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CENTRAL FILE
FOREIGN
LAND
FILE No. XW 59/Minuteman 3-2

JUN 1 1962
File No: XW-59, 3-2
T-17532
Completed: 9-22-61
DS 7321/9961

RECEIVED
JUN 4 1962
CENTRAL RECORD FILE

Mr. J. W. McMillan - 7147
Attn: G. T. Whiting

Re: Centrifuge Test of Mk 5 Mod 2 Re-entry Vehicle (U)

PROGRAM
CATEGORY
ORG.
DATE

Summary

This test was one of a series conducted on the MINUTEMAN Mk 5 Mod 2 Re-entry Vehicle (with XW-59) to determine its adequacy for missile flight tests. This was a joint Avco/Sandia Corp. test.

A Mk 5 Re-entry Vehicle was subjected to a total of four centrifuge tests under the following conditions; launch orientation held for 5 minutes at 13.2 g, lateral re-entry orientation from 0g to 32.5g maximum and back to 0g as quickly as possible along each of the two mutally perpendicular lateral axes, and the longitudinal re-entry orientation from 0g to 75g held for 30 seconds at maximum g and returned to 0g as quickly as possible.

The XW-59/59-1E (Ser. No. 102-84-9739) warhead instrumentation was monitored during testing by Sandia Field Test personnel, Avco personnel monitored their function circuits. This information will appear in their respective reports on this phase of testing.

Figures 1 thru 4 show the unit mounted on the jig on the centrifuge boom for the three orientations.

There was no visible damage to the R/V or the XW-59 after any of the centrifuge tests.

INVENTORIED
SEP 14 1965
3428-3

Division 7147 Conclusions

The purpose of these tests was to demonstrate the ability of the Mk 5 Mod 2 R/V system with the flight test XW-59 warhead to withstand the expected flight acceleration loads.

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AUG 6 1964
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All structural systems withstood the simulated flight environment without failure. However, this test should not be construed as being a complete structural certification of the Mk 3 R/V warhead interface since not all the loading was properly simulated. For example, in the unsymmetrical re-entry test (Figure 3) no appreciable interf e loads were applied, while in the actual condition there is an applied mom t and axial tension of significant magnitude.

The telemetry system operated satisfactorily.

Two peculiarities occurred during the test. One was that the TM indicated the MC-1107 Inertial Switches had been actuated prior to the first test. This was subsequently explained by the presence of a low impedance solenoid in this circuit on the AVCO side of the interface. The high impedance TM circuit could not differentiate between the solenoid and the low impedance circuit present in the warhead when the MC-1107's are actuated. The second peculiarity was that the warhead air burst transformers did not burn open during the approximately one and one-half second period that power was applied to them. During all other tests these transformers have opened in considerably less time. However, this phenomenon is not significant to compatibility since it occurred after the time the W/H would have detonated. It is theoretically possible for this situation to affect the groundburst back-up capability, but this possibility is so remote that it is not considered cause for concern.

Warhead operation through the air burst option was normal, all signals supplied by the arming and firing system satisfactorily met the warhead requirements.

[illegible]
LEO P. [illegible] - 7324-2

[illegible]
Test Project Engineer [illegible] - 7321-5

[illegible]
Approved by [illegible] - 7321-5

[illegible]
Approved by [illegible] - 7147-2

[illegible]

