AIRCRAFT ACCIDENT
IDENTIFICATION
NO.

5 11 21 1 05

Aer-NA-612/327

26 MAR 1957

FIRST ENDORSEMENT on Commanding Officer, U. S. Naval Air Special Weapons Facility, Albuquerque, New Mexico ltr Ser 327 of 13 Mar 57

From: Chief, Bureau of Aeronautics
To: Chief of Naval Operations
Via: Director, U. S. Naval Aviation Safety Center

Subj: Supplementary Report to NASWF AAR No. 3-56; forwarding of

1. Forwarded.

(b) (6) [redacted]

By direction

Copy to:
CO, NASWF Albuquerque

U. S. NAVAL AIR SPECIAL WEAPONS FACILITY
KIRTLAND AIR FORCE BASE
ALBUQUERQUE, NEW MEXICO

1451 050
MAF:JED
A9-6
SER: 3-57
13 MAR 1957

FROM: COMMANDING OFFICER
TO: CHIEF OF NAVAL OPERATIONS (OP-57)
VIA: (1) CHIEF, BUREAU OF AERONAUTICS
(2) DIRECTOR, U. S. NAVAL AVIATION SAFETY CENTER

SUBJ: SUPPLEMENTARY REPORT TO NASWF AAR NO. 3-55; SUBMITTAL OF

ENCL: (1) PHOTOGRAPHS

1. THE NAVAL AIR SPECIAL WEAPONS FACILITY (NASWF) RANGE CREW RECENTLY LOCATED PIECES OF AIRCRAFT WRECKAGE IN THE VICINITY OF THE LOCAL LOS LUNAS BOMBING RANGE APPROXIMATELY 25 MILES SOUTHWEST OF ALBUQUERQUE, NEW MEXICO. THE PIECES WERE BELIEVED TO BE MISSING PARTS OF F7U, BUNO. 129546, WHICH HAD CRASHED IN THAT VICINITY ON 21 NOVEMBER 1955.

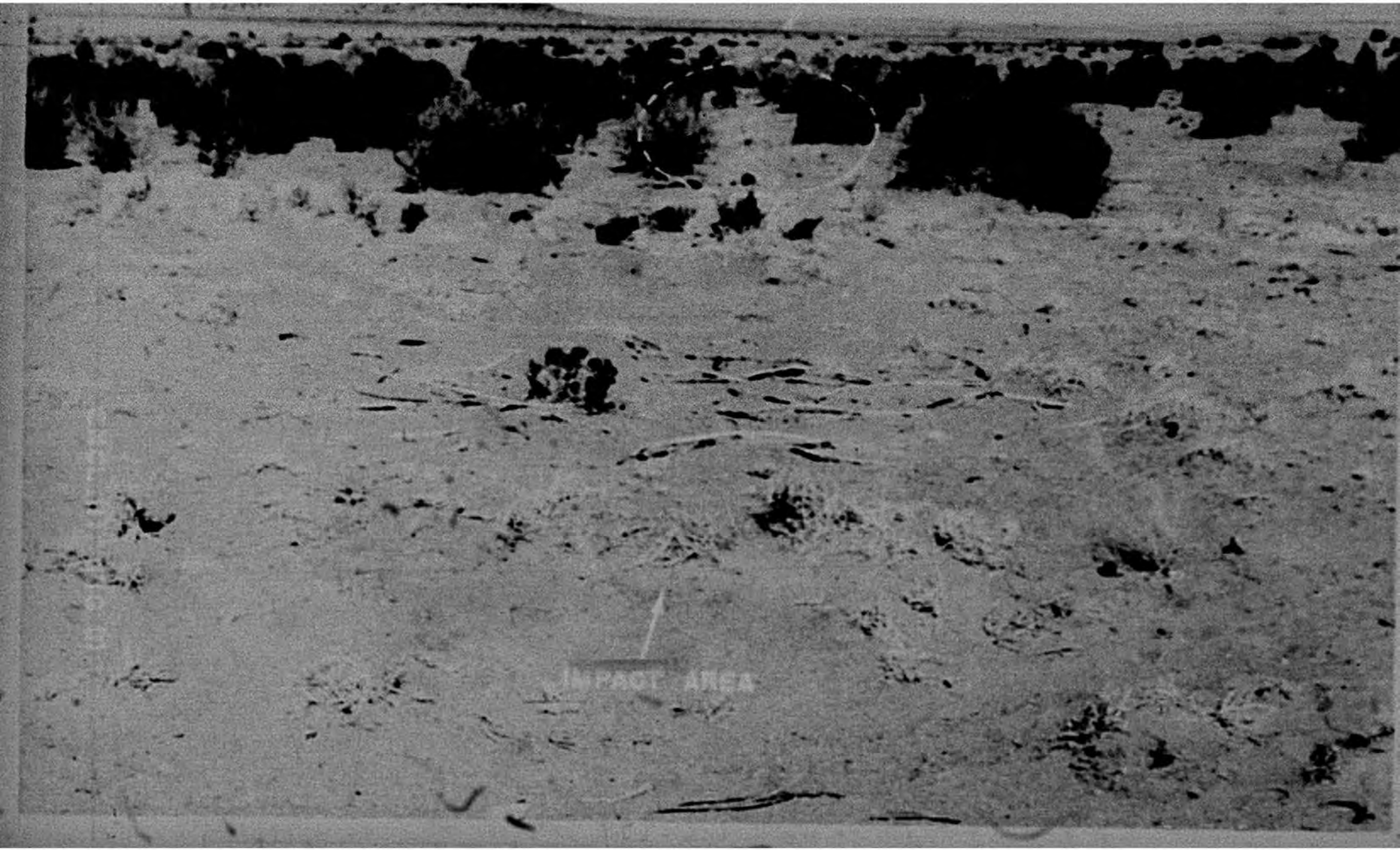
2. THE AVIATION SAFETY OFFICER PROCEEDED TO THE AREA AND AFFIRMED THAT THE ABOVE MENTIONED PARTS WERE FROM F7U-3, BUNO. 129546. UPON SEARCHING THE AREA IT WAS APPARENT THAT THIS AIRCRAFT, WHILE LINING UP FOR THE BOMBING RUN, HAD COLLIDED WITH THE GROUND. ENCLOSURE (1), FIGURE (1), SHOWS THE IMPACT POINT. OF NOTE IS THE STUMP OF THE TREE, IN THE CENTER OF THIS IMPACT AREA, WHICH SHOWS SIGNS OF BEING CRUSHED BY A DOWNWARD FORCE. THE PIECES OF WRECKAGE (ENCLOSURE (1), FIGURES (2) THROUGH (4)) WERE FOUND APPROXIMATELY 500 YARDS FURTHER ALONG THE KNOWN FLIGHT PATH OF THE AIRCRAFT.

3. INVESTIGATION OF THE PIECES OF WRECKAGE SHOWED THAT THERE WAS NO SIGN OF FIRE WHEN THEY SEPARATED FROM THE AIRCRAFT. THE FIRE (AS EVIDENCED BY THE FIRE WARNING LIGHT REPORTED BY THE PILOT AND SMOKE OBSERVED BY THE RANGE CREW, AS STATED IN PARAGRAPH 29 OF NASWF AAR 3-55) APPARENTLY RESULTED FROM THE AIRCRAFT STRIKING THE GROUND, TEARING OFF THE TAIL CONE, AND EXPOSING THE AFTERBURNER FUEL LINES TO THE WIND FORCES.

4. IN PARAGRAPH 32 (ANALYSIS) OF NASWF AAR 3-55 THE SUSPECTED FUEL LEAK AND SUBSEQUENT FIRE CAN NO LONGER BE THOUGHT OF AS THE PRIMARY CAUSE OF THE ACCIDENT, BUT INSTEAD THE PRECEDING COLLISION WITH THE GROUND CAUSING THE FUEL LEAK IS NOW CONSIDERED THE PRIMARY CAUSE OF THE ENSUING FIRE. WHETHER A MATERIAL MALFUNCTION OF THE CONTROL SYSTEM OR MISJUDGEMENT ON THE PART OF THE PILOT CAUSED THE COLLISION WITH THE GROUND CANNOT BE DETERMINED.

G. E. MARCUS

COPY TO:
BAR, DALLAS
BAR, KANSAS CITY


IMPACT AREA

ENCL (1)

DEPARTMENT OF THE NAVY
BUREAU OF AERONAUTICS
WASHINGTON 25, D. C.

IN REPLY REFER TO
Aer-PP-413/7

10 APR 1956

From: Chief, Bureau of Aeronautics
To: Director, Naval Aviation Safety Center, Naval Air Station, Norfolk, Virginia

Subj: Crash Investigation of F7U-3 Aircraft Bureau Number 129546

Encl: (1) One (1) copy of Westinghouse AGT Div Report No. A-2141 dtd 23 Feb 56

1. Enclosure (1) covers the Westinghouse investigation of the possible causes of the fire and explosion leading to the subject accident and is forwarded as information.

Rowhite

Copy to:
BAR Kansas City

R. O. [illegible]
By direction

1000

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WESTINGHOUSE ELECTRIC CORPORATION
AVIATION GAS TURBINE DIVISION

ENGINEERING DEPARTMENT

Prepared for the Bureau of Aeronautics

REPORT NO. A-2141 COPY NO. 1

TITLE CRASH INVESTIGATION OF F7U-3 BU. NO. 129546 WITH J46-WE-8B ENGINES WE404940 AND WE404944.

DATE OF ISSUE 2/23/56

BY E. R. Cheramy
E. R. CHERAMY

APPROVED [illegible]

APPROVED [illegible]

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REPORT NO. A-2141
COPY NO. 1

Encl. (1) to [illegible] (ltr) ~~[illegible]~~

Aer-PP-413/7 10 APR 1956 af.

Report No. A-2141

SUMMARY

CRASH INVESTIGATION OF F7U-3 BU NO. 129546 WITH J46-WE-8B ENGINES WE404940 AND WE404944.

By: E. R. Cheramy
Field Liaison Engineering Section

Aircraft Bu. No. 129546 piloted by Lt. F. A. Downs, USN, crashed on November 21, 1955 west of Isleta, New Mexico. The pilot was killed because he had insufficient time to free himself from the seat and open his parachute after ejecting.

The crash was a direct result of an uncontrollable fire in the left engine compartment. The fire probably started from an explosion of fuel vapors in the left engine afterburner compartment. The source of fuel causing the explosion and fire could not be determined because of the extensive fire and crash damage.

CRASH INVESTIGATION OF F7U-3 BU NO. 129546 WITH J46-WE-8B ENGINES WE404940 AND WE404944.

INTRODUCTION.

On November 21, 1955 at 10:52 A.M. an F7U-3 aircraft Bu No. 129546 crashed approximately 2 miles west of Isleta, New Mexico. It was powered by Westinghouse manufactured J46-WE-8B engines Serial Number WE404944 (Starboard) and Serial Number WE404940 (Port). The aircraft was piloted by Lt. F. A. Downs, USN. The flight was made in conjunction with a program to develope a low level, high speed bombing procedure. No chase plane was following the flight; however, observers were stationed throughout the target area to watch the procedure. The crash occurred on the second flight of the aircraft for the day. Lt. Downs was the pilot on the first flight as well as last. After the first flight the plane landed and was refueled and loaded for the second flight. After refueling and loading, Lt. Downs took off and returned to the target area. He made one practice run on the target about fifteen minutes after the takeoff and four or five minutes later began the approach for the second run. On the approach to the target, about 3-5 miles from M4 (Encl J), the pilot fired both afterburners. Standard procedure required that he use the airframe speed brakes for speed control so that on the target approach the airplane airspeed is 550K and altitude is 200 feet over the terrain. Near the railroad track, approximately M4 (Encl J), on the approach to the target area Lt. Downs reported he had a fire warning light and was aborting the flight and shutting down his engine. He banked the plane to the right and asked the range observers if they could see smoke. The Navy observers told him they saw no smoke. Immediately after this an Air Force Radio Station told him they saw smoke. Lt. Downs "rogered" and said he was dropping his stores and heading back to the base. He dropped his stores and as he disappeared over a ridge of hills one ground observer said he couldn't see the plane for the fire. Three ground observers say they heard a muffled explosion about the time the plane was over the railroad tracks (M4,Encl J) south of the target area during the approach.

After leaving the target area the airplane travelled about twelve miles and crashed inverted into a low ridge. (Ref. Map B. Encl.J). The pilot had apparently ejected shortly before the crash. His body, still in the seat, was found about 2500 feet from the crash. The canopy was found 4000 feet away from the crash indicating a normal ejection procedure. There was a path of molten and broken bits of metal extending along the flight path for approximately two miles before the crash. About one and one-half miles back from the crash a large section of airframe was found which was identified as a portion of the separator between the two afterburner sections. This piece had been burned out. Eighteen hundred feet from the wreckage the access door for the left engine was found badly burned. The ATC and AEC mounted on this door was badly burned. About 1500 feet from the wreckage, over a wide area, numerous wing pieces and fuel tank pieces were found.

The airframe apparently went in at about 30° in an inverted position. The position of the rudders and the engines indicate the inverted position and the angle was ascertained by a gun from the airframe which was buried inthe area near the center of impact. The engines vaulted or were blown out of the airframe on impact and were found 100 yards away from the center of impact in the direction of flight. The left engine was not rotating at the time of impact, the right engine was.

The aircraft was damaged excessively on and before impact. Fire damage in the area was confined mostly to the impact area, about 100 feet in diameter. Damage to the airframe due to ground fire was not considered excessive although some wooden parts of the plane were burned badly.

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DISCUSSION

The investigation committee to study the crash consisted of:

LCDR (b) (6) [redacted] USN, NASWF

Lt. (b) (6) [redacted] USN, NASWF

Lt. (b) (6) [redacted] USN, NASWF

(b) (6) [redacted] WECO Engineering

(b) (6) [redacted] WECO Engineering

(b) (6) [redacted] WECO Engineering

(b) (6) [redacted] WECO Engineering

(b) (6) [redacted] WECO Engineering

(b) (6) [redacted] WECO Service

(b) (6) [redacted] WECO Service

The following sources of information were used by the committee to arrive at their conclusions.

1. Encl. (a) Kirtland AFB Tower Operator's Comment.
2. Encl. (b) Statement by (b) (6) [redacted] PHI USN
3. Encl. (c) Statement by (b) (6) [redacted] DMI USN
4. Encl. (d) Statement by (b) (6) [redacted] AT3 USN
5. Encl. (e) Statement by (b) (6) [redacted] S/Sgt. USAF
6. Encl. (f) Statement by [redacted] (b) (6) [redacted] (b) (6) [redacted], USN
7. Encl. (g) Statement by (b) (6) [redacted]
8. Encl. (h) Statement by Rev. (b) (6) [redacted]
9. Encl. (i) Statement by (b) (6) [redacted]
10. Encl. (j) Flight Path, Maps A & B
11. Condition of Wreckage
12. History of Engines and previous flights.
13. Encl. (k) Location of Wreckage
14. Encl. (l) Wreckage at center of impact area

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I. The initial phase of the investigation consisted of an examination of the wreckage and the crash site. This was done by Messrs. Brown, Hanson, Hazelton and Weinstein for Westinghouse Electric Corporation. Their findings were as follows:

1. The left engine was windmilling or stopped at the time of impact. The throttle arm on the fuel control for this engine was found to be below idle. The condition of the compressor and turbine indicate they were stopped at impact.

2. The right engine was running at impact. This was obvious from the circumferential scratches on the compressor and turbine housings and the bending of the turbine and compressor blades. The control lever on the right engine A/B control was at 82°-83°, the military power setting.

3. The compressors or turbines did not fail before impact. The turbine blades were damaged on impact with the ground. No fatigue cracks were found on the compressor or turbine parts. There was no evidence of overtemperature of the turbine parts and no metal spray, typical of a turbine failure.

4. The A/B manifolds on both engines were secured by restraining brackets. (Bul 130). There were no fire indications on the yoke or on other parts of the A/B. This indicates there was no appreciable flame between the A/B shell and the shroud. The coloring of the A/B shell indicates normal temperature patterns.

5. The plane was probably inverted at impact since the right engine was to the left of the left engine.

6. The breaks in the turbine blades showed no signs of heat after impact.

7. The A/B pump from the left engine showed signs of rubbing with heat marks. A small soot path was evident through the flange of the case.

8. The right engine WE404044 had operated 77.8 hours before the last flight. Bulletins 57 and 130 had been performed on the A/B no detail checks were made on the past malfunctions since this engine did not apparently contribute to the crash.

9. The left engine WE404940 had operated 117.0 hours of which 38.1 hours was at MRP and 24.5 hours was A/B.

II. Examination of the crash site and flight path by Naval personnel under the direction of LCDR (b) (6) Lt. (b) (6) and Lt. (b) (6) disclosed the following: Reference Enclosure, (j) "Flight Path" Maps A and B.

1. Bits of aluminum airframe structure in the area near marker M_3 on the approach to the target (Map A). These pieces appeared to have been blown out of the airframe by an explosion and were not marked by fire. The pieces were identified positively by CVA as being from the A/B compartment of the airframe. CVA could not determine from which engine compartment the pieces came; however, they feel certain they were from the bottom of the airframe.

2. No additional parts or pieces were found along the flight path for the next 8-10 miles until approximately 2 miles before the point of impact. At this point small bits of broken and burned aluminum began appearing, increasing in size and quantity toward the point of impact. An 8 inch piece of airframe structure identified as part of the panel between the two A/B compartments was found approximately 1½ mile from the impact point.

3. The canopy was found about 4000 feet from the point of impact.

4. The seat with the pilot was found about 2500 feet from the point of impact.

5. Large sections of airframe began appearing about 1500 feet from the point of impact. Some were badly burned and some appeared to have been blown off the airframe by an explosion.

6. From this point on to the point of impact 300-500 feet on either side of the flight path a considerable number of airframe parts and pieces were found.

7. The major portion of the airframe fuselage was found at the point of impact. The rudders were on the underside of the wreckage and in a position indicating the airframe crashed inverted.

8. The only gun on the airframe was found buried in the ground in the impact area, at an angle of 30°, probably indicating the angle at which the airframe crashed.

9. Ground fire was not heavy. It was mostly contained in the impact area approximately 100 feet in diameter and can best be described as a scorching type fire only.

10. A large number of parts and pieces were found in front of the point of impact out to 1000 feet.

11. The cockpit portion of the airframe was not found or was damaged beyond recognition.

III. Messrs. Mathias, Cucco and Cheremy of Westinghouse Electric Corporation went to Albuquerque after Messrs. Brown, Weinstein and Hazelton had returned to correlate all the data available and to help determine, if possible, the main cause of the crash. The following additional information was found .

1. The left engine was installed in the airframe at Albuquerque by Navy personnel. The only major malfunctions which were noted on the engine were:

   a. The E/N leaves got crossed and required an A/B change approximately one week before the crash.

   b. The ATC and AMC were changed approximately one month before the crash.

c. A crack in the A/B fuel manifold was welded approximately one month before the crash. The crack was inside the burner at the junction of the feed line and the distribution ring.

2. Engine Bulletin 130 putting the clamp over the A/B lines had been performed but the "B" nuts were not brazed in accordance with EB 37 or replaced in accordance with EB 57. EB 57 is effective at next B inspection. One A/B fuel line "B" nut was safety wired in the wrong direction.

3. Most of the control components on the left engine had suffered fire damage while those on the right engine, although sooty, appeared to be free of fire damage.

4. The following is a list of parts from the left engine and the degree of damage from heat.

a. Main engine fuel control - badly burned

b. A/B fuel control - burned badly on the side adjacent to the main engine fuel control.

c. Dual pump - scorched - not badly burned.

d. Distributor - badly burned.

e. Oil coolers - one melted badly, the other hot but not melted.

f. ATC and AEC - very badly burned and melted.

g. A/B pump - subjected to high temperatures but not badly burned.

h. Gearbox - scorched.

i. Compressors housing - scorched and burned badly locally at the PT3 probe.

j. Overspeed relay - scorched.

k. All the rubber fuel or oil lines identifiable to the left engine were burned clean of rubber including the main fuel inlet line forward of the engine.

5. The plane captain was asked about the possibility of fuel leaks in the engine. He stated that after the first flight, before the engines were shut down, he drained both engine dump tanks. Neither tank contained excessive fuel and no leakage was observed after the tanks were drained with the engines running. The engines were then shut down and both dumped properly. The dump tanks were secured and the plane was refueled using the pressure system with the caps off the tanks. No fuel was spilled or drained into the engine compartment and no leakage of any piping was noted.

6. The flight was routine made in conjunction with a program to develop a bombing technique. This was the second flight for the day and the pilot, Lt. Downs, was very familiar with the plane and mission. The plane made a normal A/B take-off and made a dummy run on the target. A run consists of approaching the target at 200 feet and 550K, executing half of a "Cuban 8" maneuver and leaving the target area. Apparently no trouble was experienced during the dummy run since the pilot made no reports.

7. The crash site was re-examined but no additional information was obtained.

IV. The afterburner pump from the left engine was returned to Westinghouse Electric Corporation, Kansas City Works, to be examined. It appeared, at first, from the heat pattern and soot path out of the pump case, that it may have initiated the source of fuel and fire. Investigation of the pump revealed the following facts:

1. The pump had been heated excessively prior to impact.

2. The "O" ring between the cooling chamber and pump chamber was partly dislodged.

3. The pump had a rub for a very short period of time (less than one second) probably shortly before the crash.

To determine whether the A/B pump could have been the source of fuel and fire causing the crash, a special test was initiated to measure the heat rise in the pump with fuel leaking into the pumping chamber (testimony set forth in paragraph III-5 would make this a remote possibility). During build up prior to the test several attempts were made to install the "O" ring between the cooling chamber and pump chamber in the same position as the "O" ring in the pump from the wreckage. In no case could the "O" ring be installed this way without completely shearing off the portion out of the groove. The "O" ring from the crash pump was still a complete circle. It is, therefore, reasoned that the "O" ring was squeezed out in impact. An exact duplication of this phenomenon was observed on a fitting of the left hand engine overspeed relay.

