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AIRCRAFT ACCIDENT REPORT. WOLFE INDUSTRIES, INCORPORATED,  
BEECH 65-A90 KING AIR, N57V, AMERICAN UNIVERSITY CAMPUS,  
WASHINGTON, D. C. JANUARY 25, 1975

National Transportation Safety Board  
Washington, D. C.

28 January 1976

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<p>About 1210 e. s. t., on January 25, 1975, a Wolfe Industries, Inc., Beech 65-A90, King Air (N57V) crashed while conducting a VOR/DME approach to runway 18 at Washington National Airport, Washington, D. C.</p> <p>The aircraft struck the top of a 398-foot radio transmission tower located on the American University campus about 5 nmi northwest of the runway and approximately 1/2 mile north of the instrument approach course.</p> <p>Five persons on board the aircraft were fatally injured. The aircraft was destroyed.</p> <p>The National Transportation Safety Board determines that the probable cause of this accident was an unauthorized descent below the published minimum approach segment altitude during an instrument approach in instrument meteorological conditions for reasons undetermined.</p> <p>While recognizing that Air Traffic Control should have issued crossing altitude restrictions with the approach clearance and should have issued a more timely safety advisory, the Board, however, is unable to conclude that the issuance of such altitude restrictions and safety advisory in these circumstances would have prevented the occurrence of the accident.</p>					
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NATIONAL TRANSPORTATION SAFETY BOARD  
WASHINGTON, D. C. 20594

## AIRCRAFT ACCIDENT REPORT

Adopted: January 28, 1976

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WOLFE INDUSTRIES, INC.  
BEECH 65-A90 KING AIR, N57V  
AMERICAN UNIVERSITY CAMPUS  
WASHINGTON, D. C.  
JANUARY 25, 1975

SYNOPSIS

About 1210 e. s. t, on January 25, 1975, a Wolfe Industries, Inc., Beech 65-A90, King Air (N57V) crashed while conducting a VCR/DME approach to runway 18 at Washington National Airport, Washington, D. C. The ceiling was 700 feet overcast and the visibility was more than 20 miles.

The aircraft first struck the top of a 398-foot radio transmission tower, 763 feet m. s. l., located on the American University Campus about 5 nmi northwest of the runway. The main wreckage crashed in the backyard of a residence located on the campus grounds.

Five persons on board the aircraft--two flight crewmembers and three passengers--were fatally injured. The aircraft was destroyed by impact and fire. No persons on the ground were injured.

The National Transportation Safety Board determines that the probable cause of this accident was an unauthorized descent below the published minimum approach segment altitude during an instrument approach in instrument meteorological conditions for reasons undetermined.

While recognizing that Air Traffic Control should have issued crossing altitude restrictions with the approach clearance and should have issued a more timely safety advisory, the Board, however, is unable to conclude that the issuance of such altitude restrictions and safety advisory in these circumstances would have prevented the occurrence of the accident.

## 1. INVESTIGATION

### 1.1 History of Flight

At 1047 <sup>1/</sup> on January 25, 1975, Wolfe Industries, Inc., Beech 65-A90 King Air (N57V) departed Columbus, Ohio, on an instrument flight plan to the Washington National Airport, Washington, D. C. Two pilots and three passengers were aboard the corporate business flight.

The flight into the Washington area was routine, and no problems were reported with the aircraft or its systems. At 1158:20, N57V contacted Washington Approach Control and reported that the flight was maintaining an altitude of 8,000 feet. The approach controller advised the flight to maintain 8,000 feet and to depart Aldie Intersection <sup>2/</sup> on a heading of 100° "for (radar) vectors to the final approach course" for landing on runway 18 at Washington National Airport.

At 1204:20, the approach controller cleared N57V to descend to, and maintain, 5,000 feet. The flight acknowledged the clearance. At 1204:51, when the flight was about 18 nmi NW of the airport, approach control cleared N57V to descend to, and maintain, 3,000 feet and to fly on a heading of 120°. The flight acknowledged this clearance and reported out of 7,200 feet at that time.

At 1205:56, the approach controller advised the flight, "King Air five seven Victor fifteen northwest cleared VOR/DME runway one eight approach." The flight replied, "Okay we're cleared for the approach, fifty seven Victor." The approach controller then requested, "Two five seven Victor like for you to keep your airspeed up as much as you can on final."

At 1207:44, when the aircraft was about 12 nmi NW of the airport, N57V was requested to contact the tower, at which time communications with the flight were transferred from approach control to the Washington National Tower (local control) radio frequency. At 1209:45, the local controller, after observing the radar target of N57V to the left of the final approach course, advised the flight, "November five seven Victor looks slightly left of course." The flight replied, "Okay we'll check."

<sup>1/</sup> All times herein are eastern standard, based on the 24-hour clock.

<sup>2/</sup> The intersection of the Victor 4 Airway and the Casanova VOR 039° radial, 28 nmi WNW of the Washington National Airport.

The local controller stated that when he first observed the radar target associated with N57V on his radar (BRITE) display, it was between 8 and 9 miles NW of the airport and approximately 1 mile to the left of the final approach course. He said that the aircraft appeared to be paralleling the approach course at that point. He also stated that he did not, at any time, notice the altitude information relating to N57V on his radar display.

Meanwhile, the approach controller was monitoring the progress of N57V. The transcription of certain "background conversations" (see Appendix H ) indicates that at 1209:02 a remark was made concerning the aircraft's failure to "pick up that radial," at 1209:06 comment was made concerning "some towers down there"; at 1209:32 the question was asked whether "that guy shouldn't be that low up there, should he?"; and at 1209:39 a statement was made "\*\*\* thousand feet up there, (is that what it is?)".

Thereafter, at 1210:00, the approach controller, who had been watching the radar target and associated altitude information of N57V on his radarscope, called the local controller on the intercom and advised, "Five seven victor looks pretty low up there and a little bit off the radial." The approach controller stated that at the time of this observation, N57V was between 5 and 7 miles from the airport, 1/2 to 1 mile to the left of the approach course and at an altitude of 1,200 feet as displayed on the altitude readout associated with the radar target. The local controller acknowledged this message, and, at 1210:05, transmitted the following: "November five seven victor I show left of course. Does that check?" There was no reply from N57V to this advisory nor were there any further communications with the flight.

At approximately 1210, N57V struck the top of a radio transmission tower located on the campus of American University about 5 nmi from the approach end of runway 18. The tower rose 398 feet above the ground level.

When the aircraft struck the tower, its left wing and left gear separated. The remainder of the aircraft crashed behind a private residence located on the campus, about 920 feet from the radio tower.

An aeronautically qualified witness, who was standing near the base of the radio tower when the plane struck, stated that the sky was overcast and that the bottoms of the clouds were obscuring the top 30 feet of the tower. Although light rain was falling, he said the forward

visibility was very good. He first heard the sound of a low-flying aircraft, but could not see anything when he looked in the direction of the noise. He stated that a few seconds later, "... as I was looking at the tower to see where the overcast was, to measure it on the tower, the aircraft flew into my field of view and struck the tower.... It appeared to be in straight and level flight, and it was at the base of the overcast. I could see the cockpit. It appeared the aircraft had just gone VFR at the moment of the tower.... I saw the left wing depart the aircraft. The aircraft continued what looked to me to be in its line of flight, and then began tumbling. There was no explosion in the air ... and there was no explosion until it impacted the ground." The witness also stated that the engines sounded normal and were running at a "relatively high rpm."

1.2 Injuries to Persons

<u>Injuries</u>	<u>Crew</u>	<u>Passengers</u>	<u>Others</u>
Fatal	2	3	0
Nonfatal	0	0	0
None	0	0	

1.3 Damage to Aircraft

The aircraft was destroyed by impact and ground fire.

1.4 Other Damage

The radio tower was damaged slightly. Two high-voltage wiring circuits attached to the structure were broken. A small detached building, located behind a private residence, was damaged slightly by impact and smoke; two windows in a campus residence hall were broken by falling debris.

1.5 Crew Information

The captain and the copilot were qualified to serve as crewmembers on this flight. (See Appendix B.)

1.6 Aircraft Information

The aircraft was certificated and maintained according to Federal Aviation Administration (FAA) requirements. (See Appendix C.)

1.7 Meteorological Information

For the times indicated, the official surface weather observations at Washington National Airport were, in part, as follows:

0955 -- measured ceiling, 400 feet overcast, visibility -- 3 miles, light rain, fog, temperature -- 51° F, dew point -- 48° F, wind -- 180° at 10 kn; altimeter setting -- 29.55 in; runway 36 visual range -- 1,400, variable to more than 6,000 feet, fog bank over river and runway 36.

1051 -- measured ceiling, 400 feet overcast, visibility -- 10 miles, light rain, temperature -- 52° F, dew point -- 49° F, wind -- 180° at 8 kn; altimeter setting -- 29.51 in; pressure falling rapidly, fog bank over river.

1125 -- Special, measured ceiling, 500 feet broken, 1,000 feet, overcast, visibility -- 10 miles, wind -- 180° at 6 kn; altimeter setting -- 29.45 in; pressure falling rapidly, fog bank over river.

1154 -- measured ceiling, 700 feet overcast, visibility more than 20 miles; temperature -- 53° F; dew point -- 51° F; wind -- 200° at 10 kn, altimeter setting -- 29.41 in; visibility lower north, pressure falling rapidly, rain ended at 1115.

1221 -- Local, measured ceiling, 700 feet broken, 1,200 feet overcast, visibility more than 20 miles; wind -- 190° at 10 kn; altimeter setting -- 29.38 in; pressure falling rapidly.

The area winds aloft, as measured at Dulles Airport, were as follows:

0700

<u>Altitude</u> <u>ft. msl</u>	<u>Direction</u> <u>degrees true</u>	<u>Speed</u> <u>kn</u>
1,000	205	18
2,000	225	29
3,000	240	34
4,000	240	37

1900

<u>Altitude</u> <u>ft. msl</u>	<u>Direction</u> <u>degrees true</u>	<u>Speed</u> <u>kn</u>
1,000	270	24
2,000	270	32
3,000	270	37
4,000	270	41

The 24-hour terminal forecast for Washington National Airport on January 25, 1975, valid beginning 1000 was, in part, as follows:

1000 - 1700, ceiling, 1,000 feet broken, 2,500 feet overcast, visibility -- 4 miles, light rain and fog; wind -- 180° at 10 kn; variable to ceiling 500 obscured; visibility -- 1/2 mile, moderate rain and fog.

The continuous automatic terminal information service (ATIS) transmission relevant to the approach of N57V was as follows:

1130:57 (Initial Broadcast QUEBEC)

This is Washington National Airport information Quebec measured ceiling 500 broken, 1,000 overcast visibility 10, temperature 5°<sup>0</sup>, wind 180 degrees 6, altimeter 29.45 in. pressure falling rapidly north operation ILS runway 36 approach in use fog bank reported over the river. This is information Quebec.

(Broadcast every 34 seconds until 1157:55)

1157:55 (Initial Broadcast ROMEO)

This is Washington National Airport information Romeo weather. Measured ceiling 700 overcast, visibility more than 20, temperature 53°<sup>0</sup>, wind 200 degrees 10, altimeter 29.41, VOR DME runway 18 approach in use. Advise you have Romeo.

(Broadcast every 26 seconds until 1254 when Romeo terminated)

## 1.8 Aids to Navigation

There were no reported failures or malfunctions of any of the navigational radio aids (NAVAIDS) or associated components which served Washington National Airport when N57V was conducting the landing approach.

Following the accident, the FAA flight-checked all of the NAVAIID facilities and system components and found them to be operating satisfactorily.

The published procedure for a VOR/DME approach to runway 18 uses the Washington VOR/DME facility, which is located on the Washington National Airport. (See Appendix D.) This procedure requires that an inbound course of 153° be flown from the 11 DME <sup>3/</sup>fix with a minimum crossing altitude of 3,000 feet at that point. After the aircraft passes the 11 DME fix, the procedure prescribes minimum crossing altitudes of 2,100 feet at the 7 DME fix, 1,500 feet at the 5 DME fix, and 900 feet at the 3 DME fix (the final approach fix (FAF)). After passing the FAF, descent can begin to the authorized minimum descent altitude (MDA) of 720 feet.

According to the chief pilot for Wolfe Industries, Jeppesen approach charts were used by the captain of N57V. On the date of the accident, the current Jeppesen approach chart for the VOR/DME runway 18 approach was dated November 30, 1973.

## 1.9 Communications

There were no reported difficulties with air-to-ground communications between N57V and the Washington National Tower. Persons familiar with the voices of the crewmembers listened to the ATC recording and identified the copilot as making all transmissions from N57V. (See Appendix E.)

