APPROVED
This approval does not relieve the Contractor from any part of his responsibility for the correctness of design, details and dimensions.
TENNESSEE VALLEY AUTHORITY
Date MAY 24 1977
F. W. CHANDLER

SEISMIC SIMULATION TEST PROGRAM

ON

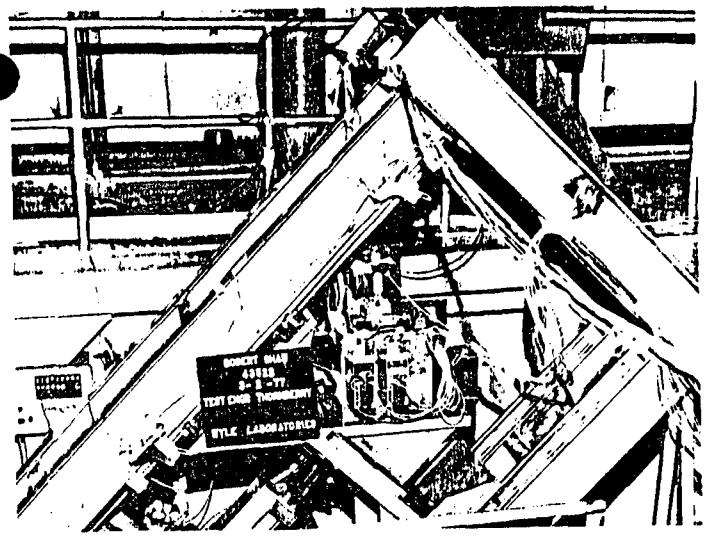
AN ELECTRONIC DIFFERENTIAL PRESSURE TRANSMITTER,
AN ELECTRONIC PRESSURE TRANSMITTER,
A SQUARE ROOT EXTRACTOR, AN ISOLATION AMPLIFIER,
AND
A COMPACT RECORDER

FILE

FOR

ROBERTSHAW CONTROLS COMPANY
P. O. BOX 3523
KNOXVILLE, TENNESSEE 37917

7908080617



SEISMIC SIMULATION
Test Report

REPORT NO. 43522-1

WYLE JOB NO. 43522

CUSTOMER P. O. NO. 3504

PAGE 1 OF 97 PAGE REPORT

DATE March 15, 1977

SPECIFICATION (S) See References in Section 7.0

1.0 CUSTOMER Robertshaw Controls Company

ADDRESS P. O. Box 3523, Knoxville, Tennessee 37917

2.0 TEST SPECIMEN A Model 117 Electronic Differential Pressure Transmitter, a Model 147 Electronic Pressure Transmitter, a Model 570-C2 Square Root Extractor, a Model 572-C2 Isolation Amplifier, and a Model 225-C1-A1-A Compact Recorder

3.0 MANUFACTURER Robertshaw Controls Company

4.0 SUMMARY A Model 117 Electronic Differential Pressure Transmitter (Item 1), a Model 147 Electronic Pressure Transmitter (Item 2), a Model 570-C2 Square Root Extractor (Item 3), a Model 572-C2 Isolation Amplifier (Item 4), and a Model 225-C1-A1-A Compact Recorder (Item 5), hereinafter called the specimens, were subjected to a Seismic Simulation Test Program as required by the Robertshaw Controls Company Purchase Order Number 3504, and Wyle Laboratories' Seismic Test Plan 541/5174-1/ES, dated December 7, 1976, Revision A.

It was demonstrated that Items 2, 3, 4 and 5 possessed sufficient integrity to withstand, without compromise of structures or electrical functions, the prescribed qualification simulated seismic environment for Browns Ferry, Sequoyah, Watts Bar, Bellefonte, and TVA Stride Nuclear Power Plants. The electronic housing of Item 1 loosened at the connection of the electronic housing to the diaphragm housing. The loosening was noted prior to the fourth axis of test. Item 1 was removed from the test setup as described in Notice of Anomaly Number 1. The electrical output of Item 1 deviated a maximum of ± 4 milliamperes during the simulated seismic test program.

Items 2, 3, 4 and 5 were also subjected to fragility (machine limit) level tests after the qualification tests had been completed. It was demonstrated that the specimens possessed sufficient integrity to withstand, without compromise of electrical functions or major compromise of structures, the prescribed fragility level tests. However, Item 5's pen drive gear had loosened and disengaged from the pen drive motor during the side-to-side/vertical negative axis. The pen drive gear was retightened and testing continued satisfactorily.

STATE OF ALABAMA
COUNTY OF MADISON } ss.

Ala. Professional Eng. License No. 7112

William W. Holbrook, being duly sworn, deposes and says: 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.

SEAL

William W. Holbrook

SUBSCRIBED and sworn to before me this 23rd day of March, 1977

Virginia P. Dent

Notary Public in and for the County of Madison, State of Alabama.

My Commission expires June 13, 1979

PREPARED BY Rod R. Thornberry
R. Thornberry

APPROVED BY H. Gordon Thomas, Larry E. Fryer

WYLE Q. A. L. M. Davies
L. M. Davies

WYLE LABORATORIES
SCIENTIFIC SERVICES AND SYSTEMS GROUP
HUNTSVILLE, ALABAMA

4.0 SUMMARY (Continued)

Notice of Anomaly Number 1 describes the loosening of the electronic housing support at the diaphragm housing for the Electronic Differential Pressure Transmitter (Item 1) which resulted in its removal from the test setup prior to the fourth axis of tests (front-to-back/vertical negative).

Table I contains test run descriptions and input accelerations during the qualification level tests.

Table II contains test run descriptions and input accelerations during the fragility (machine limit) level tests.

Figure 1 shows the Wyle Seismic Simulator.

Figure 2 shows the machine limit curve that was obtained in each test orientation during the fragility (machine limit) testing.

Photograph 1 shows the specimens installed on the Seismic Simulator in the side-to-side plus and vertical orientation.

Photograph 2 shows the electronic housing support separated from the diaphragm housing on Item 1.

Photograph 3 shows the pen drive gear for Item 5 which loosened during the fragility tests in the side-to-side/vertical negative orientation.

Photographs 4 and 5 show the accelerometer locations. The horizontal accelerometers were oriented in the side-to-side direction during the side-to-side/vertical axes tests and were re-oriented to the front-to-back direction during the front-to-back/vertical axes tests.

Appendix I contains transmissibility plots from the exploratory tests.

Appendix II contains the Instrumentation Log Sheets and the Instrumentation Equipment Sheets.

Appendix III contains the Wyle Laboratories' Seismic Test Plan 541/5417-1/ES, dated December 7, 1976, Revision A.

5.0 TEST REQUIREMENTS

5.1 Specimen Orientation and Mounting

The Seismic Simulator shall be inclined at a 45-degree angle to the floor as shown in Figure 1. The specimens shall be mounted to a Wyle-furnished mounting fixture. The fixture shall be mounted to a 45-degree angle fixture such that the base of the fixture is parallel to the floor. The specimens shall be tested in the vertical and the first horizontal axis simultaneously, and then the mounting fixture shall be rotated 90 degrees and the specimens shall be tested in the vertical and the second horizontal axis. The mounting fixture shall be rotated 180 degrees and the specimens shall be tested in the vertical and the third horizontal axis. The mounting fixture shall then be rotated 90 degrees and the specimens shall be tested in the vertical and the fourth horizontal axis.

5.2 Exploratory Test

An exploratory test shall be run in the form of a continuous sweep frequency search using a sinusoidal steady-state input at approximately 0.2 g. The search shall include a minimum of two continuous sweeps from 1 to 35 to 1 Hz at a rate of one octave per minute.

5.3 Sine Beat Qualification Tests

The specimens shall be subjected to sine beat tests consisting of ten oscillations per beat with a time pause of approximately two seconds between each of the five beats. A sine beat test shall be performed two times at one-third octave intervals between 1 and 35 Hz and/or the resonant frequencies determined in Paragraph 5.2 at a test level of 4.25 g's, within the limits of the test machine, at a location near the driving point of the single actuator. The 4.25 g input yields an effective g force of 3.0 g's in both the horizontal and vertical axes simultaneously.

5.4 Fragility Testing

The specimens shall be subjected to fragility testing after the qualification tests have been completed. The test method shall be as indicated in Paragraph 5.3, except only one test shall be performed at each test frequency. The test level shall be increased to 10 g's, within the limits of the test machine, during the fragility tests. If fragility occurs, a sine beat test shall be performed with the test level slightly below the fragility level. If fragility does not occur, a sine beat test shall be performed at machine limits.

5.0 TEST REQUIREMENTS (Continued)

5.5 Specimen Response

Two (2) specimen-mounted unidirectional piezo-electric accelerometers shall be located on each specimen under test. The placement of the accelerometers shall be at the discretion of Wyle Laboratories' Project Engineer. FM tape shall provide a record of each accelerometer response during the exploratory tests.

5.6 Electrical Powering

Electrical power as described below shall be provided for operation of the specimens during the Seismic Simulation Test Program.

Item	Description	Voltage	Input Signal
1	Electronic Differential Pressure Transmitter (Model 117)	24 VDC	---
2	Electronic Pressure Transmitter (Model 147)	24 VDC	---
3	Square Root Extractor (Model 570-C2)	117 VAC	15 maDC
4	Isolation Amplifier (Model 572-C2)	117 VAC	15 maDC
5	Compact Recorder (Model 225-C1-A1-A)	117 VAC	10-50 maDC

5.7 Electrical Monitoring

Four (4) channels of electrical monitoring shall be recorded on an oscillograph recorder during the qualification and fragility testing. These channels may be used to ascertain electrical continuity, current/voltage levels, spurious operation, contact chatter, etc. before, during and after the seismic excitation.

The four channels of electrical monitoring shall be utilized as follows:

Channel	Item	Output Signal
1	1	32 maDC
2	2	18 maDC
3	3	25 maDC
4	4	15 maDC
	5	Visual monitor of Recorder pen (mid-scale)

5.0 TEST REQUIREMENTS (Continued)

5.8 Air Pressure

Air pressure of approximately 14 inches of water shall be supplied to Item 1 and air pressure of approximately 100 psig shall be supplied to Item 2 for operation during the test program.

6.0 TEST PROCEDURES AND RESULTS

6.1 Specimen Orientation and Mounting Procedures

The Seismic Simulator was inclined at a 45-degree angle to the floor as shown in Figure 1. The specimens were mounted to a Wyle-furnished mounting fixture. The fixture was then mounted to a 45-degree angle fixture such that the base of the fixture was parallel to the floor. The specimens were tested in the vertical and the first horizontal axis simultaneously, and then the mounting fixture was rotated 90 degrees and the specimens were tested in the vertical and the second horizontal axis. The mounting fixture was then rotated 180 degrees and the specimens were tested in the vertical and the third horizontal axis. The mounting fixture was then rotated 90 degrees and the specimens were tested in the vertical and the fourth horizontal axis.

6.2 Exploratory Test Procedures

An exploratory test was run in the form of a continuous sweep frequency search using a sinusoidal steady-state input at approximately 0.2 g. The search included two continuous sweeps from 1 to 35 to 1 Hz at a rate of one octave per minute.

6.2.1 Exploratory Test Results

Test run descriptions are presented in Table I.

Transmissibility plots of the specimen response accelerometers from the exploratory tests are presented in Appendix I.

6.3 Sine Beat Qualification Test Procedures

The specimens were subjected to sine beat tests consisting of ten osillations per beat with a time pause of approximately two seconds between each of the five beats. A sine beat test was performed two times, in each of the four orientations, at one-third octave frequencies of 1, 1.25, 1.6, 2.0, 2.5, 3.2, 4, 5, 6.3, 8, 10, 12.5, 16, 20, 25, 32, and at 35 Hz. Two sine beat tests were also performed at 27 Hz in the side-to-side/vertical negative orientation due to the resonant frequency detected on Items 2 and 3. The test level was 4.25 g's or greater, within the limits of the test machine, at a location near the driving point of the actuator. The 4.25 g input yielded an effective g force of 3.0 g's in both the horizontal and vertical axes, simultaneously.

6.3.1 Sine Beat Qualification Test Results

It was demonstrated that Items 2, 3, 4 and 5 possessed sufficient integrity to withstand, without compromise of structures, the prescribed simulated seismic environment. The electronic housing of Item 1 loosened at the connection of the electronic housing to the diaphragm housing as shown in

6.0 TEST PROCEDURES AND RESULTS (Continued)

6.3.1 Sine Beat Qualification Test Results (Continued)

Photograph 2. The loosening was noted prior to the fourth axis of test. Item 1 was removed from the test setup as described in Notice of Anomaly Number 1.

Test run descriptions and input accelerations for the qualification level tests are presented in Table I.

6.4 Fragility Testing Procedures

The specimens (Items 2, 3, 4 and 5) were subjected to fragility testing after the qualification tests were completed. The test method was as indicated in Paragraph 6.3, except only one test was performed at each test frequency. The test level was increased to 10 g's, within the limits of the test machine, during the fragility tests. The 10 g input yielded an effective g force of .707 g in both the horizontal and vertical axes simultaneously. Since fragility was not noted, machine limit tests were performed in each test orientation.

6.4.1 Fragility Testing Results

It was demonstrated that the specimens (Items 2, 3, 4 and 5) possessed sufficient integrity to withstand, without major compromise of structures, the prescribed fragility (machine limit) level tests. However, Item 5's (the Recorder) pen drive gear had loosened and disengaged from the pen drive motor, as shown in Photograph 3, during the side-to-side/vertical negative axis. The pen drive gear was retightened and testing continued satisfactorily.

Test run descriptions and input accelerations for the fragility (machine limit) level tests are presented in Table II.

The machine limit curve that was obtained in each test orientation during the fragility (machine limit) testing is shown in Figure 2.

6.5 Specimen Response Procedures

Two (2) specimen-mounted unidirectional piezo-electric accelerometers were located on each specimen under test as shown in Photograph 4 and 5. The placement of the accelerometers was at the discretion of Wyle Laboratories' Project Engineer. FM tape provided a record of each accelerometer response during the exploratory tests.

6.5.1 Specimen Response Results

Transmissibility plots of the specimen response accelerometers from the exploratory tests are presented in Appendix I.

6.0 TEST PROCEDURES AND RESULTS (Continued)

6.6 Electrical Powering Procedures

Electrical power as described below was provided for operation of the specimens during the Seismic Simulation Test Program.

Item	Description	Voltage	Input Signal
1	Electronic Differential Pressure Transmitter (Model 117)	24 VDC	---
2	Electronic Pressure Transmitter (Model 147)	24 VDC	---
3	Square Root Extractor (Model 570-C2)	117 VAC	15 maDC
4	Isolation Amplifier (Model 472-C2)	117 VAC	15 maDC
5	Compact Recorder (Model 225-C1-A1-A)	117 VAC	10-50 maDC

6.7 Electrical Monitoring Procedures

Four (4) channels of electrical monitoring were recorded on an oscillograph recorder during the qualification and fragility testing. These channels were used to ascertain electrical continuity, current/voltage levels, spurious operation, contact chatter, etc. before, during and after the seismic excitation.

The four channels of electrical monitoring were utilized as follows:

Channel	Item	Output Signal
1	1	32 maDC
2	2	18 maDC
3	3	25 maDC
4	4	15 maDC
	5	Visual monitor of Recorder pen (mid-scale)

6.7.1 Electrical Monitoring Results

It was demonstrated that Items 2, 3, 4 and 5 possessed sufficient integrity to withstand, without compromise of electrical functions, the prescribed qualification and fragility simulated seismic environment. The electrical output of Item 1 deviated a maximum of ± 4 milliamperes during the simulated seismic test program.

6.0 TEST PROCEDURES AND RESULTS (Continued)

6.7.1 Electrical Monitoring Results (Continued)

The electrical output of Item 1 deviated a maximum of ± 4 milliamperes during the front-to-back/vertical plus and the side-to-side/vertical plus orientations. During these tests (Run 1 through 72), the specimen was calibrated to produce a 50-milliampere output with a pressure of 30 inches of water supplied to the input of the specimen. The specimen was calibrated, at the direction of the Robertshaw Technical Representative, to produce a 50-milliampere output with a pressure of 100 inches of water supplied to the input during testing in the side-to-side/vertical negative orientation (run 73 through 110). The maximum deviation during these tests was ± 3 milliamperes. Item 1 was removed from the test setup prior to testing in the front-to-back/vertical minus orientation. (See Notice of Anomaly Number 1.)

6.8 Air Pressure Procedures

Air pressure of approximately 14 inches of water was supplied to Item 1 during Runs 1 through 72 and 42 inches of water during Runs 73 through 112. Air pressure of approximately 100 psig was supplied to Item 2.

7.0 REFERENCES

7.1 The Robertshaw Controls Company Purchase Order Number 3504.

7.2 Wyle Laboratories' Seismic Test Plan 541/5174-1/ES, dated December 7, 1976, Revision A.

7.3 Guide for Seismic Qualification of Seismic Category 1 Fluid System Components and Electrical or Mechanical Equipment, Tennessee Valley Authority Sequoyah and Watts Bar Nuclear Plants, Appendix C, WB-DC-40-31.2.

7.4 Guide for Seismic Qualification of Seismic Category 1 Mechanical and Electrical Equipment Devices, Tennessee Valley Authority Browns Ferry Nuclear Plant, Appendix D, Specification No. 15-86220.

7.5 Guide for Seismic Qualification of Category 1 Fluid System Components and Electrical or Mechanical Equipment, Tennessee Valley Authority Bellefonte Nuclear Plant, BLN-50-D710.

7.6 Guide for Seismic Qualification of Engineered Equipment, Tennessee Valley Authority Stride, 300-03-AB, 240-01-AB.

7.7 IEEE Standard 344-1975 Specification entitled "Recommended Practice for Seismic Qualification of Class 1 Electrical Equipment for Nuclear Power Generating Stations".

NOTICE OF ANOMALY

NOTICE NO. 1 P. O. NUMBER: 3504 WYLE JOB NO. 43522 PAGE NO. 11

CONTRACT NUMBER: N/A REPORT NO. 43522-1

CATEGORY: ☒ SPECIMEN ☐ PROCEDURE ☐ TEST EQUIPMENT DATE: 3-3-77

TO: Robertshaw Controls ATTN: George Paris

PART NAME: Electronic Differential Pressure Transmitter PART NO. Model 117

TEST: Seismis Simulation I. D. NO. N/A

SPECIFICATION: 541/5174-1/ES, Revision PARA. NO. 4.0

NOTIFICATION MADE TO: George Paris DATE: 3-3-77

NOTIFICATION MADE BY: H. Jordan VIA: Telephone

REQUIREMENTS:

The specimens will be examined for possible damage following all violent tests such as at a severe structural resonance.

DESCRIPTION OF ANOMALY:

Run Number 112, post-test inspection of the Electronic Differential Pressure Transmitter (Item 1), revealed that the electronic housing support at the diaphragm housing mounting had loosened as shown in Photograph 2.

DISPOSITION – COMMENTS – RECOMMENDATIONS:

The specimen was removed from the test setup and the test sequence was continued.

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1 Copy: Operations Director

TEST WITNESS _____

_____

REPRESENTING _____

ENGINEER Rod R. Lambert

QUALITY CONTROL [illegible]

PROJECT MANAGER Larry E. Frazier

TABLE I

TEST RUN DESCRIPTIONS AND INPUT ACCELERATIONS DURING QUALIFICATION TESTS

RUN	AXES	FREQUENCY (Hz)	TEST LEVEL (g)	RUN	AXES	FREQUENCY (Hz)	TEST LEVEL (g)
1 & 2	FB/V (+)	1-35-1	0.2	73 & 74	SS/V (-)	1-35-1	0.2
3 & 4	FB/V (+)	1.0	0.9	75 & 76	SS/V (-)	1.0	0.9
5 & 6	FB/V (+)	1.25	1.5	77 & 78	SS/V (-)	1.25	1.5
7 & 8	FB/V (+)	1.6	2.3	79 & 80	SS/V (-)	1.6	2.3
9 & 10	FB/V (+)	2.0	3.0	81 & 82	SS/V (-)	2.0	3.0
11 & 12	FB/v (+)	2.5	3.5	83 & 84	SS/V (-)	2.5	3.5
13 & 14	FB/V (+)	3.2	4.3	85 & 86	SS/V (-)	3.2	4.3
15 & 16	FB/V (+)	4.0	4.3	87 & 88	SS/V (-)	4.0	4.3
17 & 18	FB/V (+)	5.0	4.3	89 & 90	SS/V (-)	5.0	4.3
19 & 20	FB/V (+)	6.3	4.3	91 & 92	SS/V (-)	6.3	4.3
21 & 22	FB/V (+)	8.0	4.3	93 & 94	SS/V (-)	8.0	4.3
23 & 24	FB/V (+)	10.0	4.4	95 & 96	SS/V (-)	10.0	4.4
25 & 26	FB/V (+)	12.5	4.3	97 & 98	SS/V (-)	12.5	4.3
27 & 28	FB/V (+)	16.0	4.3	99 & 100	SS/V (-)	16.0	4.3
29 & 30	FB/V (+)	20.0	4.3	101 & 102	SS/V (-)	20.0	4.3
31 & 32	FB/V (+)	25.0	4.3	103 & 104	SS/V (-)	25.0	4.3
33 & 34	FB/V (+)	32.0	4.3	105 & 106	SS/V (-)	27.0	4.3
35 & 36	FB/V (+)	35.0	4.3	107 & 108	SS/V (-)	32.0	4.4
				109 & 110	SS/V (-)	35.0	4.4
37 & 38	SS/V (+)	1-35-1	0.2	111 & 112*	FB/V (-)	1-35-1	0.2
39 & 40	SS/V (+)	35.0	4.3	113 & 114	FB/V (-)	35.0	4.3
41 & 42	SS/V (+)	32.0	4.4	115 & 116	FB/V (-)	32.0	4.3
43 & 44	SS/V (+)	25.0	4.4	117 & 118	FB/V (-)	25.0	4.3
45 & 46	SS/V (+)	20.0	4.3	119 & 120	FB/V (-)	20.0	4.4
47 & 48	SS/V (+)	16.0	4.3	121 & 122	FB/V (-)	16.0	4.3
49 & 50	SS/V (+)	12.5	4.3	123 & 124	FB/V (-)	12.5	4.3
51 & 52	SS/V (+)	10.0	4.3	125 & 126	FB/V (-)	10.0	4.4
53 & 54	SS/V (+)	8.0	4.3	127 & 128	FB/V (-)	8.0	4.3
55 & 56	SS/V (+)	6.3	4.4	129 & 130	FB/V (-)	6.3	4.3
57 & 58	SS/V (+)	5.0	4.3	131 & 132	FB/V (-)	5.0	4.4
59 & 60	SS/V (+)	4.0	4.3	133 & 134	FB/V (-)	4.0	4.3
61 & 62	SS/V (+)	3.2	4.3	135 & 136	FB/V (-)	3.2	4.3
63 & 64	SS/V (+)	2.5	3.5	137 & 138	FB/V (-)	2.5	3.5
65 & 66	SS/V (+)	2.0	3.0	139 & 140	FB/V (-)	2.0	3.0
67 & 68	SS/V (+)	1.6	2.3	141 & 142	FB/V (-)	1.6	2.3
69 & 70	SS/V (+)	1.25	1.5	143 & 144	FB/V (-)	1.25	1.5
71 & 72	SS/V (+)	1.0	0.9	145 & 146	FB/V (-)	1.0	0.9

NOTE: Runs 1, 2, 37, 38, 73, 74, 111, and 112 are exploratory tests. The remaining runs are sine beat tests.

LEGEND: FB/V = Front-to-Back and Vertical
SS/V = Side-to-Side and Vertical

*Removed the Electronic Differential Pressure Transmitter (Item 1) from test setup at the completion of Run 112 (see Notice of Anomaly Number 1).

TABLE II

TEST RUN DESCRIPTIONS AND INPUT ACCELERATIONS DURING FRAGILITY (MACHINE LIMIT) TEST

RUN	AXES	FREQUENCY (Hz)	TEST LEVEL (g)	RUN	AXES	FREQUENCY (Hz)	TEST LEVEL (g)
147	FB/V (-)	4.0	5.2	169	FB/V (+)	4.0	5.2
148	FB/V (-)	5.0	6.3	170	FB/V (+)	5.0	6.3
149	FB/V (-)	6.3	7.5	171	FB/V (+)	6.3	7.5
150	FB/V (-)	8.0	8.5	172	FB/V (+)	8.0	8.5
151	FB/V (-)	10.0	10.0	173	FB/V (+)	10.0	10.0
152	FB/V (-)	12.5	10.0	174	FB/V (+)	12.5	10.0
153	FB/V (-)	16.0	10.0	175	FB/V (+)	16.0	10.0
154	FB/V (-)	20.0	10.0	176	FB/V (+)	20.0	10.0
155	FB/V (-)	25.0	8.0	177	FB/V (+)	25.0	8.0
156	FB/V (-)	32.0	5.1	178	FB/V (+)	32.0	5.1
157	FB/V (-)	35.0	5.0	179	FB/V (+)	35.0	5.0
158	SS/V (-)	35.0	5.0	180	SS/V (+)	35.0	5.0
159	SS/V (-)	32.0	5.1	181	SS/V (+)	32.0	5.1
160	SS/V (-)	25.0	8.0	182	SS/V (+)	25.0	8.0
161	SS/V (-)	20.0	10.0	183	SS/V (+)	20.0	10.0
162	SS/V (-)	16.0	10.0	184	SS/V (+)	16.0	10.0
163	SS/V (-)	12.5	10.0	185	SS/V (+)	12.5	10.0
164	SS/V (-)	10.0	10.0	186	SS/V (+)	10.0	10.0
165	SS/V (-)	8.0	8.5	187	SS/V (+)	8.0	8.5
166	SS/V (-)	6.3	7.5	188	SS/V (+)	6.3	7.5
167	SS/V (-)	5.0	6.3	189	SS/V (+)	5.0	6.3
168*	SS/V (-)	4.0	5.2	190	SS/V (+)	4.0	5.2

LEGEND: FB/V = Front-to-Back and Vertical
SS/V = Side to-Side and Vertical

*Post-test inspection of the SS/V (-) axis revealed the pen drive gear of the Recorder (Item 5) had loosened and disengaged from the pen drive motor (see Paragraph 6.4.1 and Photograph 3).