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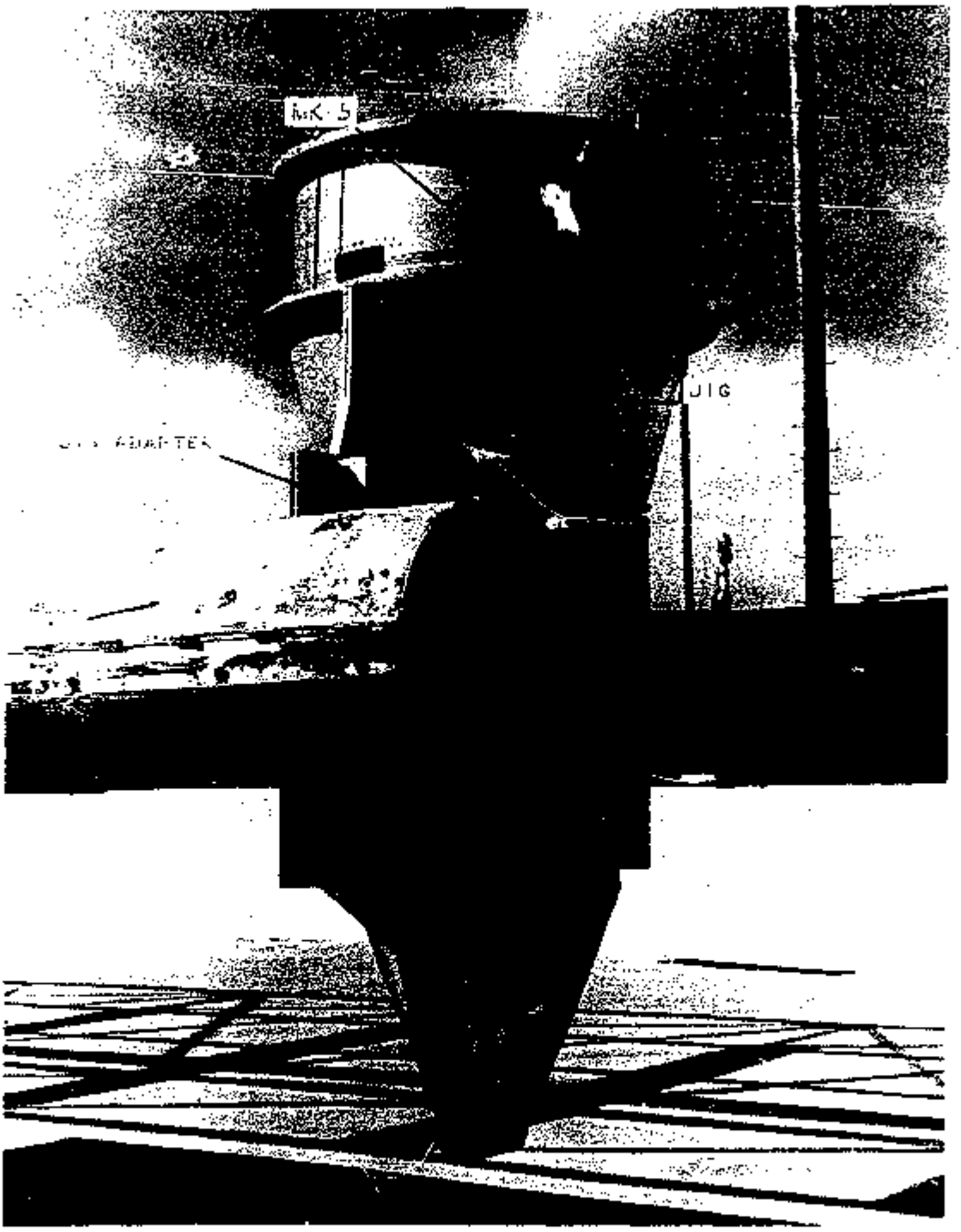

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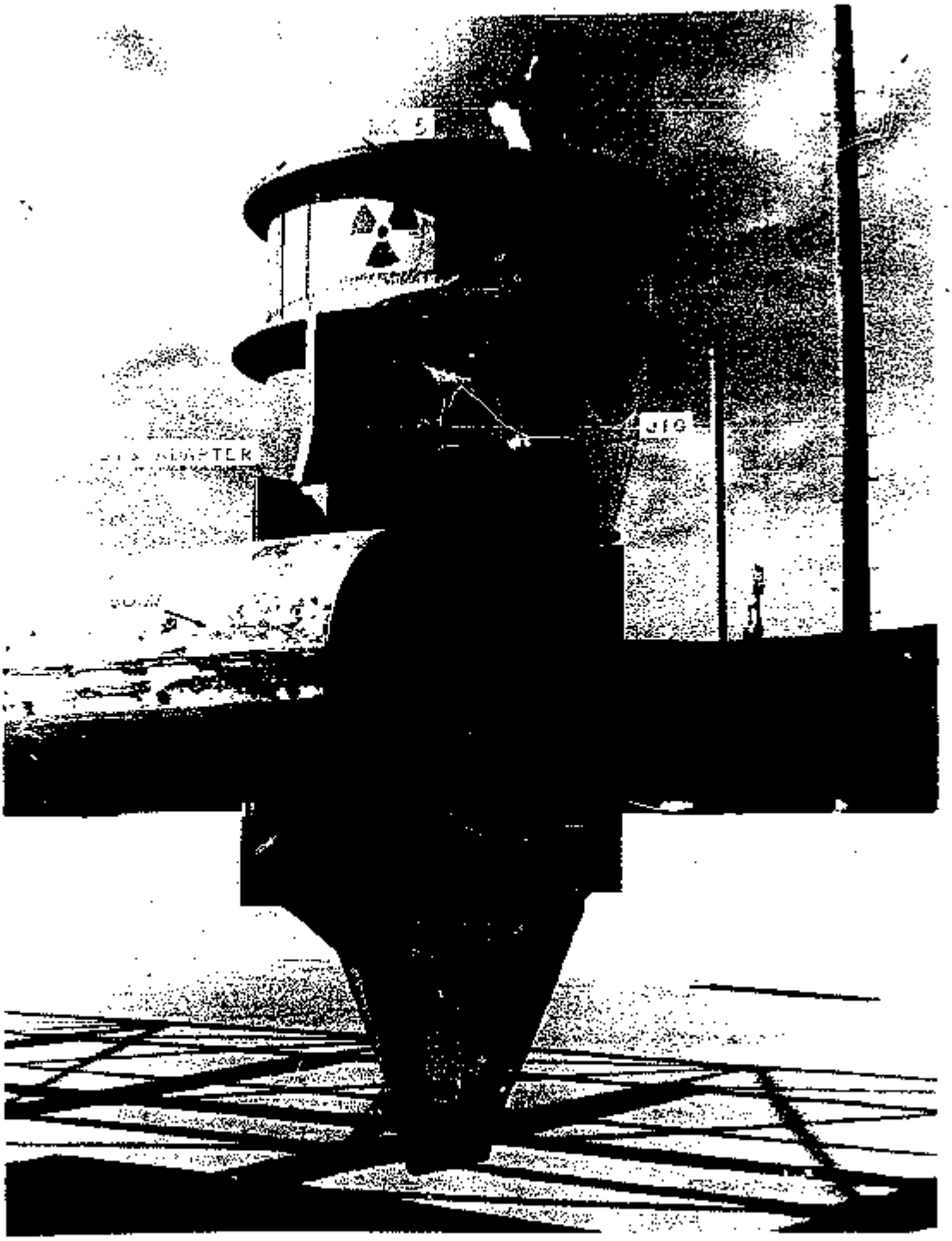

