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1248

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MAY 2 8 1958
TX-41, ~~2-6~~ 4-4
Case No. 746.00
Project No. FT-6056
Completed 2-17-58

SANDIA SYSTEMATIC DECLASSIFICATION REVIEW
1st Review Date: 9/22/98
Authority: ADD
Name: RB Urban
2nd Review Date: 9/24/98
Authority: ADD
Name: W Layne
Determination (Circle Number)
1 Classification Retained
2 Classification Changed to: U
3 Contains No DOE Classified Information
4 Coordinate With:
5 Contains UCAI?
6 Comments: OK for Internet

SANDIA SYSTEMATIC DECLASSIFICATION REVIEW
DOWNGRADING OR DECLASSIFICATION STAMP

CLASSIFICATION CHANGED TO U	AUTHORITY: W. C. Layne
Emelda Selph 9/28/98	
PERSON CHANGING MARKING & DATE	RECORD ID: 98SN4441
W C Layne 9/28/98	
PERSON VERIFYING MARKING & DATE	DATED: 9/24/98

Evaluation of Parachute Ejection Device

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CENTRAL RECORD FILE

Summary

Data obtained as a result of the 19 shots in this test were pressure in the explosive and expansion chambers, recoil force of the Drogue gun, and displacement of the afterbody upon firing of the Drogue gun. Characteristics of the pilot chute ejection system using different propellants in the Drogue gun, different shear pins in the Drogue gun, and different procedures in the tearing of the polyethylene cover were investigated.

Table I is a tabulation of the results of this test.

CENTRAL RECORD FILE
ACCOUNTABILITY CARD MK
FILE No. TX-41, 4-4

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Object of Test

The object of these tests was to determine the characteristics of the drogue gun parachute ejection device under actual firing conditions.

Authorization for Test

This test was requested by Division 1218 in a Work Order Authorization dated November 1, 1957. Mr. R. R. Heel was the consultant.

Acknowledgements

Division 1611 wishes to acknowledge the participation and assistance of the following organizations in the tests of the drogue gun assembly:

Section 1614-1 for instrumentation service
Section 1613-4 for T.V. coverage and liaison services
Section 5213-3 for camera coverage

Description of Test Item

The drogue gun is a device used to eject the pilot chute of a TX-41 weapon. The drogue gun is cylindrically shell shaped and approximately 10 inches in length with an outside diameter of 1-3/4 inches and an inside diameter of 1-1/2 inches. A solid projectile of approximately 1-1/2 inches in diameter and 3 inches in length is inserted into the drogue gun and held in place with a stainless steel shear pin. A cable is attached to the forward end of the projectile and when the propellant charge is fired this cable breaks a .020 inch thick polyethylene seal at the tail of the TX-41 and pulls the pilot chute out.

Instrumentation

Instrumentation for obtaining the rate of pressure increase and the maximum pressure in the explosive and expansion chambers consisted of a Statham pressure transducer, a filter, a system D Consolidated amplifier and a Minneapolis-Honeywell visicorder. Hole A indicated on Figure 23 is where the explosive chamber pressure was measured. Hole B, indicated on Figure 23, is where the expansion chamber pressure was measured.

Instrumentation for obtaining the recoil force consisted of two different setups. Setup No. 1 was a 4000-pound Statham load ring, serial No. 26, a system D Consolidated amplifier and a Minneapolis-Honeywell visicorder. Setup No. 2 consisted of a 5000-pound Baldwin load cell, a system D Consolidated amplifier, and a Minneapolis-Honeywell visicorder.

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Instrumentation for obtaining the beam deflections of the afterbody consisted of two Bournes Aligno-Pots, Part No. 140-2029-202, manufactured by Bournes Laboratories, Riverside, California, and a 535 Tektronix oscilloscope.

General Information

All shots were performed at the north end of the sled track in Area III. Remote firing of the Drogue was executed from Building 6540. All recording instrumentation was also located in Building 6540.

Fastax film coverage on various shots is available and may be obtained by contacting D. G. Ahlstrom, Division 1611.

Procedure and Results

A summary of results of the 19 shots may be noted in Table I.

Shot No. 1

Figure 26 is a view of the test setup prior to shot No. 1. The explosive chamber of the Drogue gun was a development model of the NC-886. The name of the propellant used in this test was N5, manufactured by N.C.T.S. of Inyokern, California. Length of the propellant was 0.90 inch. A McCormick S-685 Actuator was used to ignite the propellant. Figure 1 is a reproduction showing the pressure curve for shot No. 1. The pressure was obtained in the explosive chamber in this shot. Due to an error in calibration, the pressure curve in Figure 1 is relatively flat. Estimated peak pressure was 1225 psi.

Figure 2 is a reproduction of the results of using a load ring to obtain the recoil force of the Drogue gun. Information in this figure is unreliable due to the "ringing effect" encountered. The projectile of the Drogue gun came to rest 275 feet from the gun in this shot. Upon inspection of the ground in front of the gun it was observed that the projectile first struck the ground 50 feet from the Drogue gun.

Shot No. 2

Figures 27 and 28 are views of the test setup prior to shot No. 2. Pressure was measured in the explosive chamber, and was determined to be 1415 psi. Figure 3 is a reproduction of the pressure time curve for shot No. 2. The explosive chamber, propellant, and actuator used in this tests were of the same type as in shot No. 1. In this test tearing occurred at four points on the polyethylene with music wire connecting each point. (See Figure 27) The total perimetrical distance of the tear was 112 inches. Figure 4 is a reproduction of the results of the load ring used to obtain the recoil force of the Drogue gun. The ringing effect encountered in shot No. 1 was still

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present in shot No. 2 making results unreliable. Figures 29 and 30 are views of the test setup following firing of the Drogue gun. The outside band used to hold the polyethylene on the simulated TX-41 afterbody came loose as a result of this test. The tearing of the polyethylene was excellent. The pilot chute was ejected approximately 10 feet.

Shot No. 3

The only datum obtained in this shot was pressure in the explosive chamber. Peak pressure in the explosive chamber was 1100 psi. Figure 5 is a reproduction of the pressure time curve for shot No. 3. The explosive chamber, propellant and actuator used in this test were of the same type as in shot No. 1. The simulated afterbody with pilot chute and polyethylene cover was used in this shot. Tearing of the polyethylene occurred at four points with music wire connecting each point as in shot No. 1. The total perimetrical distance of the tear was 136 inches. The barrel of the Drogue gun was purposely obstructed by a rubber plug in this test. The tearing of the polyethylene was excellent. The pilot chute was ejected approximately four feet.

Shot No. 4

Figures 31 and 32 are views of the test setup prior to shot No. 4. Pressure was measured in the explosive chamber and in the expansion chamber of the Drogue gun in this test. The peak pressure in the explosive chamber was 1125 psi. Figure 6 shows the pressure time curve in the explosive chamber. The peak pressure in the expansion chamber was 1230 psi. Figure 7 is a reproduction of the pressure time curve in the expansion chamber. The explosive chamber, propellant, and actuator used in this test were of the same type as used in shot No. 1. In this shot tearing occurred at six points on the polyethylene with music wire connecting each point. (See Figure 31) Figure 33 is a view of the simulated afterbody showing the results of this test. The pilot chute was not ejected. The polyethylene cover did not tear completely. The outside band used to hold the polyethylene on the simulated TX-41 afterbody came loose as a result of this shot.

Shot No. 5

Figures 34 and 35 are views of the test setup prior to shot No. 5. Pressure was measured in the explosive chamber and in the expansion chamber of the Drogue gun in this test. The peak pressure in the explosive chamber was 1285 psi. Figure 8 is a reproduction of the pressure time curve in the explosive chamber. The peak pressure in the expansion chamber was 1290 psi. Figure 9 shows the pressure time curve in the expansion chamber. The explosive chamber, propellant, and actuator used in this test were of the same type as used in shot No. 1. In this shot tearing occurred at four points on the polyethylene with music wire connection each point. (See Figure 34) The total

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perimetrical distance of the tear was 136 inches. Figures 36 and 37 are views of the test setup following firing of the Drogue gun. The tearing of the polyethylene was excellent. The pilot chute was ejected approximately 10 feet.

Shot No. 6

Figures 38 and 39 are views of the test setup prior to shot No. 6. Pressure was measured only in the expansion chamber of the drogue gun in this test. The peak pressure in the expansion chamber was 1365 psi. Figure 10 is the pressure time curve in the expansion chamber. A Baldwin 5000-pound load cell was used in this test. Figure 11 is a view of the results of the load cell used to obtain the recoil force of the Drogue gun. The explosive chamber and the actuator used in this test were of the same type as in shot No. 1. The propellant used in this test was N5, manufactured by N.C.T.S. of Inyokern, California. Length of the propellant was 0.30 inch. This propellant was placed in the MC-886 with a spacer. In this shot tearing occurred at four points on the polyethylene with music wire connecting each point. (See Figure 38) Figure 40 is a view showing the results of the tearing of the polyethylene. The pilot chute was not ejected. The polyethylene cover did not tear completely because the projectile came loose and landed 75 feet from the gun.

Shot No. 7

Figures 41 and 42 are views of the test setup prior to shot No. 7. Pressure was measured in the expansion chamber of the Drogue gun in this shot. The peak pressure in the expansion chamber was 1165 psi. Figure 12 shows the pressure time curve in the expansion chamber. A Baldwin 5000-pound load cell was used in this test. Figure 13 is a reproduction of the results of the load cell used to obtain the recoil force of the Drogue gun. The explosive chamber, propellant and actuator used in this test were of the same type as in shot No. 6. Procedure for tearing the polyethylene was the same as in shot No. 6. Figure 43 is a view showing the results following firing of the Drogue gun. The tearing of the polyethylene was excellent. The pilot chute was ejected approximately 10 feet.

Shot No. 8

Figures 44 and 45 are views of the test setup prior to shot No. 8. Pressure was measured in the expansion chamber of the Drogue gun in this test. The peak pressure in the expansion chamber was 1805 psi. Figure 14 is the pressure time curve for shot No. 8. A new type of explosive chamber was used in this test. This chamber was an M-59 McCormick pressure cartridge. (See Figure 45) In this test tearing occurred at four points on the polyethylene with music wire connecting each point. (See Figure 44) Following firing it was noticed that some of the cables and music wires were broken. Tearing of the polyethylene was excellent. The pilot chute was ejected 27 feet.

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Shot No. 9

Figures 46 and 47 are views of the afterbody of the TX-41 showing the test setup used to obtain displacements. A different type Drogue gun was used in this test. (See Figure 25) The explosive chamber, propellant and actuator used in this test were of the same type as used in Shot No. 1. The beam deflection curves as recorded on the 535 oscilloscope are shown in Figure 22. The deflection was measured in two different positions. One of the Aligno-Pots recorded a deflection of 0.15 inch, while the other Aligno-Pot recorded a deflection of 0.175 inch.

The object of shots 9, 10, 11, 12, 13 and 14 was to determine if the beams on which the Drogue gun is mounted in actual application, would deflect to the extent where other components in the afterbody would be effected upon firing of the Drogue gun.

Shot No. 10

The same test setup as was used in shot No. 9 was used in shot No. 10 except for the explosive chamber, which used an M-59 McCormick pressure cartridge. The beam deflections are not available on this test because the oscilloscope triggered too late.

Shot No. 11

The same procedure as was used in shot No. 10 was used in shot No. 11, except that only one of the Aligno-Pots was used in this test. The beam deflection curve as recorded on the 535 oscilloscope is shown in Figure 20. The Aligno-Pot recorded a deflection of 0.330 inch.

Shot No. 12

The same procedure that was used in shot No. 11 was also used in shot No. 12. The beam deflection curve as recorded on the 535 oscilloscope is shown in Figure 21. The deflection measured on the oscilloscope was 0.320 inch.

Shot No. 13

Figure 48 is a view showing test setup prior to shot No. 13. One Aligno-Pot was used in this test to obtain the beam deflection. Due to triggering difficulties, results on the beam deflection were not recorded on the 535 oscilloscope. The simulated chute container was placed over the Drogue gun, to determine if the projectile of the Drogue gun would penetrate the container. The distance from the Drogue gun to the container was 3/4 inch. The material of the container was 61-S0 aluminum, 0.090 inch thick. The projectile passed through the aluminum without difficulty. (See Figure 49) The explosive chamber, propellant, and actuator used in this test were of

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the same type as those used in shot No. 1. A new type shear pin 0.166 inch diameter, 303 stainless steel was used in this test. The Drogue gun with the above shear pin in its actual position was subjected to a static test to determine the force required to shear it. The pin sheared at 3640 pounds force.

Shot No. 14

One Aligno-Pot was used in this test to obtain beam deflections. Due to triggering difficulties results of the beam deflections were not recorded on the 535 oscilloscope. The explosive chamber, propellant, and actuator were of the same type as those used in shot No. 1. A shear pin of 0.166 inch diameter, 303 stainless steel was used in this test. The barrel of the Drogue gun was slightly sprung as a result of this test. The retaining pin did not shear flush with the projectile and groved the barrel of the Drogue gun causing the barrel to assume an elliptical shape.

Shot No. 15

Figure 50 is a view showing the test setup prior to shot No. 15. Eight foot of 1/4 inch copper tubing was used between the expansion chamber and the explosive chamber. Presure was measured in the explosive chamber and in the expansion chamber of the Drogue gun in this test. The peak pressure in the explosive chamber was 1310 psi. Figure 16 is a view of the pressure time curve in the explosive chamber. The peak pressure in the expansion chamber was 1440 psi. Figure 15 is a reproduction of the pressure time curve in the expansion chamber. The explosive chamber, propellant, and actuator were the same as used in shot No. 1. In this test tearing occurred at four points on the polyethylene with music wire connecting each point. At each point a new type of connector was used on the polyethylene. Figure 52 is a view showing this new type of connector. The tearing of the polyethylene was excellent. The pilot chute was ejected approximately 10 feet.

Shot No. 16

Eight foot of 1/4 inch copper tubing was used in this test between the expansion chamber and the explosive chamber. Pressure was measured in the explosive chamber and in the expansion chamber. The peak pressure in the explosive chamber was 1385 psi. Figure 18 is the pressure time curve in the explosive chamber. The peak pressure in the expansion chamber was 1395 psi. Figure 17 is a reproduction of the pressure time curve in the expansion chamber. The explosive chamber, propellant, and actuator used in this test were of the same type as those used in shot No. 1. In this test tearing occurred at eight points on the polyethylene with music wire connecting each point. Cables from the projectile were connected to four points on the polyethylene. (See Figures 51 and 52) The copper tubing broke at the connection to

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the explosive chamber as a result of this shot. (See Figure 54) Figure 53 is a view showing the results of the tearing of the polyethylene. The tearing was not complete and the pilot chute was not ejected.

Shot No. 17

Figures 55 and 56 are views showing the test setup prior to shot No. 17. In this shot a firing system was used consisting of a pull-out switch, an XMC-881 timer, and 16 Nicad cells. The system used to fire the Drogue gun in this test was of the same type as used in actual application. The propellant and explosive chamber used in shot No. 17 was an XMC-886. The method of tearing the polyethylene cover in shot No. 17 was the same as in shot No. 16. The polyethylene cover did not tear completely in this test. The pilot chute was not ejected.

Shot No. 18

Two XMC-886's were used to expel the projectile in this shot. Figure 57 is a view of the two XMC-886's and the method of mounting them to the Drogue gun. The barrel of the Drogue gun was purposely obstructed with a rubber plug. A spacer was used between the projectile and the plug so that when the projectile started moving the plug would also move. The "O" rings used on the projectile on all other shots were not used in this shot. Pressure was measured in the expansion chamber. Peak pressure was 1335 psi. Figure 19 is a reproduction of the pressure time curve for this shot. In this test tearing occurred at four points on the polyethylene with music wire connecting each point. The tearing of the polyethylene was excellent. The projectile came loose from the cables and traveled 210 feet from the gun. The pilot chute was ejected approximately 5 feet.

Shot No. 19

Figures 58 and 59 are views of the test setup prior to shot No. 19. Two Drogue guns were used in this test. Figures 23 and 24 are views of the two Drogue guns. A piece of four inch channel steel of standard thickness was placed over the two Drogue guns. The explosive chambers used on the guns were M-59 McCormick pressure cartridges. A spacer was used between the projectile of each gun and the channel steel so that when the projectile started to move the channel steel would move also. Both shear pins were 1/8 inch stainless steel. The purpose of this test was to determine the characteristics of the steel channel upon firing of the Drogue gun. Figure 60 is a view of the steel channel following firing of the Drogue gun. Upon firing of the Drogue gun the steel channel traveled upward approximately 30 feet. The item did not travel in a vertical position but tumbled end for end. The reason for the tumbling action was that the projectile in the Drogue

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gun (to the right in Figure 59) did not proceed out of the barrel. Two holes in the barrel of the Drogue gun were open during this test and the pressure behind the projectile escaped through the holes before the projectile left the barrel.

D. G. Ahlstrom

Test Conducted by: D. G. Ahlstrom - 1611-3

G. P. Barnett

Approved by: G. P. Barnett - 1611-3

DGA:1611-3:et

Encs. Table I
Figs. 1-60

Copy to:
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M. O. Jones, 1613-4
C. N. Giles, 1614-1
A. E. Bentz, 5213-3
R. K. Smeltzer, 7221-3

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TABLE I

Tabular Results of Drougue Gun Test

Shot Sequence	Actuator Used	Propellant Used	Length of Propellant (inch)	Max Press Expansion Chamber (psi)	Max Press Explosion Chamber (psi)	Type of Polyethylene Tear	Distance of Perimetrical Tear (inch)	Distance Pilot Chute Ejected (feet)	Remarks
1	McCormick S-685	N/5	0.90	-	1225	-	-	-	Projectile of D gun came to rest at 275 feet
2	McCormick S-685	N/5	0.90	-	1415	good	112	10	
3	McCormick S-685	N/5	0.90	-	1100	excellent	136	4	D gun was obstructed by rubber plug
4	McCormick S-685	N/5	0.90	1230	1125	poor	-	Not Ejected	Band used to hold poly. - came loose
5	McCormick S-685	N/5	0.90	1290	1285	excellent	-	10	
6	McCormick S-685	N/5	0.30	1365	-	poor	-	Not Ejected	Projectile came loose, landed 75' from gun
7	McCormick S-685	N/5	0.30	1165	-	excellent	-	10	
[illegible]	-	M-50	-	1305	-	excellent	-	27	Cables and music wire were broken

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TABLE 5 (Cont.)