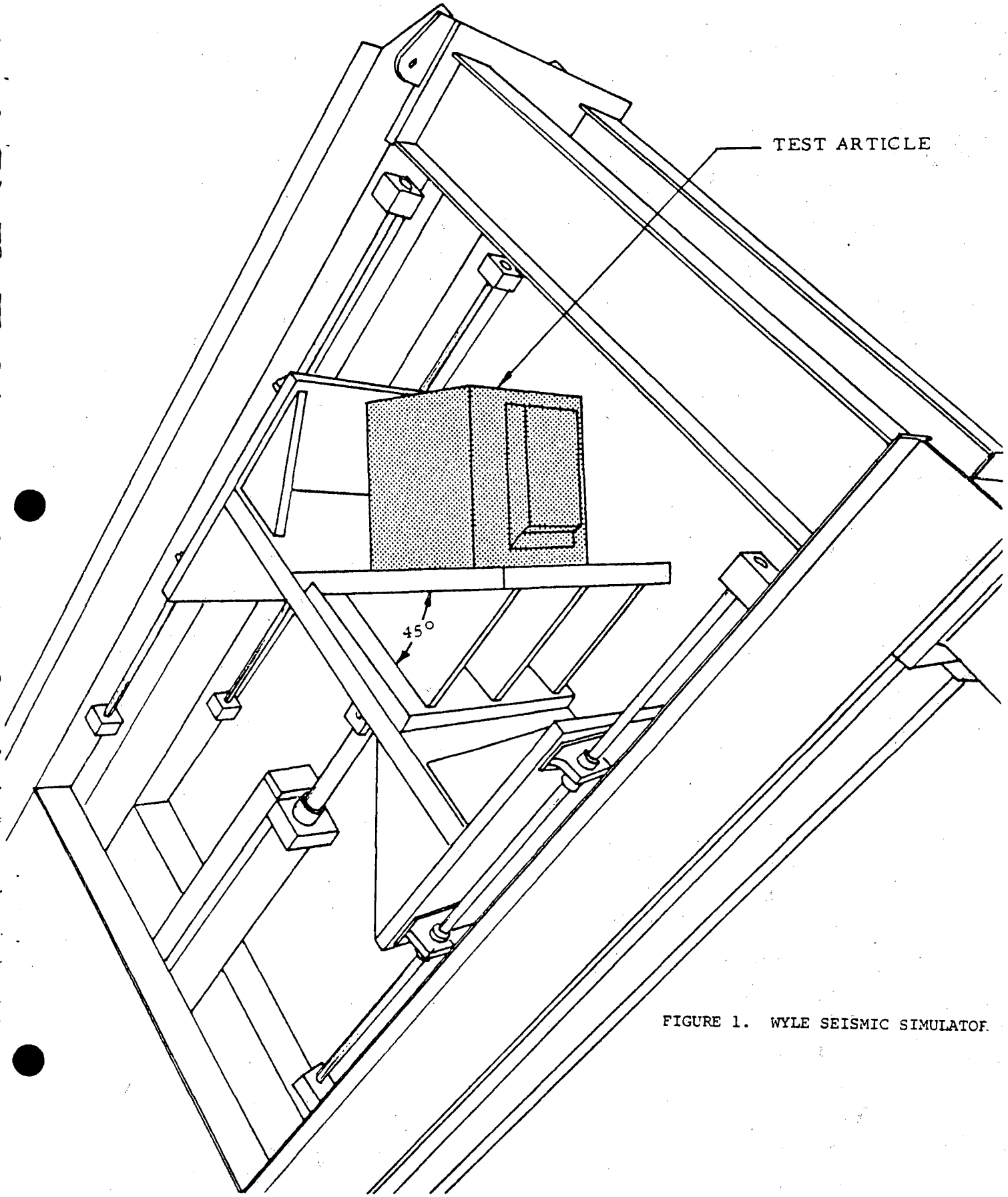


FIGURE 1. WYLE SEISMIC SIMULATOR

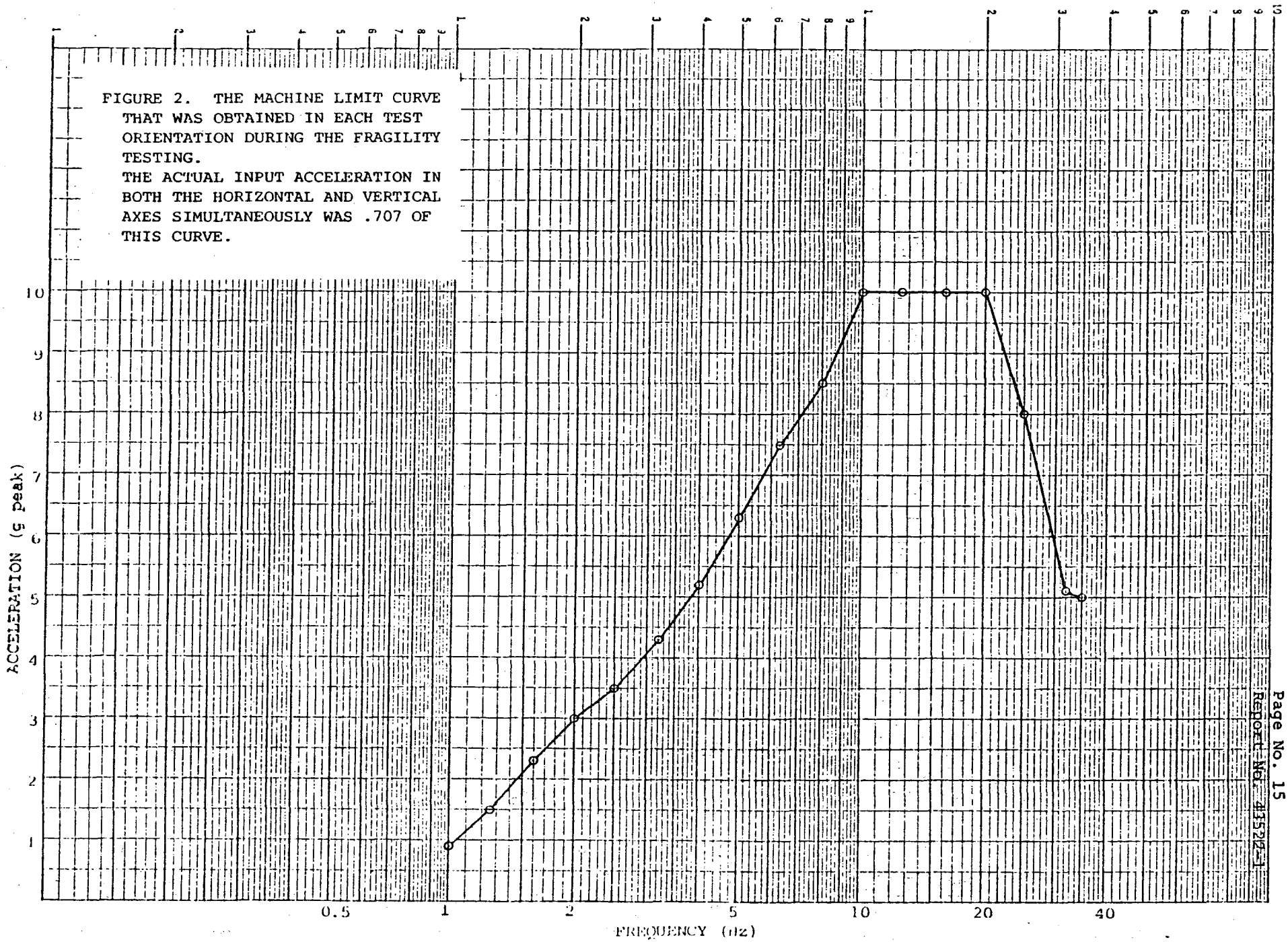
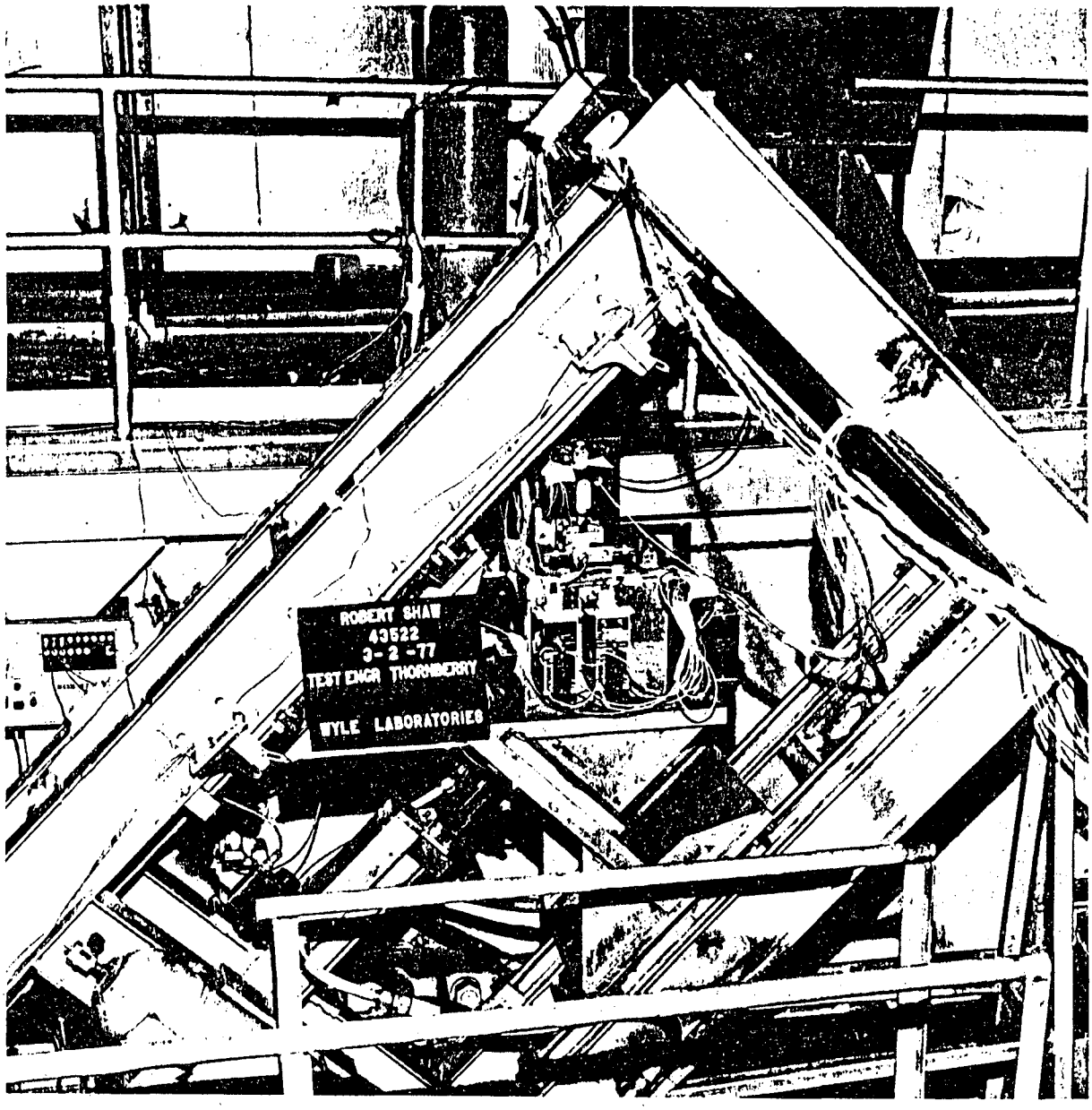
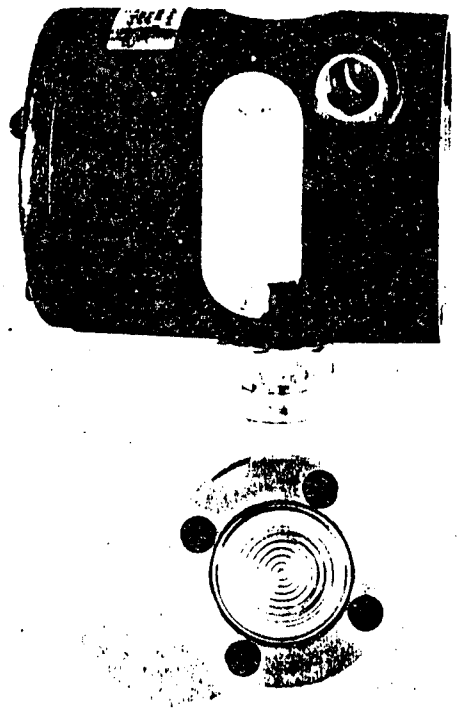


FIGURE 2. THE MACHINE LIMIT CURVE THAT WAS OBTAINED IN EACH TEST ORIENTATION DURING THE FRAGILITY TESTING.
THE ACTUAL INPUT ACCELERATION IN BOTH THE HORIZONTAL AND VERTICAL AXES SIMULTANEOUSLY WAS .707 OF THIS CURVE.