The Safety Board noted that at 1205 an erroneous altimeter setting of 30.41 was transmitted to a Piedmont Airlines flight immediately preceding N57V on the approach. Both aircraft were on the approach control radio frequency at the time of this transmission. The captain of the

3/ Distance measuring equipment - reference in nautical miles from the VORTAC facility to the aircraft and displayed numerically on the DME indicator in the cockpit.

Piedmont flight recalled hearing only the last two digits ("41") of the transmitted setting. He stated that it was within the range that he had expected and advised the copilot that the altimeter was the same as the ATIS information that they had previously received.

The Piedmont flight completed the approach without incident.

1.10 Aerodrome and Ground Facilities

Not involved.

1.11 Flight Recorders

There were no flight recorders installed in N57V nor were they required.

1.12 Wreckage

The aircraft's left wing and left engine propeller were the first components to hit the 398-foot radio tower. The contact point was 720 feet m. s. l. The highest point of the tower was 763 feet m. s. l.; ground elevation at that point is 365 feet m. s. l. When the left wing struck the tower, it separated from the aircraft and landed about 300 feet southeast of the tower. The remainder of the aircraft continued on a heading of 165°, magnetic, for approximately 920 feet, and crashed in the backyard of a residence located on the American University campus. The total wreckage was confined to an area approximately 956 feet long and 48 feet wide.

The fuselage was fragmented and consumed by ground fire. The right wing remained with the fuselage and was damaged by impact and ground fire. The left wing, which had separated just outboard of the engine nacelle at wing station (WS) 99, was found complete from that point to the wingtip with the outboard flap and the aileron still attached. The wing leading edge, outboard of the separation point for approximately 2 feet, was bent up and aft.

The right and left wing flap actuators were recovered in the fully retracted position. The cockpit flap selector handle was found in the full "up" position, which corresponds to a flap-retracted position.

Because the aircraft broke up and was burned extensively, the integrity of the flight control system before impact could not be determined. The continuity of all control cables was disrupted somewhere between the cockpit and their respective attach points.

The landing gear assemblies and the mechanical actuators were recovered. All of the actuators were fully extended. The landing gear selector handle in the cockpit was found in the "up" position, which corresponds to a gear retracted position.

Examination of both engines revealed no evidence of failure or malfunction before impact.

Only the captain's encoding altimeter was recovered in the wreckage. The front and rear sections of the instrument were sheared off and could not be found. The remainder of the case was dented and burned. The barometric setting was 29.40 in. and the altitude counter was at 550 feet. The altitude pointer and the failure monitor warning flag were missing. The copilot's altimeter was not recovered.

Both course indicators were recovered. The captain's instrument was found with a heading indication of  $174^{\circ}$ , a selected heading of  $174^{\circ}$ , and a selected course of  $154^{\circ}$ . The course deviation needle was positioned three "dots" to the right of center, the "to/from" indicator showed "to"; the heading and navigation failure warning flags were masked.

The copilot's instrument showed a heading of  $176^{\circ}$ , a selected heading of  $144^{\circ}$ , and a selected course of  $144^{\circ}$ . The "to/from" indicator showed "to", and the heading and instrument failure warning flags were masked. The DME showed 5.4 miles.

#### 1.13 Medical and Pathological Information

Postmortem examinations of the captain and copilot disclosed no evidence of incapacitating disease.

#### 1.14 Fire

There was no evidence of in-flight fire. The major portion of the fuselage and right wing were consumed by ground fire, and portions of the vertical and horizontal stabilizers were damaged by ground fire.

1.15 Survival Aspects

This accident was not survivable.

1.16 Tests and Research

1.16.1 Altimeter Examination

Under the direction of the Safety Board, the captain's encoding altimeter, an Intercontinental Dynamics Corporation Type No. 519, S/N 570, was disassembled and examined. Following are some of the findings of that examination:

1. The wheel on the altitude counter drum assembly, which indicates hundreds of feet, was bent over by the figure numeral '5', thereby suggesting a 500' reading at impact. The gear which drove the counter had marks on the teeth which suggested that impact occurred when the reading was between 400' and 500' of altitude. This gear was out of mesh with the gear which normally drove it; so the counter could have moved after initial impact.
2. An electrical test was made on the altitude alerter potentiometer, which was directly geared to the altitude pointer and counter drum assembly. The electrical readout was equal to an indicated altitude of 940 feet. However, the stator of the potentiometer could be rotated by hand. Further examination showed that a lug on the potentiometer had been bent over by an integrated circuit cam on the amplifier card. When the card and potentiometer stator were placed in their normal positions, the potentiometer resistance ratio was equal to a reading of 500 feet.
3. The transducer (capsule bellows assembly) was completely crushed and destroyed. By repositioning the transducer yoke to its apparent position at impact, an altitude of approximately 2,500 feet above the low stop was indicated. At 29.40 in. Hg barometric setting, this would correspond to a reading on the pointer of between 500 and 800 feet.

The report concluded that:

"Using the above information obtained from this severely damaged altimeter, the probable altitude indication at the time electrical power to the altimeter was interrupted was 500± 100 feet."

1.16.2 Automated Radar Terminal Service Data and Derivation of Flight Track and Descent Profile

Since there was no flight data recorder on N57V, the Safety Board derived a flight track and descent profile (see Appendix F) based on data from the Automated Radar Terminal Service System (ARTS-III).

The ARTS-III system installed at Washington National Airport processes the transponder beacon return from all selected aircraft within a specified range of the approach control radar site. The raw data from the beacon return consist of azimuth and range referenced to the antenna location and an encoded pressure altitude for aircraft equipped with a Mode 'C' transponder. These raw data are processed into positional coordinates which are differentiated with respect to the data receipt time to acquire a ground speed for the target.

The processing equipment also applies a correction, based on the current sea level barometric pressure, to the raw altitude data to produce a mean sea level altitude, resolved to the nearest 100 feet. The received altitude data, resolved to 100-foot increments, are generated within the aircraft by an altimetry system and, as such, include those errors which may be inherent within that airborne system. The data thus generated are selectively displayed on the air traffic controller's video display. In addition to the video display, the raw data and calculated parameters for all received targets are stored on a computer-generated magnetic tape.

The Safety Board derived the flight profile by applying the appropriate scale factor and the local magnetic variation (7° west) to the range and azimuth data processed by the ARTS-III system.

The descent profile is a plot of altitude versus distance traveled to point of impact. The altitude data were taken from the transponder reported pressure altitude as decoded and corrected to mean sea level by the ARTS-III system.

The positions of the aircraft at the times of pertinent radio communications and background conversation which were recorded on the ATC tape were established by comparing directly the ARTS-III and ATC time references.

Although the plot was derived from the best available information, the accuracy of the track and profile depends on the accuracy of the ARTS-III range and azimuth data and the resolution of the reported and processed data. Therefore, the plot may not represent an exact factual display.

The descent profile for N57V showed that close to the approximate 11 DME fix, the aircraft was descending through 3,000 feet and leveled off at 2,100 feet. It remained at 2,100 feet until near the 8.3 DME position and then began to descend to 1,200 feet. This altitude was maintained to a point about 6.5 DME, where a further descent began and was conducted in three small increments down to an altitude of 800 feet. This altitude was maintained until the approximate 5 DME position. After this point, there were no further transponder replies processed.

The flight track of the aircraft crossed the 333° radial of the Washington VOR (approach course) at the 9 DME point and about a 20° intercept angle. The aircraft maintained this course and proceeded through and beyond the radial and 4/5 mile to the east of it. This distance from the radial was maintained until the aircraft was abeam the 7 DME position at which time the track began a gradual correction toward the 333° radial. The aircraft collided with the tower at a point approximately 1/2 mile to the left of the inbound approach course and abeam of the 5.3 DME position on that radial.

#### 1.17 Other Information

##### 1.17.1 Air Traffic Control Procedures

The procedures and phraseology to be used by FAA personnel to provide terminal air traffic control services are set forth in FAA Handbook 7110.8D (January 1, 1975), Terminal Air Traffic Control. The handbook states that controllers are to be familiar with the provisions which pertain to their operational responsibility and to exercise their best judgments if they encounter situations not covered therein. The following are excerpts from this handbook which were relevant to the approach of N57V.

#### Section 9. Radar Arrivals

##### 1360. ARRIVAL INSTRUCTIONS

Issue all of the following to an aircraft before it reaches the approach gate:

a. Position relative to the final approach fix. If the final approach fix is not portrayed on the radar display or if none is prescribed in the procedure, issue position information relative to the navigation aid which provides final approach guidance or relative to the airport.

b. Vector to intercept the final approach course, if required.

c. Approach clearance, except when conducting a radar approach. If terrain or traffic does not permit unrestricted descent to lowest published altitude specified in approach procedure prior to final approach descent, controllers shall:

(1) Defer issuance of approach clearance until there are no restrictions or,

(2) Issue altitude restrictions with approach clearance specifying when or at what point unrestricted descent can be made.

\* \* \* \* \*

## Section 15. Additional Services

### 1540. APPLICATION

Provide additional services to the extent possible contingent upon your capability to fit it into the performance of higher priority duties and on the basis of the following:

a. Provision of a service is not mandatory because many factors (such as limitations of the radar, volume of traffic, communications frequency congestion and your workload) could prevent you from providing it.

b. You have complete discretion for determining if you are to provide or continue to provide a service in a particular case.

c. Your decision not to provide or continue to provide a service in a particular case is not subject to question by the pilot and need not be made known to him.

#### 1545. SAFETY ADVISORY

Issue an advisory to radar-identified aircraft whenever radar observation reveals a situation which, in your judgment, is likely to affect the safety of aircraft.

#### 1546. ALTITUDE DEVIATION INFORMATION

If you observe an automatic altitude report showing continuous deviation of 300 feet or more from the assigned altitude of an aircraft, issue altitude readout information to the pilot. Except during climb or descent, apply this procedure to aircraft whose automatic readout has been verified.

On December 27, 1974, following the TWA Flight 514 accident at Berryville, Virginia, on December 1, 1974, the Director, Air Traffic Service (ATS) FAA, issued a general notice (GENOT) to all controller personnel pertaining to the issuance of approach clearances. This GENOT referenced a notice to airmen (NOTAM) that had been previously issued in connection with that accident defining pilot responsibilities with respect to approach clearances:

Notice N 7110.374 subject/approach clearances CNL June 1, 1975 the following NOTAM has been issued to pilots QOT pilots are reminded that while operating under IFR on an unpublished route or while being radar vectored, they may not, upon receiving a clearance for an instrument approach, descend below the applicable minimum altitude. To insure this, when an approach clearance is received, pilots should maintain the last assigned altitude until established on a segment of a published route or instrument approach procedure. Thereafter, published altitudes apply to descent within

each succeeding route or approach segment. If the pilot is uncertain of his clearance he should immediately request the assistance of air traffic control. Regulatory action to make this operating practice mandatory is being expedited. QDT. Notwithstanding these expected pilot actions, controllers will continue to apply the provisions of 7110.8C DASH 1360/7110.9C DASH 776 as appropriate. (sic)

At the Safety Board's public hearing into the crash of N57V, the Director, ATS, testified that, "The GENOT was issued to inform the air traffic control population that this notice has been issued and would be followed up by a rule . . . . Also in the general notice to remind them that in spite of the change to the, and clarification of, pilot responsibilities, that they were to continue to comply with the provisions of paragraph 1360 in our manual."

On January 9, 1975, a telephone conference (ATSCON) was conducted by the Director, ATS, with all of the Air Traffic Control division chiefs and selected members of their staffs in the 11 FAA regions. The purpose of the ATSCON was to reiterate the requirement to adhere to paragraph 1360 in the controllers' handbook. As a result of the conference, each controller and supervisor was to be briefed personally on the provisions of paragraph 1360. The tape recording of the conference indicated the following instructions: "... I'd like each Division to take the following positive action: . . . after this telcon, somewhere in the course of today or tomorrow, . . . somebody in the Division call each radar facility, in centers and towers, and alert them to the provisions of this paragraph by chapter and verse and insure that that facility is following those procedures. Included in that would be instructions that they will verbally, on a face-to-face basis, brief the controllers and supervisors on the provisions of the paragraph. . . . Now there's apparently some confusion in areas of what those subparagraphs in the book call for. What it fundamentally says is that when any aircraft is on a radar vector the approach clearance for the approach will be withheld. . . or crossing altitudes issued until such time as the aircraft can go down to the final approach altitude unimpeded without any terrain problem. Now, that also includes crossing altitudes that are right on the final approach course that are higher than the final approach altitude. . . ."

