FORM NO. 28-650 (11-66)

152

DOUGLAS

MISSILE & SPACE SYSTEMS DIVISION
DOUGLAS AIRCRAFT CO., INC.

ENGINEERING LABORATORIES & SERVICES
TECHNICAL MEMORANDUM

TO: W. R. Spark, A-290

FROM: T. J. Sereno, A-270 (ext. 2461)

SUBJECT: CHILLDOWN INVERTER ACOUSTICAL TESTS - SII

COPIES TO: T. J. Sereno, I. M. Williamson, A-270; I. Hagino, F. Johnson, W. R. Spark, A-290; J. L. Holmgren, A3-860, C.W. Wilson, A3-860(16)

CATALOG NO. PDL 84029-2

REPORT NO. TM-DSV4B-ENV-R6065-2

DATE 10/4/67

REQUESTED BY J. L. Holmgren, A3-860

E.W.O. 29379 TCD 1T10743

TEST PLAN & ITEM NO. 41412 P-66

SALES ORDER 5769-6304

CLASSIFICATION OR RESTRICTION: Unclassified

PREPARED BY: R. A. Jenkins

APPROVED BY: T. J. Sereno

I. Hagino, Prime Lab Test Engr

APPROVAL SIGNATURES CERTIFY THAT ALL REQUIREMENTS OF REPORT HAVE BEEN MET INCLUDING THE REPORTING OF NEW TECHNOLOGY/REPORTABLE ITEMS PER SPB'S 92 AND 93. DISCLOSURES ARE MADE ON FORMS 25-207 AND 25-207-1.
NEW TECHNOLOGY: ☐ IS CONTAINED IN THIS REPORT, ☒ IS NOT CONTAINED IN THIS REPORT.

ABSTRACT:

INTRODUCTION

Acoustical environment tests were performed on three SII Chilldown Inverters as part of their qualification testing. The tests were performed in the High Intensity Noise Facility of the Douglas Dynamics and Acoustics Laboratory, Santa Monica, California. Test specimen 1 was tested August 18, 1967; specimens 2 and 3 were tested September 1, 1967.

PURPOSE

The purpose of the tests was to determine the ability of the test specimens to withstand an acoustical environment which simulated the conditions to be encountered during flight.

The purposes of this technical memorandum are to describe and [illegible] the acoustical portions of the tests and to transmit the acoustical data obtained from the tests.

FACILITY FORM 602
N70-75945 (ACCESSION NUMBER) (THRU)
75 (PAGES) None (CODE)
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SEP 1970
RECEIVED
NASA STI FACILITY
INPUT BRANCH

EQUIPMENT

Test Specimens

The test specimens were three electronic Chilldown Inverters, NAA (North American Aviation) P/N ME-495-0006-0004, test plan item P-66, manufactured by Gulton Industries for NAA. The specimens were identified as follows:

Specimen	S/N
1	15840
2	15481
3	15482

Each test specimen was mounted, in turn, on a backup structure which was attached to a rigid vibration test fixture, P/N Z-1A96648-505. Weight of the fixture was 282 pounds. This test assembly dynamically simulated the vehicle installation. A photograph of the specimen 1 test assembly is presented on page B1.

Test Equipment

Testing of all specimens was accomplished in the 1000-cubic-foot reverberation chamber of the Dynamics and Acoustics Laboratory.

The acoustic equipment and instrumentation used for testing specimen 1 are listed on pages A1 through A4; the items used for testing specimens 2 and 3 are listed on pages A5 through A8.

The facility control room instrumentation-rack configuration during testing are shown in the photographs on pages B9 and B10. The prime (Elec. Systems) laboratory test equipment (not listed in this TM) is depicted on page B11, which shows items used for specimen 1.

PROCEDURE

Test Specimen 1

The test assembly was suspended in the approximate center of the chamber with bungee cord. The backup-structure panel was oriented nearly parallel with the longitudinal axis of the noise source horn, with no major plane of the specimen, structure, or fixture parallel to any chamber surface. The natural frequency of the suspension system was determined to be 2 cps, which was within the TCD maximum requirement of 5 cps. Frequency was determined by pulling the test assembly downward from the equilibrium position, releasing it, and counting the resulting oscillations per second.

Test Specimen 1 (continued)

Six accelerometers were mounted adjacent to the specimen corners, with vehicle axis orientation as follows:

Accelerometer	Measuring Axis
1	Radial
2	Radial
3	Radial
4	Radial
5	Thrust
6	Tangential

Accelerometers 4, 5, and 6 were mounted on a single tri-axial block. The exact accelerometer locations were as shown in the photograph on page B2.

Three condenser microphones were suspended so that each was at least 18 inches from the test assembly surfaces. Microphone no. 1 was positioned opposite the specimen, which position was "upstream" with respect to the horn opening. Microphone no. 2 was positioned opposite a dummy box, located "downstream" from the specimen. Microphone no. 3 was placed above the backup structure's "upstream" sector. Exact locations are shown on pages B3 and B4.

Microphone and accelerometer systems were calibrated after the test specimen was replaced with a dummy specimen, to permit chamber environment equalization runs. Calibrations were recorded on magnetic tape while control-room reference meters and a strip-chart recorder was being adjusted.

The High-Intensity Sound System (HISS) was then fully activated, and an equalization run (No. E-1) was performed. This run exposed the test assembly to a 6-1/2 minute random noise environment with a nominal overall sound-pressure level (OASPL) of 155 db. Another equalization run (E-2) was performed, in which the OASPL was a nominal 160 db for 4-1/2 minutes. Only strip-chart recordings were made during these runs.

Following equalization, test specimen 1 was mounted, and the 18 minute 160 db environmental test was initiated. Data were tape recorded for the first 5 and the last 3 minutes of this run. Microphone outputs were analyzed and recorded on strip charts during the first and last 6 minute segments of the test, which ran to completion. Upon completion of the specimen 1 test, since neither specimen 2 or 3 were available for immediate testing, the test assembly was removed from the chamber.

Test Specimen 2

Orientations of the specimen 2 test assembly and microphone system were equivalent to those of the specimen 1 test, as the photograph on page B12 indicates. However, a seventh accelerometer, providing a radial-axis measurement, was added in the location shown on page B13. An "upstream" view of accelerometer locations is provided on page B14.

After calibrations, a dummy specimen was substituted for specimen 2, and an equalization run (E-3) was performed. The run exposed the test assembly to a nominal 160 db OASPL for 4-1/2 minutes. Strip-chart and magnetic-tape recordings were made. Specimen 2 was then mounted, and the 18 minute, 160 db test run was performed.

Test Specimen 3

After completion of specimen 2 testing, the third specimen was installed, and the test run was performed. The test configuration and conditions were equivalent to those for specimen 2. An equalization run was not required, however. Microphone and accelerometer locations for specimen 3 are shown on pages B15 through B17.

During the testing of each specimen, operating parameters of the specimen were monitored and recorded by prime (Elec. Systems) laboratory personnel located in the area immediately adjacent to the chamber. All specimen handling, connections, and disposition were performed by these personnel.

RESULTS AND DISCUSSION

The backup structure was damaged during the acoustical testing of specimen 1. Pages B5 through B8 identify the specific damage areas. The structure had been used on several other line items involving vibration, shock, and acoustics tests prior to the tests of specimens 2 and 3. The structure was repaired and caused no further delays in the performance of subsequent tests.

The acoustical environment for each test is tabulated as SPL per 1/3 octave on pages A12 through A17. Tabular data were derived from the strip charts recorded during the testing, typified by the charts on pages A9 through A11. These three charts were obtain during the first 6 minutes of the specimen 1 test run.

Graphic comparisons of the provided environments versus the specification tolerances are presented on pages A18, A19, and A20 for specimens 1, 2, and 3, respectively. In general, any variations beyond the tolerances are attributable to the fundamental operating limits of the HISS, and were not operator-correctible.

Results and Discussion (continued)

Accelerometer response signals during the acoustical testing are presented as plots of Power Spectral Density versus Frequency on the following pages:

Specimen	Page Numbers	Remarks
1	A21 through A26	1st minute
1	A27 through A32	5th minute (Accelerometers 1 & 2 fell off; data invalid)
1	A33 through A38	Final minute (accelerometers still off)
2	A39 through A45	-
3	A46 through A52	-

ATTACHMENTS

Pages A1 through A52

Pages B1 through B17

FORM 25-S-1 (REV 8-53)

PREPARED BY: [signature]
CHECKED BY: [signature]
DATE: 9-1-67
TITLE: CHILLDOWN INVERTER ACOUSTIC TEST

DOUGLAS AIRCRAFT COMPANY, INC.
MISSILE & SPACE SYSTEMS DIVISION

PAGE: A1
MODEL: DSV-4B
REPORT NO.: TM-R 6065-2

(CIRCLE ITEM USED)

ITEM No.	DESCRIPTION	MFR.	MODEL	DAC TAG No.	REMARKS	CERTIFICATION WEEK PAST / NEXT
1	OCTAVE-BAND EQUALIZER	ALLISON	349	611924-56		725/751
2	RANDOM NOISE GENERATOR	GR	1390-BS1	611825-10		
3	BEAT FREQUENCY OSCILLATOR	B&K	1014	611924-58	Accel. "Cals."	718/745
4	BEAT FREQUENCY OSCILLATOR	B&K	1014	(USAF 9795-)		
5	BEAT FREQUENCY OSCILLATOR	B&K	1013			
6	CLIPPER-MIXER-AMPLIFIER	LING	CMA 10	636069		725/751
7	VOLTAGE AMPLIFIER (30 dB)	LING	442-C	611924-7		
8	POWER AMPLIFIER	LING	C/P-3/4	611924-58		712/738
9	PISTONPHONE	B&K	4220	(S/N 126681)		
10	PISTONPHONE	B&K	4220	(S/N 47163)		717/743
11	ELECTRO-PNEUM. TRANSDUCER	LING	EPT 94B	1021	✓ARRAY POSITION No. 1 (AP-1)	709/735
12	ELECTRO-PNEUM. TRANSDUCER	LING	EPT 94B		AP-2	
13	ELECTRO-PNEUM. TRANSDUCER	LING	EPT 94B		AP-3	
14	ELECTRO-PNEUM. TRANSDUCER	LING	EPT 94B	1286A	✓AP-4	717/743
15	ELECTRO-PNEUM. TRANSDUCER	LING	EPT 94B	1008	✓AP-5	709/735
16	ELECTRO-PNEUM. TRANSDUCER	LING	EPT 94B	1015	✓AP-6	725/751
17	ELECTRO-PNEUM. TRANSDUCER	LING	EPT 94B		AP-7	
18	ELECTRO-PNEUM. TRANSDUCER	LING	EPT 94B		AP-8	
19	ELECTRO-PNEUM. TRANSDUCER	LING	EPT 94B	185A	✓AP-9	709/735
20	ELECTRO-PNEUM. TRANSDUCER	LING	EPT 94B	1010	✓AP-10	717/743
21	VOLTOHMETER	SIMPSON	269			
22	VOLTMETER	B&K	2603	626479	SPL Reference	728/750
23	OSCILLOSCOPE	TEKTRONIX	502	611924-57		728/748
24	OSCILLOSCOPE	HP	130-BR	(USAF 22)		
25	SPECTROMETER	B&K	2112	611924-49		
26	SPECTROMETER	B&K	2112	626480		722/745
27	SPECTROMETER	B&K	2111	(USAF 9795-6)		
28	FREQUENCY ANALYZER	B&K	2107	(USAF 9795-5)		
29	EXTENSION FILTERS	B&K	1620	(ID 46195)		
30	EXTENSION FILTERS	B&K	120	(USAF 9795-7)		640/740

ACOUSTICAL TEST EQUIPMENT

TEST SPEC: DSV-4B P-66 (spec. 1)

TEST DATE: 8-16 to 8-18-67

SHEET 1 OF

K+E ALBANENE® LA 1789 TRACING PAPER

FORM 25-S-1 (REV 8-53)

PREPARED BY: [signature]
CHECKED BY: 9.1.67
DATE:
TITLE: CHILLDOWN INVERTER ACOUSTIC TEST

DOUGLAS AIRCRAFT COMPANY, INC.
MISSILE & SPACE SYSTEMS DIVISION

PAGE: A2
MODEL: DSV-4B
REPORT NO.: TM-R-6065-2

(CIRCLE ITEM USED)

ITEM No.	DESCRIPTION	MFR.	MODEL	DAC TAG No.	REMARKS	CERTIFICATION WEEK PAST / NEXT
31	LEVEL RECORDER	B & K	2305	611924-50		730/805
32	LEVEL RECORDER	B & K	2305	626481		
33	LEVEL RECORDER	B & K	2305	(USAF 9795-11)		
34	POTENTIOMETER (50 dB)	B & K	ZR005	-		717/743
35	POTENTIOMETER (10 dB)	B & K	ZR003	-		
36	POTENTIOMETER (110 mv)	B & K	ZR002	-		
37	TAPE RECORDER (2-ch.)	AMPEX	PR-10			
38	TAPE RECORDER (14-ch.)	PI	2114	642393		731/805
39	TAPE RECORDER (14-ch.)	AMPEX	CP-100			
40	TIMER	STANDARD	S-10	(S/N 25728)		633/733
41	FREQUENCY COUNTER	CMC	200A	570271		
42	FREQUENCY COUNTER	HP	5512A	(EI 17252)		
43	AUTOMATIC SELECTOR	B & K	1542	611924-53		
44	MONITOR OSCILLOSCOPES (7-ch.)	E-I	260-1027	6160001		727/801
45	MONITOR OSCILLOSCOPES (7-ch.)	E-I	260-1027			
46	MICROPHONE (Cartridge)	ALTEC	21BR-180-1	(S/N 7842)	MICROPHONE SYSTEM 1 (MS-1)	645/741
47	CATHODE FOLLOWER	ALTEC	165-A	EI 51629		731/805
48	POWER SUPPLY	ALTEC	527-B	611924-6		712/738
49	MICROPHONE (Cartridge)	ALTEC	21BR-180-1	(S/N 7845)	MS-2	645/741
50	CATHODE FOLLOWER	ALTEC	165-A	EI 51632		731/805
51	POWER SUPPLY	ALTEC	527-B	611924-5		712/738
52	MICROPHONE (Cartridge)	ALTEC	21BR-180-1	(S/N 268)	MS-3	645/741
53	CATHODE FOLLOWER	ALTEC	165-A	-		731/805
54	POWER SUPPLY	ALTEC	527-B	611924-4		712/738
55	MICROPHONE (Cartridge)				MS-4	
56	CATHODE FOLLOWER					
57	POWER SUPPLY					
58	MICROPHONE (Cartridge)				MS-5	
59	CATHODE FOLLOWER					
60	POWER SUPPLY					

ACOUSTICAL TEST EQUIPMENT | TEST SPECIMEN: DSV-4B P-66 (spec. 1) | TEST DATE: 8-16-67 to 8-18-67 | SHEET 2 OF

K+E ALBANENE® LA 1789

FORM 25-6 I (REV. 8-53)

PREPARED BY: [illegible]
CHECKED BY: 9-1-67
DATE:
TITLE: CHILDOWN INVERTER ACOUSTIC TEST

DOUGLAS AIRCRAFT COMPANY, INC.
MISSILE & SPACE SYSTEMS DIVISION

PAGE: A3
MODEL: DSV-4B
REPORT NO.: TM-R-6065-2

(CIRCLE ITEM USED)

ITEM No.	DESCRIPTION	MFR.	MODEL	DAC TAG No.	REMARKS	CERTIFICATION WEEK PAST/NEXT
61	MICROPHONE (Cartridge)				MS-6	
62	CATHODE FOLLOWER					
63	POWER SUPPLY					
64	AMPLIFIER	DYNAMICS	6106	622057-6	(M1) channel 1 on TAPE RECORDER	713/739
65	AMPLIFIER	DYNAMICS	6106	622058-5	(M2) " 2 " "	(712/738)
66	AMPLIFIER	DYNAMICS	6106	622057-2	(M3) " 3 " "	(713/739)
67	AMPLIFIER	DYNAMICS	6106			
68	AMPLIFIER	DYNAMICS	6106			
69	AMPLIFIER	DYNAMICS	6106			
70	ACCELEROMETER	ENDEVCO	2242C	(S/N NA99)	ACCELEROMETER SYSTEM No. 1 (AS-1) SENS. = 2.2 PK PC/PK g	722/744
71	CHARGE AMPLIFIER	U-D	11MGSA	(S/N 293)	"RADIAL" (732/806) WAS No. 3 @ VIB. TEST	
72	ACCELEROMETER	ENDEVCO	2235C	(S/N HB67)	AS-2 SENS. = 24.9	727/745
73	CHARGE AMPLIFIER	U-D	11MGSA	(S/N 294)	"RADIAL" (732/806)	WAS No. 4
74	ACCELEROMETER	ENDEVCO	2235C	(S/N NA18)	AS-3 SENS. = 24.8	721/737
75	CHARGE AMPLIFIER	U-D	11MGSA	(S/N 295)	"RADIAL" (732/806)	WAS No. 5
76	ACCELEROMETER	ENDEVCO	2226	(S/N LB52)	AS-4 SENS. = 2.0	729/745
77	CHARGE AMPLIFIER	U-D	11MGSA	(S/N 296)	"RADIAL" (732/806)	WAS No. 6
78	ACCELEROMETER	ENDEVCO	2226	(S/N EB76)	AS-5 SENS. = 2.45	717/733
79	CHARGE AMPLIFIER	U-D	11MGSA	(S/N 297)	"THRUST" (732/806)	WAS No. 8
80	ACCELEROMETER	ENDEVCO	2226	(S/N NC61)	AS-6 SENS. = 2.83	716/733
81	CHARGE AMPLIFIER	U-D	11MGSA	(S/N 298)	"TANGENT" (732/806)	WAS No. 7
82	POWER SUPPLY	ENDEVCO	2628A	(NASA 9815)	FOR AS-1 TO AS-6	
83	STRAIN GAGE	M-M			STRAIN GAGE SYSTEM No. 1 (SGS-1)	
84	AMPLIFIER	B-B	9964			
85	STRAIN GAGE	M-M			SGS-2	
86	AMPLIFIER	B-B	9964			
87	STRAIN GAGE	M-M			SGS-3	
88	AMPLIFIER	B-B	9964			
89	STRAIN GAGE	M-M			SGS-4	
90	AMPLIFIER	B-B	9964			

ACOUSTICAL TEST EQUIPMENT | TEST SPECIMEN DSV-4B P-66 (spec. 1) | TEST DATE 8-16-67 to 8-18-67 | SHEET 3 OF

ALBANENE® LA 789

FORM 25-S-1 (REV. 8-53)

PREPARED BY: Rg...
CHECKED BY:
DATE: 9-1-67
TITLE: CHILLDOWN INVERTER ACOUSTIC TEST

DOUGLAS AIRCRAFT COMPANY, INC.
MISSILE & SPACE SYSTEMS DIVISION

PAGE: A4
MODEL: DSV-4B
REPORT NO.: TM-R-6065-2

(CIRCLE ITEM USED)

ITEM No.	DESCRIPTION	MFR.	MODEL	DAC TAG No.	REMARKS	CERTIFICATION WEEK PAST/NEXT
91	STRAIN GAGE	M-M			SGS-5	
92	AMPLIFIER	B-B	9964			
93	STRAIN GAGE	M-M			SGS-6	
94	AMPLIFIER	B-B	9964			
95	STRAIN GAGE	M-M			SGS-7	
96	AMPLIFIER	B-B	9964			
97	STRAIN GAGE	M-M			SGS-8	
98	AMPLIFIER	B-B	9964			
99	STRAIN GAGE	M-M			SGS-9	
100	AMPLIFIER	B-B	9964			
101	STRAIN GAGE	M-M			SGS-10	
102	AMPLIFIER	B-B	9964			
103	SELECTOR (8-CH)	DAC	•	-		
104	OUTPUT LOAD TERM. BOX (14-ch.)	DAC	1T14398-1	(EI) 15324		
105	CHARGE AMPLIFIER	U-D	11MGSA	(S/N 300)	Replaced S/N 297 on AS-5 PRIOR TO 160 dB RUN	733/807
106						
107						
108						
109						
110						
111						
112						
113						
114						
115						
116						

NOTES: ① MFR. LEG
B-B ..... BURR-BROWN
B&K ..... BRÜEL & KJAER
CMC ..... COMPUTER MEASUREMENTS
E-I ..... ELECTRO-INSTRUMENTS
UD ... UNHOLTZ-DICKIE
GR ..... GENERAL RADIO
H-P ..... HEWLETT-PACKARD
M-M ..... MICRO-MEASUREMENTS
P-I ..... PRECISION INSTRUMENTS

② ALL ITEMS USED WERE IN PROPER CERTIFICATION OR CALIBRATION STATE, AS DEFINED BY DAC PROCEDURES.

ACOUSTICAL TEST EQUIPMENT | TEST SPECIMEN: DSV-4B P-66 (SPEC. 1) | TEST DATE: 8-16-67 to 8-18-67 | SHEET 4 OF

U.S. ALBANENE® LA 1789

FORM 25-S-1 (REV 8-53)

PREPARED BY: [illegible]

CHECKED BY: [illegible]

DATE: 9-1-67

TITLE: CHILDOWN INVERTER ACOUSTICAL TEST

DOUGLAS AIRCRAFT COMPANY, INC.

MISSILE & SPACE SYSTEMS DIVISION

PAGE: A5

MODEL: DSV-4B

REPORT NO. TM-R-6065-2

(CIRCLE ITEM USED)

ITEM No.	DESCRIPTION	MFR.	MODEL	DAC TAG No.	REMARKS	CERTIFICATION PAST/NEXT WEEK
1	OCTAVE-BAND EQUALIZER	ALLISON	349	611924-56		725/751
2	RANDOM NOISE GENERATOR	GR	1390-BS1	611825-10		
3	BEAT FREQUENCY OSCILLATOR	B&K	1014	611924-58		718/745
4	BEAT FREQUENCY OSCILLATOR	B&K	1014	(USAF 9795-)		
5	BEAT FREQUENCY OSCILLATOR	B&K	1013			
6	CLIPPER-MIXER-AMPLIFIER	LING	CMA 10	636069		725/751
7	VOLTAGE AMPLIFIER (30 dB)	LING	442-C	611924-7		
8	POWER AMPLIFIER	LING	C/P-3/4	611924-58		712/738
9	PISTONPHONE	B&K	4220	(S/N 126681)		
10	PISTONPHONE	B&K	4220	(S/N 47163)		
11	ELECTRO-PNEUM. TRANSDUCER	LING	EPT 94B	1021	ARRAY POSITION No. 1 (AP-1)	709/735
12	ELECTRO-PNEUM. TRANSDUCER	LING	EPT 94B	1024	AP-2	734/808
13	ELECTRO-PNEUM. TRANSDUCER	LING	EPT 94B	1022	AP-3	734/808
14	ELECTRO-PNEUM. TRANSDUCER	LING	EPT 94B	186A	AP-4	717/743
15	ELECTRO-PNEUM. TRANSDUCER	LING	EPT 94B	1008	AP-5	709/735
16	ELECTRO-PNEUM. TRANSDUCER	LING	EPT 94B	1015	AP-6	725/751
17	ELECTRO-PNEUM. TRANSDUCER	LING	EPT 94B	1009	AP-7	734/808
18	ELECTRO-PNEUM. TRANSDUCER	LING	EPT 94B	1020	AP-8	734/808
19	ELECTRO-PNEUM. TRANSDUCER	LING	EPT 94B	185A	AP-9	709/735
20	ELECTRO-PNEUM. TRANSDUCER	LING	EPT 94B	1010	AP-10	717/743
21	VOLTOHMETER	SIMPSON	269			
22	VOLTMETER	B&K	2409-R	611924-51		735/809
23	OSCILLOSCOPE	TEKTRONIX	502	611924-57		728/748
24	OSCILLOSCOPE	HP	130-BR	(USAF 22)		
25	SPECTROMETER	B&K	2112	611924-49		
26	SPECTROMETER	B&K	2112	626480		722/745
27	SPECTROMETER	B&K	2111	(USAF 9795-6)		
28	FREQUENCY ANALYZER	B&K	2107	(USAF 9795-5)		
29	EXTENSION FILTERS	B&K	1620	(ID 46195)		640/740
30	EXTENSION FILTERS	B&K	120	(USAF 9795-7)		

ACOUSTICAL TEST EQUIPMENT

TEST SPECIMEN: DSV-4B P-66 specimen 2, 3

TEST DATE: 9-1-67

SHEET 1 OF 4

K+E ALBANENE® TRACING PAPER LA 1789

FORM 25-S-1 (REV 8-53)

PREPARED BY: [illegible]

CHECKED BY: [illegible]

DATE: 9-1-67

TITLE: CHILLDOWN INVERTER ACOUSTICAL TEST

DOUGLAS AIRCRAFT COMPANY, INC.

MISSILE & SPACE SYSTEMS DIVISION

PAGE: A6

MODEL: DSV-4B

REPORT NO.: TM-R-6066-2

(CIRCLE ITEM USED)

ITEM No.	DESCRIPTION	MFR.	MODEL	DAC TAG No.	REMARKS	CERTIFICATION WEEK PAST/NEXT
31	LEVEL RECORDER	B+K	2305	611924-50		730/805
32	LEVEL RECORDER	B+K	2305	626481		
33	LEVEL RECORDER	B+K	2305	(USAF 3795-11)		
34	POTENTIOMETER (50 dB)	B+K	ZR005	-		717/743
35	POTENTIOMETER (10 dB)	B+K	ZR003	-		
36	POTENTIOMETER (110 mv)	B+K	ZR002	-		
37	TAPE RECORDER (2-ch.)	AMPEX	PR-10			
38	TAPE RECORDER (14-ch.)	PI	2114	642393		731/805
39	TAPE RECORDER (14-ch.)	AMPEX	CP-100			
40	TIMER	STANDARD	S-10	(S/N 25728)		
41	FREQUENCY COUNTER	CMC	200A	570271		
42	FREQUENCY COUNTER	HP	5512A	(EI 17252)		
43	AUTOMATIC SELECTOR	B+K	1542	611924-53		
44	MONITOR OSCILLOSCOPES (7-ch.)	E-I	260-1027	616001		727/801
45	MONITOR OSCILLOSCOPES (7-ch.)	E-I	260-1027			
46	MICROPHONE (Cartridge)	ALTEC	21BR-180-1	(S/N 7842)	MICROPHONE SYSTEM 1 (MS-1)	645/741
47	CATHODE FOLLOWER	ALTEC	165-A	EI 51629		731/805
48	POWER SUPPLY	ALTEC	527-B	611924-6		712/738
49	MICROPHONE (Cartridge)	ALTEC	21BR-180-1	(S/N 7845)	MS-2	645/741
50	CATHODE FOLLOWER	ALTEC	165-A	EI 51632		731/805
51	POWER SUPPLY	ALTEC	527-B	611924-5		712/738
52	MICROPHONE (Cartridge)	ALTEC	21BR-180-1	(S/N 268)	MS-3	645/741
53	CATHODE FOLLOWER	ALTEC	165-A	—		731/805
54	POWER SUPPLY	ALTEC	527-B	611924-4		712/738
55	MICROPHONE (Cartridge)				MS-4	
56	CATHODE FOLLOWER					
57	POWER SUPPLY					
58	MICROPHONE (Cartridge)				MS-5	
59	CATHODE FOLLOWER					
60	POWER SUPPLY					

ACOUSTICAL TEST EQUIPMENT

TEST SPECIMEN: DSV-4B P-66 Specimen 2, 3

TEST DATE: 9-1-67

SHEET 2 OF 4

FORM 25-S-1 (REV. 8-53)

PREPARED BY: [illegible]

CHECKED BY:

DATE: 9-1-67

TITLE: CHILDOWN INVERTER ACOUSTICAL TEST

DOUGLAS AIRCRAFT COMPANY, INC.

MISSILE & SPACE SYSTEMS DIVISION

PAGE: A 7

MODEL: DSV-4B

REPORT NO.: TM-R-6065-2

(CIRCLE ITEM USED)

ITEM No.	DESCRIPTION	MFR.	MODEL	DAC TAG No.	REMARKS	CERTIFICATION WEEK PAST/NEXT
61	MICROPHONE (Cartridge)				MS-6	
62	CATHODE FOLLOWER					
63	POWER SUPPLY					
64	AMPLIFIER	DYNAMICS	6106	622057-6	MS-1	713/739
65	AMPLIFIER	DYNAMICS	6106	622058-5	MS-2	712/738
66	AMPLIFIER	DYNAMICS	6106	622057-2	MS-3	713/739
67	AMPLIFIER	DYNAMICS	6106			
68	AMPLIFIER	DYNAMICS	6106			
69	AMPLIFIER	DYNAMICS	6106			
70	ACCELEROMETER	ENDEVCO	2235C	S/N HB61	ACCELEROMETER SYSTEM No. 1 (AS-1) SENS. = 28.7 PK pc/PK g	725/743
71	CHARGE AMPLIFIER	U-D	11MGSA	S/N 293		732/806
72	ACCELEROMETER	ENDEVCO	2235C	S/N HB72	AS-2 SENS. = 26.8	719/737
73	CHARGE AMPLIFIER	U-D	11MGSA	S/N 294		733/807
74	ACCELEROMETER	ENDEVCO	2235C	S/N HB60	AS-3 SENS. = 27.4	724/741
75	CHARGE AMPLIFIER	U-D	11MGSA	S/N 295		732/806
76	ACCELEROMETER	ENDEVCO	2235C	S/N HB58	AS-4 SENS. = 25.9 "RADIAL"	727/744
77	CHARGE AMPLIFIER	U-D	11MGSA	S/N 296	R	732/806
78	ACCELEROMETER	ENDEVCO	2235	S/N CB69	AS-5 SENS. = 28.0 "THRUST"	722/744
79	CHARGE AMPLIFIER	ENDEVCO	11MGSA	S/N 297		732/806
80	ACCELEROMETER	ENDEVCO	2235C	S/N HB63	AS-6 SENS. = 25.1 "TANGENT"	721/737
81	CHARGE AMPLIFIER	ENDEVCO	11MGSA	S/N 298		732/806
82	POWER SUPPLY	ENDEVCO	2628A	(NASA 9815)	FOR AS-1 TO AS-6	
83	ACCELEROMETER	ENDEVCO	2226	S/N PB83	ACCELEROMETER SYSTEM No. 7 (AS-7) SEN = 2.6 - RADIAL	734/748
84	AMPLIFIER	U-D	11MGSA	S/N 289		732/807
85	STRAIN GAGE	M-M			SGS-2	
86	AMPLIFIER	B-B	9964			
87	STRAIN GAGE	M-M			SGS-3	
88	AMPLIFIER	B-B	9964			
89	STRAIN GAGE	M-M			SGS-4	
90	AMPLIFIER	B-B	9964			

ACOUSTICAL TEST EQUIPMENT

TEST SPECIMEN: DSV-4B P-66 specimen 2, 3

TEST DATE: 9-1-67

SHEET 3 OF 4

K+E ALBANENE® LA 1789

FORM 25-S-1 (REV. 8-53)

PREPARED BY: [signature]
CHECKED BY: 9-1-67
DATE:
TITLE: Shilldown Inverter Acoustic Test

DOUGLAS AIRCRAFT COMPANY, INC.
Missile & Space Systems DIVISION

PAGE: A8
MODEL: DSV-4B
REPORT NO.: TM-R-6065-2

(CIRCLE ITEM USED)

ITEM No.	DESCRIPTION	MFR.	MODEL	DAC TAG No.	REMARKS
91	STRAIN GAGE	M-M			SGS-5
92	AMPLIFIER	B-B	9964		
93	STRAIN GAGE	M-M			SGS-6
94	AMPLIFIER	B-B	9964		
95	STRAIN GAGE	M-M			SGS-7
96	AMPLIFIER	B-B	9964		
97	STRAIN GAGE	M-M			SGS-8
98	AMPLIFIER	B-B	9964		
99	STRAIN GAGE	M-M			SGS-9
100	AMPLIFIER	B-B	9964		
101	STRAIN GAGE	M-M			SGS-10
102	AMPLIFIER	B-B	9964		
103	SELECTOR (8-channel)	DAC	-	-	
104	OUTPUT LOAD TERMINATION	DAC	1T14398-1	EI 15324	-
105					
106					
107					
108					
109					
110					
111					
112					
113					
114					
115					
116					

NOTES: ① MFR. LEG UD.... Unholtz-Dickie
B-B ..... BURR-BROWN
B&K ..... BRÜEL & KJAER
CMC ..... COMPUTER MEASUREMENTS
E-I ..... ELECTRO-INSTRUMENTS
GR ..... GENERAL RADIO
H-P ..... HEWLETT-PACKARD
M-M .... MICRO-MEASUREMENTS
P-I .... PRECISION INSTRUMENTS

② ALL ITEMS USED WERE IN PROPER CERTIFICATION OR CALIBRATION STATE, AS DEFINED BY DAC PROCEDURES.