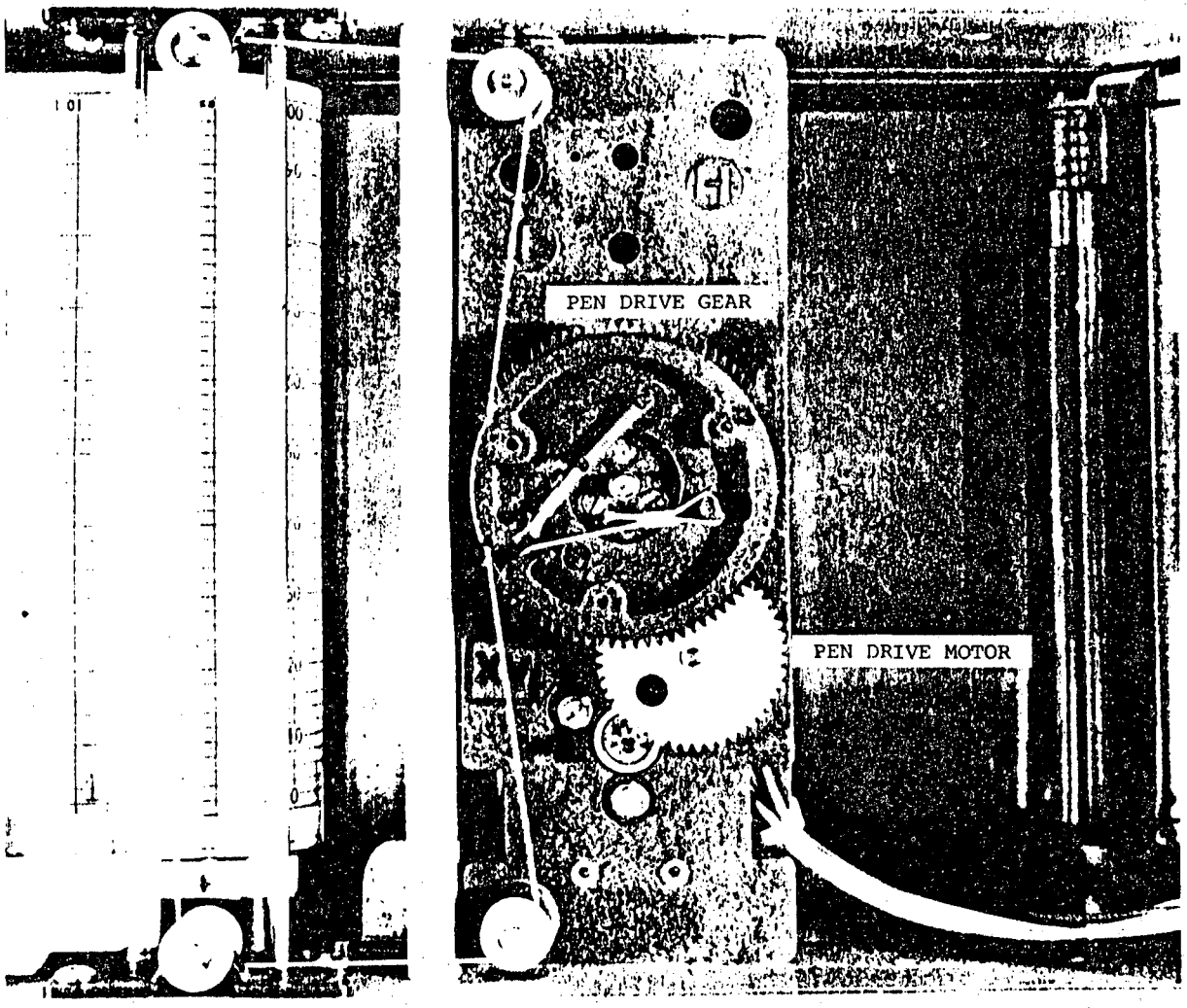
PHOTOGRAPH 1

GENERAL ARRANGEMENT OF THE SPECIMENS
FOR
SIDE-TO-SIDE AND VERTICAL TESTING
ON THE SEISMIC SIMULATOR



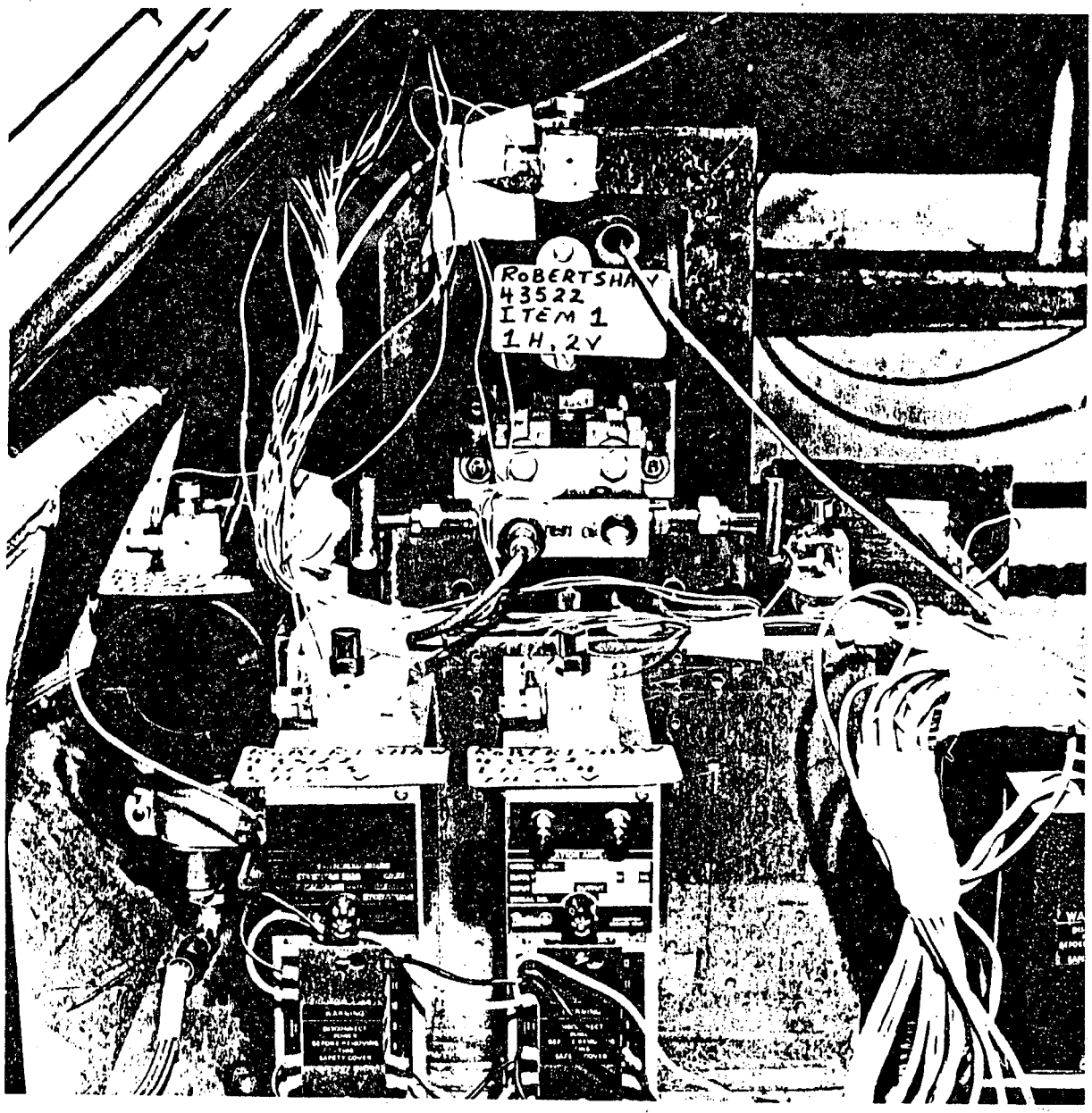
PHOTOGRAPH 2

LOOSENED ELECTRONIC HOUSING SUPPORT
FOR ITEM 1



PHOTOGRAPH 3

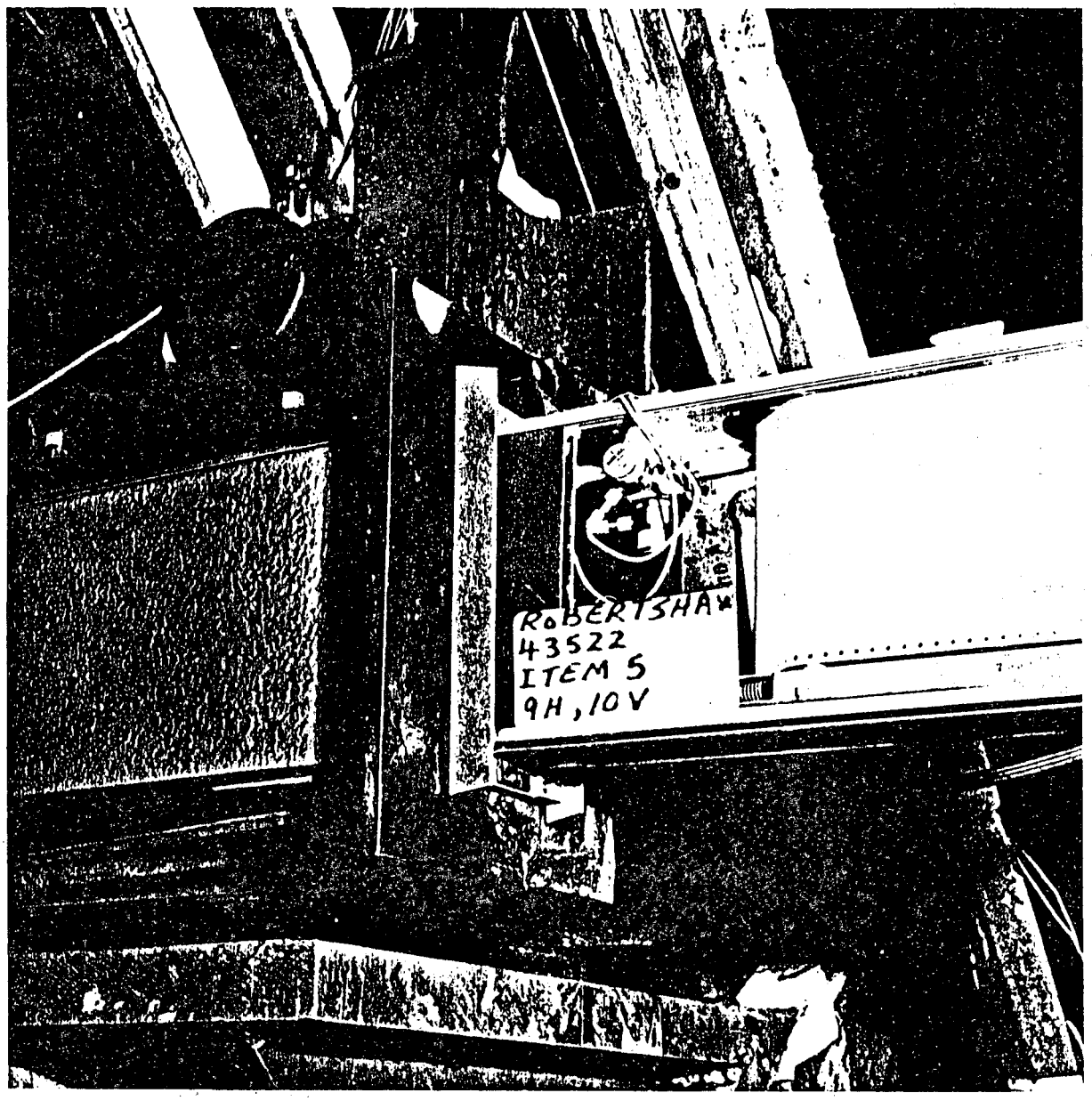
PEN DRIVE GEAR FOR ITEMS WHICH
LOOSENED DURING FRAGILITY TESTING



PHOTOGRAPH 4

ACCELEROMETER LOCATIONS

ITEM 1	1H, 2V
ITEM 2	3H, 4V
ITEM 3	5H, 6V
ITEM 4	7H, 8V



PHOTOGRAPH 5

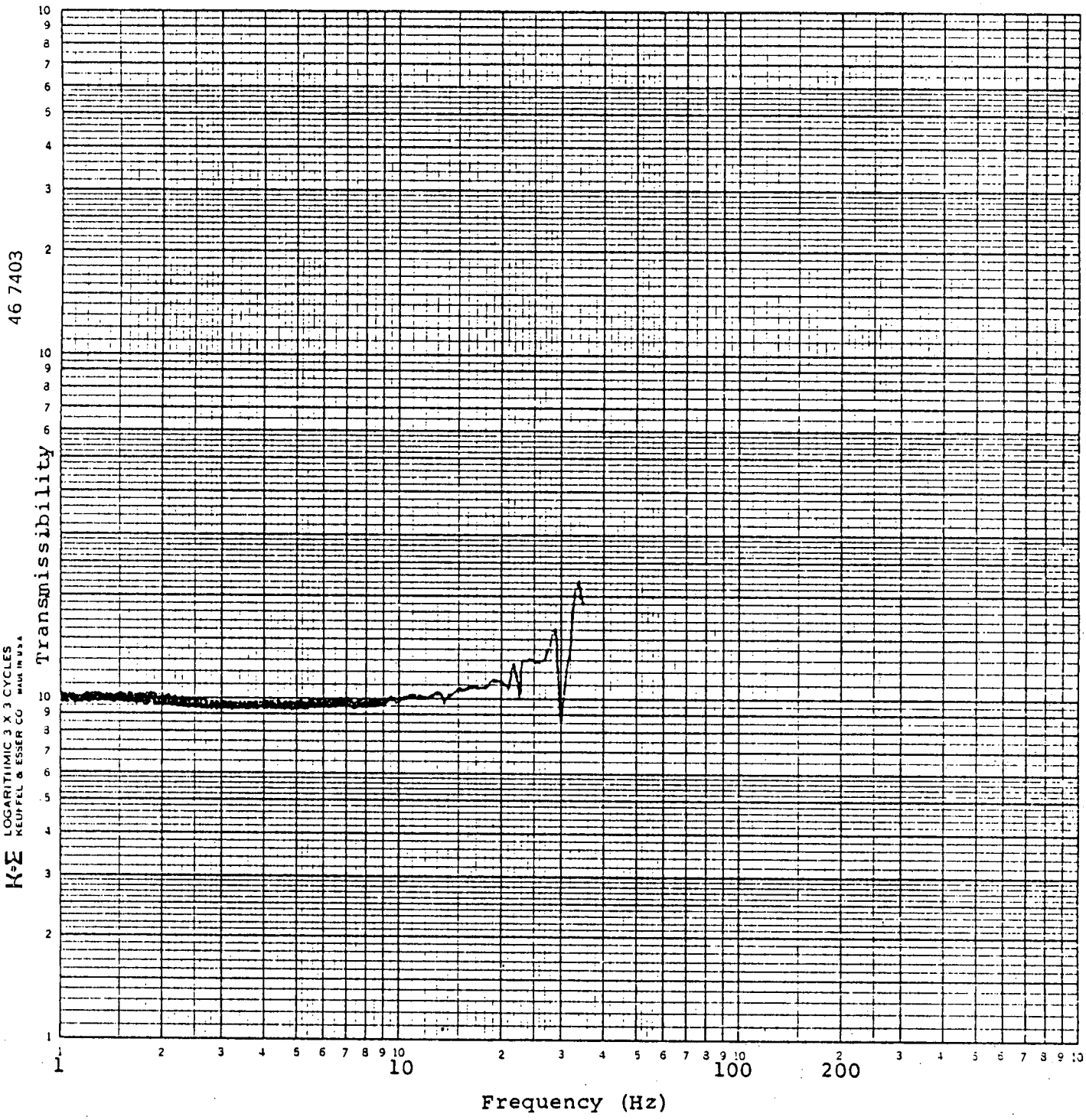
ACCELEROMETER LOCATIONS
ITEM 5 9H, 10V

APPENDIX I

TRANSMISSIBILITY PLOTS

FULL SCALE TRANSMISSIBILITY

0.1 ☐ 1.0 ☐ 10 ☐ 100 ☒ 1000 ☐



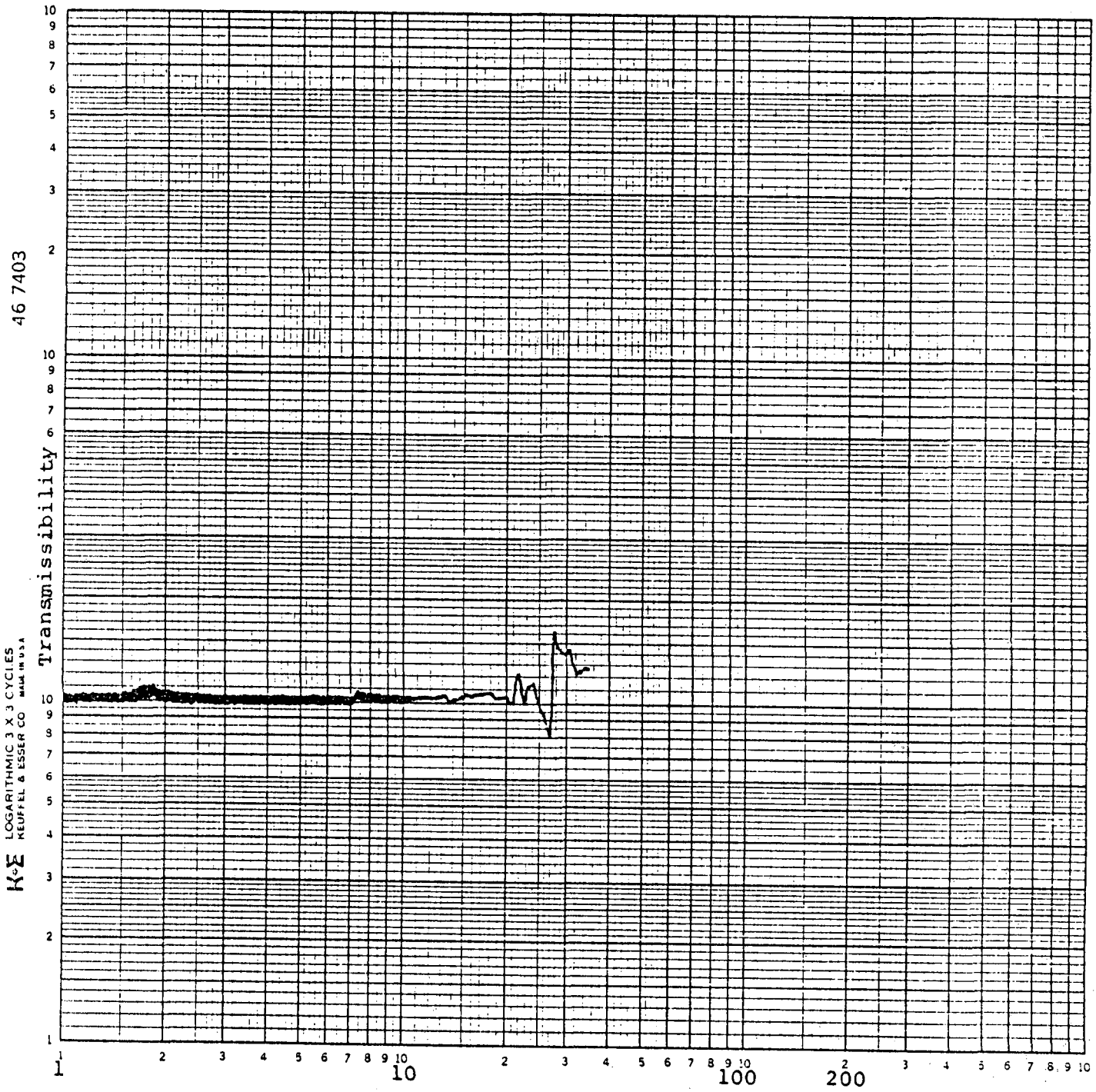
AXIS F-B/V=1

ACCEL. NO. 1F-B ÷ NO. HCA

TEST RUN NO. 1

FULL SCALE TRANSMISSIBILITY

0.1 ☐ 1.0 ☐ 10 ☐ 100 ☒ 1000 ☐



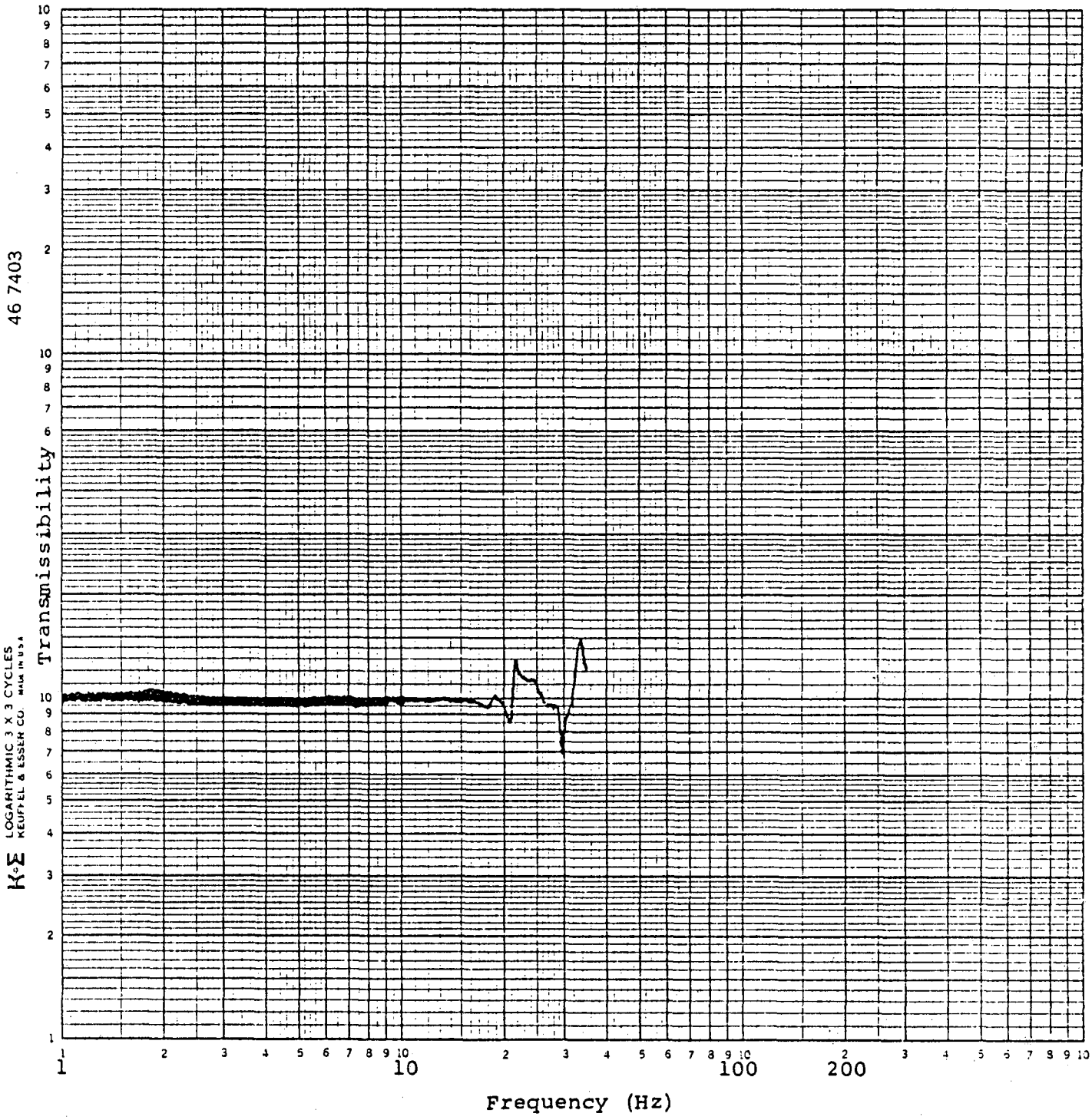
AXIS F-B/V #1

ACCEL. NO. 2V ÷ NO. VCA

TEST RUN NO. 1

FULL SCALE TRANSMISSIBILITY

0.1 ☐ 1.0 ☐ 10 ☐ 100 ☒ 1000 ☐



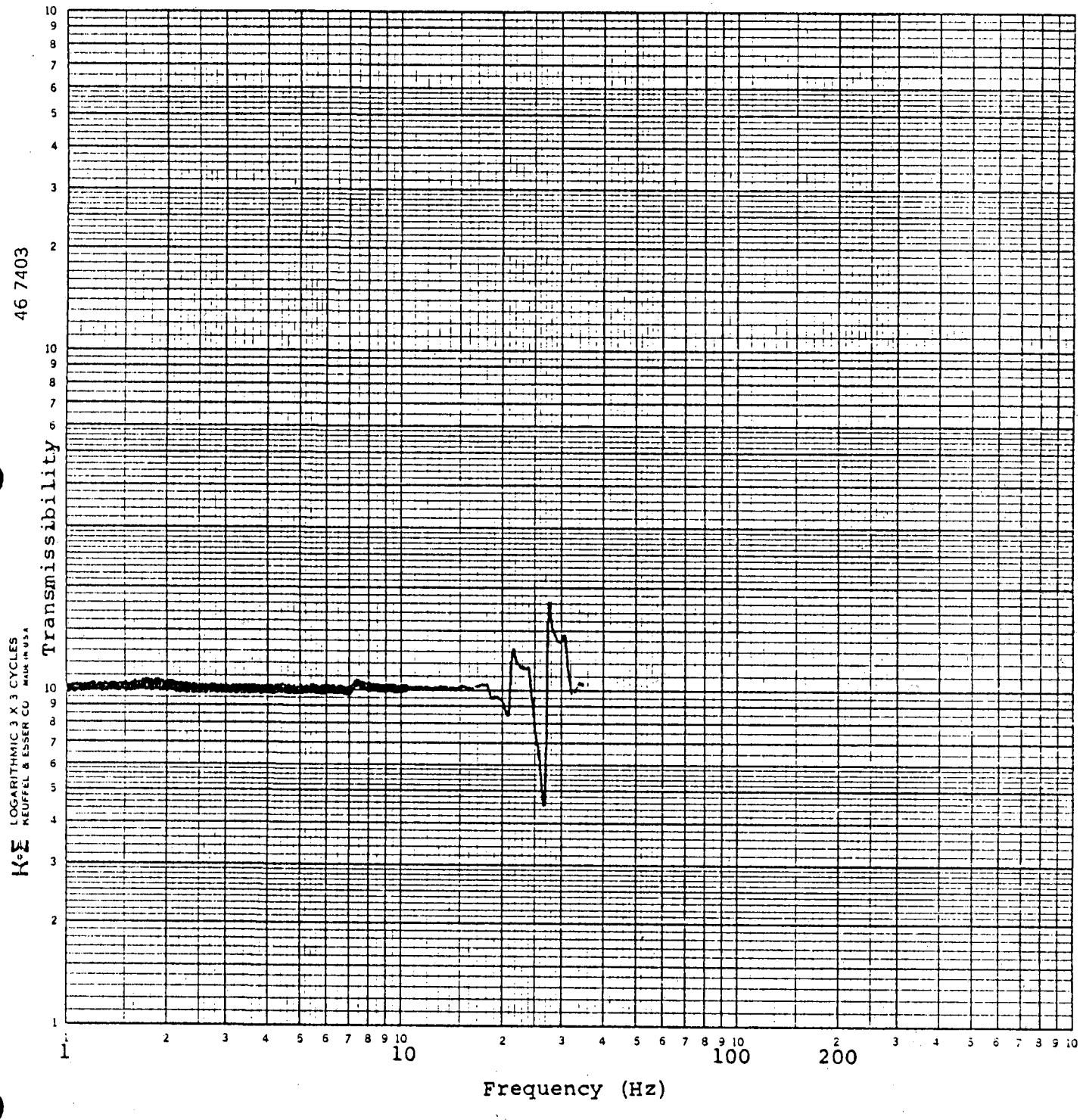
AXIS F.B/V #1

ACCEL. NO. 3F.B ÷ NO. HCA

TEST RUN NO. 1

FULL SCALE TRANSMISSIBILITY

0.1 ☐ 1.0 ☐ 10 ☐ 100 ☒ 1000 ☐



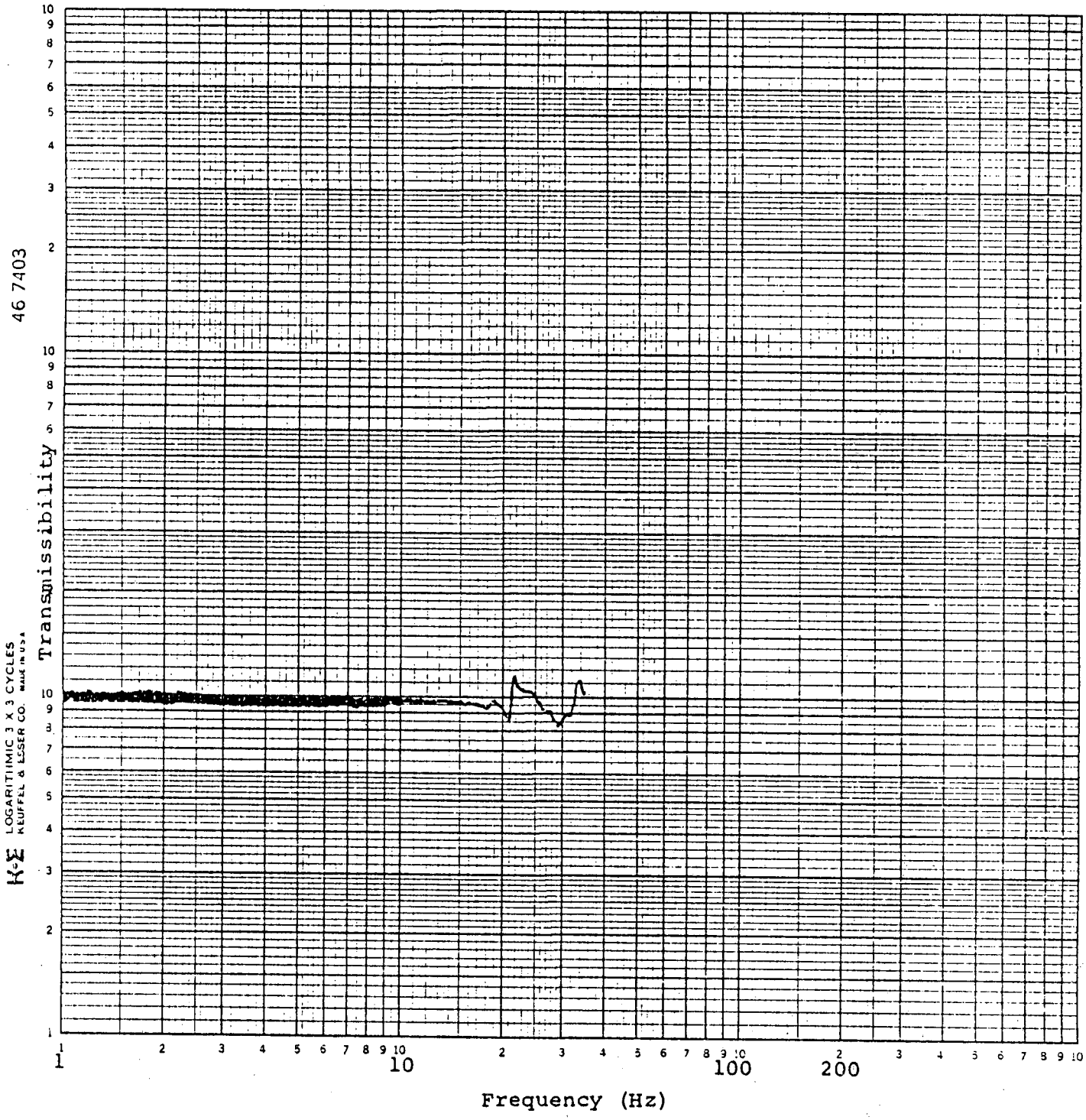
AXIS F-B/V #1

ACCEL. NO. 4V ÷ NO. VCA

TEST RUN NO. 1

FULL SCALE TRANSMISSIBILITY

0.1 ☐ 1.0 ☐ 10 ☐ 100 ☒ 1000 ☐



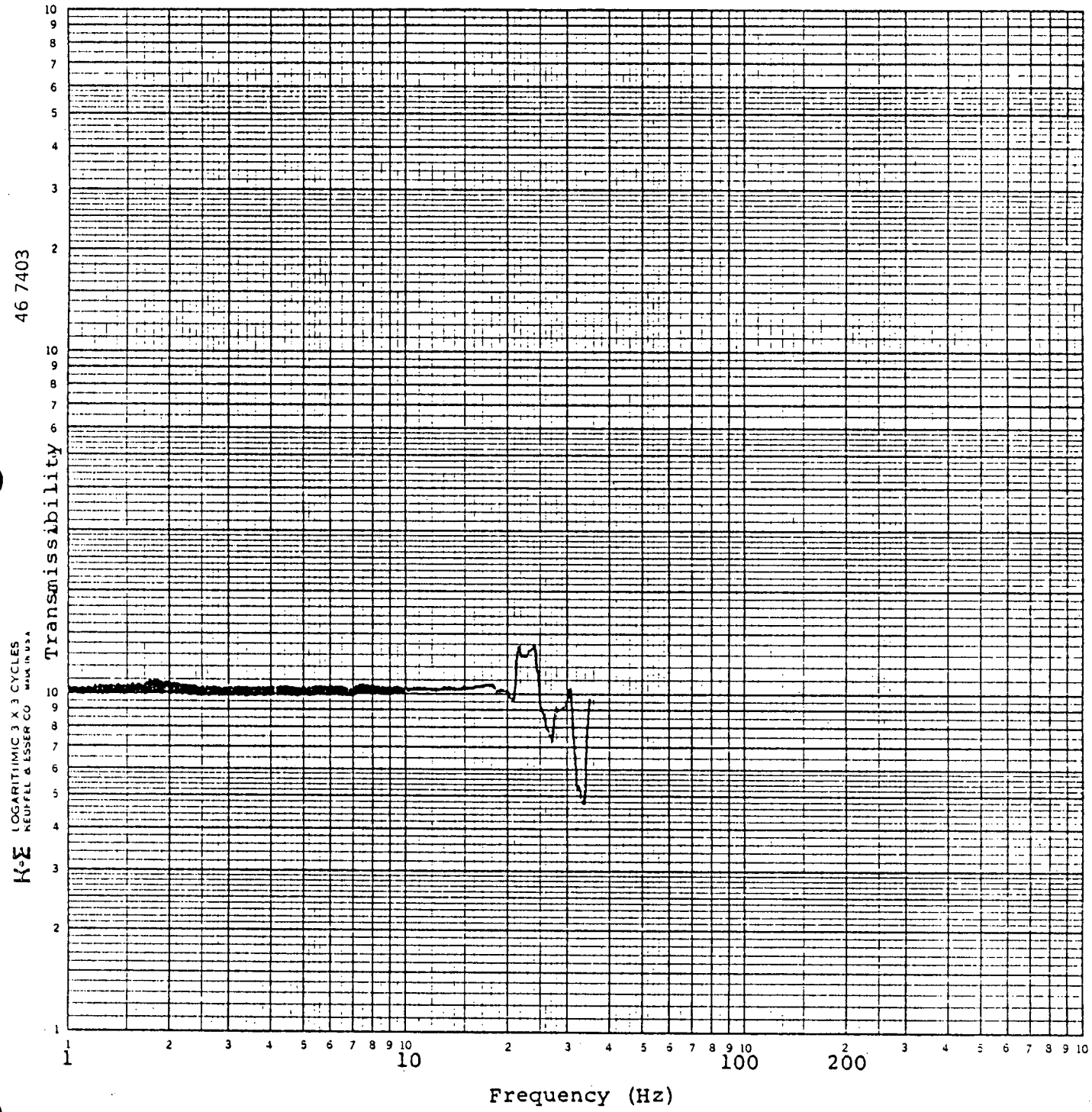
AXIS F-B/V #1

ACCEL. NO. 5FB ÷ NO. HCA

TEST RUN NO. 1

FULL SCALE TRANSMISSIBILITY

0.1 ☐ 1.0 ☐ 10 ☐ 100 ☒ 1000 ☐



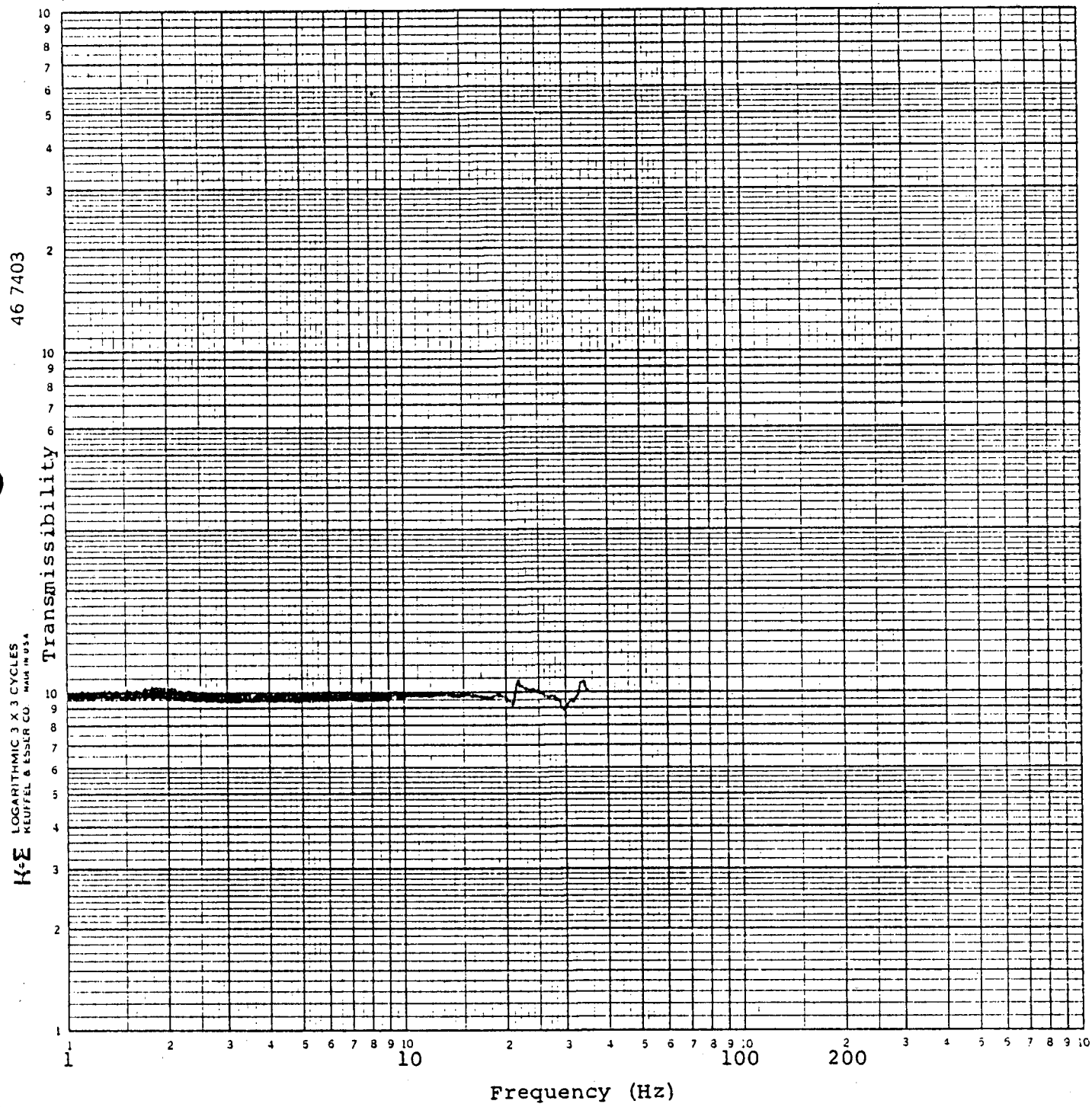
AXIS F.B/V #1

ACCEL. NO. 6V ÷ NO. VCA

TEST RUN NO. 1

FULL SCALE TRANSMISSIBILITY

0.1 ☐ 1.0 ☐ 10 ☐ 100 ☒ 1000 ☐



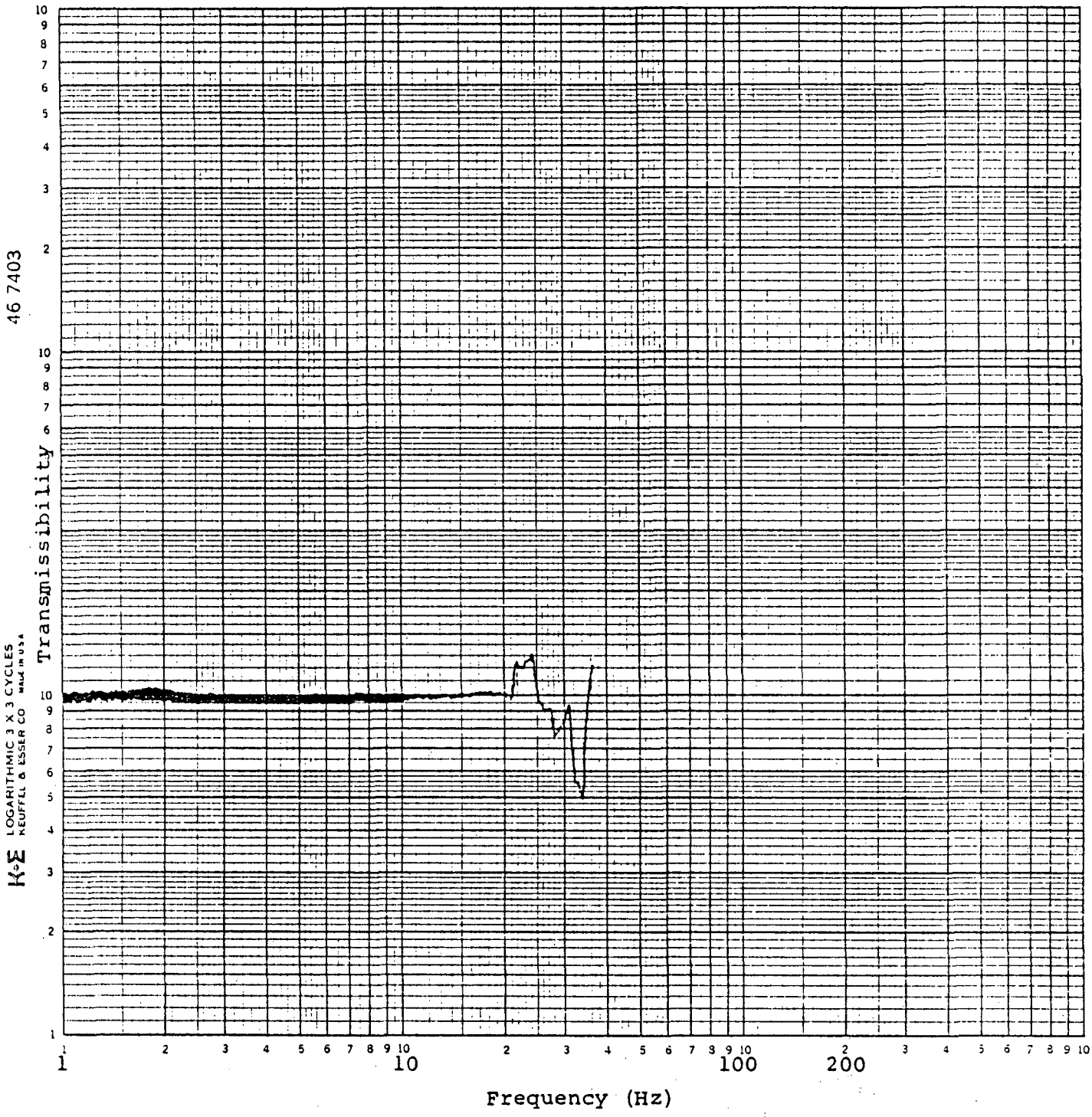
AXIS F-B/V#1

ACCEL. NO. TFB ÷ NO. HCA

TEST RUN NO. 1

FULL SCALE TRANSMISSIBILITY

0.1 ☐ 1.0 ☐ 10 ☐ 100 ☒ 1000 ☐



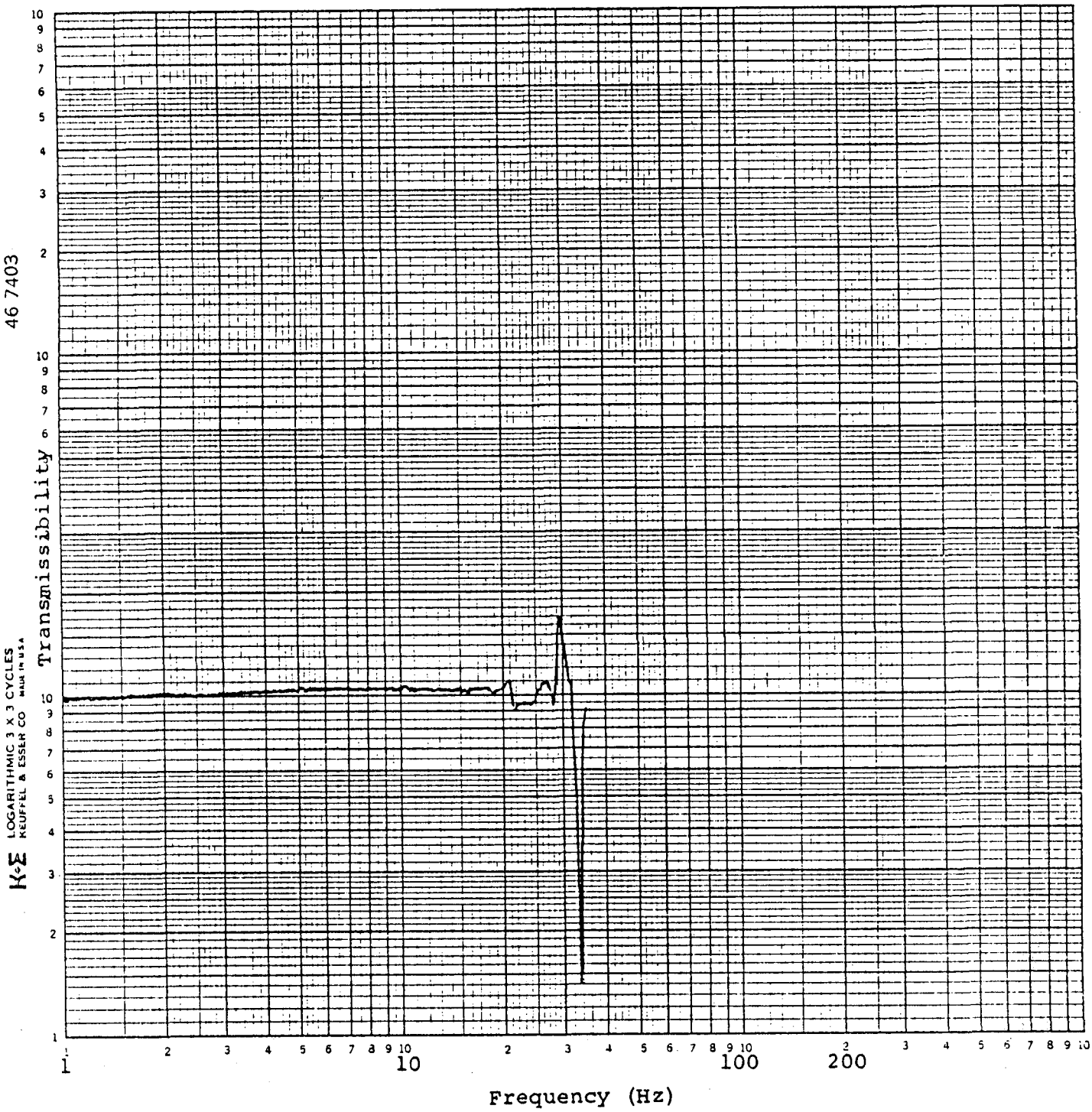
AXIS F.B/V #1

ACCEL. NO. 8V ÷ NO. VCA

TEST RUN NO. 1

FULL SCALE TRANSMISSIBILITY

0.1 ☐ 1.0 ☐ 10 ☐ 100 ☒ 1000 ☐



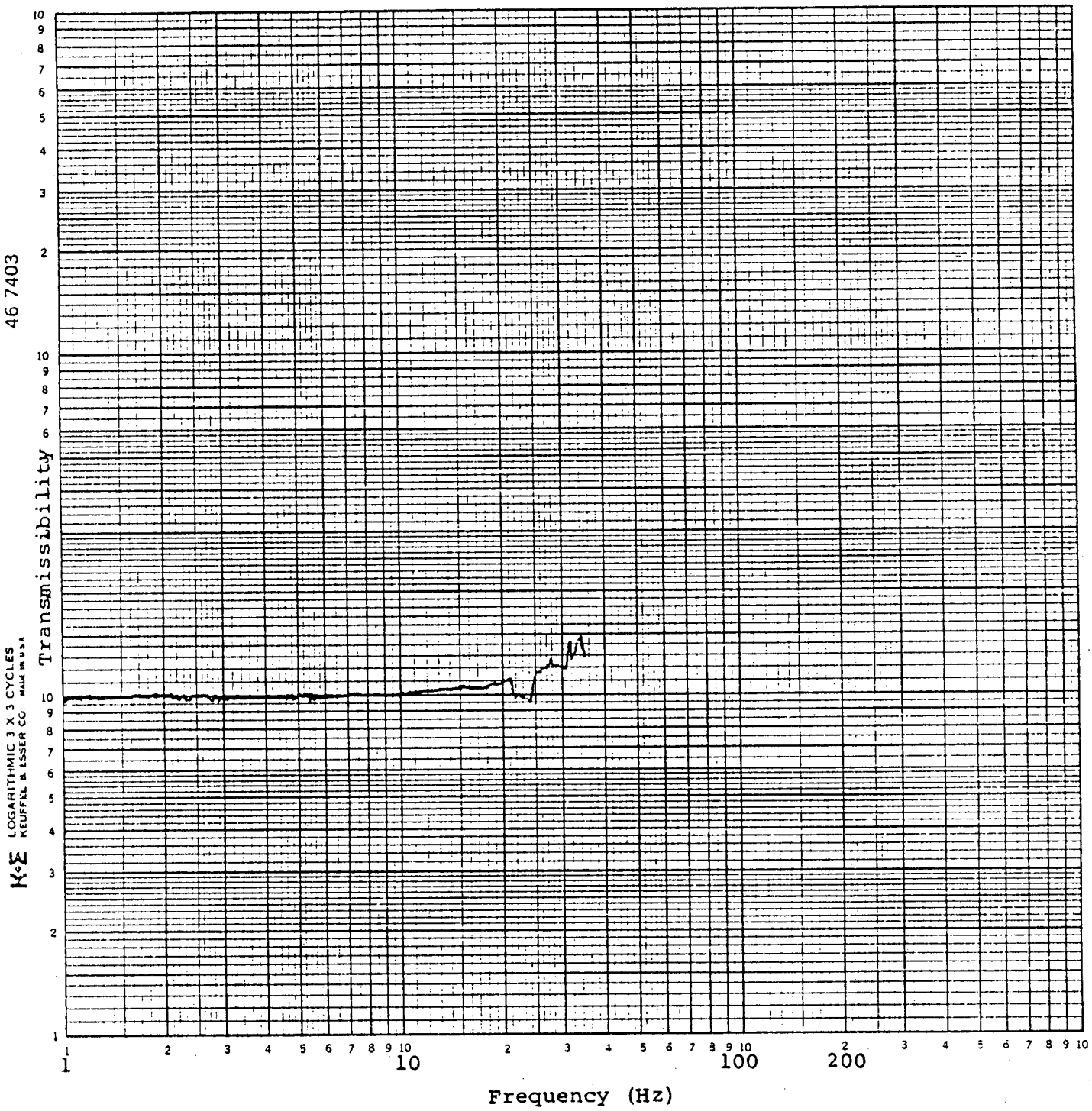
AXIS F-8/V #1

ACCEL. NO. 9F-8 ÷ NO. HCA

TEST RUN NO. 1

FULL SCALE TRANSMISSIBILITY

0.1 ☐ 1.0 ☐ 10 ☐ 100 ☒ 1000 ☐



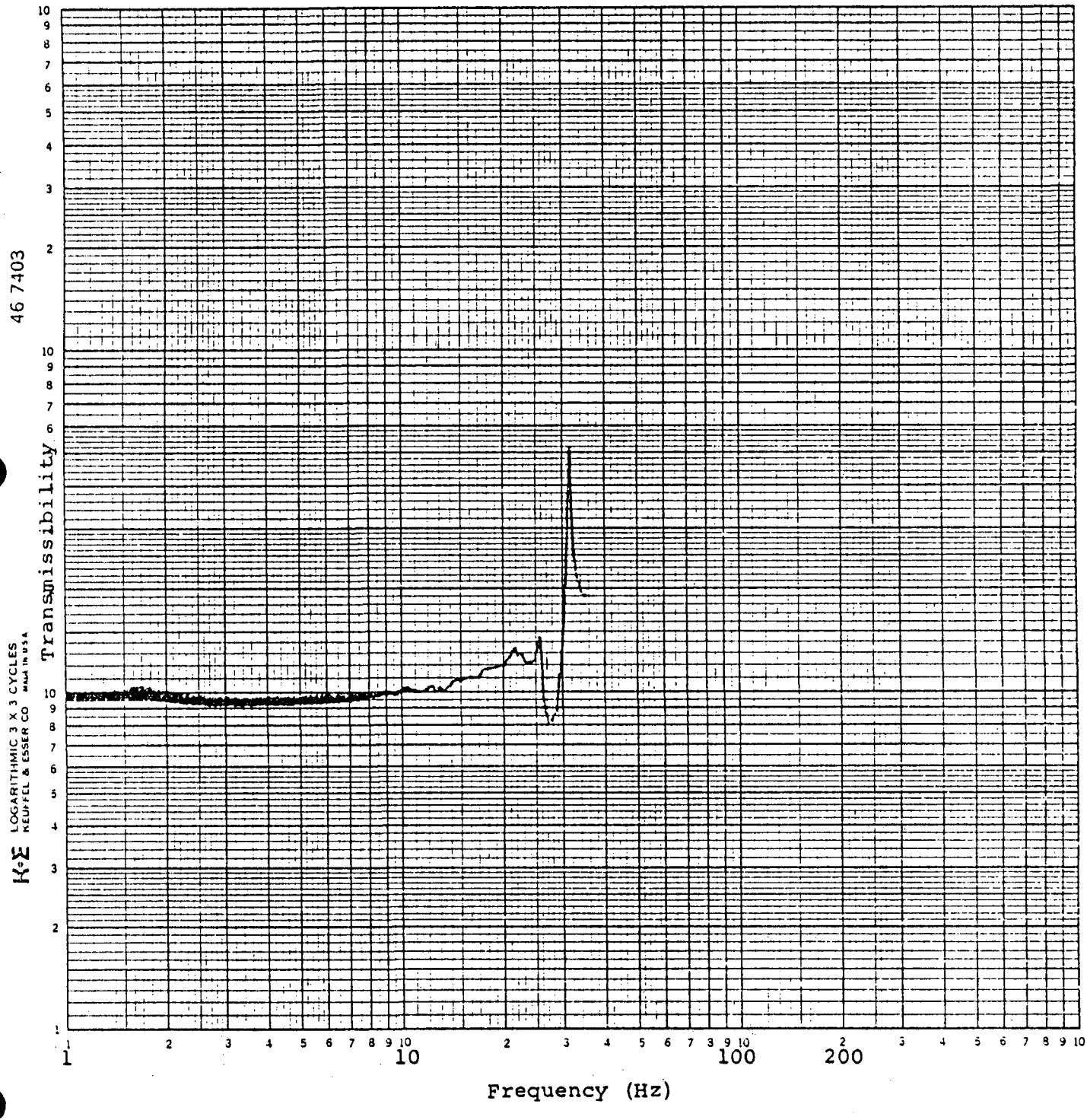
AXIS F-B/V #1

ACCEL. NO. 10V ÷ NO. VCA

TEST RUN NO. 1

FULL SCALE TRANSMISSIBILITY

0.1 ☐ 1.0 ☐ 10 ☐ 100 ☒ 1000 ☐



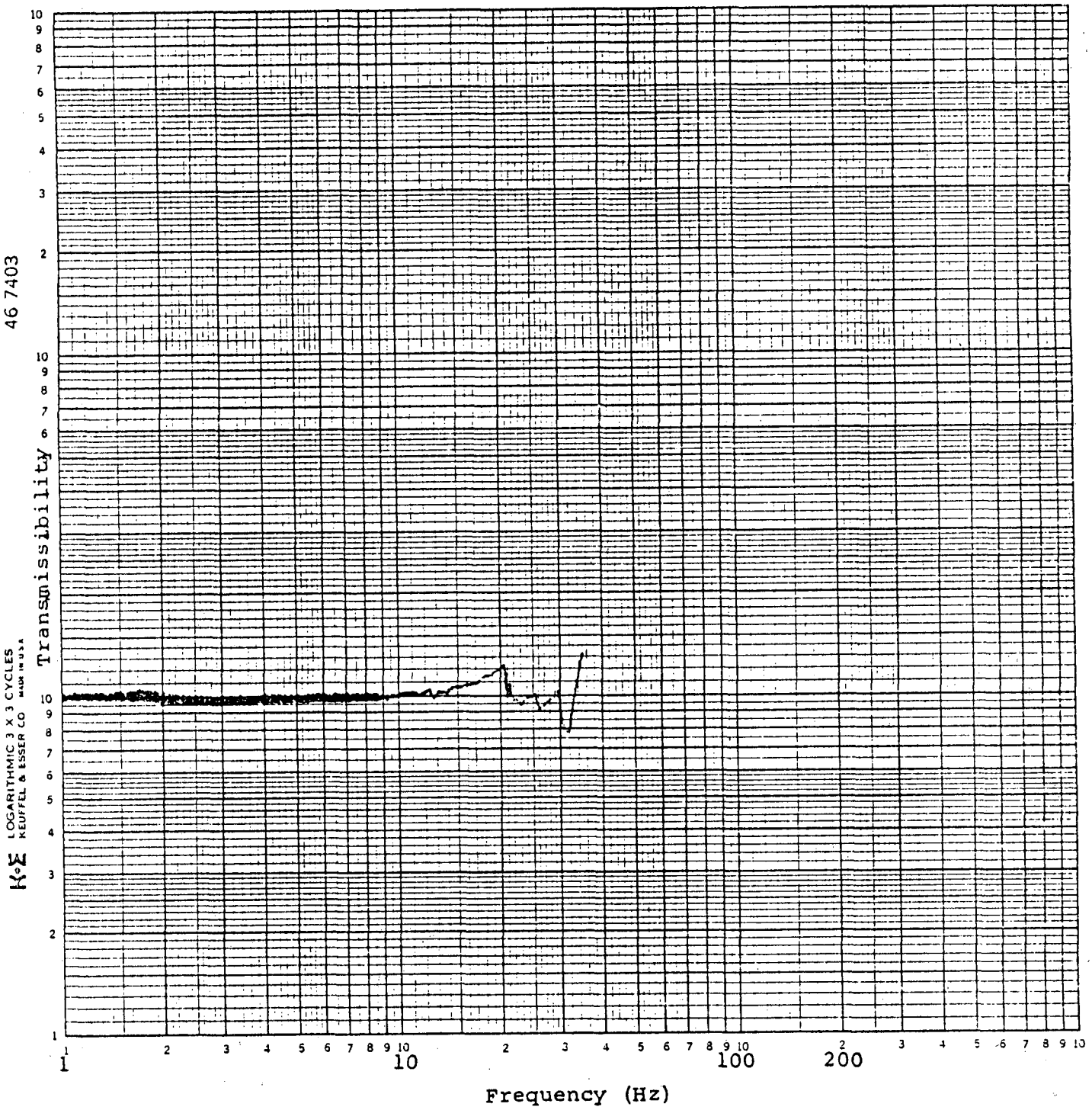
AXIS 5-5/V#1

ACCEL. NO. 15-5 ÷ NO. HCA

TEST RUN NO. 37

FULL SCALE TRANSMISSIBILITY

0.1 ☐ 1.0 ☐ 10 ☐ 100 ☒ 1000 ☐



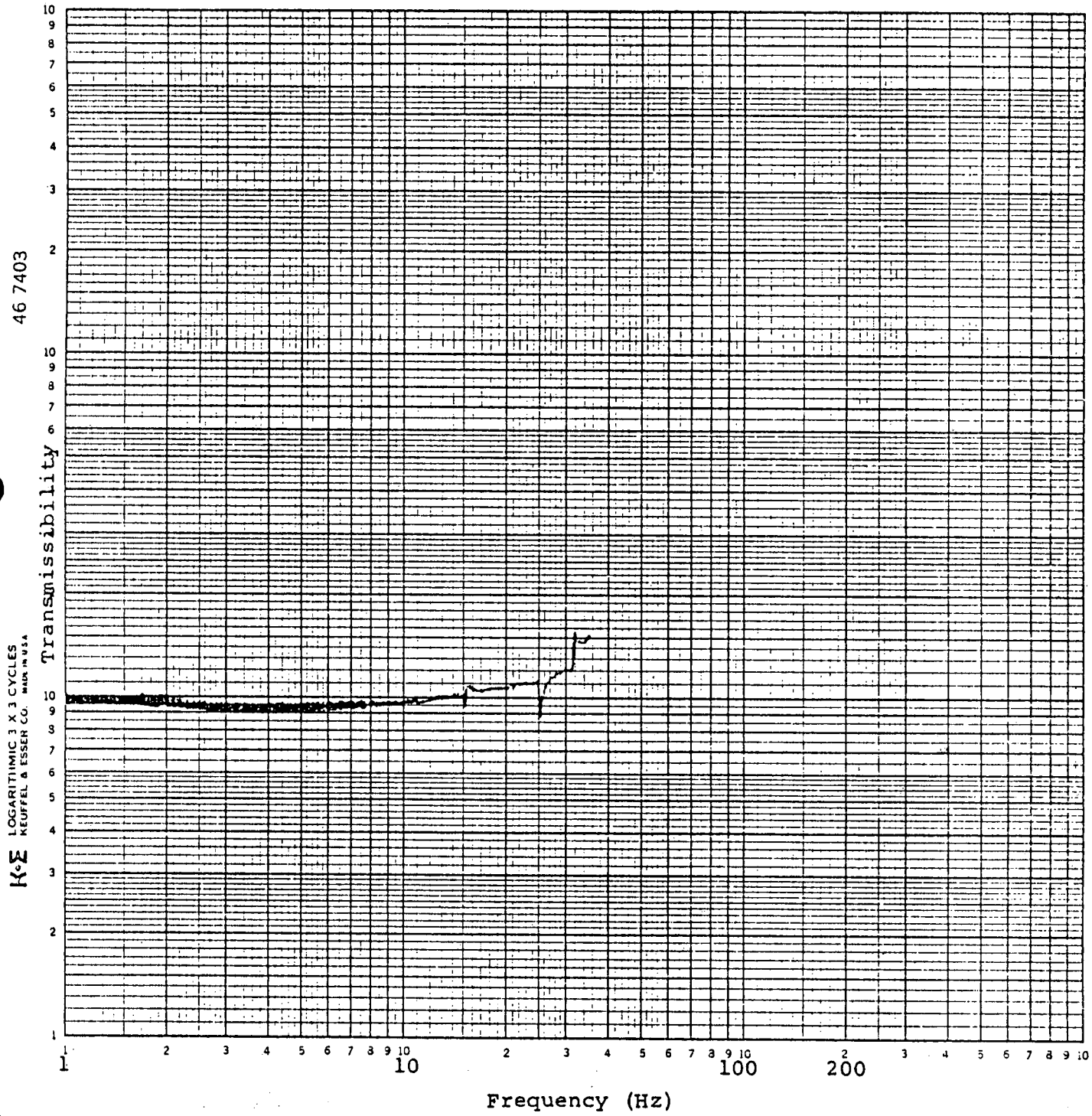
AXIS S-S/V #1

ACCEL. NO. 2V ÷ NO. VCA

TEST RUN NO. 37

FULL SCALE TRANSMISSIBILITY

0.1 ☐ 1.0 ☐ 10 ☐ 100 ☒ 1000 ☐



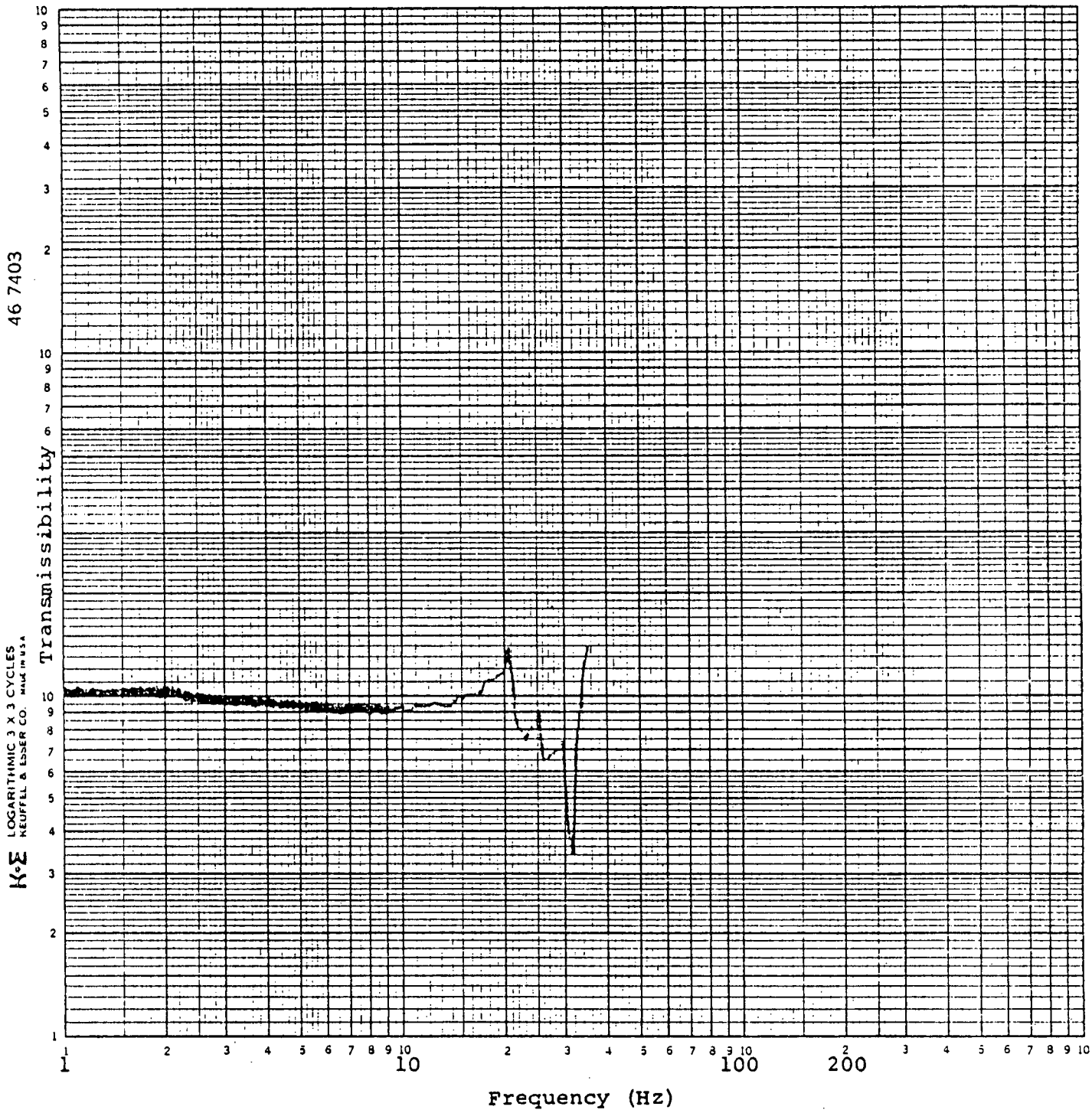
AXIS S-S/V #1

ACCEL. NO. 355 ÷ NO. HCA

TEST RUN NO. 37

FULL SCALE TRANSMISSIBILITY

0.1 ☐ 1.0 ☐ 10 ☐ 100 ☒ 1000 ☐



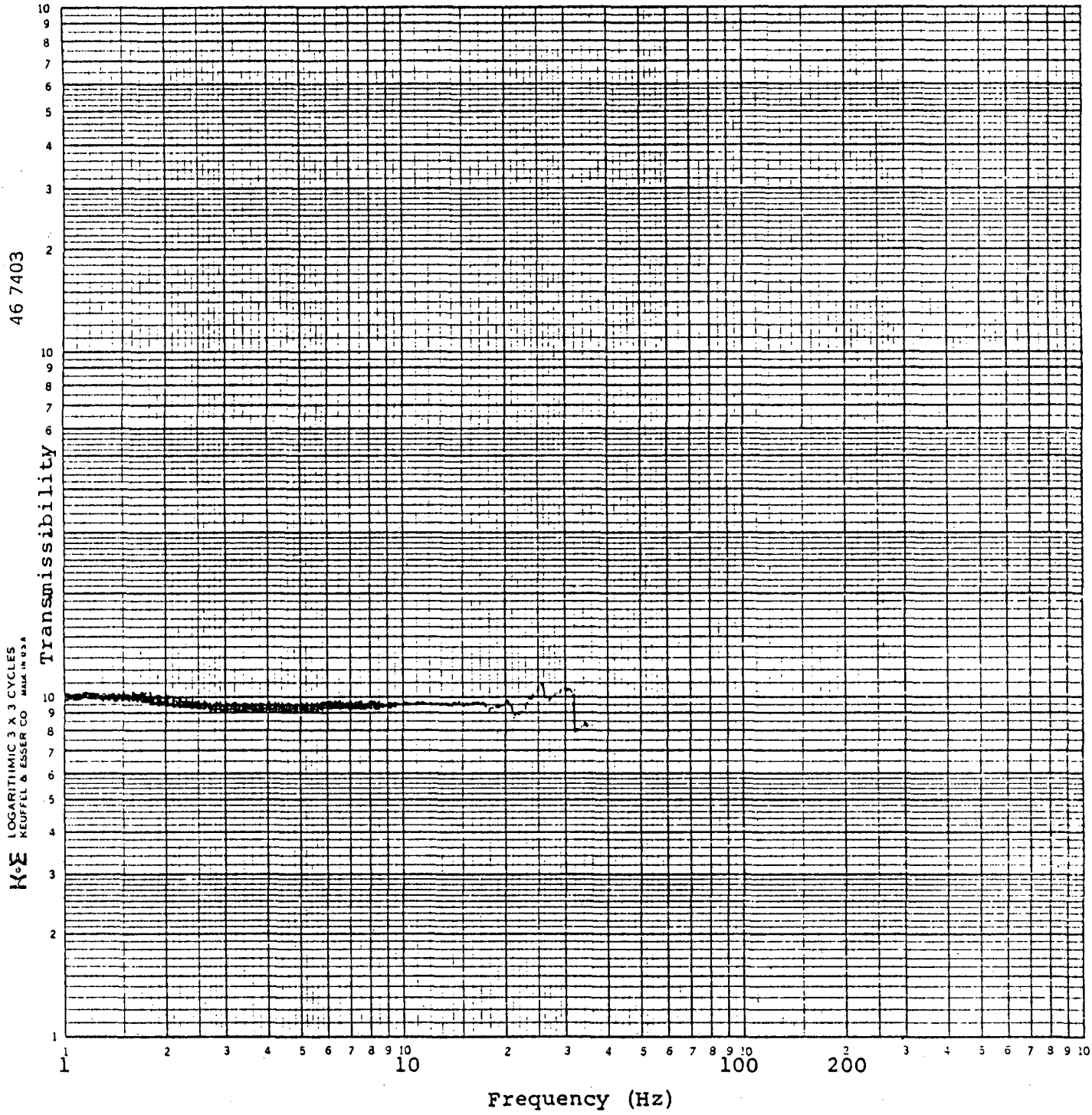
AXIS S-S/V#1

ACCEL. NO. 4Y ÷ NO. VCA

TEST RUN NO. 37

FULL SCALE TRANSMISSIBILITY

0.1 ☐ 1.0 ☐ 10 ☐ 100 ☒ 1000 ☐



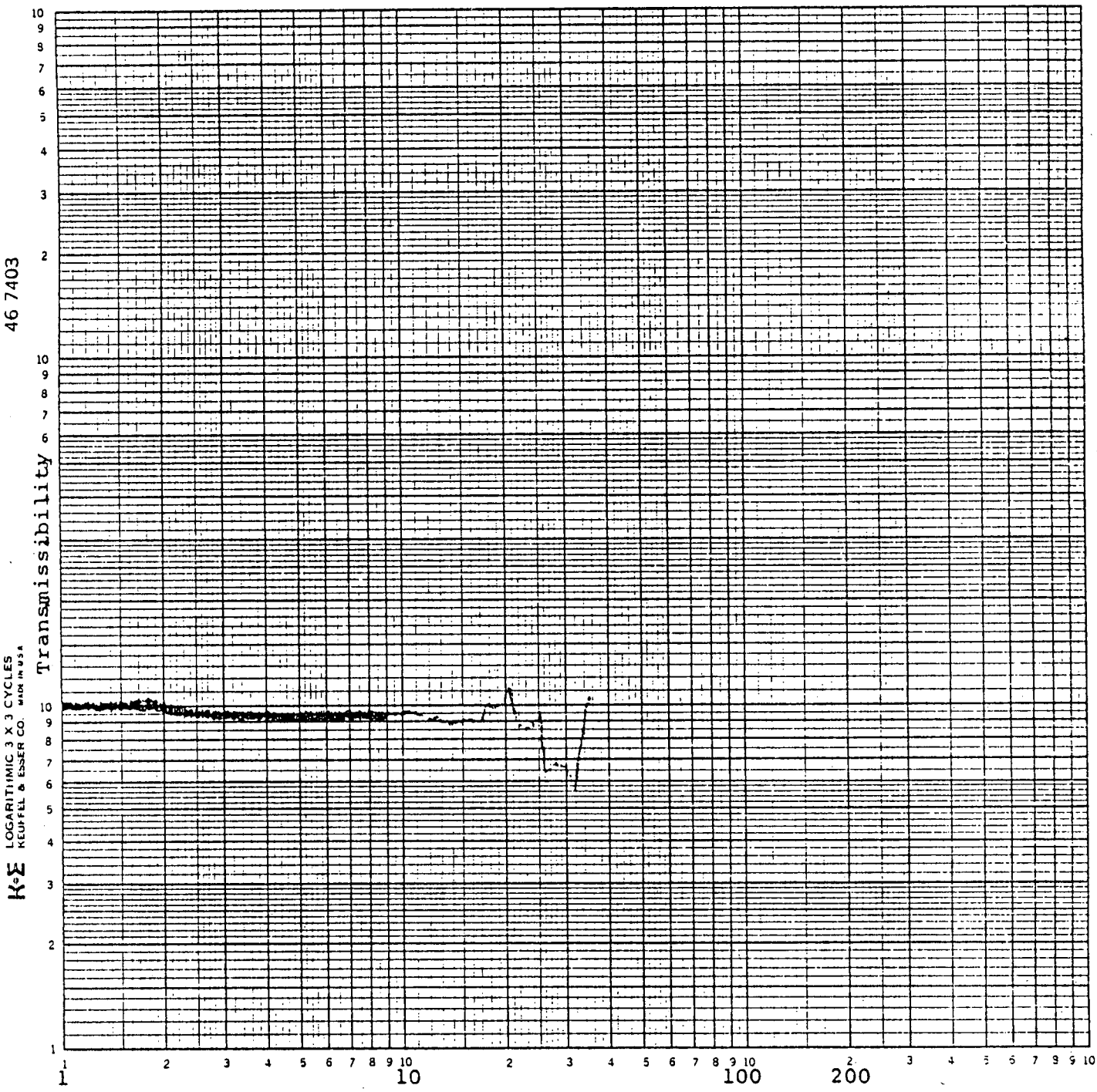
AXIS S-S/V#1

ACCEL. NO. 553 ÷ NO. 4CA

TEST RUN NO. 37

FULL SCALE TRANSMISSIBILITY

0.1 ☐ 1.0 ☐ 10 ☐ 100 ☒ 1000 ☐



