

**SA-None**

**File No. 3-2594**

# **AIRCRAFT ACCIDENT REPORT**

**MINERAL COUNTY AIRLINES  
d.b.a. HAWTHORNE NEVADA AIRLINES,  
DC-3, N15570  
NEAR LONE PINE, CALIFORNIA  
FEBRUARY 18, 1969  
Adopted: FEBRUARY 4, 1970**

**NATIONAL TRANSPORTATION SAFETY BOARD  
Bureau of Aviation Safety  
Washington, D. C. 20591**

NATIONAL TRANSPORTATION SAFETY BOARD  
DEPARTMENT OF TRANSPORTATION

MINERAL COUNTY AIRLINES.  
d. b. a. HAWTHORNE NEVADA AIRLINES.  
EC3 N15570  
NEAR LONE PINE. CALIFORNIA  
FEBRUARY 18. 1969

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NATIONAL TRANSPORTATION SAFETY BOARD  
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SYNOPSIS

A Hawthorne-Nevada Airlines (NEVT), DC-3, N15570, operating as Flight 708, crashed approximately 11 nautical miles west of Lone Pine, California, about 0510 P.s.t., February 18, 1969. The 32 passengers and three crewmembers aboard the aircraft died in the accident, and the aircraft was destroyed.

The flight departed Hawthorne, Nevada, 0350 P.s.t., on February 18, 1969, on a VFR flight plan for Burbank and Long Beach, California. At 0406, Flight 708 contacted the Tonopah Flight Service Station on the Mina VOR frequency and activated a VFR flight plan which had previously been filed by telephone from Hawthorne, Nevada. No further contact was had with the flight. The aircraft was declared missing, and presumed down somewhere between Hawthorne, Nevada, and Burbank, California. Air and ground search operations were instituted, but due to heavy snows and inclement weather, the aircraft was not located. The crash site, approximately 11 nautical miles west of Lone Pine, California, was located August 8, 1969. The aircraft crashed on the east slope of Mount Whitney, at an elevation of approximately 11,770 feet. All persons on board the aircraft perished in the impact.

The Board determines that the probable cause of this accident was the deviation from the prescribed route of flight, as authorized in the company's FAA-approved operations specifications, resulting in the aircraft being operated under IFR weather conditions, in high mountainous terrain, in an area where there was a lack of radio navigation aids,

## 1. INVESTIGATION

### 1.1 History of the Flight

Hawthorne Nevada Airlines (NEVT) operated a daily round trip from Long Beach, California (LGB), to Hawthorne, Nevada (HTH), with a stop at Burbank, California (BUR). On weekdays, the flight was scheduled to depart LGB at 1830 P.s.t., 1/ and depart HTH at 0400 P.s.t. the following morning for the return trip.

N15570, a DC-3, operating as Flight 708, departed LGB and BUR, as scheduled, with 32 passengers and a crew of three, and arrived at HTH at approximately 2040, February 17, 1969. After arrival at the airport, the passengers and stewardess were transported by bus to a lodge in Hawthorne, a distance of 1 mile. The captain and first officer utilized a company car to reach the lodge.

The captain and first officer checked into their rooms at the lodge at approximately 2115. The stewardess, after tending to the passengers, checked into her room some 15 minutes later. None of the crew visited the casino, associated with the lodge, during the layover.

While at HTH, the aircraft was serviced with 200 gallons of 100-octane gas.

Approximately 0300, February 18, 1969, the flightcrew entered the restaurant at the casino. The first officer then went to the telephone to check weather and file the clearance for the return flight.

At approximately 0305, the first officer telephoned the Tonopah (TPH) Flight Service Station (FSS). After receiving the weather briefing, which included AIRMET Alpha 2 and the area forecast, he filed the following flight plan:

Flight 708, DC-3, Visual Flight Rules (VFR) direct Hawthorne to Burbank, Altitude 11,500 feet, Time en route 2 plus 15 2/, fuel on board 3 plus 40, Pilot Hamer, Aircraft color - Blue and white, Estimated off the ground 1150Z 3/.

Approximately 0335, the bus departed the casino with the passengers and stewardess for the return trip to the airport. The captain and first officer had departed earlier by company car to make the aircraft ready for the return flight.

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1/ All times are Pacific standard, based on the 24-hour clock unless otherwise specified.

2/ 2 plus 15--2 hours and 15 minutes.

3/ 1150Z--Greenwich mean time. For purpose of clarity and simplicity, all departure times, estimated times of arrivals, and times used on official communications with ground radio facilities are given in Greenwich mean time or Zulu time. This time is 8 hours later than Pacific standard time.

Directly after takeoff a witness reported seeing the aircraft circle the field once while climbing for altitude.

At 0406, while in flight, the crew contacted the Tonopah Flight Service Station, utilizing the Mina VOR frequency, and requested that their flight plan be opened, 4/ and stated that their actual takeoff time was 0350. No further contact of any nature was made with the flight.

An extensive ground and air search was launched after the aircraft was declared missing. Due to heavy snow accumulations on the ground, ~~low~~ clouds throughout the search period, and extremely hazardous terrain, the aircraft was not located until August 8, 1969.

Pursuant to the approved operating specifications issued by the FAA, the only authorized route the company could fly while operating subject to a VFR clearance was as follows:

From HTH direct to the intersection of Victor Airway 105 (V105) and the 240° radial (240R) of Mina (MVA) VOR 5/ V105 to Beatty (BTY) VTAC 6/  
BTY VTAC direct Inyokern Airport, California  
Inyokern Airport direct Palmdale (PMD) VTAC  
PMD VTAC via Federal Airways to ~~BUR~~

The aircraft wreckage was located on the east slope of Mount Whitney, approximately 11 nautical miles (NM) west of Lone Pine, California. The impact had occurred on the face of a near vertical cliff at an elevation of about 11,770 feet m.s.l. The main body of the wreckage was situated near the base of the cliff at latitude 36°35'45" N., longitude 118°15'52" W. There were no survivors.

### 1.2 Injuries to Persons

<u>Injuries</u>	<u>Crew</u>	<u>Passengers</u>	<u>Others</u>
Fatal	3	32	0
Nonfatal	0	0	0
None	0	0	0

### 1.3 Damage to Aircraft

The aircraft was destroyed by impact and subsequent fire.

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4/ Aircraft is in the air and the crew requests that the flight plan which was previously filed be activated.

5/ VOR-VHF Omnidirectional Range.

6/ VTAC-Combination VOR and TACAN civil facility providing both azimuth and distance information.

1.4 Other Damage

None

1.5 Crew Information

See Appendix B.