On January 13, 1975, the Director, ATS, sent a memorandum to follow up ATSCON briefing. The memorandum was sent to all FAA Regional Directors. Excerpts from that memorandum follow:

Attn: Chief, Air Traffic Divisions

This is to confirm the ATSCON held on January 9, 1975, at 1:45 e. s. t.

Handbook 7110.8D-1360c and 7110.9D-776c, Arrival Instructions, was discussed. Division Chiefs are to ensure all Facility Chiefs of radar facilities are contacted and the provisions of paragraph 1360c/776c are explained to them. In addition, Facility Chiefs are to be instructed to conduct face-to-face briefings with all supervisory and controller personnel to explain the following:

1. Handbook 7110.8D-1360c/7110.9D-776c, Arrival Instructions GENOT 1/194, Approach Clearances.
2. Handbook 7110.8D-1545, Safety Advisory and 7110.8D-1546, Altitude Deviation Information.
3. Handbook 7110.9D-810, Safety Advisory and 7110.9D-811, Altitude Deviation Information.

Explain that even though altitude management is the pilot's responsibility, facilities are being asked to add to safety by keeping a close watch on altitudes.

4. Review all approach charts paying particular attention to altitude restrictions and any other limitations or restrictions depicted.

Washington National Tower is one of the facilities in the FAA's Eastern Region. Records from the facility show that the ATC division chief and other staff members participated in the ATSCON on January 9, and that the following notes from that conference were included in a memorandum for the record. It stated, in part:

SUBJECT: Approach Clearances - Radar Facilities

In an ATSCON on January 9, 1975, AEA-500 was asked to assure that the following is accomplished immediately:

1. The facility chief, deputy chief, or operations officer (area officer at ARTCCs) conduct face-to-face verbal

briefings of all controllers and supervisors to assure understanding of 7110.8D, 1360.c/7110.9D, 776.c.

2. Controllers review instrument approach charts pertinent operations. It is imperative that they be familiar with these procedures.
3. Controllers make a concerted effort to call to the attention of pilot, any questionable conditions revealed by altitude readouts. Applicable procedures are in 7110.8D, 811, 812 and 1546/7110.9D, 326 and 811.
4. Feedback in the form of problems, issues, and questions is relayed to AAT-1 via AEA-500.

The memo further stated that all facility chiefs were briefed on the items listed above. The memo showed that the Chief of the Washington Tower was briefed by telephone on January 10, 1975.

Similarly, a memorandum for the record dated January 10, 1975, and signed by the Chief, Washington Tower, indicated that he had received telephone instructions from the Division concerning controller briefings. The memorandum specifically outlined the following areas for the briefing:

- (1) Brief all controllers for thorough understanding of para. 1360(c) of 7110.8D.
- (2) Require all controllers to review all approach charts.
- (3) Brief and require all controllers to review para. 811 and 1546 of 7110.8D.
- (4) Make a concerted effort to emphasize to all controllers that they shall alert pilots regarding any questionable conditions . . . this is particularly regarding altitude deviations of 300 feet (ARTS)...."

Testimony from the Chief, Washington Tower, regarding the contents of the telephone briefing indicated that he did not construe these instructions, as transmitted in the telephone conversation, to

mean that the controllers were required to issue crossing altitude restrictions along with an approach clearance.

Documents provided to the Safety Board during the investigation show that all of the controllers involved in the approach of N57V had been briefed on, or before, January 14, 1975, in accordance with the Eastern Region ATC Division instructions.

On January 29, 1975, following the crash of N57V, a memorandum was issued by the Chief, Washington Tower, to "All Personnel." The subject of the memorandum was "Handbook 7110.8D, para. 1360.c, Supplemental Guidelines." The guidelines were to become effective immediately. The following is one of the guidelines set forth in the memorandum:

Approach clearance except when conducting PAR or ASR approach. If the pilot cannot descend unrestricted to the lowest published altitude specified in the procedures prior to final approach descent, which is the altitude depicted at the final approach fix, either defer the approach clearance until the pilot can descend unrestricted or issue all altitude restrictions except the restriction at the final approach fix, even though they are depicted on the approach chart. Example: When restrictions are given, cross 14 mile DME fix at or above 2,500' . . . .

At the Safety Board's public hearing, the Chief, Washington Tower, testified that on January 29, an ATC staff member from the FAA Eastern Region gave him guidelines by telephone. He further testified that the January 29 guidelines made it mandatory to issue crossing altitude restrictions.

#### 1.17.2 14 CFR 91 -- Instrument Flight Rules

With regard to instrument approaches conducted by civil aircraft, 14 CFR 91 states:

91.115 ATC clearance and flight plan required.

No person may operate an aircraft in controlled airspace under IFR unless -

(a) He has filed an IFR flight plan; and

(b) He has received an appropriate ATC clearance.

**91.116 Takeoff and landing under IFR: General.**

(a) **Instrument approaches to civil airports. Unless otherwise authorized by the Administrator (including ATC), each person operating an aircraft shall, when an instrument letdown to an airport is necessary, use a standard instrument approach procedure prescribed for that airport in Part 97 of this chapter.**

**2. ANALYSIS AND CONCLUSIONS**

**2.1 Analysis**

The flight crewmembers were certificated and qualified to conduct the flight. There was no indication of any medical or physiological problem that would have affected the performance of their duties.

The aircraft was certificated and maintained in accordance with applicable requirements and regulations.

There was no evidence of any in-flight failure or malfunction of the aircraft structure, systems, or powerplants.

From the recorded ATC conversations between N57V and the Washington Tower Facility, it was determined that all transmissions from the aircraft were made by the copilot. From this evidence, along with testimony of a witness who saw the aircraft depart Columbus, it was concluded that the captain was flying the aircraft from the left seat throughout the flight.

Since the copilot's altimeter was not recovered, the Safety Board considered the possibility of an incorrect barometric setting on that altimeter as a possible reason for the premature descent. This possibility was heightened by the incorrect altimeter setting -- "three zero four one" -- transmitted by approach control to the preceding Piedmont flight at 1205. At that time the correct altimeter setting was 29.41 inches. It was postulated that the incorrect altimeter setting may have been inserted on the copilot's altimeter, thus resulting in a presentation on that altimeter 1,000 feet higher than the actual altitude of the aircraft. It was determined, however, that an altimeter resetting based on the aforementioned transmission would have represented a gross departure from the existing

barometric setting as received by the flight on the "ATIS" frequency shortly before, and would have required an extensive resetting of the altimeter (approximately five full revolutions of the barometric setting knob) in order to achieve the 1-inch differential. Thus, the magnitude of the change in the setting, by itself, should have been enough to raise serious doubts as to the validity of the erroneous setting if, in fact, the pilots heard the transmission to the Piedmont flight and if they unquestioningly made this change.

More importantly, in order for this entire premise to be valid the captain, who was flying from the left seat, would have had to ignore completely his correctly set altimeter and rely solely on information from the copilot's altimeter located on the right side of the cockpit instrument panel.

In view of the above, the Safety Board concludes the possibility that a misset altimeter led to the premature descent is extremely remote and, therefore, it is not considered a factor in the cause of this accident.

As best it can be determined, the flight from Columbus to the Washington area was routine with no discrepancies reported en route. When in the Washington terminal area, the flight was descended and provided radar vectoring services by ATC to intercept the final approach course (333° radial of the Washington VOR) for a VOR/DME approach to runway 18. At 1205:56 when N57V was approximately 15 miles northwest of the airport, the flight was "cleared for the approach." Based on published approach procedures, from this point the flight should have intercepted and proceeded on the approach radial (153° inbound course) and crossed the 11 DME fix at or about 3,000 feet m. s. l. The approach then should have been continued as published -- descend to cross the 7 DME fix at or above 2,100 feet m. s. l., then descend to cross the 5 DME fix at or above 1,500 feet m. s. l., and then descend to cross the 3 DME fix (FAF) at or above 900 m. s. l. After crossing the FAF, descent to the MDA of 720 feet m. s. l. would be authorized.

The ARTS-III plot shows that N57V flew through the approach course radial at an altitude of 2,100 feet m. s. l. at the approximate 9 DME position. The aircraft continued on the same approximate flightpath and proceeded laterally 1 mile to the left of the centerline of the inbound course abeam of the 7 DME fix. The track then begins

a gradual correction back toward the final approach course, and ends at a point corresponding to the approximate position of the radio tower -- about one-half mile to the left of the approach course and just short of the abeam position of the 5 DME fix.

The descent profile shows that after N57V crossed the approach course, it maintained an altitude of about 2,100 feet m. s. l. until about the 8.3 DME position and then began to descend, averaging 1,200 feet/min., to an altitude of 1,200 feet m. s. l. This altitude was maintained from about the 7.2 DME position to the 6.6 DME position when a gradual letdown was made, first to 1,000 feet m. s. l. and then to 900 feet m. s. l. The profile shows that the aircraft maintained 900 feet until just inside the 6 DME position and then descended to 800 feet, which was maintained until the trace ends. As can be seen on the descent profile, the aircraft was 900 feet below the authorized crossing altitude at the 7 DME fix and was about 800 feet below the minimum approach segment altitude at the point of impact.

Since no aircraft or aircraft system discrepancies were found which might explain an altitude deviation of this magnitude, the operational aspects of the flight, particularly the nonadherence by the captain to the altitude restrictions outlined in the published approach procedure, must be examined.

The flight was cleared for the approach when the aircraft was descending through 4,800 feet m. s. l. and was on a heading to intercept the final approach course at a point just outside the 11 DME approach fix. The flight was then in a good position to continue the letdown and to conduct the approach in accordance with the published approach procedure. Nevertheless, the flight, shortly after attempting to turn inbound on the approach, proceeded to deviate consistently and substantially from the published altitude restrictions until it collided with the tower at an altitude (720 feet m. s. l.) which was almost 800 feet below the minimum approach segment altitude at the point of impact. These deviations occurred despite the facts that the minimum altitude applicable to each segment of the approach was clearly delineated on the profile set forth on the approach plate and the tower struck by the plane was depicted, along with other obstructions, on the plan view of the chart.

It is also significant that the aircraft never became established on the inbound radial during the approach. Although the strong southwesterly upper air winds could account, in part, for an initial overshoot

of the radial, it appears that very little, if any, correction was effected until the aircraft had transgressed about 1 mile from the centerline at an approximate position 7 miles from the airport. An off-course deviation of this magnitude would reflect a full-scale deflection of the course deviation indicator (CDI). The degree of the deviation, and particularly the point at which it occurred in this stage of the approach, be unacceptable to be a professional pilot. When a correction toward the centerline finally was made, it was not enough. Even at the point of impact, which was about one-half mile to the left of the approach radial, the deviation of the CDI would be almost full scale. (The captain's CDI needle was found showing threedots to the right.)

The entire flightpath and descent profile displays a disoriented operation, which indicates a failure in the cockpit either to monitor flight instruments or to maintain safe operating practices and procedures.

With respect to the air traffic control services provided to the flight, the aircraft was being vectored to the final approach course by approach control and was, therefore, a "radar arrival" and subject to the control procedures outlined in the Controllers Terminal Air Traffic Control Handbook (7110.8D).

The flight was cleared for the approach when it was approximately 15 miles northwest of the airport and approaching the final approach course at an altitude of 4,800 feet. Paragraph 1360c of the Controller's Handbook states that, "...If terrain or traffic does not permit unrestricted descent to lowest published altitude specified in approach procedure prior to final approach descent, controller shall:

- "1. Defer issuance of approach clearance until there are no restrictions or,
2. Issue altitude restrictions with approach clearance specifying when or at what point unrestricted descent can be made."

The final approach fix in this case was the 3.0 DME fix, which has a minimum crossing altitude of 900 feet m. s. l. Thus, the approach controller, in accordance with 1360c, should have either withheld the approach clearance until the aircraft reached the 5.0 DME fix (which would have required withholding the clearance until the aircraft had completed more than half of the entire approach) or issued altitude restrictions

with the approach clearance as follows: "N57V cross the 11-mile DME fix at 3,000 feet, 7-mile DME fix at or above 2,100 feet, 5-mile DME fix at or above 1,500 feet, cleared for the approach."

The reason that the above procedures were not followed in this instance was assigned by FAA witnesses to a failure to implement FAA directives at the Regional level. The Director of the Air Traffic Service, FAA, testified that on January 9, 1975, he had advised all FAA Air Traffic Control Division chiefs to insure that paragraph 1360c of the Controller's Handbook was being correctly interpreted and applied. He stated that specific instructions were issued verbally on January 9, and that on January 10, a followup memorandum required that supervisors brief all terminal controllers "face-to-face" to clarify these instructions.

