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SANDIA SYSTEMATIC DECLASSIFICATION REVIEW	
DATE: 9-17-97	
BY: Emeralda Selph	FOR: R.B. Cranes
DATE: 9/17/97	NO: 97SN3226
DATE: 9/3/97	

SANDIA SYSTEMATIC DECLASSIFICATION REVIEW	
1 st Review Date: 8/11/97	Determination (Circle Numbers):
Authority: <input type="checkbox"/> ADG <input checked="" type="checkbox"/> ADD	Classification Retained: <u>U</u>
Name: W. Jones	Classification Changed to: _____
2 nd Review Date: 9/3/97	Contains No DOE Classified Information: <input checked="" type="checkbox"/>
Authority: ADD	Coordinate With: _____
Name: R.B. Cranes	Contains UCAIT: <input type="checkbox"/>
	Comments: <u>atg/p/merat</u>

SC-DR-64-522

TEST PLAN FOR TX-61 WEAPON TEST 100-4
 (Title Unclassified)

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H. A. Tendall, 1513
 Sandia Laboratory, Albuquerque

March 1964

Approved by: J. W. Jones 36-A
 J. W. Jones, 1510

ABSTRACT

This report presents the proposed test plan (SDEP 117, Test Plan "B") for a free-fall test drop in the TX-61 weapon development program, designed especially to check stability with fins canted. Results of the test will be published as a supplement to this document.

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TEST PLAN FOR TX-61 WEAPON TEST 100-4

Introduction

This test plan covers a free-fall drop in the TX-61 weapon program intended especially to test stability in a unit with canted fins. The drop will be made on the dry lake target of the Tonopah Test Range under the following conditions:

Drop No. -- 100-4

Carrier -- F-104C

Ejection velocity -- 8 to 15 fps

Altitude above target -- 55,000 feet or above

Attitude -- level

Speed -- Mach 1.8 (Mach 1.7 minimum)

Test Objectives

The purposes of the test are:

1. To determine the stability of the unit during free fall, especially with regard to aerodynamic coupling, with fins canted 1 degree for clockwise rotation.
2. To determine trajectory.

Description of Test Vehicle

The test vehicle is shown in Figure 1. Its length is 141 inches, and its weight is approximately 586 pounds. The nose is an 0.081-inch-thick aluminum shell. A lead weight will be used to simulate the weight of the actual nose.

The center case is of the steel ballistic type. Additional weight will be added at the forward end to simulate proper weight distribution. The telemetry package will be mounted in the center

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portion of the center case. The center case incorporates a clamp-type joint to attach to the production-type tail section.

The tail section is an early type with doubler reinforcement and a clamp joint. A steel rod 2.5 inches in diameter will be installed in the rear case to simulate the weight of the parachute and tube assembly. The fins will be aligned to a 1-degree clockwise cant.

Instrumentation

Data will be collected by the customary methods--camera coverage and RF FM-FM telemetry link with ground stations.

Camera coverage is required to obtain data on:

1. Aircraft separation
2. Trajectory
3. Documentary.

This coverage will be provided by cameras located on the aircraft and on the ground. Continuous optical coverage of the trajectory is required from release to impact or near impact, with the impact point to be surveyed.

A 16-mm print of trajectory and aircraft separation will be delivered to Division 1513 within 5 days of the test. Still photographs of the unit installed on the aircraft, showing the pullout area, clearances with aircraft structure, and any other pertinent details will be sent to Division 1513 within 10 days of the test.

Telemetry information is required on the following characteristics:

1. Roll: continuous. A frequency response of 20 cps is required.
2. Yaw: ± 85 degrees. A frequency response of 20 cps is required.
3. Pitch: +45, -115 degrees. A frequency response of 20 cps is required.
4. Ejection velocity: 0-15 fps. A frequency response of 100 cps is required.

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Checkout Procedures

The unit will be checked for correct body alignment. The fins will be set $1^\circ \pm 3$ min. clockwise. The CG shall be located at 59.75 ± 0.30 . The pitch and roll moment of inertia shall be determined. Dynamic balancing of the unit is not required.

Predrop operational checks will be made of the telemetry and instrumentation.

