

UNCLASSIFIED

1208

RECEIVED

AUG 5 1963

AUG 6 1963

File No: T-14

T-18749

Test Completed: 7-16-62

GENERAL RELEASE FILE

MR. T. J. HOBAN, JR. - 7212
Attn: Mr. R. H. Lanes

Re: Vibration Test of the 53.73-3 Telemetry Package (U)

Test Summary

The telemetry package for the KW-53 was subjected to a sine wave vibration test to the capacity of the test equipment with a maximum value of 10g, along three mutually perpendicular axes. At the conclusion of the tests many connectors had become displaced, several screws holding components to the structure had become loosened, and several connections on a patch panel had broken. It is highly probable that the telemetry unit was no longer functional.

Object of Test

The object of this test was to prove the structural integrity of the 53.73-3 telemetry package when subjected to the vibration specified in the design qualification of this unit.

Authorization for Test

This test was requested in an Environmental Test Order from R. Robinett, 7212, to R. S. Hooper, 7321-5, dated 5-14-62. Mr. R. Robinett was the consultant.

Setup for Test

The setup for the lateral, vertical, and longitudinal orientations is shown in Figures 1 and 2. The instrumentation used is shown in Figures 3 and 4.

Procedure

The instrumentation was installed on the telemetry package, the package was assembled in the fixture, and the fixture was mounted on MB 5 in the longitudinal orientation.

SANDIA SYSTEMATIC DECLASSIFICATION REVIEW DOWNGRADING OR DECLASSIFICATION STAMP	
CLASSIFICATION CHANGED TO: <u>U</u>	AUTHORITY: <u>R.B. Cranu</u>
PERSON CHANGING MARKING & DATE: <u>Melinda Seep 7/28/98</u>	RECORD ID: <u>98SN2994</u>
PERSON VERIFYING MARKING & DATE: <u>WC Lanes 7/23/98</u>	DATED: <u>7/23/98</u>

7/14/98
 * WC Lanes
 7/23/98
 R.B. Cranu
 G
 U
 13
 511 fort permit
 -H

UNCLASSIFIED

UNCLASSIFIED

Mr. T. J. Hoban, Jr. - 7212

- 2 -

T-18749

The unit was subjected to sine wave vibration to the force capacity of MB 5 shaker, up to a maximum of 10g. The input is shown in Figure 5.

The same procedure was used for vertical and lateral orientations of the unit. The inputs for these orientations are shown in Figures 6 and 7.

All of the data was recorded on magnetic tape with unfiltered signals from accelerometers.

Results

Response vs frequency plots for all accelerometers for three orientations are shown in Figures 8 through 43. The plots, made from magnetic tape, were filtered through a low pass filter set at 1000 cps. The maximum response in longitudinal orientation was 47g at 390 cps measured longitudinally on the recorder bulkhead. The maximum response in the vertical orientation was 53g at 135 cps measured longitudinally on the bulkhead at the C.G. of the unit. The maximum response in the lateral orientation was 48g at 110 cps measured longitudinally on the bulkhead at the C.G. of the unit.

At the conclusion of the test the telemetry package was removed from the fixture and many loose screws and connectors were observed. Several broken connections were discovered in the patch panels of the unit. This damage to the unit is shown in Figures 44, 45, and 46.

Since no screws were found inside the telemetry container, it seems possible that the screws to hold connectors in place were never installed.

Conclusions and Recommendations

During the assembly of the telemetry package in the fixture, some difficulty was encountered in tightening the eccentric clamps near the C.G. of the package (Figure 4). Due to the size or eccentricity of these clamps, the point of most effective clamping was difficult to determine. A minor change in the design of these clamps would facilitate assembly.

J. F. Reid
J. F. REID - 7324-2

UNCLASSIFIED

UNCLASSIFIED

Mr. T. J. Hoban, Jr. - 7212

- 3 -

T-18749

D. T. Judd
Test Project Engineer: D. T. JUDD - 7331-1

E. Johnson
Approved By: E. JOHNSON - 7331-1

JER:7324-2:ms

Encl: Figures 1 - 46

Copy to:

C. S. Williams, Jr., 1442

D. S. Bliss, 2344

E. H. Copeland, 7331

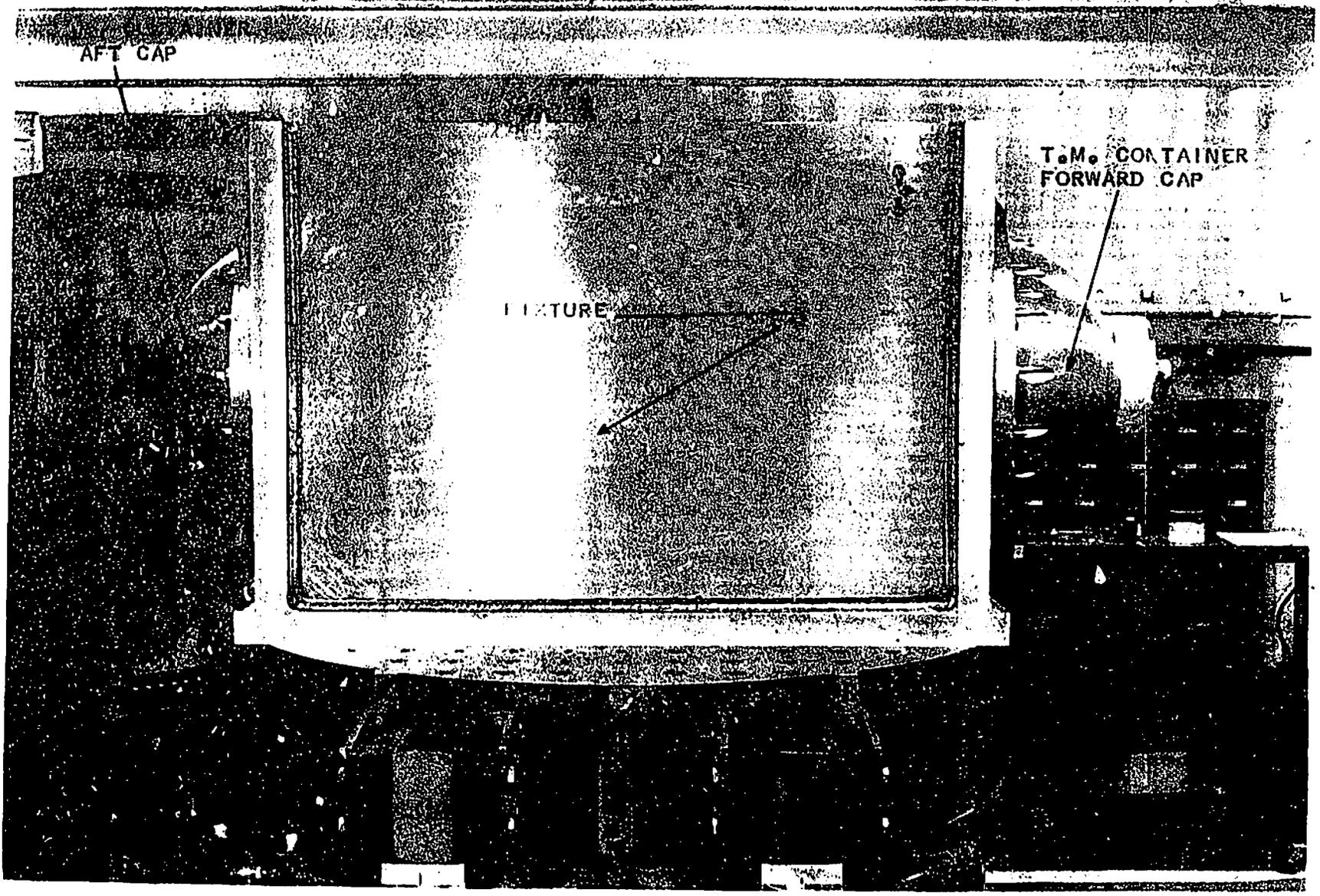
C. L. Johnson, 7523

Central Record File, 3421-3

UNCLASSIFIED

UNCLASSIFIED

#1211



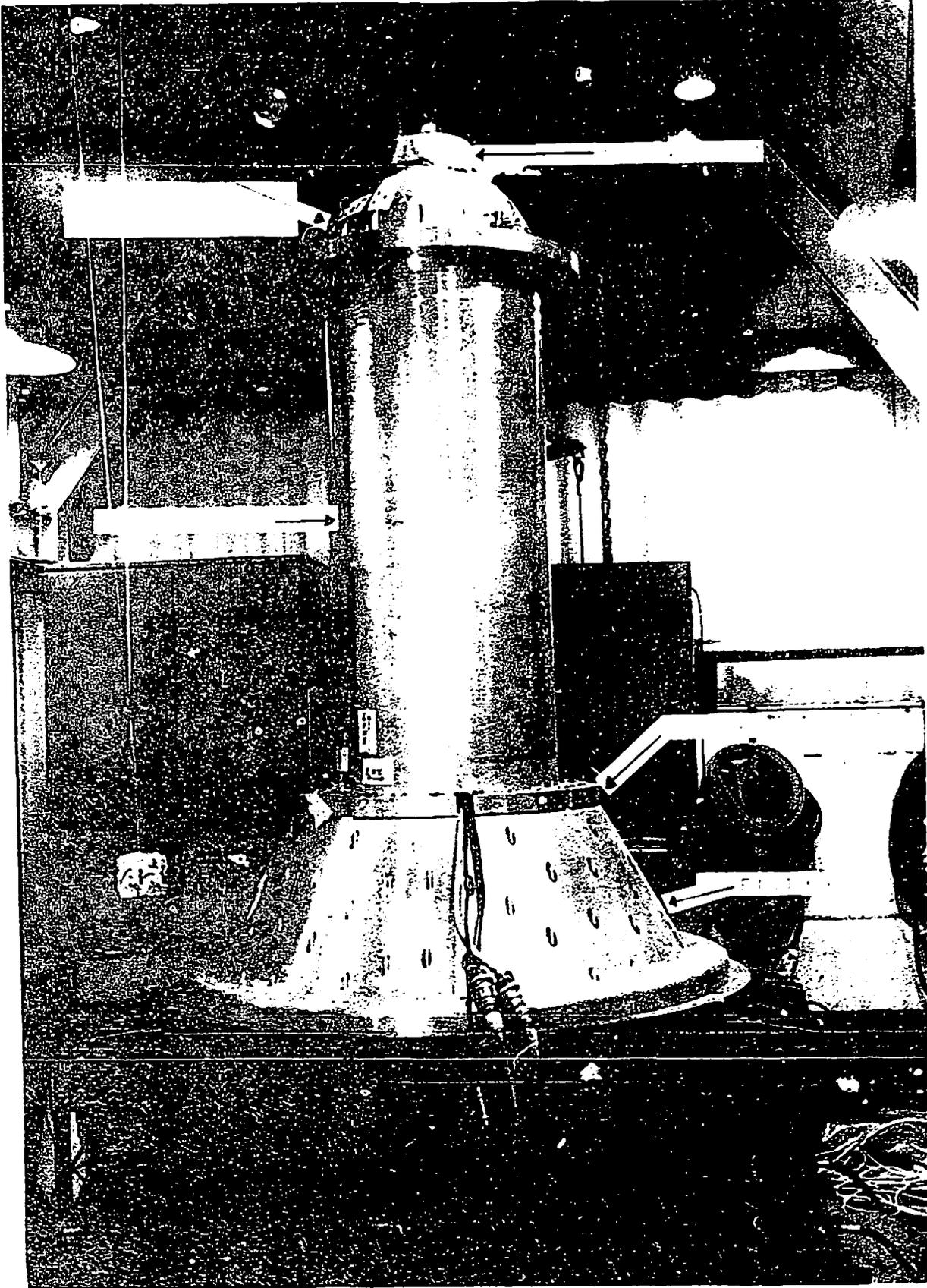
UNCLASSIFIED

D71A

UNCLASSIFIED

~~RESTRICTED~~

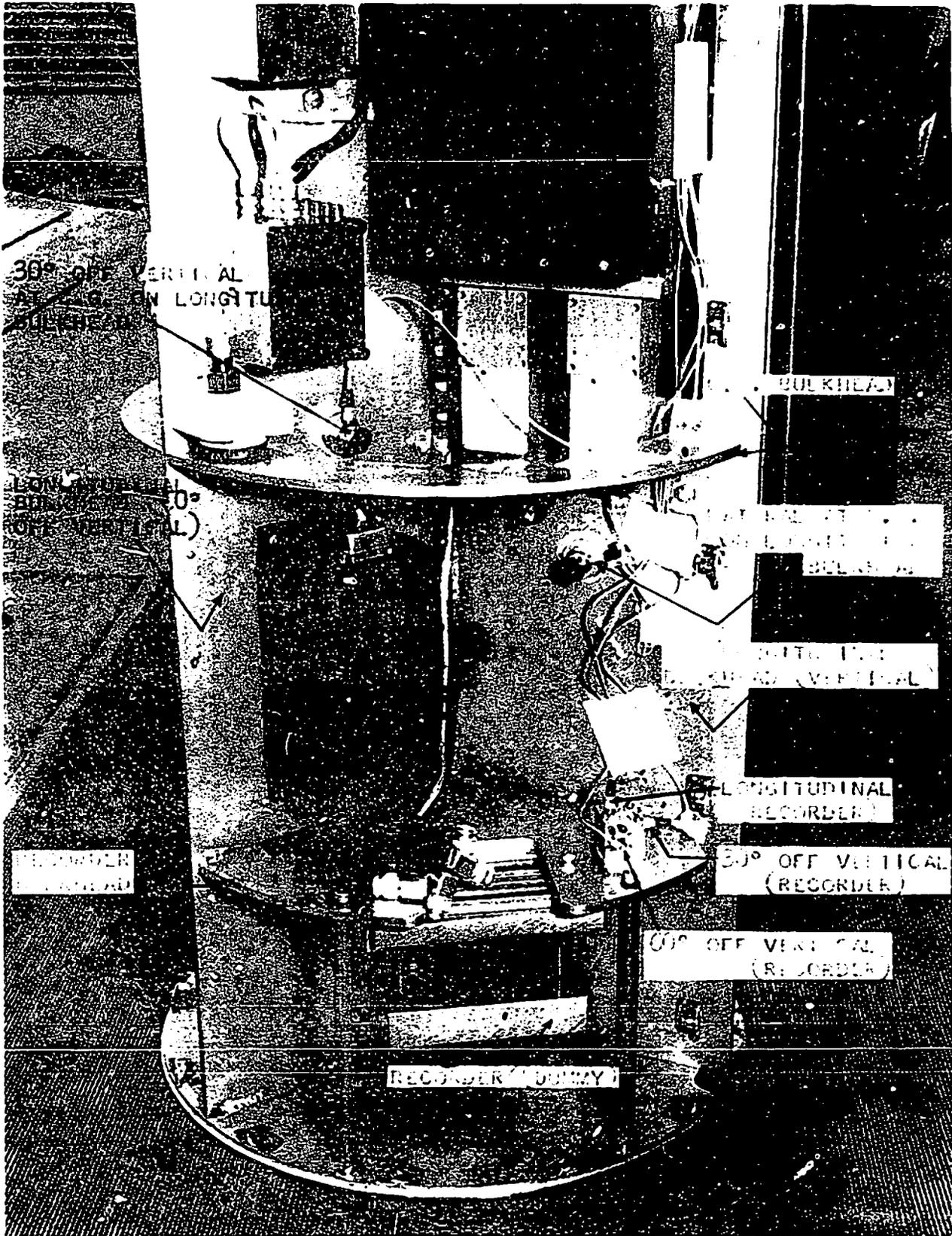
#1212



D#62-2880

~~RESTRICTED~~

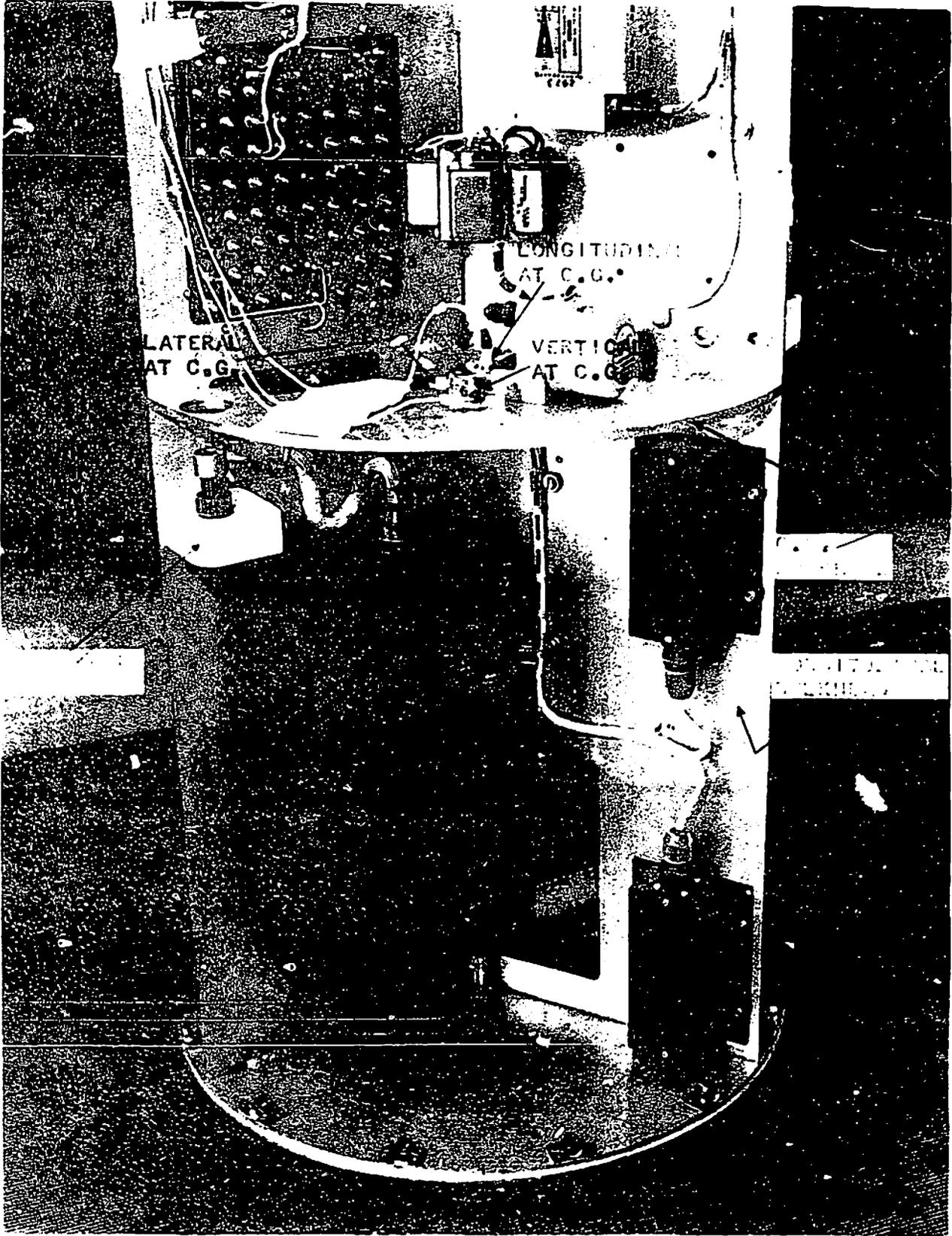
UNCLASSIFIED



D# 4/A

~~CONFIDENTIAL~~

#1214



D#501A

~~CONFIDENTIAL~~

UNCLASSIFIED

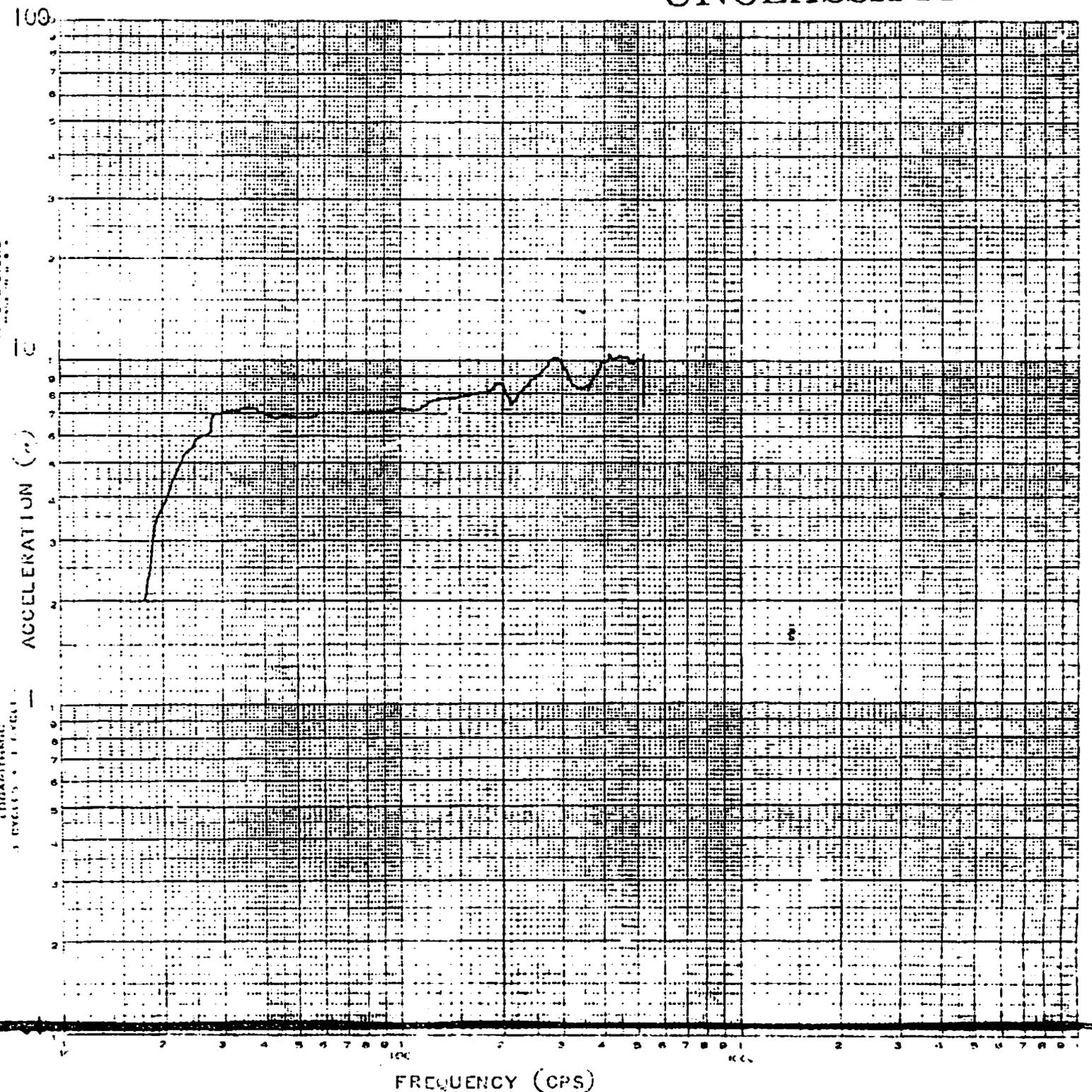


FIG. 5 FILTERED RESPONSE VS. FREQUENCY PLOT OF INPUT ACCELEROMETER MOUNTED AT THE TOP OF THE FIXTURE - LONGITUDINAL ORIENTATION - VIBRATION TEST OF THE XW-53 TELEMETRY PACKAGE. PROJECT NO. T-18749

