

TEST REPORT

REPORT NO. 54498-1
OUR JOB NO. ND 54498
YOUR P. O. NO. 7651
CONTRACT ---

WYLE LABORATORIES / Norco, California . 737-0871 , 689-2104 . TWX 910-332-1204 . Cable WYLAB

JELCO, INC.
P. O. Box 2248
Pomona, California 91766

66 - Page Report

DATE 29 June 1976

Revision A
30 September 1976

SEISMIC TESTING

ON

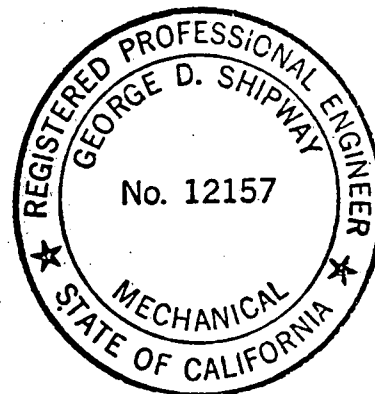
CONTROL PANEL, SHIPPING SECTION NUMBER 3

FOR

JELCO, INC.

SUPERCEDES S023-502-5-167

S023-502-5-501-0 SCE#0376



STATE OF CALIFORNIA } ss.
COUNTY OF RIVERSIDE }

Ray C. Myrick

, being duly sworn,
deposes and says: That the information contained in this report is the result of
complete and carefully conducted tests and is to the best of his knowledge true
and correct in all respects.

Ray C. Myrick

DEPARTMENT DYNAMICS

DEPT. MGR.

James J. Anderson
James J. Anderson

TEST ENGINEER

Wayne K. Franz
Wayne K. Franz

Registered
Professional
Engineer

George D. Shipway
George D. Shipway

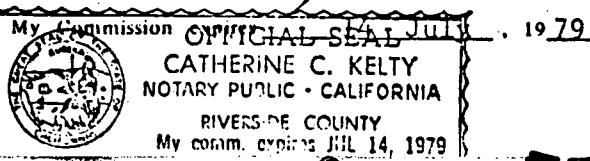
DCAS-QAR VERIFICATION

QUALITY CONTROL

Al Heerman

SUBSCRIBED and sworn to before me this 30th day of June, 19 76

Notary Public in and for the County of Riverside, State of California



W-867A

8108060 575

Revision A

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REVISION SHEET

<u>Revision Number</u>	<u>Date 1976</u>	<u>Pages Affected</u>	<u>Par. No.</u>	<u>Description of Change</u>
A	30 Sept.	7	4.4.2.3	Furnishes supplemental information.
		12	Fig. 2	Corrects axes definitions

A

APPROVED BY:

W. Franz
Test EngineerAl Heecerman
Quality Control

WYLE LABORATORIES Norco, California

1.0 REFERENCES

- 1.1 Jelco, Inc. Purchase Order No. 7651, dated 15 March 1976.
- 1.2 Bechtel Power Corporation Specification Number S023-502-5, Appendix 4F.
- 1.3 Bechtel Drawing Number 53018-C, entitled "Control Panel Layout Chemical and Volume Control, Reactor Coolant and Reactivity Systems Shipping Section 3". 18-2
- 1.4 Bechtel Drawing Number 53018-2, entitled "Control Panel Layout Chemical Control Shipping Section 3".
- 1.5 Wyle Laboratories Test Procedure No. 3570, Revision B.

2.0 GENERAL

Although Reference 1.1 above is applicable to the testing of two control panel specimens, Shipping Sections Number 7 and Number 3, only testing conducted on the latter is discussed in this report. Testing performed on Shipping Section Number 7 was described in an earlier report, Wyle Laboratories Test Report No. 54498, dated 31 March 1976.

3.0 PROCEDURES

3.1 Receiving Inspection

Prior to testing, the specimen, Shipping Section Number 3, was subjected to a visual examination for evidence of shipping damage. Specimen identification information was recorded on a receiving inspection data sheet included in the body of this report.

3.2 Test Fixture and Specimen Orientations

The specimen was fully supported on the test table by a rigid weldment of 12-inch structural steel I-beams. On this rigid base was welded a framework of four-inch square structural steel tubing. The specimen was placed on the tubing and

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3.2

(continued)

welded in place employing a specified weld pattern of two-inch long welds on eight-inch centers across the entire front and rear edges of the console. The bottom angle on each open end was left unsupported underneath the spans for the first biaxial test plane (X-Y axes). For the second test plane (Z-Y axes) the end structure was supported underneath with four-inch square tubing. The open ends were not welded down, however. Additionally, in the Z-Y plane, the front and rear tubing lengths were braced (perpendicular to the longitudinal axis of the tubes) to prevent them from behaving as springs.

With the specimen in its normal upright position, its longitudinal axis was initially aligned parallel to the horizontal test machine driver axis. For the second test orientation the specimen was rotated ninety degrees about its vertical centerline such that its lateral axis was aligned with the horizontal driver. The specimen remained in its normal upright position throughout testing. Axis definitions are presented in Figures 1 and 2. The actual setups are shown in the attached photographs.

3.3

Instrumentation

3.3.1

Accelerometers

Twenty accelerometers were attached to the specimen near the mounting points for selected instruments in the panel assembly. The orientations were changed to suit each individual test run. The locations and orientations of each are shown in Figures 1 and 2 and Table I. These accelerometer data were recorded on a galvanometer recorder system for each test run.

3.3.2

Strain Gages

Eight strain gages were mounted at selected points on the specimen. Gages arbitrarily numbered 1 through 4 were mounted on the panel face at locations shown in the attached photographs. Gages 5 through 8 were mounted vertically one and one-eighth inches above the floor line on the rear structural members. Number 5 was located on the front face of the rearmost vertical strut located between the two center doors. Number 6 was on the left face of the same strut. Number 7 was on the rearmost outer

3.3.2 (continued)

surface of the leftmost structural angle. Number 8 was on the front face of the rearmost and leftmost vertical strut. These latter four gages were not photographed.

Strain gage data were recorded employing a signal conditioning/galvanometer recorder system.

3.4 Functional Testing

No electrical functional tests were conducted. The specimen was simply assembled with dummy instruments fabricated by Wyle Laboratories. For the middle left section of the control console, the dummies, composed of wood, masonite and steel, were designed to simulate the weight, center of gravity, and mounting method for each instrument at its proper location. For the remaining sections of the console face, no attempt was made to simulate the center of gravity or the standard instrument mounting method, rather only the total instrument weight for each general panel location was simulated. The dummy instruments are shown in the attached photographs.

3.5 Seismic Testing

3.5.1 Resonance Search

The specimen was subjected to sinusoidal sweep testing in the frequency range from 1 to 35 to 1 Hz. A logarithmic frequency sweep rate of one-half octave per minute was employed at an input level of 0.2g peak.

This type test was performed uniaxially, in the three principal axes, one at a time.

3.5.2 Random and Superimposed Sine Beat

Following iterative "bare table" motion calibrations the specimen was subjected to biaxially applied random motions with biaxial sine beat motions superimposed at specific frequencies.

The biaxial random motions were amplitude controlled with a series of adjustable attenuation one-third octave bandwidth filters whose center frequencies were tuned to frequencies in one-third octave

3.5.2 (continued)

increments from 1.25 to 35 Hz. Ten oscillation-per-beat sine beats were superimposed on the random excitation at frequencies of 1.6, 2.0, and 2.5 Hz. Twenty oscillations-per-beat sine beats were employed at 1.25 Hz.

One, three, four, and five beats per frequency were used for the 1.25, 1.6, 2.0, and the 2.5 Hz test conditions, respectively, with a two-second interbeat delay in each case.

Each test run consisted of thirty seconds of random excitation with the aforementioned appropriate sine beat excitations superimposed. A separate test run was made for each of two sine beat phasing conditions: i.e., the horizontal and vertical test machine drivers in phase and the two drivers 180° out of phase. The horizontal/vertical random waveform excitations were phase incoherent throughout the testing sequence.

The test response spectra were determined with the use of a shock spectra analyzer, tuned in one-third octave frequency increments from 1.25 to 100 Hz. The data were formatted in plots of peak acceleration versus the incremental frequency.

3.5.3 Test Sequence

The detailed sequence followed in the conduction of the test is given below.

- 3.5.3.1 Calibrated the biaxial seismic input motion so that an analysis of the random signal and the four sine beats enveloped the required response spectra.
- 3.5.3.2 Installed the specimen into the test setup as previously described.
- 3.5.3.3 Installed the instrumentation which is called out in Paragraph 3.3 and verified that it was being recorded on an oscillograph.
- 3.5.3.4 Conducted a sine sweep resonance search in the longitudinal axis as detailed in Paragraph 3.5.1.
- 3.5.3.5 Conducted a sine sweep resonance search in the vertical axis.

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- 3.5.3.6 Input the 30 seconds of biaxial seismic motion as detailed in Paragraph 3.5.2, with the 1.25 Hz sine beat superimposed; first with horizontal and vertical drivers in phase and then repeated the test with the drivers out of phase.
- 3.5.3.7 Repeated Paragraph 3.5.3.6 only input the sine beats at 1.6 Hz.
- 3.5.3.8 Repeated Paragraph 3.5.5.6 only input the sine beats at 2.0 Hz.
- 3.5.3.9 Repeated Paragraph 3.5.3.6 only input the sine beats at 2.5 Hz. Reoriented the specimen so that its lateral axis was parallel to the horizontal axis of excitation. Reoriented the appropriate accelerometers to coincide with the horizontal excitation axis.
- 3.5.3.10 Conducted a sine sweep as detailed in Paragraph 3.5.1 in the horizontal axis.
- 3.5.3.11 Repeated Paragraphs 3.5.3.6 through 3.5.3.9.

4.0 RESULTS

4.1 Receiving Inspection

Inspection of the specimen revealed no visible damage due to shipping. Receiving inspection data and specimen identification are shown on a following data sheet.

4.2 Test Fixture

No visible evidence of fixture or mounting method anomalies occurred.

4.3 Functional Tests

No visible anomalies occurred in the dummy instruments or in their mounting methods.

4.4 Seismic Tests

4.4.1 Resonance Searches

Resonance behavior, defined as an output/input acceleration ratio of at least 2.5 to 1, was evident in the lateral axis test data only. These frequency and response results are shown in Table II for each accelerometer displaying a resonance or resonances in its output.

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4.4.2 Random with Sine Beats

4.4.2.1 Test Response Spectra (TRS)

The required response spectra (RRS) were enveloped by the TRS, for each sine beat condition, as shown in the attached plots.

4.4.2.2 Instrument Location Accelerations

The maximum instrument accelerations, as determined from galvanometer recordings of response accelerometer data, have been tabulated for each accelerometer. Table III is such a tabulation for the 2.5 Hz (out of phase) sine beat seismic test condition in the Z-Y biaxial test plane.

The data represent peak response accelerations for the peak table accelerations given. Since no response data have exceeded 2.5g, the requirement for less than 3.0g peak response is met, particularly when consideration is made that the inputs were significantly higher than those from the required spectra.

Only the 2.5 Hz sine beat seismic condition need be tabulated since it represents the worst case output/input amplification; i.e., it is the sine beat frequency closest to the first cabinet resonance frequency of 7.8 Hz. This rationale is valid since, from the galvanometer recordings, it is evident the peak input acceleration is derived from the sine beat input, not the random background excitation.

4.4.2.3 Strain Gages

No significant strains were measured throughout testing. The maximum strain recorded was on the order of 400 microinches per inch on gage Number 7 for the X-Y axes plane only. No other gages showed any measurable strain throughout testing. For the case of simple uniaxial strain in mild steel, 400 microinches per inch strain corresponds to 12,000 psi stress; far from its yield stress of approximately 45,000 psi (C1015, hot rolled 1-inch round).

TABLE I

ACCELEROMETER LOCATIONS

(See the attached photographs and Figures 1 and 2
for the locations)

Accelerometer Number	Orientations for Each Test				
	Resonance Search			Seismic Test	
	X	Y	Z	X-Y	Z-Y
3	X	Y	Z	Y	Y
4	X	Y	Z	Y	Y
5	X	Y	Z	Y	Y
6	X	Y	Z	Y	Y
7	X	Y	Z	X	Z
8	X	Y	Z	X	Z
9	X	Y	Z	X	Z
10	X	Y	Z	X	Z
11	X	Y	Z	X	Z
12	X	Y	Z	X	Z
13	X	Y	Z	X	Z
14	X	Y	Z	X	Z
15	X	Y	Z	X	Z
16	X	Y	Z	X	Z
17	Y	Y	Y	Y	Y
18	X	X	Z	X	Z
19	Y	Y	Y	Y	Y
20	X	X	Z	X	Z
21	X	Y	Z	Y*	Y
22	X	Y	Z	Y*	Y

* Were in the X direction for both 1.25 Hz sine beat seismic test runs.

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TABLE II
LATERAL AXIS RESONANCE SEARCH DATA (Z Axis)

<u>Direction</u>	<u>Accelerometer*</u>	<u>Frequency (Hz)</u>	<u>Maximum Response Acceleration (g peak)</u>
Sweep Down	8	7.8	1.8
	10	7.8	1.6
	10	9.0	1.2
	8	10.5	1.0
	10	22.5	0.9
	10	35.0	1.3
	8	35.0	0.7
Sweep Up	11	10.0	1.0
	10	10.0	1.2
	9	10.0	0.7
	8	10.0	0.9
	7	10.0	0.7
	6 (Vertical)	10.0	0.6
	5 (Vertical)	10.0	0.6
	4 (Vertical)	10.0	0.6
	3 (Vertical)	10.0	0.6
Sweep Down	20	9.0	0.9
	18	9.0	1.0
	16	9.0	0.9
	15	9.0	1.2
	14	9.0	1.0
	13	9.0	1.0
	20	10.5	1.0
	18	10.5	1.0
	16	10.5	0.9
	15	10.5	1.0
	14	10.5	0.8
	13	10.5	0.8
Sweep Up	22 (Vertical)	35.0	0.6
	21 (Vertical)	35.0	0.6
	20	20.0	0.5
	16	20.0	0.5
	22	10.0	0.8
	21	10.0	0.8
	20	10.0	1.5
	18	10.0	1.3
	16	10.0	1.2
	15	10.0	1.5
	14	10.0	1.2
	13	10.0	1.2
	12	10.0	0.7

* All mounted in the lateral direction except where noted.

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TABLE III

PEAK SEISMIC RESPONSE

<u>Accelerometer</u>	<u>Acceleration Peak Response* (g)</u>
3 (Vertical)	1.9
4 (Vertical)	1.9
5 (Vertical)	1.9
6 (Vertical)	1.9
7	2.1
8	1.9
9	2.0
10	2.1
11	2.0
12	1.4
13	1.9
14	1.9
15	1.9
16	1.9
17 (Vertical)	1.4
18	2.1
19 (Vertical)	1.4
20	2.2
21 (Vertical)	1.9
22 (Vertical)	2.5

* At the 2.5 Hz sine beat condition (in phase) in the Z-Y axes plane. Lateral input was 1.7g peak; vertical input was 1.4g peak. All accelerometers were in the lateral direction except where noted.

DATA SHEET

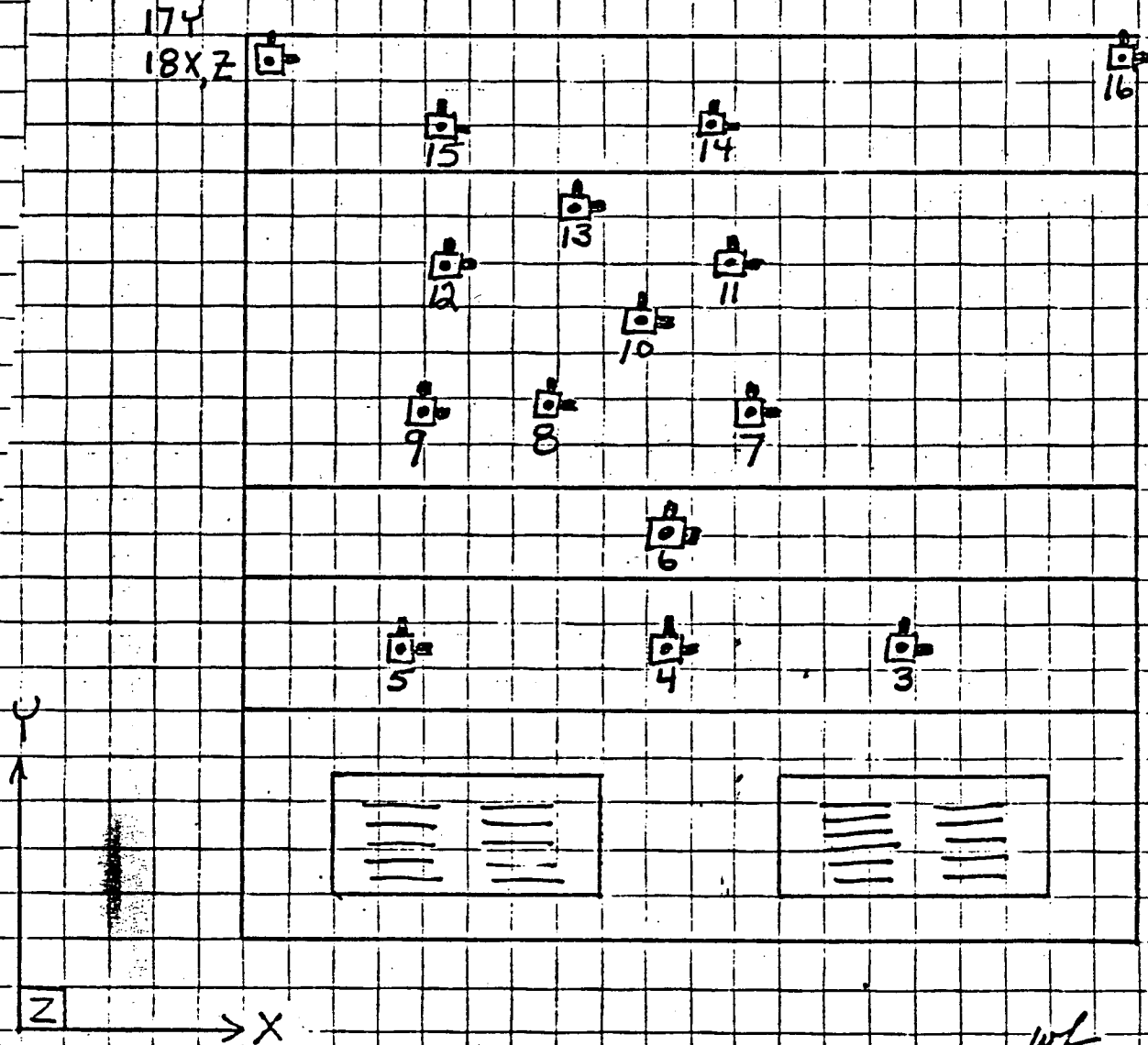
Report No. 54498-1

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CUSTOMER JELCO
Test Title: SEISMIC RANDOM AND SINE BEAT
Specimen CONTROL CONSOLE
Part No. 2CR-58, 50, 51 (#3)

Job No. 54498
S/N
Date 6/18/76

FIGURE 1
ACCELEROMETER LOCATIONS AND
AXES DEFINITIONS



DATA SHEET

Report No. 54498-1

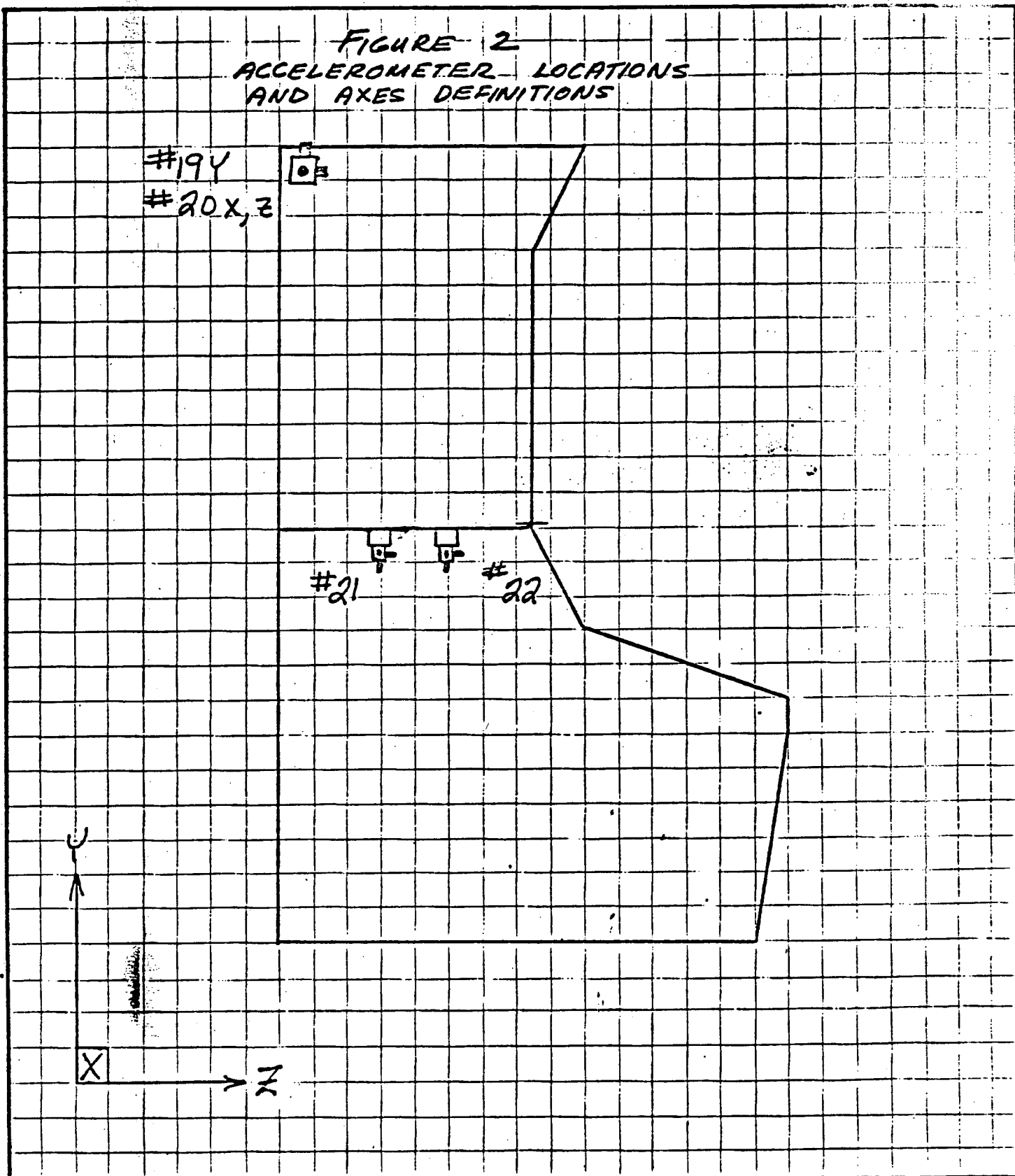
Page No. 12

CUSTOMER TELCOTest Title: SEISMIC RANDOM & SINE TEST RevisionSpecimen CONTROL CONSOLEJob No. 54498

S/N

Part No. 2CR-58,50,51 (#3)Date 6-18-76

FIGURE 2
ACCELEROMETER LOCATIONS
AND AXES DEFINITIONS



DATA SHEET

Customer JELCO Job No. 54498
Date 6-15-76
Specimen CONTROL Console

RECEIVING INSPECTION

No. of Specimens Received: (1) ONE

Record identification information exactly as it appears on the tag or specimen:

Manufacturer JELCO

Part Numbers 2CR-58,50,51 (#3)

How does identification information appear: (name plate, tag, painted, imprinted, etc.)

BLUE PRINTS

Serial Numbers: _____

Examination: Visual, for evidence of damage, poor workmanship, or other defects, and completeness of identification.

Inspection Results: There was no visible evidence of damage to the specimens unless noted below.

NOTE

* If additional space is required for serial numbers, use an additional page, or reference first functional test data sheet (if applicable).

Inspected By H. K. Kroll
Sheet No. _____ of _____
Approved H. Franz Date: 6/15/76

VIBRATION TEST DATA SHEET

RESONANCE SEARCH

Date	Time	Axis	Temp (°F)	SINUSOIDAL			Test Time (Min.)	Comments	Name
				Freq. (HZ)	Disp. ("DA)	Accel. (G)			
7/6	NOTED	X-Y-Z	AMB	1-35-1	—	0.2	*		
								* ONE CYCLE 1-35-1 HZ. AT A SWEEP RATE OF APPROX. ONE HALF OCTAVE PER MINUTE.	
-16	1715	Y	AMB	1-4	—	0.2		START SWEEP	
	1719						4	SHUTDOWN SWITCH TO SERVO CONTROL.	
-16	1720	Y	AMB	4-35-4	—	0.2		RESUME SWEEP	
	1732						12	SHUTDOWN SWITCH TO MANUAL	
16	1733	Y	AMB	4-1	—	0.2		RESUME SWEEP	
	1737						4	END OF SWEEP.	
16	1740	X	AMB	1-4	—	0.2		START SWEEP.	
	1744						4	SHUTDOWN SWITCH TO SERVO CONTROL.	
-16	1745	X	AMB	4-35-4	—	0.2		RESUME SWEEP.	
	1757						12	SHUTDOWN SWITCH TO MANUAL.	
-16	1758	X	AMB	4-1	—	0.2		RESUME SWEEP.	
	1802						4	END OF SWEEP.	
-18	1520	Z	AMB	1-4	—	0.2		START SWEEP.	
	1524						4	SHUTDOWN SWITCH TO SERVO CONTROL	
-18	1525	Z	AMB	4-35-4	—	0.2		RESUME SWEEP.	
	1537						12	SHUTDOWN SWEEP. SWITCH TO MANUAL.	
-18	1538	Z	AMB	4-1	—			RESUME SWEEP	
	1542						4	END OF SWEEP.	

