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DEC 24 1963

CENTRAL TECHNICAL FILE

DEC 23 1963

File No: TX-43, 3-2
T-18435
Test Completed: 9-14-63

MR. L. A. BURN - 1511
Attn: Mr. T. K. Hill

Re: Drop Tower Tests of 50-50 Filament Wound Test Containers in the Mk 43 Bomb Shape (U)

Test Summary

Two 50-50 (50% helical and 50% circumferential windings) filament wound containers for the Mk 43 were dropped onto concrete targets from the 300 foot drop tower to determine the effects of simulated laydown shock. The first container was oriented with the longitudinal axis 18 degrees from horizontal and dropped with a velocity vector 60 fps vertical at impact. The second container was oriented with the longitudinal axis 45 degrees from horizontal and dropped with a vertical velocity component of 83 fps and a horizontal velocity component of 39 fps at impact. The tests indicated the containers can withstand the simulated laydown shocks. However, some separation and de-lamination was observed in the forward end of the containers near the base of the spike which is a high stress area during impact. Although it was necessary to use extra windings in this area to properly form the container the windings were in the circumferential direction and added very little strength to the container. Additional strength could have been obtained by forming the container with helical or longitudinal instead of circumferential windings.

Test Setup and Procedure

The Mk 43 for Test No. 1 was rigged 18° off horizontal as shown in Figure 1. This test unit was not instrumented and contained dummy components. The target for this test was a one foot thick concrete pad with a compressive strength of 4017 psi. Impact velocity was 60 fps vertical. The Mk 43 for Test No. 2 was rigged 45° from horizontal as shown in Figure 2 and was dropped with velocity components of 83 fps vertical and 39 fps horizontal at impact. The concrete target for this test had a compressive strength of 4007 psi. Instrumentation of the test container consisted of one longitudinal and one vertical piezoelectric accelerometer on the aft bulkhead as shown in Figure 3. This container also contained dummy components.

SANDIA SYSTEMATIC DECLASSIFICATION REVIEW
DOWNGRADING OR DECLASSIFICATION STAMP
CLASSIFICATION CHANGED TO: U
AUTHORITY: W.C. Layne
Emelda Selph 6/18/98
PERSON CHANGING MARKING & DATE: W.C. Layne 6-18-98
RECORD ID: 98SN2426
PERSON VERIFYING MARKING & DATE
DATED: 6/16/98

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FILE NO. TX-43 3-2

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Acceleration data were recorded on a CEC data tape recorder Type 5-752-A and played back through a CEC Type 5-119 recording oscillograph to produce the final record.

Shock signatures were interpreted according to the procedure outlined in SC-4452A(M) dated February 1963. A comprehensive description of the test setup and recording equipment used for the test as contained in the Drop Tower File under the T-number of this test. Test Procedures were carried out according to the Tower Safe Operating Procedures.

Details and specifications of the filament wound test containers are shown in Sandia Drawing numbers [illegible] and [illegible]460. The notation 50-50 filament wound as used for these tests means that 50 percent of the windings were circumferential and 50 percent were helical windings.

Test Results

The test record from Test No. 2 is presented in Table I. The spike of the Mk 43 penetrated the concrete target to a depth that was sufficient to keep the Mk 43 standing for several milliseconds after impact and consequently no slapdown shock was experienced as anticipated. There was a small shock experienced on the aft end of the container when it fell on the target. This shock was detected by accelerometer A-1 and is shown in Table I.

Post mortem inspection indicated [illegible] and deformation on the forward end of both test [illegible] experienced during impact. This is a high stress [illegible] even though additional circumferential [illegible] filling to achieve the specified [illegible] greatly increase the strength of the [illegible] by using helical or longitudinal [illegible] if this would have [illegible] deformation [illegible] damage [illegible] sustained by [illegible]

[illegible]

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R. P. May

Test Project Engineer: R. P. MAY - 7331-1

E. White

Approved By: E. WHITE - 7331-1

DGC:7325-2:mw

Incl: Figures 1-5
Table I

Copy to:
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D. S. Bliss, 2446
E. K. Copeland, 7331
Central Technical File, 3121-3

