[redacted]

UNCLASSIFIED

SANDIA SYSTEMATIC DECLASSIFICATION REVIEW

1st Review Date: 6/9/98	Determination (Circle Numbers):
Authority: DOE ADD	1. Classification Retained
Name: R B Cranes	2. Classification Changed to: UNCL
2nd Review Date: 6-16-98	3. Contains No DOE Classified Information
Authority: ADD	4. Coordinate With:
Name: W Layne	5. Contains UCAI?
	6. Comments: DECLASSIFY

NOV 27 1959

XW-45, 3-2
Project No. T-16334
Case No. 804.05
Ref. Sym: 1613(104)

TO: DISTRIBUTION

Re: Centrifuge Test of XW-45 Flight Test Unit

INVENTORIED
SEP 14 '65
3428-3

INVENTORIED
AUG 6 '64
8427-1

RECEIVED
DEC 1 1959
CENTRAL RECORD FILE

Test Summary

A centrifuge test was conducted to check the telemetering package in the XW-45 flight test unit under sustained accelerations.

In the first condition (1) the XW-45 was mounted in the centrifuge with the nose in toward the axis of the centrifuge and 8.3° down from the horizontal. The C.G. of the warhead was subjected to 75.8 g combined acceleration in this position.

For condition 2, the warhead was mounted with the nose down and 15° from the vertical, and subjected to 67.6 g combined acceleration. Runs were made in this orientation with the warhead rotated about its own longitudinal axis in each of the four mutually perpendicular positions.

No structural damage occurred during the test. The telemetering package failed in two different orientations, but these failures were attributed by the consultant to a faulty cable leading to the warhead.

Object of Test

The object of this test was to determine if the flight test telemetering package mounted in an XW-45 warhead would operate properly while being subjected to sustained accelerations simulating missile flight conditions.

Authorization for Test

This test was requested in a letter from W. A. Maupin, 8124, to A. W. Roger, 1613, dated May 15, 1959, Ref. Sym: 8124-(113). Mr. [illegible] M. Jones, 8124, was the consultant.

CENTRAL RECORD FILE
XW-45
3-2

Setup for Test

The position of the warhead on the centrifuge for condition 1 is shown in Figs. 1 and 2. The tail of the warhead was secured to the tail plate of the jig so that during the run, the warhead was in compression during acceleration.

1810

SANDIA SYSTEMATIC DECLASSIFICATION REVIEW
DOWNGRADING OR DECLASSIFICATION STAMP

CLASSIFICATION CHANGED TO: U	AUTHORITY: W C Layne
Emelda Segah 6/24/98	RECORD ID: 98SN2423
PERSON CHANGING MARKING & DATE	
WC Layne 6/24/98	DATED: 6/16/98
PERSON VERIFYING MARKING & DATE	

[redacted]

UNCLASSIFIED

UNCLASSIFIED

Figure 3 shows the position of the warhead on the centrifuge for the runs in condition 2. The warhead was mounted in the jig in the same manner as condition 1 with the warhead tail secured to the jig tail plate, but under those conditions, the greater acceleration loads were perpendicular to the longitudinal axis of the warhead.

List of Components in the Warhead:	Dwg. No.
XMC-919, neutron generators	310638
XMC-1187 firing set	211042
telemetering package	

Test equipment used:

Hydraulic centrifuge
Berkeley counter and timer, Model 5510, Serial No. 340
Berkeley digital recorder, Model 1452

Procedure

After the telemetering system was checked out by Division 5253, the tail of the XW-45 warhead was secured to the tail plate of the jig. With the jig nose plate in place, the inside of the jig was lined with rubberized hair padding to minimize damage to the warhead if the mounting flange should fail. The tail plate and warhead were then mounted in the jig, which in turn was mounted on the centrifuge boom as shown in Figs. 1 and 2. In this orientation, which was called condition 1, the consultant desired a combination of 75 g launch acceleration along the longitudinal axis of the warhead and [illegible] g re-entry acceleration along the vertical axis. This was accomplished by mounting the XW-45 warhead at 8.0° down from the horizontal with the nose of the warhead toward the center of the centrifuge, and subjecting the C. G. of the warhead to 75.0 g in the horizontal plane. The "[illegible]" symbol on the tail of the warhead was down, in the vertical plane. The 75.0 g load was obtained using 62.5 RPM on the centrifuge and was maintained for [illegible] seconds. A record of the RPM of the centrifuge as printed on the Berkeley digital recorder was taken for the entire run.