Signed:

W. Z. Long

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Customer JELCO Job No. 54498

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Channel Identification: T/R 1 Trk. No. 1 Accel. No. 1

Transducer S/N 1171 Control (X) Response ()

Full Scale 100 G Cal Voltage 500 MVPK/ 1.0 G

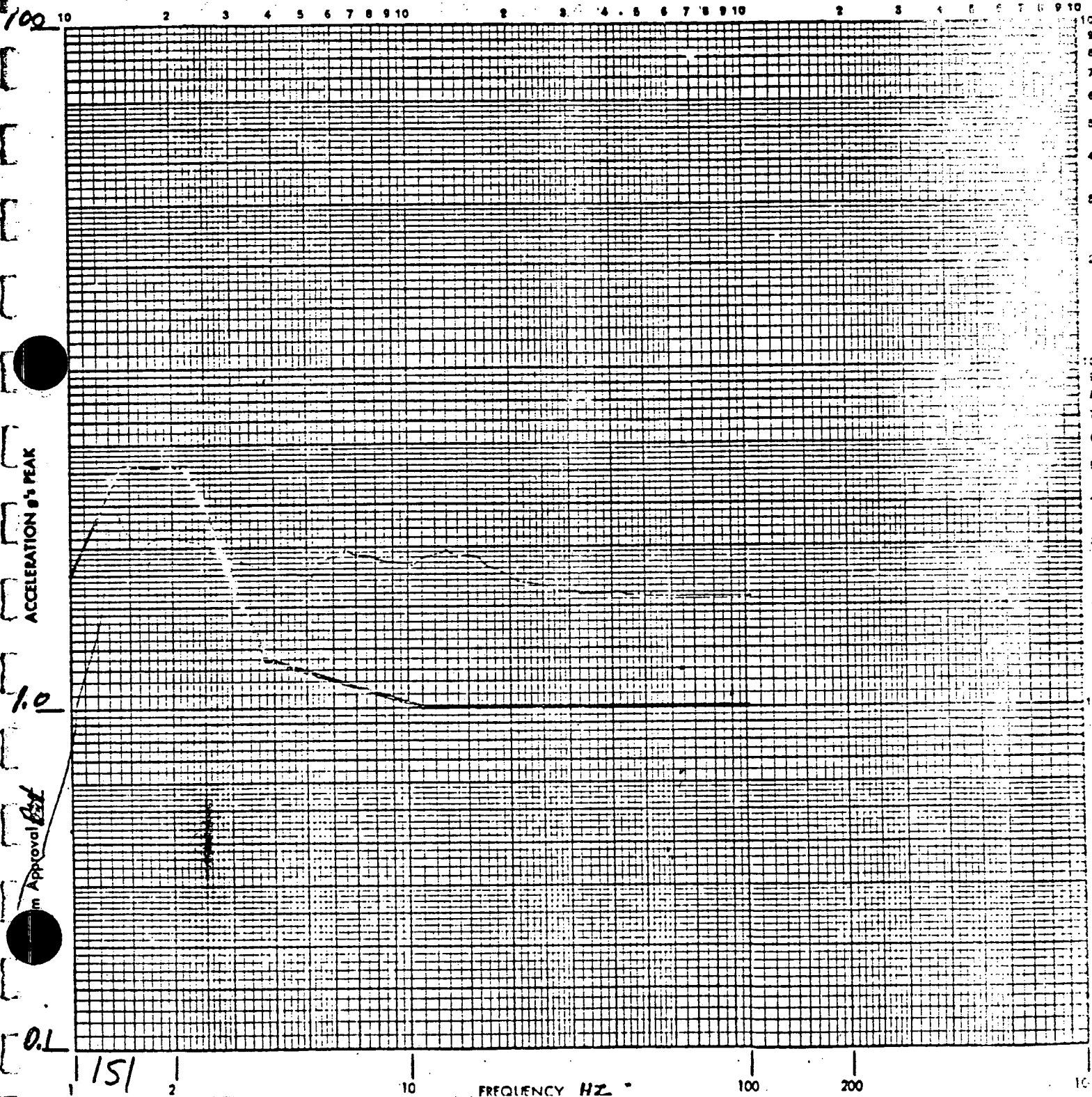
Mode PRIMARY Specimen CONTROL PANEL

Operator KNA P/N 2CR-58,50,51 (*3)

Date 6-16-76 Polarity + Q 5% Axis of Test X-Y

HORIZONTAL RESPONSE SPECTRA

1.25 Hz. in



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Customer JELCO Job No. 54498

Page No. 17

Channel Identification: T/R 1 Trk. No. 2

Accel. No. 2

Transducer S/N 1034 Control (X).

Response ()

Full Scale 100 G Cal Voltage 500 MVPK/ 1.0 G

Mode PRIMARY

Specimen CONTROL PANEL

Operator KJO "

P/N 2CR-58, 50, 51 (#

Date 6-16-76 Polarity + Q 5%

Axis of Test X-Y

VERTICAL RESPONSE SPECTRA

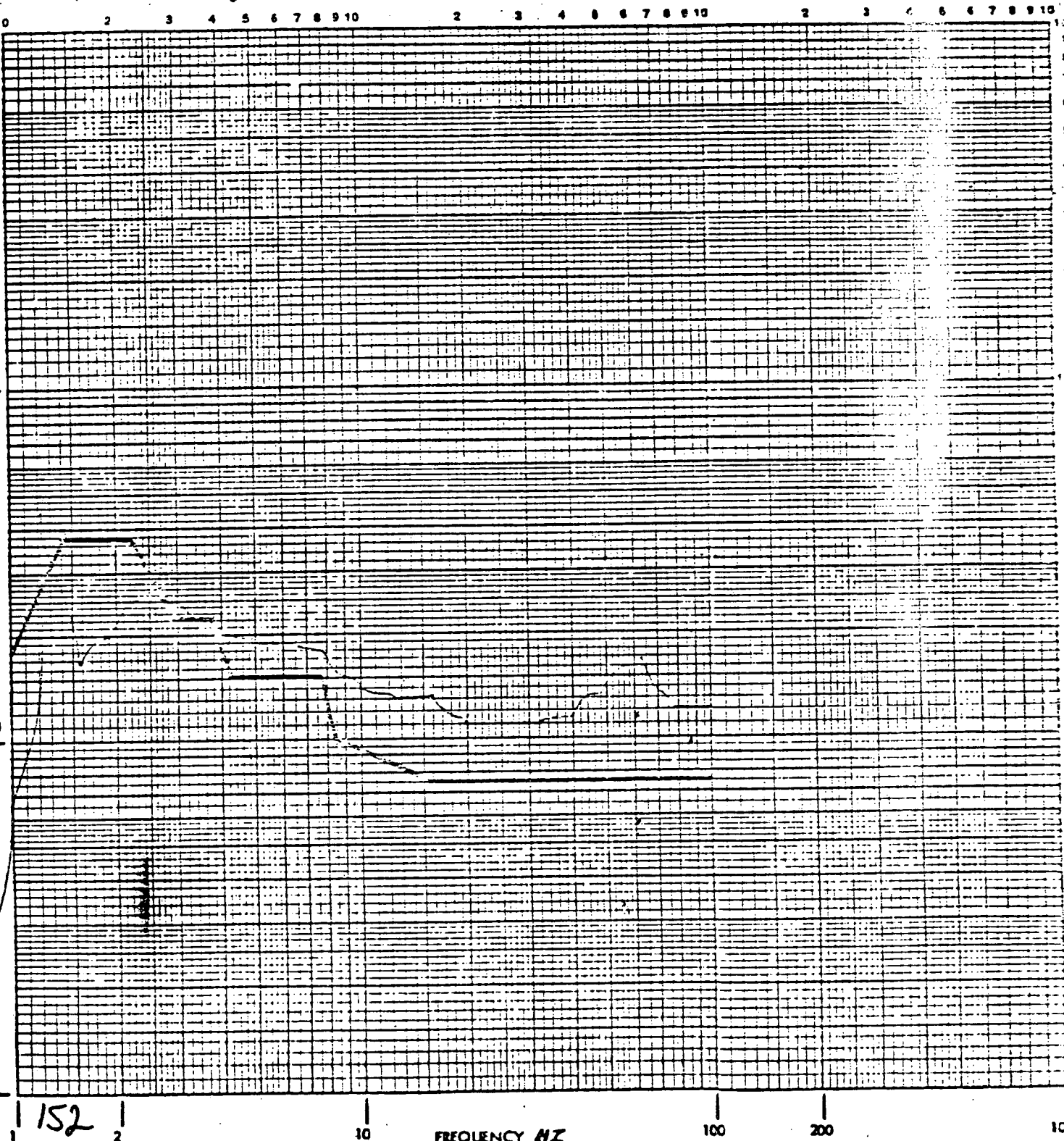
1.25 HZ IN Ø

ACCELERATION g's PEAK

1.0

Form Approval [Signature]

0.1



FREQUENCY HZ

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Customer JELCO Job No. 54498

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Channel Identification: T/R 1 Trk. No. 1 Accel. No. 1

Transducer S/N 1171 Control (X) Response ()

Full Scale 100 G Cal Voltage 500 MVPK/ 1.0 G

Mode PRIMARY Specimen CONTROL PANEL

Operator K.H. P/N 2CR-58,50,51 (#3)

Date 6-16-76 Polarity + Q 5% Axis of Test X-Y

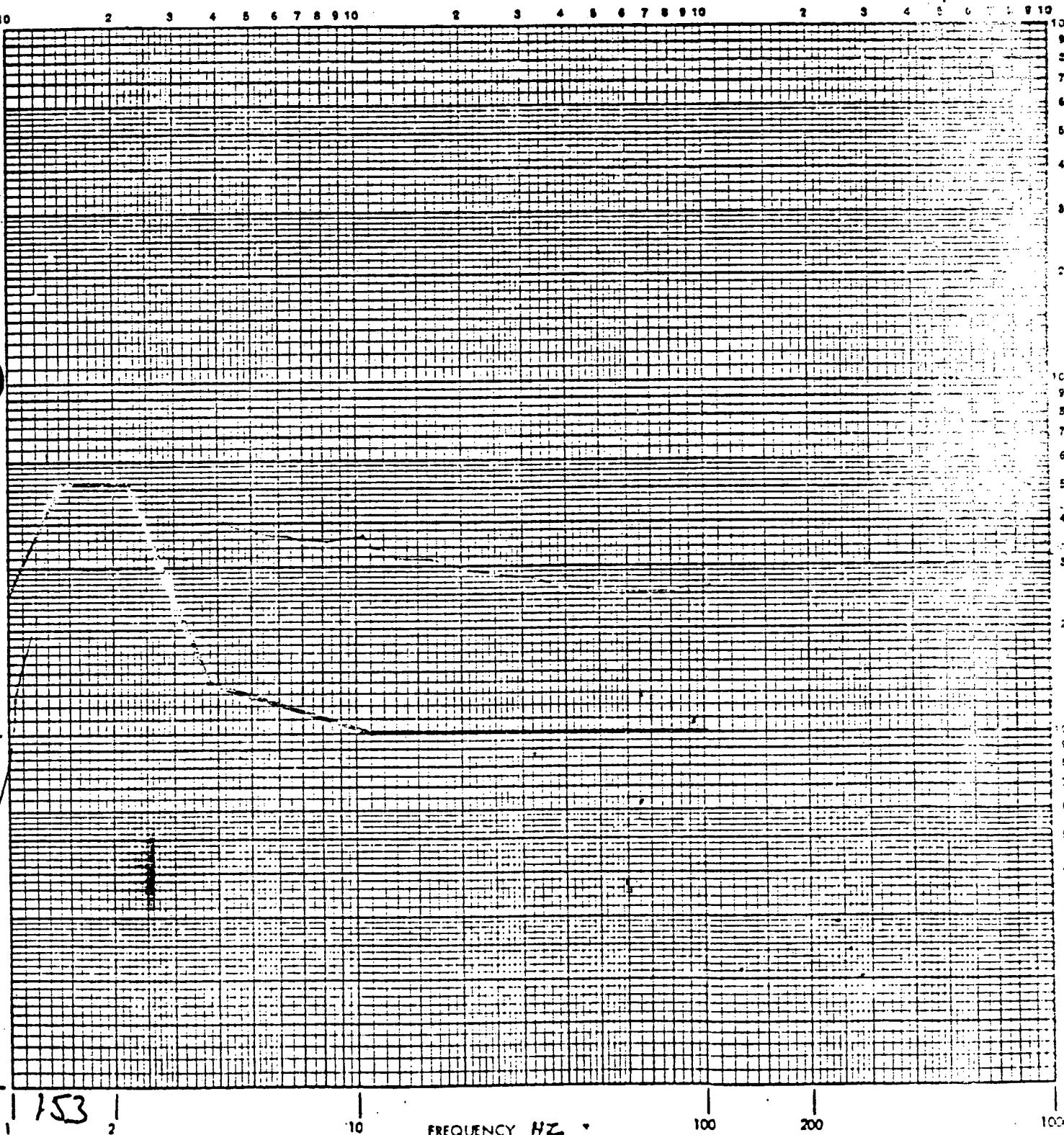
HORIZONTAL RESPONSE SPECTRA

1.2542 OUT

ACCELERATION g's PEAK

Approval Box

0.1



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Customer JELCO Job No. 54498

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Channel Identification: T/R 1 Trk. No. 2 Accel. No. 2

Transducer S/N 1034 Control (X) Response ()

Full Scale 100 G Cal Voltage 500 MVPK/ 1.0 G

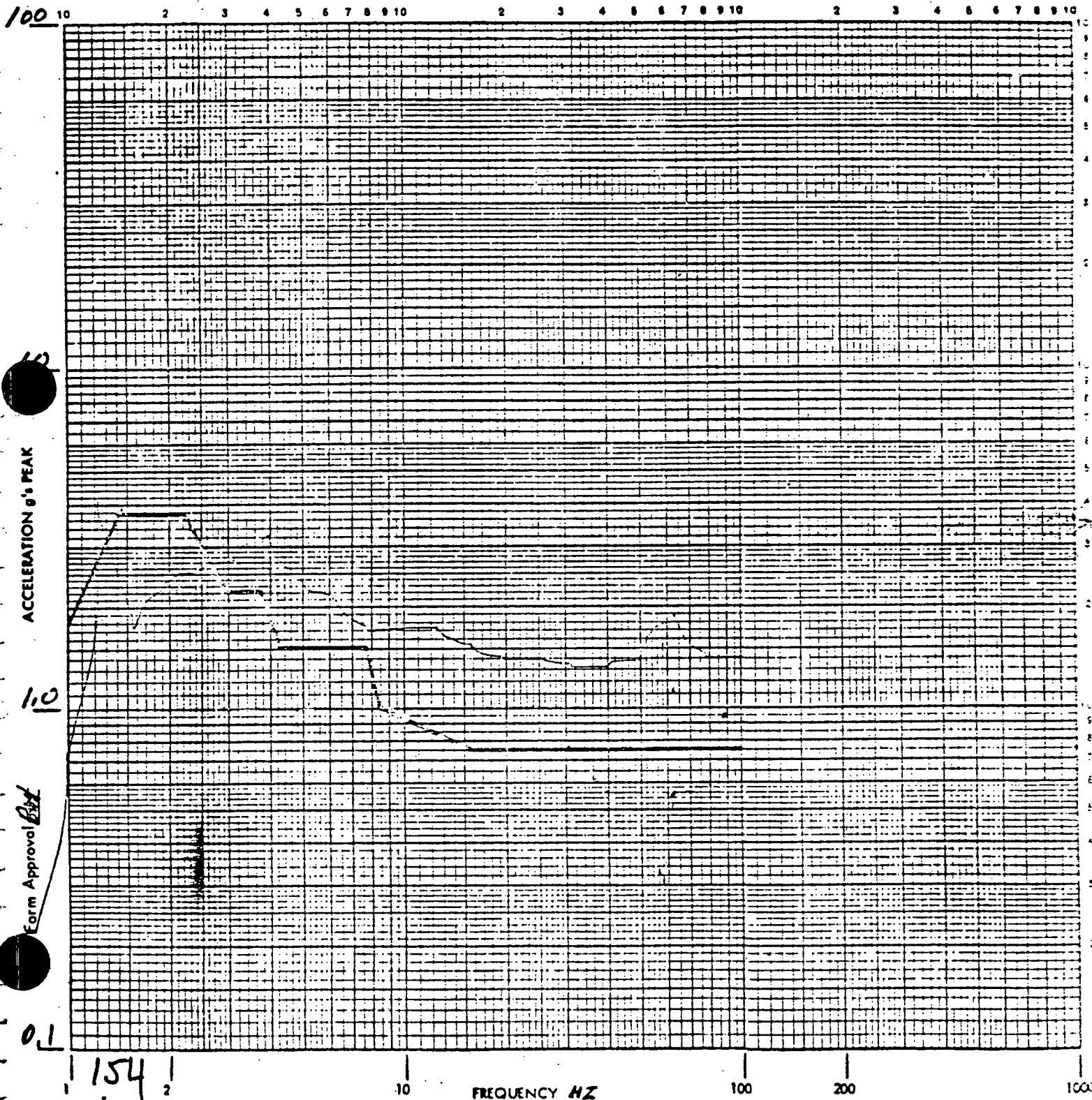
Mode PRIMARY Specimen CONTROL PANEL

Operator KNO P/N 2CR-58, 50, 51 (H)

Date 6-16-76 Polarity + 0.5% Axis of Test X-Y

VERTICAL RESPONSE SPECTRA

1.25 Hz. OUT Ø



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Customer JELCO Job No. 54498

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Channel Identification: T/R 1 Trk. No. 1 Accel. No. 1

Transducer S/N 1171 Control (X) Response ()

Full Scale 100 G Cal Voltage 500 MvPK/ 1.0 G

Mode PRIMARY Specimen CONTROL PANEL

Operator KAD P/N 2CR-58,50,51 (#3)

Date 6-16-76 Polarity + Q 5% Axis of Test X-Y

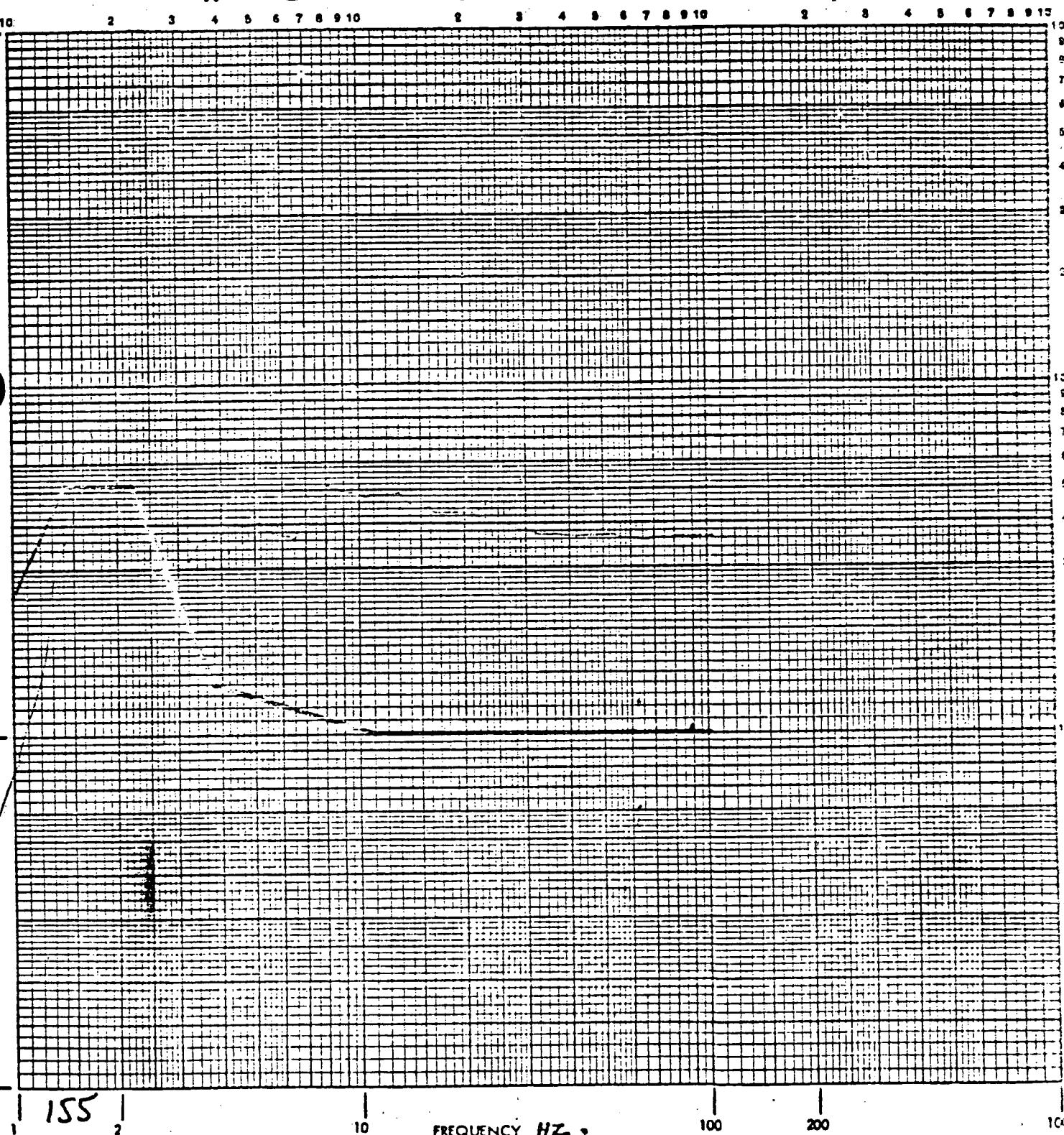
HORIZONTAL RESPONSE SPECTRA

1.6 Hz. OUT ϕ

ACCELERATION g's PEAK

Form Approval But

0.1



WYLE LABORATORIES

Customer JELCO Job No. 54498

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Channel Identification: T/R 1 Trk. No. 2 Accel. No. 2

Transducer S/N 1034 Control (X), Response ()

Full Scale 100 G Cal Voltage 500 MHPK/ 1.0 G

Mode PRIMARY Specimen CONTROL PANEL

Operator KNOY P/N 2CR-58, 50, 51

Date 6-16-76 Polarity + 0.5% Axis of Test X-Y

VERTICAL RESPONSE SPECTRA

1.6 Hz OUT

ACCELERATION g's PEAK

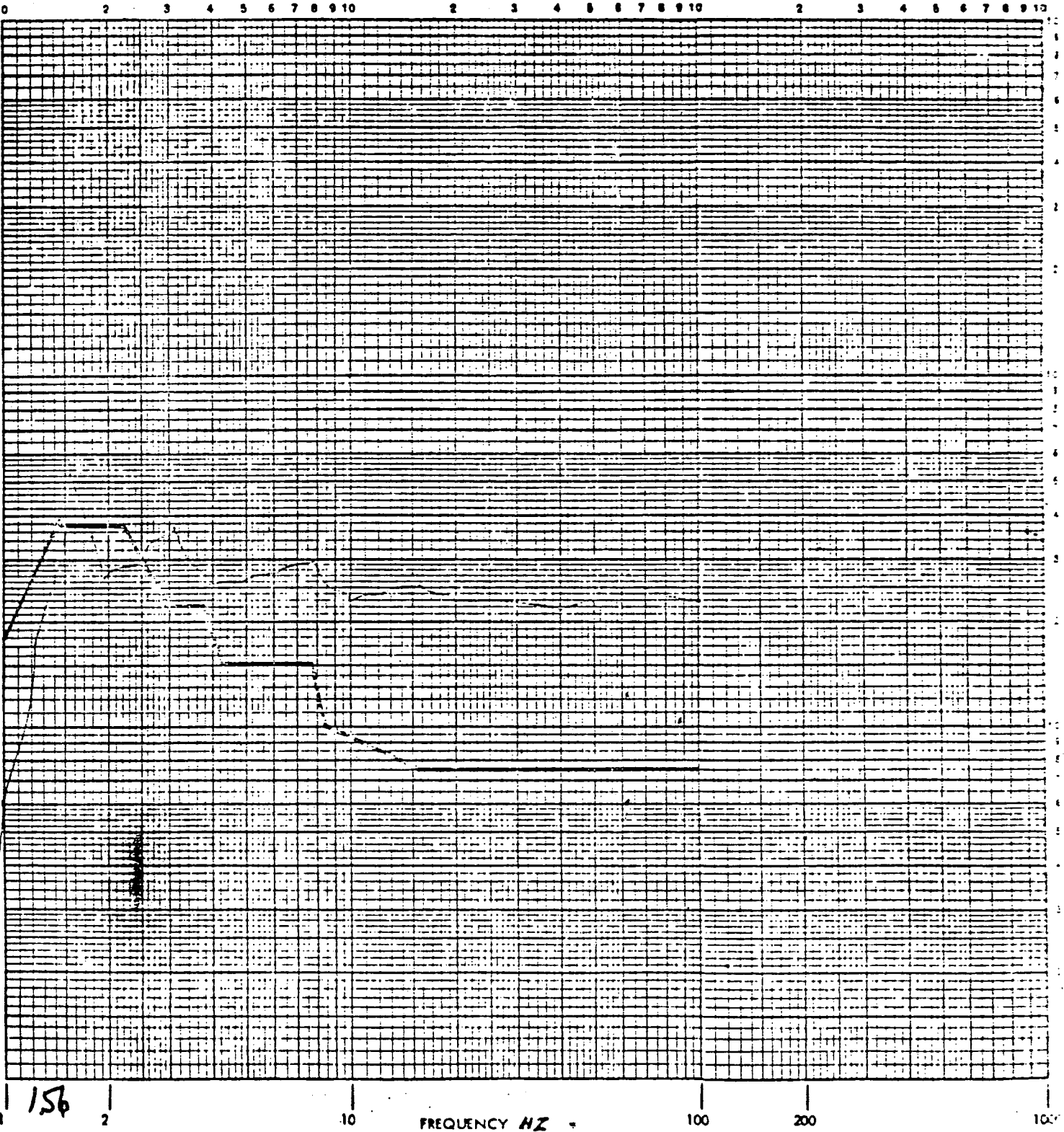
1.0

Form Approval Best

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156

FREQUENCY HZ



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Channel Identification: T/R 1 Trk. No. 1 Accel. No. 1

Transducer S/N 1171 Control (X) Response ()

Full Scale 100 G Cal Voltage 500 MVPK/ 1.0 G

Mode PRIMARY Specimen CONTROL PANEL

Operator KNO P/N 2CR-58,50,51 (*3)

Date 6-16-76 Polarity + 0.5% Axis of Test X-Y

HORIZONTAL RESPONSE SPECTRA 1.6 Hz. 1N Ø

ACCELERATION g's PEAK

1.0

0.1

0.1

157

FREQUENCY HZ.