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[redacted]

[redacted]

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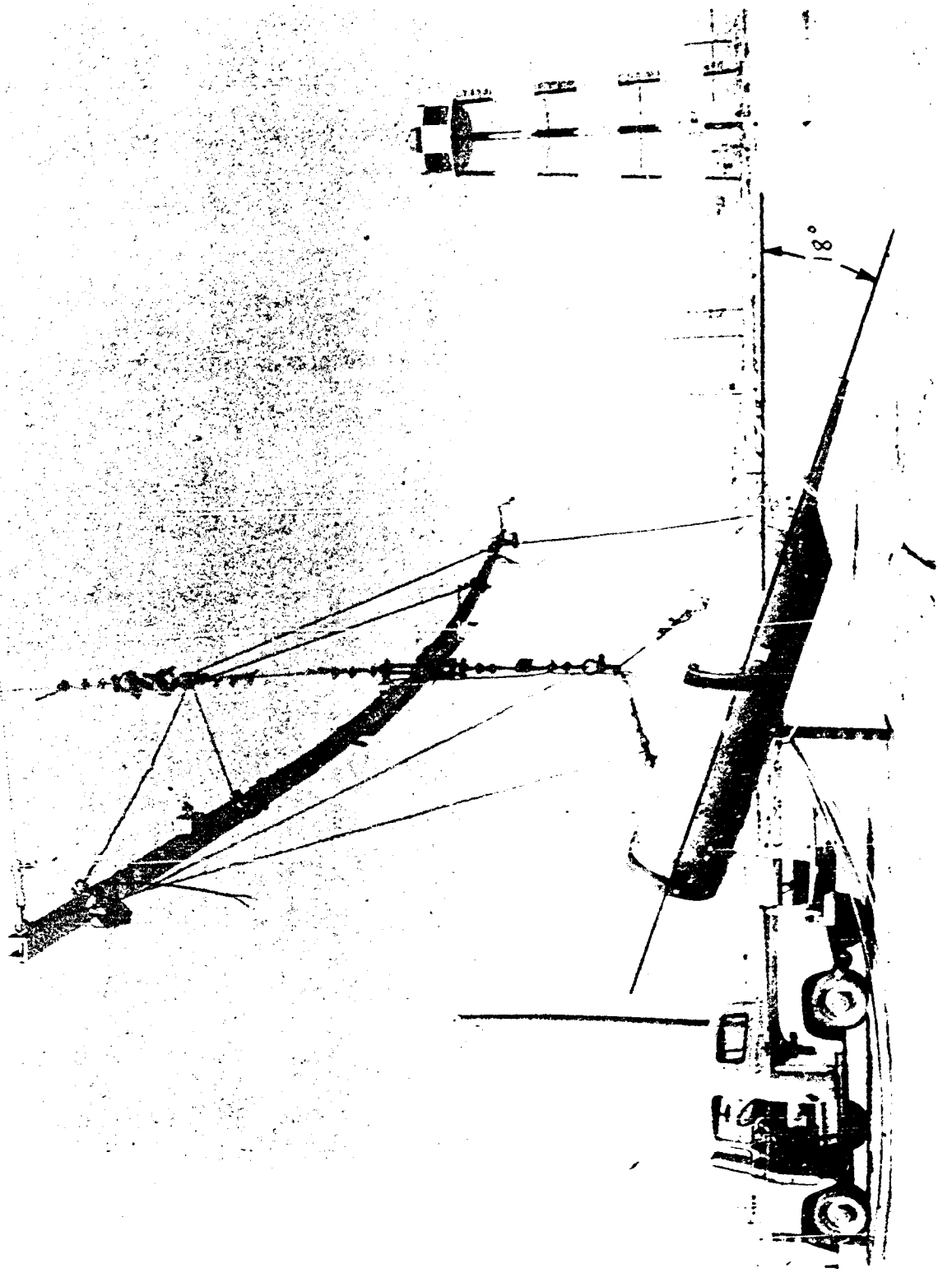

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[redacted]