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Shot Sequence	Actuator Used	Propellant Used	Length of Propellant (inch)	Max Press Expansion Chamber (psi)	Max Press Explosion Chamber (psi)	Type of Polyethylene Tear	Distance of Perimetrical Tear (inch)	Distance Pilot Chute Ejected (feet)	Remarks
9	McCormick S-685	M/5	0.90	-	-	-	-	-	
10	-	M-59	-	-	-	-	-	-	Oscilloscope trigger too late
11	-	M-59	-	-	-	-	-	-	
12	-	M-59	-	-	-	-	-	-	
13	McCormick S-685	M/5	0.90	-	-	-	-	-	Triggering troubles
14	McCormick S-685	M/5	0.90	-	-	-	-	-	
15	McCormick S-685	M/5	0.90	1440	1310	excellent	-	10	8' of 1/4" copper tubing between explo. & expan.
16	McCormick S-685	M/5	0.90	1395	1385	poor	-	Not Ejected	Copper tubing broke
17	-	MC-886	-	-	-	poor	-	Not Ejected	
18	-	2 MC-886	-	1335	-	excellent	-	5	Projectile came loose
19	-	M-59	-	-	-	-	-	-	

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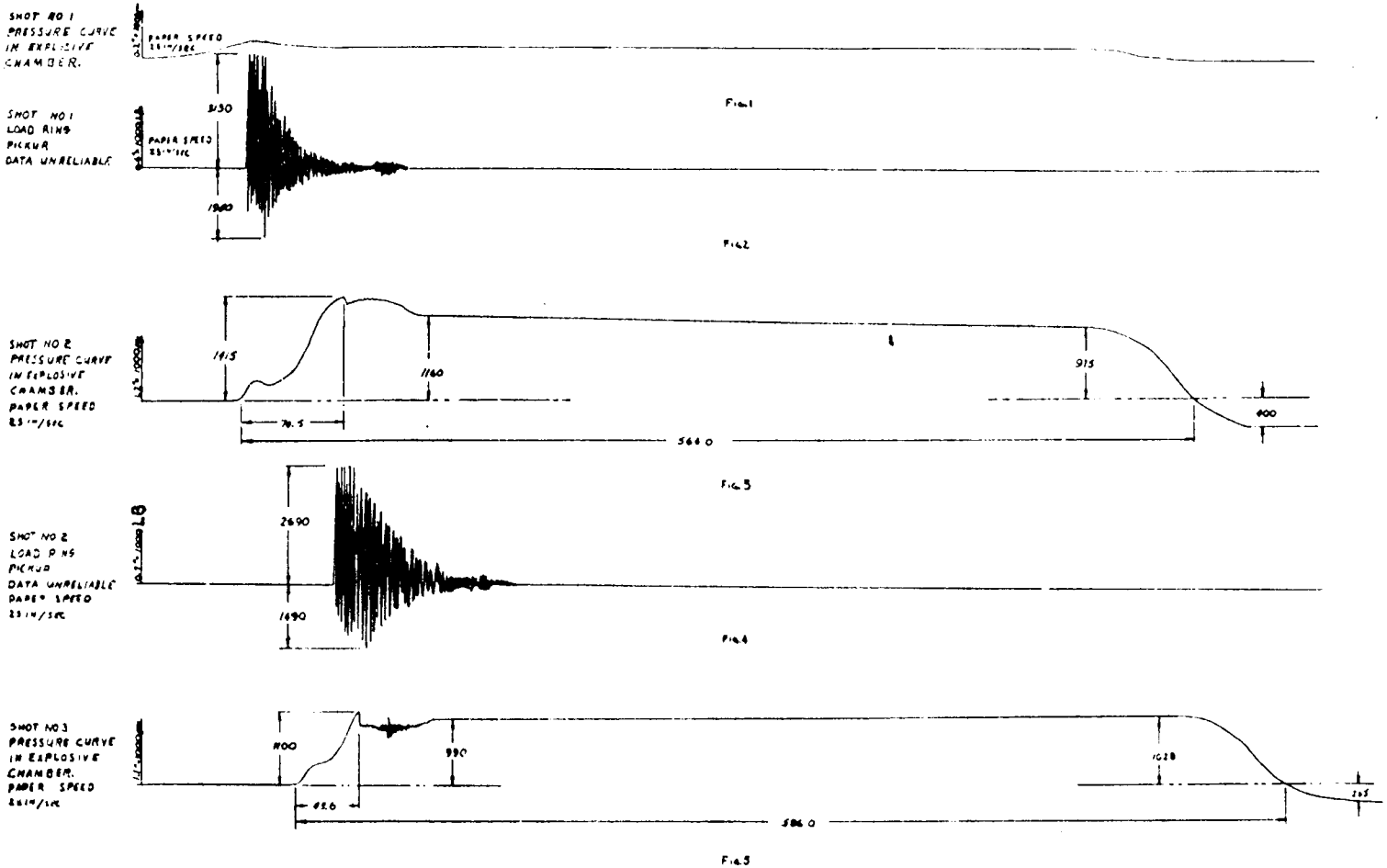
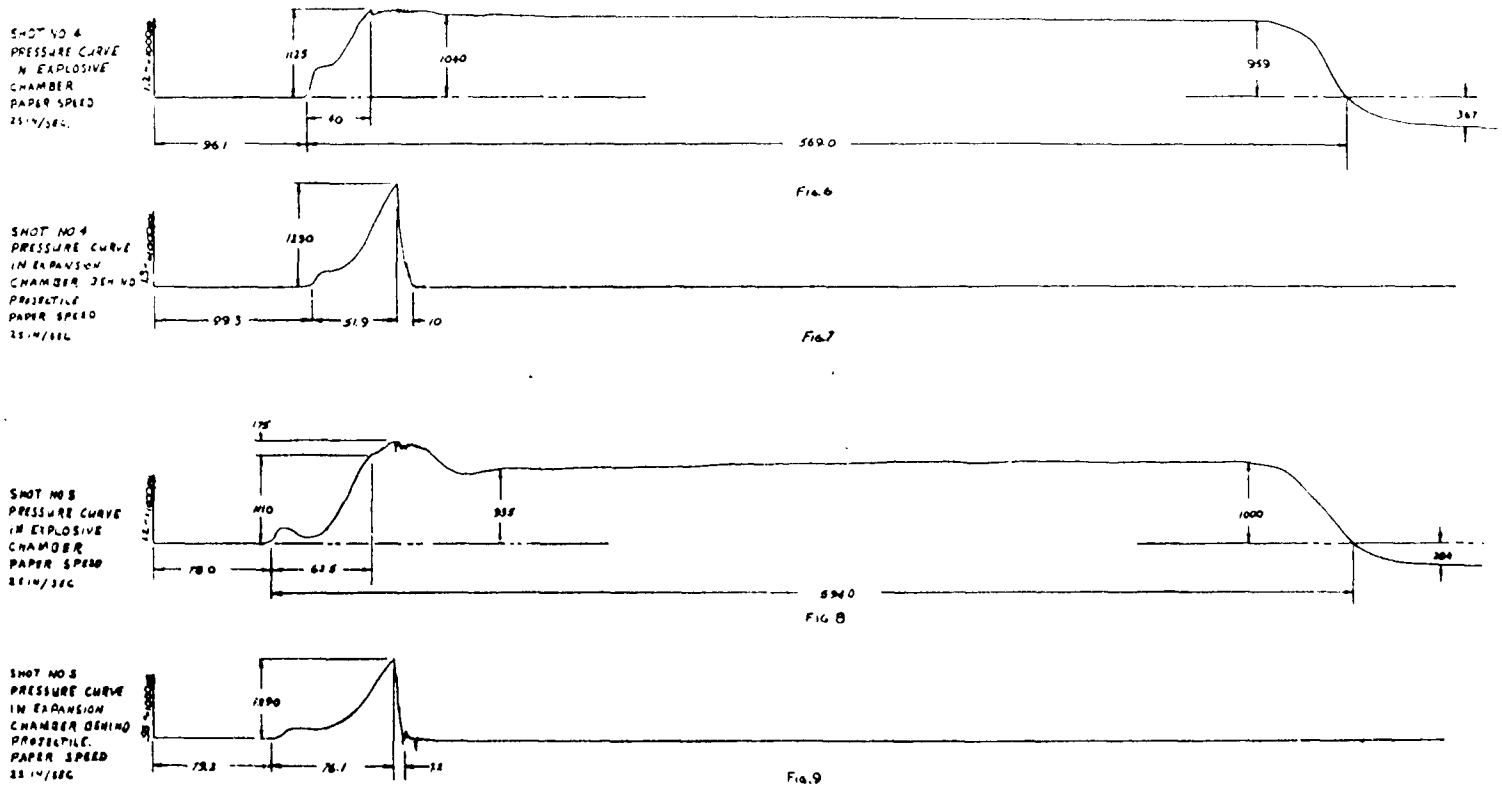


FIGURES 1, 2, 3, 4, and 5 PRESSURE-TIME AND FORCE-TIME CURVES FOR

D# 106213 SHOTS 1, 2, AND 3. (1/3 ACTUAL SIZE)

(TIME PLOTTED IN MILLISECONDS)

#1259



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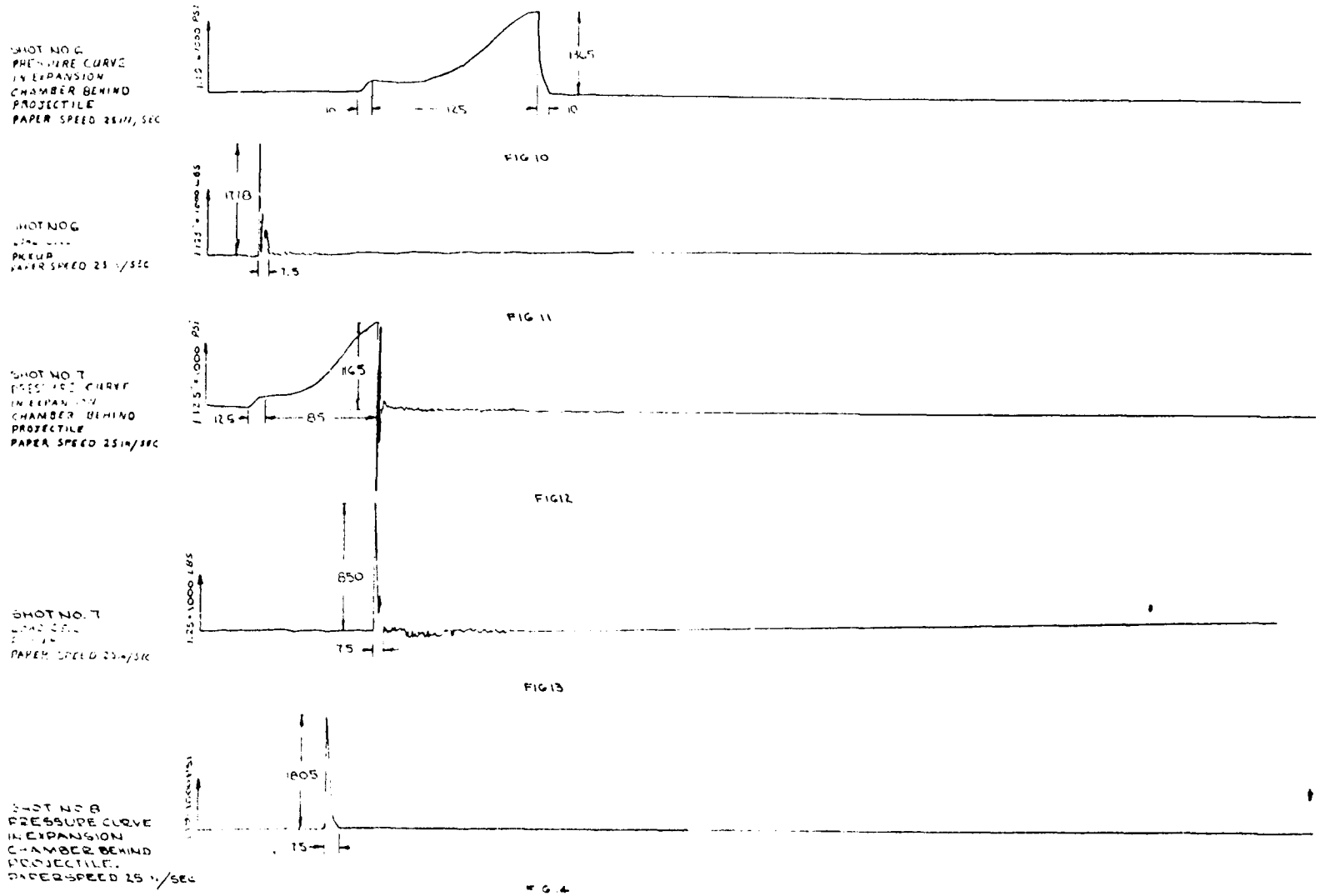
FIGURES 6, 7, 8, and 9 PRESSURE-TIME CURVES FOR SHOTS 4 AND 5

(1/3 ACTUAL SIZE) (TIME PLOTTED IN MILLISECONDS)

ET - 6056

#1260

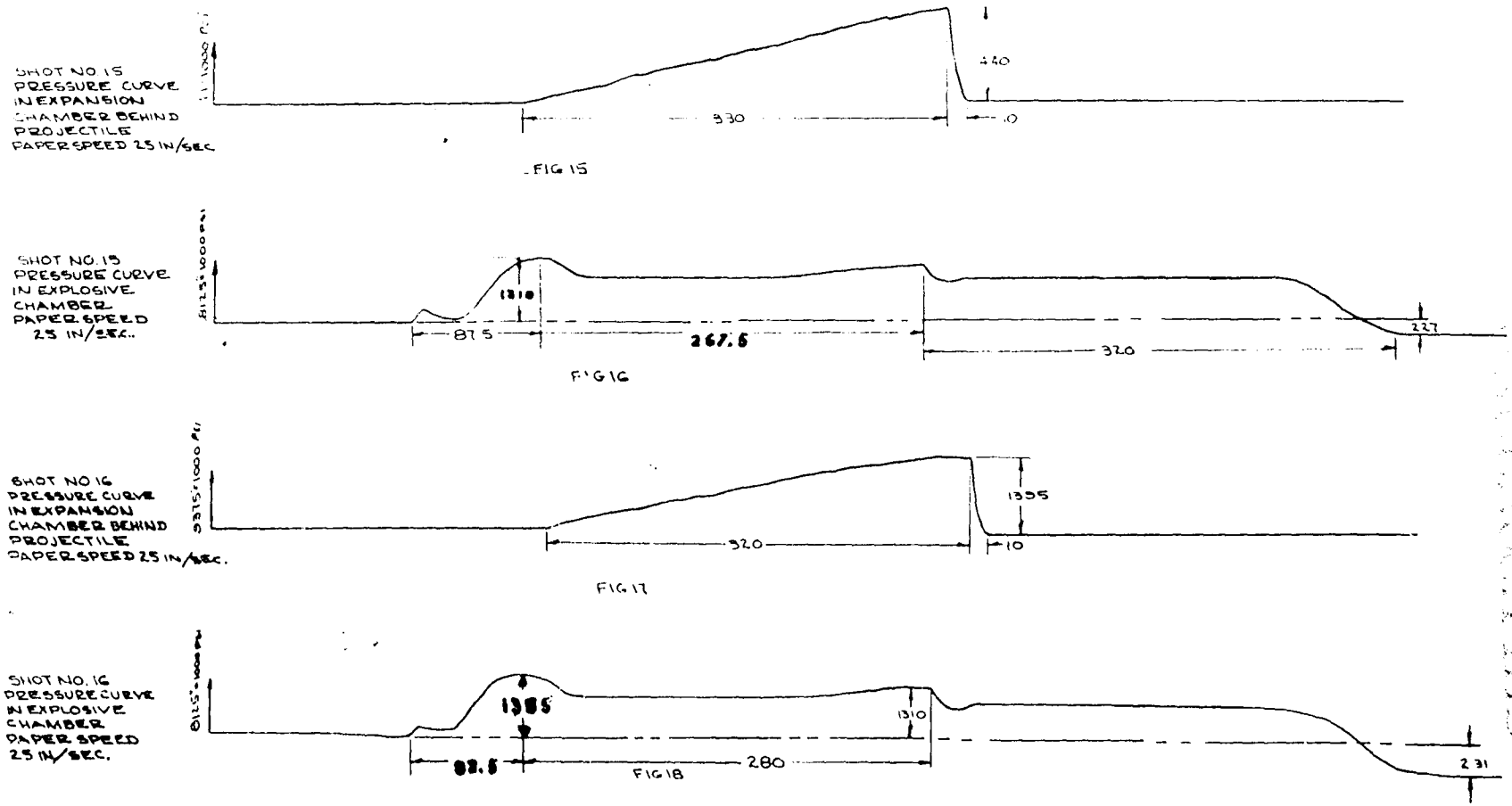


FIGURES 10, 11, 12, 13, AND 14 PRESSURE-TIME AND FORCE-TIME CURVES FOR SHOTS 6, 7, AND 8 (1/3 ACTUAL SIZE)

(TIME PLOTTED IN MILLISECONDS)

D# 106212

#1261



FIGURES 15, 16, 17, and 18 PRESSURE-TIME CURVES FOR SHOTS 15 AND 16

D #106208 (1/3 ACTUAL SIZE) (TIME PLOTTED IN MILLISECONDS)

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#1263

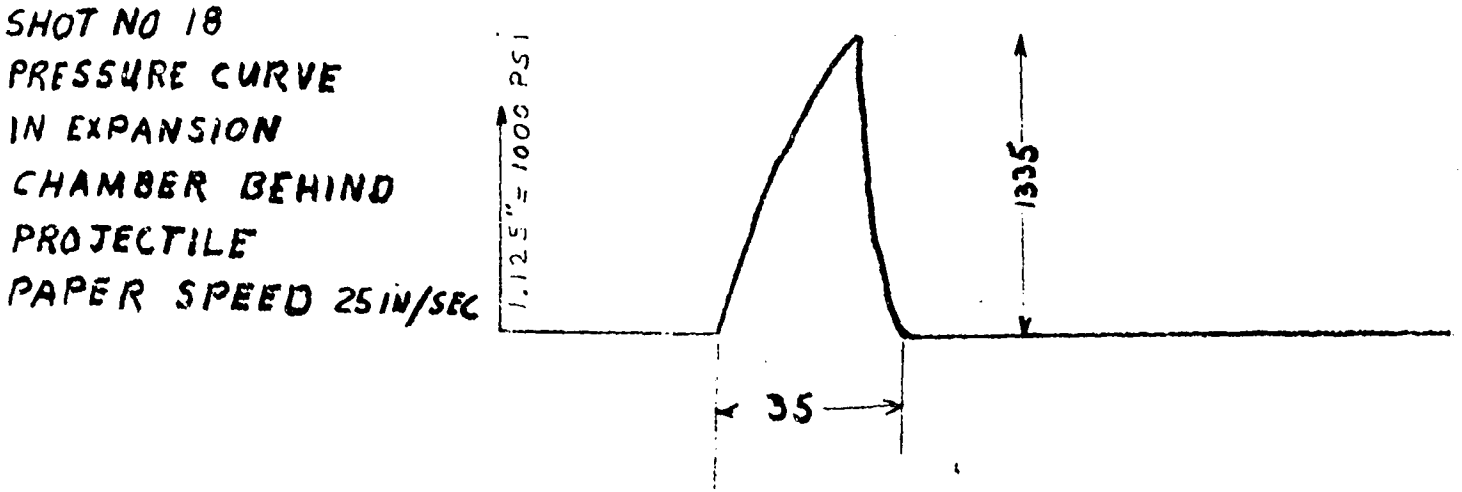

FIG. NO 19

FIGURE 19 PRESSURE-TIME CURVE FOR SHOT 18 (ACTUAL SIZE)

D# 106214 (TIME PLOTTED IN MILLISECONDS)