1.6 Aircraft History

N15570, serial No. 6320, was manufactured in 1943 by the Douglas Aircraft Company. NEVT placed the aircraft in their service on August 2, 1964. The airworthiness certificate was reissued July 2, 1964, under Aero-Bulletin 7A. 7/ Part 121 of the Federal Aviation Regulations (FAR) dictated the criteria under which the subject aircraft was maintained.

The total time of the aircraft was 48,274 hours. The next 10,000-hour overhaul was due in 2,379 hours.

The aircraft was equipped with two Pratt & Whitney, R1830-92, engines and two Hamilton Standard 23350 propellers with Model 6353A-18 blades. The aircraft was not equipped with wing and empennage deicer boots. The only operable anti-icing and/or deicing devices were windshield and propeller deicing equipment and carburetor heat. The only method, available to the crew, to check for external icing after dark was the illumination from the landing lights and hand flashlights. The NEVT Maintenance Manual, Minimum Equipment List (MEL), Items J and K, prohibit the operation of the aircraft when areas of known or probable icing conditions exist or are forecast for the route to be flown. 8/

7/ If there is no category, as in the case of aircraft certificated prior to the adoption of the regulations which established categories, the regulation or other information shown as the certification basis on the applicable aircraft specification or listing is entered on the Standard Airworthiness Certificate, FAA Form 1362. For example, Aero-Bulletin 7A is the certification basis for a Douglas DC-3C-SC3G, as in the case of N15570.

8/ NEVT Maintenance Manual, Chapter II, Section 2.95.1, Minimum Equipment List for En Route Dispatch, Items J and K read as follows:

J. Aircraft may be operated, providing no known or probable icing condition exists, or is forecast for route to be flown.

K. Aircraft may be operated without boots, providing no known or probable icing condition exists, or is forecast for route to be flown.

The company maintenance records that were reviewed disclosed that, with the exception of minor discrepancies which had no bearing on the flight of February 18, 1969, the aircraft and powerplants were maintained in accordance with existing NEVT and FAA-approved directives and procedures.

Weight and balance were within limits at takeoff from HTH and were within limits at the time of the accident.

The aircraft was equipped with:

- 2 VHF Omnidirectional Range Receivers (VOR)
- 2 VHF Transceivers
- 1 Distance Measure Equipment Receiver (DME)
- 1 Marker Beacon Receiver
- 2 Automatic Direction Finder (ADF) Receivers (Radio Compasses)
- 1 Glide Slope Receiver

## 1.7 Meteorological Information

### Synoptic Situation

The 0400 surface weather chart, prepared by the National Meteorological Center, showed a low-pressure system centered near Bishop, California, and a cold front extending from near Bishop to near San Diego, then continuing south-southwest over the Pacific Ocean. The 0700 chart showed a low-pressure system centered near Thermal, California, and a cold front extending from just northeast of Bishop to near El Centro, California, then continuing south-southwest.

Surface weather observations:

#### Tonopah

- 0400 - cirriform broken at indeterminate height, visibility 15 miles plus, temperature 31<sup>o</sup> F., dew point 24<sup>o</sup> F., wind 090<sup>o</sup> 5 knots, altimeter setting 29.84 inches.
- 0500 - cirriform broken at indeterminate height, visibility 15 miles plus, temperature 30<sup>o</sup> F., dew point 24<sup>o</sup> F., wind 120<sup>o</sup> 6 knots, altimeter setting 29.79 inches.

#### Bishop

- 0600 - measured 3,200 feet overcast, visibility 8 miles, light rain, temperature 34<sup>o</sup> F., dew point 32<sup>o</sup> F., wind 170<sup>o</sup> 14 knots, altimeter setting 29.76 inches (first observation of the day).

Edwards AFB

- 0400 - measured 4,500 feet overcast, visibility 15 miles, temperature 46° F., dew point 38° F., wind 270° 10 knots, altimeter setting 29.76 inches.
- 0500 - measured 1,500 feet overcast, visibility 7 miles, light rain shavers, temperature 43° F., dew point 40° F., wind 310° 8 knots, altimeter setting 29.76 inches, light rain showers, occasionally moderate.
- 0600 - measured 2,300 feet overcast, visibility 7 miles, light rain, temperature 42° F., dew point 41° F., wind 310° 8 knots, altimeter setting 29.75 inches, ceiling 1,700 variable 2,800 feet, light rain, occasionally moderate.

Palmdale

- 0300 - measured 4,000 feet broken, 5,500 feet overcast, visibility 10 miles, temperature 46° F., dew point 38° F., wind 170° 13 knots, altimeter setting 29.75 inches, rain began at 0245 and ended at 0256.
- 0400 - measured 3,000 feet broken, 5,500 feet overcast, visibility 7 miles, light rain, temperature 43° F., dew point 38° F., wind 120° 5 knots, altimeter setting 29.76 inches, rain began at 0328.
- 0500 Record Special - measured 2,500 feet overcast, visibility 7 miles, light rain, temperature 43° F., dew point 30° F., wind 100° 7 knots, altimeter setting 29.76 inches.
- 0600 - measured 2,500 feet broken, 5,000 feet overcast, visibility 7 miles, light rain, temperature 44° F., dew point 38° F., wind 200° 3 knots, altimeter setting 29.75 inches.

Burbank

- 0300 - 400 feet scattered, estimated 3,000 feet broken, visibility 4 miles, moderate rain, temperature 52° F., dew point 48° F., wind 120° 5 knots.
- 0400 - measured 2,300 feet broken, high broken, visibility 7 miles, temperature 51° F., dew point 47° F., wind 320° 4 knots, rain ended at 0335.



0500 - measured 1,000 feet broken, high broken, visibility 5 miles, light rain, temperature 50° F., dew point 46° F., wind 120° 4 knots, rain began at 0430.

0600 - measured 500 feet broken, 1,000 feet broken, visibility 4 miles, moderate rain, temperature 49° F., dew point 46° F., wind 320° 4 knots.

The Edwards AFB 0300 surface weather observation contained a remark that the freezing level was at 6,700 feet m.s.l., and at that level the relative humidity was 78 percent.

\*A pilot weather report contained in the 0515 Los Angeles pilot report summary was as follows:

"Edwards AFB to 10 miles east of Hector VOR, moderate turbulence, light to moderate rime icing, flight altitude 11,000 feet, C-124."

Pertinent in-flight weather advisories, issued by the Weather Bureau Forecast Offices in San Francisco at 0255 and Los Angeles at 0315, were as follows, respectively:

Valid 0255 to 0700. AIRMET Bravo 5. Northern and central California and extreme western Nevada. Mountains mostly obscured. Occasional moderate icing in clouds above 5,000 to 6,000 feet. Occasional moderate turbulence. Conditions continuing beyond 0700.