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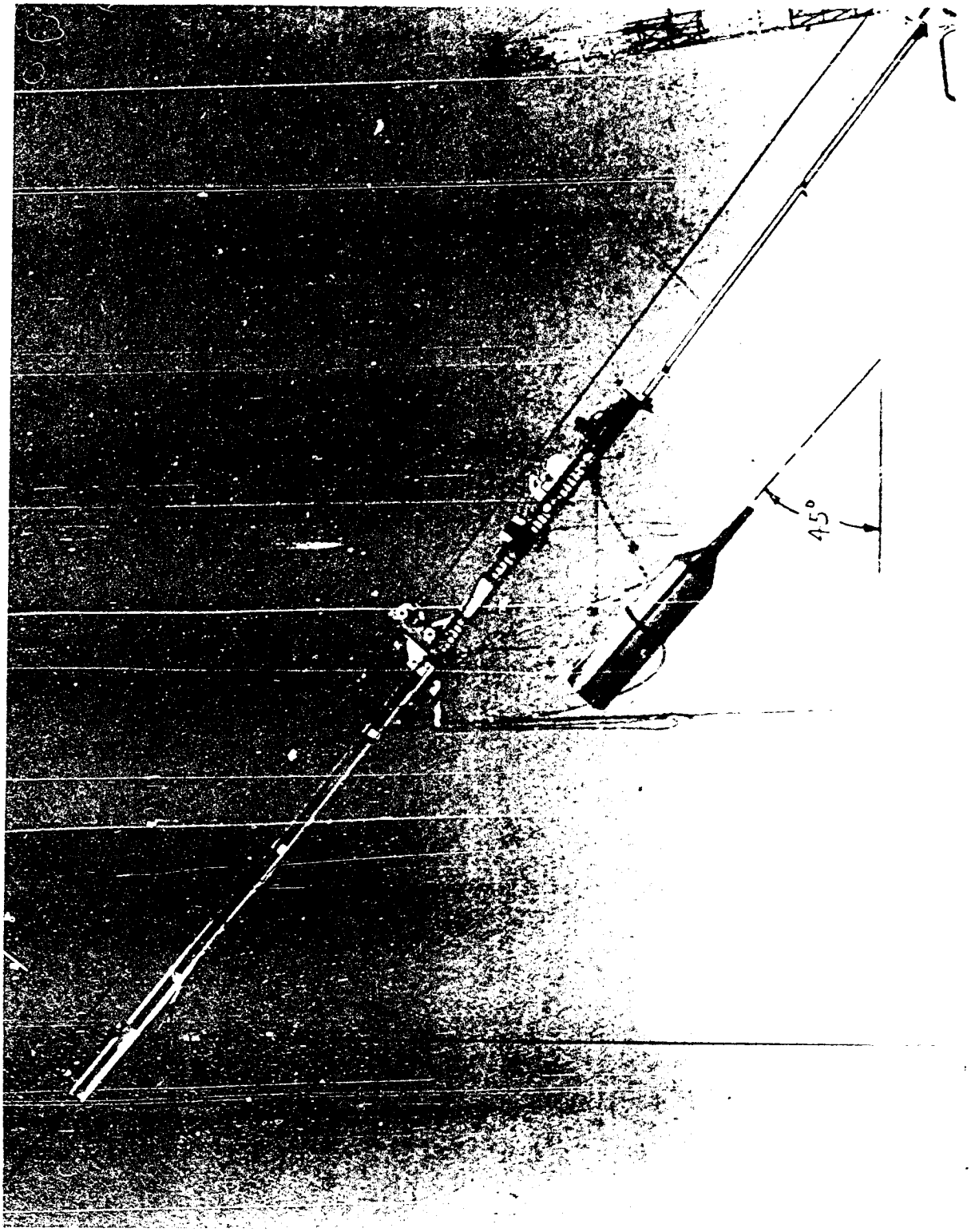