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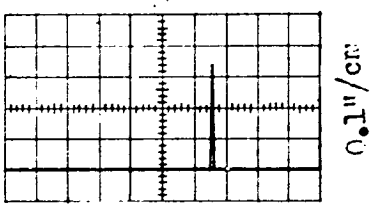
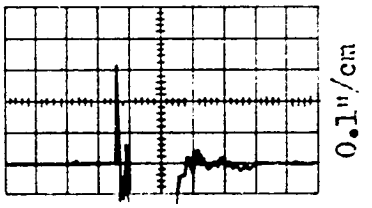


50 ms/cm

Figure 20



50 ms/cm

Figure 21

D# 106209

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Figures 20 & 21 Displacement Profile for Shots No. 11 and 12

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#1265

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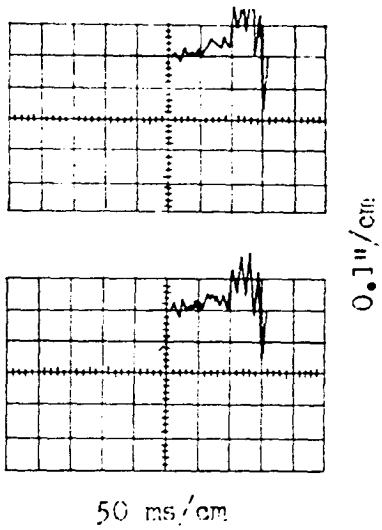

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Figure 22 Displacement Profile for Shot No. 9

[redacted]

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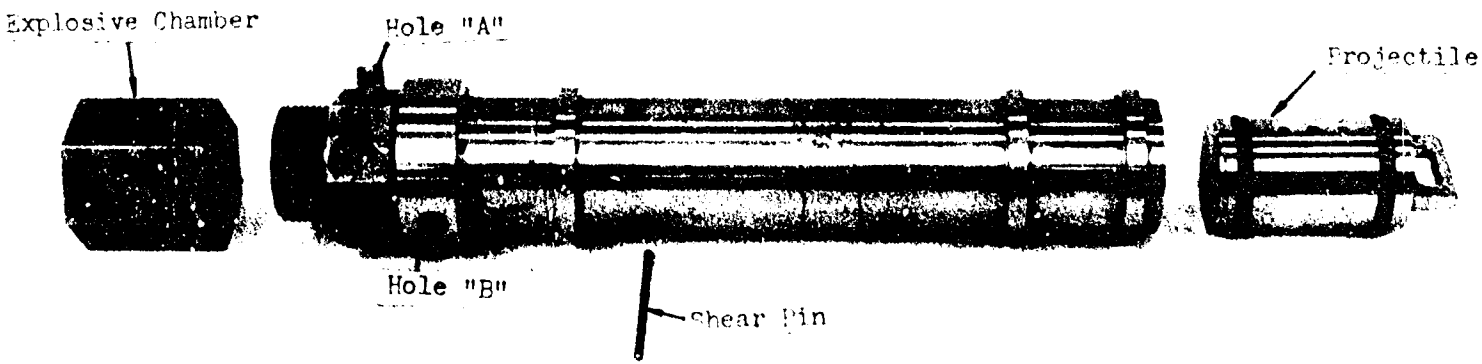

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FIG. 23 DROGUE GUN AND ITS COMPONENTS

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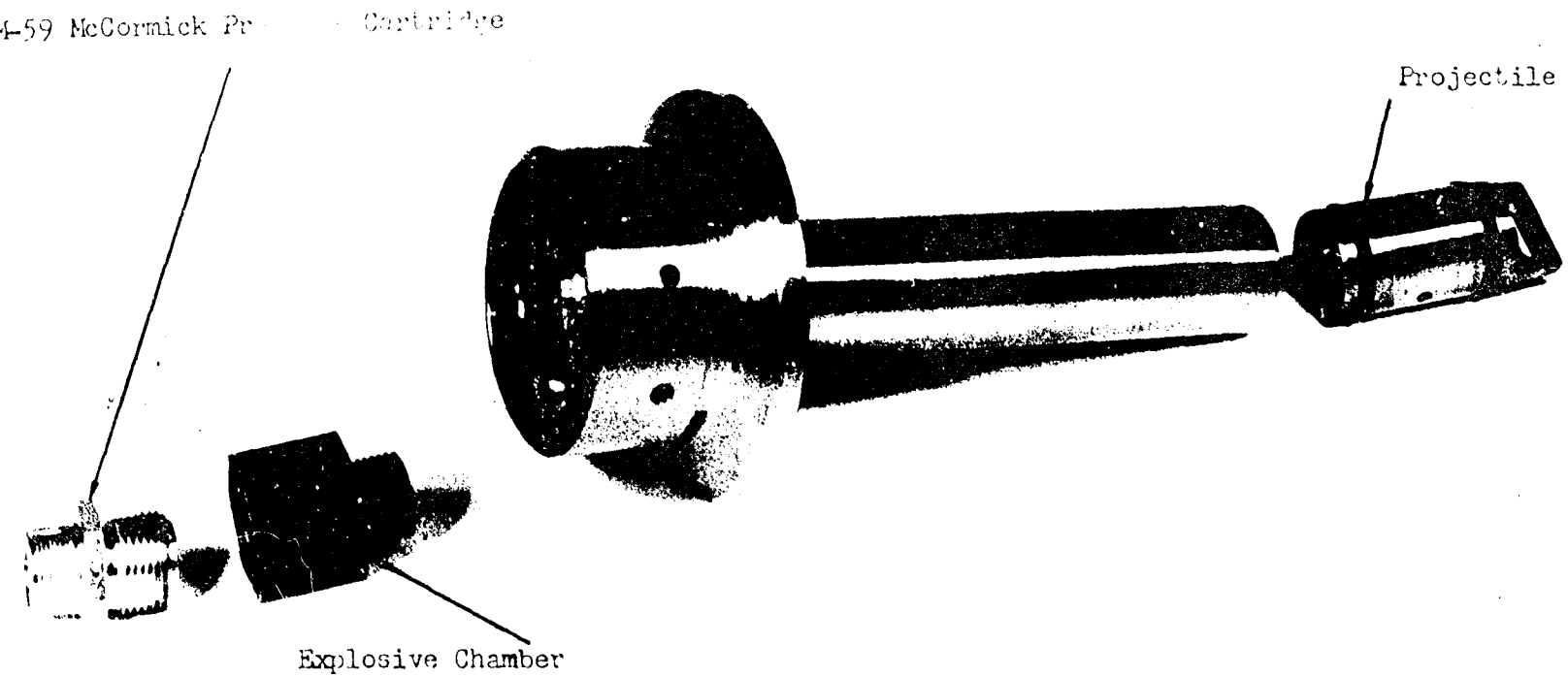

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D# 106142

FIG. 24 DROGUE GUN AND ITS COMPONENTS

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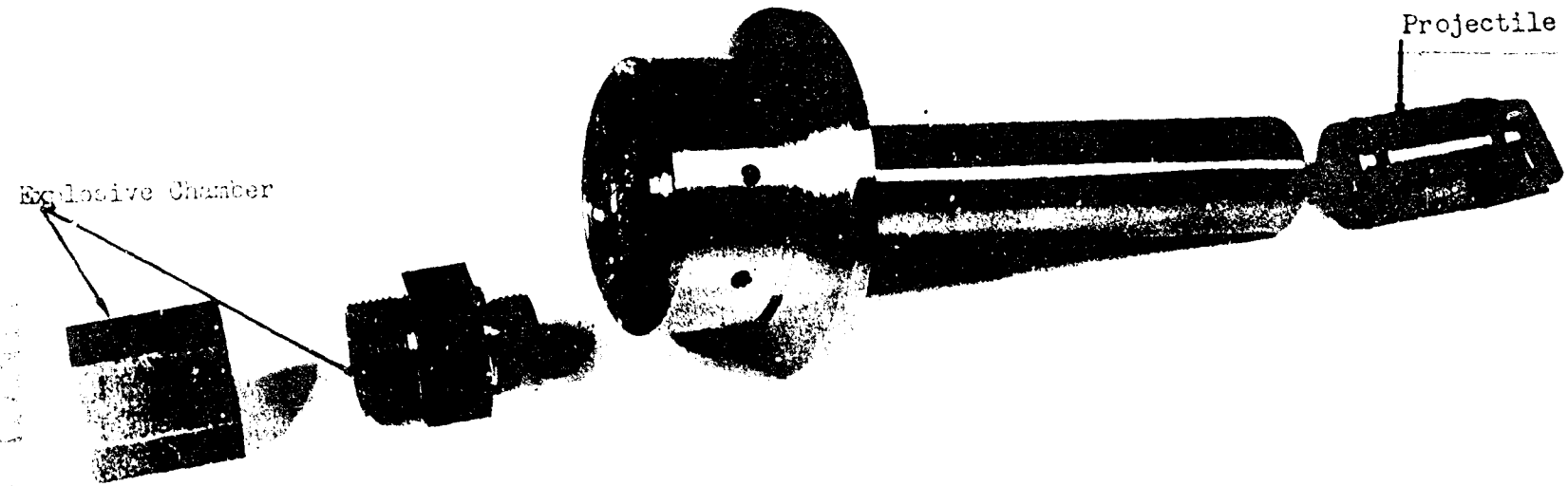

D#106143

FIG. 25 DROGUE GUN AND ITS COMPONENTS

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#1768

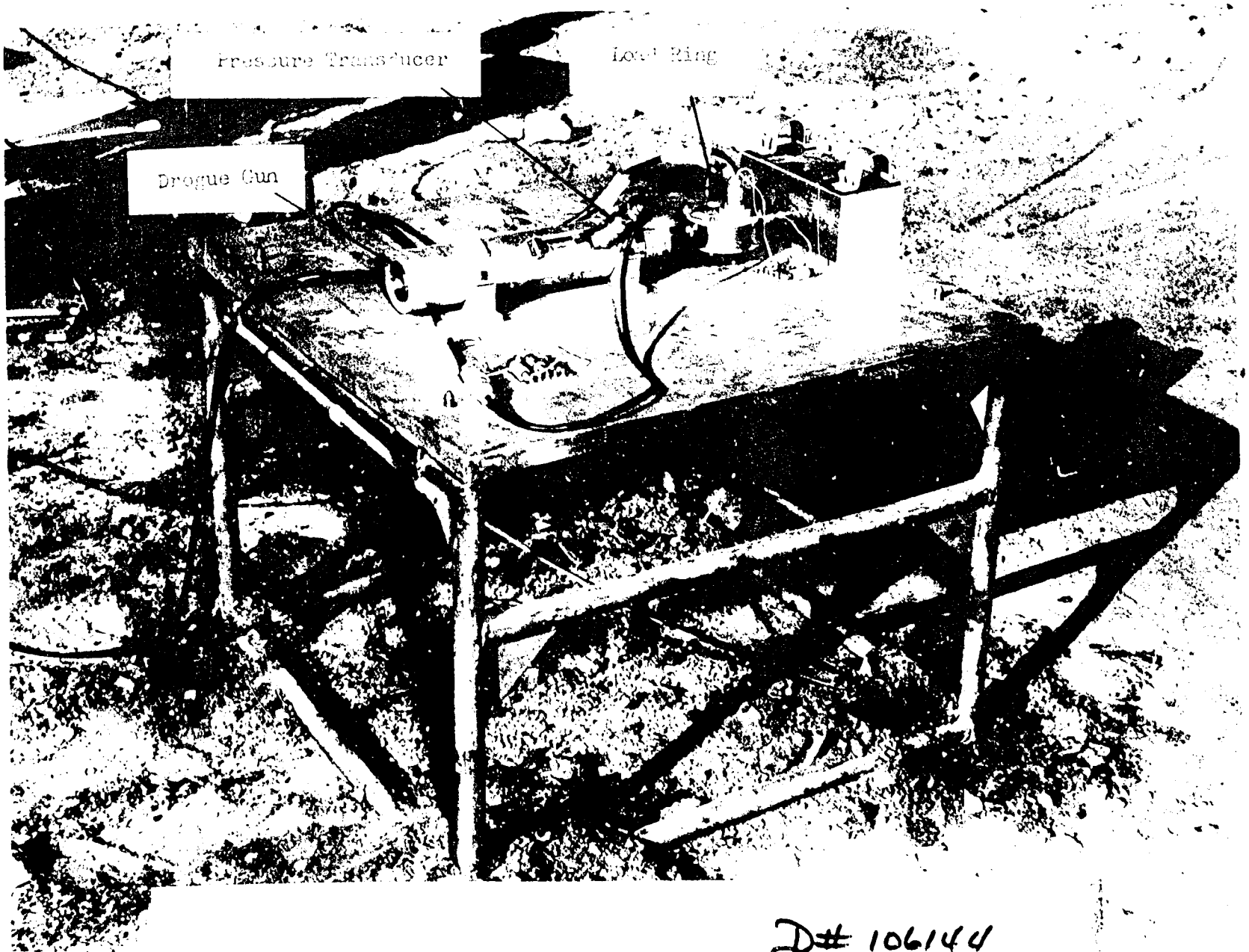

FIG. 26 TEST SETUP PRIOR TO SHOT 1

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#1270

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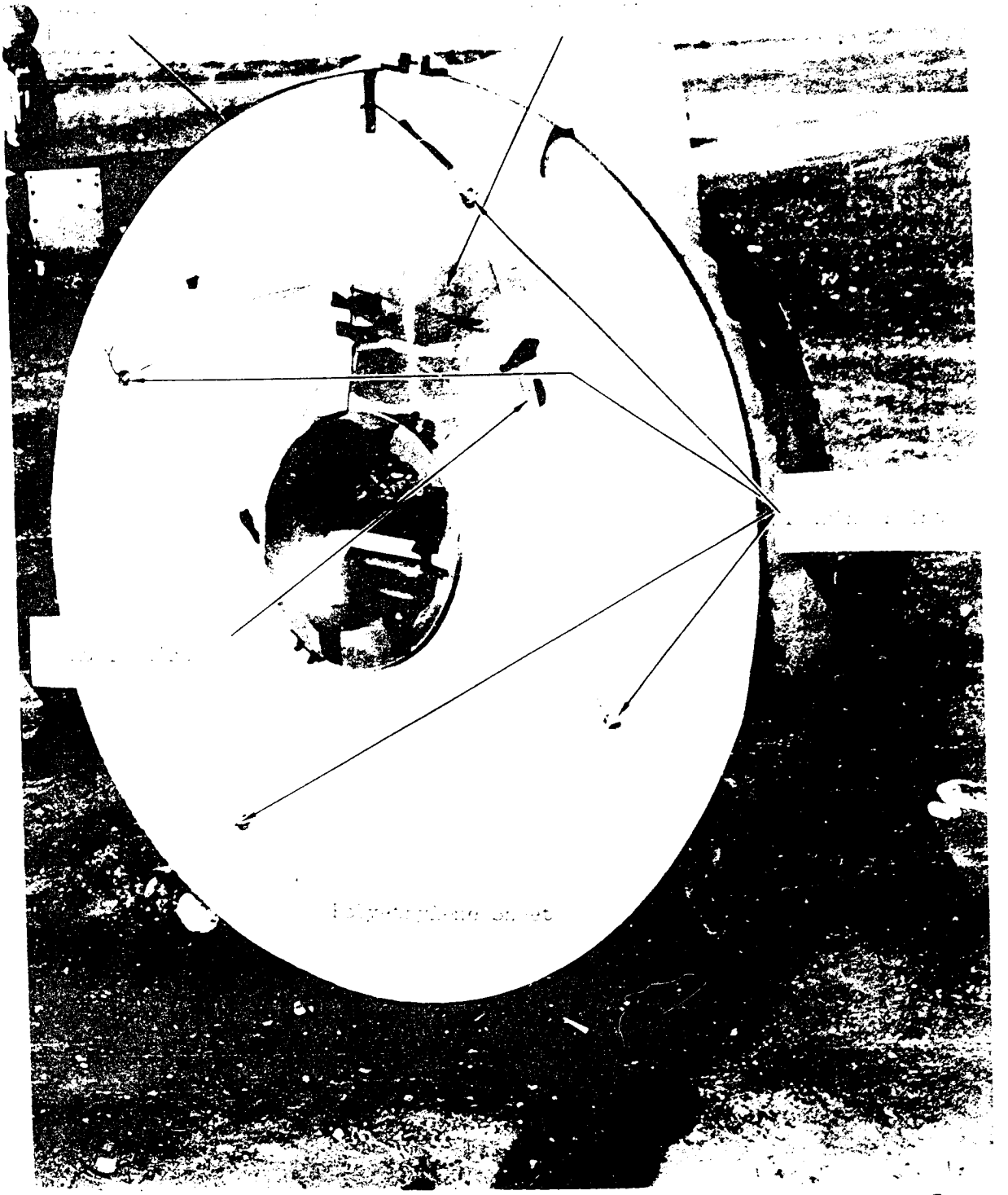

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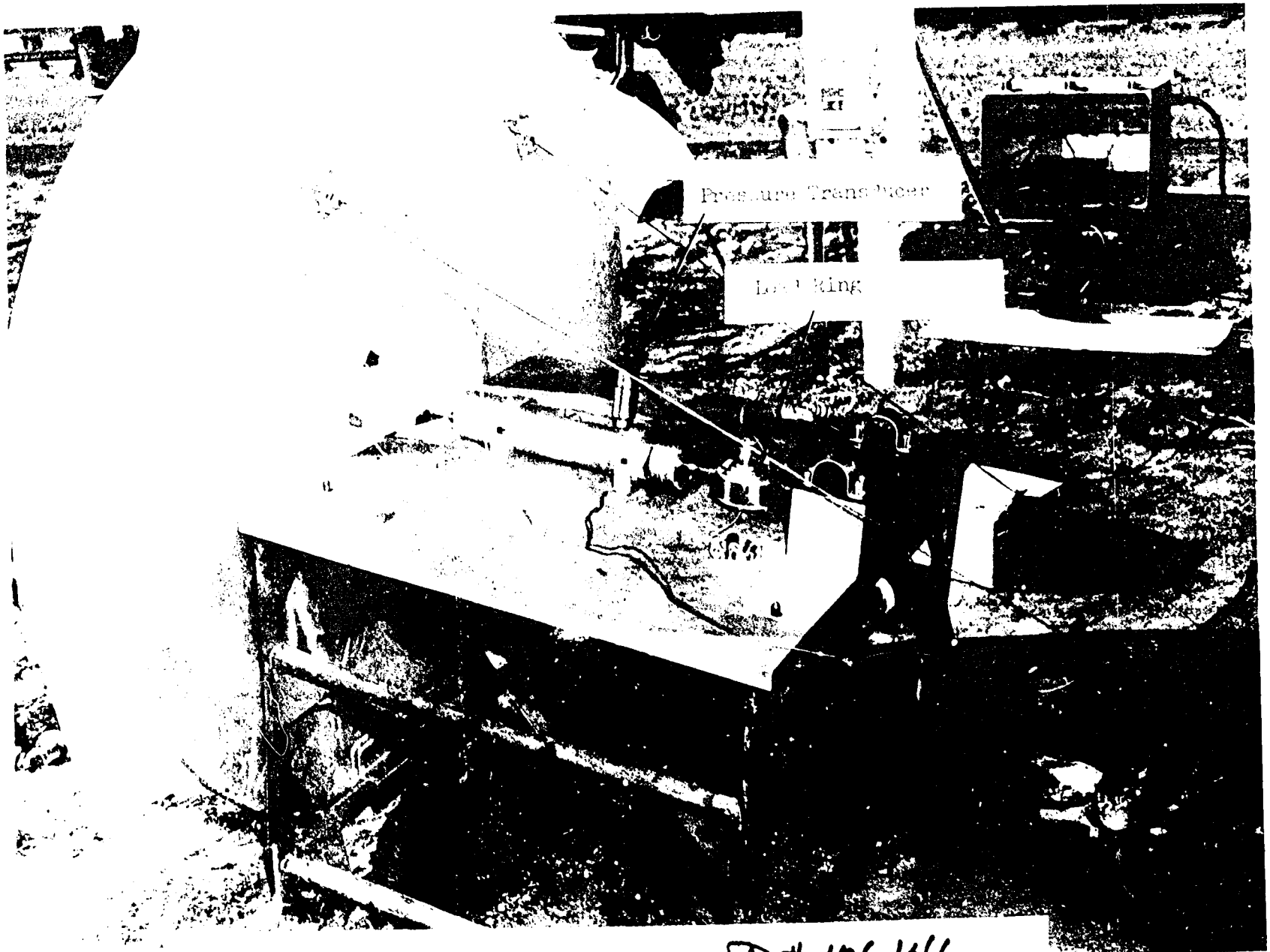
#1271



