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UNCLASSIFIED

SC-DR-65-679

RESULTS OF TX-61 WEAPON TEST 212-5 (Title Unclassified)

~~AEC ATOMIC WEAPON DATA — SIGMA 3~~

RS 3410/518

F. W. Millikin and B. C. Caskey, 1512
Sandia Laboratory, Albuquerque

February 1966

Approved by: D. M. Olson, 1510

ABSTRACT (U)

This report supplements SC-DR-64-1721, Test Plan for TX-61 Weapon Tests 212-1 through 212-5, with the results of a ballistic, high-Q sled test of the TX-61 weapon development program. The unit performed satisfactorily.

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UNCLASSIFIED

[redacted]

[redacted]

DISTRIBUTION:

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17-21/21A - R. C. Smelich, 3415-3

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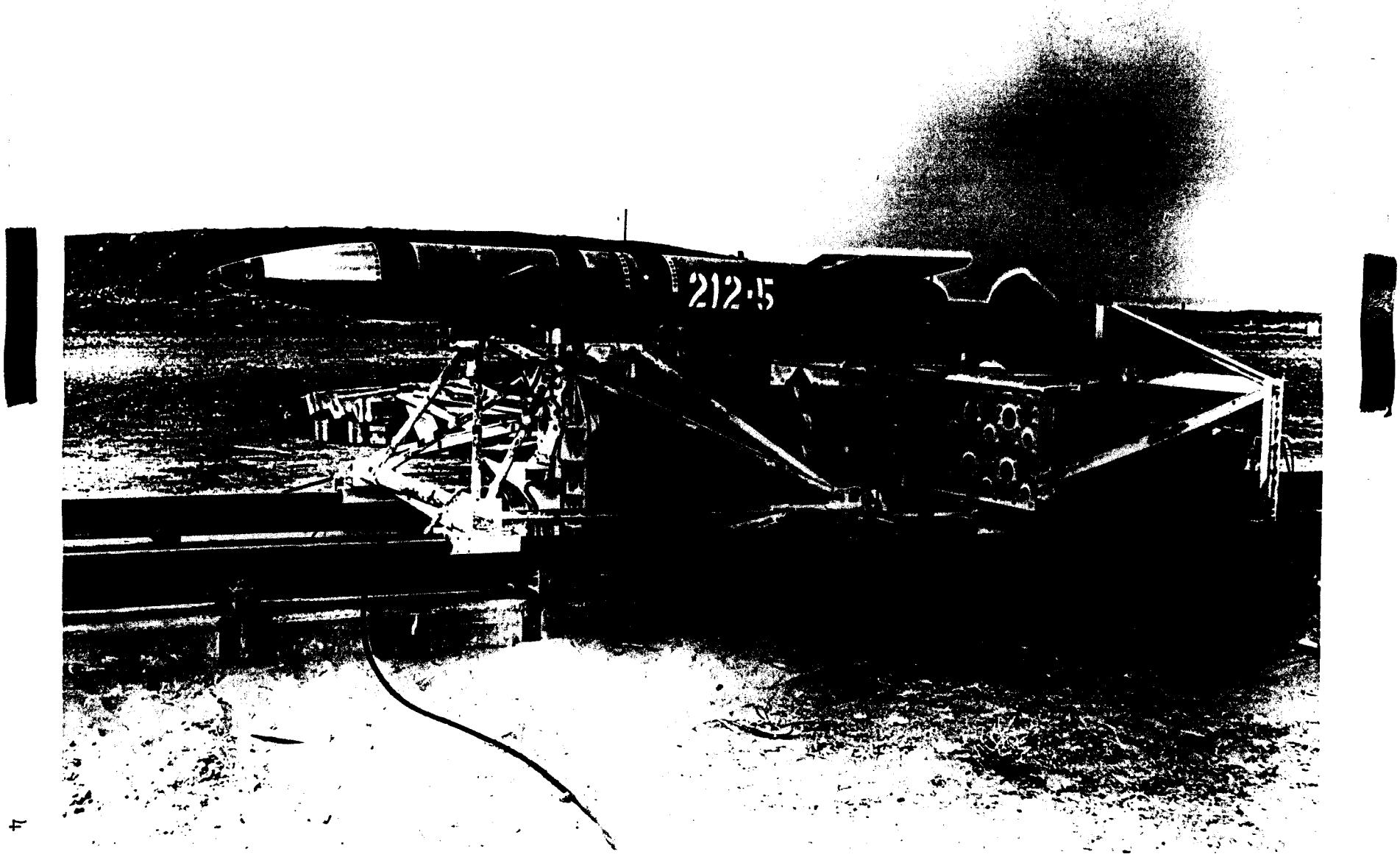


Frontispiece

RESULTS OF TX-61 WEAPON TEST 212-5

Introduction

Weapon Test 212-5 was a ballistic, high-speed sled test performed to obtain parachute information for the TX-61 weapon system. Table I summarizes the test conditions for Unit 212-5.

TABLE I

Summary of Test Conditions

Test	212-5
Date	May 26, 1965
Carrier	Ejection sled
Sled velocity at separation	1646 fps
Unit temperature condition	Ambient

Test Objectives

The purpose of this test was to evaluate the 16-foot-diameter parachute and parachute deployment system at a high dynamic pressure (2750 lb/ft^2) and at ambient temperature.

Summary

The test was successful, the sled ejection system operated normally, and the parachute and parachute deployment system functioned as planned, although the dynamic pressure obtained was only 2280 lb/ft^2.

Description of Test Vehicle

Mechanical

Figure 1 defines the test vehicle, which used an empty one-piece aluminum nose, an aluminum center case, a preflight case section, a radial-screw joint tail, and the necessary interconnecting hardware. Weights were added to achieve the correct weight and CG.

The center case section was modified to incorporate a saddle-type lug (Drawing No. 81846), and a shear plate (Drawing No. 81849) was mounted at Station 46.39 to take the longitudinal loads during sled acceleration. Accelerometers were installed in the center case section to measure the load during the sled run.

The preflight case section (Drawing No. 199030) was modified per Drawing No. 81865, Issue 1 to accept the aft lug, which was modified per Drawing No. 81860, Issue 1, and the preflight lug plate (Drawing No. 81859).

Table II summarizes the physical characteristics of the unit.

TABLE II

Test	212-5
Length (in.)	141.0
Weight (lb)	607.5
Diameter (in.)	12.75
CG (station)	61.0
Yaw MI (lb-in.^{2})	Not recorded
Parachute diameter (ft)	16

Electrical

The electrical system for the unit is described in SC-DR-64-1721, Figure 1 (CKN 78027, Issue 1). The pulse initiator timer setting (time of parachute deployment) was 1.0 second after ejection.

Instrumentation

Data were collected by camera coverage and RF FM/FM telemetry. Two Photosonic, Model 1-F, 16-mm cameras (1000 frames per second) were mounted at Station 64.0 on both the port and starboard sides. Post-impact pictures were taken with hand-held cameras.

Test Results

The test is considered a success although the planned dynamic pressure was not achieved. The sled velocity was correct, but the lower air density resulted in a lower dynamic pressure. The load on the parachute was 107 percent over the design limit instead of 125 percent. A summary of test data is listed in Table III.

TABLE III

Launch station	2980
Ejection station	975
Number of stages	Two
Maximum sled acceleration	35 g
Sled velocity at ejection	1646 fps
Parachute timer setting	1.0 sec
Parachute deployment time	1.06 after ejection
Wind velocity	16.9 fps
Wind direction	265°
Air pressure	631 mm
Air temperature	51°F
Impact station	-1840
Total flight time	6.429 sec
Temperature of unit	Ambient

The test unit was loaded on the ejector sled, and two stages of 24 HVAR's and 10 ZUNI rocket motors were used to obtain a maximum velocity of 1645.8 fps at ejection. All first and second stage motors fired. The sled ejection was normal, and the parachute functioned as planned.