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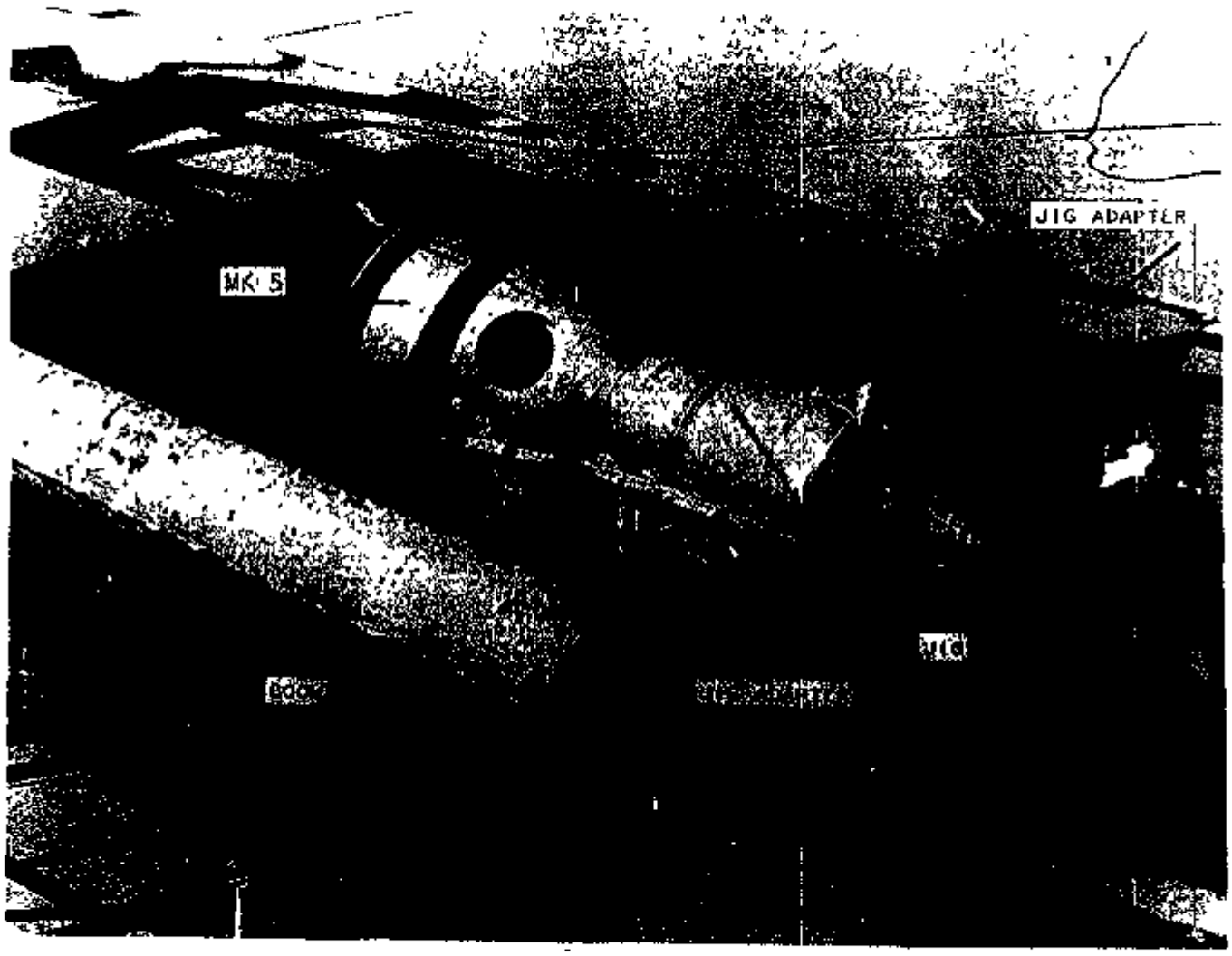

