# Aerotransportes Entre Rios S. R. L. Canadair CL-44-6, LV-JSY, Miami, FL, International Airport, Sep 27, 1975

National Transportation Safety Board, Washington, D C

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16. Abstract

At 0600 e.d.t., September 27, 1975, Aerotransportes Entre Rios Cargo Flight 501/90, a Canadair Cl-44-6, LV-JSY, crashed while attempting a night VMC takeoff from runway 27L at the Miami International Airport, Miami, Florida. The aircraft did not become airborne, and the pilot attempted unsuccessfully to reject the takeoff. The aircraft ran off the departure end of the runway and crashed on the west bank of a canal, about 960 ft. from the departure end of the runway. Six of the ten persons aboard were killed. Two crewmembers and two passengers survived the accident. The aircraft was destroyed by impact and fire. The aircraft struck and destroyed an automobile; one occupant of the car was injured.

The National Transportation Safety Board determines that the probable cause of the accident was an attempt to take off with an external makeshift flight control lock on the right elevator.

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NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C. 20594

AIRCRAFT ACCIDENT REPORT

Adopted: March 10, 1976

AEROTRANSPORTES ENTRE RIOS S.R.L.
CANADAIR CL-44-6, LV-JSY
MIAMI INTERNATIONAL AIRPORT
MIAMI, FLORIDA
SEPTEMBER 27, 1975

## SYNOPSIS

At 0600 e.d.t., September 27, 1975, Aerotransportes Entre Rios Cargo Flight 501/90, crashed while attempting a night VMC takeoff from runway 27L at the Miami International Airport, Miami, Florida. The aircraft did not become airborne, and the pilot attempted unsuccessfully to reject the takeoff. The aircraft ran off the departure end of the runway and crashed on the west bank of a canal, about 960 ft. from the departure end of the runway. Six of the ten persons aboard were killed. Two crewmembers and two passengers survived the accident. The aircraft was destroyed by impact and fire. The aircraft struck and destroyed an automobile; one occupant of the car was injured.

The National Transportation Safety Board determines that the probable cause of the accident was an attempt to take off with an external makeshift flight control lock on the right elevator.

## 1. INVESTIGATION

### 1.1 History of the Flight

Aerotransportes Entre Rios (AER) Flight 501/90 was a scheduled cargo flight from Miami, Florida, to Buenos Aires, Argentina, with intermediate stops at Panama City, Panama; Lima, Peru; Santa Cruz, Bolivia; and Asuncion, Paraguay. A crew of six and four passengers were aboard; the passengers were accompanying the cargo. AER is a foreign air carrier operating under the provisions of 14 CFR 129. The flightcrew had filed an instrument flight rules (IFR) flight plan to Panama City with the Miami Flight Service Station.

About 0555, 1/ the flight was cleared to taxi from the northwest cargo area of Miami International Airport to runway 27L, and when the aircraft reached the takeoff end of the runway, the local controller cleared the flight for takeoff.

The local controller saw the aircraft begin the takeoff run. He continued to watch the aircraft until it was about half way down the runway, at which time his attention shifted to other aircraft requiring tower assistance. When he looked back toward runway 27L, he could not see the aircraft and was still looking for it when the ILS localizer alarm sounded. Then he saw a fire at the west end of the airport; at 0600:20, he activated the crash alarm signal to the airport fire department.

Four witnesses saw the aircraft during its takeoff run. One saw the takeoff from start to impact; the other three witnesses saw the aircraft after it reached the last one-third of the runway. They unanimously stated that there was no fire or explosion until after the aircraft left the paved surface of the runway.

The witnesses who saw the aircraft in the last third of the runway, said that the aircraft was traveling at a high rate of speed, and that engine noise was loud. One witness stated that he saw the nosewheel in the air, but that later it was lowered to the ground. The other witnesses saw the aircraft slightly farther along the runway, and they stated that all three landing gears were on the ground.

The witness who saw the entire takeoff run said that the nosewheel did not leave the ground and that as the aircraft passed his position, which was about 2,000 to 2,500 ft. from the departure end of the runway, he heard the engine noise "cut," a "popping sound," and then the engine noise increased to a higher level and remained at that level until impact. The witness believed that the pilot rejected the takeoff. Other witnesses alluded to the popping sound and the change in the level of engine noise.

A surviving pilot was standing behind the captain during the takeoff run. He said that everything was normal on the takeoff run until the aircraft reached rotation speed ($V_R$). The captain tried to rotate the aircraft, but it did not respond. The captain remarked: "We are staying on the ground, we can't take off." About 2 or 3 seconds later, the survivor heard reverse thrust and the brakes being applied. He believed that the captain either pulled or forced the controls back before he attempted to reject the takeoff.

The survivor believed that the reverse thrust sounded normal, and he felt the aircraft decelerate. He did not remember seeing the

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1/ All times herein are eastern daylight, based on the 24-hour clock.

amber runway lights during deceleration, but he did recall that the remaining runway was short when reverse thrust was applied. When he saw the fence at the end of the runway, he ran back to the cabin and braced himself against the aft side of the galley.

After the aircraft left the runway, it struck the ILS localizer monitor structure and continued through the ILS localizer antennae array.

Wheel tracks, from the runway onto the sod, were commensurate with the three landing gears of the aircraft. These tracks continued for 879 ft. to an irrigation ditch adjacent to the airport perimeter road. The left main landing gear collapsed at the irrigation ditch. The aircraft continued beyond the irrigation ditch, across the inner perimeter, through a steel wire fence, across the outer perimeter road where it struck a parked car, and came to rest on the west bank of a canal. The aircraft was destroyed by impact and the ensuing fire.

On the evening of September 26, when the inbound flight was parked for customs inspection, the incoming flight engineer installed an external control lock on the right elevator. The lock was installed because the right elevator gust lock hydraulic actuating cylinder of the internal gust lock system had been removed so that a fluid leak could be repaired. Ground service witnesses saw the external lock being installed; however, there were no witnesses who saw the lock being removed from the aircraft before it departed as Flight 501/90.

The accident occurred at night, and at an elevation of 9 ft. The geographic coordinates of the accident site were latitude 25° 47' N. - longitude 80° 17' W.

## 1.2 Injuries to Persons

| Injuries | Crew | Passengers | Other |
|---|---|---|---|
| Fatal | 4 | 2 | 0 |
| Nonfatal | 2 | 2 | 1 |
| None | 0 | 0 | |

## 1.3 Damage to Aircraft

The aircraft was destroyed.

## 1.4 Other Damage

The ILS localizer monitor and localizer antennae for runway 9R were destroyed. A section of chain link fence at the airport's western boundary and a guard rail at the perimeter road were damaged. A vehicle parked on the perimeter road was destroyed.

