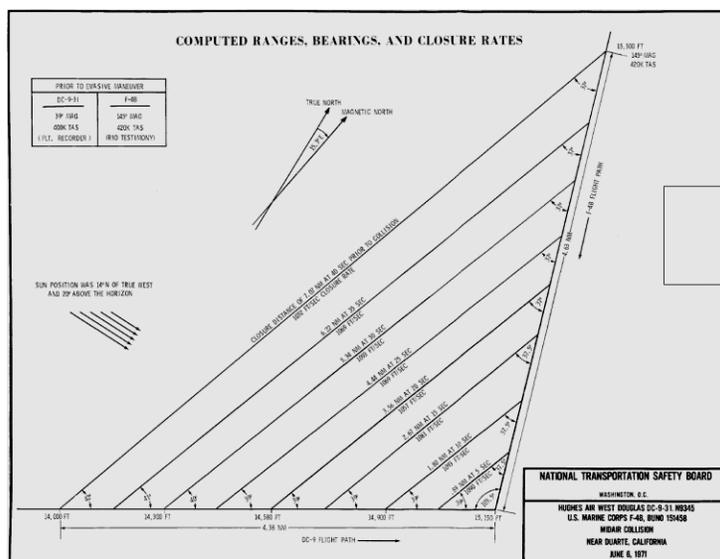
Prior to the accident, the Hughes Airwest Flight 706 flew a scheduled route between Los Angeles International Airport, Los Angeles, California and Seattle-Tacoma International Airport, Seattle, Washington with 5 stopovers in Salt Lake City, Utah, Boise, Idaho, Lewiston, Idaho, Pasco, Washington, and Yakima, Washington. Since being put in to service in 1969, it had accrued 5,542 airframe hours and was piloted by Captain Theodore Nicolay, with 15,490 hours of total flying time, including 2,562 hours flying DC-9s and First Officer Price Bruner, who had 17,128 total hours flying time, with 272 in DC-9s. The U.S. Marine Corps F-4B-18-MC Phantom II, coded '458' had been active since April 15, 1964 and was consigned to Marine Fighter Attack Squadron 323, Marine Aircraft Group 11, 3<sup>rd</sup> Marine Air Wing, after passing through the hands of various squadrons prior to that. The fighter-bomber was piloted by 1<sup>st</sup> Lieutenant James R. Phillips and Radar Intercept Officer, 1<sup>st</sup> Lieutenant Christopher E. Schiess.

The Phantom was participating in a two plane cross-country flight when its radio failed while landing at Mountain Home Air Force Base, Idaho. At that point, the aircraft was ordered to complete repairs at Mountain Home AFB and to then return immediately to Marine Corps Air Station El Toro (MCAS El Toro). Testing at Mountain Home exposed that the aircraft had an inoperative radio, inoperative transponder, oxygen system leak, and a degraded radar system.

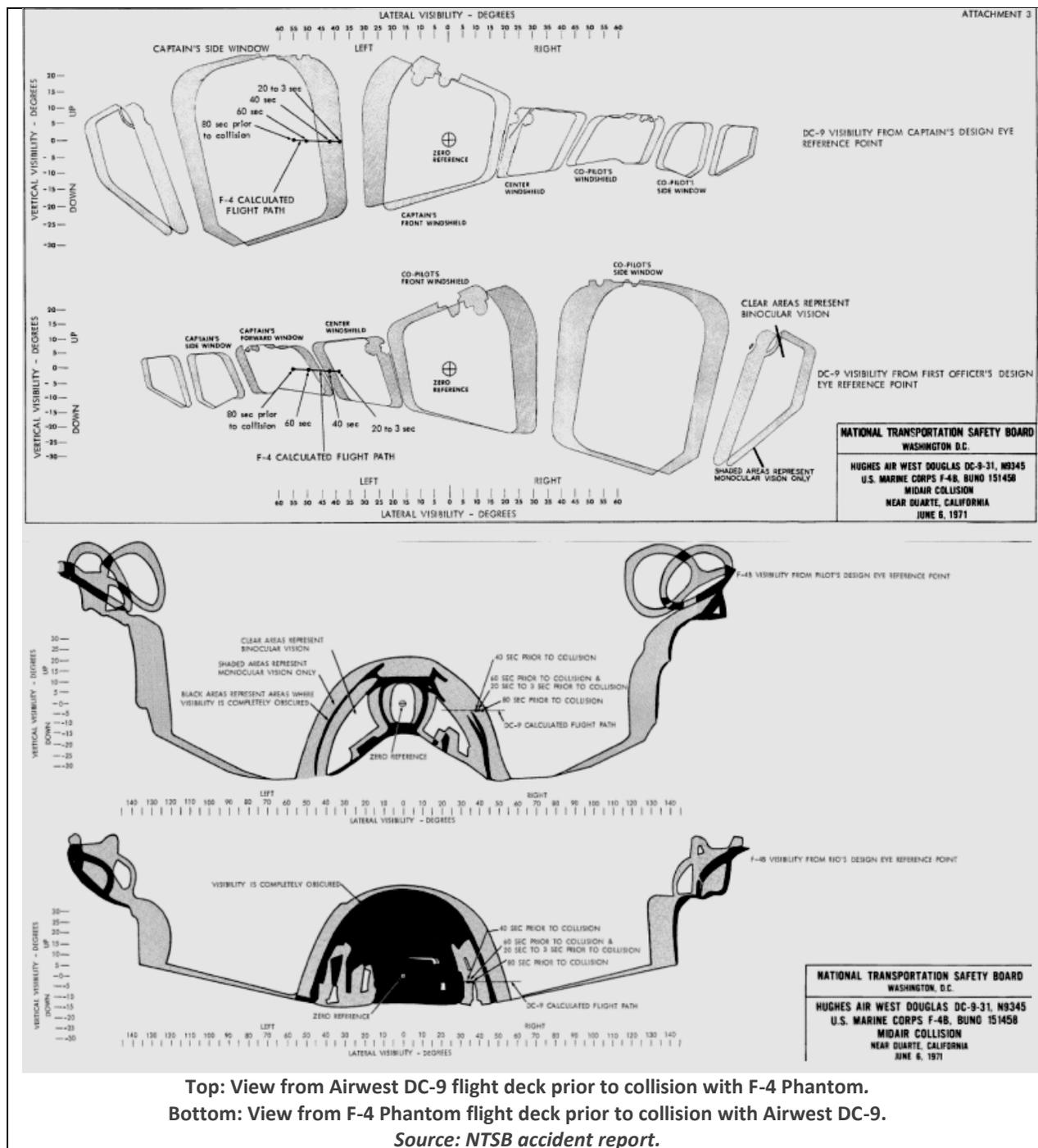
Military personnel were able to fix the radio and confirm the oxygen leak, but they did not have the knowledge necessary to repair the transponder or radar. Lt. Phillips requested permission to fly the F-4B with a dysfunctional transponder and advanced to Naval Air Station Fallon, Nevada. En route to NAS Fallon the oxygen leak deteriorated until it was disabled completely and the aviator was instructed to fly at low altitude.