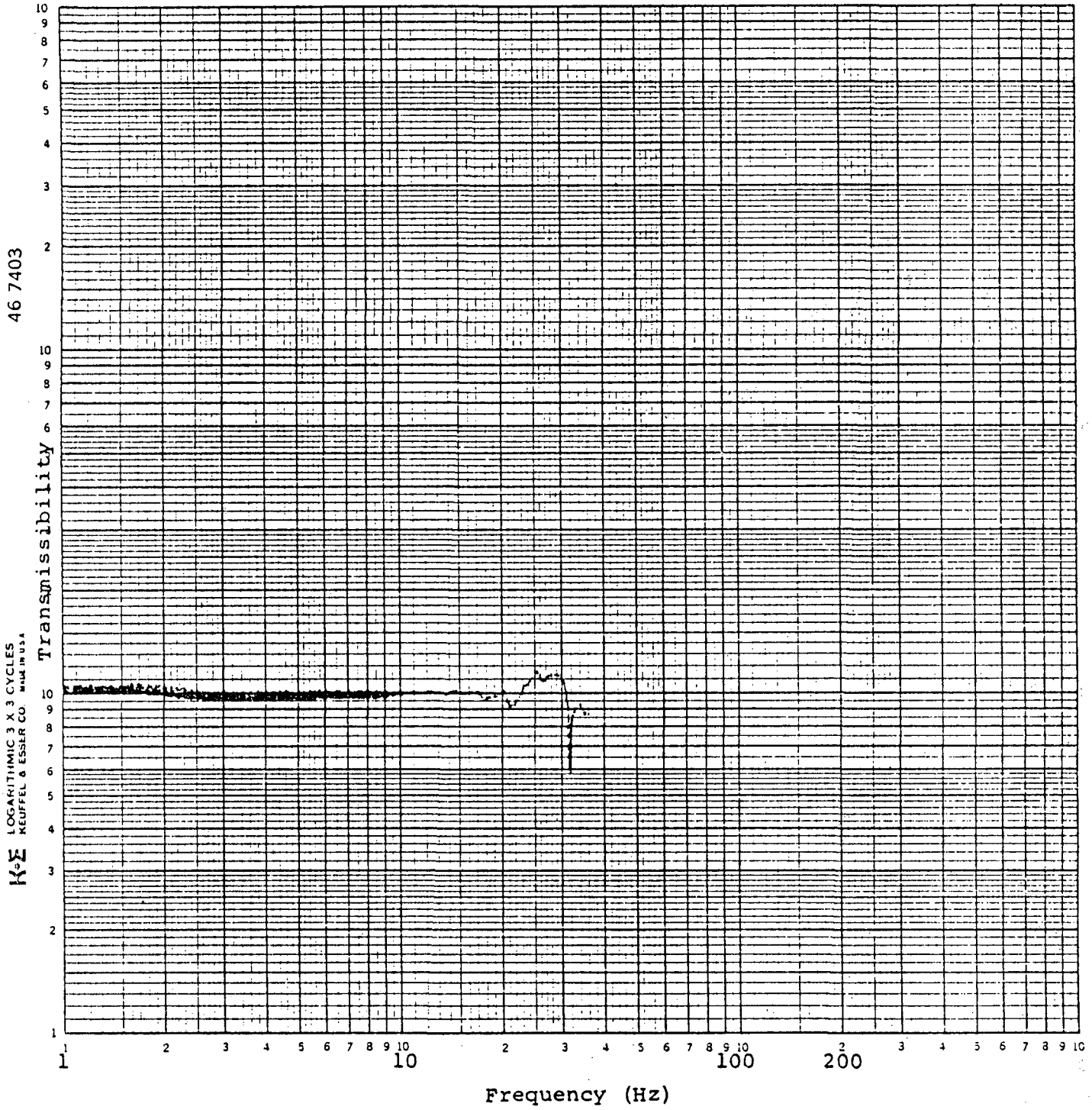
AXIS S-S/V #1

ACCEL. NO. 6V ÷ NO. VCA

TEST RUN NO. 37

FULL SCALE TRANSMISSIBILITY

0.1 ☐ 1.0 ☐ 10 ☐ 100 ☒ 1000 ☐



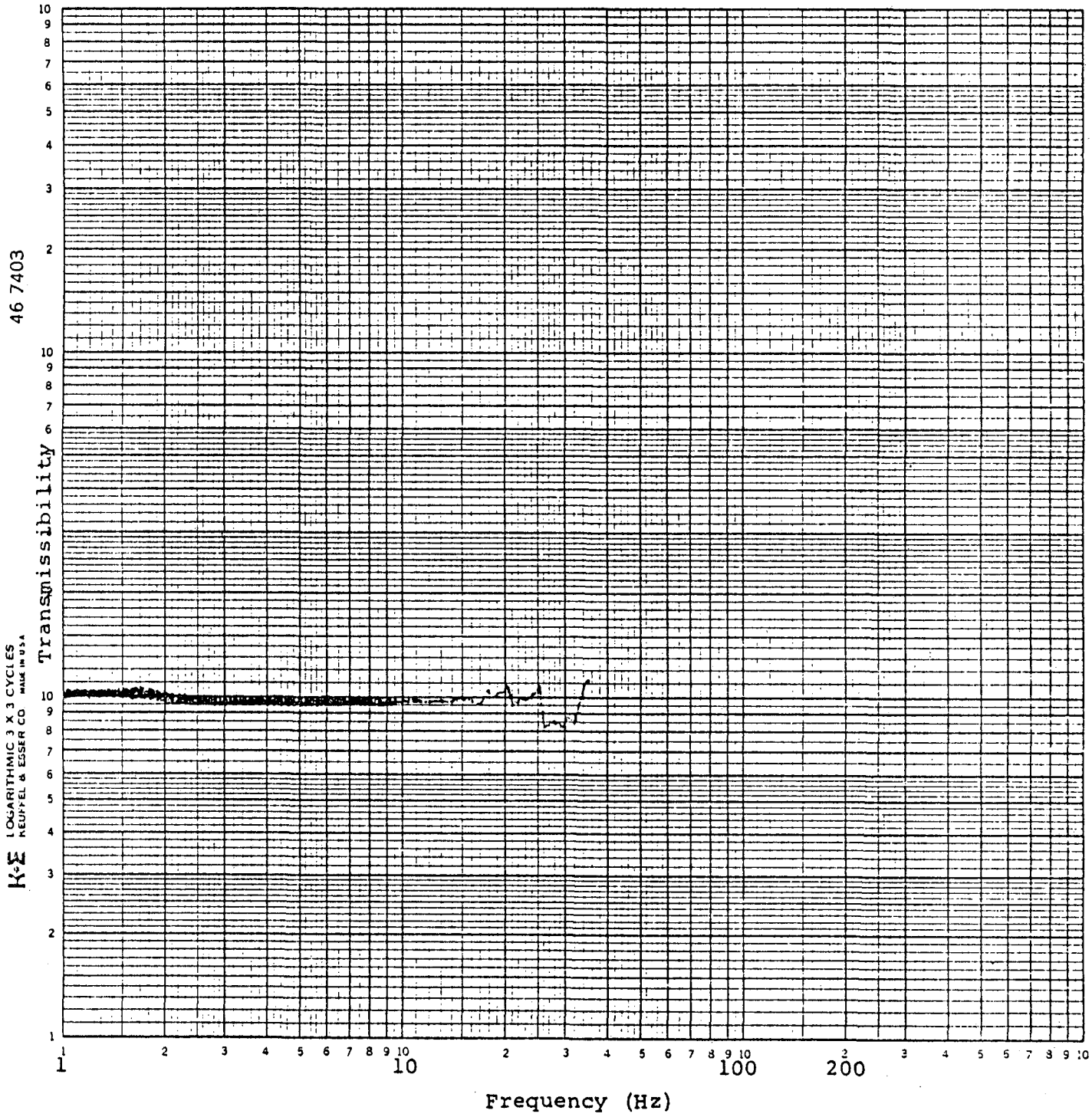
AXIS S-S / V#1

ACCEL. NO. 75-5 ÷ NO. HCA

TEST RUN NO. 37

FULL SCALE TRANSMISSIBILITY

0.1 ☐ 1.0 ☐ 10 ☐ 100 ☒ 1000 ☐



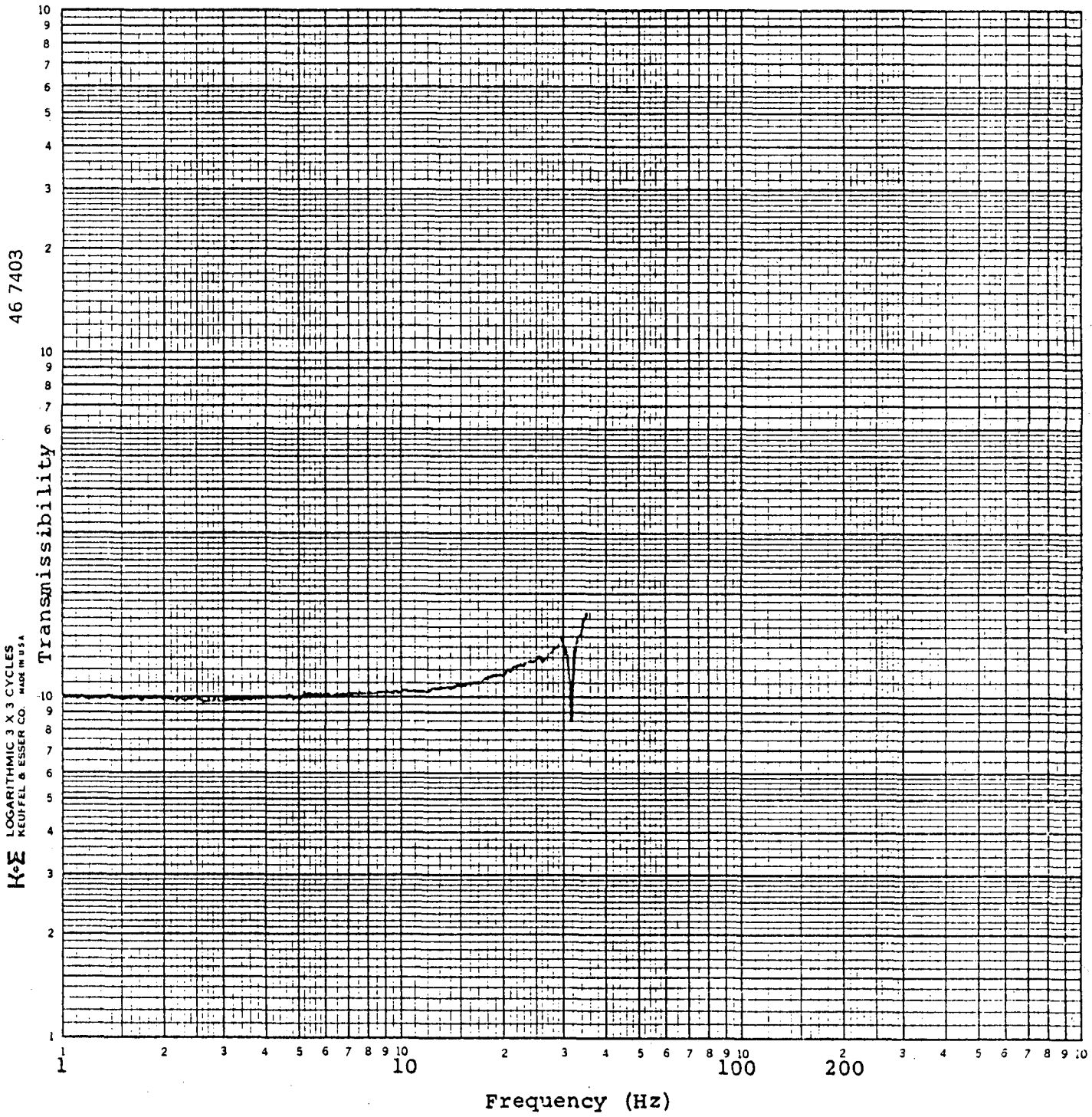
AXIS S-S/V#1

ACCEL. NO. 8V ÷ NO. VCA

TEST RUN NO. 37

FULL SCALE TRANSMISSIBILITY

0.1 ☐ 1.0 ☐ 10 ☐ 100 ☒ 1000 ☐



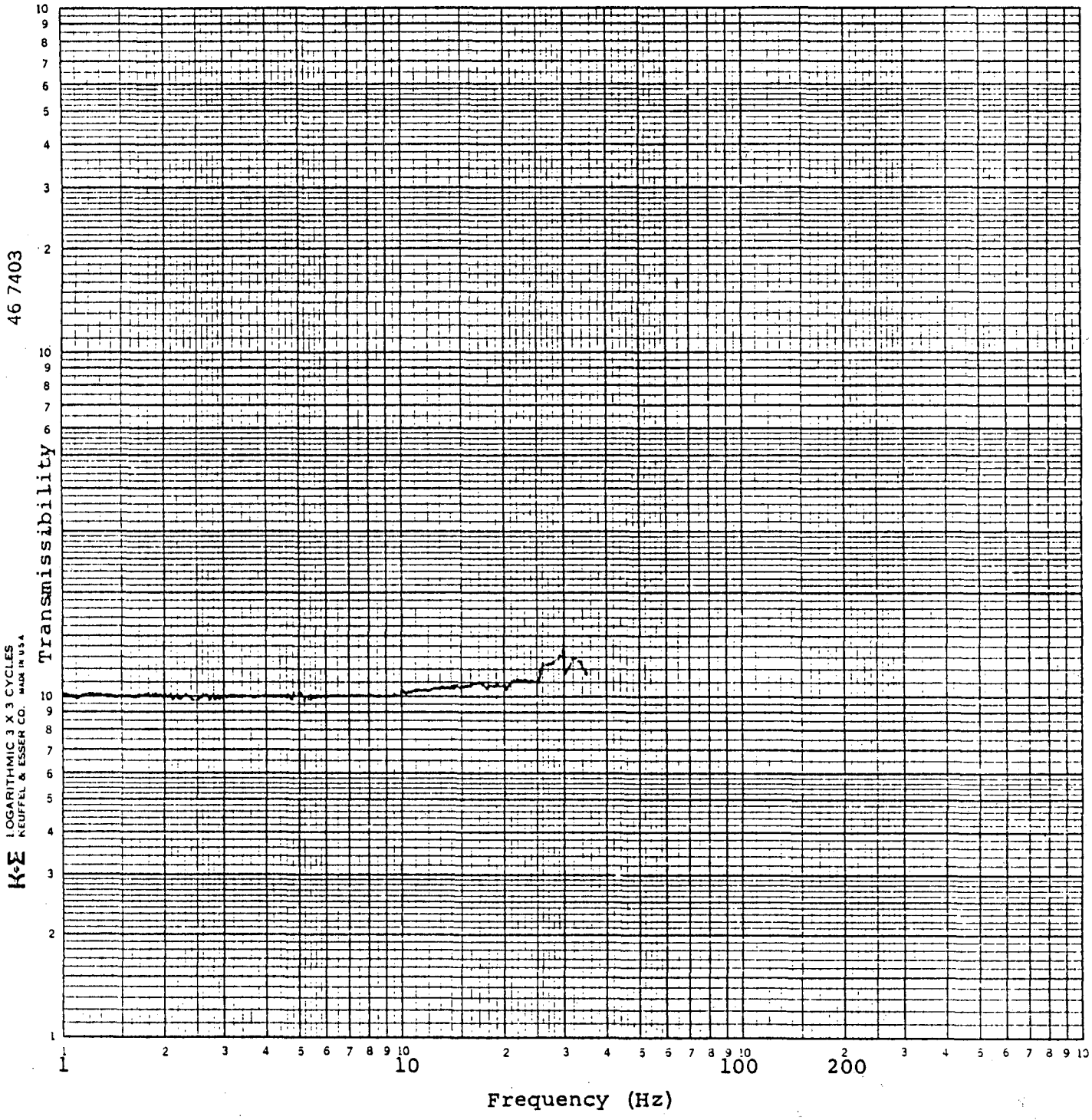
AXIS S-S/V #1

ACCEL. NO. 955 ÷ NO. HCA

TEST RUN NO. 37

FULL SCALE TRANSMISSIBILITY

0.1 ☐ 1.0 ☐ 10 ☐ 100 ☒ 1000 ☐



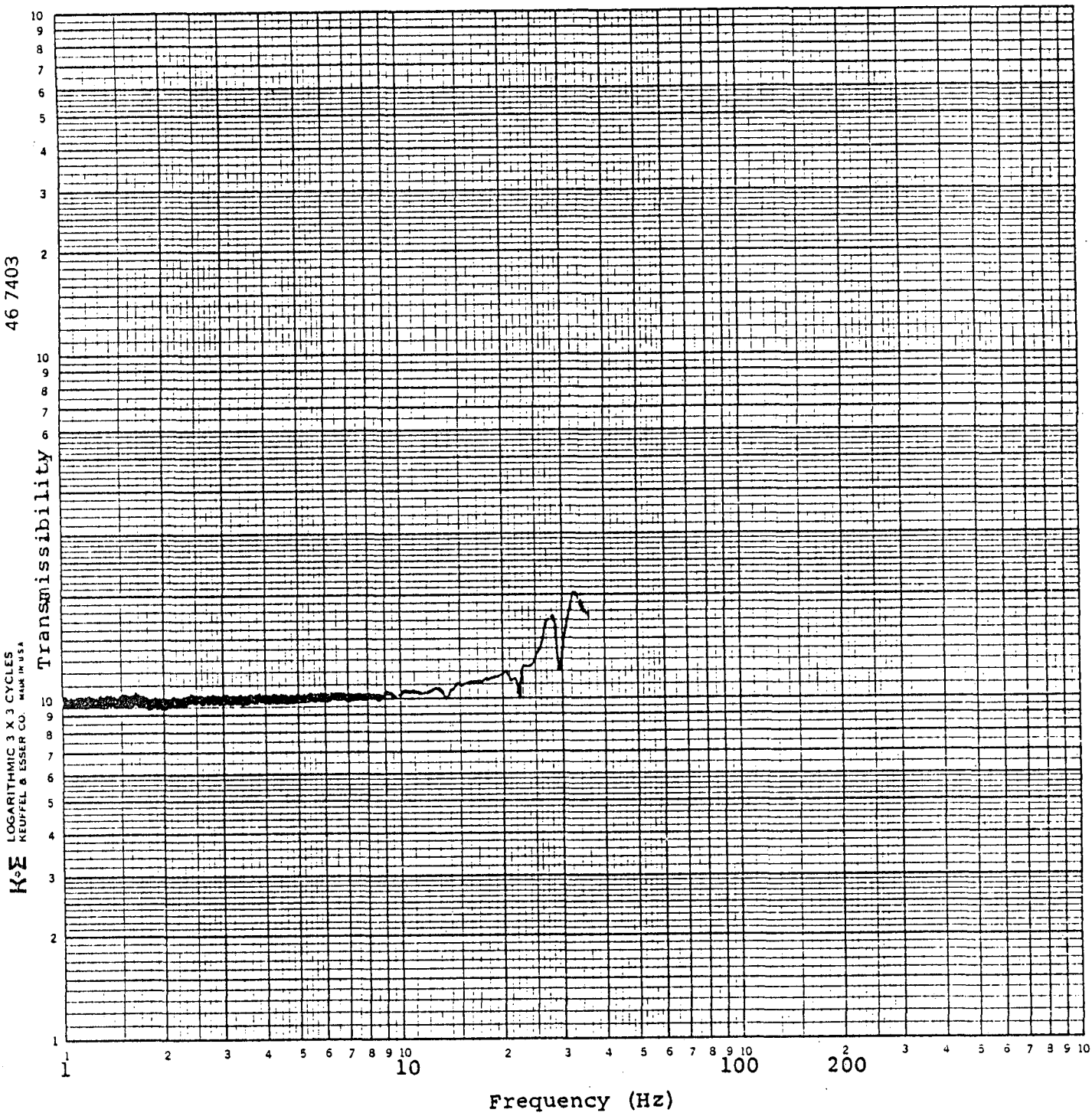
AXIS S-S/V#1

ACCEL. NO. 10V ÷ NO. VCA

TEST RUN NO. 37

FULL SCALE TRANSMISSIBILITY

0.1 ☐ 1.0 ☐ 10 ☐ 100 ☒ 1000 ☐



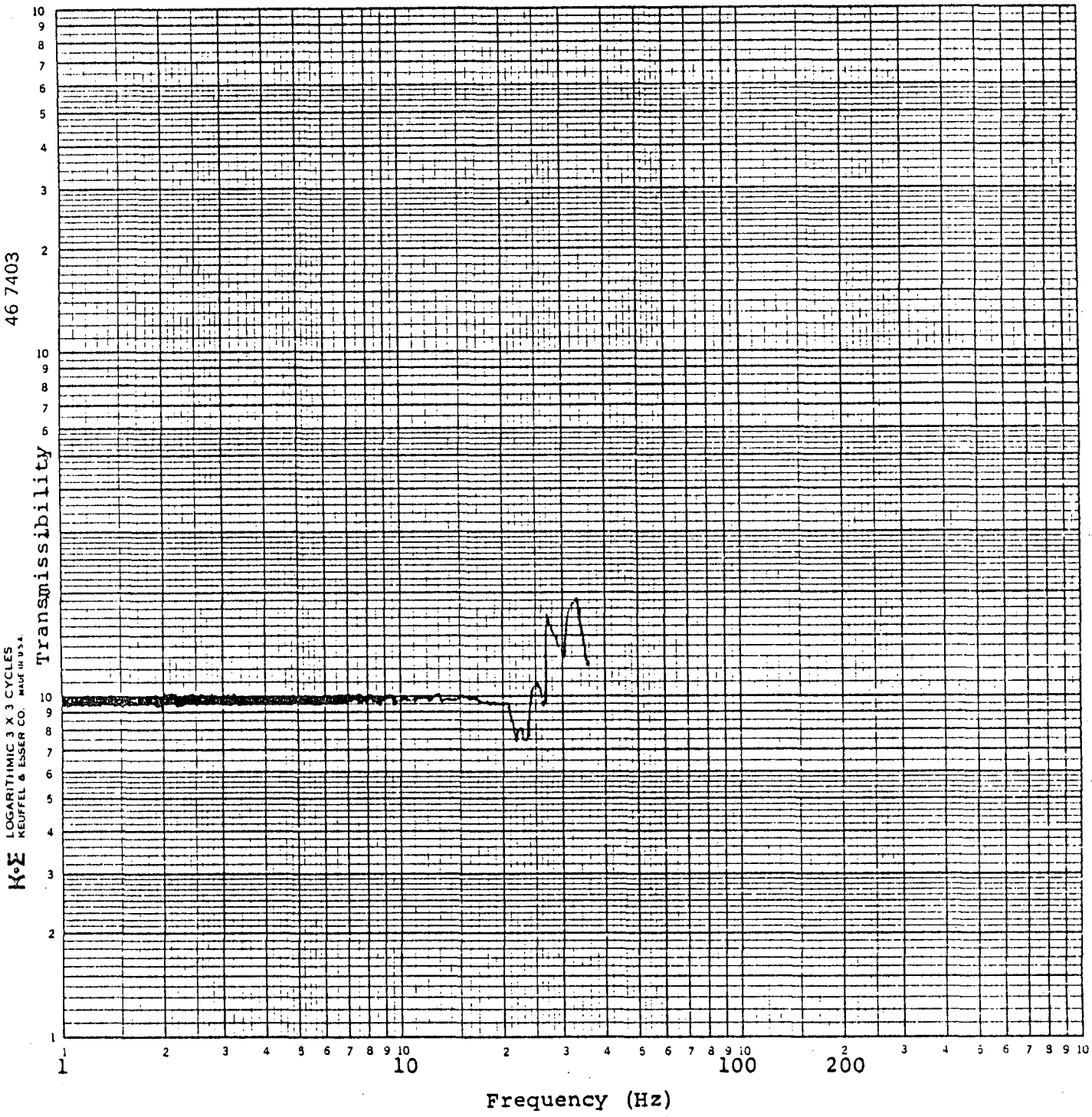
AXIS SS/VERT #2

ACCEL. NO. 1SS ÷ NO. HCA

TEST RUN NO. 74

FULL SCALE TRANSMISSIBILITY

0.1 ☐ 1.0 ☐ 10 ☐ 100 ☒ 1000 ☐



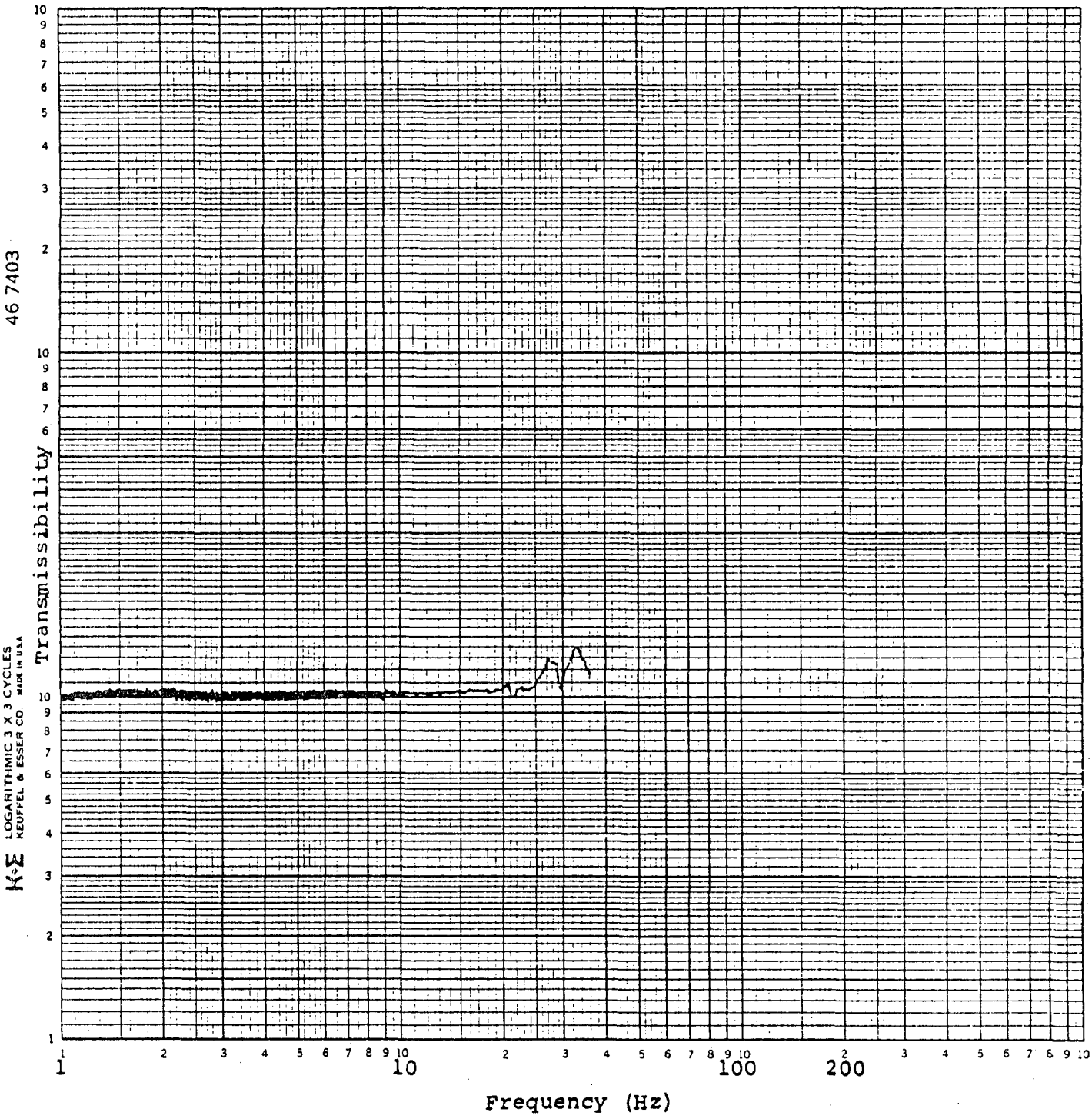
AXIS SS/VERT. #2

ACCEL. NO. 2V ÷ NO. VCM

TEST RUN NO. 74

FULL SCALE TRANSMISSIBILITY

0.1 ☐ 1.0 ☐ 10 ☐ 100 ☒ 1000 ☐



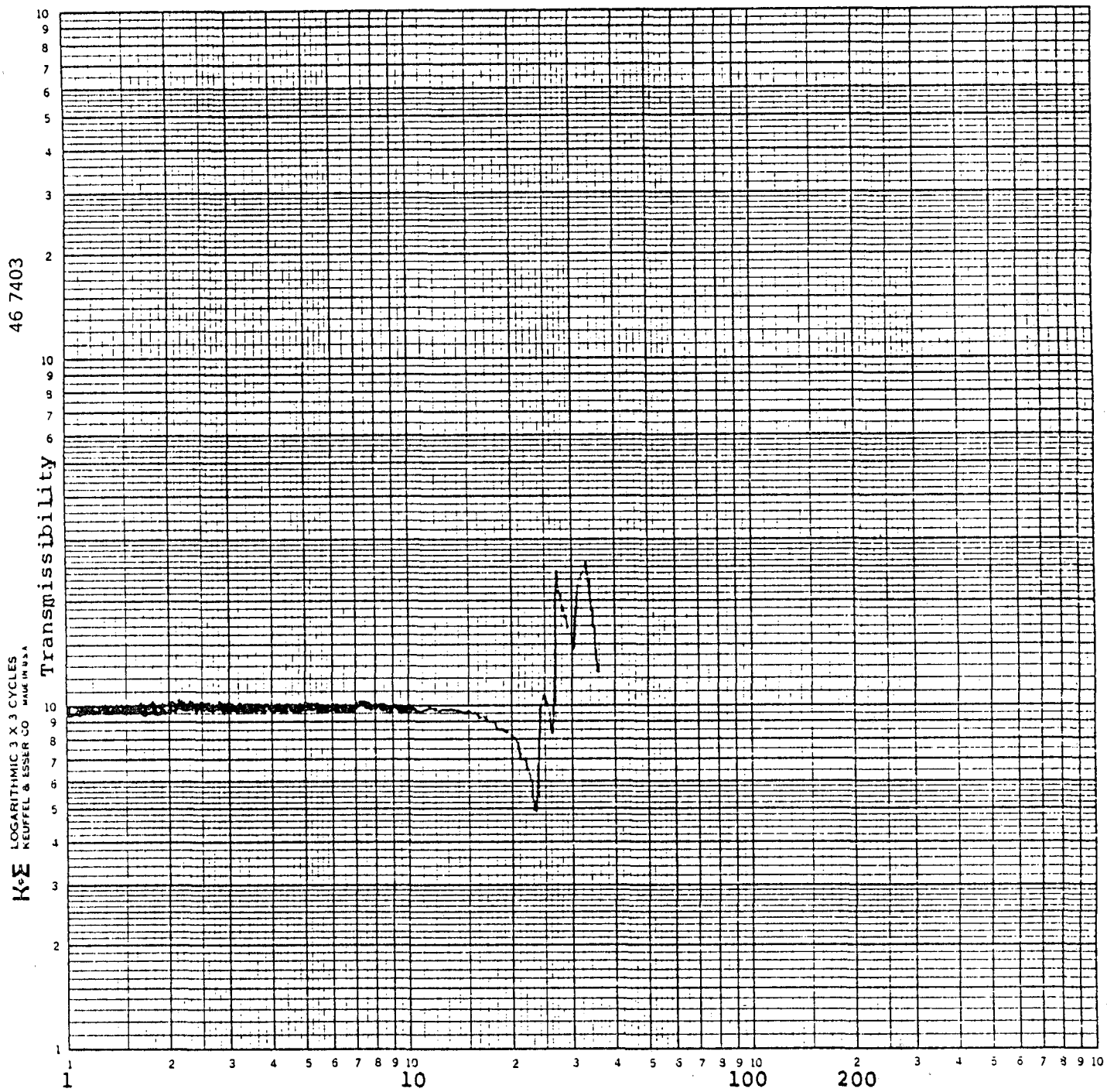
AXIS SS/VERT #2

ACCEL. NO. 3SS ÷ NO. HCM

TEST RUN NO. 74

FULL SCALE TRANSMISSIBILITY

0.1 ☐ 1.0 ☐ 10 ☐ 100 ☒ 1000 ☐



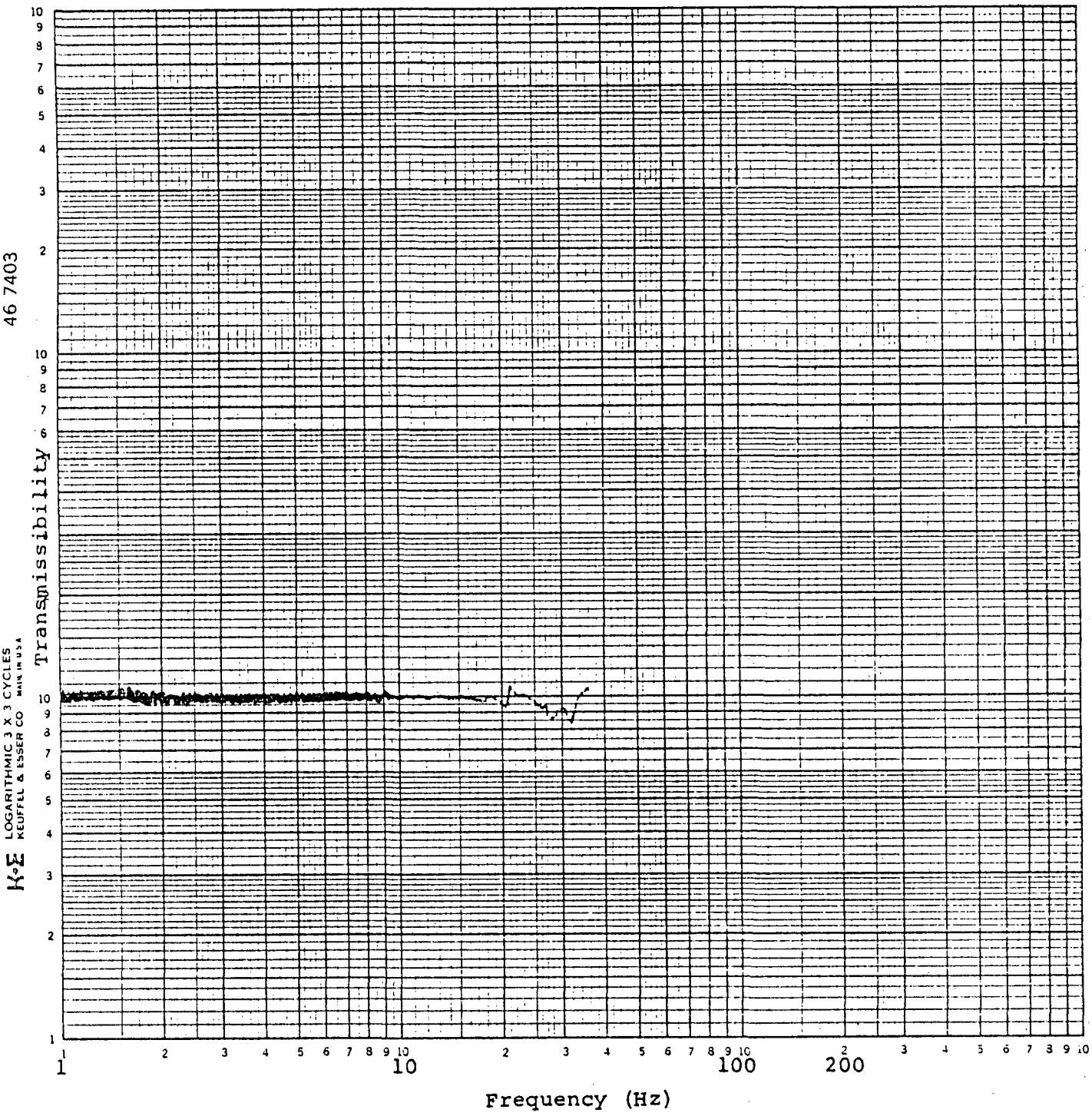
AXIS SS/VERT #2

ACCEL. NO. 4Y ÷ NO. YCM

TEST RUN NO. 74

FULL SCALE TRANSMISSIBILITY

0.1 ☐ 1.0 ☐ 10 ☐ 100 ☒ 1000 ☐



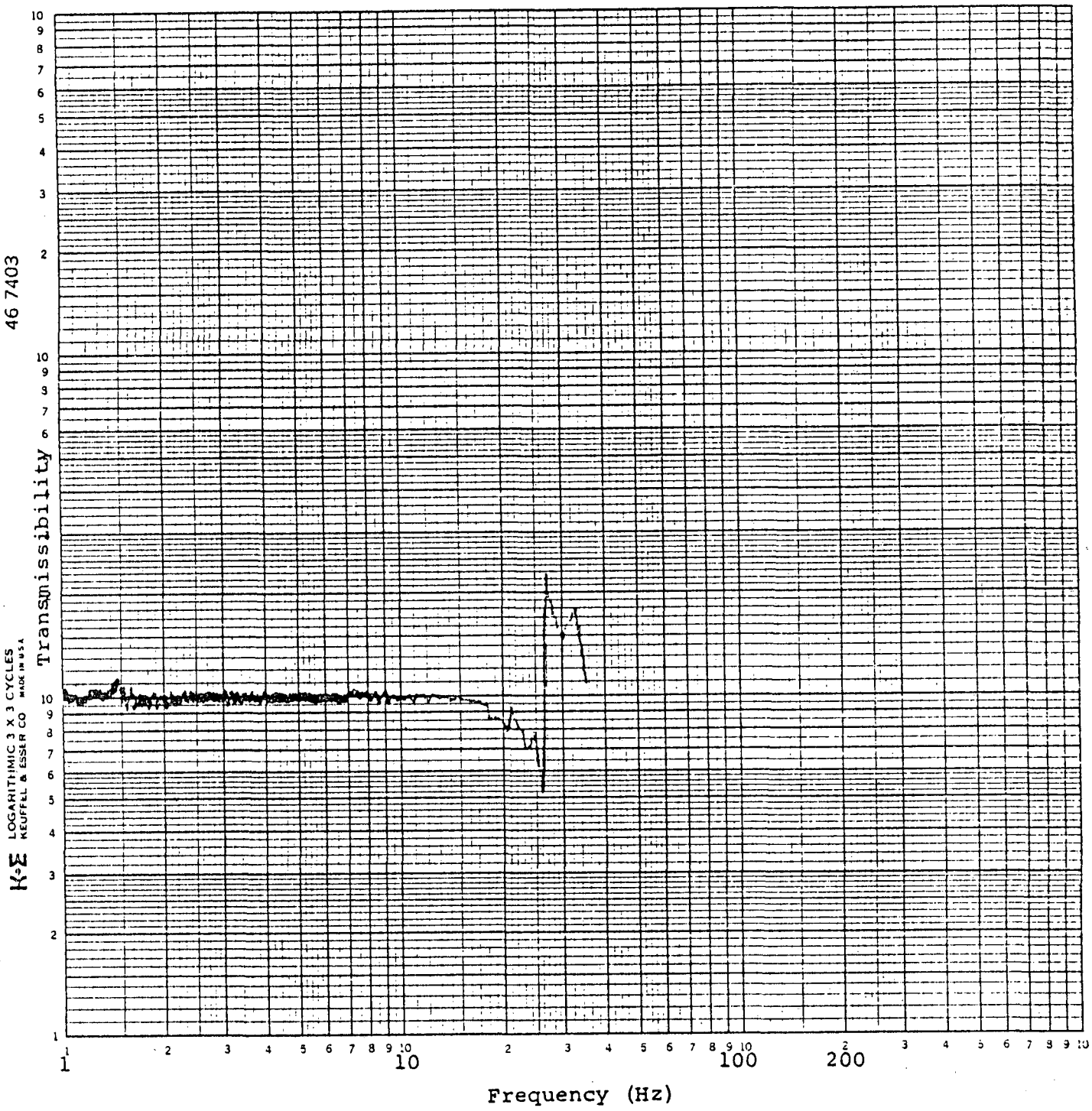
AXIS SS/VERT. #2

ACCEL. NO. SSS ÷ NO. HCM

TEST RUN NO. 74

FULL SCALE TRANSMISSIBILITY

0.1 ☐ 1.0 ☐ 10 ☐ 100 ☒ 1000 ☐



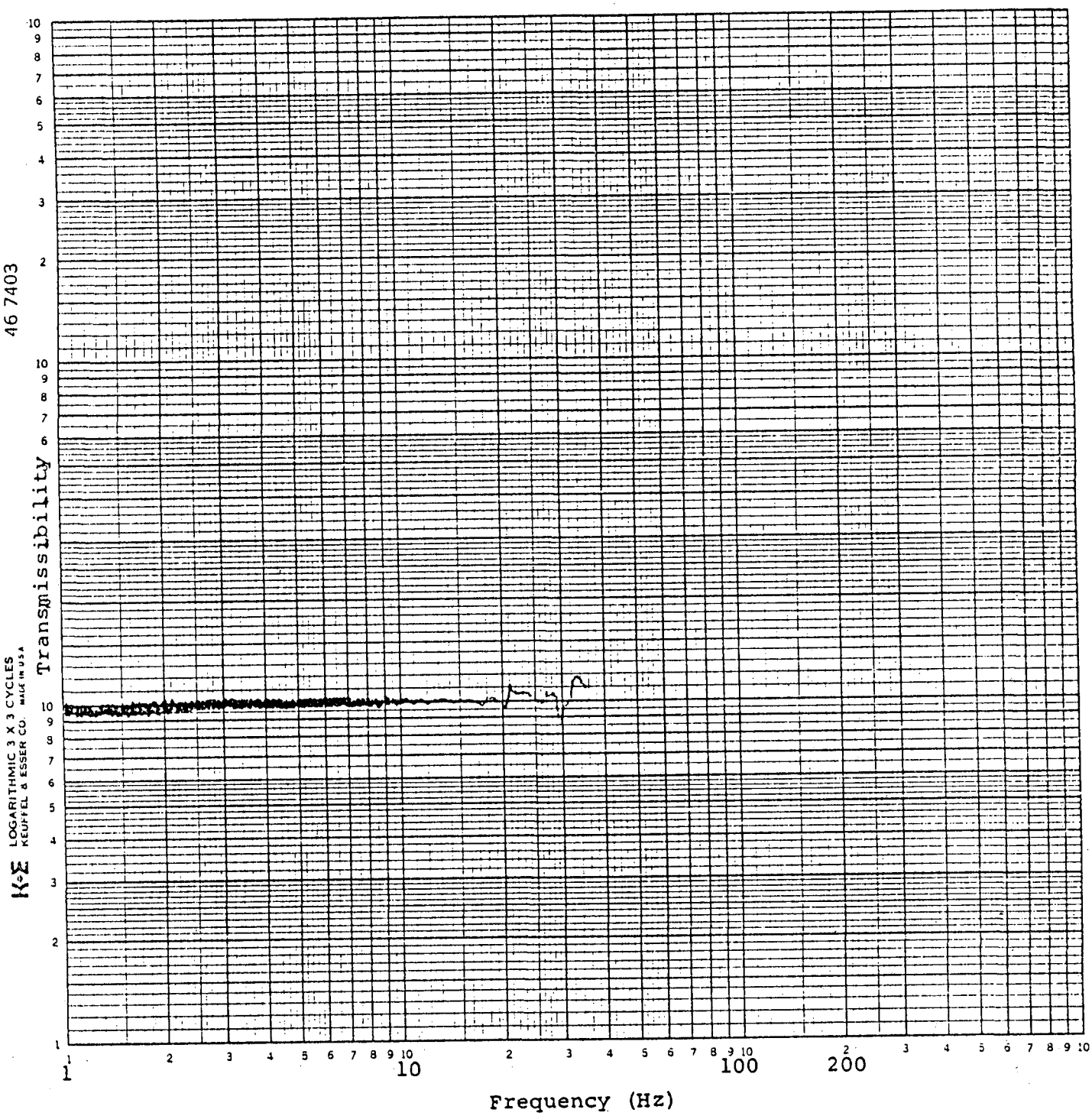
AXIS SS/VERT. #2

ACCEL. NO. 6V ÷ NO. VCM

TEST RUN NO. 74

FULL SCALE TRANSMISSIBILITY

0.1 ☐ 1.0 ☐ 10 ☐ 100 ☒ 1000 ☐



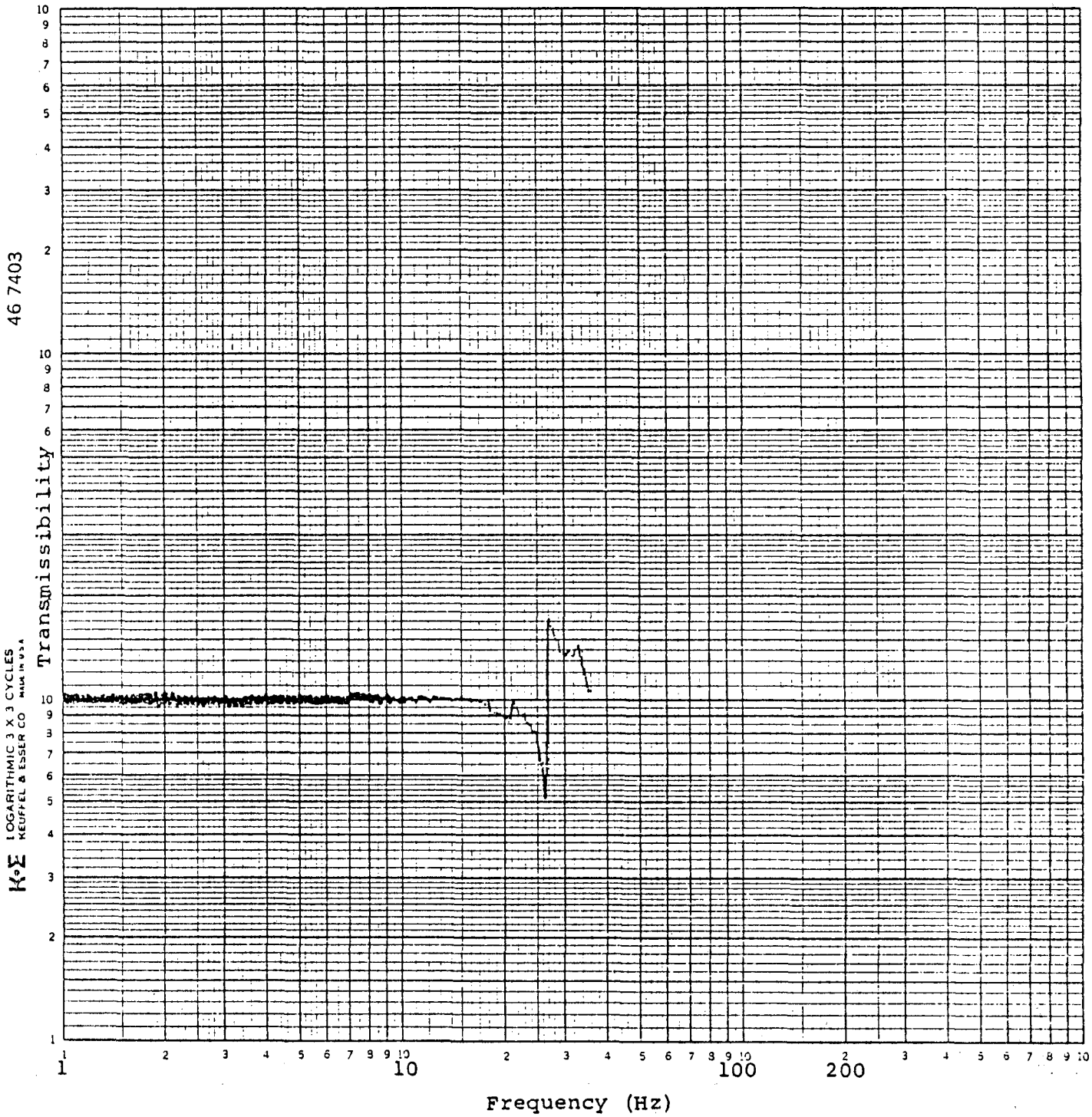
AXIS SS/VERT. #2

ACCEL. NO. 7SS ÷ NO. HCM

TEST RUN NO. 74

FULL SCALE TRANSMISSIBILITY

0.1 ☐ 1.0 ☐ 10 ☐ 100 ☒ 1000 ☐



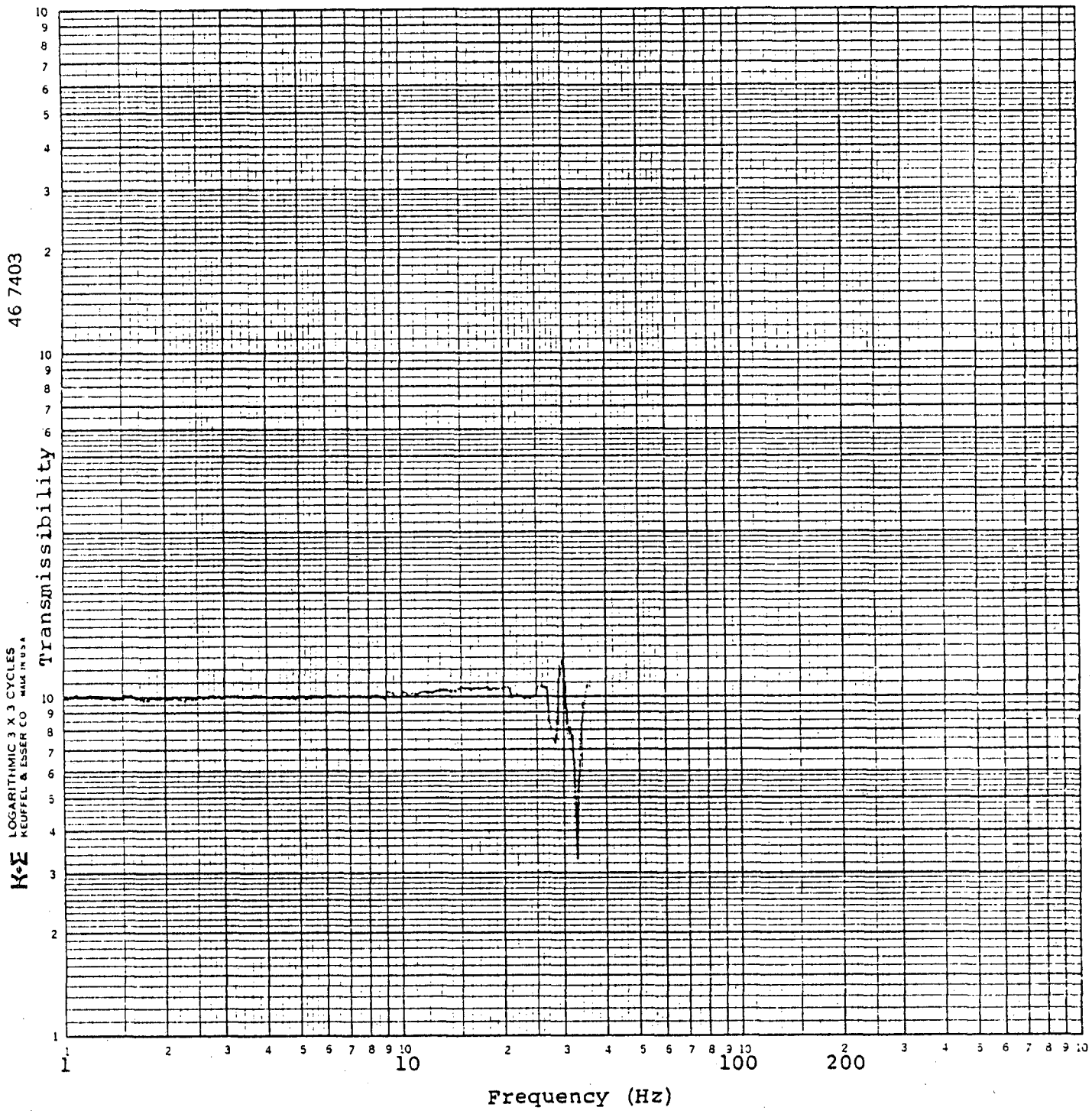
AXIS SS/VERT. #2

ACCEL. NO. 8V ÷ NO. VCM

TEST RUN NO. 74

FULL SCALE TRANSMISSIBILITY

0.1 ☐ 1.0 ☐ 10 ☐ 100 ☒ 1000 ☐



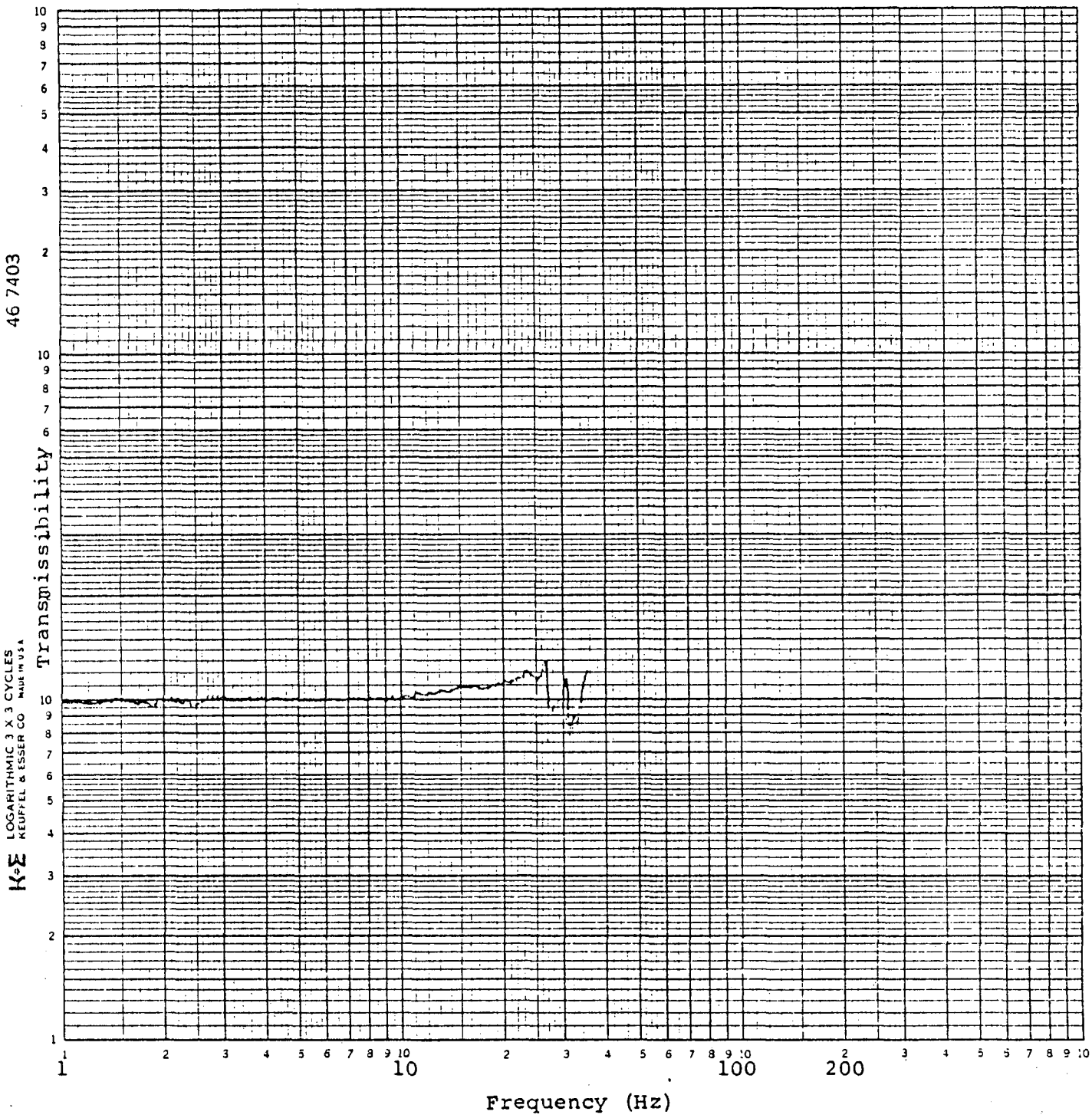
AXIS SS/VERT. #2

ACCEL. NO. 955 ÷ NO. HCM

TEST RUN NO. 74

FULL SCALE TRANSMISSIBILITY

0.1 ☐ 1.0 ☐ 10 ☐ 100 ☒ 1000 ☐



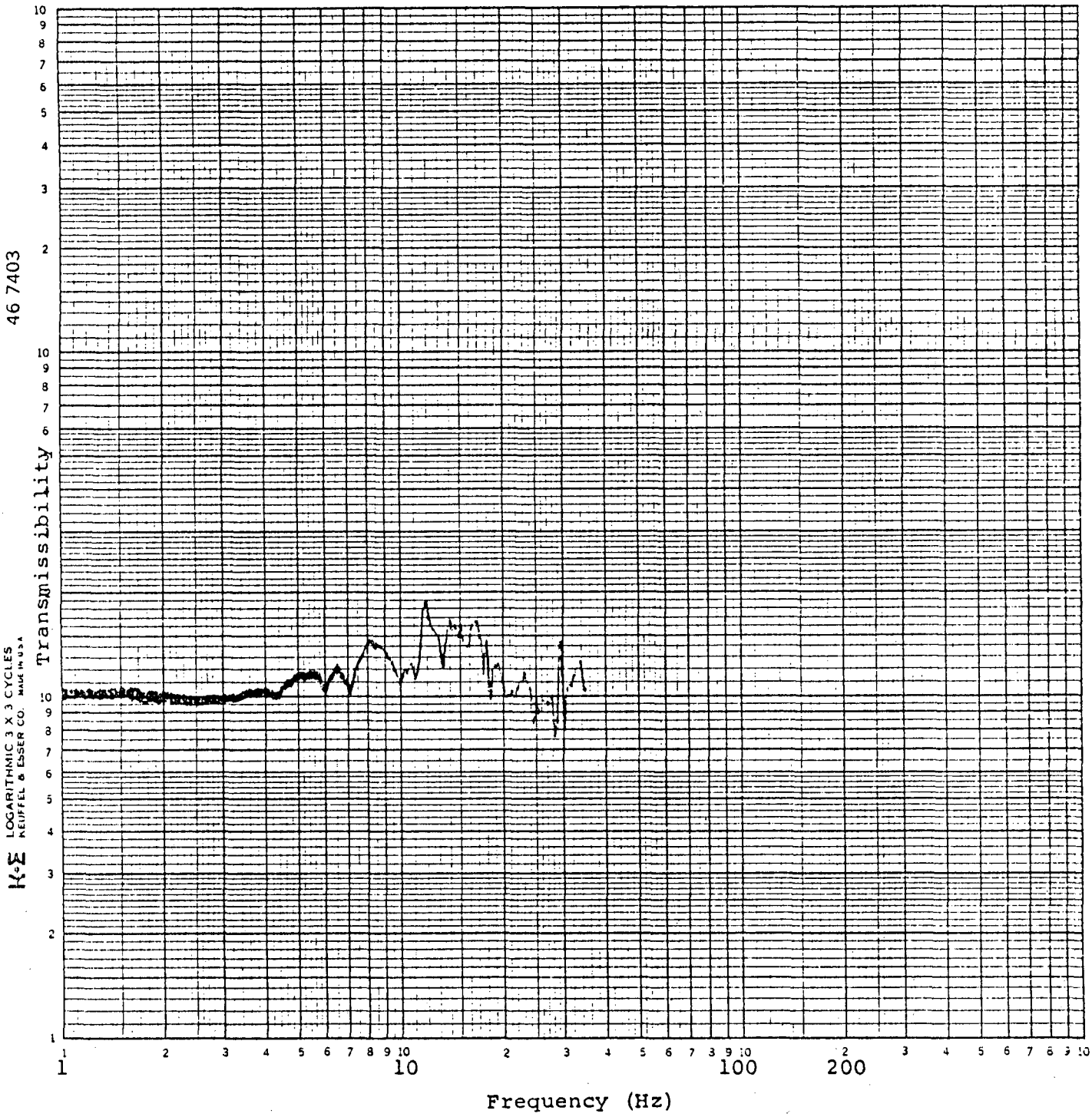
AXIS SS/VERT. #2

ACCEL. NO. 10V ÷ NO. VCA

TEST RUN NO. 74

FULL SCALE TRANSMISSIBILITY

0.1 ☐ 1.0 ☐ 10 ☐ 100 ☒ 1000 ☐



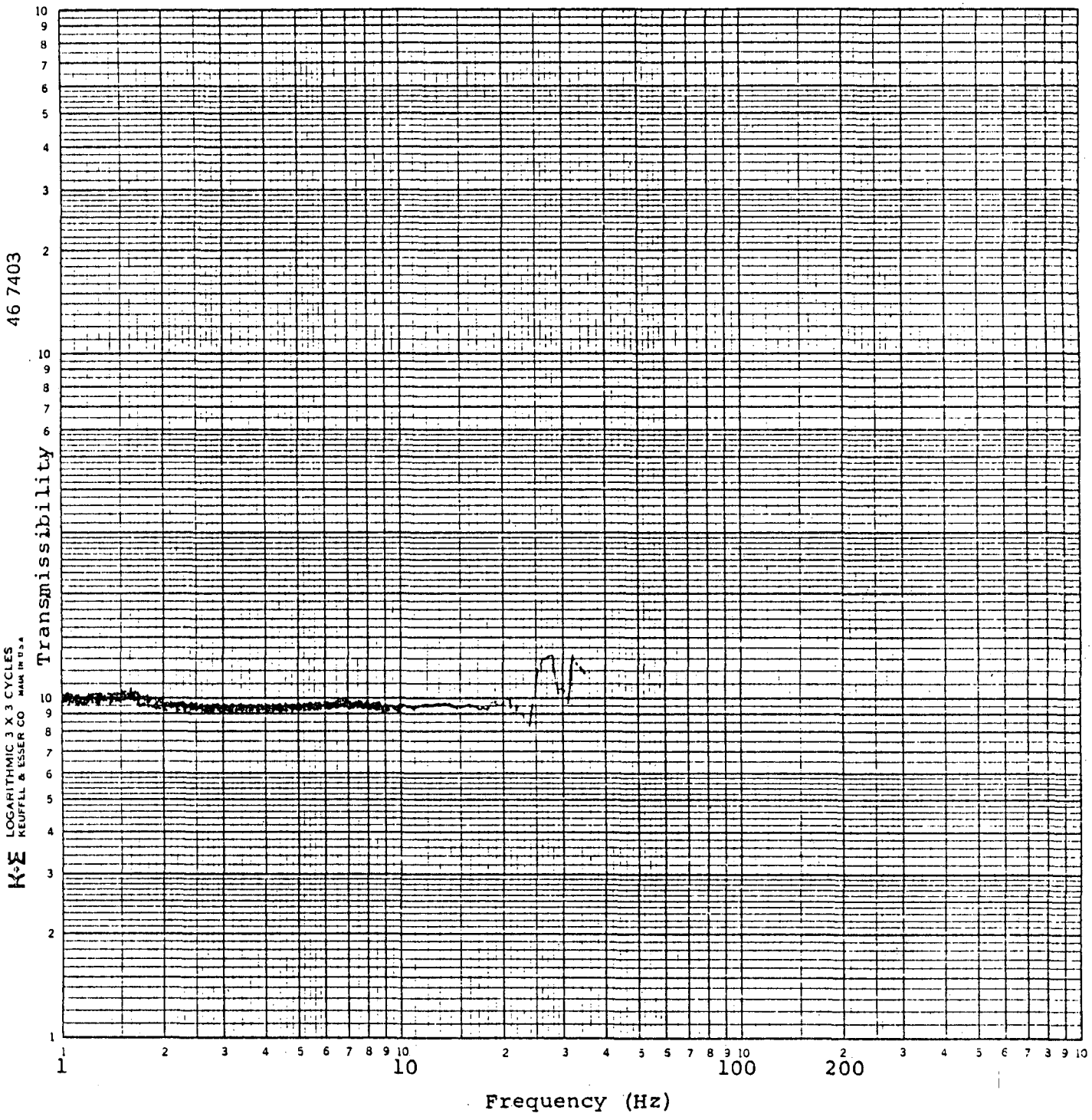
AXIS F-B/V#2

ACCEL. NO. 1F-B ÷ NO. HCA

TEST RUN NO. 111

FULL SCALE TRANSMISSIBILITY

0.1 ☐ 1.0 ☐ 10 ☐ 100 ☒ 1000 ☐



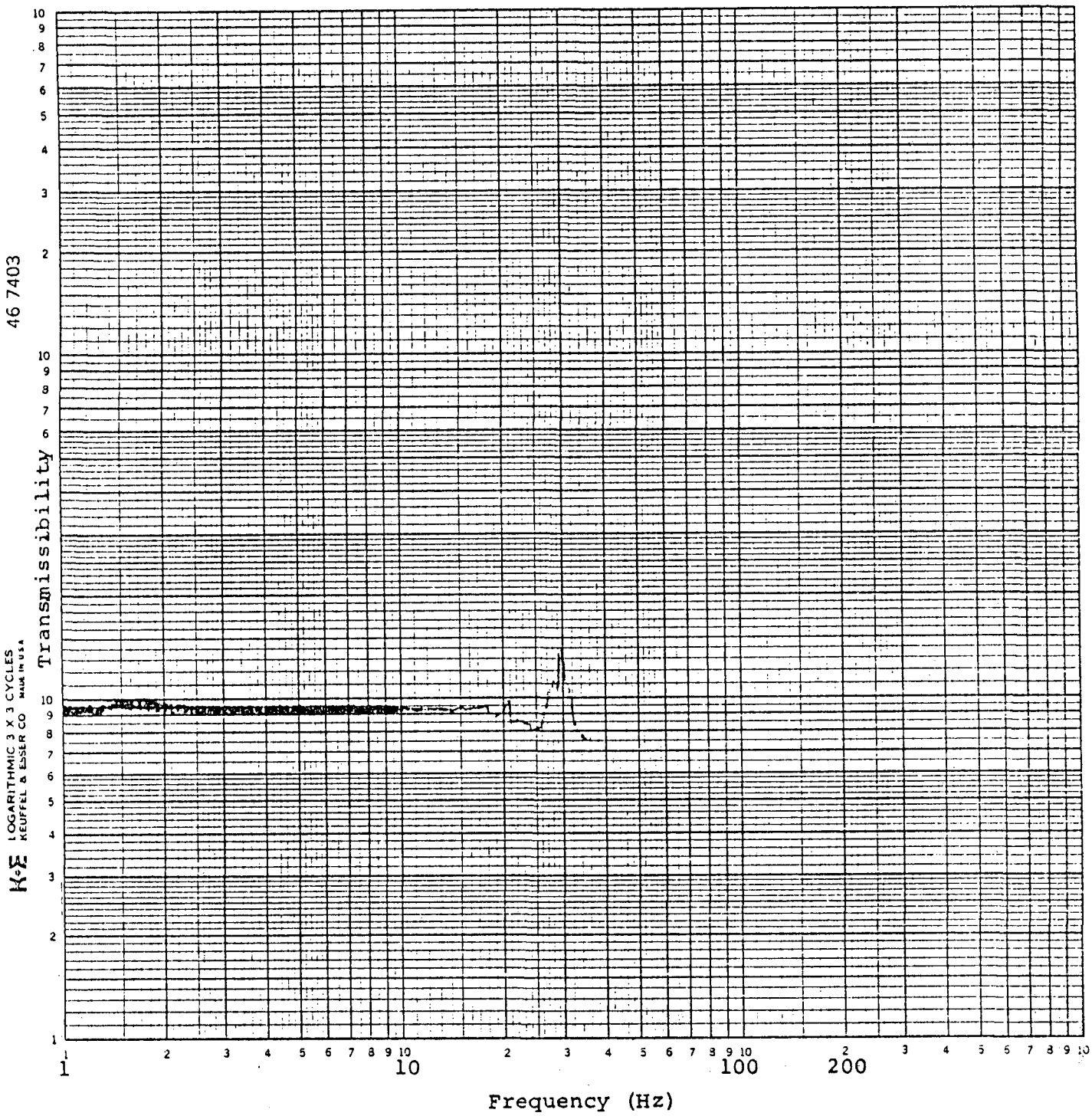
AXIS F-B/V#2

ACCEL. NO. 2V ÷ NO. VCA

TEST RUN NO. 111

FULL SCALE TRANSMISSIBILITY

0.1 ☐ 1.0 ☐ 10 ☐ 100 ☒ 1000 ☐



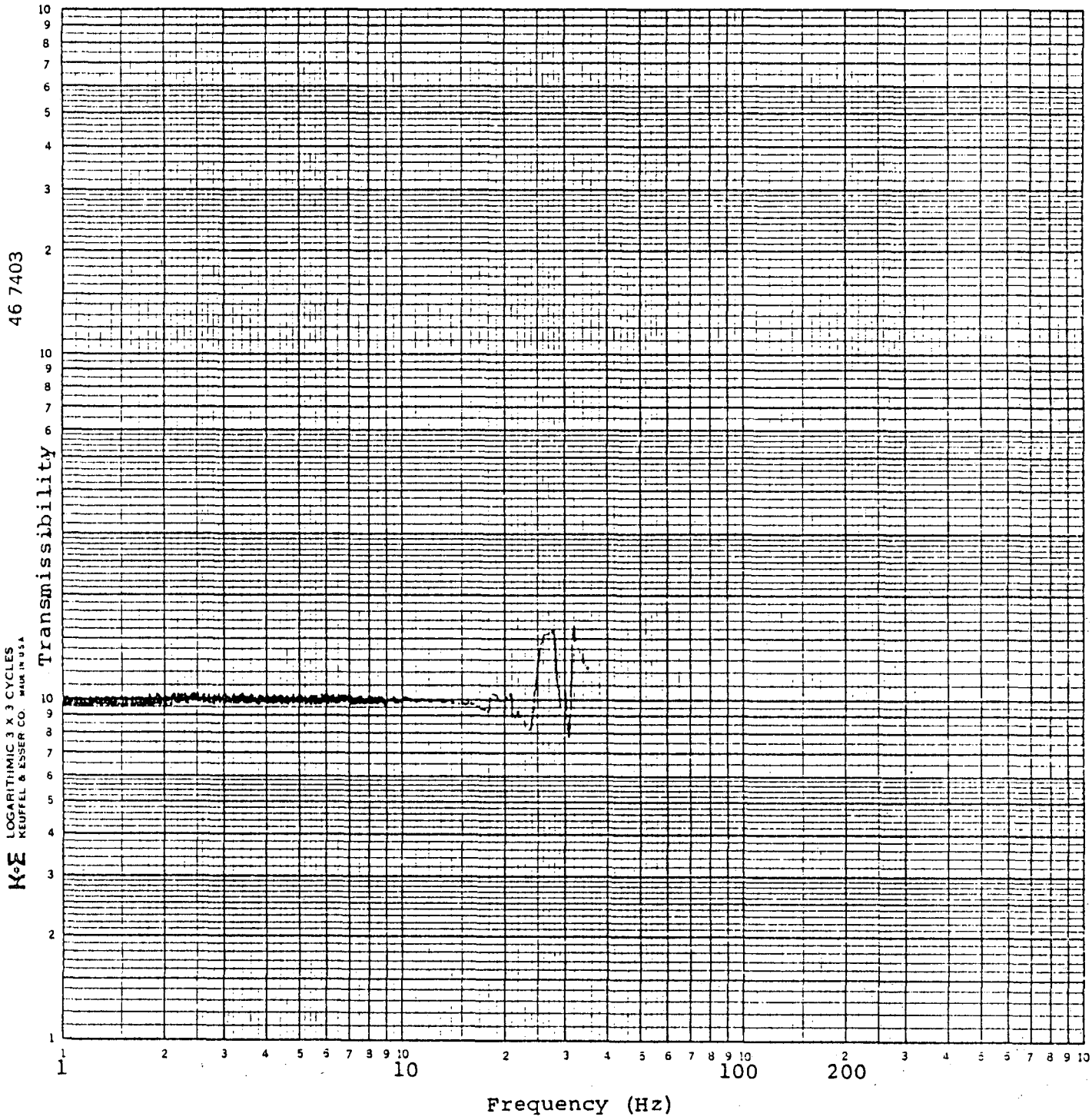
AXIS F.B/V#2

ACCEL. NO. 3F.B ÷ NO. HCA

TEST RUN NO. 111

FULL SCALE TRANSMISSIBILITY

0.1 ☐ 1.0 ☐ 10 ☐ 100 ☒ 1000 ☐



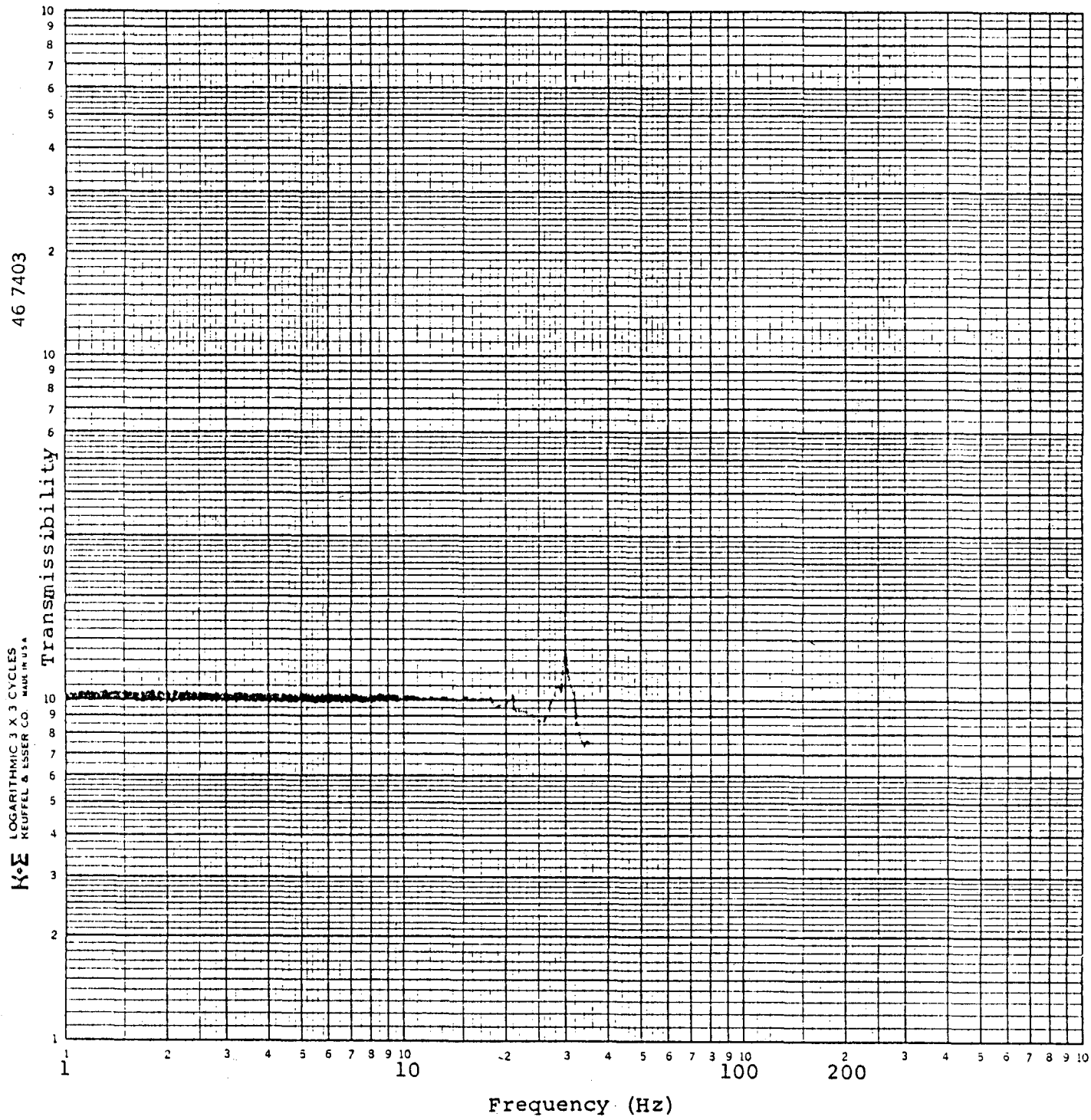
AXIS F-B/V#2

ACCEL. NO. 4V ÷ NO. VCA

TEST RUN NO. 111

FULL SCALE TRANSMISSIBILITY