The following in-flight trajectory data were extrapolated from available data to approximately the time of parachute initiation:

Velocity	1525 ft/sec
Dynamic pressure	2280 lb/ft^2
Altitude	5450 ft msl

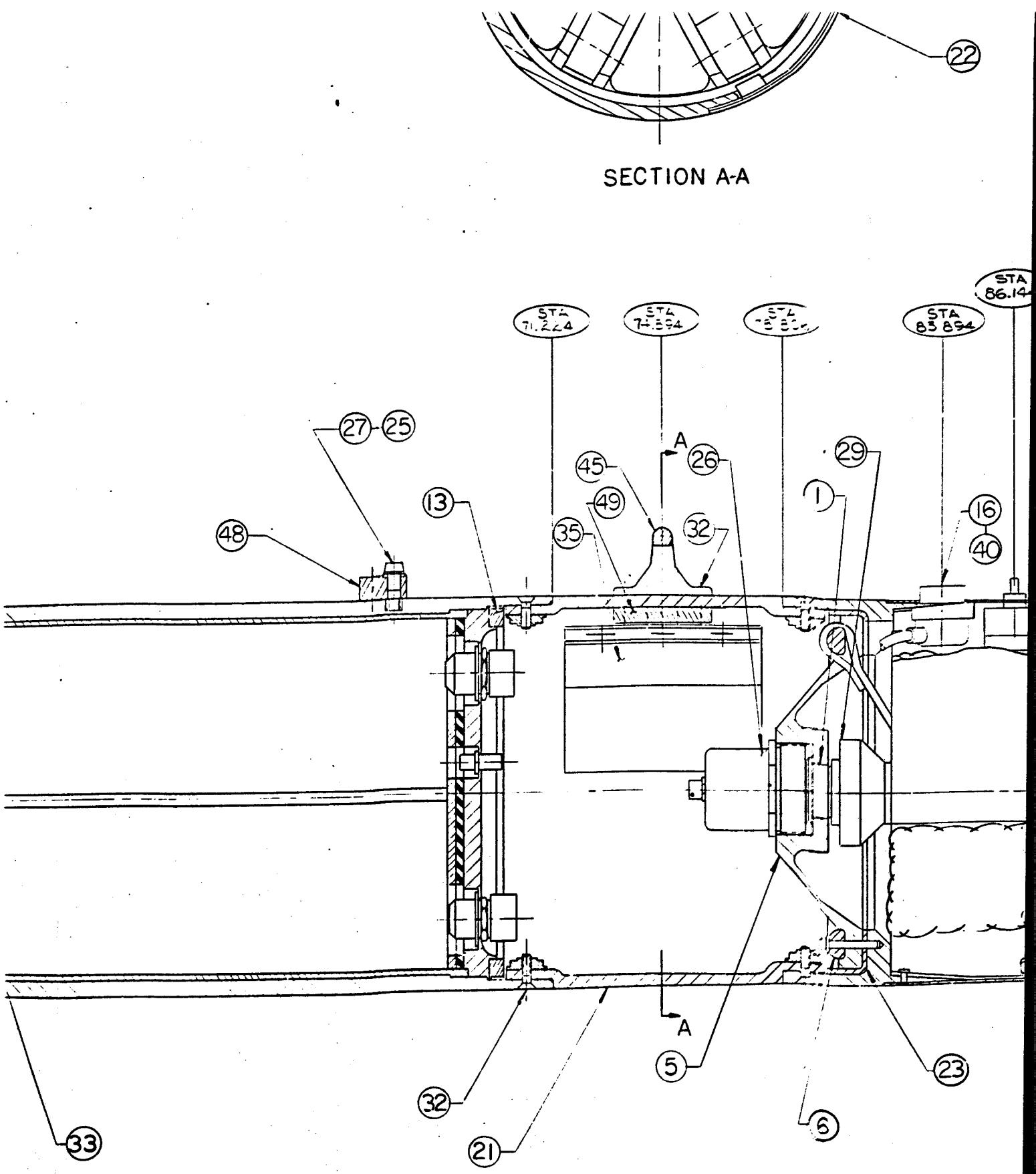
Since the parachute deployment was either mistracked or out of view of all cameras, no sequence times were obtained. The on-board cameras operated through parachute inflation, but then stopped because of the opening of the acceleration switch at full parachute deceleration. The coverage obtained was excellent, and the unit followed a typical retarded trajectory. No damage occurred to the unit or to the parachute during deployment.

The telemetry system operated satisfactorily from launch through impact, and good data on the launch, track, and trajectory were recorded.

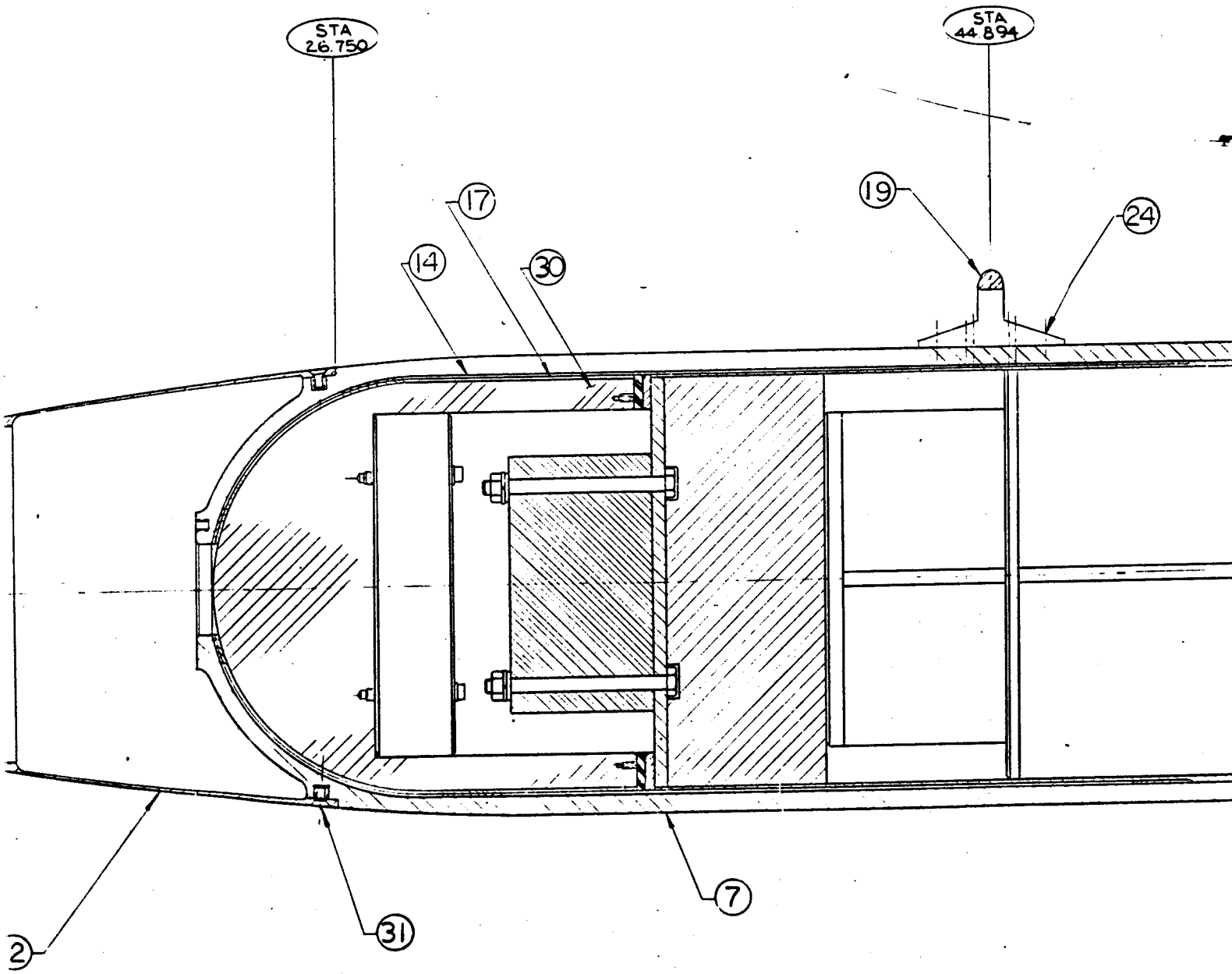
The parachute deployment command monitor was apparently triggered by telemetry system transients, and therefore no indication of the command system operation was obtained. All other monitors were received satisfactorily. The longitudinal accelerometer indicated about 132 g during parachute loading (see Figure 4). During first-stage acceleration the longitudinal peak was 46 g, and the vertical peak was 29 g. During second-stage initiation the longitudinal peak was 54 g, and the vertical peak was 56 g. At ejection the vertical peak was 51 g. Figures 2 and 3 show the unit after impact.