UNCLASSIFIED

~~CONFIDENTIAL~~

UNCLASSIFIED

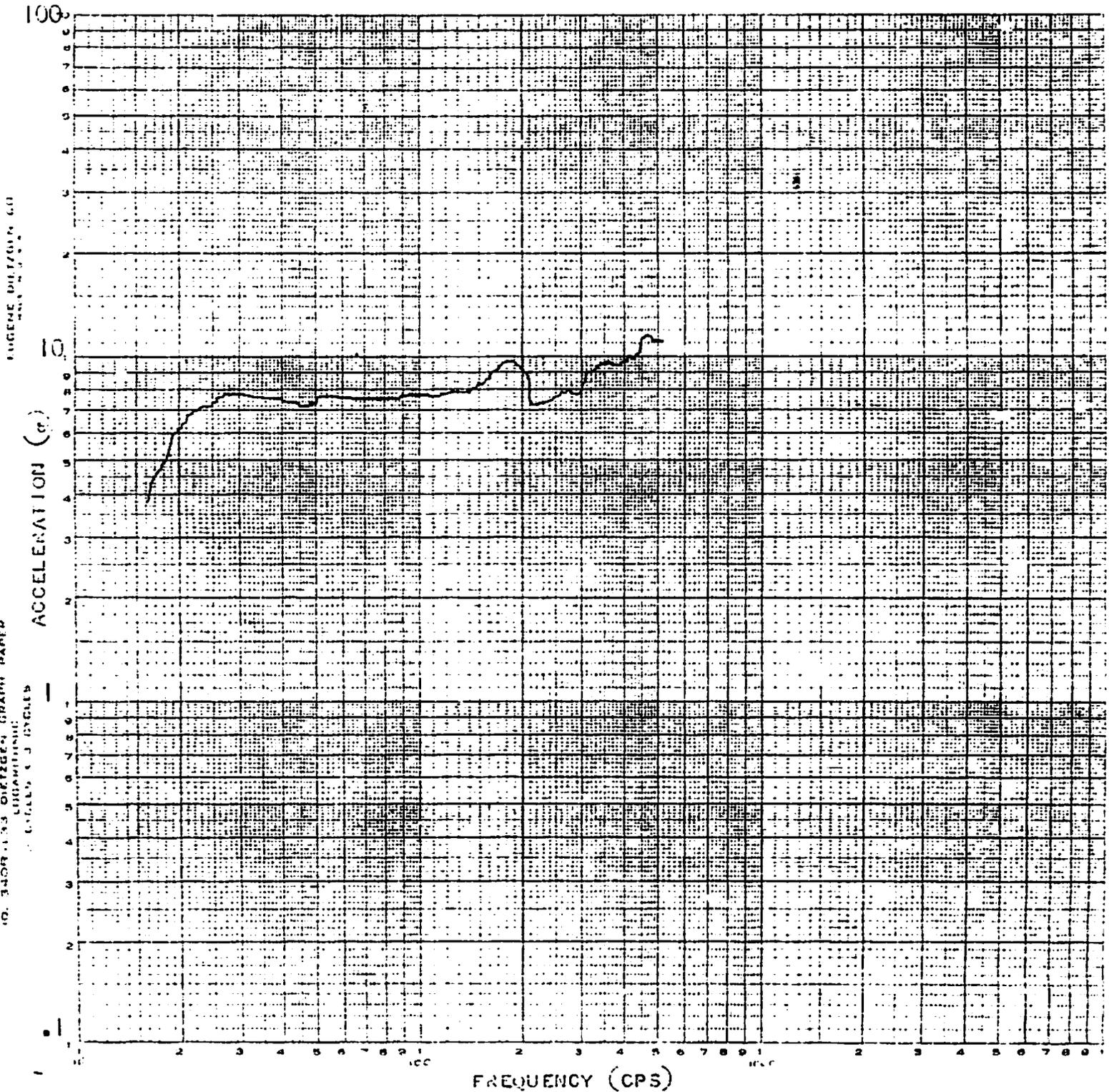


FIG. 6 FILTERED RESPONSE VS. FREQUENCY PLOT OF INPUT ACCELERATOR MOUNTED ON FORWARD END OF THE FIXTURE - VERTICAL ORIENTATION - VIBRATION TEST OF THE XA-55 TELEMETRY PACKAGE.

PROJECT NO. T-16749

~~CONFIDENTIAL~~

UNCLASSIFIED

UNCLASSIFIED

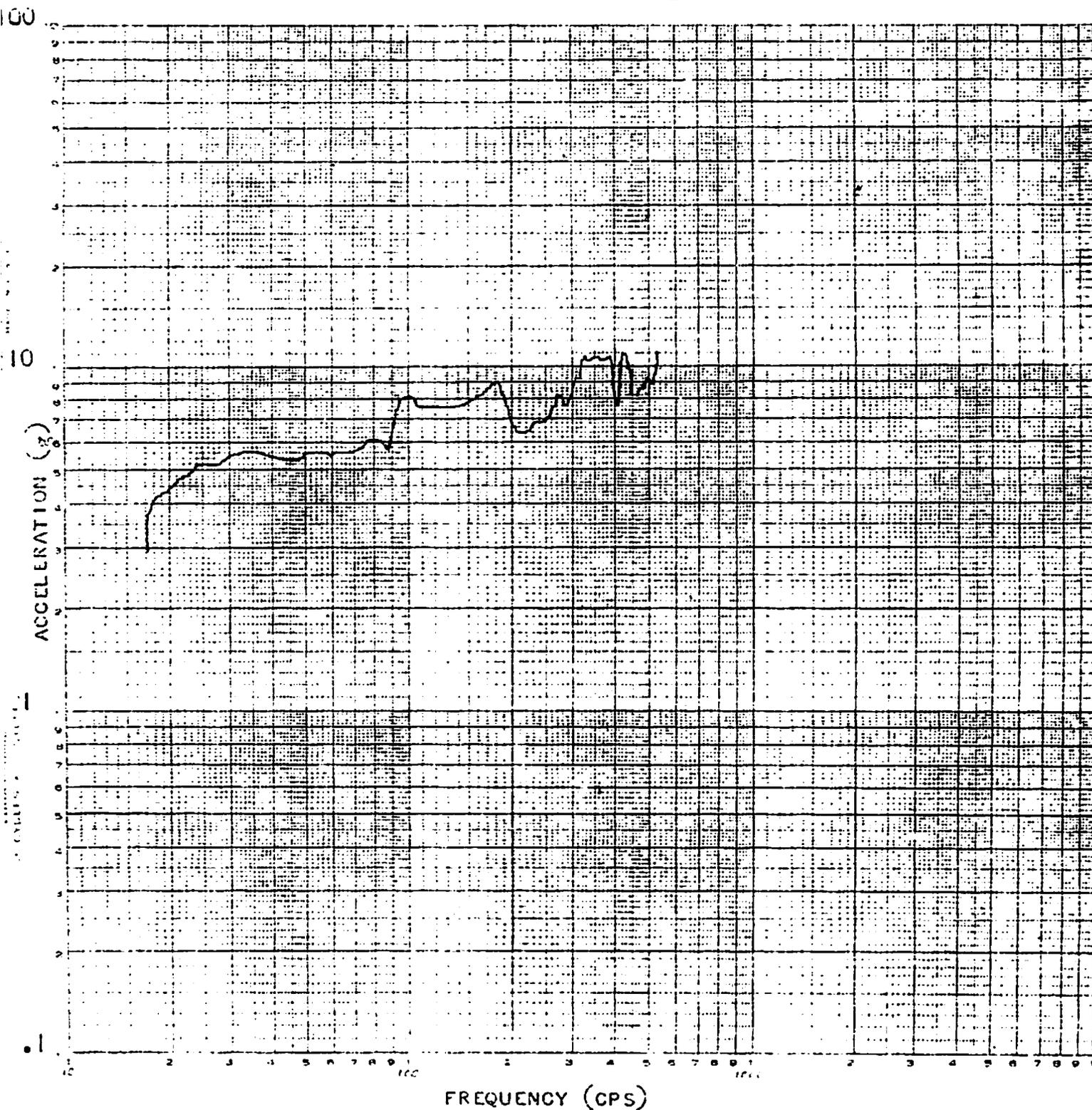


FIG. 7 - FILTERED RESPONSE VS. FREQUENCY PLOT OF INPUT ACCELEROMETER MOUNTED ON FORWARD END OF THE FIXTURE - LATERAL ORIENTATION - VIBRATION TEST OF THE XW-53 TELEMETRY PACKAGE.

UNCLASSIFIED

PROJECT NO. T-18749

UNCLASSIFIED

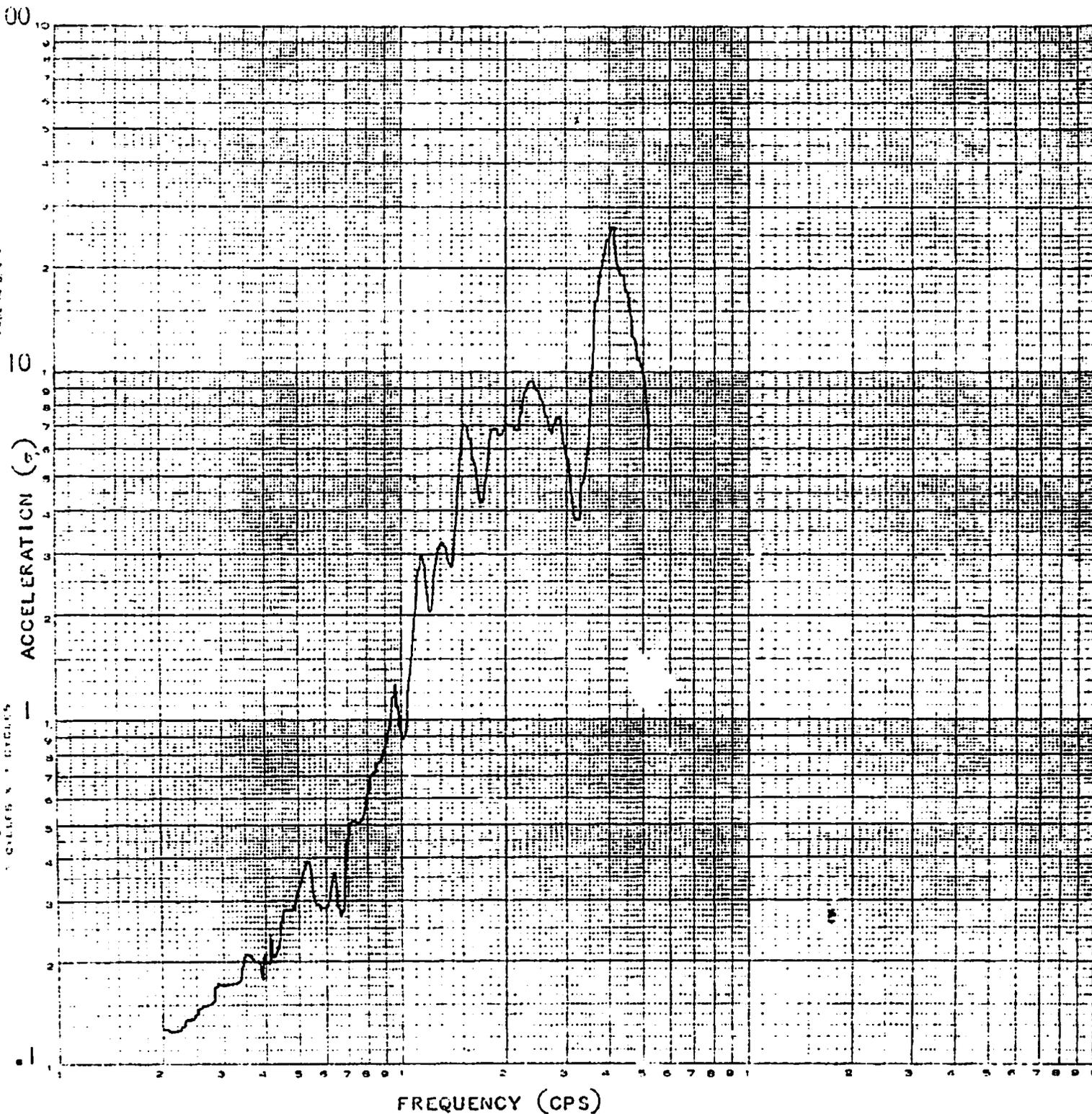


FIG. 8 - FILTERED RESPONSE VS. FREQUENCY PLOT OF ACCELEROMETER ON THE RECORDER BULKHEAD, 30° OFF VERTICAL - LONGITUDINAL ORIENTATION - VIBRATION TEST OF THE X-53 TELEMETRY PACKAGE.

PROJECT NO. T-18749

UNCLASSIFIED

UNCLASSIFIED

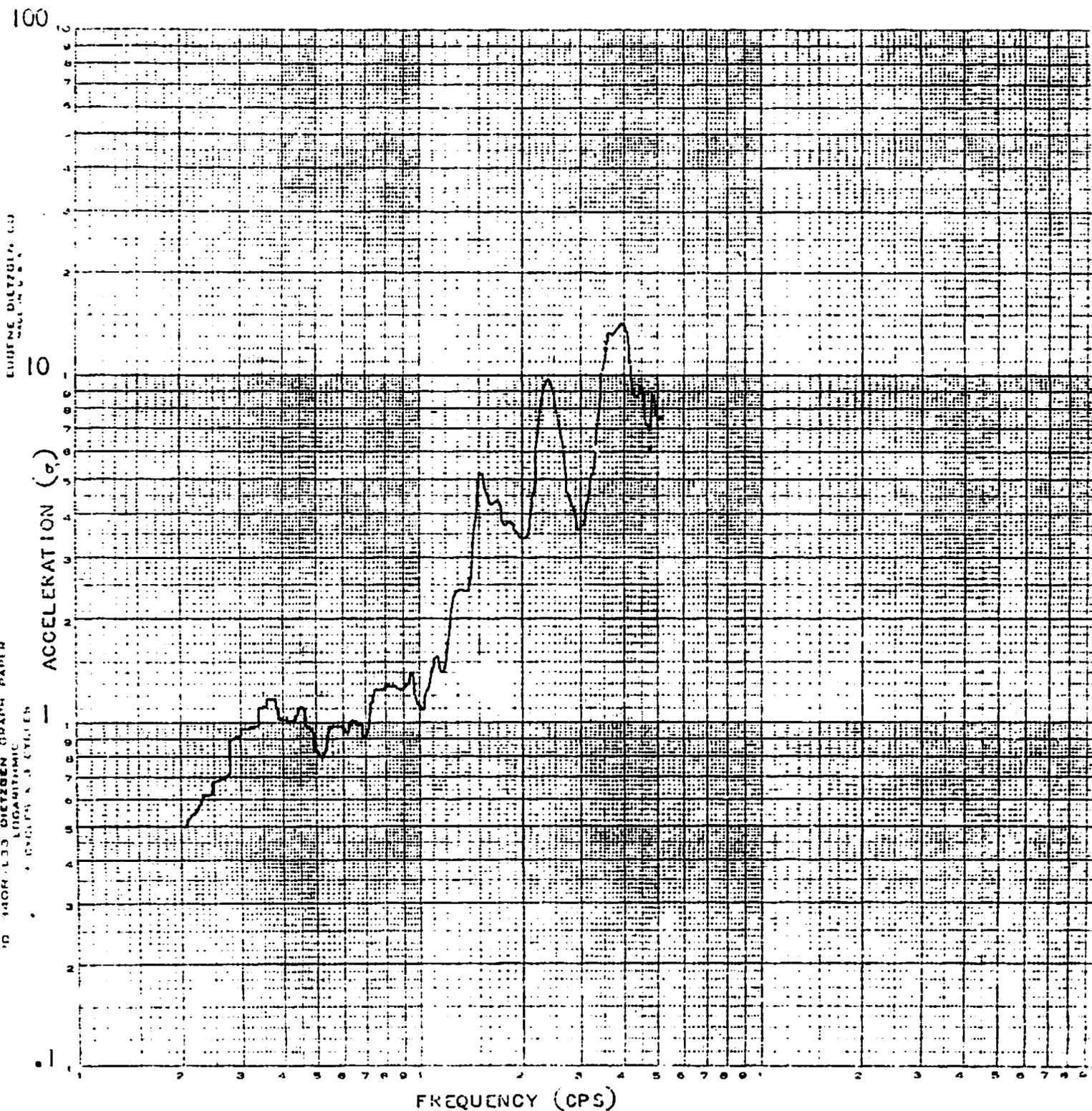


FIG. 9 - FILTERED RESPONSE VS. FREQUENCY PLOT OF ACCELEROMETER ON THE RECORDER BULKHEAD, 60° OFF VERTICAL - LONGITUDINAL ORIENTATION - VIBRATION TEST OF THE XW-53 TELEMETRY PACKAGE.

PROJECT NO. T-18749

UNCLASSIFIED

UNCLASSIFIED

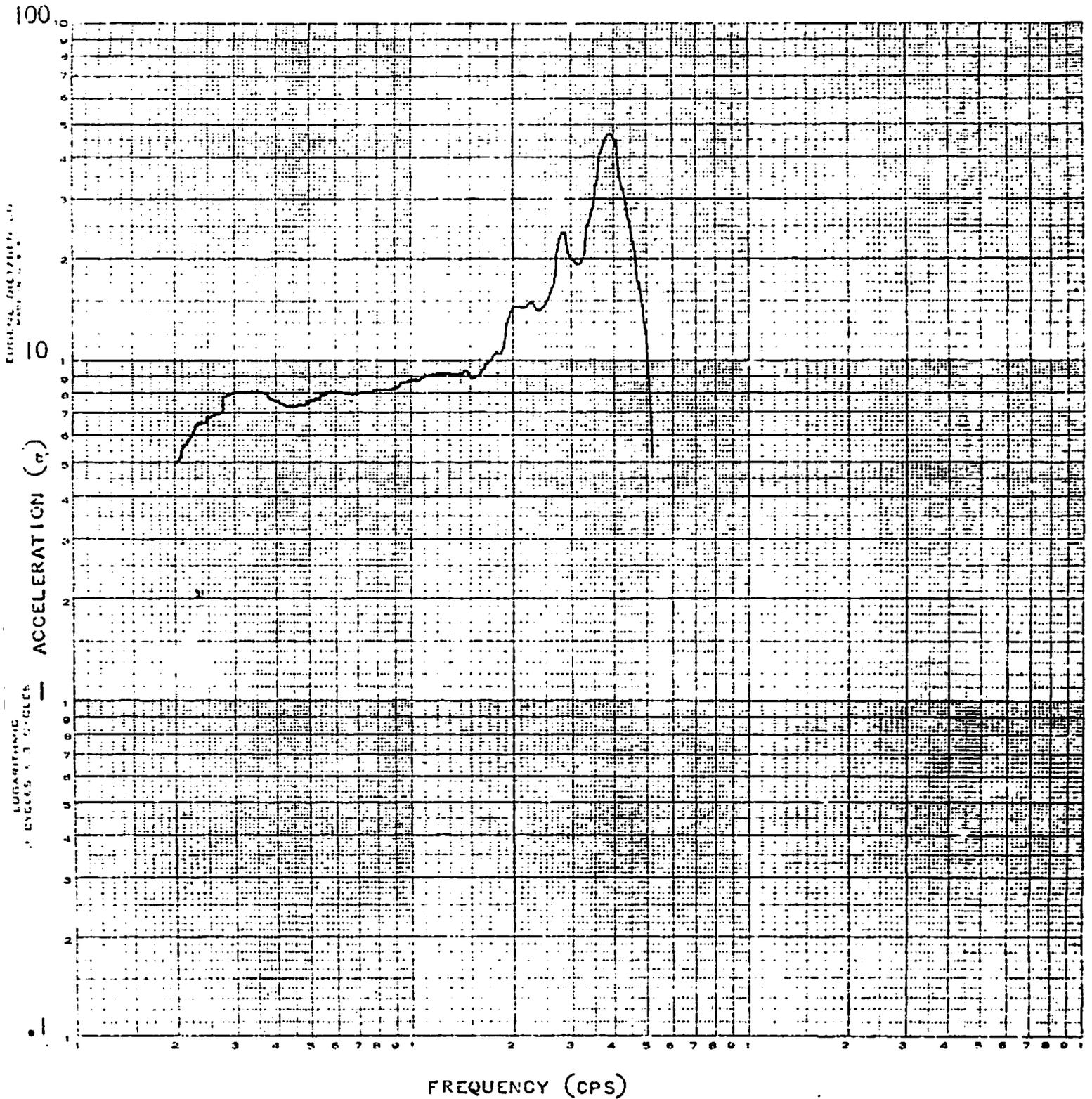


FIG. 10 - FILTERED RESPONSE VS. FREQUENCY PLOT OF LONGITUDINAL ACCELEROMETER ON THE RECORDER BULKHEAD - LONGITUDINAL ORIENTATION - VIBRATION TEST OF THE XV-53 TELEMETRY PACKAGE.