0.1 ☐ 1.0 ☐ 10 ☐ 100 ☒ 1000 ☐



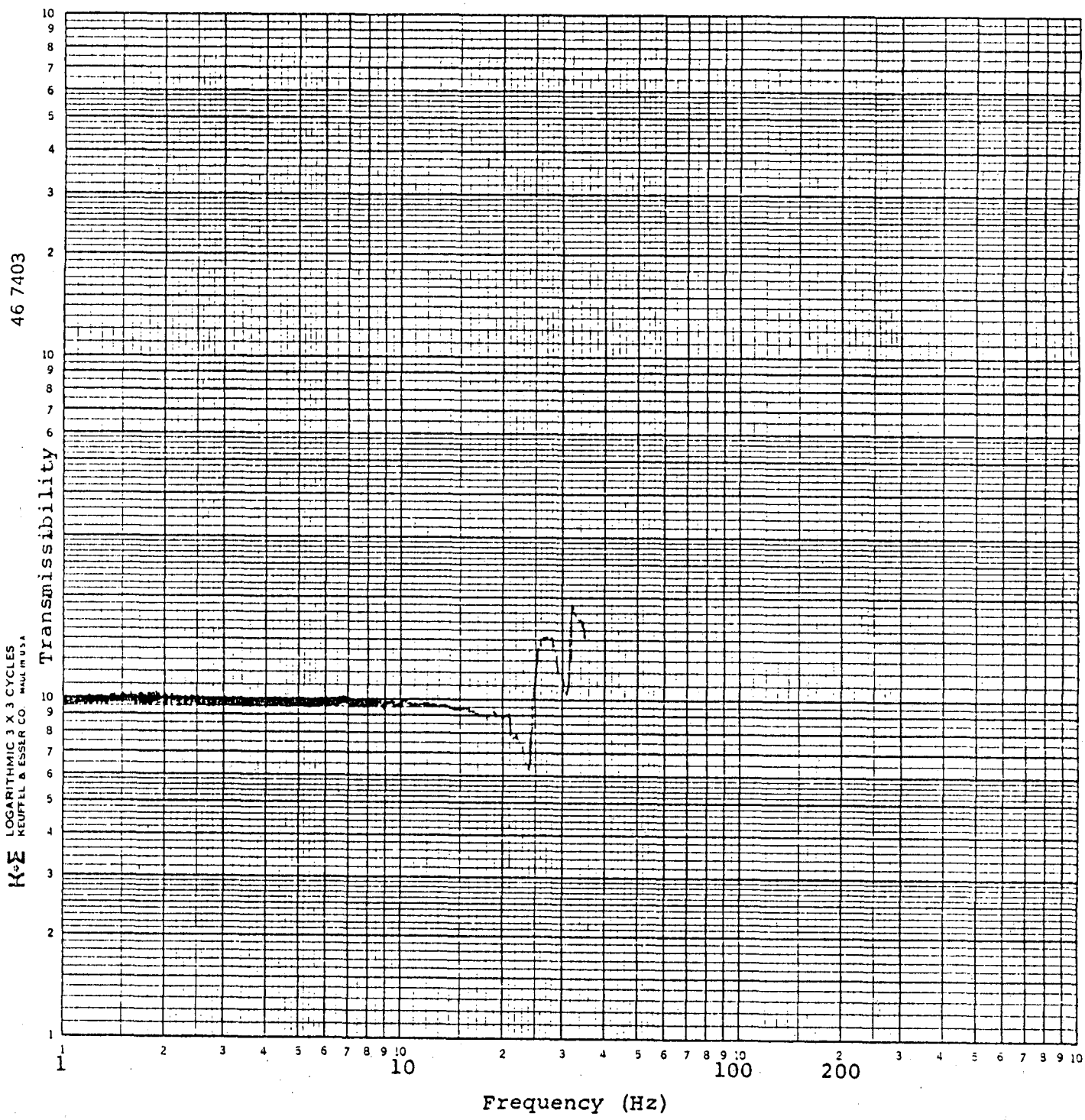
AXIS F-B/V #2

ACCEL. NO. 5F-B ÷ NO. HCA

TEST RUN NO. 111

FULL SCALE TRANSMISSIBILITY

0.1 ☐ 1.0 ☐ 10 ☐ 100 ☒ 1000 ☐



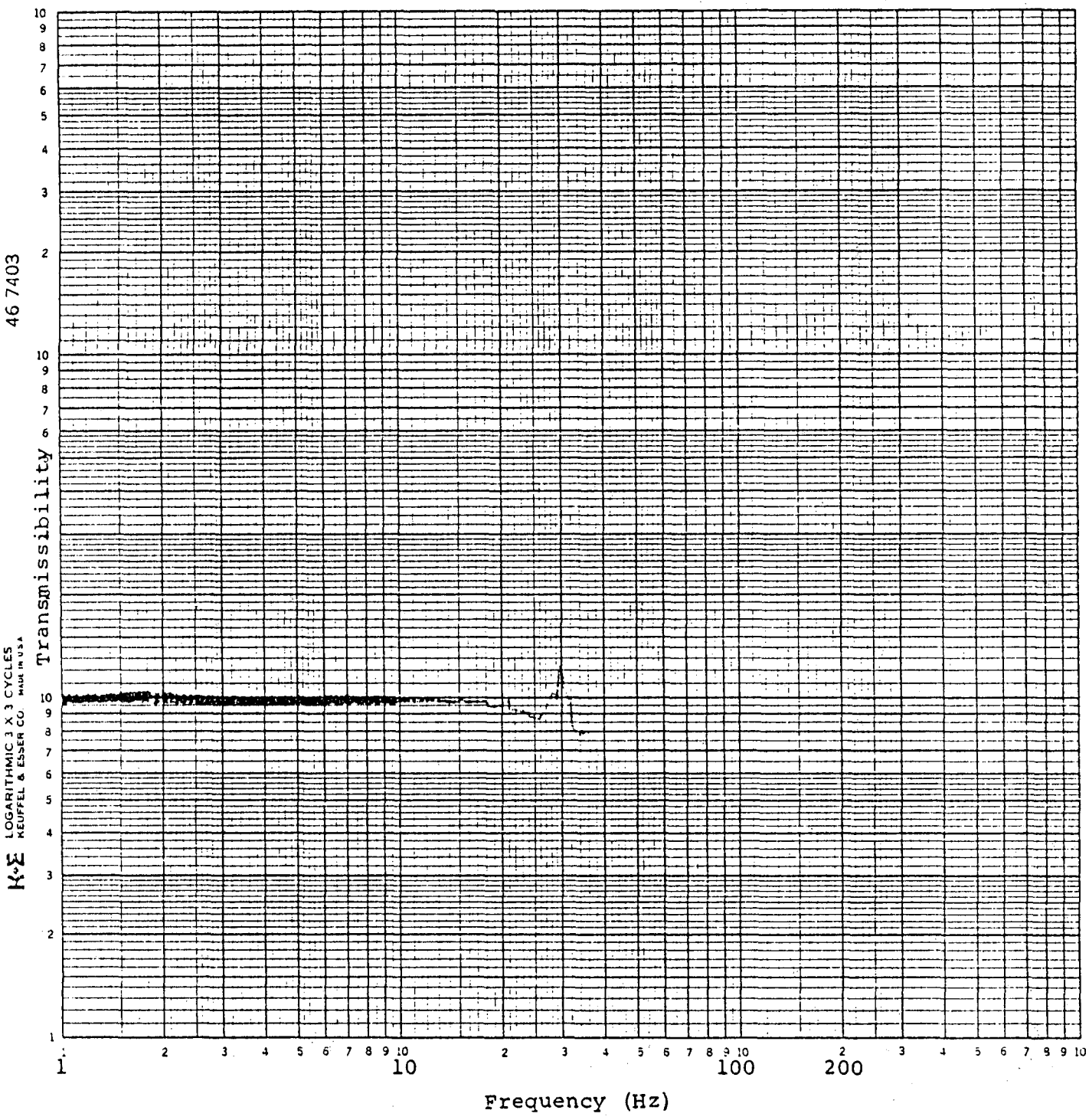
AXIS F-B/V #2

ACCEL. NO. 6V ÷ NO. VCA

TEST RUN NO. 111

FULL SCALE TRANSMISSIBILITY

0.1 ☐ 1.0 ☐ 10 ☐ 100 ☒ 1000 ☐



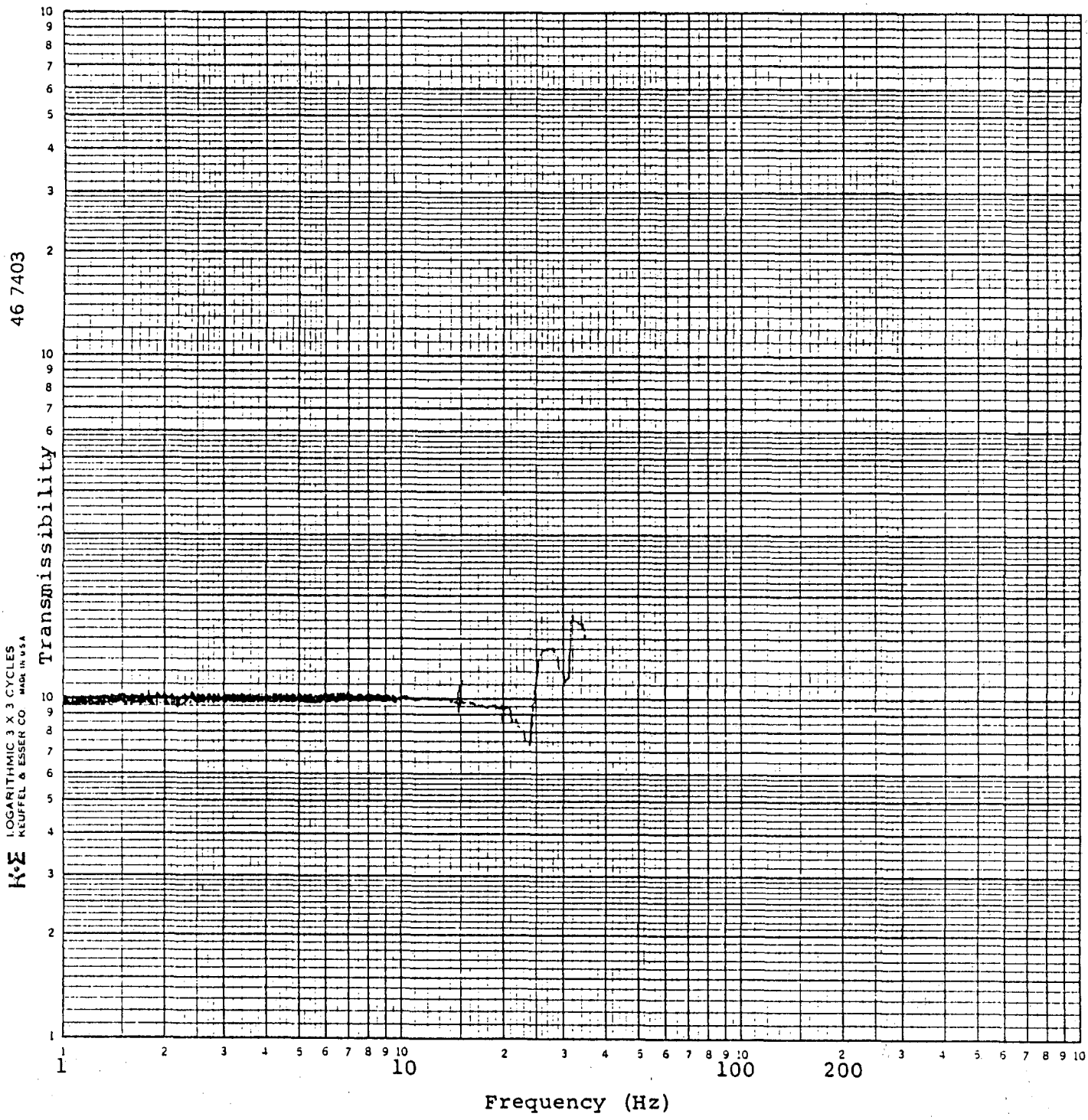
AXIS F-B/V #2

ACCEL. NO. TFB ÷ NO. HCA

TEST RUN NO. III

FULL SCALE TRANSMISSIBILITY

0.1 ☐ 1.0 ☐ 10 ☐ 100 ☒ 1000 ☐



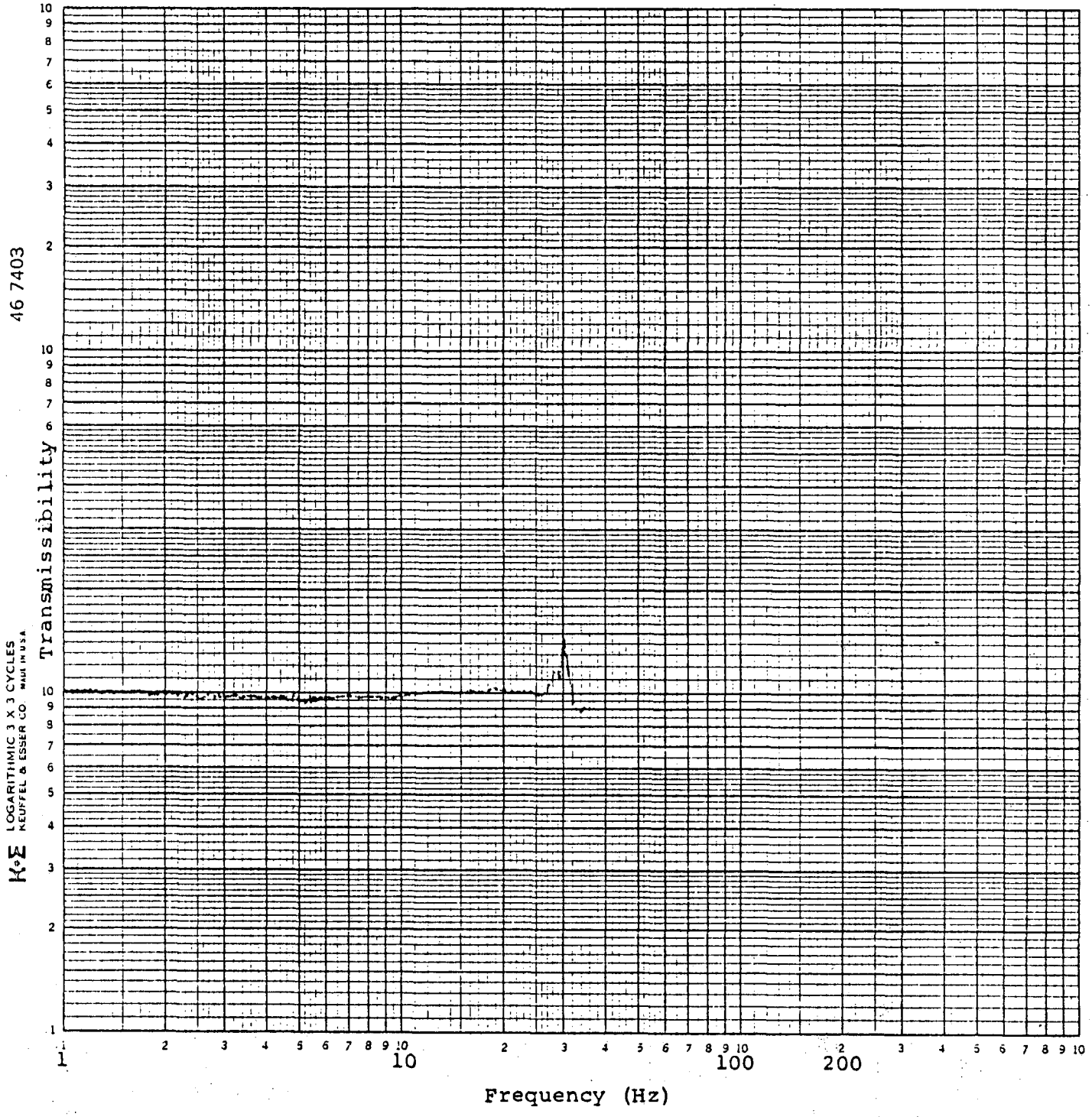
AXIS F-B/V #2

ACCEL. NO. 8V ÷ NO. VCA

TEST RUN NO. III

FULL SCALE TRANSMISSIBILITY

0.1 ☐ 1.0 ☐ 10 ☐ 100 ☒ 1000 ☐



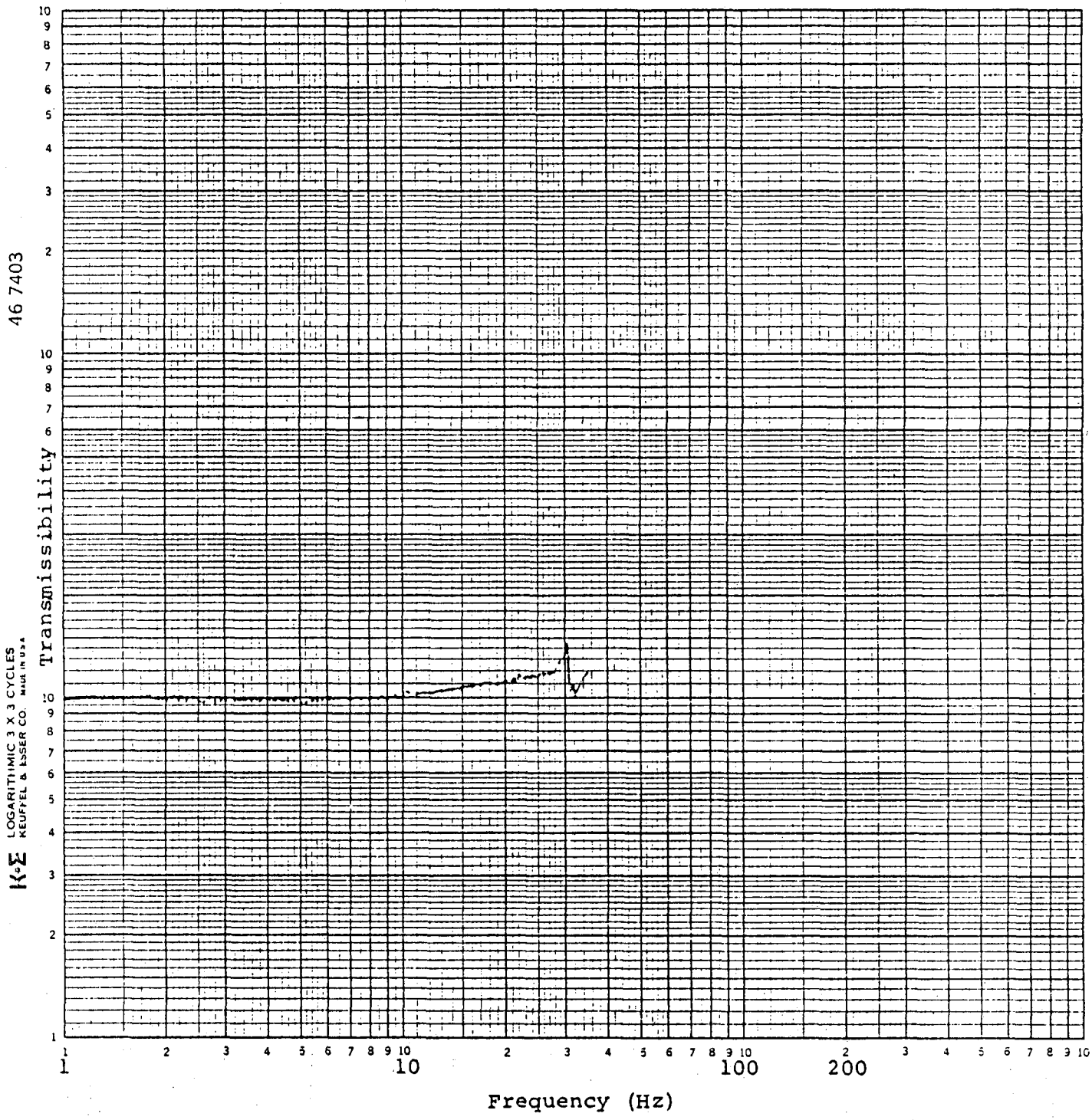
AXIS F.B/V #2

ACCEL. NO. 9F.B÷ NO. HCA

TEST RUN NO. 111

FULL SCALE TRANSMISSIBILITY

0.1 ☐ 1.0 ☐ 10 ☐ 100 ☒ 1000 ☐



AXIS F.B/V#2

ACCEL. NO. 10V ÷ NO. VCA

TEST RUN NO. 111

APPENDIX II

INSTRUMENTATION LOG SHEETS
AND
INSTRUMENTATION EQUIPMENT SHEETS

W 322

WYLE LABORATORIES
INSTRUMENTATION LOG SHEET

JOB NO. 43522

CUSTOMER ROBERTSHAW

LOG PAGE NO. 1 OF 24

TEST ENGINEER RBP

DATE	TIME	REMARKS (Include Run Number, Part Changes, Shift Changes and all other pertinent data)
1, MARCH 77		SET UP TAPE TO RECORD 10 RESPONSE ACCELS, 2 MONITOR ACCELS
		+ CONTROL ACCEL; WILL RECORD 4 ELECT MONITORS, 1 LVDT,
		AND CONTROL ACCEL ON VISICORDER.
		RECORD CAL SIGNAL 1 V. PK. @ 100 Hz. ON TAPE
		TAPE START 000' END 0100'
		SEISMIC TEST OF SPECIMENS WILL BE PERFORMED
		ON LONG STROKER MACHINE.
	1445	RUN #1 SINE SWEEP 1-35-1 Hz.; 0.2g INPUT FB/V #1 (+)
		TAPE START 0100' END 0530' RECORD TAPE ONLY
	1500	RUN #2 SINE SWEEP 1-35-1 Hz.; 0.2g INPUT FB/V #1
		TAPE START 0530' END 0955' RECORD TAPE ONLY
		RUN #3 SINE BEAT 1 Hz. 0.9g INPUT FB/V #1
		RECORD OGRAPH ONLY

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TEST ENGINEER RBP

(Include Run Number, Part Changes, Shift Changes and all other pertinent data)

DATE	TIME	REMARKS	
1, MARCH 71		RUN #4 SINE BEAT 1 Hz; 0.9g INPUT	FB/VERT #1
		RUN #5 SINE BEAT 1.25 Hz.; 1.5g INPUT	FB/V #1
		RUN #6 SINE BEAT 1.25 Hz.; 1.5g INPUT	FB/V #1
		RUN #7 SINE BEAT 1.6 Hz.; 2.3g INPUT	FB/V #1
		RUN #8 SINE BEAT 1.6 Hz.; 2.3g INPUT	FB/V #1
		RUN #9 SINE BEAT 2.0 Hz.; 3.0g INPUT	FB/V #1
		RUN #10 SINE BEAT 2.0 Hz.; 3.0g INPUT	FB/V #1
		RUN #11 SINE BEAT 2.5 Hz. 3.5g INPUT	FB/V #1
		RUN #12 SINE BEAT 2.5 Hz. 3.5g INPUT	FB/V #1

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TEST ENGINEER RBD

(Include Run Number, Part Changes, Shift Changes and all other pertinent data)

DATE	TIME	REMARKS	
1, MARCH 77		RUN # 13 SINE BEAT @ 3.2 Hz ; 4.3g INPUT	FB/V #1
		RUN # 14 SINE BEAT @ 3.2 Hz ; 4.3g INPUT	FB/V #1
		RUN # 15 SINE BEAT @ 4.0 HZ, 4.3G INPUT	F-B/V #1
		RUN # 16, SINE BEAT @ 4.0 HZ 4.3G INPUT	F-B/V #1
		RUN # 17, SINE BEAT @ 5.0 HZ 4.3G INPUT	F-B/V #1
		RUN # 18, SINE BEAT @ 5.0 HZ 4.3G INPUT	F-B/V #1
		RUN # 19, SINE BEAT @ 6.3 HZ 4.3G INPUT	F-B/V #1
		RUN # 20 SINE BEAT @ 6.3 HZ 4.3G INPUT	F-B/V #1
		RUN # 21, SINE BEAT @ 8.0 HZ 4.3G INPUT	F-B/V #1