The XMC1839 operation was as follows:

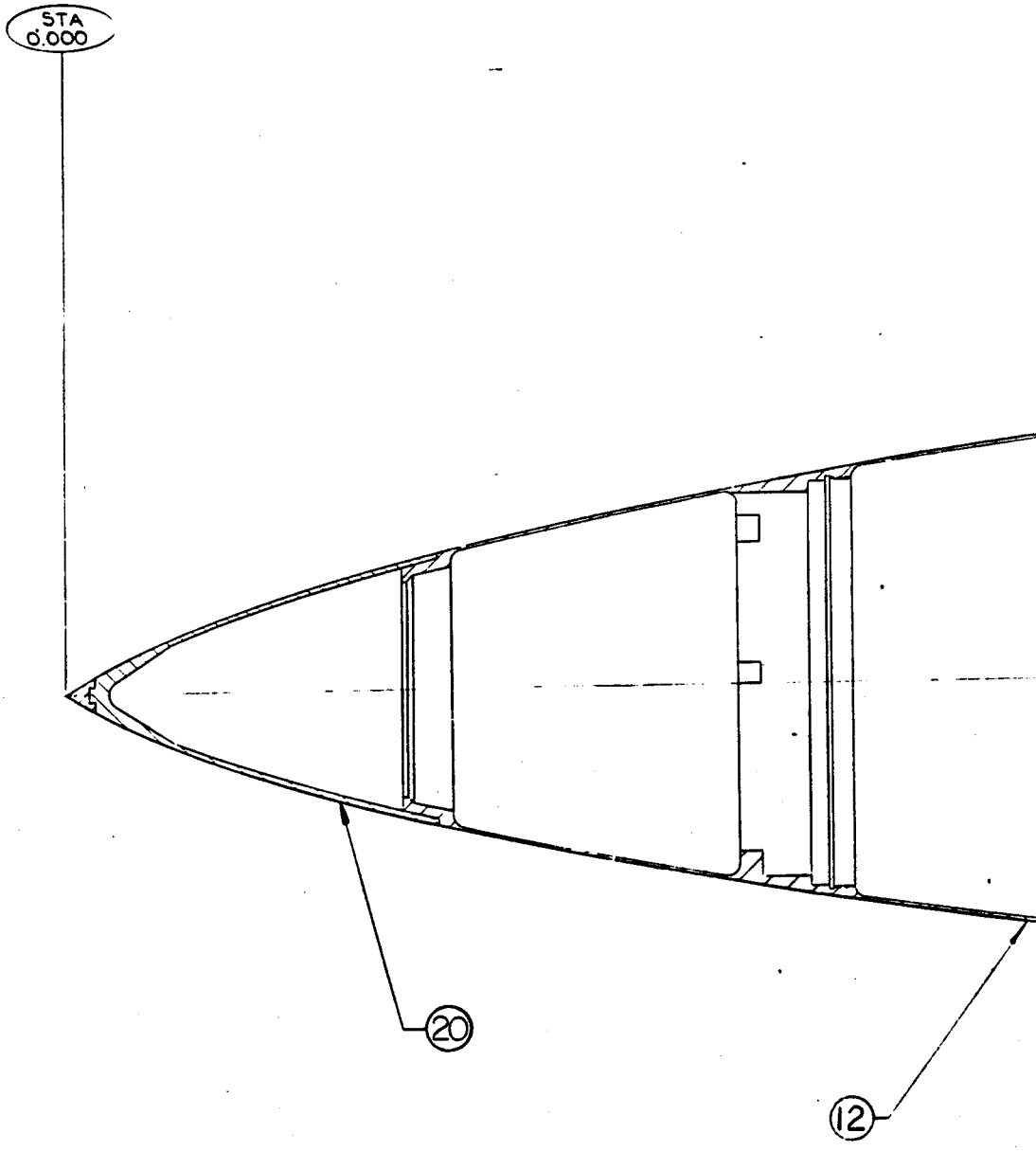
	XMC1839 S/N 134	XMC1839 S/N 143
Closed (sec from launch)	3.45	3.46
Open (sec from launch)	4.29	4.30
Duration of closure (sec)	0.84	0.84