PROJECT NO. T-18749

UNCLASSIFIED

UNCLASSIFIED

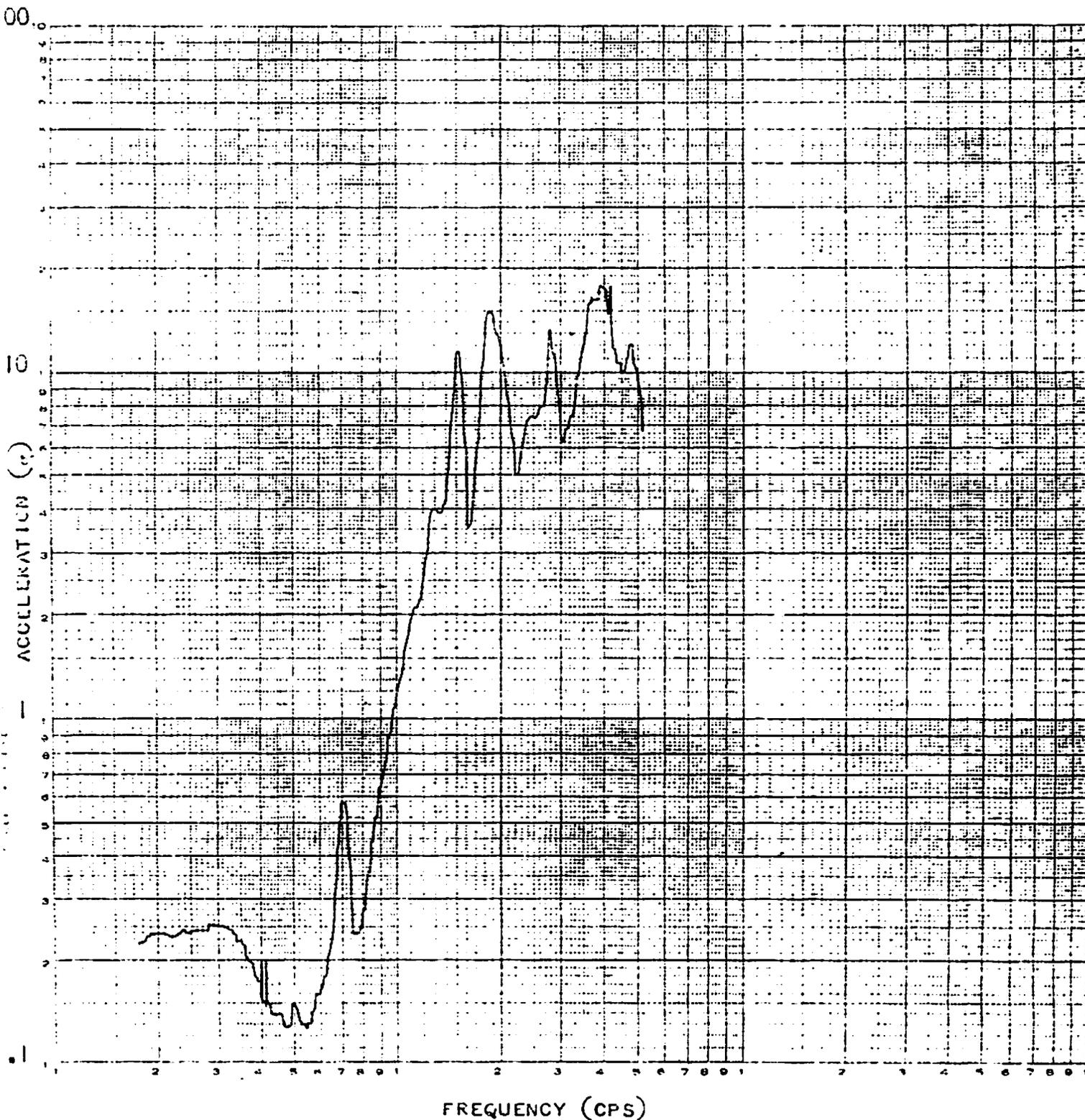
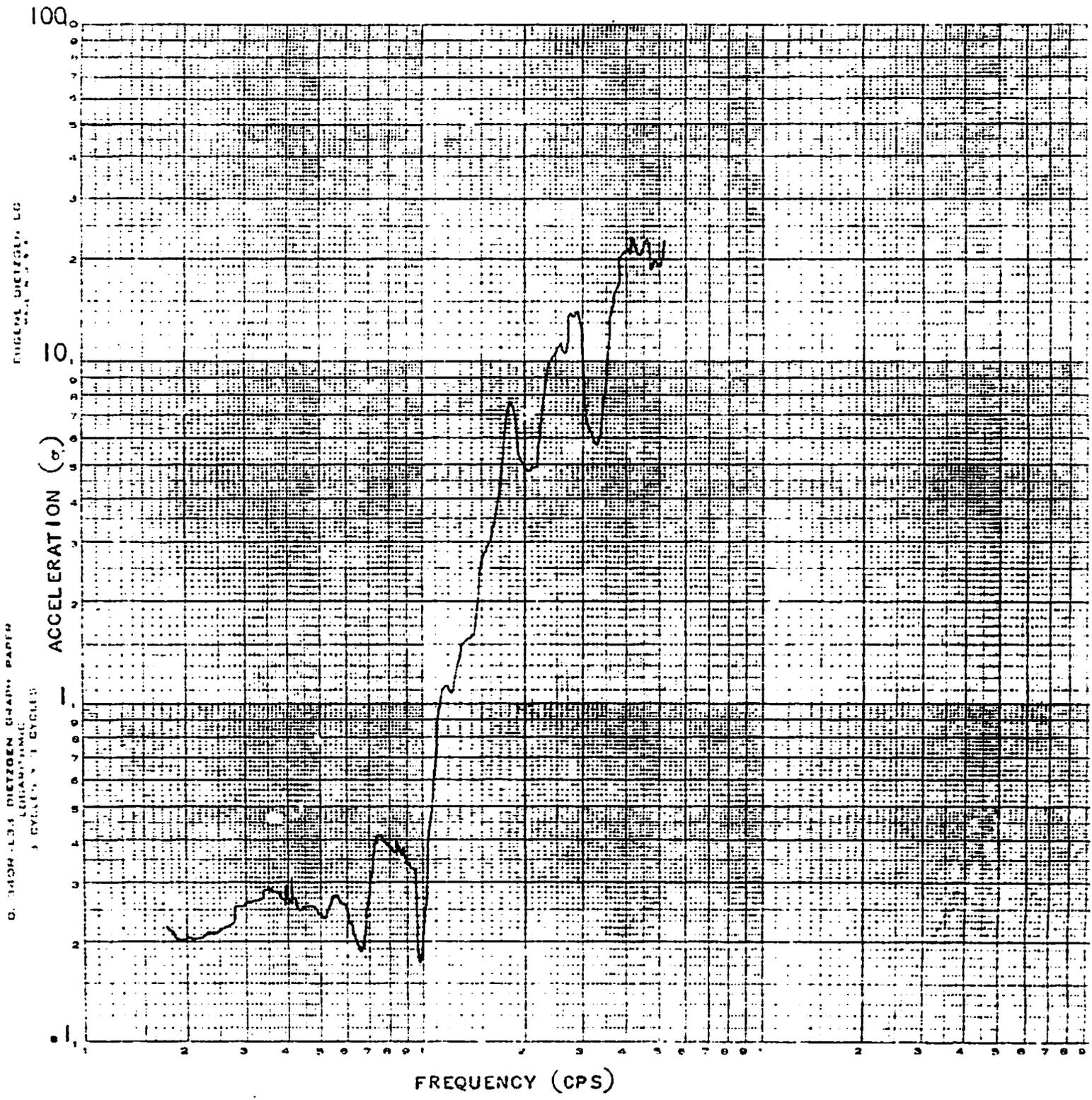


FIG. 11 - FILTERED RESPONSE VS. FREQUENCY PLOT OF VERTICAL ACCELEROMETER ON THE C.G. BULKHEAD - LONGITUDINAL ORIENTATION - VIBRATION TEST OF THE X-53 TELEMETRY PACKAGE.

PROJECT NO. T-18749

UNCLASSIFIED

UNCLASSIFIED



ENGINEERING UNIT, LG

O. 140R-134 DIETZEN GRAFIC PAPERS
LOUISIANA
3 CYCLES, 1 CYCLES

FIG. 12 - FILTERED RESPONSE VS. FREQUENCY PLOT OF LATERAL ACCELEROMETER ON THE C.G. BULKHEAD - LONGITUDINAL ORIENTATION - VIBRATION TEST OF THE XH-53 TELEMETRY PACKAGE.

PROJECT NO. T-18749

UNCLASSIFIED

UNCLASSIFIED

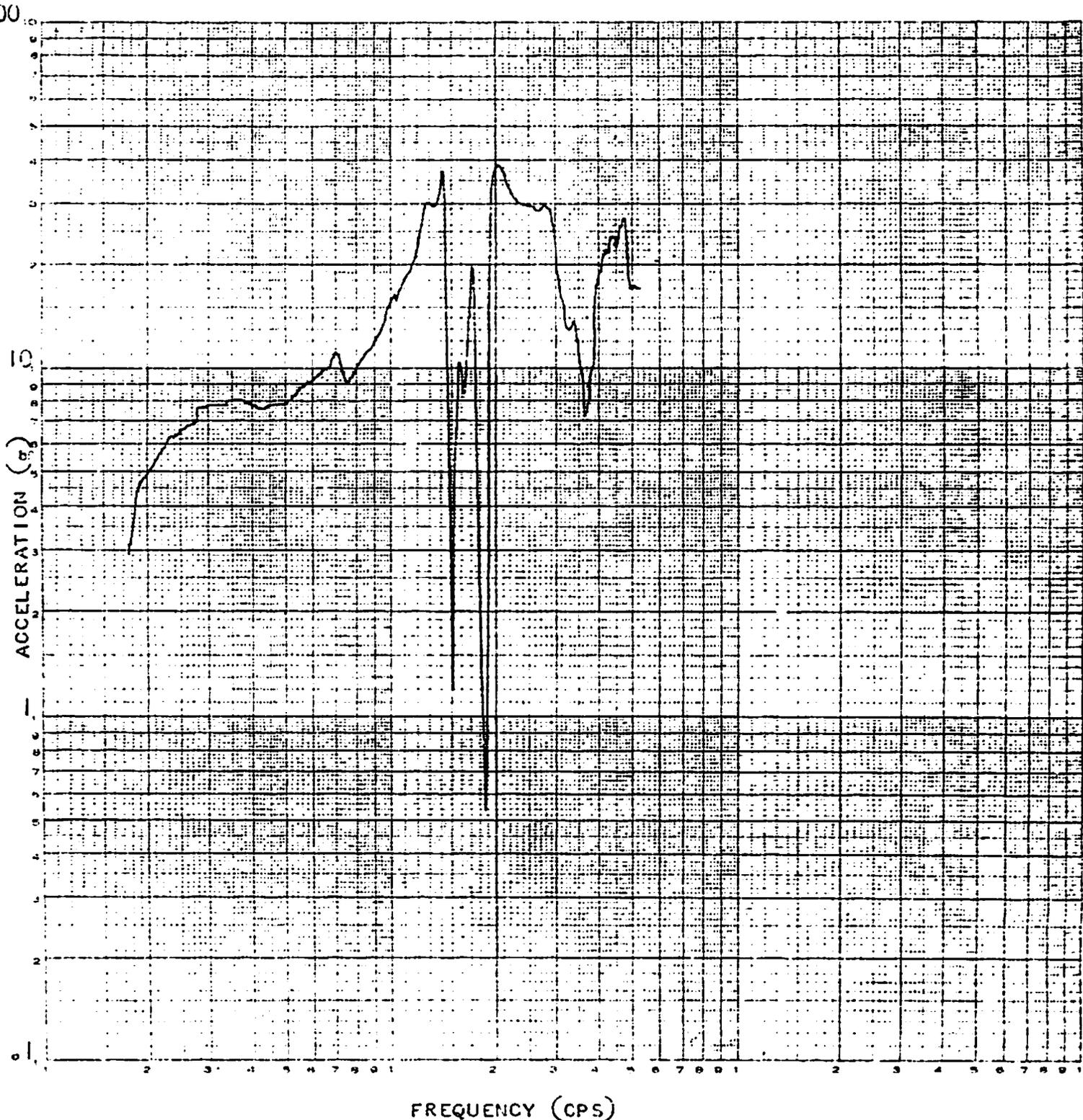


FIG. 13 - FILTERED RESPONSE VS. FREQUENCY PLOT OF THE LONGITUDINAL ACCFLEROMETER ON THE C.G. BULKHEAD - LONGITUDINAL ORIENTATION - VIBRATION TEST OF THE XV-53 TELEMETRY PACKAGE.

PROJECT NO. T-18749

UNCLASSIFIED

[REDACTED]
UNCLASSIFIED

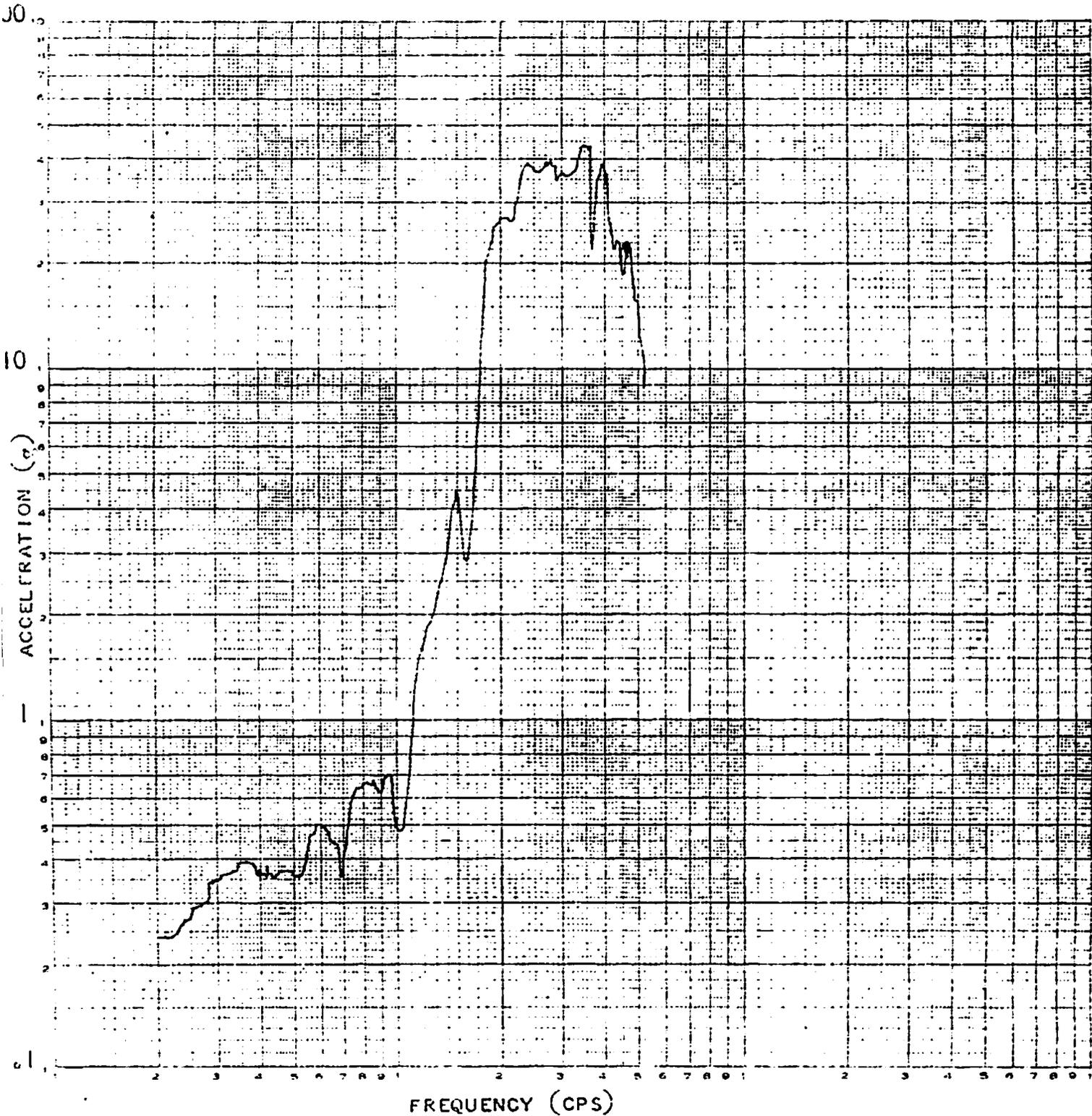


FIG. 14 - FILTERED RESPONSE VS. FREQUENCY PLOT OF LATERAL ACCELEROMETER ON LONGITUDINAL BULKHEAD AT C.G. - LONGITUDINAL ORIENTATION - VIBRATION TEST OF THE XR-53 TELEMETRY PACKAGE.

PROJECT NO. T-18749

[REDACTED]
UNCLASSIFIED

[REDACTED]

UNCLASSIFIED

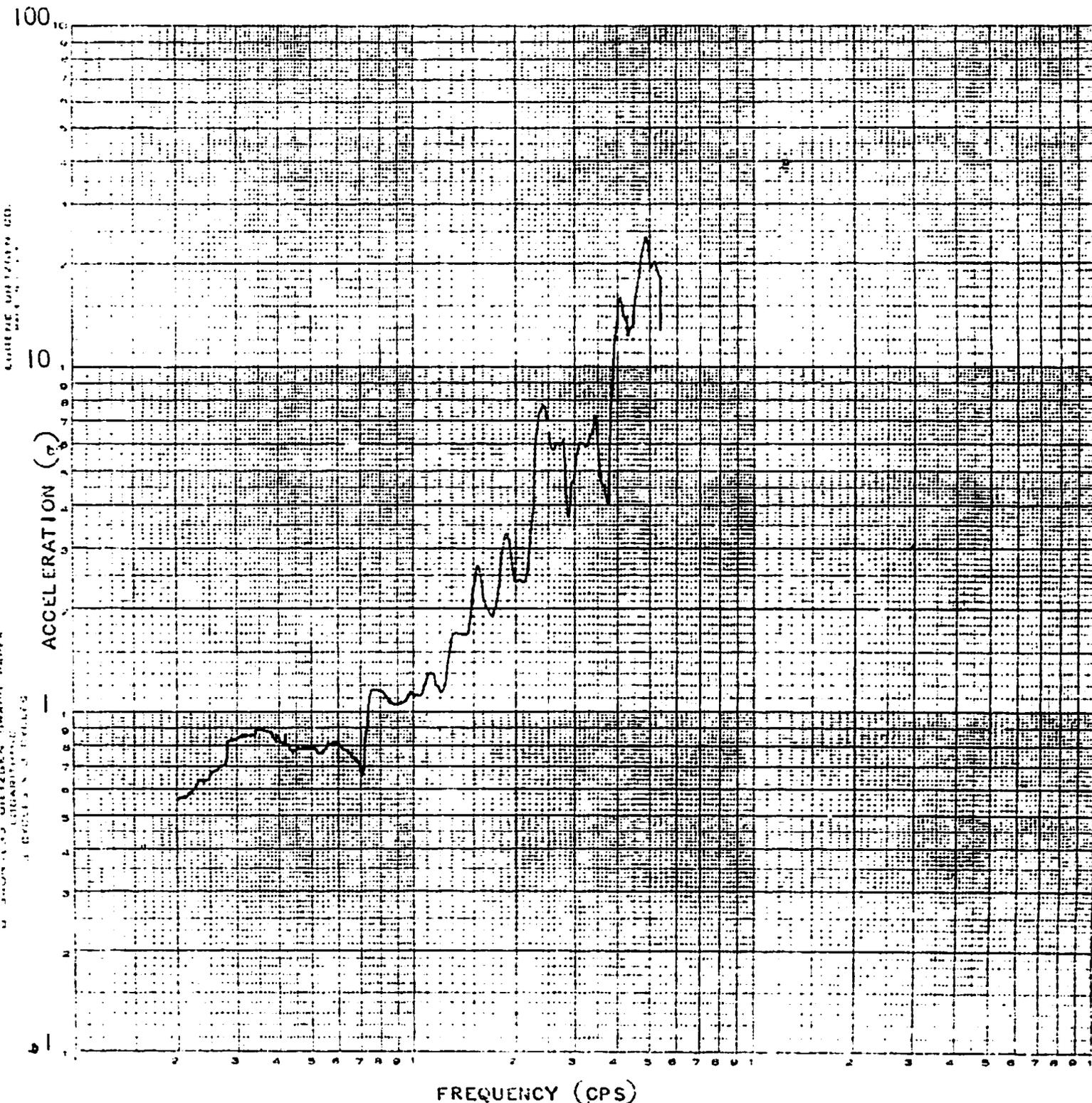


FIG. 15 - FILTERED RESPONSE VS. FREQUENCY PLOT OF ACCELEROMETER ON LONGITUDINAL BULKHEAD, 30° OFF VERTICAL - LONGITUDINAL ORIENTATION - VIBRATION TEST OF THE XW-53 TELEMETRY PACKAGE.

UNCLASSIFIED

[REDACTED]

PROJECT NO. T-18749

~~CONFIDENTIAL~~
UNCLASSIFIED

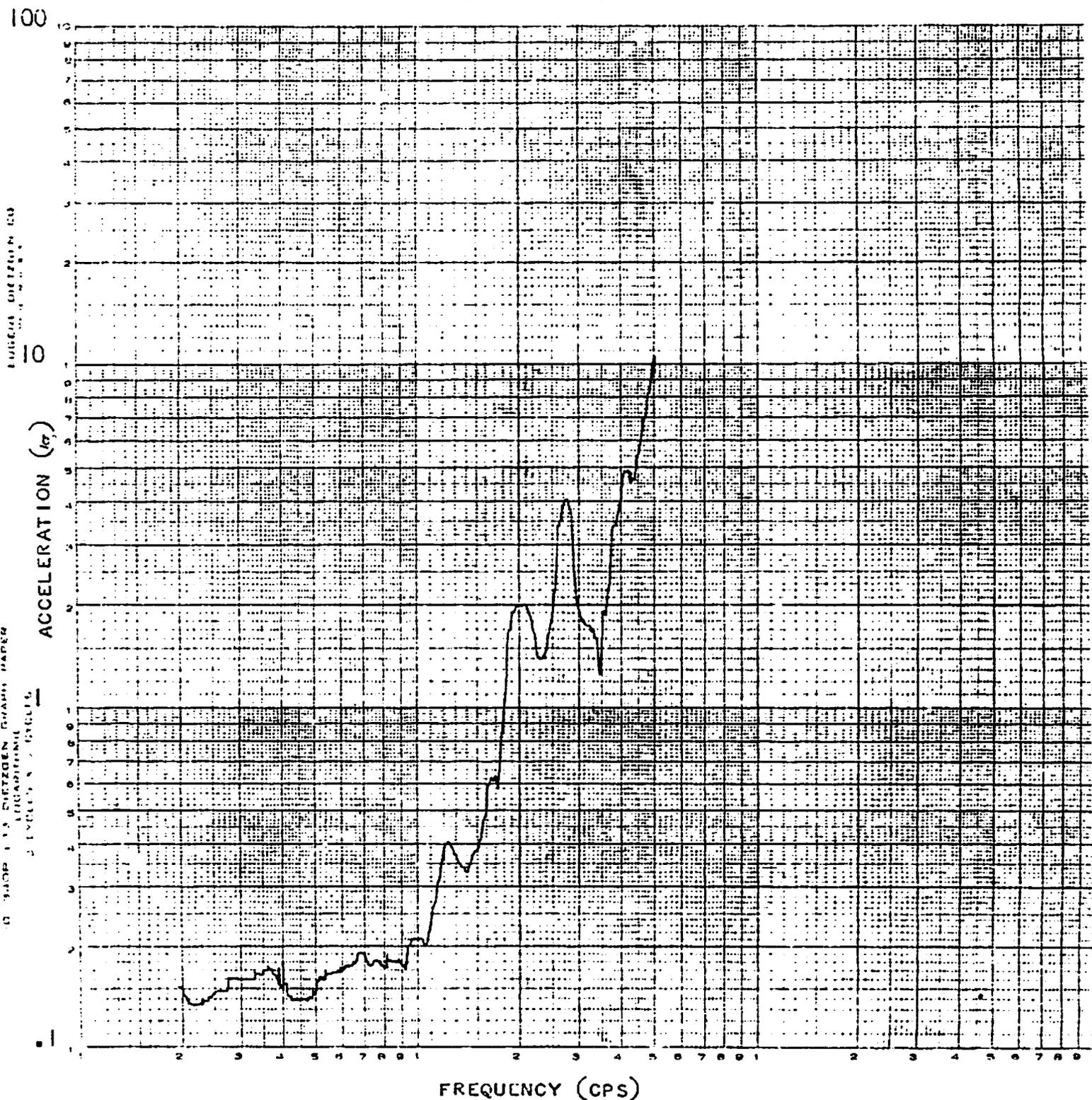


FIG. 16 - FILTERED RESPONSE VS. FREQUENCY PLOT OF VERTICAL ACCELEROMETER MOUNTED ON THE BASE OF THE FIXTURE - LONGITUDINAL ORIENTATION - VIBRATION TEST OF THE XW-53 TELEMETRY PACKAGE.