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TEST ENGINEER RBP

(Include Run Number, Part Changes, Shift Changes and all other pertinent data)

DATE	TIME	REMARKS	
1 MARCH 77		RUN#22, SINE BEAT @ 8.0 HZ 4.3G INPUT	F-B/V#1
		RUN#23, SINE BEAT @ 10.0 HZ 4.4G INPUT	F-B/V#1
		RUN#24, SINE BEAT @ 10.0 HZ 4.4G INPUT	F-B/V#1
		RUN#25, SINE BEAT @ 12.5 HZ 4.3G INPUT	F-B/V#1
		RUN#26, SINE BEAT @ 12.5 HZ 4.3G INPUT	F-B/V#1
		RUN#27, SINE BEAT @ 16.0 HZ 4.3G INPUT	F-B/V#1
		RUN#28, SINE BEAT @ 16.0 HZ 4.3G INPUT	F-B/V#1
		RUN#29, SINE BEAT @ 20.0 HZ 4.3G INPUT	F-B/V#1
		RUN#30, SINE BEAT @ 20.0 HZ 4.3G INPUT	F-B/V#1

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TEST ENGINEER RBP

(Include Run Number, Part Changes, Shift Changes and all other pertinent data)

DATE	TIME	REMARKS	
2 MARCH 77		RUN#31, SINE BEAT @ 25HZ 4.3G INPUT	F-B/V#1
		RUN#32, SINE BEAT @ 25HZ 4.3G INPUT	F-B/V#1
		RUN#33, SINE BEAT @ 32HZ 4.3G INPUT	F-B/V#1
		RUN#34, SINE BEAT @ 32HZ 4.3G INPUT	F-B/V#1
		RUN#35, SINE BEAT @ 35HZ 4.3G INPUT	F-B/V#1
		RUN#36, SINE BEAT @ 35HZ 4.3G INPUT	F-B/V#1
		ROTATED SPECIMENS 90° TO THE S-S/V# 1 (+) AXIS	
	1150	RUN#37, SINE SWEEP 1-35-1 HZ 0.2G INPUT	S-S/V#1
		TAPE START 1376' END 1375'	

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TEST ENGINEER RBP

DATE	TIME	REMARKS (Include Run Number, Part Changes, Shift Changes and all other pertinent data)	
2 MARCH 77	1210	RUN#38, SINE SWEEP 1-35-1 HZ 0.2G INPUT	S-S/V#1
		TAPE START 1375' END 1595'	
		RUN#39, SINE BEAT @ 35HZ 4.3G INPUT	S-S/V#1
		RUN#40, SINE BEAT @ 35HZ 4.3G INPUT	S-S/V#1
		RUN#41, SINE BEAT @ 32HZ 4.4G INPUT	S-S/V#1
		RUN#42, SINE BEAT @ 32HZ 4.4G INPUT	S-S/V#1
		RUN#43, SINE BEAT @ 25HZ 4.4G INPUT	S-S/V#1
		RUN#44, SINE BEAT @ 25HZ 4.4G INPUT	S-S/V#1
		RUN#45, SINE BEAT @ 20HZ 4.3G INPUT	S-S/V#1
		RUN#46, SINE BEAT @ 20HZ 4.3G INPUT	S-S/V#1

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TEST ENGINEER RBP

DATE	TIME	REMARKS (Include Run Number, Part Changes, Shift Changes and all other pertinent data)	
2 MARCH 77		RUN# 47 SINE BEAT @ 16.0 HZ 4.3G INPUT	S-S/V#1
		RUN# 48, SINE BEAT @ 16.0 HZ 4.3G INPUT	S-S/V#1
		RUN# 49, SINE BEAT @ 12.5 HZ 4.3G INPUT	S-S/V#1
		RUN# 50 SINE BEAT @ 12.5 HZ 4.3G INPUT	S-S/V#1
		RUN# 51, SINE BEAT @ 10.0 HZ 4.3G INPUT	S-S/V#1
		RUN# 52, SINE BEAT @ 10.0 HZ 4.3G INPUT	S-S/V#1
		RUN# 53, SINE BEAT @ 8.0 HZ 4.3G INPUT	S-S/V#1
		RUN# 54, SINE BEAT @ 8.0 HZ 4.3G INPUT	S-S/V#1
		RUN# 55, SINE BEAT @ 6.3 HZ 4.3G INPUT	S-S/V#1

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DATE	TIME	REMARKS (Include Run Number, Part Changes, Shift Changes and all other pertinent data)	
2 MARCH 77		RUN#56, SINE BEAT @ 6.3 HZ 4.3G INPUT	S-S/V #1
		RUN#57, SINE BEAT @ 5.0 HZ 4.3G INPUT	S-S/V #1
		RUN#58, SINE BEAT @ 5.0 HZ 4.3G INPUT	S-S/V #1
		RUN#59, SINE BEAT @ 4.0 HZ 4.3G INPUT	S-S/V #1
		RUN#60, SINE BEAT @ 4.0 HZ 4.3G INPUT	S-S/V #1
		RUN#61, SINE BEAT @ 3.0 HZ 4.3G INPUT	S-S/V #1
		RUN#62, SINE BEAT @ 3.0 HZ 4.3G INPUT	S-S/V #1
		RUN#63, SINE BEAT @ 2.5 HZ 3.5G INPUT	S-S/V #1
		RUN#64, SINE BEAT @ 2.5 HZ 3.5G INPUT	S-S/V #1