Run 2 was made using the [illegible] specifications of condition 2. These were [illegible] g perpendicular to the [illegible] axis of the warhead and [illegible] along the longitudinal axis. [illegible] the warhead at [illegible] from the vertical [illegible] the nose of the warhead down and the tail toward the [illegible] of the centrifuge, as shown in Figure 3. The resultant acceleration [illegible] of the warhead or 63.0 R.P.M. of the centrifuge. [illegible] seconds [illegible] It was desired that [illegible]

UNCLASSIFIED

[redacted]

[redacted]

UNCLASSIFIED

and jig tail plate were rotated 180° in the jig about the XW-45 longitudinal axis and bolted down.

The consultant then received word that the specifications for condition 2 were changed to 62.5 g perpendicular to and 17.5 g along the longitudinal axis of the warhead. Since the warhead had been rotated it was decided to make the run in the present position. Under these new specifications the warhead should have been mounted at 15.6° from the vertical. The nearest to this that was possible with the jig however, was the 14.0° used previously.

Run 3 was then made with the warhead at 14.0° from vertical, nose out and down as shown in Fig. 3. "TDC" was in, toward the axis of the centrifuge on the centerline of the boom. The consultant decided a load of 64.7 g perpendicular to and 16.2 g along the warhead longitudinal axis would be satisfactory. These loads were achieved by applying a resultant load of 66.7 g (77.3 RPM) in the horizontal plane with the warhead mounted 14° from vertical. This speed was maintained for 60 seconds. A Berkeley recorder print out record was made for the entire run. During this run the angle adjustment holes on the jig became enlarged slightly, allowing it to tilt to a 15° angle from vertical. This position of 15° from vertical with nose out and down, similar to Fig. 3, was used for the remainder of the condition 2 runs.

The warhead and tail plate were rotated 90° so that for run 4, "TDC" was pointing toward the leading edge of the boom. The loading was 65.3 g perpendicular to and 17.5 g parallel to the warhead longitudinal axis, with 67.6 g resultant acceleration at a speed of [illegible] RPM. The telemetering signal failed after the centrifuge [illegible] [illegible] RPM, but the run was continued [illegible] seconds. [illegible] recorder [illegible] used to obtain a record of the speeds. The failure of the telemetering package was found to be caused by a loose wire in the [illegible].

Run 5 was begun after the warhead and tail plate were rotated 180° so that the "TDC" was toward the trailing edge of the centrifuge boom. The same conditions as the previous run were intended [illegible] the TM signal failed at [illegible] RPM so the [illegible] failed. [illegible] failure was found [illegible] [illegible] [illegible] [illegible] signal failed at [illegible] [illegible] [illegible] [illegible]

[illegible]

UNCLASSIFIED

1812

[redacted]

[redacted]

UNCLASSIFIED

The warhead was rotated back so the "TDC" was on the trailing edge of the boom for another attempt at run 5. This eighth run was nearly completed but the TM failed after 30 seconds at 77.8 RPM. It came back on at about 20 RPM but still no cause for the failure was found. The run was started again but this time the TM went out at 59 RPM and came back on at 22 RPM. After the run the XW-45 warhead was removed from the jig, disassembled, and visually inspected very carefully. No failure or damage was found so it was reassembled and mounted in the jig as before. The only change was that the cable to the warhead was led in from a different direction across the jig. The telemetry operated properly throughout this run. A speed of 77.8 RPM was reached and maintained for the desired 60 seconds. This completed the test and the FTU was shipped back to Livermore.

Results

There was no structural damage to the XW-45 warhead during the tests. The TM package failed in two positions under condition 2, but both failures were attributed to a faulty cable connector leading to the warhead.

Conclusions and Recommendations

The results indicated that the telemetering package and the structure of this flight test unit will withstand the missile flight accelerations as simulated in this test.

R. M. [illegible] - 1613-2

[illegible] Project Engineer: [illegible] - 1613-3

Approved by: R. S. [illegible] - 1613-3

[illegible]

[illegible]

[illegible] — CR 373041-disp

CR 373041-disp.