100

200

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Customer JELCO Job No. 54498

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Channel Identification: T/R 1 Trk. No. 2

Accel. No. 2

Transducer S/N 1034 Control (X),

Response ()

Full Scale 100 G Cal Voltage 500 MvPK/ 1.0 G

Mode PRIMARY

Specimen CONTROL PANEL

Operator KNO

P/N 2CR-58 50 51 (2)

Date 6-16-76 Polarity + Q 5%

Axis of Test X-Y

VERTICAL RESPONSE SPECTRA

1.6 Hz in 9

ACCELERATION g's PEAK

1.0

Form Approval Est

0.1

158

FREQUENCY HZ

100

200

1000

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Channel Identification: T/R 1 Trk. No. 1 Accel. No. 1

Transducer S/N 1171 Control (X) Response ()

Full Scale 100 G Cal Voltage 500 MVPK/ 1.0 G

Mode PRIMARY Specimen CONTROL PANEL

Operator Kno P/N 2CR-58,50,51 (#3)

Date 6-16-76 Polarity + 0 5% Axis of Test X-Y

HORIZONTAL RESPONSE SPECTRA

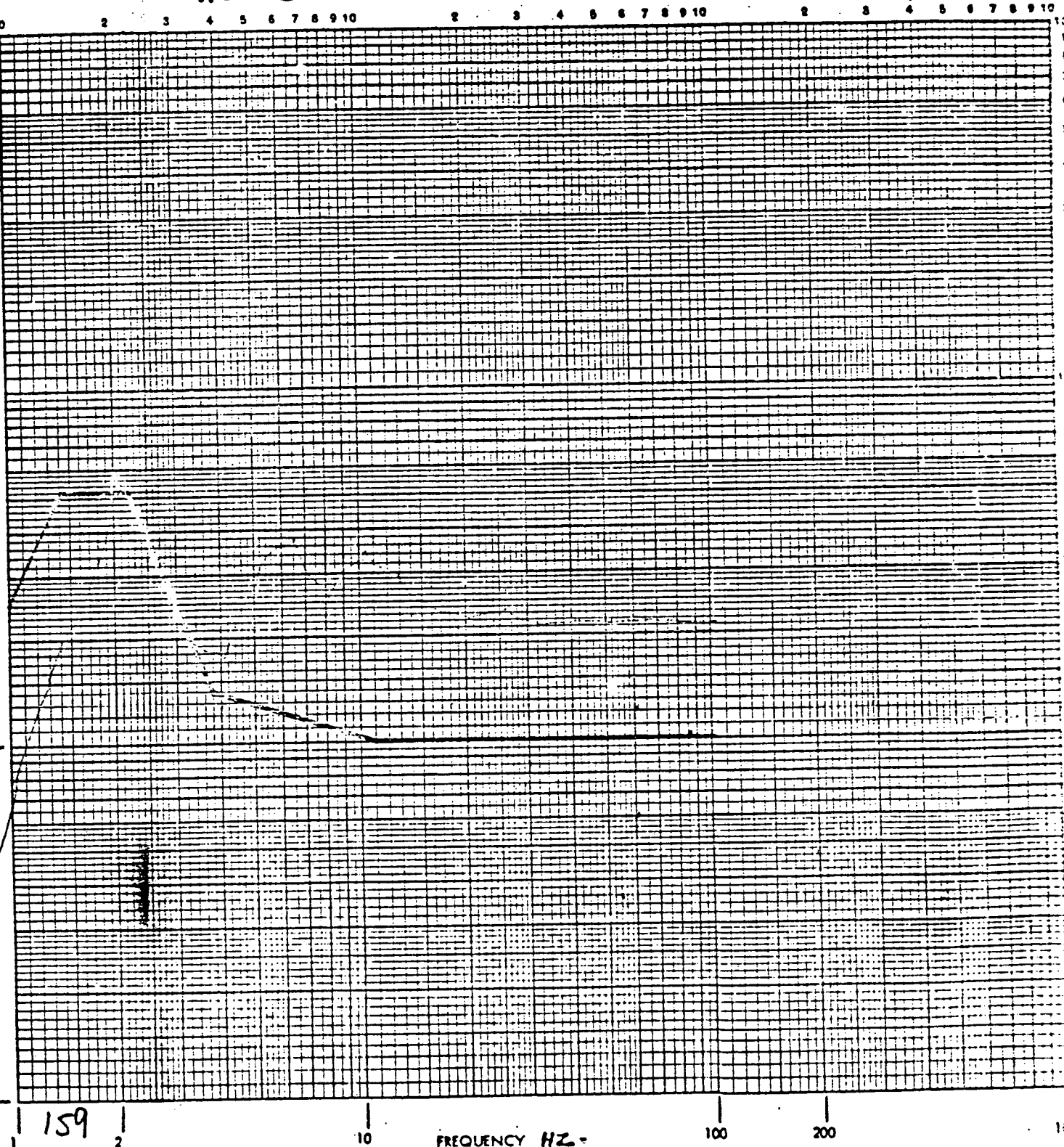
2.0 Hz. in ϕ

ACCELERATION g's PEAK

1.0

0.1

0.1



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Customer JELCO Job No. 54498

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Channel Identification: T/R 1 Trk. No. 2

Accel. No. 2

Transducer S/N 103K Control (X),

Response ()

Full Scale 100 G Cal Voltage 500 MVPK/ 1.0 G

Mode PRIMARY

Specimen CONTROL PANEL

Operator KNO 4

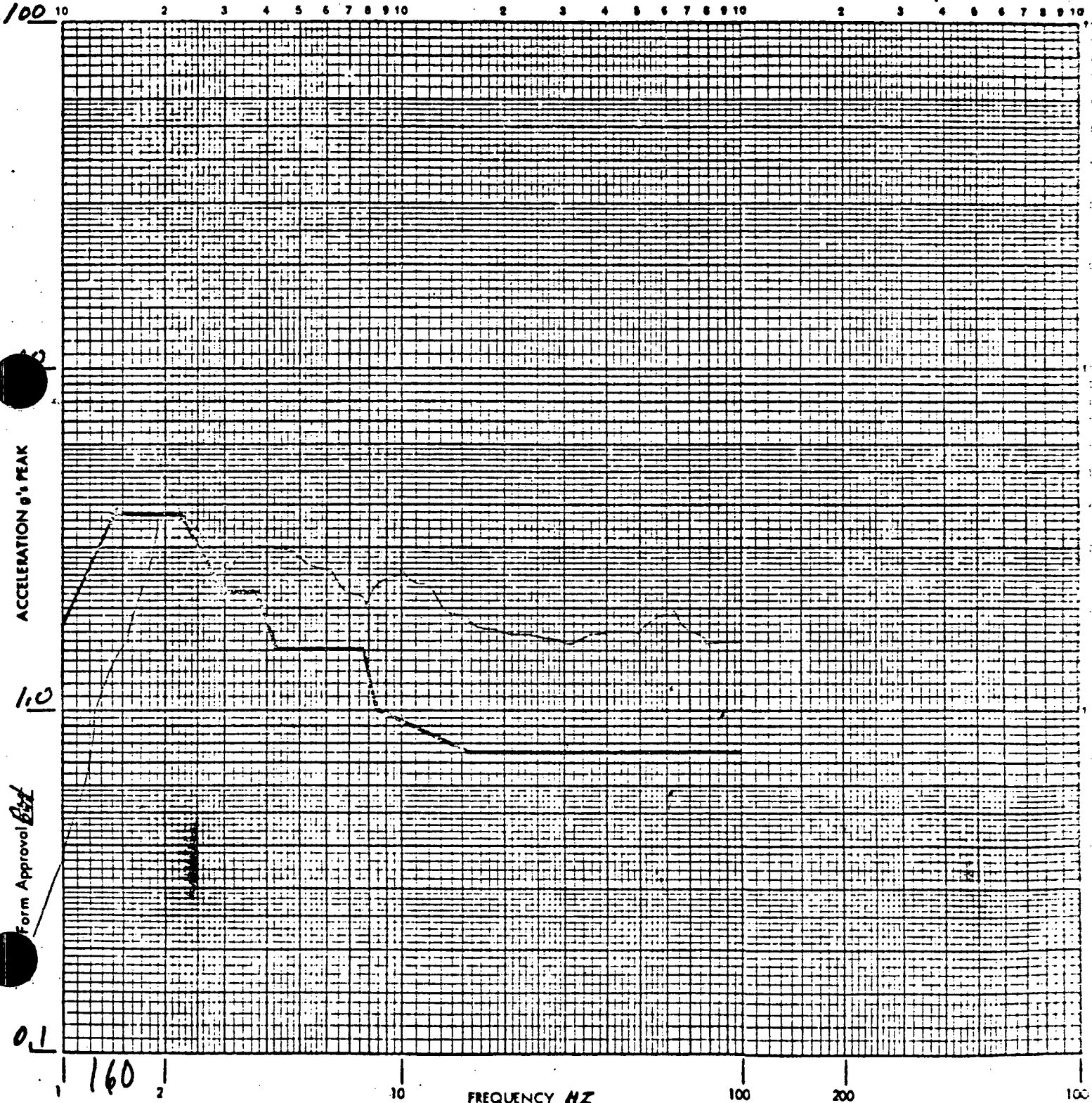
P/N 2CR-58, 50, 51

Date 6-16-76 Polarity + Q 57%

Axis of Test X-Y

2.0 Hz. in ϕ

VERTICAL RESPONSE SPECTRA



Form Approval Box

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Customer JELCO Job No. 54498

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Channel Identification: T/R 1 Trk. No. 1 Accel. No. 1

Transducer S/N 1171 Control (X) Response ()

Full Scale 100 G Cal Voltage 500 MVPK/ 1.0 G

Mode PRIMARY Specimen CONTROL PANEL

Operator MNO P/N 2CR-53,5051 (*3)

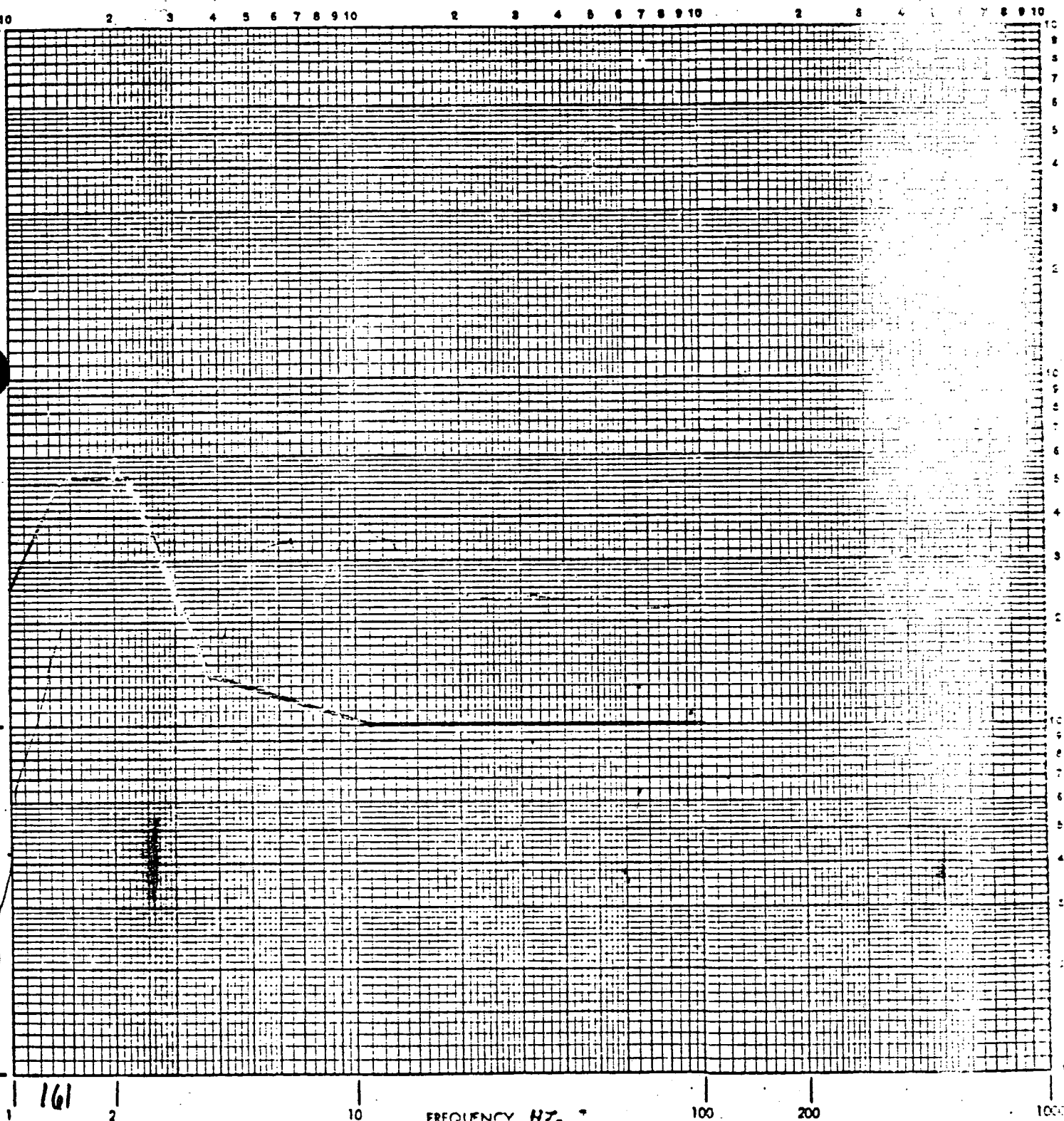
Date 6-16-76 Polarity + 0.5% Axis of Test Y-Y

HORIZONTAL RESPONSE SPECTRA

2.0 Hz 0.07

ACCELERATION g's PEAK

Approval Ext



WYLE LABORATORIES

Report No. 54498-1

Customer JELCO Job No. 54498

Page No. 27

Channel Identification: T/R 1 Trk. No. 2 Accel. No. 2

Transducer S/N 1034 Control (X), Response ()

Full Scale 100 G Cal Voltage 500 MVPK/ 1.0 G

Mode PRIMARY Specimen CONTROL PANEL

Operator KND P/N 2CR-53, 50, 51 (3)

Date 6-16-76 Polarity + Q 5% Axis of Test X-Y

VERTICAL RESPONSE SPECTRA

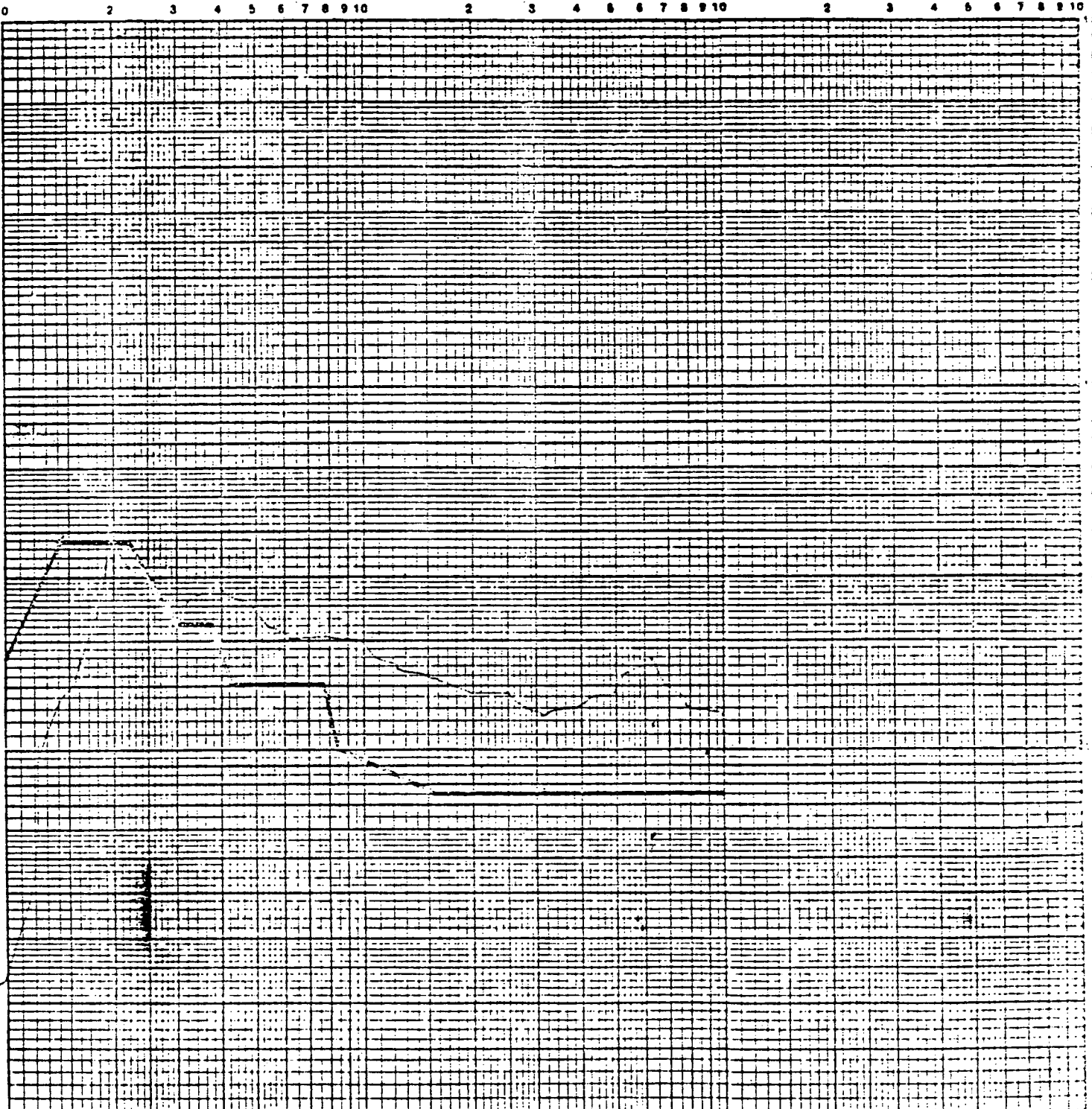
2.0 Hz. OUT

ACCELERATION g's PEAK

1.0

Form Approval

0.1



162

10

FREQUENCY HZ

100

200

1000

WYLE LABORATORIES

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Customer JELCO Job No. 54498

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Channel Identification: T/R 1 Trk. No. 1 Accel. No. 1

Transducer S/N 1171 Control (X) Response ()

Full Scale 100 G Cal Voltage 500 MVPK/ 1.0 G

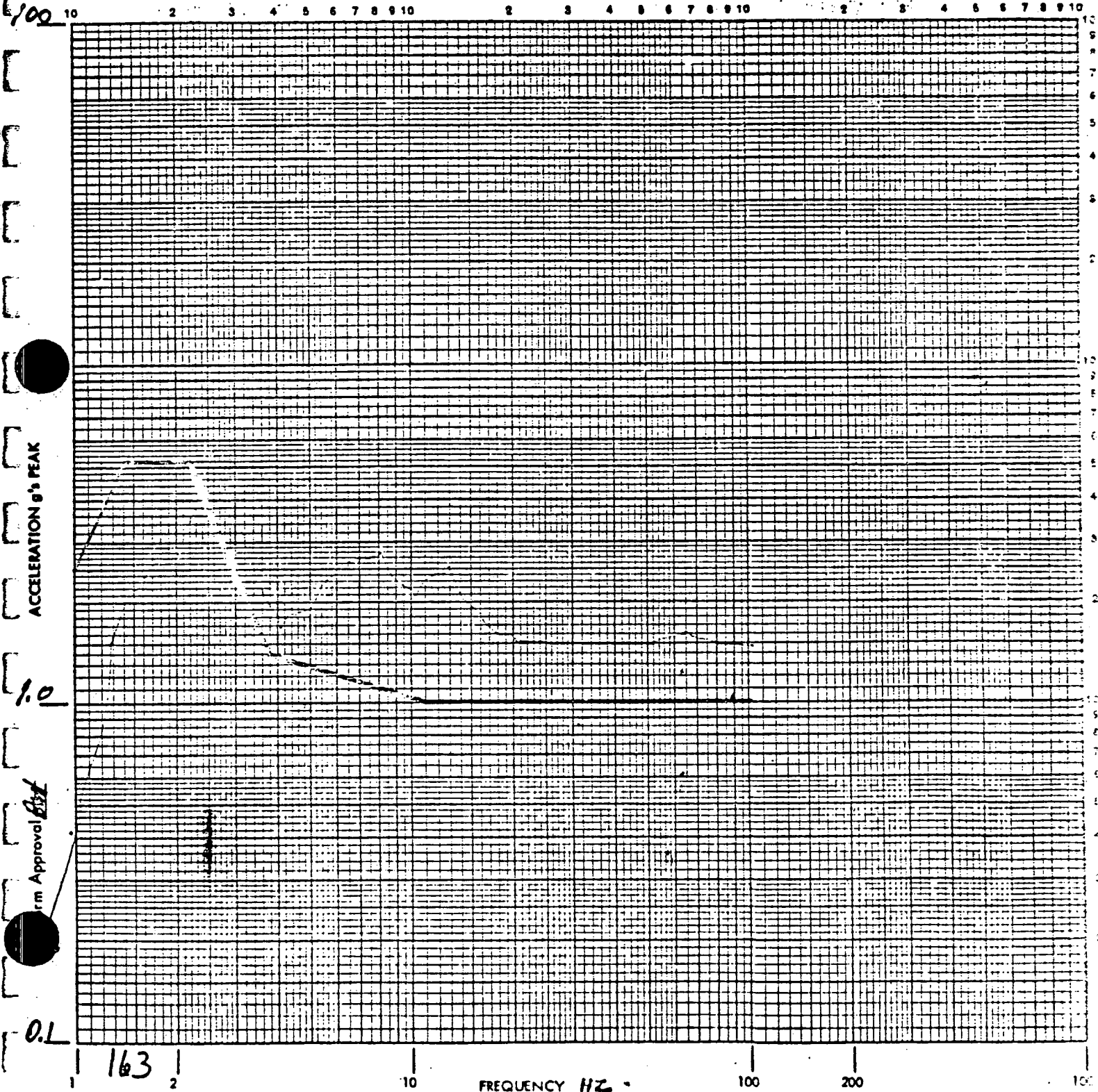
Mode PRIMARY Specimen CONTROL PANEL

Operator K. NO. 11 P/N 2CR-58,50,51 (*3)

Date 6-16-76 Polarity + Q 5% Axis of Test X-Y

HORIZONTAL RESPONSE SPECTRA

2.5 HZ. OUT ϕ



WYLE LABORATORIES

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Customer JELCO Job No. 54498

Page No. 29 3

Channel Identification: T/R 1 Trk. No. 2

Accel. No. 2

Transducer S/N 1034 Control (X)

Response ()

Full Scale 100 G Cal Voltage 500 MVPK/ 1.0 G

Mode PRIMARY

Specimen CONTROL PANEL

Operator KNO11

P/N 2CR-53, 50, 51

Date 6-16-71 Polarity + 0.5%

Axis of Test X-Y

VERTICAL RESPONSE SPECTRA

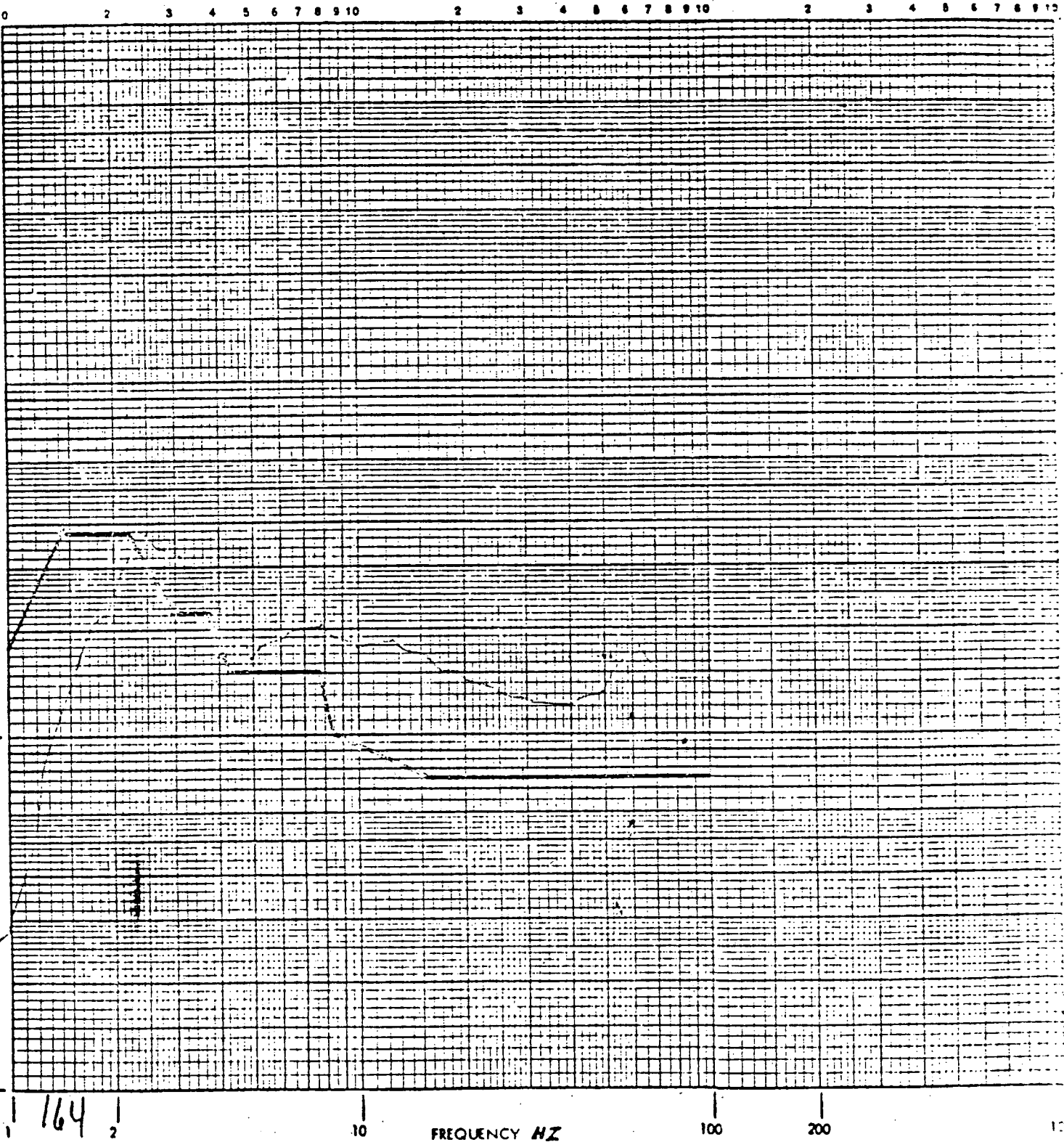
2.5 HZ. OUT

ACCELERATION g's PEAK

1.0

Form Approval [Signature]

0.1



WYLE LABORATORIES

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Customer JELCO Job No. 54498

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Channel Identification: T/R 1 Trk. No. 1 Accel. No. 1

Transducer S/N 1171 Control (X) Response ()

Full Scale 100 G Cal Voltage 500 MHPK/ 1.0 G

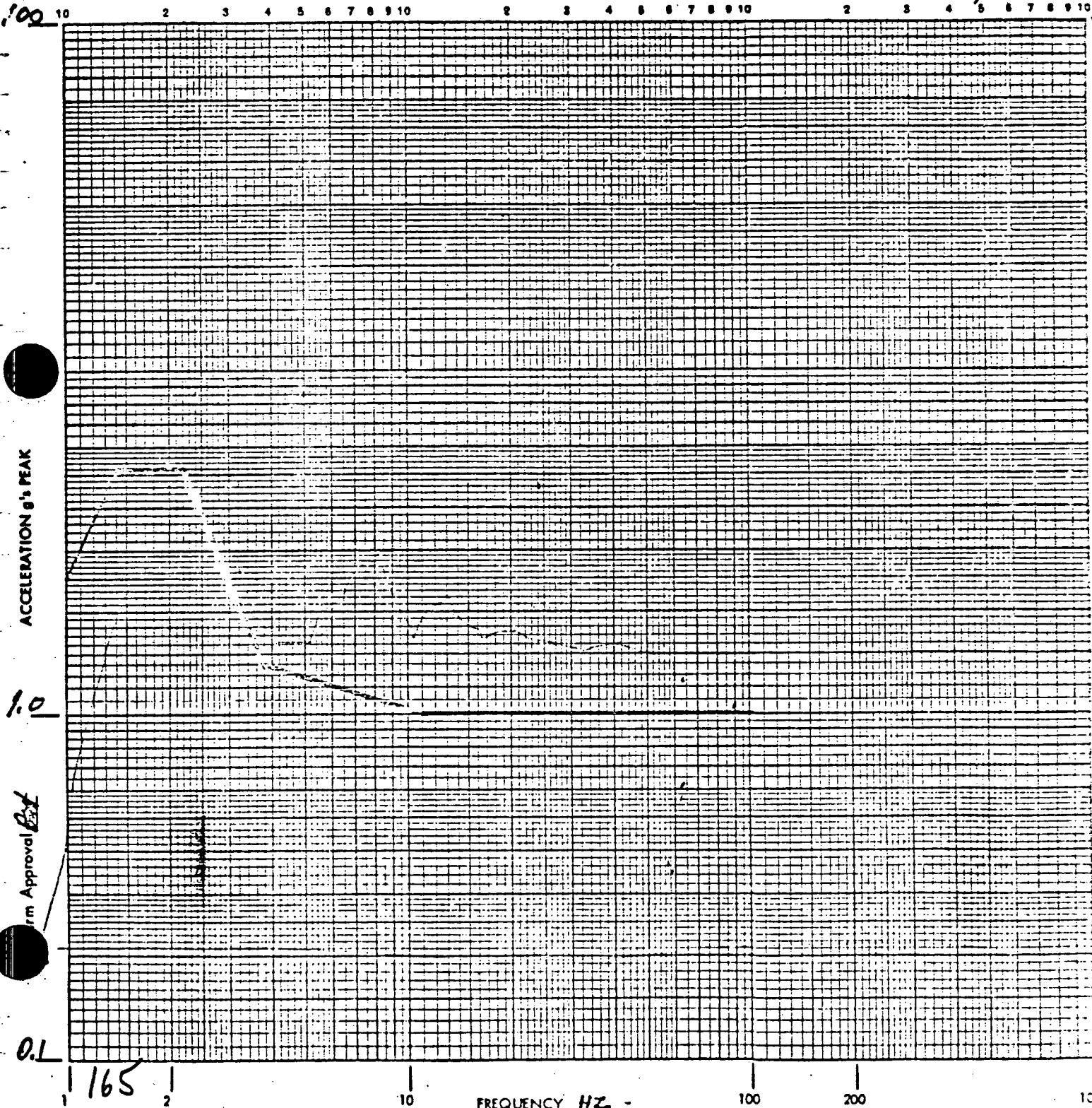
Mode PRIMARY Specimen CONTROL PANEL

Operator Kna11 P/N 2CR-58,50,51 (*3)

