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3577

SANDIA SYSTEMATIC DECLASSIFICATION REVIEW
1st Review Date: 7/7/98
Authority: RBC ADD
Name: R B Cramer
2nd Review Date: 7/23/98
Authority: ADD
Name: W S Layne
Determination (Circle Numbers):
1. Classification Retained
2. Classification Changed to: U
3. Contains No DOE Classified Information
4. Coordinate With:
5. Contains UCAI? NO
6. Comments: Declassify

TX-25 3.2
Project No. 1-16133
Case No. 862.00
Ref. Sym. 1613(42)

TO: DISTRIBUTION

Re: 300-Foot Tower Test of the TX-25

Summary of Results

Three drop tests of the TX-25 onto concrete were made from the 300-foot tower, to test the two shock mitigation systems used and to provide acceleration data during simulated laydown conditions. Two versions of the weapon were tested; the external (drops Nos. 1 and 2) and the internal (drop No. 3). Impact velocity was 30 fps for drop No. 1, onto a horizontal target, and 37.2 fps for drops Nos. 2 and 3. During drops Nos. 2 and 3, both the targets and the units were oriented at an angle to simulate impact velocity components on the unit of 22 fps horizontal and 30 fps vertical.

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No damage occurred to any of the components during the tests. An electrical test of the firing components, made after drops 1 and 2 only, indicated proper functioning in all cases.

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JUL 18 1959
CONTROL RECORD FILE

Maximum faired acceleration pulses recorded during the tests were: 63 g longitudinal, on the X-unit, and 59.4 g lateral, on the MC-543 timer.

Object of Test

The object of this test was to determine the suitability of the shock mitigation systems used on the internal and external versions of the TX-25, and to provide acceleration shock signatures during simulated laydown conditions.

Jug
TX-25
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Authorization for Test

This test was requested in a Work Order Authorization from J. F. Ford, 1247, to F. H. Adams, 1612, dated Jan. 9, 1959.

Setup for Test

Fig 1 is an exploded view of the TX-25 (external version) showing component orientation. Fig 2 shows the TX-25 (internal version) in its container, and the shock mitigating drum liner.

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Fig 3 shows the TX-25 (external version) suspended ready for drop No. 1, with impact velocity of 30 fps onto a horizontal target. Drop No. 2 of the TX-25 (external version) was made with the unit suspended at an angle of 36° to the vertical. Resultant impact velocity was 37.2 fps

SANDIA SYSTEMATIC DECLASSIFICATION REVIEW
DOWNGRADING OR DECLASSIFICATION STAMP
CLASSIFICATION CHANGED TO: U
AUTHORITY: W.C. Layne
Emelda Selph 7/30/98
PERSON CHANGING MARKING & DATE
RECORD ID: 98SN3148
W C Layne 7/30/98
PERSON VERIFYING MARKING & DATE
DATED: 7/23/98

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onto a target oriented at 36° to the horizontal, to simulate impact velocity components on the unit of 22 fps horizontal and 30 fps vertical. Fig 4 shows the T4-25 (internal version) ready for drop No. 3, with impact conditions as listed for drop No. 2.

Components tested are listed in Table I.

Test equipment used for all tests was one consolidated oscillograph, Type 5-119R, serial no. 3071, with Kintel amplifiers, Model 1117.

Accelerometers used during the tests are listed in Table II and shown in Figs 5 through 8.

Procedure

Accelerometers were mounted at the requested locations during assembly of the units.

The three drop tests were made from the 300-foot tower. In each case, the unit was attached to the moveable carriage, and the proper orientation and height above the target were adjusted. The unit was then raised to a position vertically above the target and released by an explosive cutter mechanism to free-fall, gaining the desired terminal velocity.

Targets used were of reinforced concrete, 6 ft by 12 ft by 2 ft thick.

Results

Figs 9, 10, and 11 show the condition of the test units after drops Nos. 1, 2, and 3 respectively. No structural failures or damage to components was experienced during any of the tests. The components used during drops No. 1 and 2 were subjected to both electrical and visual post mortem examinations and found to function properly; a visual check only was made of the components used in drop No. 3.

During tests No. 2 and 3, in which the targets were oriented at an angle of 36° to the horizontal and the units impacted with their longitudinal axis perpendicular to the target surface, full slap-down conditions were not experienced due to insufficient target area. During drop No. 2, the unit bounced completely clear of the target after initial impact and fell onto dirt. Only partial slap-down impact on the concrete occurred during drop No. 3.

Table III lists accelerations, rise times, and pulse durations recorded during the tests.

Figs 12, 13, and 14 are oscillograph records of the tests.

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Conclusions

Both versions of the TX-25 withstood the impact loads imported during the tests; however, it could not be determined whether the components would have remained undamaged had full slap-down conditions been experienced.

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G. M. Willson

1613 Project Engineer: D. W. BAUDER - 1613
D. W. Bauder

Approved by: E. S. HOOPER - 1613

GMW:1615:jlm

Copy to:
1/5A J. I. Ford, 1247
Attn: P. R. Owens
2/5A W. A. Gardner, 1610
3/5A J. M. Wiesen, 1592
4/5A C. L. Gomel, 5523
5/5A R. K. Smeltzer, 4721-3

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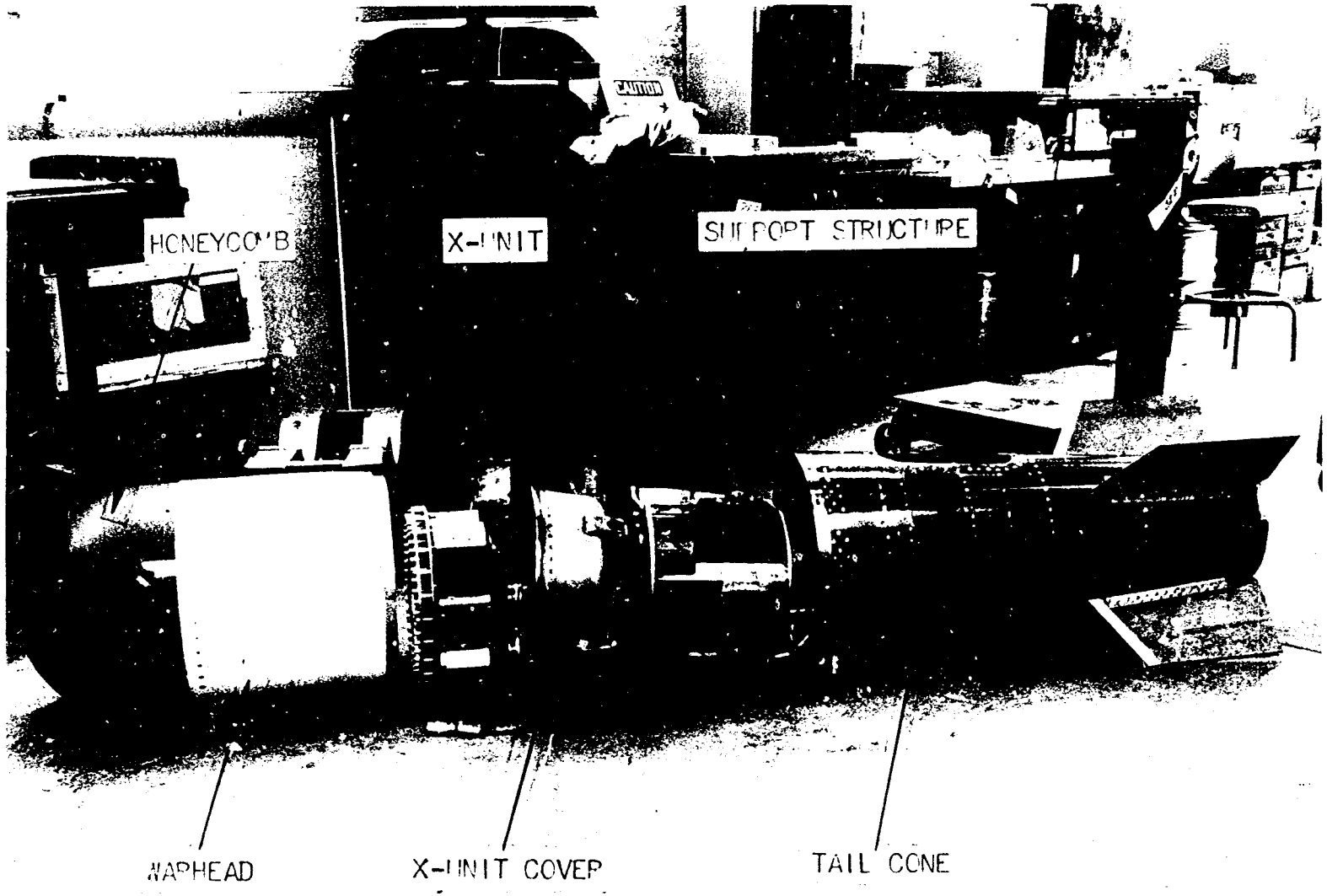