## 1.5 Crew Information

Because of the duration of the planned flight, the company used an augmented flightcrew of three pilots, two flight engineers, and a loadmaster.

All the crewmembers were qualified and certificated in accordance with existing rules and regulations of Argentina. The captain was flying the aircraft. (See Appendix B.)

## 1.6 Aircraft Information

Aircraft LV-JSY, a Canadair CL-44-6 Yukon, was registered in Argentina to Aerotransportes Entre Rios, S.R.L. The aircraft had an Argentine airworthiness certificate (No. 4581) which was issued April 14, 1975, and would have expired April 14, 1976. (See Appendix C.)

The aircraft was loaded with a cargo of aircraft engines, automobile and tractor parts, and perfume. The perfume, a flammable liquid and classified as a dangerous article, was properly packaged, marked, and labeled.

According to the weight and balance manifest, the total cargo weight on LV-JSY was 13,021 lbs. All the cargo recovered was weighed; the recovered cargo weighed 10,677 lbs.

AER procedures required that the first officer fill out the weight and balance manifest. The computed weight and balance for this flight were 169,161 lbs. and 22 percent MAC. The maximum allowable gross takeoff weight was 205,000 lbs. and the center of gravity limits were 17 to 31 percent MAC.

When the weight and balance were recomputed, they were found to be within prescribed limits although the first officer had incorrectly computed the moment arm for compartments I and K. The aircraft had 60,000 lbs. of Jet-A fuel aboard at takeoff.

## 1.7 Meteorological Information

The official National Weather Service observations immediately before and after the accident read, in part, as follows:

0551 - thin scattered clouds at 25,000 feet; visibility--10 miles; temperature--75°F; dew point--72°F; wind--340° at 5 kn; altimeter setting--29.96 in.Hg.

0603 - scattered clouds at 2,000 feet; scattered clouds at 25,000 feet, visibility--8 miles; temperature--75°F; dew point--72°F; wind--360 at 4 kn; altimeter setting--29.96 in.Hg. (aircraft mishap)

The accident occurred in moonlight under scattered clouds.

1.8 Aids to Navigation

Not applicable.

1.9 Communications

There were no pertinent communication discrepancies reported.

1.10 Aerodrome and Ground Facilities

Runway 27L is asphalt surfaced and grooved, and is 9,349 ft. long and 150 ft. wide. The runway was clear and dry and had been steam cleaned on September 14, 1975. The high intensity runway lights were illuminated. The last 2,000 ft. of the runway lights are color coded amber.

The localizer monitor structure, located 400 ft. from the departure end of runway 27L, consisted of wooden monitor detector poles mounted on a cross-frame structure of 4- by 4-inch timbers.

The localizer antennae array, located 554 ft. from the departure end of the runway, consisted of eight loop-type antennae mounted on a metal platform. The platform was anchored in eight concrete foundations to insure antennae rigidity. The concrete foundations extended about 1 ft. above ground level.

1.11 Flight Recorders

No flight recorders were installed in this aircraft. 14 CFR 129 does not require a flight recorder to be installed; however, Annex 6, Part I to the Convention of International Civil Aviation, Par. 6.3.1 requires the installation of a flight data recorder for accident investigations as a standard for turbopropeller aircraft engaged in international commerce. The Government of Argentina has signed this Annex and has not published an exception to compliance with Par. 6.3.1.

1.12 Wreckage

The empennage came to rest on the east bank of a canal 961 ft. from the departure end of the runway. The fuselage was across the canal and the center section, wings and engines were on its west bank. The fuselage forward of the wing, the cargo in the cabin, and the occupants were found west of the canal. (See Appendix D.)

The inboard and outboard flaps of both wings were damaged by impact and fire. The left flap outboard actuator was extended about 12

inches which compared to 15° of flap extension. The needle of the flap position indicator was 3/4 inch from the word "up." The recommended flap setting for takeoff was 15°.

The gust lock control valve, located in the upper rear corner of the nosewheel well, was recovered. All lines were broken, and the actuating lever was still attached. The lever was found rotated forward past the "off" stop. The actuating cylinder for the right elevator gust lock had been removed and both hydraulic lines were capped securely with standard caps.

There was no evidence to indicate a failure of the aircraft's systems, structure, or powerplants before the aircraft ran off the runway's surface.

About 40 percent of the left nosewheel tire tread was found on the runway about 5,600 ft. from the departure end. The tread separated from the tire carcass, but the tire was not blown out.

A wooden external elevator control lock was recovered from the canal, floating in midstream about 40 ft. north of the fuselage wreckage. The control lock was recovered after the wreckage had been removed from the canal. One side of the ground control lock assembly was unburned while the other side was severely burned. There was no fabric streamer attached to the control lock when it was recovered from the canal.

1.13 Medical and Pathological Information

The deceased occupants sustained multiple, severe traumatic injuries. None of the deceased had been burned.

Toxicological tests of the captain and the copilot were negative for alcohol, acid, alkaloid basic drugs, cyanide, amphetamines, opiates and barbiturates. The tests of the remaining occupants were negative for alcohol and acid and basic drugs. No significant levels of carbon monoxide were found.

1.14 Fire

Upon their arrival at the scene, the airport firefighters saw fire on the surface of the canal water and around the wings and fuselage. The fuselage appeared to be generally intact and spanned the canal. At 0620, the fire was under control and at 0700 all fires were out.

1.15 Survival Aspects

This accident was partially survivable. Seat tiedowns failed throughout the aircraft; two seatbelts failed; the aircraft structure was compromised; and, the occupants were ejected from their compartments.

The cockpit and cabin were destroyed. The surviving flight engineer occupied the radio operator's seat which was located behind the senior flight engineer's seat. The survivor's first indication that something was wrong was when he was thrown against the flight engineer's seat while the aircraft was moving. He did not remember the aircraft's stopping, nor did he remember being in the wreckage.

The two surviving passengers did not use their seatbelts; one was standing in the cabin and the other was seated facing rearward in the double aft-facing passenger seat. One fatally injured passenger was seated in an aft-facing seat and was wearing a seatbelt.

1.16 Tests and Research

The wheel brake assemblies were examined; the lining segments had no abnormal wear. There was no evidence of overheating, failure, or leakage on any brake assembly; and the wheel bearings rotated freely.

The eight antiskid units were examined; two units were tested functionally and the remaining six were partially disassembled to determine their capabilities. Postaccident findings included impact damage to the flywheel bearing race support posts, burned tires, and water and sand inside the wheel shells. No preimpact damage was found that would have caused the units to malfunction.