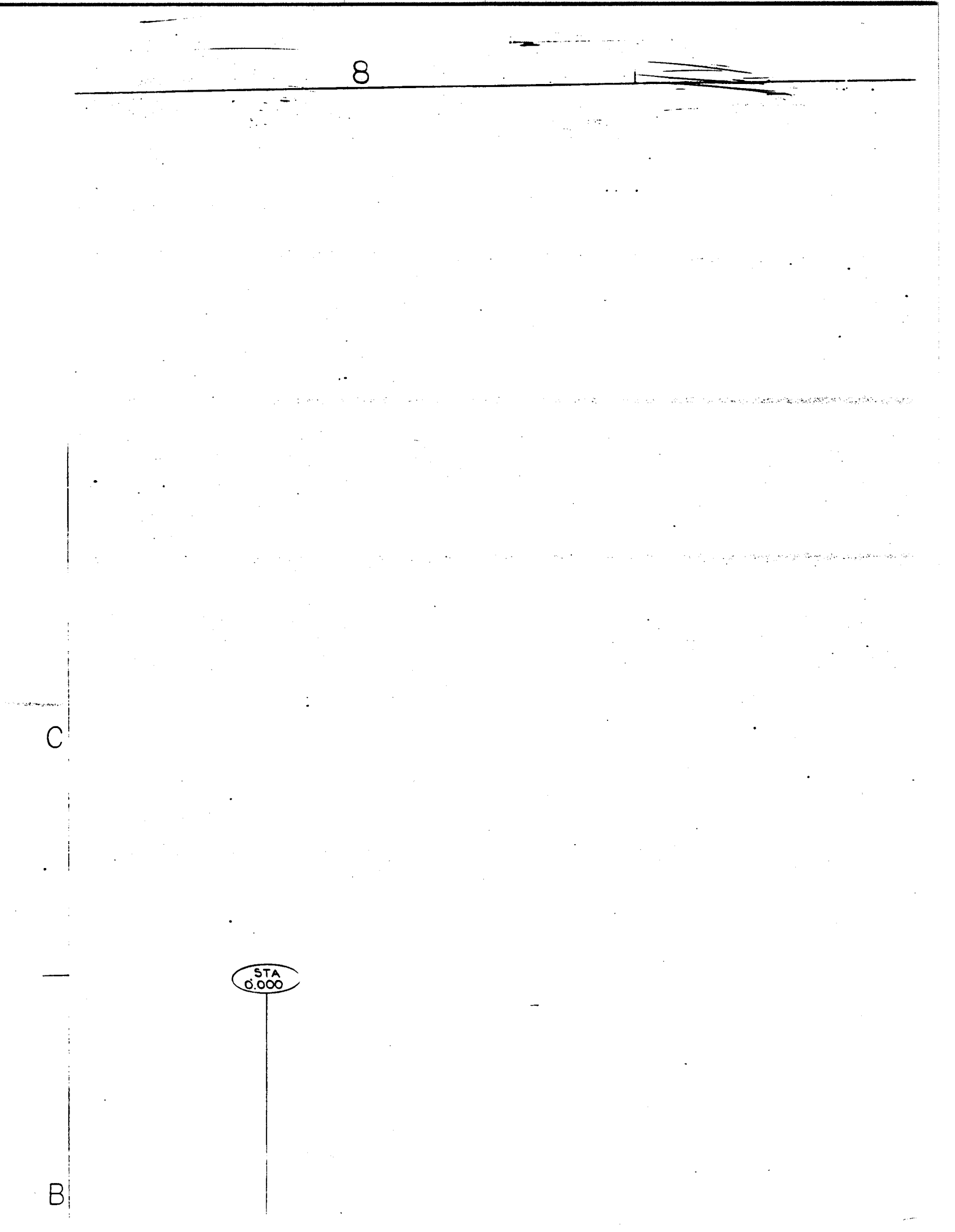


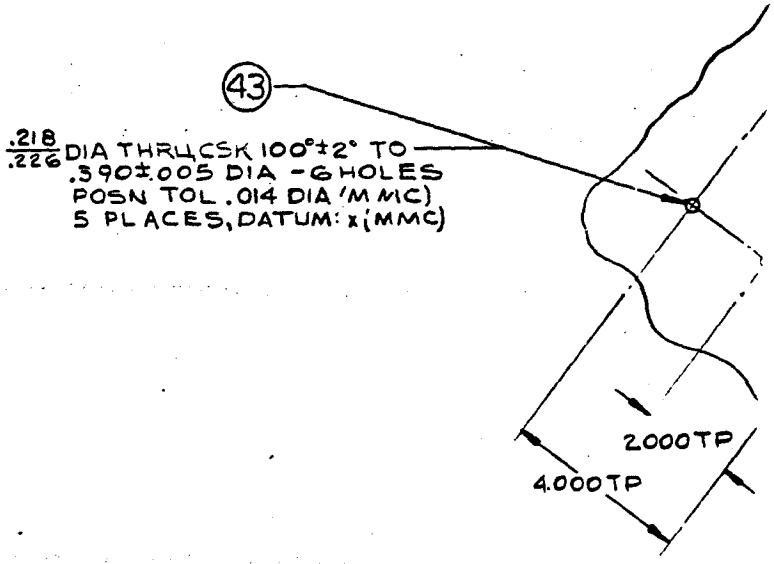
SECTION A-A

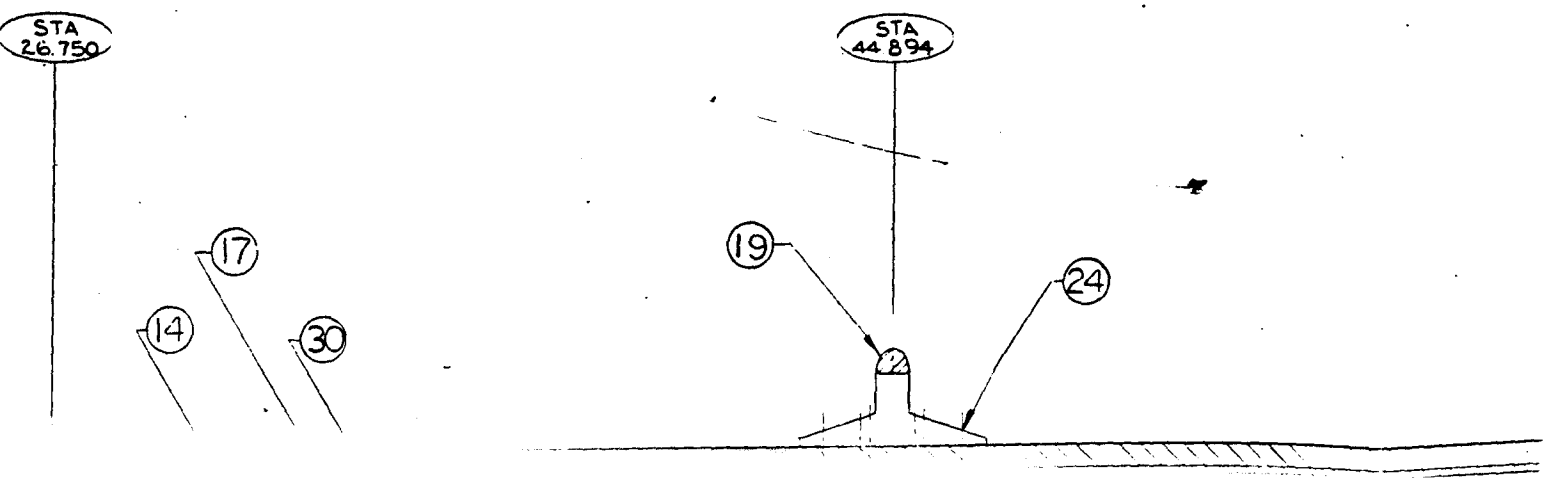


[redacted] DWG. NO. N65280 SHEET 1 OF 1 FRAME 2 and 2




C
STA
0.000
B


43
.218
.226 DIA THRU CSK 100°±2° TO
.390±.005 DIA - 6 HOLES
POSN TOL .014 DIA (M MC)
5 PLACES, DATUM: x (MMC)
2.000 TP
4.000 TP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14
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19
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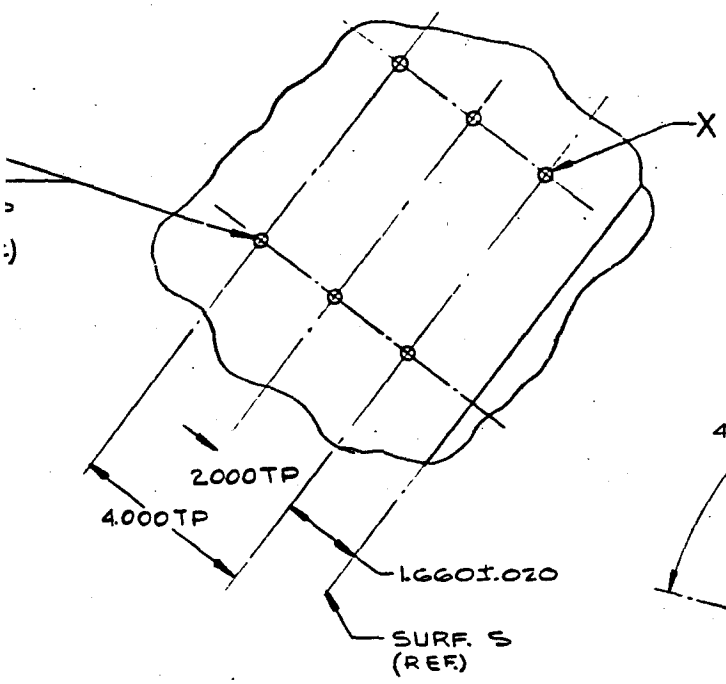
X
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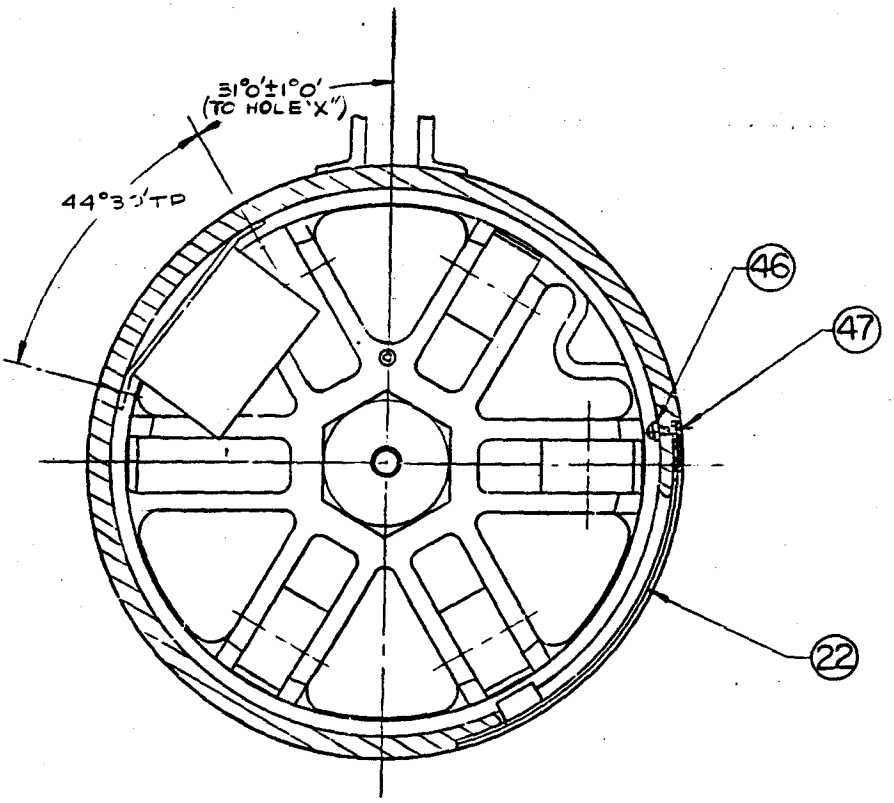
4.000TP
1.660±.020
SURF. S
(REF.)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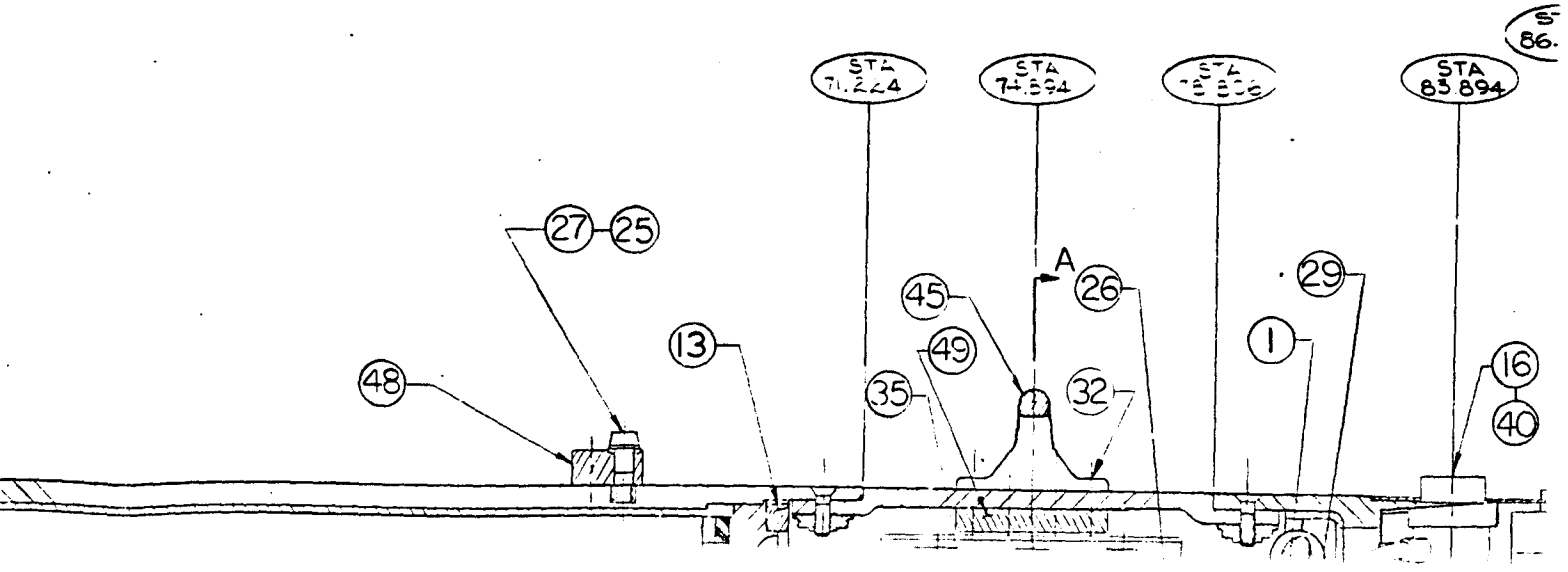
(TO HOLE 'X')
44°30'TP
46
47
22