Date 6-16-76 Polarity + Q 5% Axis of Test X-Y

HORIZONTAL RESPONSE SPECTRA

25Hz. in ϕ



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Customer JELCO Job No. 54498

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Channel Identification: T/R 1 Trk. No. 2

Accel. No. 2

Transducer S/N 1034 Control (X),

Response ()

Full Scale 100 G Cal Voltage 500 MvPK/ 1.0 G

Mode PRIMARY

Specimen CONTROL PANEL

Operator KNO

P/N 2CR-58, 50, 51

Date 6-16-76 Polarity + Q 5%

Axis of Test X-Y

VERTICAL RESPONSE SPECTRA

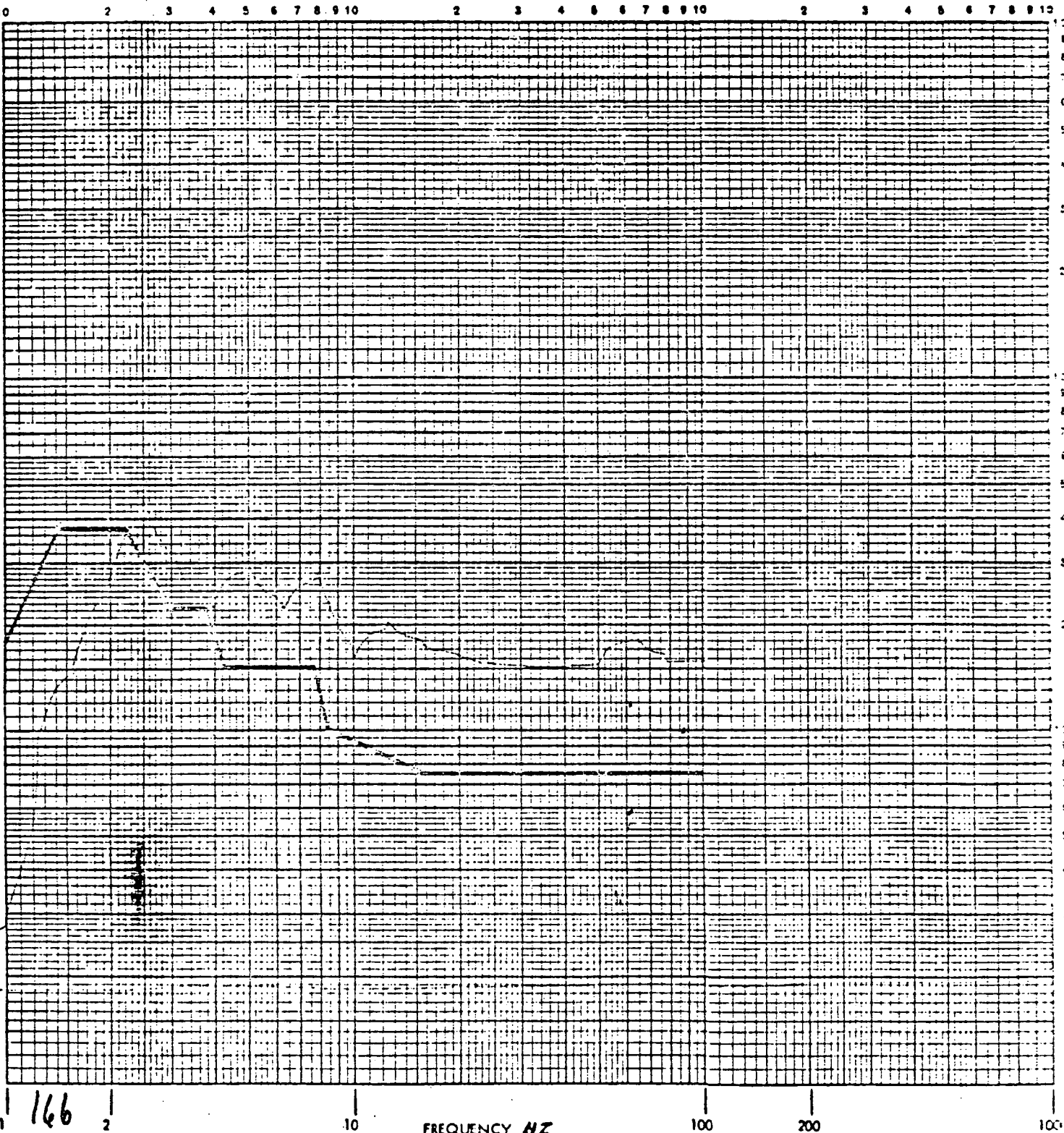
2.5 Hz. in ϕ

ACCELERATION g's PEAK

1.0

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0.1



WYLE LABORATORIES

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Customer JELCO Job No. 54498

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Channel Identification: T/R 1 Trk. No. 1 Accel. No. 1

Transducer S/N 1171 Control (X) Response ()

Full Scale 100 G Cal Voltage 500 MvPK/ 1.0 G

Operator K2011 Mode PRIMARY Specimen CONTROL PANEL

Date 6-18-76 P/N 2CR-58,50,51 (*3)

Date 6-18-76 Polarity + Q 5% Axis of Test Z-Y

HORIZONTAL RESPONSE SPECTRA

1.25 Hz. IN

ACCELERATION g's PEAK

1.0

Approval Det

0.1

167

FREQUENCY HZ.

100

200

WYLE LABORATORIES

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Customer JELCO Job No. 54498

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Channel Identification: T/R 1 Trk. No. 2 Accel. No. 2

Transducer S/N 1034 Control (X), Response ()

Full Scale 100 G Cal Voltage 500 MVPK/ 1.0 G

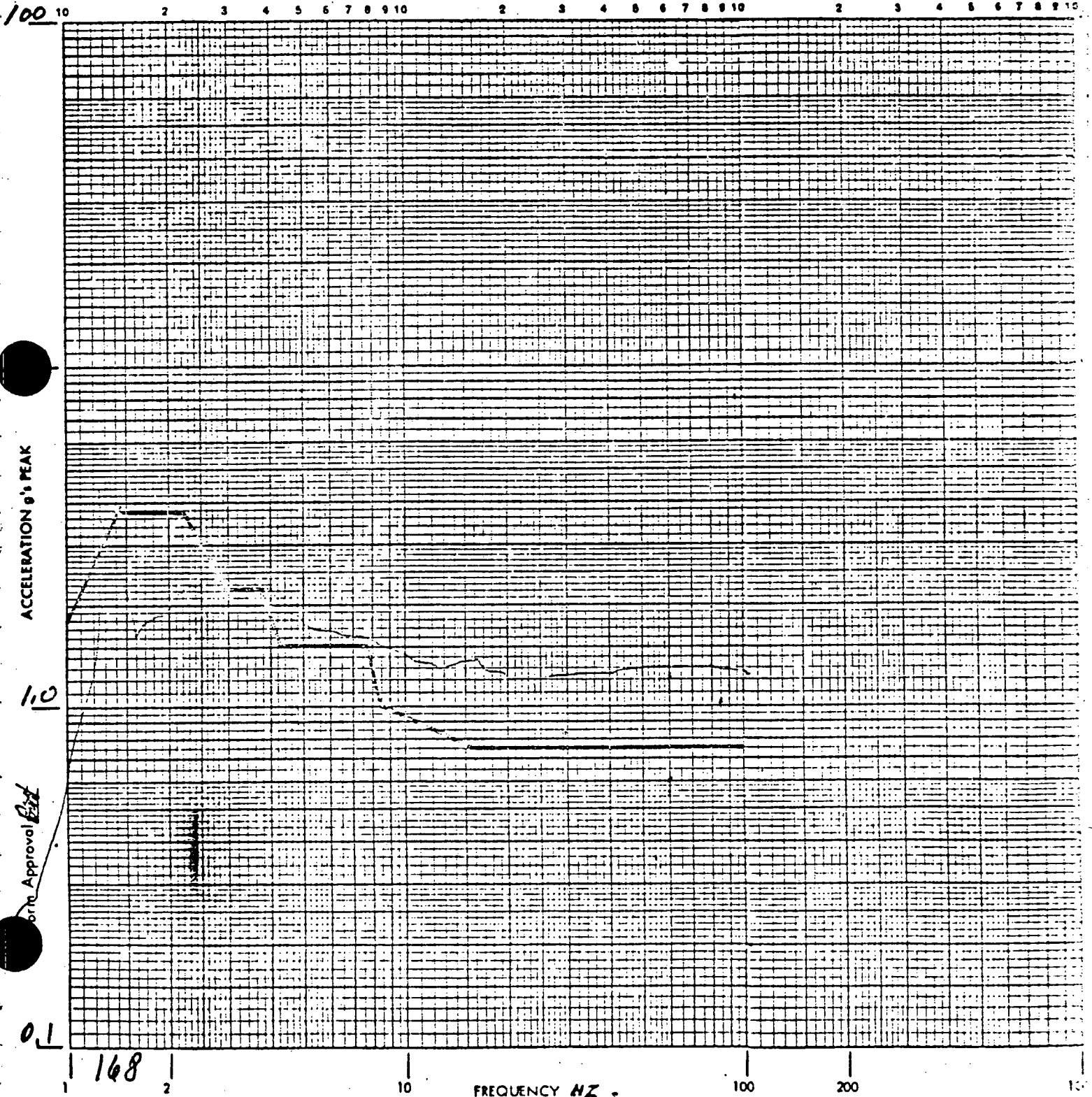
Mode PRIMARY Specimen CONTROL PANEL

Operator KNO 11 P/N 2CR-58, 50, 51

Date 6-18-76 Polarity + Q 5% Axis of Test Z-Y

1.25 Hz in ϕ

VERTICAL RESPONSE SPECTRA



Site Approval East

WYLE LABORATORIES

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Customer JELCO Job No. 54498

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Channel Identification: T/R 1 Trk. No. 1 Accel. No. 1

Transducer S/N 1171 Control 001 Response ()

Full Scale 100 G Cal Voltage 500 MVPK/ 1.0 G

Mode PRIMARY Specimen CONTROL PANEL

Operator Kno'' P/N 2CR-58,50,51 (*3)

Date 6-18-76 Polarity + Q 5% Axis of Test Z-Y

HORIZONTAL RESPONSE SPECTRA

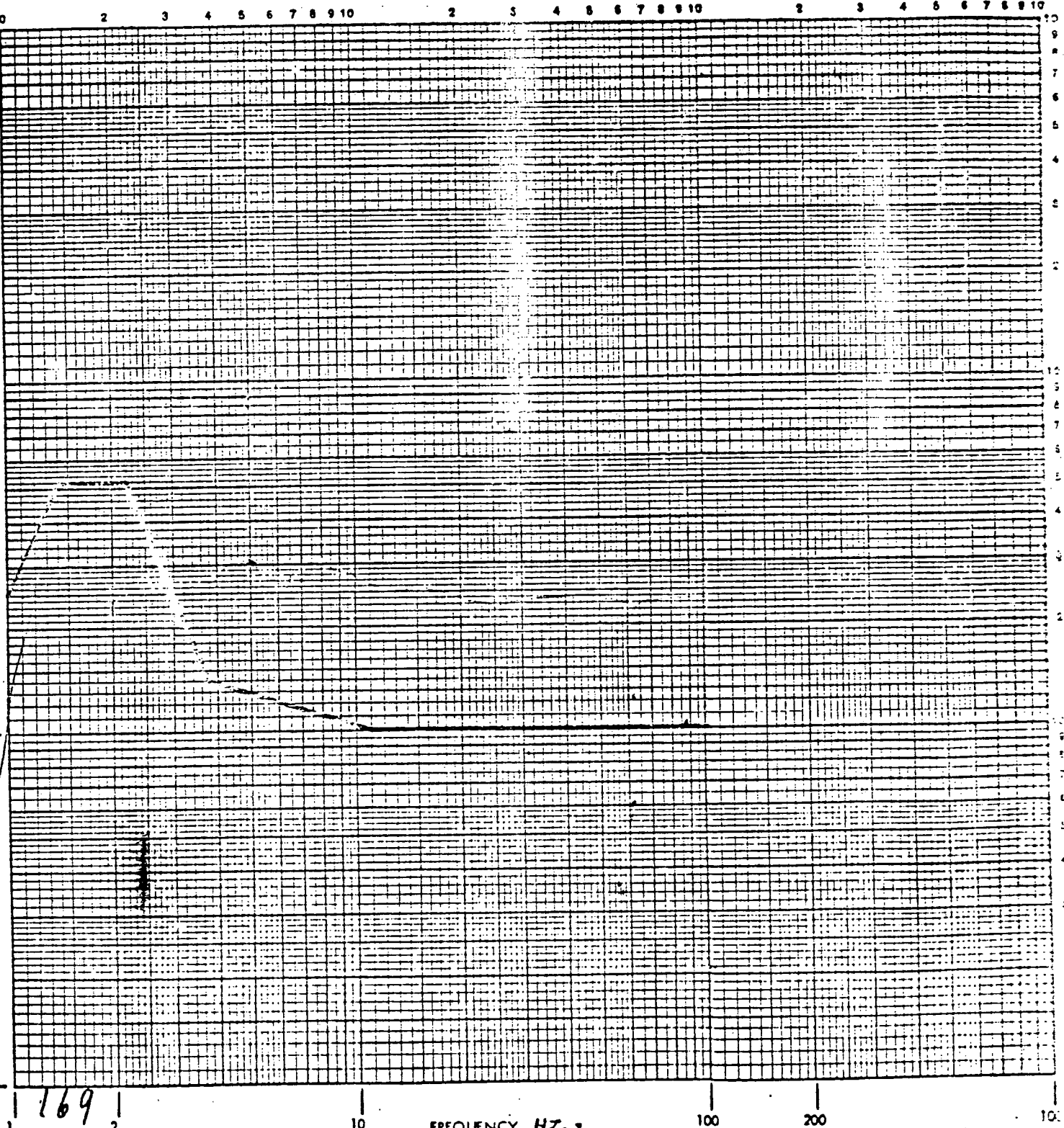
1.25 Hz. CAT Ø

ACCELERATION g's PEAK

1.0

in Approval Det

0.1



WYLE LABORATORIES

Report No. 54498-1

Customer JELCO Job No. 54498

Page No. 35

Channel Identification: T/R 1 Trk. No. 2 Accel. No. 2

Transducer S/N 1034 Control (X), Response ()

Full Scale 100 G Cal Voltage 500 MVPK/ 1.0 G

Mode PRIMARY Specimen CONTROL PANEL

Operator RN 11 P/N 2CR-58, 50, 51

Date 6-18-74 Polarity + Q 5% Axis of Test Z-Y

VERTICAL RESPONSE SPECTRA

1.25 Hz OUT

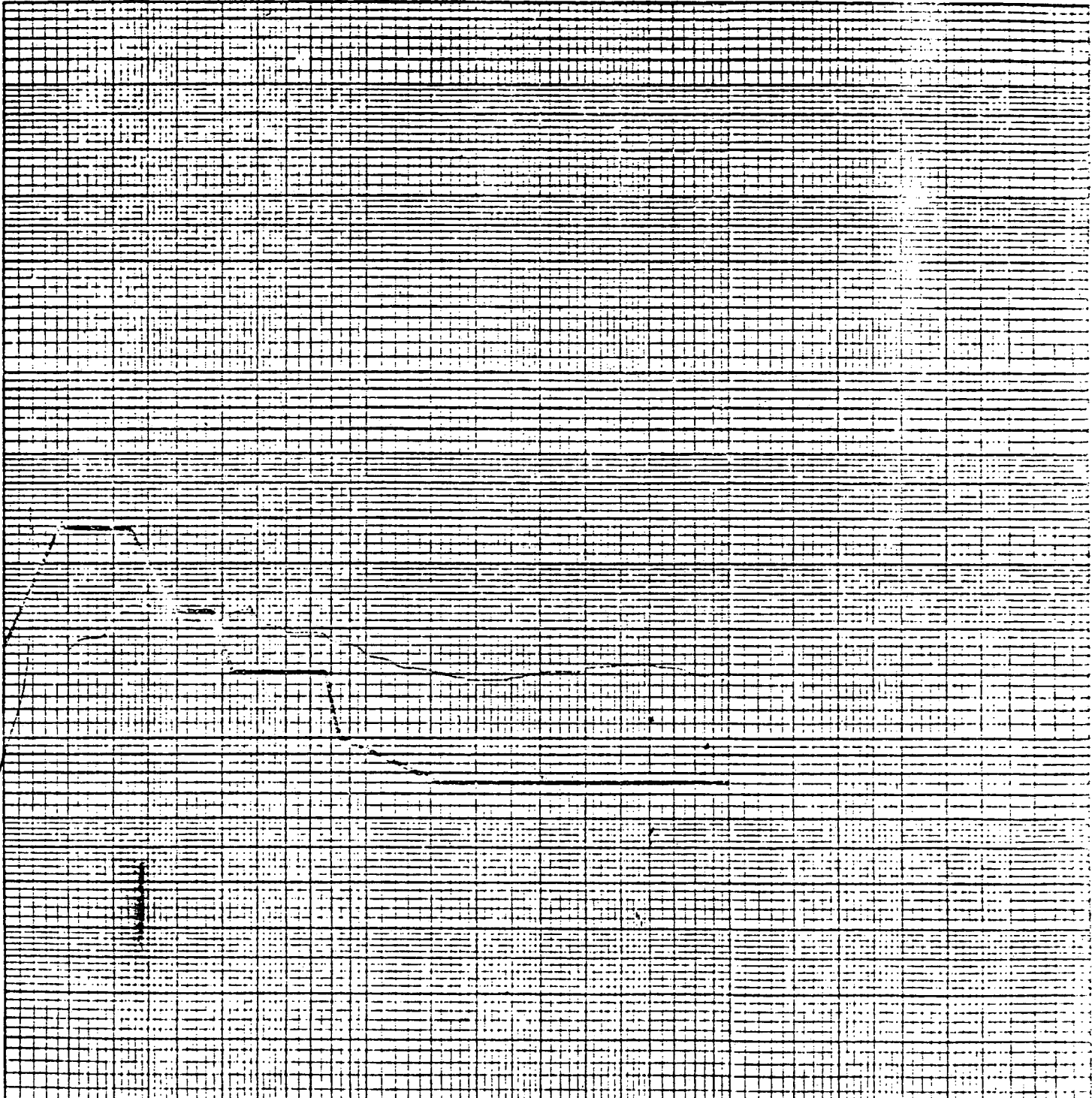
100 10 2 3 4 5 6 7 8 9 10 2 3 4 5 6 7 8 9 10 2 3 4 5 6 7 8 9 10

ACCELERATION g's PEAK

1.0

0.1

Form Approval *[Signature]*



170

FREQUENCY HZ

100

200

1000

WYLE LABORATORIES

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Customer JELCO Job No. 54498

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Channel Identification: T/R 1 Trk. No. 1 Accel. No. 1

Transducer S/N 1171 Control (X) Response ()

Full Scale 100 G Cal Voltage 500 MVPK/ 1.0 G

Mode PRIMARY Specimen CONTROL PANEL

Operator KWB 11 P/N 2CR-58,50,51 (#3)

Date 6-18-76 Polarity + Q 5% Axis of Test Z-Y

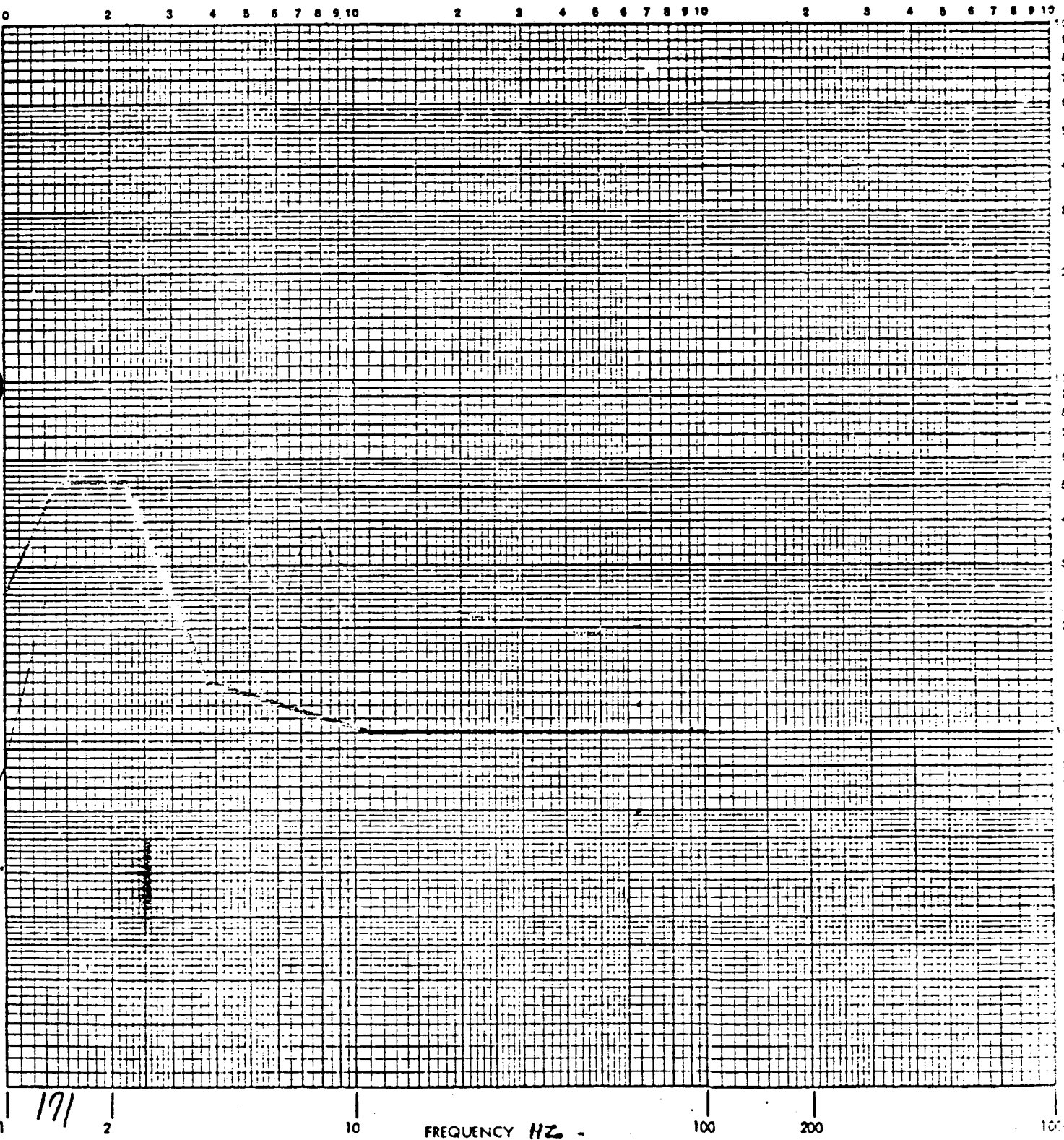
HORIZONTAL RESPONSE SPECTRA

1.6 HZ. OUT

ACCELERATION g's PEAK

1.0

0.1



FREQUENCY HZ

WYLE LABORATORIES

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Channel Identification: T/R 1 Trk. No. 2 Accel. No. 2

Transducer S/N 1034 Control (X), Response ()

Full Scale 100 G Cal Voltage 500 MVPK/ 1.0 G

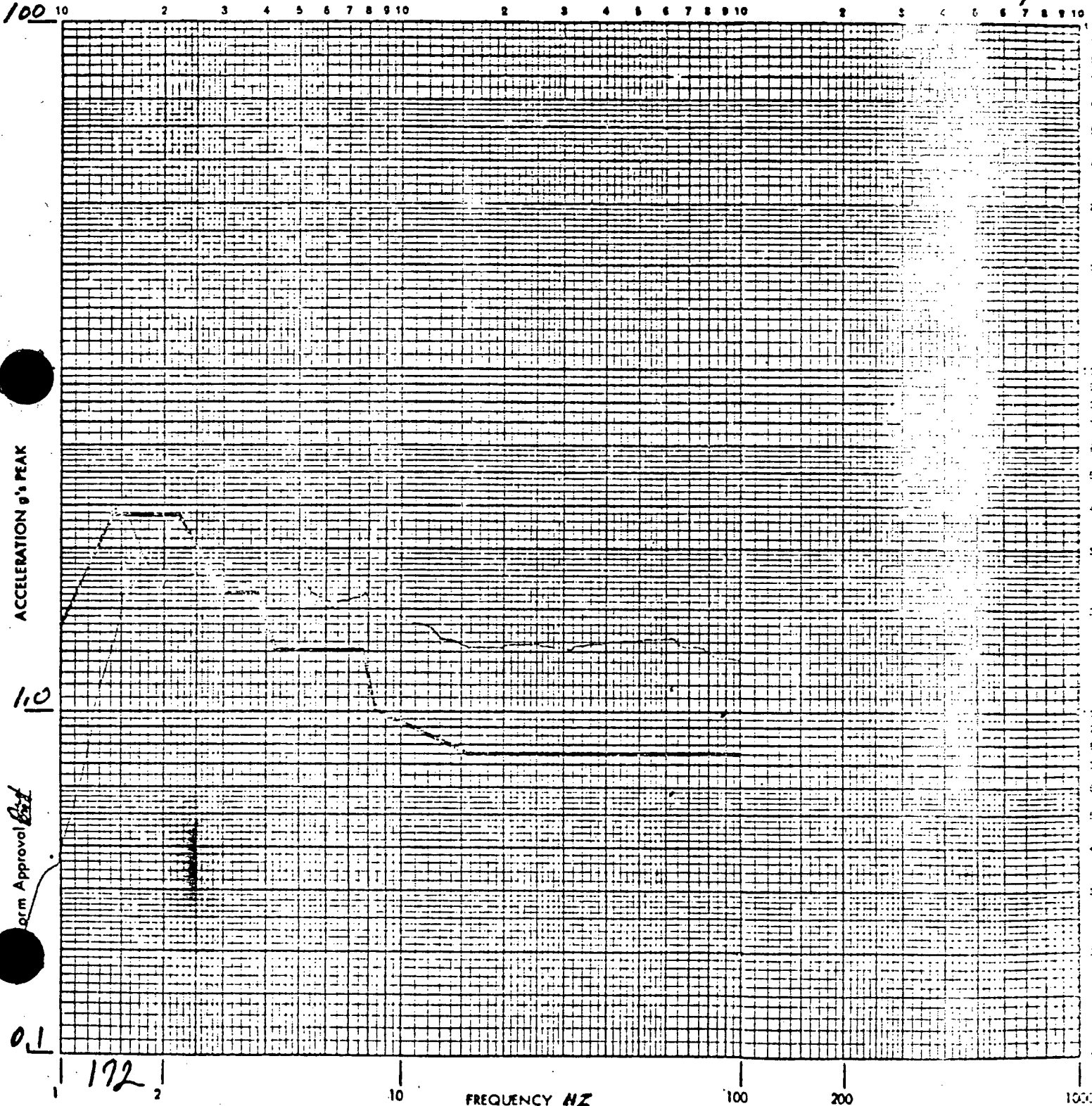
Mode PRIMARY Specimen CONTROL PANEL

Operator R. No. 11 P/N 2CR-58, 50, 51

Date 6-18-76 Polarity + Q 570 Axis of Test Z-Y

VERTICAL RESPONSE SPECTRA

1.6 HZ. OUT Ø



WYLE LABORATORIES

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Customer JELCO Job No. 54498