ACOUSTICAL TEST EQUIPMENT

TEST SPECIMEN: DSV-4B P-66 Specimen 2,3
TEST DATE: 9-1-67
SHEET 4 OF 4

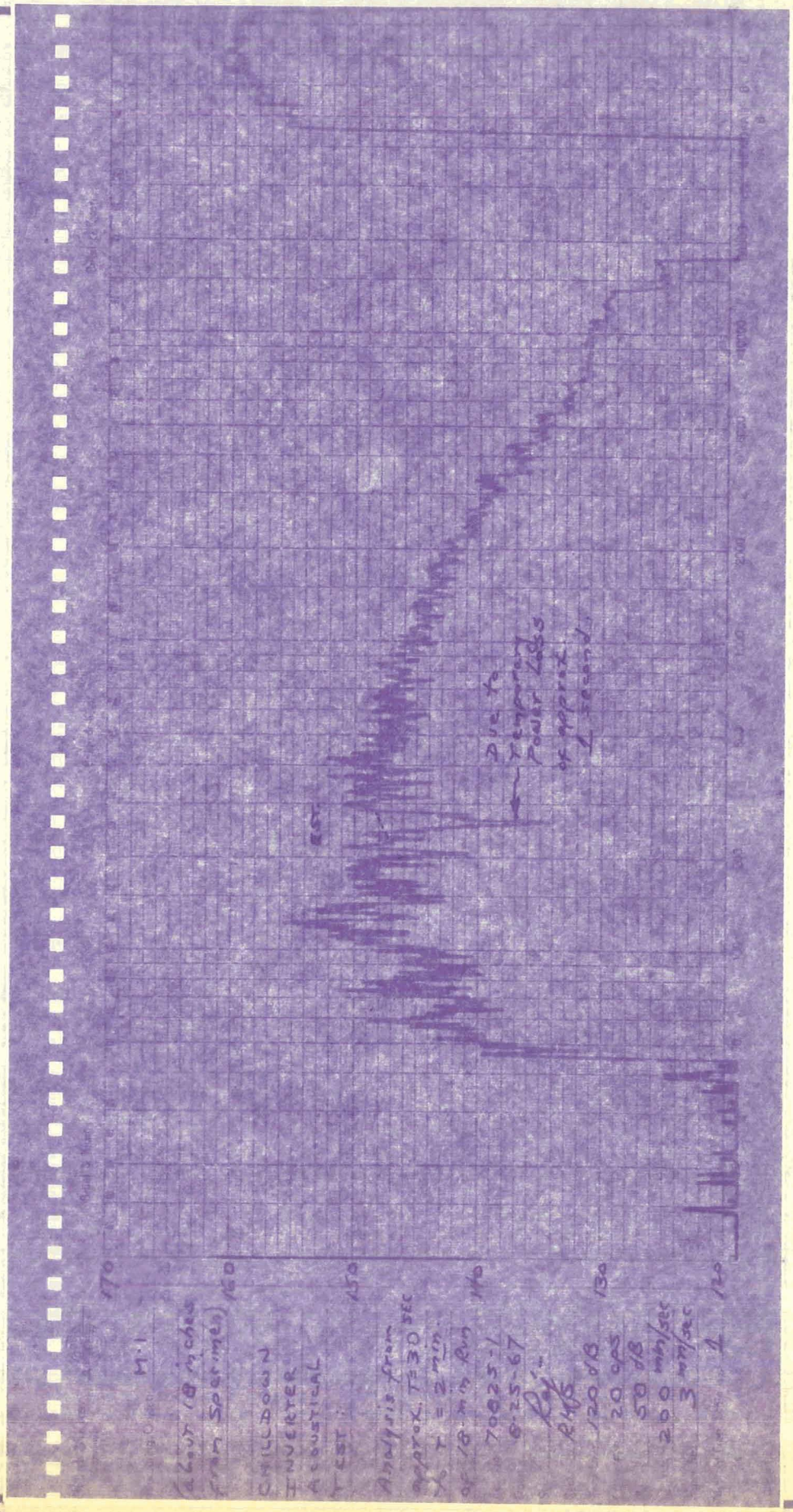
K+E ALBANENE® LA 1789

FORM 25-S-1
(REV. 8-53)

PREPARED BY: Rj...
CHECKED BY:
DATE: 8-29-67
TITLE: CHILLDOWN INVERTER ACOUSTIC TEST

DOUGLAS AIRCRAFT COMPANY, INC.
MISSILE & SPACE SYSTEMS DIVISION

PAGE: A9
MODEL: DSV-4B
REPORT NO.: TM-R6065-2



1/3-OCTAVE ANALYSIS OF MICROPHONE SYSTEM No. 1
OUTPUT DURING 18-MINUTE TEST
OF SPECIMEN No. 1

K+E ALBANENE® TRACING PAPER LA 1789

FORM 25 S-1 (REV. 8-53)

PREPARED BY: Rj...

CHECKED BY:

DATE: 8-29-67

TITLE: CHILLDOWN INVERTER ACOUSTICAL TEST

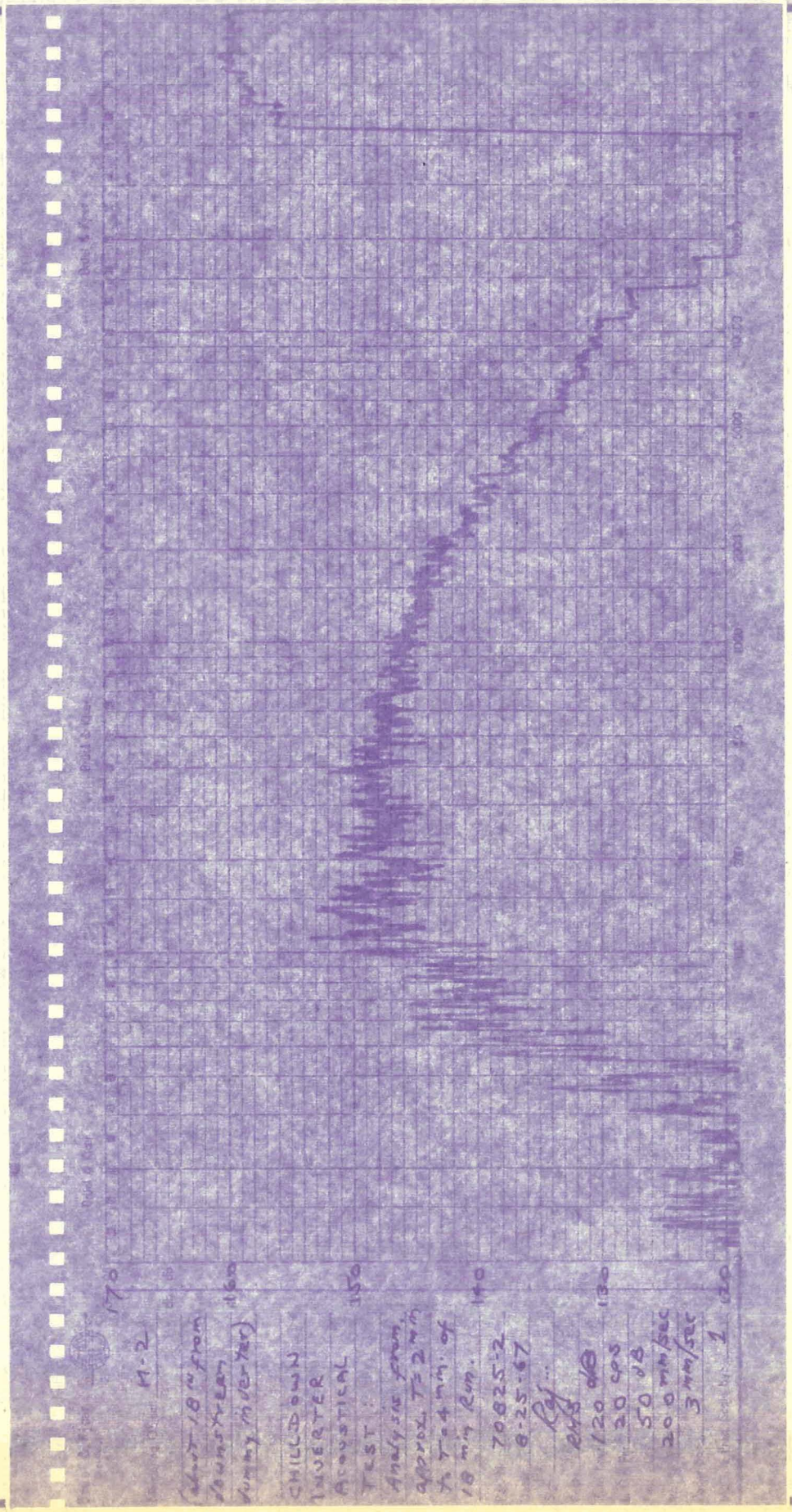
DOUGLAS AIRCRAFT COMPANY, INC.

MISSILE & SPACE SYSTEMS DIVISION

PAGE: A10

MODEL: DSV-4B

REPORT NO.: TM-R6065-2



1/3-OCTAVE ANALYSIS OF MICROPHONE SYSTEM NO. 2 OUTPUT DURING 18-MINUTE TEST OF SPECIMEN NO. 1

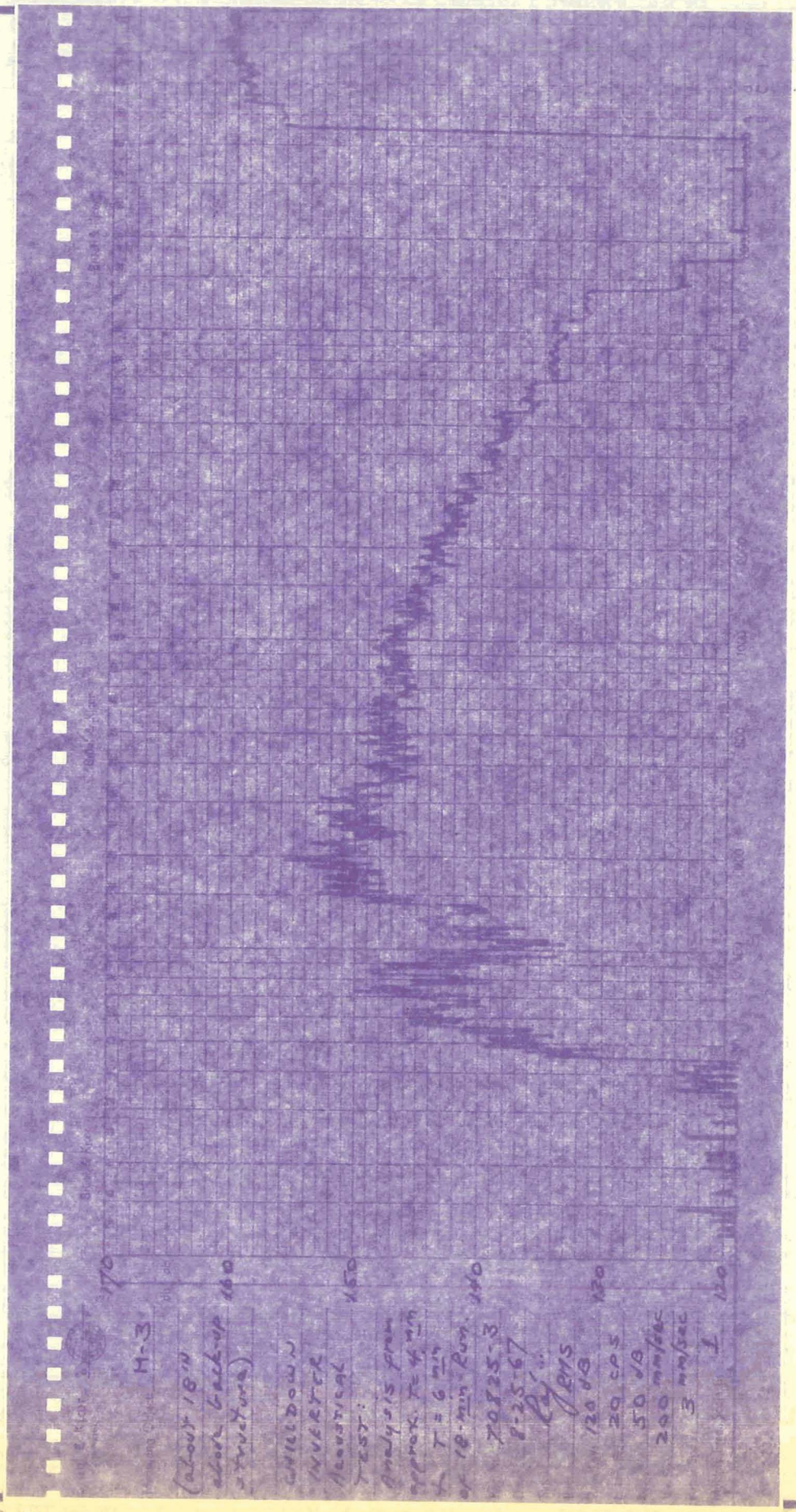
K+E ALBANENE® LA 1789

FORM 25-S-1
(REV. 8-53)

PREPARED BY: Rj...
CHECKED BY:
DATE: 8-29-67
TITLE: CHILLDOWN INVERTER ACOUSTICAL TEST

DOUGLAS AIRCRAFT COMPANY, INC.
MISSILE & SPACE SYSTEMS DIVISION

PAGE: A11
MODEL: DSV-4B
REPORT NO.: TM-R6065-2



1/3-OCTAVE ANALYSIS OF MICROPHONE SYSTEM NO. 3 OUTPUT DURING 18-MINUTE TEST OF SPECIMEN NO. 1

K+E ALBANENE® TRACING PAPER LA 1799

FORM 25-S-1 (REV. 8-53)

PREPARED BY: Raj

CHECKED BY:

DATE: 8-28-67

TITLE: CHILLDOWN INVERTER ACOUSTICAL TEST

DOUGLAS AIRCRAFT COMPANY, INC.

MISSILE & SPACE SYSTEMS DIVISION

PAGE: A12

MODEL: DSV-4B

REPORT NO.: TM- R6065-2

ENVIRONMENT PROVIDED FOR SPECIMEN No. 1

VS.

SPECIFICATION

1/3-OCTAVE SOUND PRESSURE LEVELS (in dB re 2×10^{-4} μbar)

BAND CENTER FREQUENCY (cps)	Microphone: 1	2	3	AVERAGE	SPECIFICATION	DIFFERENCE	EXCEEDS TOLERANCE BY *
5					119.0		
6.3	Exceeds Instrumentation capability				120.5		
8					123.5		
10	NO DATA AVAILABLE				125.5		
12.5					127.0	>-7.0	
16	Responses are less than 120 dB per band				129.0	>-9.0	
20					130.5	>-10.5	>-0.5
25					132.0	>-12.0	>-2.0
31.5					135.0	>-15.0	>-5.0
40					137.5	>-17.5	>-7.5
50	139.0	135.0	137.0	137.0	139.5	-2.5	
63	143.0	141.5	143.5	142.5	141.5	+1.0	+1.0
80	145.0	141.5	145.0	144.0	143.0	+1.0	+1.0
100	145.0	146.5	139.5	147.0	144.0	+3.0	
125	151.0	148.5	142.0	147.0	145.0	+2.0	
160	147.0	148.5	150.5	149.0	146.5	+2.5	
200	148.0	148.0	151.5	149.0	147.5	+1.5	
250	148.0 EST	147.5	150.0	148.5	148.5	0.0	
315	149.0	148.5	150.0	149.0	149.5	-0.5	-0.5
400	148.5	149.0	147.5	148.5	150.0	-1.5	-1.5
500	147.5	147.5	148.0	147.5	148.0	-0.5	-0.5

* TOLERANCES: $^{+0}_{-10}$ dB, 5 cps to 100 cps, and 2 kcps to 10 kcps

$^{+4}_{-0}$ dB, 100 cps to 2 kcps

K+E ALBANENE® LA 1789

FORM 25-S-1 (REV. 8-53)

PREPARED BY: Lej...
CHECKED BY:
DATE: 8-28-67
TITLE: CHILLDOWN INVERTER ACOUSTICAL TEST

DOUGLAS AIRCRAFT COMPANY, INC.
MISSILE & SPACE SYSTEMS DIVISION

PAGE: A13
MODEL: DSV-4B
REPORT NO.: TM-R6065-2

ENVIRONMENT PROVIDED FOR SPECIMEN No. 1
versus
SPECIFICATION

1/3-OCTAVE BAND CENTER FREQUENCY (cps)	SOUND PRESSURE LEVELS (in dB re 2×10^{-4} μ-bar) Microphone: 1	2	3	Average	Specification	Difference	Exceeds Tolerance By *
630	147.0	147.5	148.0	147.5	146.5	+1.0	
800	147.0	146.5	146.0	146.5	146.5	0.0	
1.0 k	145.5	146.5	147.0	146.5	146.5	0.0	
1.25 k	144.5	144.5	146.0	145.0	146.5	-1.5	-1.5
1.6 k	143.5	144.5	144.5	144.0	146.5	-2.5	-2.5
2.0 k	142.5	143.0	143.5	143.0	146.5	-3.5	
2.5 k	140.5	141.0	142.0	141.0	146.5	-5.5	
3.15 k	139.5	140.0	141.0	140.0	146.5	-6.5	
4.0 k	137.0	137.0	139.0	137.5	146.5	-9.0	
5.0 k	135.0	135.0	138.0	136.0	145.5	-9.5	
6.3 k	133.0	133.0	136.0	134.0	145.0	-11.0	-1.0
8.0 k	131.0	131.5	134.0	132.0	144.0	-12.0	-2.0
10.0 k	131.0	130.5	134.0	132.0	143.0	-11.0	-1.0
OVERALL	159.5	159.5	160.0	159.5	160.0	-0.5	

NOTE: Microphone outputs above were obtained during the first five minutes, approximately, of an 18-minute exposure, and reflect 1.7-second/1/3-octave sequential analysis.

K+E ALBANENE® TRACING PAPER LA 1789

FORM 25-5-1 (REV. 8-53)

PREPARED BY: RJ/RMB
CHECKED BY:
DATE: 5-6-67
TITLE: CHILLDOWN INVERTER ACOUSTICAL TEST

DOUGLAS AIRCRAFT COMPANY, INC.
MISSILE & SPACE SYSTEMS DIVISION

PAGE: A14
MODEL: DSV-4B
REPORT NO.: TM-R6065-2

ENVIRONMENT PROVIDED FOR SPECIMEN No. 2
VERSUS
SPECIFICATION

1/3-OCTAVE BAND CENTER FREQUENCY (cps)	SOUND PRESSURE LEVELS (in dB re 2×10^{-4} μbar) Microphone: 1	2	3	AVERAGE	SPECIFICATION	DIFFERENCE	EXCEEDS TOLERANCE BY *
5	NO DATA AVAILABLE: EXCEEDS INSTRUMENTATION CAPABILITY				119.0		
6.3					120.5		
8					123.5		
10					125.5		
12.5	113.0	120.0	115.0	116.0	127.0	-11.0	-1.0
16	115.0	125.0	117.0	119.0	129.0	-10.0	
20	117.0	122.0	118.0	119.0	130.5	-10.5	-0.5
25	115.0	119.5	113.0	116.0	132.0	-16.0	-6.0
31.5	116.0	122.5	117.5	118.5	135.0	-16.5	-6.5
40	123.0	132.0	122.0	125.0	137.5	-12.5	-2.5
50	132.0	131.5	132.0	132.0	139.5	-7.5	
63	140.0	137.0	137.5	138.0	141.5	-3.5	
80	141.5	139.5	143.0	141.5	143.0	-1.5	
100	142.5	142.5	141.0	142.0	144.0	-2.0	
125	148.0	147.5	144.0	146.5	145.0	+1.5	
160	148.0	148.5	151.0	149.0	146.5	+3.5	
200	147.5	148.5	149.5	148.5	147.5	+1.0	
250	147.5	148.0	148.0	148.0	148.5	-0.5	-0.5
315	151.0	150.5	148.5	150.0	149.5	+0.5	
400	148.5	149.0	148.0	148.5	150.0	-1.5	-1.5
500	148.0	149.5	148.0	148.5	148.0	+0.5	

* TOLERANCES: $^{+0}_{-10}$ dB: 5 cps to 100 cps, and 2 kcps to 10 kcps

$^{+4}_{-0}$ dB: 100 cps to 2 kcps

ALBANENE® LA 1789

FORM 25-S-1 (REV. 8-53)

PREPARED BY: Raj/RMB
CHECKED BY:
DATE: 9-6-67
TITLE: CHILLDOWN INVERTER ACOUSTICAL TEST

DOUGLAS AIRCRAFT COMPANY, INC.
MISSILE & SPACE SYSTEMS DIVISION

PAGE: A15
MODEL: DSV-4B
TM: R6065-2
REPORT NO.:

ENVIRONMENT PROVIDED FOR SPECIMEN No. 2
VERSUS
SPECIFICATION

SOUND PRESSURE LEVELS (in dB re 2×10^{-4} μ-bar)

1/3-OCTAVE BAND CENTER FREQUENCY (CPS)	Microphone: 1	2	3	AVERAGE	SPECIFICATION	DIFFERENCE	EXCEEDS TOLERANCE BY *
630	147.5	149.0	148.5	148.5	146.5	+2.0	
800	147.0	147.0	147.0	147.0	146.5	+0.5	
1.0 k	145.0	146.5	146.5	146.0	146.5	-0.5	-0.5
1.25 k	145.0	146.5	145.5	145.5	146.5	-1.0	-1.0
1.6 k	144.0	145.0	144.5	144.5	146.5	-2.0	-2.0
2.0 k	142.0	144.0	143.0	143.0	146.5	-3.5	
2.5 k	141.0	142.0	142.0	141.5	146.5	-5.0	
3.15 k	139.5	140.5	141.5	140.5	146.5	-6.0	
4.0 k	137.5	138.5	140.0	138.5	146.5	-8.0	
5.0 k	136.0	137.0	139.0	137.5	145.5	-8.0	
6.3 k	134.0	135.0	137.5	135.5	145.0	-9.5	
8.0 k	133.5	134.0	136.5	134.5	144.0	-9.5	
10.0 k	133.0	133.0	136.0	134.0	143.0	-9.0	
OVERALL	159.5	160.0	160.0	160.0	160.0	0.0	

K+E ALBANENE® LA 1789 TRACING PAPER

FORM 25-S-1 (REV. 8-53)

PREPARED BY: RMB

CHECKED BY:

DATE: 9-6-67

TITLE: CHILLDOWN INVERTER ACOUSTICAL TEST

DOUGLAS AIRCRAFT COMPANY, INC.

MISSILE & SPACE SYSTEMS DIVISION

MODEL: DSV-4B

REPORT NO.: TM-R6065-2

ENVIRONMENT PROVIDED FOR SPECIMEN No. 3

VERSUS

SPECIFICATION

1/3-OCTAVE BAND CENTER FREQUENCY (cps) — SOUND PRESSURE LEVELS (in dB re 2×10^{-4} μ·bar)

1/3-Octave Band Center Frequency (cps)	Microphone 1	Microphone 2	Microphone 3	Average	Specification	Difference	Exceeds Tolerance By *
5	No Data Available: Exceeds Instrumentation Capability				119.0		
6.3					120.5		
8					123.5		
10					125.5		
12.5	114.0	120.5	117.5	117.0	127.0	-10.0	
16	118.5	120.0	119.0	119.0	129.0	-10.0	
20	114.0	123.0	119.5	119.5	130.5	-11.0	-1.0
25	114.0	119.5	118.0	117.0	132.0	-15.0	-5.0
31.5	117.0	122.0	117.5	119.0	135.0	-16.0	-6.0
40	118.0	123.0	115.0	119.0	137.5	-18.5	-8.5
50	130.0	134.0	130.0	131.0	139.5	-8.5	
63	139.0	138.0	139.0	138.5	141.5	-3.0	
80	142.0	140.5	143.5	142.0	143.0	-1.0	
100	143.0	142.5	140.5	142.0	144.0	-2.0	
125	148.5	149.5	142.5	146.5	145.0	+1.5	
160	149.5	148.5	152.0	150.0	146.5	+3.5	
200	147.5	147.5	151.5	149.0	147.5	+1.5	
250	147.5	151.5	147.5	149.0	148.5	+0.5	
315	149.5	150.0	148.5	149.5	149.5	0.0	
400	148.0	150.0	148.0	148.5	150.0	-1.5	-1.5
500	148.5	149.5	148.0	148.5	148.0	+0.5	

* TOLERANCES: $^{+0}_{-10}$ dB: 5 cps to 100 cps, and 2 kcps to 10 kcps

$^{+4}_{-0}$ dB: 100 cps to 2 kcps

K+E ALBANENE® LA 1789

FORM 25-S-1 (REV. 8-53)

PREPARED BY: RJ/RMB
CHECKED BY:
DATE: 9-6-67
TITLE: CHILLDOWN INVERTER ACOUSTICAL TEST

DOUGLAS AIRCRAFT COMPANY, INC.
MISSILE & SPACE SYSTEMS DIVISION

PAGE: A17
MODEL: DSV-4B
REPORT NO.: TM-R6065-2

ENVIRONMENT PROVIDED FOR SPECIMEN No. 3
versus
SPECIFICATION

1/3-OCTAVE BAND CENTER FREQUENCY (CPS)	SOUND PRESSURE LEVELS (in dB re 2×10^{-4} μ-bar) Microphone: 1	2	3	AVERAGE	SPECIFICATION	DIFFERENCE	EXCEEDS TOLERANCE BY *
630	148.5	149.0	149.0	149.0	146.5	+2.5	
800	147.0	148.0	147.0	147.5	146.5	+1.0	
1.0 k	146.5	147.0	146.5	146.5	146.5	0.0	
1.25 k	145.5	146.5	146.0	146.0	146.5	-0.5	-0.5
1.6 k	144.0	145.5	144.5	144.5	146.5	-2.0	-2.0
2.0 k	143.0	144.0	144.0	143.5	146.5	-3.0	
2.5 k	141.5	142.5	143.0	142.5	146.5	-4.0	
3.15 k	139.5	141.0	142.0	141.0	146.5	-5.5	
4.0 k	137.5	139.0	140.0	139.0	146.5	-7.5	
5.0 k	136.5	137.0	139.5	137.5	145.5	-8.0	
6.3 k	135.0	135.5	138.0	136.0	145.0	-9.0	
8.0 k	134.0	134.0	136.5	135.0	144.0	-9.0	
10.0 k	134.0	133.5	136.5	134.5	143.0	-8.5	
OVERALL	160.0	160.5	160.5	160.5	160.0	+0.5	

K+E ALBANENE® LA 1789

FORM 25-S-1 (REV. 8-53)

PREPARED BY Raj

CHECKED BY

DATE: 9-7-67

TITLE CHILLDOWN INVERTER ACOUSTICAL TEST

DOUGLAS AIRCRAFT COMPANY, INC.

MISSILE & SPACE SYSTEMS DIVISION

PAGE A18

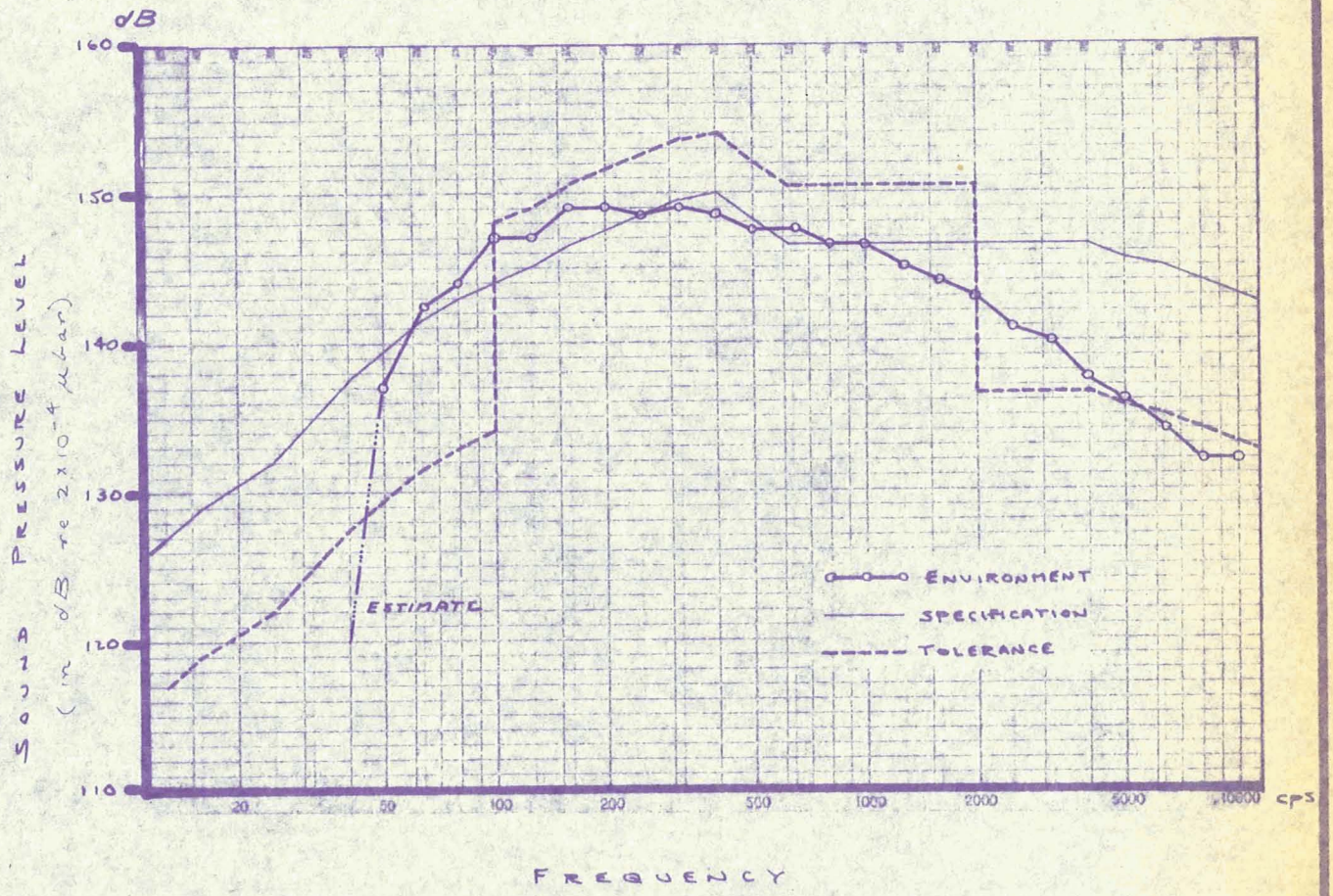
MODEL DSV-4B

REPORT NO. TM-R6065-2

ENVIRONMENT PROVIDED FOR SPECIMEN No. 1

VERSUS

SPECIFICATION TOLERANCES



TEST DATE: 8-18-67

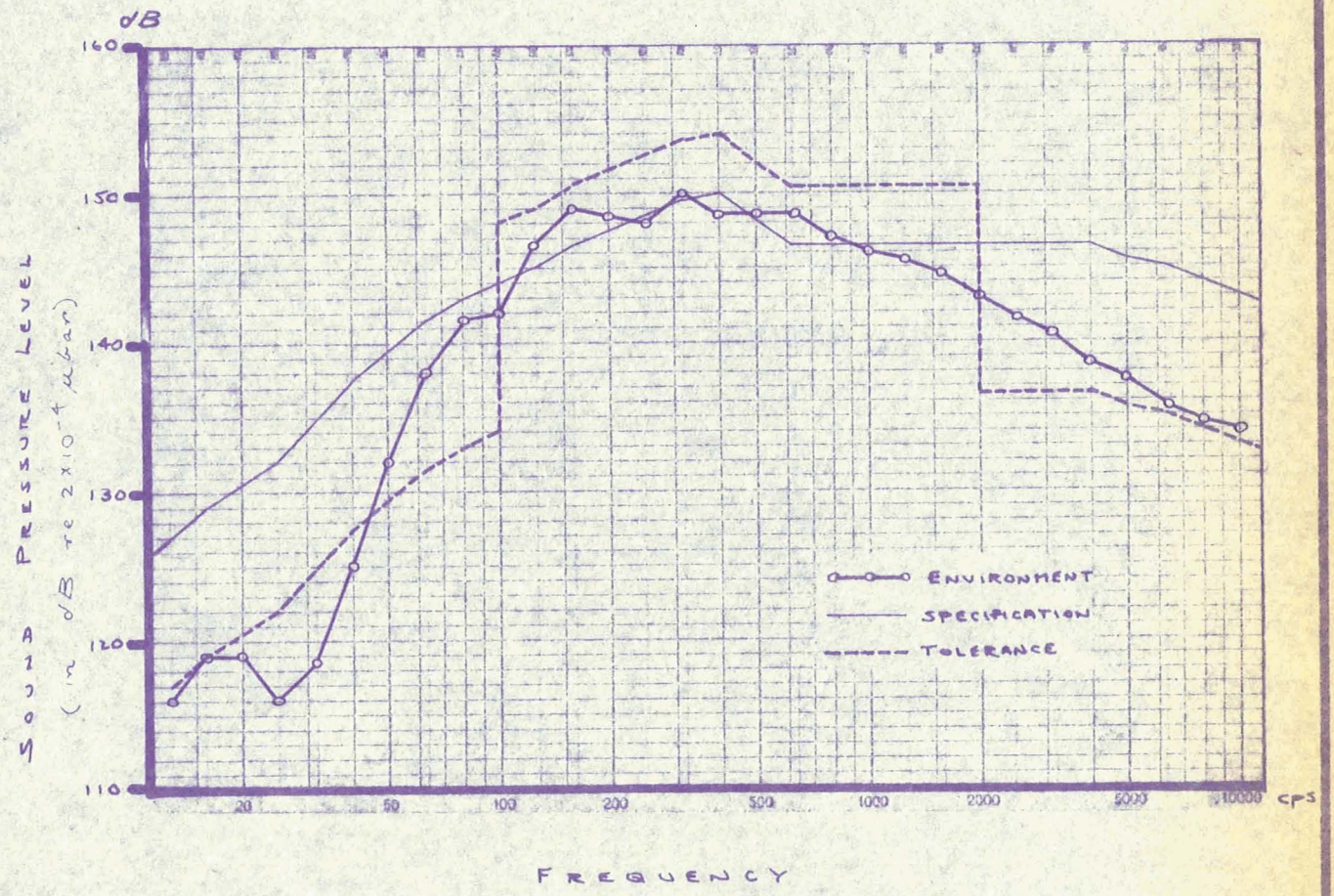
NOISE SYSTEM EQUALIZATION: -(12, 10, 5, 9, 0)

NOTE: No data is available for the 5, 6.3, 8 and 10 cps (center frequency) 1/3-octave bands since these are beyond the instrumentation systems' response capability.