Valid 0315 to 0600. AIRMET Alfa 2. Southern California mountains north of Los Angeles - Palm Springs mostly obscured by clouds and a few shavers, with passes marginal or closed.

Local moderate icing in clouds above 3,000 feet above sea level. Occasional moderate to local severe turbulence up through 15,000 feet above sea level. Also, extensive low clouds coastal slopes south of Los Angeles - Palm Springs with ceilings less than 2 miles with fog. Mountain clouds spreading over remainder coastal mountains and conditions continuing beyond 0600.

Pertinent winds aloft observations were in part as follows for the stations selected:

<u>Height</u> <u>(1,000 ft. m.s.l.)</u>	<u>Direction</u> <u>(degree true)</u>	<u>Velocity</u> <u>(knots)</u>
<u>Winnemucca, Nevada 0400 P.s.t.</u>		
9	140	9
12	170	26
14	185	33
<u>Edwards AFB 0155 P.s.t.</u>		
10	160	18
12	160	39
14	160	49
<u>San Nicolas Island 0400 P.s.t.</u>		
9	230	29
12	215	33
14	195	37
<u>Yucca, Arizona 0315 P.s.t.</u>		
9	155	26
12	175	31
14	165	34

Prior to departing HTH, the first officer telephoned the Tonopah FSS and obtained weather information. This weather briefing was given by the controller on duty. In accordance with NEVT procedures, pertinent weather was entered on the NEVT flight release form, a copy of which remained at HTH. Under the heading titled: "Forecast En Route Weather," the following was inserted:

- TPH - High broken, visibility 15 plus
- PMD - Measured 4,000 broken, 5,500 overcast, visibility 10 miles
- BUR - 400 scattered, estimated 3,000 broken, visibility 4 miles
- LGB - Estimated 2,300 broken, 4,500 overcast, visibility 4 miles light rain

Under the heading "Forecast Weather at Destination":

- BUR - Ceiling 2,500 broken, 5,000 overcast, light rain
- LGB - 1,500 scattered, ceiling 7,000 overcast, light rain occasionally 1,200 broken, visibility 3 miles in rain and fog

In addition to the surface weather as listed in the flight release, the controller read the contents of AIRMET Alfa 2 to the first officer. At the conclusion of the weather briefing, the first officer filed a VFR flight plan with the TPH FSS.

### 1.8 Aids to Navigation

The following radio navigational facilities were available for crew use along the route set forth in NEVT's operations specifications:

MVA VTAC	115.1 MHz <u>9/</u>
Coaldale, Nevada (OAL) VTAC	117.7 MHz
BTY VTAC	114.7 MHz
China Lake Naval Air Station TACAN (NID)	CH 43, 110.6 MHz
PMD VTAC	114.5 MHz

The NID TACAN is a military station and required TACAN equipment for full utilization. Flight 708 did not have this equipment, but had DME. Tuning the DME to the paired frequency of NID (110.6) would permit Flight 708 to receive distance information from the TACAN; however, no azimuth information would be received.

There were no known interruptions to the output of any of these facilities while Flight 708 was airborne.

### 1.9 Communications

The only known communication from Flight 708 while airborne was received by the TPH FSS on the MVA frequency, requesting that the FSS open the aircraft's flight plan, which had been filed prior to departure.

### 1.10 Aerodrome and Ground Facilities

Not applicable.

### 1.11 Flight Recorders

No flight voice recorders were installed aboard N15570, nor are they required by current Federal Aviation Regulations.

### 1.12 Aircraft Wreckage

Impact occurred on the face of a sheer cliff at an elevation of 11,770 m.s.l., as measured by an aircraft pressure altimeter. This altimeter was cross-referenced, for accuracy, to the airport elevation at Lone Pine, California, and with the altimeters of helicopters in

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9/ MHz - Abbreviation for MegaHertz (megacycles).

service at the accident site. The main body of the wreckage slid down the cliff and came to rest 500 feet back from the cliff at an elevation of 11,400 feet m.s.l. The gradient from the main body of the wreckage to the base of the cliff varied from 45° to 55°, and aircraft parts were located between the main body of the wreckage and the cliff base. The site is above the snow line. (See Attachment 1.) The cliff, against which the aircraft crashed, formed a part of the south wall of an oblong bowl-shaped canyon, oriented east to west.

Parts of the structure and engines of N15570 were located at the base of the cliff, where impact occurred. Parts were scattered for approximately 400 feet down the slope to an area where large sections of the aircraft had come to rest, after sliding down the slope. The centerline of the wreckage scatter was aligned on a north-south heading.

The forward portion of the fuselage, including the cockpit enclosure, could not be identified, although portions of cockpit equipment were found in the wreckage.

Both wings separated from the center wing section at the wing attach point. The right wing was intact to the wingtip attach point, but the wingtip had separated. This section included the outboard flap and aileron with tab. The leading edge was crushed aft and outboard. All control cable breaks exhibited tensile failure. The left wing was intact from the attach point area to the wingtip, and included the aileron and outboard flap. The wing leading edge, at the inboard separation area, was crushed aft and inboard. The wing top skin and stringers were buckled upward and aft. The lower surface was rolled upward. The wingtip and 10 feet of the wing outboard leading edge were crushed upward and aft.

The aft fuselage and empennage section separated from the remainder of the fuselage, at the forward edge of the cargo door. The edges on the forward end of this segment were crushed to the left and aft. Both horizontal stabilizers and the vertical stabilizer were attached to this section.

The rudder was attached to the vertical stabilizer. All rudder attachments were complete. The trailing edge of the rudder was crushed forward. The upper portion of the rudder was crushed forward beyond the rudder to the stabilizer attach point.

The left and right horizontal stabilizers were intact. The right elevator separated from the stabilizer and was found in the wreckage scatter. The left elevator inboard section was attached to the stabilizer. The rib structure was crushed downward and forward. The outboard section was not recovered.

Both engines were located. The left engine was 200 feet down the slope, and the right was 500 feet down the slope in the main wreckage area. Both engines received impact damage and neither exhibited any evidence of in-flight or ground fire damage.

Visual inspection of the left engine through the Nos. 1 and 2 cylinder openings did not reveal any evidence of preimpact failure. The wafer-type oil screen was disassembled and inspected. Small amounts of carbon were present, but no evidence of metal contamination was noted.

The right engine was similarly examined utilizing the Nos. 3 and 4 cylinder openings with the same results. There were some small bronze-like metallic particles attached to the oil screen.

All of the flight, engine, and systems control panels were damaged from impact and ensuing fire. All of these instruments were broken away from their panels.