FIG. 1---EXPLODED VIEW OF THE TX-25 (EXTERNAL VERSION) 300-FT. TOWER TEST OF THE TX-25
PROJECT NO. T-16133

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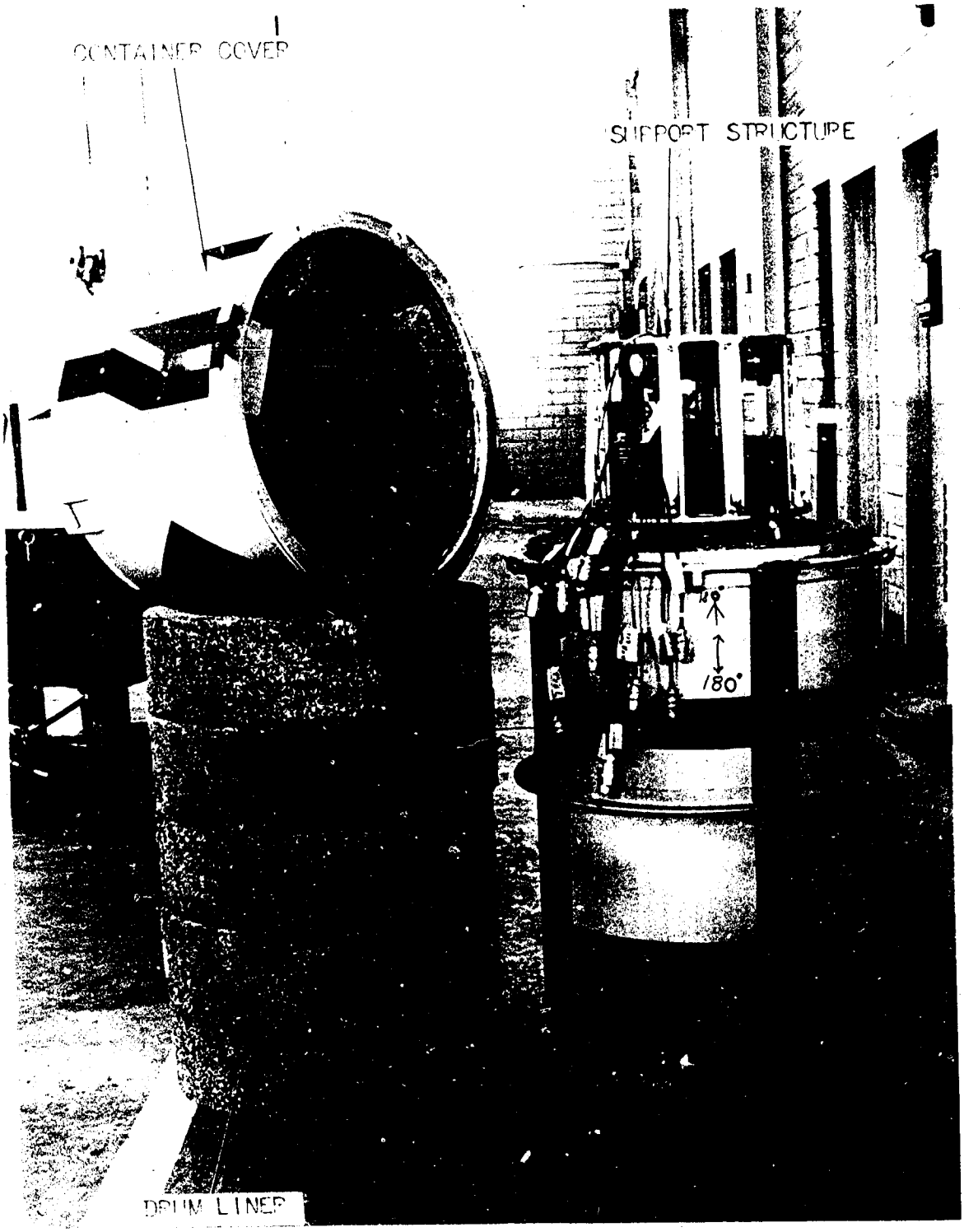

[illegible] THE TX-25 (INTERNAL VERSION) WITH CONTAINER COVER REMOVED---300-FT. TOWER TEST OF THE TX-25
PROJECT NO. T-16133 REF. SYM: 1613(42)

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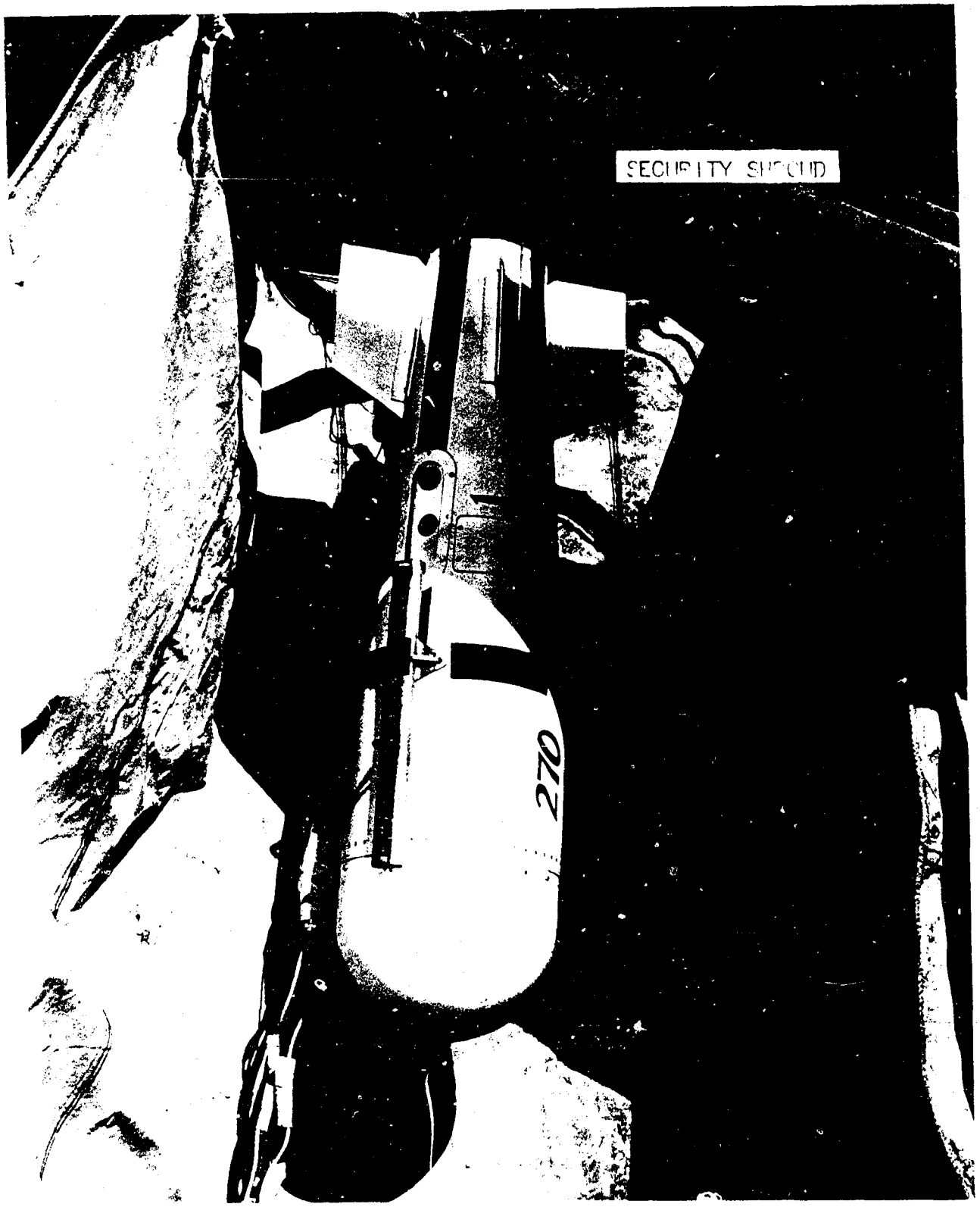