Apparently, because of a differing interpretation of the briefing by management personnel in the FAA Eastern Region in conjunction with a differing interpretation of the requirements of paragraph 1360c by the Chief of the Washington Tower, the directive was not communicated to controllers in the Washington Tower as intended. Consequently, controllers at the Washington Tower were not aware that they should issue altitude restrictions along with an approach clearance. This procedure was not implemented at Washington National Airport until January 29, 1975, 4 days after N57V crashed into the radio tower.

It is not possible to determine what effect, if any, the issuance of crossing altitudes by the controller would have had on the pilot of N57V. The pilot deviated from the published procedures (the minimum altitudes and approach course) which are clearly delineated on the approach plate and which the pilot is required to follow by regulation.<sup>4/</sup> It is apparent that the ATC handling of radar arrivals, insofar as terrain avoidance is concerned, is most critical when an aircraft is being vectored in airspace which is neither on an airway nor part of a published approach procedure. In such circumstances, altitude restrictions provided by ATC assume greater significance inasmuch as the pilot may not know the precise position of his aircraft in relation to ground obstructions. On the other hand, in the instant situation, the flight was not cleared for the approach until it had been vectored to a point at which interception with the final approach course, at an appropriate altitude, was imminent. Consequently, in these circumstances, the provision of altitude restrictions would have been more in the nature of a backup or secondary service in that the pilot, who remains primarily

<sup>4/</sup> Section 91.116(a) of the FAR (14 CFR 91.116(a)).

responsible for terrain avoidance, would have been receiving information readily available from the approach plate. In any event, the absence of altitude restrictions in the clearance cannot be conceived to account for the wide deviation of the flight from the approach course.

At 1209:47 the local controller who was in contact with N57V observed the flight off course and advised: "November five seven victor looks slightly left of course." The flight replied, "OK, we'll check." This was the last communication received from N57V.

At 1209:47 the ARTS-III derived descent profile shows the aircraft at approximately 800 feet m. s. l., or about 1,000 feet below the prescribed minimum altitude for that segment of the approach. When asked why he did not also at this time advise the flight of its low altitude, the local controller testified that he did not observe the altitude data block on the BRITE display.

Although radio communications with N57V had been transferred from approach control to the tower, the approach controller retained responsibility for insuring adequate separation of the flight from other aircraft. A review of the background conversations found on the ATC tape showed that the approach controller first became concerned over the progress of N57V at 1209:02 when he commented, "Wonder if he's ever going to pick up that radial." This comment was followed 6 seconds later by, "I know there're some towers down there (Shouldn't be any problem)." These comments appear to be directed primarily at the aircraft's off-course position at that time. However, at 1209:32, the comment, "That guy shouldn't be that low up there should he?" then indicates a distinct concern for the low altitude of the aircraft at that point, and a safety advisory should have been issued more promptly by the approach controller to the local controller rather than some 28 seconds later. At 1210:00 he called the local controller on the intercom and advised, "Five seven victor looks pretty low up there and a little bit off the radial." After receipt of this information the local controller called the flight, "November five seven victor, I show you left of course, does that check?" There was no reply from N57V.

Again, as in the case of the failure to issue altitude restrictions with the approach clearance, it is difficult to ascertain what might have happened if a more timely safety advisory had been issued and whether the pilot of N57V might then have been alerted in sufficient time so that collision with the tower could have been averted.

The local controller testified that although he had monitored the inbound progress of N57V on the BRITE display, he had not noticed the altitude of the aircraft on the ARTS-III data block and was, therefore, unaware of the actual "low" altitude of the flight when he was called by the approach controller. He further stated that after receiving this advisory from the approach controller on the intercom at 1210:00 he had intended to advise the flight that it was low by means of a "split transmission" -- he would first await an acknowledgement to the "left of course" advisory and then transmit that the flight was low.

The term "split transmission" is not contained in any official FAA glossary nor is its usage provided for in any procedure relating to ATC services. The only explanation for this term was as described above by the local controller following the accident.

The Safety Board concludes that the local controller's decision to separate the elements of the safety advisory (low and off course) was not professional since at this point altitude was far more critical than course. Although it is not the controller's responsibility to monitor the altitude presentation except to insure that the aircraft are separated properly, the Safety Board believes that, after being told that N57V was "pretty low," the controller should have checked the altitude on the data block and should have relayed the complete safety advisory. However, even if both safety advisories had been issued in the same transmission, it probably would have been too late to prevent the accident because of the proximity of the aircraft to the towers at that time.

## 2.2 Conclusions

### (a) Findings

1. There was no preimpact failure or malfunction of the aircraft, structure, systems, or powerplants.
2. There was no evidence that either pilot was physically incapacitated before the accident.
3. The flight was a "radar arrival" and should, therefore, have been provided altitude restrictions in the approach clearance as required by Controller's Handbook 7110.8D, paragraph 1360 c.

4. The flight was cleared for a VOR/DME approach to runway 18 at Washington National Airport when it was approximately 15 nmi from the airport. No altitude restrictions were issued with the clearance.
5. The pilot was required by Federal Aviation Regulations to conduct an instrument approach in accordance with the applicable published approach procedure.
6. The aircraft crashed into a radio transmission tower, located approximately 5 nmi from the airport at an altitude of 720 feet m. s. l. and approximately one-half mile to the left of the approach course prescribed in the instrument approach procedure.
7. The minimum crossing altitude for the segment of the approach where the aircraft crashed is 1,500 feet m. s. l.
8. Air Traffic Control should have issued a more timely safety advisory to N57V concerning its low altitude.
9. The approach controller advised the local controller on the intercom that N57V was "pretty low and to the left of course" at 1210:00. However, the local controller transmitted to the flight only that it was left of course.

**(b) Probable Cause**

The National Transportation Safety Board determines that the probable cause of this accident was an unauthorized descent below the published minimum approach segment altitude during an instrument approach in instrument meteorological conditions for reasons undetermined.

While recognizing that Air Traffic Control should have issued crossing altitude restrictions with the approach clearance and should have issued a more timely safety advisory, the Board, however, is unable to conclude that the issuance of such altitude restrictions and safety advisory in these circumstances would have prevented the occurrence of the accident.

### 3. RECOMMENDATIONS

As a result of the Trans World Airlines Flight 514 accident at Berryville, Virginia, on December 1, 1974, a number of recommendations pertaining to the air traffic control system were submitted to the F/A. Recommendation A-75-22 concerning the issuance of Safety Advisories is relevant to the accident and is cited herein. A copy of the recommendation letter and the Administrator's response are included in Appendix G.

BY THE NATIONAL TRANSPORTATION SAFETY BOARD

/s/ JOHN H. REED  
Acting Chairman

/s/ LOUIS M. THAYER  
Member

/s/ WILLIAM R. HALEY  
Member

McADAMS and BURGESS, Members, dissented. (See page 29.)

/s/ FRANCIS H. McADAMS  
Member

/s/ ISABEL A. BURGESS  
Member

January 28, 1976

McADAMS and BURGESS, Members, dissenting:

We do not agree with the probable cause as stated by the majority. Although we agree that the unauthorized descent was a cause of the accident, we believe that the failure of ATC to either defer the clearance, issue altitude restrictions, or issue a timely safety advisory was also a cause of the accident.

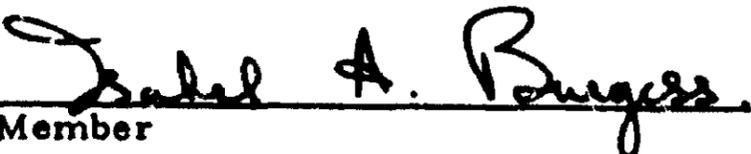
The majority takes the position that ATC should have either deferred clearance or issued altitude restrictions as required by paragraph 1360(c), and issued a more timely safety advisory, but does not conclude that the failure to do so was a causal factor. The ATC involvement is not given the weight of even a contributing factor despite the conclusion that ATC had a duty to issue altitude instructions.

It is difficult to understand how the majority can conclude that ATC should have issued such instructions, yet, at the same time, fail to conclude that had such instructions been issued the accident would likely have been averted.

In our judgments, it is logical to conclude that had the pilot of N57V received either altitude restrictions or a deferred clearance and had he been given a more timely advisory, he would have responded in such a way that the accident probably would have been averted. Accordingly, if it is reasonable to assume that had the pilot not made an unauthorized descent, the accident would not have occurred, it is just as reasonable to assume that had the controllers provided a proper clearance and a more timely safety advisory, the accident likewise probably would not have occurred. Ergo, the laches of ATC are indeed a causal factor.

Based on the foregoing, we would state the probable cause to be an unauthorized descent below the published minimum approach segment altitude during an approach in instrument meteorological conditions, and the failure of ATC to defer clearance, issue altitude restrictions, or issue a timely safety advisory.

  
Member

  
Member

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APPENDIX A

INVESTIGATION AND HEARING

1. Investigation

At 1230 e. d. t., on January 25, 1975, the National Transportation Safety Board was notified of the accident. The Safety Board immediately sent an investigation team to the scene. The team established investigative groups for operations/air traffic control, witnesses, weather, and structures/maintenance records.

Representatives of the Federal Aviation Administration, National Business Aircraft Association, and Beech Aircraft Corporation assisted the Safety Board during the investigation.

During the investigation, the Safety Board became aware that the ATC recorded communications contained background sounds picked up by speakers connected to the tape recorder in such a manner that they acted as microphones. The voices were buried in and slightly louder than the ambient tape noise and normal tape-machine noise. The transcript of background conversations (Appendix H) was derived by the investigating group as a result of an intensive review and evaluation. The transcript contains transmissions, intercommunications, and background utterances from the local control and the F-1 channels. The transcript begins shortly after the aircraft was handed off to local control and just after it departed 2,100 feet. Background conversations before this time were not related to N57V.

2. Hearing and Depositions

Depositions were taken on March 5, 1975, in Columbus, Ohio, and on March 3, 1975, at Dulles International Airport, Virginia. On review of the transcript of these depositions, the Board decided that additional information would be needed to make a complete record of the facts and circumstances pertaining to this accident. Consequently, a public hearing was held. The hearing was convened on April 18, 1975, in Washington, D. C. The transcripts of those prior depositions have been made a part of the public record of the investigation.

Parties to the hearing included the Federal Aviation Administration, Wolfe Industries, Inc., the National Business Aircraft Association, the Professional Air Traffic Controllers Organization, and the Aircraft Owners and Pilots Association.

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APPENDIX B

CREW INFORMATION

Captain Richard N. White

Captain White, 50, had been employed as a pilot by Wolfe Industries, Inc., since April 5, 1971. He held commercial pilot certificate No. 1091159 with multi-single engine land, flight instructor, and instrument rating. He had accumulated 9,745 flight-hours, 49.5 of which were in the Beech King Air. He completed a 5-day ground training course conducted by the Beech Aircraft Corporation in December 1974, and completed initial flight training and checkout in the King Air conducted by the Ohio Corporation on December 17, 1974.

He was issued a second-class medical certificate on June 13, 1974, with the limitation that the "holder shall possess correcting glasses for near vision while exercising the privileges of his airman certificate."

Pilot White had flown into Washington National Airport five times in the 12-month period before the accident, the last flight of which was conducted on July 23, 1974.

He had approximately 16 hours off-duty time before reporting for this flight.

Copilot Richard D. Hatem

Copilot Hatem, 28, was hired by Wolfe Industries, Inc., as a standby copilot on July 15, 1974. He held commercial pilot certificate No. 1801953 with multi-engine land, single-engine land and sea, and flight instructors ratings. He had accumulated 1,963 flight-hours, 39 of which were in the Beech King Air.

Copilot Hatem had approximately 16 hours off-duty time before reporting for this flight.