The main radio fuse panel and function box were found. All of the fuses were missing. The interior of the main radio function box was examined. The wiring was in good order and there was no evidence of overheating.

The instruments, radio units, and parts recovered at the site were documented. Settings and readings were recorded and, at a later date, certain units were taken to the appropriate facility for detailed examination.

One altimeter was found near the main wreckage cluster. Its glass was broken, the pointers were missing, the adjustment knob was broken off, and the altimeter setting was 29.78 inches.

The bent face of the other altimeter was recovered at the cliff base. It contained the ~~10,000-foot~~ and 1,000-foot pointer and scales. The 100-foot pointer and scale were missing. By comparison with a good, like-type altimeter, using the alignment pin marks, the following was noted:

- (a) Approximate altitude of 11,700 feet m.s.l.
- (b) Approximate altimeter setting of 29.78 inches.

An aircraft clock was found with the glass missing and the winding stem broken off. The case was intact, but the minute hand was loose. The time shown was 5:21.

The magnetic compass was recovered. The glass was broken and the card was loose. It indicated a reading of approximately 170°.

One directional gyro was recovered. The instrument was damaged by impact forces. The heading card contained the marks of the face aperture. The marks occurred approximately at 170° and 1950.

The gyro wheel of the turn and bank indicator was recovered at the cliff base. The wheel exhibited air nozzle damage to the drive buckets, concentric to the parallel sides of the wheel.

The following communications and navigational units were recovered. These units received impact damage, and some had been exposed to ground fire. These units were taken to and examined at the FAA Avionics Laboratory in Los Angeles, California, to establish crystal settings. The laboratory readings of these settings were as follows:

- |  |  |
|--|--|
| (a) VHF Navigation Receiver, Type 51R3 | 114.6  |
| (b) VHF Navigation Receiver, Type 51R3 | 114. (tenths switch destroyed by fire)                                       |
| (c) DME Interrogator                   | 111.6  |
| (d) VHF Transceiver                    | 122. tenths between .75 and .80  |
| (e) VHF Transceiver                    | whole number switch between 118. and 119., tenths switch between .40 and .45 |

Both ADF receivers, type MN-62A, were recovered showing varied degrees of external impact damage. The switches were found in the off position, with no evidence of impact damage. The front cover plates on the receiver units were loose. The ceramic shafts through the frequency plates were broken and the plates were free to move. Parts of both tuning control panels for these units were recovered. These units and parts of tuning panels were taken to the FAA Avionics Facility at Los Angeles for examination. The following was obtained using the tuning condenser drive mechanism measurements:

- ADF Receiver, tuned to 500 kHz on 410-850 Band
- ADF Receiver, tuned to 117 kHz on 100-200 Band

The magnetic bearing indicator was recovered. This unit was crushed in and bent to the left. The glass was broken and the TO/FROM pointer was missing. This unit showed a 159° reading.

The course indicator was recovered, crushed at the forward and aft ends. The forward frame of this unit was missing, and the adjustment stem was bent and broken at the aft end. This unit showed a 063° setting.

All radio and navigation components discussed above were subjected to severe impact forces.

Various other navigational and communications receivers and instruments were recovered and documented. Detailed descriptions are not considered relevant to the type of flight being conducted.

The main oxygen bottle was recovered in the main wreckage area. The lines were broken away, the valve on top of the bottle was closed, and the bottle was empty.

Three **small** oxygen walk-around bottles were recovered. The heads of two bottles were broken off. The third bottle was in good condition and had a 500 p.s.i. gauge reading.

Two oxygen flow regulators were recovered. Their pointers and face plates were loose. These regulators are located in the cockpit and serve the pilot and copilot positions. The flow metering knobs were missing; however, the flow valves in each regulator were in the closed position. The outlet fittings and supply lines were broken off.

Deicer boots were not installed on this aircraft. The isopropyl alcohol tank and motor-driven pump were not found. The propeller deicer pump switch was not found. The prop deicer flow control valves were found in the full open position. Switches and valves had been subjected to fire and impact damage.

### 1.13 Fire

There was no evidence of in-flight fire. All fire damage was caused by postimpact, fuel-fed fire.

### 1.14 Survival Aspects

This was a nonsurvivable accident.

Nine watches were found in the wreckage scatter. Those with intact crystals had stopped at the following times:

Lady's watch	5:08
Lady's watch	5:09
Man's watch	5:09
Man's watch	5:11

Watches with missing or destroyed crystals had stopped at the following times:

Man's watch	5:07
Lady's watch	5:10
Man's watch	6:20
Unidentified watch	7:05

### 1.15 Company Information

Mineral County Airlines, d.b.a. Hawthorne Nevada Airlines, is an air taxi operator based in Burbank, and holds Certificate No. 17-WE-66, issued by the FAA. They have been authorized by the Civil Aeronautics Board to operate large aircraft (over 12,500 lbs.). Under this authorization, the company, at the time of the accident, operated two DC-3's, including the crashed aircraft, and one L-049. They operate the following scheduled services: between Long Beach, Burbank, and Hawthorne, Nevada; between the San Francisco-Oakland area and Hawthorne, with occasional trips to Tahoe, California. Their main business is transporting customers to the gambling casinos in Nevada.

Hawthorne' Nevada Airlines operates their large aircraft under the operating rules of the FAR's Part 121, as set forth in their approved operation specifications. They have been authorized to utilize a flight following system in lieu of a dispatch system.

### 1.16 Search and Rescue

Immediately upon notification that the aircraft was missing, the Western Aerospace Rescue Recovery Center (WARRC), located at Hamilton Air Force Base, California, launched an intensive search which continued through March 8. Inclement weather, producing heavy snows, greatly hampered this effort. The WARRC reported that military volunteers and Civil Air Patrol (CAP) personnel participated in the search. A total of 426 sorties were flown, involving 944.3 flight-hours. The following types of aircraft were utilized:

- 13 - HC-130 (USAF Hercules)
- 3 - HC-97 (USAF Stratocruisers)
- 2 - HU-16 (USAF Albatross)
- 4 - T-28 (From USNAS China Lake)
- 172 - Light Aircraft from California CAP
- 38 - Light Aircraft from Nevada CAP
- 8 - Light Aircraft (Civilian Volunteers from Bishop, California)
- 1 - Helicopter (Civilian Volunteers from Bishop, California)

Seventy-eight ground teams and about 1,095 personnel were involved in the search. Approximately 302 ground vehicles were utilized. These included CAP vehicles and vehicles from Mineral County and Inyo County Sheriffs' offices.

A total of 188 mobile radio units and 83 fixed ground radio units were used.



There is no figure for the amount of monies expended for the search. The Air Force, in addition to supplying the fuel for its own aircraft, reimburses the CAP for the fuel and oil utilized in its aircraft and ground vehicles.