FIG. 3---TY-[illegible] (EXTERNAL VE[illegible]) SUSPENDED FOR [illegible] NO. 1
[illegible]-FT. TOWER TEST OF THE TY-25 REF. SYM: 161[illegible](4[illegible])
PROJECT NO. T-16133

D#9-8315

1. 4--SHOT OF THE TX-25 (INTERNAL VERSION) SUSPENDED FOR DROP NO. 3.---- 300 FOOT TOWER TEST OF THE TX-25.
PROJECT NO. T-16133 REF. SYM: [illegible]

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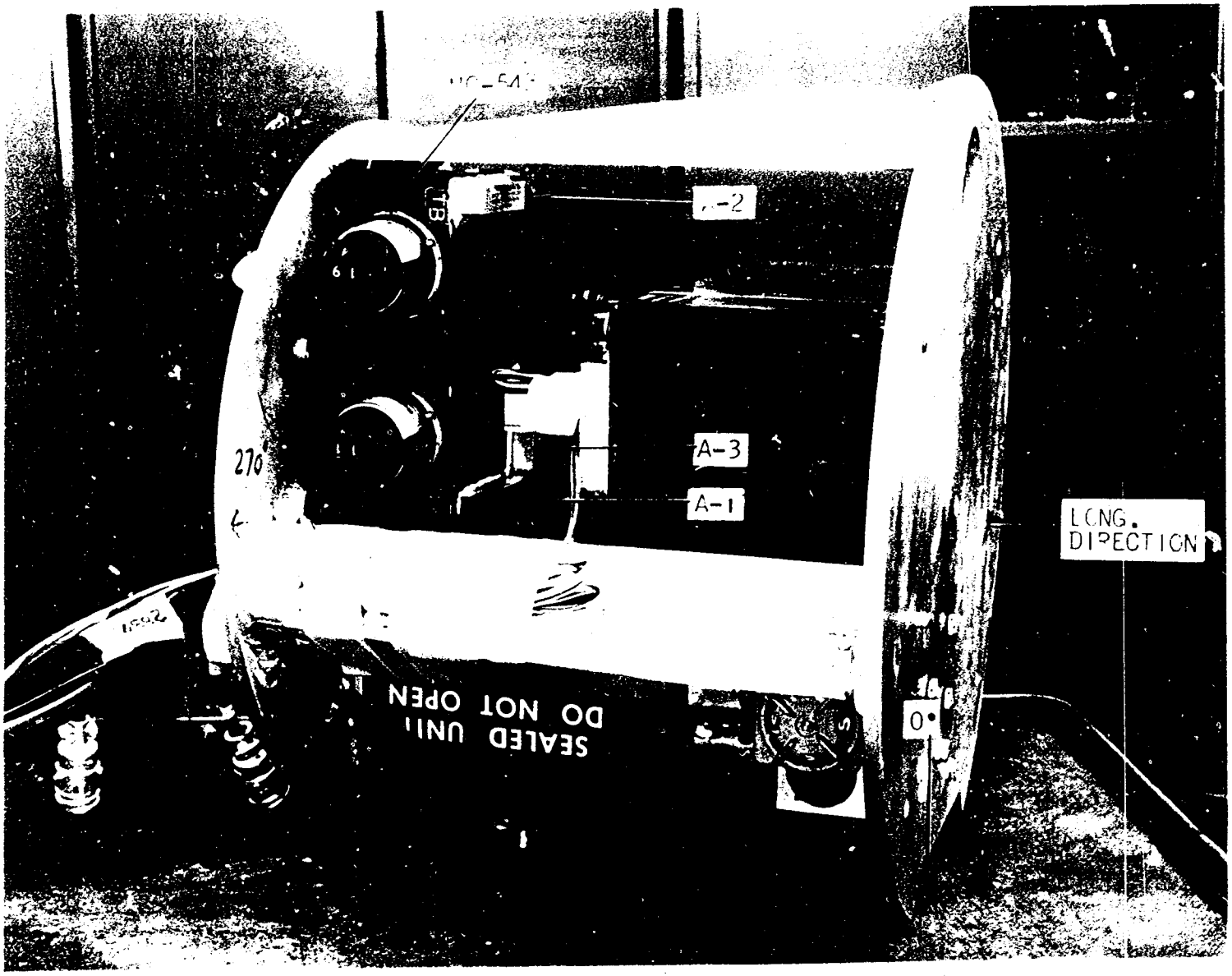