The following conditions affected the aircraft's takeoff performance:

| | |
|---|---|
| Takeoff gross weight | 169,121 lbs. |
| Center of gravity | 19.8 percent MAC |
| Field elevation | 9 ft. m.s.l. |
| Runway length | 9,349 ft. |
| Temperature | 75°F. |
| Wind | 360°/4 kn |
| Runway direction | 270° |

The Safety Board computed the takeoff performance based on the following manufacturer's data.

| | |
|---|---|
| Critical engine speed ($V_1$) | 108 KIAS |
| Rotation speed ($V_R$) | 119 KIAS |
| Liftoff speed ($V_{LOF}$) | 123 KIAS |
| a. Distance to - $V_{LOF}$ | 3,480 ft. |
| b. Time to - $V_{LOF}$ | 31.5 sec. |
| Maximum refusal speed (MRS) 2/ | 139.5 KIAS |
| a. Distance to MRS | 4,490 ft. |
| b. Time to MRS | 36 sec. |

2/ Maximum refusal speed is the indicated speed to which the aircraft can be accelerated and still stopped on the remaining runway. The length of runway 27L was such that the aircraft could have accelerated to a speed greater than liftoff speed ($V_{LOF}$) and still stopped on the runway.

1.17 Other Information

Gust Lock Information

On September 15, 1975, maintenance personnel removed the hydraulic actuator for the right elevator's internal gust lock; the part needed repair because of a fluid leak. The mechanism had not been replaced at the time of the accident.

The Canadair CL-44-6 aircraft is equipped with elevator control surfaces that are free floating--their movements result from the aerodynamic reaction to trailing edge servo tabs. Each elevator moves independently of the other, and its travel is limited by control stops.

The primary flight controls are mechanically connected to the servo tabs which run the length of each elevator control surface's trailing edge. Movement of the control column actuates the servo tabs which, in reacting to aerodynamic pressure, move the associated control surfaces. Since only the servo tabs are positioned by movement of the control column, the system permits the control column to operate freely through its entire range, even with an external gust lock inserted.

The aircraft also is equipped with an internal gust lock system, which, when engaged, locks the control surfaces to prevent damage by wind buffeting. When any control surface is locked, a microswitch, mounted on the locking actuator, operates the amber master caution lights and the surface lock windows on the annunciator panels. These lights will remain illuminated until all control surfaces are unlocked. The gust lock lever is interconnected with the engine power levers so that takeoff power cannot be applied to more than one engine on each side when the gust lock lever is in the "locked" positions.

According to the CL-44-6 operating manual, the flight controls must be unlocked during the pretakeoff checklist and the flightcrew should observe the control positions on the indicators. With an external gust lock installed on the right elevator, releasing the internal gust lock would permit the left elevator to droop down while the right elevator remained faired with the horizontal stabilizer. The indicators would show these positions.

The external elevator control lock was not produced by the aircraft manufacturer. The manufacturer first became aware of the device during the investigation of this accident. Such a device was not a part of, nor included in, the certification of the aircraft.

AER personnel stated that there are no written standard operating procedures governing the carriage, stowage, installation, and removal of external elevator control locks. They did state, however, that the lock

is only carried on an aircraft when there is a malfunction of the internal control lock mechanism and the installation of the external type lock is required to protect the elevator from wind damage while the aircraft is on the ground.

Regardless of when the external gust lock was installed on the elevator, an informal company procedure directed the flight engineer who installed the lock to leave a note for the oncoming flight engineer. This note was to be affixed to the flight engineer's instrument panel to inform him that an external control lock had been installed. When the external gust lock was not in use, it was usually stowed between the crew bunks and the cockpit wall. The senior flight engineer was responsible for removing the lock during his preflight inspection of the aircraft and for stowing it properly.

The flight engineer on the inbound flight to Miami stated that only one external elevator control lock was on the aircraft and that he installed it on the right elevator after the aircraft was parked for customs inspection. He prepared a note which stated that the lock was in place; he affixed the note to the stem of the clock on the flight engineer's instrument panel. A red fabric streamer was on the lock and in place when the lock was installed.

A ground service mechanic saw the lock being installed and said that the lock was still in place when the aircraft was towed from the gate to the cargo area. He did not see the streamer. He saw the oncoming flight engineer make his walk-around inspection, but did not see him remove the lock nor did he see any ladders in the vicinity of the aircraft's horizontal stabilizer.

An AER employee saw the gust lock on the right elevator while the aircraft was being loaded in the cargo area, and said that there was a streamer attached to the lock. He advised the oncoming flight engineer that the external gust lock was installed when he briefed him on the aircraft's status. The flight engineer acknowledged this information.

When the surviving flight engineer of Flight 501/90 came to the cockpit, he saw the senior flight engineer making his checks; he did not see a note on the flight engineer's panel clock. He believed that the senior flight engineer made the walk-around inspection alone and did not use a ladder during this check. He did not see an external control lock on the aircraft nor did he see it inside the aircraft.

## Performance Restriction

According to the aircraft manufacturer, the total elevator effectiveness with the right elevator secured by the external control lock would have been reduced to about 40 percent. Under these conditions, assuming that the pilot used the normal rotation procedures of pulling

the control column aft one-half its travel limit and used a pull force of about 40 lbs., the aircraft would not rotate at $V_R$ (119 kn.) Rotation at $V_R$ would have required more than the normal amount of control column travel and pull force. The manufacturer stated that in the normal three-point attitude, the aircraft would have flown off the ground at about 165 KIAS.

## 2. ANALYSIS AND CONCLUSIONS

### 2.1 Analysis

The crewmembers were qualified and certificated for their respective duties in accordance with the laws and regulations of the Argentine Government. There was no evidence of any medical factors or physiological problems that would have affected the flightcrew's performance.

The aircraft was certificated and maintained in accordance with existing regulations and approved procedures. The gross weight and c.g. were within prescribed limits for the intended flight. There was no significant weather that would have affected the control or performance of the aircraft.

Except for the separation of the left nosewheel tire tread, there was no evidence of preimpact failure or malfunction of the aircraft's structure, powerplants, or systems.

Early in the investigation, attention was focused on the failure of the aircraft to lift off the runway and the unsuccessful attempt to reject the takeoff. The only indication of an aircraft problem was the nosegear tire tread found on the runway about 3,600 feet from the departure end. Evidence indicates that the tread separated from the carcass cord, and that this may have been caused by underinflation or ply separation which allowed air to enter pockets under the tread. The Safety Board concluded that the failure of this tread did not play a significant part in the accident sequence.

There was no evidence of any preimpact failure or malfunction of the aircraft structure or the powerplants. The only discrepancy noted in the aircraft records was the removal of the right elevator internal lock mechanism and the capping of the hydraulic lines.