UNCLASSIFIED

1813

[redacted]

UNCLASSIFIED

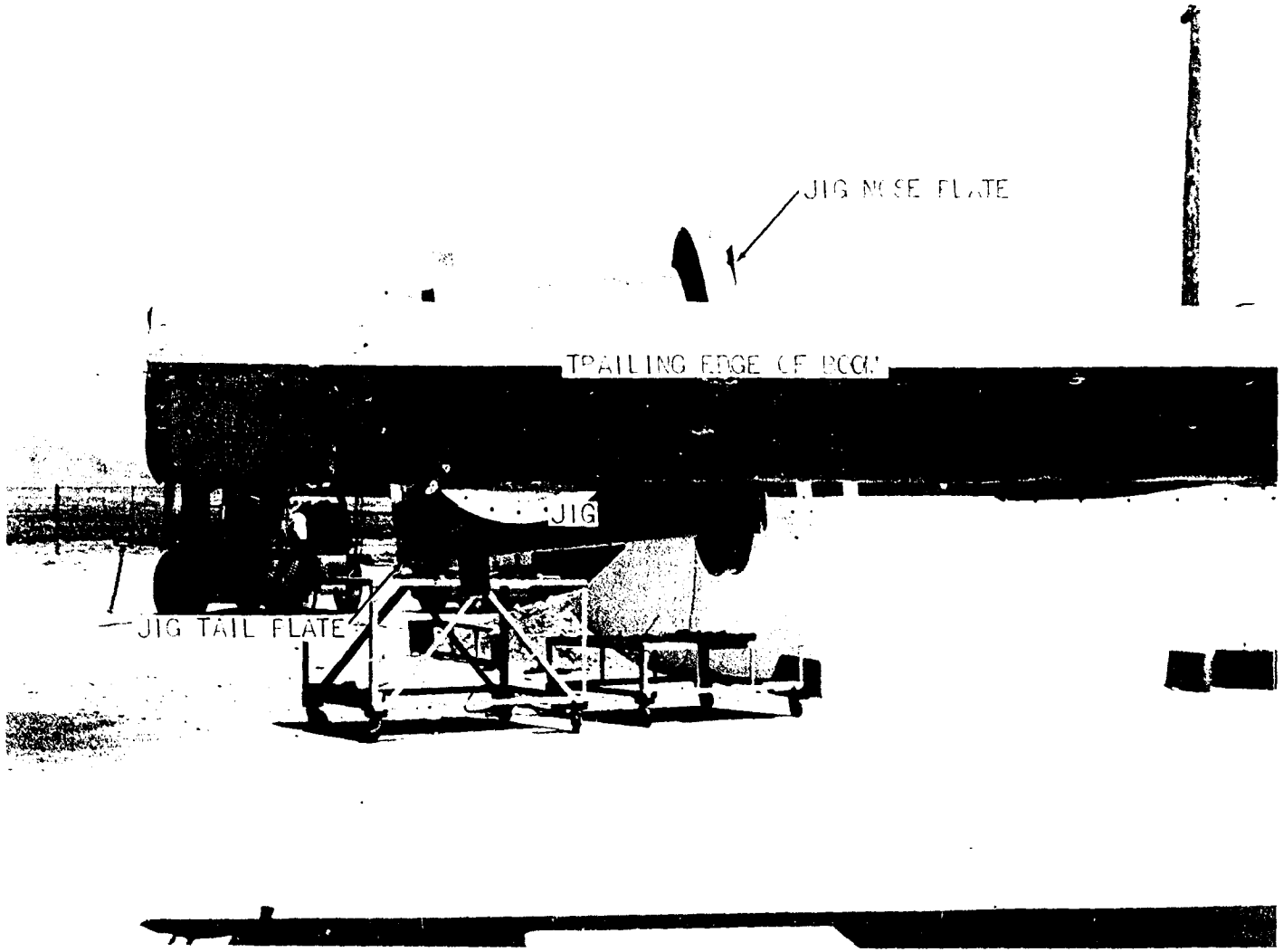

FIG. 1 --- ORIENTATION OF JIG FOR CONDITION I --- CENTRIFUGE TEST OF XW-45 FLIGHT TEST UNIT

REF. SYM: 1613 (. .)
PROJECT NO. T-16334