The running test system was set up to simulate engine conditions. The outlet of the pump had a $\frac{1}{4}$ inch line bleeding back to pump inlet, and a surge check valve venting the pumping chamber overboard. Several thermocouples were mounted on the case of the pump to measure temperatures. The following information was found from the tests.

1. With the pump running dry at maximum rpm (simulating normal military operation) the maximum temperature on the pump case was 192°F.

2. With the pump running at maximum rpm and the inlet shutoff valve open and no flow except that through the $\frac{1}{2}$ inch line the maximum temperature was 182°F.

3. With the pump at maximum rpm, inlet shutoff valve closed and the "O" ring between the cooling chamber and pump chamber completely removed. (Simulating maximum leakage into the pumping chamber from the cooling chamber) the maximum temperature was 114°F.

It is concluded from these tests that the A/B pump did not overheat and cause the fire or explosion. The "O" rings used in the pump will operate indefinitely at 250°F which is a considerable margin over the maximum temperatures encountered in normal operation. A rub between the rotating and stationary parts of the pump could possibly cause sufficient heat to cause a fire. However, the pump from the wreckage was not damaged sufficiently to have had the degree of rubbing necessary for this to happen. The "O" ring between the cooling chamber and the pumping chamber could not have been installed as found in the wreckage, therefore, it must have been displaced during the crash.

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CONCLUSIONS

Aircraft Bu. No. 129546 piloted by Lt. F. A. Downs, USN, crashed on November 21, 1955 as a result of an uncontrollable fire in the left engine compartment. The most probable sequence of events leading to the crash are as follows:

Fuel vapors from a foreign source or sources unknown were ignited by the heat of the left engine afterburner during the second approach to the target. The ignition was in the form of an explosion which blew off the small piece of airframe found near the target area. The explosion may have initiated a fuel leak forward of the firewall which supplied the ensuing fire or a fuel leak forward of the firewall supplied the fuel which caused the explosion and the ensuing fire. It is evident, however, that there was fuel forward of the firewall after the explosion. This held the fire which probably burned through the airframe fuel crossover line creating the source of fuel for burning after the engine was shut down.

The most probable sequence of events which cause the pilot's death are as follows:

After leaving the target area the pilot called the tower at Kirtland AFB and was granted a straight in emergency approach on runway 3. The aircraft was probably traveling at 2-300 KIAS at an altitude of approximately 1200 feet above the terrain. This altitude would have been necessary to clear a ridge between the crash site and the point of ejection with the plane in a 30° dive. (Angle of gun at impact point P II-8). Shortly after the call to the tower the pilot probably realized the aircraft was burning too badly to make the field and began his ejection procedure. After ejecting the canopy and during the seat ejection procedure, it is felt that the fire caused an explosion in one of the wing fuel tanks throwing the aircraft in an inverted position. This caused the pilot to be ejected downward.

Statistics indicate that it takes an average of 15 seconds from the moment of decision for an ejection to full opening of the parachute. This would mean that in straight and level flight an altitude of 1800 feet would be required for a successful ejection. If an ejection was attempted at 1200 feet, the presumed altitude before the crash, the pilot would probably not be able to get the parachute completely open before he hit the ground. He would, however, be free of the seat and the parachute would be in the process of opening. In this instance, the pilot was still strapped in the seat indicating that he did not have the time to unbuckle his safety belt and get free of the seat. Since it normally takes about 5 seconds after ejection to get free of the seat, it is concluded that the pilot must have been ejected downward.

RECOMMENDATIONS

A check of the left afterburner after the crash disclosed that the connections to the manifold were the standard AN type fittings using conical sealing and "B" nut coupling. One "B" nut was safety wired incorrectly. AN connections on afterburner fuel lines have been chronic leak sources in the past and two modifications to the afterburner have been made to correct the condition. The first modification was brazing the fittings. This was done on some engines prior to shipment in accordance with CID 421177. This change was identified on engines as EB#37. The second modification changed "B" nut connections to flange type fittings using a metal "O" ring seal. This modification, per CID 42192, was identified on the engines; in advance of the block point as EB#37A. Both the braze and flange modification CID's added a "plastiseal" fitting on the firewall end of the manifold lines. This change is incorporated by EB#71. One hundred sixty-nine (169) of the early engines were shipped before either EB#37 or EB#37A became effective and 14 unmodified manifolds were shipped as spares.

Prior to the issuance of EB#37 or EB#37A another modification was made on the A/B fuel manifold. This modification in accordance with CID 42910 welded the inlet tubes of the manifold to their internal supporting clips. This modification and those made by CID 42177 (EB#37) or CID 42192 (EB#37A) were combined in EB#57. EB#57 added the flange fitting to those afterburners having the unbrazed AN fittings as well as welding the inlet tubes to the clips. On afterburners having either the flange fittings (EB#37A) or the brazed AN fittings (EB#37) on the manifolds, EB#57 requires only that the inlet tubes be welded to the supporting clips.

A considerable amount of correspondence expressing the urgency of incorporating the brazed or flanged fittings on the afterburner had been sent to the field. The importance of these improvements were re-emphasized at several BuAer maintenance conferences. However, there appears to have been some difficulty in getting all engines modified because of the distribution of parts. Recently the classification of EB#57 was changed to "Urgent" to stress the need of these modifications. It is strongly recommended that this bulletin be incorporated as soon as possible or if parts for the change are not available that the AN fittings be brazed as described by CID 42177. It is further recommended that afterburners which do not have either the brazed or flange fittings be removed from flight status.

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CRASH INESTIGATION OF F 7U-3 129546, PILOT DOWNS, 11-21-55

BY E. R. CHERAMY, WESTINGHOUSE ELECTRIC CORP.

C O P Y

Enclosure (a)

EXCERPTS FROM TOWER STATEMENT:

1030 (approx i.e. ± - 30 secs) Departed Kirtland AFB.

1050 Aircraft called stating fire warning lights on and was cleared straight in. Reported he was 30 miles SW.

1052 Tower observed mushroom shaped column of smoke 15 miles SW.

Rest of statement will be sent over Monday 28 November 1955.

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C O P Y

Enclosure (b)

STATEMENT OF (b) (6) [redacted] PH1 REGARDING CRASH OF F7U BU NO 129546.

On the morning of November 21, 1955 F7U-546 piloted by Lt., F. A. Downs was coming in to make his second run on his second flight of the morning, and as he approached the rail road tracks I noticed he was pulling up and to the right of the flight line. I had just a few moments before, handed the radio to (b) (6) [redacted] DM1, who was giving LT DOWNS the data he had compiled from the weather balloon he had sent up.

I asked (b) (6) [redacted] why F7U-546 was pulling up and off the flight line. Shafer replied that 546 was having troubles. As 546 crossed by in front of us he asked if we could see any fire out of the tail of the plane, and at that time there was no visible fire. F7U-546 proceeded in the approximate direction of the base which I assumed was northeast. As he crossed a ridge approximately 1 mile from the photo grid he said he was going to jettison the unit he was carrying. I saw the unit fall with my naked eye.

I picked up my field glasses to look at the plane and as I looked up I saw a ball of flames and a trail of brownish-black smoke. The plane was going in a direction almost straight away from where I was, and I coulnd't see the plane for the fire.

At the time I saw the fire the plane appeared to be approximately 1,000 feet to 1,500 feet above the ground. I followed the trail of smoke out of sight over the ridge. That was the last contact we had with F7U-546.

(b) (6) [redacted] PH1

C O P Y

Enclosure (c)

STATEMENT OF (b) (6) [redacted] DM1 REGARDING CRASH OF F7U BU NO 129546

I was called to the jeep radio to give wind data to LT DOWNS prior to his run. I stayed with the radio so that (b) (6) [redacted] could operate the camera. LT DOWNS said "I am one minute". Several seconds later when the plane was about over the tracks LT DOWNS said "I have a fire warning light and am aborting and am shutting down the engine".

At about this time we heard an explosion. LT DOWNS said he had a fire warning light in the other engine. He asked us if we saw any smoke. He was at this time passing behind the shack and out of my field of view. (b) (6) [redacted] could see him and said he saw no smoke. I told LT. DOWNS we saw no smoke. Immediately after this "Drem-Head One", the Air Force Radio Station at the range, said that they saw smoke. Mr. DOWNS said he was dropping the unit and heading back to the base.

(b) (6) [redacted] DM1

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C O P Y

Enclosure (d)

STATEMENT OF (b) (6) [redacted] AT3 REGARDING CRASH OF F7U BUNO 129546

At the time 546 was circling to make what proved to be his last pass, I was observing the weather balloon from the theodulite station located approximately 25 yds. parallel and down range from the grid. When I next saw 546 it was coming in on his run and everything appeared to be normal until he started to pull up somewhere between the tracks and the first box. When he was around the second box I heard a muffled explosion. He seemed to attain about 1,000 feet elevation and then banked right in a direction toward the base.

About this time (b) (6) [redacted] asked (b) (6) [redacted] and me if we saw any smoke or fire indications from the plane. I had an unobstructed view of the aircraft and I noticed no smoke or indication of fire. I passed this info on to (b) (6) [redacted] and I heard him pass on the same info to LT. DOWNS over the radio.

When I turned back to look for the plane again it was out of my sight beyond a ridge. (b) (6) [redacted] came over to where I was at this time and showed me a trail of brown smoke where the plane went over the ridge.

(b) (6) [redacted]

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C O P Y

Enclosure (e)

STATEMENT OF (b) (6) [redacted] S/SGT AF (b) (6) [redacted] USAF REGARDING CRASH OF F7U BUNO 129546.

The following testimony was given to me by S/SGT Ingraham:

LCDR (b) (6) [redacted]

I am (b) (6) [redacted] S/SGT., USAF, attached to the Data Analysis branch of 4925th Test Squadron (Development). My aviation experience consists chiefly of one year at the Los Lunas Bombing Range and five years of watching aircraft flying from Air Force Bases.

The F7U was approaching the bombing range for the second run when I heard the pilot call in and request the range crew to check his airplane for evidence of fire or smoke. The pilot said that he was aborting the run and he started a turn to his right. At approximately this time I heard two muffled explosions.

During a normal low level run the planes usually pass to the left of my position, however the F7U passed overhead as it aborted the run and headed toward Kirtland Field. I saw fire and a thin trail of smoke coming out of the tail of the airplane as it passed overhead. The Air Force radio operators told the pilot they saw fire and smoke and the pilot "rogered" the transmission. I saw fire and a thin trail of smoke coming out of the tail as the plane headed away from our location.

Our radio operators asked the Area Expire Tower if the airplane had crashed since our field of vision was obstructed due to the hilly terrain features. The Area Expire Tower reported that the plane had crashed and they directed the Navy range crew to head for the crash scene.

(b) (6) [redacted]

Report No. A -02141
Enclosure (f)
23 November 1955

C O P Y

STATEMENT OF LCDR (b) (6) [redacted] USN

About 1100 on 21 November 1955, I was practicing a simulated "flameout" landing at Kirtland Air Force Base, Albuquerque, New Mexico. I was heading in an easterly direction at approximately 13,000 feet indicated (8,000 feet about terrain) when I head Tambourine 546 (F7U-3 BuNo 129546 Pilot, Lt. Frank DOWNS, USN) call the tower requesting a straight in approach for runway 3. He stated that he had two fire warning lights on. Tambourine 546 also requested someone to check if his aircraft was trailing smoke. The pilot sounded calm and gave no indication of distress. The tower immediately cleared Tambourine 546 for a straight in approach on any runway.

I aborted my simulated "flameout" approach and took up a southwesterly heading. I asked Tambourine 546 what his position was. Tambourine 546 did not answer. A F-80 below me had also asked for the same information but I heard no reply from Tambourine 546.

I took up the reciprocal heading of runway 3, heading out on an approximate heading of 210° and an initial indicated altitude of 13-14,000 feet, letting down to intercept Tambourine 546 during his straight in approach.

When I arrived over the west side of the Rio Grande I sighted a silvery aircraft about 11 O'clock down. His altitude I judged to be about 2-3,000 feet above the terrain. The aircraft was on a heading of approximately 070°. The aircraft was approximately two (2) miles west of Isleta Hill. I estimate I was 8-10 miles away from the aircraft.

I got the impression the aircraft was in a slight glide the instant I sighted it. Almost immediately thereafter I noticed the aircraft pitch down rapidly, setting up a dive angle of approximately 30°. The rate of

speed appeared to increase appreciably. I would estimate the speed roughtly 400 knots IAS.

The dive appeared to be straight in. The wings appeared to be level and I detected no bank or change in direction. There was no apparent "flameout" during the dive.

A fraction of a second before the violent impact I thought I detected a bright white flash near the forward part of the aircraft. It was followed so closely by the explosion that it might have been the actual impact or an optical illusion. The explosion consisted of an orange colored ball of flame expanding to cover a considerable area. Black smoke was emitted almost instantly after the orange "fire ball" fully expanded.

I saw no object leave the aircraft during the dive. The airplane appeared to be in a clean configuration. I was too far away to detect any smaller details regarding the aircraft. I detected no flame or smoke trailing the aircraft at any time.

I immediately gave a "May Day" report over UHF radio and turned on my emergency IFF while I circled the scene of the crash.

(b) (6) [redacted]

C O P Y

Enclosure (g)

STATEMENT OF (b) (6) [redacted] REGARDING CRASH OF F7U BUNO 129546

The following testimony was given to me verbally by (b) (6) [redacted] LCDR. (b) (6) [redacted] USN

I am (b) (6) [redacted] employed by the Kirtland Air Force Base Fire Department. My experience in aviation consists chiefly of serving on the crash crew detail at Kirtland. I have seen the F7U Cutlass many times when it was flying and also when it was taxiing. I have ridden in airplanes, but only in the capacity of a passenger. In addition to my duties at the Fire Department, I serve in an Anti-Aircraft unit with the National Guard of New Mexico.

On the day the accident occurred I was driving south on U.S. Highway 85 near Isleta, New Mexico. I noticed an airplane making a shallow dive, I did not notice any fire or smoke trailing from the airplane. I shifted my attention to driving my car and I did not see the airplane strike the ground. I noticed smoke and fire after the plane crashed.

At the time of the crash, I estimate that my position was approximately two miles east-southeast of the crash scene. The airplane's heading was approximately in line with my position. When I saw the airplane in the air I didn't think anything was unusual about the airplane's manuever since I have noticed aircraft operating in that general area on previous occasions.

As soon as I saw the smoke and fire, I parked my car and hiked to the scene of the crash. I was the first one to reach the crashed airplane and instructed people as they arrived to avoid picking up any parts.

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C O P Y

I proceeded to the location of the pilot's ejection seat and met the Priest, who was the first one to get to the pilot's body. Nothing was moved until military authorities arrived because it was obvious that the pilot was not alive.

(b) (6) [redacted]

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C O P Y

Enclosure (k)

STATEMENT OF REVEREND (b) (6) [redacted] REGARDING CRASH OF F7U BUNO 129546.

The following testimony was given to me verbally by the Reverend (b) (6) [redacted]

LCDR. (b) (6) [redacted] USN

I am Reverend (b) (6) [redacted] Pastor of the St. Augustine Church, in Isleta, New Mexico. I have been flying my own light plane for the past ten years. I witnessed an F7U Cutlass flying exhibition several years ago in Chicago, Illinois.

At the time of the crash occurred, I was in my home. Mr. (b) (6) [redacted] (b) (6) [redacted] came over to notify me that an airplane had crashed near Isleta Hill. I immediately proceeded to the scene of the crash to give any possible assistance. I found the cockpit canopy and then continued toward the area where the airplane struck the ground. The pilot's body was found strapped in the ejection seat well clear of the other parts of the airplane. His helmet was lying nearby. It was obvious that the pilot was dead so I didn't touch anything. I was the first man to arrive at the crash scene and no one carried away any parts of the wreckage prior to the arrival of the military authorities.

Several military aircraft were circling the area and we attempted to point out the location of the pilot's body.

(b) (6) [redacted]

Enclosure (i)

C O P Y

STATEMENT OF MR. (b) (6) [redacted] REGARDING CRASH OF F7U BUNO 129546.

The following testimony was given to me by Mr. (b) (6) [redacted]

LCDR. (b) (6) [redacted] USN

I am Mr. (b) (6) [redacted] storekeeper at Isleta, New Mexico. I have very little experience with aviation matters, with the exception of seeing various types aircraft flying overhead.

At the time the crash happened I was outside of the store that I operate. I first noticed smoke rising from a field approximately two and a half miles away. I did not hear an explosion.

I left immediately for the scene of the crash, joining Reverend (b) (6) [redacted] who was the first man there. Several airplanes were circling the area at this time.

We found the pilot strapped in his ejection seat and his helmet lay near by. We were certain that the pilot was dead so we did not move or touch anything.

The airplane's parts were strewn over a large area and only small pieces were left. To my knowledge, no parts were carried from the crash scene prior to the arrival of military authorities.

Mr (b) (6) [redacted]

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KEY TO LOCATION OF WRECKAGE

ITEM NO	ITEM
1.	Unidentified skin
2.	Vertical longeron upper end from center firewall at fuselage station 437.
3.	Speed brake return line, part of
4.	Unidentified skin
5.	Removable engine track support, part of
6.	Canopy actuating piston
7.	Adjustment pots LEFT A.E.C.
8.	Seat
9.	LEFT A. T. C.
10.	Unidentified skin
11.	Slat actuating cylinder
12.	A. E. C. LEFT engine
13.	"T" fitting $\frac{1}{2}$ inch diameter
14.	Micro switch, unidentified
15.	Unidentified skin
16.	Unidentified skin
17.	Fuel line
18.	Speed brake blo-close relief vale
19.	Structure landing gear area, part of
20.	Access door to airframe fuel filter
21.	Unidentified skin
22.	Generator bay door vent actuator
23.	Unidentified door
24.	Unidentified door
25.	Unidentified skin
26.	Inverter
27.	Generator, unidentified

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ITEM NO.	ITEM
28.	Armor plate, seat bulkhead
29.	Wing fold actuator
30.	Right fin and rudder assembly
31.	Right electric compartment door hinge
32.	Hydraulic swivel, wing access area
33.	Pitch dampner
34.	Gun Mk-12
35.	Left landing gear yoke
36.	V. D. pump
37.	Left wing structure, part of
38.	Left speed brake
39.	Slat actuating cylinder
40.	Aft fuselage fuel cell pump, part of
41.	Engine hanger, part of
42.	Slot track area, part of
43.	Left ailervator assembly
44.	Arresting gear up latch
45.	Left engine turbine, not rotating
46.	Engine parts
47.	Fuel line
48,	Main landing gear strut, part of
49.	Cannon plug, Electronic equipment (unidentified), Inverter, Skin (unidentified), Radio fuel pump noise filter
50.	Right main gear strut
51.	Engine turbine blades

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ITEM NO.	ITEM
52.	Engine turbine blades
53.	Unidentified skin
54.	Wiring
55.	Wiring
56.	Arresting gear structure
57.	Wing fold, part of
58.	Left engine fuel connection
59.	Air bottle
60.	Wing stub, parts of
61.	Pump identified
62.	Fuel pump
63.	MK-55 Mod 0 Bomb Rack
64.	Ailivator
65.	Engine parts
66.	Port nose wheel
67.	Access drive
68.	Radio gear
69.	Engine drive section
70.	Left engine fuel pump
71.	Right oil pump
72.	Underside fuel cap
73.	Air bottle
74.	Wing fold, main beam
75.	Pump, identified
76.	Nose wheel end structure