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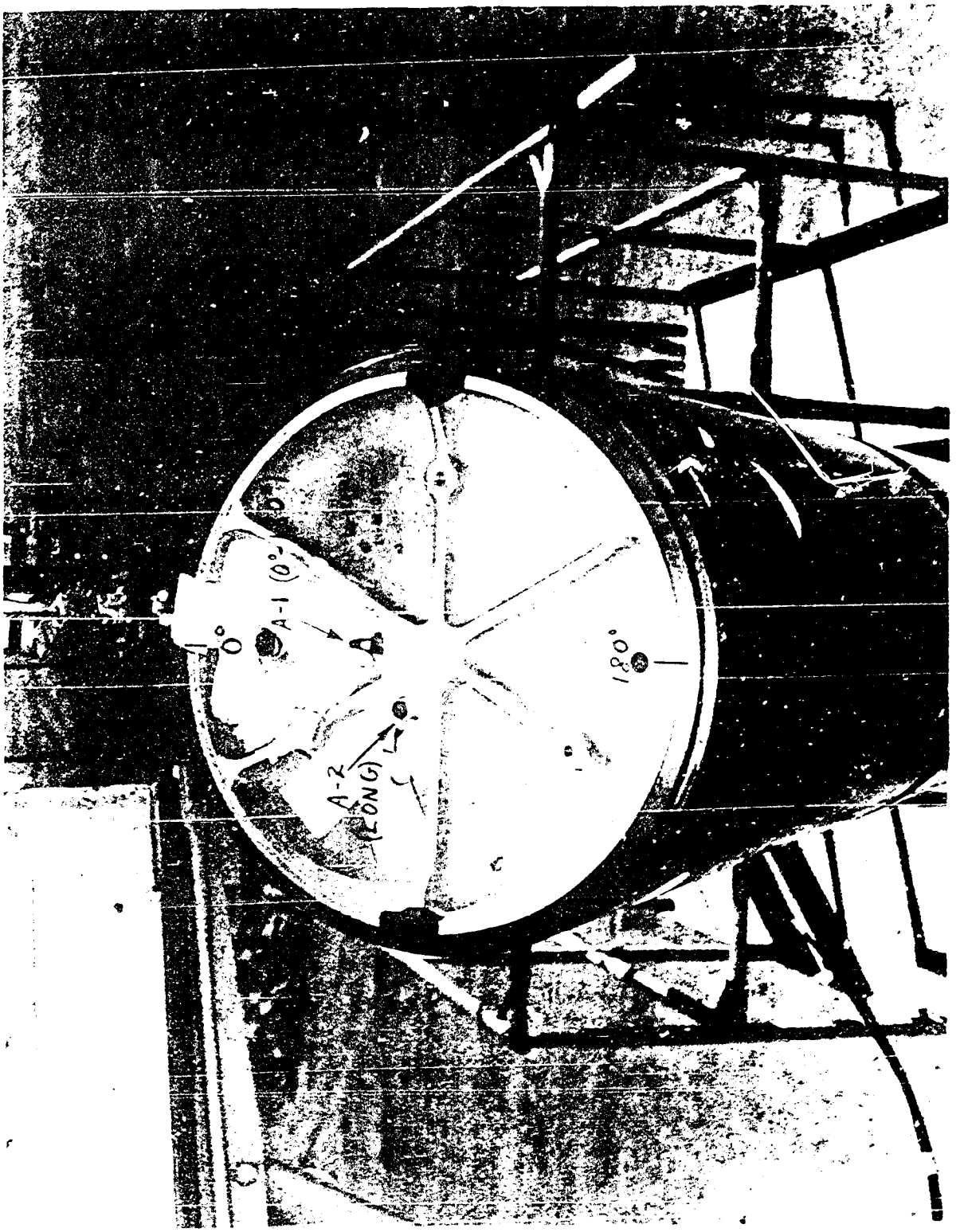