UNCLASSIFIED

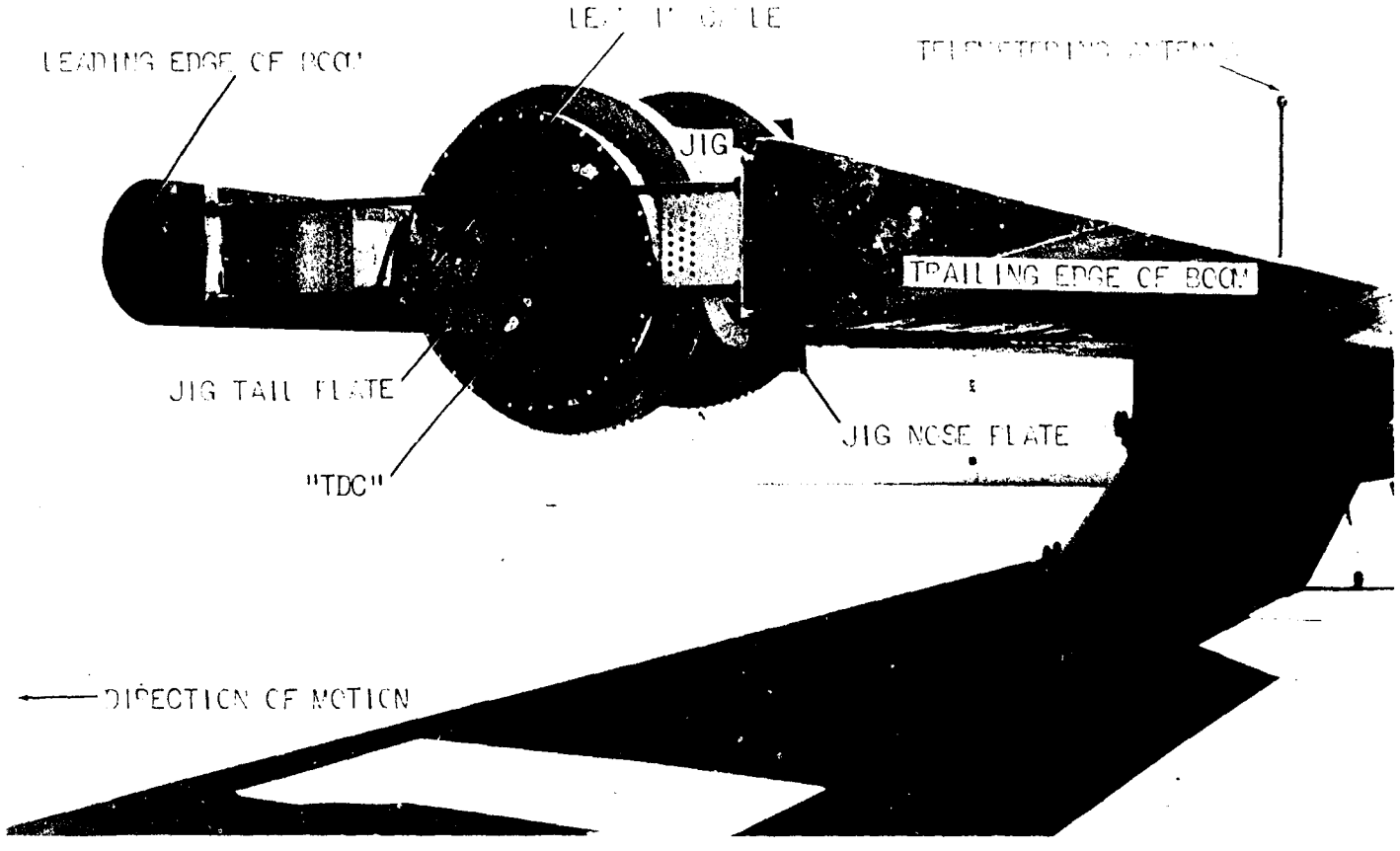

FIG. 2 --- ORIENTATION OF JIG FOR CONDITION I --- CENTRIFUGE TEST OF XW-45 FLIGHT TEST UNIT

REF. SYM: 161[illegible] ( )
PROJECT NO. T-16334

UNCLASSIFIED