Data Format

Optical Data

The following data, with respect to time, are required in tabular form. A frame-by-frame reading is desired. Smoothed data with 3-point velocity computation is desired in these categories:

1. Altitude (ft)
2. Range (ft)
3. Drift (ft)
4. Trajectory angle with respect to air (deg)
5. Total velocity with respect to air (fps)
6. x, y, and z components of velocity with respect to air (fps)
7. Mach number
8. x and y components of wind (fps)
9. Dynamic pressure (lb/ft^2)
10. Speed of sound (fps)
11. Air density (lb/ft^3)
12. Ambient pressure (in. Hg)
13. Calibrated air speed (knots)
14. Drag coefficient
15. Acceleration (g)

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Telemetry Data

An annotated oscillograph record is desired of the drop from 10 seconds before release to impact. A record speed of 10 inches per second is desired until 15 seconds after release; thereafter 1 inch per second is sufficient. The following signals, deflections, and notations are desired:

1. Ejection velocity: maximum deflection, peak value noted.
2. Roll: maximum deflection or 2 inches, whichever is less. Peak values noted.
3. Yaw: maximum deflection or 2 inches, whichever is less. Peak values noted.
4. Pitch: maximum deflection or 2 inches, whichever is less. Peak values noted.

A preliminary short record of the above is to be delivered to both Divisions 1513 and 7424 within 2 days after the test.

In addition to the annotated oscillograph records, it is requested that graphs of the following be made:

1. Trajectory angle versus altitude
2. C_D versus Mach number
3. Total velocity and dynamic pressure versus time
4. Mach number versus time
5. Altitude versus time and range
6. Vertical velocity versus time from release (ejection)
7. Roll rate versus time from release

A preliminary test report containing test conditions and preliminary test results is to be delivered to Division 1513 within 10 days of the test.

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Units, Scale, and Range

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<u>Data Format</u>	<u>Page</u>	<u>Ordinate</u>	<u>Abscissa</u>	<u>Remarks</u>
Turnover Attitude versus altitude	11	Traj. angle 5°/cm Pitch angle 5°/cm Yaw angle 5°/cm	Altitude 0-60,000 ft 2500 ft/cm	Triple plot
Drag coefficient	13	Mach no. 0.1/2 cm Mach 1 to 2	C _D 0.1/5 cm 0.4 to 0.5	
Total velocity and dynamic pressure versus time	16	a. Dynamic pressure 100 lb-ft ² /cm b. Total velocity 50 ft/sec/cm	Time 2 sec/cm	Double plot
Speed	18	Mach no. 0.1/cm	Time 2 sec/cm	
Trajectory	19	Altitude 2500 ft/cm	a. Time 2 sec/cm b. Range 5000 ft/cm	Double plot
Ejection velocity	-	Vertical velocity 2 fps/cm; 0 to 20	Time from release 0 to 170 10 millisecond/cm	
Roll rate	-	0.5 rps/cm 0 to 10 rps	Time from release 2 sec/cm 0 to 70 sec	