UNCLASSIFIED

~~CONFIDENTIAL~~

PROJCT NO. T-18749

~~CONFIDENTIAL~~

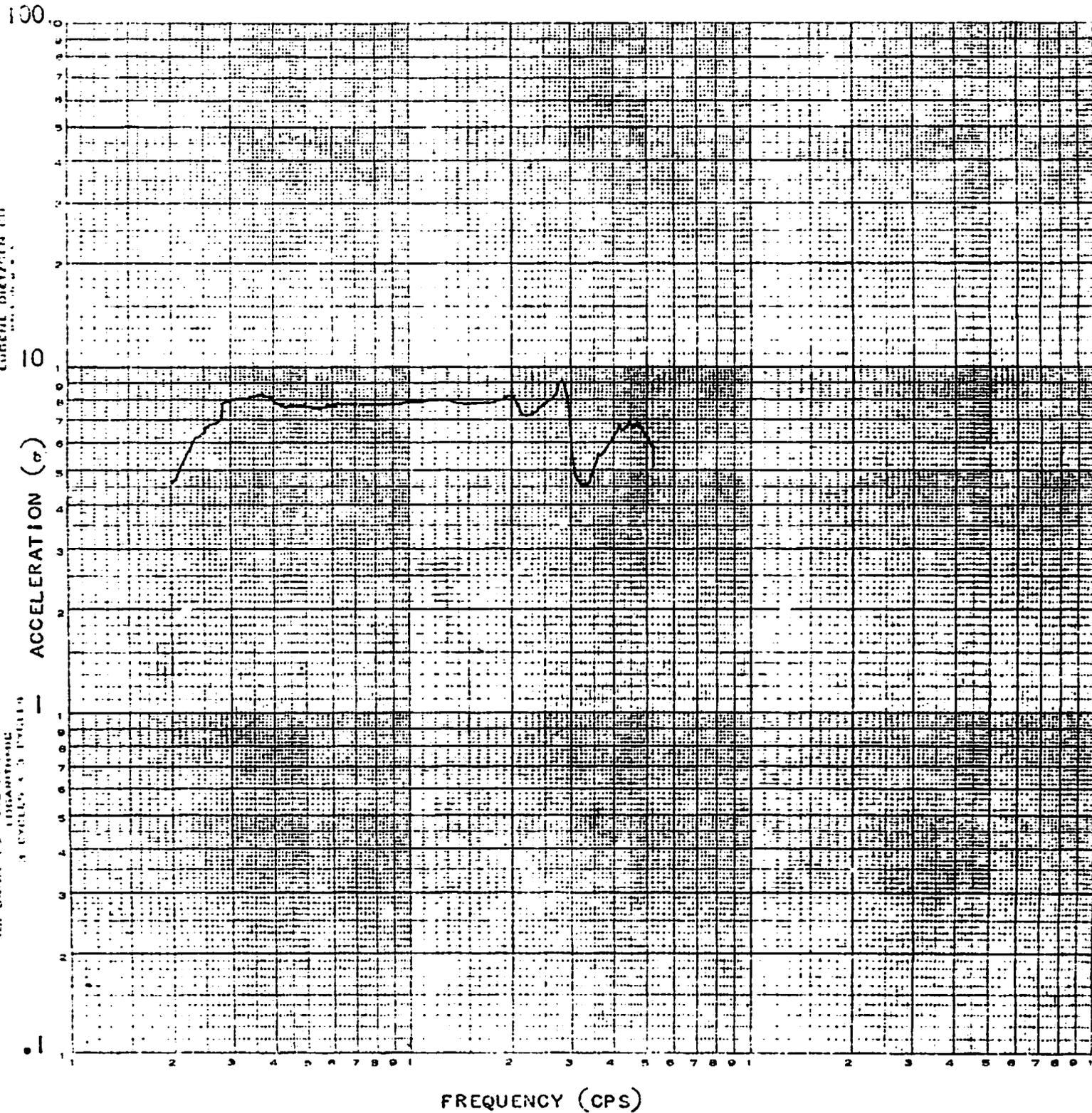
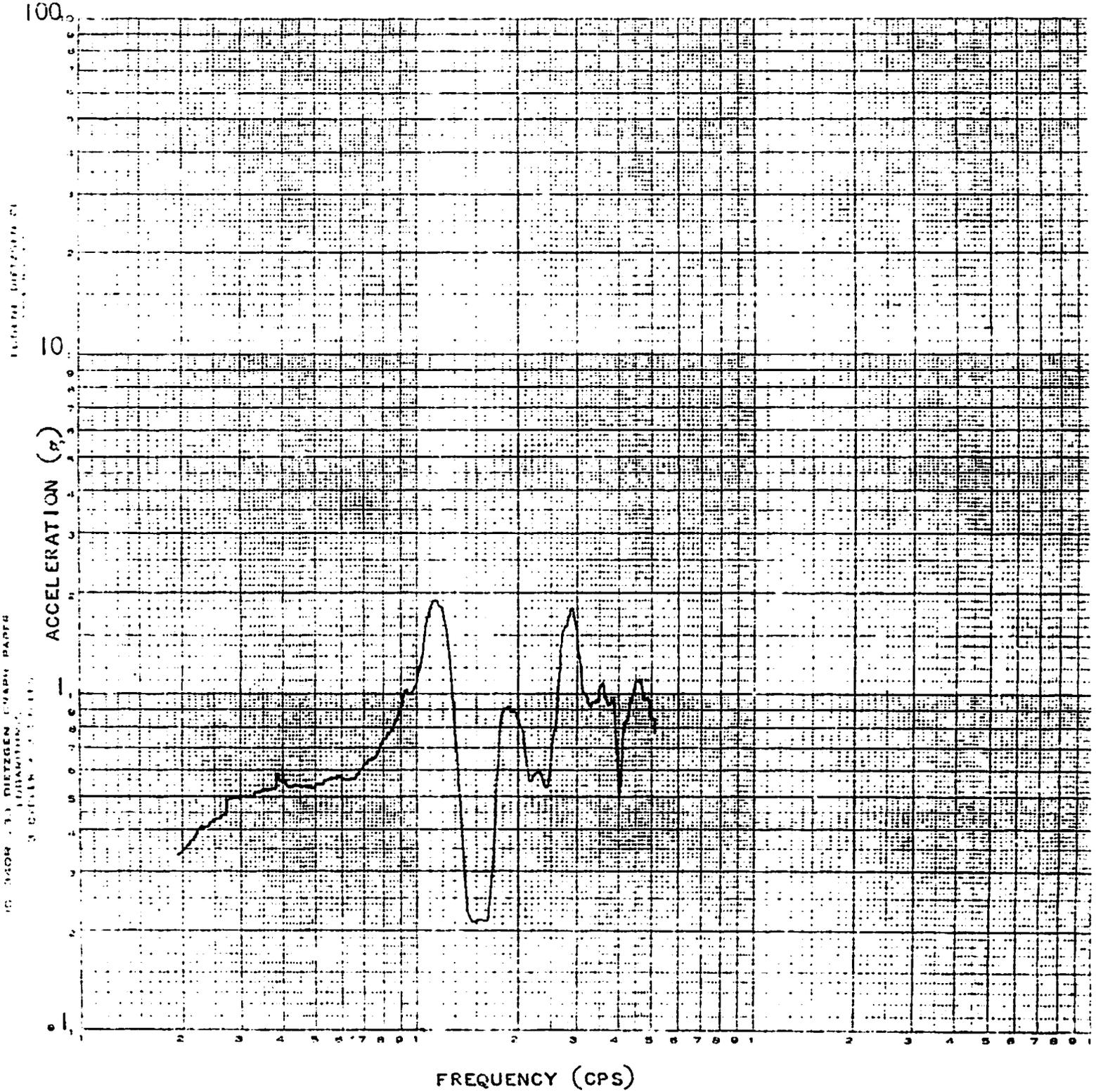


FIG. 17 - FILTERED RESPONSE VS. FREQUENCY PLOT OF LONGITUDINAL ACCELEROMETER ON THE BASE OF THE FIXTURE - LONGITUDINAL ORIENTATION - VIBRATION TEST OF THE XW-53 TELEMETRY PACKAGE.

~~CONFIDENTIAL~~

~~CONFIDENTIAL~~



10-340R-33 RIETZEN GRAPH PAPER
100000000
3000000000

FIG. 13 - FILTERED RESPONSE VS. FREQUENCY PLOT OF VERTICAL ACCELEROMETER MOUNTED ON THE TOP OF THE FIXTURE - LONGITUDINAL ORIENTATION - VIBRATION TEST OF THE XV-53 TELEMETRY PACKAGE.

PROJECT NO. T-18749

~~CONFIDENTIAL~~

[REDACTED]

UNCLASSIFIED

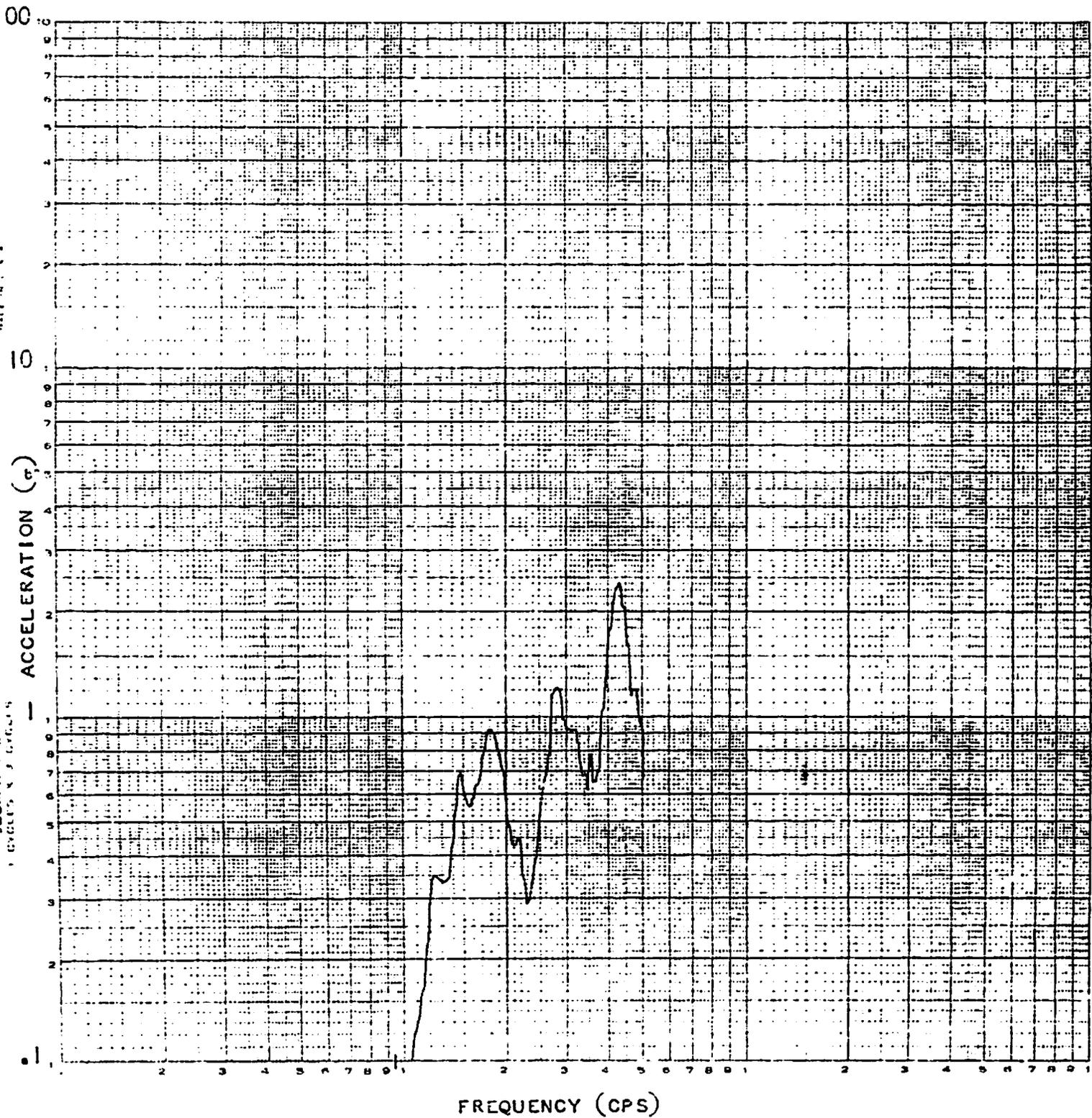


FIG. 19 - FILTERED RESPONSE VS. FREQUENCY PLOT OF LATERAL ACCELEROMETER MOUNTED ON THE TOP OF THE FIXTURE - LONGITUDINAL ORIENTATION - VIBRATION TEST OF THE XV-55 TELEMETRY PACKAGE.

PROJECT NO. T-18749

[REDACTED]

UNCLASSIFIED

~~CONFIDENTIAL~~

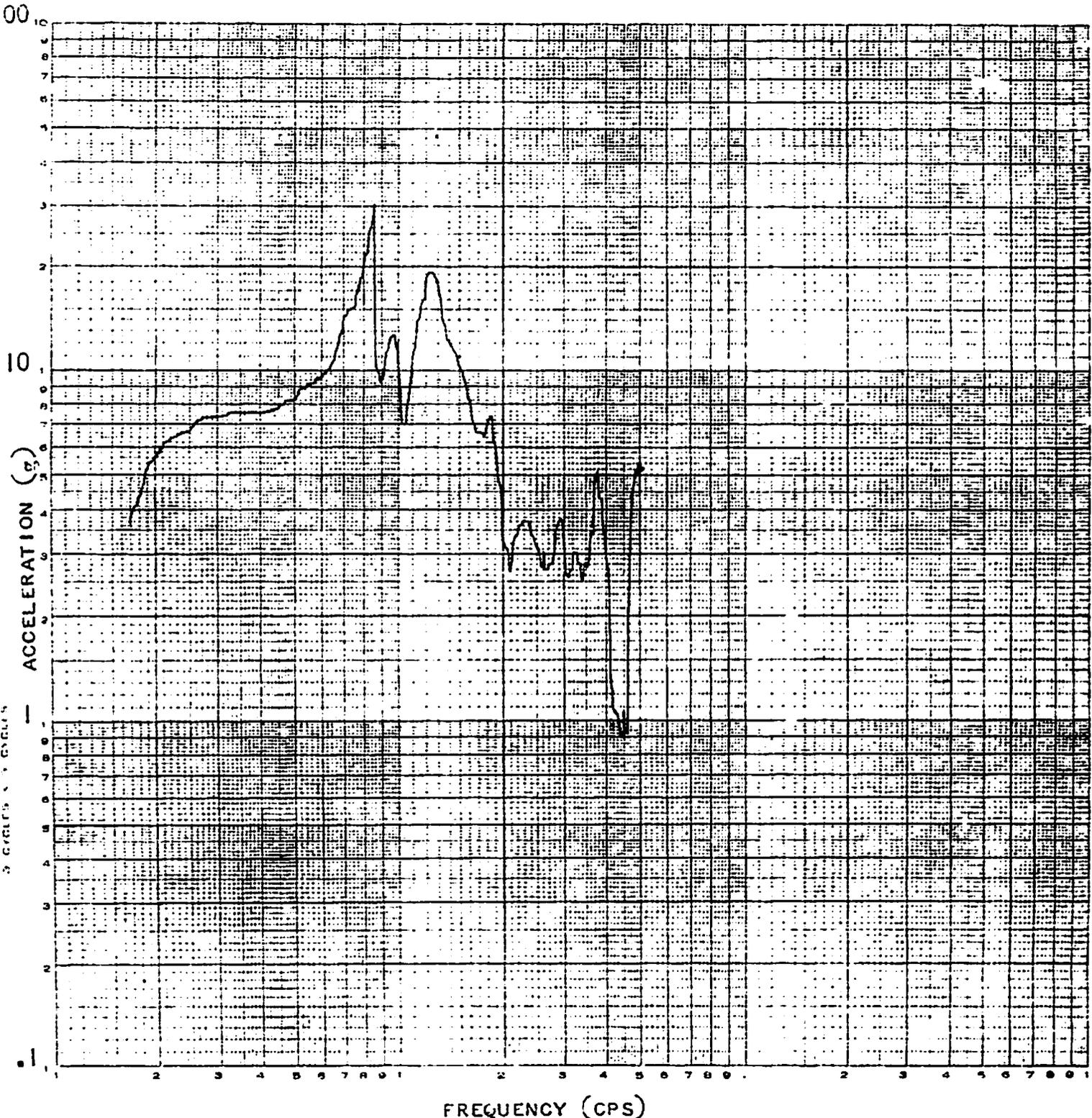


FIG. 20 - FILTERED RESPONSE VS. FREQUENCY PLOT OF ACCELEROMETER ON THE RECORDER BULKHEAD, 30° OFF VERTICAL - VERTICAL ORIENTATION - VIBRATION TEST OF THE XW-53 TELMETRY PACKAGE.

PROJECT NO. T-18749

~~CONFIDENTIAL~~

[REDACTED]

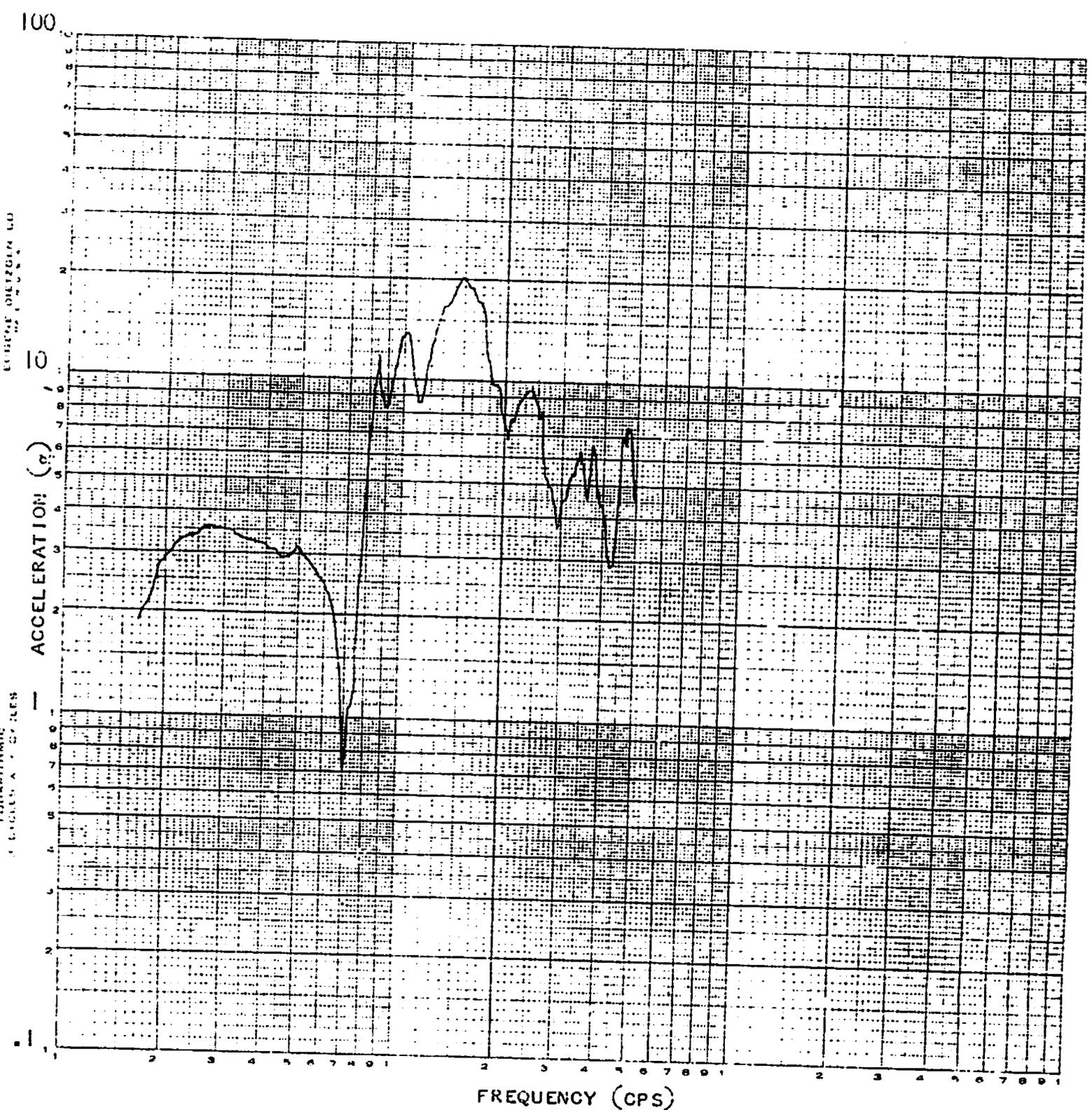


FIG. 21 - FILTERED RESPONSE VS. FREQUENCY PLOT OF ACCELEROMETER ON THE RECORDER BULKHEAD, 60° OFF VERTICAL - VERTICAL ORIENTATION - VIBRATION TEST OF THE XV-53 TELEMETRY PACKAGE.

PROJECT NO. T-18749

[REDACTED]

~~CONFIDENTIAL~~

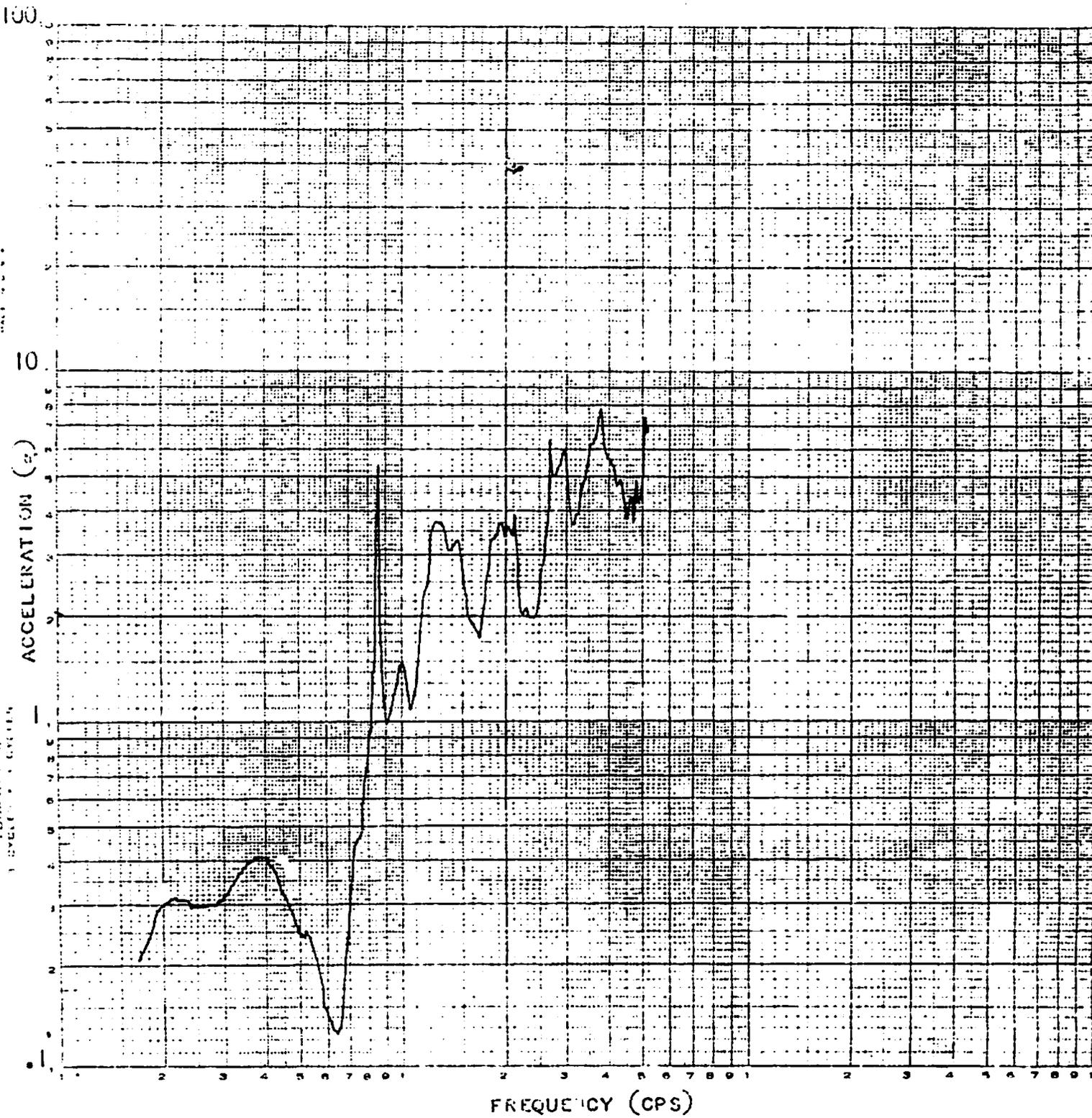


FIG. 22 - FILTERED RESPONSE VS. FREQUENCY PLOT OF LONGITUDINAL ACCELEROMETER ON THE RECORDER BULKHEAD - VERTICAL ORIENTATION - VIBRATION TEST OF THE XW-53 TELEMETRY PACKAGE.