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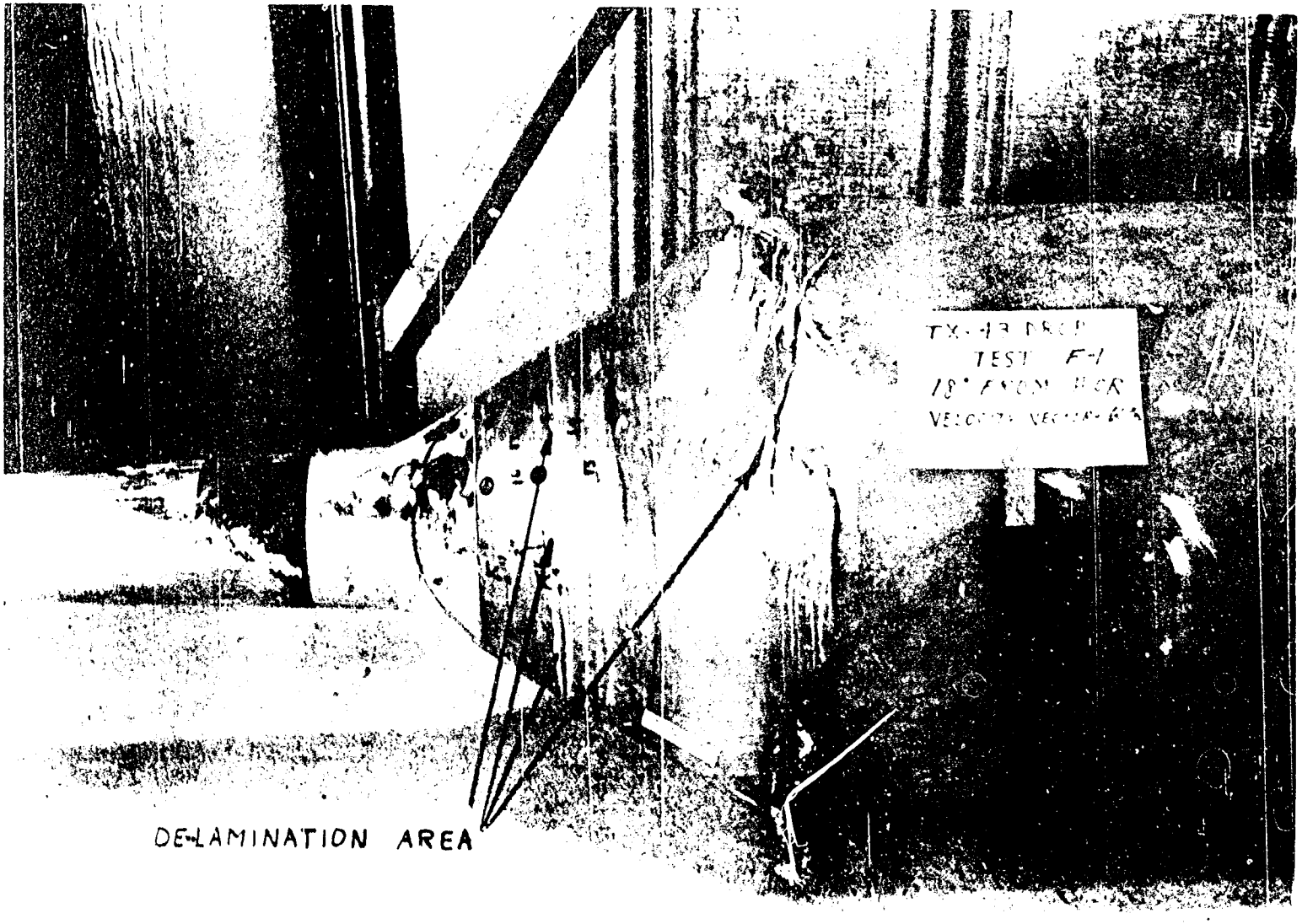

