

## CIVIL AERONAUTICS BOARD

## ACCIDENT INVESTIGATION REPORT

*Lusor  
file*

Adopted: November 5, 1957

Released: November 8, 1957

COLUMBIA-GENEVA STEEL COMPANY, LOCKHEED LODESTAR, N 1245V,  
NEAR TYRONE, PENNSYLVANIA, DECEMBER 20, 1956

The Accident

A Lockheed Lodestar, model 18-56, N 1245V, owned by United States Steel Corporation and operated by its subsidiary, Columbia-Geneva Steel Company, crashed approximately five miles north of Tyrone, Pennsylvania, about 1923<sup>1/2</sup> on December 20, 1956. The captain, copilot, and a company official, the only persons aboard, were killed and the aircraft was destroyed.

History of the Flight.

N 1245V departed Greater Pittsburgh Airport, Pittsburgh, Pennsylvania, at 1850, December 20, 1956, on an IFR flight plan via airways V-35, V-6, V-168, V-30, and V-1 to New York International Airport, Jamaica, New York. The crew consisted of Captain Roy H. Rollo and Copilot Lewis Thomas Williams. Mr. Alden Roach, President of Columbia-Geneva Steel Company, was the only passenger.

At the time of takeoff from Pittsburgh, the gross weight of the aircraft was 19,421 pounds (maximum allowable gross load 19,500 pounds) and the weight was properly distributed. The purpose of the flight was to transport Mr. Roach to New York International Airport. The flight reported to Pittsburgh Air Route Traffic Center at 1905 when it was over New Alexandria, Pennsylvania, altitude 7,000 feet. A revised routing clearance to New York International Airport was issued to the flight at 1906 by ARTC to proceed via airways V-35, V-6, V-168, and Blue 18, and to climb to and maintain 9,000 feet.<sup>2/</sup> Accordingly, N 1245V reported leaving 7,000 and 8,000 feet at 1907 and 1909, respectively.

At 1921 the Civil Aeronautics Administration Communications Station at Philipsburg, Pennsylvania, received a call from the flight giving its position as over the Coalport intersection at 1916, estimating Philipsburg at 1930. Philipsburg radio then requested N 1245V to change over to the frequency of the New York Air Route Traffic Control Center and this message was acknowledged. This was the last radio contact with the flight.

At 1928 Philipsburg radio received a telephone call, from a location 24 miles east of the Coalport intersection and approximately 12 miles south-southwest of the Philipsburg Airport, to the effect that an aircraft, later identified as N 1245V, had crashed and was burning in a nearby mountainous wooded area.

<sup>1/</sup> All times herein are eastern standard and based on the 24-hour clock; altitudes are mean sea level.

<sup>2/</sup> See attachment - Aeronautical Chart Section.

The Philipeburg 1928 weather sequence was: Ceiling measured 400 feet, overcast; visibility 2 miles; fog; temperature 40; dewpoint 40; wind calm; altimeter 30.04

### Investigation

The place of ground impact was in heavily wooded, rugged terrain, at an elevation of about 1,500 feet. The impact heading of the main wreckage was southwesterly, nearly a reciprocal of the destination heading. Numerous parts of the aircraft had separated in flight and these were found scattered for almost a mile in an easterly direction back along the flight path.<sup>3/</sup>

The major parts which separated in flight were: The left outer wing panel; the right outer wing panel outboard of the wing flap; the left and right fins and rudders; the left and right horizontal stabilizers and elevators; the aft fuselage rearward from the large window located just forward of the cabin door; and both powerplants. All other major components were found at the wreckage site. The landing gear and wing flaps were found in the retracted position.

A detailed study of the wreckage indicated that the left wing and the empennage failed almost simultaneously. It was determined that the left horizontal stabilizer was the first empennage unit to separate, followed by the right horizontal stabilizer. This latter component showed evidence of having been struck on its leading edge during the inflight breakup; the most logical striking object was the left aileron balance weight assembly, which also separated in flight.

Following the left wing and empennage failure, portions of the engines' cowlings and parts of the fuselage separated. Thereafter, both powerplant assemblies tore out and the right outer wing panel separated just before ground impact.