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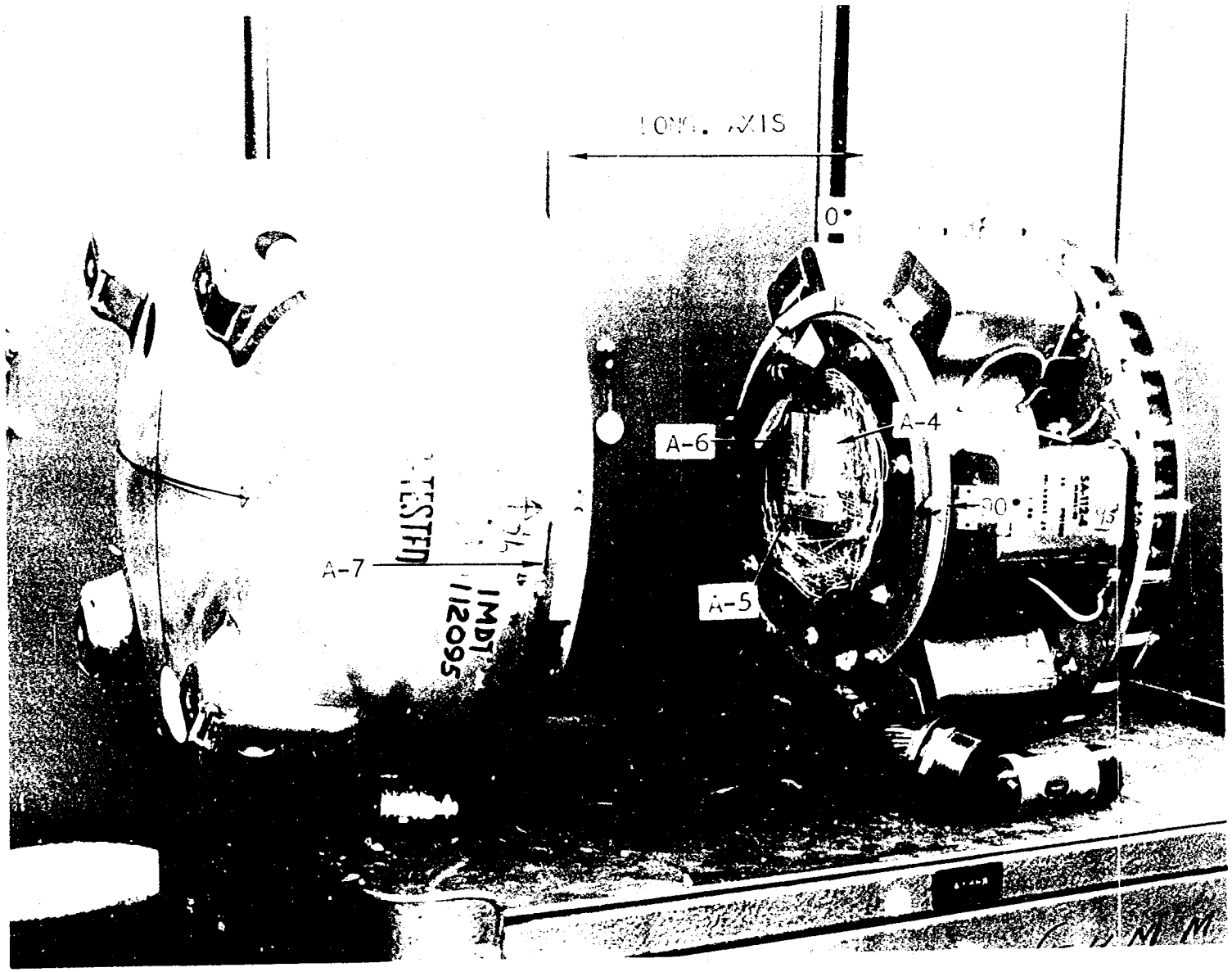

FIG. [illegible] A-4 [illegible] A-7 [illegible] AND [illegible]
[illegible] TEST [illegible]

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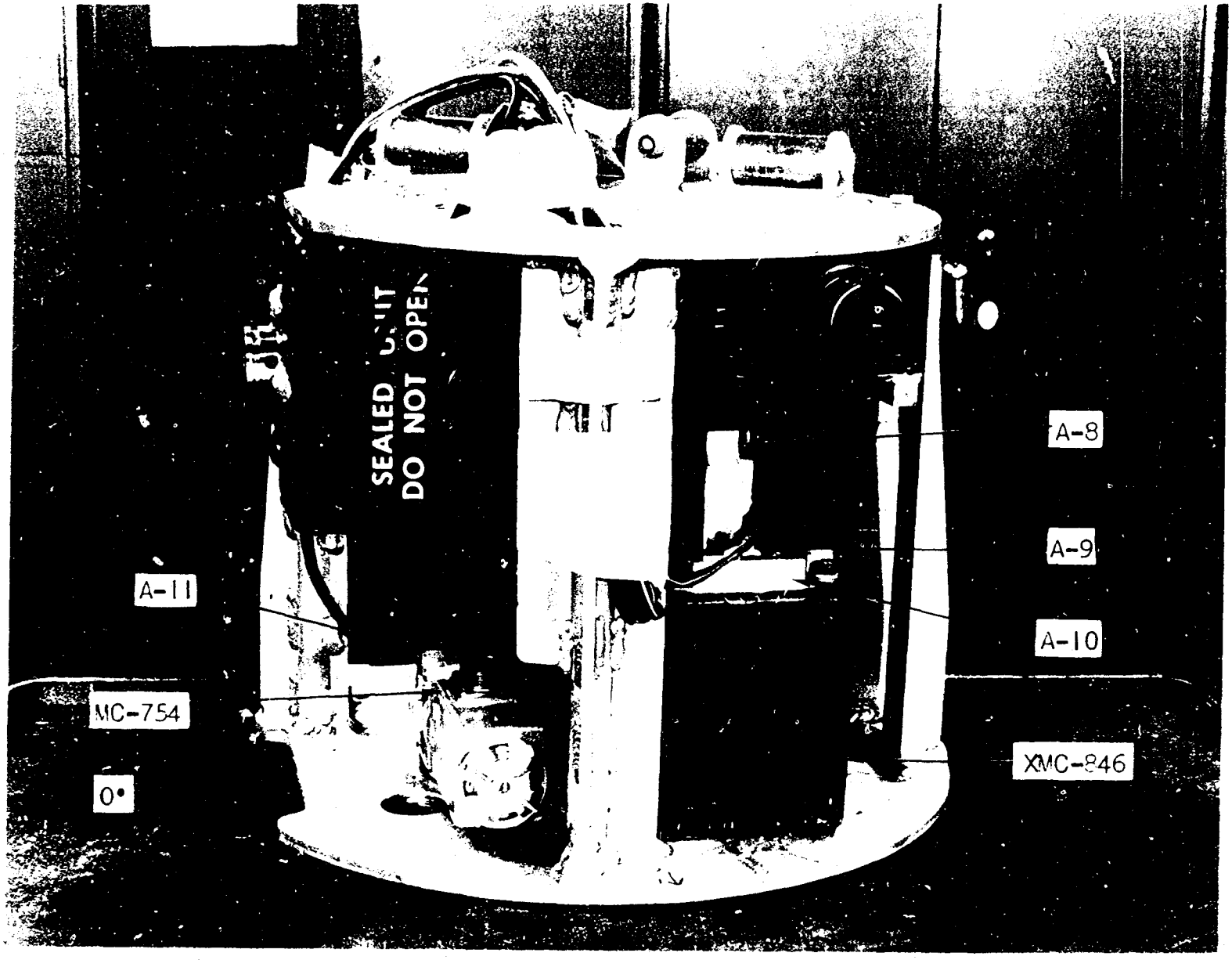

FIG.7---ACCELEROMETERS A-8 THRO[illegible] A-11 MOUNTED ON COMPONENTS
300-FT. TOWER TEST OF THE TX-[illegible]