D#106146

FIG. 29 VIEW OF AFTERBODY FOLLOWING SHOT 2 (DROGUE GUN)

D#106147

ST - 6056

#12.72

#1273

[redacted]

UNCLASSIFIED

FIG. 30 VIEW OF AFTER ONE FOLLOWING [illegible]

D# 106148

[redacted]

UNCLASSIFIED

UNCLASSIFIED

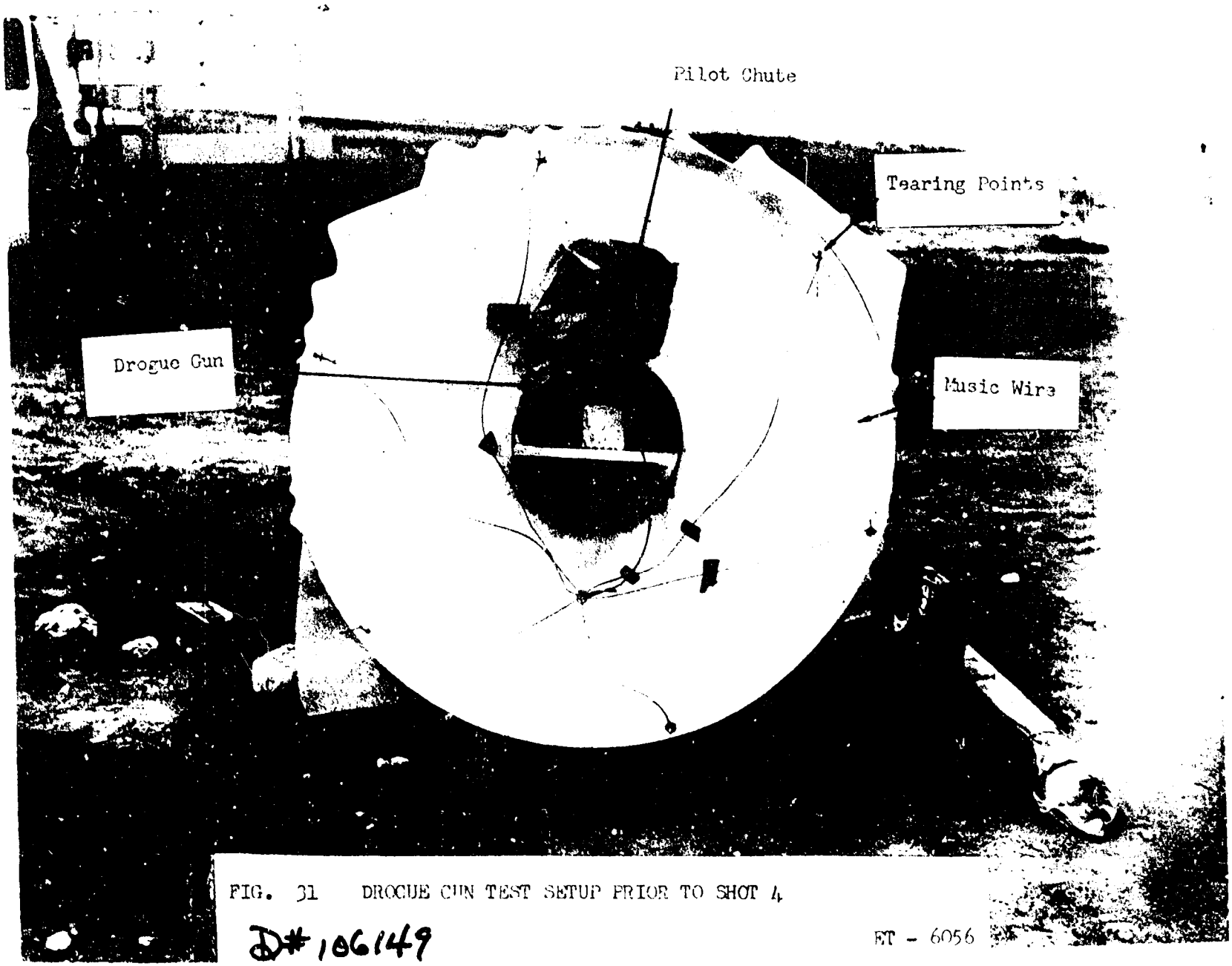


FIG. 31 DROGUE GUN TEST SETUP PRIOR TO SHOT 4

D#106149

ET - 6056

UNCLASSIFIED

#1274

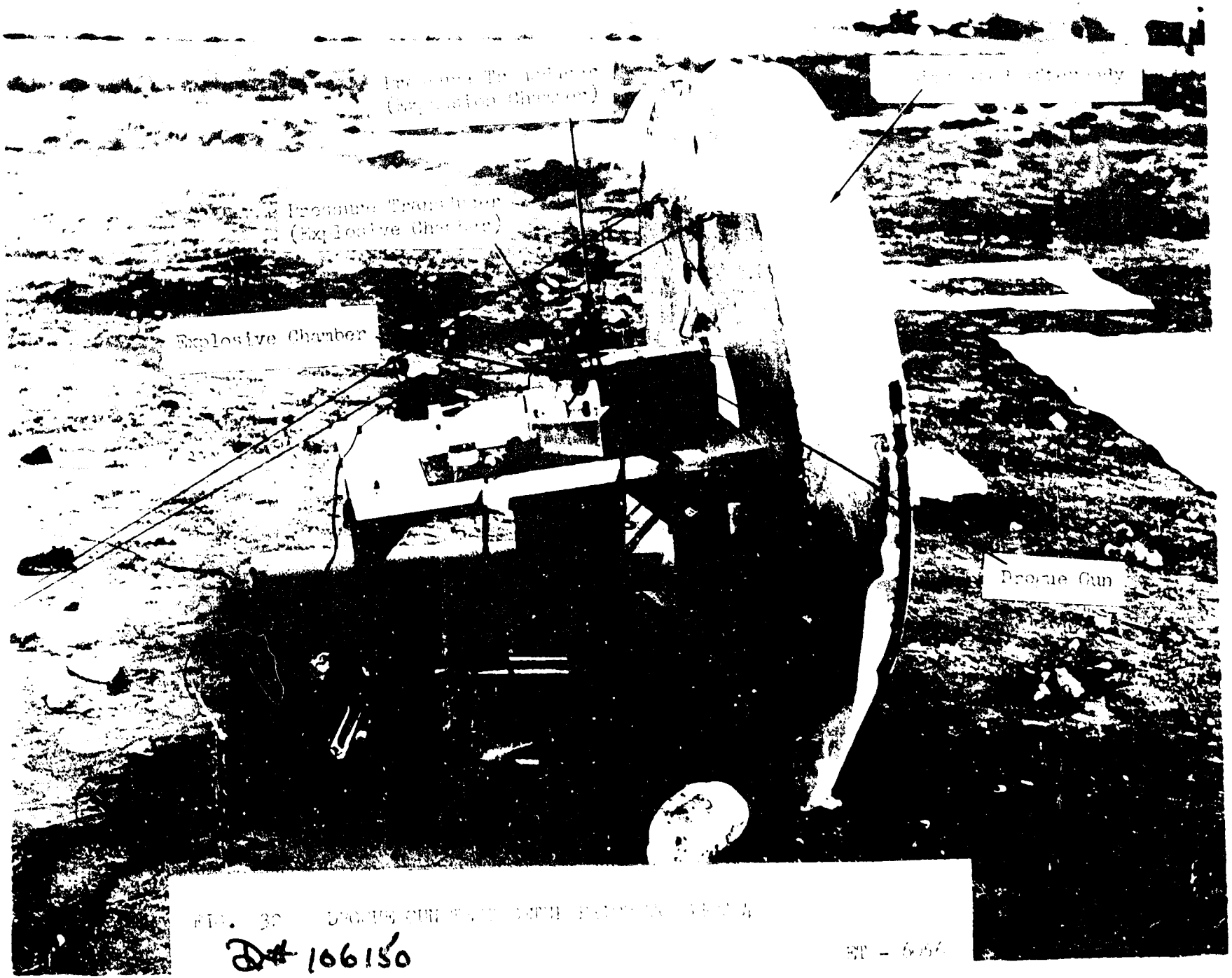


FIG. 32 [illegible]

D# 106150

UNCLASSIFIED

#1275

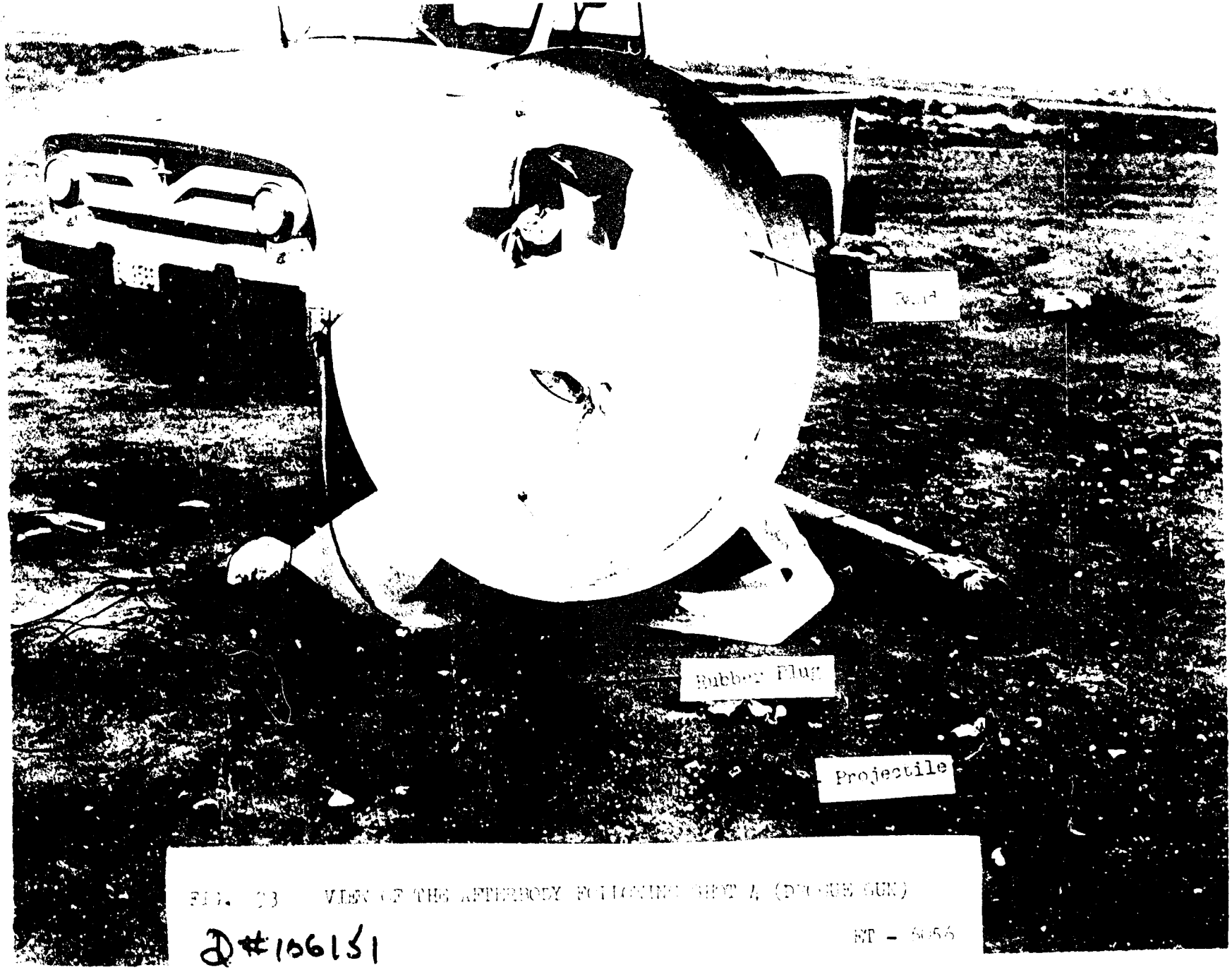


FIG. 23 VIEW OF THE AFTERBODY FOLLOWING SHOT 4 (DROGUE GUN)