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Channel Identification: T/R 1 Trk. No. 1 Accel. No. 1

Transducer S/N 1171 Control (X) Response ()

Full Scale 100 G Cal Voltage 500 MVPK/ 1.0 G

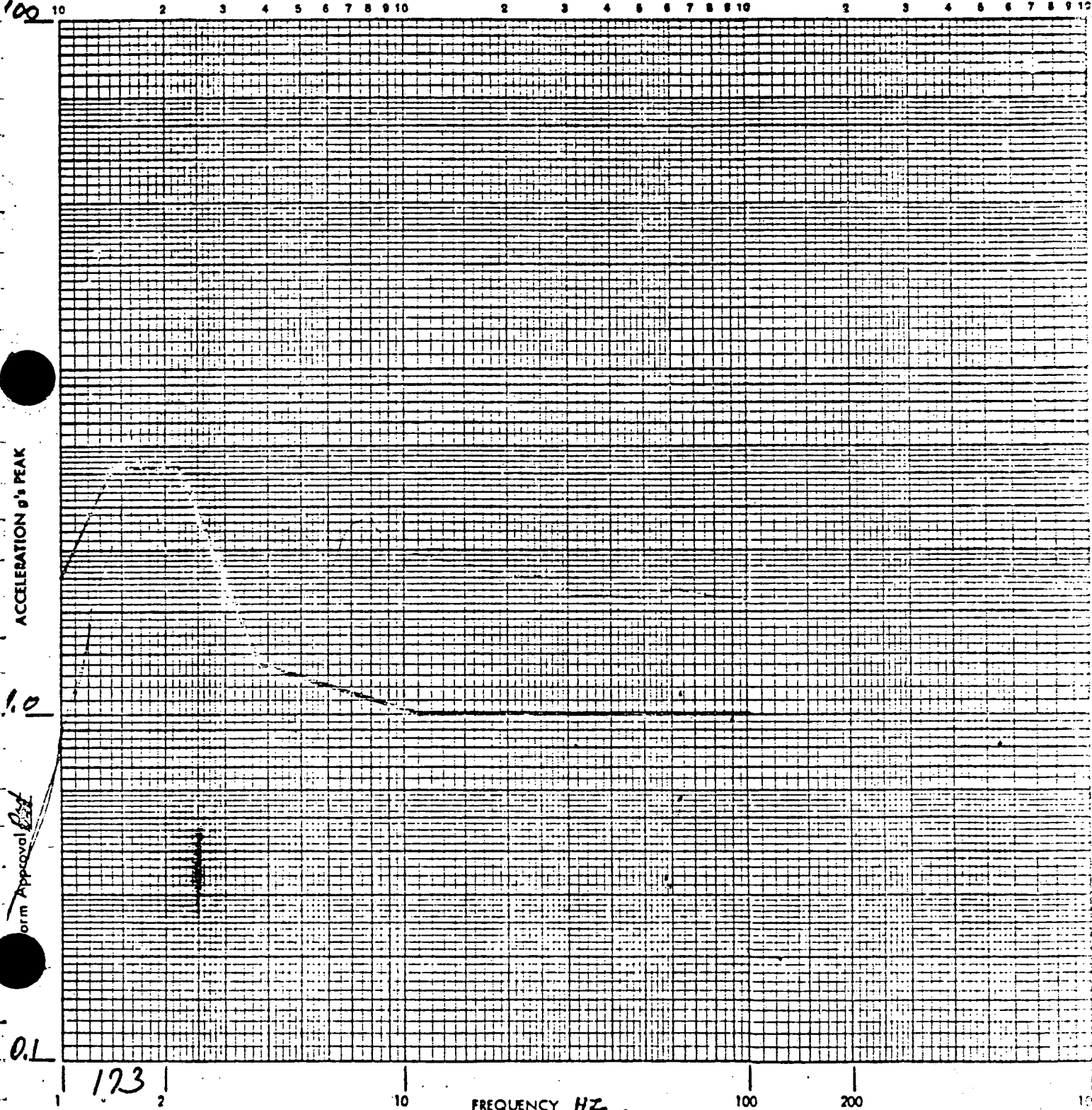
Mode PRIMARY Specimen CONTROL PANEL

Operator RNO 11 P/N 2CR-58,50,51 (#3)

Date 6-18-76 Polarity + Q 5% Axis of Test Z-Y

HORIZONTAL RESPONSE SPECTRA

1.6 Hz in 0



WYLE LABORATORIES

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Customer JELCO Job No. 54498

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Channel Identification: T/R 1 Trk. No. 2 Accel. No. 2

Transducer S/N _____ Control (X), Response ()

Full Scale 100 G Cal Voltage 500 MvPK/ 1.0 G

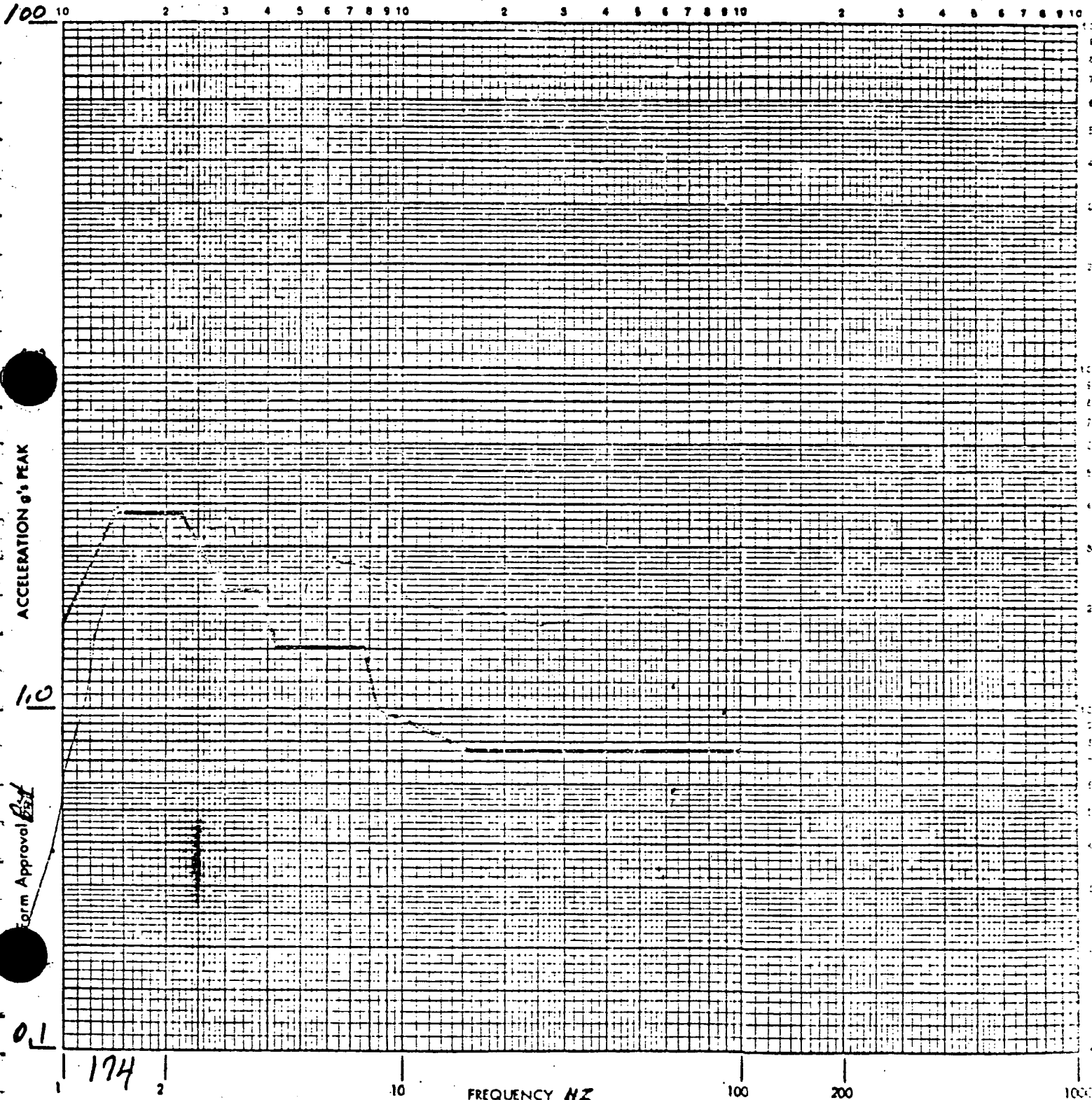
Mode PRIMARY Specimen CONTROL PANEL

Operator _____ P/N 2CR-58, 50, 51 (2)

Date _____ Polarity + 0.5% Axis of Test Z.Y.

VERTICAL RESPONSE SPECTRA

1.6HR. IN Ø



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WYLE LABORATORIES

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Customer JELCO Job No. 54498

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Channel Identification: T/R 1 Trk. No. 1 Accel. No. 1

Transducer S/N 1171 Control 001 Response ()

Full Scale 100 G Cal Voltage 500 MVPK/ 1.0 G

Mode PRIMARY Specimen CONTROL PANEL

Operator KNO P/N 2CR-53,50,51 (#3)

Date 6-18-76 Polarity + Q 5% Axis of Test Z-Y

HORIZONTAL RESPONSE SPECTRA

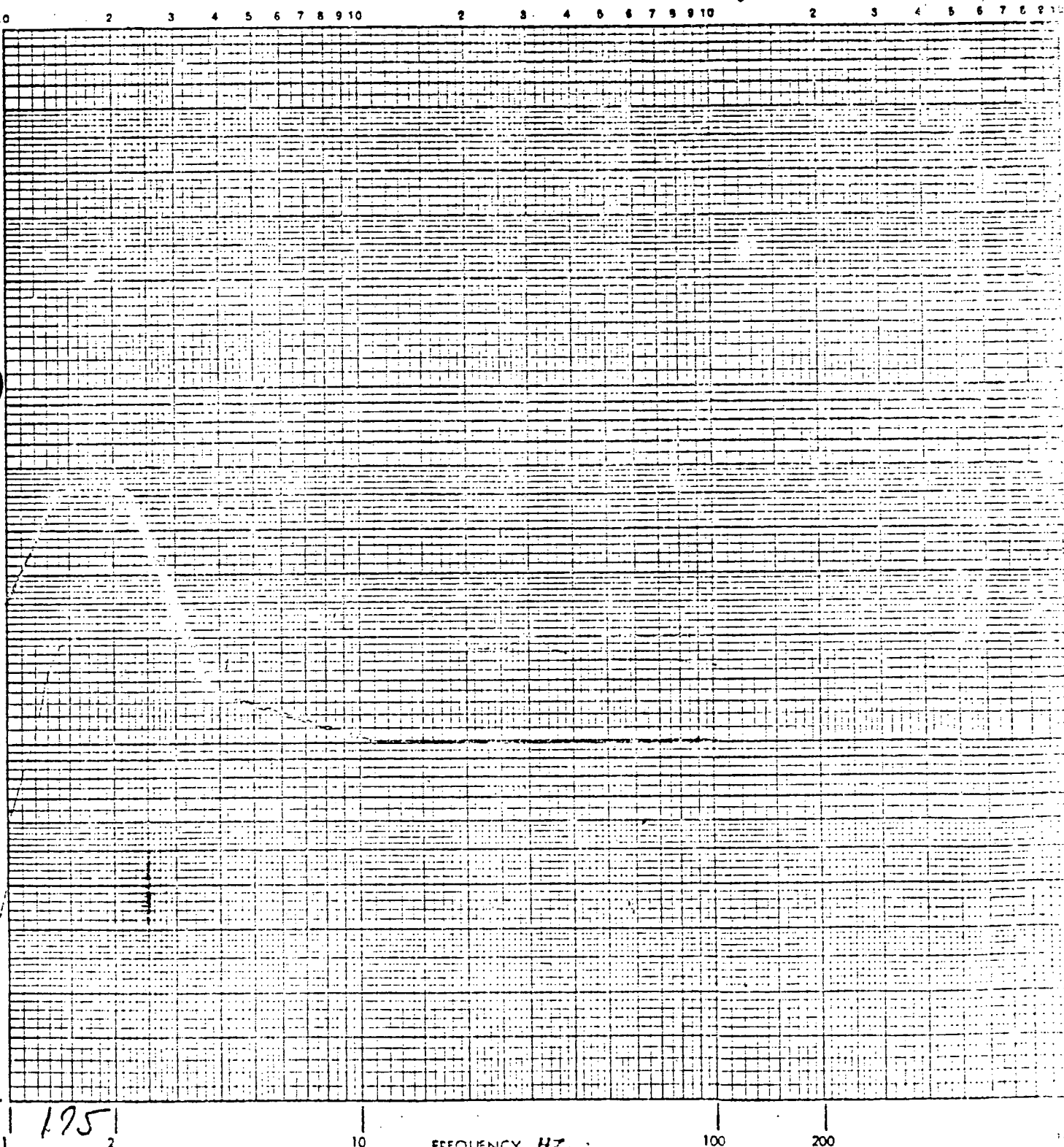
2.0 Hz. IN P

ACCELERATION g's PEAK

1.0

m Approval [Signature]

0.1



WYLE LABORATORIES

Report No. _____

Customer JELCO Job No. 54498

Page No. _____

Channel Identification: T/R 1 Trk. No. 2

Accel. No. _____

Transducer S/N 1034 Control (X),

Response ()

Full Scale 100 G Cal Voltage 500 MVRK/ 1.0 G

Mode PRIMARY

Specimen CONTROL PANEL

Operator KG NO 11

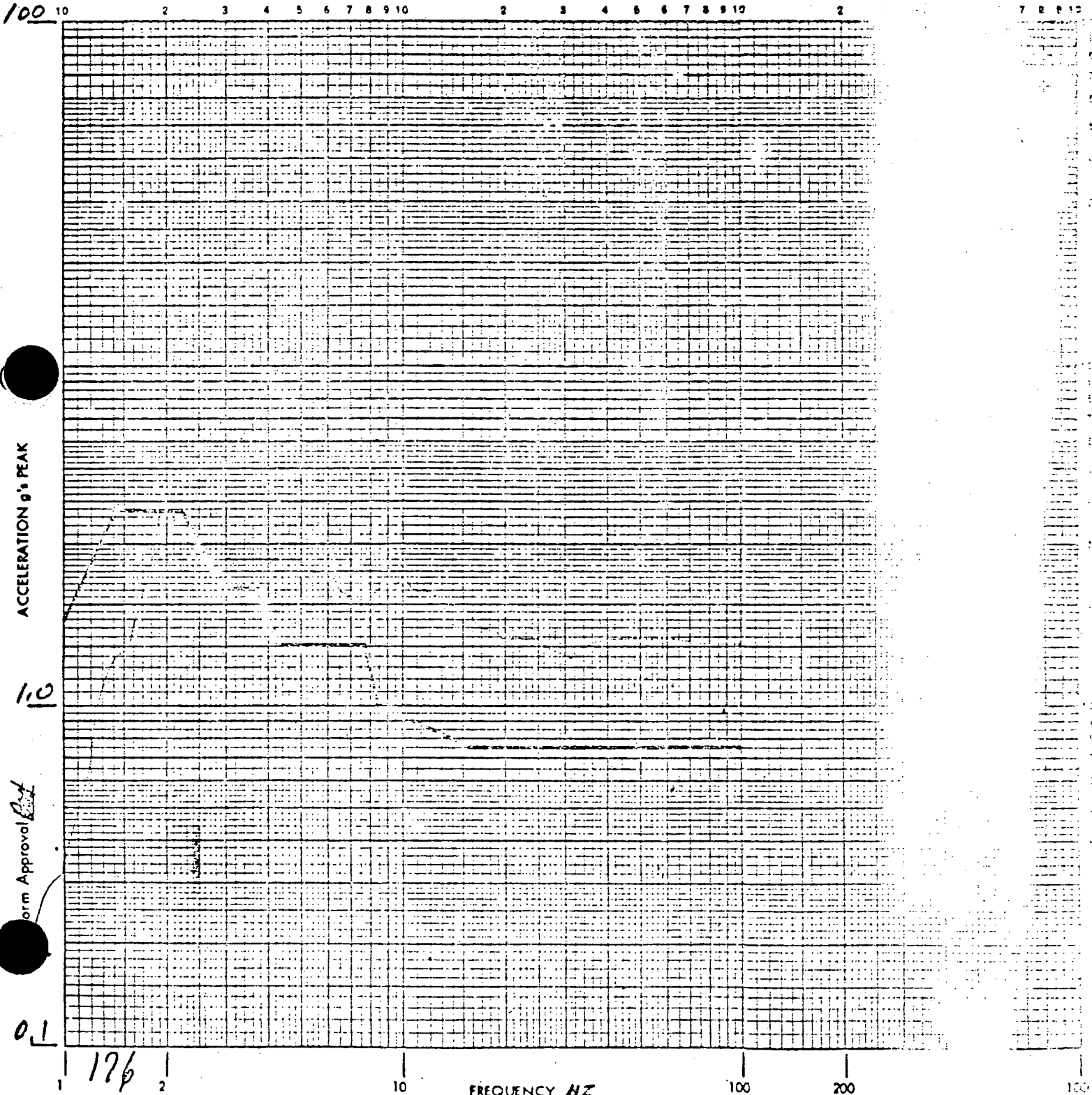
P/N 200-71 51

Date 6-18-76 Polarity + Q 5%

Axis of Test Z

VERTICAL RESPONSE SPECTRA

2.0 HZ



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WYLE LABORATORIES

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Customer JELCO Job No. 54498

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Channel Identification: T/R 1 Trk. No. 1 Accel. No. 1

Transducer S/N 1171 Control (X) Response ()

Full Scale 100 G Cal Voltage 500 MVPK/ 1.0 G

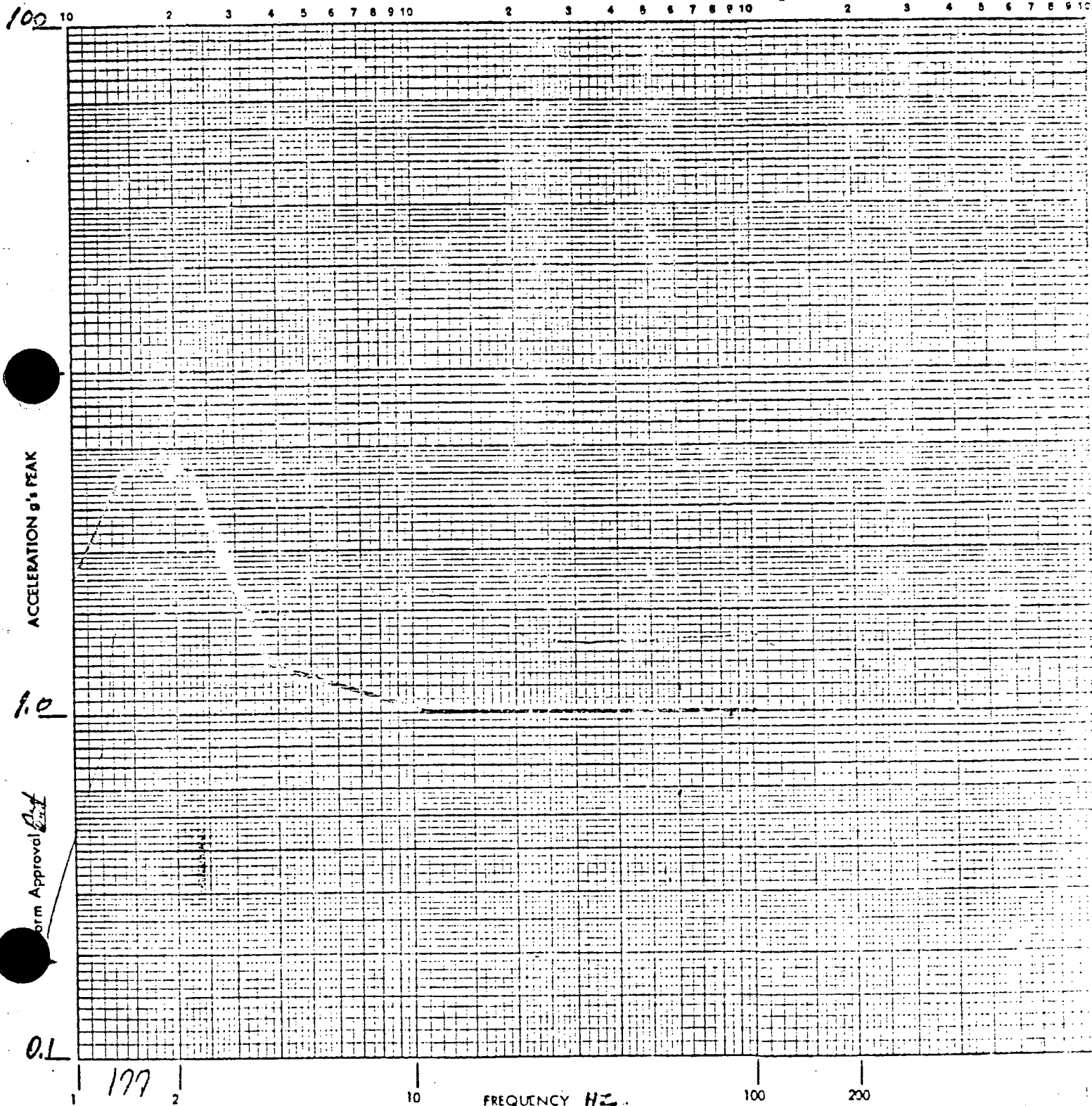
Mode PRIMARY Specimen CONTROL PANEL

Operator KJH P/N 2CR-53,50,51 (43)

Date 6-18-76 Polarity + Q 5% Axis of Test Z-Y

HORIZONTAL RESPONSE SPECTRA

2.0 Hz. OUT



ACCELERATION g's PEAK

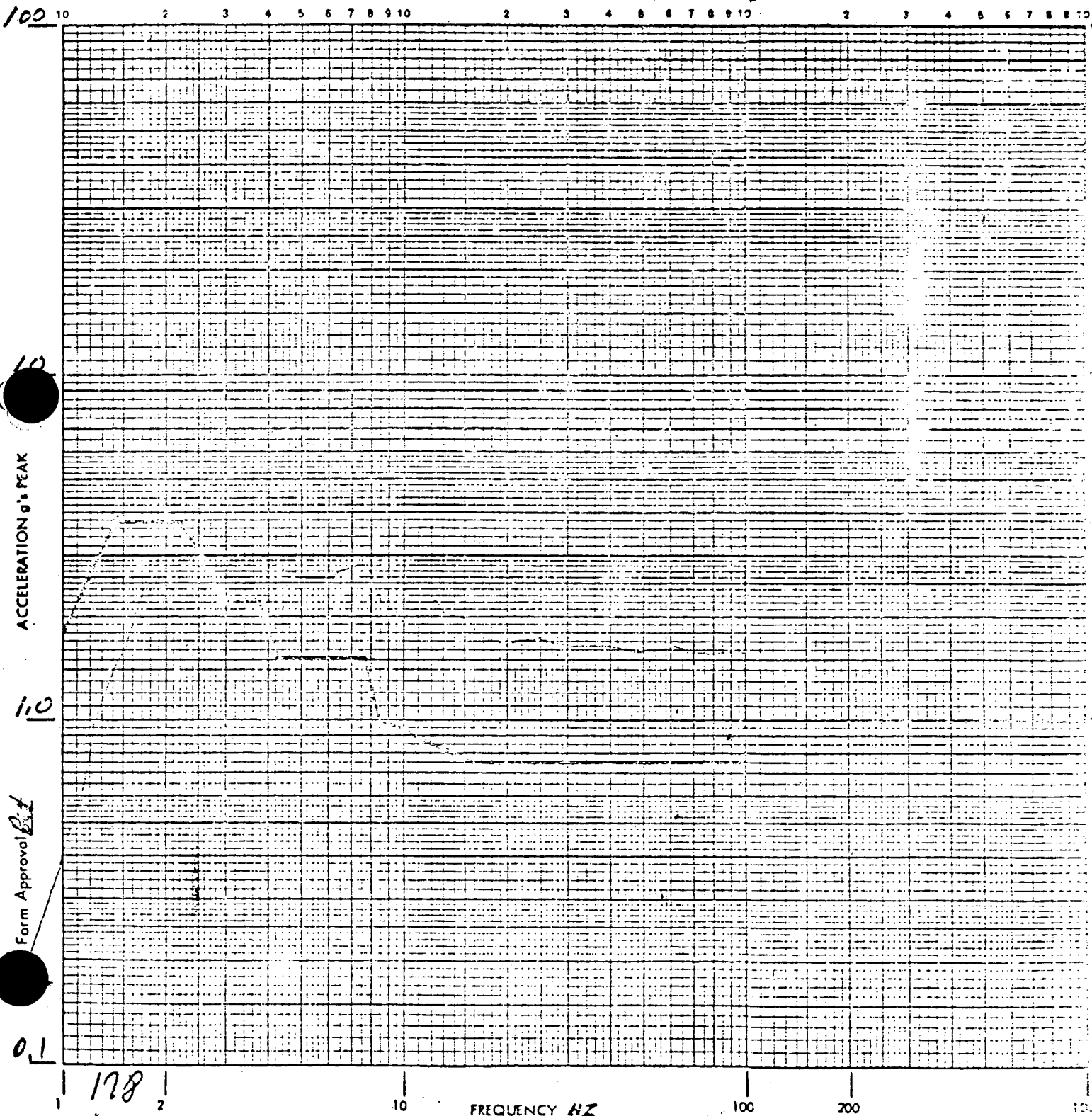
Form Approval Out

Customer JELCO Job No. 54498Page No. 43Channel Identification: T/R 1 Trk. No. 2Accel. No. 2Transducer S/N 1034 Control (X),

Response ()

Full Scale 100 G Cal Voltage 500 MHPK/ 1.0 GMode PRIMARYSpecimen CONTROL PANELOperator KMOVP/N 2CR-58, 50, 51Date 6-18-76 Polarity + Q 5%Axis of Test Z-Y

VERTICAL RESPONSE SPECTRA

2.0 HZ. OUT

WYLE LABORATORIES

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Customer JELCO Job No. 54498

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Channel Identification: T/R 1 Trk. No. 1 Accel. No. 1

Transducer S/N 1171 Control 001 Response ()