APPENDIX C

AIRCRAFT INFORMATION

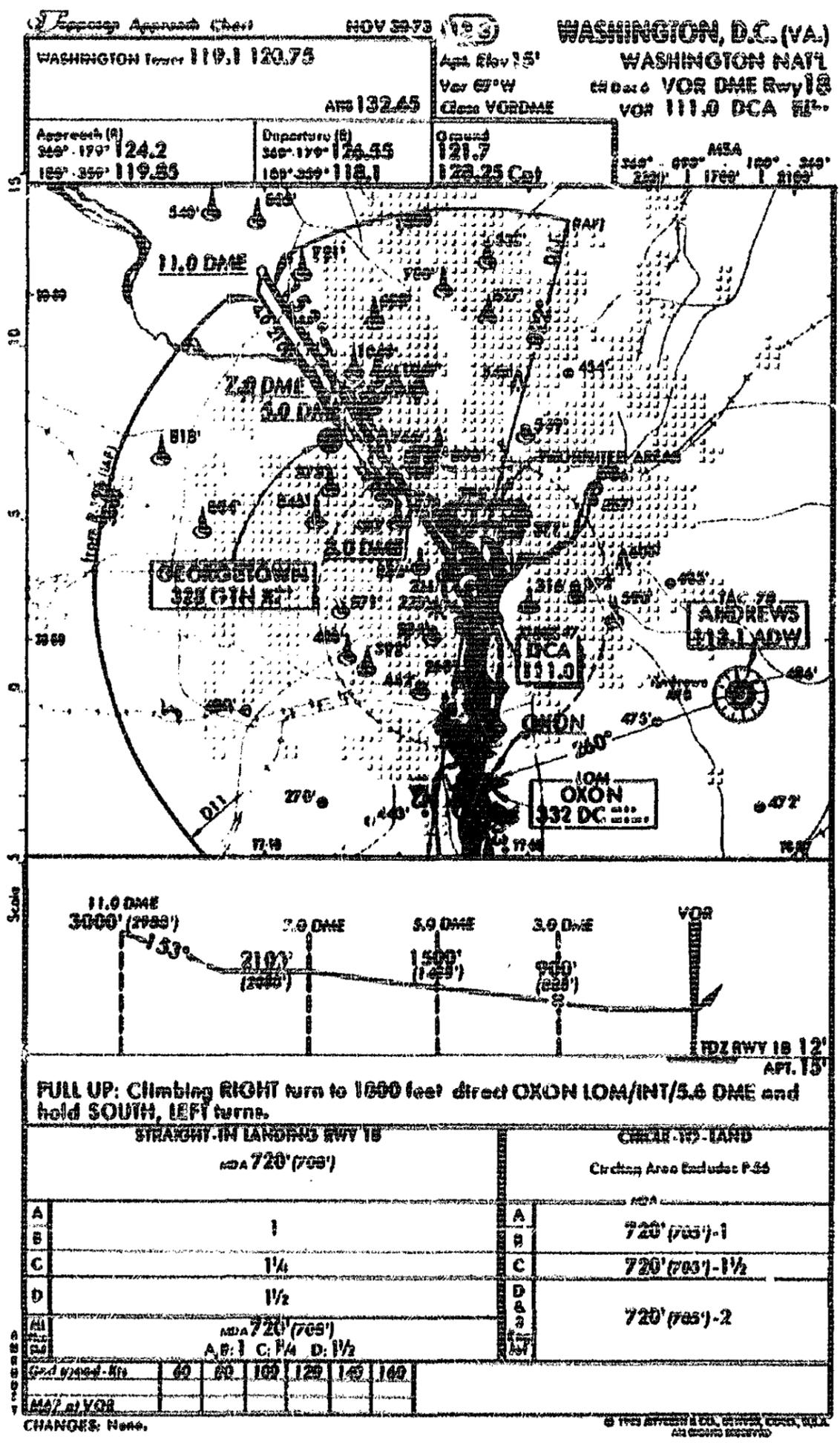
Aircraft N57V, a Beech 65-A90 King Air, serial No. L5268, was manufactured on April 4, 1967, and was purchased by the Marathon Oil Company, Findley, Ohio, on May 3, 1967. The aircraft was purchased jointly by the Ohio Company, The Dispatch Printing Company, WNSB-TV, Inc., Radi Ohio, Inc., (Wolfe Industries, Inc.) on December 13, 1974.

The aircraft had accumulated a total of 4337:19 operating-hours since the date of manufacture. The last progressive maintenance inspection on the aircraft was conducted on January 20, 1975.

N57V was equipped with two Pratt and Whitney PT-6 A-20 engines and two Hartzell Model HCB3TN-33 propellers.

A review of the maintenance records of the aircraft showed that it had been maintained in accordance with FAA requirements and approved company procedures. There were no outstanding maintenance discrepancies on the aircraft when it departed on the flight.

APPENDIX D



"ILLUSTRATION ONLY - NOT TO BE USED FOR NAVIGATIONAL PURPOSES"

APPENDIX E

WASHINGTON NATIONAL TOWER

TRANSCRIPT

The attached transcript concerns the accident involving N57V, BE-90, near Washington National Airport on January 25, 1975, at 1710 GMT.

Transcription Period: From 1653 GMT to 1715 GMT on frequencies 119.85, 124.7, and 119.1 MHz.

Transmissions by:

- AR - Wash. Approach Arrival West Controller
- DR-1 - Wash. Approach Departure West Controller
- DR-2 - Wash. Approach Departure East Controller
- LC - Wash. Tower Local Controller
- ALC - Wash. Tower Asst. Local Controller
- F1 - Wash. Approach Final West Controller
- F2 - Wash. Approach Final East Controller
- ZDC - Wash. Center Aldie Sector
- V727 - Military Aircraft (Navy)
- P602 - Priority Air Transport Flight 602 (Army)
- PI942 - Piedmont Airlines Flight 942
- V486 - Military Aircraft (Navy)
- UA318 - United Airlines Flight 318
- PI910 - Piedmont Airlines Flight 910
- N57V - N57V BE-90, King-Air
- HNA24 - Henson Air Taxi Flight 24
- PI921 - Piedmont Airlines Flight 921
- AL819 - Allegheny Airlines Flight 819
- EA1450 - Eastern Airlines Flight 1450
- AA275 - American Airlines Flight 275
- DL325 - Delta Airlines Flight 325
- TW427 - Trans World Airlines Flight 427
- NA468 - National Airlines Flight 468

NOTE: This transcript is timed in 1-minute intervals except on transmissions to, from or regarding N57V. The second that these transmissions began is indicated to the left of the transmitted matter, e. g., (30) thirty seconds after the preceding minute.

APPENDIX E

1653 GMT      AR      Piedmont nine forty two turn left heading three two zero descend and maintain five thousand

AR      Pat six zero forty two rather six oh two descend and maintain three thousand

P602      Pat six zero two is out of five for

AR      Piedmont nine forty two contact approach one two four point seven

PI942      Twenty four seven so long

AR      So long

AR      Pat six oh two continue descent to now and maintain one thousand five hundred the Davison weather four hundred scattered measured ceiling five hundred broken eight hundred overcast visibility seven wind one eight zero degrees at five the altimeter three zero four two -- correction that's not the correct altimeter I'll have the altimeter for you in a moment

P602      Six zero two roger and also say again descent altitude

V486      Approach ah four eight six level at three

AR      That's ah navy four eight six level at three the uh altitude for pat six oh two is one thousand five hundred

1654      P602      Six oh two roger

UA318      Ah Wash approach United three eighteen is with you descending to eight

AR      Navy four eight six contact approach on three one six point seven now

V486      Roger three one six point seven

APPENDIX E

1655

AR United three eighteen ident maintain eight thousand  
depart Aldie heading one zero zero for vectors to  
the final approach course landing south operation  
do you have the ATIS

UA318 Yes sir we have uh quebec

AR Roger

AR (Intercom to DR)  
That Pat i may take a right box around back on  
to the final

P602 Wash center Pat six oh two departing Ironside  
zero four zero

AR Pat zero six two roger and uh (Center calling on  
overhead speaker -- "Ironside Piedmont nine ten--"  
garbled) your altitude is a little bit high for turn  
in for final I'll have a short box pattern around to  
the right for you in a while

P602 Six zero two

UA318 And approach three eighteen you might advise  
quebec still shows landing north

AR Yes sir the weather remains the same as far as  
I know and uh it'll be uh VOR DME runway one  
eight for the approach the uh altimeter two niner  
four uh two

UA318 All right two niner four two VOR DME one eight

AR Pat six oh two the Washington altimeter two niner  
four two

P602 Pat six oh two two niner four two

PI910 Washington approach Piedmont nine ten descending  
to six with quebec

PI910 Washington Wash approach Piedmont nine ten

AR Say again

PI910 Piedmont nine ten we're descending to six

APPENDIX E

AR Piedmont nine ten ident maintain six thousand  
depart Ironside heading zero one zero for vectors  
to the uh final approach course it'll be uh VOR  
DME runway one eight approach over

PI910 Okay Piedmont nine ten ten degrees at Ironsides  
and understand you got a south operation

AR Navy three seven seven two seven turn right  
heading zero eight zero

1656 V727 Roger coming right zero eight zero five thousand

AR Pat six oh two turn right one five zero

P602 Six oh two is right one five zero

AR Pat six oh two affirmative and the Davison  
altimeter two niner four two

P602 Two niner four two

AR United three eighteen and Piedmont nine ten here's  
the latest weather it's uh measured ceiling seven  
hundred overcast visibility more than twenty miles  
altimeter two niner four one United three eighteen  
okay

UA318 (garbled) we just got it it's romeo now

AR Roger and Piedmont nine ten copy

PI910 Nine ten firm we got romeo

AR United three eighteen descend and maintain seven  
thousand

1657 UA318 Uh three eighteen down to five

AR United three eighteen descend and maintain seven  
thousand

APPENDIX E

UA318 Down to seven United three eighteen

AR United three eighteen contact approach one two four point seven now

UA318 Good day sir

AR Piedmont nine ten you copy that latest weather

PI910 That's affirm

AR Okay

AR Navy seven two seven turn right heading one two zero

V727 Roger coming right one two

1658 ZDC Five seven victor is a King-Air eight thousand

AR Pat six oh two turn right heading two four zero

P602 Six oh two is right two four zero

(20) N57V Ah Washington approach King-Air fifty seven victor is with you eight thousand

(23) AR King-Air five seven victor Wash approach ident maintain eight thousand depart Aldie heading one zero zero for vectors to the final approach course and you had the ATIS information

(31) N57V Yes we do and after Aldie we'll go to one zero zero fifty seven victor

AR Navy seven two seven descend and maintain three thousand

1659 V727 Rog roger leaving five for three

AR Pat six oh two the Davison altimeter now two niner four zero

APPENDIX E

P602 Two niner four zero we're level one thousand five hundred

AR Pat six oh two roger

AR Navy seven two seven turn right heading one three zero

V727 One three (garbled)

1700 AR Pat six oh two turn right heading three zero zero cleared ILS approach runway three two at Davison you're four and a half miles from the outer marker

P602 Six oh two roger

AR And Pat ah six oh two in case I didn't explain it good enough you are on the north side of localizer at this time that box pattern was on the north side

P602 Six zero two roger

AR Piedmont nine ten turn left heading three two zero

PI910 Three two zero Piedmont nine ten

1701 AR Navy seven two seven contact Washington approach on three eight nine point eight

AR Piedmont nine ten descend and maintain five thousand contact approach one two four point seven now

PI910 Nine ten twenty four seven out of six for five

AR Pat six oh two contact Davison tower one two six point three or two two niner point four now over

P602 Six zero two roger

1702 AR Navy seven two seven Washington

APPENDIX E

1703

V727 Hey Washington this is Navy three seven seven  
two seven no joy three eight nine eight over

AR Navy seven two seven roger

AR Stand by one

AR Navy seven two seven contact approach on three  
oh one point five in the event of lost communications  
intercept the localizer execute ILS to one nine right  
and contact Andrews any frequency

V727 Roger say again frequency please

AR Three oh one point five

V727 Roger three eight one five shifting

AR Three zero one point five

1704

V727 Roger copy

(20) AR November five seven victor descend and maintain  
five thousand

(23) N57V We're out of eight for (garbled) for five thousand  
fifty seven vic

(27) AR November five seven victor contact approach one  
two four point seven now over

(30) N57V Okay fifty seven victor (garbled)

F1 Piedmont nine ten turn right heading one two zero  
eight northwest cleared VOR DME runway one  
eight approach

PI910 Piedmont nine ten is cleared for one eight DME  
VOR approach

(46) N57V Washington approach King-Air fifty seven victor  
is with you out of seven point five for five thousand

APPENDIX E

1705 (51) F1 King-Air five seven victor Washington approach control descend and maintain three thousand fly heading one two zero

(58) N57V Okay one two zero and we're down to three thousand we're out of seven point two now

F1 Piedmont nine ten contact tower one one niner point one

PI910 Nine ten one out to ah get us a new altimeter before we leave

F1 Ah three zero four one

PI910 'kay

1706 (56) F1 King-Air five seven victor fifteen northwest cleared VOR DME runway one eight approach

(02) N57V Okay we're cleared for the approach fifty seven victor

(12) F1 Two five seven victor like for you to keep your airspeed up as much as ah you can on final

(16) N57V Okay

(Intrafacility conversation muffled and garbled)