It could not be established if the de-icing system components were in operation at the time of the accident, as the setting of the de-icer control prior to impact is unknown. Impact forces caused deformation and binding of the de-icer distributor valve motor; however, it was found to be in good condition electrically and therefore is believed to have been capable of operation before impact. Except for the damage sustained during the accident, the wing and empennage leading edge de-icing boots were in good condition

The engines and propellers were removed from the crash scene and transported to the engine manufacturer's plant at Caldwell, New Jersey, for disassembly and examination. Both propellers were equipped with alcohol de-icing equipment. The positions of the propeller domes were: Left, 45 degrees; right, 61 degrees. All stops were properly positioned. Study of the shim plate markings indicated that the propeller blade angles at impact were: Left propeller, 33 to 52 degrees; right propeller, 48 to 54 degrees. A complete examination of both engines disclosed no evidence of a failure of any of the essential components of the powerplants while in flight. It was observed that there was a notable absence of deposits in the combustion chambers of both engines. Both heat and alcohol were available as anti-icing measures to cope with carburetor and/or induction icing. Top deck screens were installed on both carburetors.

The aircraft was equipped with a dual set of instruments which included sensitive altimeters, airspeed, turn-and-bank, rate of climb, and artificial horizon indicators. Besides these instruments there were a magnetic compass, directional gyro, Collins Integrated Flight System, and two automatic direction finders.

All radio communication and navigation equipment was extensively damaged by impact and fire. Some information was obtained from examination of components of the Collins Integrated Flight System. The azimuth ring of the course indicator was on a heading of approximately 48 degrees. The heading marker was set at approximately 44 degrees and the setting of the course arrow was approximately 74 degrees. The indicator card of the omni bearing indicator was seized at an approximate reading of 43 degrees. A frequency setting could not be obtained from the remains of the omni receiver.

Examination of the entire wreckage disclosed no evidence of fatigue failure, nor was there any evidence to indicate that a foreign object struck the aircraft in flight. All parts of the aircraft were accounted for within the wreckage distribution area. The initial airframe failures were all the result of loads in excess of the design strength of the particular parts or components. There was no evidence which indicated that a fire or explosion occurred during flight.

An examination of the aircraft log books and maintenance records disclosed no pertinent discrepancies. Changes and modifications required by all applicable airworthiness directives had been accomplished. The logs also indicated that the aircraft had received its prescribed 25-hour, 50-hour, and 100-hour inspections. The aircraft had flown 92 hours since the last 100-hour inspection on October 3, 1956, and 30 minutes since the last line inspection on the day of the accident.

On the afternoon of December 20, 1956, an overcast existed over the entire State of Pennsylvania, with ceilings ranging from zero to about 1,500 feet in the southwestern portion with tops at approximately 11,000 to 12,000 feet. Fog and occasional light rain was occurring. At the time of the flight's departure the freezing level was about 10,000 feet at Pittsburgh and lowering to the east to near 9,000 feet in the Tyrone area. Forecasts available before departure of N 1245V indicated light to moderate rime icing above the freezing level, with the freezing level forecast to be 9,000 feet in western Pennsylvania sloping downward to about 6,000 feet in western New York. Meteorological conditions were conducive to the formation of carburetor or induction system icing.

There were several flights through the Philipsburg area at the approximate time of the accident. They reported no icing or turbulence; however, their flight altitudes were below the 9,000-foot level of the Lockheed. Two of these flights mentioned a broken cloud condition a few miles west of Philipsburg.

A number of witnesses in the accident area heard the aircraft. One witness, located approximately two miles south of the crash, heard the flight go northeast at low altitude and then turn back toward the crash site. Two other persons, several miles northeast of the impact, also heard the aircraft turn back. All witnesses told of hearing irregular engine sounds, followed by engine silence.

The person making the telephone call to the Philipsburg CAA Communications Station at 1928 said the call was made about five minutes after the crash which establishes 1923 as the approximate time of the accident. The actions necessary to complete this call were duplicated by Board investigators and demonstrated that the witness' estimate of five minutes was quite accurate. The pilot of N 1245V had reported over the Coalport intersection at 1921 and this radio report was given in an ordinary tone of voice with no hint of an existing emergency.

### Analysis

Because of the lack of certain tangible evidence much is unknown. It is known that the pilot was flying under IFR conditions and was assigned an altitude of 9,000 feet; also that his last position report was made at 1921, five minutes after reaching Coalport. Since this report was made in a normal tone of voice and since nothing was said to the contrary, it can be reasoned that an emergency situation was not recognized at that time. However, approximately two minutes after that report was made the aircraft struck the ground. Therefore, whatever happened did so quickly and shortly after the last report was made.