Full Scale 100 G Cal Voltage 500 MVPK/ 1.0 G

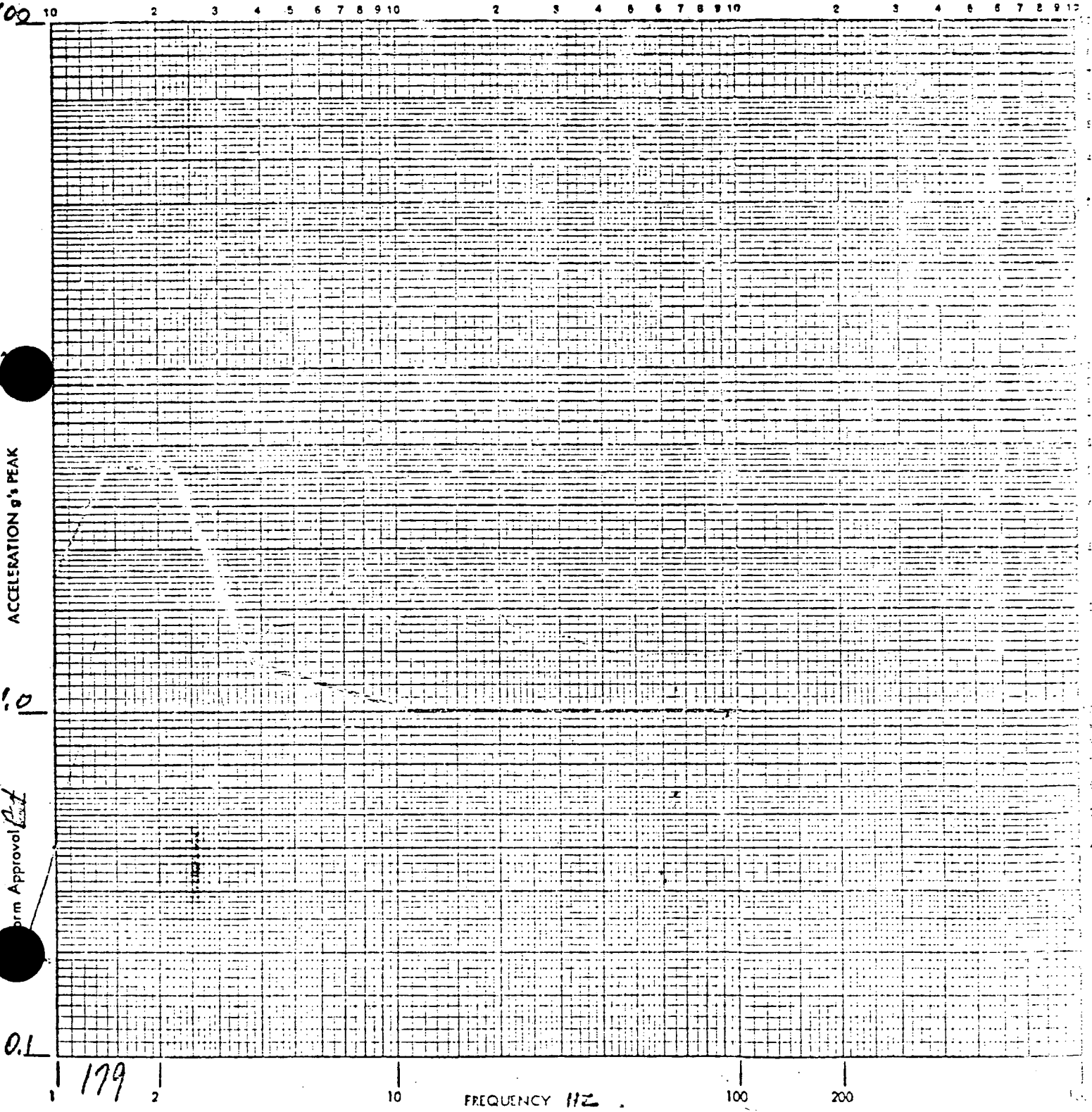
Mode PRIMARY Specimen CONTROL PANEL

Operator KNO P/N 2CR-50,50,51 (#3)

Date 6-18-76 Polarity + Q 5% Axis of Test Z-Y

HORIZONTAL RESPONSE SPECTRA

2.5HZ. CUT



ACCELERATION g's PEAK

FORM APPROVAL

FREQUENCY HZ

WYLE LABORATORIES

Report No. 54498-1

Customer JELCO Job No. 54498

Page No. 45

Channel Identification: T/R 1 Trk. No. 2

Accel. No. 2

Transducer S/N 1034 Control (X),

Response ()

Full Scale 100 G Cal Voltage 500 MVPK/ 1.0 G

Mode PRIMARY

Specimen CONTROL PANEL

Operator KNOX

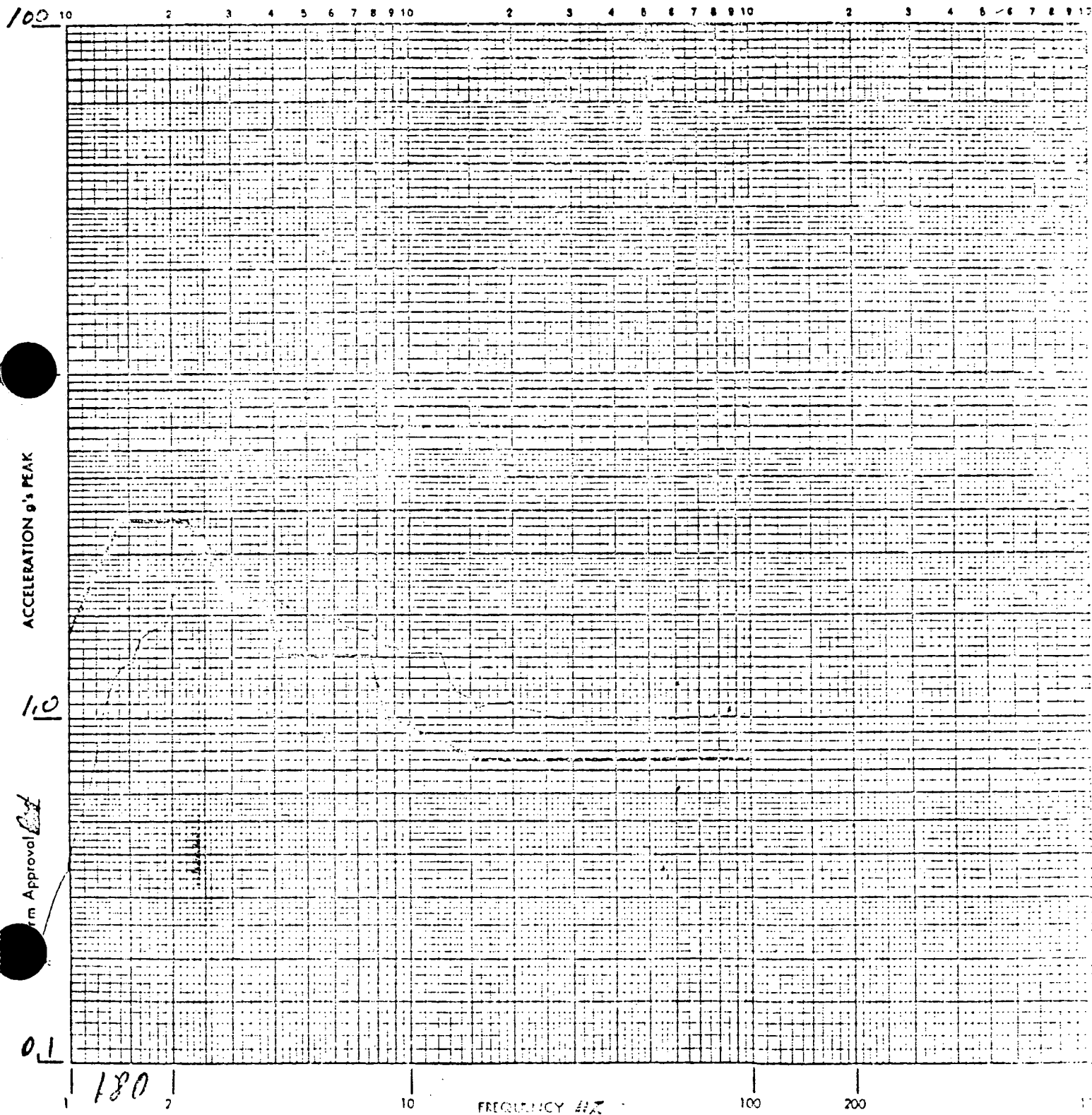
P/N 2CR-58, 50, 51

Date 6-18-76 Polarity + 0 5%

Axis of Test Z-Y

VERTICAL RESPONSE SPECTRA

2.5 Hz. OUT



Form Approval [Signature]

WYLE LABORATORIES

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Customer JELCO Job No. 54498

Page No. 46

Channel Identification: T/R 1 Trk. No. 1 Accel. No. 1

Transducer S/N 1171 Control 00 Response ()

Full Scale 100 G Cal Voltage 500 MVPK/ 1.0 G

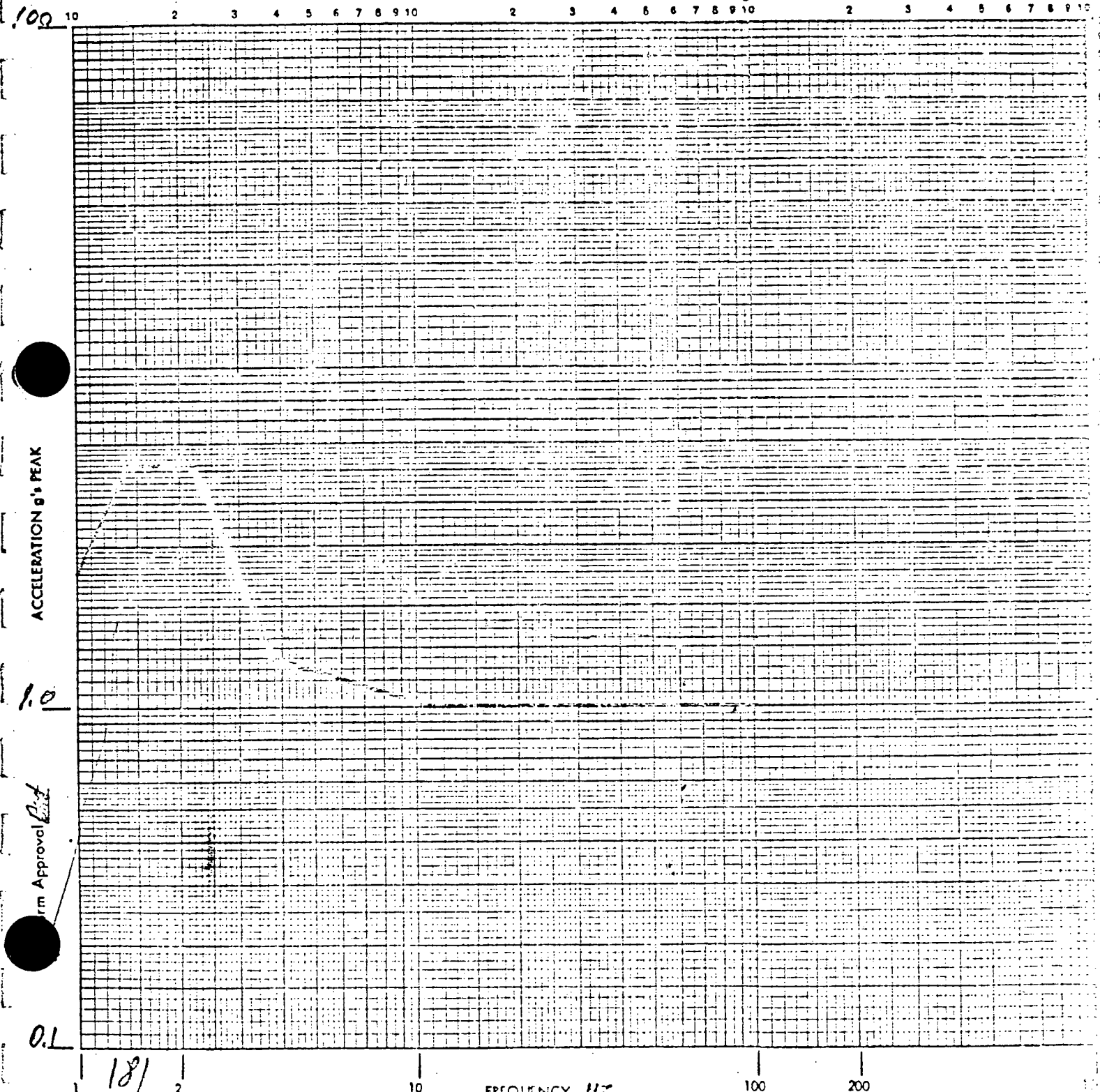
Mode PRIMARY Specimen CONTROL PANEL

Operator KNO P/N 2CR-53,50,51 (93)

Date 6-18-76 Polarity + 0.5% Axis of Test Z-Y

HORIZONTAL RESPONSE SPECTRA

2.5 Hz IN



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WYLE LABORATORIES

Report No. 2-1

Customer JELCO Job No. 54498

Page No. 1

Channel Identification: T/R 1 Trk. No. 2 Accel. No. 1

Transducer S/N 1034 Control (K) 1 Response () 1

Full Scale 100 G Cal Voltage 500 MVRK/ 1.0

Mode PRIMARY Specimen CO

Operator KN 11 P/N 20

Date 6-18-76 Polarity + 0 5% Axis of Test E

VERTICAL RESPONSE SPECTRA

2.5 Hz

100

ACCELERATION g's PEAK

1.0

0.1

Form Approval 182

182

10

FREQUENCY HZ

100

200

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SPECIMEN CONTROL CONSOLE
 CUSTOMER SELCO
 PART NO. 2CR-58,50,51 (43)
 S/N _____

JOB NO. 5449
 DATE 6-18-76
 TEST BY F. KNOLL
 WITNESS _____

WYLE LABORATORIES

TEST: SEISMIC RANDOM & SINE BEAT

EQUIPMENT	MANUFACTURER	MODEL NO.	RANGE	WYLE NO.	CALIBRATION		ACCY.
					LAST	DUE	
EXCITER	TEAM CORP	W 3000	12" DIA 30,000 FORCE LBS	-	-	-	N/A
EXCITER	TEAM CORP	W 1800	10" DIA 15,000 FORCE LBS	-	-	-	N/A
EXCITER	TEAM CORP	W 1800	10" DIA 15,000 FORCE LBS	-	-	-	N/A
SERVO CONTROLLER	McFADDEN	152 A	-	-	PRIOR TO USE	-	N/A
SERVO CONTROLLER	McFADDEN	152 A	-	-	PRIOR TO USE	-	N/A
SERVO CONTROLLER	McFADDEN	152 A	-	-	PRIOR TO USE	-	N/A
AMPLIFIER	McFADDEN	152 A	-	-	PRIOR TO USE	-	N/A
AMPLIFIER	McFADDEN	152 A	-	-	PRIOR TO USE	-	N/A
AMPLIFIER	McFADDEN	152 A	-	-	PRIOR TO USE	-	N/A
SHOCK SPECTRUM ANALYZER	SPECTRAC DYNAMICS	13231	120 CHANNEL	7530	SYSTEM CALIBRATION		NF6. SPEC.
SPECTRUM SHAPER	BRUEL KJØER	123	12.5 TO 40 KHZ	31337	PRIOR TO	USE	N/A
SPECTRUM SHAPER	BRUEL KJØER	123	12.5 TO 40 KHZ	31570	PRIOR TO	USE	N/A
EQUAIZER SHAPER	TRACOR	822	1.25 TO 10 HZ	31534	PRIOR TO	USE	N/A
EQUAIZER SHAPER	TRACOR	822	1.25 TO 10 HZ	31574	PRIOR TO	USE	N/A
X-Y RECORDER	HENLETT PACHARD	7005B	X = 30"/SEC Y = 20"/SEC	50889	PRIOR TO	USE	NF6. SPEC.
OSCILLOSCOPE	HENLETT PACHARD	122 AR	DUAL TRACE	30226	5-17-76	11-21-76	±5%
ELECTRONIC VOLTMEETER	BRUEL KJØER	2416	0.01 TO 100 VOLTS	6356	3-29-76	8-1-76	±4% AVG

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SPECIMEN CONTROL CONSOLE
 CUSTOMER JELCO
 PART NO. 2CR-58,50,51 (#5)
 S/N _____

JOB NO. 54490
 DATE 6-18-76
 TEST BY P. KROLL
 WITNESS _____

WYLE LABORATORIES

TEST: SEISMIC RANDOM & SINE BEAT

EQUIPMENT	MANUFACTURER	MODEL NO.	RANGE	WYLE NO.	CALIBRATION		ACCY.
					LAST	DUE	
SWEEP OSCILLATOR	S.D.	164A-5	.005-50KHZ.	99987	2-19-76	8-22-76	$\pm 2\%$
SERVO MONITOR	S.D.	105A	—	31306	PRIOR TO USE		N/A
ACCELEROMETER	UNIVOLTZ DICKIE	75D21	0-2000 HZ.	7567	4-9-76	7-9-76	$\pm 2\%$
ACCELEROMETER	UNIVOLTZ DICKIE	75D21	0-2000 HZ.	7571	5-17-76	8-17-76	$\pm 2\%$
ACCELEROMETER	UNIVOLTZ DICKIE	75D21	0-2000 HZ.	7144	6-10-76	9-10-76	$\pm 2\%$
ACCELEROMETER	UNIVOLTZ DICKIE	75D21	0-2000 HZ.	7360	4-14-76	7-14-76	$\pm 2\%$
ACCELEROMETER	UNIVOLTZ DICKIE	75D21	0-2000 HZ.	7320	6-15-76	9-15-76	$\pm 2\%$
ACCELEROMETER	UNIVOLTZ DICKIE	75D21	0-2000 HZ.	7377	6-15-76	9-15-76	$\pm 2\%$
ACCELEROMETER	UNIVOLTZ DICKIE	75D21	0-2000 HZ.	7398	6-15-76	9-15-76	$\pm 2\%$
ACCELEROMETER	UNIVOLTZ DICKIE	75D21	0-2000 HZ.	7566	4-13-76	7-13-76	$\pm 2\%$
ACCELEROMETER	UNIVOLTZ DICKIE	75D21	0-2000 HZ.	7523	6-15-76	9-15-76	$\pm 2\%$
ACCELEROMETER	UNIVOLTZ DICKIE	75D21	0-2000 HZ.	7572	6-15-76	9-15-76	$\pm 2\%$
ACCELEROMETER	UNIVOLTZ DICKIE	75D21	0-2000 HZ.	7300	6-15-76	9-15-76	$\pm 2\%$
ACCELEROMETER	UNIVOLTZ DICKIE	75D21	0-2000 HZ.	7559	4-27-76	7-27-76	$\pm 2\%$
ACCELEROMETER	UNIVOLTZ DICKIE	75D21	0-2000 HZ.	7578	3-22-76	6-22-76	$\pm 2\%$
ACCELEROMETER	UNIVOLTZ DICKIE	75D21	0-2000 HZ.	7143	3-22-76	6-22-76	$\pm 2\%$
ACCELEROMETER	UNIVOLTZ DICKIE	75D21	0-2000 HZ.	7532	3-22-76	6-22-76	$\pm 2\%$

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54490

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SPECIMEN CONTROL CONSOLE
 CUSTOMER TELCO
 PART NO. 2CR-58,50,51 (#3)
 S/N _____

JOB NO. 54498
 DATE 6-18-76
 TEST BY P. KNOLL
 WITNESS _____

WYLE LABORATORIES TEST: SEISMIC RANDOM + SINE BEAT

EQUIPMENT	MANUFACTURER	MODEL NO.	RANGE	WYLE NO.	CALIBRATION		ACCY.
					LAST	DUE	
ACCELEROMETER	UNIHOLTS	75D21	0-2000 Hz	7540	3-27-76	6-22-76	±2%
ACCELEROMETER	UNIHOLTS	25D21	0-2000 Hz	6625	6-15-76	9-15-76	±2%
ACCELEROMETER	COLUMBIA	302-6	0-2000 Hz	6618	5-4-76	8-4-76	±2%
ACCELEROMETER	COLUMBIA	302-6	0-2000 Hz	6619	5-4-76	8-4-76	±2%
ACCELEROMETER	ENDEVCO	2215	0-2000 Hz	7540	6-15-76	9-15-76	±2%
ACCELEROMETER	ENDEVCO	2211	0-2000 Hz	6794	6-15-76	9-15-76	±2%
ACCELEROMETER	ENDEVCO	2213	0-2000 Hz	31023	6-10-76	9-10-76	±2%
CHARGE AMP	UNIHOLTS	D22	0-1000 g.	7341	1-13-76	7-11-76	±2%
CHARGE AMP	UNIHOLTS	D22	0-1000 g.	7342	1-13-76	7-11-76	±2%
CHARGE AMP	UNIHOLTS	D22	0-1000 g.	7343	1-13-76	7-11-76	±2%
CHARGE AMP	UNIHOLTS	D22	0-1000 g.	7344	1-13-76	7-11-76	±2%
CHARGE AMP	UNIHOLTS	D22	0-1000 g.	7338	1-27-76	7-25-76	±2%
CHARGE AMP	UNIHOLTS	D22	0-1000 g.	31407	3-16-76	9-19-76	±2%
CHARGE AMP	UNIHOLTS	D22	0-1000 g.	7335	1-27-76	7-11-76	±2%
CHARGE AMP	UNIHOLTS	D22	0-1000 g.	7336	1-27-76	7-11-76	±2%
CHARGE AMP	UNIHOLTS	D22	0-1000 g.	7337	1-27-76	7-11-76	±2%
CHARGE AMP	UNIHOLTS	D22	0-1000 g.	7340	1-27-76	7-11-76	±2%

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SPECIMEN CONTROL CONSOLE
 CUSTOMER TELCO
 PART NO. 2CR-58,50,51 (#3)
 S/N _____

JOB NO. 54498
 DATE 6-18-76
 TEST BY P. KNOLL
 WITNESS _____

WYLE LABORATORIES

TEST: SEISMIC RANDOM, SINE BEAT

EQUIPMENT	MANUFACTURER	MODEL NO.	RANGE	WYLE NO.	CALIBRATION		ACCY.
					LAST	DUE	
CHARGE AMP	UNHOLTZ DICKIE	D22	0-1000 g.	7339	1-27-76	7-25-76	±2%
CHARGE AMP	UNHOLTZ DICKIE	11	0-1000 g.	31488	1-13-76	7-11-76	±2%
CHARGE AMP	UNHOLTZ DICKIE	8P	0-1000 g.	6723	5-12-76	11-14-76	±2%
CHARGE AMP	UNHOLTZ DICKIE	8P	0-1000 g.	4541	1-8-76	7-4-76	±2%
CHARGE AMP	UNHOLTZ DICKIE	8P	0-1000 g.	30990	5-12-76	11-14-76	±2%
CHARGE AMP	UNHOLTZ DICKIE	8P	0-1000 g.	30997	5-12-76	11-14-76	±2%
CHARGE AMP	UNHOLTZ DICKIE	8P	0-1000 g.	30770	5-12-76	11-14-76	±2%
CHARGE AMP	UNHOLTZ DICKIE	8P	0-1000 g.	30880	5-12-76	11-14-76	±2%
CHARGE AMP	UNHOLTZ DICKIE	11	0-1000 g.	31490	1-13-76	7-11-76	±2%
CHARGE AMP	UNHOLTZ DICKIE	11	0-1000 g.	31493	3-15-76	9-9-76	±2%
CHARGE AMP	UNHOLTZ DICKIE	11	0-1000 g.	31406	1-13-76	7-11-76	±2%
CHARGE AMP	UNHOLTZ DICKIE	11	0-1000 g.	31491	1-13-76	7-11-76	±2%
TAPEREORDER	SANBORN	3924B	14 CHANNEL	31265	PRIOR TO USE		N/A
TAPEREORDER	SANBORN	3924B	14 CHANNEL	31266	PRIOR TO USE		N/A
SINE BEAT GENERATOR	McFADDEN	2090	.5-50 Hz.	—	SYSTEM CALIB.		N/A
SUM OF DIFFERENCE AMPLIFIER	McFADDEN	200A4	4 CHANNEL	—	SYSTEM CALIB.		N/A

Report No. 54498-51

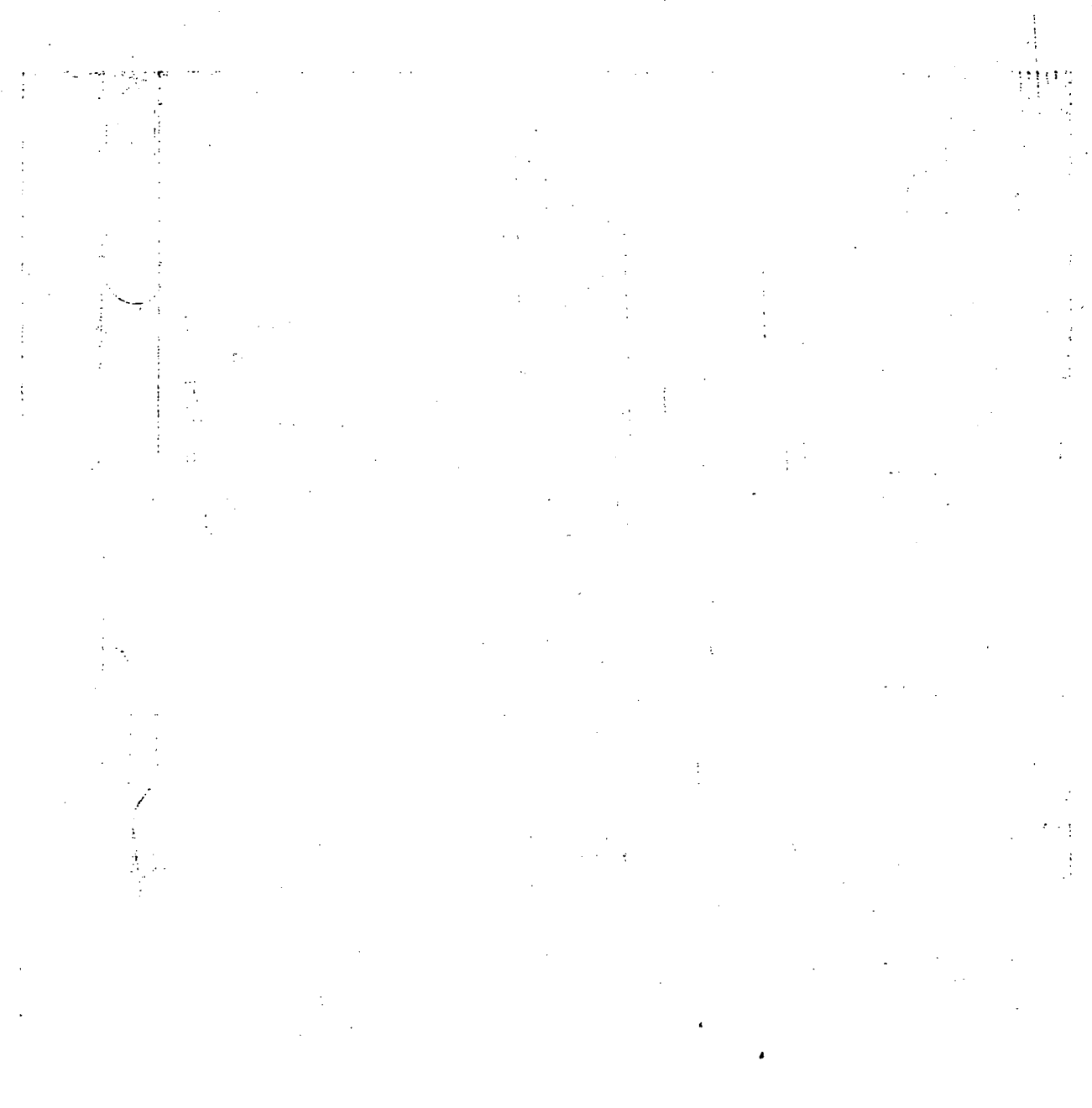
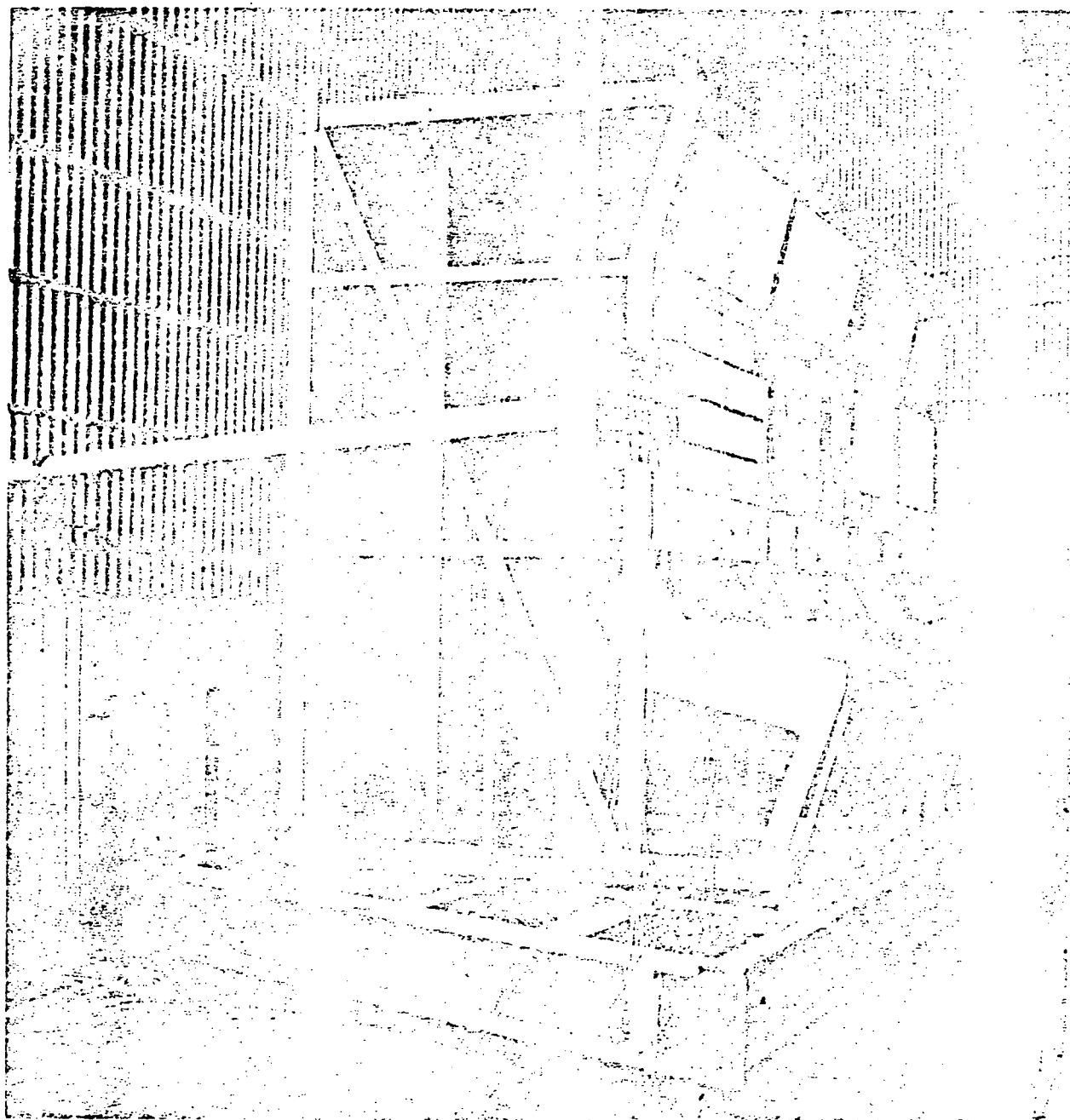