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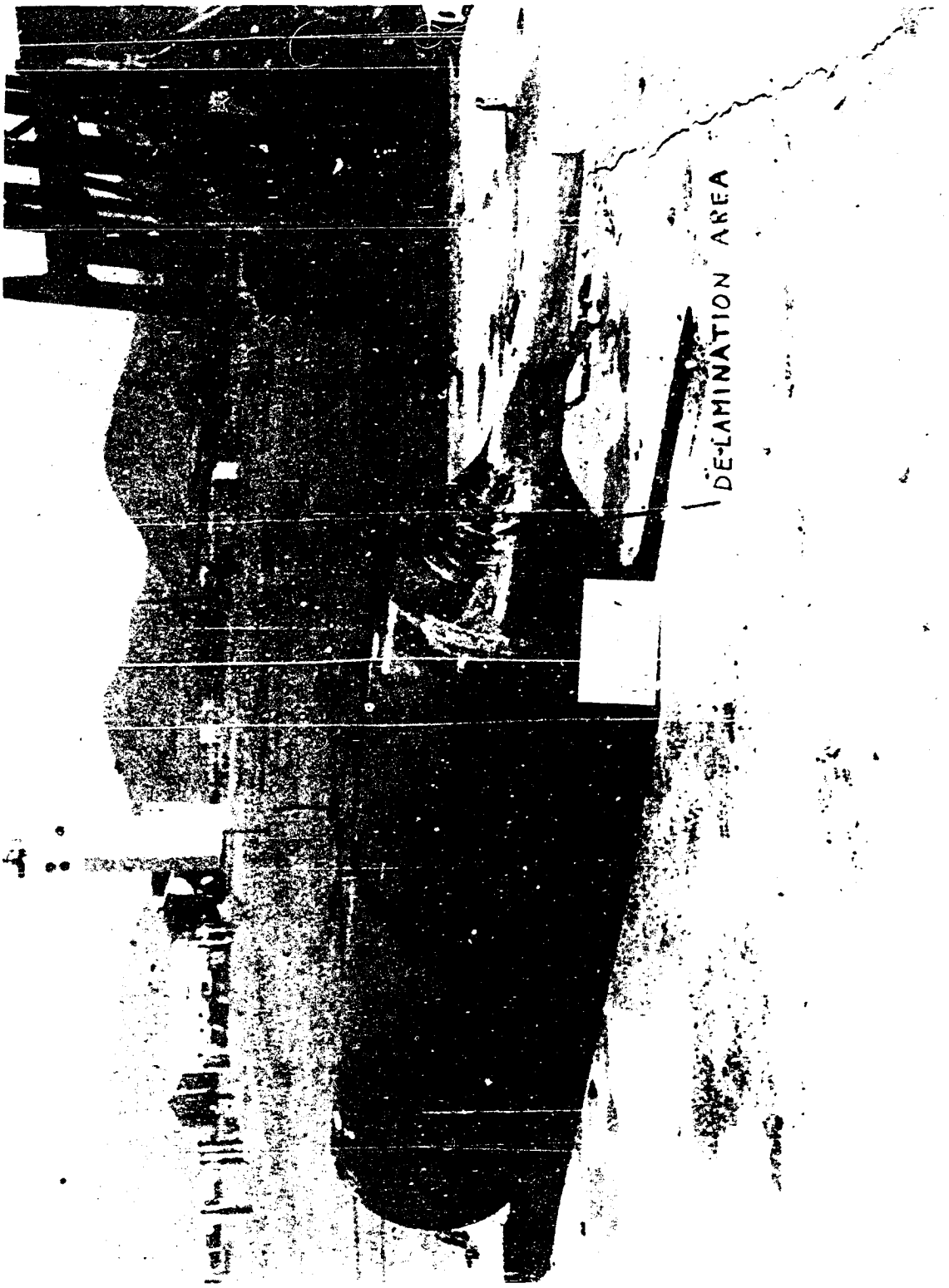