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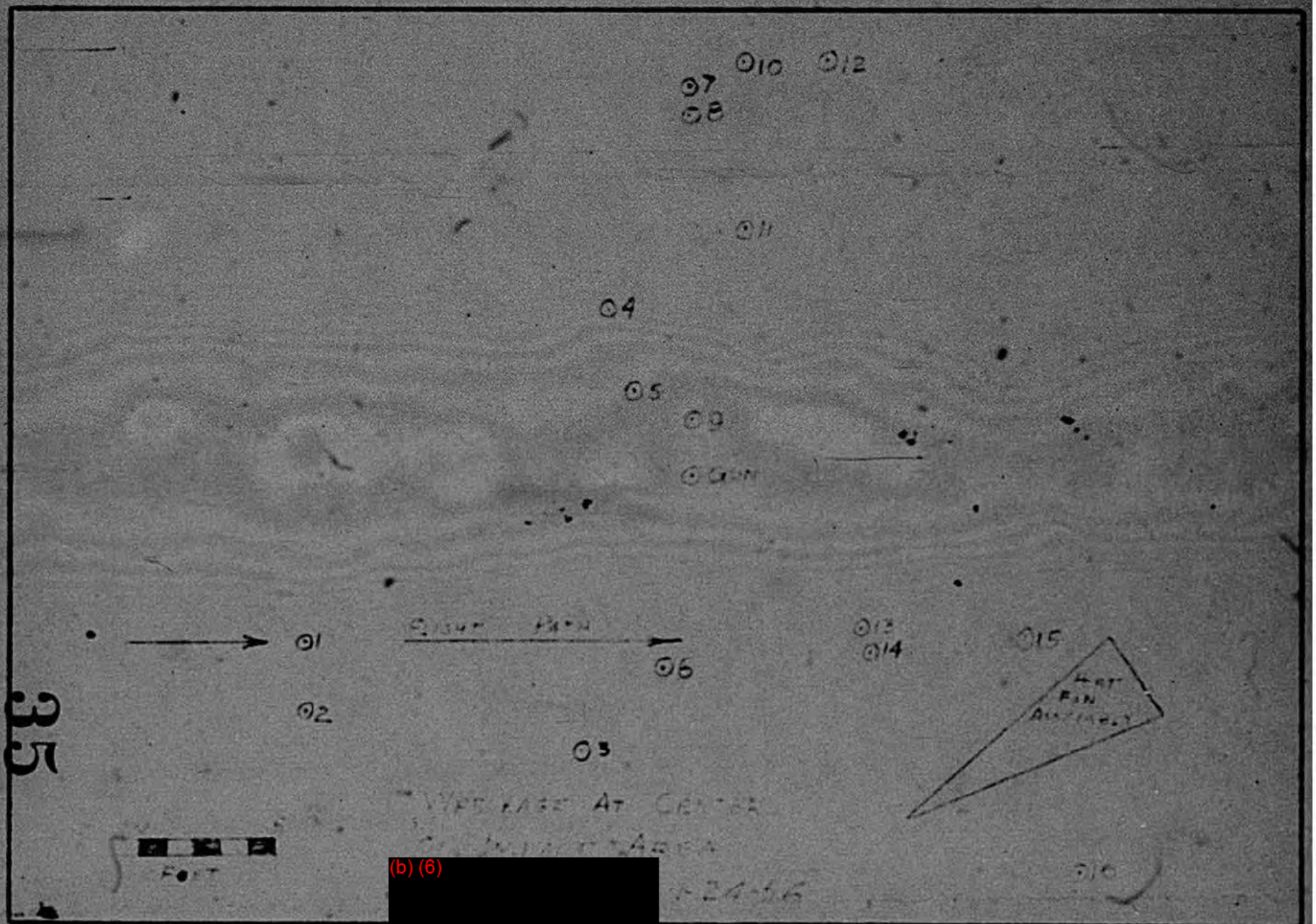
KEY TO WRECKAGE AT CENTER OF IMPACT AREA

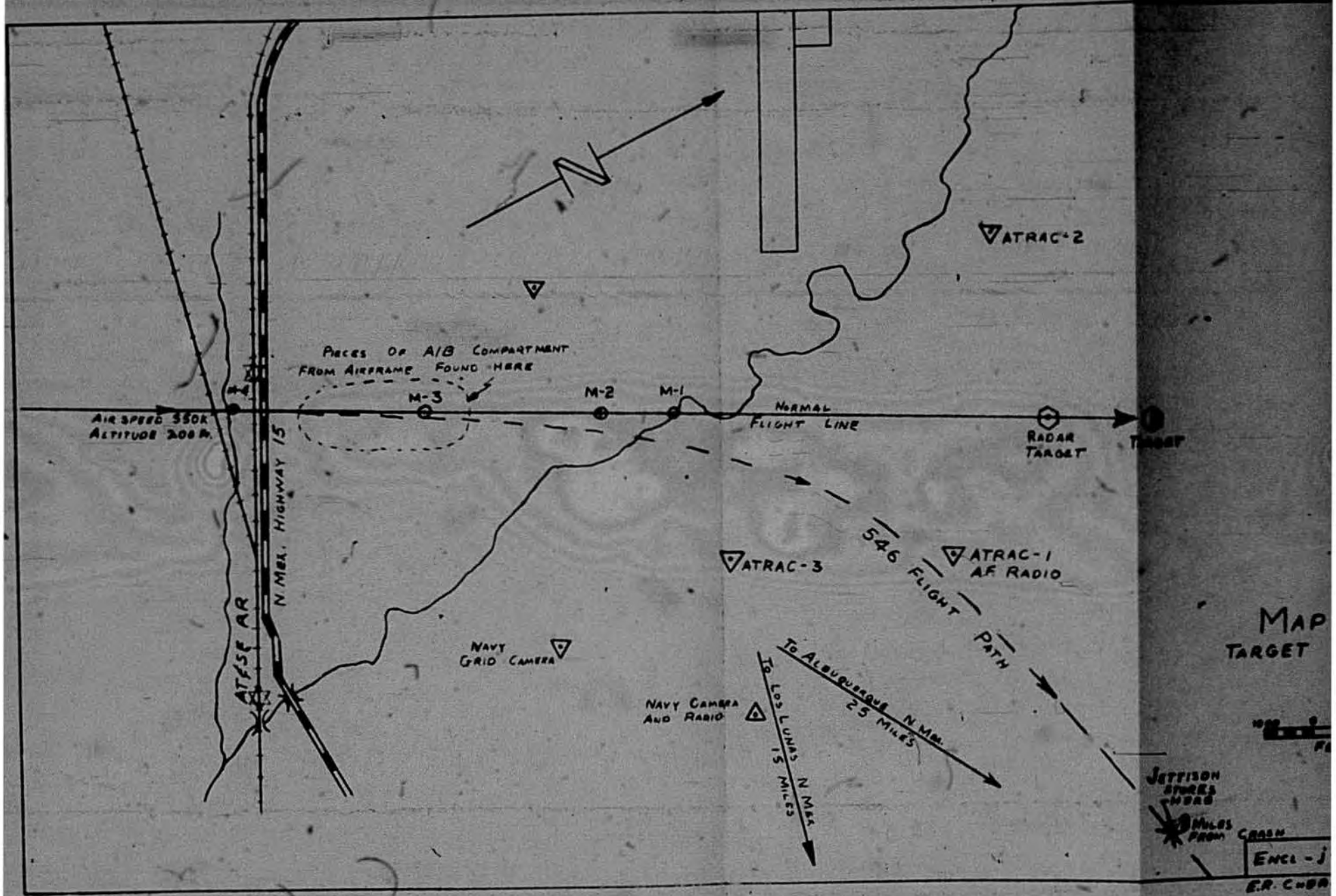
ITEM NO.	ITEM
1.	Spar right wing
2.	Slot structure, part of
3.	A. E. C. inverter
4.	Electronic compartment unidentified & thermal valve
5.	Unidentified electric part
6.	Unidentified electric part
7.	Left landing structure area, part of
8.	Fuel fitting right connection section
9.	Landing gear mount fitting
10.	After-burner support
11.	Fuel fitting
12.	Whittiker valve
13.	Unidentified skin
14.	End fitting unidentified cylinder, part of
15.	Yaw Dampener, G-4
16.	Unidentified skin

34



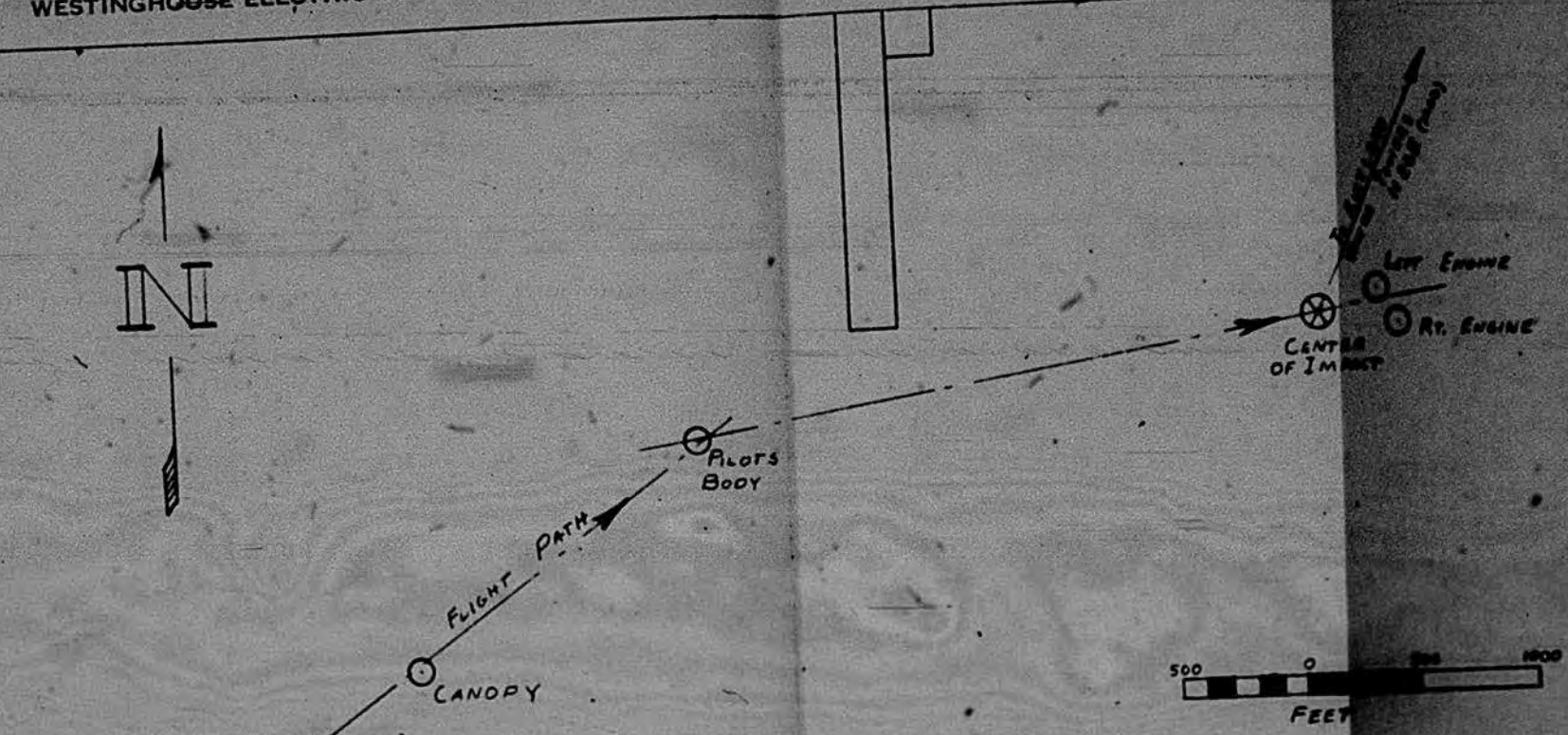
35

WESTINGHOUSE ELECTRIC CORPORATION



SKETCH SHEET

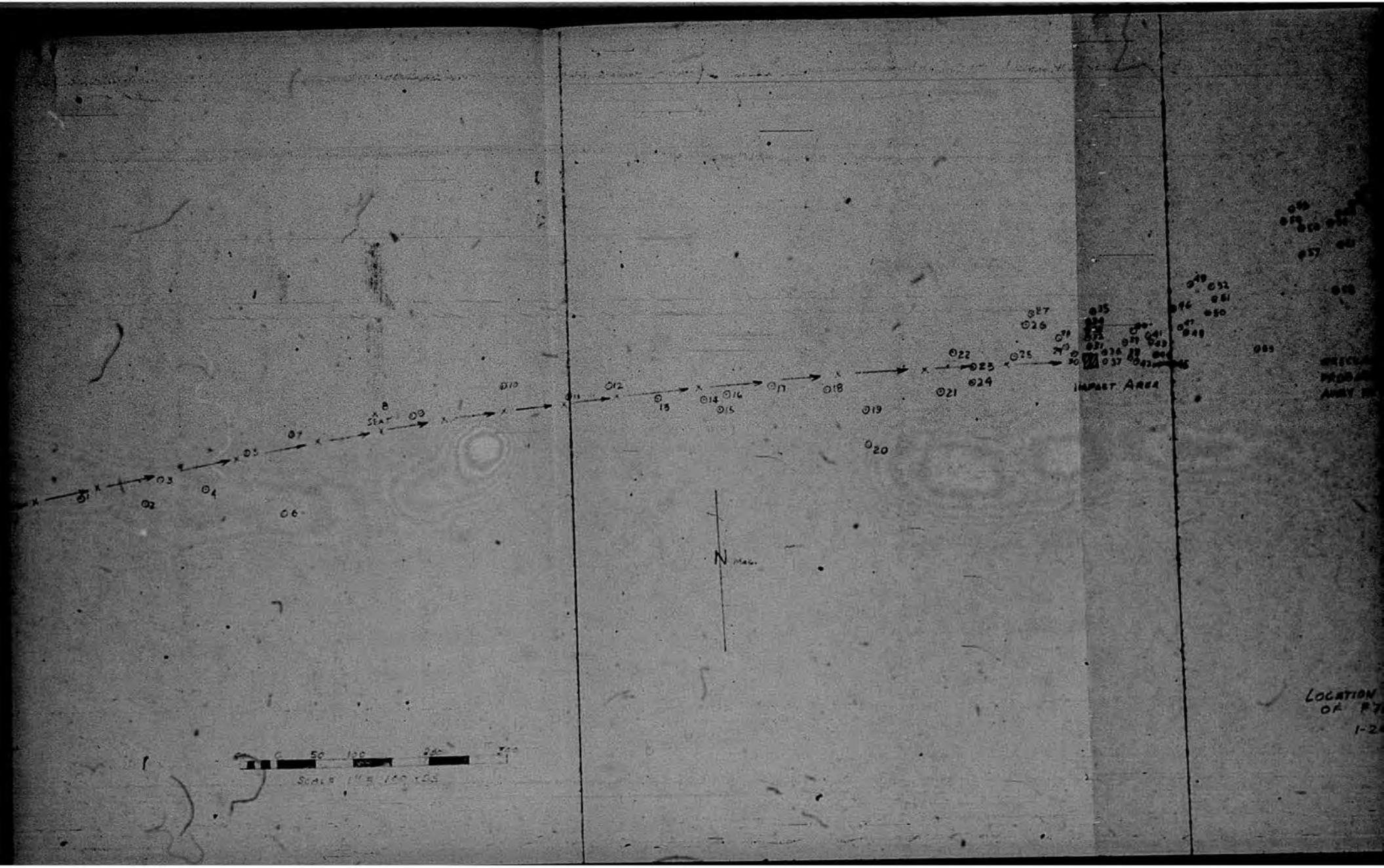
WESTINGHOUSE ELECTRIC CORPORATION



MAP B
CRASH SITE

ENCL-J-A2

E.R. CHERAMY


IMPACT AREA
N
LOCATION OF

DEPARTMENT OF THE NAVY
BUREAU OF AERONAUTICS
WASHINGTON 25, D. C.

IN REPLY REFER TO

Aer-MA-3222/67

P

9 APR 1956

From: Chief, Bureau of Aeronautics
To: Director, Naval Aviation Safety Center, Norfolk, Va.

Subj: Crash Investigation of F7U-3 Aircraft Bureau Number 129546 with J46-WE-8B Engines WE-404940 and WE-404944, Westinghouse Report Number A-2141 of 23 February 1956; transmittal of

Encl: (1) WECO report number A-2141 of 23 February 1956, copy number 2
(2) Buler message 052155Z of January 1956

1. Enclosures (1) and (2) are forwarded for information and/or appropriate action. Latter indicates action taken to eliminate discrepancy.

File with [signature]

T. W. SCHWARZMANN
By direction

AAR
F7U-3 Buno 129546
Pilot Downs 21 Nov 55.

973

973

39

2/10
IBM

Aer-5123/30

SECOND ENDORSEMENT on Naval Air Special Weapons Facility, Albuquerque, New Mexico, Aircraft Accident Report 3-55 on F7U-3, BuNo. 129546, accident occurring 21 November 1955

22 [illegible]

From: Chief, Bureau of Aeronautics
To: Chief of Naval Operations
Via: Director, U. S. Naval Aviation Safety Center, Norfolk, Virginia

Subj: NASWF AAR 3-55; forwarding of

Ref: (a) Westinghouse J-46 Engine Bulletin No. 151, issued 3 Feb 1956

1. Forwarded.

2. The Chief of the Bureau of Aeronautics concurs with the conclusions and recommendations of the investigative board and the first endorsement thereto, subject to the following comments:

a. Conclusions a., b., and c. of the basic report - In the absence of any specific evidence, it is impossible to determine the cause of the material failure which resulted in the reported fuel fire. It is possible that in this instance oil leakage from the high pressure oil system could have been sufficient to produce an explosion which ruptured the high pressure oil lines when the afterburners were lighted. However, it should be noted that in the past only slight oil leakage from the high pressure oil system has been reported. To reduce or possibly prevent fires originating from leakage of high pressure oil lines, reference (a), effective 1 March 1956, provided instructions for the replacement of flexible tubing in the high pressure oil system with hose assemblies and tubes of more durable design.

b. Recommendation b. of the basic report and paragraph 2.b. of the first endorsement - As there is no indication that the pilot did not readily detect the presence of the fire warning light, it is considered that the present fire warning system is adequate. New developments in fire warning presentations consist mainly of locating the fire warning light centrally and high on the instrument panel, and removal of other possible distracting lights from this area of the panel.

c. Recommendation e. of the basic report and paragraph 2.d. of the first endorsement- Aircraft Service Change No. 179, issued 18 January 1956, provides for the installation of MS-16036-2 cartridge actuated automatic lap belts on ejection seats of all F7U-3, -3M, -3P aircraft. Also, automatic parachute release devices will be incorporated initially in parachutes to be used in aircraft equipped with ejection seats and automatic lap belts, and ultimately in all other parachutes in general operation use. Action has been initiated by the Bureau of Aeronautics for the procurement of two types of automatic parachute release devices. Initial deliveries of these devices are currently scheduled for 1 May 1956.

(b) (6) [redacted]

40

(b) (6) [redacted]

Copy to:
CO, NASWF, Albuquerque, New Mexico
BAR Dallas

CONFIDENTIAL
MODIFIED HANDLING AUTHORIZED

DEC 30 1955

E-9318

From: Chance Vought Aircraft, Incorporated
To: Commanding Officer, Naval Air Special Weapons Facility, Kirtland Airforce Base, Albuquerque, New Mexico
Via: Bureau of Aeronautics Representative, Dallas, Texas

Subj: Examination of Wreckage of F7U-3, Buno. 129546

Encl: (1) One duplicator copy of "Wreckage Examined from Airplane Buno. 129546". (CONFIDENTIAL MHA)

1. Certain parts from the subject airplane were examined by this Contractor's representatives at Albuquerque, on 23 November 1955. Observations considered pertinent are presented in enclosure (1).

Respectfully,

CHANCE VOUGHT AIRCRAFT, INCORPORATED

G. Gasper
Chief Project Engineer - Cutlass

GG/ha

Copy to:
Chief, Bureau of Aeronautics, Washington 25, D. C. (w/1 cy encl (1))
Director, Naval Aviation Safety Center, Norfork, Virginia (w/1 cy encl (1))

BUREAU OF AERONAUTICS REPRESENTATIVE
FILMED
JAN 1956
AUTHORIZED
(b) (6)
[redacted]
DALLAS TEXAS

047

41

UNCLASSIFIED WHEN ENCLOSURES ARE REMOVED

CONFIDENTIAL
MODIFIED HANDLING AUTHORIZED

CV1-6050

Enclosure (1) to
E-5312

Wreckage Examined From Bu No. 129546

1. It is estimated that 60% or 70% of the airplane was recovered. The rest was consumed by fire. Distribution of wreckage at the site of impact indicated that there was a violent explosion just prior to impact. Location of major components indicated that the airplane was inverted at the time.

2. The bits of burned aluminum found in the target area, where the first explosion was reported, were identified as parts of lower sections of skin formers at either fuselage station 437 or 455.

3. The eight inch piece of built-up "H" section, found 4,800 feet prior to the impact site, was identified as the upper end of a vertical member of the centerline firewall at fuselage station 437.

4. The pieces of speed brake plumbing and the engine control boxes, found approximately 2,500 feet from the site, were from the lower left hand engine bay at fuselage stations 355 and 377 respectively.

5. The condition of the engines indicated that the right hand was developing power but the left hand was stopped.

6. Numerous parts that were blown clear at the site of impact, showed signs of severe burning. This could have only occurred prior to impact. From these parts, it was established that an intense fire existed in the lower left hand engine and afterburner compartments from approximately fuselage station 315 to 455. Burning also occurred in the right hand afterburner compartment. The magnitude of this fire is evidence that it was fed from the fuel system.

7. The main fuel cell pump manifold showed evidence of heat and smoke on the exterior surfaces and none on the broken sections, indicating that the inflight fire had progressed forward of the engine bay.

8. The engine and airframe components which were recovered and identifiable from the left hand engine bay all showed similar signs of inflight fire.

9. The left hand Automatic Temperature Control box which is mounted on the left hand engine bay door was found approximately 4000 feet before the impact area, indicating one of two possibilities: The door had melted away, dropping this component, or an explosion occurred at this point in the flight.

10. A piece of engine compressor bolt was found pierced through a section of self sealing fuel cell; however, the cell section was too small to establish which cell it was from. In addition, it was not possible to establish whether the bolt penetration took place prior to, or at the time of impact. No other indications of possible engine structural failure were found.

Enclosure (1) to
B-5312

11. The left hand afterburner fuel line did not have either of the engine bulletins incorporated which were designed to prevent leakage of the fitting at the afterburner fuel manifold (EB-37 or 57). Engine Bulletin 130 was installed on both engines. This bulletin kit prevents fuel spillage outside the engine in case of a structural failure of the fuel manifold.

12. The fitting at the left hand afterburner fuel manifold was a "B" nut which had been safety wired in the wrong direction. It could not be determined if this fitting had been leaking. Only one of the two such fittings for the left hand afterburner was found.

13. The condition of the tail pipe shroud of both engines (straightened corrugations: indicated the possibility of an explosion between the shroud and tail pipe of both engines.

14. The vent pipe in the aft fuselage cell was badly burned at the aft end both inside and outside; this end was also crushed, presumably by impact. This indicated the possibility of a fire in this cell prior to the impact.

15. The majority of structural and airframe systems components in the left hand engine bay were destroyed, lost or unidentifiable, making it impossible to check in detail the condition of each potential leakage source.