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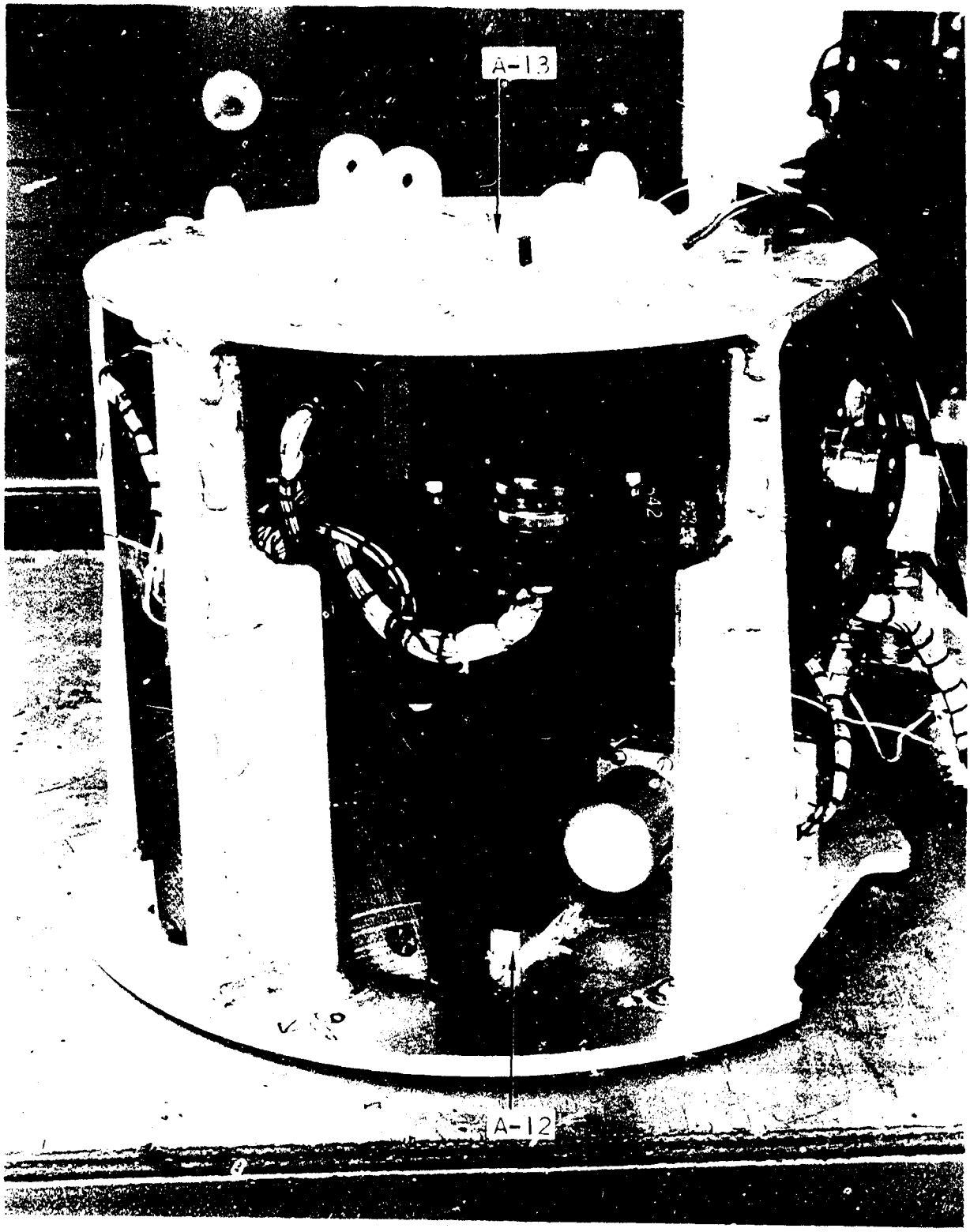

[illegible] LEROMETERS [illegible]
[illegible] .---- [illegible]-FT. TOWER TEST [illegible]
[illegible]
[redacted] 3
-11- [illegible]

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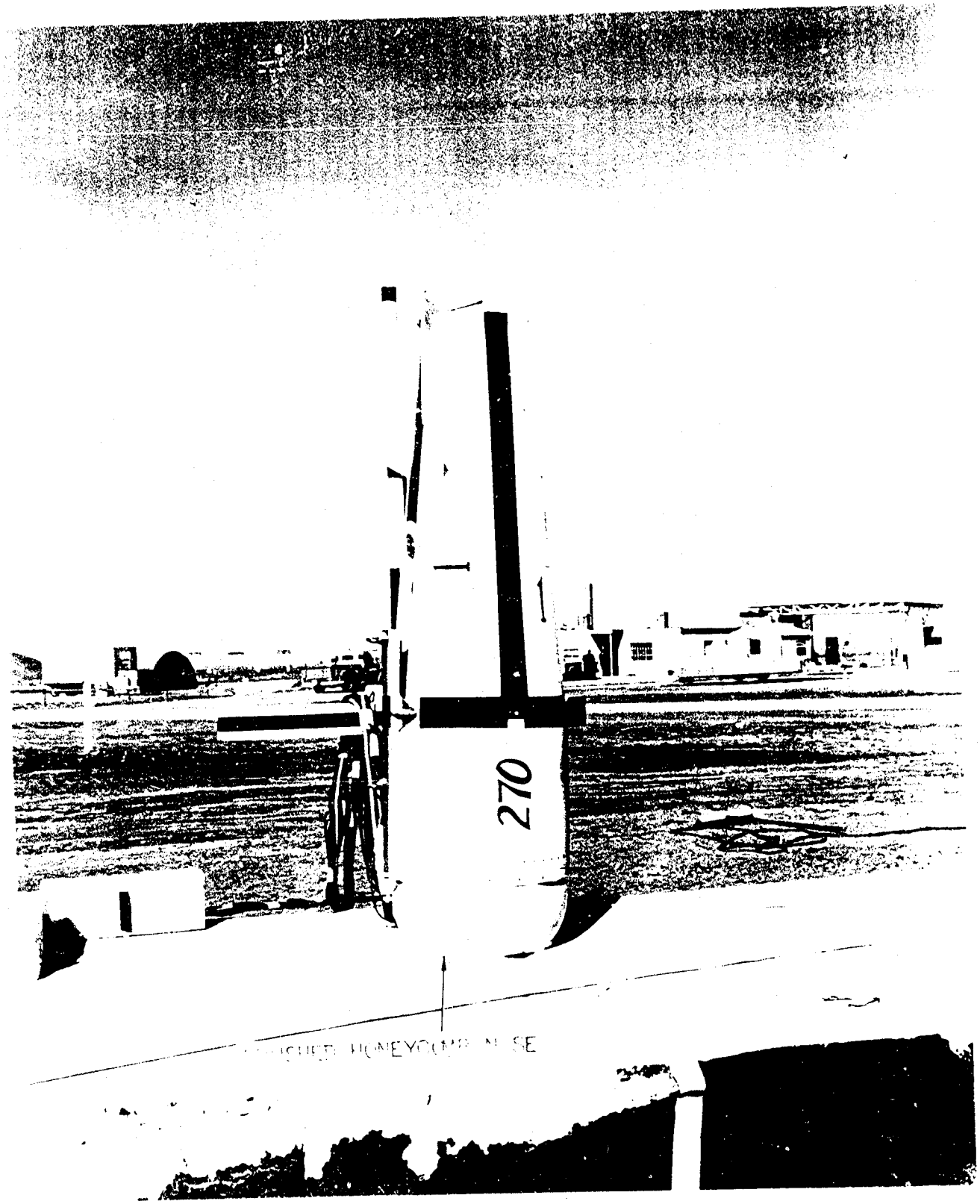