To protect the elevator control surface when the aircraft was on the ground, the carrier provided a manual control lock to be used by the flightcrew. The flightcrew that brought the aircraft to Miami installed the lock on the right elevator when the aircraft was parked. Witnesses saw the lock at various times while the aircraft was on the ground. Two persons reportedly advised the flight engineer of flight

501/90 that the lock was installed. Several days after the accident, the lock was recovered from the canal. Had the lock been stowed in the cabin, the Safety Board would have expected to recover it on the west bank of the canal with the cabin contents. The fire damage to the lock indicated that it was exposed to fire while floating in the water. Consequently, the Safety Board concludes that the lock was installed when the aircraft crashed.

The takeoff performance of the aircraft apparently was normal until the captain attempted to rotate it and to fly it off the ground. His comments about being unable to take off indicate that he did not know why he could not rotate. By the time he had determined that he could not overcome whatever prevented him from getting the nose of the aircraft up to the takeoff attitude, he had proceeded too far down the runway to stop. The procedures used by the captain to reject the takeoff were carried out in accordance with the aircraft operating manual.

The Safety Board's examination of the tires and brakes indicates that, with the exception of the nosewheel tread failure, they operated normally and provided the expected braking action. The engines were placed in reverse thrust in a timely manner and without difficulty. The surviving pilot felt the effect of the reverse thrust and braking. There is no evidence that the stopping capability of the aircraft was seriously compromised.

The performance data indicate that by the time the captain began to reject the takeoff, there was not enough runway left in which to stop. Because there was no flight recorder data, the Safety Board was unable to determine the airspeed at which the takeoff was rejected. However, by applying normal reaction times and by evaluating the surviving pilot's statement, the Safety Board concludes that the takeoff was rejected at a speed above 139 kn. Ground witnesses' statements that the aircraft was about two-thirds of the way down the runway before they saw or heard a rejected takeoff substantiate this conclusion. Calculations based on the normal acceleration capability of the aircraft indicate that the airspeed may have been as high as 165 kn when the takeoff was rejected.

The Safety Board examined the flight control gust lock system to determine how the control lock could have been detected by the flightcrew. Evidence indicates that the flight engineer knew that the control lock was on the right elevator. Possibly, he did not see the lock during his visual, external inspection of the aircraft. There is some evidence to indicate that the red streamer which was attached to the lock was either blown out of sight by the wind or became detached before the preflight inspection. Possibly, the engineer found the note attached to the clock, intended to remove the lock later, and forgot it. Based on the available evidence, however, the Safety Board cannot determine the reason for the engineer's failure to remove the lock.

Later, the pilots had an opportunity to detect the restricted movement of the right elevator during pretakeoff checks. When they released the hydraulic gust locks during the checks, they should have noted the position of the elevators as depicted on the flight-control position indicators in the cockpit. With the external lock installed, the control position indicators would have shown the right elevator to be in the faired, or trailing, position, and the left elevator to be in the normal trailing-edge-down position.

In summary, the flightcrew attempted to take off with an external elevator control lock installed on the right elevator; the lock was not detected by the flightcrew. The captain was unable to raise the nose of the aircraft to a takeoff attitude because of reduced elevator effectiveness caused by the external elevator control lock. By the time the captain determined that his aircraft could not become airborne, the aircraft had traveled too far down the runway to stop safely on the pavement. The captain attempted to reject the takeoff but was unable to stop before striking various obstacles beyond the departure end of the runway. Impact with these obstacles caused major damage to the aircraft, and the final impact with the west bank of the canal caused rapid deceleration of the aircraft, disruption of the major structures of the aircraft, and an explosion and fire. The survival of the two passengers and two crewmembers was fortuitous. They were ejected from the aircraft and were not trapped in a fire area. The fire department responded quickly and their activities were adequate and timely.

## 2.2 Conclusions

### (a) Findings

1. The aircraft was within the prescribed weight and balance limits.

2. The right elevator hydraulic gust lock actuator had been removed, which made that part of the internal elevator gust lock system inoperative.

3. An external elevator lock was carried on the aircraft. The use of this lock was not part of the certification of the aircraft.

4. The external elevator control lock was installed on the right elevator after the aircraft landed at Miami and was still in place after the aircraft was loaded and taxied from the ramp for takeoff.

5. The pilots could have detected the presence of this lock by referring to the flight control surface position indicators.

6. The pilot was unable to rotate the aircraft to the takeoff attitude.

7. By the time the pilot determined that he could not rotate the aircraft and initated procedures to reject the takeoff, the aircraft had accelerated to a speed which prevented him from stopping on the runway.

8. The aircraft struck a number of obstacles off the paved area of the airport; these impacts resulted in the destruction of the aircraft and fire.

(b) Probable Cause

The National Transportation Safety Board determines that the probable cause of the accident was an attempt to take off with an external makeshift flight control lock on the right elevator.

BY THE NATIONAL TRANSPORTATION SAFETY BOARD

/s/ WEBSTER B. TODD, JR.
Chairman

/s/ FRANCIS H. McADAMS
Member

/s/ LOUIS M. THAYER
Member

/s/ ISABEL A. BURGESS
Member

/s/ WILLIAM R. HALEY
Member

March 10, 1976

## APPENDIX A

## INVESTIGATION AND HEARING

### 1. Investigation

At 0635 e.d.t., September 27, 1975, the National Transportation Safety Board was notified of the accident. An investigator-in-charge was dispatched from the New York Office of the NTSB and arrived at Miami about 1330, September 27, 1975, where he was joined by investigators from the Safety Board's Washington Headquarters. The Federal Aviation Administration, the Argentina Bureau of Accident Investigation, Argentina Department Aeronaves y Technica, Aerotransportes Entre Rios, Professional Air Traffic Controllers Organization, Canadair Limited, Rolls Royce Aero Engines, Inc., the Dade County Aviation Department, Dade County Public Safety Department, and the Dade County Metro Fire Department (Airport Division) participated in the investigation. Working groups were established for operations, structures, systems, powerplants and human factors.

### 2. Public Hearing

No public hearing was held.

APPENDIX B

## CREW INFORMATION

The following data are applicable to the flight crewmembers who were operating the aircraft at the time of the accident.

### Captain Pedro Jose Guerra

Captain Pedro Jose Guerra, 49, was hired by AER August 4, 1972. He held Argentine Airline Transport Certificate No. 618 with aircraft single engine land (ASEL) and aircraft multi-engine land (AMEL) ratings. He was type rated in Curtiss C-46, and Canadair CL-44 aircraft. His last medical examination certificate was dated September 22, 1975, with no limitations. Captain Guerra had flown 11,601 hours, of which 2,352 hours were in the CL-44. He had flown 215 hours and 53 hours during the last 90 and 30 days, respectively. He had passed his last line check on August 14, 1975. The captain had been off duty more than 24 hours before reporting to duty for this flight.