No definitive area for search could be established, since the flight gave no position reports and the exact flightpath was unknown. The searchers covered a wide area but met with no success. The full-scale search was suspended on March 8. As of that time, there were no reports of injury or death to any personnel involved in the search.

During the weekend of March 15 and 16, WARRC reported that the California CAP flew 49 sorties involving 22 light aircraft, which accumulated 103.5 flight-hours in the continuing search for the missing aircraft. During this effort, one aircraft was lost. It was reported to have crashed at the 12,500-foot level on Mt. Tom. There were three persons on board, who were subsequently rescued by helicopter. Two of the occupants were reported to have sustained undetermined back injuries. The third occupant received a leg injury. All were members of the California CAP. The aircraft was privately owned.

The search continued, on a spasmodic basis, with many false leads being followed, to no avail. On August 8, 1969, the wreckage was located by the pilot of a small aircraft from Bakersfield, California. The pilot returned in a helicopter the next day, August 9, and verified the wreckage as that of N15570. Later that same day, a Kaman H43B helicopter from WARRC flew two sorties to the accident site from Lone Pine, transporting Inyo County Sheriff's and China Lake Mountain Rescue Group's personnel to the scene.

On August 10, the helicopter crashed while attempting to land near the accident site. At the time, the helicopter was carrying a crew of three, the Inyo County Sheriff, and the County Coroner. The Sheriff received injuries, requiring his hospitalization, and the helicopter was extensively damaged.

## 2. ANALYSIS AND CONCLUSIONS

### 2.1 Analysis

The examination of the aircraft wreckage and systems disclosed no evidence of any mechanical, electrical, powerplant, radio, or navigational system malfunctions that would have contributed to this accident. Further, there was no evidence of any flight instrument error.

The Board finds that the causal factors of this accident lie within the areas of navigation and weather.

The wreckage was located on the east slope of Mount Whitney, 11 nautical miles west of Lone Pine, California. The aircraft had impacted the south wall of an oblong, bowl-shaped, east-west oriented canyon at a measured altitude of 11,770 feet m.s.l. The aircraft was on a southerly heading of approximately  $170^{\circ}$  to  $195^{\circ}$  magnetic and in a cruise attitude at the time of impact. Except for an area north to northeast, the walls of the canyon extend to an elevation greater than the altitude of the impact point. The aircraft would have had to track between  $180^{\circ}$  to  $225^{\circ}$  magnetic to gain entrance to the canyon on its north side and reach the crash site on the south wall.

Although the authorized route for this flight, as set forth in Hawthorne Nevada Airlines operations specifications, required the aircraft to join V105 airway northwest of Mina VOR, then proceed via V105 to Beatty VTAC, then direct to Inyokern Airport, direct to Palmdale VTAC, then via Federal Airways to Burbank, the crew filed a VFR flight plan requesting a direct flight between Hawthorne and Burbank. The most obvious route from Hawthorne to the impact site would have been down the Owens Valley, over Bishop, California, to the impact site. This route most closely approximated the direct route as requested on the VFR flight plan.

The ATD (Actual Time of Departure) as given by the crew to Tonopah FSS was 0350. The approximate time of impact, as determined by the stopped watches at the crash site, was 0510. The approximate elapsed time of 1 hour and 20 minutes was sufficient to permit Flight 708 to fly the route from Hawthorne, over Bishop, down the Owens Valley to the impact site. This is considered the route taken by the flight. There was no logical or conceivable reason to believe the crew would fly the authorized route part way and then deviate. Also, the elapsed time from ATD to impact was insufficient to allow such a route to be flown.

The width of the Owens Valley (a NNW-SSE oriented valley), measured from mountain peak to mountain peak, is only about 20 nautical miles. The terrain rises above 14,000 feet m.s.l. on either side of the valley. No VOR airways traverse the valley, nor are there any VOR/VTAC facilities close enough to supply reliable navigation information. There were no usable facilities in this area that would permit accurate utilization of the ADF. In addition, both ADF switches were found in the off position, with no evidence of impact damage.

At an altitude of 11,500 feet m.s.l., the route required the crew to navigate a slot approximately 100 nautical miles long and about 20 nautical miles wide. To accomplish this feat safely, the flightcrew would have to maintain continuous reference to known ground checkpoints, and the mountains would have to be visible.

The crash occurred at night. There was no moon. The aircraft impacted in a cruise attitude. There was no indication of any evasive action being taken. Therefore, the Board is of the opinion that the terrain was not visible to the crew.

At 0400, a cold front was lying along the western side of the valley. By 0700, the front had crossed the valley. Sequence reports showed lowering ceilings over the route of flight. The first weather report of the day from Bishop, issued at 0600, reported a measured ceiling of 3,200 feet with light rain. The accident probably occurred behind the cold front. The weather would have been characterized by low overcast, clouds, and snow. The accident site would have been obscured by clouds, and cloud tops would have been above 20,000 feet m.s.l. Precipitation and moderate to heavy icing conditions would have been encountered.

As Flight 708 proceeded down the valley, it was operating close to the cold front. The aircraft could have been flying beneath an overcast, between cloud levels, in an area of precipitation, or completely upon instruments. Support for the conclusion that the aircraft was operating in or into icing conditions was found in the position of the propeller anti-icing flow valves. The propeller deicer pump switch was not found. The flow valves were found in the full open position. Impact forces would not affect the position of these valves. The valves would not have been opened unless the aircraft was either in, or entering into, icing conditions.

As Flight 708 proceeded south down the valley, it entered an area of worsening weather caused by the eastward movement of the cold front. Whether the aircraft was entirely on instruments, in and out of clouds, between or below layers, or operating in snow, is not known. Whatever the flight conditions, forward visibility must have become severely restricted. With the loss of ground reference, the possibilities of navigating the Owens Valley at 11,500 feet m.s.l. were almost nil. There were no radio navigational facilities within range from which reliable information could be obtained. Laboratory analysis of the crystal settings on the VOR receivers did not place them on any reliable VOR frequency. The crystal settings, coupled with the onmi-bearing selector settings, suggest the possibility that BTY and PMD VTAC's were being utilized. The intelligence received from these facilities would be unreliable due to the mountainous terrain, as well as the range and altitude of the aircraft from the transmitting stations.

The point of impact was approximately 11 nautical miles from the approximate center of the valley. Examination of the compass cards of the magnetic compass and directional gyro indicated the aircraft was on a heading between 170° to 195°.

A course of approximately  $145^{\circ}$  is necessary in order to take the flight down Owens Valley. There was a headwind averaging  $165^{\circ}$  at 35 knots acting on the aircraft during the flight time of over an hour.