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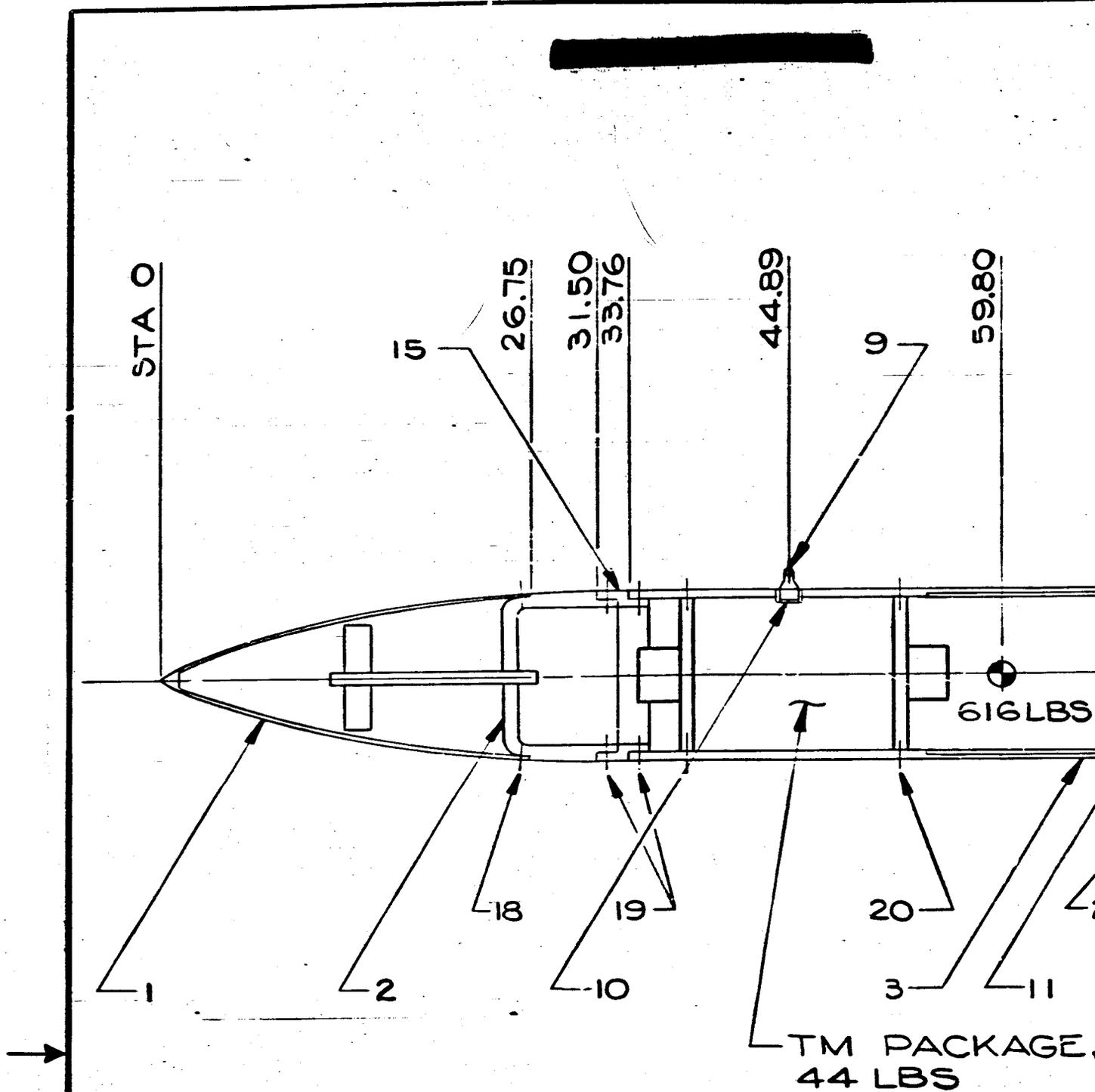
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Data Distribution for 100-4

	W. V. Hereford, 7215	W. H. Curry, 7424	D. M. Bruce, 1542	C. L. Carpenter, 1513	APGC (PGWRB) Attn: Chief Bomb Ballistics Div., For: Marjorie Field Eglin Air Force Base, Fla.	Naval Weapons Lab. Dahlgren, Va.	Hdqrs FC/DASA: Attn: Adj. Gen. For: Major R. K. Wright, FCDD3
Preliminary Test Report	x	x		x			x
Data Reduction Report	x	x	x	x	x	x	
Plots: Turnover	x	x		*			
Roll Rate versus Time	x	x		*			
Mach Number versus Time	x	x		*			
Total Velocity and Dynamic Pressure	x	x		*			
Trajectory	x	x		*			
Ejection Velocity	x	x	x	*	x	x	
Drag Coefficient vs Mach No.	x	x		*	x	x	
Annotated Records:							
Gyros	x	x		x			
Ejection Acceleration	x	x		x			
Roll	x	x		x			
Film: Documentary	x	x		x	x	x	
Aircraft	x	x		x	x	x	
Stills: Documentary	x			x			