### First Officer Richard Hofmann

First Officer Richard Hofmann, 30, was hired by AER December 5, 1974. He held Argentine Commercial Pilot First-Class Certificate No. 1176 with night, instrument, and AMEL ratings. He was type-rated as copilot in CL-44-6 aircraft. His last medical examination certificate was dated May 12, 1975, with no limitations. The first officer had flown 1,876 hours of which 486 hours were in the CL-44-6 aircraft. During the last 90 and 30 days he had flown 196 and 46 hours, respectively. He passed his last line check on August 14, 1975. First Officer Hofmann had been off duty more than 24 hours before reporting for this flight.

### Flight Engineer Carlos DaCruz

Flight Engineer Carlos DaCruz, 51, was hired by AER August 5, 1971. He held Argentine Flight Mechanic's Certificate No. 848 and was qualified in Douglas C-47, Canadair CL-44-6, and Lockheed Constellation L-749 aircraft. His last medical examination certificate was dated September 9, 1975, with no limitations. He had flown 5,449 hours of which 3,539 hours were in CL-44-6 aircraft. During the last 90 and 30 days he had flown 199 and 65 hours, respectively. Flight Engineer DaCruz had been off duty more than 24 hours before reporting for this flight.

APPENDIX C

AIRCRAFT INFORMATION

LV-JSY, a Canadair CL-44-6, was registered in Argentina to Aerotransportes Entre Rios S.R.L. The aircraft had Airworthiness Certificate No. 4581 issued April 14, 1975, with an expiration date of April 14, 1976. The Argentine registration certificate designated Aerotransportes Entre Rios S.R.L. as the owner of the aircraft.

The aircraft had accumulated 20,108:54 hours in service and a total of 5,891 landings as of September 23, 1975.

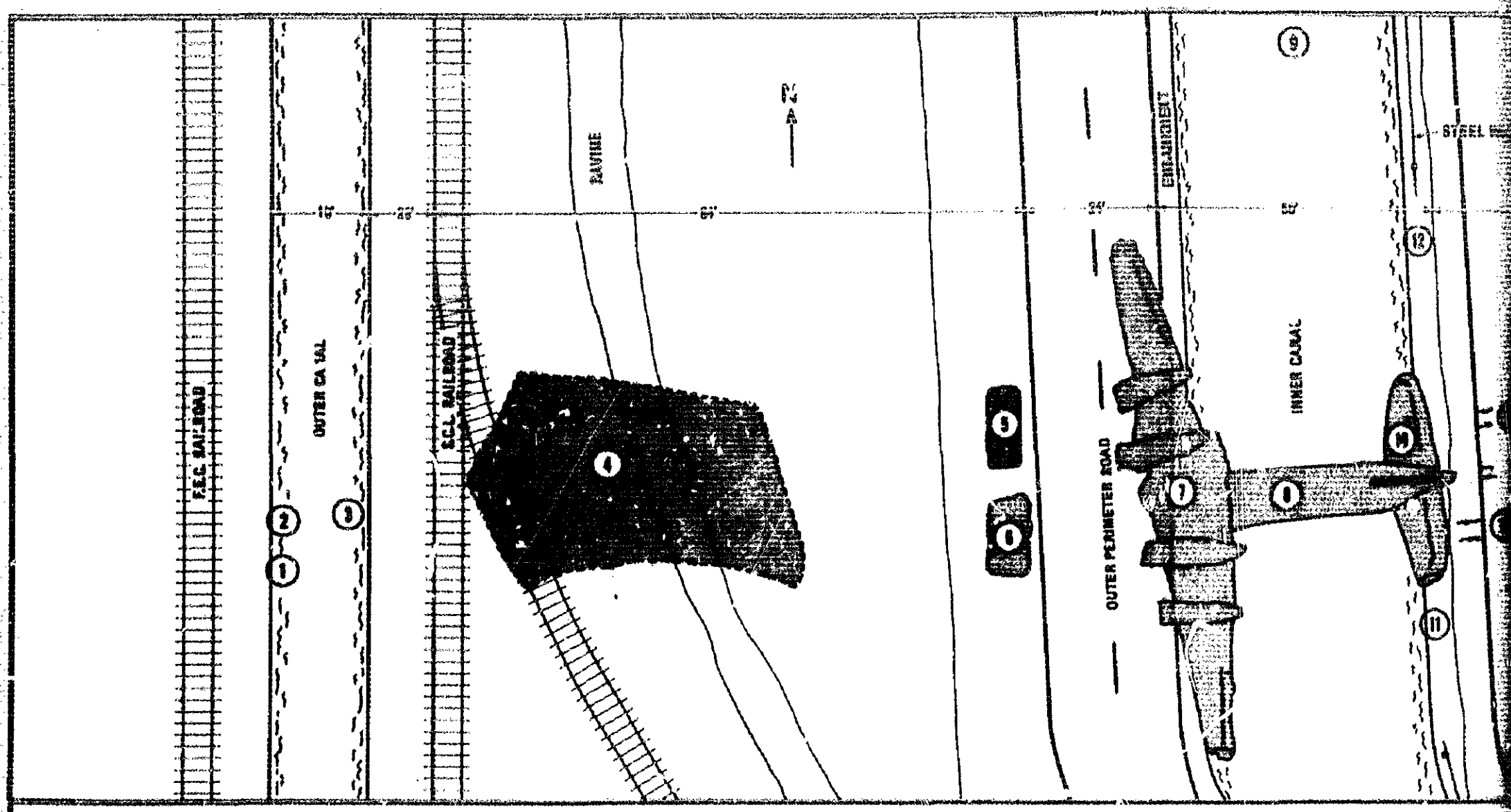
LV-JSY was powered by four Rolls Royce Tyne Model 515/10 engines.