16. Only two slat actuating cylinders were recovered in tact. Examination showed them to be in the closed-and-locked position. This indicates also that the landing gear was retracted at the time of impact.

17. Examination of the canopy and its actuating piston indicated it had jettisoned normally. This is further substantiated by its location which was 3900 feet prior to the impact site.

18. The pilots seat actuators were adjusted to position the seat full down and aft. The face curtain was extended. The safety "D" handle which allows ejection through the canopy glass, was not pulled. The seat cannon appeared to have been fired in the normal manner. These conditions and those in paragraph 8 above, indicate a normal ejection cycle.

19. The hydraulic filters that were recovered were clean and showed no evidence of pump failure. The New York Airbrake pumps showed only impact damage. The bronze parts were not galled as in a typical failure.

20. The power control cylinders and slider valves were examined. No foreign material or other conditions that might cause malfunction were found.

21. One of the two control system trim jacks was recovered. It was extensively damaged but was positioned to give a nose up trim of approximately 6°. This is normal trim for an airspeed of 175 to 200 kts.

22. One of the G-4 auto pilot servos was unlocked. This usually indicates that the G-4 was "on" at impact. For the servo to be unlocked requires power to both the primary and secondary bus.

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ORIGINAL

GSM/ch
A25
Ser: 805
7 December 1955

FIRST ENDORSEMENT on NASWF Aircraft Accident Report No. 3-55

From: Commanding Officer
To: Chief of Naval Operations (Op-57)
Via: (1) Chief, Bureau of Aeronautics
(2) U.S. Naval Aviation Safety Center

Subj: NASWF AAR 3-55; forwarding of

1. Forwarded, approved.

2. The conclusions and recommendations of the board are concurred in. The following comments apply to the board's recommendations:

a. Laboratory investigation into the cause of the fire is continuing at the Westinghouse and Chance Vought Facilities.

b. The NASWF Safety Officer is conducting a series of lectures on "fire in flight" emergencies and fire warning systems. Individual project officers are making detailed studies into the reliability of the systems installed in their aircraft. From these studies, a more precise unit doctrine for emergencies involving fire will be developed. As an aid in the development of such doctrine, however, more information is needed. Based on their squadron experiences, NASWF pilots have widely varied opinions as to the reliability of fire warning systems. A Naval Aviation Safety Center opinion as to the over-all ratio of false indications to actual fires would be very helpful.

c. The NASWF personnel who work on the Los Lunas Bombing Range have been re-briefed on assisting the pilot wherever possible. This briefing carefully emphasized that radio operators should furnish accurate factual information but should not attempt to make decisions for the pilot.

d. The need for automatic seat belt and parachute opening devices has been repeatedly demonstrated. This accident further emphasizes the requirement.

3. Near the end of the investigation, the Flight Surgeon Member of the Board had to depart on temporary additional duty. His statement will be forwarded as soon as he returns.

G. E. MARCUS

G. S. Morrison

G. S. MORRISON
Acting

ORIGINAL

AIRCRAFT ACCIDENT REPORT
(OPNAV FORM 3750-1 (REV. 3-52))

PAGE 1 OF 11 PAGES
(OPNAV REPORT-3750-1)

THE AIRCRAFT ACCIDENT BOARD SHALL SUBMIT THIS REPORT TO THE C.O. OF THE ACTIVITY CONDUCTING THE INVESTIGATION. IT SHALL THEN BE FORWARDED BY THE C.O. IN ACCORDANCE WITH CURRENT AIR INSTRUCTIONS.

1. DATE OF ACCIDENT	HOUR	2. ACTIVITY SUBMITTING REPORT	3. AIR SERIAL NO.
21 November 1955	1052T	Naval Air Special Weapons Facility	3-55

4. MODEL A/C	BUNO.	CHECK DAMAGE TO A/C	5. REPORTING CUSTODIAN OF A/C
F7U-3	129546	[X] a [ ] b [ ] c [ ] d [ ] e	Naval Air Special Weapons Facility

6. NAME OF UNIT OPERATING THE A/C	BASED AT	OPERATIONAL CHAIN OF COMMAND
Naval Air Special Weapons Facility	Kirtland AFB Albuquerque, N. Mex.	BuAer

7. LOCATION OF ACCIDENT	8. UNIT TO WHICH OPERATOR ATTACHED
220°, 9 N.M. from Kirtland AFB	Naval Air Special Weapons Facility

9. PERSONNEL INVOLVED (including name and injury code of those injured, not occupants of A/C)

FULL NAME, RANK, SERVICE, FILE NO. (List pilot in control first.)	A AGE	B BILLET	C POSITION	D INJURY
DOWNS, Frank "A", Lieutenant, USN, (b) (6) [redacted]	33	Pilot	Cockpit	A

10. PILOT EXPERIENCE	TOTAL ALL MODELS	TOTAL THIS MODEL	LAST 12 MONTHS ALL MODELS	LAST 3 MONTHS ALL MODELS	LAST 3 MONTHS THIS MODEL
TOTAL HOURS	2370.5	164.6	230.9	75.9	39.8
INSTRUMENT HOURS			23.3	10.9	00.0
NIGHT HOURS			18.0	4.8	00.0
CV LANDINGS DAY/NITE					

INSTRUMENT RATE: Special/no/no
PILOT'S AGE: 33
DATE DESIGNATED: 8-8-45

11. COST OF A/C: [redacted] [redacted] Approx. $525,000.00
12. PURPOSE OF FLIGHT: Development — CODE: 1K
13. TIME IN FLIGHT: 0+32
14. TYPE OF ACCIDENT: Fire (explosion) — CODE: F
15. MANEUVER INVOLVED: Fire began during loft bombing. Crash occurred while returning to base.
16. WEATHER: [X] VFR [ ] IFR — CEILING: Clear — VISIBILITY: 60 M
17. DARKNESS: [ ] YES [X] NO
18. CLEARANCE ISSUED: VFR
19. WIND DIRECTION: — FORCE: Calm
20. ATTITUDE ON IMPACT: Inverted — ANGLE OF IMPACT: 30° — STOPPING DISTANCE: 0 ft. — SPEED ON IMPACT: 350 K (est)
21. DID FIRE FOLLOW IMPACT: [X] YES [ ] NO

22. AIRCRAFT AND ENGINE DATA (Fill in all data in every case of material failure or malfunction, actual or suspected)

By Navy

MILITARY	SERVICE TOUR	MONTHS IN THIS TOUR	TOTAL NUMBER OF OVERHAULS	FLY HOURS SINCE OVERHAULS	FLY HOURS SINCE ACCEPTANCE	TYPE OF CHECK LAST PERFORMED	FLY HOURS SINCE CHECK	NO. DAYS SINCE CHECK
AIRCRAFT	1	17	0	0	160.2	60 Hr	9.3	22
	MODEL ENGINE	SERIAL NO. OF ENGINE						
ENGINE 1	J46-WE-8B	WE-401940	0	0	116.7	A	9.3	22
ENGINE 2	J46-WE-8B	WE-401944	0	0	77.8	A	9.2	22
ENGINE 3								
ENGINE 4								

HAS THIS A/C BEEN DAMAGED IN PREVIOUS ACCIDENT(S) DURING PRESENT SERVICE TOUR? [ ] YES [X] NO — IF YES, GIVE DATE(S) OF PREVIOUS ACCIDENT(S): — GIVE SERIAL NUMBER OF THIS ACCIDENT, IF SUBMITTED: None

23. CONTRIBUTORY FACTORS (Mark or fill in only one primary "P" factor, all others secondary "S")
[ ] P [ ] S PILOT (OR CREW) ERROR
[ ] P [ ] S ERROR OF OTHER PERSONNEL
[X] P [ ] S MATERIAL FAILURE OR MALFUNCTION
[ ] P [ ] S

24. CHECK CONDITIONS INVOLVED IN THIS ACCIDENT (Give details)
[ ] T-BIRD, STACKWASH, SLIPSTREAM, TURBULENCE
[ ] PITCHING OR ROLLING DECK
[ ] COMMUNICATION DIFFICULTY
[ ] AIRPORT HAZARD
[ ] OTHER WAR
[ ] TERRAIN CONDITIONS

25. EMERGENCY CONDITIONS
[ ] IMMEDIATE FORCED LANDING
[ ] PRECAUTIONARY LANDING
[X] ENGINE FAILURE, fire
[ ] FUEL EXHAUSTION OR MISCALCULATION

26. PERSONNEL SAFETY EQUIPMENT USED
[X] PARACHUTE [X] EJECTION SEAT [X] SHOULDER HARNESS [X] SAFETY BELT [ ] EXPOSURE SUIT [X] G-SUIT [X] PROTECTIVE HELMET [X] OXYGEN EQUIP.
[ ] LIST OTHERS

MEDICAL OFFICER'S REPORT SERIAL NUMBER: 1-55

27. ENCLOSURES AND DISTRIBUTION CHECK OFF LIST.

CHECK	ENCLOSURES	CHECK	NO.	DISTRIBUTION OF COMMANDING OFF.
	PILOT		ORIG.	CNO (OP-[redacted]) VIA CHN. OF COMD.
	ITG		2cc	[redacted] DIRECT NAVASAFCEN via
(1)	ENG. OFF.		2cc	OTHER DIRECT
	CAT. OFF.			CHECK AND LIST OTHERS AS REQUIRED
(2)-(13)	WITNESSES		1cc	BAR, Dallas
(2)-(16)	OTHERS		1cc	Com 8 ND
(20)-(24)	PHOTOGRAPHS		1cc	SNO, FC/AFSWP
(16)-(18)	DRAWINGS		1cc	BAR, Kansas City
	WEATHER REPORT			
	LANDING REPORT			

45

(b) (6) [redacted]

DATE SUBMITTED TO C.O.: 5 December 1955

Enclosure Page 5120906

29. THE ACCIDENT:

At 1030 on 21 November, 1955, LT P. A. DOMS departed Kirtland Air Force Base in F7U-3 BuNo. 129516 on a local VFR left bombing mission. His task was to drop a practice 1,100 pound dummy bomb on the target at Los Lunas Bombing Range, 24 miles N of Kirtland AFB. His drop was to be made during a left bombing run with an entry speed of 550 knots and 200 feet altitude, a run with which he was quite familiar.

On arrival at the range, LT DOMS made one dummy run and lined up for the firing run. During the run-in he reported to the Navy range radio station, "Camel Two" that he had a fire warning light, was aborting the run, and shutting down the engine. At this time observers at the range heard an explosion. LT DOMS then reported another fire warning light and requested the observers to check for smoke. The Navy radio reported no smoke. However, a closer USAF radio station reported smoke. LT DOMS did not acknowledge this transmission but stated that he was jettisoning his bomb, which he did do. He then disappeared out of sight over a ridge.

He continued toward base and at 1050 called the tower reporting two fire warning lights and requesting a straight-in approach. The tower cleared him to any runway. LT DOMS requested any other aircraft to check for smoke or fire. Then at 1052 the aircraft was observed to nose over abruptly and fly into the ground. The pilot ejected but failed to clear the seat.

30. DAMAGE TO THE AIRCRAFT:

Initial explosion on Los Lunas Bombing Range blew small pieces from the port afterburner compartment and the aircraft seems burned steadily thereafter, leaving a trail of molten metal and [illegible] Enclosure (22), figure 1, shows many of these pieces.

On impact, the aircraft exploded violently and burned. The engines, the vertical stabilizers, and the rudders were the largest pieces remaining. The wings, of metallite construction were largely consumed by fire. Half of the port wing remained. Hardly a single piece of the cockpit remained. Enclosure (22), figures 5-8, shows the scene of central impact. Enclosure (22), figure 14, shows most of the remains of the aircraft piled on a 25 foot low bed truck.

Small bits of skin, and molten metal, were scattered along the flight path for more than two miles. However, the primary concentration of parts extended from an area 100 yards short of the impact point to a position 500 yards forward of the center of impact.

31. THE INVESTIGATION:

The Flight Surgeon member of the Aircraft Accident Board arrived on

the scene with the ambulance and USAF crash crew and made the initial examination of the body. The other three members and the Chance Vought Tech representative arrived approximately fifteen minutes later. A preliminary study of the crash scene occurred immediately and continued until nightfall when guards were posted to safeguard the wreckage against pilferage. Chance Vought Aircraft, Incorporated, and Westinghouse Electric Corporation each volunteered to send teams of investigators. These arrived [illegible] November and commenced work 23 November. In the meantime, the members of the Aircraft Accident Board studied the wreckage, tagged all identifiable pieces, plotted their locations, (enclosure (19)), and moved them to Kirtland AFB for study. The investigation included several more trips to the impact area and to the Los Lunas Bombing Range for additional searches and a detailed study of all identifiable bits and pieces.

The Westinghouse investigators worked steadily until 27 November. Then a second group arrived 30 November and worked until 2 December. The Chance Vought investigators worked from 23 to 27 November. The CVA Tech rep is continuing the investigation with the Accident Board. The Board worked closely with the civilian investigators, cross checked their findings, and reached conclusions based upon all available evidence. The results of this investigation are reported as follows:

Pilot Experience:

The investigation of pilot background revealed the following: LT DUNNS completed flight training and was designated a naval aviator (NFA) on 8 August, 1945. He served in three different fighter squadrons and spent two years in Air Development Squadron Three before reporting to the NASWF on 21 October 1953. In the NASWF he was the F7U-3 Project Officer. He established a reputation as an outstanding naval aviator with an enviable list of research and development accomplishments. He pioneered in development of jet fighter tactics and played an important part in standardizing the technique for the "Loft Bombing Maneuver" as flown in the F7U-3, enclosure (16). Within the three months preceding his accident, LT DUNNS had flown this maneuver approximately 30 times. His total flight time was 2,370.5 hours. His experience since December 1949 is summarized as follows:

Type Aircraft	Hours Flown
F4U	293.4
SNJ	73.5
FoF	2.8
FGF	1.7
TO-TV	101.3
R4D	96.4
JRB/SNB	170.1

Type Aircraft	Hours Flown
AD	18.6
F3D	.5
F2H	89.0
F9F	344.9
F7U	160.3
Total:	1,352.7

While official records show no previous accident history, friends of LT DOWNS state that he had successfully ditched two aircraft, believed to be F4U-1's. The ditchings reportedly resulted from engine failures.

Setting and Purpose:

For practice bombing work, the Naval Air Special Weapons Facility uses the Los Lunas Bombing Range located 25 miles southwest of Kirtland Air Force Base. This range is under positive radio control with a navy radio and/or camera crew on station 2½ miles south of the target and an Air Force radio crew on duty one mile south of the target. Enclosure (17) is a detailed sketch of the Los Lunas Bombing Range showing the location of the target, the radio crews, geographic check points, and the flight path of LT DOWNS' aircraft on 21 November.

On 21 November, 1955, LT DOWNS had the assigned mission of dropping an 1,100 pound practice bomb with a ten pound black powder spotting charge. The purpose of the drop was to compare the effectiveness of a standard cartridge type spotting charge used on previous drops with the larger ten pound charge. The drop maneuver was to be a "Loft Bombing Run". The observing aircraft, an AJ-2, was stationed at 35,000' (30,000' above the terrain) to check the effectiveness of the spotting charge. This loft maneuver had been standardized by the NASWF so that speeds and power settings varied less than 1% from one run to the next. Enclosure (16) describes this maneuver in detail.

Sequence of Events:

The flight schedule for 21 November called for LT DOWNS to drop two 1,100 pound practice bombs. At 0900 he took off for the first flight, made two practice loft bombing runs, dropped the 1,100 pound bomb on the third run, and returned to base, landing at 0930. He reported no discrepancies and indicated that the project was moving on schedule. See Maintenance Officer's statement, enclosure (1).

The plane captain serviced the aircraft and prepared it for flight, enclosure (2). The Ordnance Crew loaded another practice bomb. After preflighting the aircraft, LT DOWNS taxiied out and at 1030 took off on runway

26 using both afterburners for take-off. He proceeded directly to Los Lunas bombing range and at approximately 1044 made a practice left bombing run using both afterburners. After the run was completed, at 1046, he shut down both afterburners and maneuvered for position for the second and final run. At approximately 1048 he was lined up in position for the firing run and lighted both afterburners. Shortly thereafter, a small explosion occurred. Mr. Hicks may not have heard the explosion but he noted a fire warning light and called to report aborting the run and shutting down one engine. Then he reported a second fire warning light, and requested a smoke check.

The Navy radio station reported no smoke, but the Air Force Station did report smoke, enclosures (3)-(6). Lt [redacted] acknowledged neither transmission but reported that he was jettisoning the 1,100 pound practice bomb and securing one engine. Ground observers saw the bomb fall away and also saw fire trailing from the aircraft just before it disappeared from sight over a small ridge. However, they failed to report the fire to the pilot.

Lt [redacted] headed for Kirtland Air Force Base, bearing 063° distance 24 nautical miles, climbed slowly to a maximum altitude of between two and three thousand feet above the terrain and slowed gradually to the single engine speed of approximately 220 knots. He shifted to tower frequency, reported two fire warning lights and requested a straight-in approach to runway 34. The tower cleared him to any runway and alerted crash equipment. A USAF F3H-2N was over the field at this time. The pilot headed toward the approaching distressed aircraft and sighted it from a distance of approximately 8-10 miles at an estimated altitude of 2-3,000 feet. At this time the J71-3 nosed over abruptly into an estimated 30° glide and crashed. The crash occurred at 1052, 3-4 minutes after the pilot first reported a fire warning light.

Shortly before impact, the pilot ejected himself from the aircraft but failed to clear the ejection seat. Death occurred immediately upon impact.

The U. S. Air Force crash crew and ambulance proceeded immediately to the scene, preceded by two civilian witnesses, enclosures (10) and (11). The pilot was still strapped into the ejection seat, and the parachute rip cord had not been pulled. In removing the body from the seat, medical personnel inadvertently pulled the parachute rip cord.

The U. S. Navy investigators arrived at 1215, about three minutes after the body had been carried away in the ambulance. NASA OPNAV Form 3750-8, Medical Officers Report, Serial 4-55 was executed by the USAF Medical Officer who arrived first at the scene, First Lieutenant (b) (6) [redacted] (b) (6) [redacted] USAF, (MC).

Evidence of Ejection:

As shown on enclosure (18), the aircraft canopy was located on the line of flight 1,400' short of the ejection seat. From approximately the position of the canopy, the flight path curved slightly to the right. The aircraft collided with the ground 2,500' beyond the ejection seat. There was evidence of an explosion in the impact area but no evidence of explosion near the canopy or the ejection seat. At 230 knots, the time of travel from the canopy to impact would be approximately 15 seconds.

Location of Aircraft Parts:

As shown on enclosures (17) and (22-1), 13 small pieces of metal skin were found along the flight path on the Los Lunas Bombing Range. These pieces were identified as parts of skin from the afterburner area of an F70-1. The practice bomb jettisoned by the pilot was located 5 miles bearing 060° from the Los Lunas Target. A search for 12 miles along the projected flight path from the Los Lunas Bombing Range failed to reveal any additional aircraft parts. However, this area is very rough and the exact flight path was unknown.

Working backward along the flight line established by the ejection seat and the canopy, small bits of skin and molten metal were found for two miles, then stopped. Enclosure (18) is a sketch of the overall impact area showing the projected flight line, the canopy, the seat, and the impact area. Most identifiable pieces were tagged and plotted for location. Enclosure (15) gives the detailed plot showing the location of all components which could be identified.

Impact Area:

The major components found in the impact area indicate that the aircraft struck the ground in an inverted attitude. The starboard vertical stabilizer and rudder and the starboard engine were all on the port side of the impact area. The port stabilizer and port engine were both on the starboard side. Half of a large camera pod, normally mounted under the port wing, was found 150 feet to the right of the impact area.

The aircraft struck a volcanic ridge at a semi-level point. However, approximately 500 feet beyond the impact point the ridge sloped downward to the northeast. This slope partially explains the fact that some heavy components continued forward as far as 1,500 feet and explains the northerly twist to the plot of wreckage.

Focus of Investigation:

The witness reports, enclosures (3)-(6) indicated that an explosion

occurred shortly after the pilot lighted his afterburners for the second run. Location of airframe skin on the Los Lunas Bombing range and pieces of molten metal, skin, and structural pieces for two miles short of the aircraft canopy indicated a very hot fire burned from the time of the initial explosion until the crash occurred. The fire was so intense and so prolonged that it could only be a fuel fire. Consequently, the members of the Aircraft Accident Board, representatives from Chance Vought and representatives from Westinghouse Electric concentrated on finding the source of fuel and the cause of ignition.

Study of Wreckage:

After tagging and plotting the location of each identifiable part, the MAAF hauled all the recovered pieces to Kirtland AFB and laid them out on the hangar deck for careful scrutiny. Each part was studied individually for evidence of pre-impact damage and for leads as to the source of fire. This study established the following points.

a. The left engine was either wind-milling or stopped at time of impact, enclosure (12)

b. The right engine was running at or close to military RPM.

c. Neither the compressor nor the turbines failed before impact.

d. The fire centered in the aft part of the left engine bay but extended along the lower side of the left engine from the fuel strainer access to the forward part of the afterburner compartment. This indicates fire on both sides of the firewall (fuselage station 107.5) between the engine compartment and the afterburner compartment, enclosure (11).

e. There was excess heat, and possibly fire, in the forward part of the starboard afterburner compartment.

f. The afterburner pump from the left engine showed signs of rubbing with heat marks, enclosure (12), paragraph 10 and enclosure (24). A small soot path is evident through the flange of the casing.

g. The engine controls probably functioned normally.

h. The left engine did not have Engine Bulletins 37 or 57 incorporated. Note: EB 57 superceded EB 37. Both were designed to prevent leakage of the fitting at the afterburner fuel manifolded inlet line. The wording of EB 57 is such as to require incorporation at the next B check which was not quite due on the

engine. No visible evidence of leakage at this fitting and no evidence of excess heat on this fitting could be found. See enclosure (24). However, the afterburner shroud showed evidence of excessive heat. Further, the burning which occurred in flight indicates that the most intense fire probably occurred in the engine compartment, not the AB Compartment.