### Accident Summary:

While approaching Bakersfield Flight Service Station, Phillips and Schiess decided to stray east from the designated flight plan to evade heavy air traffic near Los Angeles. The crew was forced to climb over 14,500 feet in altitude, from 1,000 feet to 15,500 feet because of worsening weather conditions. Meanwhile, Flight 706 had been given two radar traffic advisories, neither of which displayed any sign of the '458'. Shortly after the fighter reached the elevation needed to elude bad weather, its Distance Measuring Equipment (DME, i.e. radar) showed that MCAS El Toro was approximately 50 miles away. Because of the design of the aircraft, the pilot then executed an aileron roll, where he rolled the aircraft 360°, to be able to see any sign of air traffic above or below the aircraft as they were approaching. Schiess spotted the DC-9 in his peripheral vision between three and ten seconds prior to the collision, while looking at the radar, (on which no aircrafts were detected due to its failing condition) and hollered a warning to Phillips. Phillips attempted an evasive roll but unfortunately, was unable to clear the oncoming airliner. After the two aircrafts collided, the DC-9 “cart-wheeled” through the air, crashed into a mountain and exploded, killing all onboard; the F-4B then crashed in to Mount Bliss, roughly one mile from the airliner wreckage, killing the pilot. The only person spared from a horrific death was 1<sup>st</sup> Lieutenant Schiess, who was able to eject and parachute to safety.



Closing diagram of Airwest DC-9 and F-4 Phantom near Duarte, CA. Source: NTSB accident report.



**Inspection:**

Exploration of the incident exposed what happened in the final moments of the tragic accident and the series of events that led up to it. It appeared that the Phantom came into contact with the airliner in two places: First, with its left wing impacting the forward passenger cabin and the vertical stabilizer slicing through the cockpit. It was calculated that just an additional ten feet of clearance would have averted the entire collision. The initial inspection found nine bodies



of the crew of BuNo458 to request radar advisory service, particularly considering the fact that they had an inoperable transponder. (p. 27)



### **Recommendations:**

As a result of this accident the Safety Board recommended that the Federal Aviation Administration install video and audio surveillance in air traffic control facilities; provide positive control airspace from takeoff to landing for all Instrument Flight Rules (IFR) traffic; and ensure that all radar facilities are capable of receiving Code 7700 (where the pilot

declares an emergency and the aircraft is not radar identified), and establish definitive procedures for the handling of such traffic. They also recommended that the Federal Aviation Administration and the Department of Defense develop a program to inform all airspace users of the heaviest traffic areas. Additionally, it was recommended that the Department of Defense restrict high-speed, low-level operations to designated areas and routes; delineate explicit circumstances where the 10,000 feet/250 knots limitation may be exceeded; consider using air intercept radar for collision avoidance purposed; and publicize the availability of the FAA Radar Advisory Service and consider making the use of this service mandatory (NTSB, 1972, pg. 10).

### **Conclusion:**

In conclusion, because of miserable circumstances and communication issues, many lost their lives that day. Therefore, I am in agreement with the recommendations the National Transportation Safety Board made in an attempt to instigate safer, organized policies for secure commercial and military aviation. Employing these courses of action have made it so that aircrafts are now guided from the beginning of their flight to the end, emergency procedures are in place, speeds are limited, and pilots and passengers are able to fly with comfort, knowing there are regulations in place designed for the safety of everyone involved.

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