(57) ALC What type is five seven victor

1707 (59) F1 Five seven victor is a King-Air

ALC L B

(44) F1 November five seven victor contact tower one one niner point one

(48) N57V Good day

(54) N57V National tower King-Air fifty seven victor is with you

APPENDIX E

(57) LC Navy fifty seven victor roger

LC Piedmont nine twenty one cleared for takeoff  
traffic three out for runway one eight

PI910 Nine twenty one rolling

LC Henson number twenty four taxi into position and  
hold traffic landing runway one eight

HNA24 Twenty four

(Unknown) Seven five sierra

LC Allegheny eight nineteen tax contact departure  
control

AL819 'ger so long

LC See ya

DR-1 All right (garbled) -- J L (overriding DR-1  
position)

LC Piedmont nine twenty one

DR-1 Roger -- Piedmont nine oh seven turn left heading

LC Piedmont nine twenty one proceed southbound and  
contact departure control

PI910 Good day you all

LC Good night

1709 LC Eastern fourteen fifty taxi into position and hold  
traffic will depart runway one five first

EA1450 Position and hold Eastern fourteen fifty

LC Henson twenty four after departure maintain runway  
heading cleared for takeoff

APPENDIX E

HNA24 Twenty four is rolling

LC Henson twenty four runway heading of one five

DR-1 All right Piedmont nine twenty one is off too huh

LC Yeah I just gave that one didn't you get it

DR-1 Ahead or behind Allegheny

LC Behind of course

DR-1 Thank you

LC Piedmont nine ten turn right and taxi clear  
contact ground control point seven

PI910 Okay

(47) LC November five seven victor looks slightly left  
of course

(51) N57V Okay we'll check

LC Henson twenty four contact departure control

HNA24 Twenty four so long

LC Good day

1710 FI Five seven victor looks pretty low up there and  
a little bit off the radial

(03) LC Yeah

(05) LC November five seven victor I show you ah left  
of course does that check

(11) LC November five seven victor ah tower

LC Henson twenty four contact departure

APPENDIX E

LC Eastern fourteen fifty cleared for takeoff

EA1450 Fourteen fifty rolling

LC American two seventy five taxi into position  
and hold

AA275 American two seventy five position and hold

(27) LC November five seven victor if you read ident over

(34) LC I don't get the five seven vic anymore he called  
me once though

(38) (Unknown) Uh oh

(40) FI Five seven victor Washington tower

(45) LC November five seven victor Washington

DL325 Wash tower Delta three twenty five

LC Delta three twenty five Washington tower roger

1711 LC American two seventy five cleared for takeoff

AA275 American two seventy five is rolling

(09) FI Are you talking to five seven victor

(11) LC Negative

TW427 TWA four two seven ready in sequence

LC Roger hold short

LC Eastern fourteen fifty

DR-2 J T

LC Eastern fourteen fifty contact departure control

EA1450 Roger

APPENDIX E

F2 Ask Delta if he sees anything up there

LC Okay

LC Delta three twenty five ah -- what are your flight conditions (override unknown source: "we anticipate")

DL325 We're in the soup six -- at fifteen hundred feet

LC All right thank you

NA468 Four sixty eight's ready

LC Thank you hold short

(44) LC November five seven victor this is Washington tower if you read ah you're cleared to land over

(51) F1 Do you have five seven victor yet

(53) LC Negative

LC (Overriding DR-1 position)  
"Twenty five direct Brooke contact center on frequency uh correction it's Eastern one seventy seven direct Brooke contact (override source unknown: 'radar contact') center one two three point nine"

LC American two seventy five

DR-1 Direct Brooke we'll see ya

DR-1 Okay

LC All right wait wait a minute will ya one person

LC American two seventy five contact departure control

AA275 So long

APPENDIX E

F2 Ask Delta what his flight conditions are now

LC Delta three twenty five are you still in the soup

DL325 Yes sir at thirteen hundred

LC Okay sir ah climb and maintain three thousand  
Delta three twenty five present heading

DL325 Okay

F2 Still in the soup with that guy I

LC I'm going to pull Delta off and ah give him to  
departure

F2 All right turn him right to two forty right now  
(garbled)

LC Two forty

F2 Yeah two forty and climb to three thousand

LC All right coming to you

LC Delta three twenty five climb and maintain ah  
three thousand and ah turn right heading two  
four zero

DL325 Two four zero heading three thousand

LC All right there's a ah aircraft ahead of you we  
can't seem to find that's the reason for this

F2 I'm taking Eastern off to ah I don't know what's  
going on

LC Okay

LC Delta three twenty five go to frequency one one  
eight point three one one eight three

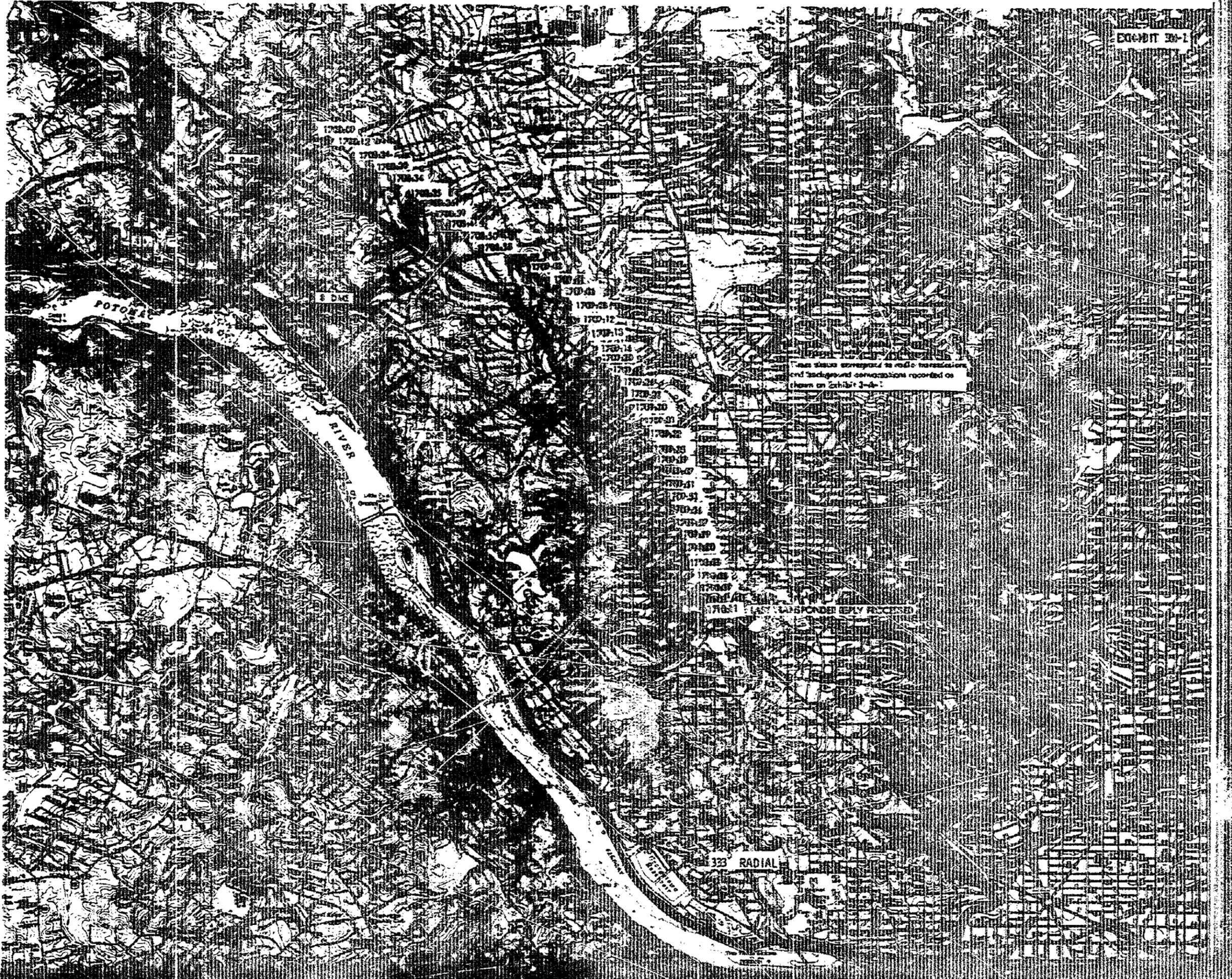
1713

APPENDIX E

DL325 Eighteen three  
(Unknown) Do you say you got one out there lost  
LC Ah we can't see him we lost him on the radar  
we're still looking

1714  
LC He is down  
F2 He he's down where  
F2 At the airport  
LC Not at the airport American University  
F2 Roger  
LC National four sixty eight cleared for takeoff  
(Unknown) (garbled) on the delay sir  
LC National four sixty eight cleared for takeoff  
NA648 That wasn't long was it

1715



This station was operated in radio transmission and background communications recorded on tapes on Exhibit 3-4a.

LAST RESPONSE RECEIVED

333 RADIAL

**NATIONAL TRANSPORTATION SAFETY BOARD**

WASHINGTON, D.C.

**FLIGHT TRACK**  
(ARTS OR DERIVED)

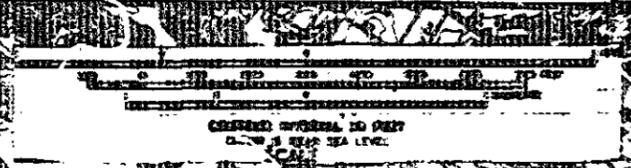
**BEECH 90 KING AIR N57V**

**WOLF INDUSTRIES, INC.**

**AMERICAN UNIVERSITY CAMPUS**

**WASHINGTON, D.C.**

**JANUARY 25, 1975**



Reproduced from  
best available copy.