D#106151

ET - 6056

#12.76

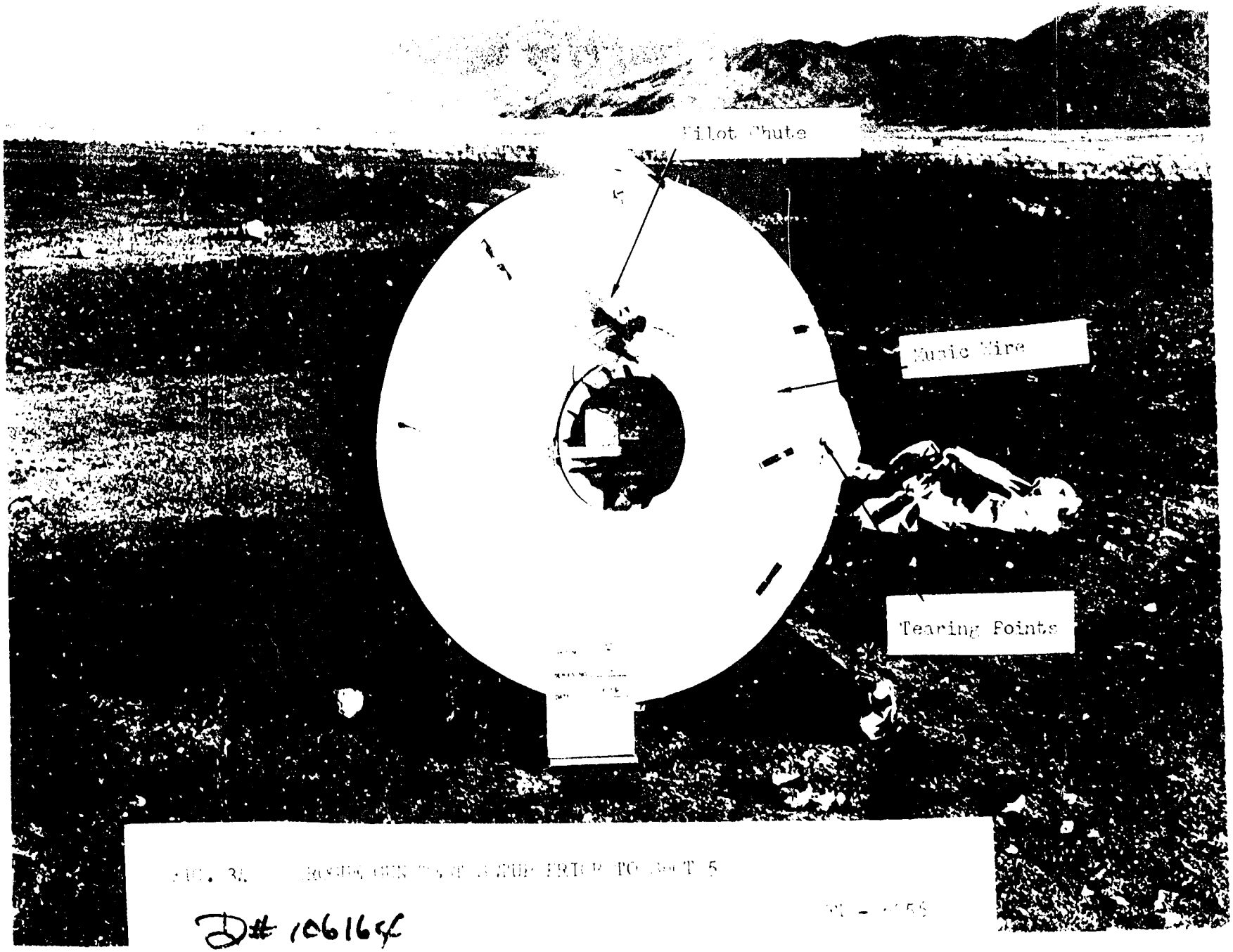


FIG. 3A [illegible] PRIOR TO [illegible] 5

D# 106164

#1277

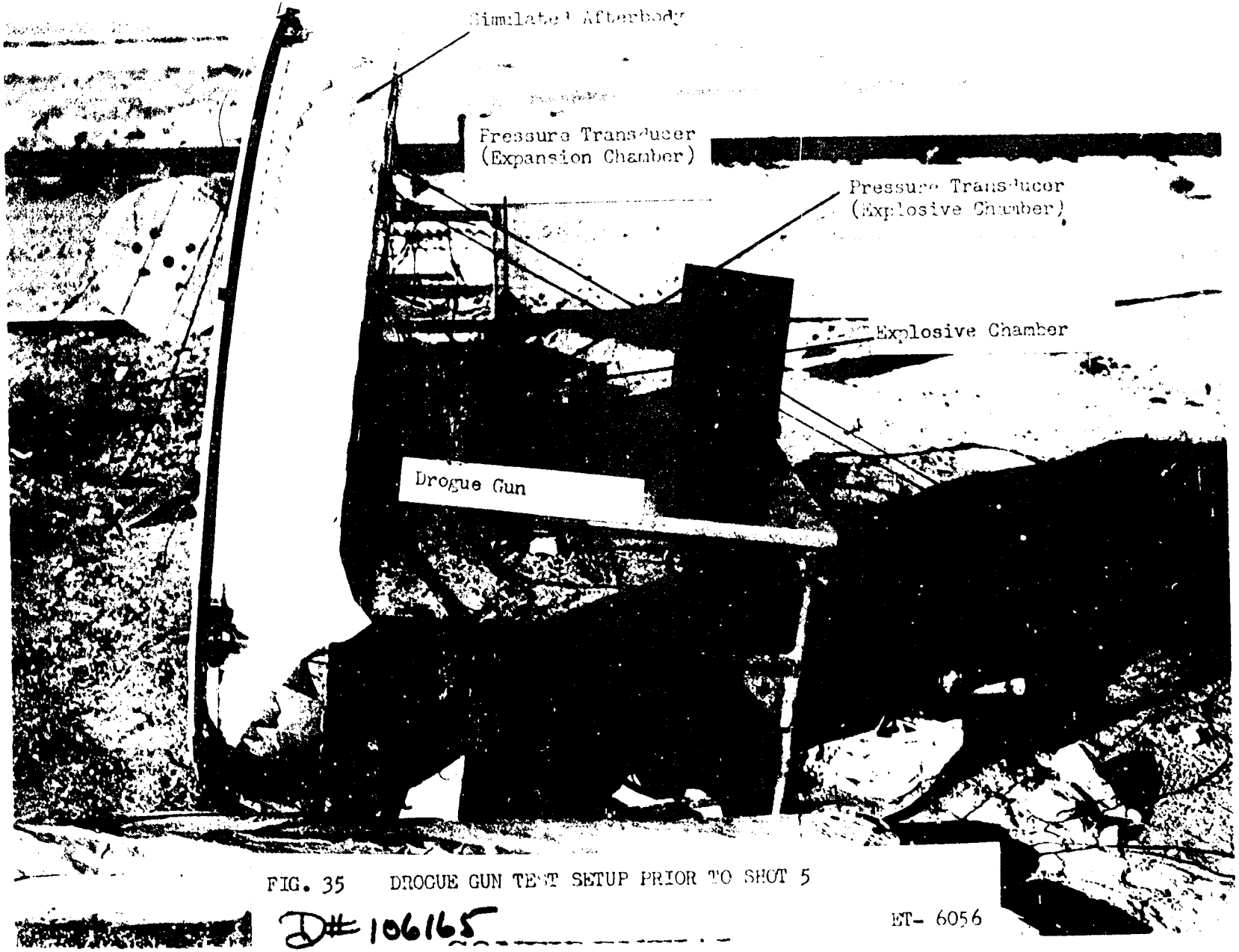


FIG. 35 DROGUE GUN TEST SETUP PRIOR TO SHOT 5

D# 106165

ET- 6056

UNCLASSIFIED

UNCLASSIFIED

#1278

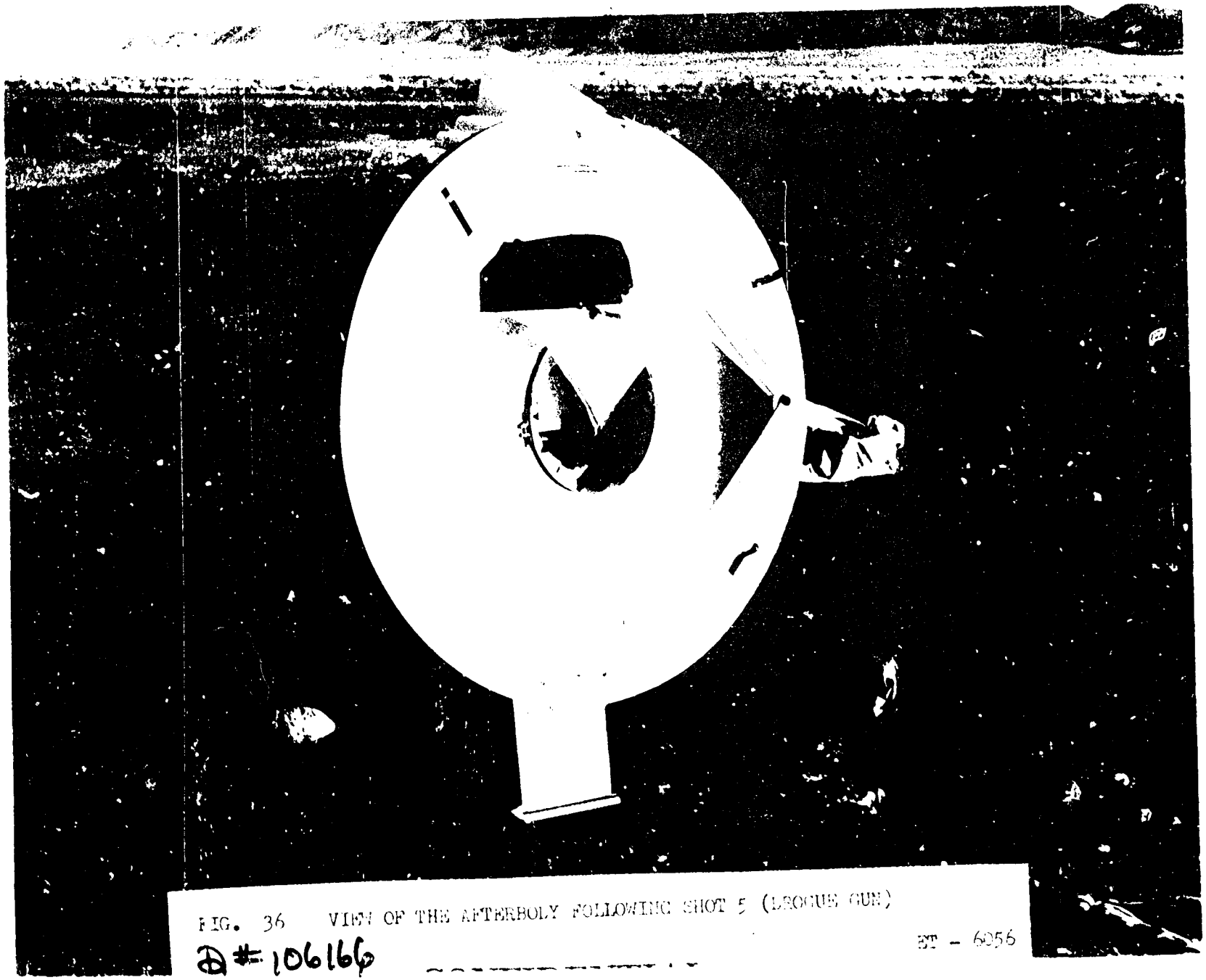


FIG. 36 VIEW OF THE AFTERBODY FOLLOWING SHOT 5 (DROGUE GUN)

ET - 6056

D #106166

#1279

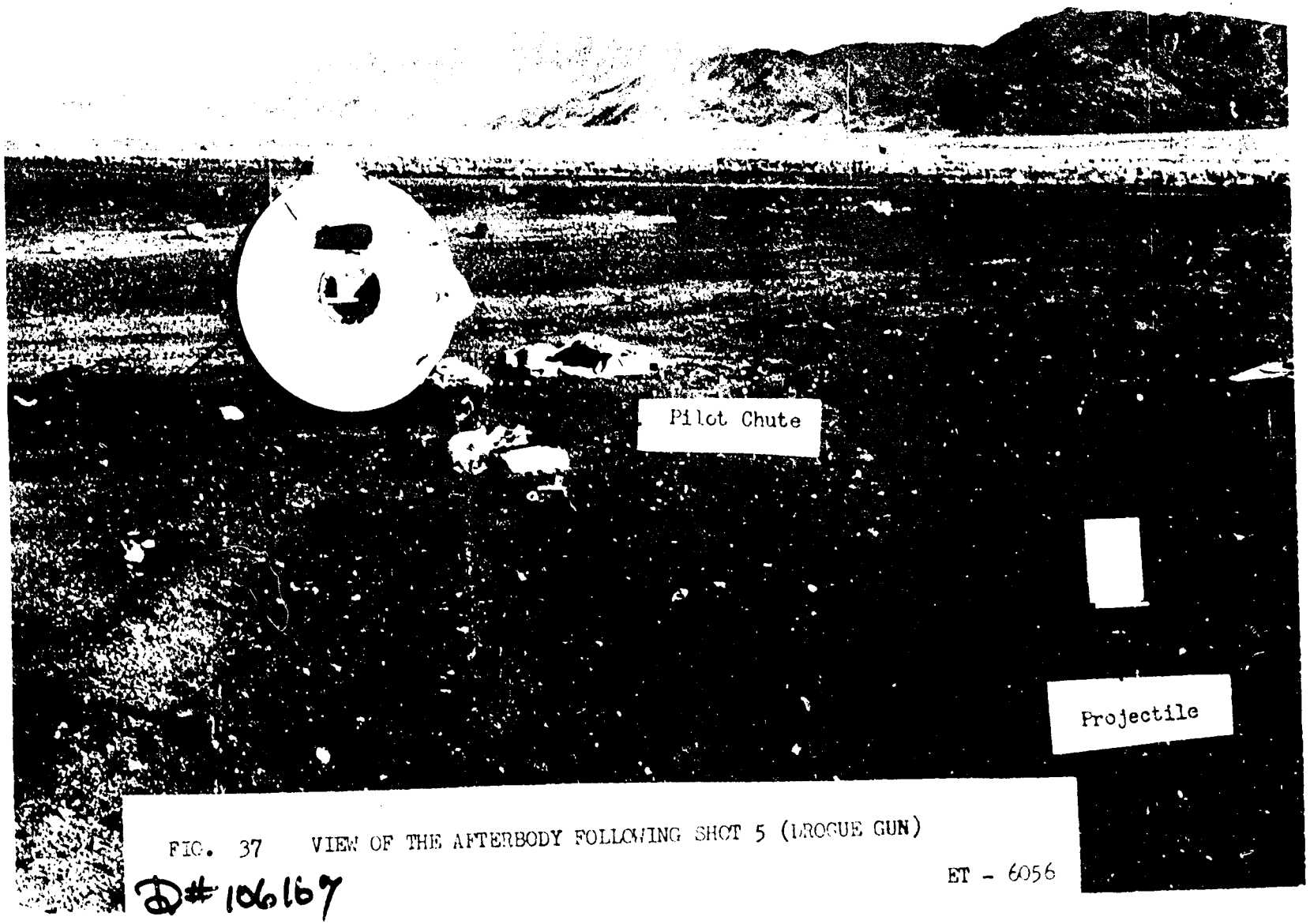


FIG. 37 VIEW OF THE AFTERBODY FOLLOWING SHOT 5 (DROGUE GUN)

ET - 6056

D# 106167

UNCLASSIFIED

#71280

[redacted]

#1281

UNCLASSIFIED

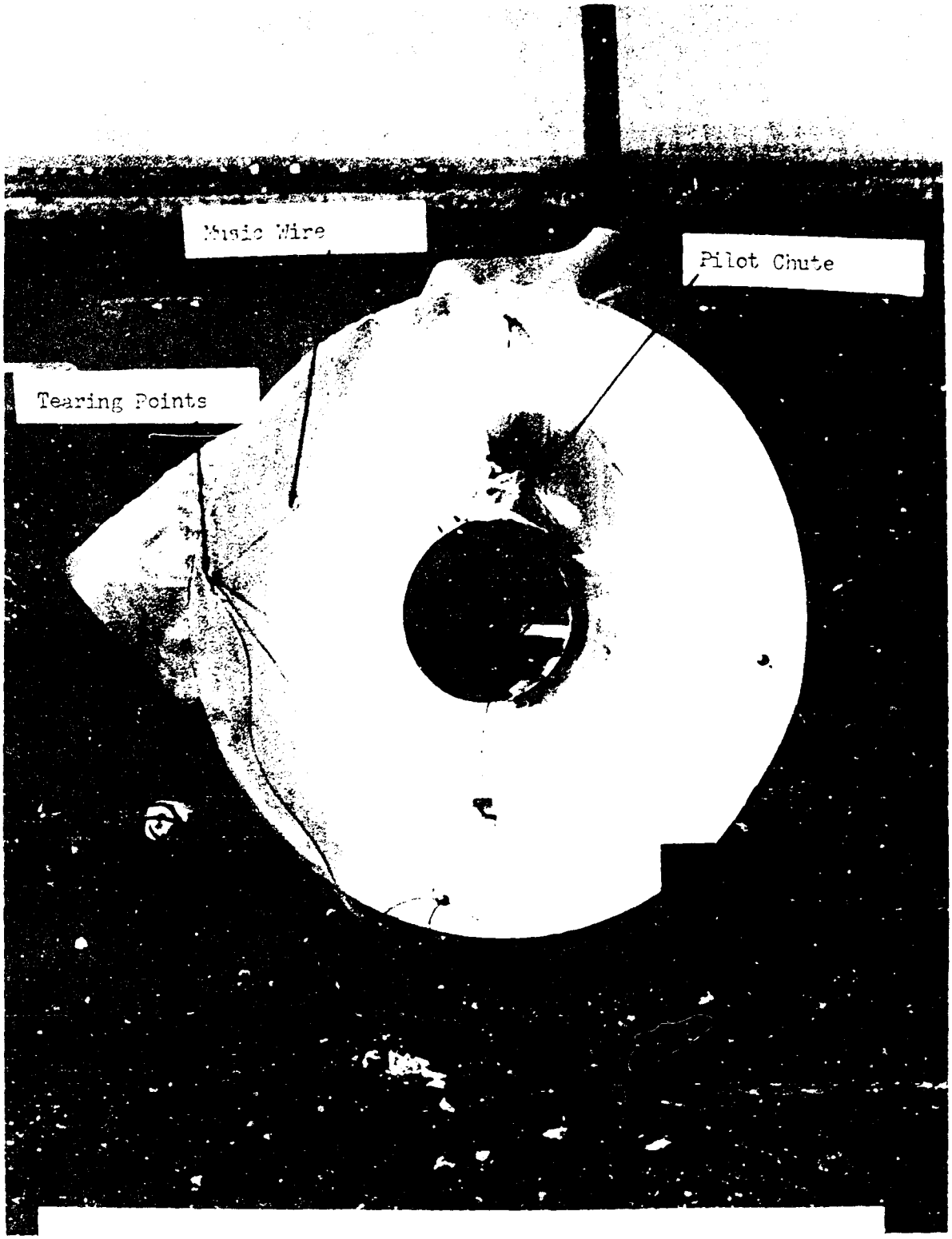


FIG. 38 DROGUE GUN TEST SETUP PRIOR TO SHOT 6

D# 106176

ET - 6056

UNCLASSIFIED

[redacted]

FIG. 39 DROGUE GUN TEST SETUP PRIOR TO SHOT 6

ET - 6056

D# 106177

UNCLASSIFIED

#1282

FIG. 40 VIEW OF AFTERBODY FOLLOWING SHOT 6 (EPONITE GUN)

UNCLASSIFIED

D#106178

#1283

FIG. 42 DROGUE GUN TEST SETUP PRIOR TO SHOT 7

D#106179

ET - 6056

UNCLASSIFIED

#1284

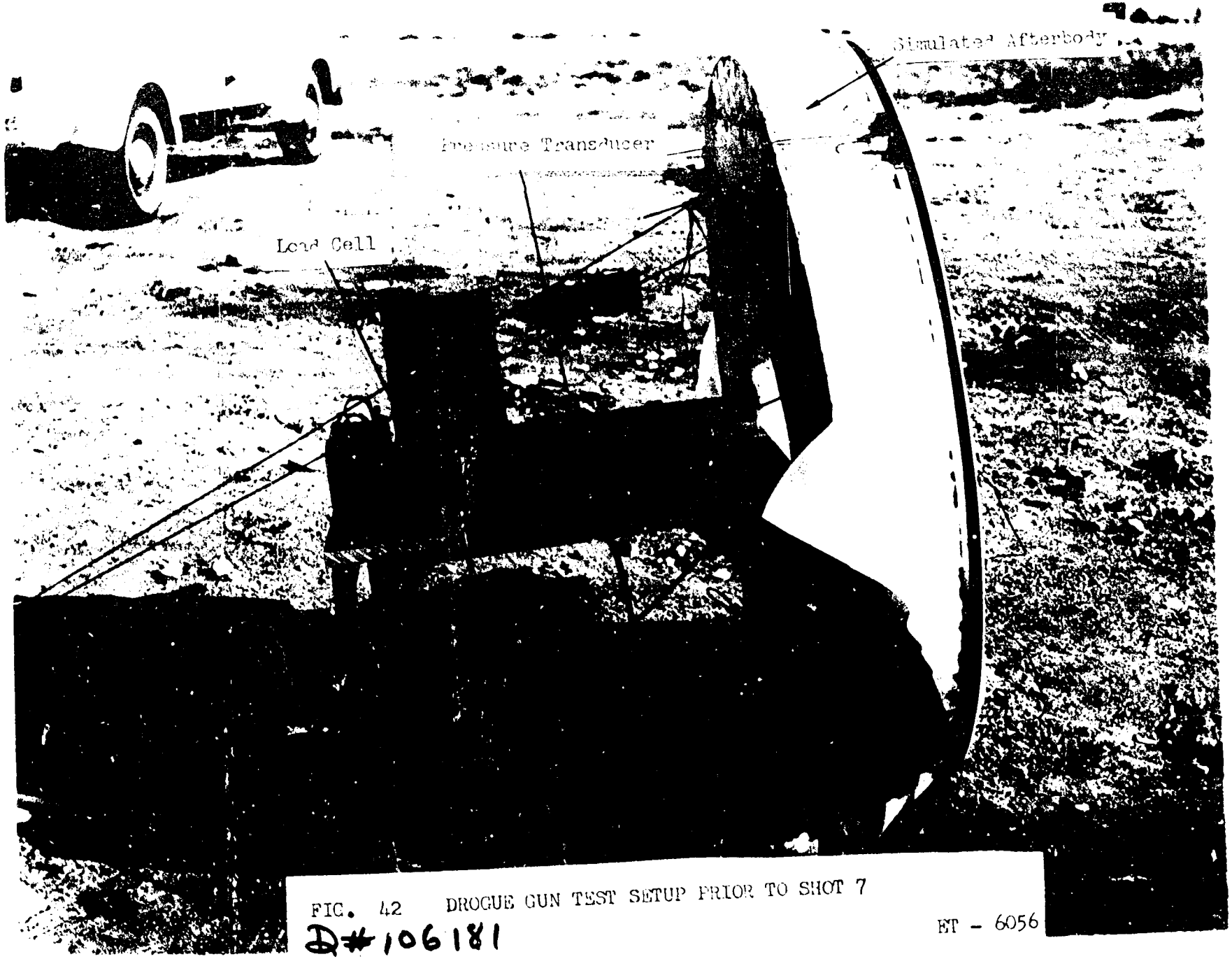


FIG. 42 DROGUE GUN TEST SETUP PRIOR TO SHOT 7

D#106181

ET - 6056

UNCLASSIFIED

#1285

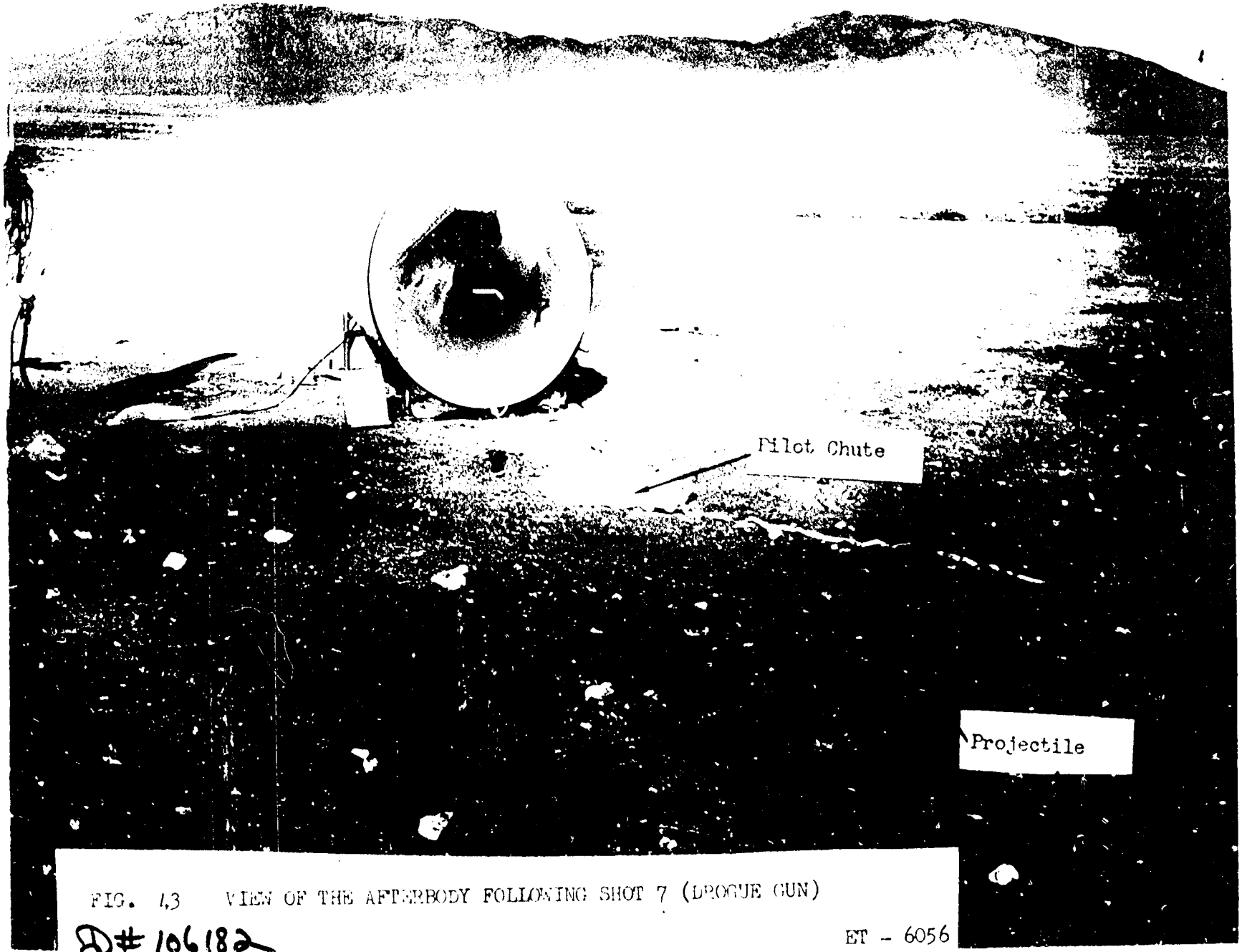


FIG. 43 VIEW OF THE AFTERBODY FOLLOWING SHOT 7 (DROGUE GUN)