Additional points uncovered during this survey included the following:

a. The ejection seat functioned normally.

b. The pilot's harness functioned properly and held the pilot. However, the G loads encountered were so great that the pilot's abdomen walls failed.

c. The pilot's crash helmet was broken.

Enclosures (16)-(18) present the preliminary, unofficial conclusions of the CVA and NOB investigators. The members of the Aircraft Accident Board monitored their investigations carefully. Except as noted alongside the statements, the Board confirmed their findings.

Maintenance History:

The Maintenance History gave no clue as to the possible cause of the fire. It further showed no previous history of fire warning light indications on this aircraft.

Continuing Investigation:

Westinghouse is conducting laboratory tests on the port afterburner fuel pump and the port afterburner fuel manifold inlet fitting. Chance Vought is conducting laboratory tests of certain pieces of aircraft skin in an effort to determine more closely the sequence of the fire.

32. ANALYSIS:

From the foregoing investigation, the following analysis can be made:

The pilot made a normal afterburner take-off, using afterburner for approximately 2 minutes. 14 minutes later he lighted the afterburners for 2 minutes during a practice left bombing run. On top of the Half Cuban Eight, he secured the afterburners and began positioning himself for the next run. At approximately this time a fuel leak occurred, probably in the left engine compartment, and fuel leaked aft through the firewall into the left afterburner compartment. Approximately 2 minutes after securing the afterburners, the pilot relighted them. The lighting of the

afterburner probably established the conditions for fuel ignition. Ignition and a small explosion occurred shortly thereafter. At this time the pilot had 500 K [illegible] airspeed and 200 feet altitude. The fire burned intensely from then until the aircraft crashed 3-4 minutes later.

The pilot observed first one and then a second fire warning light. Presumably both lights were on the left engine because the pilot seemed to feel that securing the left engine would solve the problem. When the pilot asked for a smoke check on Los Lunas Bombing Range he probably heard the Navy radio report of no smoke and also the subsequent USAF radio report lighting smoke. Both the spot on aircraft and the Navy ground station of the second transmission [illegible] clear.

The pilot continued toward [illegible] and shifted to tower frequency, apparently [illegible] that securing one engine would extinguish the fire.

Apparently, some new development occurred very suddenly which caused the pilot to decide to eject. Judging by absence of extra debris in the [illegible], there was not an explosion. However, it may have been a [illegible] failure. Hydraulic control lines run through the fire area to the elevators. The fire may have destroyed the lines and caused the aircraft to [illegible] either pitch or roll. The canopy and seat were near enough to the impact area to indicate that the pilot ejected as soon as he lost control.

LT [illegible] was a noted athlete in top-notch physical condition with much better than average reflexes. His failure to clear the seat tends to indicate that the aircraft was out of control and possibly in a dive when he commenced ejection. It has been impossible to determine the pilot's exact altitude at time of ejection. Enclosure (8), which estimates 2-3,000 feet, is the only information on this point.

Aircraft Damage:

Enclosure (12), paragraph 10 describes defects noted in the port afterburner fuel pump. Enclosure (21) figures 1-3 gives pictures of this pump showing signs of wear. There was also a soot path evident through the flame of the spring. However, the soot path may not be significant. The intensity of the fire would probably have removed soot markings. More likely, those marks resulted from the ground fire which followed impact. Laboratory tests are being conducted in an effort to determine how important a role this pump may have played. At the present time there is insufficient evidence to list it as a cause of the fire.

Enclosure (21), figures 4 and 5 shows the port afterburner fuel manifold inlet fitting. As can be noted, this is a threaded fitting. Engine Bulletin 57 requires replacement of the threaded fitting with two flanges bolted together. An "O" ring between the flanges provides the seal. No visual evidence

of leakage could be found. In accordance with BuAer dispatch 0122122 of April, this area had been inspected during the pre-flight check. Laboratory tests are being conducted on this fitting to determine whether it does actually leak under pressure. At the present time there is no evidence to warrant listing it as a cause of fire. In view of the wording of Engine Bulletin 57, the NAMC Maintenance Department was acting properly in planning incorporation of this bulletin during the forthcoming B Check.

[illegible] of the structural and airframe system components in the port [illegible] were either lost or destroyed. Therfore it was impossible [illegible] more important, fire hazards.

33. CONCLUSIONS AND RECOMMENDATIONS:

Conclusions:

As a result of the investigation and analysis the following conclusions are reached:

a. Material failure caused this accident.

b. The specific material failure was a fuel fire of undetermined cause originating in the port engine compartment and extending throughout the port engine and afterburner compartments and possibly including the starboard engine compartment.

c. The fire and a small explosion occurred shortly after ignition of the afterburners.

d. The pilot erred in not converting his speed to altitude when he observed a second fire warning light.

(b) (5)

[redacted]

Recommendations:

From these conclusions it is recommended that:

a. Laboratory investigation into the cause of this fire continue.

b. All pilots frequently review their fire warning systems and the procedures to be used in extinguishing fires.

c. Frequent reviews of NASWF fire warning doctrine be made. As new aircraft reach the NASWF; ie, F3H, A3D, A4D; frequent reviews will be necessary to ensure that doctrine is as precise as knowledge of aircraft characteristics will permit.

d. Wherever radio range crews work closely with aircraft, as on bombing ranges, they be briefed on the importance of relaying accurate information to the pilot, especially in time of emergency.

e. High performance Naval aircraft be equipped with improved safety belt release and automatic parachute opening devices.

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25 November 1955

MAINTENANCE OFFICERS STATEMENT IN CONNECTION WITH THE ACCIDENT OF F7U-3, BUNO 129546

F7U-3, BuNo 129546 was received from NAR, Dallas, Texas on 23 April 1954. This aircraft had completed 17 months of its first Service Tour at the time of the accident. The aircrafts operating time was 160 hours. The right engine had 78 hours and the left engine had 117 hours since new. During the 60 hour maintenance inspection, completed 9.6 hours prior to the accident, both engines received type "A" inspections.

Maintenance records indicate no reported malfunctions of the fire warning system. An examination of preflight checkoff sheets, pilot discrepancy reports and other maintenance records failed to disclose any discrepancies that might have contributed to the fire and/or subsequent crash of the aircraft.

The aircraft was preflighted by the assigned plane captain, and signed off as being ready for flight. Upon completion of the first flight the pilot was questioned as to the condition of the aircraft and progress of the project by the Assistant Maintenance Officer. The pilot reported satisfactory progress and no discrepancies on the aircraft. The Naval Aircraft flight record, completed by the pilot at termination of the first flight showed no maintenance discrepancies.

On the second flight of the day, a fire of undetermined cause, indicated by the fire detector system was reported by the pilot to the tower. A study of the salvaged aircraft and engine parts indicates that the fire originated in either the left engine or the left afterburner compartments.

(b) (6)
[redacted]
LCDR, USN

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ENCLOSURE (3)

F7U-3, BuNo. 129546 21 November 1955

F7U-3, BuNo. 129546 was preflighted in the hanger between 0715 to 0800, then towed to the flight line. The preflight was performed by [illegible] to the F7U-3 Standard Preflight Sheet. On the line, Ordnance loaded 4 Mk 76's in rack. The plane was signed off on the [illegible] sheet around 0825. The pilot then performed a walk-around inspection and was strapped into cockpit and he started the engines. Checks for fuel and hydraulic fluid leakage were made from the underside of aircraft. Speed brakes, power controls, auxiliary rudders and canopy were checked for operation. The aircraft then left the line for the first flight.

About 30 minutes later, the aircraft landed and taxied into Area "E" for loading and refueling. The pilot reported no discrepancies.

The aircraft was refueled by pressure refueling and the fuel cell caps were removed during the refueling operation. Hydraulic systems were checked for proper fluid level. After refueling, fuel cells were secured and aircraft checked for hydraulic and fuel leaks. The airframe was checked for damage. After the shops concerned were finished, the aircraft was inspected by me for discrepancies and found ready for flight. Then the pilot and I signed the yellow sheet.

The pilot performed walk around inspection and climbed into the cockpit and was strapped in. The aircraft was then started and checked for leaks and control movement.

The aircraft taxied to Runway #26. To me, standing on the ramp of Area "E", everything appeared normal. The pilot used both afterburners on take-off.

(b) (6) [redacted] AD2

[redacted] (2)

57.

STATEMENT OF (b) (6) [redacted] DM1 REGARDING CRASH OF F/U BUNO 129546

On 21 November 1955 I was the Navy radio operator at Los Lunas Bombing Range.

I was called to the jeep radio to give wind data to LT DOWNS prior to his run. I stayed with the radio so that (b) (6) [redacted] could operate the camera. LT DOWNS said "I am one minute out". Several seconds later when the plane was about over the tracks LT DOWNS said "I have a fire warning light and am aborting and am shutting down the engine."

At about this time we heard an explosion. LT DOWNS said he had another fire warning light. He asked us if we saw any smoke. He was at this time passing behind the shack and out of my field of view. Weather could see him and said he saw no smoke. I told LT DOWNS we saw no smoke. Immediately after this "Drum-Head One", the Air Force Radio Station at the range, said that they saw smoke. Mr. DOWNS said he was [illegible] the unit and heading back to the base.

(b) (6) [redacted] DM1

ENCLOSURE (3)

[illegible]NT OF (b) (6) [redacted] PH1 REGARDING CRASH OF F7U BUNO 129546

On the morning of 21 November 1955 I was observing F7U-546 piloted [illegible] A. DOWNS, at the Los Lunas Bombing Range. LT DOWNS was coming to make his second run on his second flight of the morning, and as he [illegible]ached the railroad tracks, I noticed he was pulling up and to the [illegible] of the flight line. I had just a few moments before, handed the [illegible] to (b) (6) [redacted] DM1, who was giving LT DOWNS the data he had [illegible]led from the weather balloon he had sent up.

I asked (b) (6) [redacted] why F7U-546 was pulling up and off the flight line. [illegible] replied that 546 was having troubles. As 546 crossed by in front [illegible] asked if we could see any fire out of the tail of the plane, and [illegible] time there was no visible fire. F7U-546 proceeded in the approx[illegible] direction of the base which I assumed was northeast. As he crossed [illegible] approximately 1 mile from the photo grid he said he was going to [illegible] the unit he was carrying. I saw the unit fall with my naked eye.

I picked up my field glasses to look at the plane and as I looked up [illegible] a ball of flames and a trail of brownish-black smoke. The plane was [illegible] in a direction almost straight away from where I was, and I couldn't [illegible] plane for the fire.

[illegible] the time I saw the fire the plane appeared to be approximately [illegible] feet to 1,500 feet above the ground. I followed the trail of smoke [illegible] sight over the ridge. That was the last contact we had with [illegible]6.

(b) (6) [redacted] PH1.

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ENCLOSURE (A)

STATEMENT OF (b) (6) [redacted] AT3 REGARDING CRASH OF F7U BUNO 129546

On the morning of 21 November 1955 I was an observer at the Los Lunas Bombing Range.

At the time 546 was circling to make what proved to be his last pass, I was observing the weather balloon from the theodolite station located approximately 25 yds parallel and down range from the grid. When I again saw 546 it was coming in on his run and everything appeared to be normal until he started to pull up somewhere between the tracks and the first box. When he was around the second box I heard a muffled explosion. He seemed to attain about 1,000 feet elevation and then banked right in a direction toward the base.

About this time (b) (6) [redacted] asked (b) (6) [redacted] and me if we saw any smoke or fire indications from the plane. I had an unobstructed view of the aircraft and I noticed no smoke or indication of fire. I passed this info on to (b) (6) [redacted] and I heard him pass on the same info to LT DOWNS over the radio.

When I turned back to look for the plane again it was out of my sight beyond a ridge. (b) (6) [redacted] came over to where I was at this time and showed me a trail of brown smoke where the plane went over the ridge.

(b) (6) [redacted]

[redacted] (5)

I, (b) (6) [redacted] AF (b) (6) [redacted] A/1C USAF WAS THE RADIO OPERATOR AT THE LOS LUNAS BOMBING RANGE 21 NOV. 55. AT A LITTLE BEFORE 1100, A/C 516 REPORTED THE LIGHTS ON HIS INSTRUMENT PANEL INDICATED A FIRE IN THE PLANE. HE ASKED IF ANYONE SAW FIRE COMING OUT OF HIS A/C. CAMEL 2, THE NAVY RADIO JEEP REPORTED HE SAW NO FIRE. I SAW SMOKE COMING OUT THE BACK OF HIS PLANE AND REPORTED THAT FACT TO HIM. HE DID NOT ROGER THIS. HE WAS HEADED FOR THE BASE AND I DID NOT SEE HIM AGAIN. SHORTLY AFTER, I TRIED TO CONTACT THE BASE FOR INFORMATION OF THE A/C, BUT GOT NO ANSWER. I THEN TRIED TO CONTACT THE BASE BY UHF. THEY COULD HEAR ME BUT I COULD NOT HEAR THEM WELL ENOUGH TO UNDERSTAND WHAT THEY WERE SAYING. I TRIED TO CONTACT THEM ON HF AGAIN AND AFTER SEVERAL CALLS, I CONTACTED THE BASE. THEY ADVISED THAT A/C 516 HAD CRASHED ABOUT 12 MI. SOUTH OF THE BASE AND TOLD ME TO HAVE A/C 405 AND 12[illegible] SEARCH THAT AREA. I CONTACTED THESE A/C AND TOLD THEM THAT INFORMATION. ONE OF THE A/C TOLD THE OPERATOR AT CAMEL 2 THAT HE THOUGHT HE SAW THE PILOT OF 516 BAIL OUT AND GAVE HIM THE POSITION AND TOLD HIM TO SEARCH THAT AREA. CAMEL 2 DEPARTED TO SEARCH FOR THE PILOT IMMEDIATELY. I REPORTED THIS TO THE BASE AND TOLD THEM I WOULD KEEP THEM ADVISED. LATER I TALKED TO THE PILOT OF 12[illegible] AND HE SAID THEY WERE PUTTING THE PILOT IN AN AMBULANCE AND DID NOT KNOW IF HE WAS ALIVE OR NOT. I REPORTED THIS TO THE BASE AND THAT IS WHAT I SAW AND DID.

(b) (6) [redacted]

[redacted] (6)

23 November 1955

MEMORANDUM

From: LCDR, (b) (6) [redacted] USN
To: Commanding Officer, Naval Air Special Weapons Facility

Subj: Accident involving LT Frank A. DOWNS, USN in F7U, BuNo 129546

1. On 21 November 1955 I was scheduled and flew the AJ-2 to photograph the drops from F7U, BuNo 129546 piloted by LT DOWNS. In the AJ, I circled the target at 35,000 feet awaiting the release signal from the F7U. Part way through his run LT DOWNS announced "Aborting the run, I have a fire light. I'm shutting it down". Then some 5 seconds later, "I have two fire lights, can you see any smoke back there". I stated that I could not see him and requested his position. The range crew then stated that they could see smoke. LT (b) (6) [redacted] then stated, "I am getting rid of this store".

2. I was letting down as fast as possible and looking for the F7U. I did not see the F7U but saw two large columns of smoke, one black and one white. It was at this time, at some 28,000 ft, that I again called 546 Tomorine asking his position, I got no answer, I called him again on channel 3; still no answer. I then asked the range crew, on channel 12, whether or not they could see him they replied in the Negative. I then turned on Emergency IFF and gave Kirtland Tower the MAYDAY message. After letting down I was surprised to see that the two smoke columns were so far apart. I now suspect that the second column which I saw was smoke from the aircraft prior to its crash and that the third column was the actual crash.

I searched the area for the parachute until 1130 then, satisfied that there was no chute, I returned to the base and landed.

(b) (6) [redacted]

ENCLOSURE (7)

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STATEMENT OF LCDR (b) (6) [redacted] USN REGARDING CRASH OF F7U BUNO 129546

About 1100 on 21 November 1955, I was practicing a simulated "flameout" landing at Kirtland Air Force Base, Albuquerque, New Mexico. I was heading in an easterly direction at approximately 13,000 feet indicated (8,000 feet above terrain) when I heard Tambourine 546 (F7U-3 BuNo 129546 Pilot, LT Frank DONNS, USN) call the tower requesting a straight in approach for runway 3. He stated that he had two fire warning lights on. Tambourine 546 also requested someone to check if his aircraft was trailing smoke. The pilot sounded calm and gave no indication of distress. The tower immediately cleared Tambourine 546 for a straight in approach on any runway.

I aborted my simulated "flameout" approach and took up a southwesterly heading. I asked Tambourine 546 what his position was. Tambourine 546 did not answer. An F-80 below me had also asked for the same information but I heard no reply from Tambourine 546.

I took up the reciprocal heading of runway 3, heading out on an approximate heading of 210° and an initial indicated altitude of 13-14,000 feet, letting down to intercept Tambourine 546 during his straight in approach.

When I arrived over the west side of the Rio Grande I sighted a silvery aircraft about 11 o'clock down. His altitude I judged to be about 2-3,000 feet above the terrain. The aircraft was on a heading of approximately 070°. The aircraft was approximately two (2) miles west of Isleta Hill. I estimate I was 8-10 miles away from the aircraft.

I got the impression the aircraft was in a slight glide the instant I sighted it. Almost immediately thereafter I noticed the aircraft pitch down rapidly, setting up a dive angle of approximately 30°. The rate of speed appeared to increase appreciably. I would estimate the speed roughly 400 knots IAS.

The dive appeared to be straight in. The wings appeared to be level and I detected no bank or change in direction. There was no apparent "flameout" during the dive.

A fraction of a second before the violent impact I thought I detected a bright white flash near the forward part of the aircraft. It was followed so closely by the explosion that it might have been the actual impact or an optical illusion. The explosion consisted of an orange colored ball of flame expanding to cover a considerable area. Black smoke was emitted almost instantly after the orange "fire ball" fully expanded.

I saw no object leave the aircraft during the dive. The airplane appeared to be in a clean configuration. I was too far away to detect any smaller details regarding the aircraft. I detected no flame or smoke trailing the aircraft at any time.

I immediately gave a "May Day" report over UHF radio and turned on my emergency IFF while I circled the scene of the crash.

[redacted]

[redacted]

[illegible] CIVIL AERONAUTICS ADMINISTRATION

INCIDENT REPORT

To: NASWF
Kirtland Air Force Base
Albuquerque, N.M.

From: CAA Control Tower
Kirtland Air Force Base
Albuquerque, N.M.

The following is a description of an incident which affected the operation of this Airways Operations Facility. It is forwarded to acquaint you with the particulars of the incident, and it is requested that it be immediately brought to the attention of the pilot or other individuals involved. It is hoped that a review of these facts will result in recommendations which will prevent recurrence of incidents of this type. No reply is required, however, if desired, the undersigned will be glad to answer any questions at your convenience. Any action which you can take to assist the Airways Operations Division to provide more efficient service will be appreciated.

TYPE OF INCIDENT
Accident
Primary

TIME OF INCIDENT
DATE: Nov 21, 1955 x Day

AGENCY/AIRCRAFT IDENTIFICATION
Tambourine 546, a local FTU aircraft - based KAFB

NAME(S) OF PERSONNEL OR PILOT
None

SUMMARY OF INCIDENT
Tambourine 546 departed KAFB on a VFR local flight at approximately 1030 MST. At 1050 MST Tambourine 546 called the tower and declared an emergency with fire warning lights and requested a straight-in approach. Tower cleared Tambourine 546 to land on any runway and asked for his position. Tambourine 546 advised he was 30 miles out and would make an approach for runway 3, straight-in.

Tower initiated standard emergency procedures immediately.

At 1052 MST Tower observed a thin column of smoke approximately 15 miles Southwest of KAFB.

Tambourine 0405, an AJ-1, advised the tower an aircraft in his flight was lost and asked tower if they had a DF on the aircraft, then Tambourine 0405 immediately advised he had a column of smoke and a crash in sight and believed it to be the FTU. Tower directed emergency equipment to Base Operations for off-base crash, and notified all agencies of probable crash of FTU.

Tambourine 0405 advised tower the crash was approximately 4½ miles Northwest of Isleta Indian Pueblo, on the northern slope of Isleta Hill.

Special Weather 1052 MST: Clear, Visibility 60 miles, Wind calm, Altimeter 30.07, smoke over city.

Aircraft demolished, pilot's condition unknown.
REMARKS
None
ATTACHMENTS
None

DATE
11-[illegible]-55

61

[illegible] OF FACILITY CHIEF
(b) (6) [redacted]

[illegible] (9)

STATEMENT OF (b) (6) [redacted] REGARDING CRASH OF F7U BUNO 129516

The following testimony was given to me verbally by (b) (6) [redacted].

LCDR (b) (6) [redacted] USNR

I am (b) (6) [redacted] employed by the Kirtland Air Force Base Fire Department. My experience in aviation consists chiefly of serving on the crash crew detail at Kirtland. I have seen the F7U Cutlass many times when it was flying and also when it was taxiing. I have ridden in airplanes, but only in the capacity of a passenger. In addition to my duties at the Fire Department, I serve in an Anti-Aircraft unit with the National Guard of New Mexico.

On the day the accident occurred I was driving south on U. S. Highway 85 near Isleta, New Mexico. I noticed an airplane making a shallow dive. I did not notice any fire or smoke trailing from the airplane. I shifted my attention to driving my car and I did not see the airplane strike the ground. I noticed the smoke and fire after the plane crashed.