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(Include Run Number, Part Changes, Shift Changes and all other pertinent data)

DATE	TIME	REMARKS	
2 MARCH 77		RUN#65, SINE BEAT @ 2.0 HZ 3.0G INPUT	S-S/V#1
		RUN#66, SINE BEAT @ 2.0 HZ 3.0G INPUT	S-S/V#1
		RUN#67, SINE BEAT @ 1.6 HZ 2.3G INPUT	S-S/V#1
		RUN#68, SINE BEAT @ 1.6 HZ 2.3G INPUT	S-S/V#1
		RUN#69, SINE BEAT @ 1.26 HZ 1.5G INPUT	S-S/V#1
		RUN#70, SINE BEAT @ 1.25 HZ 1.5G INPUT	S-S/V#1
		RUN#71, SINE BEAT @ 1.0 HZ 0.9G INPUT	S-S/V#1
		RUN#72, SINE BEAT @ 1.0 HZ 0.9G INPUT	S-S/V#1
		RE CALIBRATED ITEM#1 TO 100" H_2O = 50 MA	

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TEST ENGINEER RBP

DATE	TIME	REMARKS (Include Run Number, Part Changes, Shift Changes and all other pertinent data)	
3 MARCH 77		ROTATED SPECIMEN 180° TO THE S-S/V#2 - AXIS	
		RUN#73, SINE SWEEP 1-35-1 HZ 0.2G INPUT	S-S/V#2
		TAPE START 1545' END 1815'	
		RUN#74, SINE SWEEP 1-35-1 HZ 0.2G INPUT	S-S/V#2
		TAPE START 1815' END 2030'	
		RUN#75, SINE BEAT @ 1.0 HZ 0.4G INPUT	S-S/V#2
		RUN#76, SINE BEAT @ 1.0 HZ 0.4G INPUT	S-S/V#2
		RUN#77, SINE BEAT @ 1.25 HZ 1.5G INPUT	S-S/V#2
		RUN#78, SINE BEAT @ 1.25 HZ 1.5G INPUT	S-S/V#2
		RUN#79, SINE BEAT @ 1.6 HZ 2.3G INPUT	S-S/V#2

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TEST ENGINEER RBP

(Include Run Number, Part Changes, Shift Changes and all other pertinent data)

DATE	TIME	REMARKS	
3 MARCH 77		RUN#80, SINE BEAT @ 1.6HZ 2.3G INPUT	S-S/V#2
		RUN#81, SINE BEAT @ 2.0HZ 3.0G INPUT	S-S/V#2
		RUN#82, SINE BEAT @ 2.0HZ 3.0G INPUT	S-S/V#2
		RUN#83, SINE BEAT @ 2.5HZ 3.5G INPUT	S-S/V#2
		RUN#84, SINE BEAT @ 2.5HZ 3.5G INPUT	S-S/V#2
		RUN#85, SINE BEAT @ 3.0HZ 4.3G INPUT	S-S/V#2
		RUN#86, SINE BEAT @ 3.2HZ 4.3G INPUT	S-S/V#2
		RUN#87, SINE BEAT @ 4.0HZ 4.3G INPUT	S-S/V#2
		RUN#88, SINE BEAT @ 4.0HZ 4.3G INPUT	S-S/V#2

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TEST ENGINEER RBP

DATE	TIME	REMARKS (Include Run Number, Part Changes, Shift Changes and all other pertinent data)	
3 MARCH 77		RUN#89, SINE BEAT @ 5.0 HZ 4.3 G INPUT	S-S/V#2
		RUN#90, SINE BEAT @ 5.0 HZ 4.3 G INPUT	S-S/V#2
		RUN#91, SINE BEAT @ 6.3 HZ 4.3 G INPUT	S-S/V#2
		RUN#92, SINE BEAT @ 6.3 HZ 4.3 G INPUT	S-S/V#2
		RUN#93, SINE BEAT @ 8.0 HZ 4.3 G INPUT	S-S/V#2
		RUN#94, SINE BEAT @ 8.0 HZ 4.3 G INPUT	S-S/V#2
		RUN#95, SINE BEAT @ 10.0 HZ 4.4 G INPUT	S-S/V#2
		RUN#96, SINE BEAT @ 10.0 HZ 4.4 G INPUT	S-S/V#2
		RUN#97, SINE BEAT @ 12.5 HZ 4.3 G INPUT	S-S/V#2

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DATE	TIME	REMARKS (Include Run Number, Part Changes, Shift Changes and all other pertinent data)	
3 MARCH 77		RUN#98, SINE BEAT @ 12.5 HZ 4.3G INPUT	S-S/V#2
		RUN#99, SINE BEAT @ 16.0 HZ 4.3G INPUT	S-S/V#2
		RUN#100, SINE BEAT @ 16.0 HZ 4.3G INPUT	S-S/V#2
		RUN#101, SINE BEAT @ 20.0 HZ 4.3G INPUT	S-S/V#2
		RUN#102, SINE BEAT @ 20.0 HZ 4.3G INPUT	S-S/V#2
		RUN#103, SINE BEAT @ 25.0 HZ 4.3G INPUT	S-S/V#2
		RUN#104, SINE BEAT @ 25.0 HZ 4.3G INPUT	S-S/V#2
		RUN#105, SINE BEAT @ 27.0 HZ 4.3G INPUT	S-S/V#2
		RUN#106 SINE BEAT @ 27.0 HZ 4.3G INPUT	S-S/V#2