ENVIRONMENT PROVIDED FOR SPECIMEN No. 2

VERSUS

SPECIFICATION TOLERANCES



TEST DATE: 9-1-67

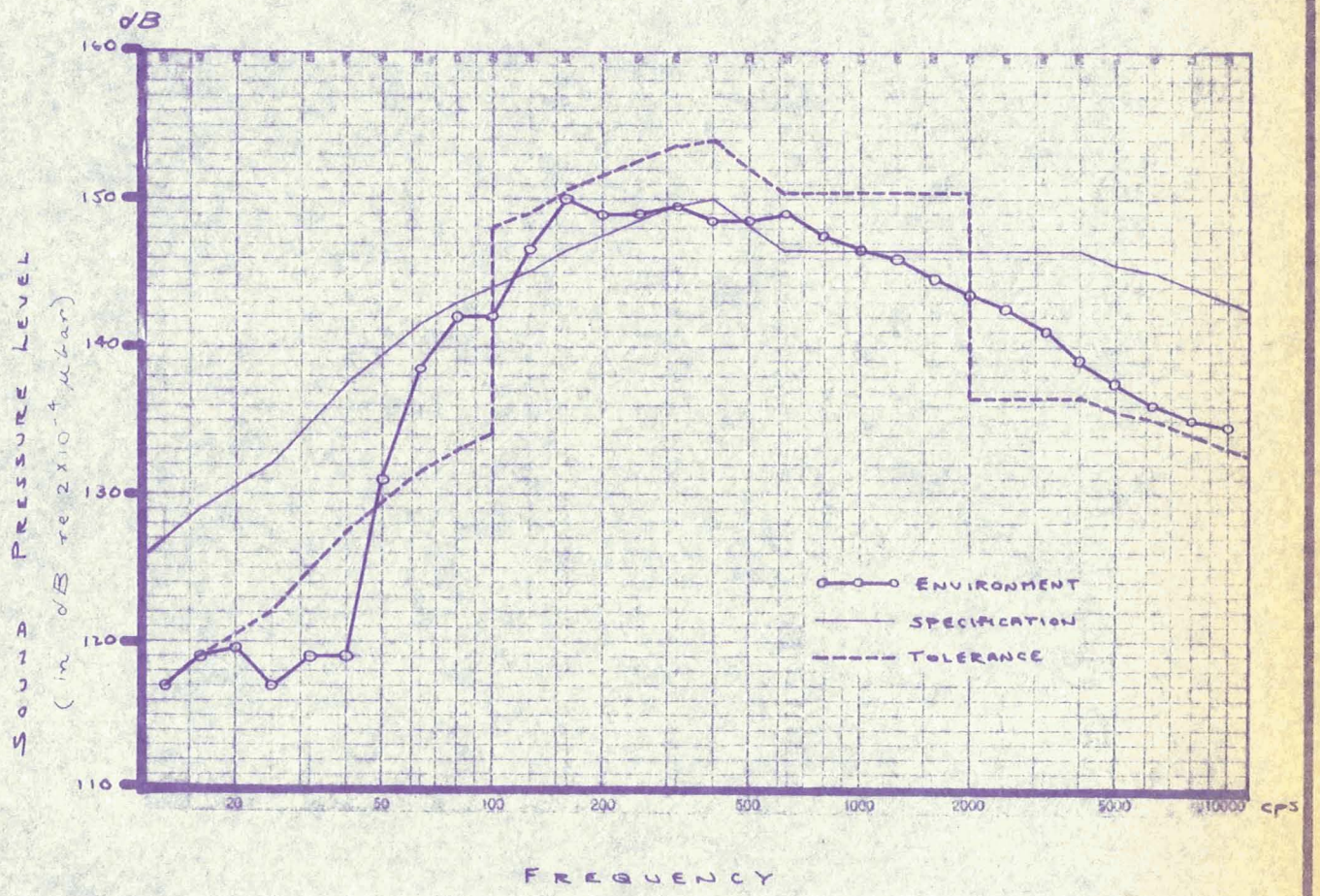
NOISE SYSTEM EQUALIZATION: -(22, 17, 10, 14, 0)

NOTE: No data is available for the 5, 6.3, 8 and 10 cps (center frequency) 1/3-octave bands since these are beyond the instrumentation systems' response capability.

ENVIRONMENT PROVIDED FOR SPECIMEN NO. 3

VERSUS

SPECIFICATION TOLERANCES



TEST DATE: 9-1-67

NOISE SYSTEM EQUALIZATION: -(22, 17, 10, 14, 0)

NOTE: No data is available for the 5, 6.3, 8 and 10 cps (center frequency) 1/3-octave bands since these are beyond the instrumentation systems' response capability.

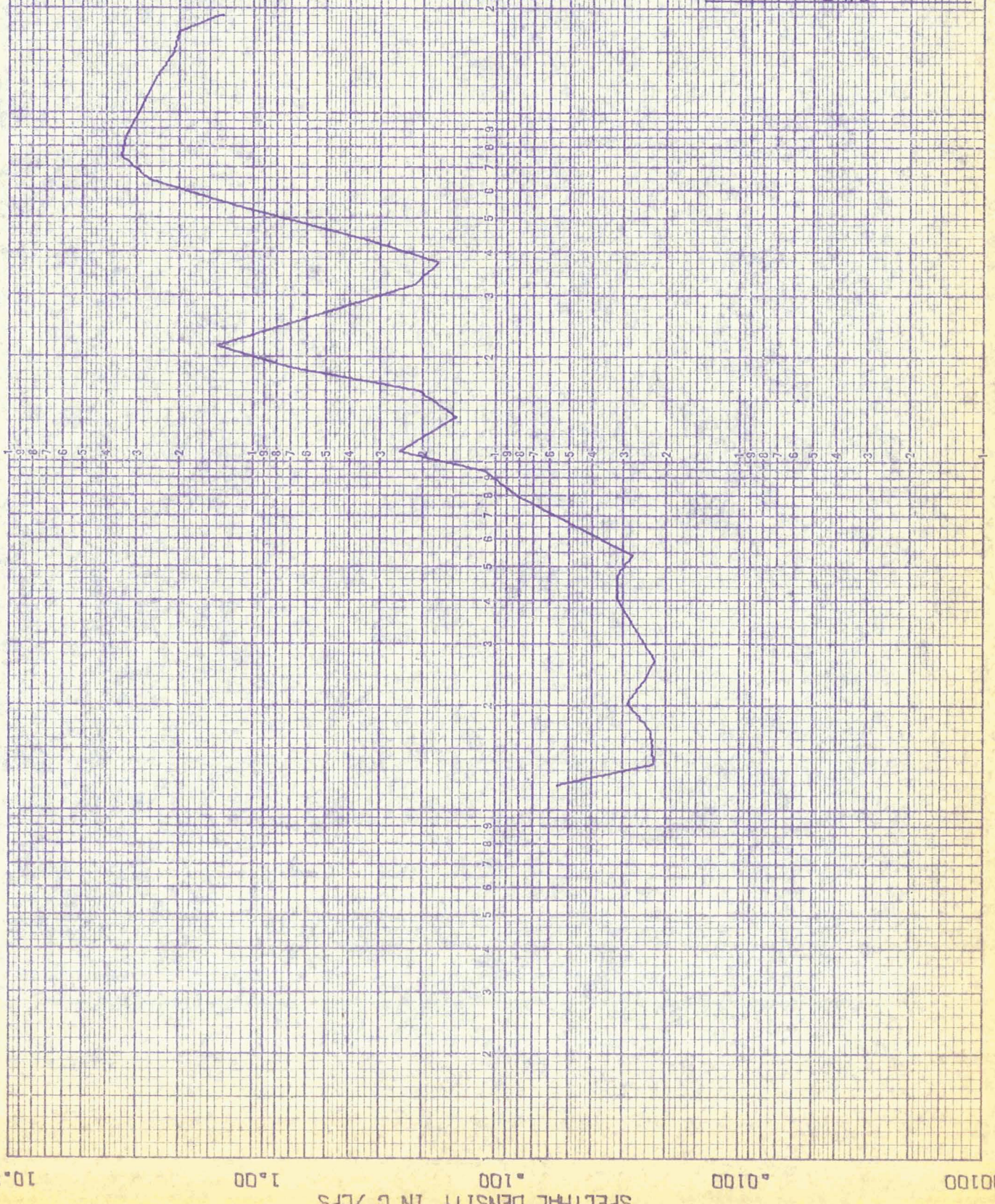
DSV-46 ACOUSTIC VIBRATION TEST

CHILLOGUN INVERTER ELECTRONIC ASSEMBLY P-66 Specimen 1

CONFIGURATION
P/N 1ST. MIN. OF RUN

NOTE
SEE PAGE B-2 FOR
PICK-UP LOCATION

TEST CONDITIONS
TEST DATE 8-18-67
AXIS OF EXCITATION
PICK-UP NUMBER 1
PICK-UP RESPONSE
INPUT ACCELERATION PER PAGE
RMS VALUE 64.3



DSV-48 ACOUSTIC VIBRATION TEST

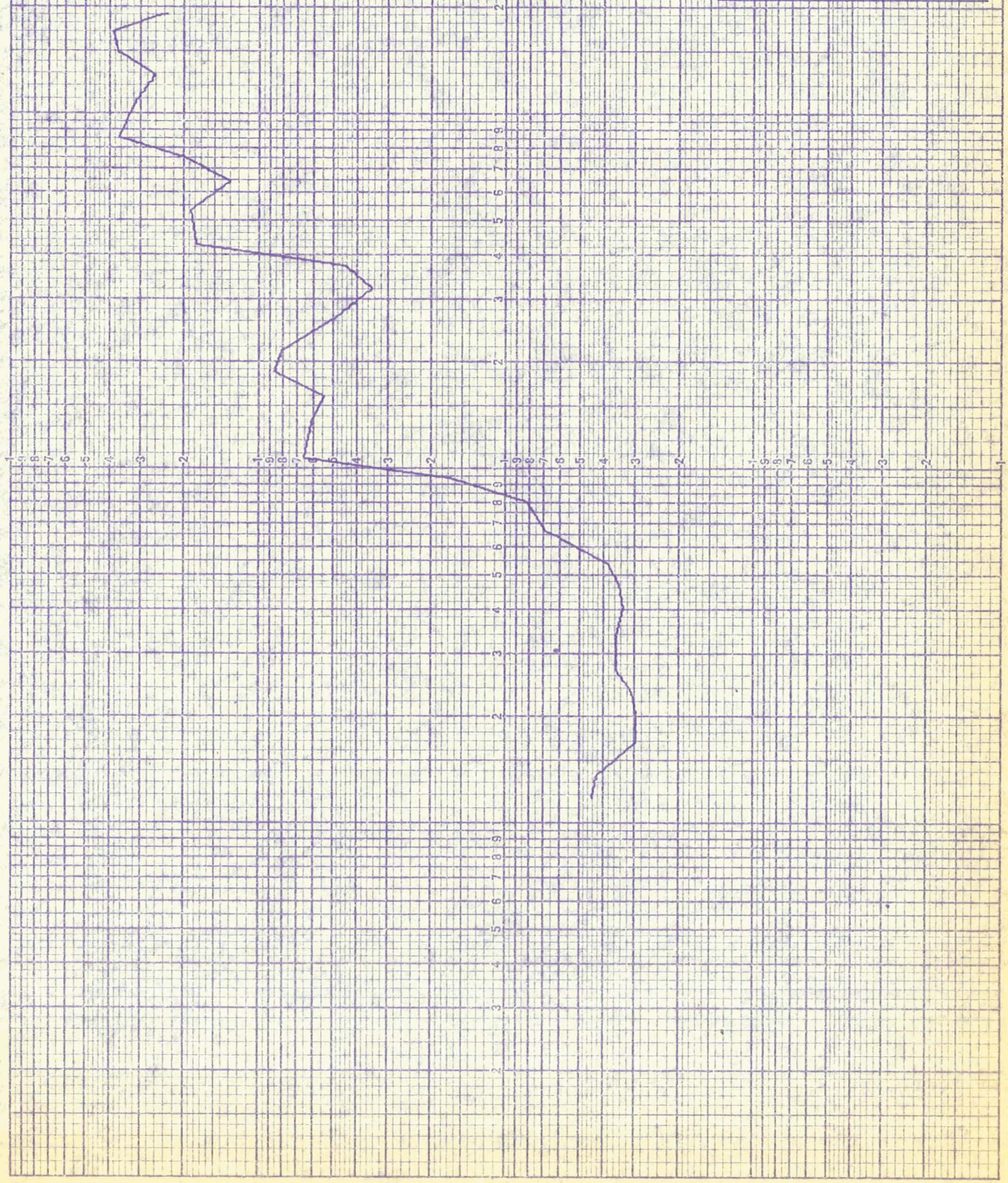
CHILLDOWN INVERTER ELECTRONIC ASSEMBLY P-66 Specimen 1

CONFIGURATION
P/N 1ST. MIN. OF RUN

NOTE
SEE PAGE B.2 FOR
PICK-UP LOCATION

TEST CONDITIONS

TEST DATE	8-18-67
AXIS OF EXCITATION	
PICK-UP NUMBER	2
PICK-UP RESPONSE	
INPUT ACCELERATION PER PAGE	
RMS VALUE	73.4



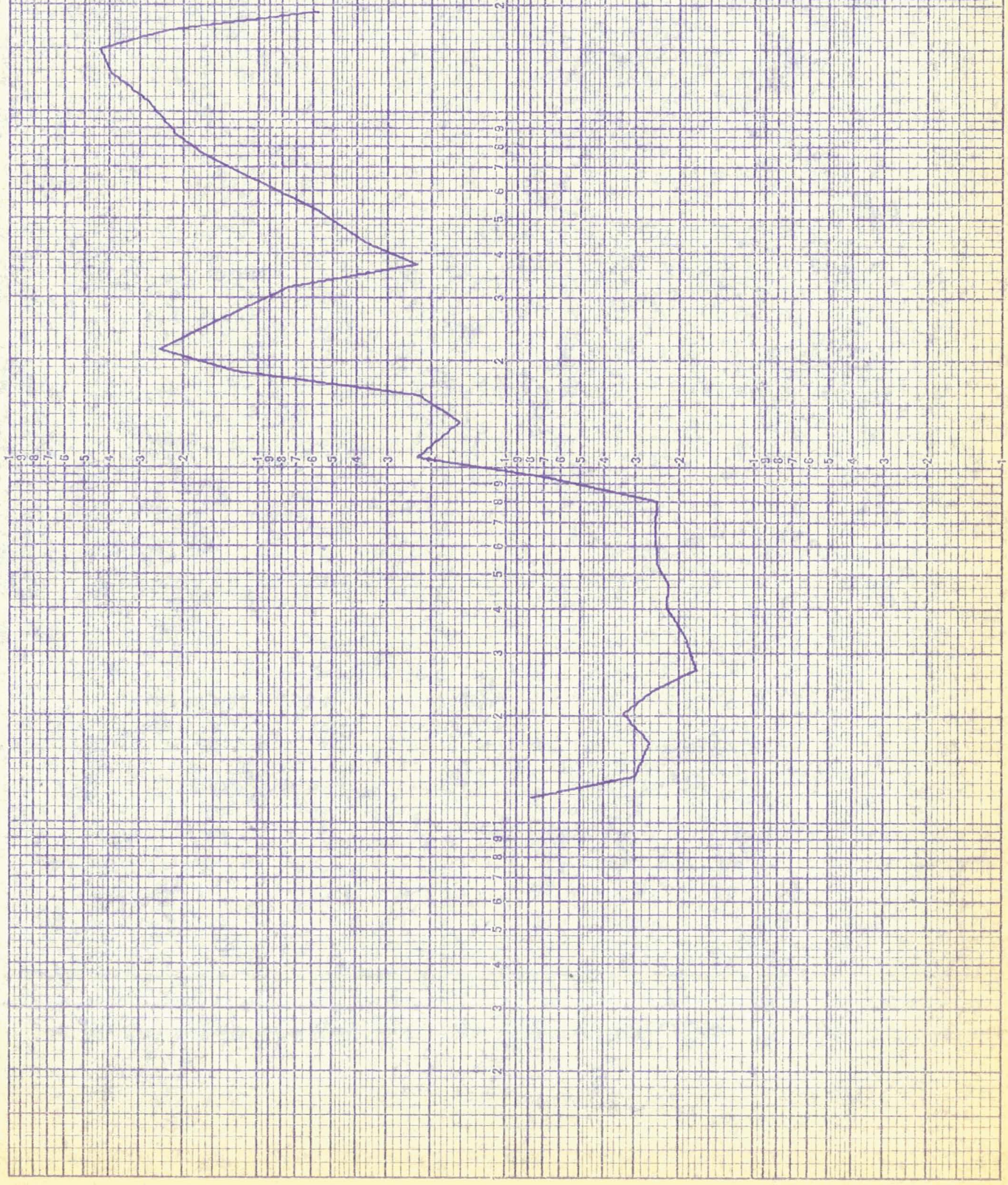
DSV-4B ACOUSTIC VIBRATION TEST

CHILLDOWN INVERTER ELECTRONIC ASSEMBLY P-66 Specimen 1

CONFIGURATION
P/N 1ST. MIN. OF RUN

NOTE
SEE PAGE R-2 FOR
PICK-UP LOCATION

TEST CONDITIONS
TEST DATE 8-18-67
AXIS OF EXCITATION
PICK-UP NUMBER 3
PICK-UP RESPONSE
INPUT ACCELERATION PER PAGE
RMS VALUE 63.4



DSV-4B ACOUSTIC VIBRATION TEST

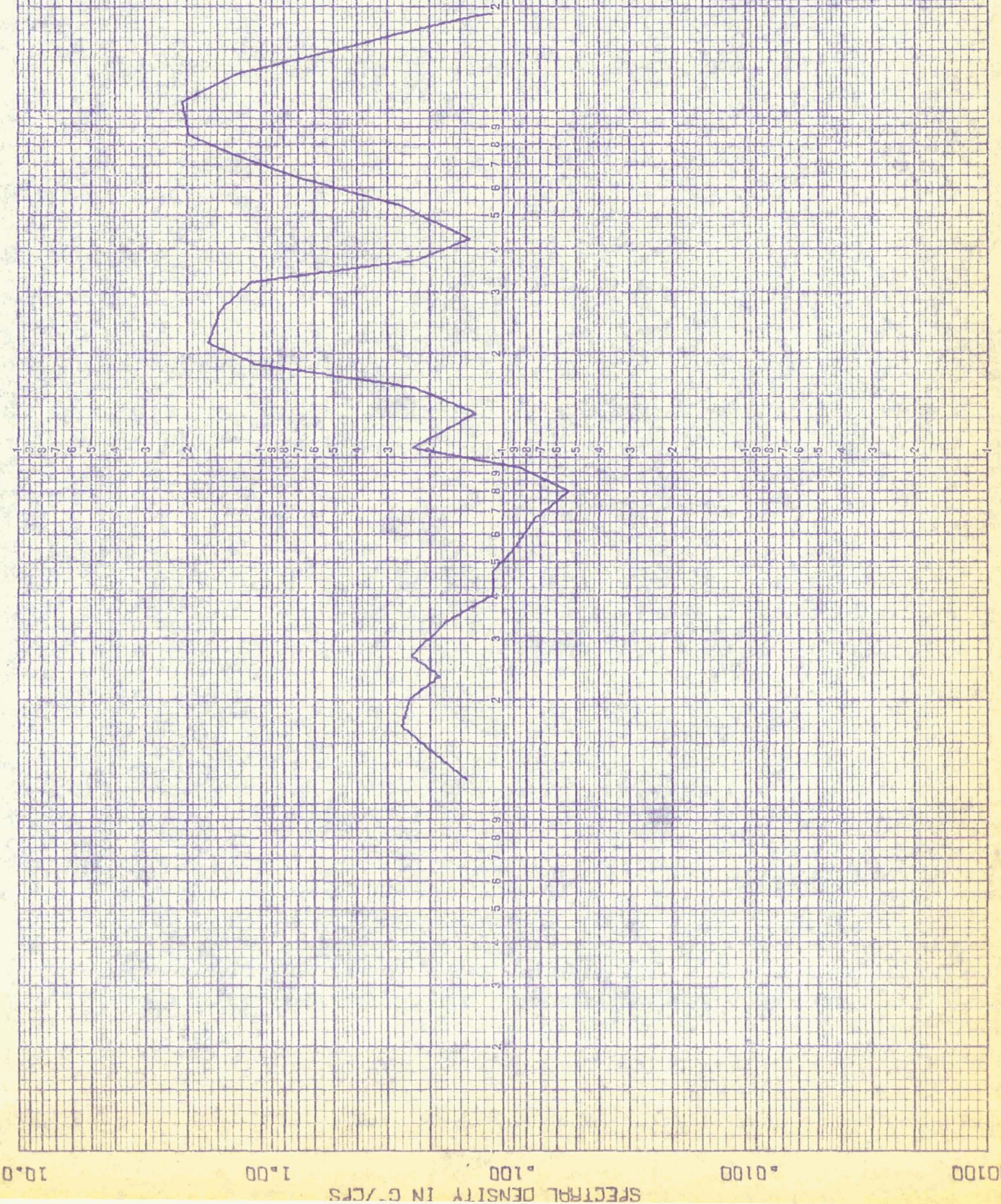
CHILLDOWN INVERTER ELECTRONIC ASSEMBLY P-66 Specimen 1

CONFIGURATION
P/N 1ST. MIN. OF RUN

NOTE
SEE PAGE B.2 FOR
PICK-UP LOCATION

TEST CONDITIONS

TEST DATE	8-18-67
AXIS OF EXCITATION	
PICK-UP NUMBER	4
PICK-UP RESPONSE	
INPUT ACCELERATION PER PAGE	
RMS VALUE	42.8



DSV-48 ACOUSTIC VIBRATION TEST

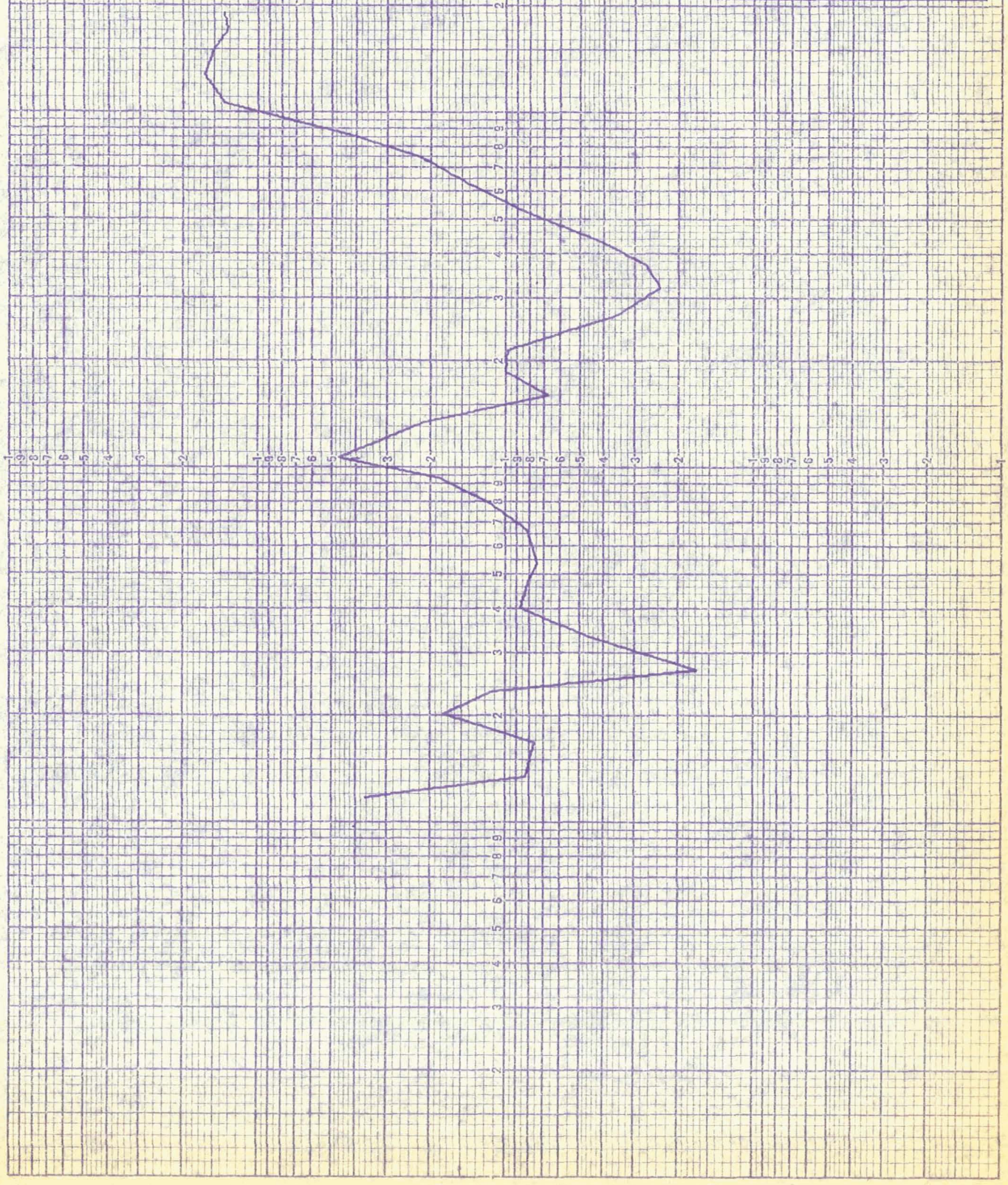
CHILLDOWN INVERTER ELECTRONIC ASSEMBLY P-68 Specimen 1

CONFIGURATION
P/N 1ST. MIN. OF RUN

NOTE
SEE PAGE B2 FOR
PICK-UP LOCATION

TEST CONDITIONS

TEST DATE	8-18-67
AXIS OF EXCITATION	
PICK-UP NUMBER	S
PICK-UP RESPONSE	
INPUT ACCELERATION PER PAGE	
RMS VALUE	17.0



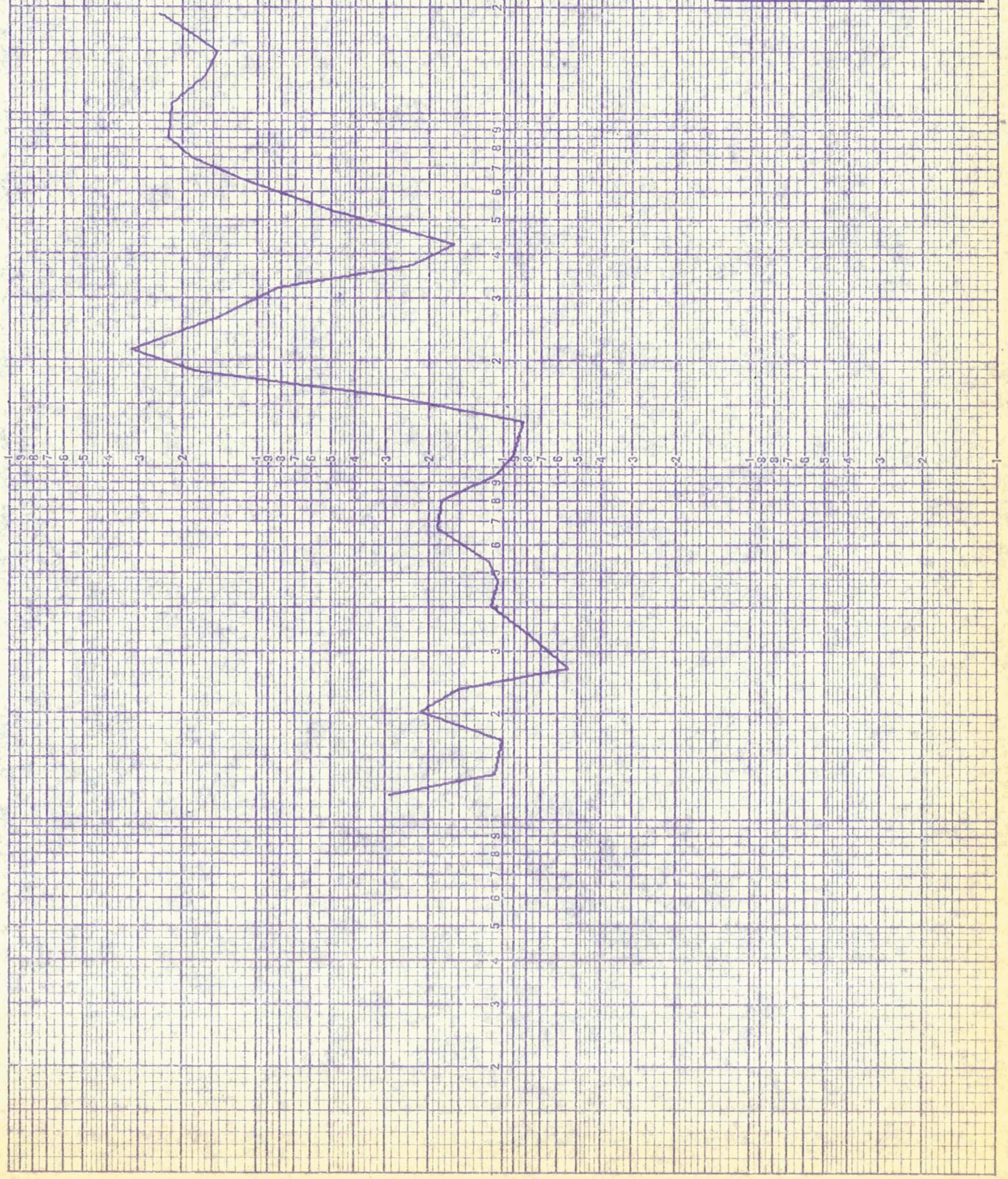
DSV-96 ACOUSTIC VIBRATION TEST

CHILLDOWN INVERTER ELECTRONIC ASSEMBLY P-68 Specimen 1

CONFIGURATION
P/N 1ST. MIN. OF RUN

NOTE
SEE PAGE B2 FOR
PICK-UP LOCATION

TEST CONDITIONS
TEST DATE 8-18-67
AXIS OF EXCITATION
PICK-UP NUMBER 6
PICK-UP RESPONSE
INPUT ACCELERATION PER PAGE
RMS VALUE 24.6