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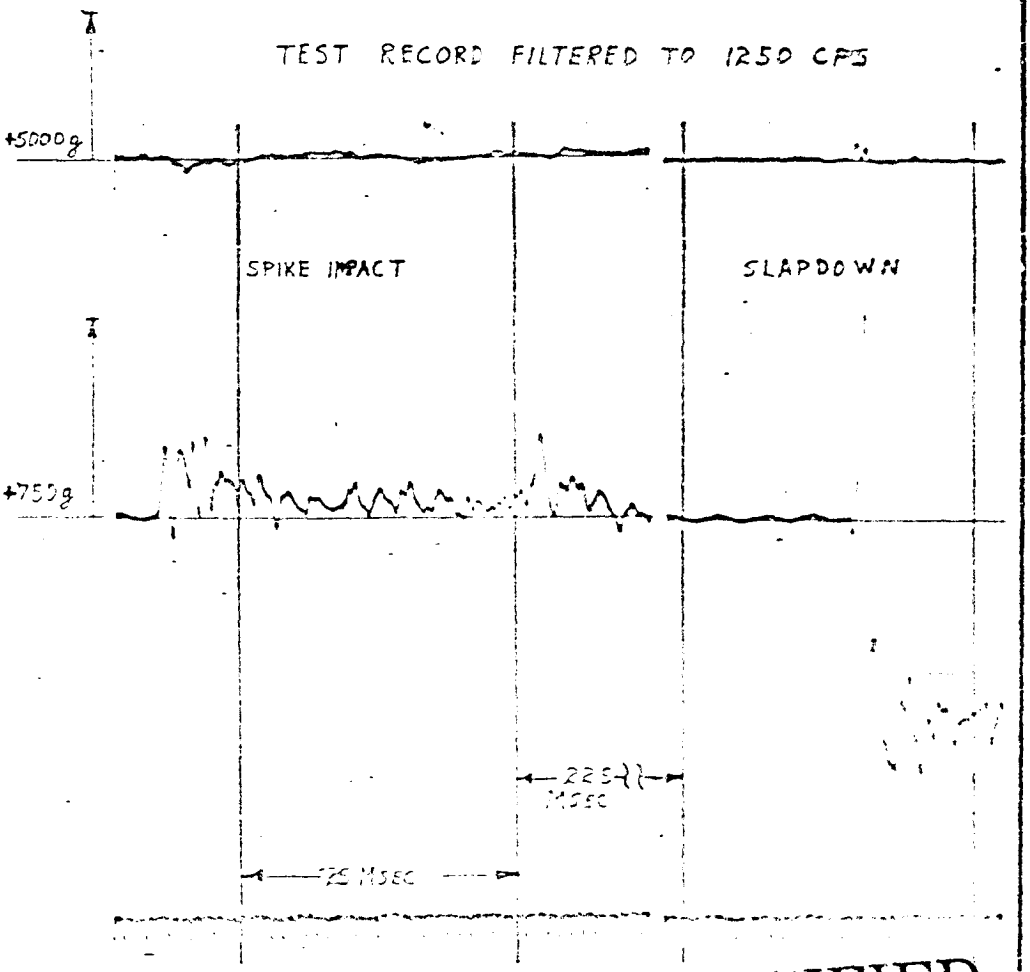

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TABLE I

ACCELERATION TEST REC
DROP TEST OF 50-50
WOUND TEST CONTAINERS

TRANSDUCER INFORMATION		
Gage No.	Model	Loca on Orienta
A-1	ENDEVCO 2225	CENTER AFT BUL 0°-.1
A-2	ENDEVCO 2215	CENTER AFT BUL LONGITU

[redacted]

TABLE I TEST NO. T-18435

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ACCELERATION TEST RECORD FOR TEST NO. 2
DROP TEST OF 50-50 FILAMENT
WOUND TEST CONTAINERS FOR THE MK43

TRANSDUCER INFORMATION								TEST CONDITIONS
Gage No.	Model	Location and Orientation	Max. (+)	Max. (-)	MFP	Rise Time (ms)	Pulse Duration (ms)	
A-1	ENDEVCO 2225	CENTER OF AFT BULKHEAD 0°-180°	IMPACT 180	380	—	—	—	
			SLAPDOWN 530	—	530	0.3	1.5	
								TEMP. = 70°F
A-2	ENDEVCO 2215	CENTER OF AFT BULKHEAD LONGITUDINAL	IMPACT [illegible]	75	300	0.5	40.5	V_V = 83 FPS
			SLAPDOWN NO DATA, ACCELEROMETER SHIFTED					V_L = 39 FPS
								45°
								TARGET NO. 62-3 COMPRESSIVE STRENGTH = 4007 PSI 11' x 17' x 1' THICK

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