SECTION A-A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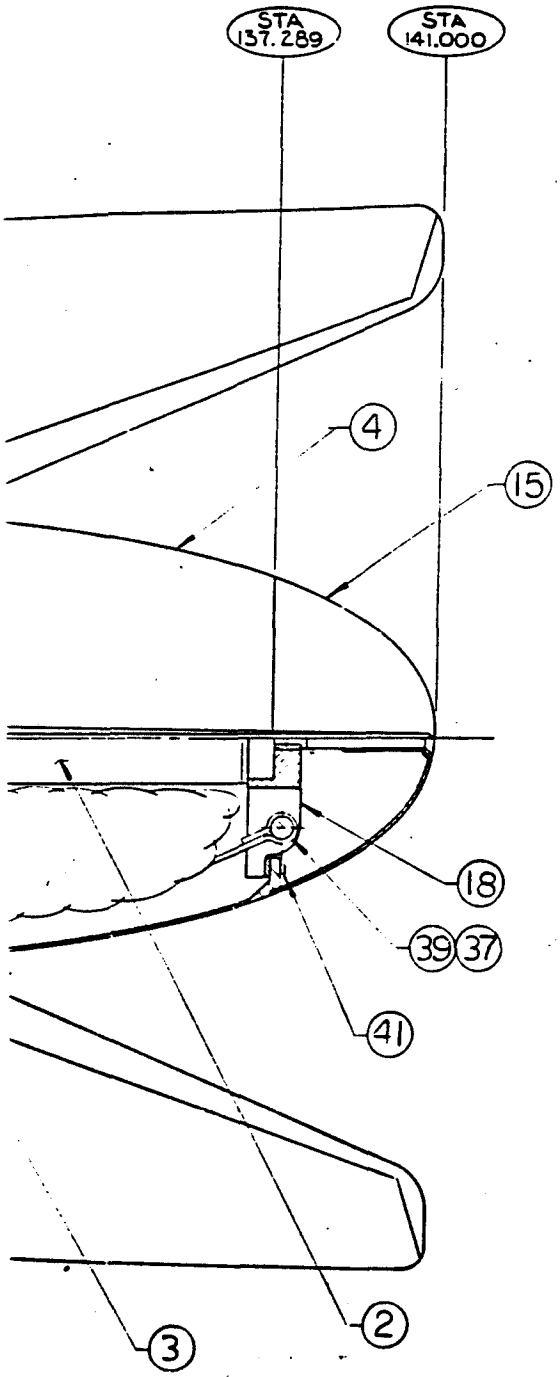


1	N81859	PREFLIGHT LUG PLATE (212 SERIES)		
1	N81849	SHEAR PLATE (212 SERIES)		
5	AN509-10R12	SCREW, MACH 100° CSK HD		
5	AN363-1032	NUT, SELF LOCK		
1	N81850	AFT LUG, MOD. (212 SERIES)		
4	AN503-10R5	SCREW, MACH, 100° CSK HD 10-32 x 11/32 LG		
6	AN509-10R13	SCREW, MACH, 100° CSK HD		
32	NAS1216-4-8	SCREW, PAN HD, "HI-TORQUE"		
4	MS35456-23	SCREW, CAP, SOC HD		
4	MS35193-58	SCREW, MACHINE 82° CSK HD		
4	MS20392-7C57	PIN, FLAT HD		
1	N54557	JUNCTION BOX, UNIVERSAL (BTS)		
1	N60446	PULSE INITIATOR (TEST) FS (ISS 1)		
1	N59546	TM INSTALLATION 101 (ISS. 2)		1
80	194092-00	SCREW, SPECIAL (ISS 1)		
36	194091-00	SCREW, SPECIAL (ISS 1)		
1	N52816	FORWARD BALLAST (ITEMS 1 & 3) (ISS 5)		
1	———	CUTTER MECHANISM (MODIFIED)		
1	(AF)	PARACHUTE (16 FT) (MODIFIED)		
5	MS20006-8	BOLT, INTERNAL WRENCHING		
1	311784-00	x MC 1835		
5	MS35338-27	WASHER, LOCK		
12	194079-00	SCREW, MACHINE (ISS 2)		
1	206105-00	INSULATOR, THERMAL (ISS 2)		
1	195303-00	DOOR, ACCESS (ISS 2)		
1	N81865	CASE SECTION, PREFLIGHT-MOD.		
1	1440105	RADOME (ISS C)		
1	N81846	SUSPENSION LUG (212 SERIES)		
1	192125-00	DEPLOYMENT PLATE (MACHINED) (ISS 3)		
1	N65257	SPACER (ISS 1)		
1	188923-00	CABLE ASSY (P/O) (MODIFIED)		
1	186753-00	CAP AND BOLT, REAR (ISS 3)		
1	186774-00	SLEEVE (ISS 3)		
1	186733-00	RING, EXTERNALL THREADED (ISS 3)		
1	N65277-00	NOSE CASE (ALUMINUM) (ISS 3)		
4	186730-00	FIN (ISS 3)		
4	180397-00	COVER AND SCREW, AFT (ISS 2)		
4	180396-00	COVER AND SCREW, FWD (ISS 2)		
1	180391-00	CASE SECTION, REAR (ISS 17)		
1	N81861	CASE SECTION, CENTER-, MOD.		
2	206104-00	RING HALF (ISS 3)		
1	206102-00	SUPPORT, SUSPENSION LINE (ISS 3)		
1	180370-00	CASE EXTENSION, REAR (ISS 3)		
8	180364-00	PIN, SHEAR (ISS 1)		
1	180363-00	TUBE-PLUG (ISS 2)		
1	180361-00	TUBE ALUMINUM-INSIDE (ISS 3)		

LIST OF MATERIAL

DWG CLASSIFICATION LEVEL [redacted]

PART CLASSIFICATION [redacted]

SHEET 1
ISSUE 5
SHEET INDEX

CLASSIFICATION CATEGORY [redacted]

ORG	DATE	INITIALS
[redacted]		

MFG AGENCY APPROVALS

TITLE TX-61 SLED. CHUTE EVALUATION

FIRST APPLICATION

SIZE J

MFG AGENCY NO.