Ground elevation at the scene of the accident is 1,500 feet and this altitude, considered in relation to the assigned altitude of the aircraft, means that the aircraft descended 7,500 feet, at an average rate of descent of about 3,750 feet per minute. Although the exact pattern of the descent is not known, it is believed that the speed of the airplane during the descent, coupled with maneuvering loads, created forces beyond the design strength of the aircraft. This is undoubtedly true since no evidence was found to indicate any prior failure or defect of any of the components of the aircraft.

The witnesses unfortunately did not see but only heard the aircraft. Although some stated the direction of flight, the approximate altitude, and that the engines appeared to be functioning improperly, it must be remembered that these impressions were formed under conditions in which accurate estimates were not possible. To determine the direction or height above the ground, or both, from the sound would have been especially difficult in this instance because of probable reverberation and distortion among the hills. The engine sounds heard could have been caused either by a malfunctioning engine or engines, or as the result of the pilot's intentional throttling back of the engines during an uncontrolled descent.

The engines, when examined subsequent to the accident, did not show any indication of operational failure or malfunctioning prior to impact which could have caused or contributed to the accident. Because of the time interval involved during disintegration of the airplane and final free fall of the engines, evidence obtained from the propellers was of no significance with regard to power being produced at the start of the emergency. However, it was concluded that neither propeller had been feathered.

Because the azimuth ring of the course indicator of the Collins Integrated Flight System was found stopped at 48 degrees (nearly the reciprocal of the heading at impact) and because this instrument is operated electrically, a possible electrical failure as a contributing cause to this accident was considered. It was determined, however, that the probability of such a failure occurring at cruising altitude was quite remote and that the failure

must have occurred during the breakup of the airplane with the stoppage of the azimuth ring where it did as merely a coincidence. Furthermore, even if an electrical failure had occurred while at cruise, the pilot had recourse to other instruments, not operated electrically, by which attitude and direction could be maintained.

Another possibility considered was that induction or carburetor ice could have caused a complete loss of power of the engines either separately or simultaneously and that this loss of power resulted in loss of control. This is believed not to have been the case for several reasons. Although the aircraft was probably in clouds at 9,000 feet and the weather conditions at cruising altitude were conducive to this type of icing, it must be remembered that the pilot had available the approved anti-icing devices which incorporated the use of heat and alcohol. Weather observations and forecasts for the area on this day indicated clearly the weather conditions which the flight would encounter. Even if the use of heat or alcohol had failed, it is inconceivable that a pilot of Captain Rollo's experience would have allowed loss of power to result in loss of control of the aircraft.

There are possibly many unknown factors which might have contributed to loss of control. Unfortunately, the existence of such factors in this instance can neither be proved nor disproved because of lack of evidence. It is the Board's opinion, therefore, that the loss of control which allowed airloads to be developed beyond the design strength of the aircraft was due to unknown causes.

### Findings

On the basis of all available evidence the Board finds that:

1. The crew and aircraft were currently certificated.
2. The gross load of the aircraft was under the maximum allowable weight and properly distributed.
3. A routine instrument flight was made from Pittsburgh to the Philipsburg area.
4. Meteorological conditions at the aircraft's cruising altitude were conducive to the formation of carburetor or induction system icing.
5. During an uncontrolled descent the aircraft failed structurally as a result of airloads in excess of design strength.
6. There was no aircraft or engine fire prior to ground impact.

### Probable Cause

The Board determines that the probable cause of the accident was the loss of control for reasons unknown resulting in a rapid descent during which structural failure occurred.

BY THE CIVIL AERONAUTICS BOARD:

/s/ JAMES R. DURFEE

/s/ CHAN GURNEY

/s/ HARMAR D. DENNY

/s/ LOUIS J. HECTOR

Member G. Joseph Minetti did not take part in the adoption of this report.

## S U P P L E M E N T A L   D A T A

### Investigation

The Civil Aeronautics Board was advised of this accident the night of December 20, 1956. An investigation was immediately started in accordance with the provisions of Section 702 (a) (2) of the Civil Aeronautics Act of 1938, as amended.

### Aircraft Owner

The United States Steel Corporation has headquarters at 71 Broadway, New York, New York, and an office at Westchester County Airport, White Plains, New York. The subsidiary, Columbia-Geneva Steel Company, has headquarters at 120 Montgomery Street, San Francisco, California. The corporation and its subsidiaries operate numerous transport type aircraft based at various points in the United States. Their aviation sections are operated under a system comparable to air carrier practice with the pilots receiving regular check flights and periodic flight training from airline training agencies. Maintenance of company aircraft is at an equal level.