The engine serial numbers and times in service were as follows:

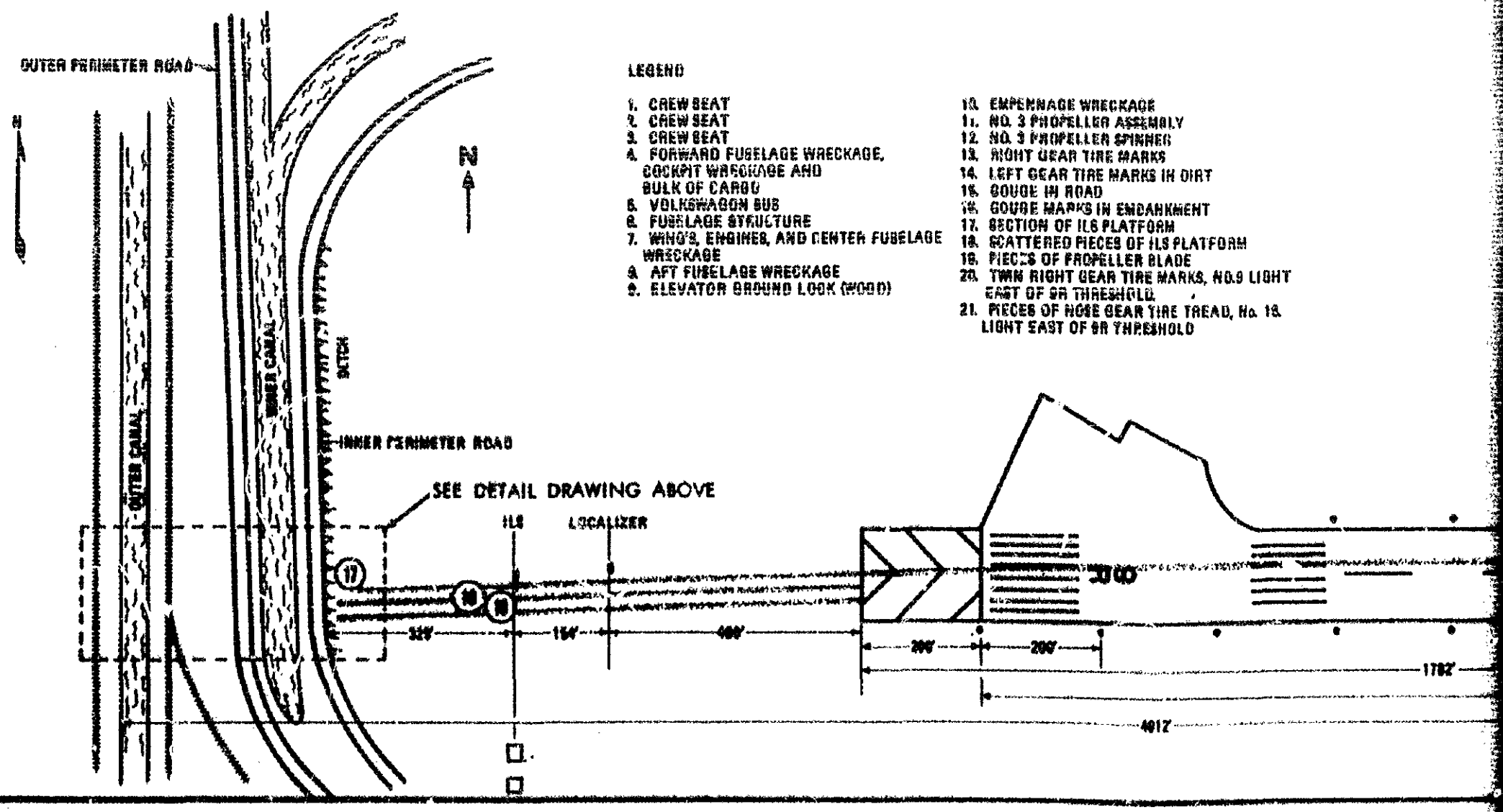
| Engine No. | Serial No. | Time Since Overhaul | Time Since New |
|---|---|---|---|
| 1 | 5030 | 1,661 | 13,372 |
| 2 | 5044 | 1,508 | 14,000 |
| 3 | 5014 | 3,307 | 13,984 |
| 4 | 5020 | 1,957 | 13,854 |

The propellers were DeHavilland Type PD 228/476/3. The serial numbers and times in service were as follows:

| Propeller No. | Serial No. | Time Since Overhaul | Time Since New |
|---|---|---|---|
| 1 | 4A/424001 | 9,456 | 14,313 |
| 2 | 4A/423816 | 3,371 | 12,301 |
| 3 | 4A/424007 | 2,329 | 13,320 |
| 4 | 4A/423833 | 9,877 | 16,083 |