As previously discussed, there were no reliable navigational aids from which the flight might adequately pinpoint their position as they progressed down Owens Valley. The only navigational system available was a system of dead reckoning, DR (heading, time, and distance). This system involves establishing a heading that will make good a specific track. The heading is held for the time computed as necessary to cover the distance desired.

The distance from Hawthorne to a point south of Owens Lake and west of the China Lake restricted area (R2505) is about 145 miles. This point would be out of Owens Valley and the terrain could be successfully overflown at the flight's altitude of 11,500 feet. Having reached this point, the flight could take up a more southerly heading and proceed on to Palmdale.

The crew received no winds aloft information and therefore could not know that they were flying in a headwind of about 35 knots. This, of course, results in a lower than anticipated ground speed. Therefore, in the flight time of a little over an hour at a ground speed of approximately 105 knots, and with due consideration for climb-to-flight altitude, the aircraft would progress to a position north-northeast of Mount Whitney, instead of out of the Valley south of Owens Lake. The Board, therefore, concludes that the crew proceeded down Owens Valley, unaware of the headwinds, to a point in time where they felt they were out of the Valley. At this position, they took up a more southerly heading ( $170^{\circ}$  to  $195^{\circ}$ ) in order to proceed to Palmdale. In actuality, they were north-northeast of Mount Whitney. The southerly heading placed the aircraft on a course which took it into the north opening of the canyon and against the south wall.

In summary, the Board finds that after takeoff, Flight 708 climbed and proceeded toward Bishop, California, at an altitude of 11,500 feet m.s.l. Sometime after the aircraft passed over Bishop, an area of deteriorating weather was encountered, with an ensuing loss of forward visibility. The loss of visibility rendered pilotage by outside visual reference impossible, and the flight attempted to traverse the Owens Valley using DR navigational methods. There were no accurate radio navigational aids available. Unaware of the headwinds, the crew changed course when they thought they were out of the Valley and struck the mountains on the west side of the Valley.

## 2.2 Conclusions

### (a) Findings

1. N15570 was certificated and maintained in an airworthy condition as prescribed by FAA regulations.
2. N15570 was not equipped with wing and empennage deicer boots.
3. The company's Minimum Equipment List (MEL) barred flight when areas of known or probable icing exist, or are forecast to exist for the route to be flown.
4. N15570 was below the maximum gross weight allowable for takeoff, and within the allowable c.g. limits at takeoff from Hawthorne, Nevada.
5. The flightcrew was properly qualified and in compliance with FAA flight time limitations and crew rest regulations.
6. The weather briefing was adequate. Based on the information available, the crew should have been alerted to the probability that weather conditions in the Owens Valley could become marginal for a VFR flight. The crew did not request and did not receive a briefing on the winds aloft over the proposed route of flight.
7. A VFR flight plan was filed by telephone with FSS at Tonopah.
8. The route of flight as filed was Hawthorne to Burbank direct, with 11,500 feet m.s.l. as the en route altitude.
9. The ~~time~~ of departure from Hawthorne was approximately 0350 P.s.t., and ~~time~~ of impact was approximately 0510 P.s.t.
10. The route of flight was from Hawthorne, direct to Bishop, and then to point of impact.
11. A magnetic heading of about 145<sup>o</sup> was necessary to traverse Owens Valley.
12. A change of heading to 170<sup>o</sup> to 195<sup>o</sup> was made just prior to impact, which brought the aircraft into the canyon and up against the south wall.

13. A change of heading was made because the crew thought they were out of the Valley and in a position to take up a more southerly heading toward Palmdale.
14. The aircraft was in straight and level flight when it struck the canyon wall at the 11,770-foot level.
15. The altimeters were properly set, and there was no altimetry error.
16. The accident site was obscured because of weather and darkness.
17. The propeller anti-icing flow valves were positioned full open.
18. The electrical, radio navigation, and communications systems were functioning properly.
19. There are no reliable navigational aids in Owens Valley.
20. Both engines were delivering power in the cruise range at impact.
21. There was no evidence of in-flight structural failure or fire.
22. This was a nonsurvivable accident.

(b) Probable Cause

The Board determines that the probable cause of this accident was the deviation from the prescribed route of flight, as authorized in the company's FAA-approved operations specifications, resulting in the aircraft being operated under IFR weather conditions, in high mountainous terrain, in an area where there was a lack of radio navigation aids.

3. RECOMMENDATIONS

As stated in this report, the aircraft was declared missing on February 18, 1969. The wreckage was not located until August 8, 1969, a period of almost 6 months. During this period, considerable effort, monies, and manpower went into an extensive search. Although the search was systematic and extensive at its beginning, as time went on, the efforts narrowed as interest waned and manpower and machines became more difficult to obtain.

Had the wreckage been located earlier, that is, directly after the crash instead of some 6 months later, the cost of the search and rescue effort would have been reduced substantially. In addition, exposure of man and machines to hazardous flight and ground search conditions would have been minimized. We know now that none of the lives on board this aircraft would have been saved through expeditious location of the wreckage, but history tells us there have been survivors of other accidents that have perished awaiting rescue.

A crash locator beacon, activated once the aircraft had crashed, would have provided an expeditious means of locating the aircraft. By letter dated May 31, 1968, the Safety Board commented favorably to the FAA Administrator concerning Information Release 68-12 and Advanced Notice of Proposed Rule Making (NPRM) 68-4 on the subject "Crash Locator Beacon Requirements for General Aviation."

In March of 1969, the FAA circulated NRM 69-11, "Crash Locator Beacons and Survival Radio Equipment for Air Taxi Operators and Commercial Operators of Small Aircraft." By letter to the Administrator dated May 26, 1969, the Safety Board commented favorably to the proposal. It was pointed out that a crash locator beacon would have been of assistance in locating N15570, which was missing at that time.

BY THE NATIONAL TRANSPORTATION SAFETY BOARD:

/s/ JOHN H. REED  
Chairman

/s/ OSCAR M. LAUREL  
Member

/s/ FRANCIS H. McADAMS  
Member

/s/ LOUIS M. THAYER  
Member

/s/ ISABEL A. BURGESS  
Member

February 4, 1970.

Investigation and Hearing

1. Investigation

On the afternoon of February 18, 1969, the Board was notified that the aircraft was missing and presumed down on a flight from Hawthorne, Nevada, to Burbank, California. Investigators departed immediately for Hawthorne and Burbank. Since the aircraft was not located at that time, only the operational and maintenance records phases of the investigation were conducted. Interested parties included the Federal Aviation Administration, Hawthorne Nevada Airlines, and Pratt & Whitney Aircraft Division of United Aircraft Corporation. This phase of the investigation was completed on February 25. Since the aircraft had not been located, the investigators departed for their home bases.