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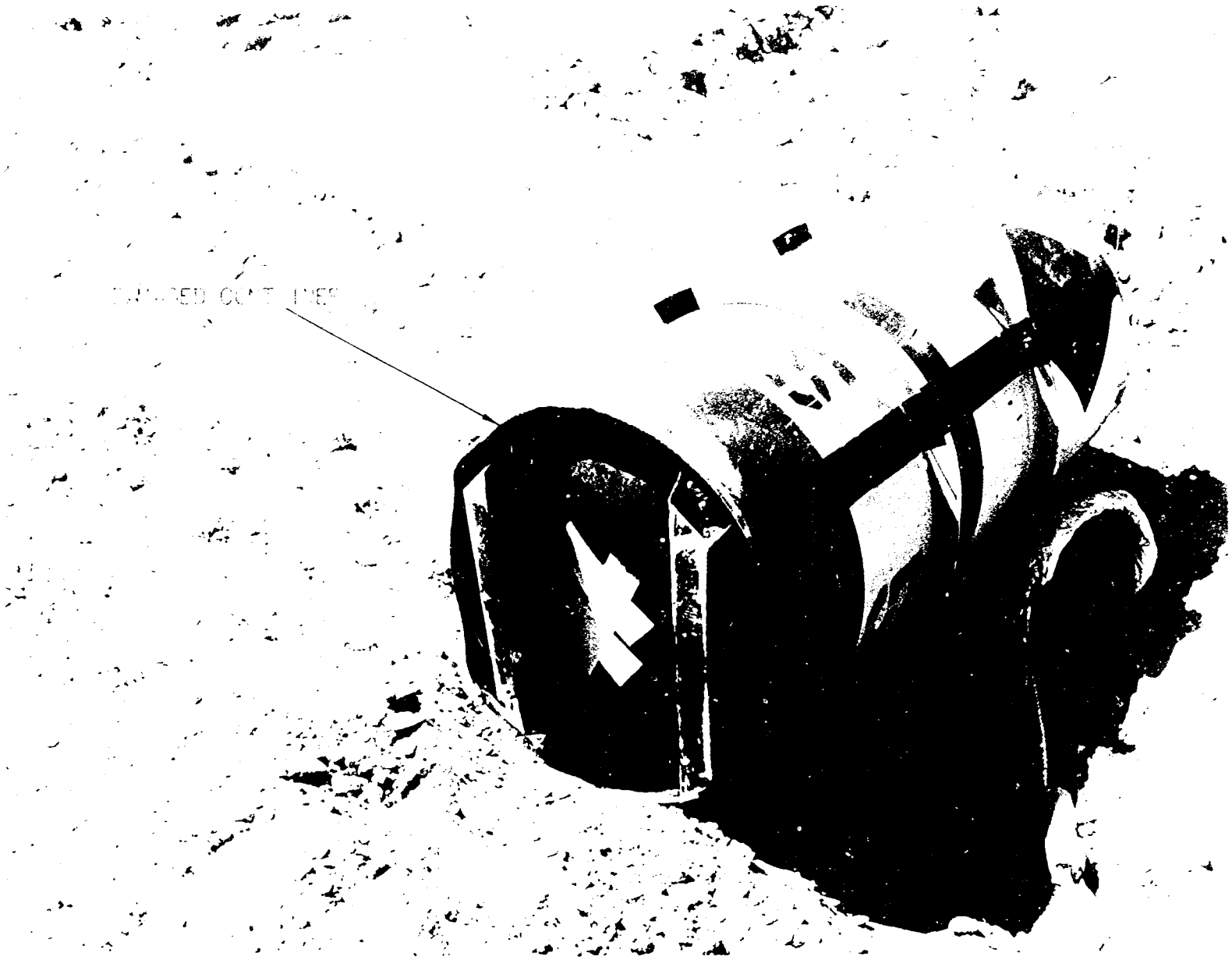

FIG. 11---TX-[illegible] (INTERNAL VERSION) [illegible]
[illegible]-FT. TOWER TEST OF THE TX-[illegible]

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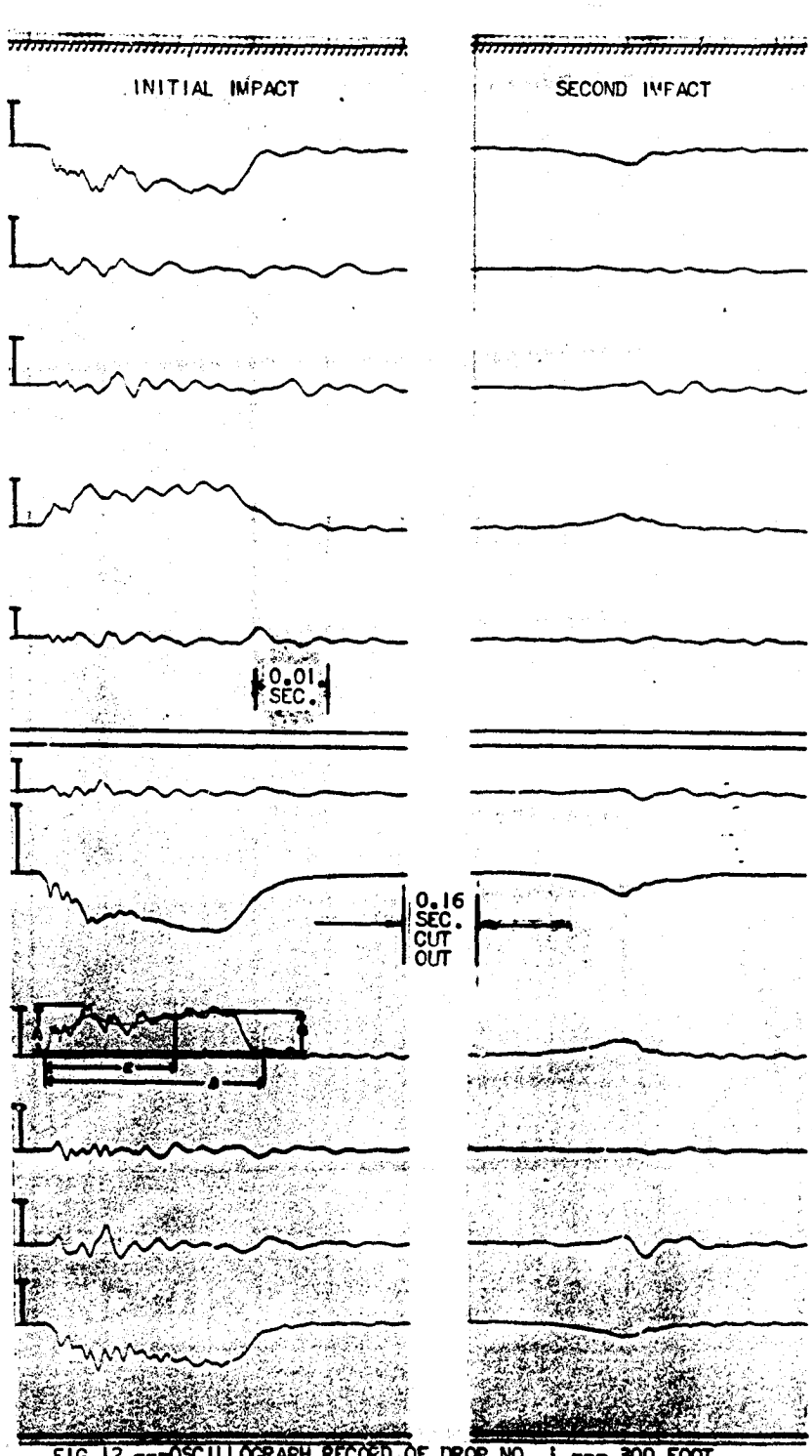
ACCEL. NO.	RECORDING DIRECTION	LOCATION	CALIBRATE VALUE
A-1	LONG.	MC-543 TIMER	50 G
A-2	0° LAT.	MC-543 TIMER	50 G
A-3	270° LAT.	MC-543 TIMER	50 G
A-4	LONG.	MC-656 X-UNIT	50 G
A-5	0° LAT.	MC-656 X-UNIT	30 G
A-6	270° LAT.	MC-656 X-UNIT	30 G
A-7	LONG.	X-UNIT COVER	50 G
A-8	LONG.	XMC-846 BATTERY	50 G
A-9	0° LAT.	XMC-846 BATTERY	50 G
A-10	270° LAT	XMC-846 BATTERY	30 G
A-11	LONG.	MC-754 SWITCH	50 G



NOTES: ACCELERATIONS WERE READ AS PER SCS-10
A=PEAK ACCELERATIONS (ZERO TO PEAK)
B=MAXIMUM FAIRED PULSE
C=RISE TIME (10% TO 90% FAIRED VALUE)
D=PULSE DURATION (10% TO 10% FAIRED VALUE)