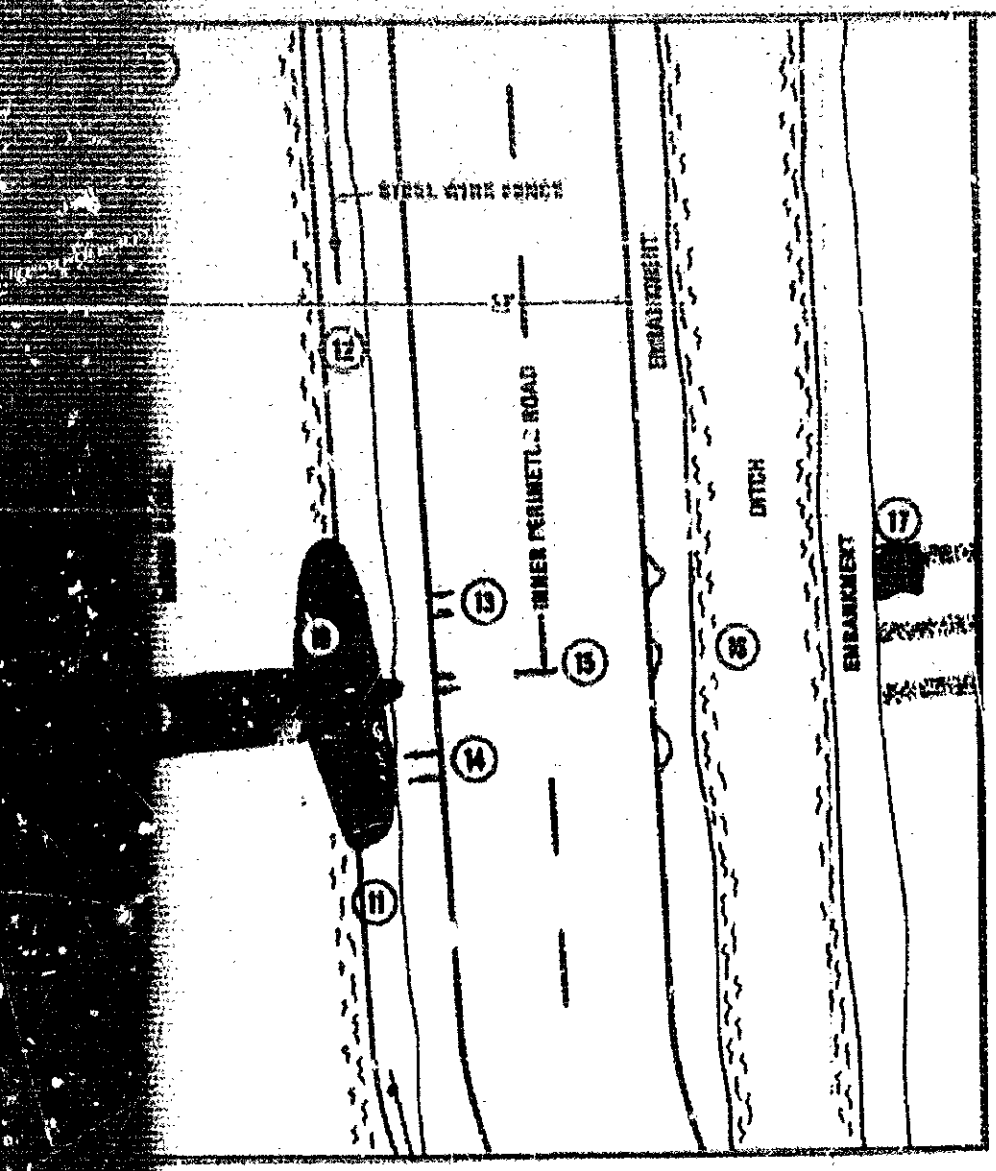


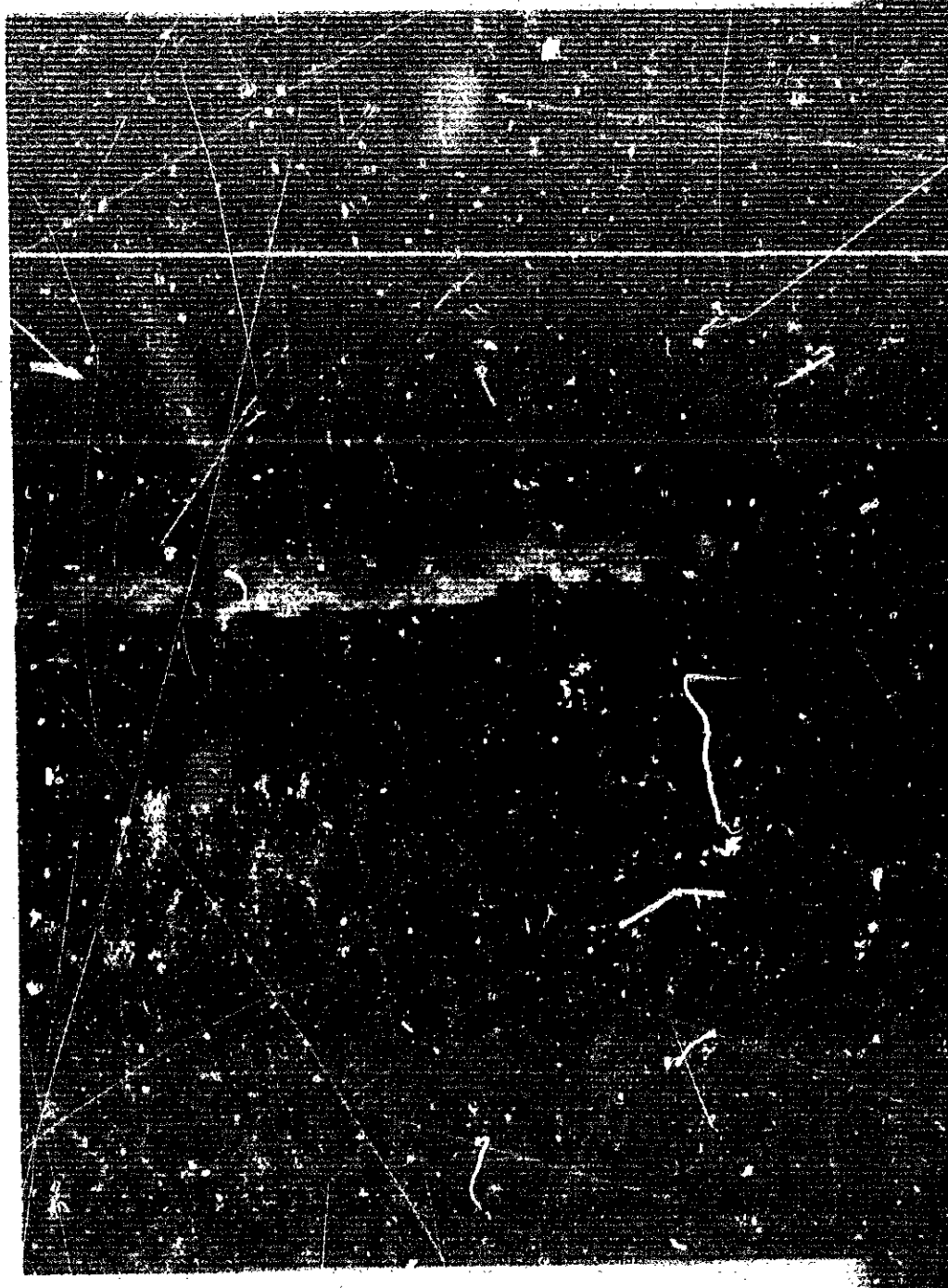

NOTE: Drawings not to scale

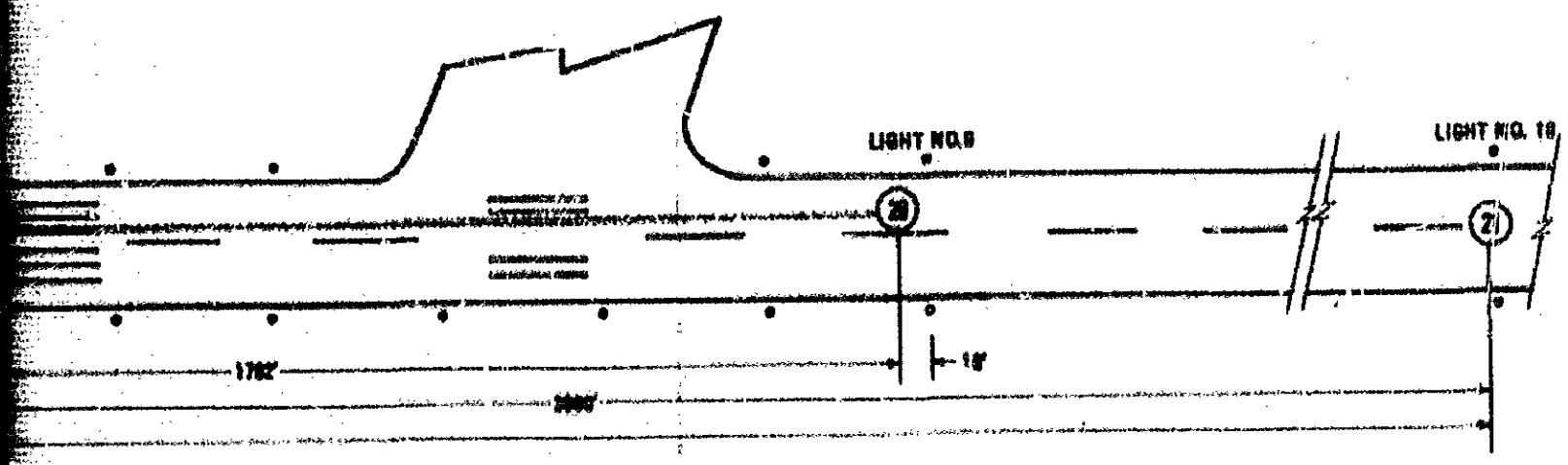



LEGEND

1. CREW SEAT
2. CREW SEAT
3. CREW SEAT
4. FORWARD FUSELAGE WRECKAGE, COCKPIT WRECKAGE AND BULK OF CARGO
5. VOLKSWAGON SUB
6. FUSELAGE STRUCTURE
7. WING'S, ENGINES, AND CENTER FUSELAGE WRECKAGE
8. AFT FUSELAGE WRECKAGE
9. ELEVATOR GROUND LOOK (WOOD)
10. EMPENNAGE WRECKAGE
11. NO. 3 PROPELLER ASSEMBLY
12. NO. 3 PROPELLER SPINNER
13. RIGHT GEAR TIRE MARKS
14. LEFT GEAR TIRE MARKS IN DIRT