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TEST ENGINEER RBP

DATE	TIME	REMARKS (Include Run Number, Part Changes, Shift Changes and all other pertinent data)	
3 MARCH 77		RUN#107, SINE BEAT @ 32.0HZ 4.4G INPUT	S-S/V#2
		RUN#108, SINE BEAT @ 32.0HZ 4.4G INPUT	S-S/V#2
		RUN#109, SINE BEAT @ 35.0HZ 4.4G INPUT	S-S/V#2
		RUN#110, SINE BEAT @ 35.0HZ 4.4G INPUT	S-S/V#2
		ROTATED SPECIMEN 90° TO THE F B/V#2 - AXIS	
		RUN#111, SINE SWEEP 1-35-1HZ 0.2G INPUT	F-B/V#2
		TAPE START 2030' END 2250'	
		RUN#112, SINE SWEEP 1-35-1HZ 0.2G INPUT	F-B/V#2
		TAPE START 2250' END 2500'	
		REMOVED ITEM #1 FROM TEST SET-UP	

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TEST ENGINEER RBP

DATE	TIME	REMARKS (Include Run Number, Part Changes, Shift Changes and all other pertinent data)	
3 MARCH 77		RUN#113, SINE BEAT @ 35.0HZ 4.3G INPUT	F-B/V#2
		RUN#114, SINE BEAT @ 35.0HZ 4.3G INPUT	F-B/V#2
		RUN#115, SINE BEAT @ 32.0HZ 4.3G INPUT	F-B/V#2
		RUN#116, SINE BEAT @ 32.0HZ 4.3G INPUT	F-B/V#2
		RUN#117, SINE BEAT @ 25.0HZ 4.3G INPUT	F-B/V#2
		RUN#118, SINE BEAT @ 25.0HZ 4.3G INPUT	F-B/V#2
		RUN#119, SINE BEAT @ 20.0HZ 4.4G INPUT	F-B/V#2
		RUN#120, SINE BEAT @ 20.0HZ 4.4G INPUT	F-B/V#2
		RUN#121, SINE BEAT @ 16.0HZ 4.3G INPUT	F-B/V#2

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TEST ENGINEER RBP

(Include Run Number, Part Changes, Shift Changes and all other pertinent data)

DATE	TIME	REMARKS	
3 MARCH 77		RUN#122, SINE BEAT @ 16.0 HZ 4.3G INPUT	F B/V#2
		RUN#123, SINE BEAT @ 12.5 HZ 4.3G INPUT	F-B/V#2
		RUN#124, SINE BEAT @ 12.5 HZ 4.3G INPUT	F-B/V#2
		RUN#125, SINE BEAT @ 10.0 HZ 4.4G INPUT	F-B/V#2
		RUN#126, SINE BEAT @ 10.0 HZ 4.4G INPUT	F-B/V#2
		RUN#127, SINE BEATS @ 8.0 HZ 4.3G INPUT	F-B/V#2
		RUN#128, SINE BEAT @ 8.0 HZ 4.3G INPUT	F-B/V#2
		RUN#129, SINE BEAT @ 6.3 HZ 4.3G INPUT	F-B/V#2
		RUN#130, SINE BEAT @ 6.3 HZ 4.3G INPUT	F-B/V#2

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TEST ENGINEER RBP

(Include Run Number, Part Changes, Shift Changes and all other pertinent data)

DATE	TIME	REMARKS	
3 MARCH 77		RUN#131, SINE BEAT @ 5.0HZ 4.4G INPUT	F-B/V#2
		RUN#132, SINE BEAT @ 5.0HZ 4.4G INPUT	F-B/V#2
		RUN#133, SINE BEAT @ 4.0HZ 4.3G INPUT	F-B/V#2
		RUN#134, SINE BEAT @ 4.0HZ 4.3G INPUT	F-B/V#2
		RUN#135, SINE BEAT @ 3.2HZ 4.3G INPUT	F-B/V#2
		RUN#136, SINE BEAT @ 3.2HZ 4.3G INPUT	F-B/V#2
		RUN#137, SINE BEAT @ 2.5HZ 3.5G INPUT	F-B/V#2
		RUN#138, SINE BEAT @ 2.5HZ 3.5G INPUT	F-B/V#2
		RUN#139, SINE BEAT @ 2.0HZ 3.0G INPUT	F-B/V#2

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TEST ENGINEER RBP

DATE	TIME	REMARKS (Include Run Number, Part Changes, Shift Changes and all other pertinent data)	
3 MARCH 77		RUN#140 SINE BEAT @ 2.0HZ 3.0G INPUT	F-B/V#2
		RUN#141, SINE BEAT @ 1.6 HZ 2.3G INPUT	F-B/V#2
		RUN#142, SINE BEAT @ 1.6HZ 2.3G INPUT	F-B/V#2
		RUN#143, SINE BEAT @ 1.25HZ 1.6G INPUT	F-B/V#2
		RUN#144, SINE BEAT @ 1.25HZ 1.5G INPUT	F-B/V#2
		RUN#145 SINE BEAT @ 1.0HZ 0.4G INPUT	F-B/V#2
		RUN#146, SINE BEAT @ 1.0HZ 0.4G INPUT	F-B/V#2
4 MARCH 77		FRAGILITY TESTING F-B/V#2 - AXIS	
		RUN#147 SINE BEAT @ 4.0HZ 5.2G INPUT	F-B/V#2

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(Include Run Number, Part Changes, Shift Changes and all other pertinent data)

DATE	TIME	REMARKS	
4 MARCH 77		RUN#148, SINE BEAT @ 5.0HZ 6.3G INPUT	F-B/V#2
		RUN#149 SINE BEAT @ 6.3HZ 7.5G INPUT	F-B/V#2
		RUN#150, SINE BEAT @ 8.0HZ 8.5G INPUT	F-B/V#2
		RUN#151, SINE BEAT @ 10.0HZ 10.0G INPUT	F-B/V#2
		RUN#152, SINE BEAT @ 12.5HZ 10.0G INPUT	F-B/V#2
		RUN#153, SINE BEAT @ 16.0HZ 10.0G INPUT	F-B/V#2
		RUN#154, SINE BEAT @ 20.0HZ 10.0G INPUT	F-B/V#2
		RUN#155, SINE BEAT @ 25.0HZ 8.0G INPUT	F-B/V#2
		RUN#156, SINE BEAT @ 32.0HZ 5.1G INPUT	F-B/V#2

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(Include Run Number, Part Changes, Shift Changes and all other pertinent data)

DATE	TIME	REMARKS	
4 MARCH 77		RUN#157, SINE BEAT @ 35.0 HZ 5.0G INPUT	F-B/V#2
		ROTATED SPECIMENS 90° TO THE S-S/V#2 - AXIS	
		RUN#158, SINE BEAT @ 35.0 HZ 5.0G INPUT	S-S/V#2
		RUN#159, SINE BEAT @ 32.0 HZ 5.1G INPUT	S-S/V#2
		RUN#160, SINE BEAT @ 25.0 HZ 8.0G INPUT	S-S/V#2
		RUN#161, SINE BEAT @ 20.0 HZ 10.0G INPUT	S-S/V#2
		RUN#162, SINE BEAT @ 16.0 HZ 10.0G INPUT	S-S/V#2
		RUN#163, SINE BEAT @ 12.5 HZ 10.0G INPUT	S-S/V#2
		RUN#164, SINE BEAT @ 10.0 HZ 10.0G INPUT	S-S/V#2

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(Include Run Number, Part Changes, Shift Changes and all other pertinent data)

DATE	TIME	REMARKS	
4 MARCH 77		RUN#165, SINE BEAT @ 8.0HZ 8.5G INPUT	S-S/V#2
		RUN#166, SINE BEAT @ 6.3HZ 7.5G INPUT	S-S/V#2
		RUN#167, SINE BEAT @ 5.0HZ 6.3G INPUT	S-S/V#2
		RUN#168, SINE BEAT @ 4.0HZ 5.2G INPUT	S-S/V#2
		POST CHECKOUT OF ITEMS REVEALED PEN DRIVE GEAR HAD LOOSENED AND SLIPPED ALLOWING PEN DRIVE MOTOR TO RUN FREE. RESET AND TIGHTENED GEAR	
		ROTATED SPECIMENS 90° TO THE F-B/V#1 + AXIS	
		RUN#169, SINE BEAT @ 4.0HZ 5.2G INPUT	F-B/V#1
		RUN#170, SINE BEAT @ 5.0HZ 6.3G INPUT	F-B/V#1

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(Include Run Number, Part Changes, Shift Changes and all other pertinent data)

DATE	TIME	REMARKS	
4 MARCH 77		RUN#171, SINE BEAT @ 6.3HZ 7.5G INPUT	F-B/V#1
		RUN#172, SINE BEAT @ 8.0HZ 8.5G INPUT	F-B/V#1
		RUN#173, SINE BEAT @ 10.0HZ 10.0G INPUT	F-B/V#1
		RUN#174, SINE BEAT @ 12.5HZ 10.0G INPUT	F-B/V#1
		RUN#175, SINE BEAT @ 16.0HZ 10.0G INPUT	F-B/V#1
		RUN#176, SINE BEAT @ 20.0HZ 10.0G INPUT	F-B/V#1
		RUN#177, SINE BEAT @ 25.0HZ 8.0G INPUT	F-B/V#1
		RUN#178, SINE BEAT @ 32.0HZ 5.1G INPUT	F-B/V#1
		RUN#179, SINE BEAT @ 35.0HZ 5.0G INPUT	F-B/V#1

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DATE	TIME	REMARKS (Include Run Number, Part Changes, Shift Changes and all other pertinent data)	
4 MARCH 77		ROTATED SPECIMENS 90° TO THE S-S/V#1 +AXIS	
		RUN#180, SINE BEAT @ 36.0HZ 5.0G INPUT	S-S/V#1
		RUN#181, SINE BEAT @ 32.0HZ 5.1G INPUT	S-S/V#1
		RUN#182, SINE BEAT @ 25.0HZ 8.0G INPUT	S-S/V#1
		RUN#183, SINE BEAT @ 20.0HZ 10.0G INPUT	S-S/V#1
		RUN#184, SINE BEAT @ 16.0HZ 10.0G INPUT	S-S/V#1
		RUN#185, SINE BEAT @ 12.5HZ 10.0G INPUT	S-S/V#1
		RUN#186, SINE BEAT @ 10.0HZ 10.0G INPUT	S-S/V#1
		RUN#187, SINE BEAT @ 8.0HZ 8.5G INPUT	S-S/V#1

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WYLE LABORATORIES
INSTRUMENTATION LOG SHEET

JOB NO. 43522

CUSTOMER ROBERTSHAW

LOG PAGE NO. 24 OF 24

TEST ENGINEER RBP

DATE	TIME	REMARKS (Include Run Number, Part Changes, Shift Changes and all other pertinent data)	
4 MARCH 77		RUN#188, SINE BEAT @ 6.3HZ 7.5G INPUT	S-S/V#1
		RUN#189, SINE BEAT @ 5.0HZ 6.3G INPUT	S-S/V#1
		RUN#190, SINE BEAT @ 4.0HZ 5.2G INPUT	S-S/V#1

INSTRUMENTATION EQUIPMENT SHEET

Date 1 MAR 77 Job No. 43522 Test Area PIT #1

Technician FROST Customer ROBERTSHAW Type Test SEISMIC

No.	Instrument	Manufacturer	Model No.	Serial No.	Wyle or Gov't No.	Range	Accuracy	Calibration On	Calibration Due
1	ACCELEROMETER	ENDEVCO	2235	LA54	95310	1000g	±5%	12-14-76	3-14-77
2	ACCELEROMETER	ENDEVCO	2272	EP49	96146	1000g	±5%	12-14-76	3-14-77
3	ACCELEROMETER	ENDEVCO	2272	EQ 36	96150	1000g	±5%	12-14-76	3-14-77
4	ACCELEROMETER	ENDEVCO	2272	EQ73	96157	1000g	±5%	12-14-76	3-14-77
5	ACCELEROMETER	ENDEVCO	2272	EQ 38	96151	1000g	±5%	12-14-76	3-14-77
6	ACCELEROMETER	ENDEVCO	2272	EQ45	96153	1000g	±5%	12-14-76	3-14-77
7	ACCELEROMETER	ENDEVCO	2272	EQ 58	96155	1000g	±5%	12-14-76	3-14-77
8	ACCELEROMETER	ENDEVCO	2272	EQ 44	96152	1000g	±5%	12-14-76	3-14-77
9	ACCELEROMETER	ENDEVCO	2272	EP 53	96147	1000g	±5%	12-14-76	3-14-77
10	ACCELEROMETER	ENDEVCO	2272	EQ 68	96156	1000g	±5%	12-14-76	3-14-77
11	ACCELEROMETER	ENDEVCO	2272	EQ 34	96149	1000g	±5%	12-14-76	3-14-77
12	ACCELEROMETER	ENDEVCO	2272	EQ 56	96154	1000g	±5%	12-14-76	3-14-77
13	ACCELEROMETER	ENDEVCO	2271	CQ 56	96194	1000g	±5%	12-14-76	3-14-77
14	ACCELEROMETER	ENDEVCO	2272	ES 23	96268	1000g	±5%	12-14-76	3-14-77
15	ACCELEROMETER	ENDEVCO	2219	AB94	96290	500g	±5%	1-26-77	4-26-77
16	CHARGE AMP	DYNAMICS	7302	—	1594	500g	±2%	1-4-77	7-4-77
17	CHARGE AMP	DYNAMICS	7302	—	1536	500g	±2%	1-4-77	7-4-77
18	CHARGE AMP	DYNAMICS	7302	—	1657	500g	±2%	1-4-77	7-4-77

Instrument Test Engineer R.B Pamberton Checked & Received By Rod Pomberton

WH-1029

INSTRUMENTATION EQUIPMENT SHEET

Date 1 MAR. 77 Job No. 43522 Test Area PIT #1

Technician FROST Customer ROBERTSHAW Type Test SEISMIC

No.	Instrument	Manufacturer	Model No.	Serial No.	Wyle or Gov't No.	Range	Accuracy	Calibration On	Calibration Due
19	CHARGE AMP	DYNAMICS	7302	-	1538	500g	±2%	1-4-77	7-4-77
20	CHARGE AMP	DYNAMICS	7302	-	1605	500 g	±2%	1-4-77	7-4-77
21	CHARGE AMP	DYNAMICS	7302	-	1658	500 g	±2%	1-4-77	7-4-77
22	CHARGE AMP	DYNAMICS	7302	-	1504	500 g	±2%	1-4-77	7-4-77
23	CHARGE AMP	DYNAMICS	7302	-	1582	500 g	±2%	1-4-77	7-4-77
24	CHARGE AMP	DYNAMICS	7302	-	1565	500 g	±2%	1-4-77	7-4-77
25	CHARGE AMP	DYNAMICS	7302	-	1526	500 g	±2%	1-4-77	7-4-77
26	CHARGE AMP	DYNAMICS	7302	-	1634	500 g	±2%	1-4-77	7-4-77
27	CHARGE AMP	DYNAMICS	7302	-	1549	500 g	±2%	1-4-77	7-4-77
28	CHARGE AMP	DYNAMICS	7302	-	1686	500 g	±2%	1-4-77	7-4-77
29	CHARGE AMP	DYNAMICS	7302	-	1611	500 g	±2%	1-4-77	7-4-77
30	CHARGE AMP	DYNAMICS	7302	-	1664	500 g	±2%	1-4-77	7-4-77
31	OSCILLOSCOPE	TEKTRONIX	RM561	-	605F54	.02-10v/cm	±3%	12-13-76	3-13-77
32	VOLTMETER	B & K	2426	-	95492	300V	±2%	12-30-76	3-30-77
33	TAPE RECORDER	B & H	CPR 4010	-	96291	D.C. 2.5KHz	±2%	9-22-76	3-22-77
34	X-Y RECORDER	H.P.	7004B	-	95202	.5mv-10v/in	±.2%	1-19-77	4-19-77
35	GALVO AMP	HONEYWELL	166A600	-	96285	1:1	±2%	9-9-76	3-9-77
36	VISICORDER	HONEYWELL	1508	-	96274	2.5Hz	±2%	11-9-76	5-9-77

Instrument Test Engineer R.B. Pinkerton Checked & Received By Rod V. Rosbury

WII-1029

INSTRUMENTATION EQUIPMENT SHEET

Date 1 MAR 77 Job No. 43522 Test Area Pit # 1

Technician FROST Customer ROBERTSHAW Type Test SEISMIC

No.	Instrument	Manufacturer	Model No.	Serial No.	Wyle or Gov't No.	Range	Accuracy	Calibration On	Calibration Due
37	SWEEP OSCILLATOR	SPEC DYNAMICS	SD104	—	97485	.5-50KHz	±4%	1-18-77	4-18-77
38	TRACKING FILTER	SPEC DYNAMICS	SD101	—	80018	40db	±3%	1-24-77	7-24-77
39	LOG CONVERTER	SPEC DYNAMICS	SD112	—	96145	80db	±2%	1-24-77	4-24-77
40	CARRIER GENERATOR	SPEC DYNAMICS	SD1010	—	96129	40db	±.5db	1-25-77	4-25-77
41	TRACKING FILTER	SPEC DYNAMICS	SD1012	—	81609	40db	±.5db	1-25-77	4-25-77
42	SWEEP OSCILLATOR	SPEC DYNAMICS	SD104	—	95360	.5-50KHz	±2%	1-24-77	4-24-77
43	SERVO MONITOR	SPEC DYNAMICS	SD 105	—	95359	1000g	±4%	1-24-77	4-24-77
44	POWER SUPPLY	DRESSEN	2744	—	95174	0-15vdc	±10mv	2-1-77	8-1-77
45	POWER SUPPLY	KEPCO	SM160-2	—	97872	0-160vdc	±10mv	2-1-77	8-1-77
46	PRESSURE GAGE	WEKSLER	45-0/15	—	001	15psi	±.5%	11-19-76	11-19-77
47	PRESSURE GAGE	ROBERTSHAW	—	—	80324	1000psi	±.5%	12-13-76	3-13-77
48	Power Supply	E.M. REGATRAN	212A	—	80247	0-100vdc	±2%	11-19-76	5-19-77
49	Power Supply	E.M. REGATRAN	TR036-05	—	80245	0-35vdc	±0.1%	11-16-76	5-16-77
50	POWER SUPPLY	KEPCO	SM160-2	—	97871	0-160vdc	±0.1%	1-5-77	4-5-77

Instrument Test Engineer RB Pinkerton Checked & Received By Rod R. Lombery

WII-1029

TEST PROCEDURE

WYLE LABORATORIES
SCIENTIFIC SERVICES AND SYSTEMS GROUP
P. O. BOX 1008 • HUNTSVILLE, ALABAMA 35807
TWX (810) 726-2225 • TELEPHONE (205) 837-4411

TEST PROCEDURE NO. 541/5174-1/ES
DATE: December 7, 1976
Revision A

SEISMIC TEST PLAN
OF
FIVE COMPONENTS

FOR

ROBERTSHAW CONTROLS COMPANY
KNOXVILLE, TENNESSEE
(TVA WB-DC-40-31.2)

APPROVED BY: _____
FOR: _____

APPROVED BY: _____
FOR: _____

APPROVED BY: _____
FOR: _____

APPROVED BY
PROJECT MANAGER: _____

APPROVED BY
QUALITY ENGINEER: _____

PREPARED BY
PROJECT ENGINEER: Herschel D. Jordan

1.0 MOUNTING

1.1 Specimen Orientation and Mounting

The Seismic Simulator will be inclined at a 45-degree angle to the floor (see Figure 1). The Five Components, described in Paragraph 1.2, hereinafter called the specimens, will be mounted to a Wyle-furnished mounting fixture. The fixture will be mounted to a 45-degree angle fixture such that the base of the fixture is parallel to the floor. The specimens will be tested in the vertical and the first horizontal axis simultaneously, and then the mounting fixture will be rotated 90 degrees and the specimens will be tested in the vertical and the second horizontal axis. The mounting fixture will be rotated 90 degrees and the specimens will be tested in the vertical and the third horizontal axis. The mounting fixture will then be rotated 90 degrees and the specimens will be tested in the vertical and fourth horizontal axis. The specimens will be tested simultaneously.

1.2 Specimen Description

Item	Model	Component	
1	117	Electronic Differential Pressure Transmitter	
2	147	Electronic Pressure Transmitter	
3	570-C2	Square Root Extractor	
4	572-C2	Isolation Amplifier	A
5	225-C1-A1-A	Compact Recorder in Case #040-950-397-01	A

2.0 EXCITATION

2.1 Simultaneous Axes Excitation

Each horizontal axis will be equally excited simultaneously with the vertical axis due to the Seismic Simulator being oriented at a 45-degree angle. The input waveform will be multiplied by a factor of 1.414 because of the orientation.

2.2 Exploratory Test

An exploratory test will be run in the form of a continuous sweep frequency search using a sinusoidal steady-state input at approximately 0.2 g. The search will include a minimum of two continuous sweeps from 1 to 35 to 1 Hz at a rate of one octave per minute.

2.3 Sine Beat Qualification Tests

The specimens will be subjected to sine beat tests consisting of ten oscillations per beat with a time pause of approximately two seconds between each of the five beats. A sine beat test will be performed two times at one-third octave intervals between 1 and 35 Hz and/or the resonant frequencies determined in Paragraph 2.2 at a test level of 4.25 g's, within the limits of the test machine, at a location near the driving point of the single actuator. The 4.25 g input yields an effective g force of 3.0 g's in both the horizontal and vertical axes simultaneously.

2.4 Fragility Testing - (OPTIONAL)

The specimens can be subjected to fragility testing after the qualification tests have been completed. The test method will be as indicated in Paragraph 2.3 except only one test will be performed at each test frequency. The test level will be increased to 10 g's (7.07 g's in each axis), within the limits of the test machine (see Figure 2), during the fragility tests. If fragility occurs, a sine beat test will be performed with the test level slightly below fragility level. Some fragility tests will be performed during qualification testing (Paragraph 2.3) if fragility occurs at g levels below 4.2 g's. If fragility does not occur, a sine beat test will be performed at machine limits.

3.0 INSTRUMENTATION

3.1 Excitation Control

A control accelerometer will be mounted on the test table at a location near the driving point for the actuator.

3.2 Specimen Response

Two (2) specimen-mounted uniaxial piezo-electric accelerometers will be located on each specimen under test, if the exploratory tests are performed. The placement of the accelerometers will be at the discretion of the Wyle Test Engineer or the Robertshaw Controls Technical Representative. Transmissibility plots of the specimen response accelerometers from the exploratory search tests will be provided in the test report.

3.3 Electrical Power

Electrical power, as described below, will be provided for the specimens:

Items	Voltage
1 and 2	24 VDC
4	26.5 VDC
3, 4 and 5	117 VAC

3.4 Electrical Input Signals

Electrical input signals of 10 to 50 milliamperes DC will be provided for Items 3 through 5.

3.5 Electrical Monitoring

Four (4) channels of electrical monitoring will be recorded on an oscillograph recorder during the qualification and fragility testing. These channels may be used to ascertain electrical continuity, current/voltage levels, spurious operation, contact chatter, etc. before, during and after the seismic excitation.

The four channels of electrical monitoring will be utilized as follows:

Channel	Item	Output Signal
1	1	10 to 50 maDC
2	2	10 to 50 maDC
3	3	10 to 50 maDC
4	4	10 to 50 maDC
Visual	5	10 to 50 maDC (0 to full-scale)

3.6 Air Pressure

Air pressure of approximately 0.5 psig (14 inches of water) will be supplied to Item 1 and air pressure of approximately 100 psig will be supplied to Item 2 for operation during the test program.

4.0 IN-PROCESS INSPECTION

The records will be checked for equality of performance after each test.

The specimens will be examined for possible damage following all violent tests such as at a severe structural resonance.

All important vibration effects will be logged.

Photographs will be taken of any noticeable physical damage that may occur.

5.0 REPORT

Ten (10) certification-type reports will be issued subsequent to completion of testing. This report will be signed by a Registered Professional Engineer and will summarize the details and recommendations concerning deficiencies and repairs, results and conclusions, photographs of test setups, failures, etc. The report will also contain a list of test equipment used and calibrations.

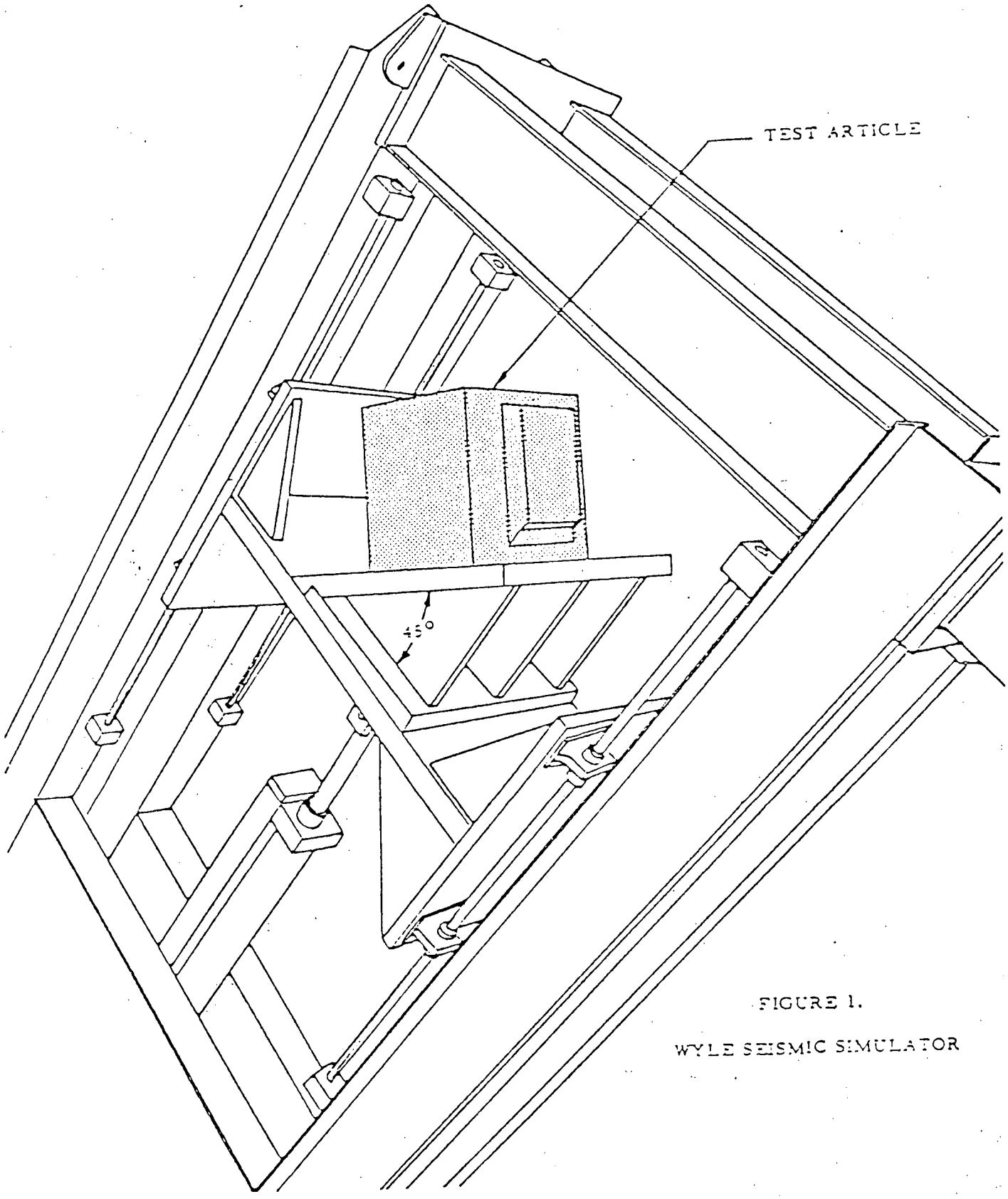

FIGURE 1.

WYLE SEISMIC SIMULATOR

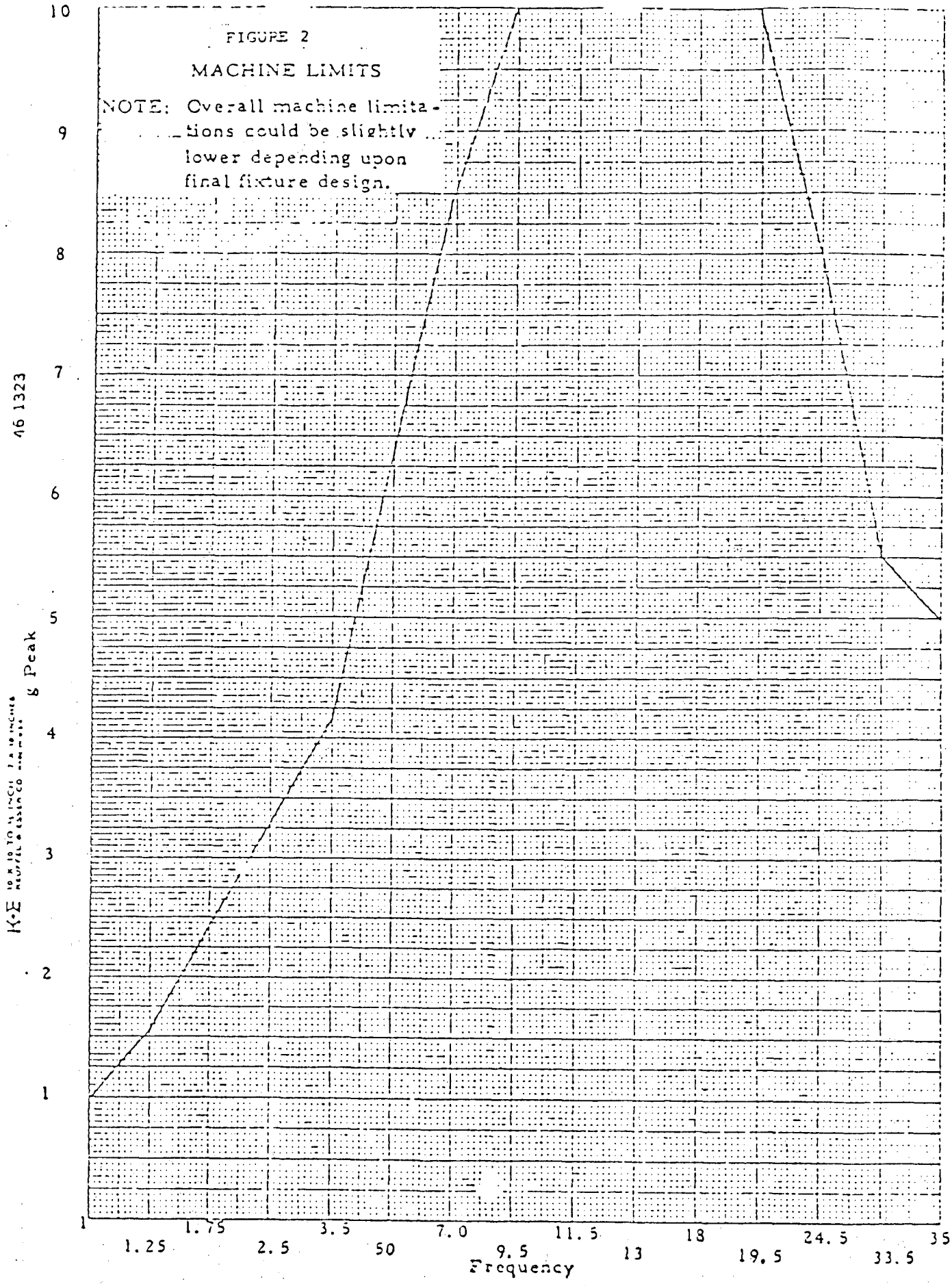
FIGURE 2
MACHINE LIMITS
NOTE: Overall machine limitations could be slightly lower depending upon final fixture design.
K-E 10 X 10 TO 1/2 INCH 1 X 10 INCHES
46 1323
g Peak
10
9
8
7
6
5
4
3
2
1
1
1.25
1.75
2.5
3.5
50
7.0
9.5
11.5
13
18
19.5
24.5
33.5
35
Frequency