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SEP 3 1961

File No: TX-53, 3.2
T-17625
Project No: 13.858.00
Date Completed: 8-8-61

MR. E. I. BRUCE - 7117
Attn: R. D. Grever,

Re: Drop Tower Test of Honeycomb Nose: GFU-1

Summary of Test

This was a drop test conducted on the 185' drop tower to evaluate an aluminum honeycomb nose for use in the TX-53 to mitigate the laydown delivery acceleration to 70g. The maximum gained acceleration level obtained during this test was 158.6g with a rise time of 0.59 ms and a pulse duration of 32.20 ms.

Object of Test

The object of this test was to evaluate an aluminum honeycomb nose for use on the TX-53 to mitigate laydown delivery acceleration to 70g.

Authorization for Test

This test was requested in a Work Order Authorization from Mr. E. I. Bruce, 7117, to Mr. E. H. Copeland, 7321, dated 3-6-61. The test was then assigned to 7323-3. Mr. R. D. Grever, 7117, was the consultant on the test.

Setup and Procedure

The test unit used for this test, which was called GFU-1, was a mockup of the TX-53. The test unit had a steel cylinder with lead plates bolted inside in place of the normal case and components of the TX-53. The test unit also consisted of honeycomb side panels, wedges, afterbody and nose. The drawing numbers for these parts are contained in Table I.

The test unit was brought to the 185' Drop Tower and after normal rigging of the unit and carriage the test unit was suspended from the Drop Tower carriage. The test unit was moved into position and dropped on a 6'x12'x2' reinforced concrete target. The test unit was dropped 59.4 ft. and impacted at 61.3 ft per sec. The over all setup for the test is shown in Fig. 1.

The accelerations were recorded on a Consolidated Data Tape Model 5-752A using Kintel amplifiers Model 111BF. The tape was then played back on an Ampex FM tape recorder Model 114-A and then recorded on a Consolidated 5-119 oscillograph using Ampex Low Pass Output Data Filters which filter to 625 CPS.

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The location of the accelerometers is shown in Fig. 2. The specifications for the accelerometers is contained in Table II.

Results

The accelerations obtained from this test are contained in Table III. The accelerometer signatures can be seen in Fig. 3. All accelerations were read according to SCS 10, paragraph 7.4 to 7.4.5. The cable used on accelerometer No. A-8 was cut during the test and the data from this accelerometer was lost.

The honeycomb nose crushed from the original thickness of 20 inches to 10 3/8 inches at 0° and 10 3/4 inches at 180°.

The calculated impact velocity of the test unit was 62 ft/sec in the vertical drop tower test of honeycomb nose GFU-1.

G. T. Day by DM

G. T. GAY - 7323-3

7321 Project Engineer: Dale Buchanan
DALE BUCHANAN - 7321-5

Approved By: R. S. Cooper
R. S. COOPER - 7321-5

GTG:mm

Encl: Figs. 1, 2, 3,
Tables I, II, III

Distribution:
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R. K. Smeltzer, 3421-3