At the time of the crash, I estimate that my position was approximately two miles east-southeast of the crash scene. The airplane's heading was approximately in line with my position. When I saw the airplane in the air I didn't think anything was unusual about the airplane's maneuver since I have noticed aircraft operating in that general area on previous occasions.

As soon as I saw the smoke and fire, I parked my car and hiked to the scene of the crash. I was the first one to reach the crashed airplane and I instructed people as they arrived to avoid picking up any parts.

I proceeded to the location of the pilot's ejection seat and met the Priest, who was the first one to get to the pilot's body. Nothing was moved until military authorities arrived because it was obvious that the pilot was not alive.

(b) (6) [redacted]

STATEMENT OF REVEREND (b) (6) [redacted] REGARDING CRASH OF F7U BUNO 123946

The following testimony was given to me verbally by the Reverend (b) (6) [redacted]

LCDR (b) (6) [redacted] USNR

I am Reverend (b) (6) [redacted] Pastor of the St Augustine Church, in Isleta, New Mexico. I have been flying my own light plane for the past ten years. I witnessed an F7U Cutlass flying exhibition several years ago in Chicago, Illinois.

At the time the crash occurred, I was in my home. Mr. (b) (6) [redacted] came over to notify me that an airplane had crashed near Isleta Hill. I immediately proceeded to the scene of the crash to give any possible assistance. I found the cockpit canopy and then continued toward the area where the airplane struck the ground. The pilot's body was found strapped in the ejection seat well clear of the other parts of the airplane. His helmet was lying nearby. It was obvious that the pilot was dead so I didn't touch anything. I was the first man to arrive at the crash scene and no one carried away any parts of the wreckage prior to the arrival of the military authorities.

Several military aircraft were circling the area and we attempted to point out the location of the pilot's body.

(b) (6) [redacted]

ENCLOSURE (21)

[illegible] STATEMENT OF (b) (6) [redacted] AND (b) (6) [redacted]
WESTINGHOUSE, REGARDING CRASH OF F70 BUNO 129546.

We have visited the scene of the crash and have studied the pieces as displayed on the hangar floor. The facts that we feel sure of are summarized as follows:

1. The left engine was windmilling or stopped at time of impact.

2. The right engine was running at military RPM at time of impact or very close to military RPM. These facts are obvious from the appearance of the compressor and turbine blades. The control leaver angles substantiate this.

3. The compressors and turbines did not fail before impact. Enough parts were pieced together to show a compressor disk failure did not occur especially on the 1st 3 stages. The turbine blades failed at impact with the ground. No fatigue cracks were found on the turbine or the compressor. There was no evidence of overtemperature of the turbine parts. No metal spray (which would be typical of a turbine failure) was present.

4. The A/B manifolds were both secured by the restraining brackets R/B130. There were no fire indications on the yoke or on other parts of the A/B. This indicates there was no appreciable flame between the A/B shell and the shroud. The coloring of the A/B shell indicates normal temperature patterns. (AAR Board Note: Further investigation revealed part A/B shroud severely burned)

5. Plane was probably inverted at time of impact since right engine was to the left of the left engine.

6. The housings of the compressor and turbine agree with items (1) and (2) by their lack of circumferential scratches on the left engine and by the large number of scratches on the right engine.

7. Engine 404940 had 116.7 hours prior to this flight. This was the left engine.

8. Engine 404944 had 77.8 hours prior to this flight. This was the right engine.

9. The right engine could not have had a failure because it was still operating. The pilot did not mention any engine trouble.

10. The breaks in the turbine blades show no signs of heat after impact.

11. The A/B pump from the left engine showed signs of rubbing with heat marks. A small soot path is evident through the flange of the casing.

(b) (6) [redacted]
Jet Project Engineer

(b) (6) [redacted]
Jet Engineer

2 December 1955

To: Naval Air Special Weapons Facility

1. Sequence of Flight:

A. Tamborine 546 had completed a practice run over the target. After passing the target he executed a Cuban 8 maneuver, at roll out he probably retracted both engine throttles to MRP. He circled back to align himself for a second pass at the target. The time involved for this maneuver was approximately 4-5 minutes. It is felt that somewhere between the time that the pilot retracted from A/B till he selected A/B for the second target pass that an undetermined source of fuel was instigated.

B. In order to complete his mission the pilot ignited both afterburners 3 to 4 miles from IP (pt A map A). As Tamborine 546 passed over the IP he reported his first fire warning light. Witness reports indicate an explosion occurred about this time. Approx 2-3000 feet further along the flight path from reported explosion (pt B map A) about 12 small pieces of the airframe were found. These pieces were positively identified as aluminum structure from around the bottom afterburner compartment. These pieces showed no evidence of fire. Pt C Map A identifies the location of these pieces.

C. Seconds after Tamborine 546 reported his first fire warning lite he reported a second warning light and asked for a smoke check. One observer reported no smoke. A second observer reported smoke. It is uncertain if Tamborine 546 heard the transmission reporting smoke at Pt. Q of Map A. However, he did report at this time he was securing the engine and jettisoning stores. About this time Tamborine 546 tried for altitude and deviated from his course heading for runway #3 at the airbase to make an emergency landing. As Tamborine 546 passed over the hills at approximately Pt. E, one witnesses reported his airplane was engulfed in a ball of flame.

D. Approximately 9 miles from Pt. D molten aluminum and bits of the airframe were found strewn along the flight path continuing to the point of impact. Approximately 2 miles back from the point of impact an 8 inch section of the airframe structure from the A/B compartment was found badly burned.

E. It is estimated that the plane was at least 1200 feet above the terrain when the pilot elected to eject. Shortly after or in conjunction with ejection, the airframe experienced a second explosion most probably in the wing section which could account for the aircraft impacting on its back. The approximate location is marked F on Map B. The airplane experienced a 3rd explosion on impact at Pt. G Map B.

Conclusions:

A. Sometime between pulling out of first target pass and initiating after-burning for a second pass a major fuel leak occurred. The A/B on the port engine was put in burning and the hot section ignited the fuel vapors carried through the firewall resulting in the initial explosion at Pt. B Map A. The first warning light observed by the pilot was believed to have been for the A/B section. The fire moved rapidly forward in the engine compartment reaching the major concentration of fuel, and in so doing opened other sources of fuel. [illegible] were uncontrolable by securing the engine, and/or master switches.

B. Due to the condition of the wreckage, it has been impossible to determine the exact source of the fuel which caused the original explosion that precipitated the burning fires, which led to the destruction of the aircraft.

(b) (6) [redacted]	(b) (6) [redacted]	(b) (6) [redacted]
Supv. Field Service Engrg.	Senior Engrg. Field Servicing Engrg.	J46 Project Engrg. A.C.T. Service Dept.

Aircraft Accident Board Comment:

The Board does not concur in the belief that an explosion occurred at the point of ejection. Disagreement is based on the absence of debris in this area. However, an inflight explosion may have occurred within 100 or 200 feet of the ground just prior to eject.

STATEMENT OF (b) (6) [redacted] CHANCE VOUGHT AIRCRAFT REGARDING ACCIDENT OF F7U-3, BUNO 129546

Investigation of subject accident to date has indicated the following conditions as concerns the airframe. The condition of the engines indicates that the RH was developing power but the LH was stopped. The fact that one of the G-4 auto pilot servos was unlocked shows that electrical power was available to both the primary and secondary BUs.

Distribution of the wreckage points to an explosion in the air on the order of 100' high. Also location of major components shows the airplane to be inverted at time of impact. It is estimated that 70% of the airplane was recovered. The rest being consumed by fire.

There is no doubt that an intense fire existed prior to impact. The extent of damage indicates that it could have been only a fuel fire. It seems to have been centered in the aft part of the LH engine bay as evidenced by parts falling along the flight path. However, there is positive evidence of fire at certain points all the way along the lower side of the LH engine from the fuel strainer access to the fwd part of the afterburner compartment. This places the fire on both sides of the fire seal at fuselage sta. 407. Also there is evidence of excessive heat in the fwd part of the RH afterburner compartment.

The slat actuating cylinders recovered, only 2, show the slats to be retracted. This would also indicate the gear was retracted at the time of impact.

Examination of the canopy jettison system parts, shows it to have functioned normally and the ejection seat was fired in the usual manner.

The power control system, New York Airbrake Pumps, shows not to have failed any of the bronze parts that are typical in failures of these pumps.

The control trim system jack that was recovered, which is one of two, shows a nose-up trim setting of 6° existed at time of impact.

(b) (6) [redacted]

70

[illegible] REPORT COMMENT BY (b) (6) [redacted] PROPULSION
[illegible]OR. ON CRASH OF F7U BUNO 129546

The condition of the Power Plant and Fuel System remains have not provided sufficient evidence thus far to conclusively indicate the original source of the fire and explosion which occurred on F7U-3 BuNo. 129546.

The following evidence has been found and is somewhat conflicting:

1. Indication of in flight fire has been found as much as two feet forward of the engine compartments. (Underside fueling Compartments).

2. The hottest part of the airframe seemed to be the left hand Engine Compartment. Two (2) components located in this bay dropped out approximately [illegible]00 feet prior to impact.

3. Small pieces of structure from the fuselage aft of the fire wall, were dropped in the flight path of the aircraft, at the target area.

4. A small piece of compressor thru bolt was found pierced thru a section of fuel cell, however, no means of determining whether this occurred prior to or following impact, has been found. *

5. The left hand engine did not have either of the Engine Bulletins incorporated which were designed to prevent leakage of the fitting at the afterburner fuel manifold. (EB-37 or 57).

6. The condition of the tail pipe shroud of both engines (straightened corrugations) indicated the possibility of an explosion between the shroud and tail pipes.

7. The majority of the structural and airframes system components in the left hand engine compartment, were either destroyed, lost or unidentifiable, making it impossible to check in detail each potential fuel leakage source.

8. The vent pipe in the aft fuselage fuel tank, indicated that a fire existed in that cell prior to impact.

From the above information it is estimated that the source of fuel for the major fire was in the left hand engine bay, although the difficulty may have been initiated in the afterburner section of the engines.

(b) (6) [redacted]

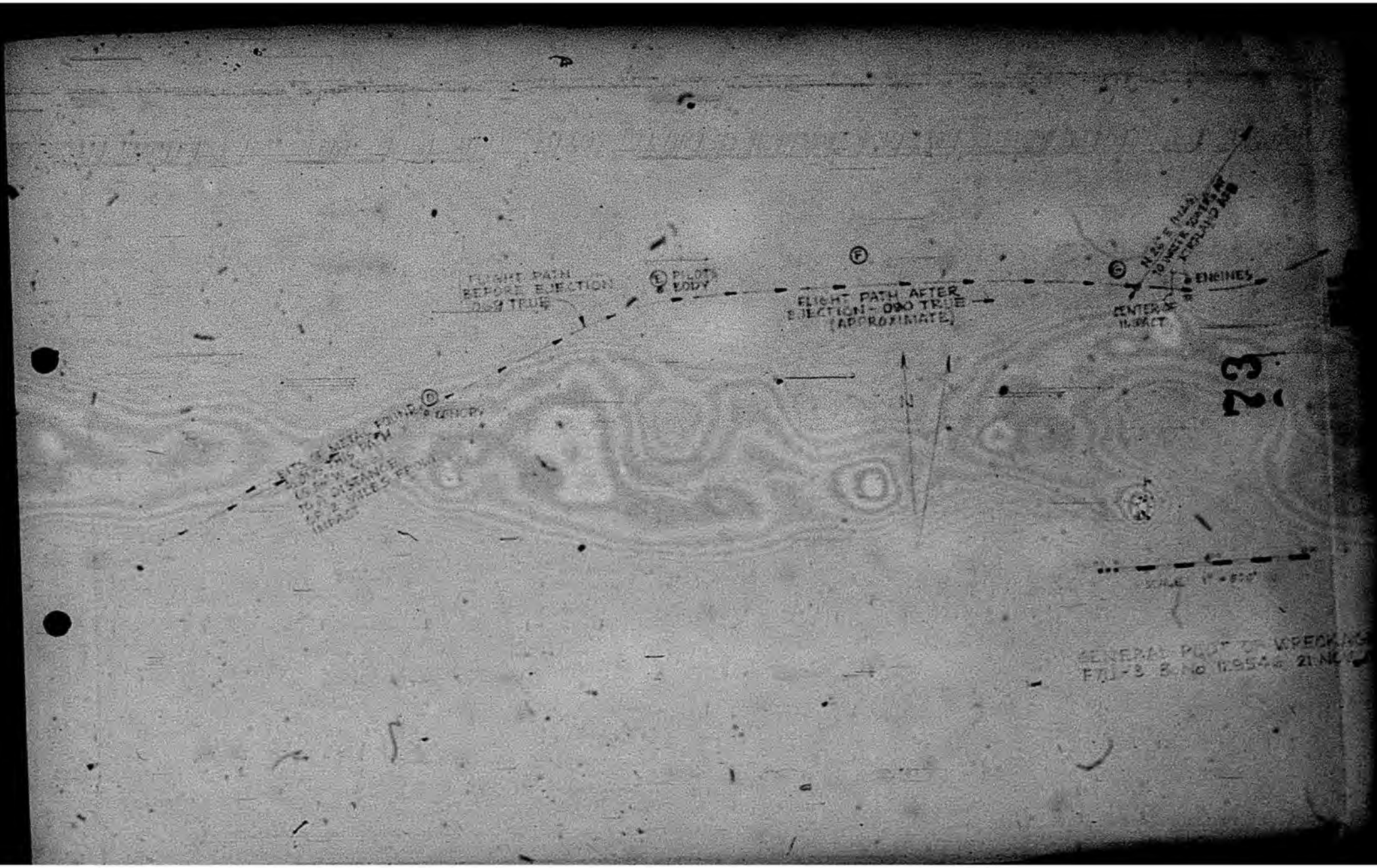
*AR Board Note: It seems highly unlikely that this puncture occurred before impact. Had it done, an immediate mid-air explosion of major proportions would probably have occurred.

DESCRIPTION OF [illegible] F7U-3 LOFT BOMBING RUN AS PERFORMED AT LOS LUNAS BOMBING RANGE

The loft run with the F7U-3 on the Los Lunas target area is commenced approximately 5-7 miles from the target. The inbound flight line, 15° magnetic, is visually sighted by the pilot by the aid of three pylons spaced in a straight line to the target. In order to obtain the required 550 kt TAS run-in speed, both afterburners are cut in approximately 5 miles from the target and left in operation throughout the loft maneuver. To stabilize the airspeed, (520 kt IAS normal for 550 kt TAS) speedbrakes are opened partially during the run-in and retracted at pull-up. During the run-in the aircraft is about 100 to 200 feet above the terrain. At [illegible], one of the pylons, the pilot retracts the speedbrakes, if they [illegible] cut, and applies a 4 "G" pull-up. An altitude gain of approximately [illegible] occurs during the maneuver with an airspeed of approximately 280 [illegible] on top. Once the pilot has reached the top of the maneuver and the [illegible] is built up with a slight nose down attitude, the pilot comes out [illegible] afterburners and rolls the aircraft to an upright attitude. In order [illegible] run, the pilot turns away from the flight [illegible] to about 5000' above terrain at [illegible] miles from the target, [illegible] applying military power prior to [illegible] attitude. By the time the pilot is on the [illegible] attitude, it is time to cut in both after- [illegible] total time from commencement [illegible] normally four minutes. The [illegible] to re-lighting afterburners is [illegible]

ENCLOSURE (16)

22


FLIGHT PATH BEFORE EJECTION
PILOTS BODY
FLIGHT PATH AFTER EJECTION - 090 TRUE (APPROXIMATE)
ENGINES
CENTER OF IMPACT
N
73

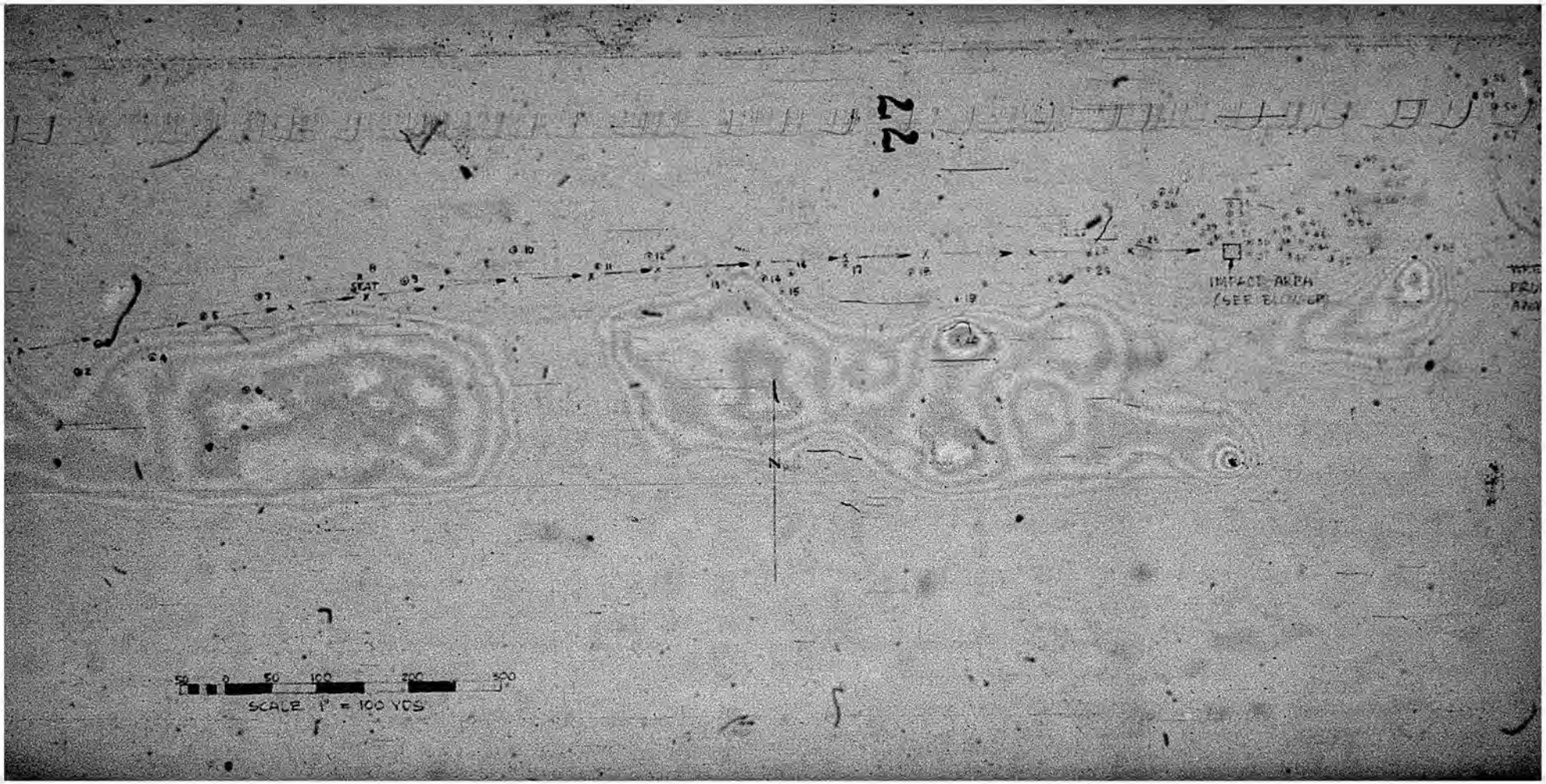
[illegible] THE IMPACT AREA SEE ENCL 1, FIG 1

ITEM NO	ITEM
1.	Unidentified skin
2.	Vertical longeron upper end from center line firewall at fuselage station 437.
3.	Speed brake return line, part of
4.	Unidentified skin
5.	Removable engine track support, part of
6.	Canopy actuating piston
7.	Adjustment [illegible] LEFT A.E.C.
8.	Seat
9.	LEFT A.E.C.
10.	Unidentified skin
11.	Flat actuating cylinder
12.	A.E.C. LEFT engine
13.	[illegible] fitting ¼ inch diameter
14.	Micro switch, unidentified
15.	Unidentified skin
16.	Unidentified skin
17.	Fuel line
18.	Speed brake [illegible] close [illegible] valve
19.	Structure landing gear area, part of
20.	Access door to airframe fuel filter
21.	Unidentified skin
22.	Generator bay door vent actuator
23.	Unidentified door
24.	Unidentified door
25.	Unidentified skin
26.	Inverter
27.	Generator, unidentified

ITEM NO	ITEM
28	Armor plate, seat bulkhead
29	Wing fold actuator
30	KEY TO ITEMS FOUND BEYOND IMPACT AREA SEE ENCL 19 FIG 1
	Right fin and rudder assembly
31	Right electric compartment door hinge
32	Hydraulic swivel, wing access area
33	Pitch dampner
34	Gun Mk-12
35	Left landing gear yoke
36	F. D. pump
37	Left wing structure, part of
38	Left speed brake
39	Slat actuating cylinder
40	Aft fuselage fuel cell pump, part of
41	Engine hanger, part of
42	Slot track area, part of
43	Left ailervator assembly
44	Arresting gear up latch
45	Left engine turbine, not rotating
46	Engine parts
47	Fuel line
48	Main landing gear strut, part of
49	Cannon plug, Electronic equipment (unidentified), Inverter, Skin (unidentified), Radio fuel pump noise filter
50	Right main gear strut
51	Engine turbine blades