On August 8, 1969, the wreckage of N15570 was sighted. On August 9, the sighting was confirmed and investigators moved into the site on August 11. Systems, Human Factors, and Structures/Powerplants groups were organized to conduct the investigation at the site.

The on-scene investigation was completed on August 14.

2. Hearing

There was no public hearing.

3. Preliminary Reports

An interim report of investigation summarizing the facts disclosed by the first phase of the investigation was published on April 17, 1969.



Crew Information

Captain Fred William Hall

Captain Hall, born May 6, 1925, was employed by Hawthorne Nevada Airlines on June 1, 1964. He held Airline Transport Certificate No. 432915, with ratings in the DC-3, DC-4, C-46, L-049, and Martin 202/204. He satisfactorily passed his last physical examination for a first-class medical certificate on September 3, 1968, with no limitations.

Captain Hall had accumulated a total of 16,348 hours, including 6,000 hours in the DC-3. He had flown 519.9 hours in 1968. He had flown a total of 27.8 hours in the past 90 days, and, 3.3 hours in the past 30 days. There was no flight time recorded for Captain Hall in January. He flew 3.3 hours in the L-049 on February 12, 1969. He logged 2.5 hours instrument time in 1968.

Captain Hall received his last proficiency check on January 3, 1969, his last en route check (L-049) on June 26, 1968, and completed recurrent ground training in December 1968.

Captain Hall was listed as company Director of Operations, Chief Pilot, as well as FAA Authorized Check Airman in the DC-3 and L-049.

First Officer Raymond Hamer

First Officer Hamer, born November 19, 1927, was employed by the company on April 15, 1965. He held Commercial Pilot Certificate No. 1332332, which was upgraded to an Airline Transport Certificate on January 1, 1969. He satisfactorily passed a first-class medical examination on November 26, 1968, and was issued a certificate with no limitations.

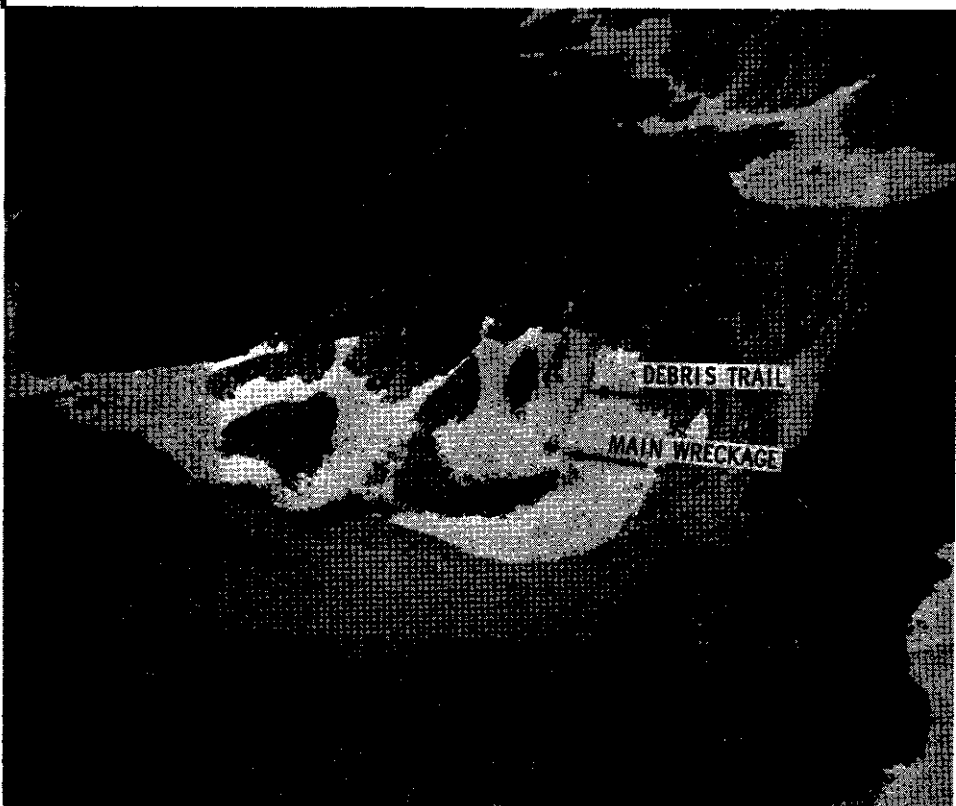
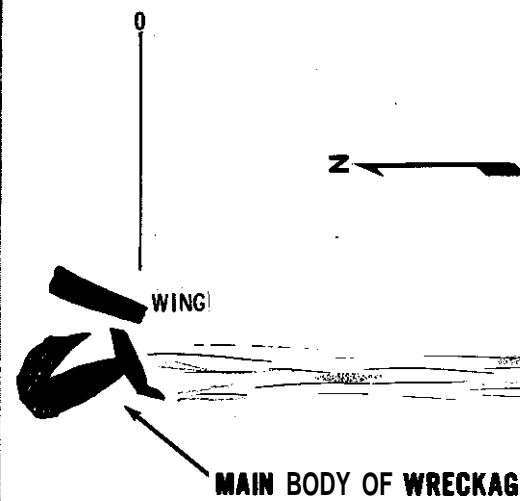
Mr. Hamer had accumulated a total of 3,445 hours, of which 967.9 were flown in 1968. He flew 162.4 hours in the last 90 days, and 53.4 hours in the last 30 days. He recorded no instrument time in 1968, 0.5 hours in January 1969, and 0.0 hours in February 1969.

Mr. Hamer received a line check on February 1, 1969, and an instrument proficiency check the same date. He completed 5 hours of Link proficiency training on January 30, 1969, and 16 hours of recurrent ground school training on January 21, 1969.

Stewardess Patricia S. Nannes

Stewardess Nannes, born August 9, 1947, **was** employed by the company in September 1968. She completed a 50-hour airline stewardess program on October 25, 1968, and flew as stewardess on both the **DC-3** and L-049.

The flightcrew had 24 hours rest prior to departing Long Beach, California, and a rest period of approximately 4 hours between the time of landing at Hawthorne and the departure for Burbank.