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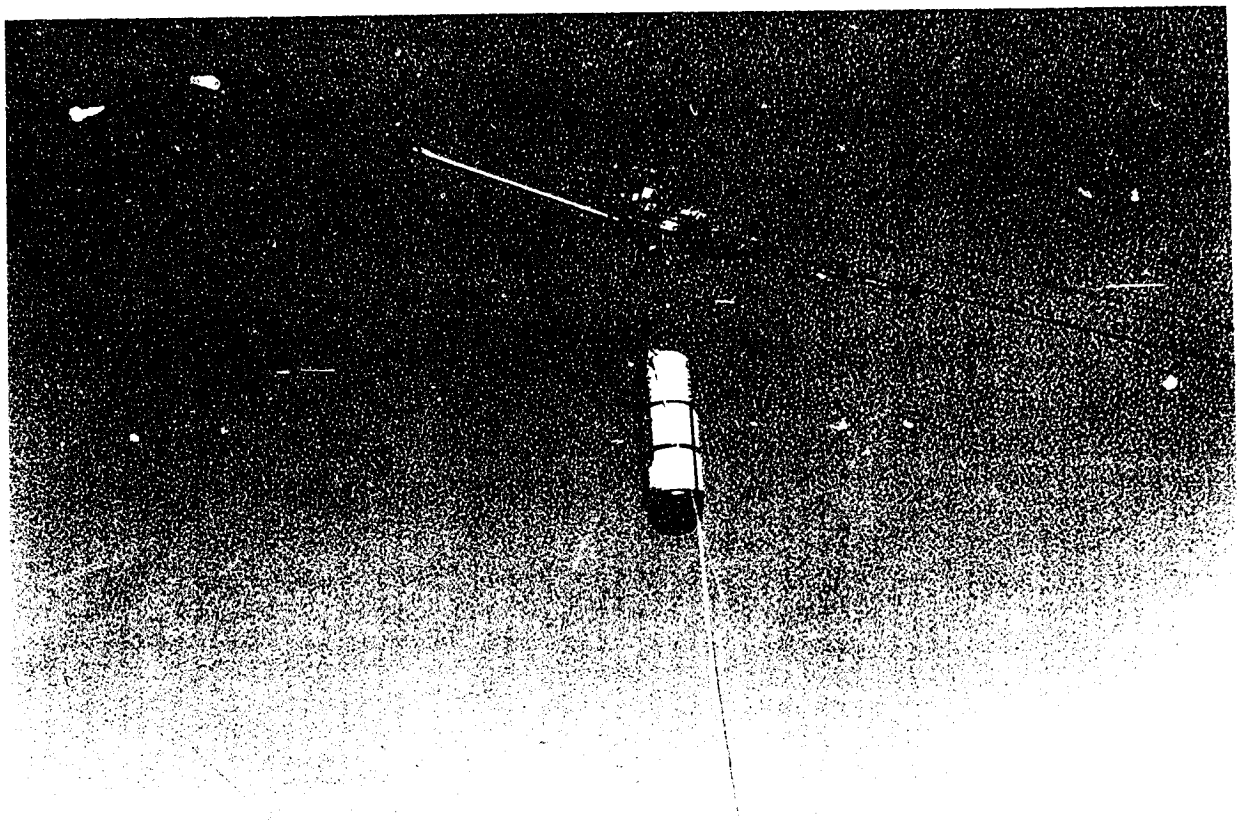

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FIGURE 1 - TEST SETUP FOR GFU-1, V_V = 62 FT/SEC -- DROP TOWER TEST, HONEYCOMB ENERGY ABSORPTION CAPABILITY