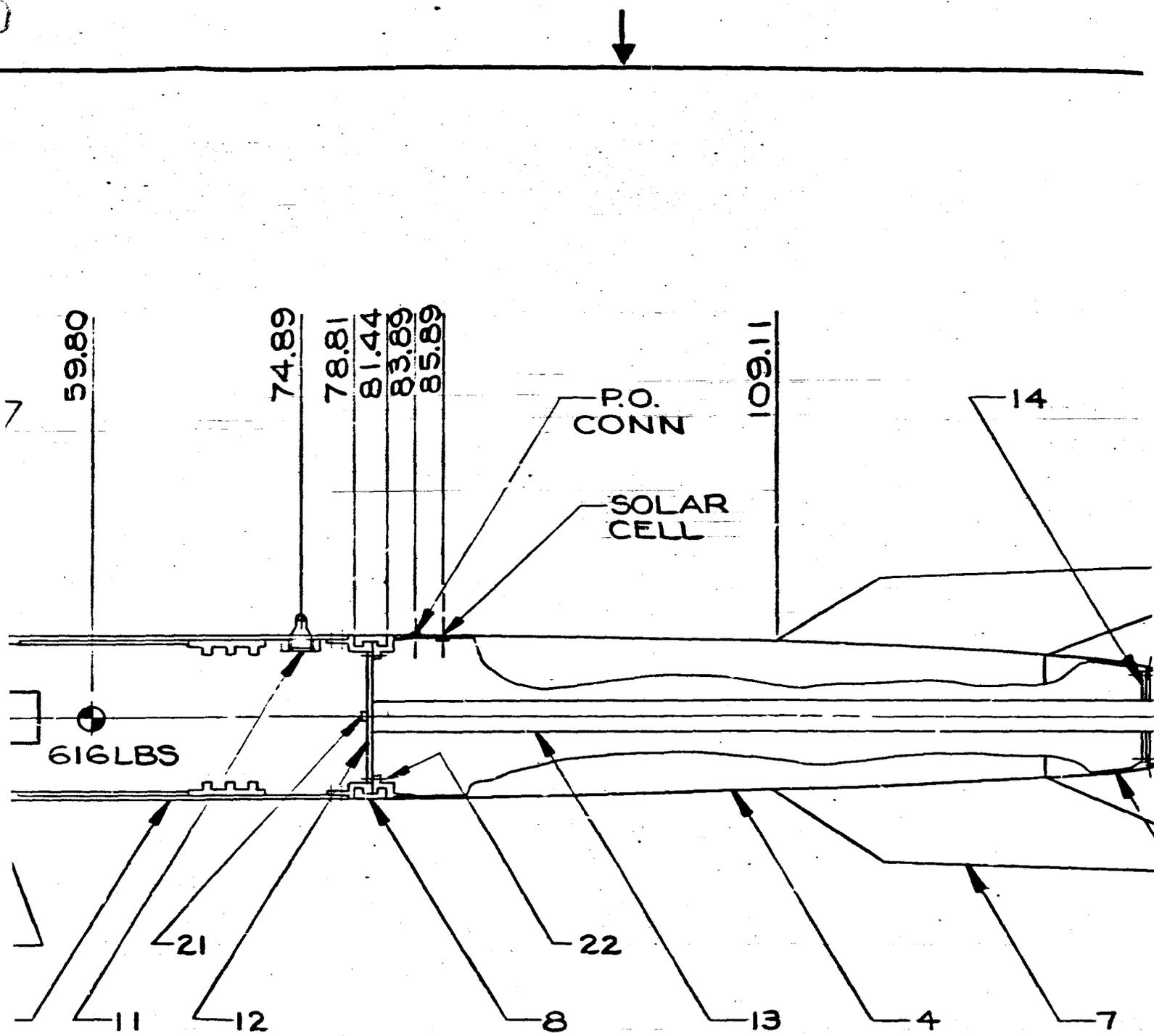
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- 1 N49146
- 2 N49147
- 3 N49148
- 4 180391, ISS 4
- 5 180370, ISS 2
- 6 180369, ISS 3
- 7 186730

- NOSE, BALLISTIC
- PLUG & WEIGHT ASSY (STL WT RE
- CENTER CASE, BALLISTIC (WITH
- CASE SECTION, REAR
- CASE EXTENSION, REAR (MODI
- CAP, REAR (MODIFIED)
- FIN - CANTED 1° AS MODIFIED