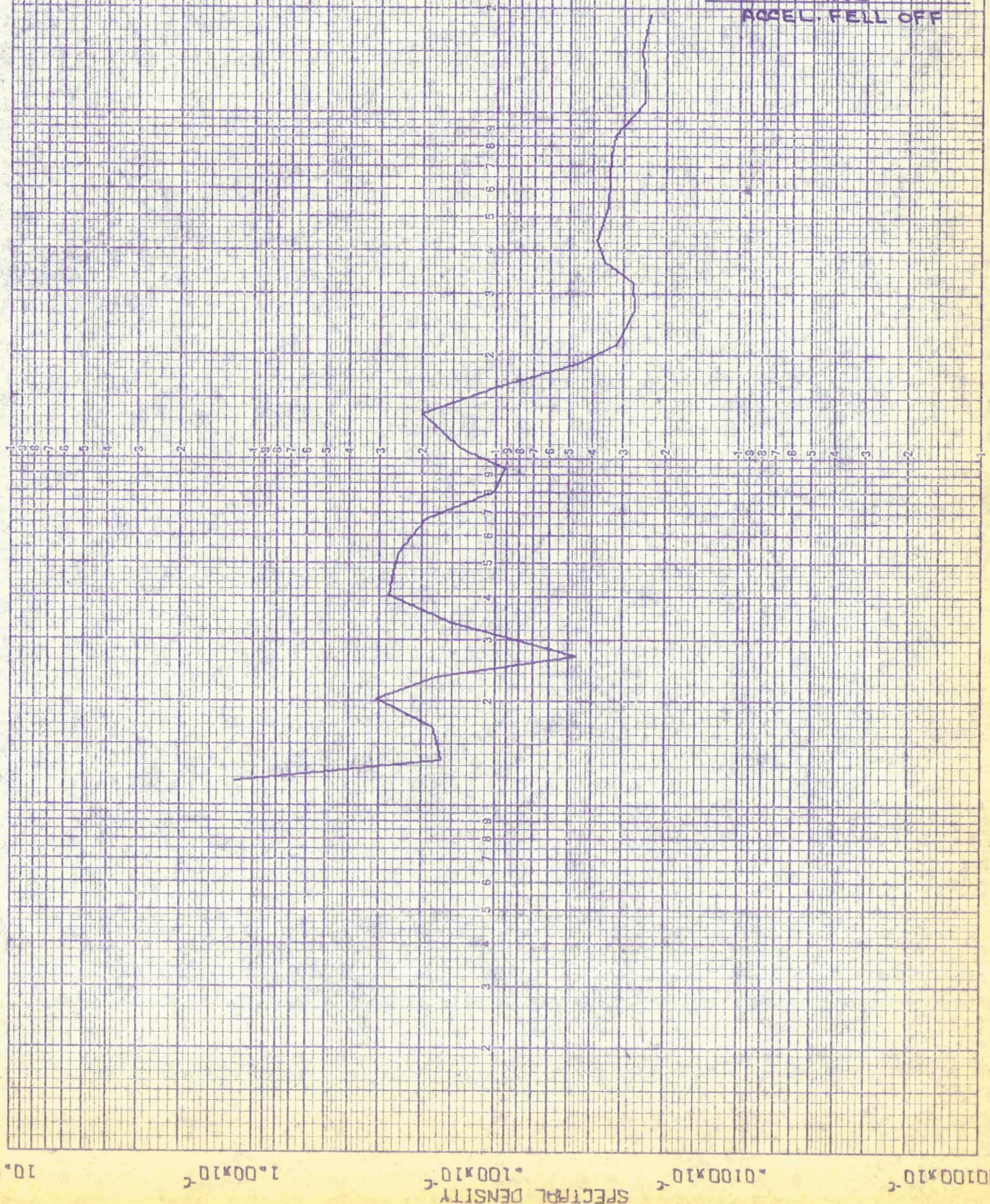
DSV-48 ACOUSTIC VIBRATION TEST

CHILLDOWN INVERTER ELECTRONIC ASSEMBLY P-68 Specimen 1

CONFIGURATION
P/N 5TH. MIN. OF RUN

NOTE
SEE PAGE B-2 FOR
PICK-UP LOCATION

TEST CONDITIONS
TEST DATE 8-18-67
AXIS OF EXCITATION
PICK-UP NUMBER 1
PICK-UP RESPONSE
INPUT ACCELERATION PER PAGE
RMS VALUE 1.02
ACCEL. FELL OFF



DSV-4B ACOUSTIC VIBRATION TEST

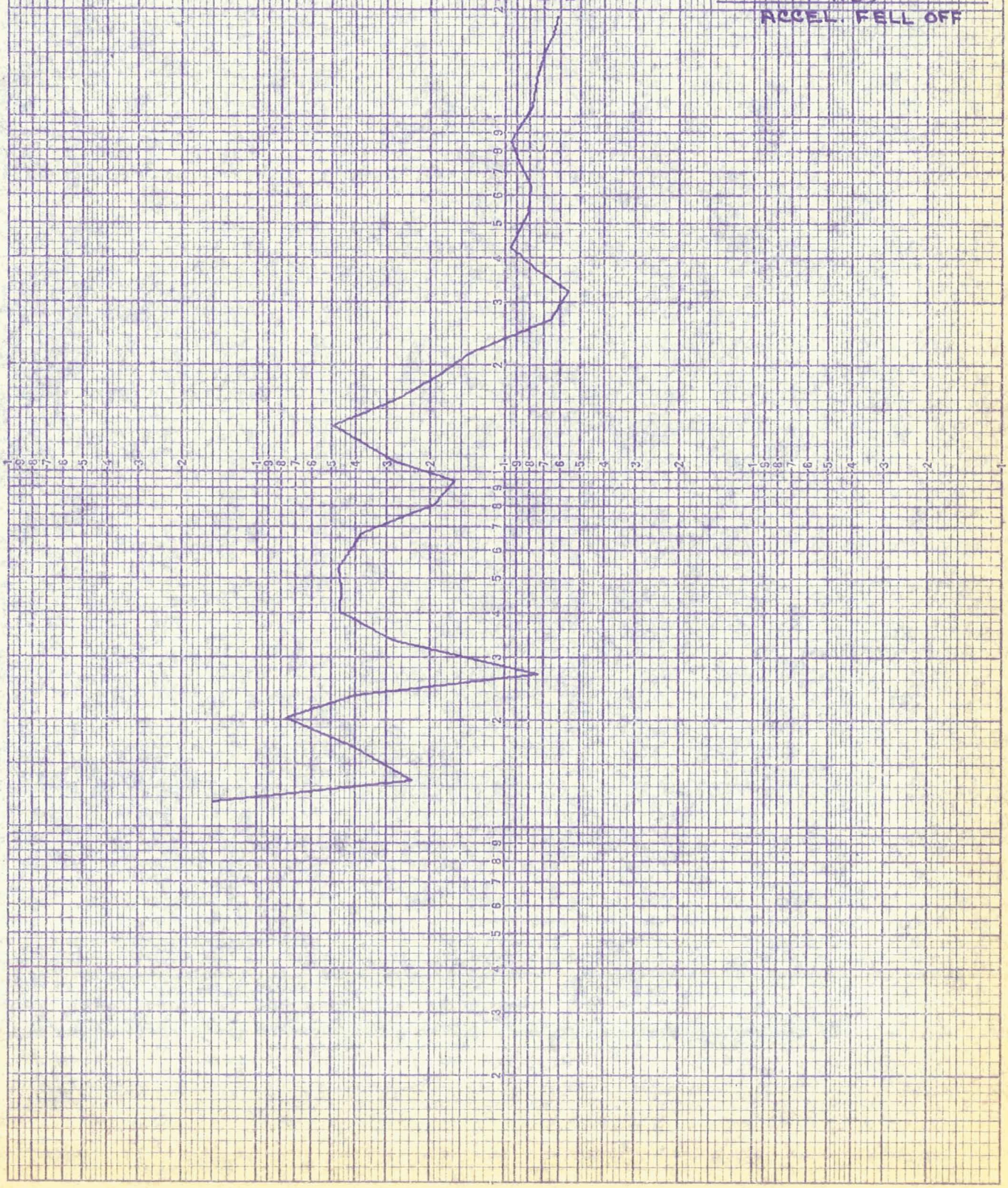
CHILLDOWN INVERTER ELECTRONIC ASSEMBLY P-68 Specimen 1

CONFIGURATION
P/N STH. MIN. OF RUN

NOTE
SEE PAGE B.2 FOR
PICK-UP LOCATION

TEST CONDITIONS
TEST DATE 8-18-67
AXIS OF EXCITATION
PICK-UP NUMBER 2
PICK-UP RESPONSE
INPUT ACCELERATION PER PAGE
RMS VALUE 1.69

ACCEL. FELL OFF



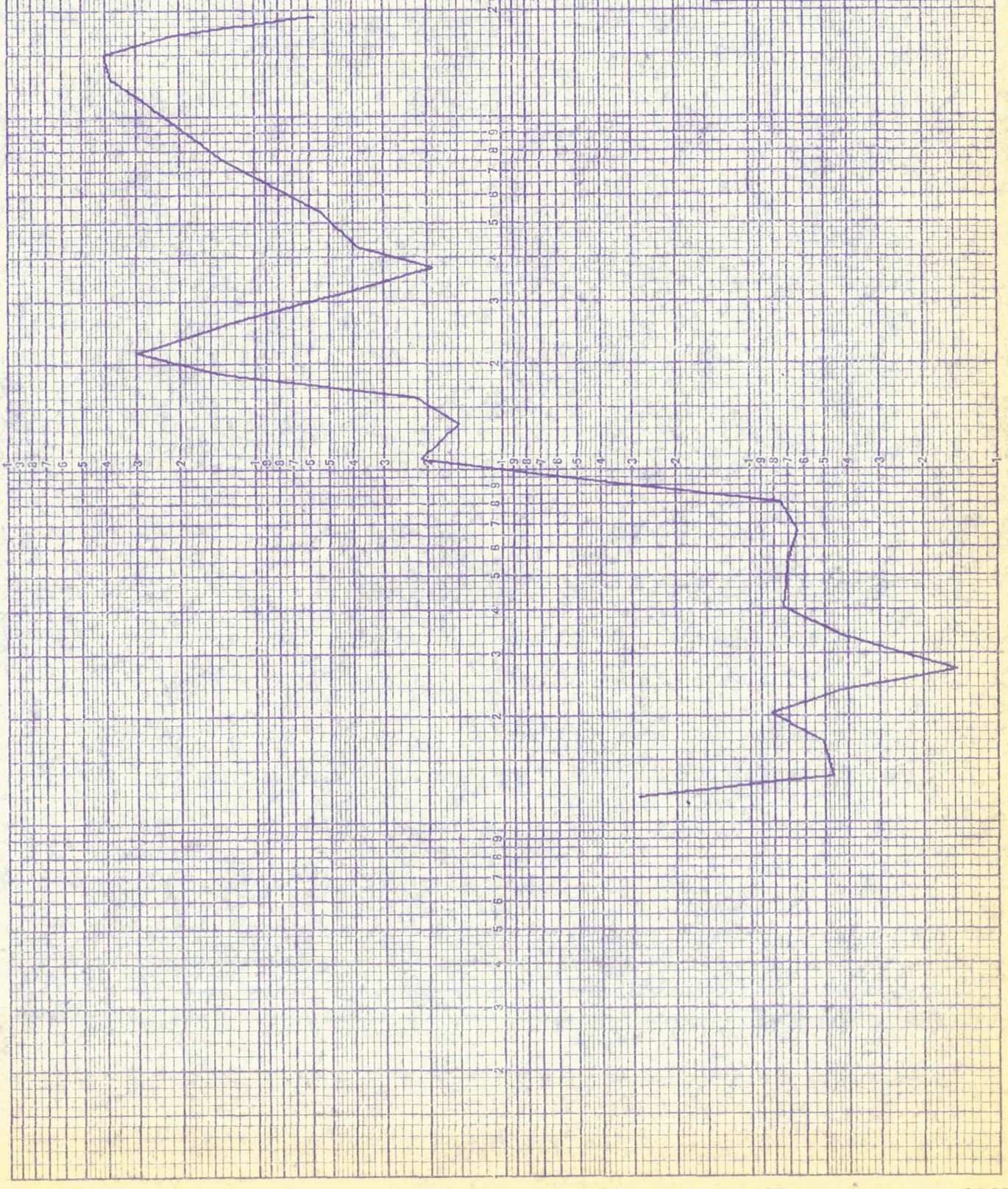
DSV-48 ACOUSTIC VIBRATION TEST

CHILLDOWN INVERTER ELECTRONIC ASSEMBLY P-66 Specimen 1

CONFIGURATION
P/N STH. MIN. OF RUN

NOTE
SEE PAGE B-2 FOR
PICK-UP LOCATION

TEST CONDITIONS
TEST DATE 8-18-67
AXIS OF EXCITATION
PICK-UP NUMBER 3
PICK-UP RESPONSE
INPUT ACCELERATION PER PAGE
RMS VALUE 61.5



DSV-48 ACOUSTIC VIBRATION TEST

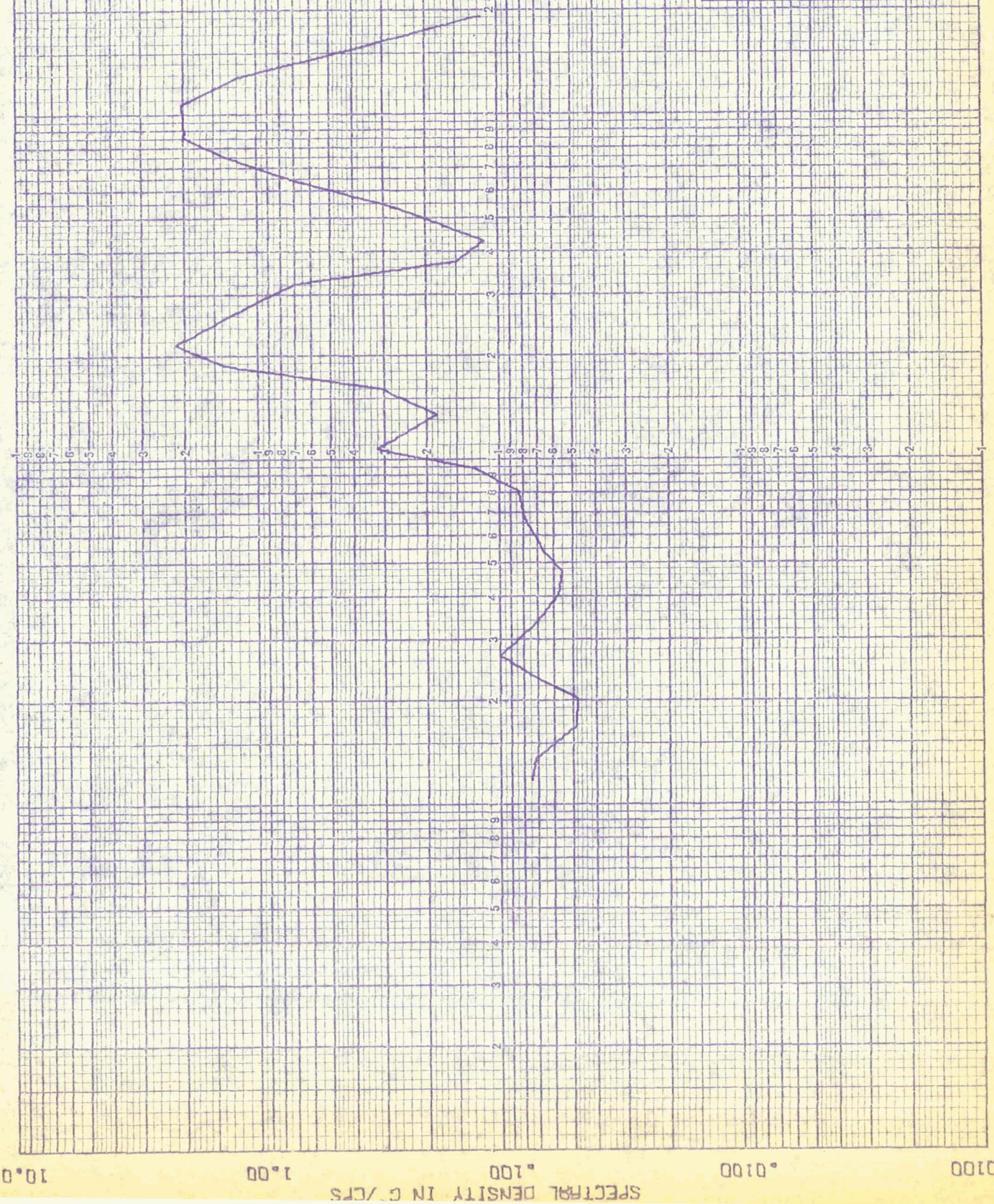
CHILLDOWN INVERTER ELECTRONIC ASSEMBLY P-66 Specimen 1

CONFIGURATION
P/N STH. MIN. OF RUN

NOTE
SEE PAGE B-2 FOR
PICK-UP LOCATION

TEST CONDITIONS

TEST DATE	8-18-67
AXIS OF EXCITATION	
PICK-UP NUMBER	4
PICK-UP RESPONSE	
INPUT ACCELERATION PER PAGE	
RMS VALUE	42.1



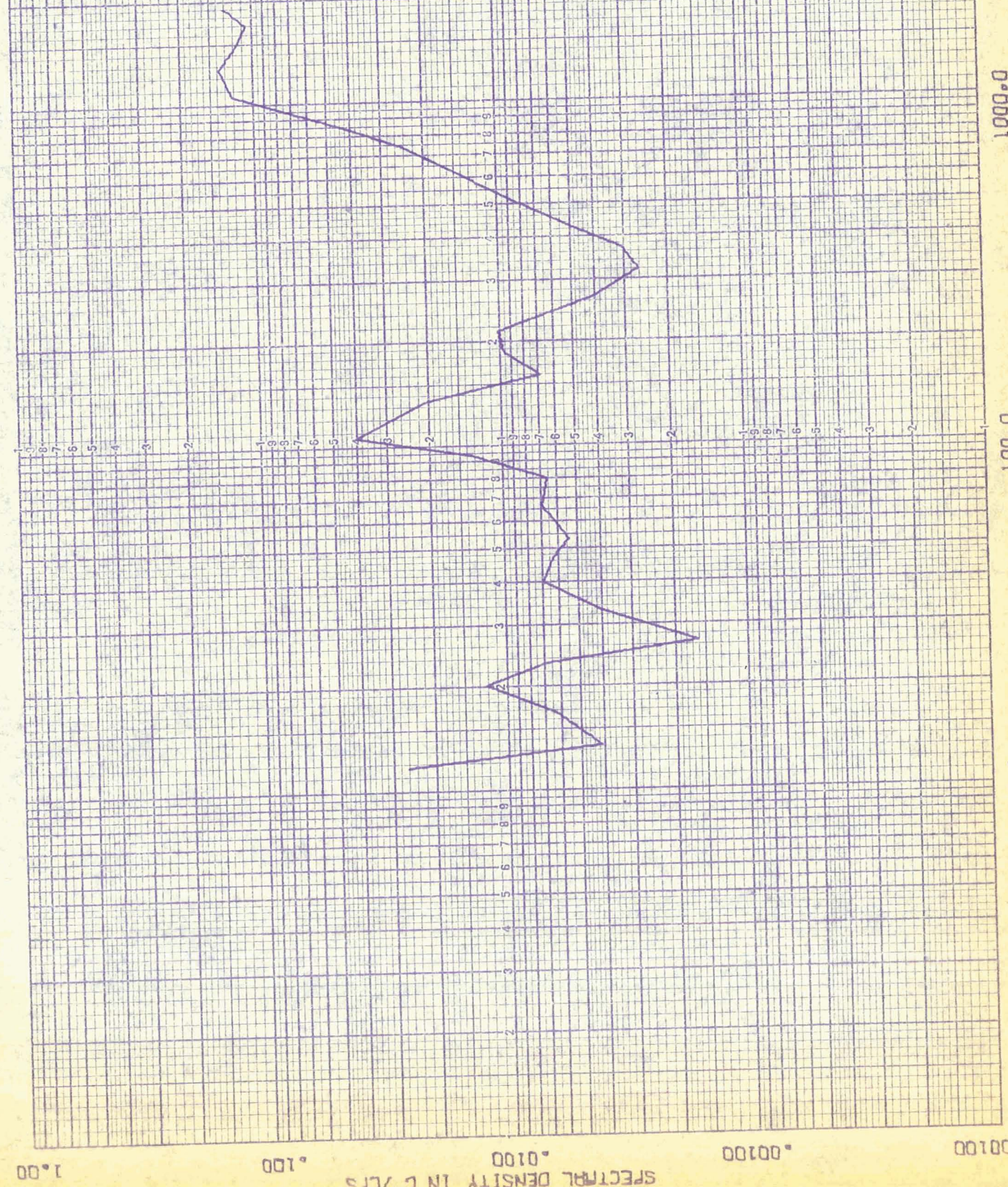
DSV-4B ACOUSTIC VIBRATION TEST

CHILLDOWN INVERTER ELECTRONIC ASSEMBLY P-68 Specimen 1

CONFIGURATION
P/N STH. MIN. OF RUN

NOTE
SEE PAGE B-2 FOR
PICK-UP LOCATION

TEST CONDITIONS
TEST DATE 8-18-67
AXIS OF EXCITATION
PICK-UP NUMBER S
PICK-UP RESPONSE
INPUT ACCELERATION PER PAGE
RMS VALUE 16.3



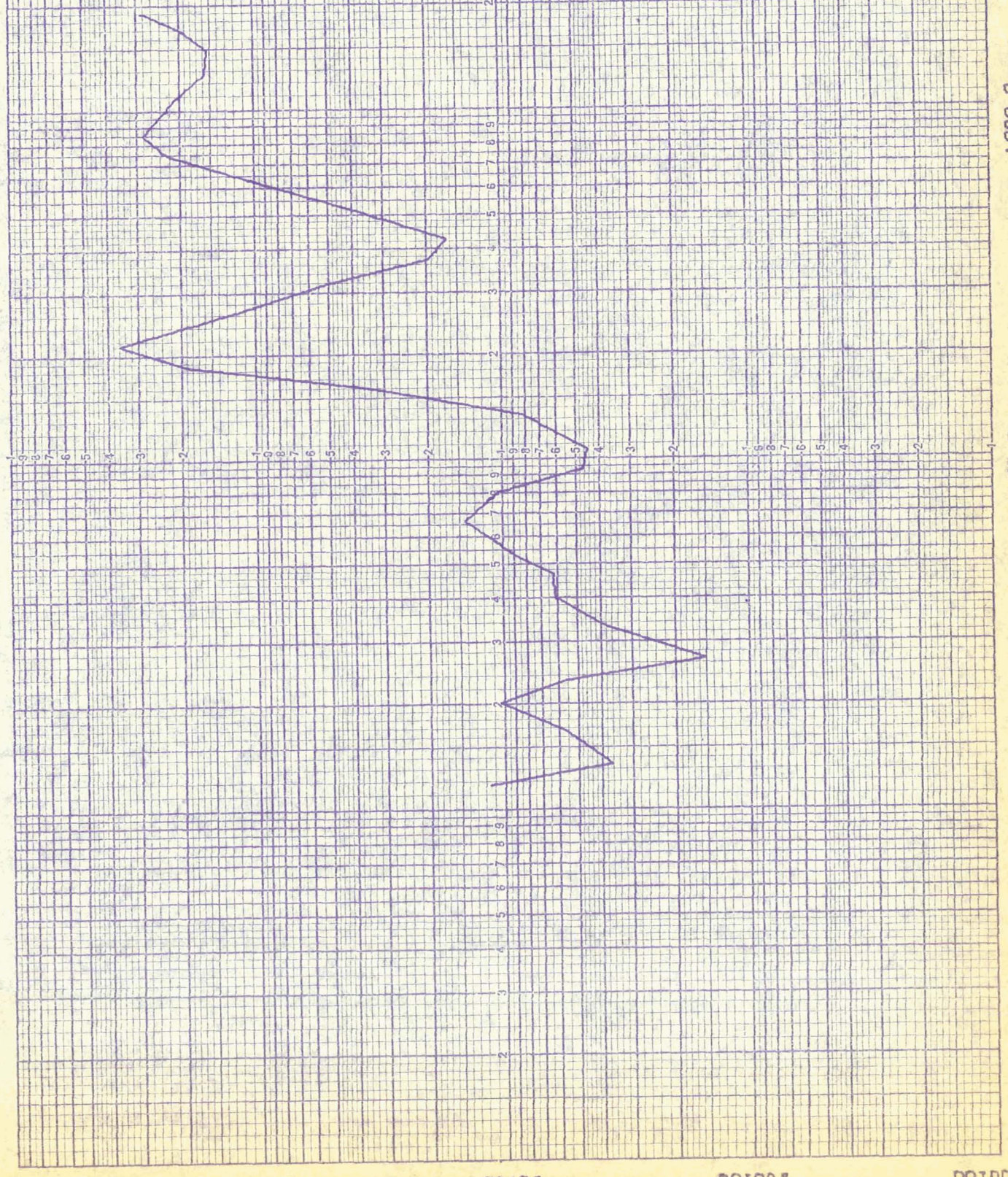
DSV-48 ACOUSTIC VIBRATION TEST

CHILLDOWN INVERTER ELECTRONIC ASSEMBLY P-68 Specimen 1

CONFIGURATION
P/N STH. MIN. OF RUN

NOTE
SEE PAGE B-2 FOR
PICK-UP LOCATION

TEST CONDITIONS
TEST DATE 8-18-67
AXIS OF EXCITATION
PICK-UP NUMBER 61
PICK-UP RESPONSE
INPUT ACCELERATION PER PAGE
RMS VALUE 25.16



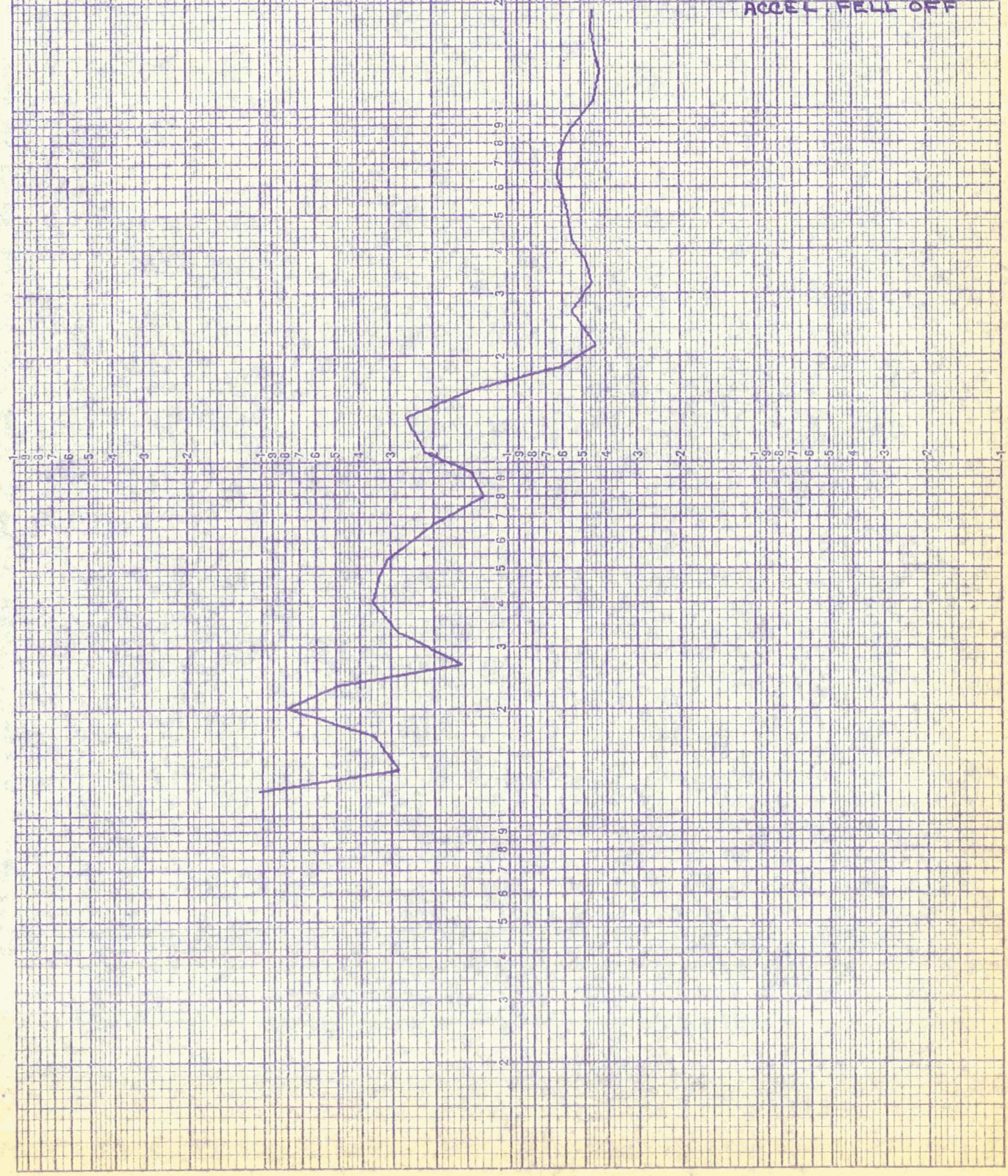
DSV-4B ACOUSTIC VIBRATION TEST

CHILLDOWN INVERTER ELECTRONIC ASSEMBLY P-66 Specimen 1

CONFIGURATION
P/N LAST MIN. OF RUN

NOTE
SEE PAGE B2 FOR
PICK-UP LOCATION

TEST CONDITIONS
TEST DATE 8-18-67
AXIS OF EXCITATION
PICK-UP NUMBER 1
PICK-UP RESPONSE
INPUT ACCELERATION PER PAGE
RMS VALUE 1.3
ACCEL. FELL OFF