ITEM NO	ITEM
52	Engine turbine blades
53	Unidentified skin
54	Wiring
55	Wiring
56	Arresting gear structure
57	Wing fold, part of
58	Left engine fuel connection
59	Air bottle
60	Wing stub, parts of
61	Pump, unidentified
62	Fuel pump
63	MK-55 Mod 0 Bomb Rack
64	Ailivator
65	Engine parts
66	Port nose wheel
67	Access drive
68	Radio gear
69	Engine drive section
70	Left engine fuel pump
71	Right oil pump
72	Underside fuel cap
73	Air bottle
74	Wing fold, main beam
75	Pump, unidentified
76	Nose wheel and structure

76

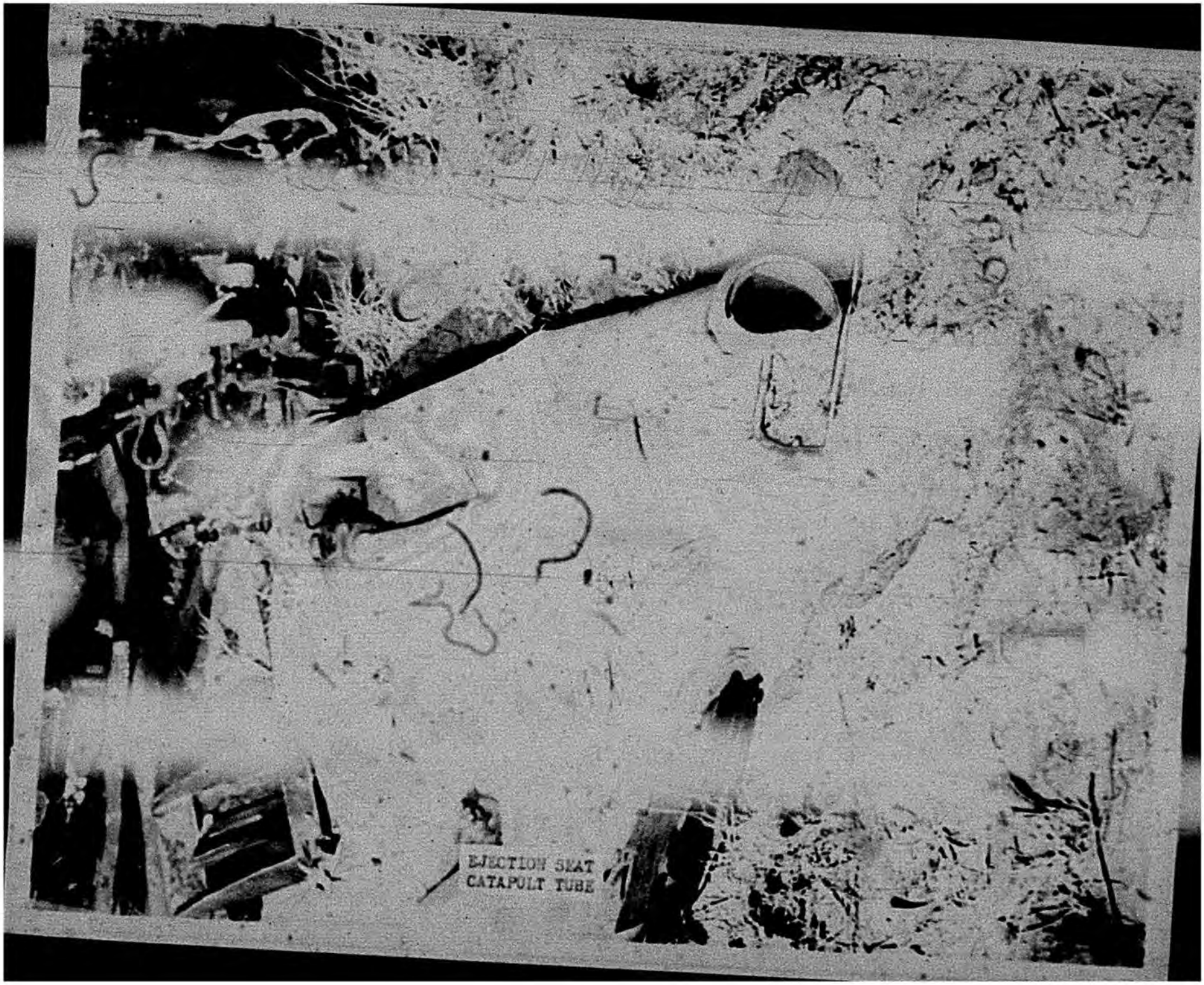

IMPACT AREA
(SEE BLOW-UP)
SCALE 1" = 100 YDS
50 0 50 100 200 300

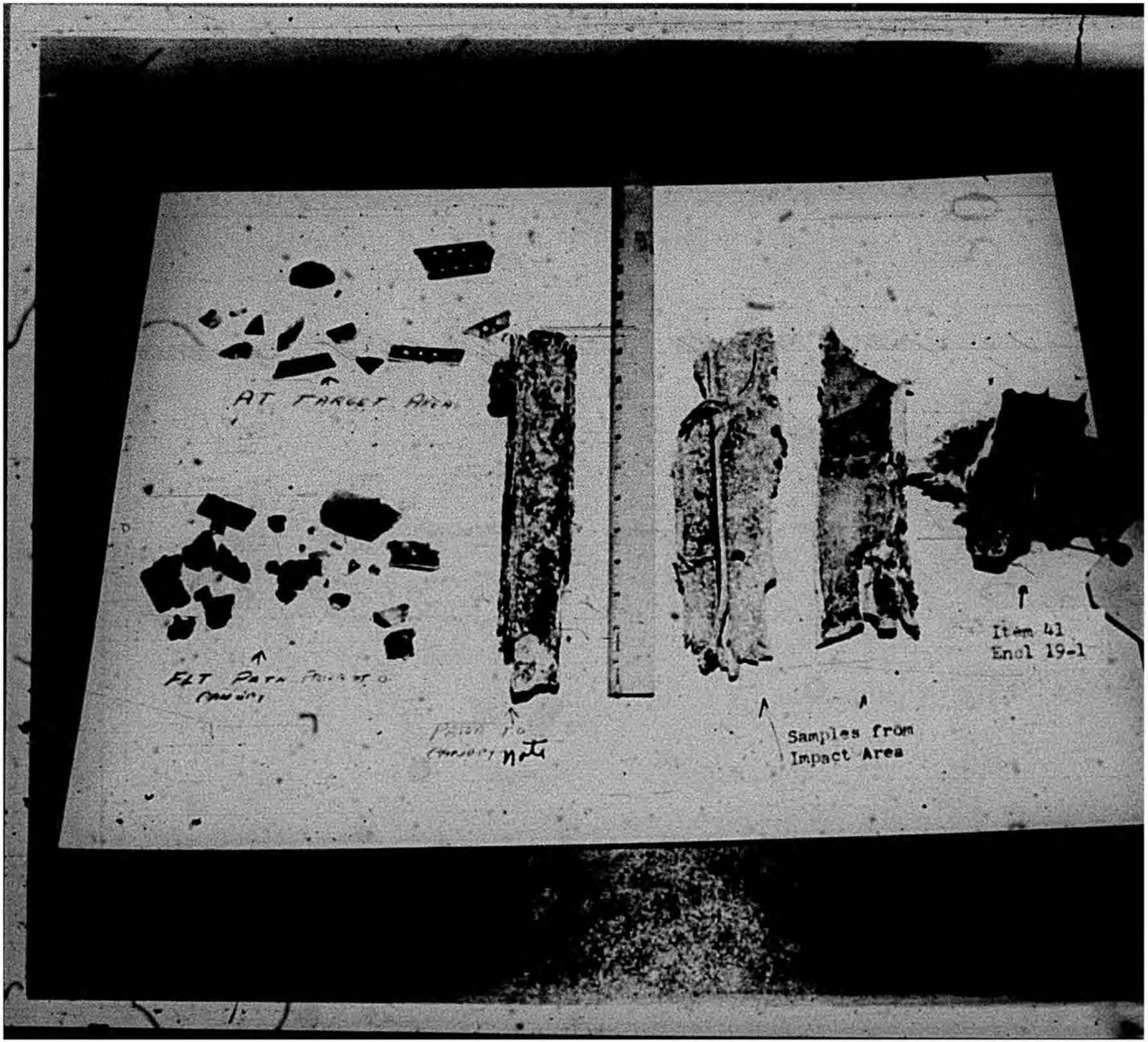
[illegible] TO [illegible] IN IMPACT AREA [illegible] CL 19 FIG 2

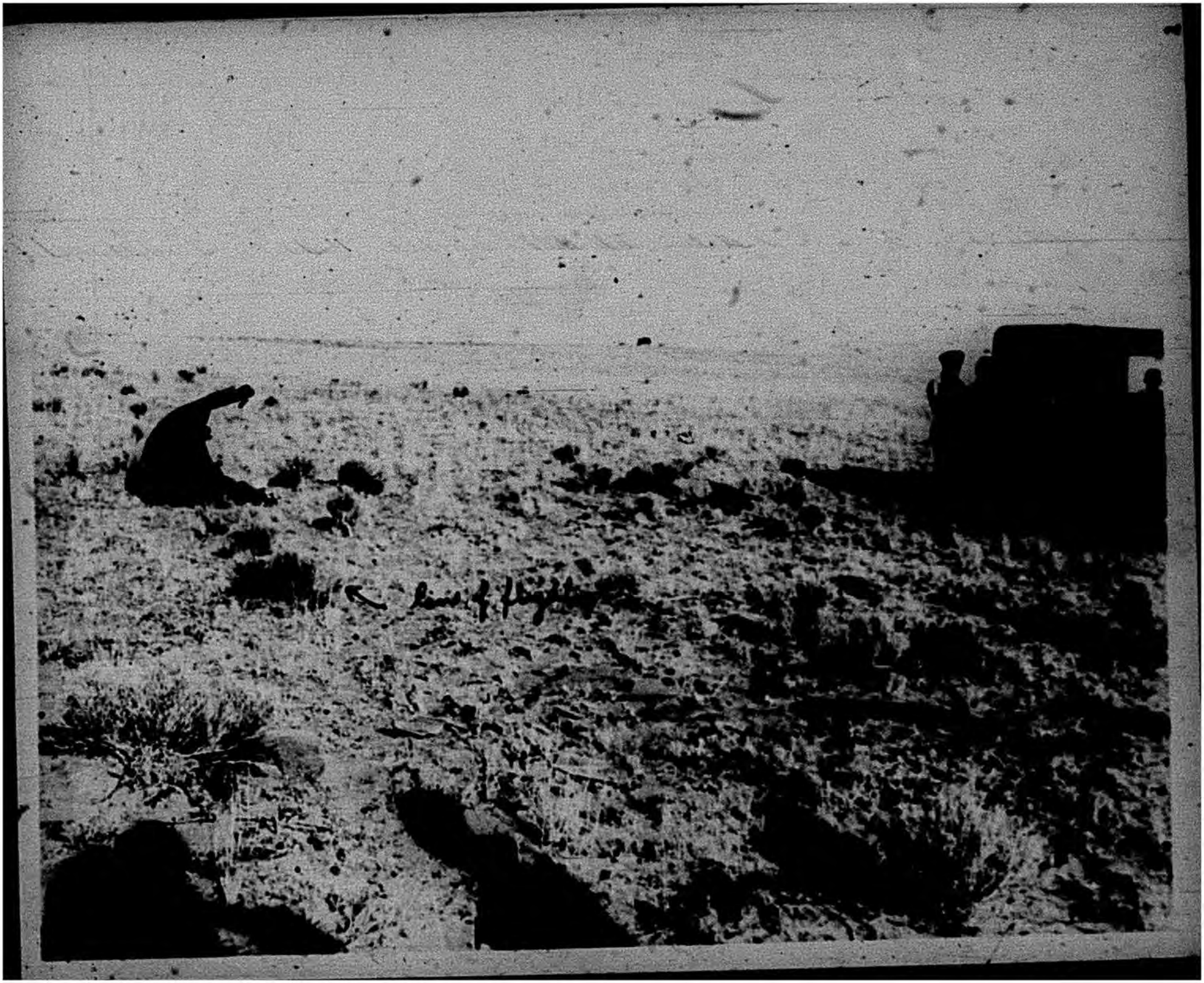
ITEM NO	ITEM
1.	Spar right wing
2.	Slot structure, part of
3.	A.E.C. Inverter
4.	Electronic compartment unidentified & thermal valve
5.	Unidentified electric part
6.	Unidentified electric part
7.	Left landing structure area, part of
8.	Fuel fitting right connection section
9.	Landing gear mount fitting
10.	After-burner support
11.	Fuel fitting
12.	Whittaker valve
13.	Unidentified skin
14.	End fitting unidentified cylinder, part of
15.	Yaw Damper, C-4
16.	Unidentified skin

2.