FIGURE 4 - SETUP FOR LONGITUDINAL REENTRY ORIENTATION. CENTRIFUGE TEST OF MK5/XW-59 REENTRY VEHICLE.

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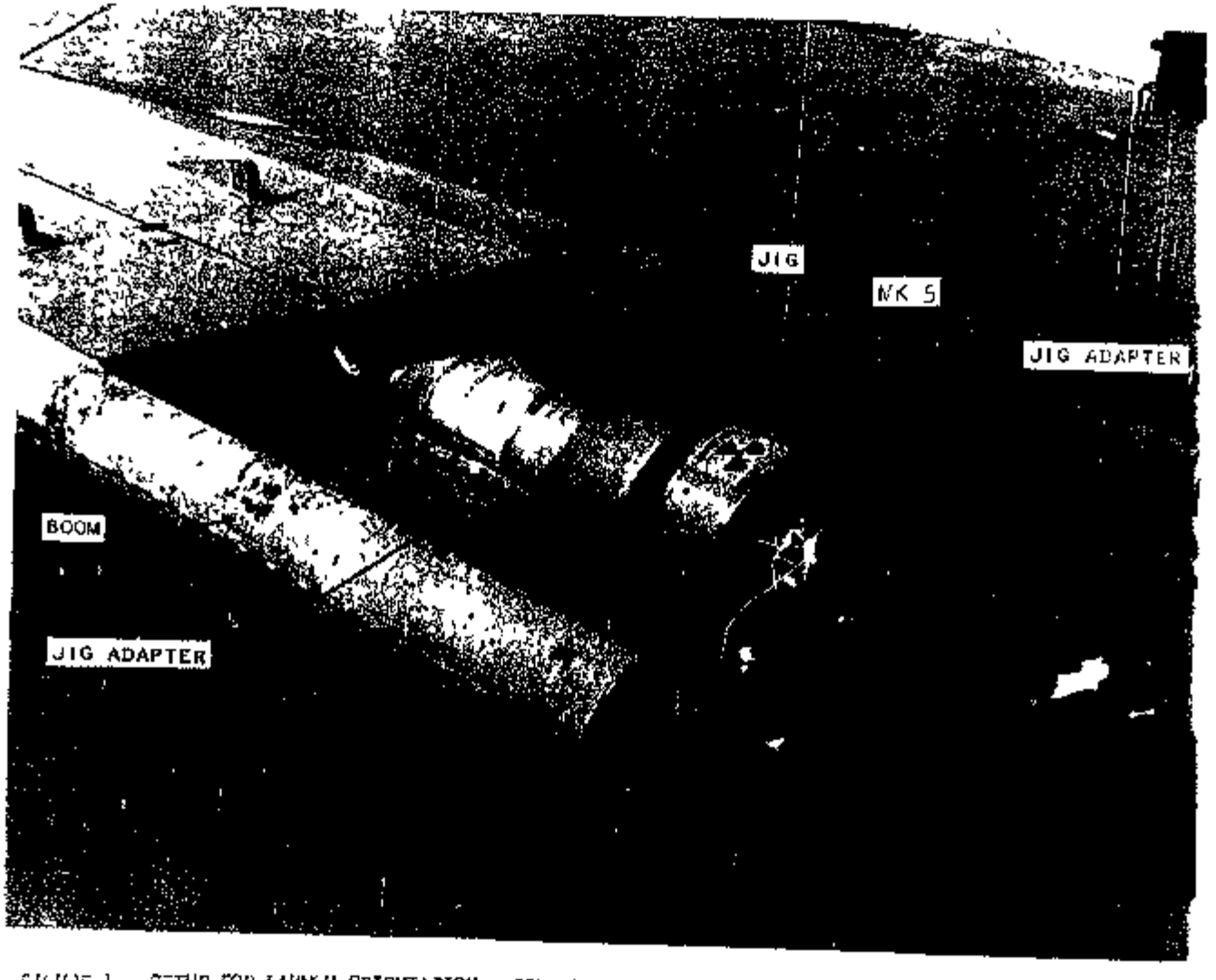

FIGURE 1 - SETUP FOR LAUNCH ORIENTATION. CENTRIFUGE TEST OF MK5/XW-50 MISSILE VEHICLE.

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