### Flight Personnel

Captain Roy H. Rollo, age 43, held a currently effective airman certificate with an airline transport rating and type ratings on Lockheed PV-1 and L-18. He was employed by an associate company on January 1, 1945, as a pilot, and was transferred to Columbia-Geneva Steel Company on August 21, 1951, as chief pilot. Captain Rollo had flown a total of 10,615 hours, of which 498 were in the Lockheed Lodestar. His last instrument flight check was passed satisfactorily on November 1, 1956. The date of his last physical (no waivers) was June 5, 1956. His flying time in the 30 days prior to December 20, 1956, was 22 hours, 50 minutes.

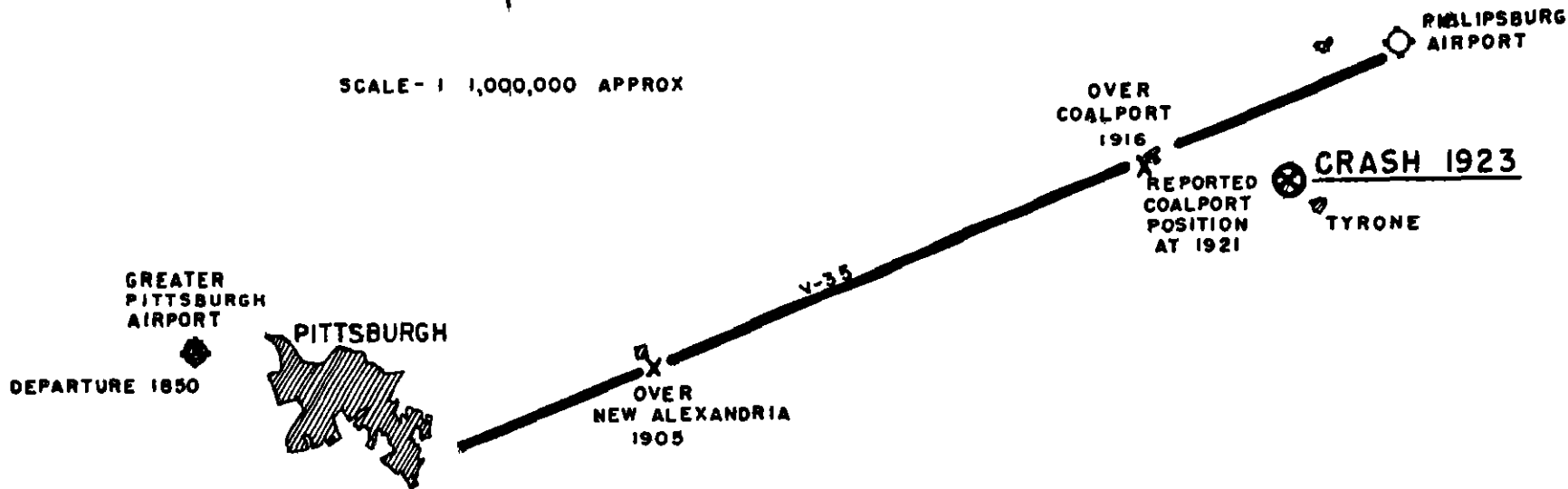
Pilot Lewis Thomas Williams, age 47, held a currently effective airman certificate with ratings of commercial pilot, single- and multi-engine land, and DC-3 and Lockheed 18 type ratings. He was employed by Columbia-Geneva Steel Company as a copilot-mechanic on December 3, 1954. His total flying time was 2,315 hours, of which 424 hours were in the type aircraft involved. His last physical examination was passed on June 30, 1956.

### The Aircraft

Lockheed Lodestar N 1245V, model 18-56, serial number 2470, was manufactured June 16, 1943. It was purchased from the Brown Paper Mill Company, Inc., Monroe, Louisiana, in 1954. Total airframe time was 3,715 hours, with 2,525 hours since major overhaul, and 30 minutes since last line inspection. The aircraft was equipped with two Wright Aeronautical Corporation model R-1820-56 engines, and two Hamilton Standard model 33D50-135 propellers. Time on both engines since last overhaul was 420 hours, with the same amount of time on both propellers since overhaul.