15. GOUGE IN ROAD
16. GOUGE MARKS IN EMBANKMENT
17. SECTION OF ILS PLATFORM
18. SCATTERED PIECES OF ILS PLATFORM
19. PIECES OF PROPELLER BLADE
20. TWIN RIGHT GEAR TIRE MARKS, NO.9 LIGHT EAST OF 9R THRESHOLD
21. PIECES OF NOSE GEAR TIRE TREAD, No. 18 LIGHT EAST OF 9R THRESHOLD



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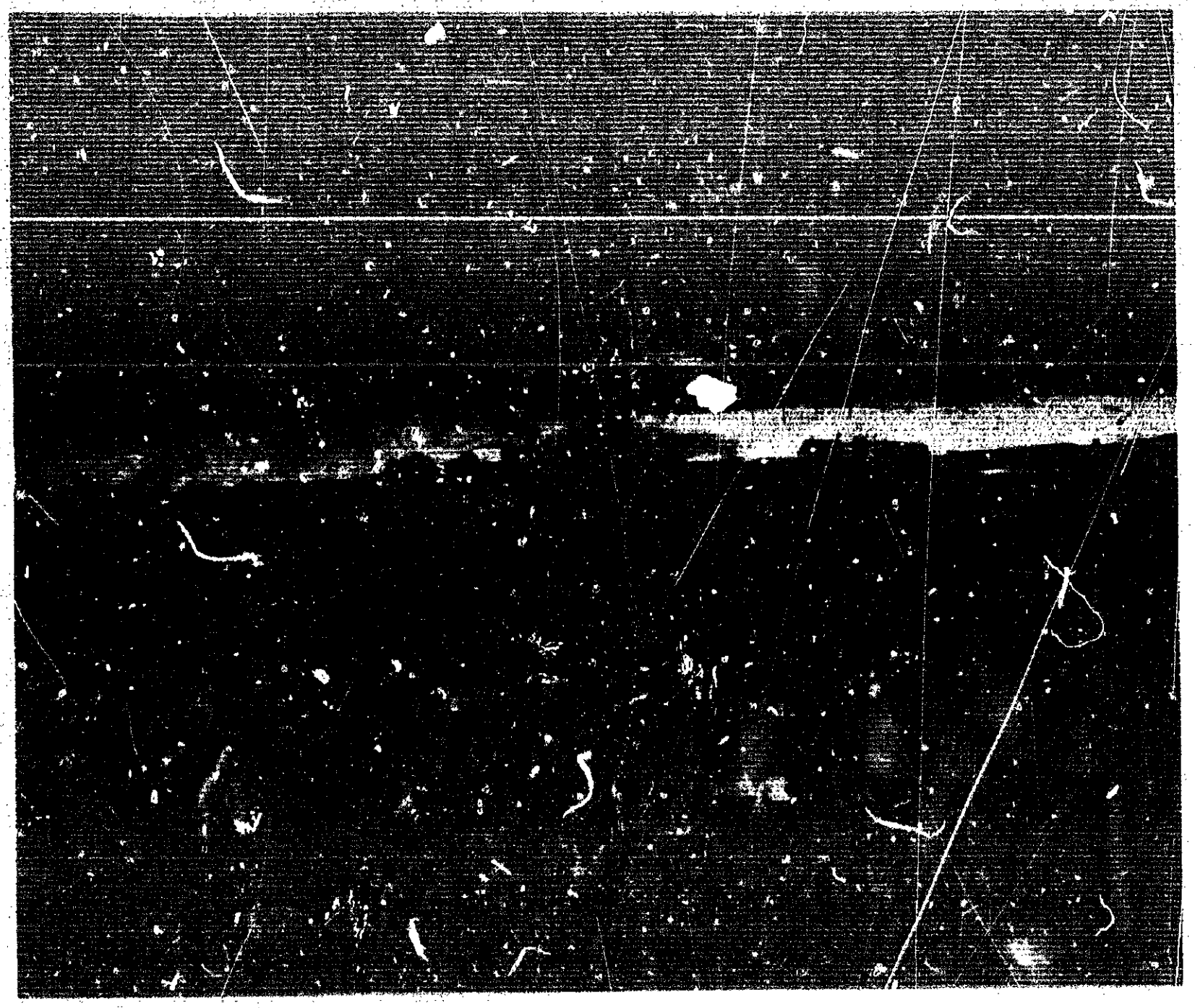
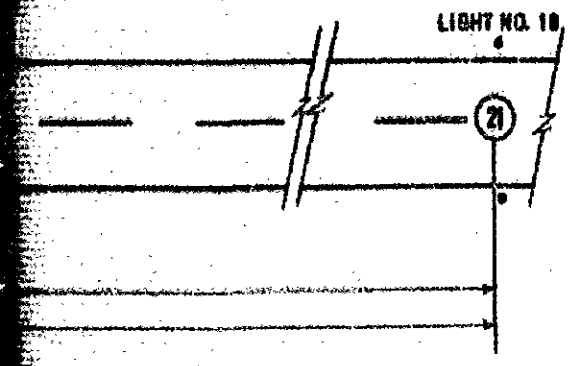
APPENDIX D



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**SEPTEMBER 27, 1975**
**DCA 76-AZ-005**