UNCLASSIFIED

PROJECT NO. T-17625

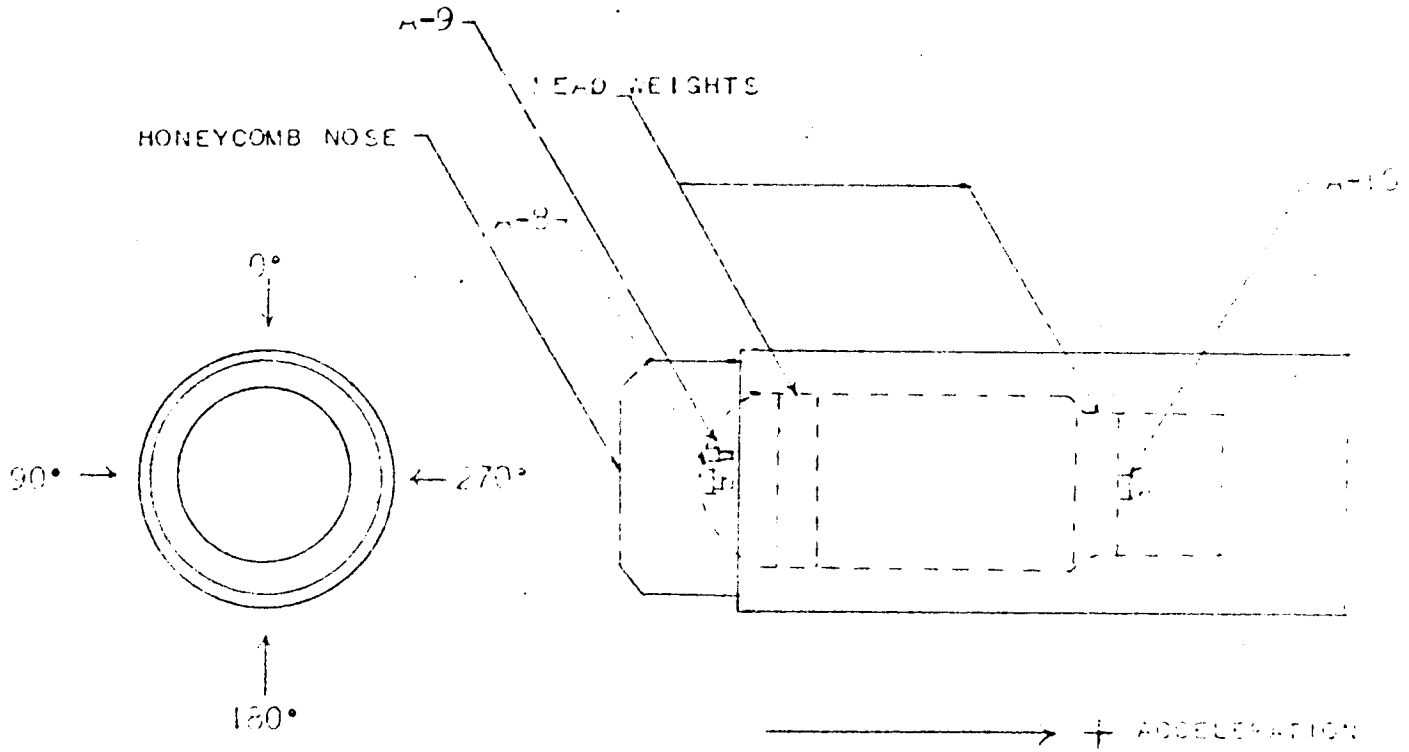

FIGURE 2 - ACCELEROMETER LOCATIONS FOR GFU-1 -- DROP TOWER TEST, HONEYCOMB ENERGY ABSORPTION CAPABILITY

PROJECT NO. T-17625

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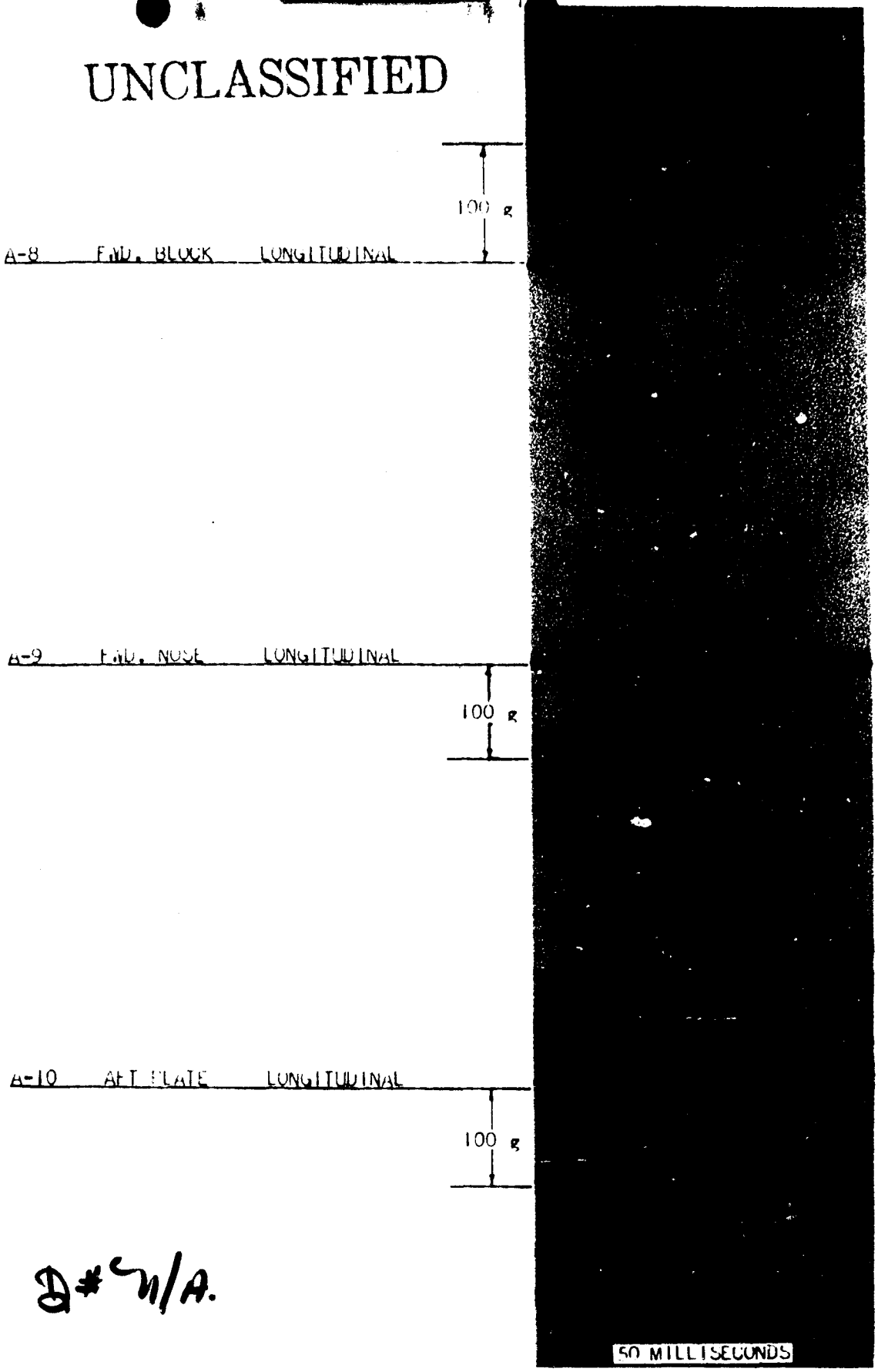

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FIGURE 3 - ACCELEROMETER SIGNATURES FOR GFU-1, V_V = 62 FT/SEC -- DROP TOWER TEST, HONEYCOMB ENERGY ABSORPTION CAPABILITY

PROJECT NO. T-17625

UNCLASSIFIED

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T-17625

TABLE I

Test Unit Components for GFU-1
Drop Tower Test, Honeycomb
Energy Absorption Capability

Components	Drawing No.
Cylinder, steel	SK9(1217)3856
Side panels	158661
Wedges	158662
Afterbody	158674
Nose	163272

T-17625

TABLE II

Accelerometer Specifications for GFU-1
Drop Tower Test, Honeycomb
Energy Absorption Capability

Position No.	Statham Serial No.	Statham Model No.	Range (±g's)	Natural Frequency (cps)
A-8	634	A5A-100-300	100	810
A-9	7020	A5A-1000-350	1000	1500
A-10	622	A5A-100-300	100	700

UNCLASSIFIED

T-17625

TABLE III

Acceleration Data for GFU-1
Drop Tower Test (62 ft/sec), Honeycomb
Energy Absorption Capability

Inst. No.	Location	Direction	Acceleration (g's or rad/sec^2) Max (+)	Max (-)	Faired	Time (ms) Rise	Pulse
A-8	Fwd Block	Long.			Cable cut		
A-9	Fwd Nose	Long.	188	12.1	168.6	0.59	32.2
A-10	Aft Plate	Long.	132	49	87.3	9.1	33.8

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