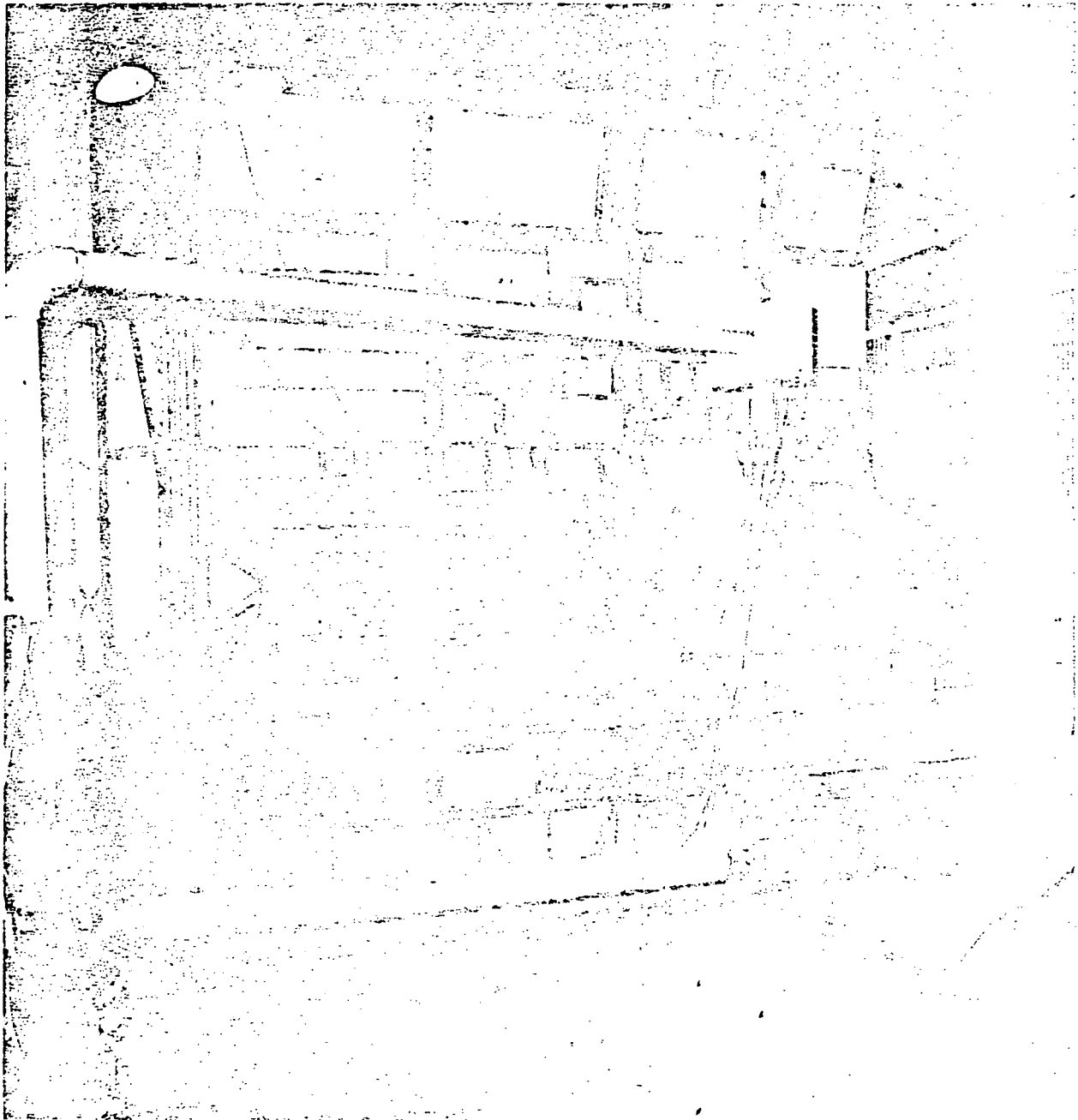
FIGURE 1

STATIONARY STATE OF THE SYSTEM



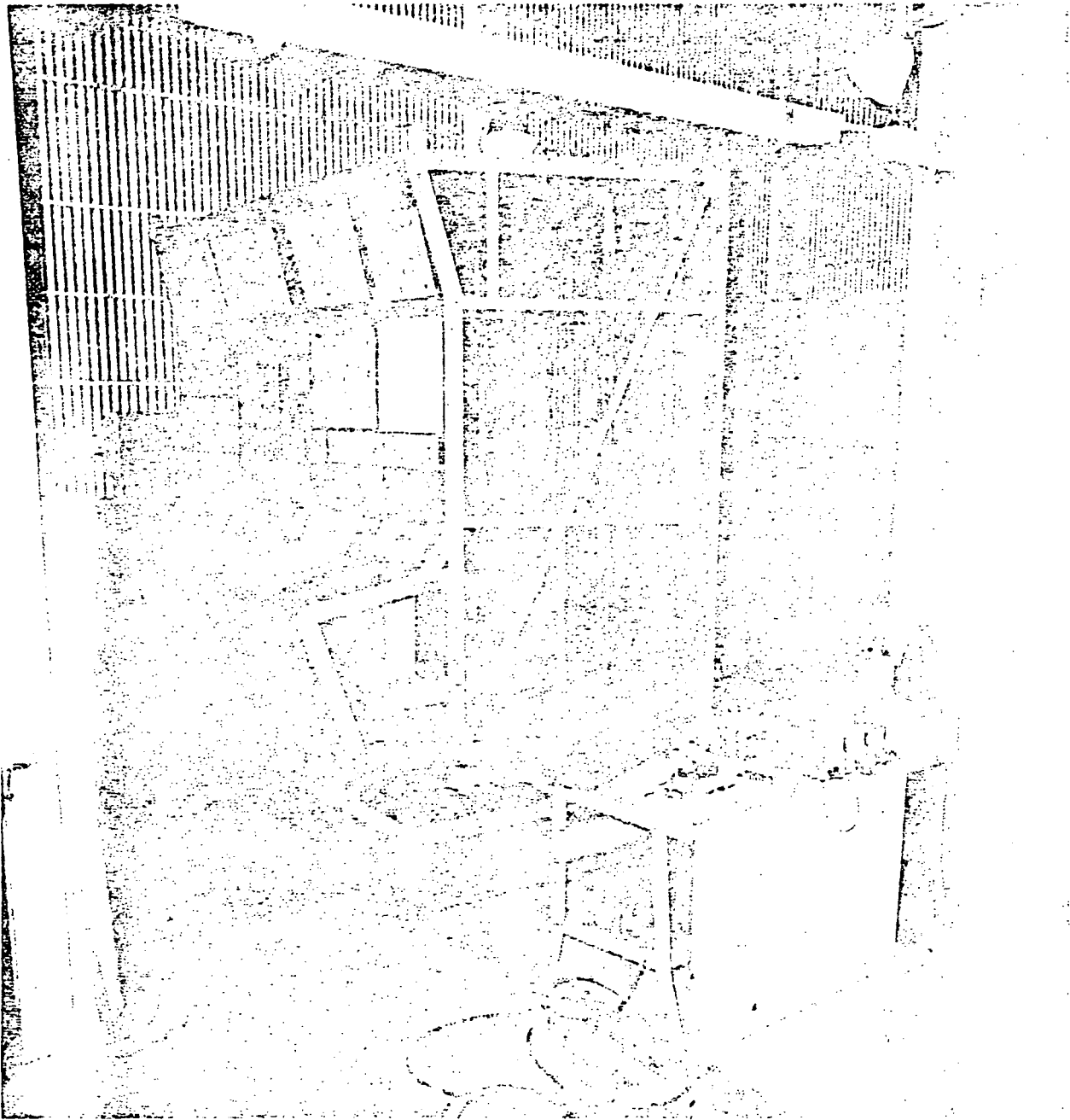
PHOTOGRAPH 2

SEISMIC TEST SHEET - A-Y BIAXIAL PLANE



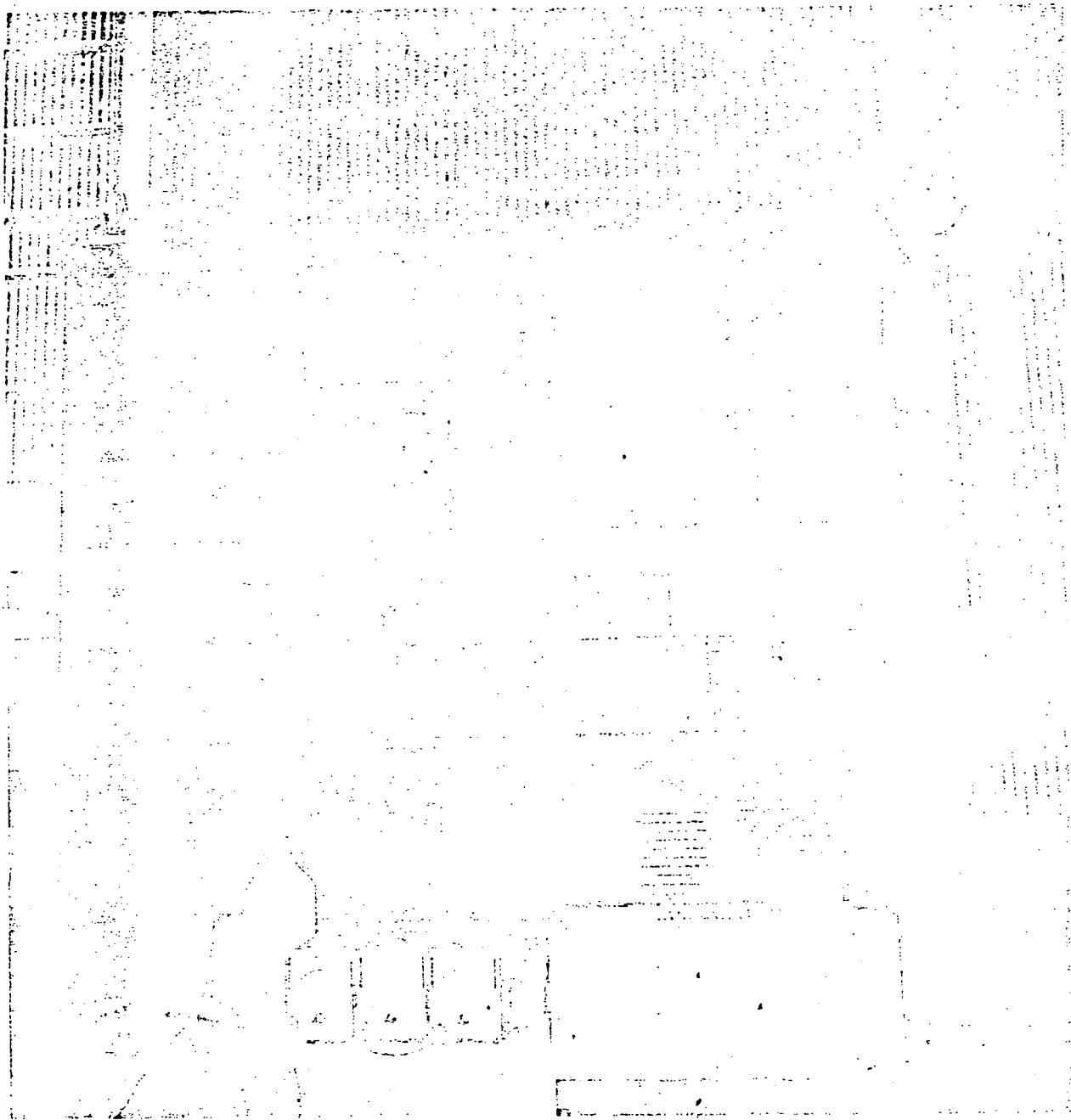
PHOTOGRAPH 3

SEISMIC TEST SETUP - Z-Y BIAXIAL PLANE



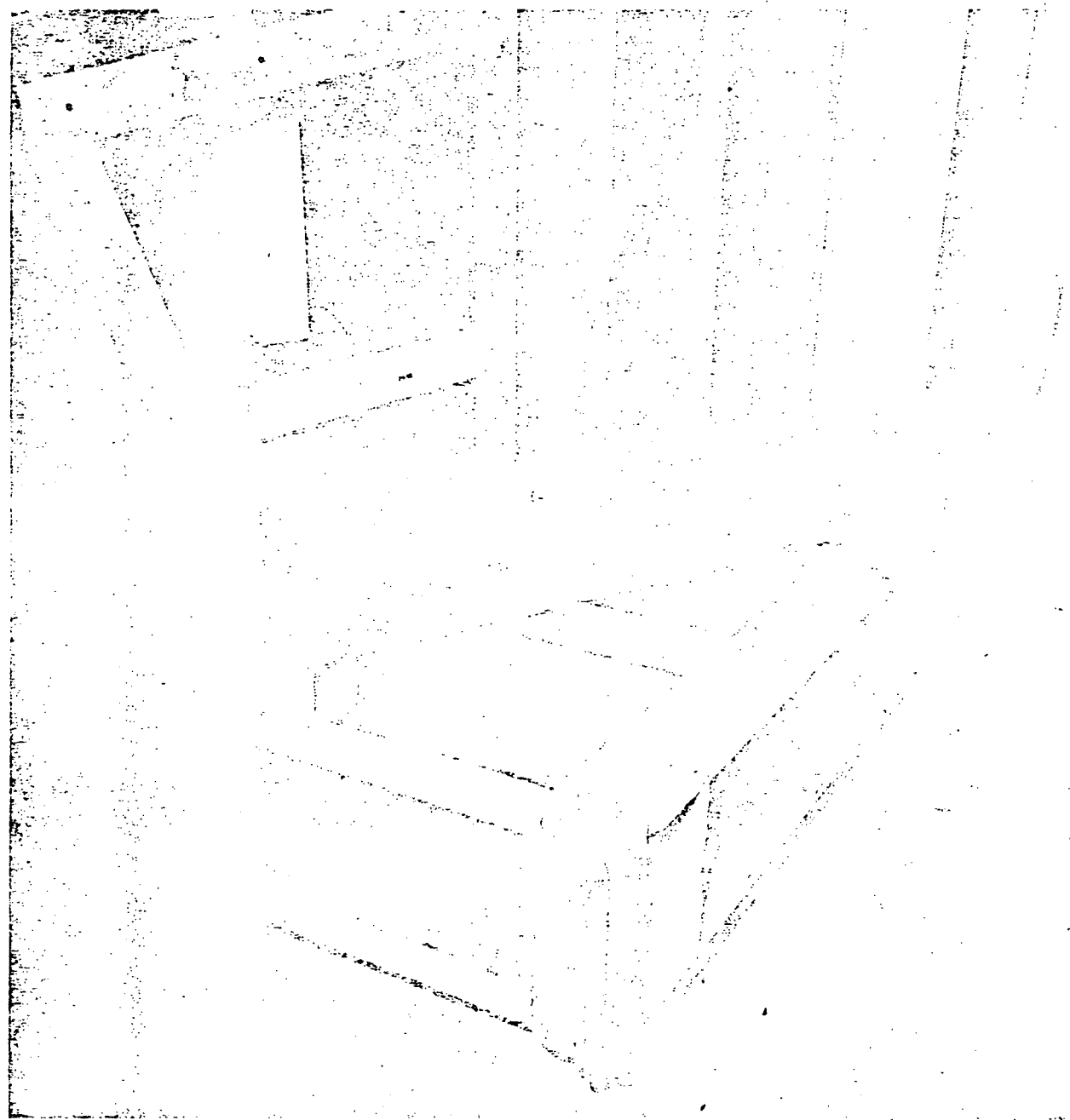
PHOTOGRAPH 4

SEISMIC TEST SETUP - Z-Y BIAXIAL PLANE



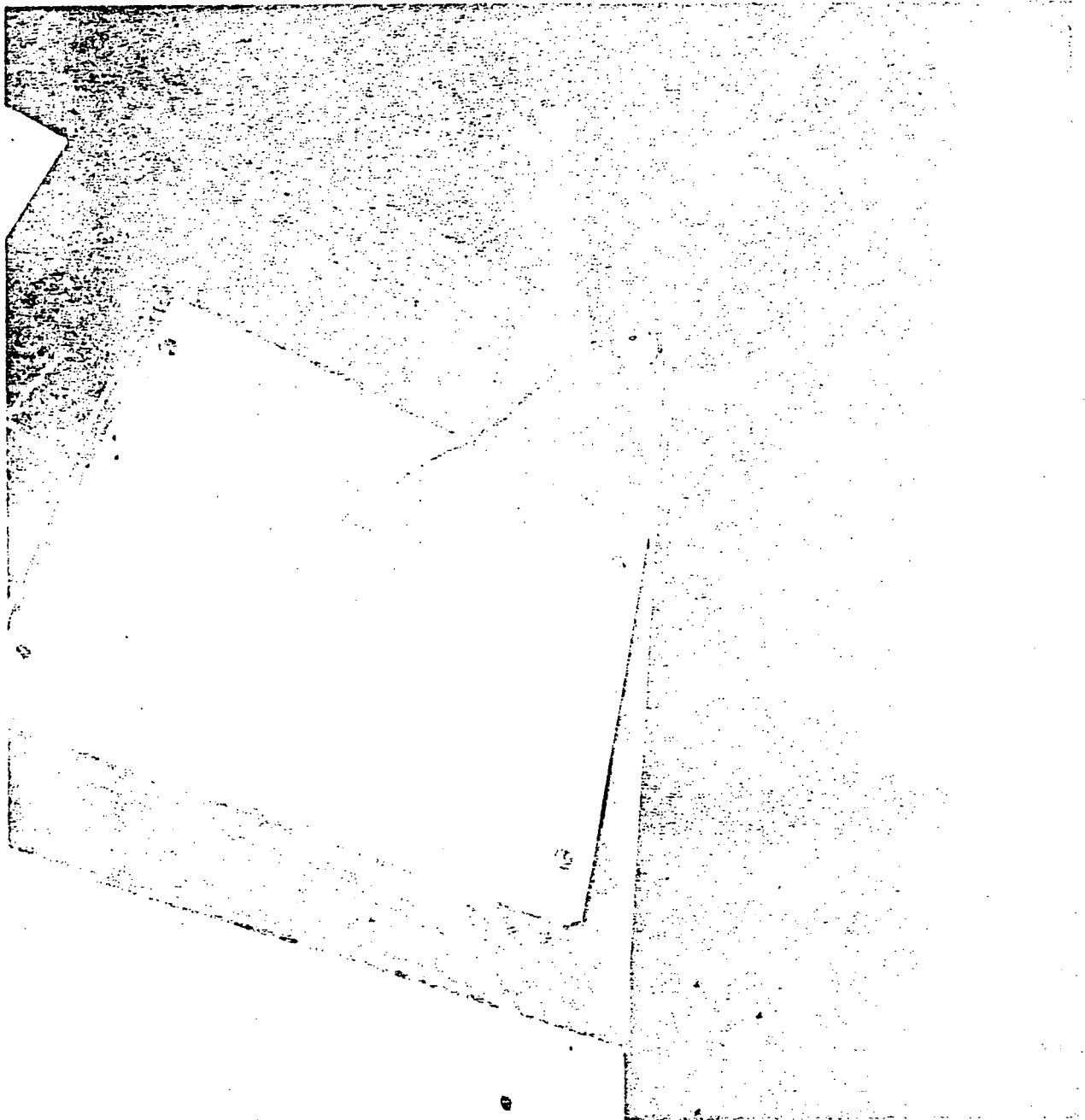
PHOTOGRAPH 5

FULL PANEL VIEW



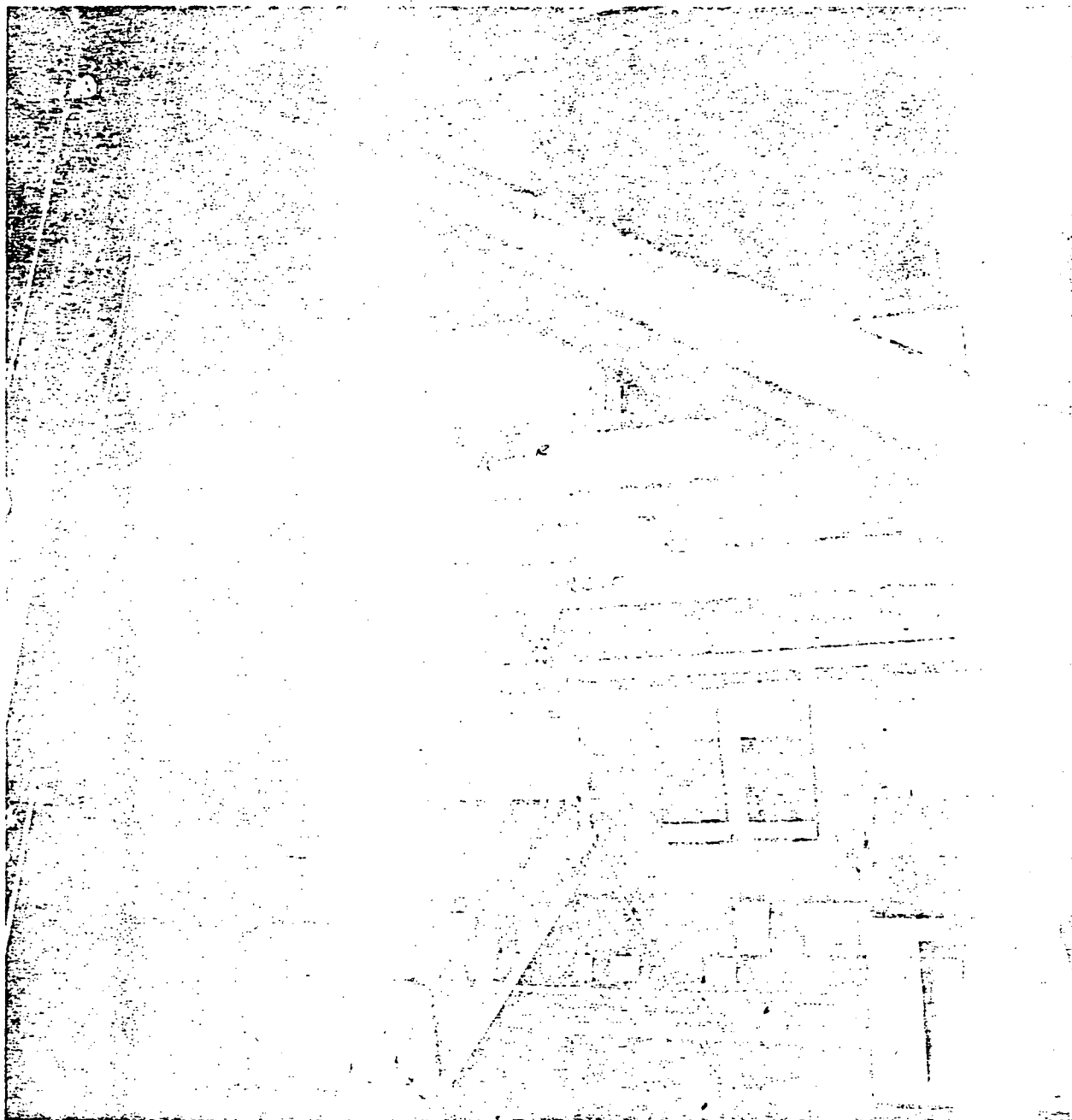
PHOTOGRAPH 6

TYPICAL END SUPPORT
(Z-Y Bending Plane Only)