PROJECT NO. T-18749

~~CONFIDENTIAL~~

~~CONFIDENTIAL~~

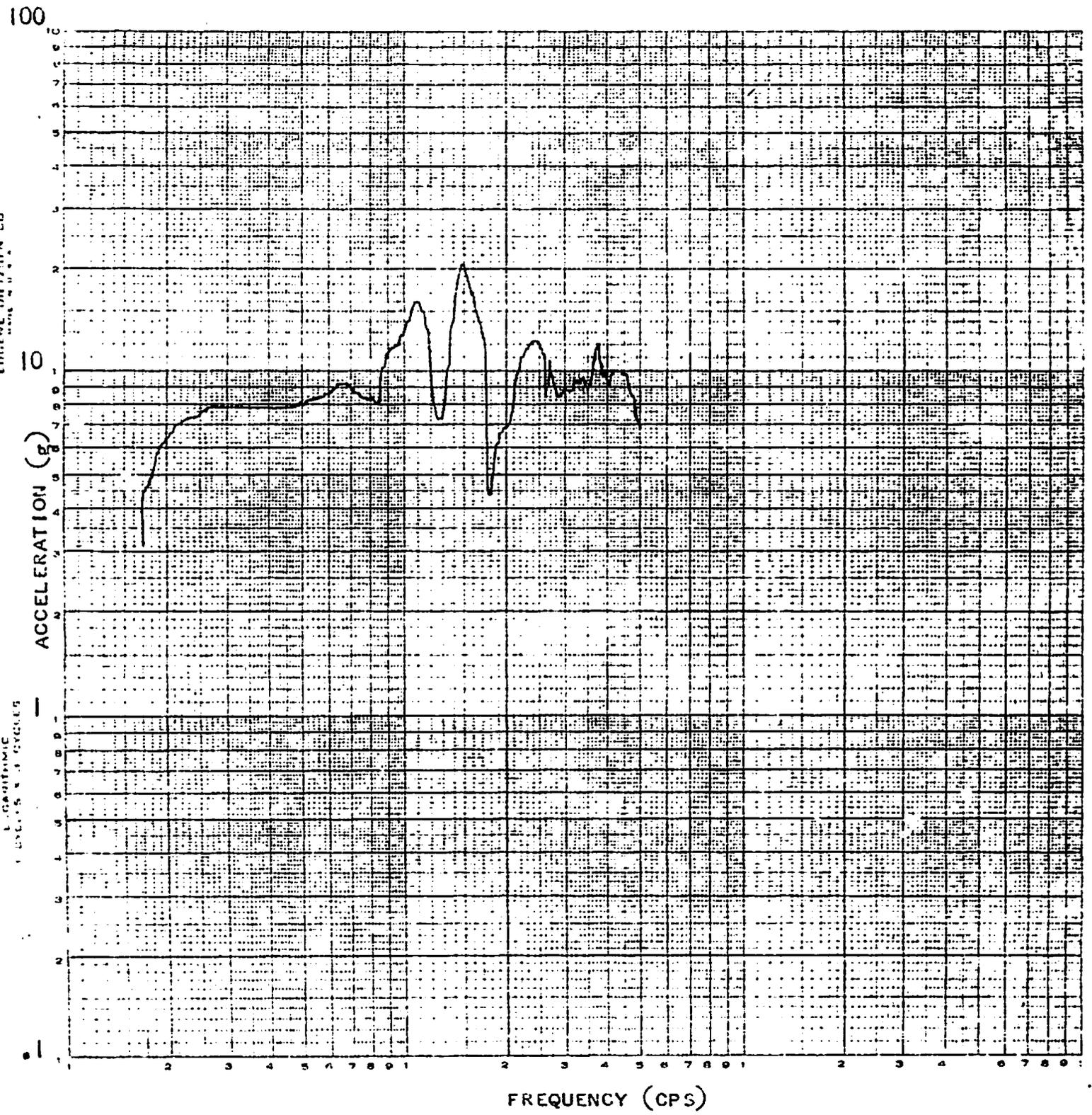


FIG. 23 - FILTERED RESPONSE VS. FREQUENCY PLOT OF VERTICAL ACCELEROMETER ON THE C.G. BULKHEAD - VERTICAL ORIENTATION - VIBRATION TEST OF THE XW-53 TELEMETRY PACKAGE.

PROJECT NO. T-18749

~~CONFIDENTIAL~~

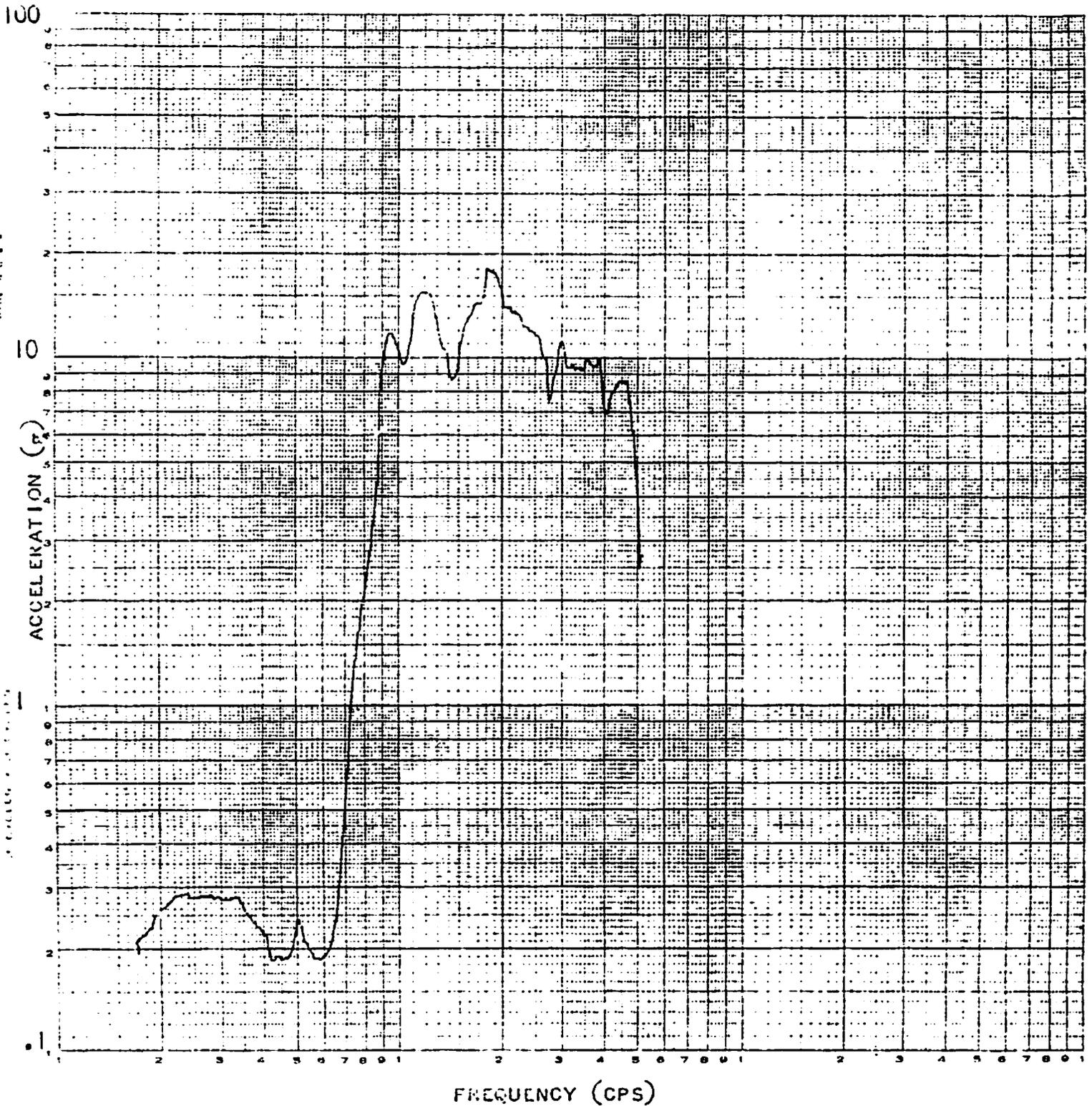


FIG. 24 FILTERED RESPONSE VS. FREQUENCY PLOT OF LATERAL ACCELERATION ON THE C.G. BULKHEAD - VERTICAL ORIENTATION - VIBRATION TEST OF THE XW-53 TELEMETRY PACKAGE.

PROJECT NO. T-1 3749

~~CONFIDENTIAL~~
UNCLASSIFIED

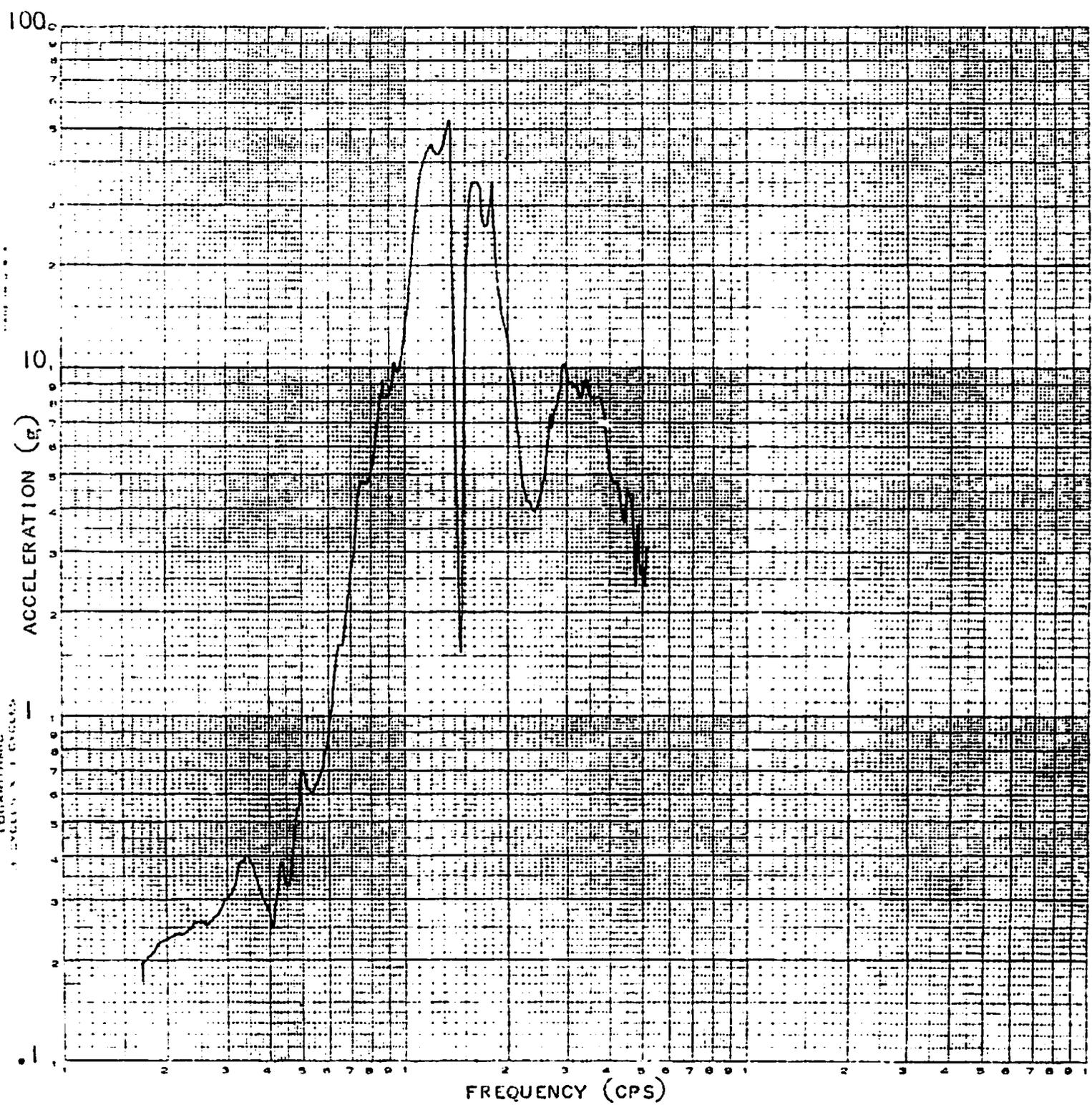


FIG. 25 FILTERED RESPONSE VS. FREQUENCY PLOT OF THE LONGITUDINAL ACCELEROMETER ON THE C.G. BULKHEAD - VERTICAL ORIENTATION - VIBRATION TEST OF THE XW-53 TELEMETRY PACKAGE. PROJECT NO. T-13749

~~CONFIDENTIAL~~
UNCLASSIFIED

UNCLASSIFIED

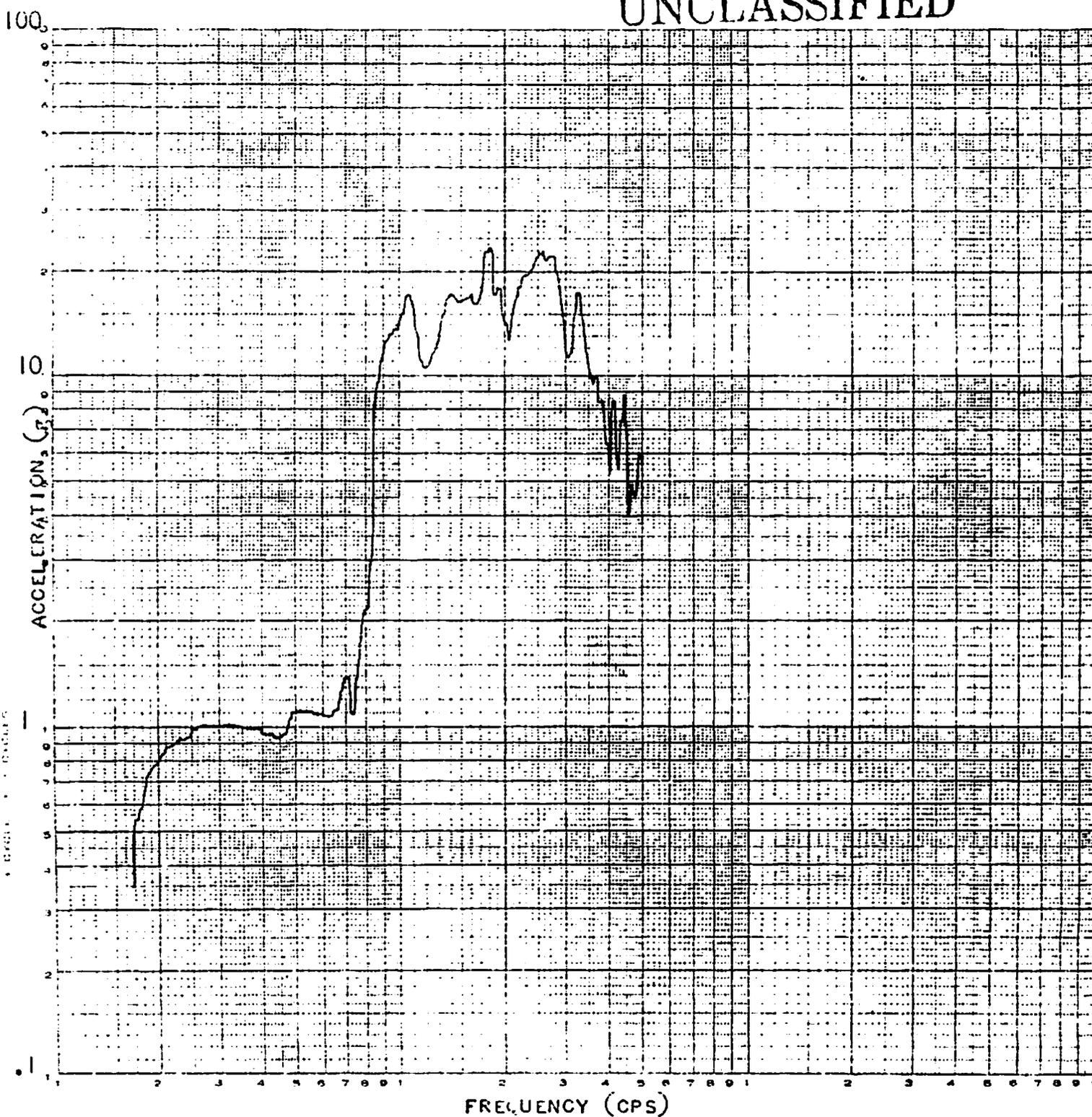


FIG. 26 FILTERED RESPONSE VS. FREQUENCY PLOT OF LATERAL ACCELEROMETER ON LONGITUDINAL BULKHEAD AT C.G. - VERTICAL ORIENTATION - VIBRATION TEST OF THE XA-53 TELMETRY PACKAGE.

PROJECT NO. T-13749

UNCLASSIFIED

UNCLASSIFIED

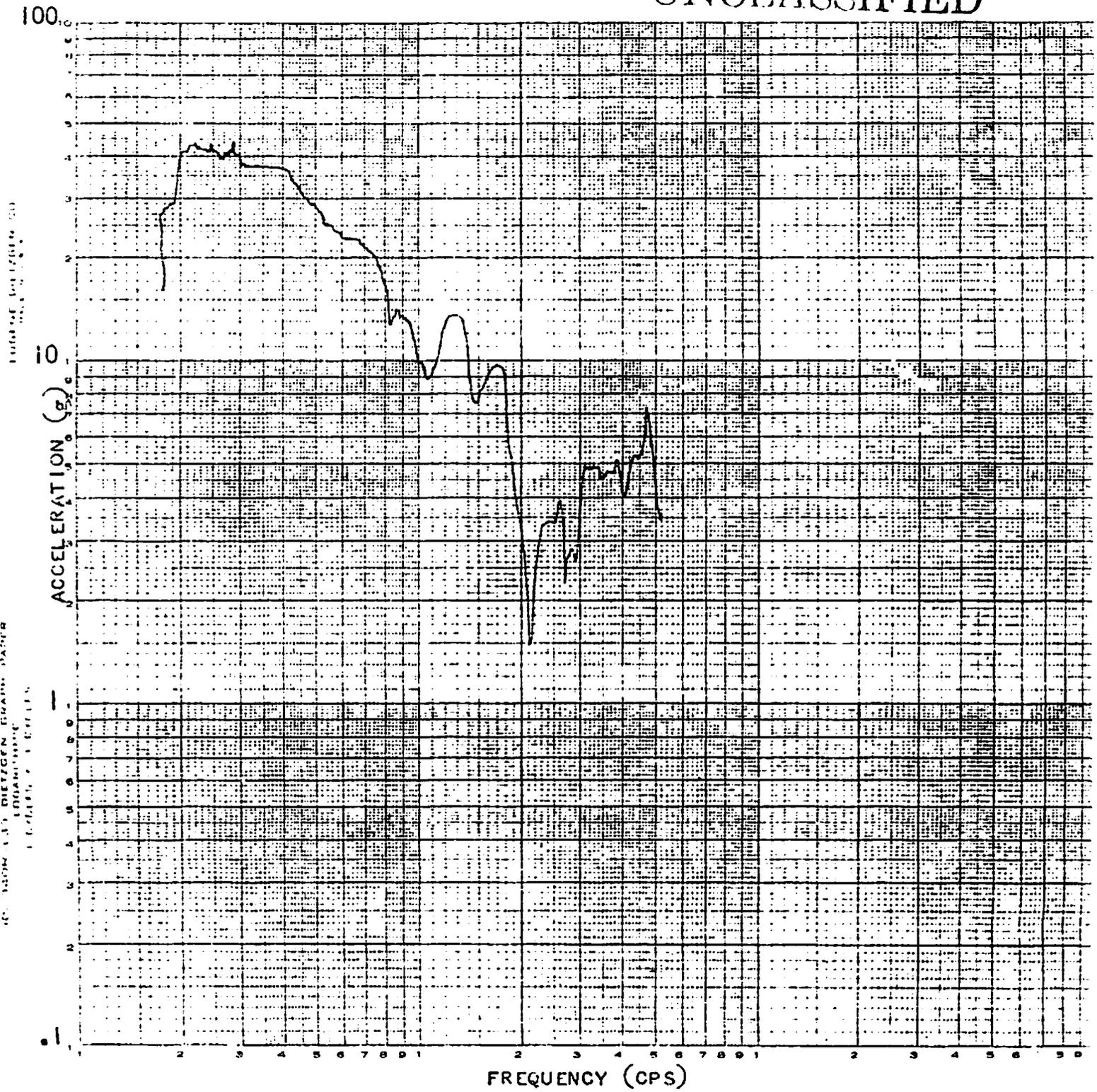


FIG. 27 FILTERED RESPONSE VS. FREQUENCY PLOT OF ACCELEROMETER ON LONGITUDINAL BULKHEAD, 30° OFF VERTICAL - VERTICAL ORIENTATION - VIBRATION TEST OF THE Xiv-53 TELEMETRY PACKAGE. PROJECT NO. T-13749

UNCLASSIFIED

[REDACTED]

UNCLASSIFIED

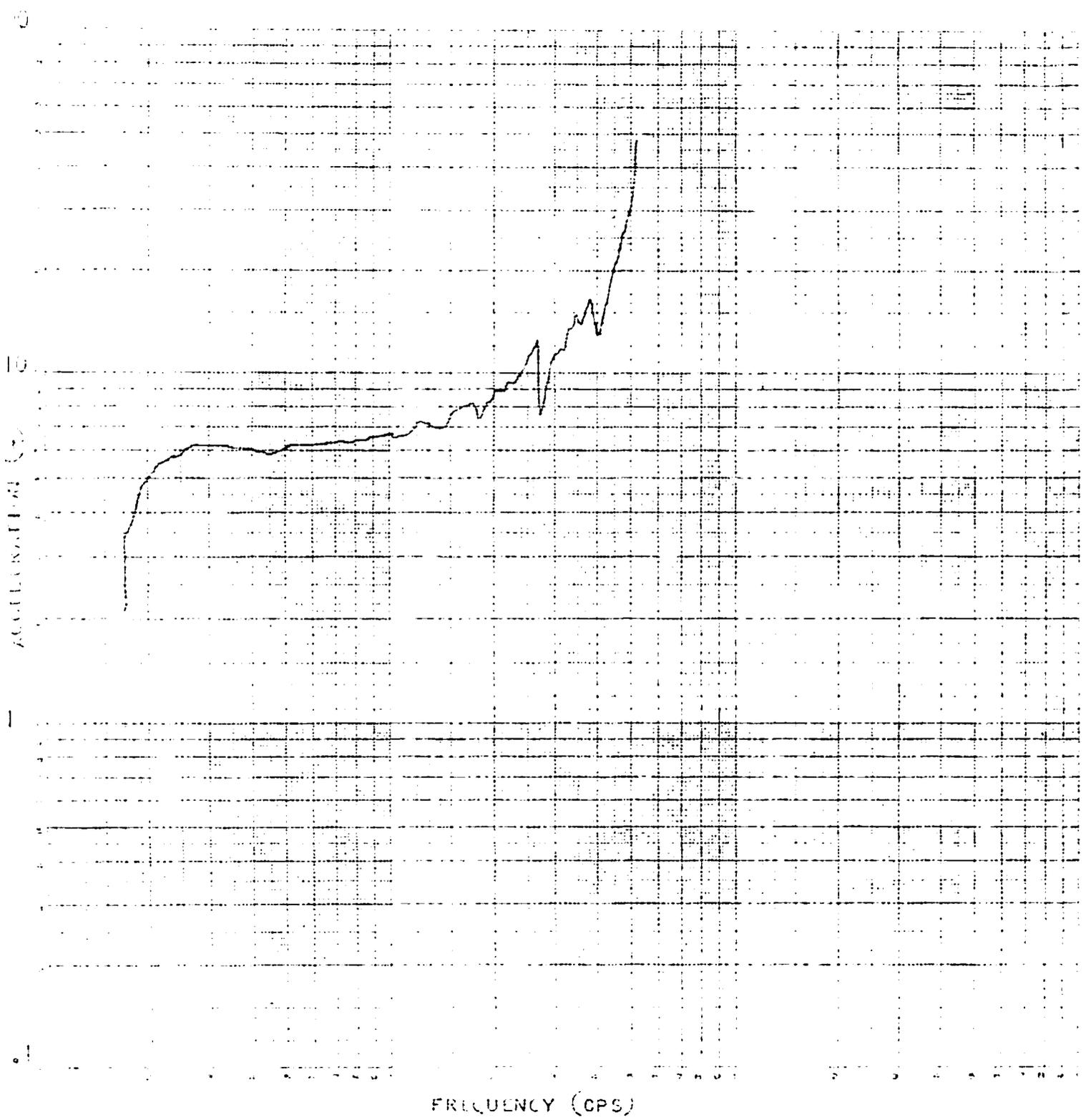


FIG. 28. EFFECT OF RESPONSE VS. FREQUENCY PLOT OF VERTICAL ACCELERATION ON THE FIXTURE AT THE C.G. - VERTICAL ORIENTATION - VIBRATION TEST OF THE X-53 TELEMETRY PACKAGE.