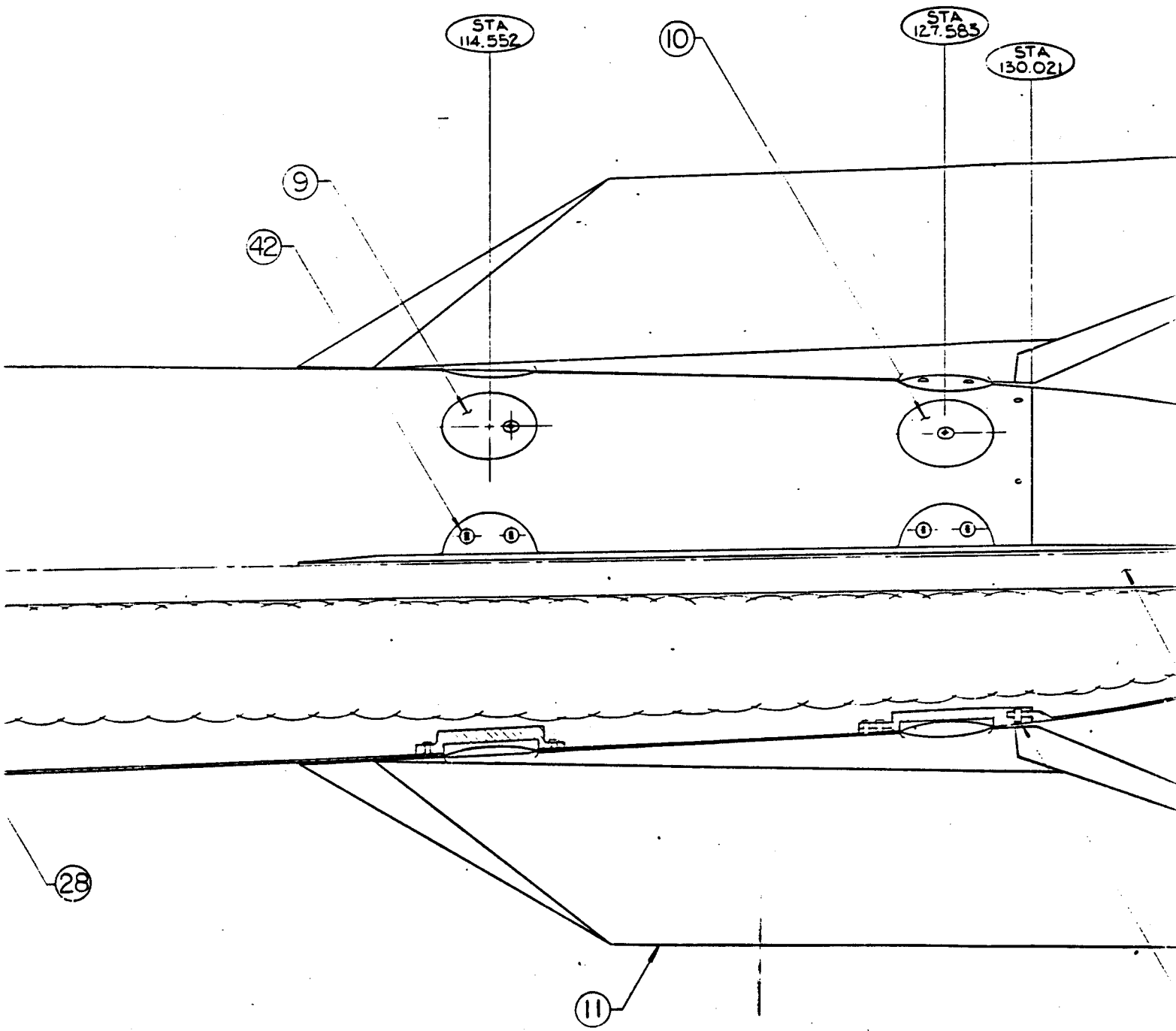
DWG NO. N65280

SCALE 1/2. DOC REF. SYM.

SHEET 1 OF 1

GROUP 1 - EXCLUDED FROM AUTOMATIC DOWNGRADING AND DECLASSIFICATION

[redacted]



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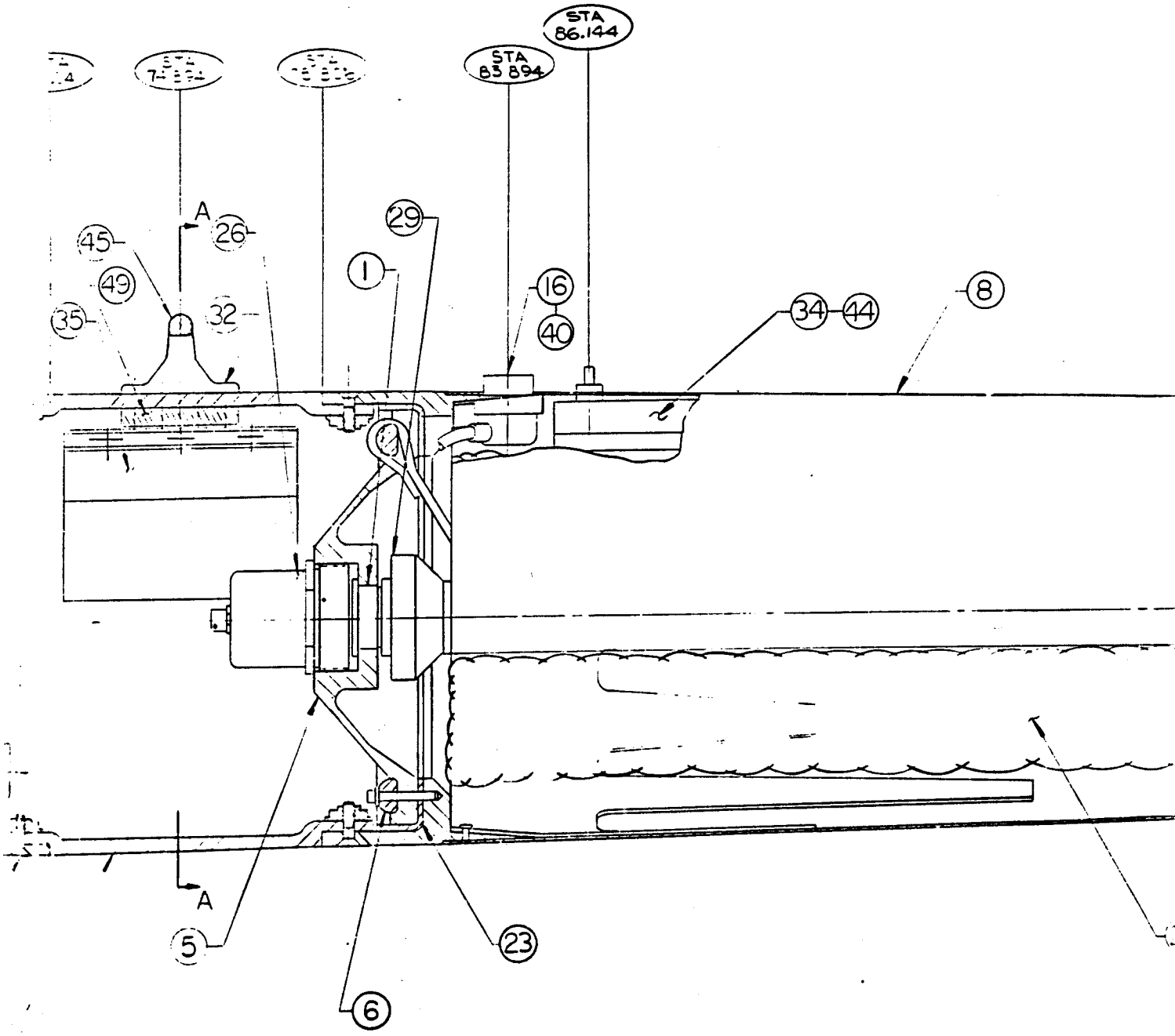
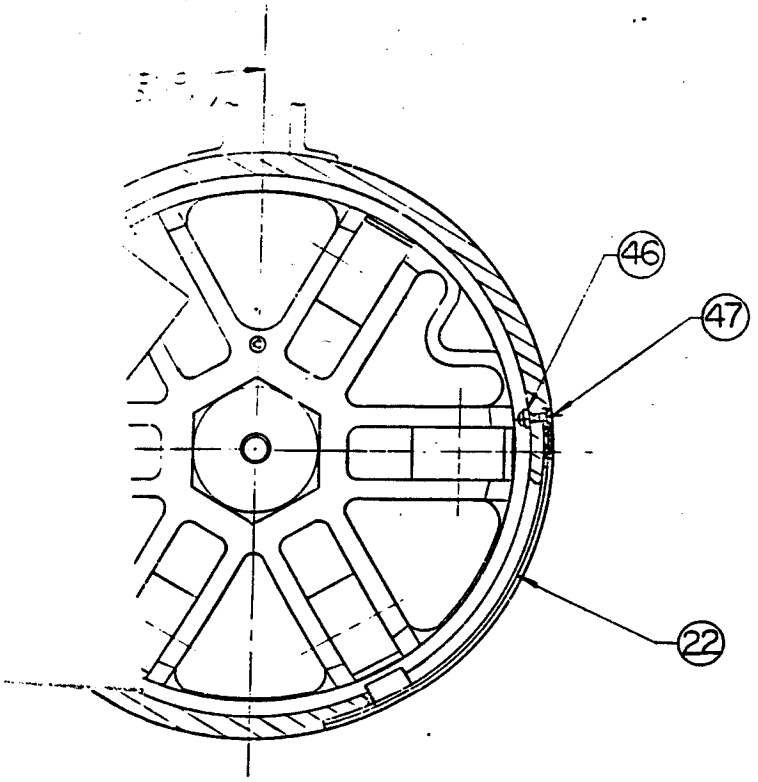
SECTION A-A