PHOTOGRAPH 7

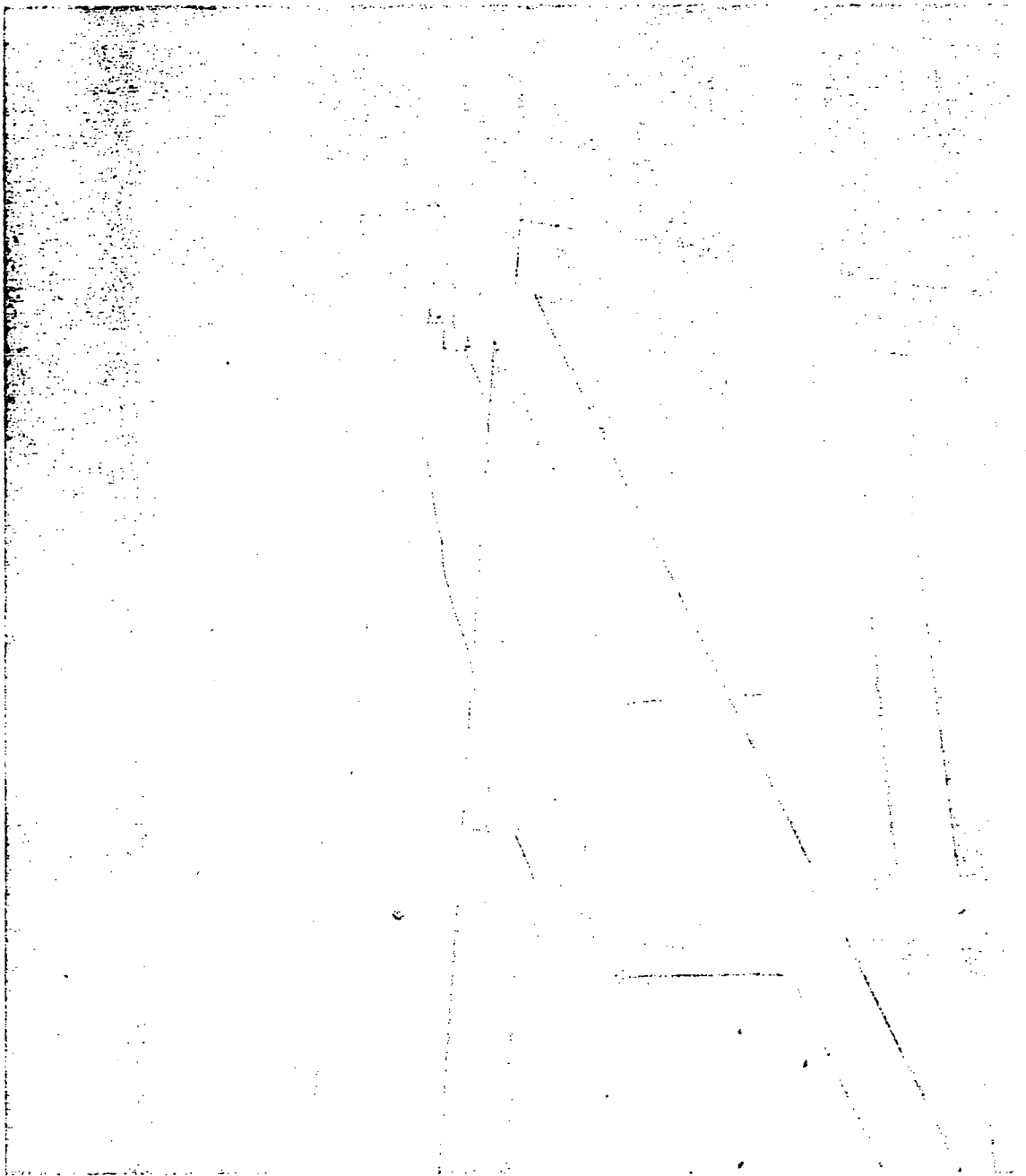
ACCELEROMETER LOCATION



PHOTOGRAPH 8

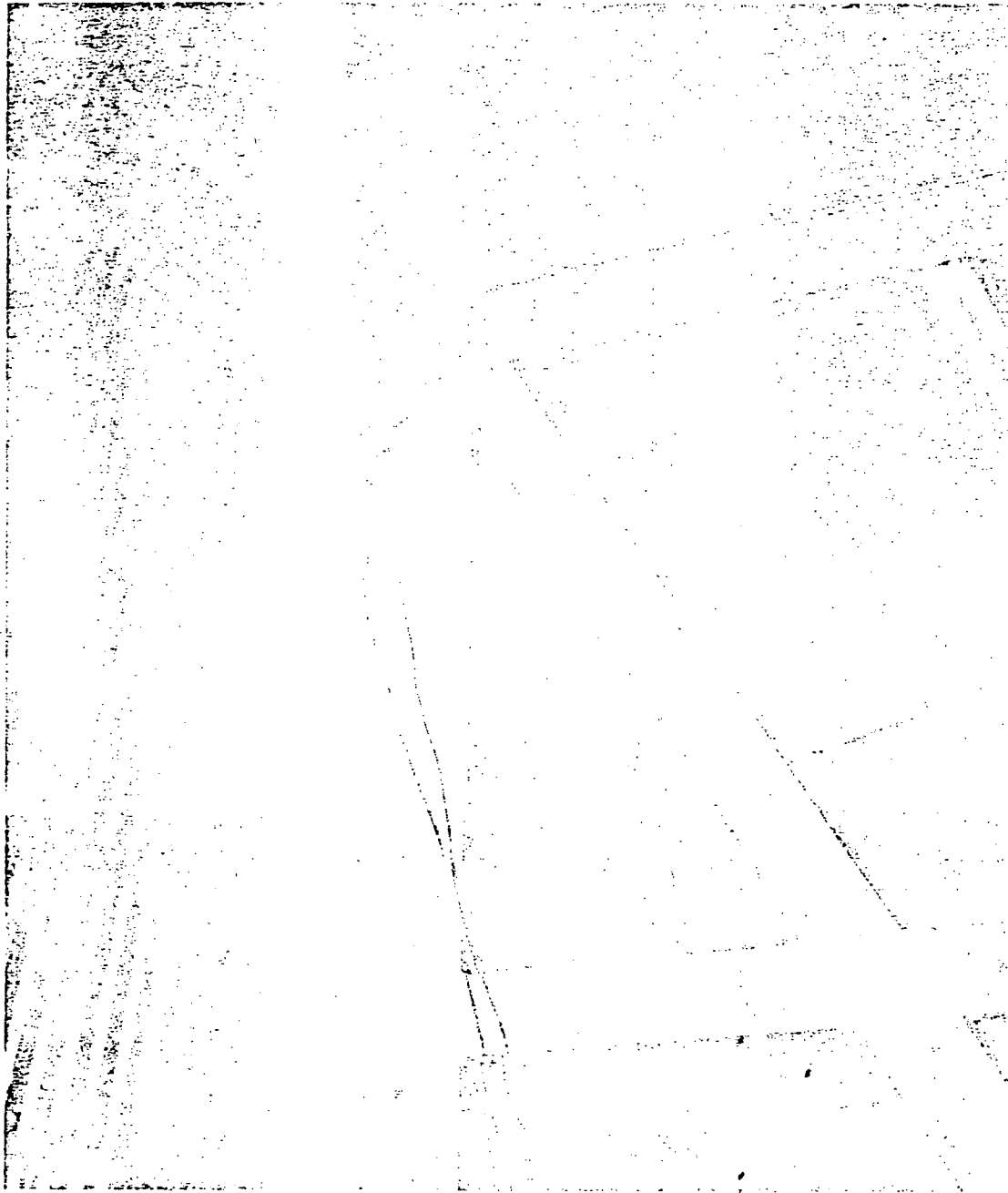
ACCELEROMETER LOCATION
AND BURST INSTRUMENT DETAIL

194



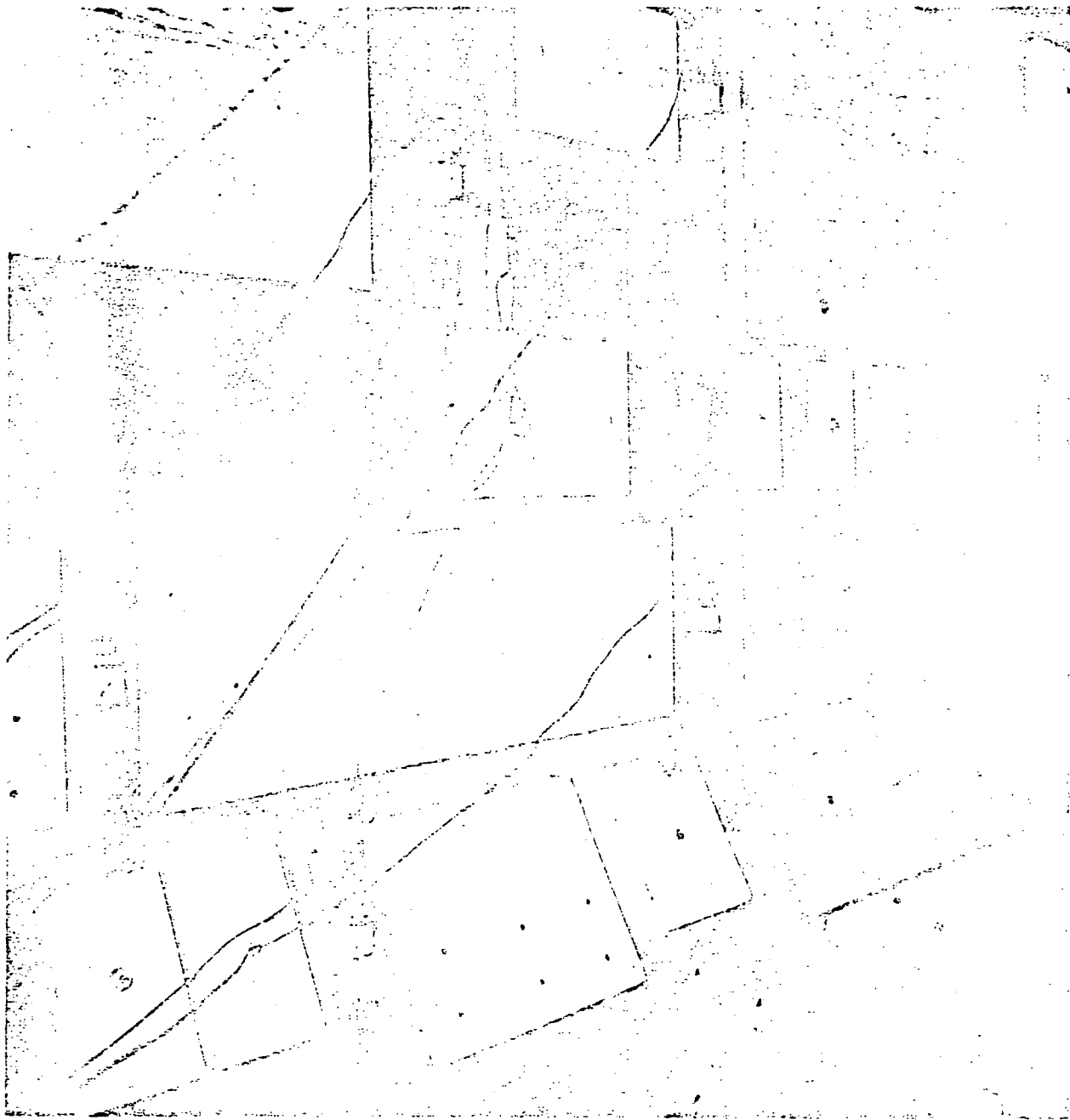
PHOTOGRAPH 9

ACROSS SECTION LOCATION
AND TYPICAL GROUND SURFACE ELEVATION



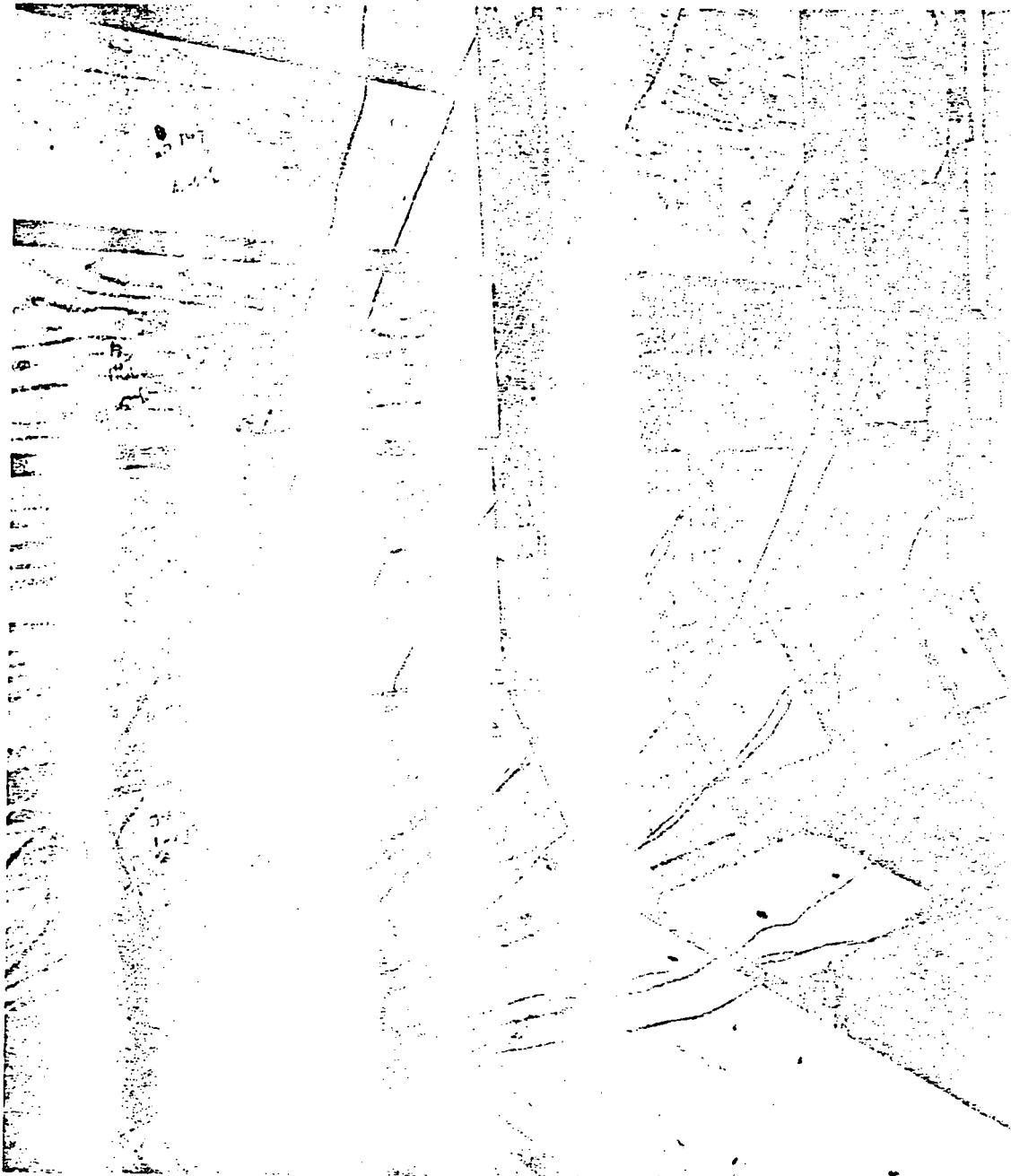
PHOTOGRAPH 10

ACCESSION TO LOCATION



PHOTOGRAPH 11

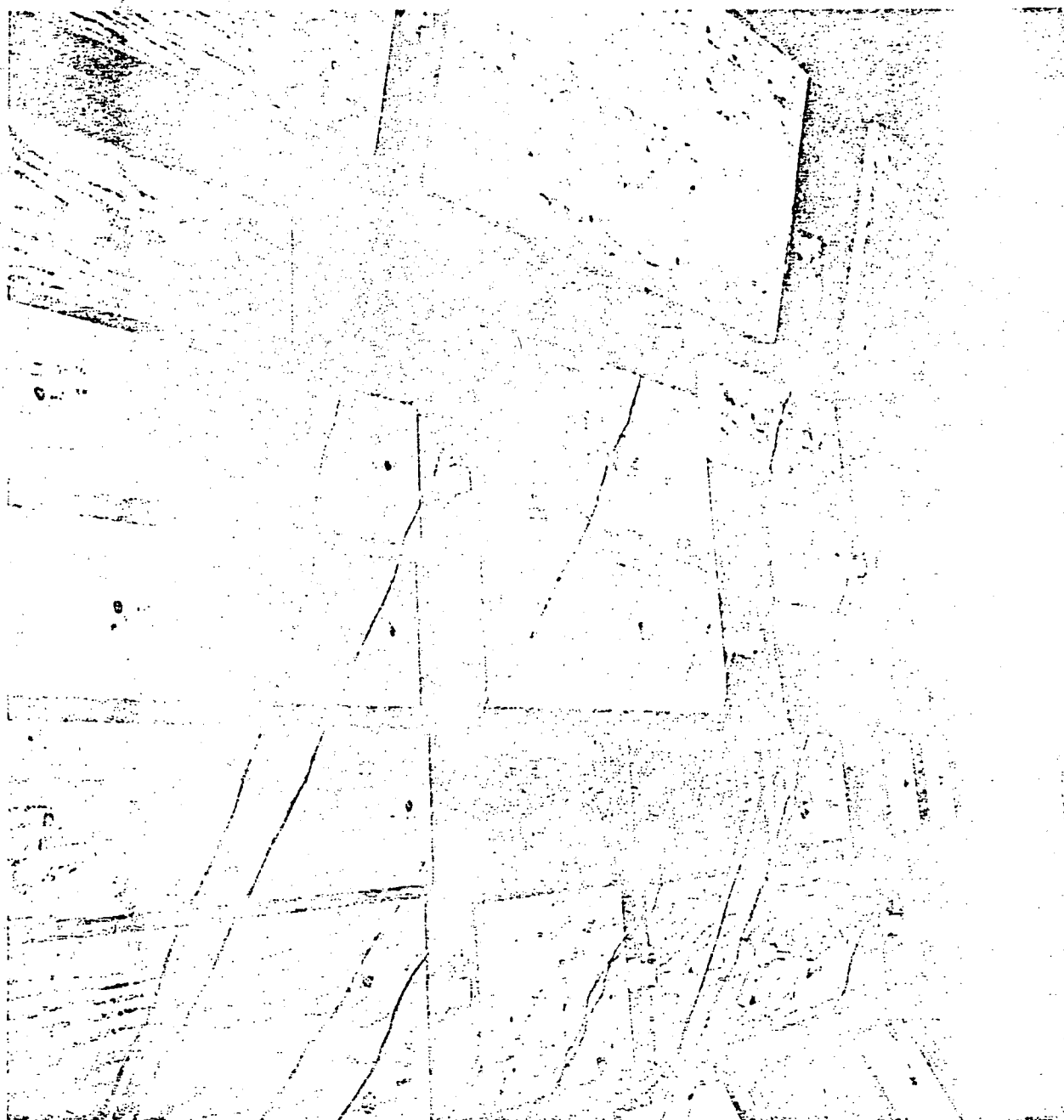
ACCCELEROMETER AND STRAIN GAGE LOCATIONS



PHOTOGRAPH 12

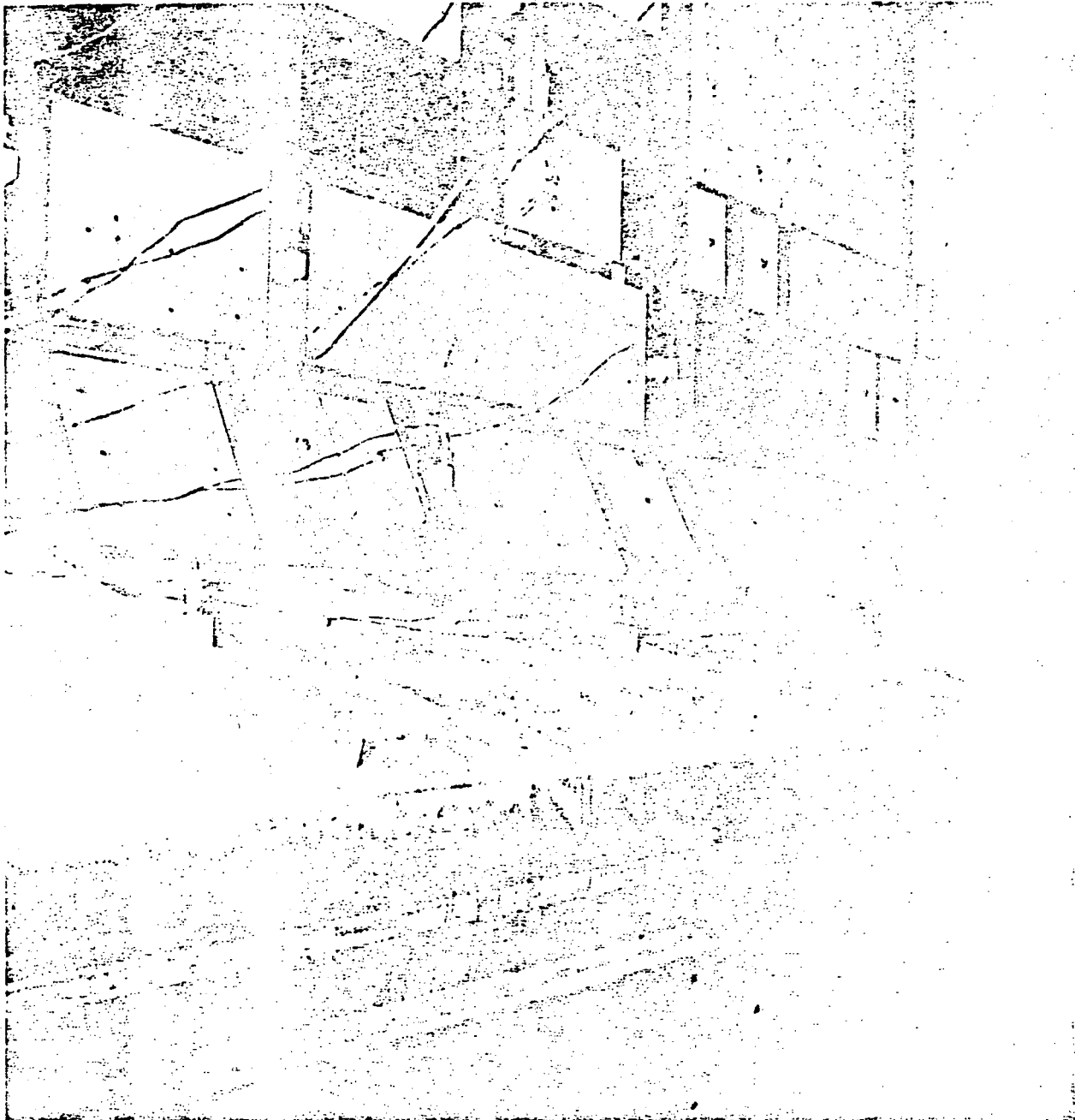
ACCELEROMETRIC LOCATIONS

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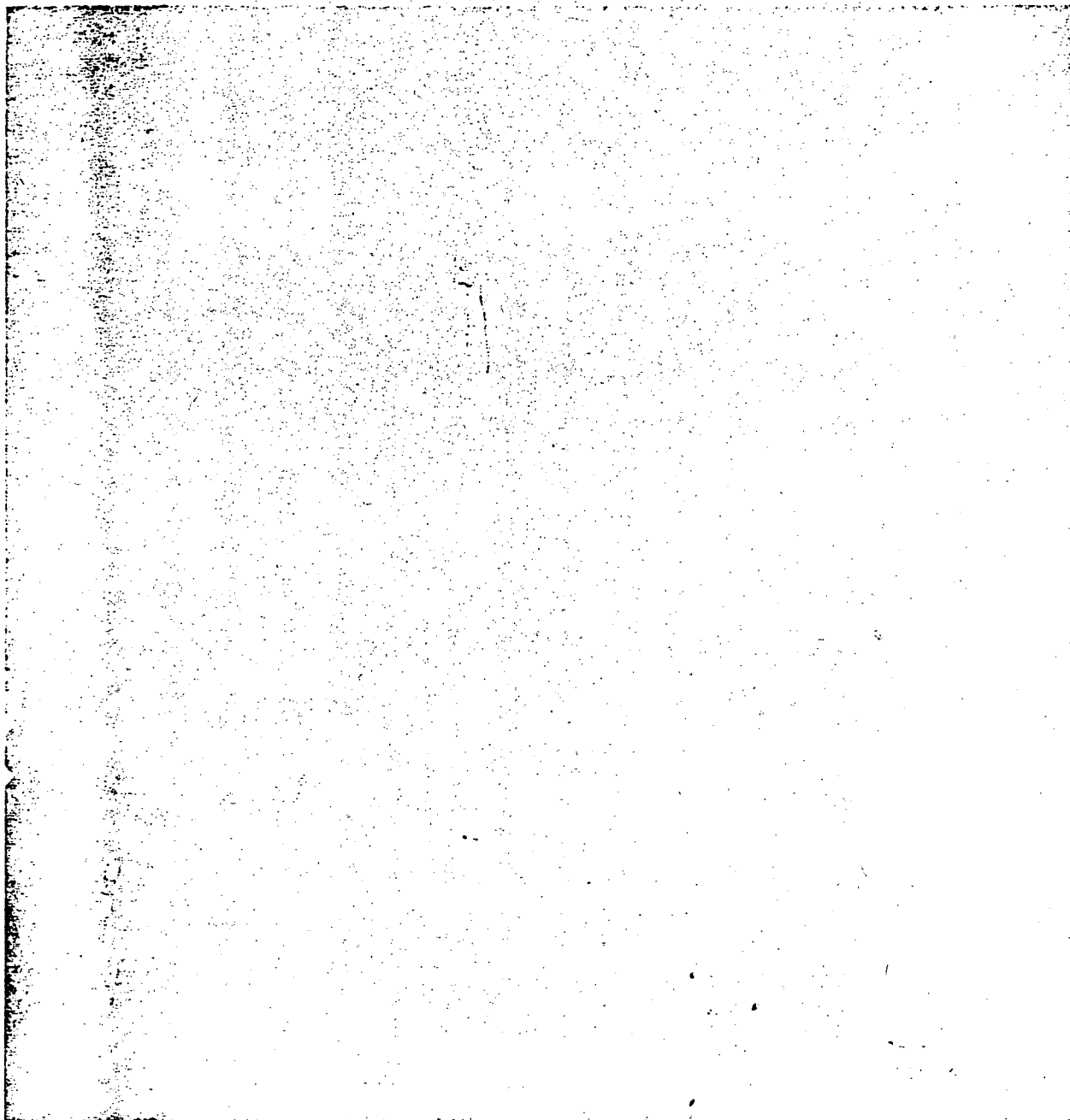
PHOTOGRAPH 13

ACCELEROMETER LOCATIONS



PHOTOGRAPH 14

ACCELEROMETER LOCATIONS



PHOTOGRAPH 15

ACCELEROMETER LOCATION

TEST REPORT

REPORT NO. 54498
OUR JOB NO. ND 54498
YOUR P. O. NO. 7651
CONTRACT ---

5 - Page Addendum

DATE 29 June 1976

JELCO, Inc.
P. O. Box 2248
Pomona, California 91766

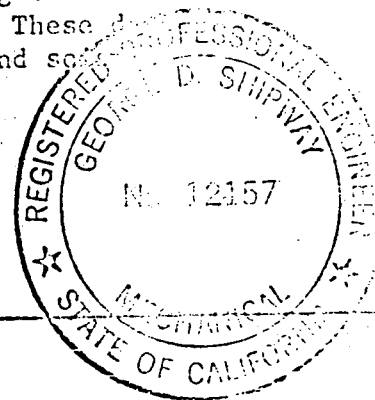
ADDENDUM I

1.0 REFERENCES

- 1.1 Jelco, Inc. Purchase Order No. 7651, dated 15 March 1976.
- 1.2 Wyle Laboratories Test Report No. 7651, dated 31 March 1976.

2.0 PURPOSE

The purpose of this addendum is to incorporate four pages of test data sheets inadvertently omitted from Reference 1.2. These sheets furnish test information for resonance search and so random with sine beat tests on Shipping Section No. 7.



STATE OF CALIFORNIA } ss.
COUNTY OF RIVERSIDE

Ray C. Myrick, being duly sworn,
deposes and says: That the information contained in this report is the result of
complete and carefully conducted tests and is to the best of his knowledge true
and correct in all respects.

Ray C. Myrick

DEPARTMENT ELECTRONICS

DEPT. MGR. *James J. Anderson*
James J. Anderson

TEST ENGINEER *W. K. Franz*
W. K. Franz

Registered Professional Engineer *George D. Shipway*
George D. Shipway

DCAS-QAR VERIFICATION

W. K. Franz

Subscribed and sworn to before me this 29th day of June, 1976.

Notary Public in and for the County of Riverside, State of California

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OFFICIAL SEAL
CATHERINE C. KELLY
NOTARY PUBLIC - CALIFORNIA

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