UNCLASSIFIED

UNCLASSIFIED

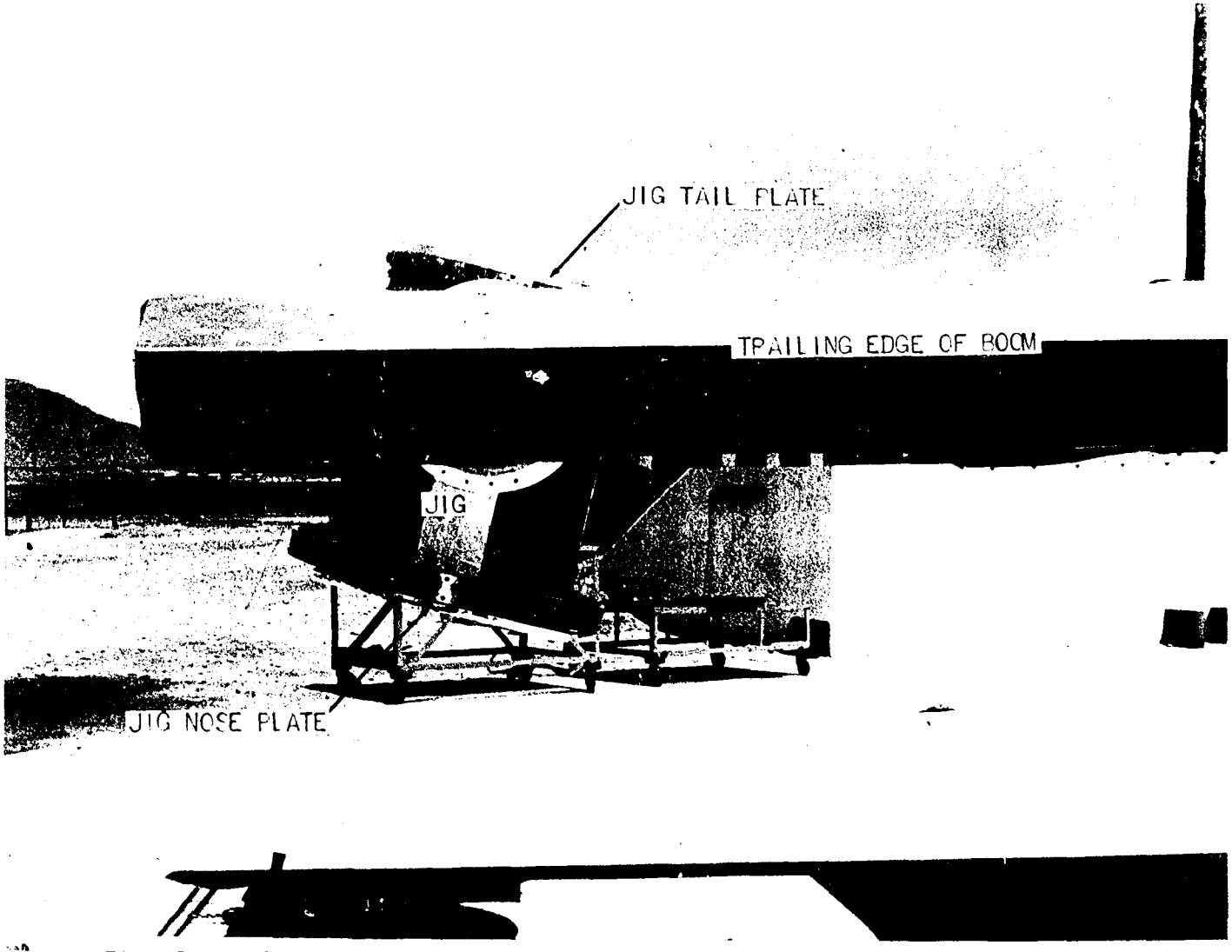

FIG. 3 --- ORIENTATION OF JIG FOR CONDITION 2 --- CENTRIFUGE TEST OF XW-45 FLIGHT TEST UNIT

REF. SYM: 1613 (104)
PROJECT NO. T-16334

UNCLASSIFIED