PROJECT NO. T-11749

[REDACTED]

UNCLASSIFIED

UNCLASSIFIED

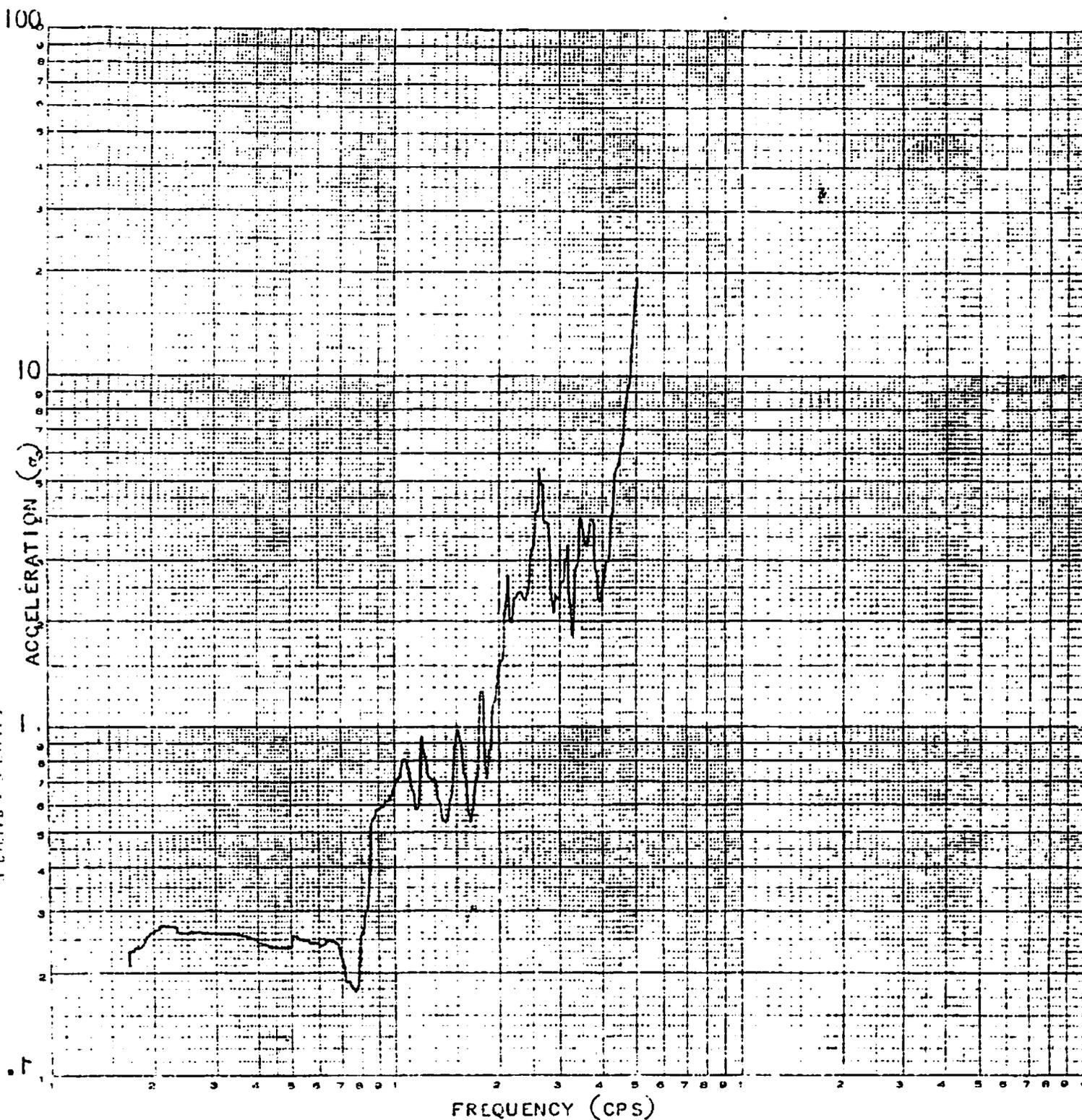


FIG. 29 FILTERED RESPONSE VS. FREQUENCY PLOT OF LATERAL ACCELEROMETER ON THE FIXTURE AT THE C.G. - VERTICAL ORIENTATION - VIBRATION TEST OF THE X7-53 TELLEMETRY PACKAGE.

PROJECT NO. T-18749

UNCLASSIFIED

UNCLASSIFIED

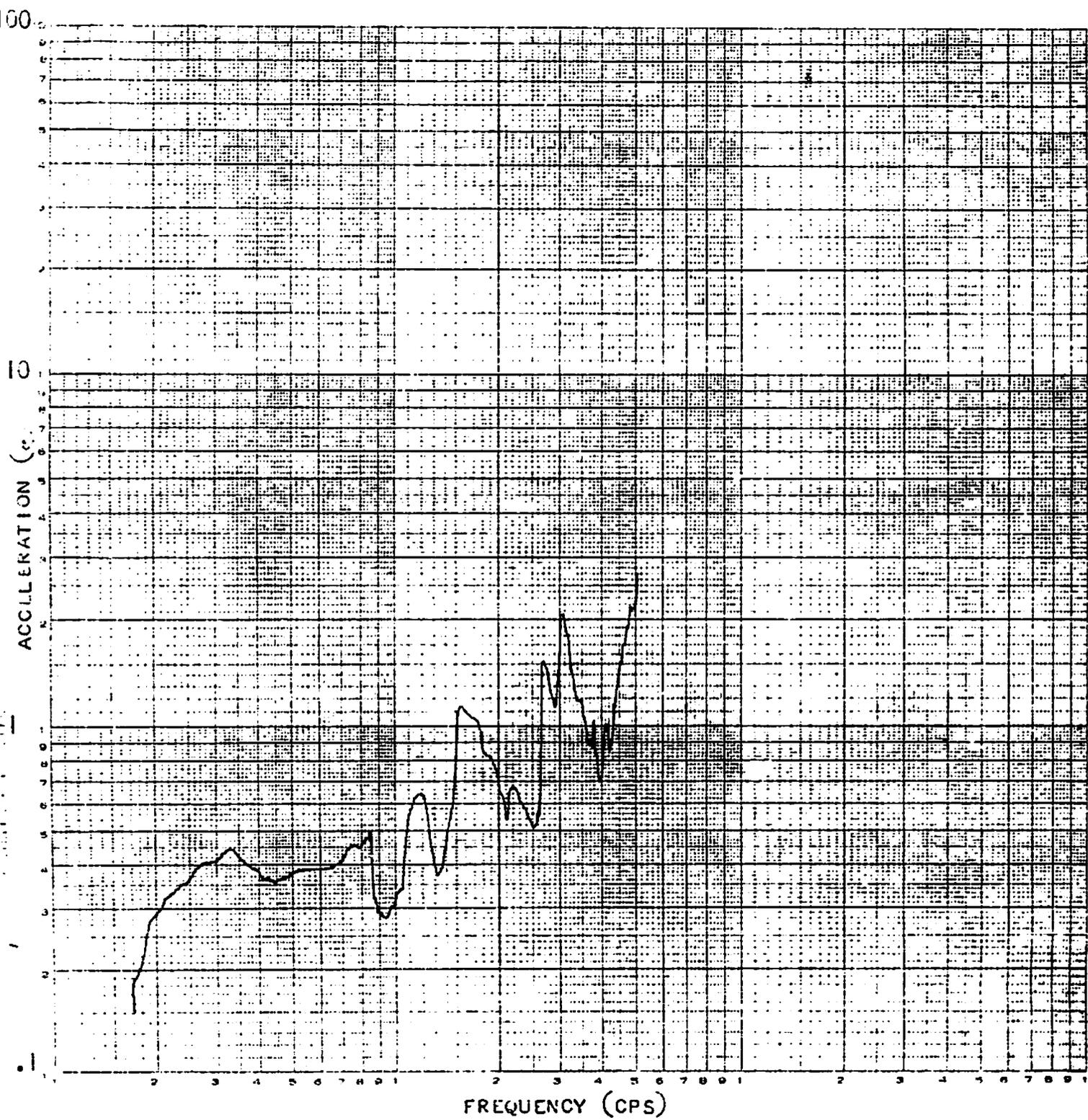


FIG. 30 FILTERED RESPONSE VS. FREQUENCY PLOT OF LATERAL ACCELEROMETER MOUNTED ON THE FORWARD END OF THE FIXTURE - VERTICAL ORIENTATION - VIBRATION TEST OF THE XA-53 TELEMETRY PACKAGE.

PROJECT NO. T-18749

UNCLASSIFIED

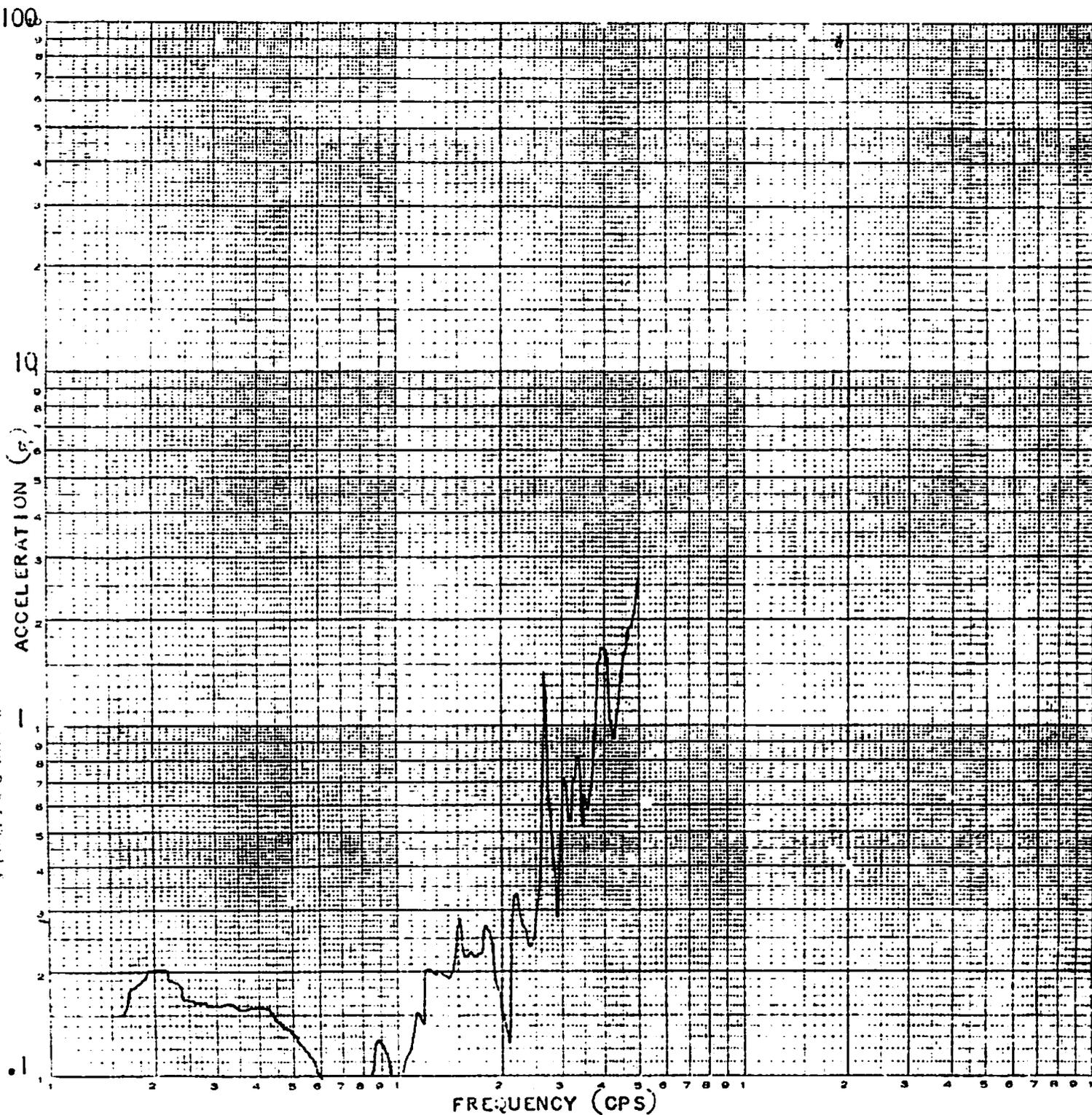


FIG. 31 FILTERED RESPONSE VS. FREQUENCY PLOT OF LONGITUDINAL ACCELEROMETER MOUNTED ON THE FORWARD END OF THE FIXTURE - VERTICAL ORIENTATION - VIBRATION TEST OF THE XW-53 TELEMETRY PACKAGE.

PROJECT NO. T-18749

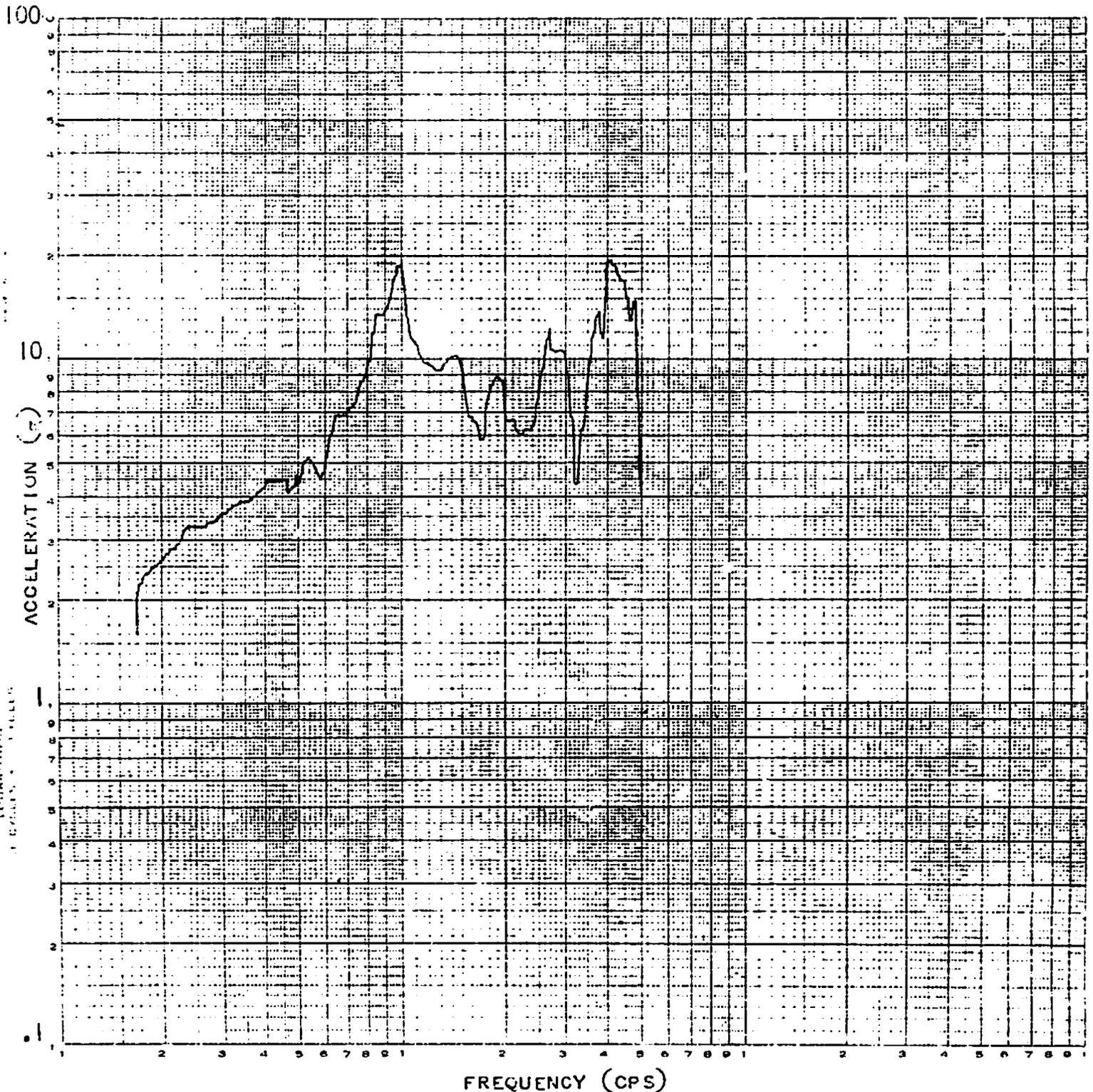
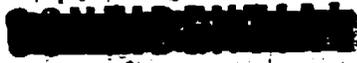


FIG. 32 FILTERED RESPONSE VS. FREQUENCY PLOT OF ACCELEROMETER ON THE RECORD-R BULKHEAD, 30° OFF VERTICAL - LATERAL ORIENTATION - VIBRATION TEST OF THE XW-53 TELEMETRY PACKAGE.

PROJECT NO. T-18749



UNCLASSIFIED

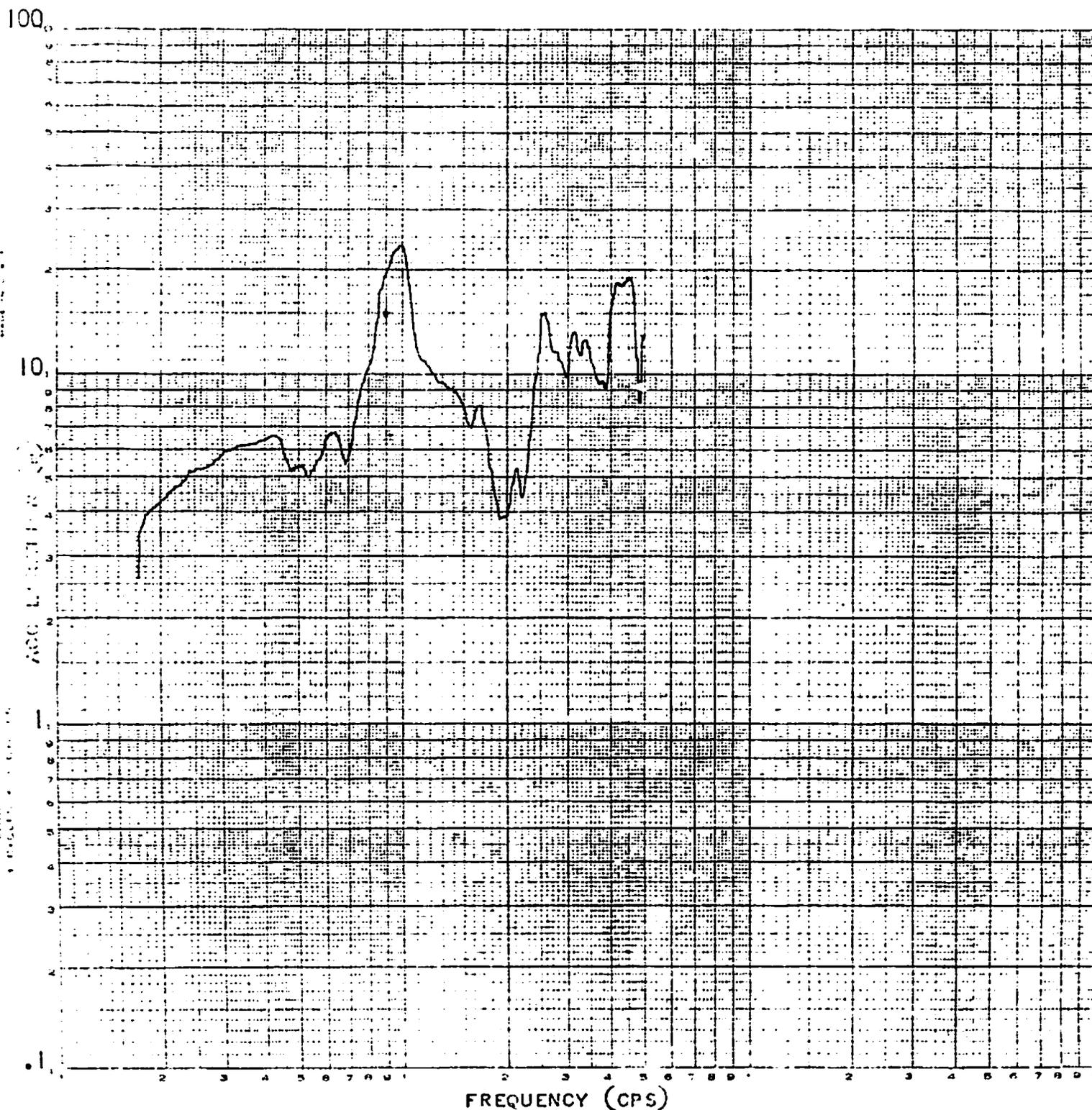


FIG. 33 FILTERED RESPONSE VS. FREQUENCY PLOT OF ACCELEROMETER ON THE RECORDER BULKHEAD, 60° OFF VERTICAL - LATERAL ORIENTATION - VIBRATION TEST OF THE XE-53 TELEMETRY WAGON.