4NM

3NM

2NM

FLIGHT PATH DISTANCE TO IMPACT

9 DME

8 DME

7 DME

Published on OCA 108 DME

LEGEND

Flight Path

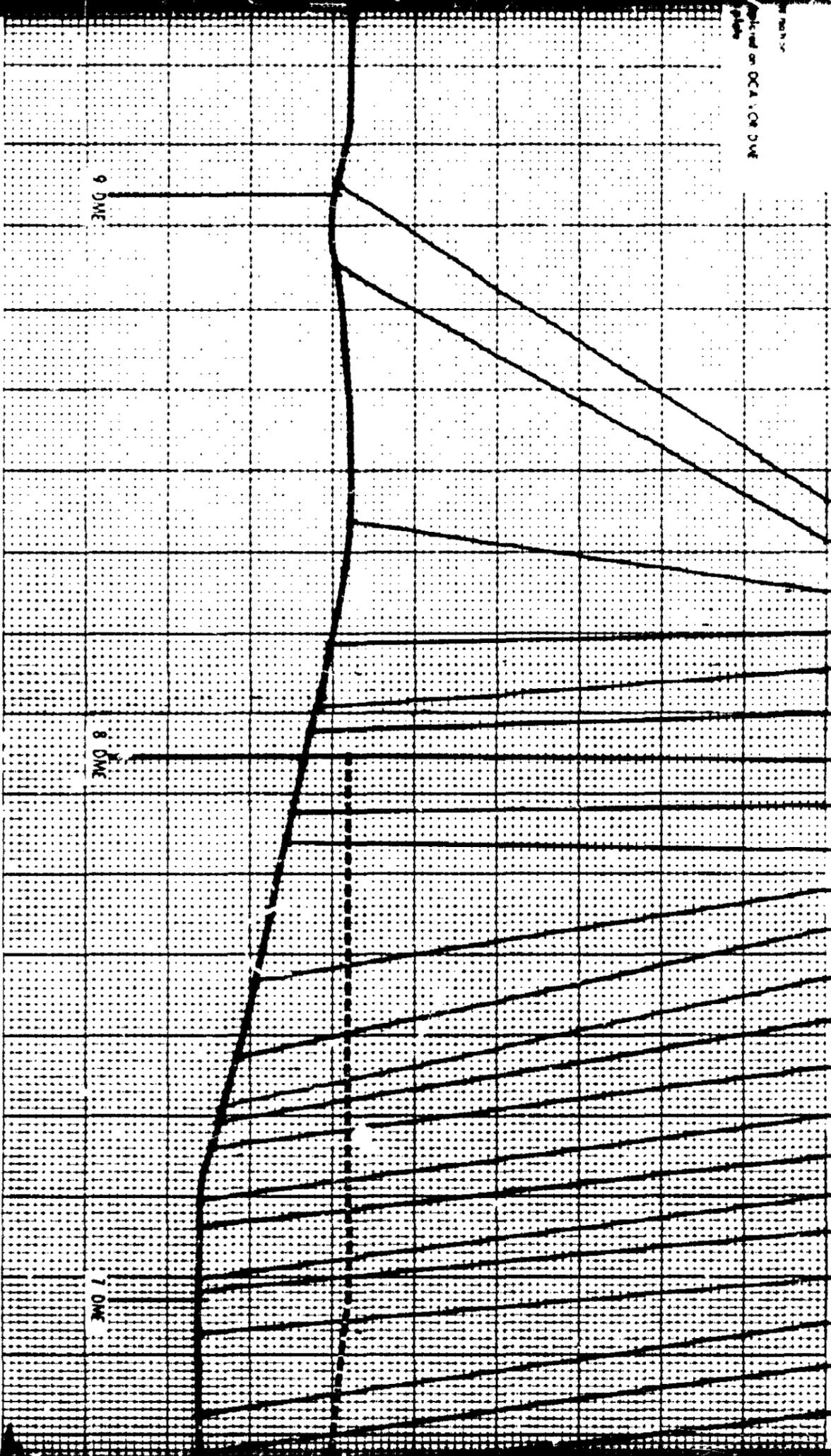
Center Point

Flight 24

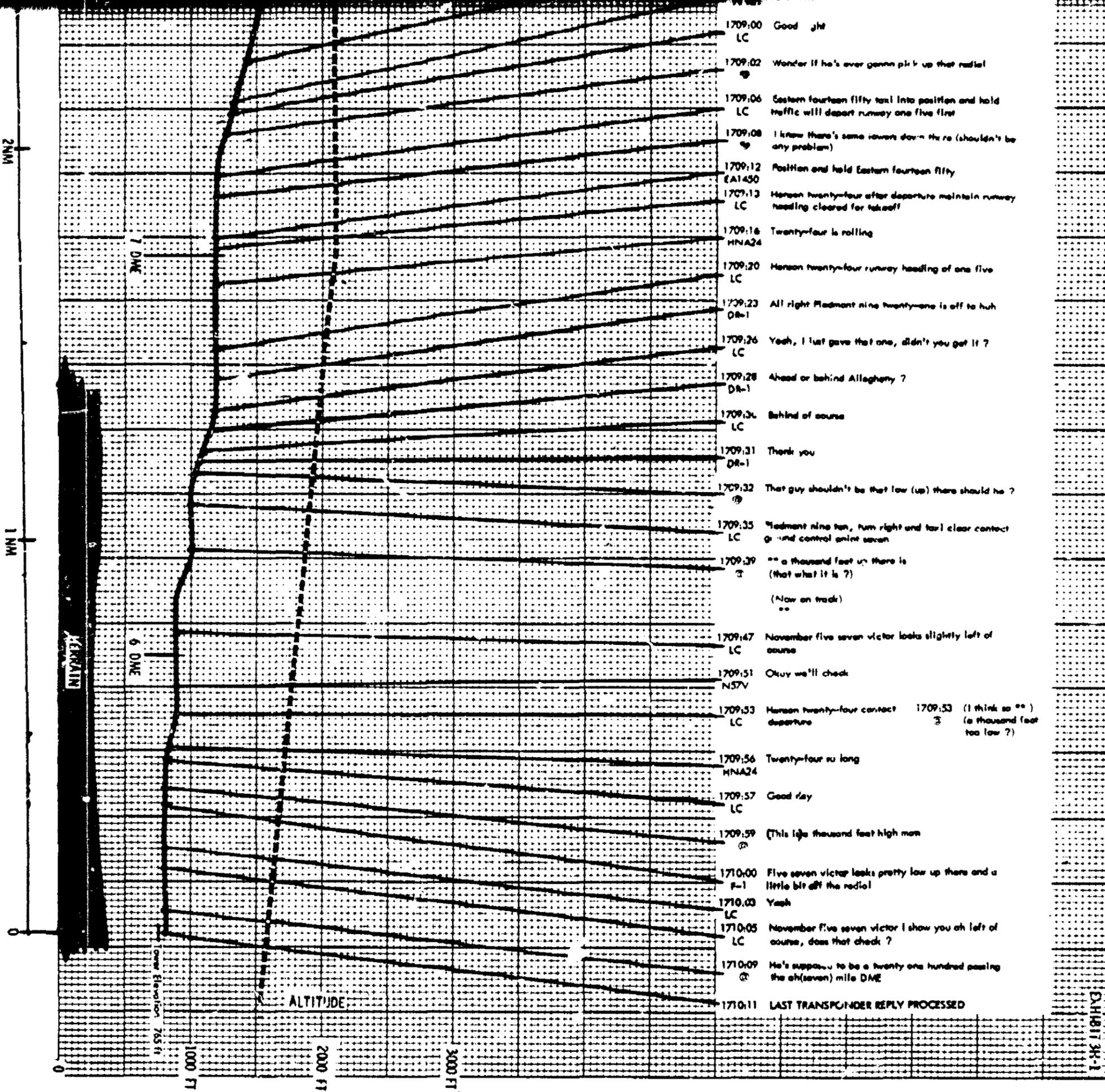
819

921

Flight 135



- 1708:09 Henson number twenty-four, taxi into position and hold traffic landing runway one eight LC
- 1708:12 Twenty-four HNA24
- 1708:24 Seven five seven UNK
- 1708:30 Allegheny eight nineteen tax contact departure control LC
- 1708:34 'ger so long AL819
- 1708:35 See ya LC
- 1708:36 All right (garbled) — JL (overriding DR-1 position) DR-1
- 1708:39 Piedmont nine twenty-one LC
- 1708:41 Roger — Piedmont nine oh seven, turn left heading DR-1
- 1708:50 Did they? \*
- 1708:55 Piedmont nine twenty-one, proceed southbound and contact departure control LC
- 1708:59 Good day to you all PI 921
- 1709:00 Good night LC
- 1709:02 Wonder if he's ever gonna pick up that radial \*
- 1709:06 Eastern fourteen fifty taxi into position and hold traffic will depart runway one five first LC
- 1709:08 I know there's some tower down there (shouldn't be any problem) \*
- 1709:12 Position and hold Eastern fourteen fifty EA1450
- 1709:13 Henson twenty-four after departure maintain runway heading cleared for takeoff LC
- 1709:16 Twenty-four is rolling HNA24
- 1709:20 Henson twenty-four runway heading of one five LC
- 1709:23 All right Piedmont nine twenty-one is off to hub DR-1
- 1709:26 Yeah, I just gave that one, didn't you get it? LC



APPENDIX F

EXHIBIT 34-1

**NATIONAL TRANSPORTATION SAFETY BOARD  
WASHINGTON, D.C.**

APPENDIX G

CORRECTED COPY - DESTROY PREVIOUS ISSUE. \*

ISSUED June 12, 1975

-----  
Forwarded to:

Honorable James E. Dow  
Acting Administrator  
Federal Aviation Administration  
Washington, D. C. 20591

SAFETY RECOMMENDATION(S)

A-75-52

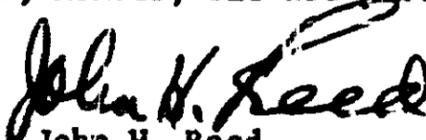
-----  
The National Transportation Safety Board's investigations of an accident involving Trans World Airlines Flight 514 on December 1, 1974, and an accident involving N57V, a Beech BE-90, on January 25, 1975, indicate that the controllers possessed safety advisory information which was not issued to the pilots. Both pilots were flying at excessively low altitudes. The issuance of such essential information is currently not mandatory since a safety advisory is an "additional service" and the controller has complete discretion for determining if this service is to be provided.

The categorization of a safety advisory as an additional service in paragraph 1545 of FAA Handbook 7110.8D and paragraph 810 of FAA Handbook 7110.9D is inconsistent with the apparent intent of paragraph 1800 of FAA Handbook 7110.8D and paragraph 907 of FAA Handbook 7110.9D. There is a lack of definitive guidelines to enable controllers to distinguish between a situation which is "likely to affect the safety of an aircraft" and a situation involving an imminent emergency. We believe both situations should be treated as emergencies.

On the basis of the above conclusion, the National Transportation Safety Board recommends that the Federal Aviation Administration:

Revise FAA Handbook 7110.8D and FAA Handbook 7110.9D to make the issuance of a safety advisory mandatory. (Class II)

REED, Chairman, THAYER, BURGESS, and HALEY, Members, concurred in the above recommendation. McADAMS, Member, did not participate.

  
By: John H. Reed  
Chairman

\* Underscored portion denotes change.

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1517B

APPENDIX H

SPECIALIST'S FACTUAL REPORT OF INVESTIGATION OF BACKGROUND  
NOISES HEARD ON AN ATC TAPE

A. ACCIDENT

Location: Washington, D.C.  
Date : January 25, 1975  
Aircraft: Beechcraft 90, N57V  
Operator: Private  
NTSB No.: IAD 75-A-1044

B. GROUP

Paul C. Turner, National Transportation Safety Board, Chairman  
Lloyd C. LaGrange, National Transportation Safety Board, Member  
John Ferguson, National Transportation Safety Board, Member  
Noel P. Keane, Professional Air Traffic Association, Member  
Roger B. Rothmel, Federal Aviation Administration, Member  
Frank M. McDermott, Frank M. McDermott, Ltd., Member

C. SUMMARY

The FAA-recorded communications contained background sounds which were identified as coming from speakers attached in such a manner that they acted as microphones connected to the tape recorder inputs through a 50 db pad. The voices were buried in and slightly louder than the ambient noise and normal tape machine noise. The transcript of background conversation was made individually and collectively by the group members. Although the details of what was being said varied among individuals, the gist of what was being said was consistent.

D. DETAILS OF THE INVESTIGATION

An investigator listening to a copy of Final One (F-1) position recording heard background conversation just above the noise level. Compression as a result of re-recording probably made the signals audible. The speakers were attached to the recorder summing amplifier through a -50 to -60 db pad, which was considered adequate to reduce signal feed-through due to the speaker acting as a microphone. This should normally be adequate to prevent interference; however, the automatic gain control (AGC) in combination with a strong signal from the speaker can result in an audible recording and that is apparently what happened in this case.

D. DETAILS OF THE INVESTIGATION (Cont'd)

Barely audible signals, both understandable and not understandable can be made out in the background at an estimated 50 db below normal signal levels before compression. The six persons who made up the group to listen to the record found it difficult to decipher enough of the conversation to make sense. In some cases, the suggestion of a word was enough to enable some of the group to hear it and then the suggestion of a different word would make it hearable as well.

Two tapes were taken to the FBI radio engineering labs where some of the correlated noise was removed in a re-recording. This attempt to enhance the tapes' audibility was enough to change its sound and cause further difficulties with the transcription.

Following the group effort, the audio lab engineer listened while varying filters and repeating passages a number of times. This resulted in a more complete, understandable transcript. However, attempts to confirm what was heard were frustrating, in that the power of suggestion frequently enabled others to hear an utterance which later proved to be different.

The master tape was recorded on a 20-channel Magnasync/Moviola recorder and was played back on the same type machine. Recordings were made with the Magnasync amplifier driving a Bogen amplifier into an Ampex recorder. Other copies were made directly from the tape head into a battery-operated preamplifier and then into a professional Crown amplifier/preamplifier and recorder to see if electronic noise could be eliminated.

The clearest recording was made feeding the Magnasync output into an amplifier and then into the Ampex recording system. A Voiceprint machine was used to repeat sections of the tape and a Lexicon variable speed, variable pitch machine was used to vary the speed and pitch. Signal conditioning other than simple/high low filtering to restrict the signal to the barest audio range tended to distort the already weak signal and increase the difficulty in transcribing the tape.

All 20 channels from each of two recorders were listened to and six were filtered and copied at the FBI lab. The tapes were listened to from the time N57V went to tower and departed 2,100 feet at approximately 1707:54, until 1713:00.

The tapes from the FBI lab were examined and only two were found to contain usable data. Only F-1 contained information relative enough to the accident to be studied.

APPENDIX H

Specialist's ATC Report

D. DETAILS OF THE INVESTIGATION (Cont'd)

Local north, (which becomes) clearance delivery (in a south operation is located in the tower cab and) contained the following at approximately 1711:50.

We don't know

\* \* \*

Looks like the # # is down at Memorial Bridge

\* \* \*

Don't say anything. Don't say too much on that thing (Vic)

1712:00 Thank you (John)

Gotta climb him

Climb him.

Climb Delta man

Is the pilot \* \* \*

This is followed by nonpertinent procedural type conversation relative to existing traffic. Delta 325's approach was broken off and he was directed out of the landing pattern with minimal explanation.

The attached transcript, which contains transmissions and intercommunications and background utterances was derived from two tape recordings--the local control channel and the F-1 channel. The transcript begins shortly after the aircraft was handed off to local control and just after it departed 2,100 feet. Background conversation occurring immediately prior to this time appears totally unrelated to 57-Victor and concerns differentiating between two items by the use of blue lights and clearing a runway for a possible change of landing direction.