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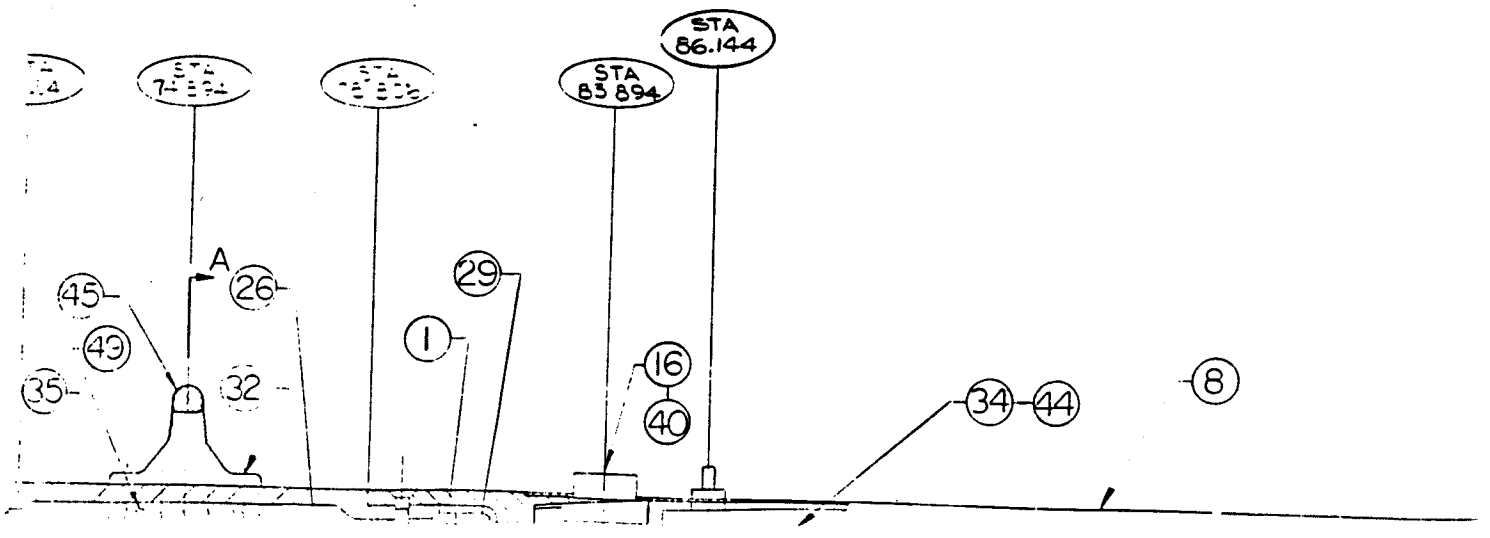
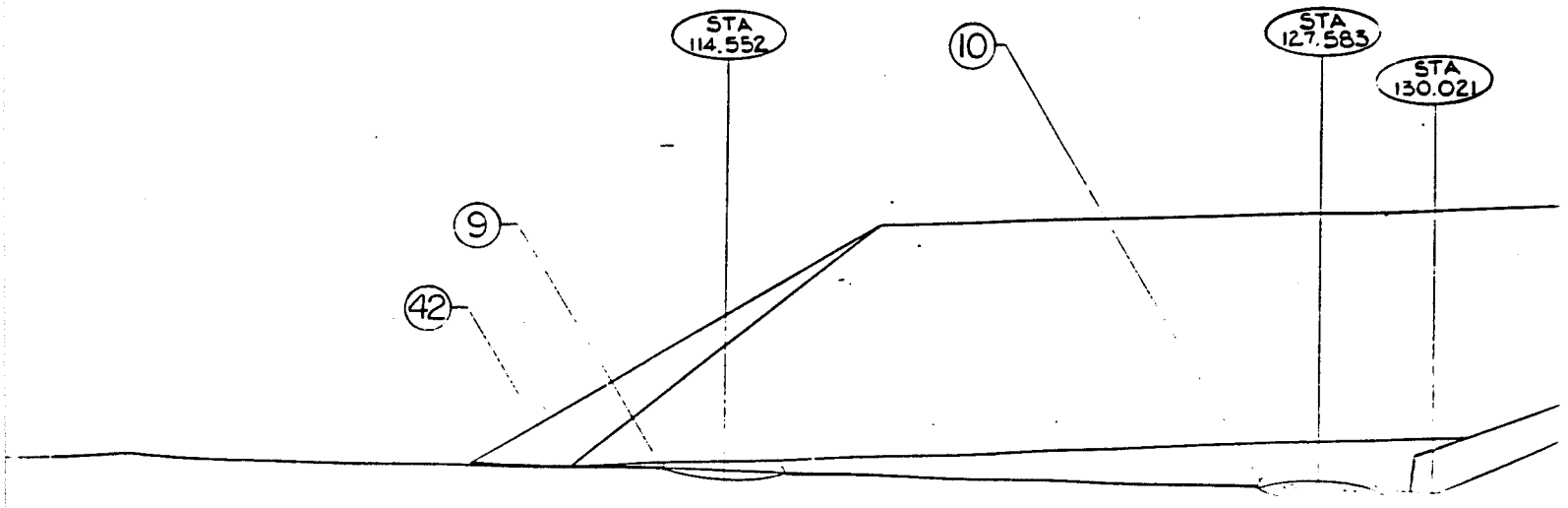


SLED, CHUTE EVALUATION TEST VARIATIONS

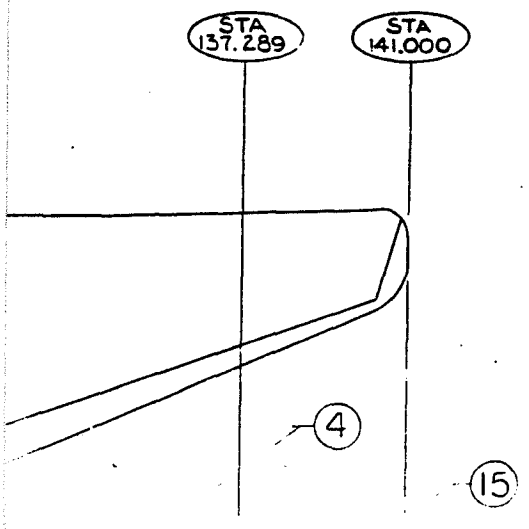
DWG ISS.		TEST NO.
1		212-1
2		212-2
3		212-3
4		212-4
5		212-5



NOTES

1. FOR ADDITIONAL INFORMATION PERTAINING TO FIELD TEST EQUIPMENT, SEE DRAWING NUMBER N59546.

1		BASSINGER, R DORNEMAN, E. 4412-5	7-6-64	
2		ADDED: 212-2 DESIGNATION AND ITEM 45 DELETED: ITEM 27 AND NOTE 2 CHANGED: ITEM 5 WAS 180372-00; ITEM 19 WAS 194059-00; ITEM 25 WAS 186792-00; ITEM 34 WAS H6C473; ITEM 35 WAS N60418; ITEM 38 WAS 12 REQ.; ITEM 39 WAS 16 REQ; ITEM 40 WAS MS 35192-42; ITEM 43 WAS MS35193-72. MAYER CO 2212-5	8-12-64	
3		ADDED: ITEMS 25, 27, 48 & 49; 212-3 DESIG. CHANGED: 7, 19, 21 & 45 SOLOMKO, A 2212-5		
4		ADDED: 212-4 DESIGNATION CHANGED: ITEM 5 WAS 198021-00; ITEM 6 WAS 180380-00; ITEM 8 WAS 155 5; ITEM 12 WAS 186735-00; ITEM 17 WAS 192114-00; ITEM 20 WAS 192148-00; ITEM 23 WAS 192174-00; ITEM 34 WAS N77403; ITEM 35 WAS N65396; ITEM 44 WAS MS35225-44, SCREW, MACH, FAN HD DELETED: ITEMS 36, 38, & 39; VIEW C-C RODZEWICH, J.J. 2212-5		
5		ADDED: 212-5 DESIGNATION; CHANGED: ITEM 12 WAS N 60483; K.R. DUNEAR, 2212-5	11/6/64	