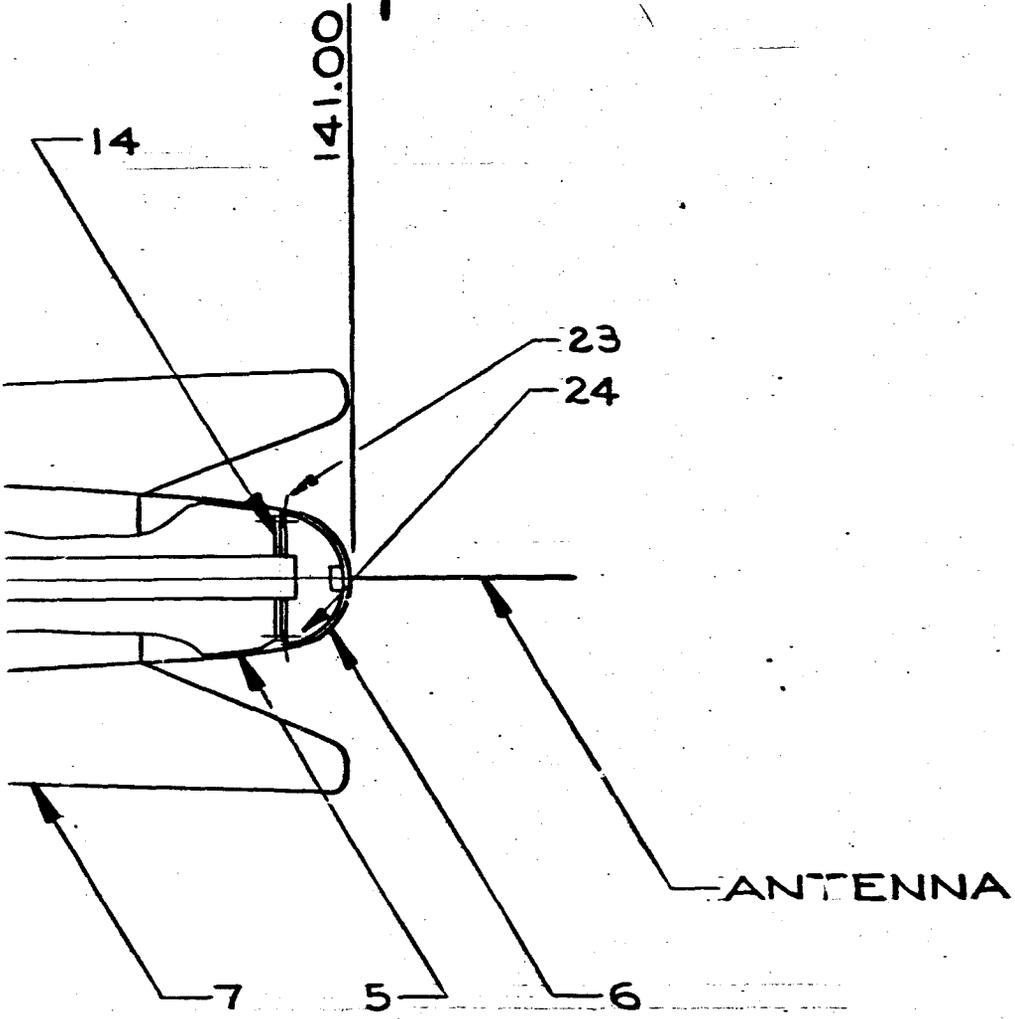
PACKAGE, N51444
S

PL WT REPLACED BY 40LB LEAD WT)
 IC(WITH N52879, CLAMP ADAPTER)

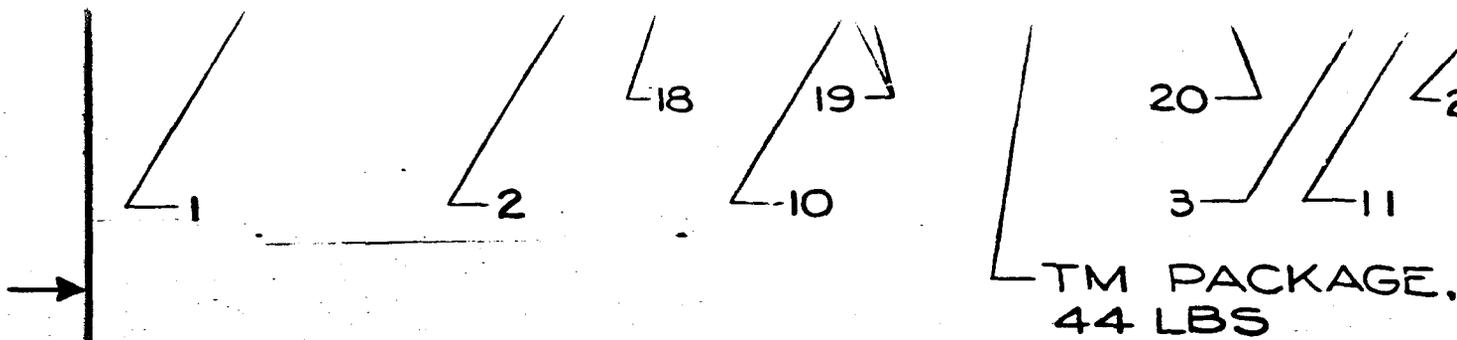
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REVISIONS