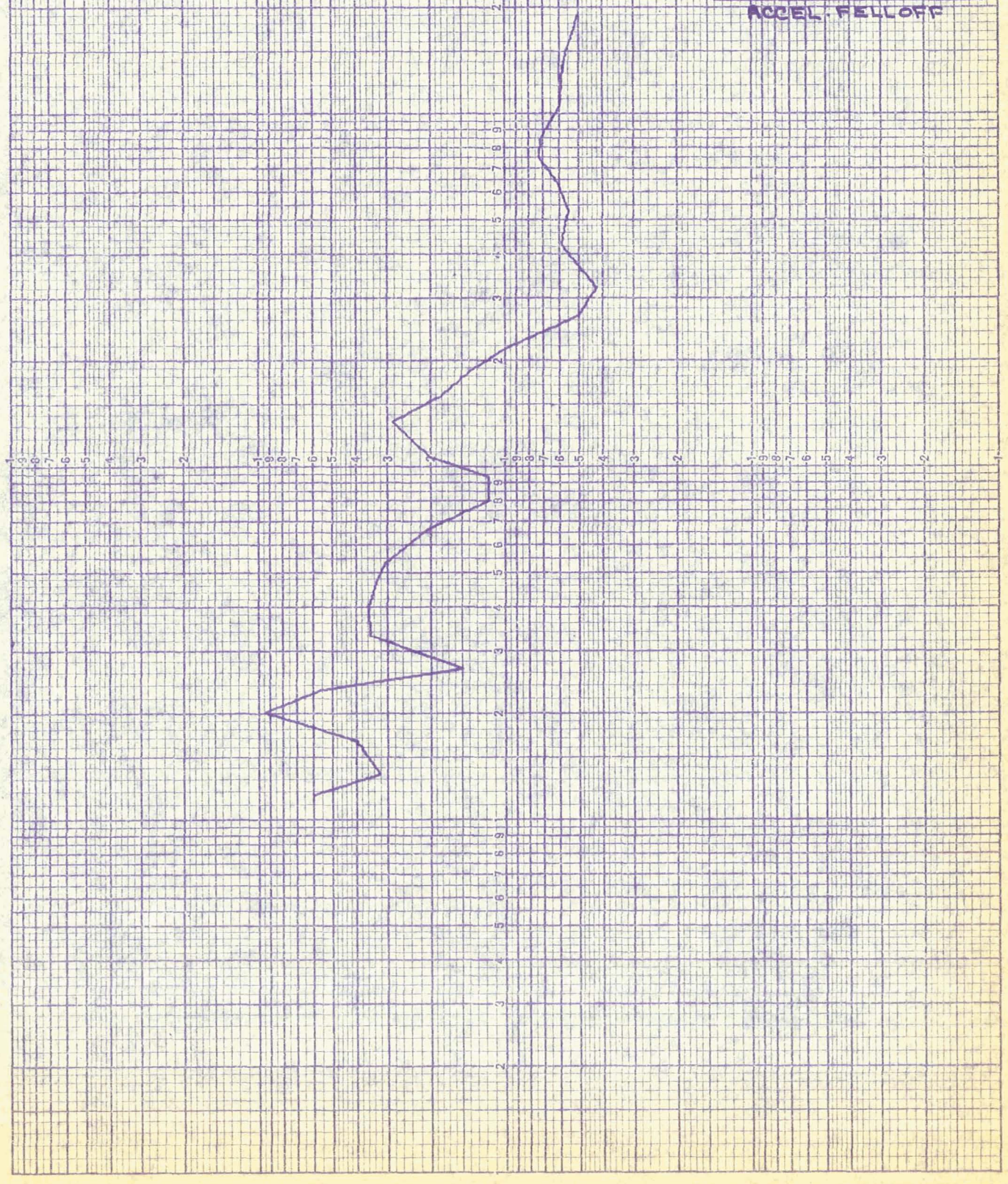
OSV-46 ACOUSTIC VIBRATION TEST

CHILLDOWN INVERTER ELECTRONIC ASSEMBLY P-66 Specimen 1

CONFIGURATION
P/N LAST MIN. OF RUN

NOTE
SEE PAGE B2 FOR
PICK-UP LOCATION

TEST CONDITIONS
TEST DATE 8-18-67
AXIS OF EXCITATION
PICK-UP NUMBER 2
PICK-UP RESPONSE
INPUT ACCELERATION PER PAGE
RMS VALUE 1.4
ACCEL. FELLOFF



DSV-48 ACOUSTIC VIBRATION TEST

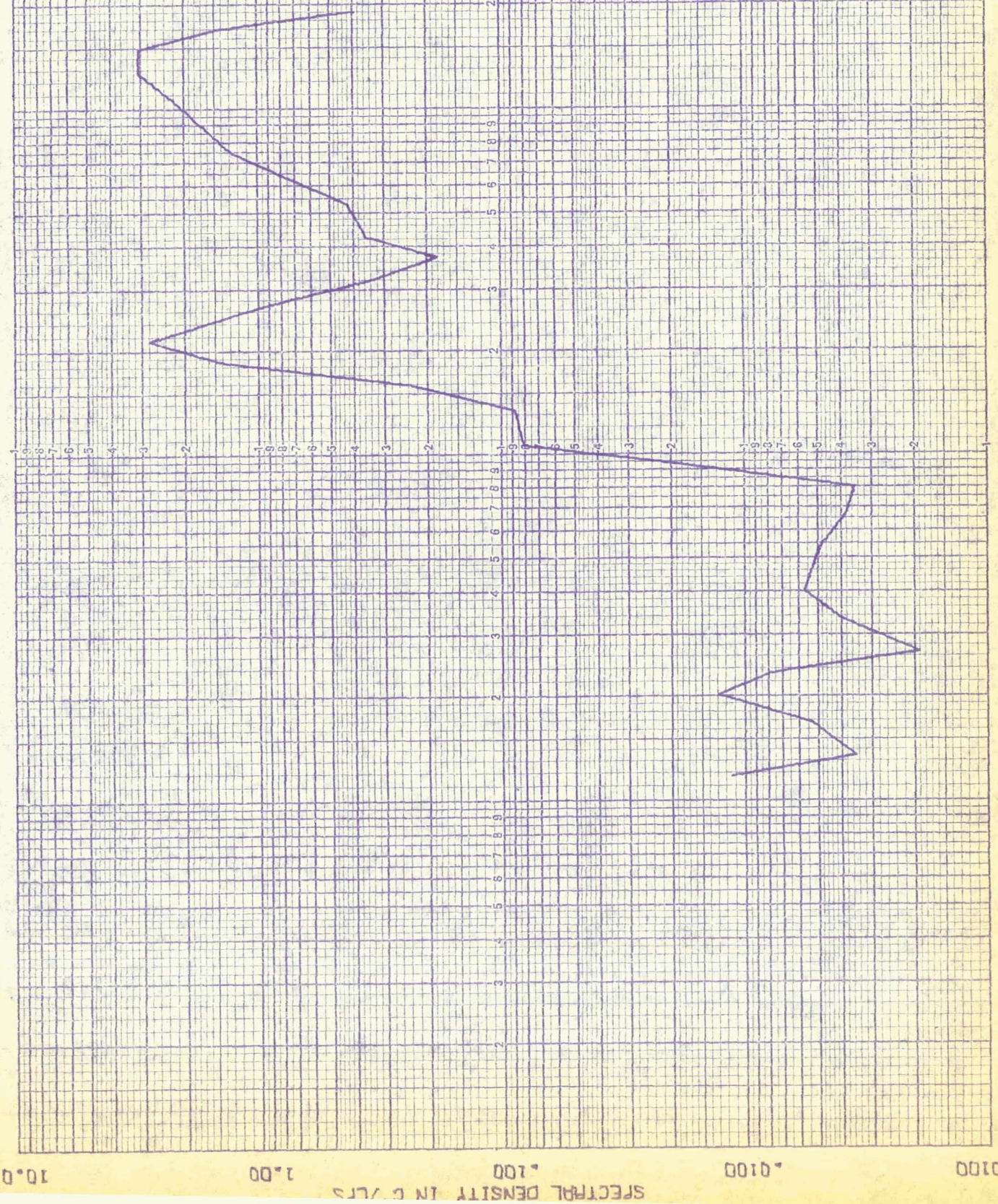
CHILLDOWN INVERTER ELECTRONIC ASSEMBLY P-66 Specimen 1

CONFIGURATION
P/N LAST MIN. OF RUN

NOTE
SEE PAGE 13 FOR
PICK-UP LOCATION

TEST CONDITIONS

TEST DATE	8-18-67
AXIS OF EXCITATION	
PICK-UP NUMBER	3
PICK-UP RESPONSE	
INPUT ACCELERATION PER PAGE	
RMS VALUE	55.4



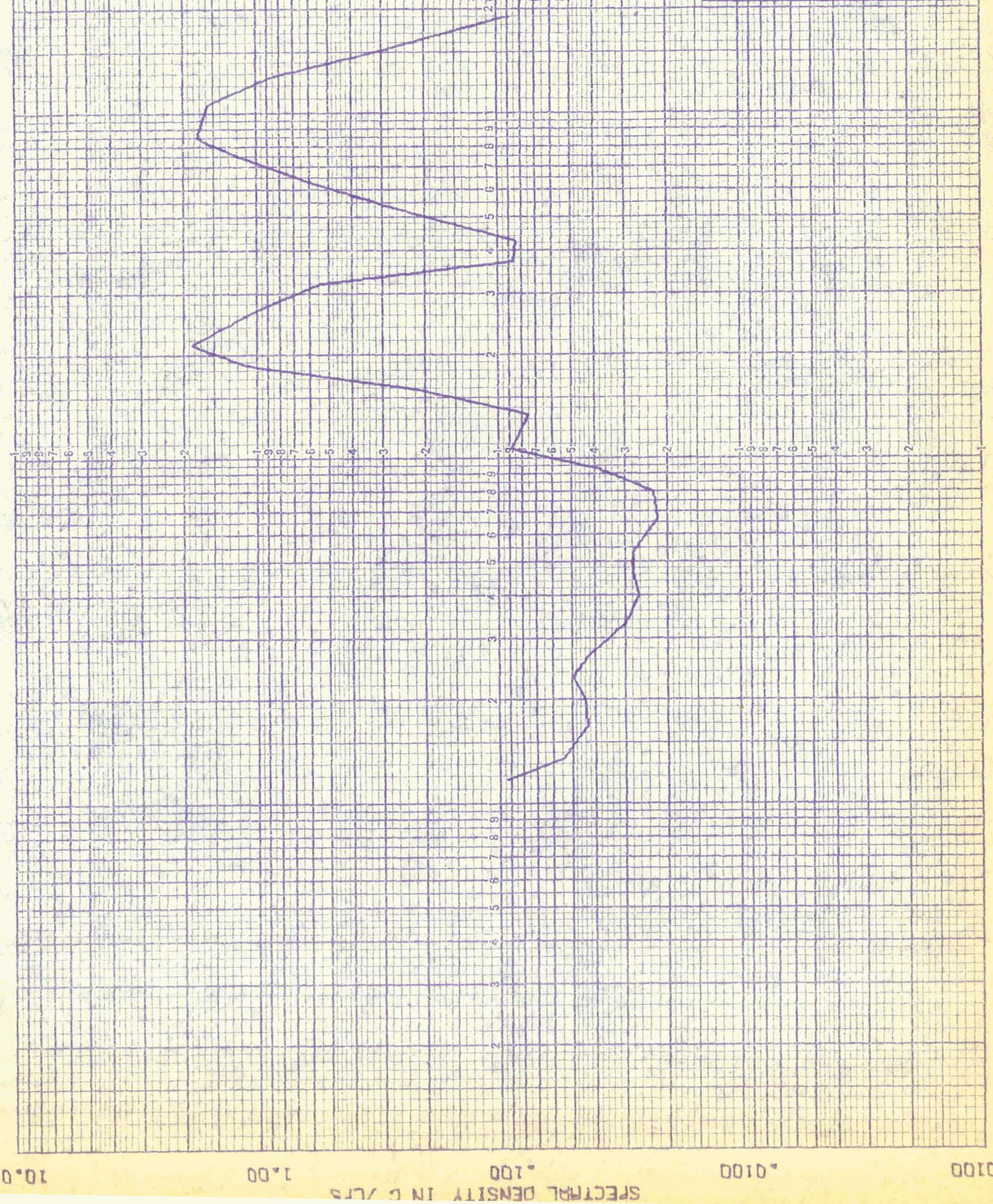
OSV-48 ACOUSTIC VIBRATION TEST

CHILLDOWN INVERTER ELECTRONIC ASSEMBLY P-66 Specimen 1

CONFIGURATION
P/N LAST MIN. OF RUN

NOTE
SEE PAGE B2 FOR
PICK-UP LOCATION

TEST CONDITIONS
TEST DATE 8-18-67
AXIS OF EXCITATION
PICK-UP NUMBER 4
PICK-UP RESPONSE
INPUT ACCELERATION PER PAGE
RMS VALUE 38.05



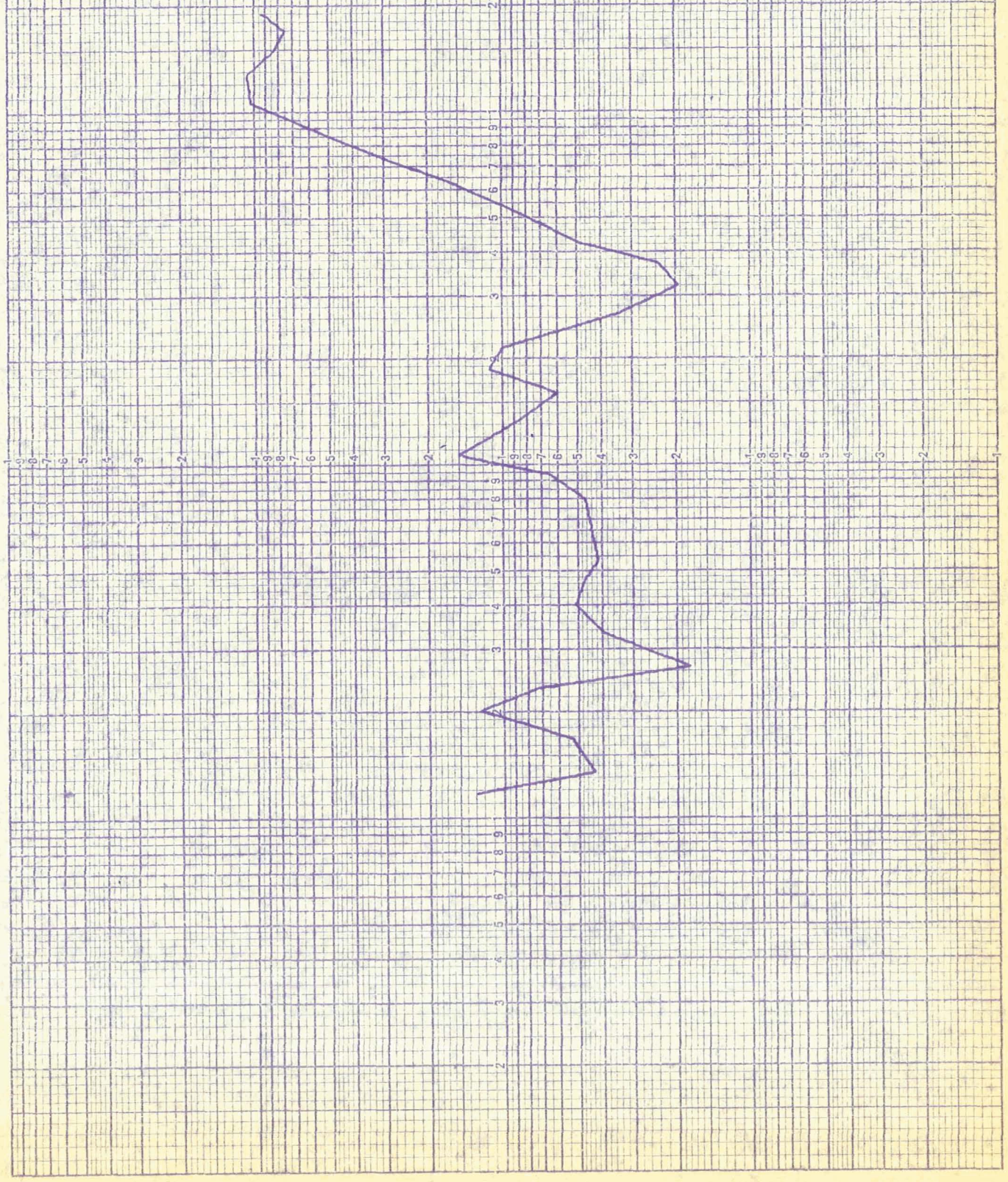
OSV-4B ACOUSTIC VIBRATION TEST

CHILLDOWN INVERTER ELECTRONIC ASSEMBLY P-66 Specimen 1

CONFIGURATION
P/N LAST MIN. OF RUN

NOTE
SEE PAGE B2 FOR
PICK-UP LOCATION

TEST CONDITIONS
TEST DATE 8-18-67
AXIS OF EXCITATION
PICK-UP NUMBER S
PICK-UP RESPONSE
INPUT ACCELERATION PER PAGE
RMS VALUE 14.1



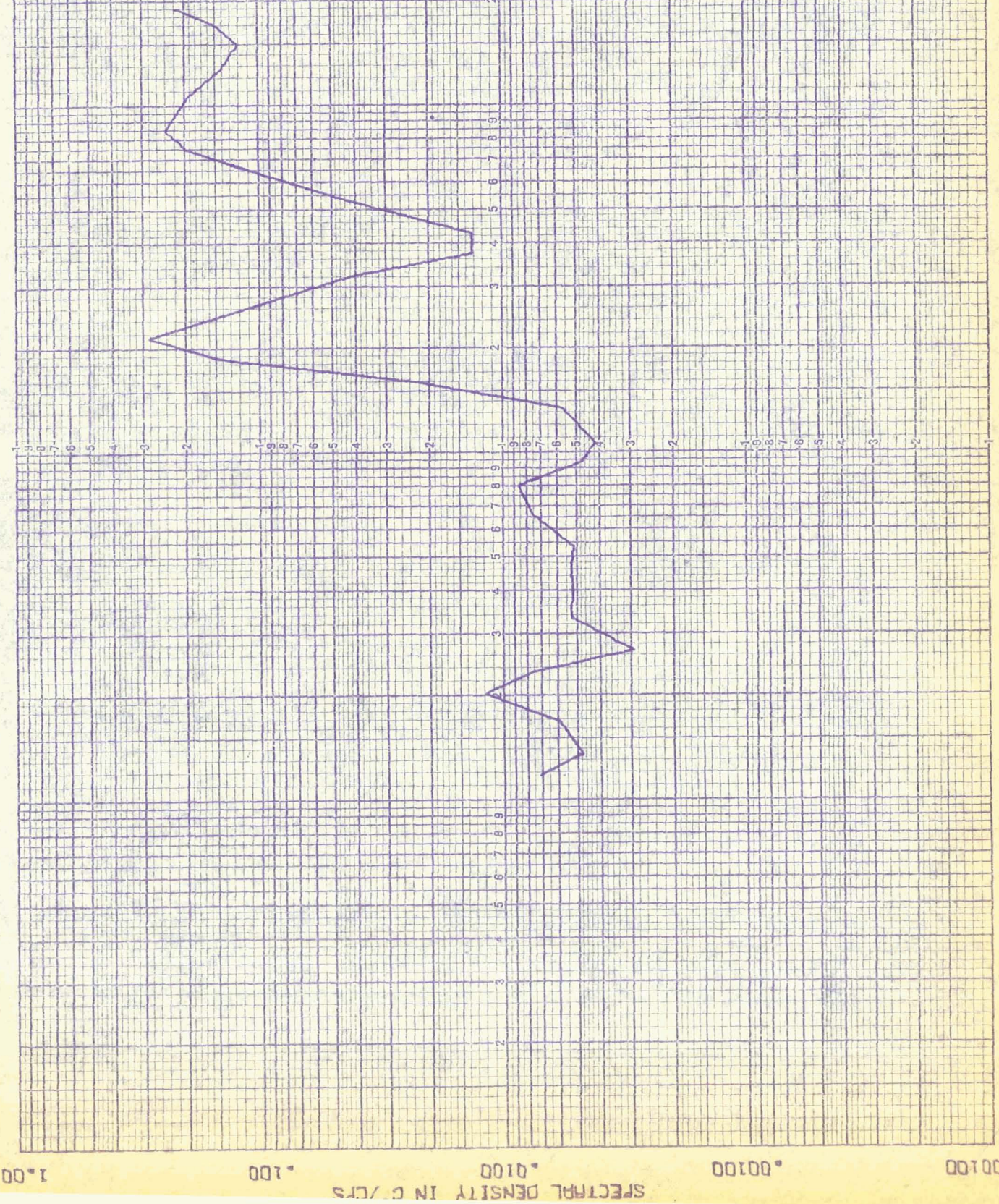
DSV-48 ACOUSTIC VIBRATION TEST

CHILLDOWN INVERTER ELECTRONIC ASSEMBLY P-68 Specimen 1

CONFIGURATION
P/N LAST MIN. OF RUN

NOTE
SEE PAGE B2 FOR
PICK-UP LOCATION

TEST CONDITIONS
TEST DATE 8-18-67
AXIS OF EXCITATION
PICK-UP NUMBER (6)
PICK-UP RESPONSE
INPUT ACCELERATION PER PAGE
RMS VALUE 21.9