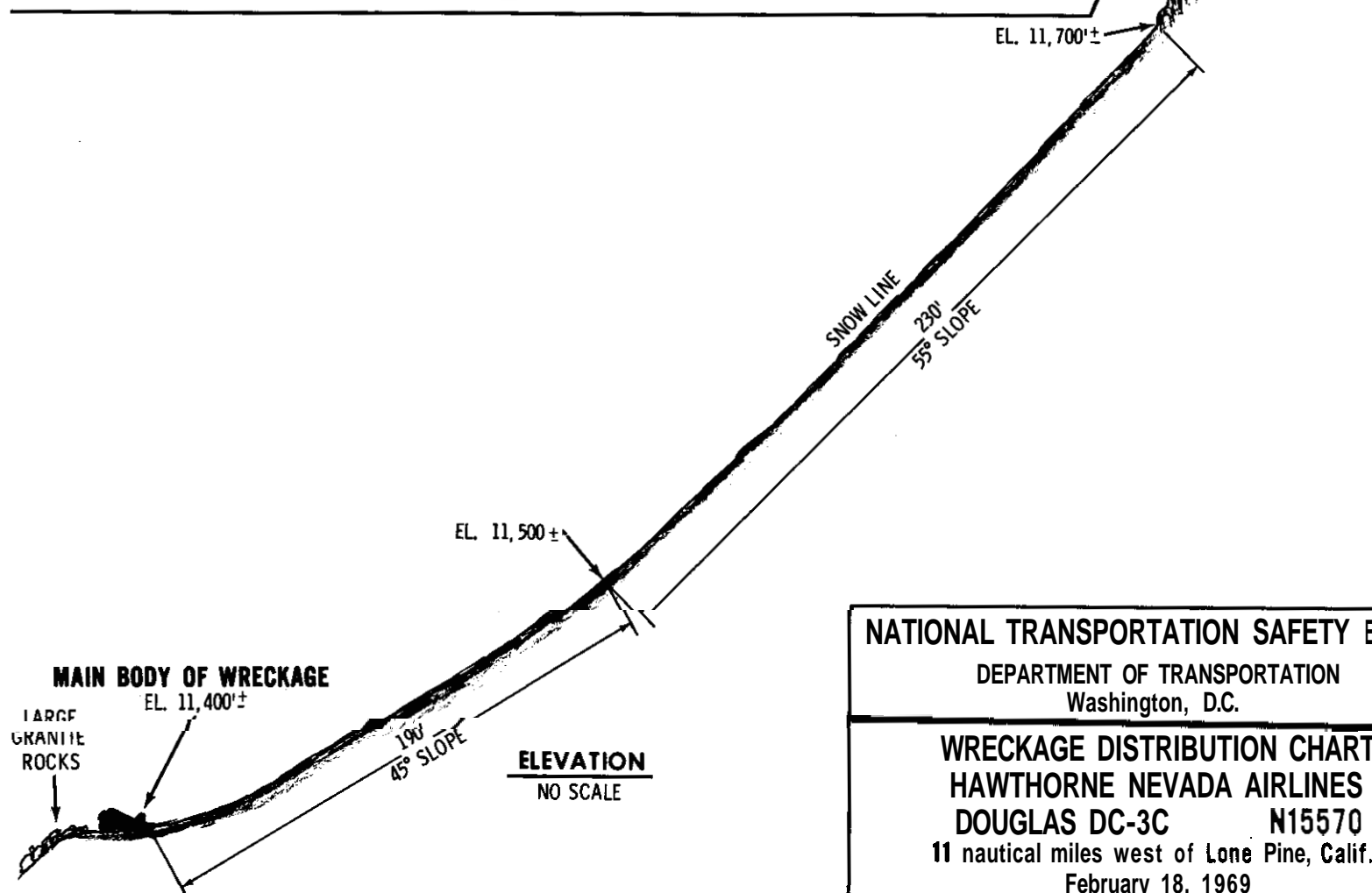
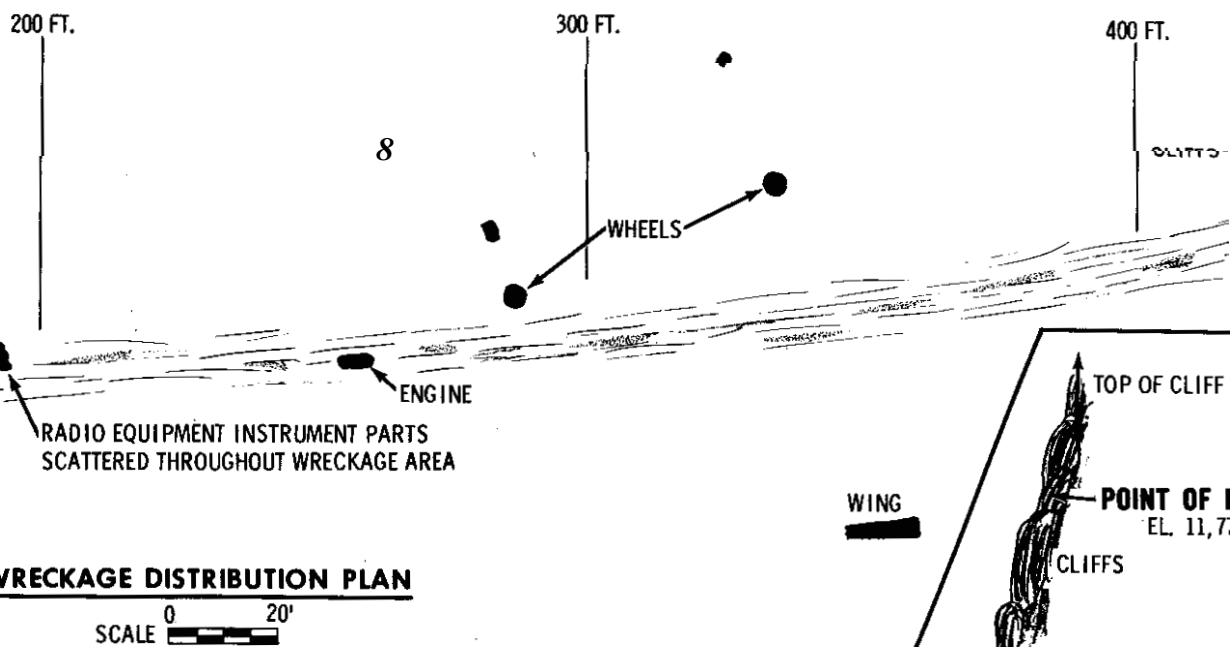


LOOKING SOUTHEAST



Ⓜ = HELIPAD

LOOKING SOUTH



NATIONAL TRANSPORTATION SAFETY BOARD  
 DEPARTMENT OF TRANSPORTATION  
 Washington, D.C.

**WRECKAGE DISTRIBUTION CHART**  
**HAWTHORNE NEVADA AIRLINES**  
**DOUGLAS DC-3C N15570**  
 11 nautical miles west of Lone Pine, Calif.  
 February 18, 1969