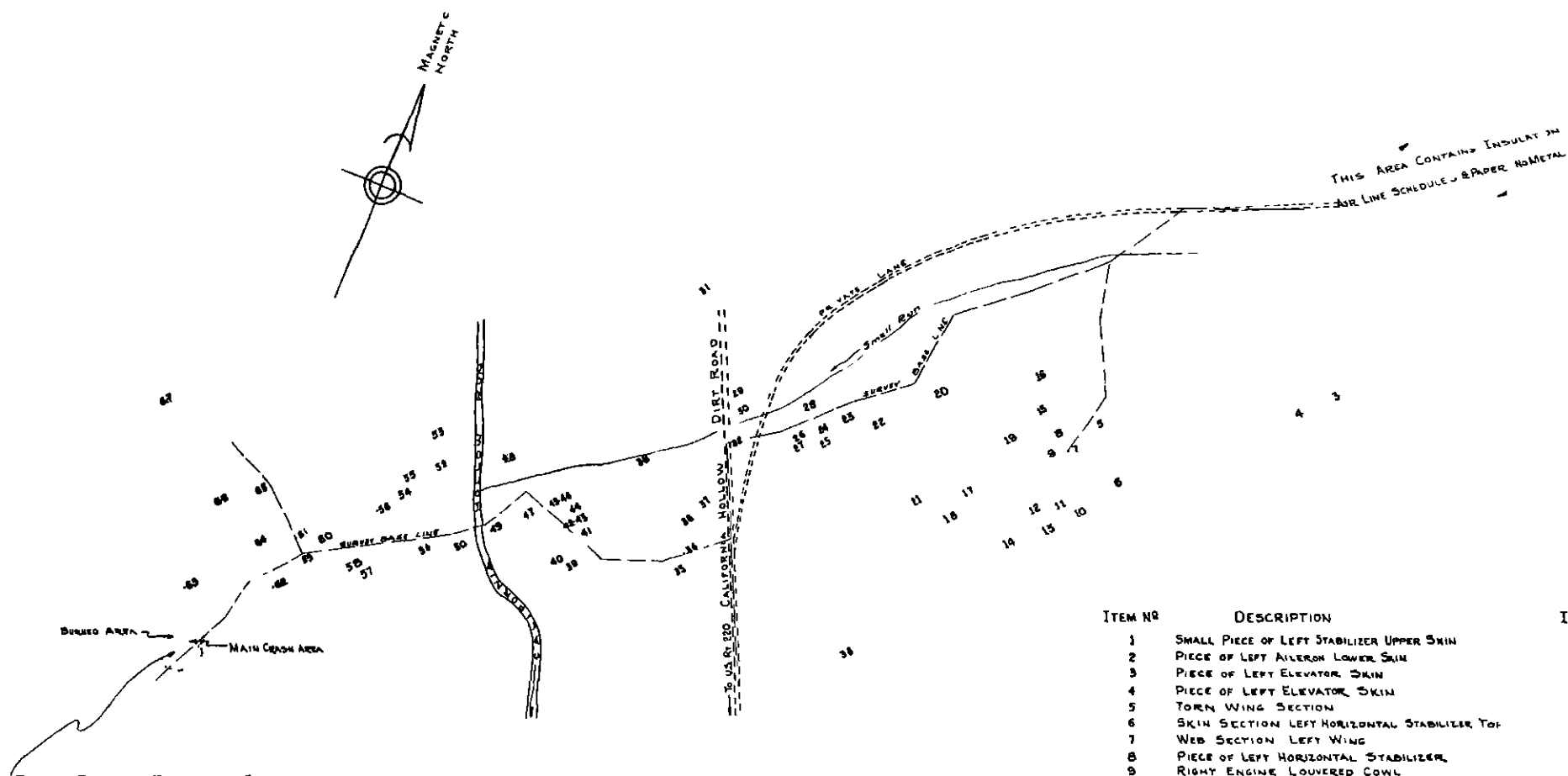
SCALE - 1 1,000,000 APPROX



ATTACHMENT

COLUMBIA-GENEVA STEEL CO.  
LOCKHEED LODESTAR NI245V  
NEAR TYRONE, PENNSYLVANIA  
DECEMBER 20, 1956





PARTS FOUND IN THIS AREA INCLUDE

- 1 RIGHT WING CENTER SECTION & OUTER PANEL TO ALERON CUTOUT
- 2 COCKPIT AREA & FUSELAGE NOSE
- 3 MISCELLANEOUS INTERCOMMUNICATION EQUIPMENT
- 4 LEFT WING CENTER SECTION
- 5 MISCELLANEOUS FUSELAGE STRUCTURE
- 6 LEFT & RIGHT LANDING GEARS
- 7 LEFT ENGINE TAIL PIPE