ACOUSTIC VIBRATION TEST

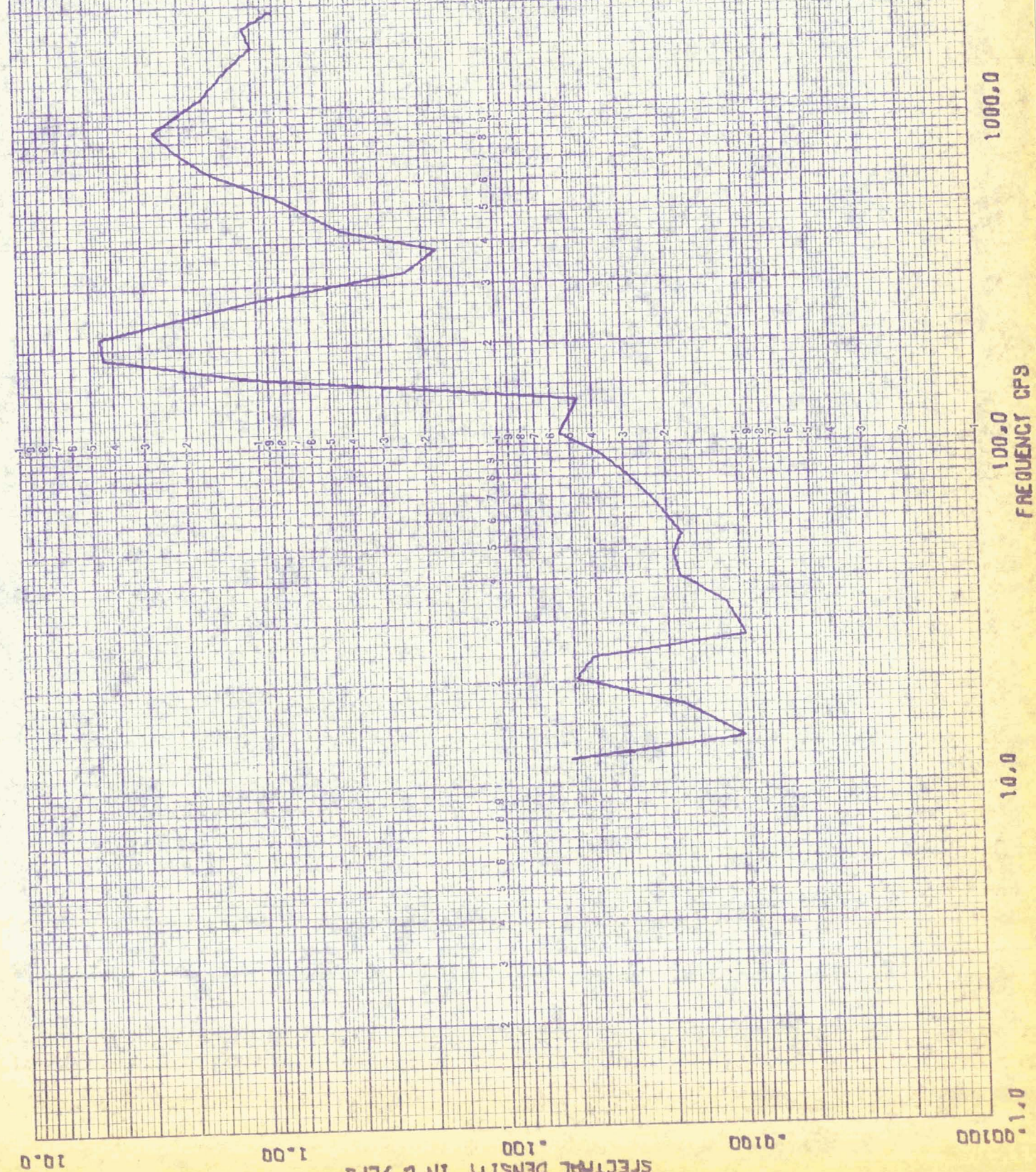
CHILLDOWN INVERTER ELECTRONIC ASSEMBLY P-68 SPECIMEN 2 S/N 15841

CONFIGURATION
P/N

NOTE
SEE PAGE _____ FOR
PICK-UP LOCATION

TEST CONDITIONS REVISED 9-13-67

TEST DATE	9-1-67
AXIS OF EXCITATION	
PICK-UP NUMBER	1
PICK-UP RESPONSE	
INPUT ACCELERATION PER PAGE	
RMS VALUE	53.4



ACOUSTIC VIBRATION TEST

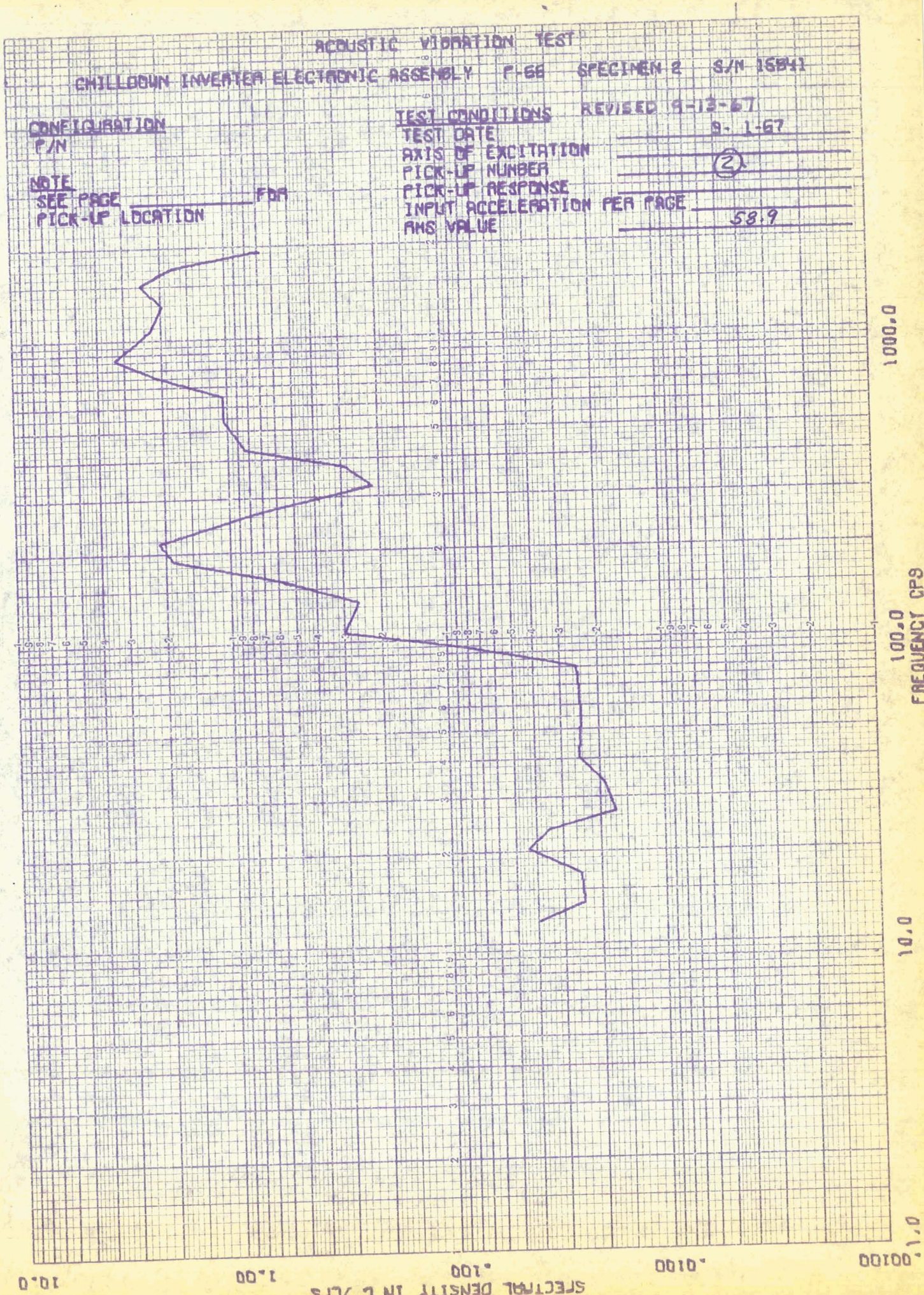
CHILLDOWN INVERTER ELECTRONIC ASSEMBLY F-68 SPECIMEN 2 S/N 15841

CONFIGURATION
P/N

NOTE
SEE PAGE _____ FOR
PICK-UP LOCATION

TEST CONDITIONS REVISED 9-13-67

TEST DATE 9-1-67
AXIS OF EXCITATION
PICK-UP NUMBER 2
PICK-UP RESPONSE
INPUT ACCELERATION PER PAGE
RMS VALUE 58.9



ACOUSTIC VIBRATION TEST

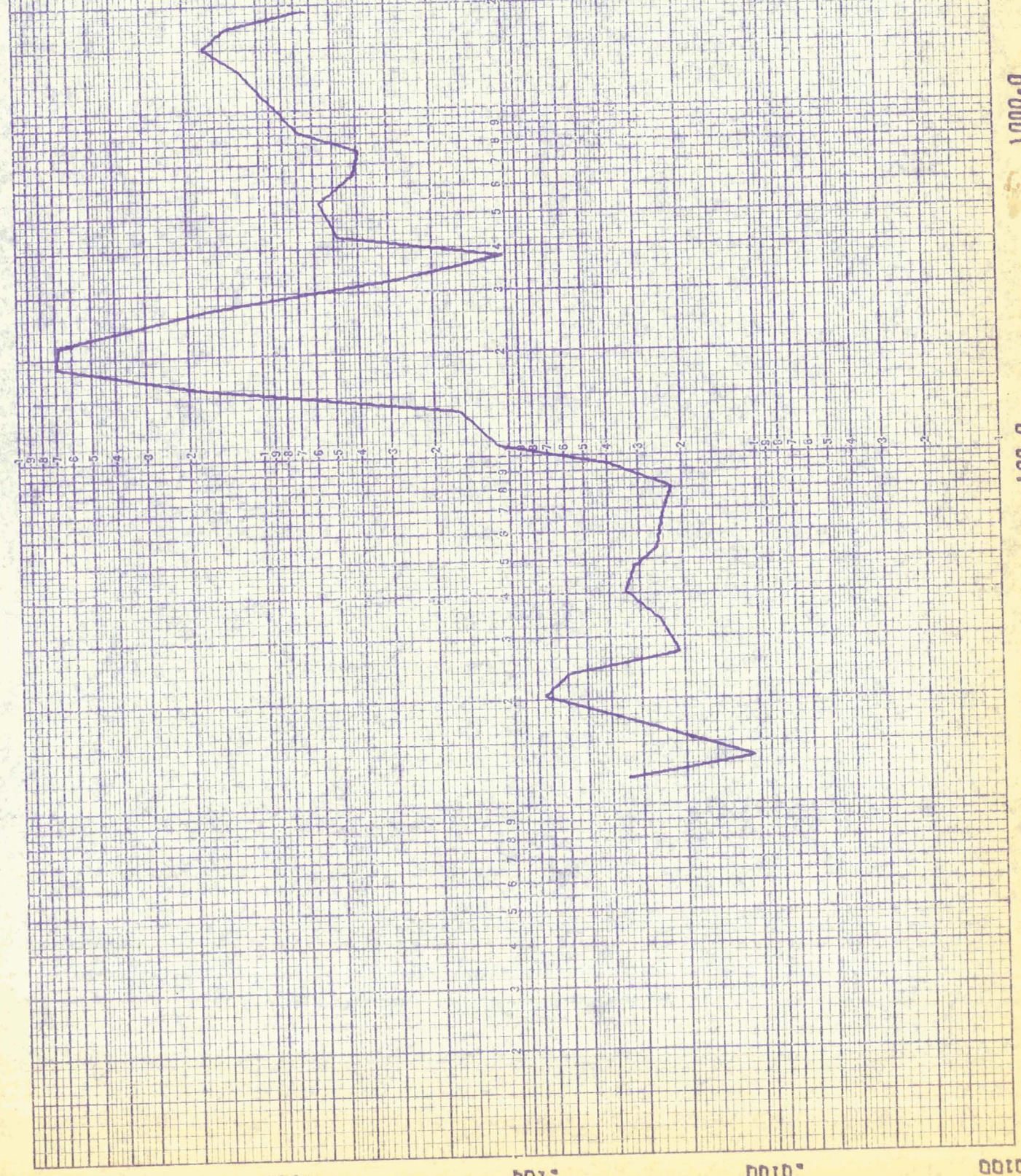
CHILLDOWN INVERTER ELECTRONIC ASSEMBLY P-66 SPECIMEN 2 S/N 15841

CONFIGURATION
P/N

NOTE
SEE PAGE _____ FOR
PICK-UP LOCATION

TEST CONDITIONS REVISED 9-13-67

TEST DATE	9-1-67
AXIS OF EXCITATION	
PICK-UP NUMBER	3
PICK-UP RESPONSE	
INPUT ACCELERATION PER PAGE	
RMS VALUE	47.4



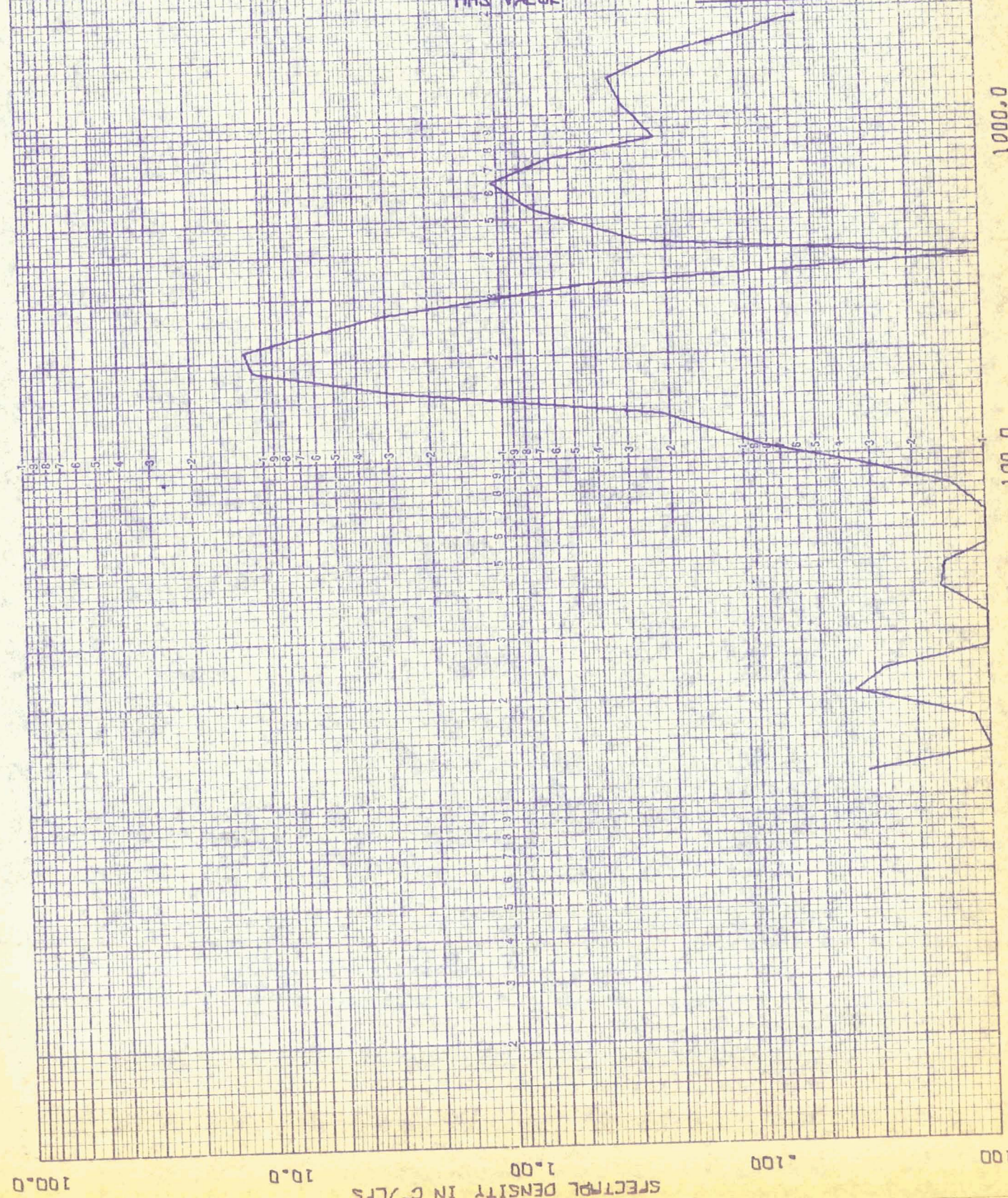
ACOUSTIC VIBRATION TEST

CHILLDOWN INVERTER ELECTRONIC ASSEMBLY P-66 SPECIMEN 2 S/N 16841

CONFIGURATION
P/N

NOTE
SEE PAGE _____ FOR
PICK-UP LOCATION

TEST CONDITIONS
TEST DATE 9-1-67
AXIS OF EXCITATION
PICK-UP NUMBER 4
PICK-UP RESPONSE
INPUT ACCELERATION PER PAGE
RMS VALUE 40.2



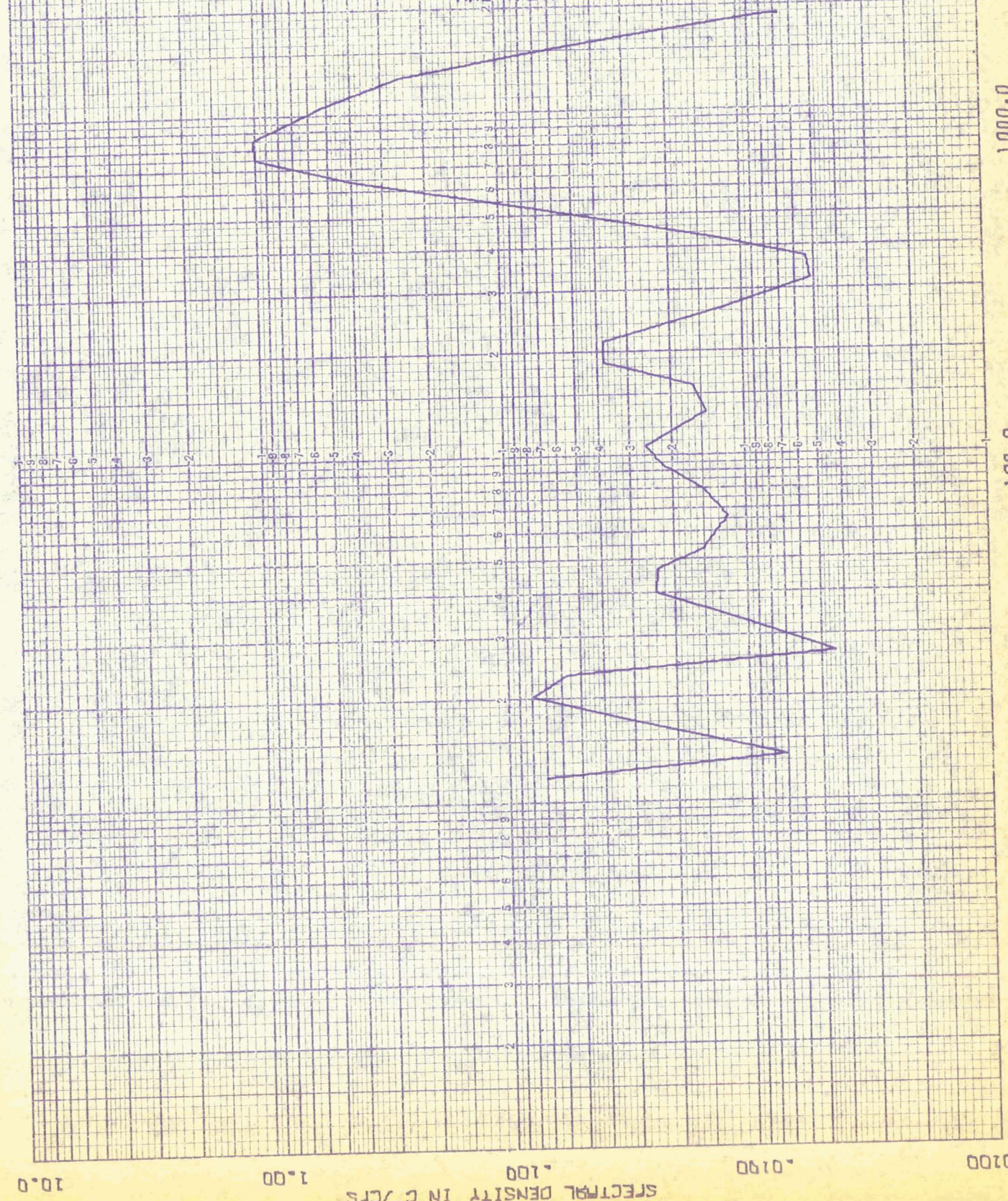
ACOUSTIC VIBRATION TEST

CHILLDOWN INVERTER ELECTRONIC ASSEMBLY F-66 SPECIMEN 2 S/N 16841

CONFIGURATION
P/N

NOTE
SEE PAGE _____ FOR
PICK-UP LOCATION

TEST CONDITIONS
TEST DATE 9-1-67
AXIS OF EXCITATION
PICK-UP NUMBER 5
PICK-UP RESPONSE
INPUT ACCELERATION PER PAGE
RMS VALUE 28.1



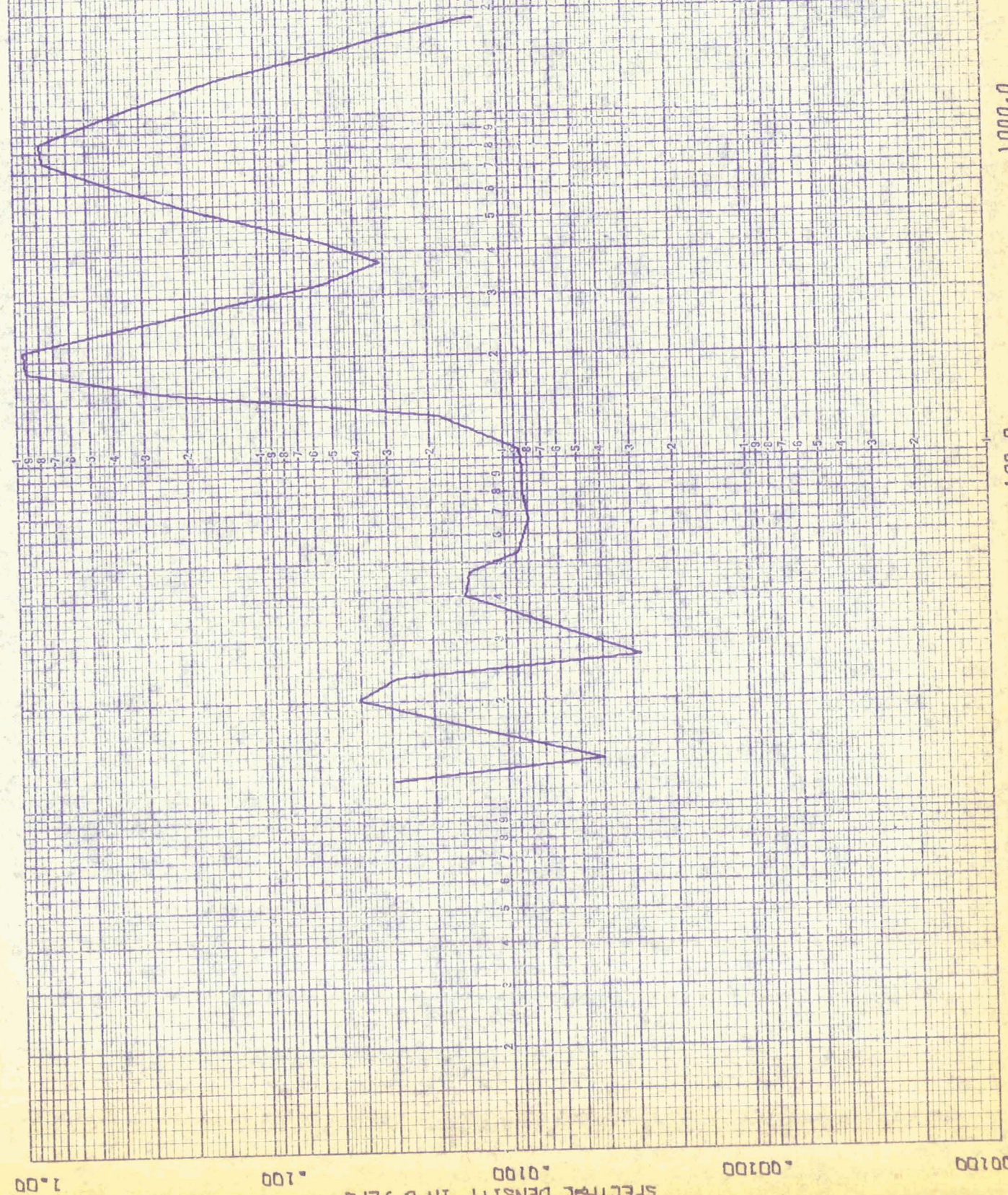
ACOUSTIC VIBRATION TEST

CHILLDOWN INVERTER ELECTRONIC ASSEMBLY P-56 SPECIMEN 2 S/N 15841

CONFIGURATION
P/N

NOTE
SEE PAGE _____ FOR
PICK-UP LOCATION

TEST CONDITIONS
TEST DATE 9-1-67
AXIS OF EXCITATION
PICK-UP NUMBER 6
PICK-UP RESPONSE
INPUT ACCELERATION PER PAGE
RMS VALUE 22.4



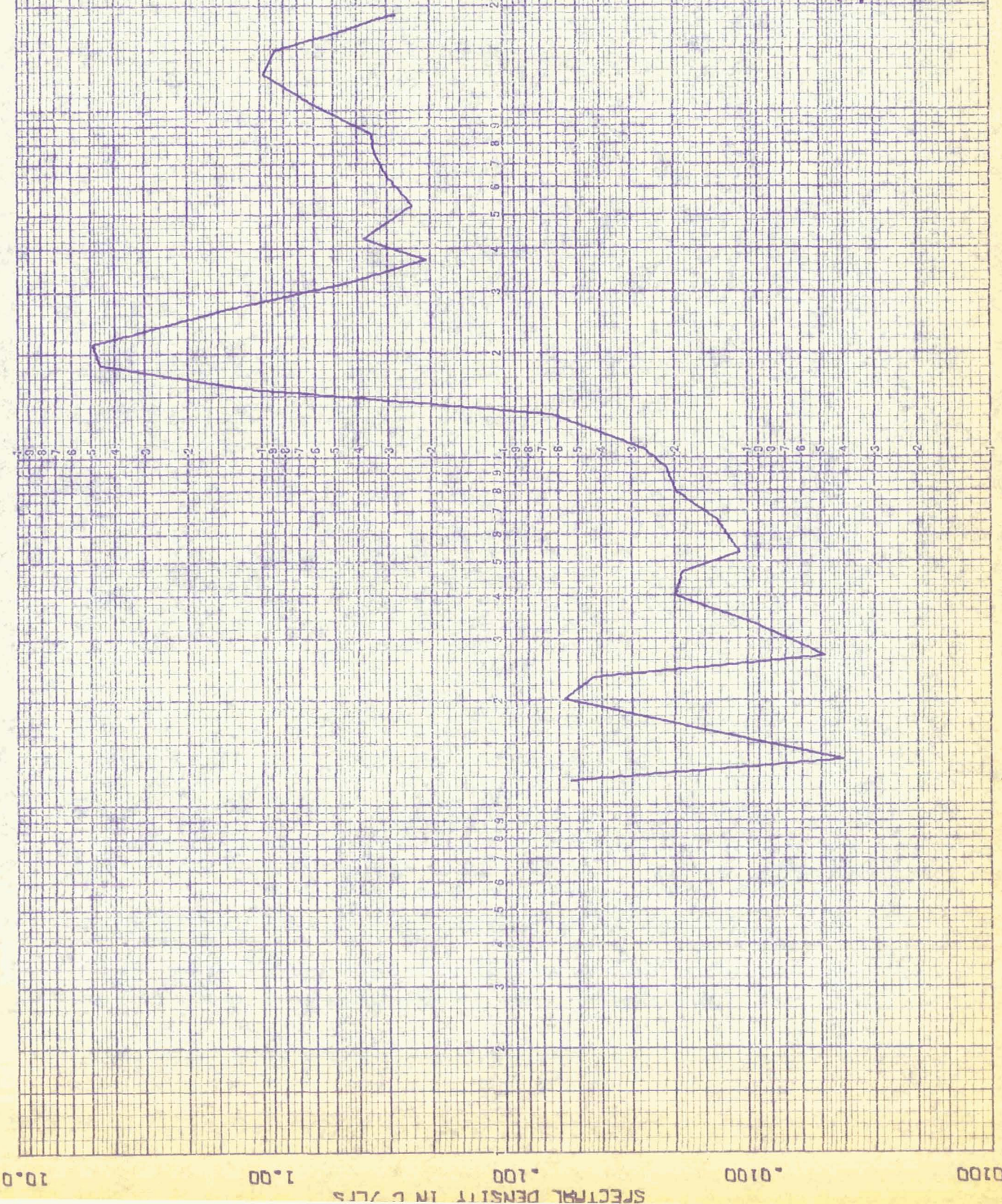
ACOUSTIC VIBRATION TEST

CHILLDOWN INVERTER ELECTRONIC ASSEMBLY P-66 SPECIMEN 2 S/N 15841

CONFIGURATION
P/N

NOTE
SEE PAGE _____ FOR
PICK-UP LOCATION

TEST CONDITIONS
TEST DATE 9- 1-67
AXIS OF EXCITATION
PICK-UP NUMBER 7
PICK-UP RESPONSE
INPUT ACCELERATION PER PAGE
RMS VALUE 37.9



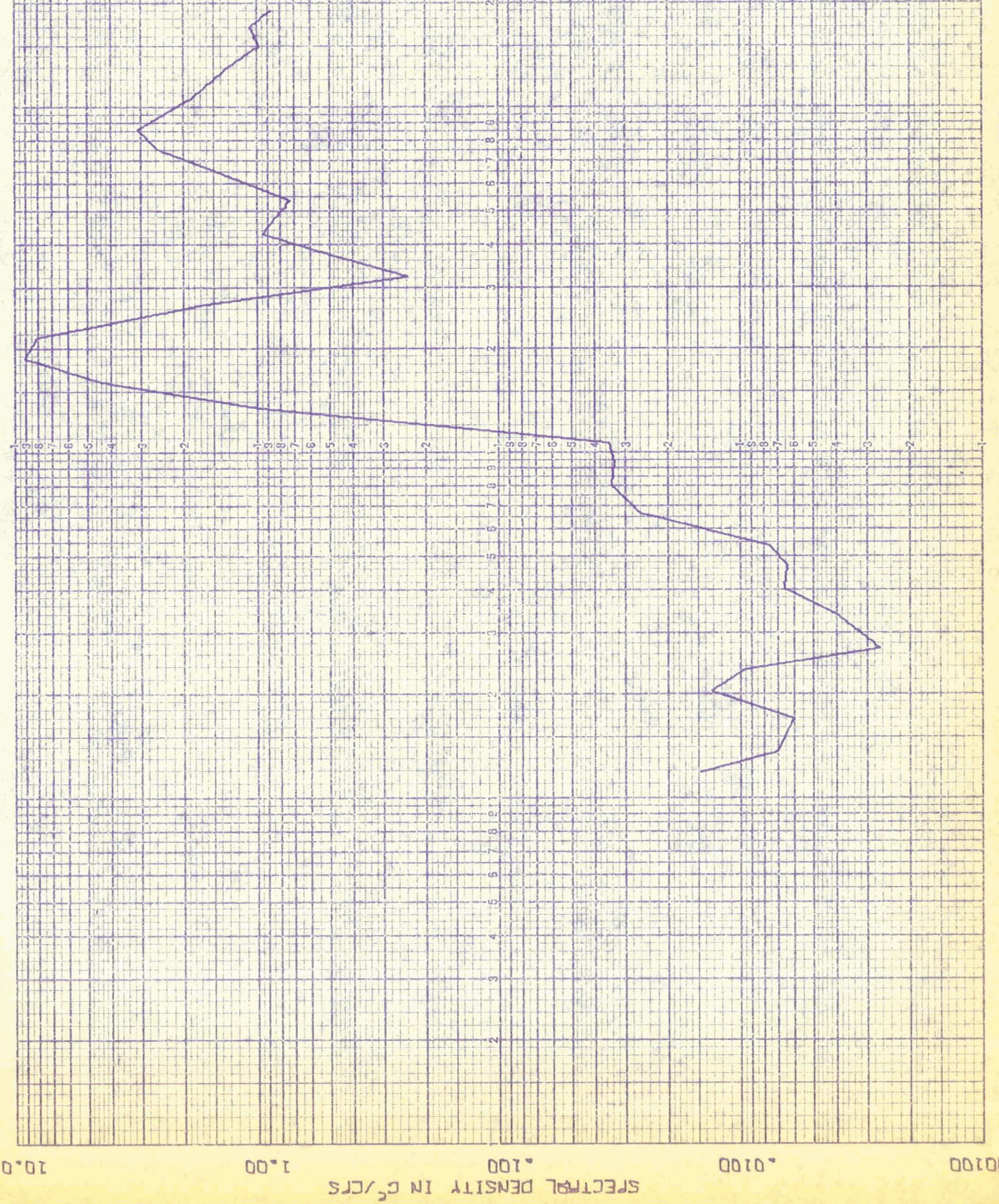
ACOUSTIC VIBRATION TEST

CHILLDOWN INVERTER ELECTRONIC ASSEMBLY P-66 SPECIMEN 3 S/N 15842

CONFIGURATION
P/N

NOTE
SEE PAGE _____ FOR
PICK-UP LOCATION

TEST CONDITIONS
TEST DATE 9-1-67
AXIS OF EXCITATION
PICK-UP NUMBER 1
PICK-UP RESPONSE
INPUT ACCELERATION PER PAGE
RMS VALUE 59.1



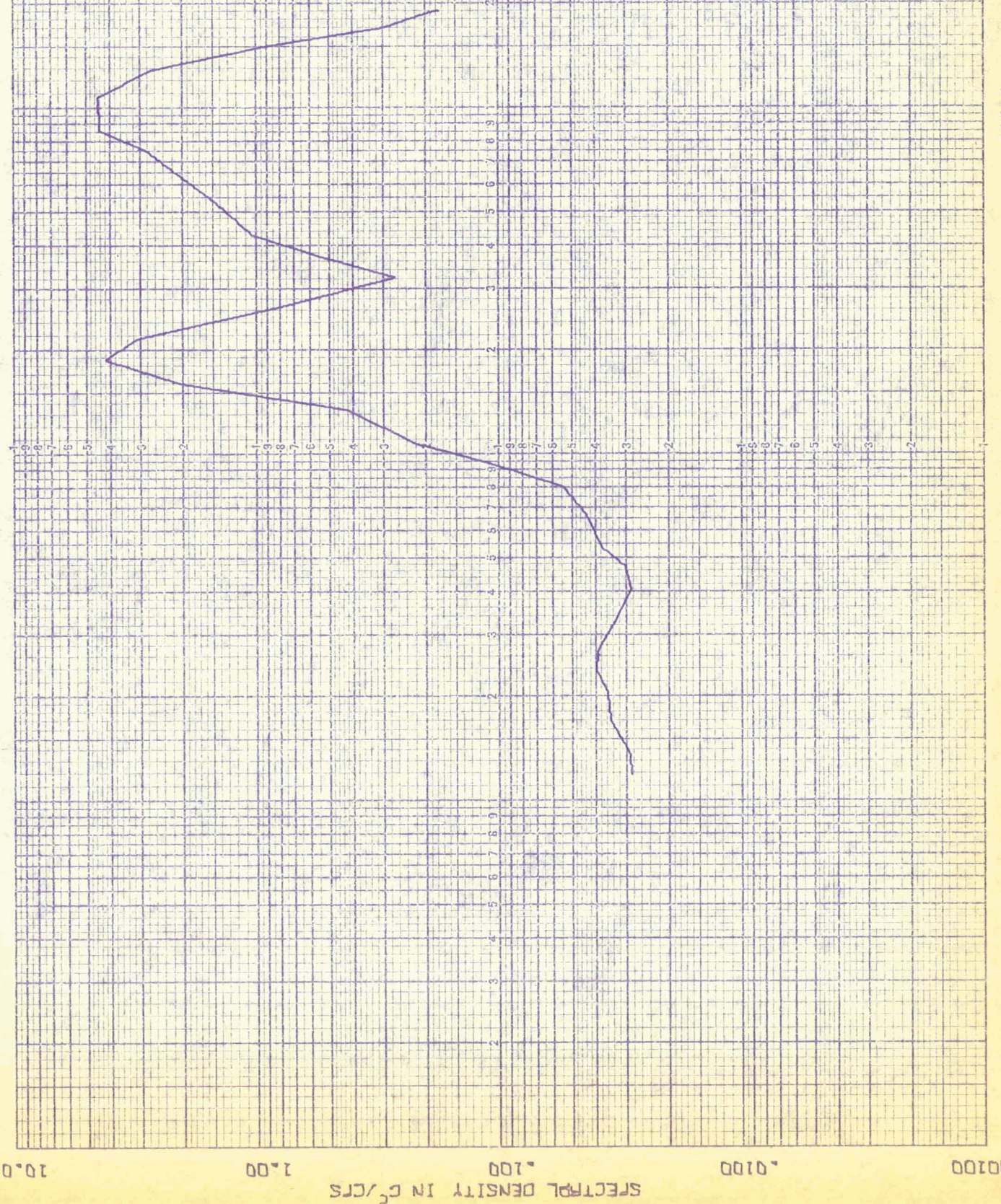
ACOUSTIC VIBRATION TEST

CHILLDOWN INVERTER ELECTRONIC ASSEMBLY P-66 SPECIMEN 3 S/N 15842

CONFIGURATION
P/N

NOTE
SEE PAGE _____ FOR
PICK-UP LOCATION

TEST CONDITIONS
TEST DATE 9-1-67
AXIS OF EXCITATION
PICK-UP NUMBER 2
PICK-UP RESPONSE
INPUT ACCELERATION PER PAGE
RMS VALUE 63.3



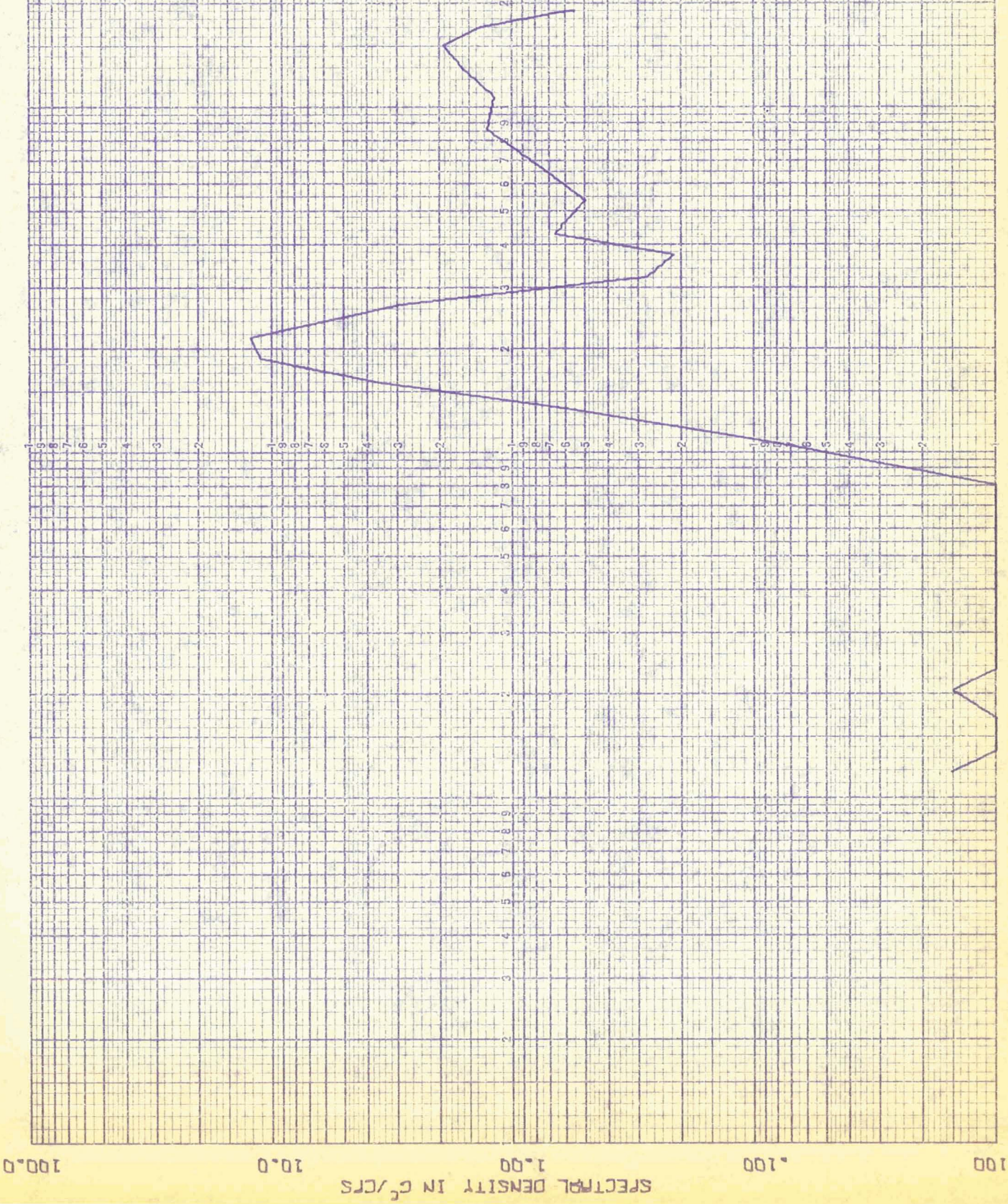
ACOUSTIC VIBRATION TEST

CHILLDOWN INVERTER ELECTRONIC ASSEMBLY P-66 SPECIMEN 3 S/N 15842

CONFIGURATION
P/N

NOTE
SEE PAGE _____ FOR
PICK-UP LOCATION

TEST CONDITIONS
TEST DATE 9-1-67
AXIS OF EXCITATION
PICK-UP NUMBER 3
PICK-UP RESPONSE
INPUT ACCELERATION PER PAGE
RMS VALUE 55.4