The first entry at 1708:50 is unintelligible. The first clear comment which apparently concerns 57-Victor is at 1709:02, "I wonder if he's ever gonna pick up that radial." This and all subsequent conversation was discussed with the controllers involved who remembered no specifics. However, they did explain that some bits of post-accident conversation following the discussion of the aircraft altitude could have been related to the police helicopter, the marking of the scope where the target disappeared, and the recording of the scope control settings at the time of changeover to another controller.

Specialist's ATC Report

APPENDIX H

D. DETAILS OF THE INVESTIGATION (Cont'd)

At 1710:46, when the F-1 controller called Tony, his supervisor, to inform him of the possible accident, the position became the center of attention as the watch supervisor went to the position. Several different voices were evidently being recorded. However, the low level of the recording precluded positive speaker identification.

  
Paul C. Turner  
Aerospace Engineer

Attachment

APPENDIX H

TRANSCRIPTION OF VOICES HEARD IN THE BACKGROUND OF THE  
WASHINGTON TOWER IFR ROOM RECORDING OF TRANSMISSIONS CONCERNING  
N57V, A BEECH 90, WHICH CRASHED ON APPROACH TO WASHINGTON  
NATIONAL AIRPORT ON JANUARY 25, 1975, AT 1710 GMT

LEGEND

F-2 Final East Controller  
F-1 Final West Controller Position  
LC Local Control  
DR-1 Departure West Controller Position  
DR-2 Departure East Controller Position  
FWC Final West Controller  
HNA Henson Air Taxi Flight 24  
AL 919 Allegheny Flight 919  
PI 921 Piedmont Flight 921  
EA 1450 Eastern Airlines Flight 1450  
N57V Beech 90 KingAire  
AA 275 American Airlines Flight 275  
DEL 325 Delta Flight 325  
TW 427 Trans World Airlines Flight 427  
NA 468 National Airlines Flight 468  
UNK Unknown  
\* Unintelligible word  
# Nonpertinent word  
\$ Break in continuity  
( ) Questionable text  
(( )) Editorial insertion

TRANSMISSIONS AND INTERCOM COMMUNICATIONS

<u>TIME &amp; SOURCE</u>	<u>CONTENT</u>
1708:09 LC	Henson number twenty-four, taxi into position and hold traffic landing runway one eight
1708:12 HNA 24	Twenty-four
1708:24 UNK	Seven five sierra
1708:30 LC	Allegheny eight nineteen tax contact departure control
1708:34 AL 819	'ger so long
1708:35 LC	See ya
1708:36 DR-1	All right ((garbled)) --- J L (overriding DR-1 position)
1708:39 LC	Piedmont nine twenty-one
1708:41 DR-1	Roger --- Piedmont nine oh seven, turn left heading
1708:55 LC	Piedmont nine twenty-one proceed southbound and contact departure control

BACKGROUND UTTERANCES  
(F-1 Position Recording)

<u>TIME &amp; SOURCE</u>	<u>CONTENT</u>
	(See text of report)
1708:50 (?)	Did they *

TRANSMISSION AND INTERCOM COMMUNICATIONS

<u>TIME &amp; SOURCE</u>	<u>CONTENT</u>
1708:55 LC	Piedmont nine twenty-one, proceed southbound and contact departure control
1708:59 PI 921	Good day you all
1709:00 LC	Good night
1709:06 LC	Eastern fourteen fifty taxi into position and hold traffic will depart runway one five first
1709:12 EA 1450	Position and hold Eastern fourteen fifty
1709:13 IC	Henson twenty-four after departure maintain runway heading cleared for takeoff
1709:16 HRA	Twenty-four is rolling
1709:20 LC	Henson twenty-four runway heading of one five
1709:23 DR-1	All right Piedmont nine twenty-one is off to hub

BACKGROUND UTTERANCES

<u>TIME &amp; SOURCE</u>	<u>CONTENT</u>
1709:02 (?)	Wonder if he's ever gonna pick up that radial
1709:08 (?)	I know there's some towers down there (shouldn't be any problem)

APPENDIX H

TRANSMISSIONS AND INTERCOM COMMUNICATIONS

<u>TIME &amp; SOURCE</u>	<u>CONTENT</u>
1709:26 LC	Yeah, I just gave that one, didn't you get it?
1709:28 DR-1	Ahead or behind Allegheny
1709:30 LC	Behind of course
1709:31 DR-1	Thank you
1709:35 LC	Piedmont nine ten, turn right and taxi clear contact ground control point seven
1709:39 PI 910	Okay
1709:47 LC	November five seven victor looks slightly left of course
1709:51 N5TV	Okay we'll check
1709:53 LC	Henson twenty-four contact departure control  ((Impact estimated between 1709:52 and 1709:55))

BACKGROUND UTTERANCES

<u>TIME &amp; SOURCE</u>	<u>CONTENT</u>
1709:32 (?)	That guy shouldn't be that low up there should he?
1709:39 (?)	* * a thousand feet up there is (that what it is?)  (Now on track)  * *
1709:53 (?)	(I think so * *)  (A thousand foot too low?)

TRANSMISSIONS AND INTERCOM COMMUNICATIONS

<u>TIME &amp; SOURCE</u>	<u>CONTENT</u>
1709:56 HNA 24	Twenty-four so long
1709:57 LC	Good day
1710:00 F-1	Yeah
1710:05 LC	November five seven victor I show you ah left of course, does that check?
1710:12 LC	November five seven victor ah tower
1710:15 LC	Henson twenty-four contact departure
1710:18 LC	Eastern fourteen fifty cleared for takeoff
1710:21 EA 1450	Fourteen fifty rolling
1710:23 LC	American two seventy-five taxi into position and hold

BACKGROUND UTTERANCES

<u>TIME &amp; SOURCE</u>	<u>CONTENT</u>
1709:59	(This is) a thousand feet high man ((This statement made by the arrival one controller, and according to him was in reference to some antennas which are marked on the scope and were missed by 5TV))
1710:09 (?)	He's supposed to be at twenty-one hundred passing the ah (seven) mile DME
1710:20 (?)	(I think so)

APPENDIX H

TRANSMISSIONS AND INTERCOM COMMUNICATIONS

<u>TIME &amp; SOURCE</u>	<u>CONTENT</u>
1710:25 AA 275	American two seventy-five, position and hold
1710:28 LC	November five seven victor if you read, ident over
1710:34 LC	I don't get the five seven vic any more he called me once though
1710:38 UNK	Ur oh
1710:40 F-1	Five seven victor Washington tower
1710:45 LC	November five seven victor Washington
1710:54 DL 325	Wash tower Delta three twenty-five
1710:59 LC	Delta three twenty-five Washington tower roger

BACKGROUND UTTERANCES

<u>TIME &amp; SOURCE</u>	<u>CONTENT</u>
1710:26 (?)	(They) sure as # should(n't) be. A thousand feet (going in by the antenna)
1710:45 (?)	He's gone baby
1710:46 FWC	Hey Tony five seven victor was on my scope, he was very low (pretty near the radial) left of course. The tower's not talking to him any more (I'm not talking to him any more) he went into coast
1710:59 ((End of words))	And disappeared off the scope

TRANSMISSIONS AND INTERCOM COMMUNICATIONS

<u>TIME &amp; SOURCE</u>	<u>CONTENT</u>
1711:02 LC	American two seventy-five cleared for takeoff
1711:05 AA 275	American two seventy-five is rolling
1711:10 F-1	Are you talking to five seven victor?
1711:11 LC	Negative
1711:13 TW 427	TWA four two seven ready in sequence
1711:15 LC	Roger hold short
1711:18 LC	Eastern fourteen fifty
1711:20 DR-2	J T
1711:23 LC	Eastern fourteen fifty contact departure control

BACKGROUND UTTERANCES

<u>TIME &amp; SOURCE</u>	<u>CONTENT</u>
1711:06 FWC	No sir
1711:09 (?)	(They called him)
1711:11 (?)	(* * that frequency)
1711:14 (?)	They're not talking to him
1711:18 FWC	I think he pranged it (I believe it)
1711:20 FWC	He went into coast three times and disappeared
1711:22 (?)	(I really) think he (busted it) ((or)) (I'm worried)

APPENDIX H

TRANSMISSIONS AND INTERCOM. COMMUNICATIONS

<u>TIME &amp; SOURCE</u>	<u>CONTENT</u>
1711:25 EA 1450	Roger
1711:26 F-2	Ask Delta if he sees anything up there
1711:28 LC	Okay
1711:29 LC	Delta three twenty-five ah --- what are your flight conditions (override unknown source: "we anticipate")
1711:34 DL 325	We're in the soup six -- at fifteen hundred feet
1711:35 LC	All right thank you
1711:40 NA 468	Four sixty eight's ready
1711:41 LC	Thank you hold short
1711:44 LC	November five seven victor this is Washington tower if you read ah you're cleared to land over

BACKGROUND UTTERANCES

<u>TIME &amp; SOURCE</u>	<u>CONTENT</u>
1711:27 FWC	* * King Aire
1711:47 (?)	(He's a police man)

TRANSMISSIONS AND INTERCOM COMMUNICATIONS

<u>TIME &amp; SOURCE</u>	<u>CONTENT</u>
1711:51 F-1	Do you have five seven victor yet?
1711:53 LC	Negative
1711:59 LC	(Overriding DP-1 position) "Twenty-five direct Brooke contact center on fre-- uh correction, it's Eastern one seventy seven direct Brooke contact (override source unknown: 'radar contact') center one two three point nine"
1712:07 LC	American two seventy-five
1712:08 DR-1	Direct Brooke we'll see ya
1712:09 DP 1	Okay
1712:11 LC	All right wait, wait a minute will ya one person
1712:13 LC	American two seventy-five contact departure control
1712:16 AA 275	So long

BACKGROUND UTTERANCES

<u>TIME &amp; SOURCE</u>	<u>CONTENT</u>
1711:54 (?)	They don't have him, he's not there, he's (disappeared) ((or)) (gone clear) off the scope
	* Nothing (That's it)
	He's gone  (You don't do it with your finger)
	#
(?)	Yes

APPENDIX H

TRANSMISSIONS AND INTERCOM COMMUNICATIONS

<u>TIME &amp; SOURCE</u>	<u>CONTENT</u>
1712:17 F-2	Ask Delta what his flight conditions are now
1712:18 LC	Delta three twenty-five are you still in the soup
1712:20 DL 325	Yes sir at thirteen hundred
1712:23 LC	Okay sir ah climb and maintain three thousand Delta three twenty-five present heading
1712:28 DL 325	Okay
1712:30 F-2	Still in the soup with that guy I
1712:31 LC	I'm going to pull Delta off and ah give him to departure
1712:35 F-2	All right turn him right to two forty right now  ((Garbled))
1712:36 LC	Two forty

BACKGROUND UTTERANCES

<u>TIME &amp; SOURCE</u>	<u>CONTENT</u>
	(Who picked this trace here)
	(He picked it out)
	(You mark it * *)
1712:24 FWC	He was very low and I saw him * * * * he was extremely low
	(What time you say * *)
	* (Where do I set my * *)
	*
	*

APPENDIX H

TRANSMISSIONS AND INTERCOM COMMUNICATIONS

<u>TIME &amp; SOURCE</u>	<u>CONTENT</u>
1712:37 F-2	Yeah two forty and climb to three thousand
1712:39 LC	All right coming to you
1712:41 LC	Delta three twenty-five climb and maintain ah three thousand and ah turn right heading two four zero
1712:47 DL 325	Two four zero heading three thousand
1712:49 LC	All right there's ah aircraft ahead of you we can't seem to find that's the reason for this
F-2	I'm taking Eastern off to ah I don't know what's goin on
1713:06 LC	Okay
1713:10 LC	Delta three twenty-five go to frequency one one eight point three one one eight three
1713:14 DL 325	Eighteen three
1713:27 UNK	Do you say you got one out there lost

BACKGROUND UTTERANCES

<u>TIME &amp; SOURCE</u>	<u>CONTENT</u>
1712:40 (?)	* *

APPENDIX H

TRANSMISSIONS AND INTERCOM COMMUNICATIONS

TIME &  
SOURCE

CONTENT

1713:30  
LC

Ah we can't see him we lost him on the  
radar we're still looking

1714:32  
LC

He is down

BACKGROUND UTTERANCES

TIME &  
SOURCE

CONTENT

1713:29  
(?)

Ask him if they ever talked to him  
((followed by several short undecipherable  
phrases))