FIG.12 ---OSCILLOGRAPH RECORD OF DROP NO. 1.--- 300 FOOT TOWER TEST OF THE TX-25

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ACCEL. NO.	RECORDING DIRECTION	LOCATION	CALIBRATE VALUE
A-1	LONG.	MC-543 TIMER	50 G
A-2	0° LAT.	MC-543 TIMER	100 G
A-3	270° LAT.	MC-543 TIMER	50 G
A-4	LONG.	MC-656 X-UNIT	50 G
A-5	0° LAT.	MC-656 X-UNIT	50 G
A-6	270° LAT.	MC-656 X-UNIT	40 G
A-7	LONG.	X-UNIT COVER	50 G
A-8	LONG.	XMC-846 BATTERY	50 G
A-9	0° LAT.	XMC-846 BATTERY	50 G
A-10	270° LAT.	XMC-846 BATTERY	40 G
A-11	LONG.	MC-754 SWITCH	50 G
A-12	LONG.	FWD. MOUNTING PLATE SUPPORT STRUCTURE	50 G
A-13	LONG.	AFT MOUNTING PLATE SUPPORT STRUCTURE	50 G

NOTE: ALL ACCELERATIONS WERE AS READ PER DCS-10

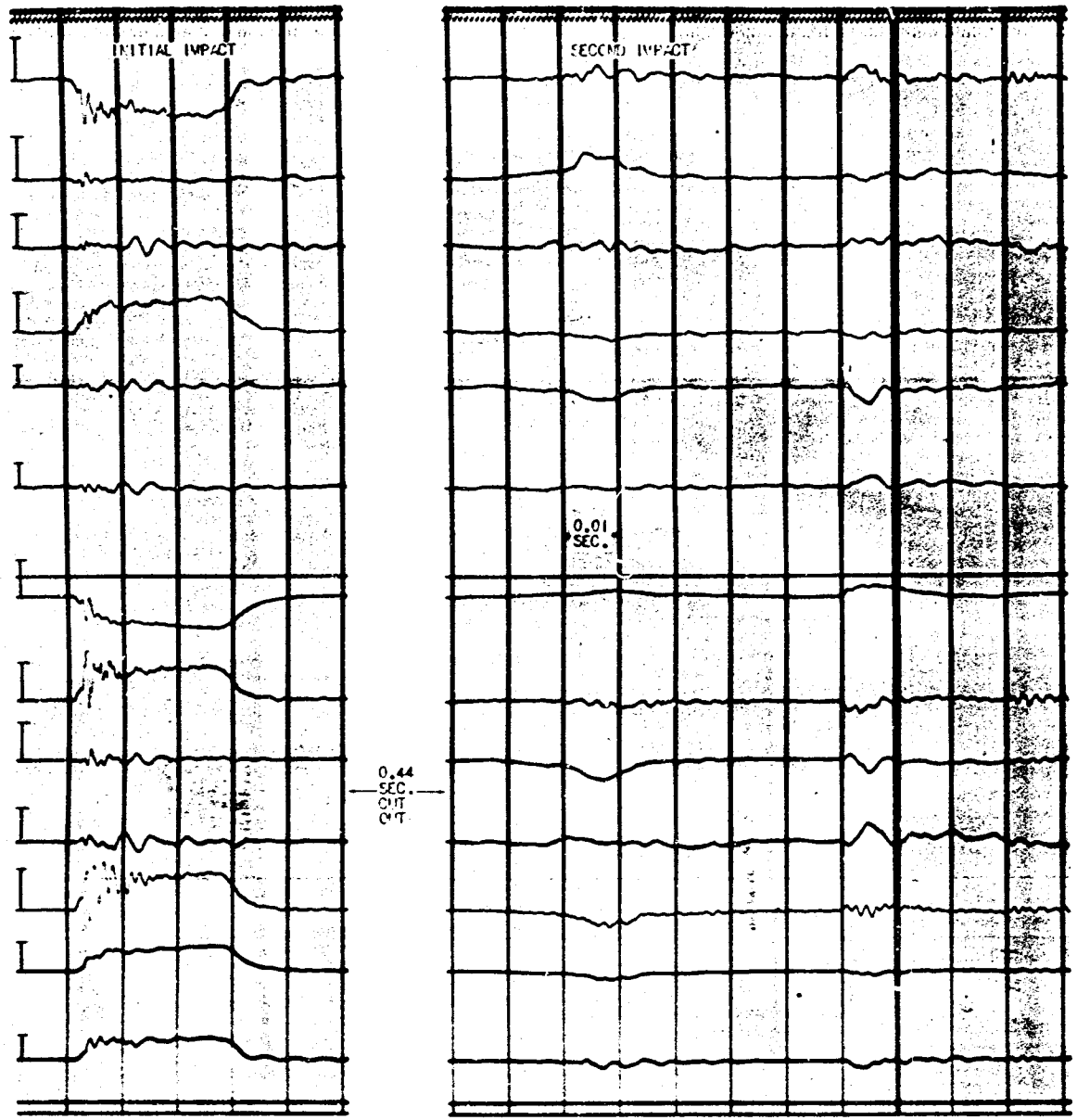

FIG. 13 ---OSCILLOGRAPH RECORD OF DROP NO. 2. ----300 FOOT TOWER TEST OF THE TX-25

PROJECT NO. T-16133

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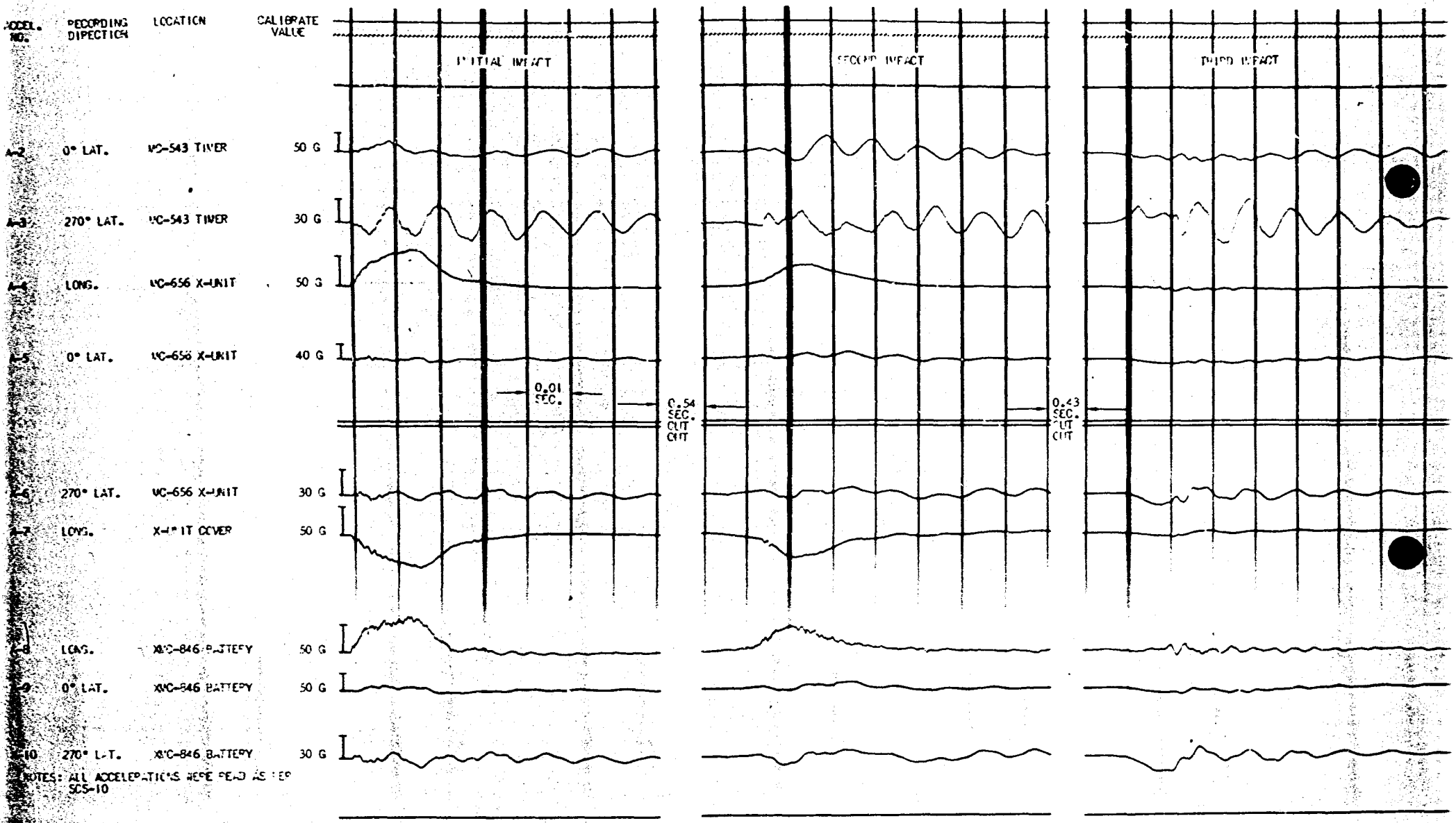

FIG.14 --- OSCILLOGRAPH RECORD OF DROP NO. 3. ----300 FOOT TOWER TEST OF THE TX-25.