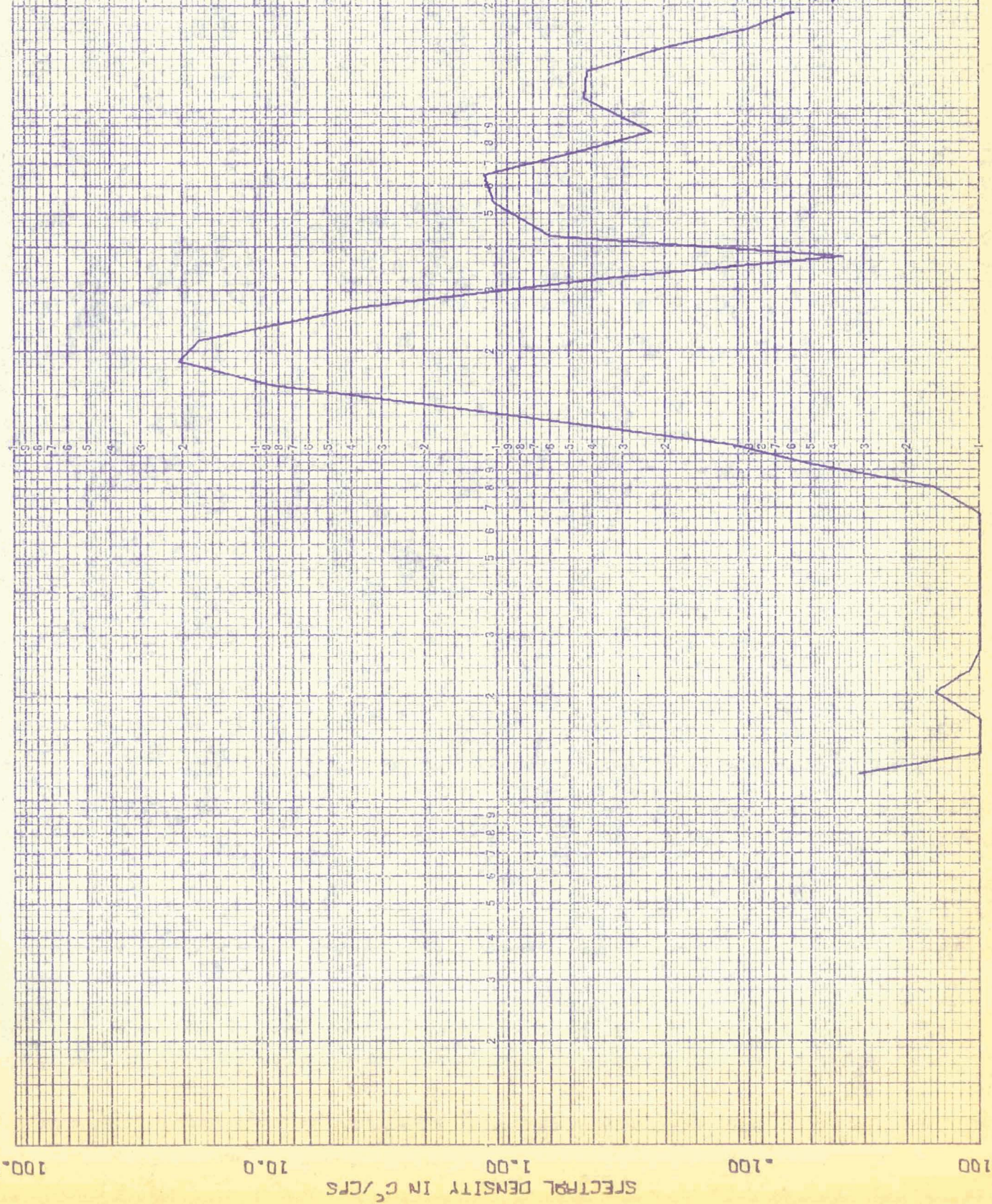
ACOUSTIC VIBRATION TEST

CHILLDOWN INVERTER ELECTRONIC ASSEMBLY P-66 SPECIMEN 3 S/N 16842

CONFIGURATION
P/N

NOTE
SEE PAGE _____ FOR
PICK-UP LOCATION

TEST CONDITIONS
TEST DATE 9-1-67
AXIS OF EXCITATION
PICK-UP NUMBER 4
PICK-UP RESPONSE
INPUT ACCELERATION PER PAGE
RMS VALUE 49.2



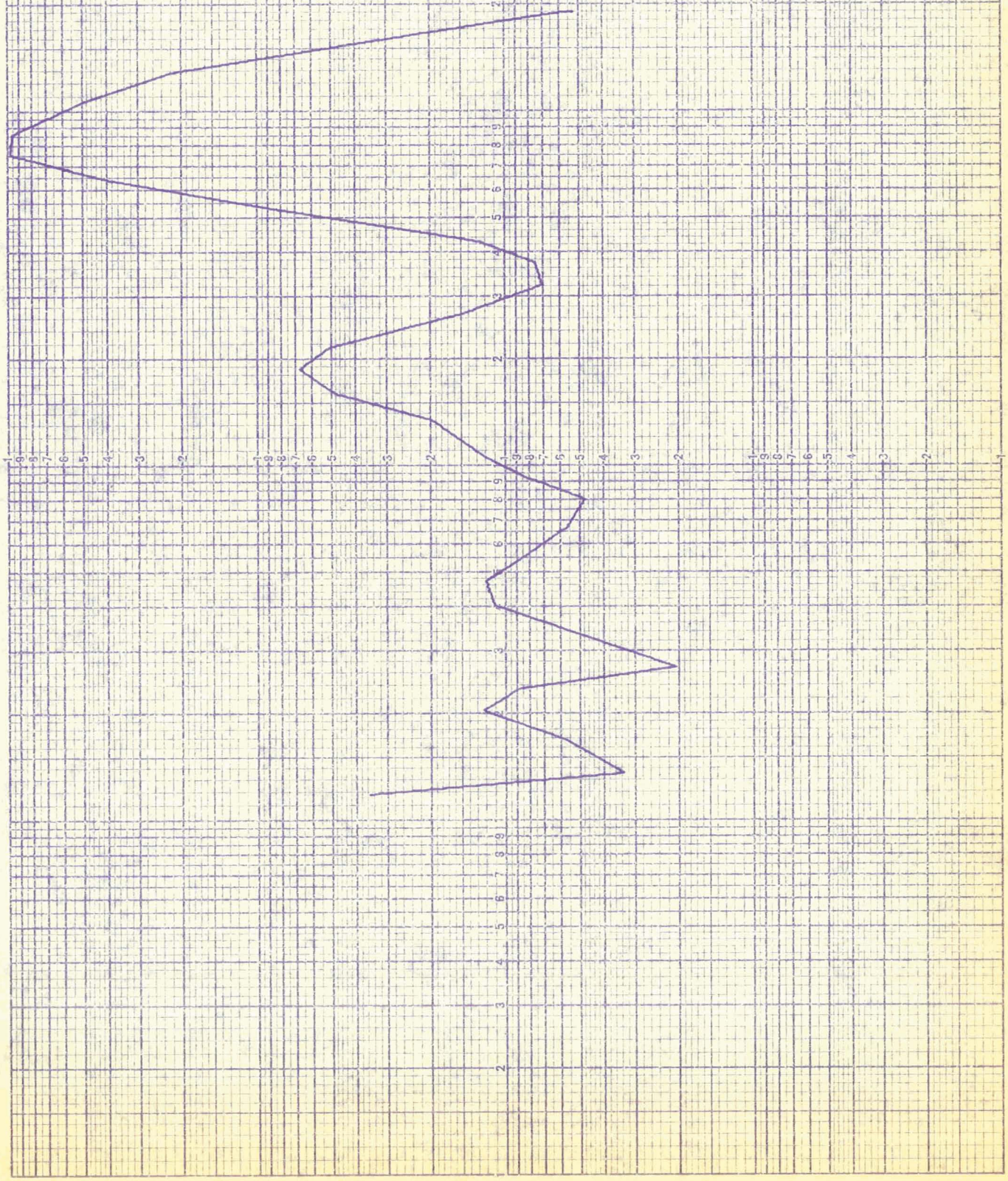
ACOUSTIC VIBRATION TEST

CHILLDOWN INVERTER ELECTRONIC ASSEMBLY P-66 SPECIMEN 3 S/N 15842

CONFIGURATION
P/N

NOTE
SEE PAGE _____ FOR
PICK-UP LOCATION

TEST CONDITIONS
TEST DATE 9-1-67
AXIS OF EXCITATION
PICK-UP NUMBER 5
PICK-UP RESPONSE
INPUT ACCELERATION PER PAGE
RMS VALUE 22.6



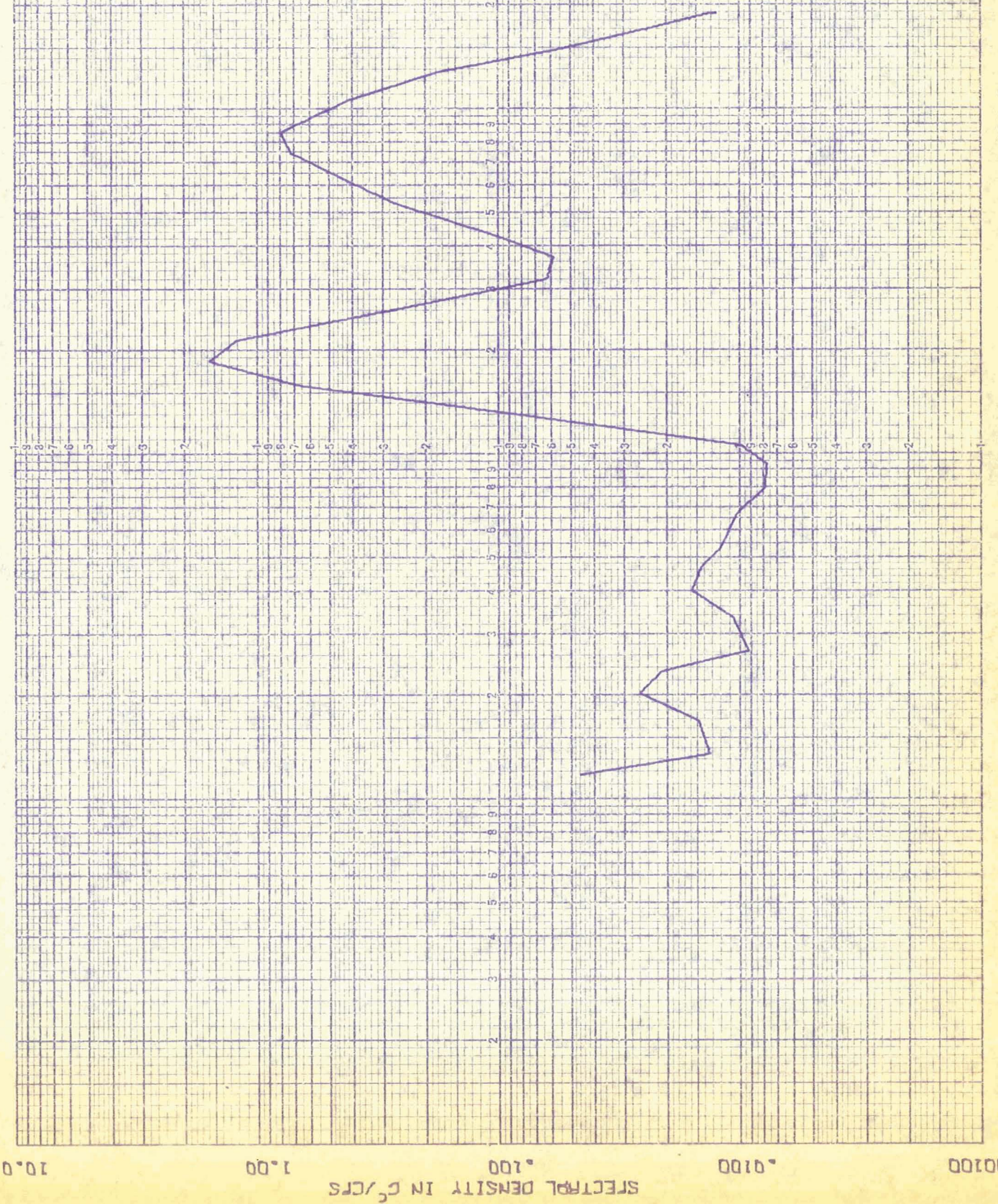
ACOUSTIC VIBRATION TEST

CHILLDOWN INVERTER ELECTRONIC ASSEMBLY P-66 SPECIMEN 3 S/N 15848

CONFIGURATION
P/N

NOTE
SEE PAGE _____ FOR
PICK-UP LOCATION

TEST CONDITIONS
TEST DATE 9-1-67
AXIS OF EXCITATION
PICK-UP NUMBER 6
PICK-UP RESPONSE
INPUT ACCELERATION PER PAGE
RMS VALUE 24.6



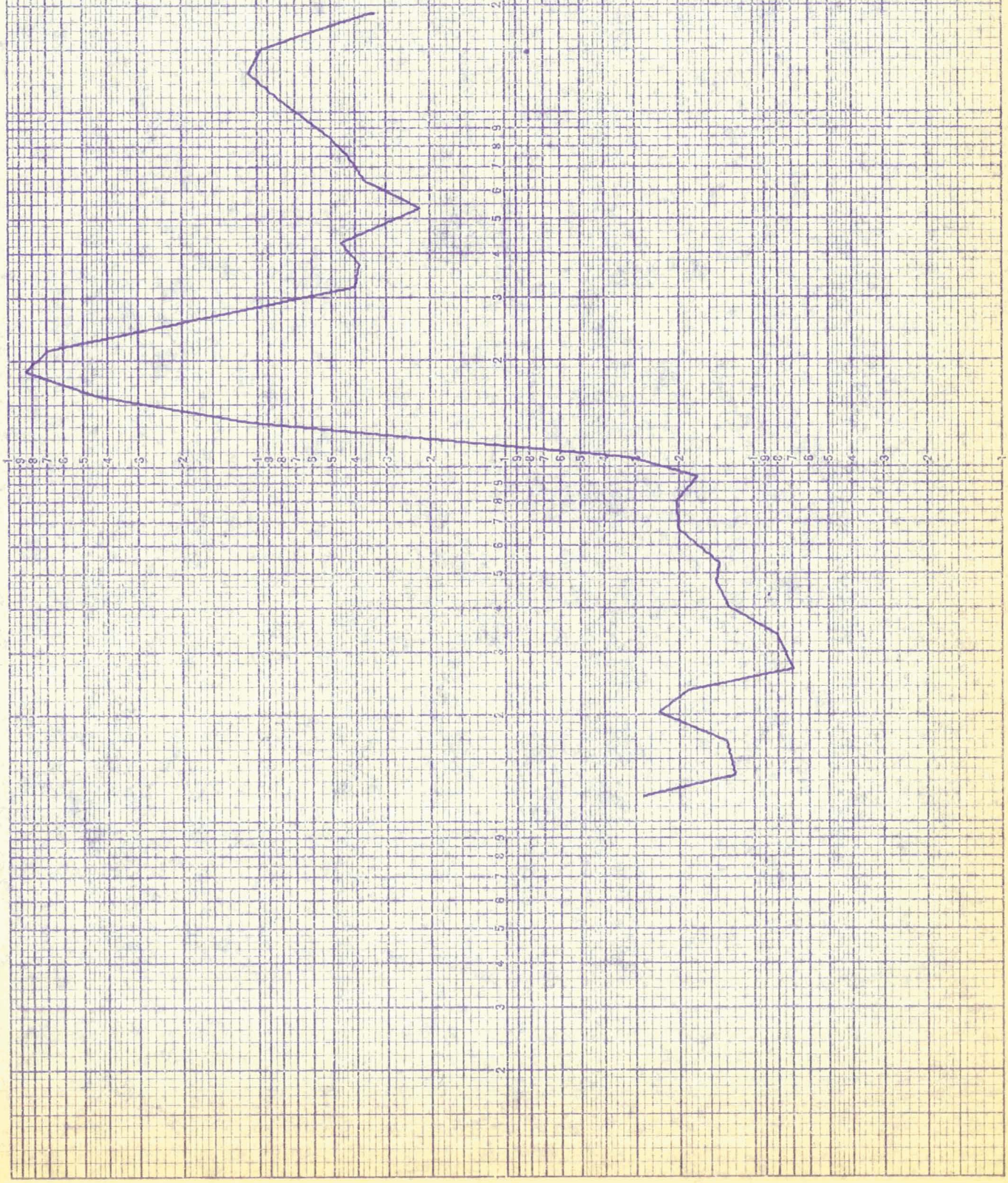
ACOUSTIC VIBRATION TEST

CHILLDOWN INVERTER ELECTRONIC ASSEMBLY P-66 SPECIMEN 3 S/N 15842

CONFIGURATION
P/N

NOTE
SEE PAGE _____ FOR
PICK-UP LOCATION

TEST CONDITIONS
TEST DATE 9-1-67
AXIS OF EXCITATION
PICK-UP NUMBER 7
PICK-UP RESPONSE
INPUT ACCELERATION PER PAGE
RMS VALUE 44.2



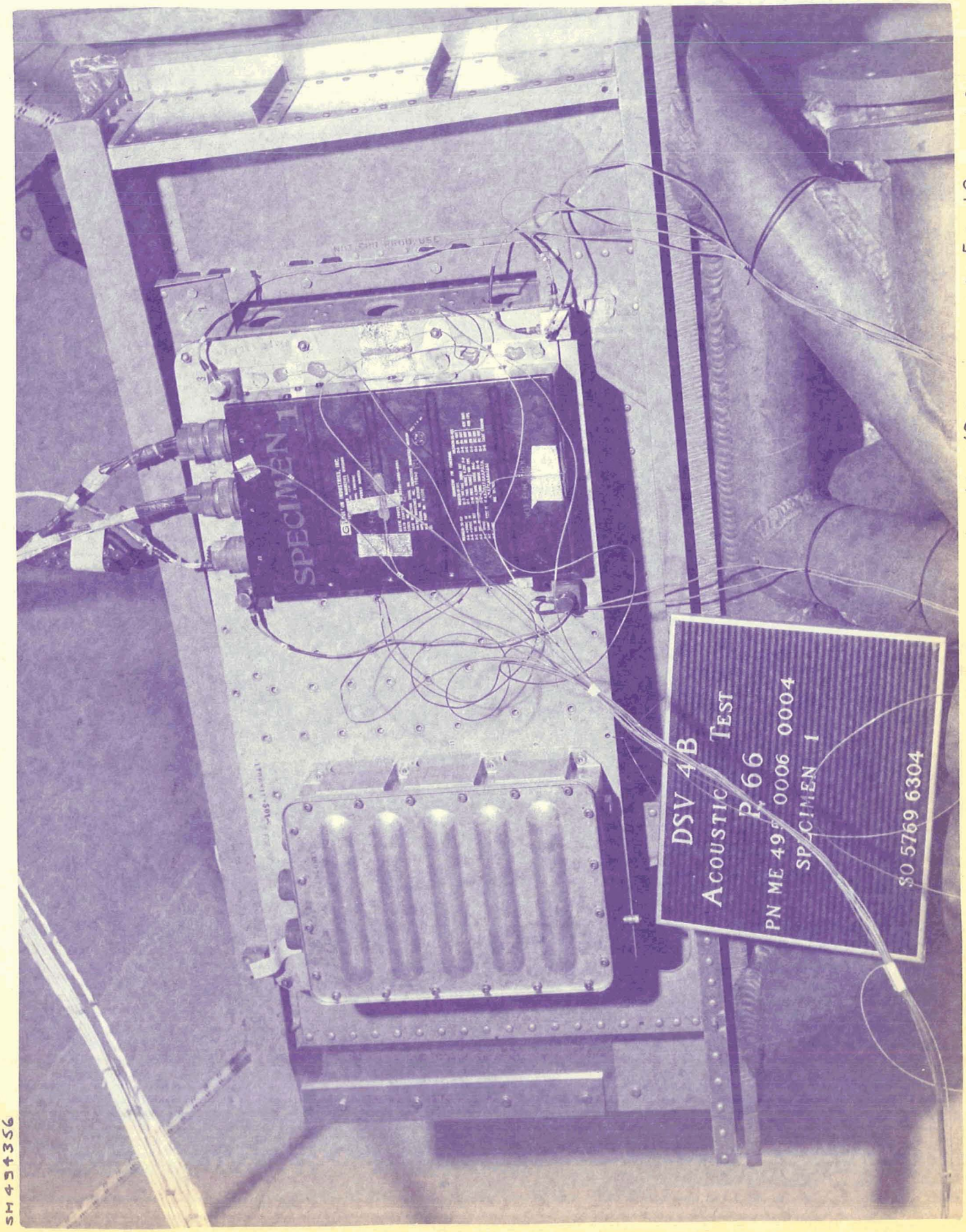
FORM 25-S-1
(REV. 8-53)

PREPARED BY: Rj...
CHECKED BY:
DATE: 8-29-67
TITLE: CHILLDOWN INVERTER ACOUSTICAL TEST

DOUGLAS AIRCRAFT COMPANY, INC.

MISSILE & SPACE SYSTEMS DIVISION

PAGE: B-1
MODEL: DSV-4B
TM-R6065-2
REPORT NO.:



INSTRUMENTED SPECIMEN No. 1 READY FOR EXPOSURE TO 160 dB ENVIRONMENT FOR 18 MINUTES

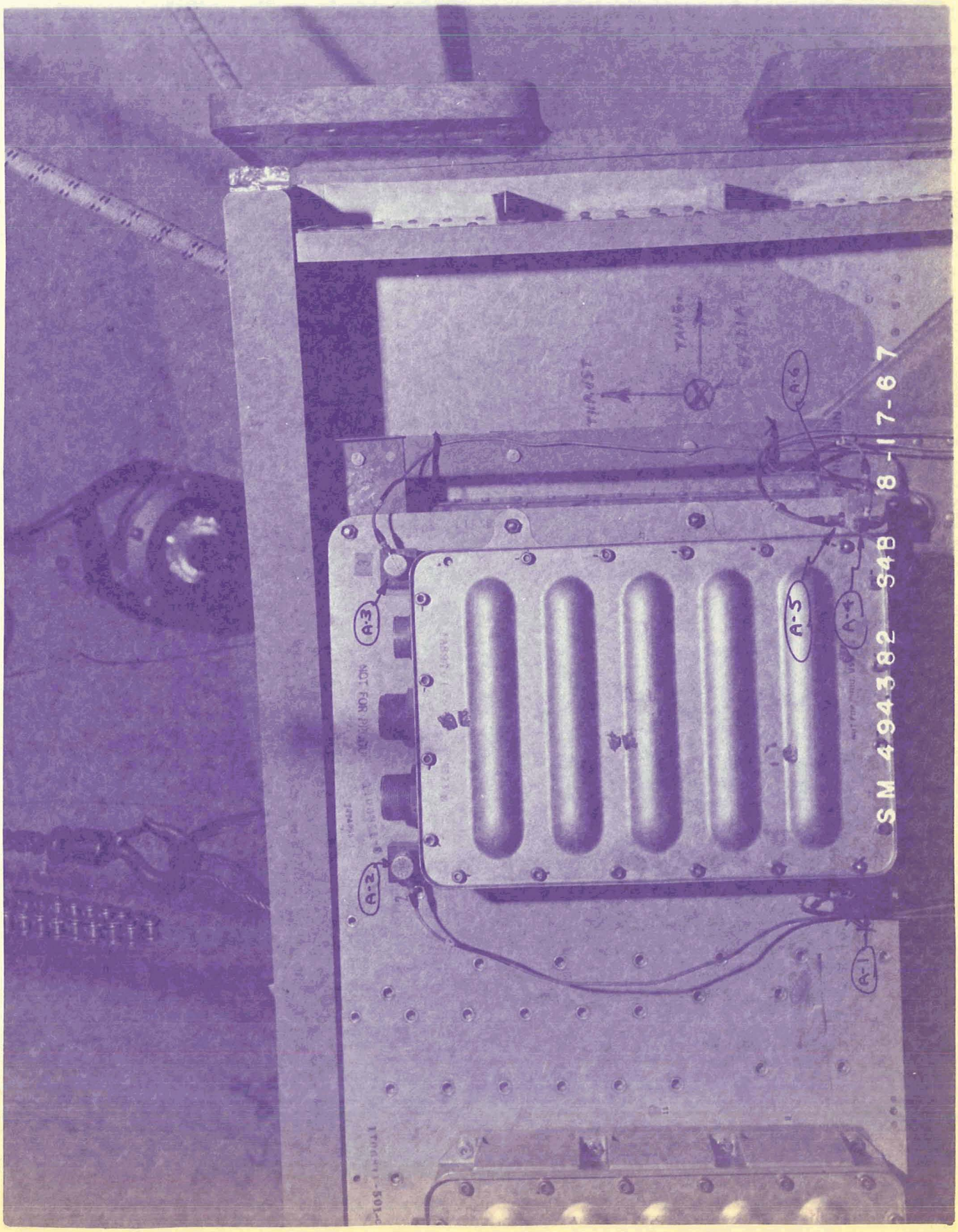
SM 34356

FORM 25-S-1
(REV. 8-53)

PREPARED BY: Ray...
CHECKED BY:
DATE: 8-29-67
TITLE: CHILLDOWN INVERTER ACOUSTICAL TEST

DOUGLAS AIRCRAFT COMPANY, INC.
MISSILES & SPACE SYSTEMS DIVISION

PAGE: B-2
MODEL: DSV-4B
REPORT NO.: TM-R-6065-2



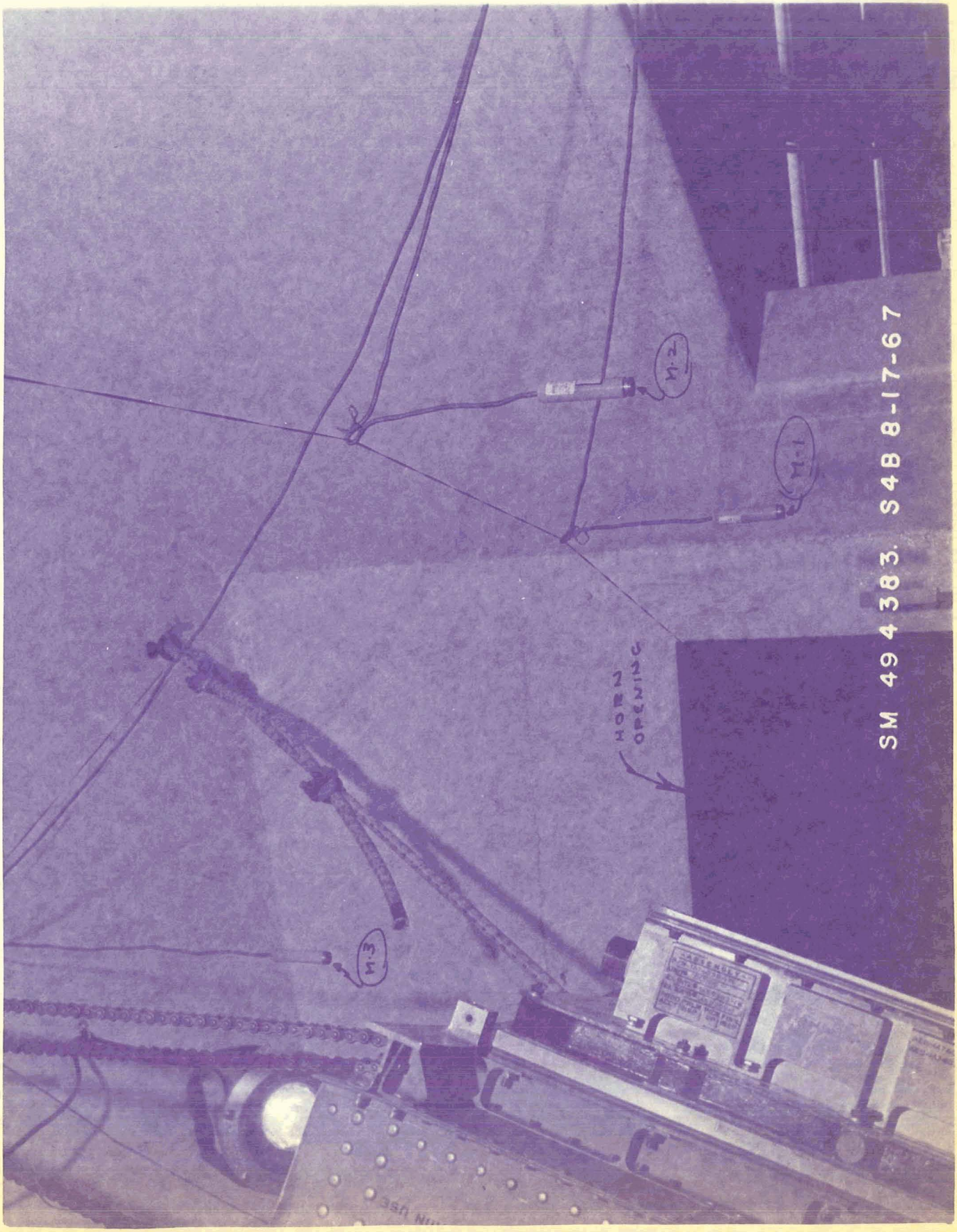
ACCELEROMETER LOCATIONS FOR ALL TEST PHASES (SHOWN WITH DUMMY SPECIMEN IN PLACE FOR EQUALIZATION RUNS) WITH SPECIMEN No. 1

FORM 25-S-1
(REV. 8-53)

PREPARED BY: Rg...
CHECKED BY:
DATE: 8-29-67
TITLE: CHILLDOWN INVERTER ACOUSTICAL TEST

DOUGLAS AIRCRAFT COMPANY, INC.
MISSILE & SPACE SYSTEMS DIVISION

PAGE: B-3
MODEL: DSV-4B
TM-R6065-2
REPORT NO.:



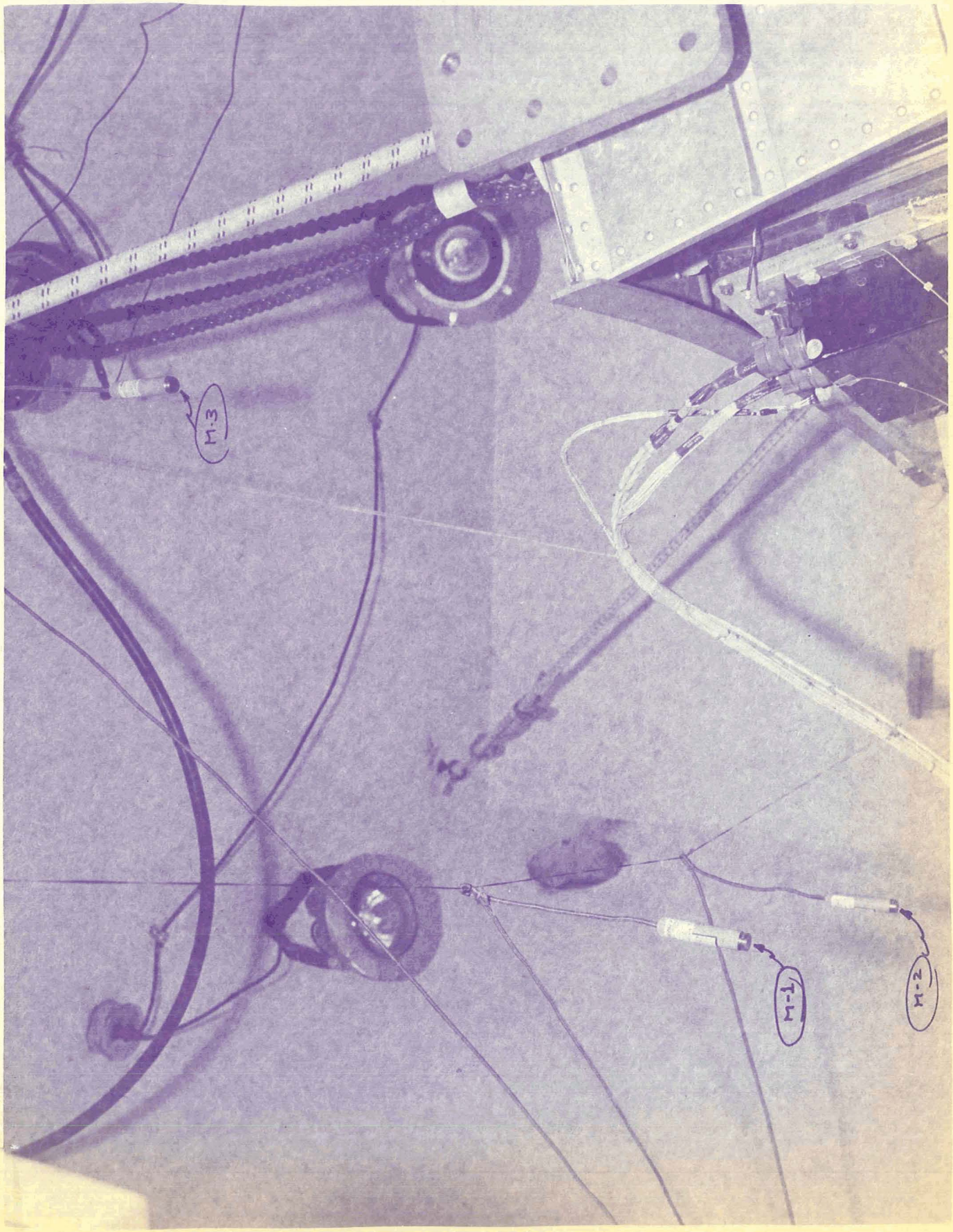
MICROPHONE PLACEMENT AND NOISE SOURCE HORN OPENING FOR TEST OF SPECIMEN No. 1

FORM 25-S-1
(REV. 8-53)