D# 106182

ET - 6056

#1286

UNCLASSIFIED

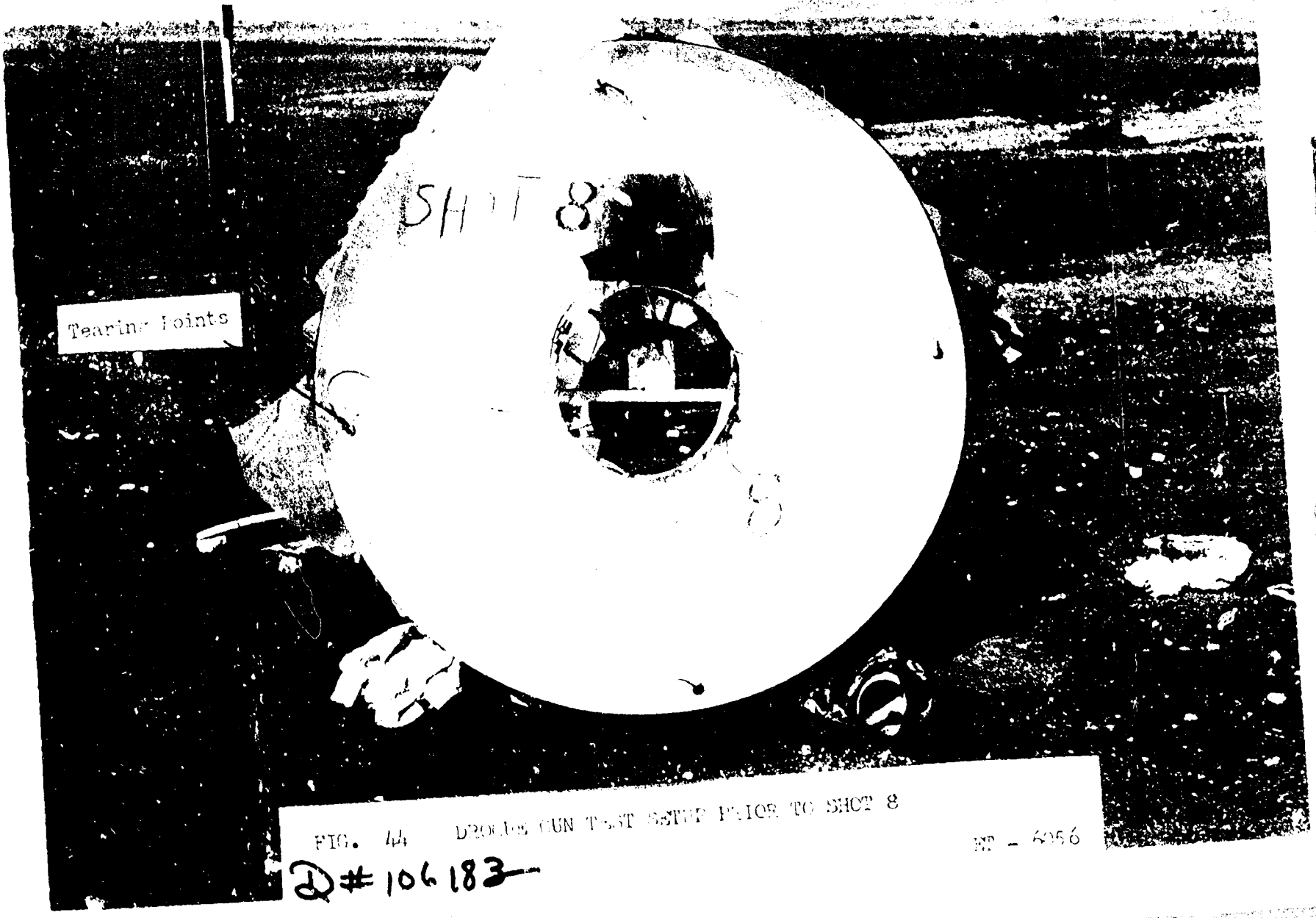


FIG. 44 DROPLET GUN TEST SETUP PRIOR TO SHOT 8

EP - 6056

D#106183

UNCLASSIFIED

#1287

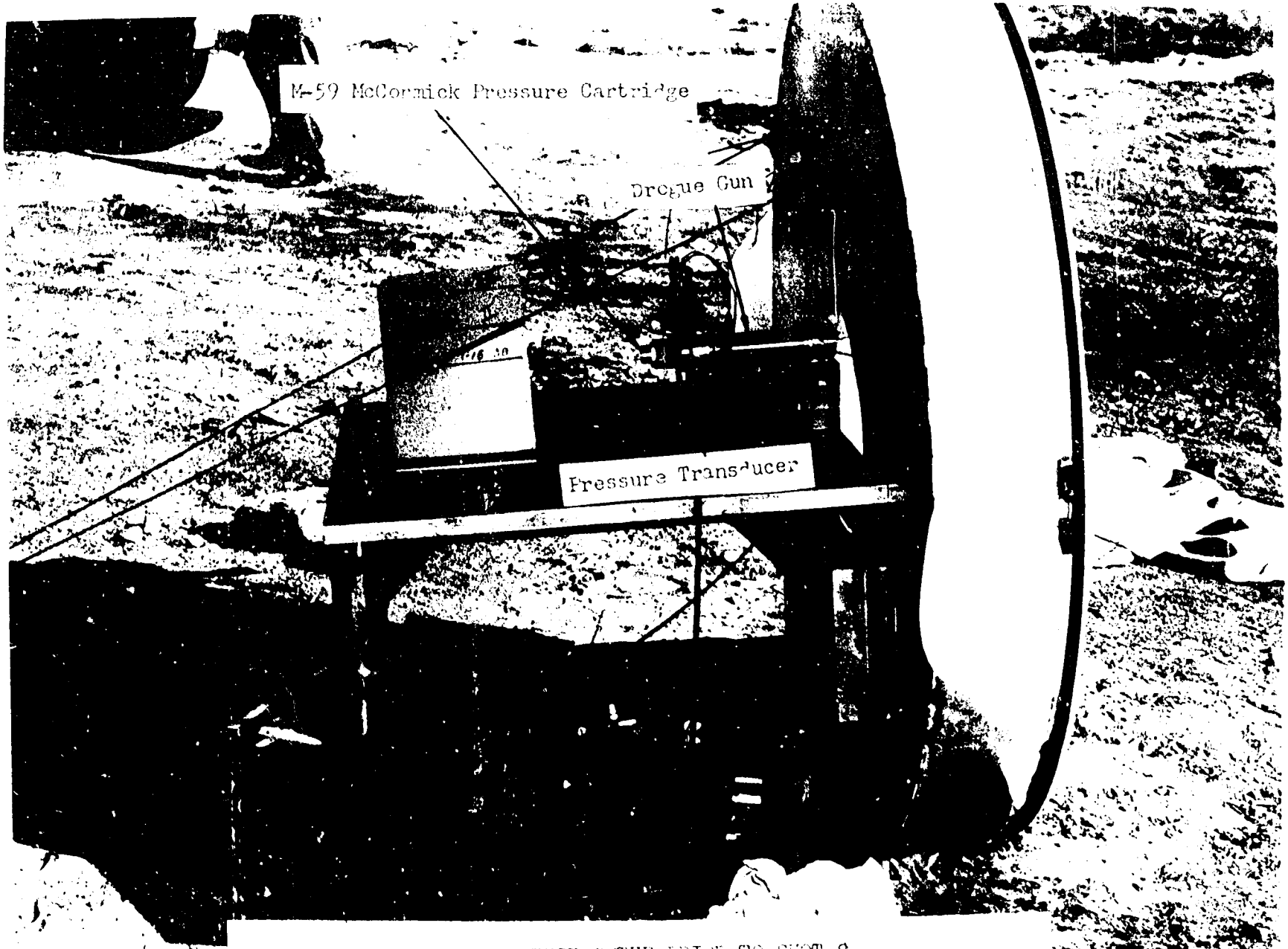


FIG. 45 DROGUE GUN TEST SETUP PRIOR TO SHOT 8

D# 106184

ET - 6056

#1288

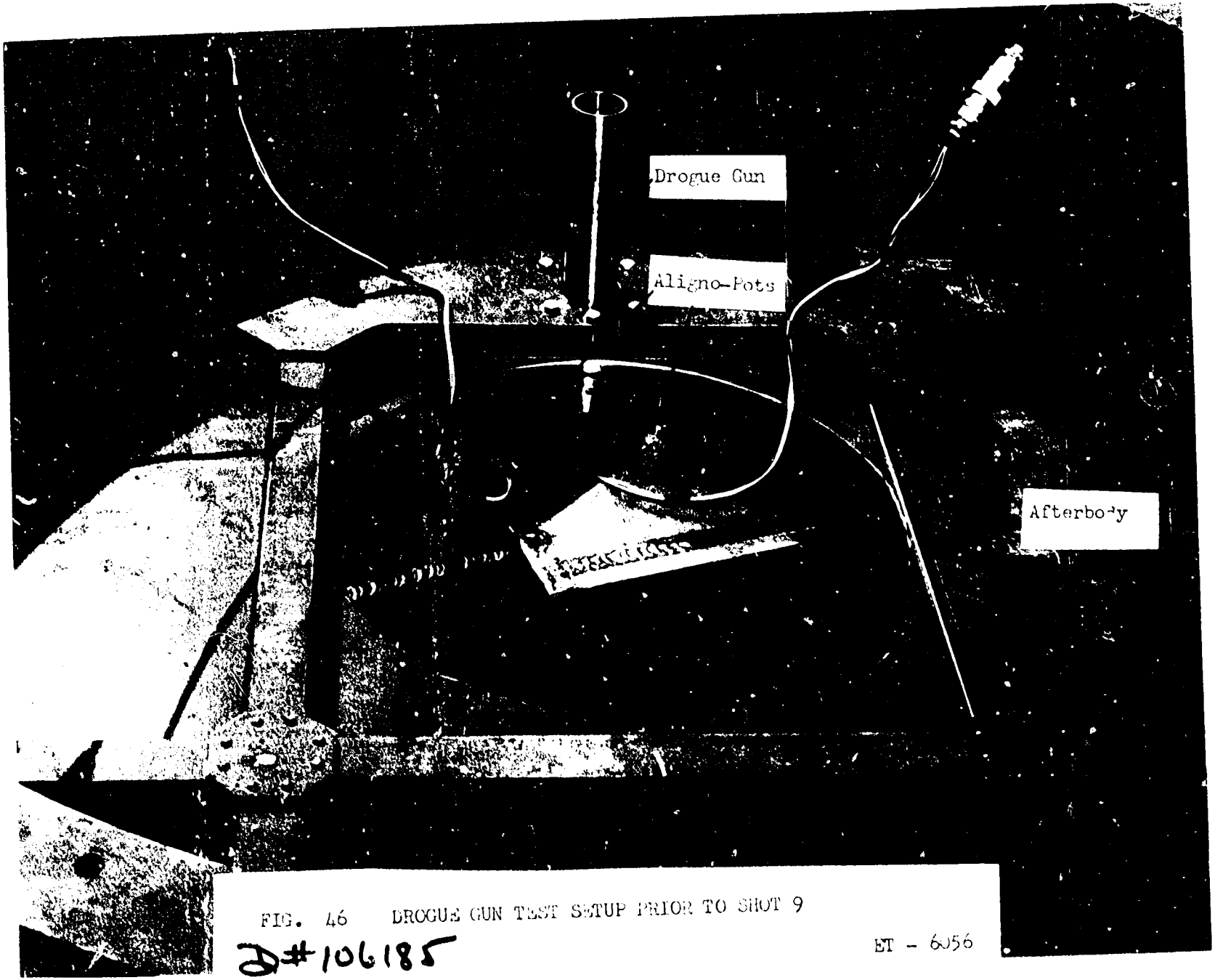


FIG. 46 DROGUE GUN TEST SETUP PRIOR TO SHOT 9

D#106185

ET - 6056

#1285

UNCLASSIFIED

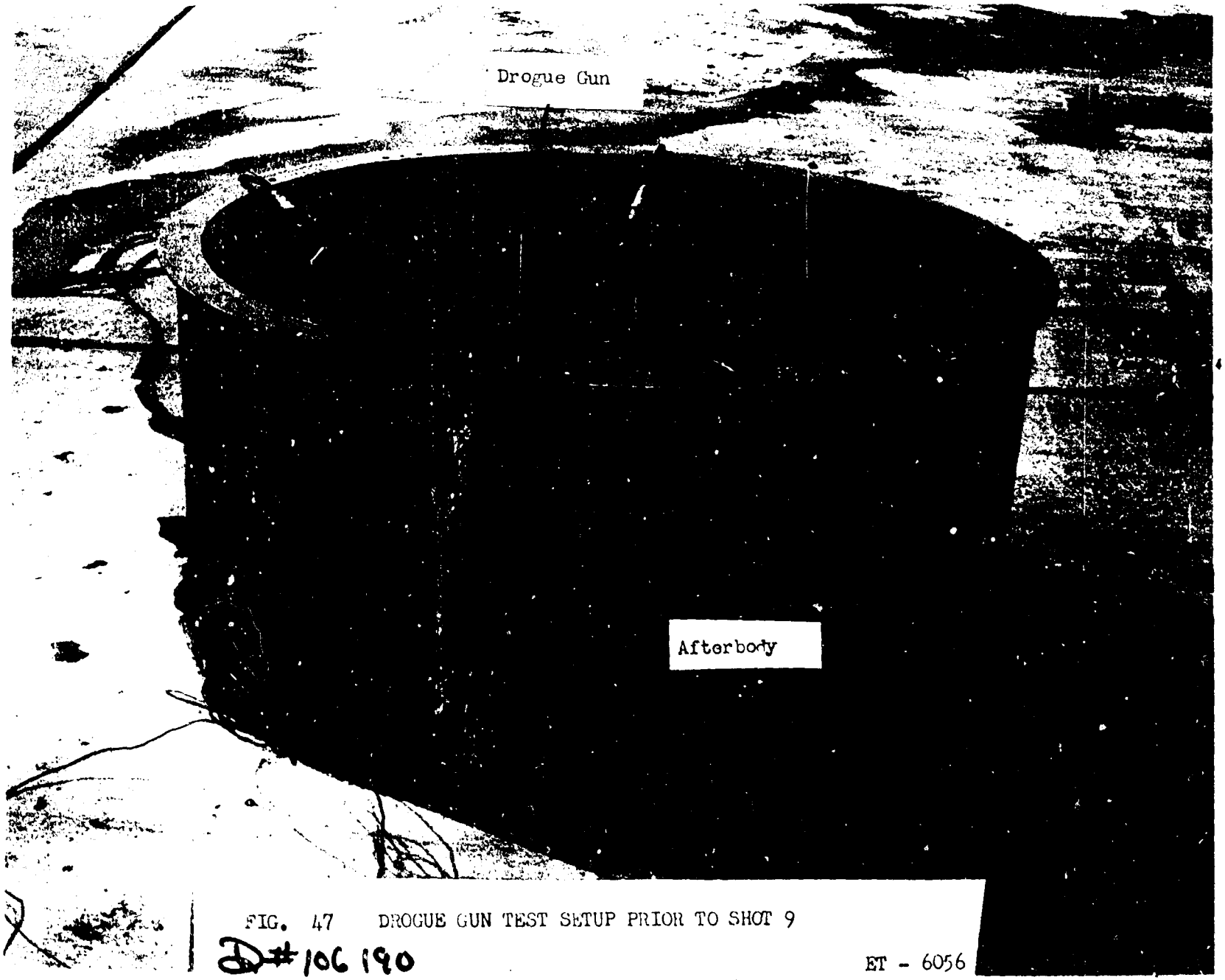


FIG. 47 DROGUE GUN TEST SETUP PRIOR TO SHOT 9

D#106 190

ET - 6056

#1259

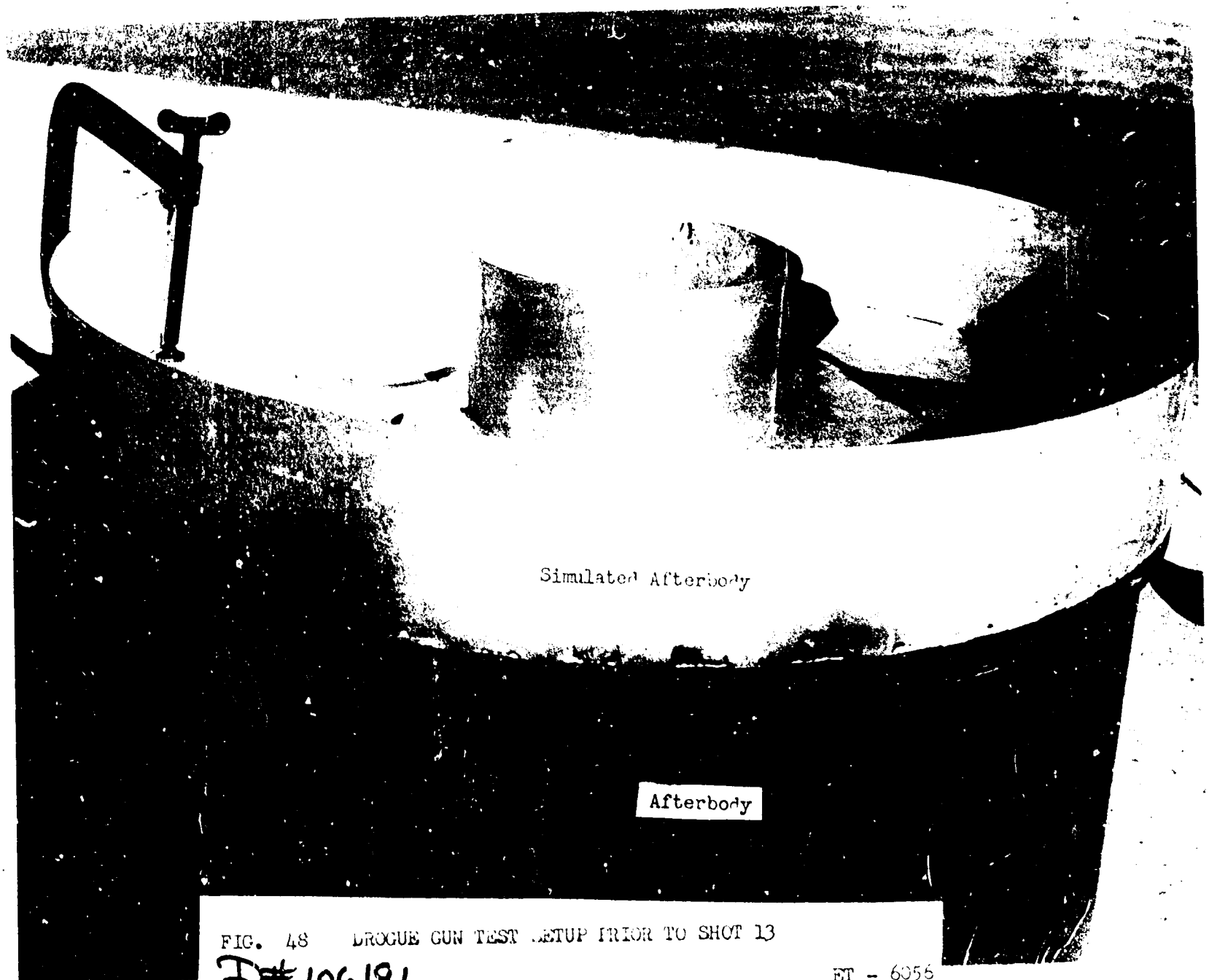


FIG. 48 DROGUE GUN TEST SETUP PRIOR TO SHOT 13