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REF. SYM: 1613(42)

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Project No. T-16133
Ref. Sym. 1613(42)

TABLE I

List of Components Tested During 300-Foot Tower Test of the TX-25

Component and MC-No.	Drawing No.	Serial No.	Test Drop Used
Warhead	127600J	none	1, 2, 3
Nose Cone (2 ea)	149751J	none	1, 2
Case Section, Rear	149815J	none	1, 2
Support, mounting	149901	none	1, 2, 3
Base, Container	150049	none	3
Cover, Container	150717	none	3
Packing, Base, Honeycomb	150602	none	3
Liner, Metal Drum	150760	none	3
Liner, Metal Drum	150842	none	3
Liner, Metal Drum	150843	none	3
Packing, Cover	150661	none	3
MC-543 Timer, Sequential	310080-01	GP-12834-J8	1
MC-543 Timer, Sequential	310080-01	GP-12984-K8	2, 3
MC-842 Generator Pulse	310479-00	AA-3097-E8	1, 2, 3
MC-656 X-Unit	310219-01	AA-4981-J8	1
MC-656 X-Unit	310219-01	AA-4921-J8	2, 3
XMC-846 Battery Pack, Thermal	310490-01	AA-1045-F8	1
XMC-846 Battery Pack, Thermal	310490-01	AA-1062-F8	2, 3
MC-754 Switch, Arming-Safing	310354-00	SAF-0042-A8	1, 2, 3

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Ref. Sym. 1613(42)

TABLE II

Accelerometer Number	Recording Direction	Location	Statham Mod. No.	Serial No.	Natural Frequency (cps)	Figure Referring No.
A-1	Long	MC-543 Timer	F-100-300	1300	630	5
A-2	0° Lat	MC-543 Timer	Fa-100-350	2312	420	5
A-3	270° Lat	MC-543 Timer	F-100-300	1374	530	5
A-4	Long	MC-656 X-Unit	F-100-350	2314	700	6
A-5	0° Lat	MC-656 X-Unit	A6a-100-350	2849	410	6
A-6	270° Lat	MC-656 X-Unit	A6a-100-350	2808	375	6
A-7	Long	X-Unit Cover	Fa-50-300	2603	655	6
A-8	Long	XMC-846 Battery	AsA-500-350	3999	over 1500	7
A-9	0° Lat	XMC-846 Battery	A6a-100-350	2807	400	7
A-10	270° Lat	XMC-846 Battery	A6a-50-350	2852	280	7
A-11	Long	MC-754 Switch	A6a-100-350	2837	1075	7
A-12	Long	Fwd. Mounting Plate, Support Structure	A6a-50-350	2861	295	8
A-13	Long	Aft. Mounting Plate, Support Structure	A6a-50-350	2855	290	8

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TABLE III - ACCELERATIONS, RISE TIMES, AND PULSE DURATIONS RECORDED DURING 300-FOOT TOWER TEST OF THE TX-25

			DROP NO. 1					DROP NO. 2				
			UNIT SUSPENSION ANGLE: 90° TO HORIZONTAL TARGET ORIENTATION: HORIZONTAL IMPACT VELOCITY: 30 FPS					UNIT SUSPENSION ANGLE: 36° TO VERTICAL TARGET ORIENTATION: 36° TO HORIZONTAL IMPACT VELOCITY: 37.2 FPS				
ACCEL. NO.	RECORDING DIRECTION	LOCATION	MAX. ACCEL. (g) +	MAX. ACCEL. (g) -	MAX. FAIRED PULSE (g)	RISE TIME (MILLISEC)	PULSE DURATION (MILLISEC)	MAX. ACCEL. (g) +	MAX. ACCEL. (g) -	MAX. FAIRED PULSE (g)	RISE TIME (MILLISEC)	PULSE DURATION (MILLISEC)
A-1	Long.	MC-543 Timer	-	47.8	-43.9	17.2	28.7	-	52.1	-44.8	16.9	32.1
A-2	0° Lat.	MC-543 Timer	8.8	9.5	-	-	-	59.4	13.0	+59.4	13.0	27.0
A-3	270° Lat.	MC-543 Timer	11.3	14.2	-	-	-	14.9	13.0	-	-	-
A-4	Long.	MC-656 X-Unit	-	50	-46.0	18.0	33.0	-	43.2	-43.2	19.9	33.3
A-5	0° Lat.	MC-656 X-Unit	8.1	12.1	-	-	-	-	+40.8	+40.8	2.8	5.9
A-6	270° Lat.	MC-656 X-Unit	5.0	11.1	-	-	-	18.0	2.4	+17.8	2.9	6.7
A-7	Long.	X-Unit Cover	-	44.9	-44.9	17.2	33.2	-	44.0	-44.0	16.4	36.5
A-8	Long.	XMC-846 Battery		52.3	-47.1	17.9	28.4	-	64.0	-43.5	14.7	32.0
A-9	0° Lat.	XMC-846 Battery	8.6	10.8	-	-	-	36.1	26.9	+35.9	1.7	4.5
A-10	270° Lat.	XMC-846 Battery	8.8	12.7	-	-	-	21.9	3.4	+21.9	1.9	6.0
A-11	Long.	MC-754 Switch	-	51.0	-45.0	17.7	31.4	-	58.7	-45.4	17.6	32.5
A-12	Long.	Fwd. Mounting Plate, Support Structure	Not Used					-	43.3	-43.3	14.2	34.3
A-13	Long.	Aft Mounting Plate, Support Structure	Not Used					-	45.9	-45.3	11.8	30.6

	DROP NO. 3				
	UNIT SUSPENSION ANGLE: 36° TO VERTICAL TARGET ORIENTATION: 36° TO HORIZONTAL IMPACT VELOCITY: 37.2 TO FPS				
Same As Above	MAX. ACCEL. (g) +	MAX. ACCEL. (g) -	MAX FAIRED PULSE (g)	RISE TIME (MILLISEC)	PULSE DURATION (MILLISEC)
	-	-	Out	-	-
	44.0	23.0	+44.0	3.2	7.2
	32.0	27.1	+32.0	3.0	5.1
	-	63.2	-63.2	11.4	32.0
	20.0	8.0	+14	25.0	46.8
	16.1	8.0	+16.1	4.9	13.1
	-	63.0	-63.0	12.7	33.3
	-	63.2	-62.1	11.6	23.3
	21.0	5.2	+21.0	10.0	17.1
	21.1	10.0	+21.1	6.0	15.0
	Not Used				
	Not Used				
	Not Used				

NOTES:
1. Plus accelerations are: forward longitudinal, towards 0° lateral, and towards 90° lateral.
2. Accelerations were read as per SCS-10.
3. Accelerations recorded at frequencies over 0.6 natural frequency, as listed in Table II, may be attenuated.

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