PROJECT NO. 7-10749

UNCLASSIFIED

UNCLASSIFIED

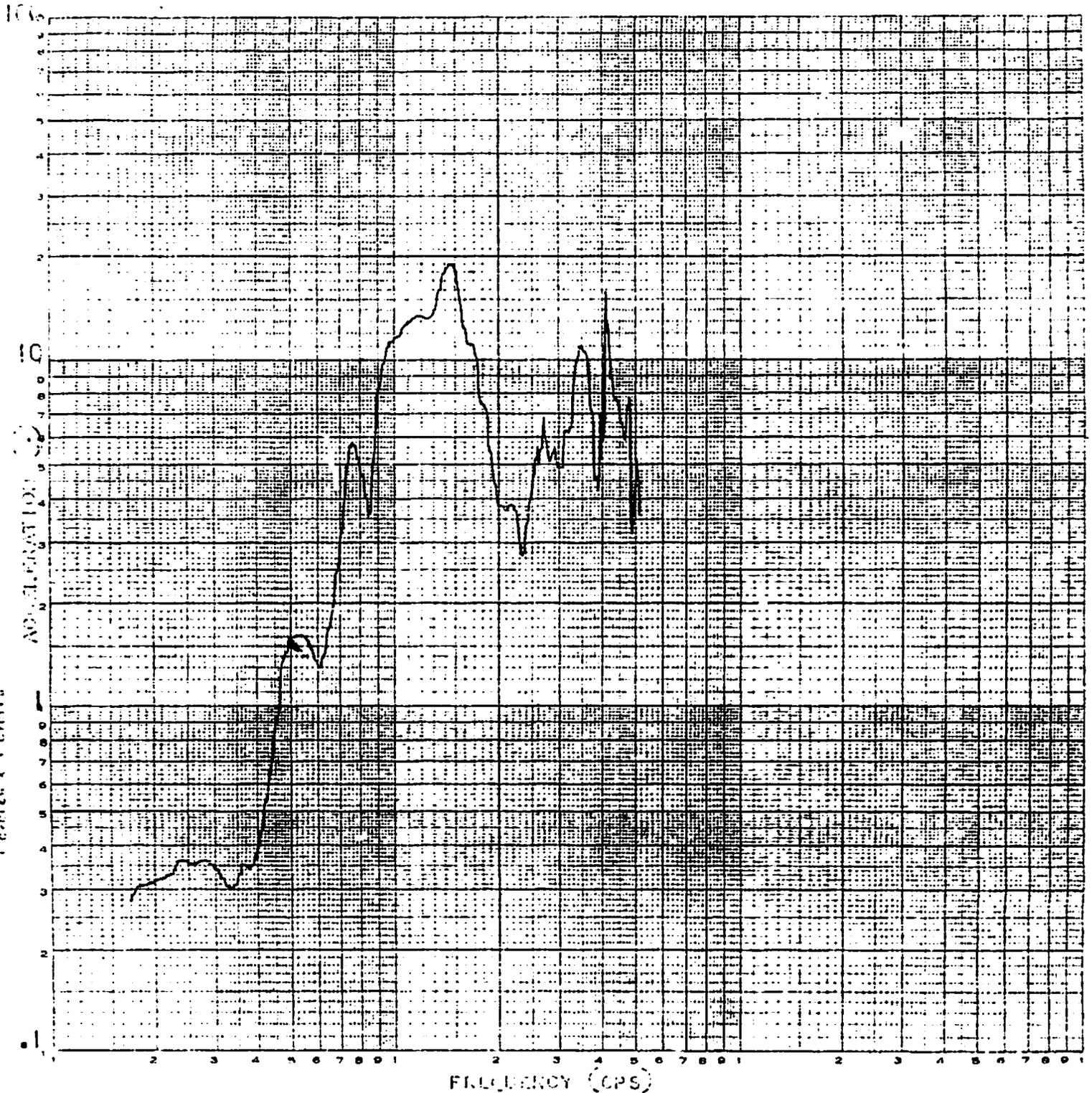
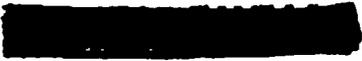
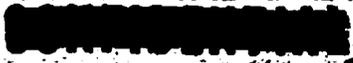


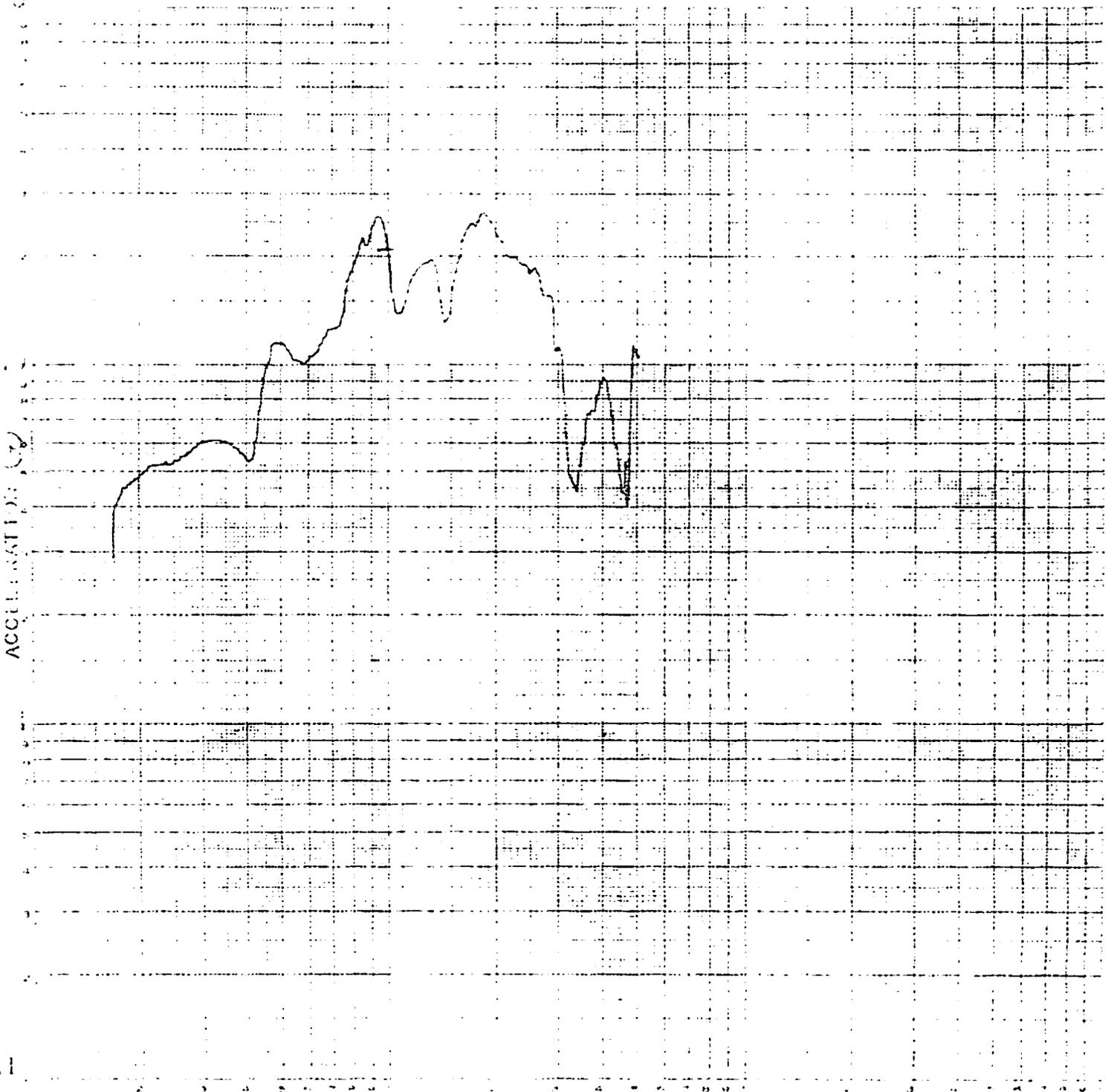
FIG. 35 FILTERED RESPONSE VS. FREQUENCY PLOT OF VERTICAL ACCEL. METER
 AT THE S.N. SURFACE - 1.0. SURFACE CENTER -
 AT SURFACE CENTER OF THE W-55 THERMOPHY. SURFACE CENTER (10. 0-170)



UNCLASSIFIED

[REDACTED]

UNCLASSIFIED



[REDACTED]

UNCLASSIFIED

UNCLASSIFIED

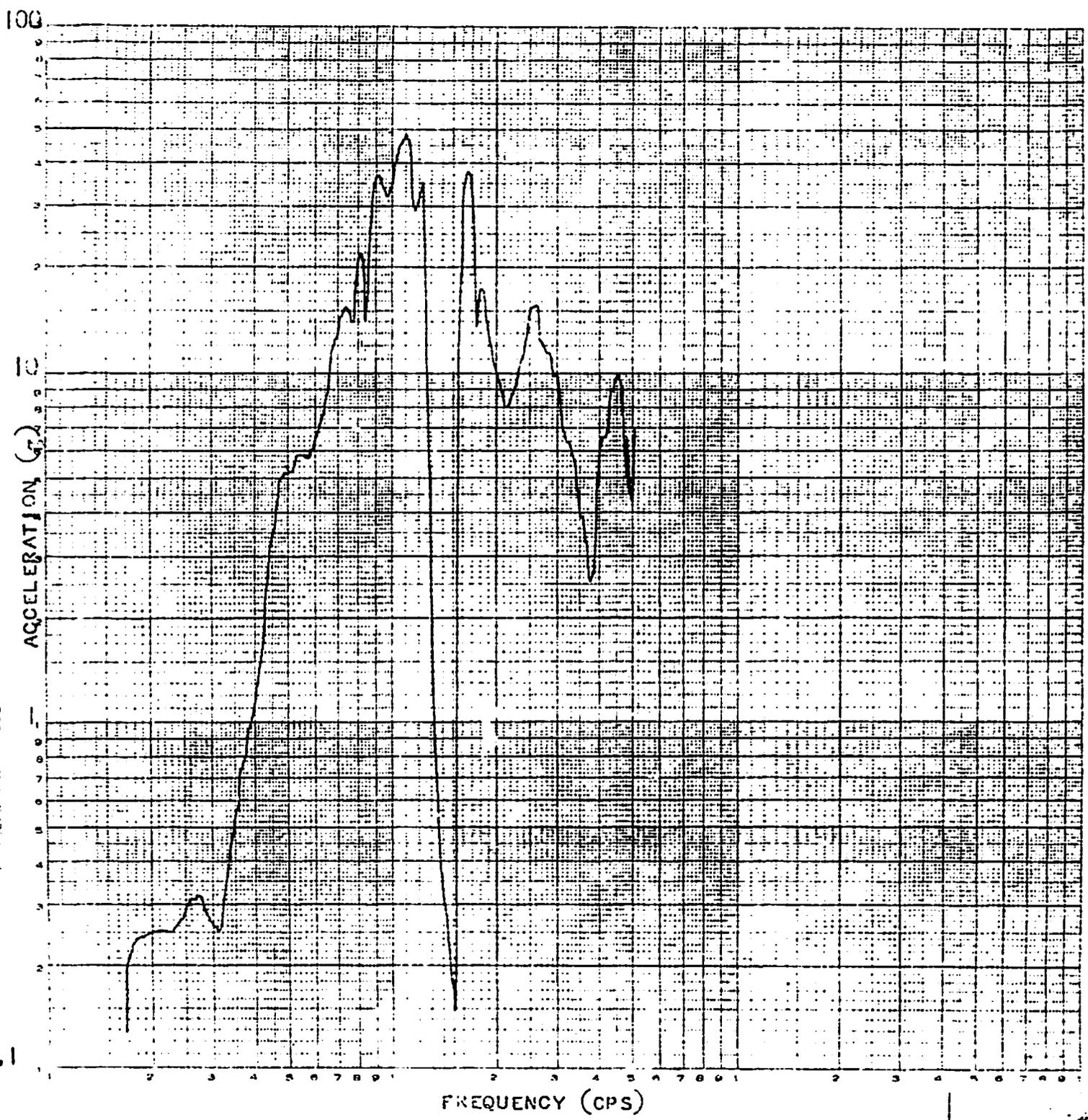


FIG. 37 FILTERED RESPONSE VS. FREQUENCY PLOT OF THE LONGITUDINAL ACCELEROMETER ON THE C.G. BULKHEAD - LATERAL ORIENTATION - VIBRATION TEST OF THE XN-53 TELEMETRY PACKAGE.

PROJECT NO. T-18749

UNCLASSIFIED

UNCLASSIFIED

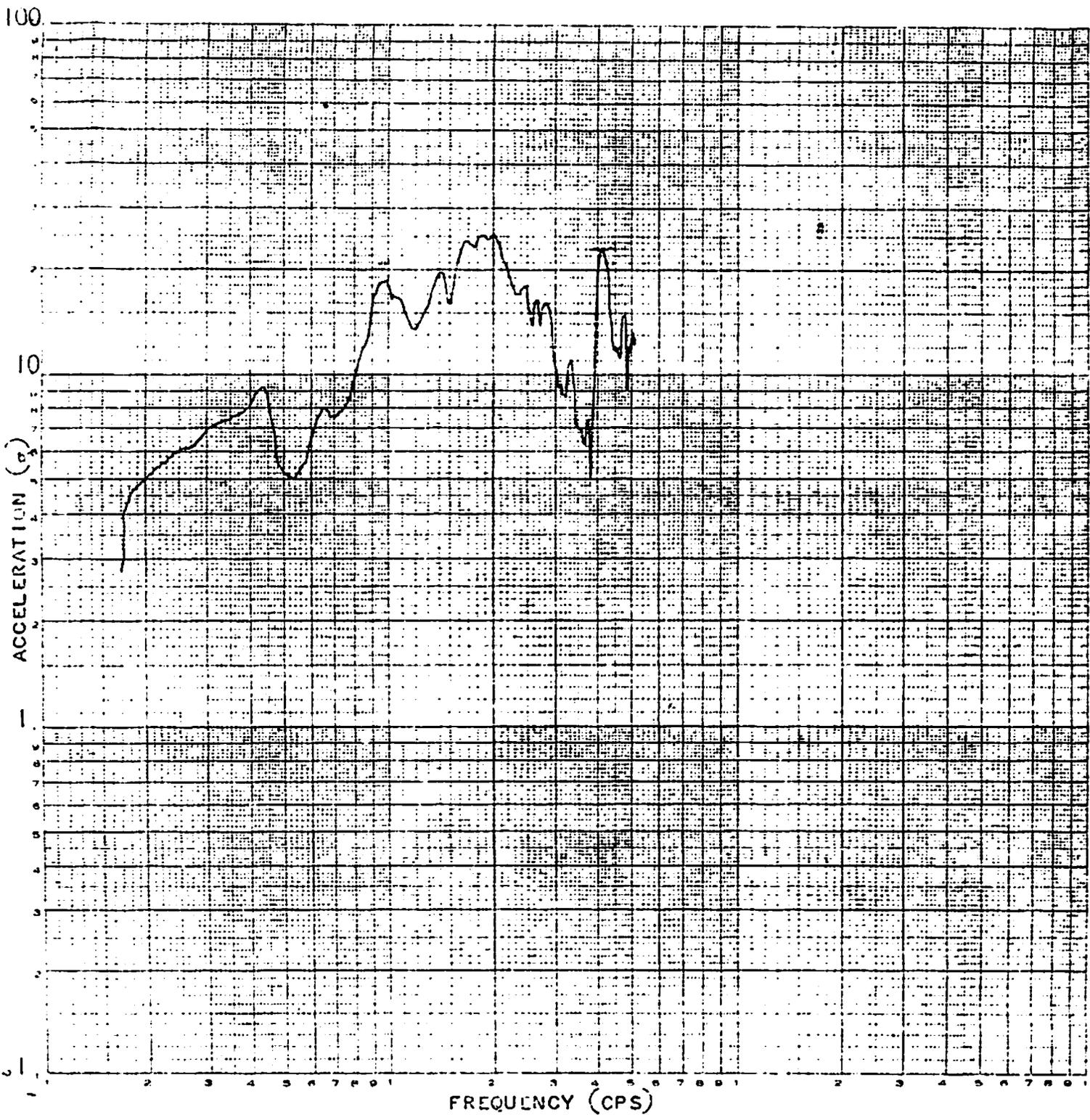


FIG. 38 FILTERED RESPONSE VS. FREQUENCY PLOT OF LATERAL ACCELEROMETER ON LONGITUDINAL BULKHEAD OF C.G. - LATERAL ORIENTATION - VIBRATION TEST OF THE XN-53 TELEMETRY PACKAGE.

PROJECT NO. T-18749

UNCLASSIFIED

~~CONFIDENTIAL~~

UNCLASSIFIED

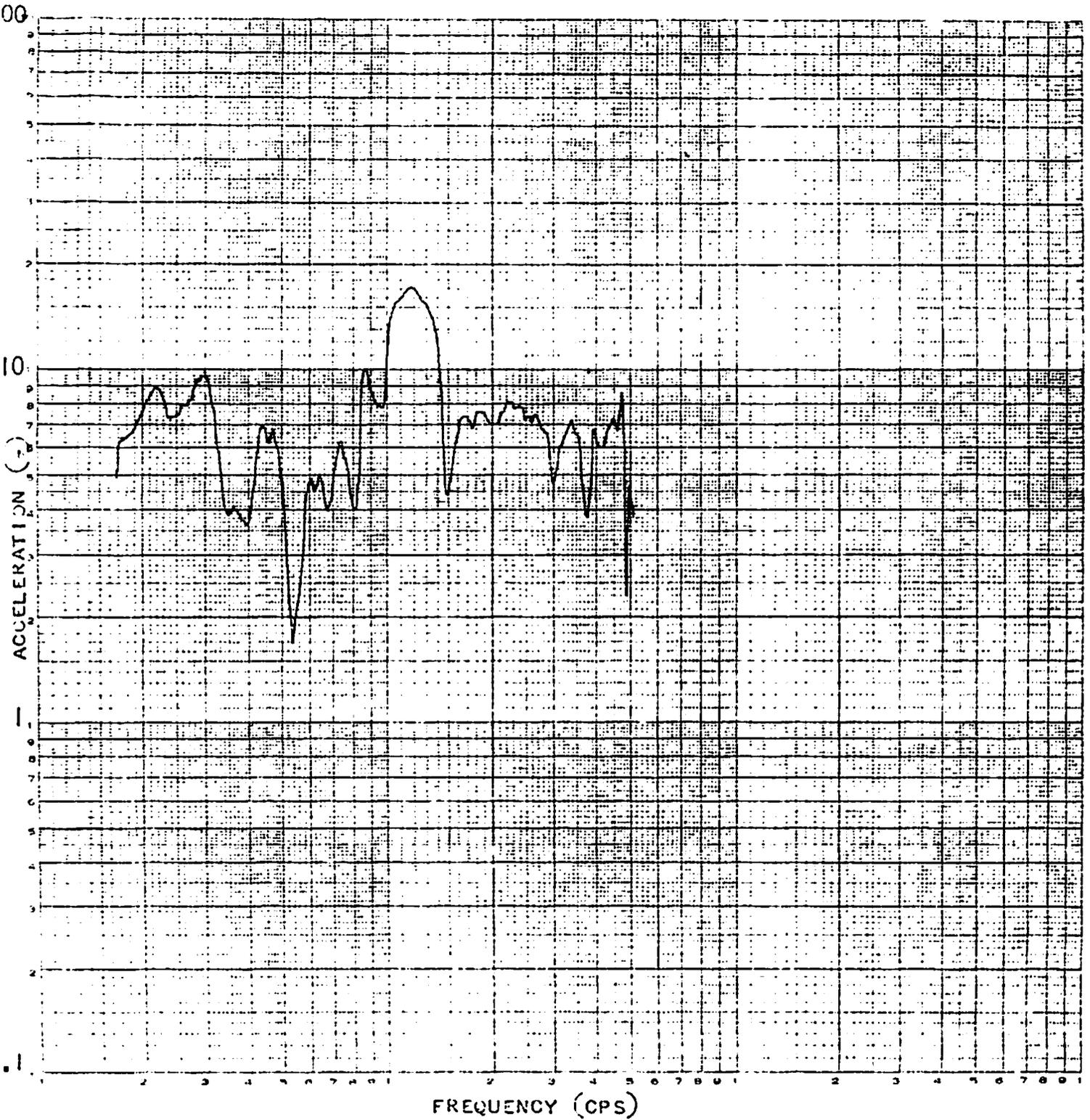


FIG. 39 FILTERED RESPONSE VS. FREQUENCY PLOT OF ACCELEROMETER ON LONGITUDINAL BULKHEAD, 30° OFF VERTICAL - LATERAL ORIENTATION - VIBRATION TEST OF THE XW-53 TELEMETRY PACKAGE. PROJECT NO. T-18749

~~CONFIDENTIAL~~

UNCLASSIFIED

~~CONFIDENTIAL~~

UNCLASSIFIED

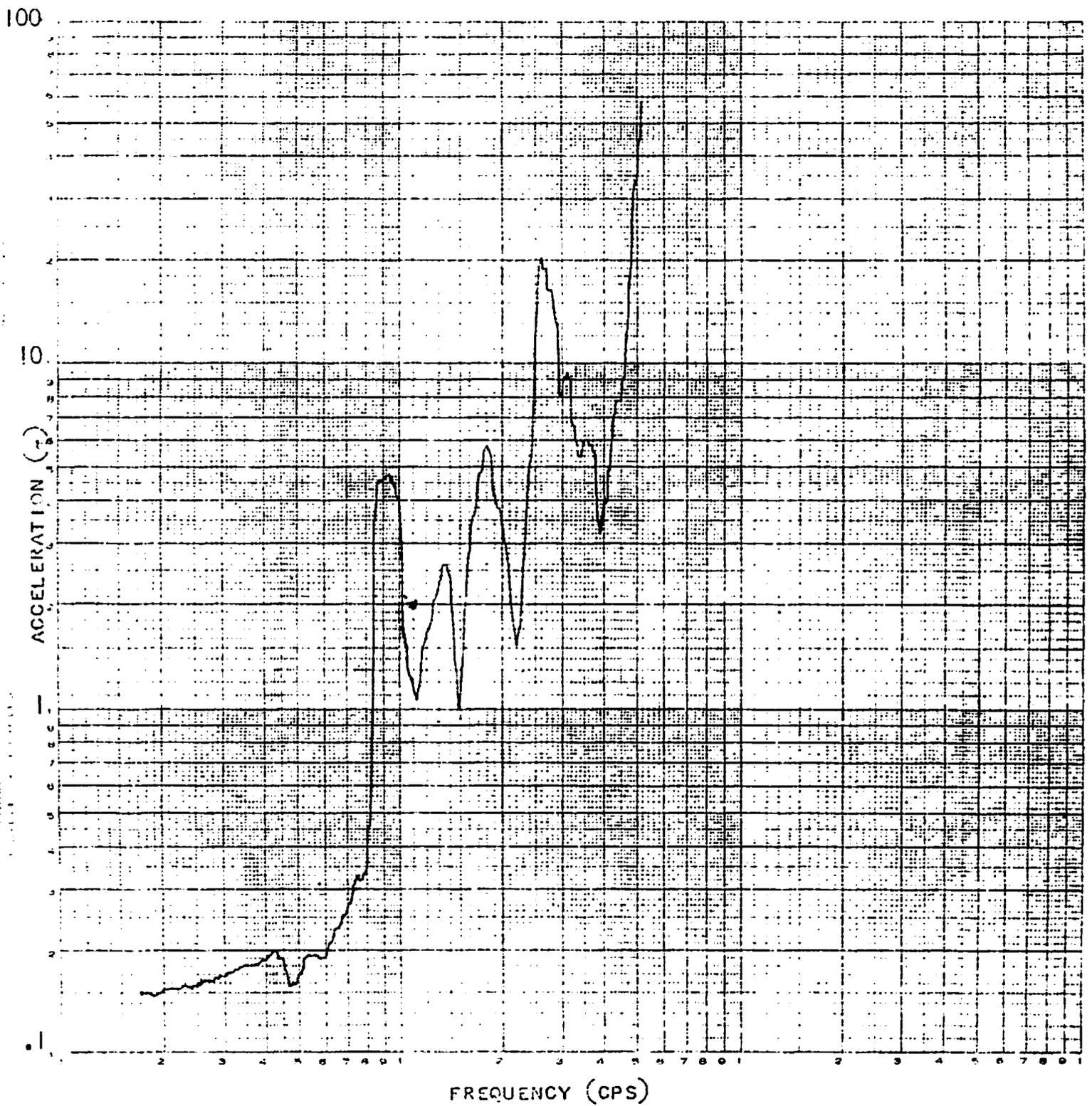


FIG. 40 FILTERED RESPONSE VS. FREQUENCY PLOT OF VERTICAL ACCELEROMETER ON THE FIXTURE AT THE C.G. - LATERAL ORIENTATION - VIBRATION TEST OF THE XW-53 TELEMETRY PACKAGE.