D# 106191

ET - 6056

UNCLASSIFIED

#1291

UNCLASSIFIED

[illegible] 13 ([illegible])

D#106192

ET - [illegible]

#1242

UNCLASSIFIED

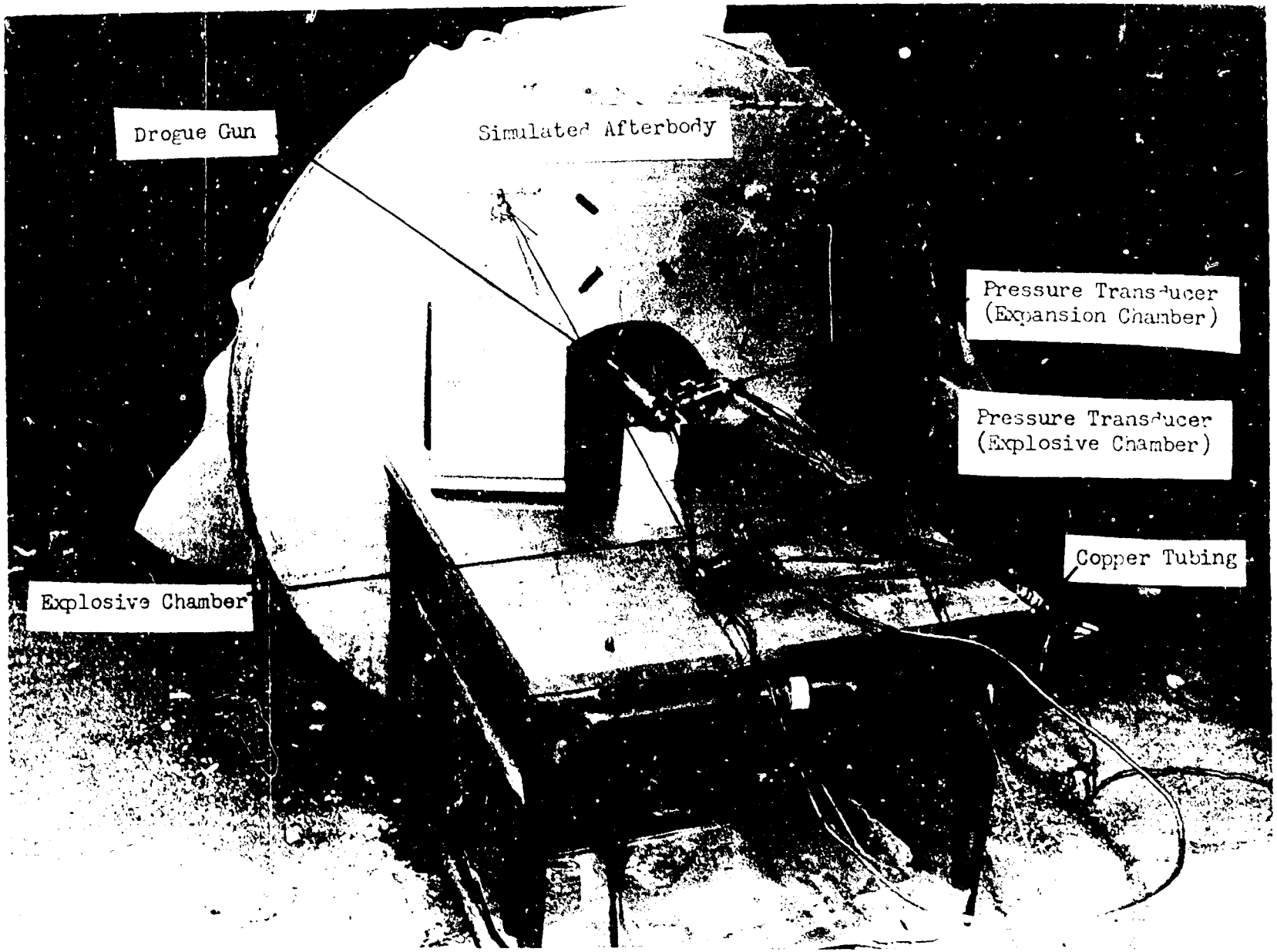


FIG. 50 DROGUE GUN TEST SETUP PRIOR TO SHOT 15

D# 106193

ET - 6056

#1243

UNCLASSIFIED

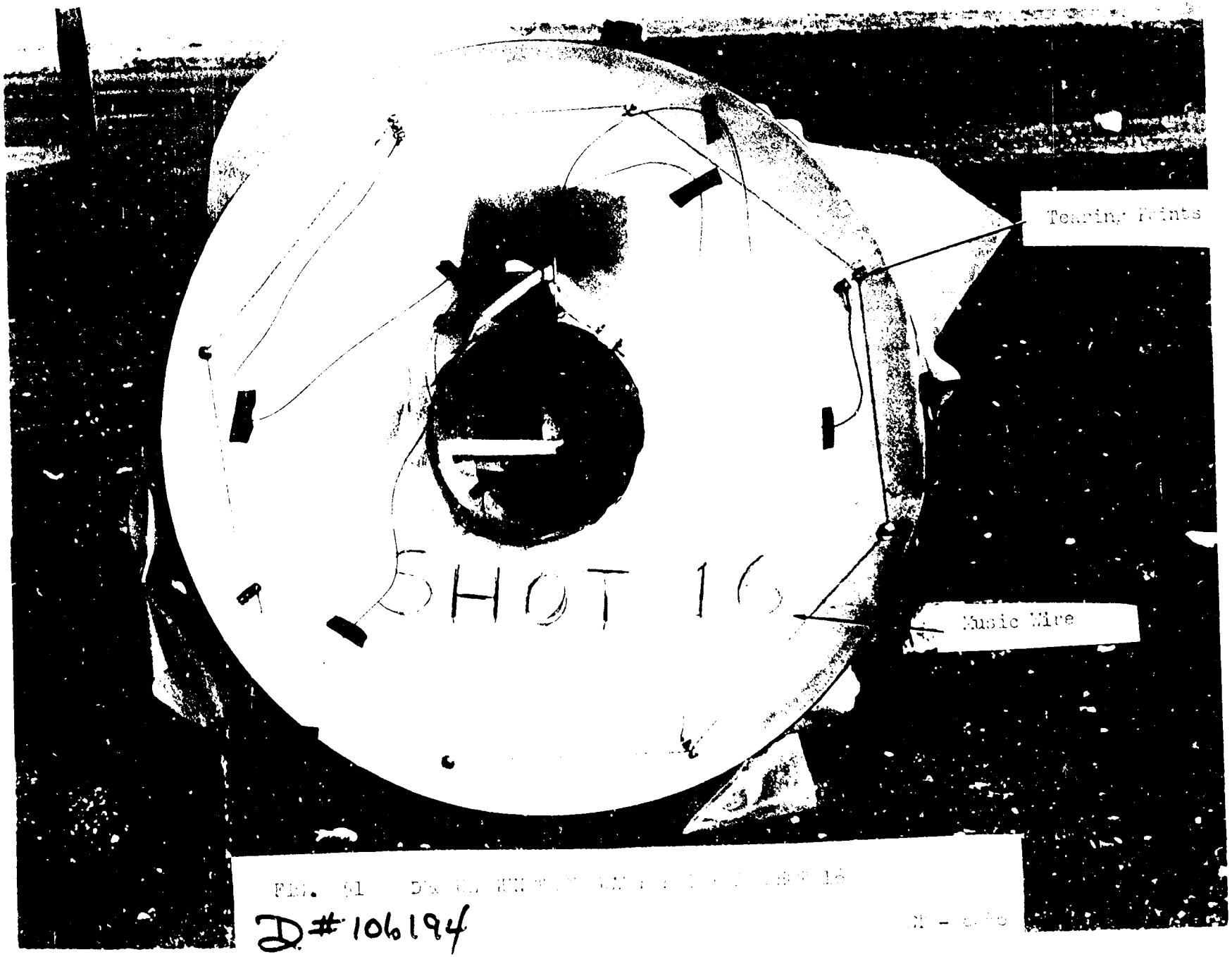


FIG. 51 [illegible] 16

D#106194

#1244

UNCLASSIFIED

New Type Point Connection

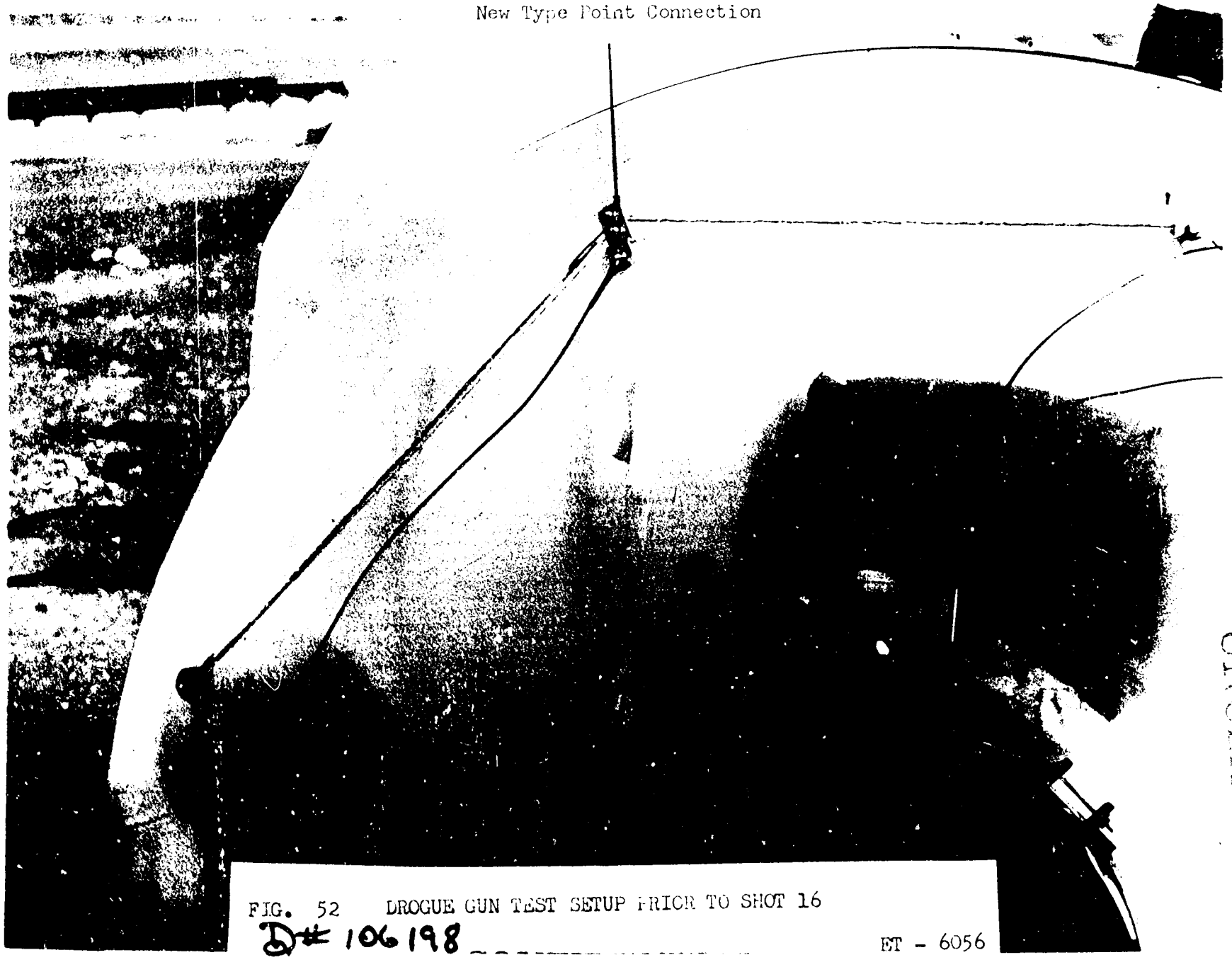


FIG. 52 DROGUE GUN TEST SETUP PRIOR TO SHOT 16

D# 106198

ET - 6056

UNCLASSIFIED

UNCLASSIFIED

#1265

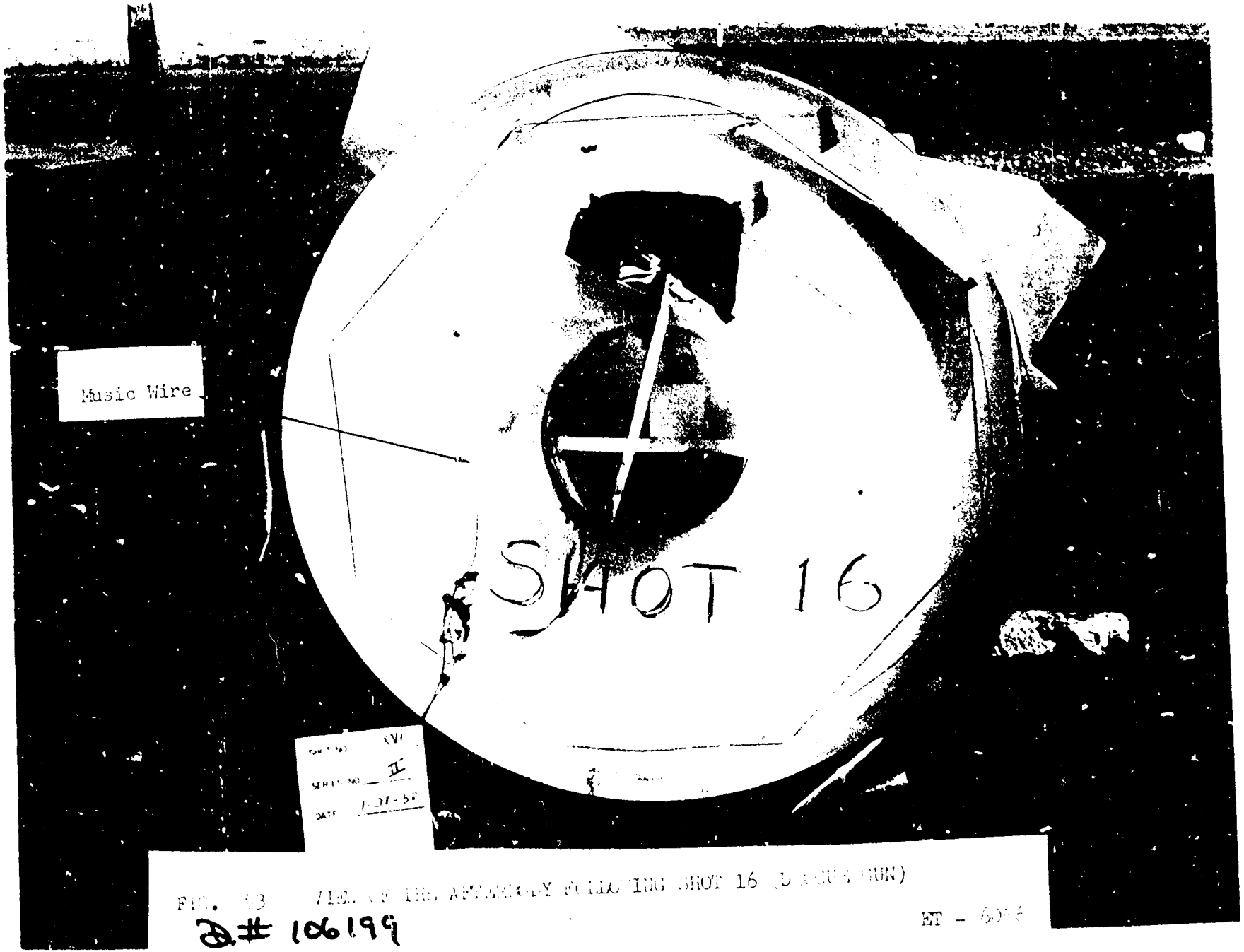


FIG. 53 VIEW OF THE AFTERBODY FOLLOWING SHOT 16 (DRAGUE GUN)