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4	MS35456-23	SCREW, CAP, SOC HD			
4	MS35193-58	SCREW, MACHINE 82° CSK HD			
4	MS20392-7C57	PIN, FLAT HD			
1	N84567	JUNCTION BOX, UNIVERSAL (STS)			
1	[illegible]	[illegible] (ISS 1)			
1	N59546	TM INSTALLATION 101 (ISS 2)		1	
80	194092-20	SCREW, SPECIAL (ISS 1)			

Figure 2

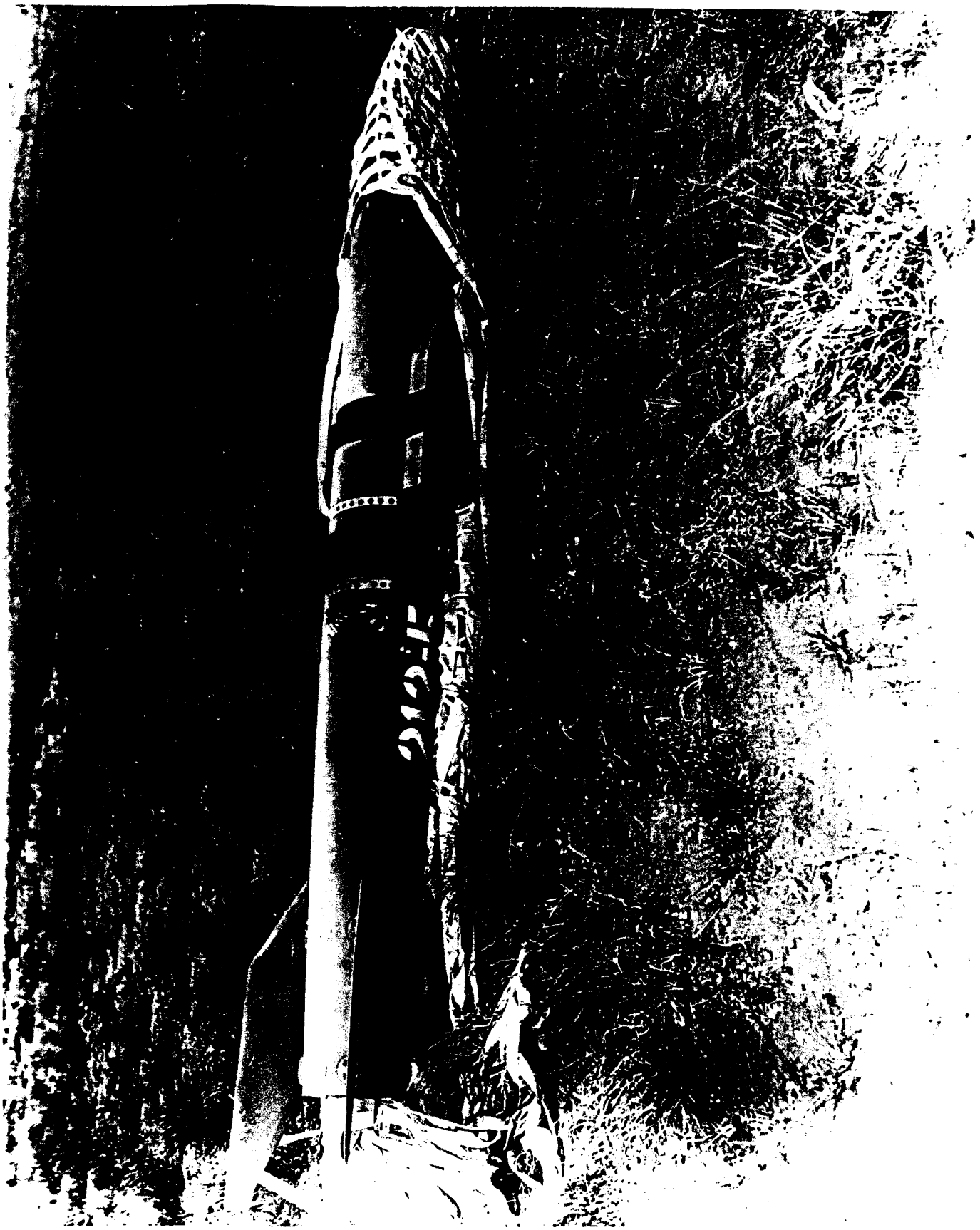

Figure 3

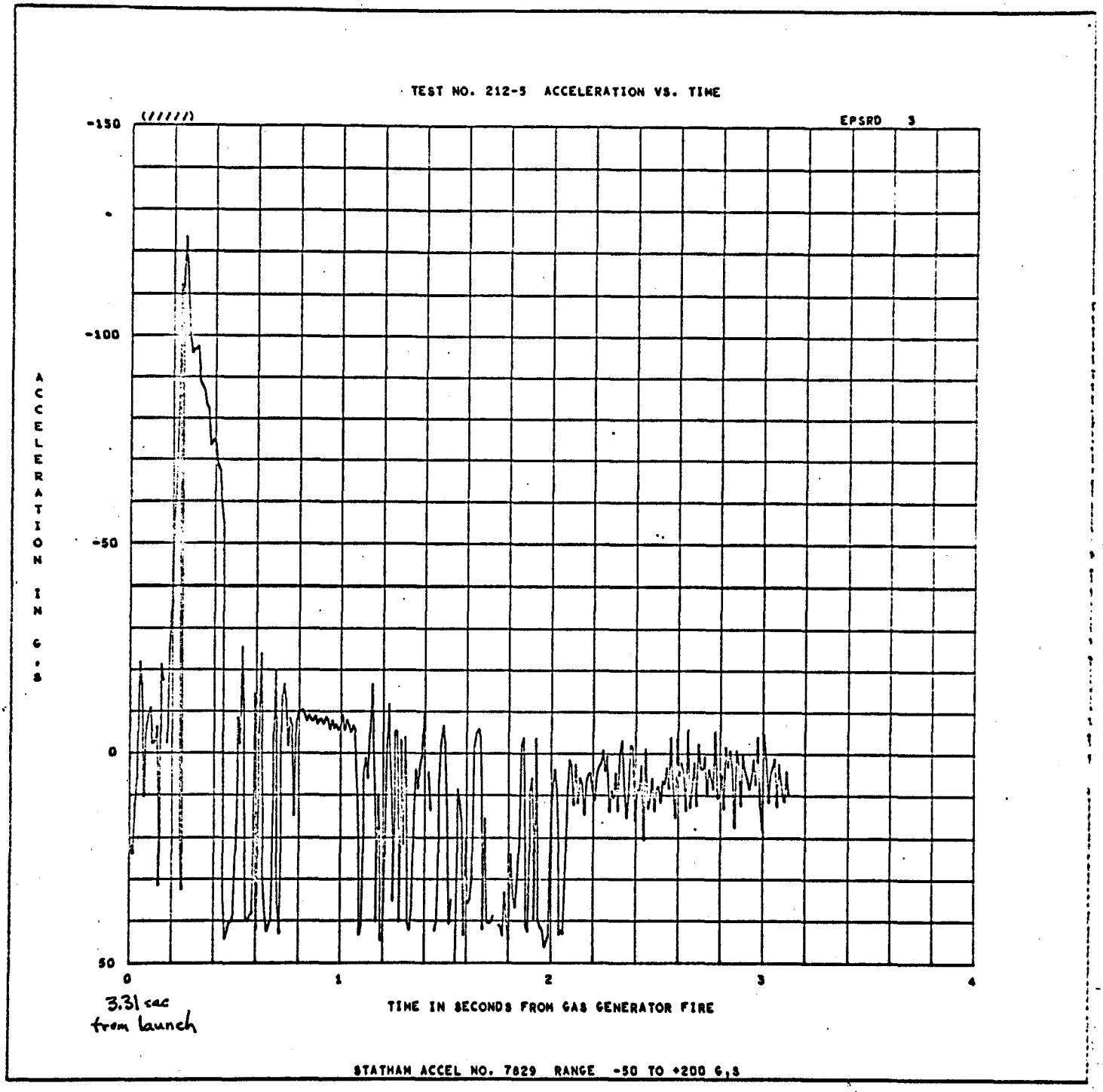
TEST NO. 212-5 ACCELERATION VS. TIME
(/////)
EPSRD 3
-150
-100
-50
0
50
ACCELERATION IN G's
0
1
2
3
4
3.31 sec from launch
TIME IN SECONDS FROM GAS GENERATOR FIRE
STATHAM ACCEL NO. 7829 RANGE -50 TO +200 G,S

Figure 4