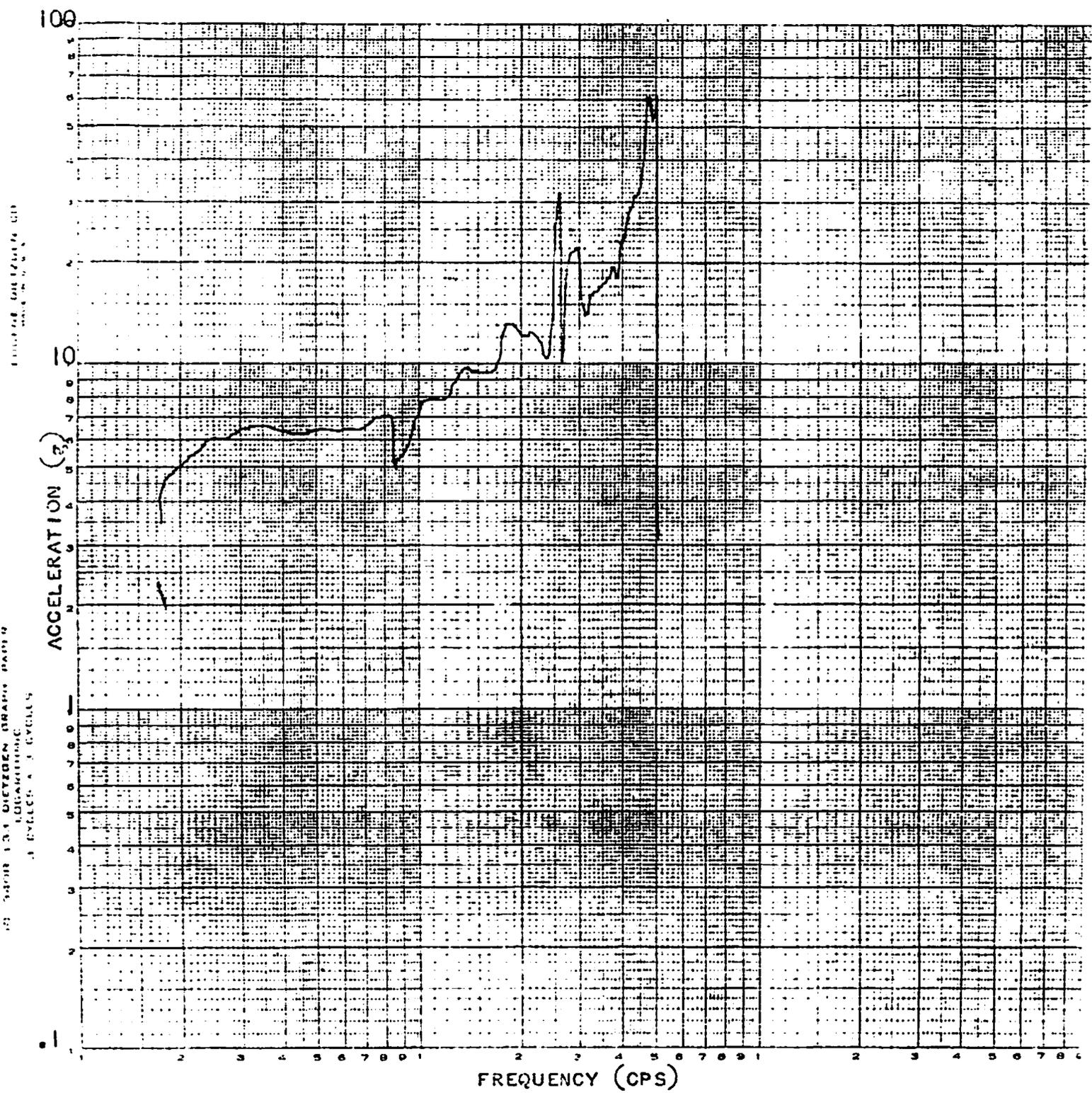
PROJECT NO. T-18749

~~CONFIDENTIAL~~

UNCLASSIFIED

[REDACTED]

UNCLASSIFIED



100-1000 1.5 DIETZEN GRAPH PAPER LOGARITHMIC 1 CYCLES X 3 CYCLES

FIG. 41 FILTERED RESPONSE VS. FREQUENCY PLOT OF LATERAL ACCELEROMETER OF THE FIXTURE AT THE C.G. - LATERAL ORIENTATION - VIBRATION TEST OF THE XN-53 TELEMETRY PACKAGE. PROJECT NO. T-187

[REDACTED]

UNCLASSIFIED

UNCLASSIFIED

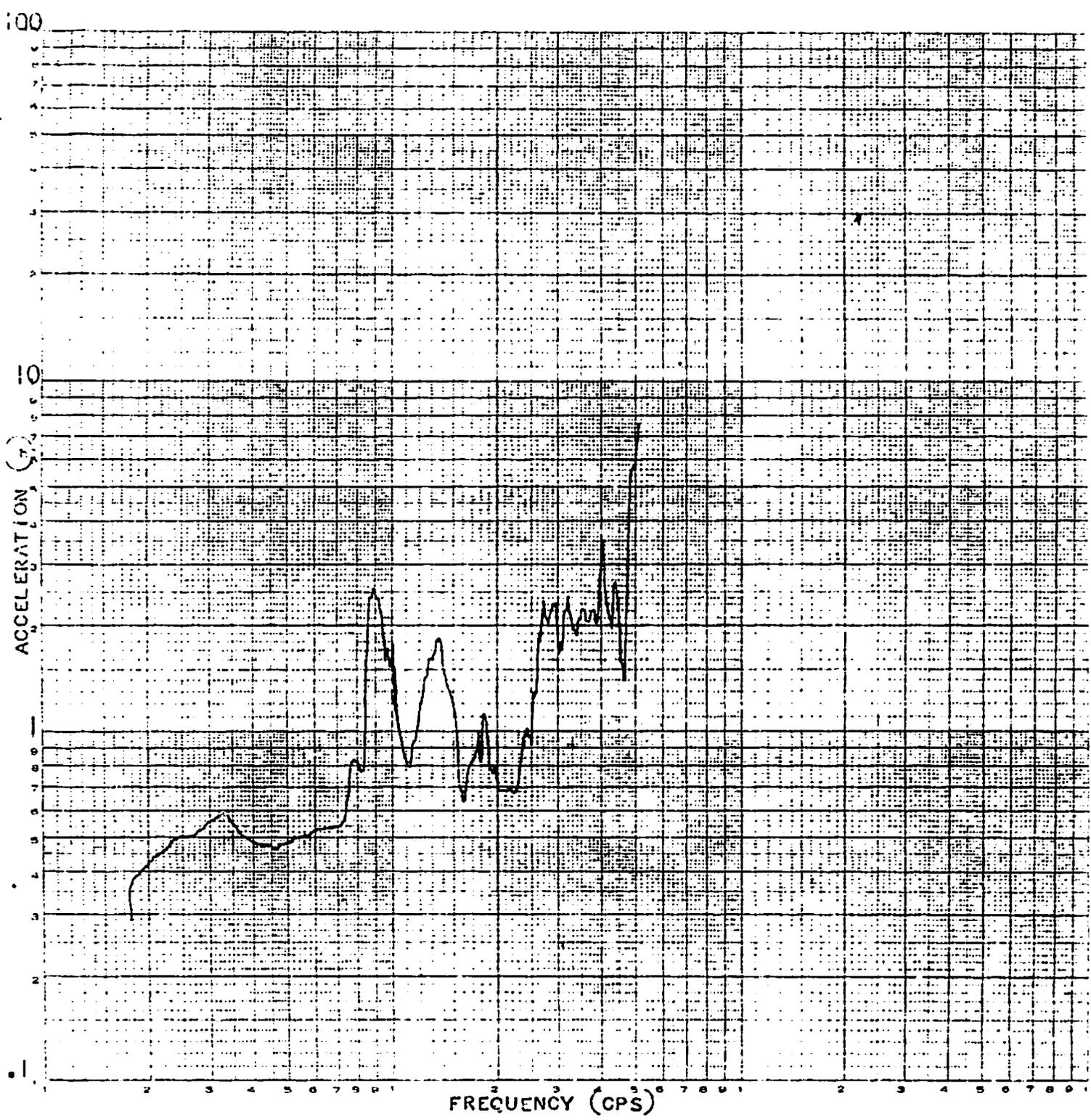


FIG. 42 FILTERED RESPONSE VS. FREQUENCY PLOT OF VERTICAL ACCELEROMETER MOUNTED ON THE FORWARD END OF THE FIXTURE - LATERAL ORIENTATION - VIBRATION TEST OF THE XV-53 TELEMETRY PACKAGE. PROJECT NO. T-18749

UNCLASSIFIED

UNCLASSIFIED

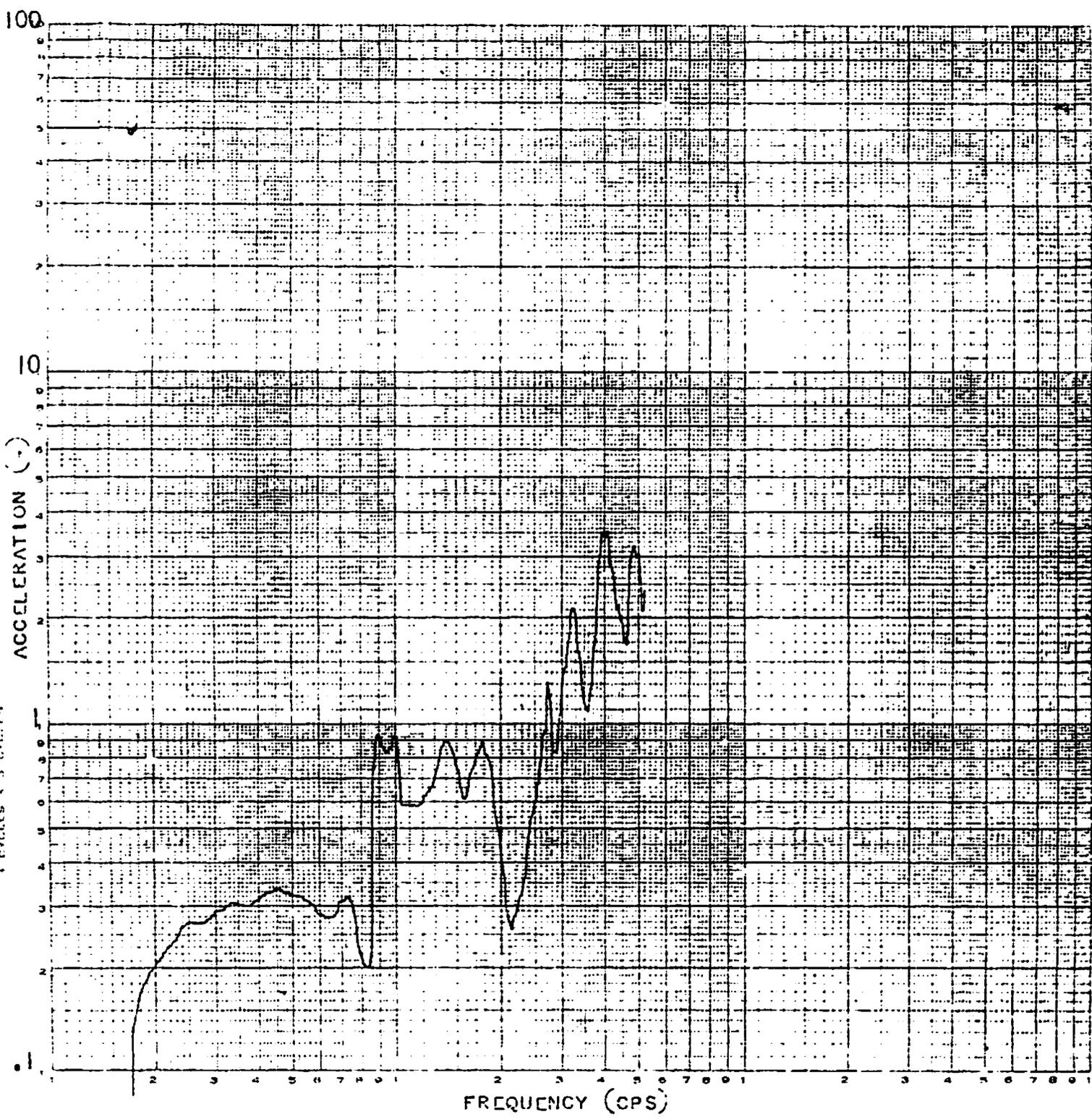
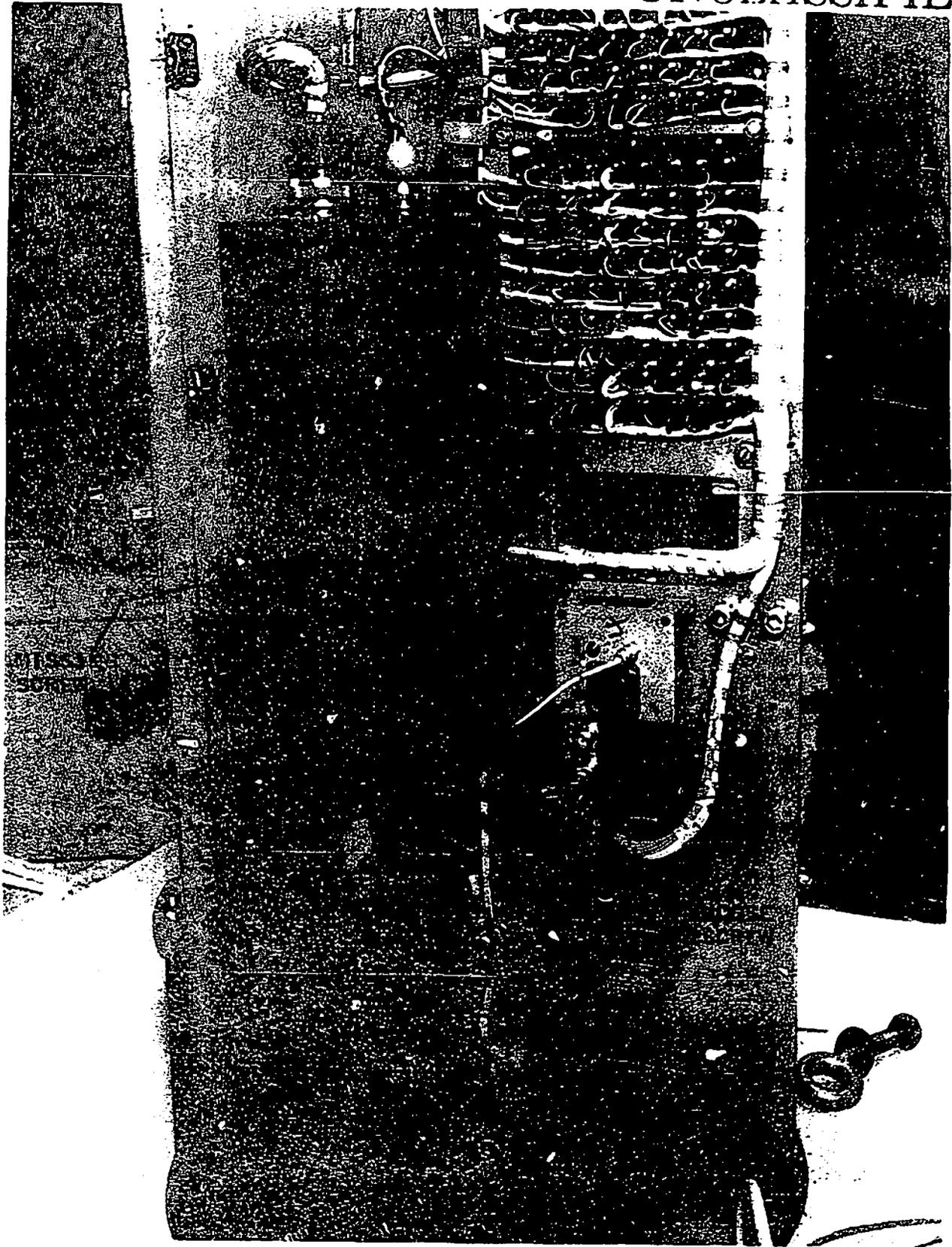


FIG. 43 FILTERED RESPONSE VS. FREQUENCY PLOT OF LONGITUDINAL ACCELEROMETER MOUNTED ON THE FORWARD END OF THE FIXTURE - LATERAL ORIENTATION - VIBRATION TEST OF THE XN-53 TELEMETRY PACKAGE. PROJECT NO. T-18749

UNCLASSIFIED

#1254

UNCLASSIFIED



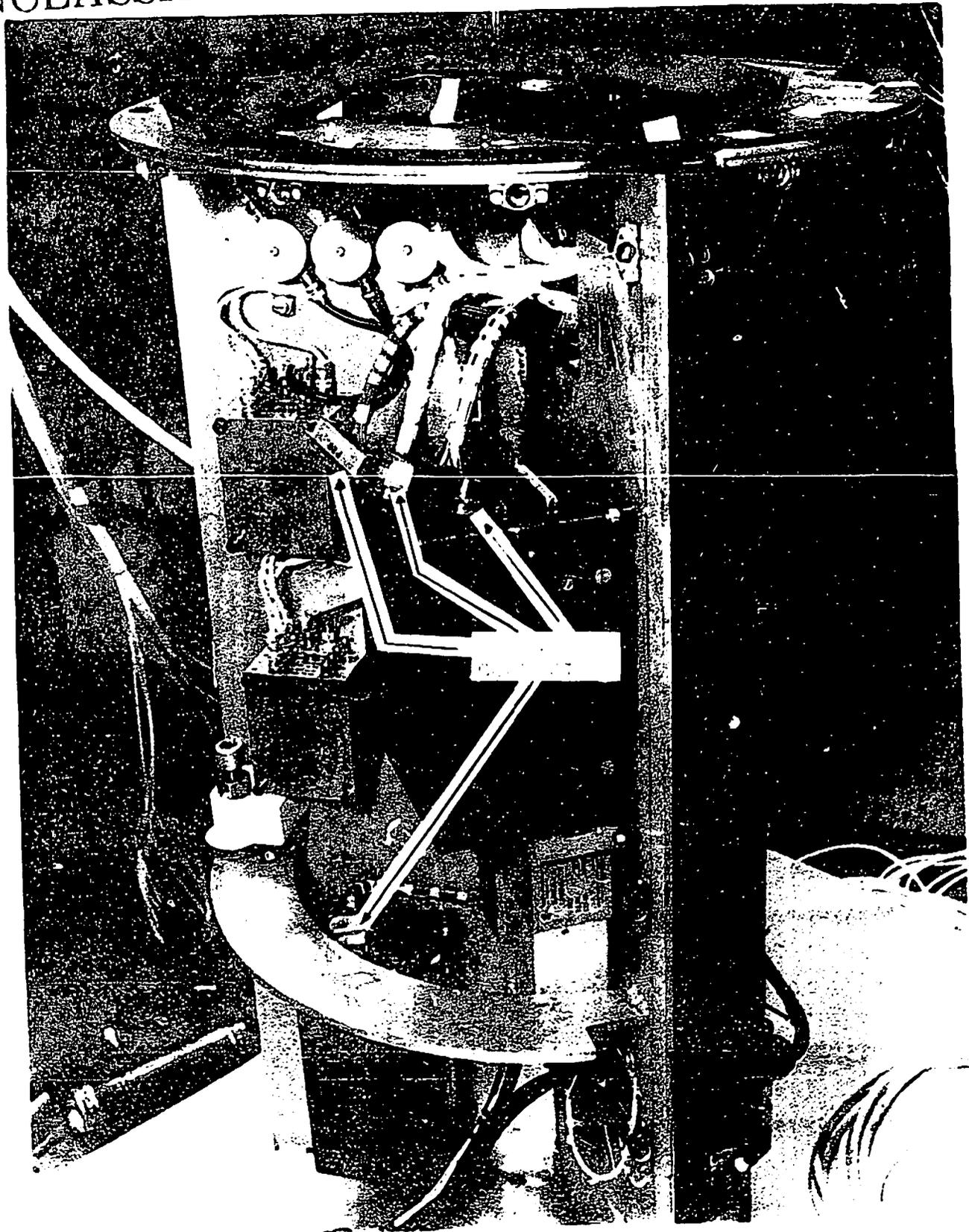
Q#7/A

[REDACTED]

UNCLASSIFIED

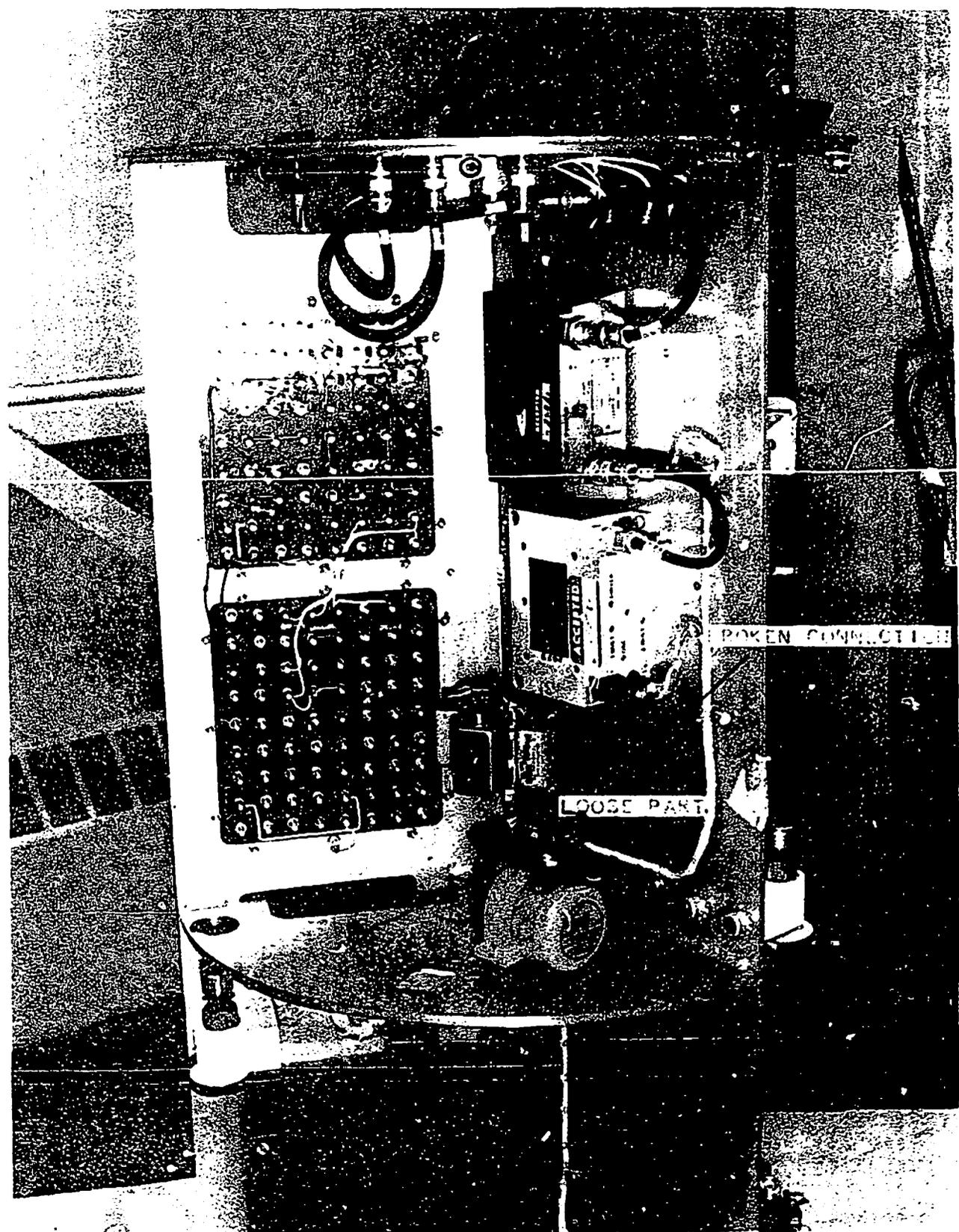
UNCLASSIFIED

1255



D#71A

UNCLASSIFIED



D# 71/A

~~CONFIDENTIAL~~