D# 106199

ET - 6056

#7296

UNCLASSIFIED

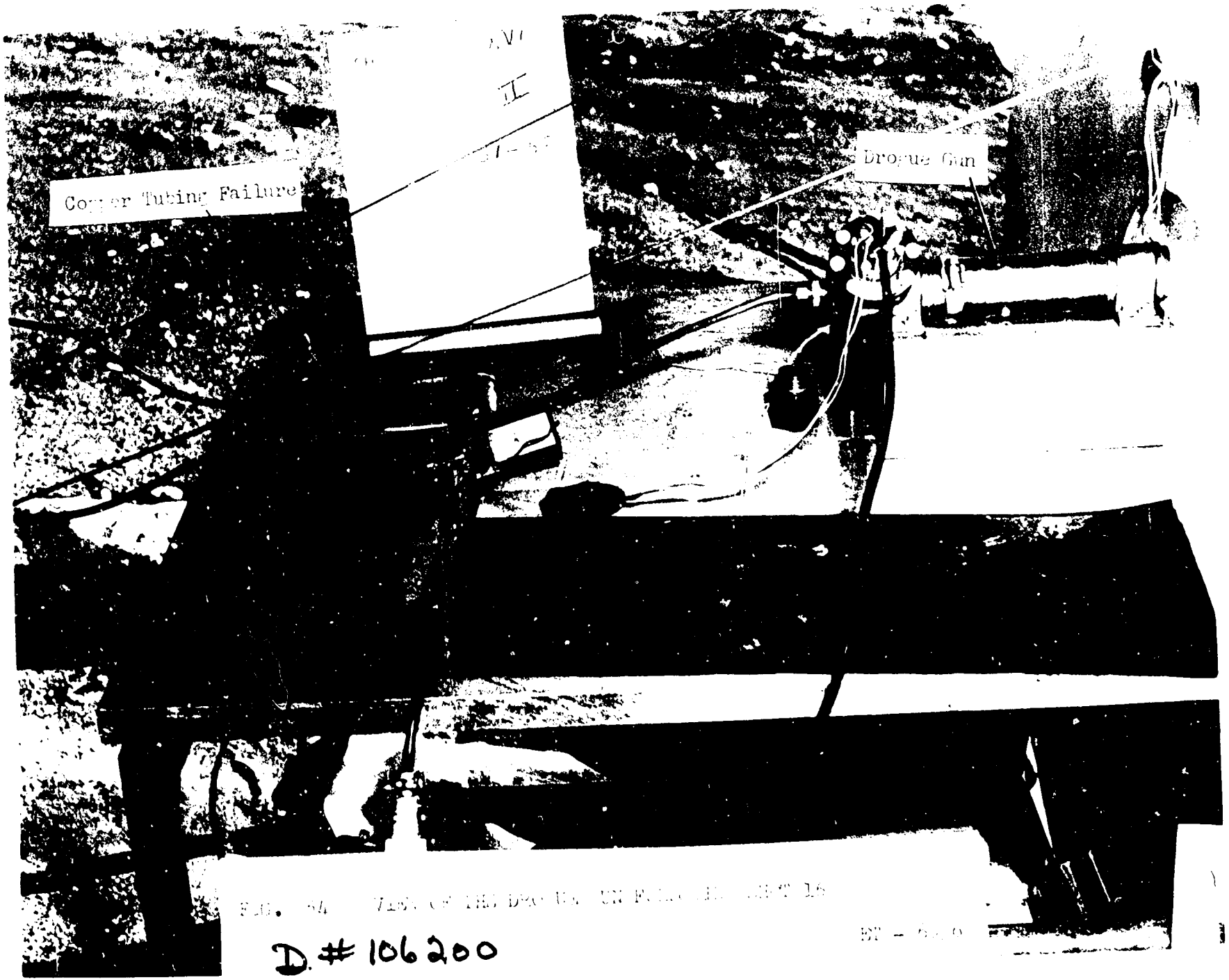


FIG. 64 VIEW OF THE DROGUE UNFORTUNATE SHOT 16

ET - 6[illegible]

D. # 106200

#1297

UNCLASSIFIED

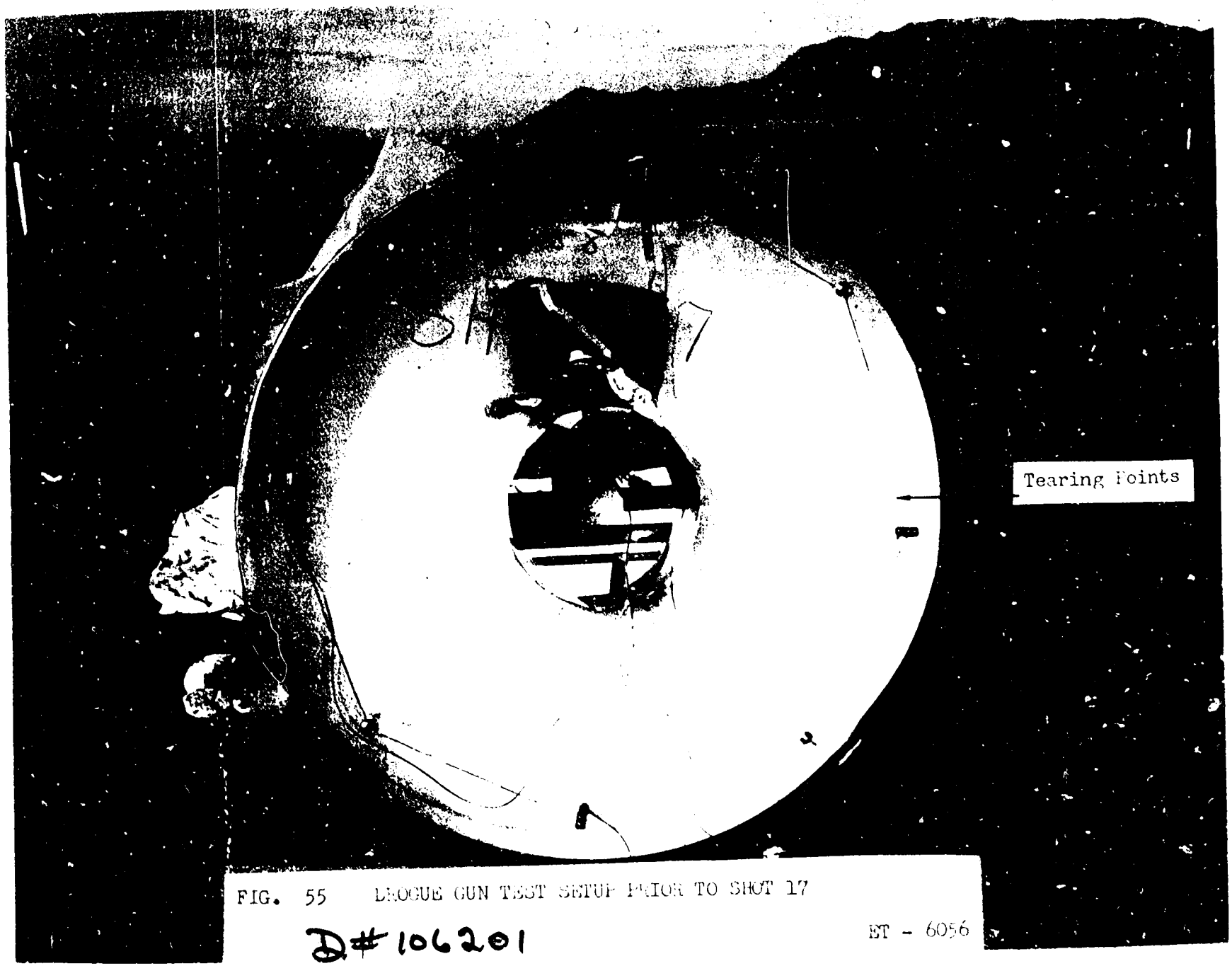


FIG. 55 DROGUE GUN TEST SETUP PRIOR TO SHOT 17

D#106201

ET - 6056

#1248

UNCLASSIFIED

UNCLASSIFIED

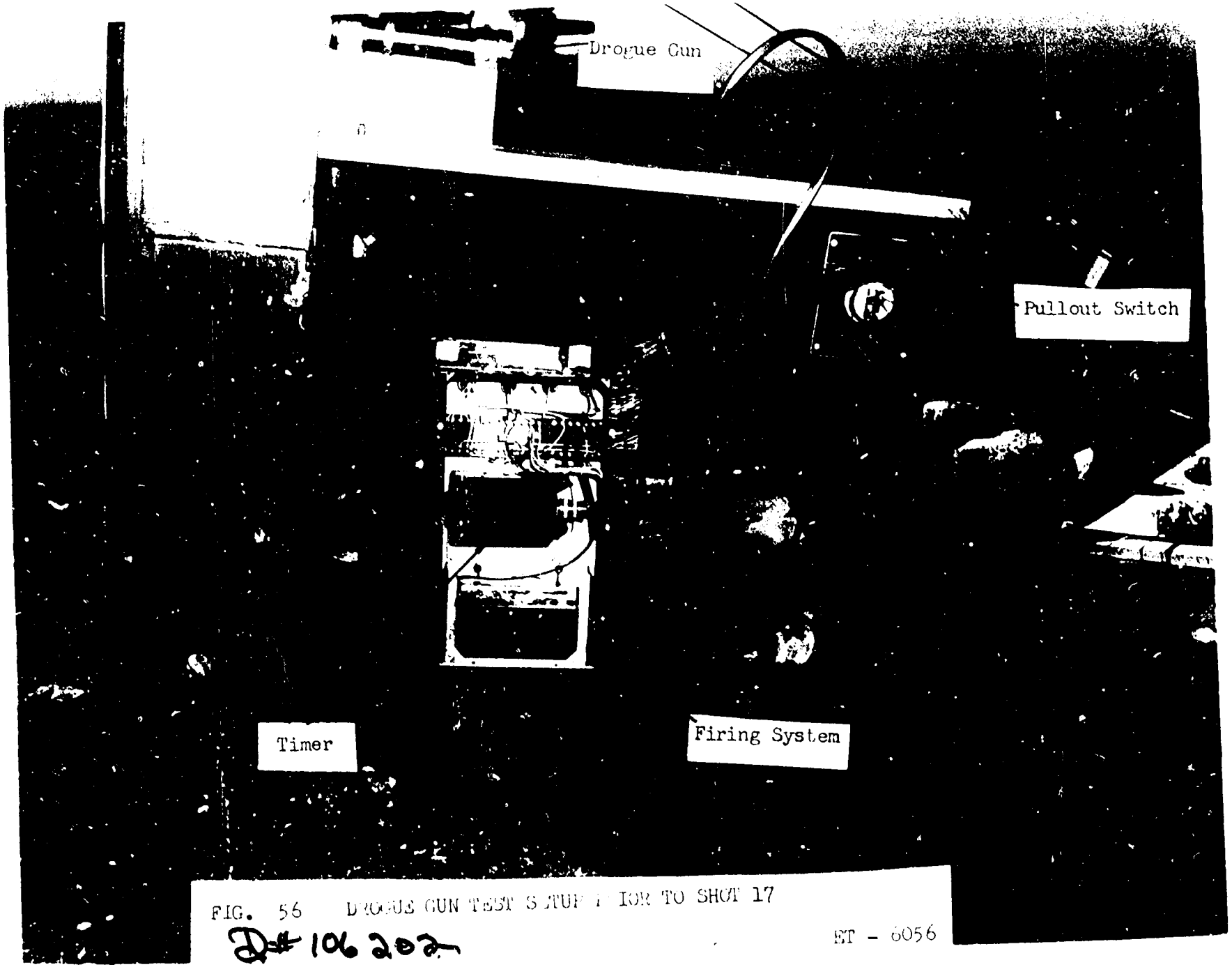


FIG. 56 DROGUE GUN TEST SETUP PRIOR TO SHOT 17

D# 106 202

ET - 6056

UNCLASSIFIED

#1269

D# 106204

1300

UNCLASSIFIED

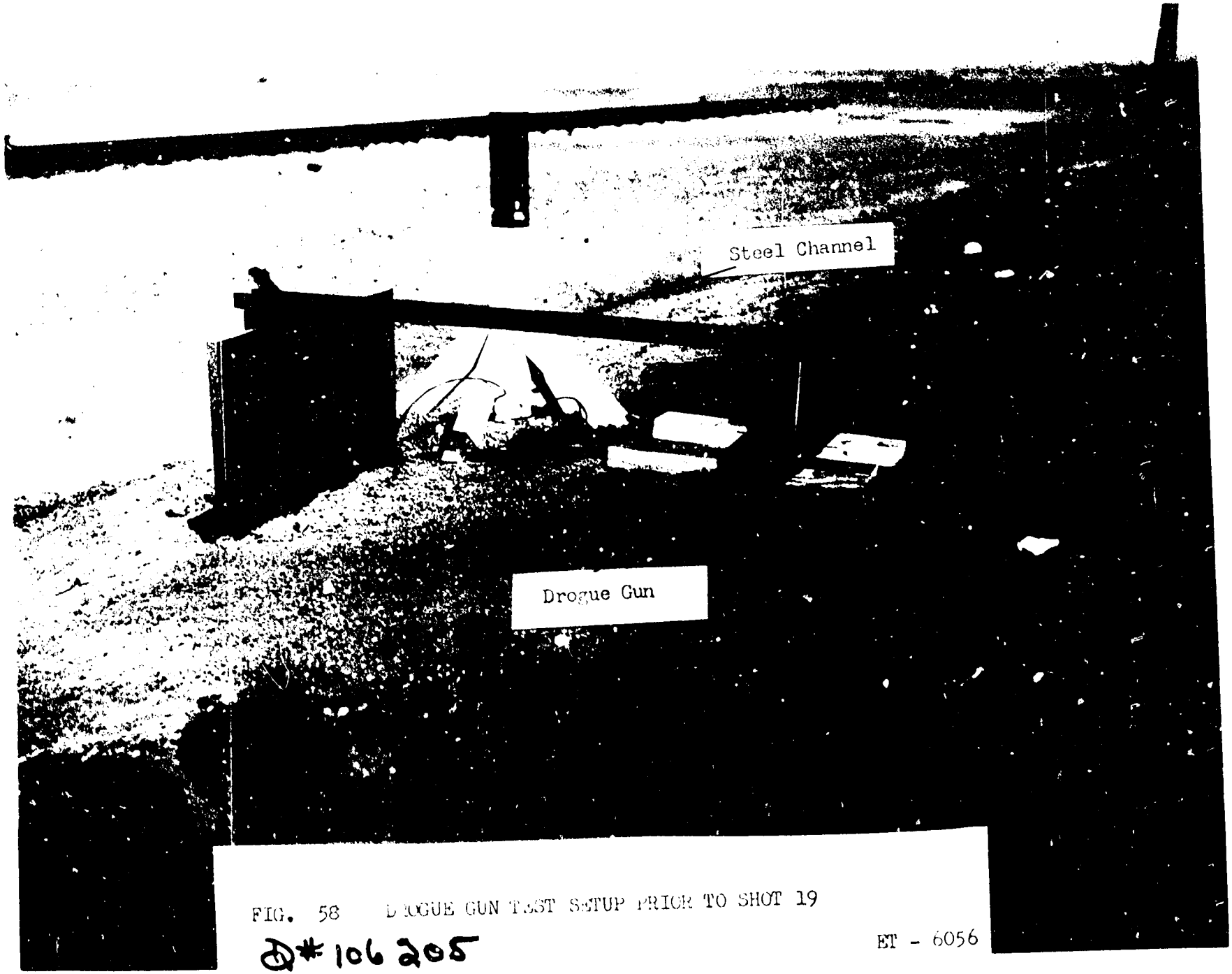


FIG. 58 DROGUE GUN TEST SETUP PRIOR TO SHOT 19

D# 106 205

ET - 6056

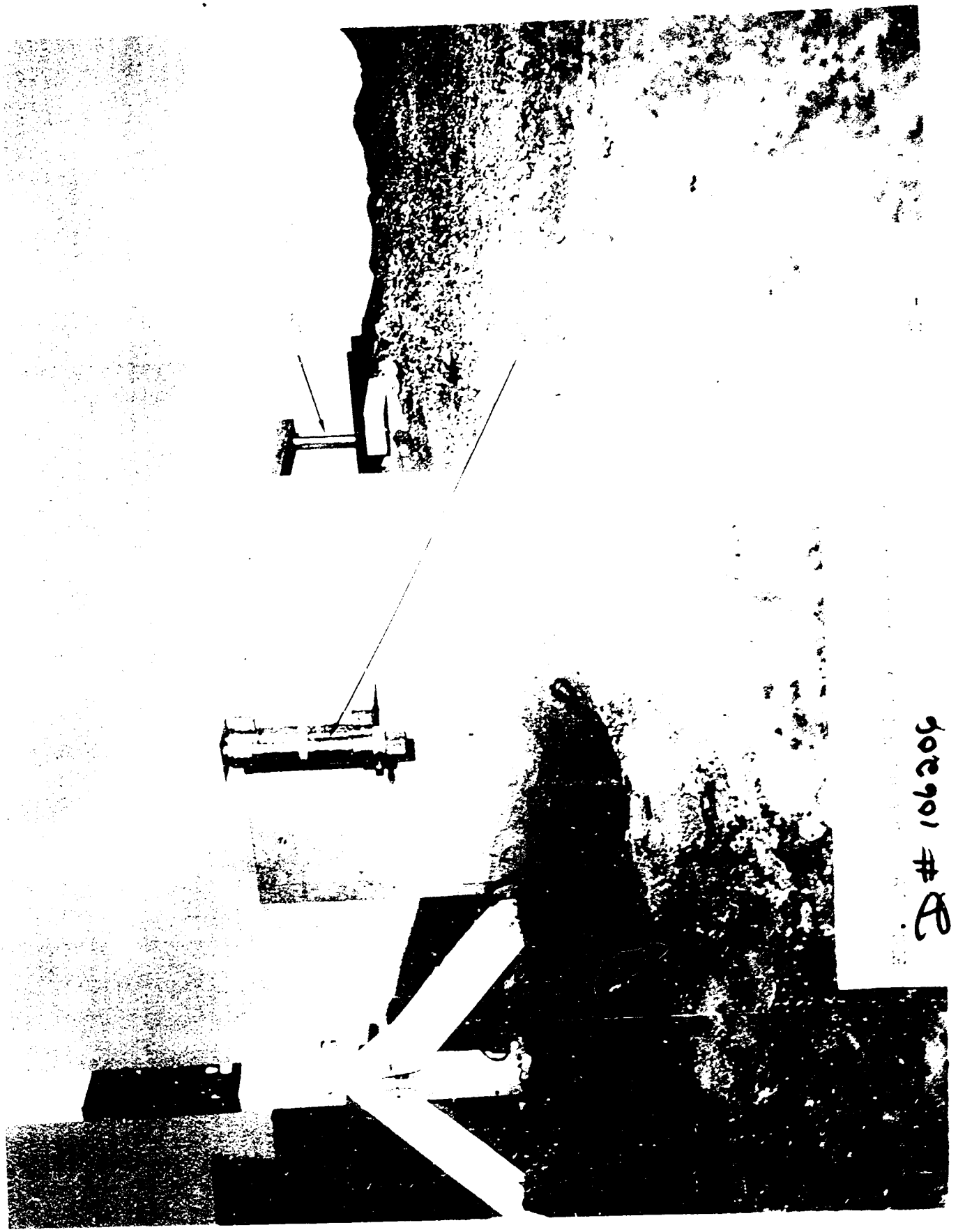
#1301

UNCLASSIFIED

UNCLASSIFIED

[redacted]

#1302



#A 106206

[redacted]

UNCLASSIFIED

UNCLASSIFIED

D#106207

#1303

UNCLASSIFIED