ISS	DESCRIPTION	DATE	CHKR	ENGR
1	PREPARED BY: ALVINO, 4412-5	11-27-63		Hof

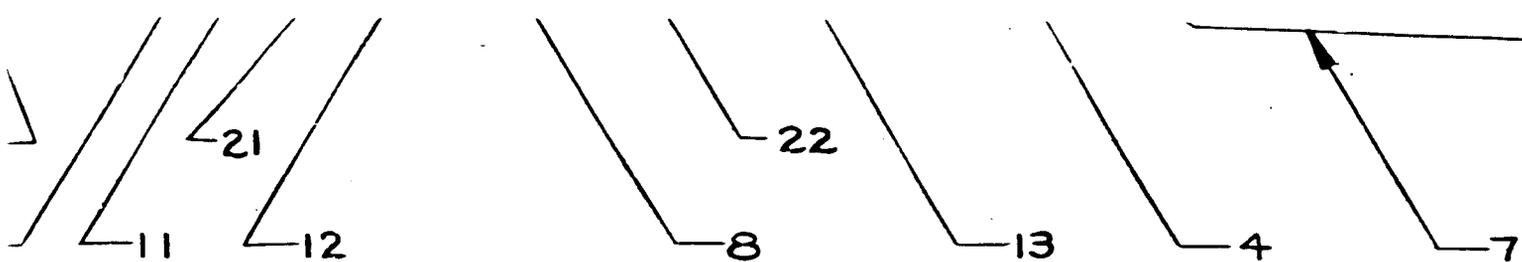


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N60410
DWG. NO.



1	N49146	NOSE, BALLISTIC
2	N49147	PLUG & WEIGHT ASSY (STL WT RE
3	N49148	CENTER CASE, BALLISTIC (WITH
4	180391, ISS 4	CASE SECTION, REAR
5	180370, ISS 2	CASE EXTENSION, REAR (MODIF
6	180369, ISS 3	CAP, REAR (MODIFIED)
7	186730	FIN - CANTED 1° AS MODIFIED
8	186737	CLAMP - AFT
9	192132, ISS 2	LUG, SUSPENSION
10	N54886-1	INSERT, SUSPENSION LUG (BALLI
11	N54886-2	INSERT, SUSPENSION LUG (BALL
12	N54890	SUPPORT, ROD, FWD (BTS)
13	N54889-3	ROD, REAR CASE SECTION (BTS)
14	N54887	SUPPORT, ROD, AFT (BTS)
15	N54853	EXTENSION, FWD (BALLISTIC U
16		
17		
18	SCREW, FL HD, #4-40 x 5/16 LG	
19	SCREW, FL HD, 1/2-20 x 1/4 LG	
20	SCREW, FL HD, 3/8-16 x 1/4 LG	
21	SCREW, SOC HD, 1/2-13 x 1 1/2 LG	
22	SCREW, SOC HD, 1/4-28 x 1 LG (W/LOCKWASHER	
23	SCREW, FL HD, #4-40 x 3/16 LG	
24	SCREW, SOC HD, #8-32 x 9/16 LG (W/LOCKWASH	
25		
26		





PACKAGE, N51444
S

PL WT REPLACED BY 40LB LEAD WT)
IC(WITH N52879, CLAMP ADAPTER)

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JG (BALLISTIC UNIT)
UG(BALLISTIC UNIT)
BTS)
ON (BTS)
TS)
LISTIC UNIT)

WASHER)

CKWASHER)

DWG CLASSIFICATION LEVEL		PART CLASSIFICATION		
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CLASSIFICATION CATEGORY		ORG	DATE	INITIAL
		1513		
		AGENCY APPRO		