78

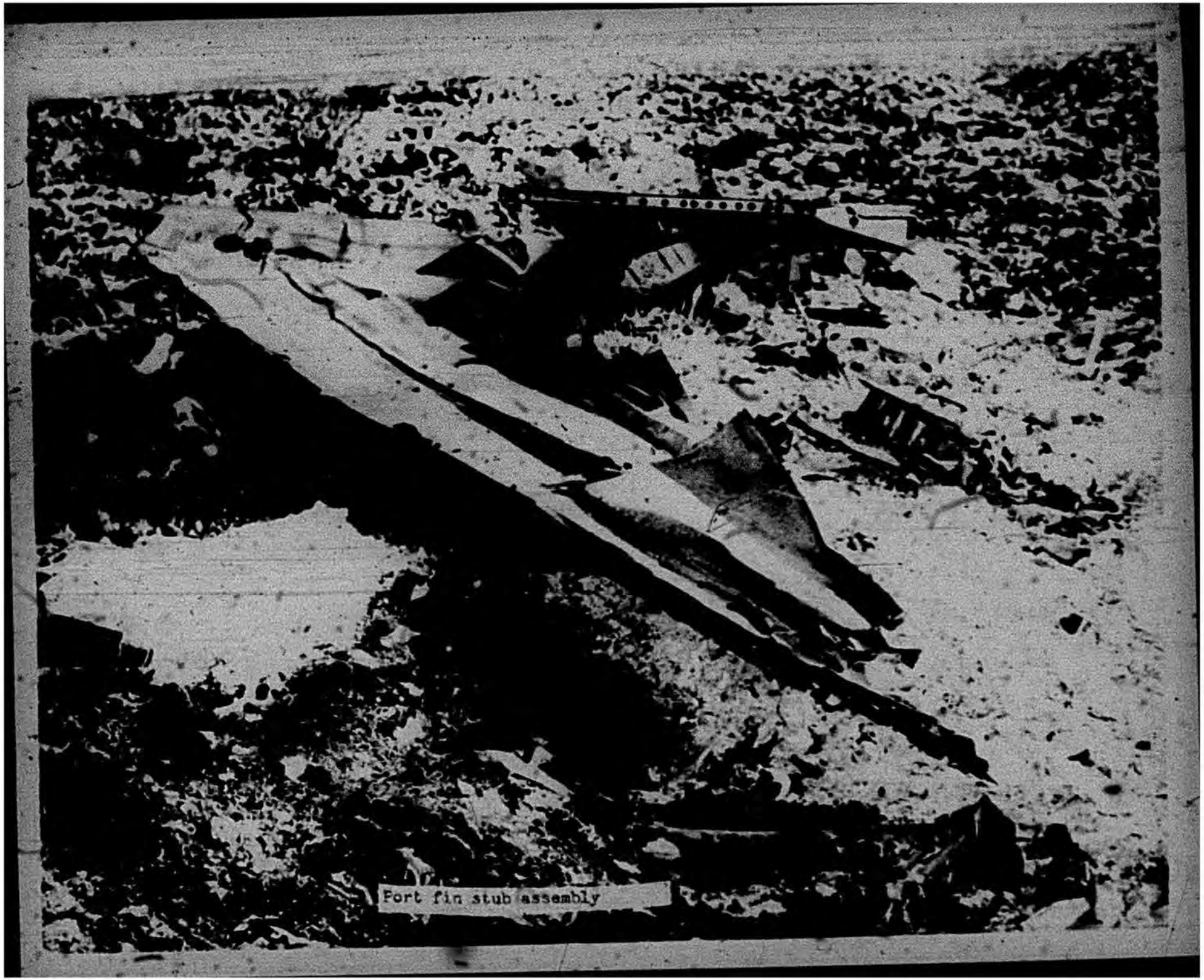

EJECTION SEAT
CATAPULT TUBE


AT TARGET AREA
FLT PATH
Samples from
Impact Area
Item 41
Encl 19-1

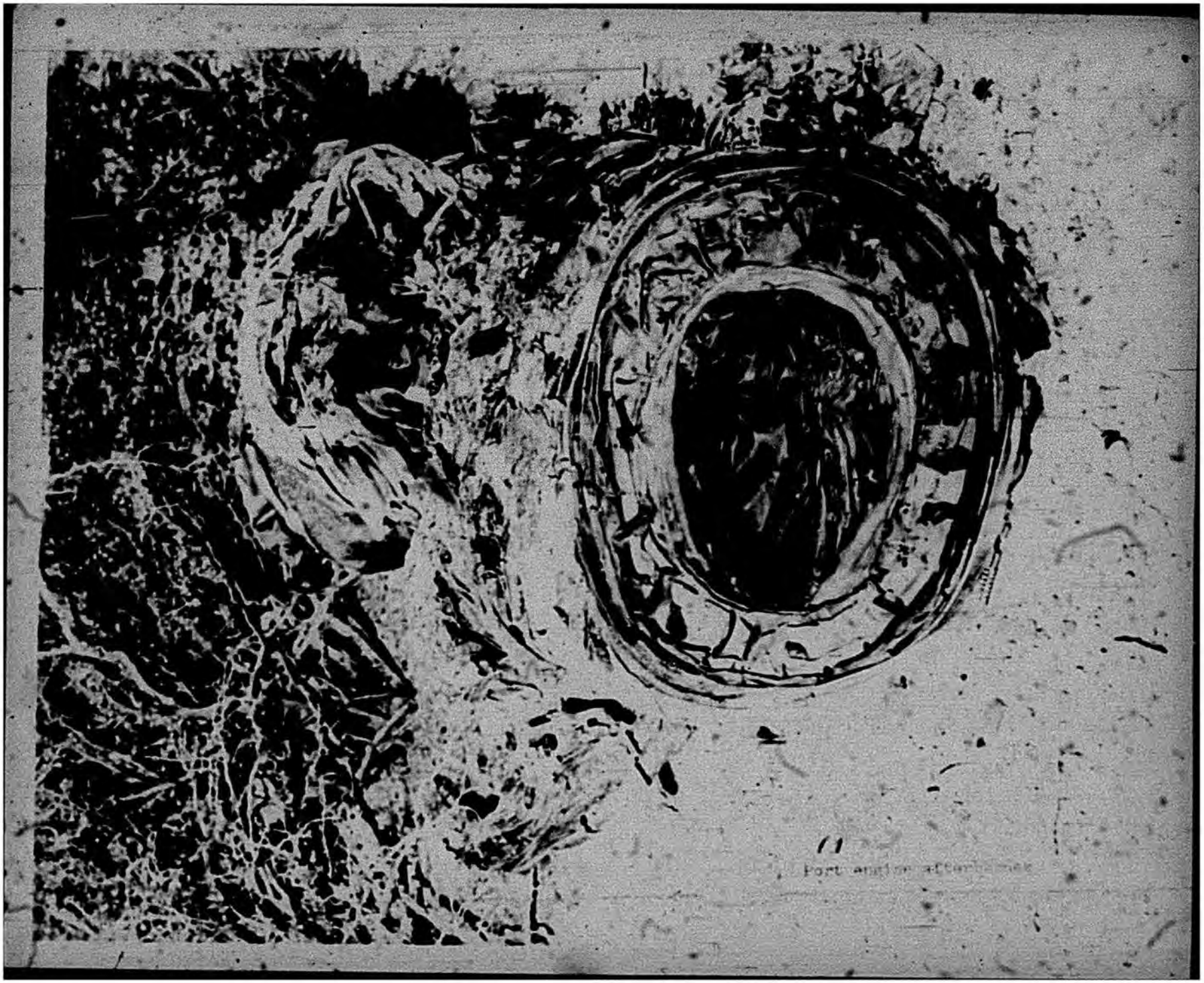

line of flight

at

Impact Line

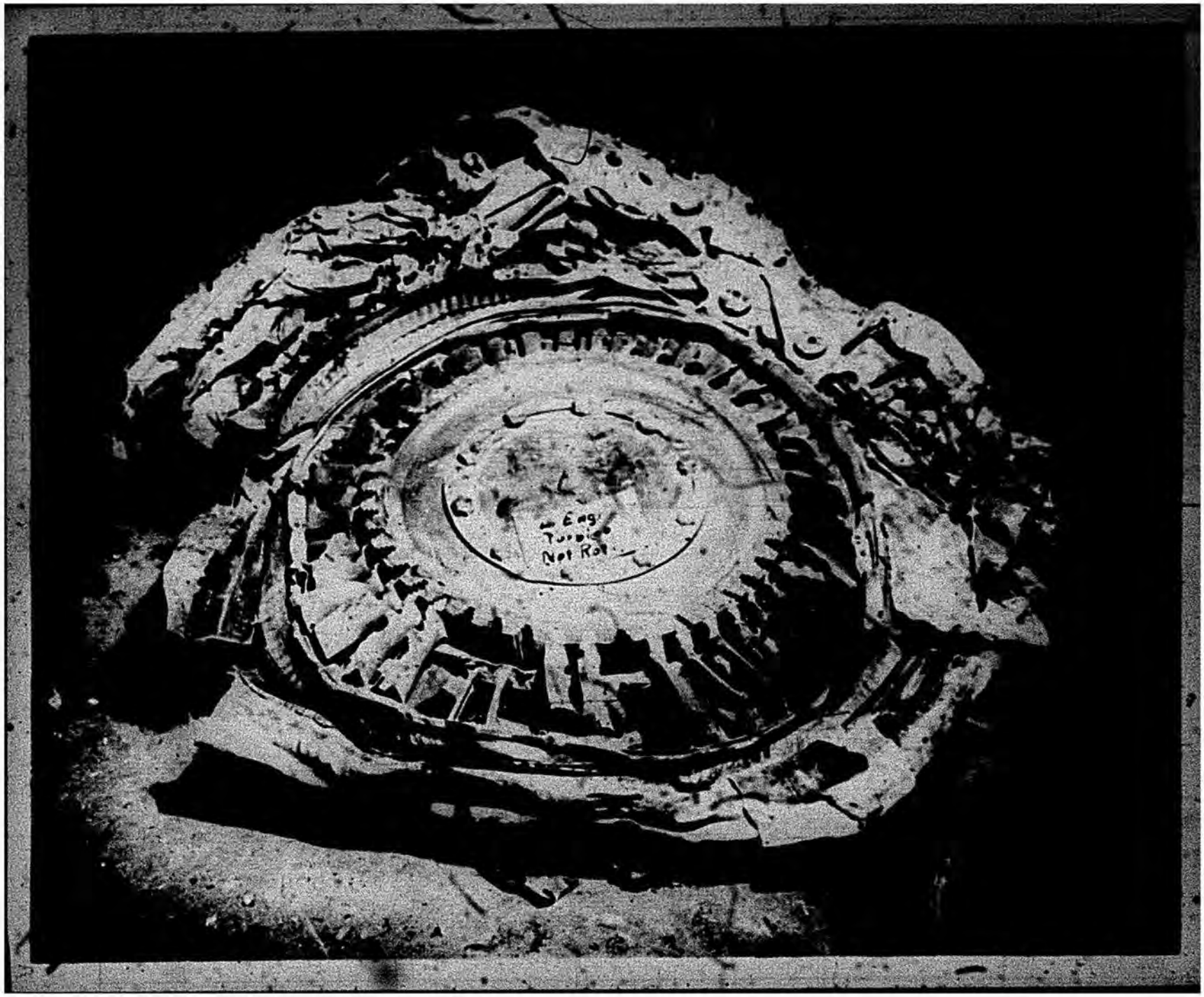

Port fin stub assembly

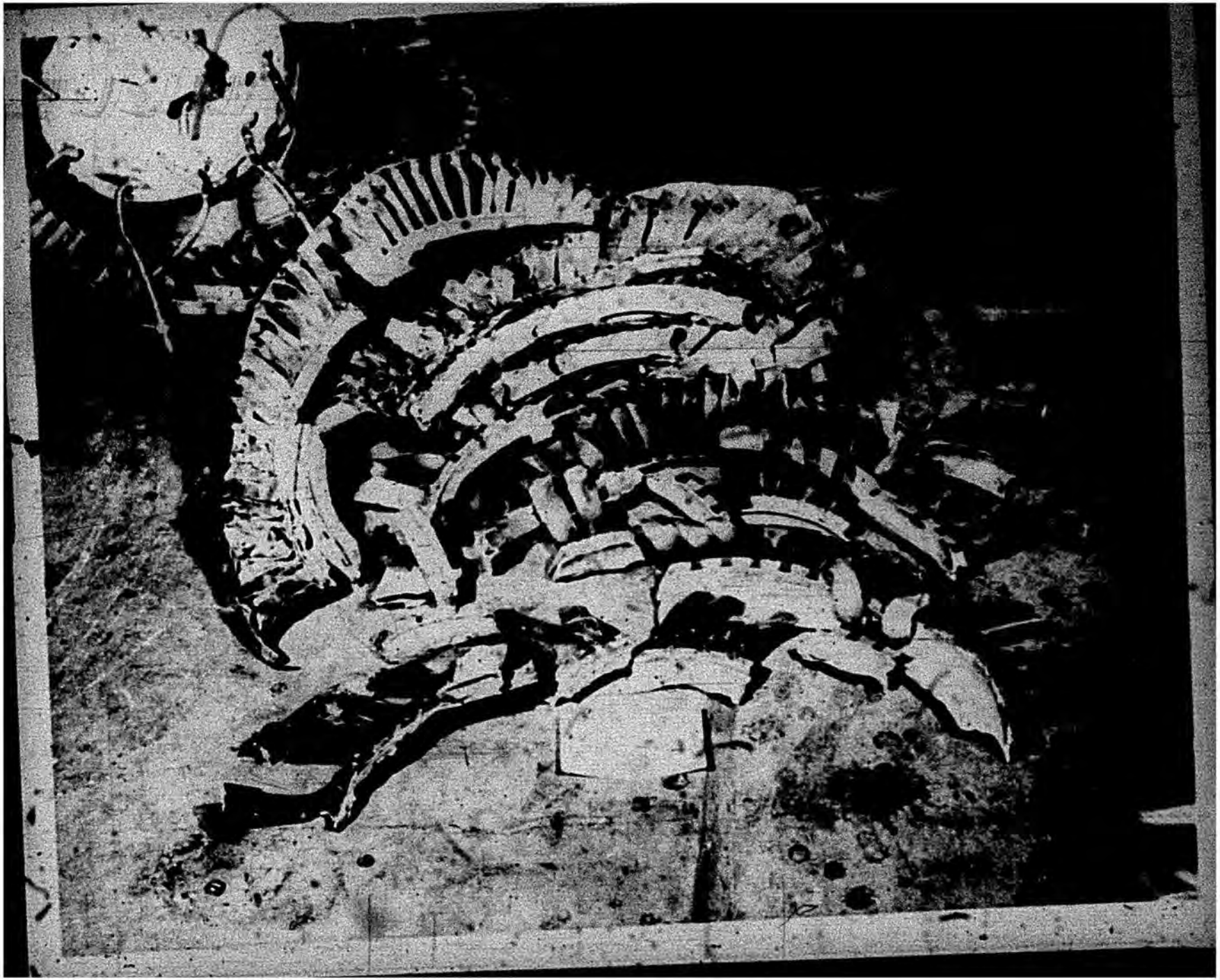
Starboard fin stub assembly



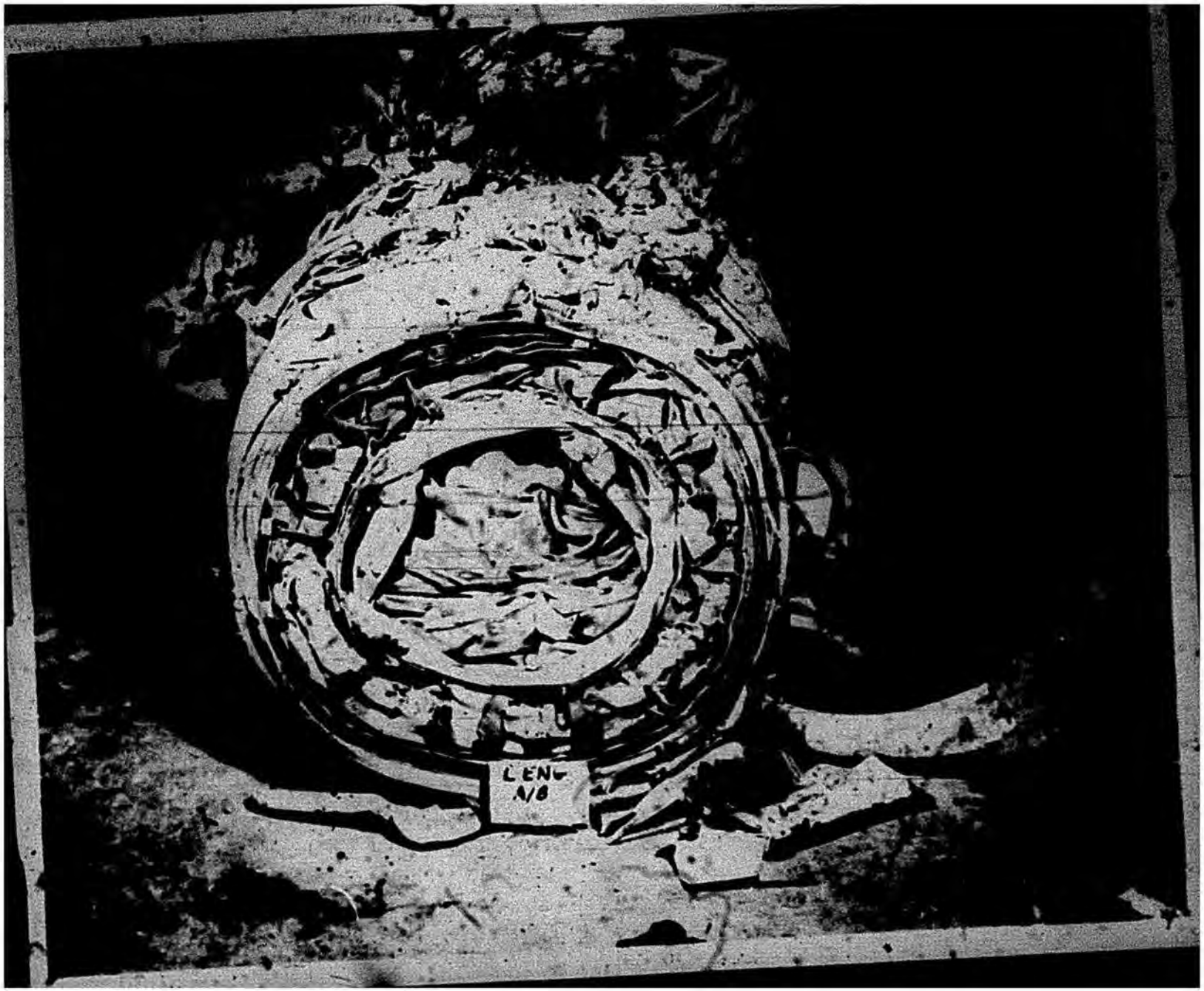
Port engine afterbarrel

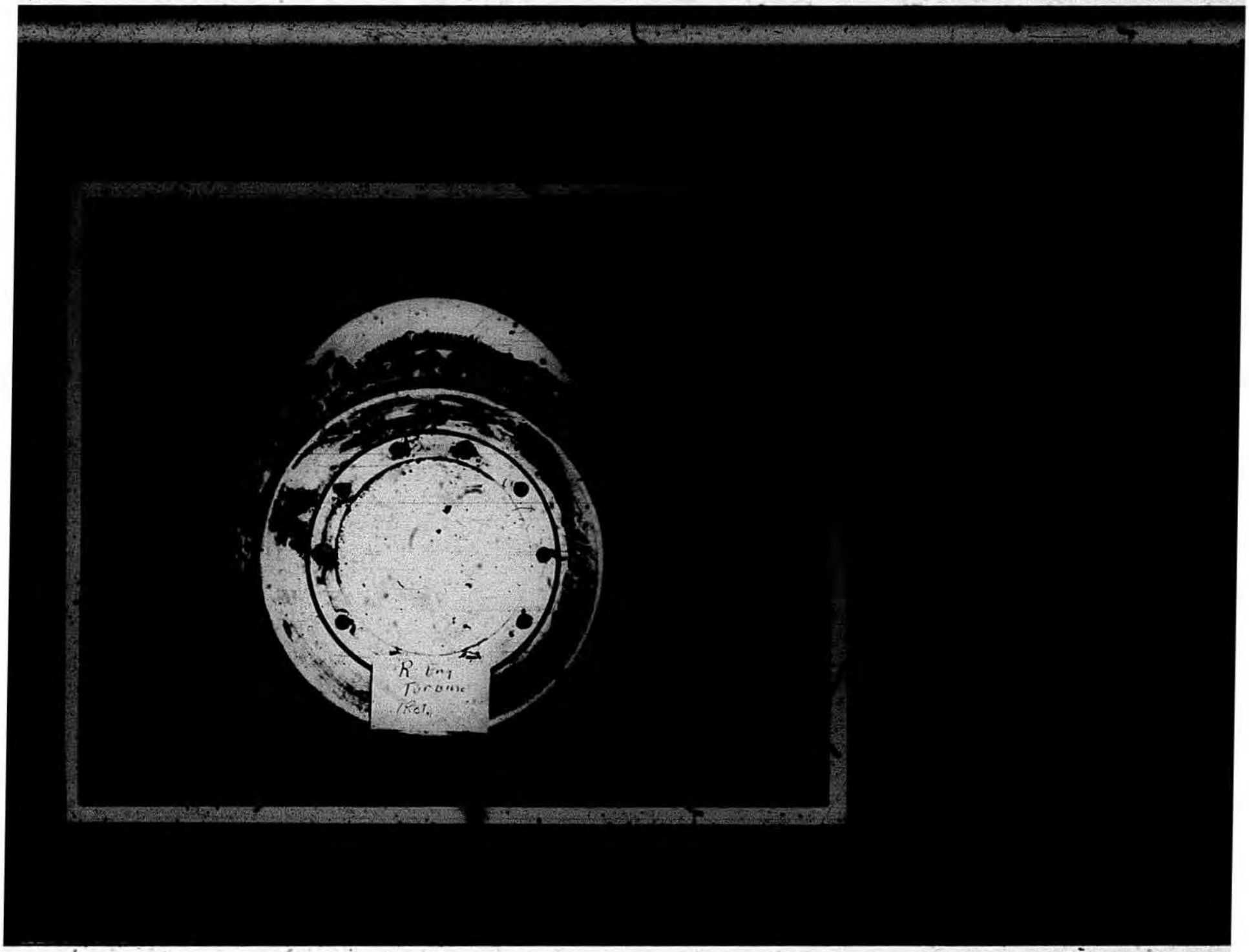
COMPOSITE OF ALL
RECOVERED PARTS


Eng
Turbine
Not Rot

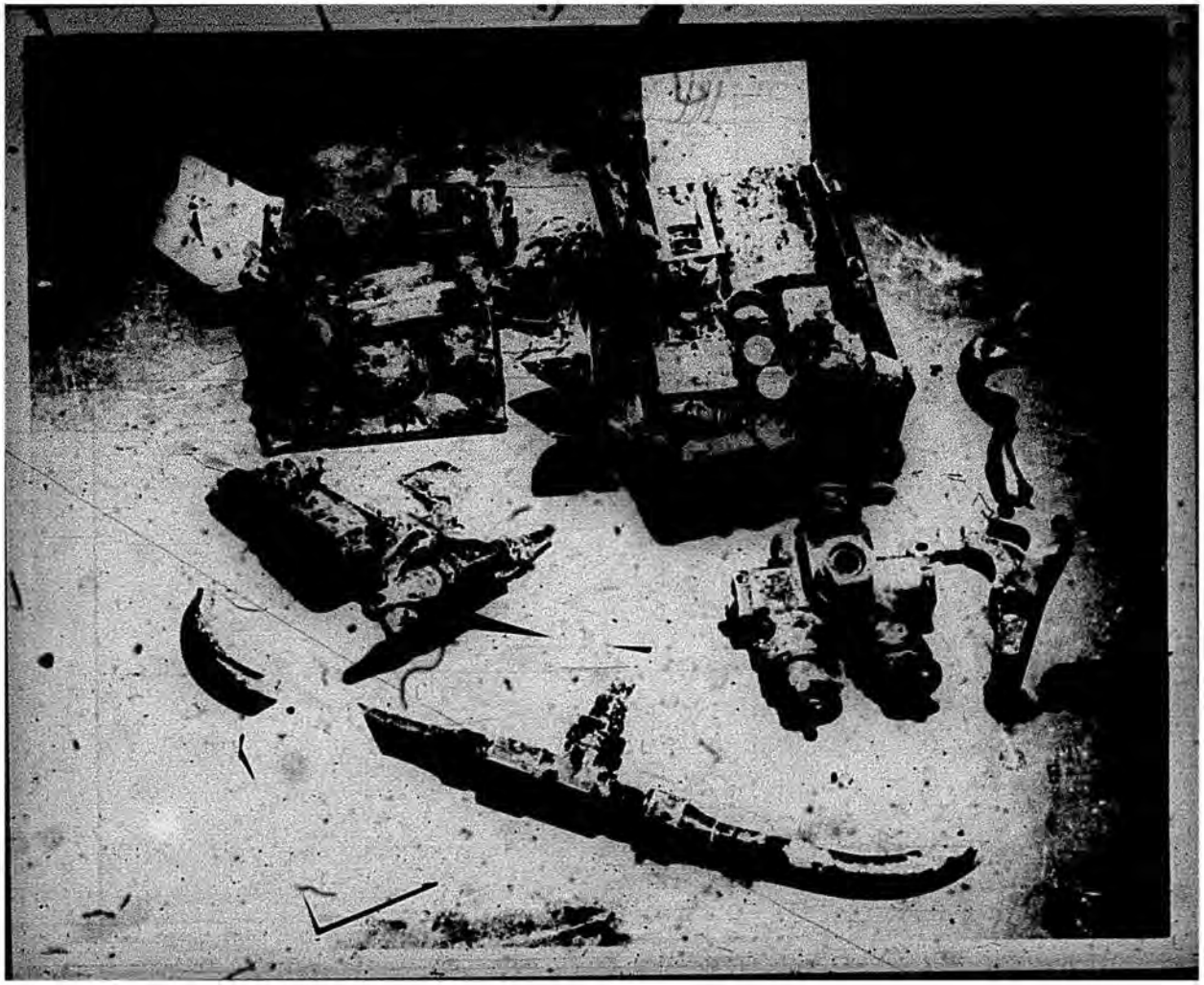


Additional


LENG
N/O

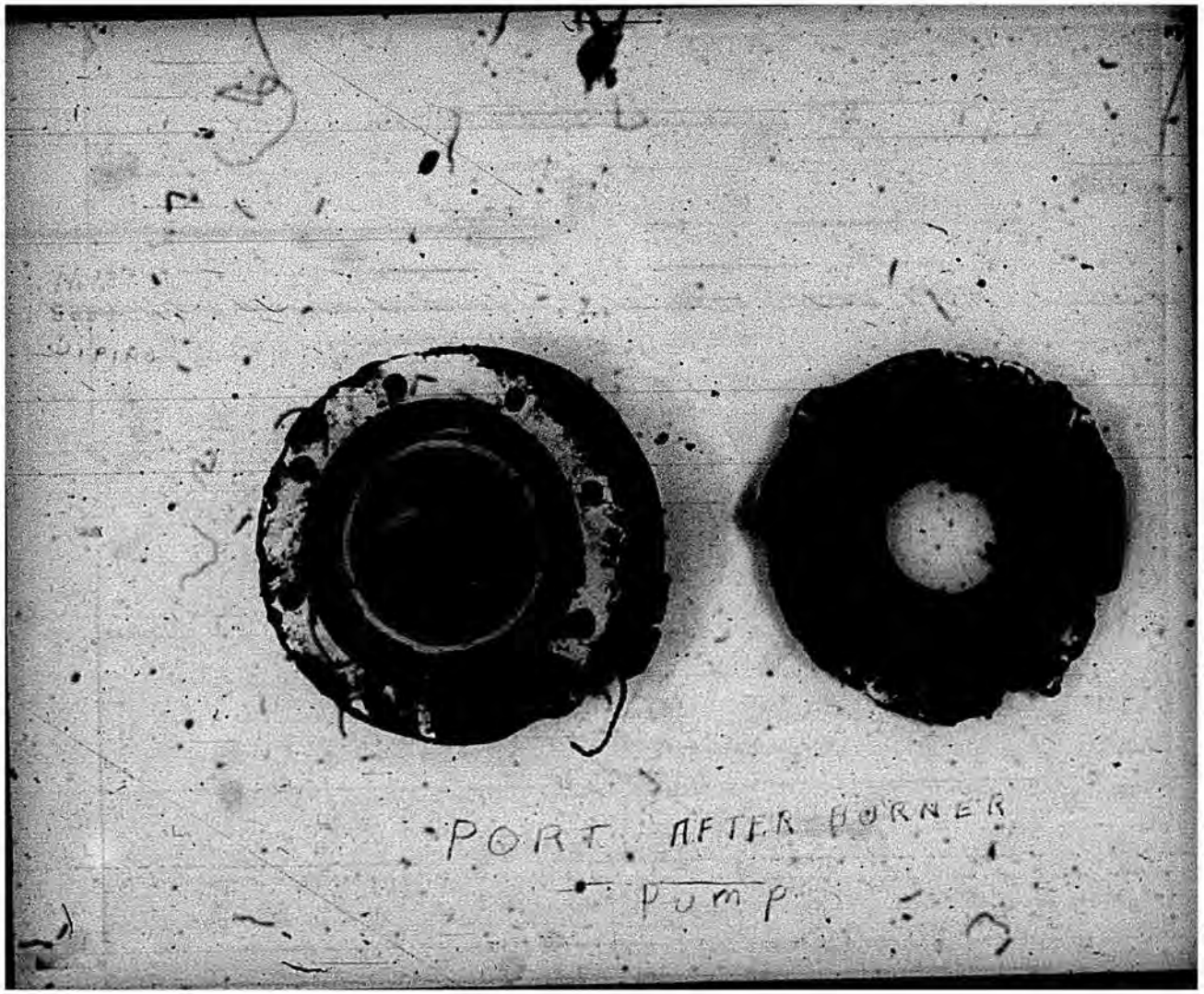

R Eng
Turbine
(Rot.)

GEAR BOXES
AND CONTROLS
FROM BOTH
ENGINES



L'H POWER
CONTROL CYL
BU NO 1057546

FORWARD


PORT AFTER BORNER
PUMP

FUEL
MANIFOLD
OUTLET LINE

MARKS RESULT
FROM CUTTING
TORCH
AFTERBURNER
FUEL MANIFOLD
INLET LINE.