APPROX. SCALE 1:480

ITEM NO	DESCRIPTION	ITEM NO	DESCRIPTION
1	SMALL PIECE OF LEFT STABILIZER UPPER SKIN	35	RIGHT UPPER RUDDER
2	PIECE OF LEFT ALERON LOWER SKIN	36	OIL COOLER DOOR
3	PIECE OF LEFT ELEVATOR SKIN	37	LOWER SECTION OF RIGHT RUDDER
4	PIECE OF LEFT ELEVATOR SKIN	38	EMERGENCY EXIT DOOR & BOTTOM FUSELAGE SKIN
5	TORN WING SECTION	39	RUDDER SPRING TAB
6	SKIN SECTION LEFT HORIZONTAL STABILIZER TOP	40	BAGGAGE COMPARTMENT DOOR
7	WEB SECTION LEFT WING	41	SKIN FUSELAGE BOTTOM AFT OF DOOR
8	PIECE OF LEFT HORIZONTAL STABILIZER	42	SKIN FUSELAGE BOTTOM NEAR CABIN DOOR
9	RIGHT ENGINE LOUVERED COWL	43	SKIN FUSELAGE
10	LEFT HAND OUTBOARD FLAP SECTION	44	RIGHT VERT STABILIZER LOWER
11	SKIN LEFT HORIZONTAL STABILIZER BOTTOM	45	RIGHT HAND TAIL PIPE & SHROUD NACELLE FILL, ON GEAR 5th
12	SKIN - LEFT HORIZONTAL STABILIZER TOP	46	ACCESSORY COWLING & PIECE OF LEFT HAND STABILIZER TOP
13	RIGHT ELEVATOR	47	CARBURATOR HEATING DUCT
14	PIECE OF LEFT ELEVATOR TOP SKIN AND SPAR	48	MAIN CABIN DOOR, TAIL HEAT DUCT, CONT. SKIN, R.H. HANG STRAP
15	UPPER RIGHT VERTICAL FIN	49	TABLE CABIN HEAT DUCT
16	PIECE OF ALERON BOTTOM SKIN	50	OUTBOARD HALF OF RIGHT HORIZONTAL STABILIZER
17	LEFT STABILIZER TIP	51	SKIN AND RADIO
18	LEFT WING LEADING EDGE JUST OUTBOARD OF FRACTURE	52	SEAT
19	PIECE OF LEFT HORIZONTAL STABILIZER	53	FUSELAGE TOP SKIN WITH GRIMES BEACON
20	HALF OF RIGHT HAND HORIZONTAL STABILIZER TIP	54	FLAP SECTION
21	LEFT LOWER RUDDER	55	FIREWALL WITH PULLEY & CONTROLS
22	SKIN - FUSELAGE RIGHT	56	PART OF RADIO
23	HALF OF RIGHT HORIZONTAL STABILIZER TIP	57	AFT FUSELAGE AND HALF RIGHT STABILIZER
24	OIL COOLER DUCT	58	RADIO EQUIPMENT - REAR FUSELAGE
25	REAR SECTION DOOR HOUSING	59	LEFT WING INBOARD FLAP SECTION
26	FLAP NACELLE FAIRING ON FLAP	60	CABIN SEAT
27	LEFT HAND HORIZ STABILIZER LEADING EDGE	61	FUSELAGE TOP SKIN WITH GRIMES BEACON
28	LEFT ELEVATOR TAB	62	FUSELAGE SKIN TOP RIGHT SIDE OVER PICTURE WINDOW
29	PLEXIGLASS WINDOW & LH INBOARD BOTTOM ACCESS COWLING	63	PARACHUTE BAG
30	FUSELAGE SKIN ABOVE WINDOW	64	FLOORBOARD
31	PIECE OF RIGHT ALERON WITH BALANCE WEIGHT	65	RIGHT OUTER WING SECTION
32	RIGHT HAND HORIZ STABILIZER TRAILING EDGE FILL	66	ENGINE
33	LEFT OUTER WING	67	ENGINE
34	VERTICAL STABILIZER & RUDDER - LEFT HAND		

WRECKAGE DISTRIBUTION CHART  
 PREPARED FOR  
 CIVIL AERONAUTICS BOARD  
 AIRCRAFT ACCIDENT  
 UNITED STATES STEEL CORPORATION  
 LOCKHEED LODESTAR N12451  
 TYRONE, PA. DEC 20, 1956

SURVEY & DRAWING BY FUNK & MENDEL REVIS. PROOF ENGINEERING