PREPARED BY: Raf...
CHECKED BY:
DATE: 8-29-67
TITLE: CHILLDOWN INVERTER ACOUSTICAL TEST

DOUGLAS AIRCRAFT COMPANY, INC.
MISSILE & SPACE SYSTEMS DIVISION

PAGE: B 4
MODEL: DSV-4B
REPORT NO.: TM-R 6065-2



MICROPHONES PLACEMENT, AS VIEWED FROM NOISE SOURCE HORN OPENING, FOR TEST NO. 1 OF SPECIMEN 2

SM 494357

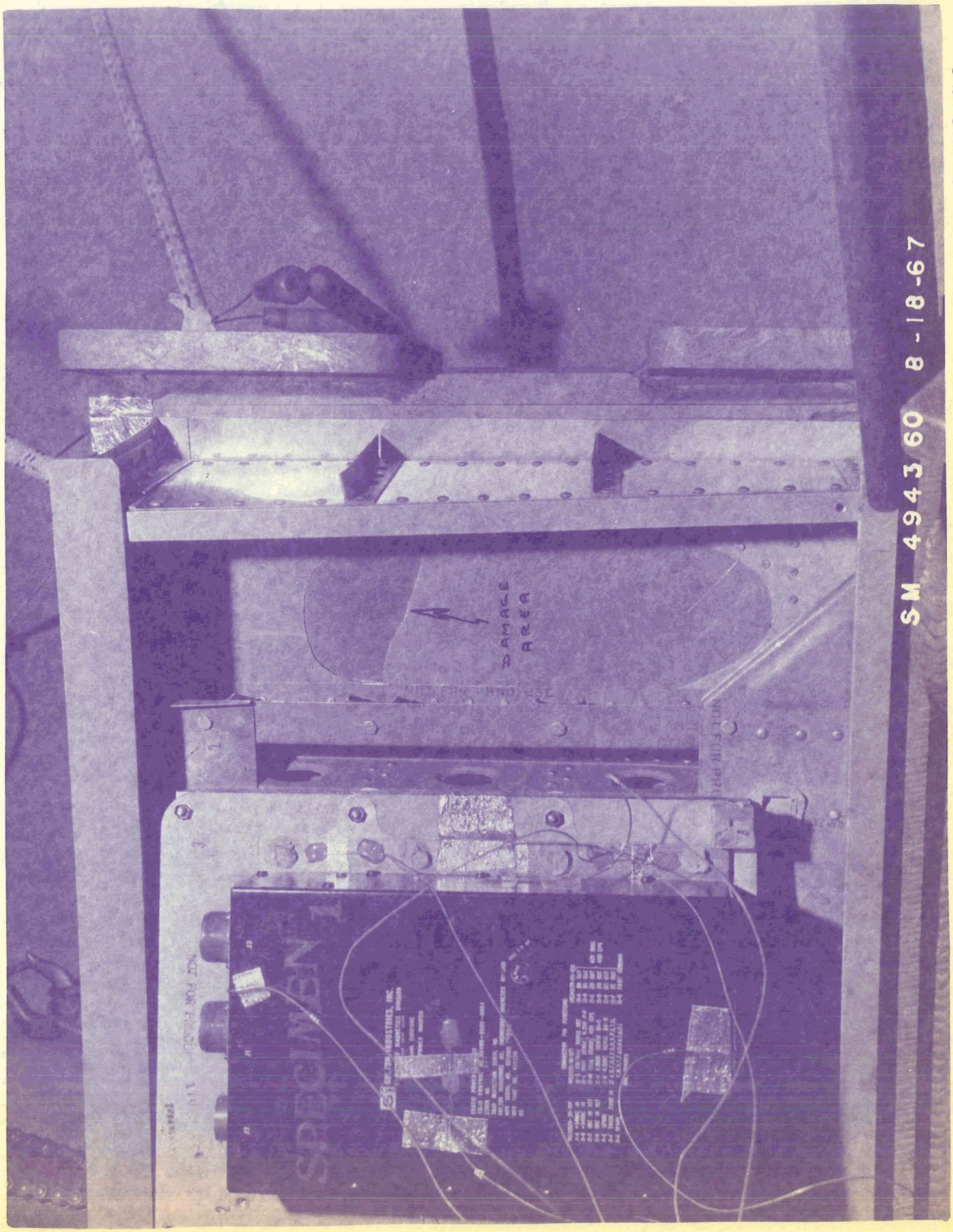
FORM 25-S-1
(REV. 8-53)

PREPARED BY: Lj...
CHECKED BY:
DATE: 8-29-67
TITLE: CHILLDOWN INVERTER ACOUSTICAL TEST

DOUGLAS AIRCRAFT COMPANY, INC.

MISSILE & SPACE SYSTEMS DIVISION

PAGE: B5
MODEL: DSV-4B
TM-R6065-2
REPORT NO.:



DAMAGE TO UPSTREAM SECTION OF BACK-UP STRUCTURE PANEL AFTER 18-MINUTE EXPOSURE TO 160 dB OVERALL SPL DURING TEST OF SPECIMEN No. 1

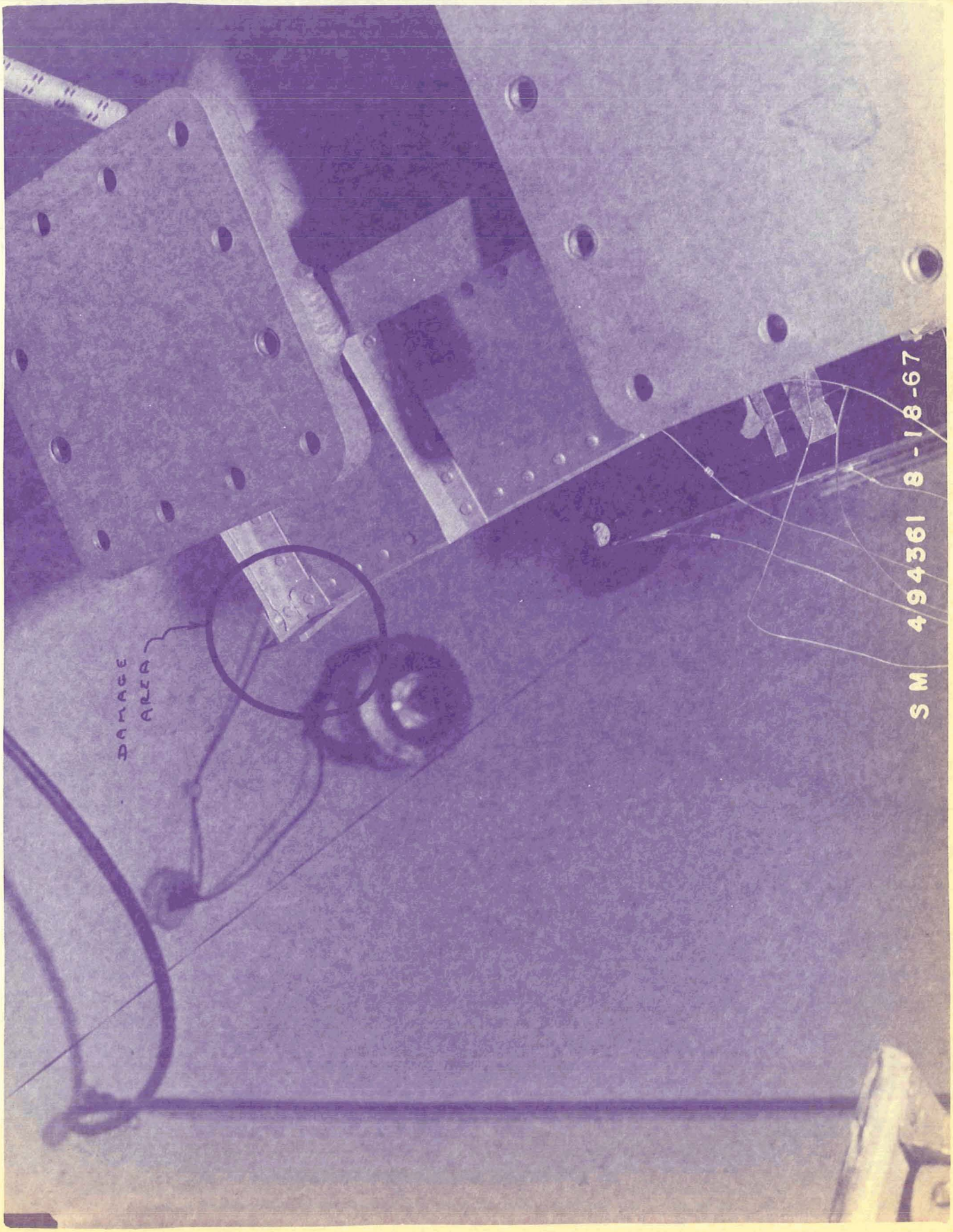
FORM 25-S-1
(REV. 8-53)

PREPARED BY: Rg...
CHECKED BY:
DATE: 8-29-67
TITLE: CHILLDOWN INVERTER ACOUSTICAL TEST

DOUGLAS AIRCRAFT COMPANY, INC.

MISSILE & SPACE SYSTEMS DIVISION

PAGE: B6
MODEL: DSV-4B
REPORT NO.: TM-R6065-2



DAMAGE TO UPSTREAM ANGLE OF BACK-UP STRUCTURE AFTER 18-MINUTE EXPOSURE TO 160 dB OVERALL SPL

FORM 25-S-1
(REV. 8-53)

PREPARED BY: Raj...
CHECKED BY:
DATE: 8-29-67
TITLE: CHILLDOWN INVERTER ACOUSTICAL TEST

DOUGLAS AIRCRAFT COMPANY, INC.
MISSILE & SPACE SYSTEMS DIVISION

PAGE: B7
MODEL: DSV-4B
TM-R6065-2
REPORT NO.:

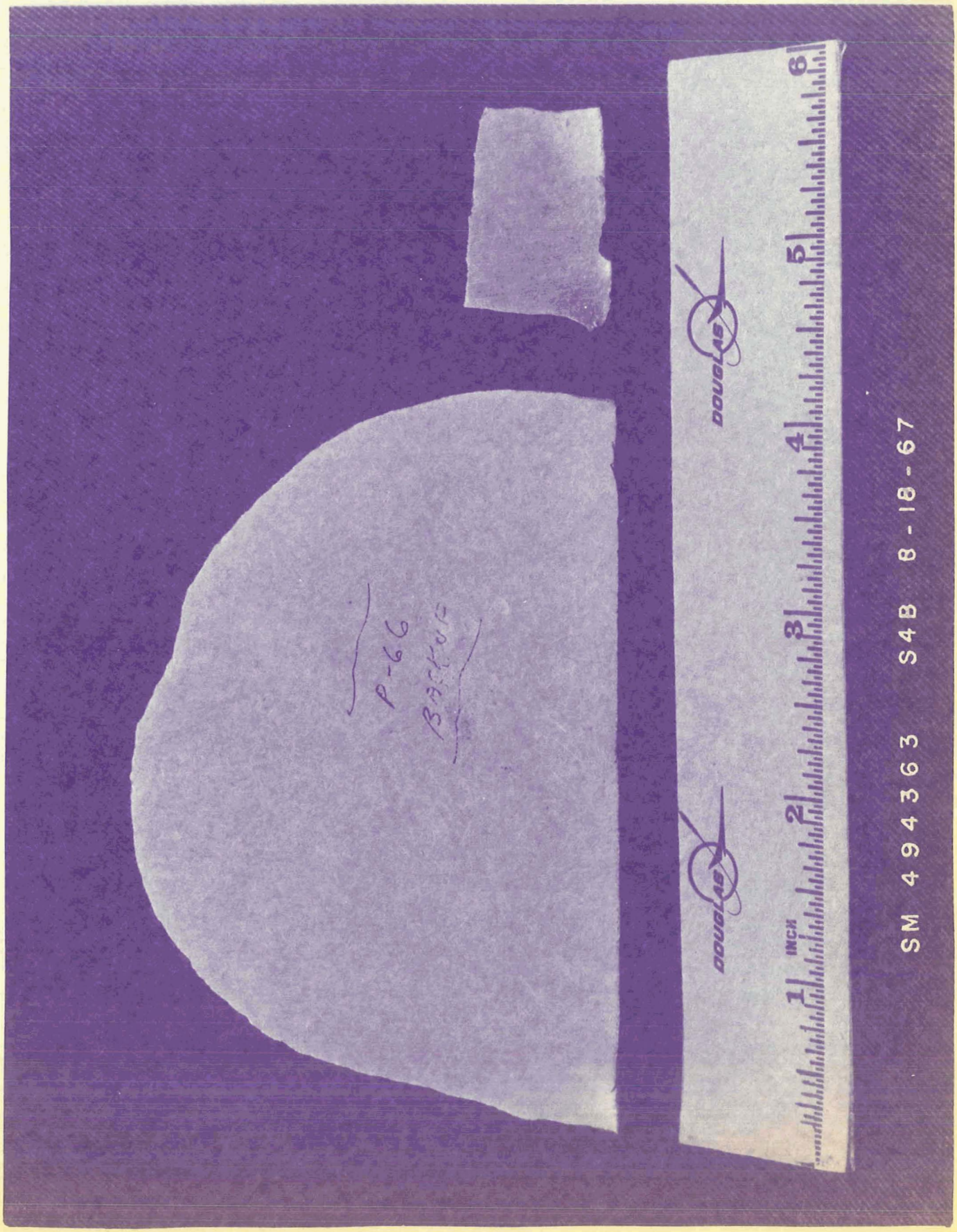
APPROXIMATE LOCATION OF DAMAGE TO DOWNSTREAM SECTION OF BACK-UP STRUCTURE PANEL AFTER 18-MINUTE TEST RUN (DAMAGED AREA HIDDEN BY FIXTURE)

FORM 25-S-1
(REV. 8-53)

PREPARED BY: Rg...
CHECKED BY:
DATE: 8-29-67
TITLE: CHILLDOWN INVERTER ACOUSTICAL TEST

DOUGLAS AIRCRAFT COMPANY, INC.
MISSILE & SPACE SYSTEMS DIVISION

PAGE: B8
MODEL: DSV-4B
REPORT NO.: TM-R6065-2



PIECES FROM DAMAGED AOO3 UPSTREAM SECTION OF BACK-UP PANEL USED FOR TEST OF SPECIMEN NO. 1

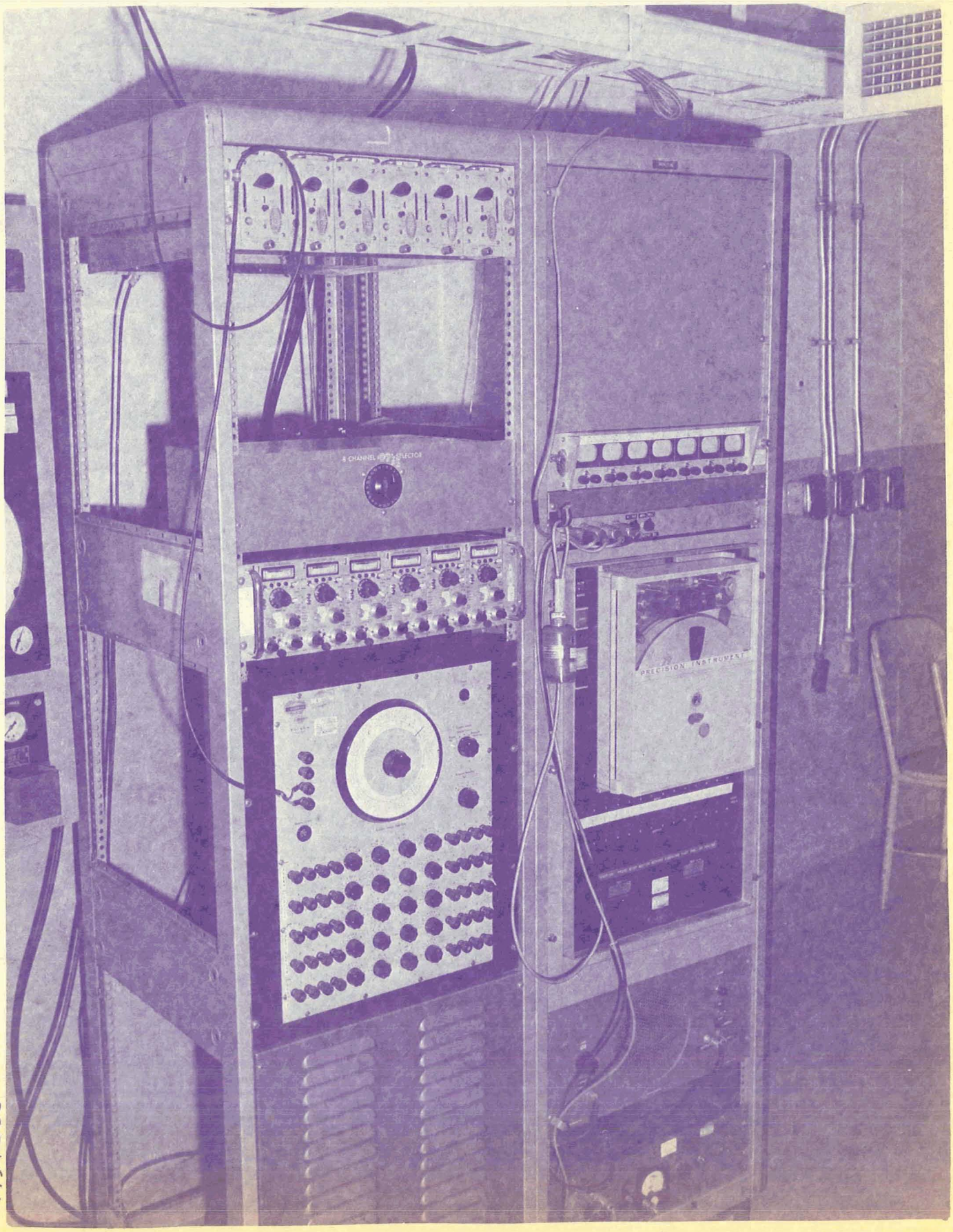
FORM 25-S-1
(REV. 8-53)

PREPARED BY: Raj...
CHECKED BY:
DATE: 8-29-67
TITLE: CHILLDOWN INVERTER ACOUSTICAL TEST

DOUGLAS AIRCRAFT COMPANY, INC.

MISSILE & SPACE SYSTEMS DIVISION

PAGE: B9
MODEL: DSV-4B
REPORT NO.: TM-R6065-2



SM494358

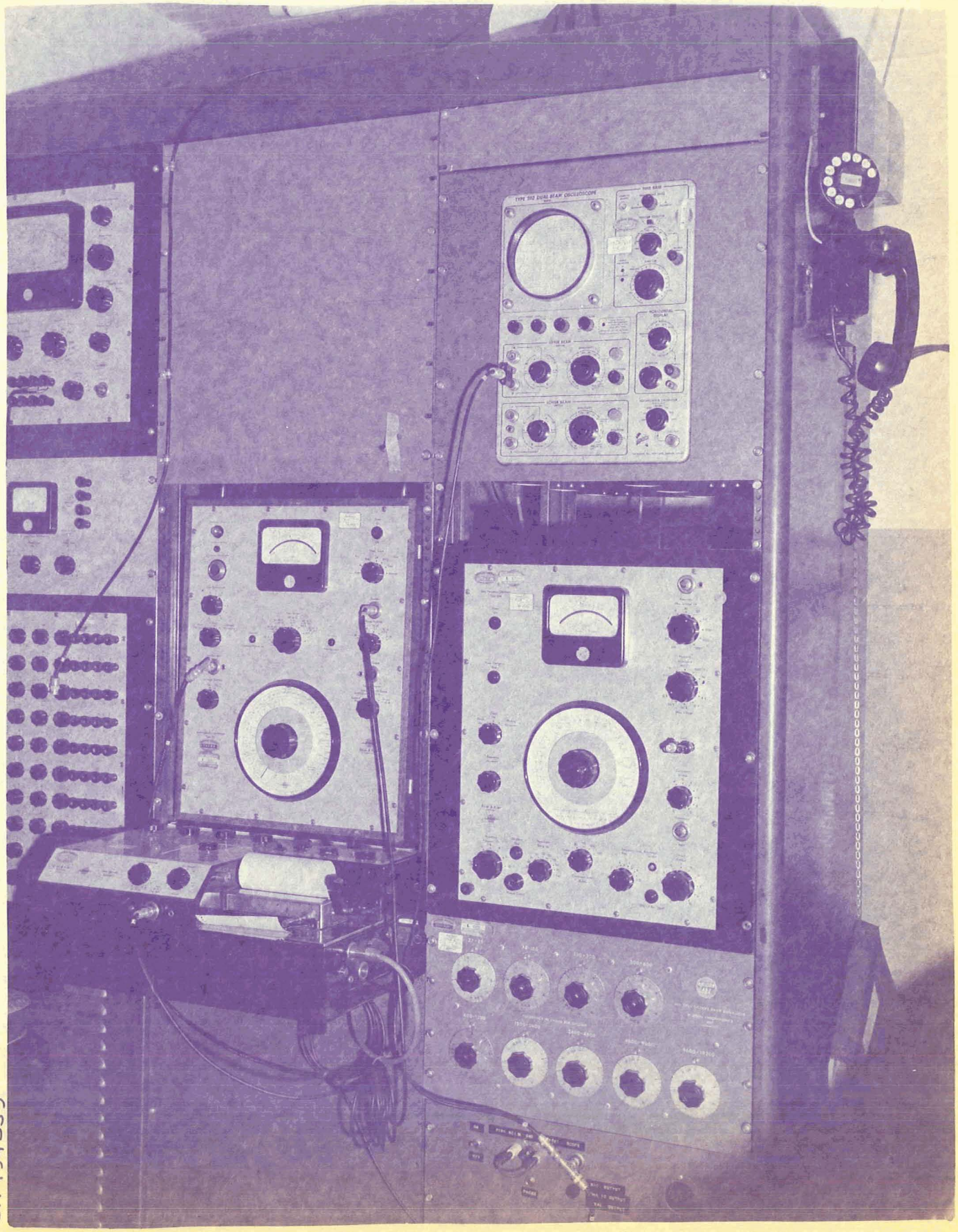
MICROPHONE AND ACCELEROMETER SYSTEMS AMPLIFIERS AND TAPE RECORDER STATION

FORM 25-S-1
(REV. 8-53)

PREPARED BY: Ray...
CHECKED BY:
DATE: 8-29-67
TITLE: CHILLDOWN INVERTER ACOUSTICAL TEST

DOUGLAS AIRCRAFT COMPANY, INC.
MISSILE & SPACE SYSTEMS DIVISION

PAGE: B 10
MODEL: DSV-4B
REPORT NO.: TM-R6065-2



SM 94359

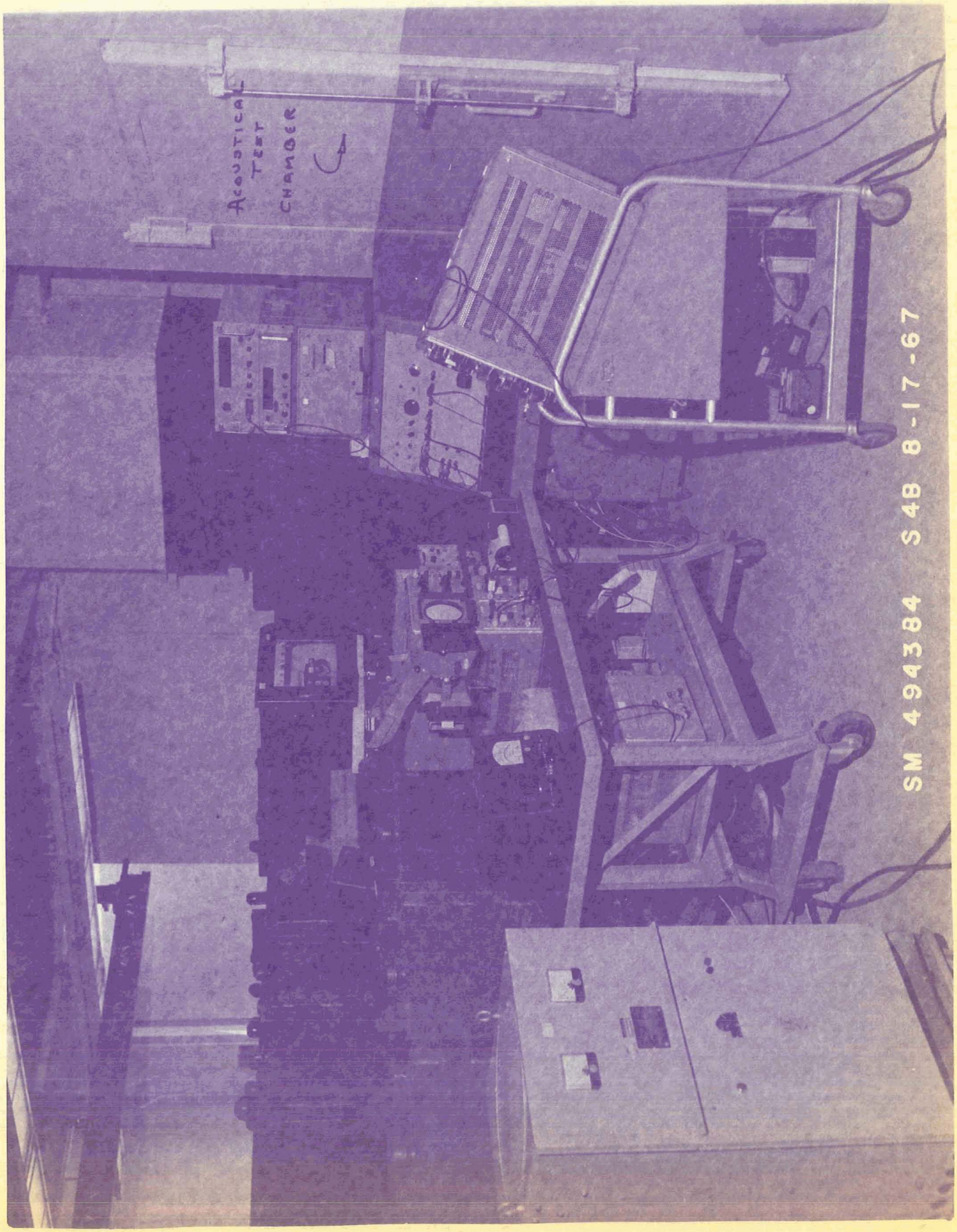
HIGH INTENSITY SOUND SYSTEM EXCITATION SOURCE, AND ANALYZER/RECORDER STATION

FORM 25-S-1
(REV. 8-53)

PREPARED BY: Lj...
CHECKED BY:
DATE: 8-29-67
TITLE: CHILLDOWN INVERTER ACOUSTICAL TEST

DOUGLAS AIRCRAFT COMPANY, INC.
MISSILE & SPACE SYSTEMS DIVISION

PAGE: B11
MODEL: DSV-4B
REPORT NO.: TM-R6065-2



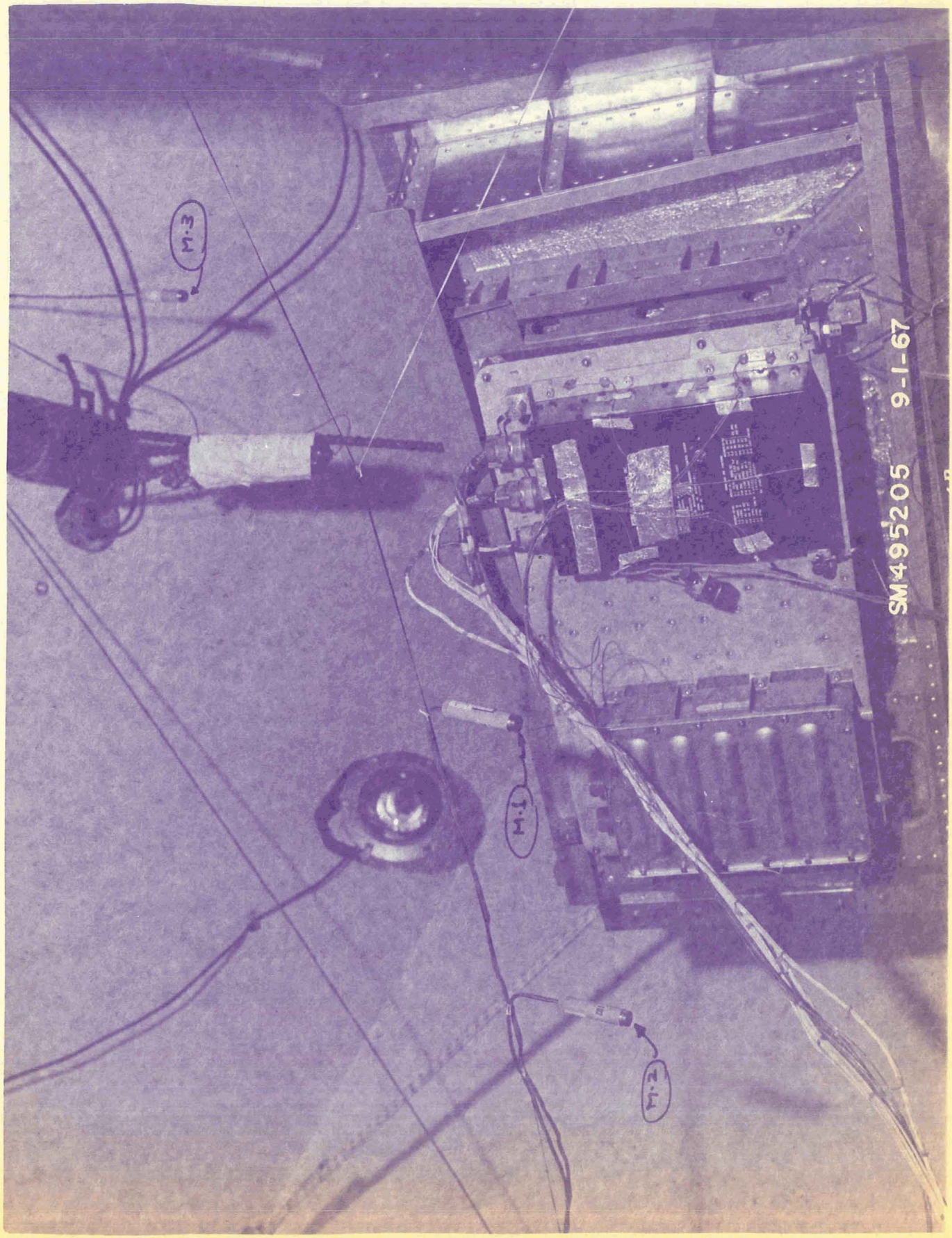
FORM 25-S-1
(REV. 8-53)

PREPARED BY: Rgj
CHECKED BY:
DATE: 9-15-67
TITLE: CHILLDOWN INVERTER ACOUSTICAL TEST

DOUGLAS AIRCRAFT COMPANY, INC.

MISSILE & SPACE SYSTEMS DIVISION

PAGE: B-12
MODEL: DSV-4B
REPORT NO.: TM-R-6065-2



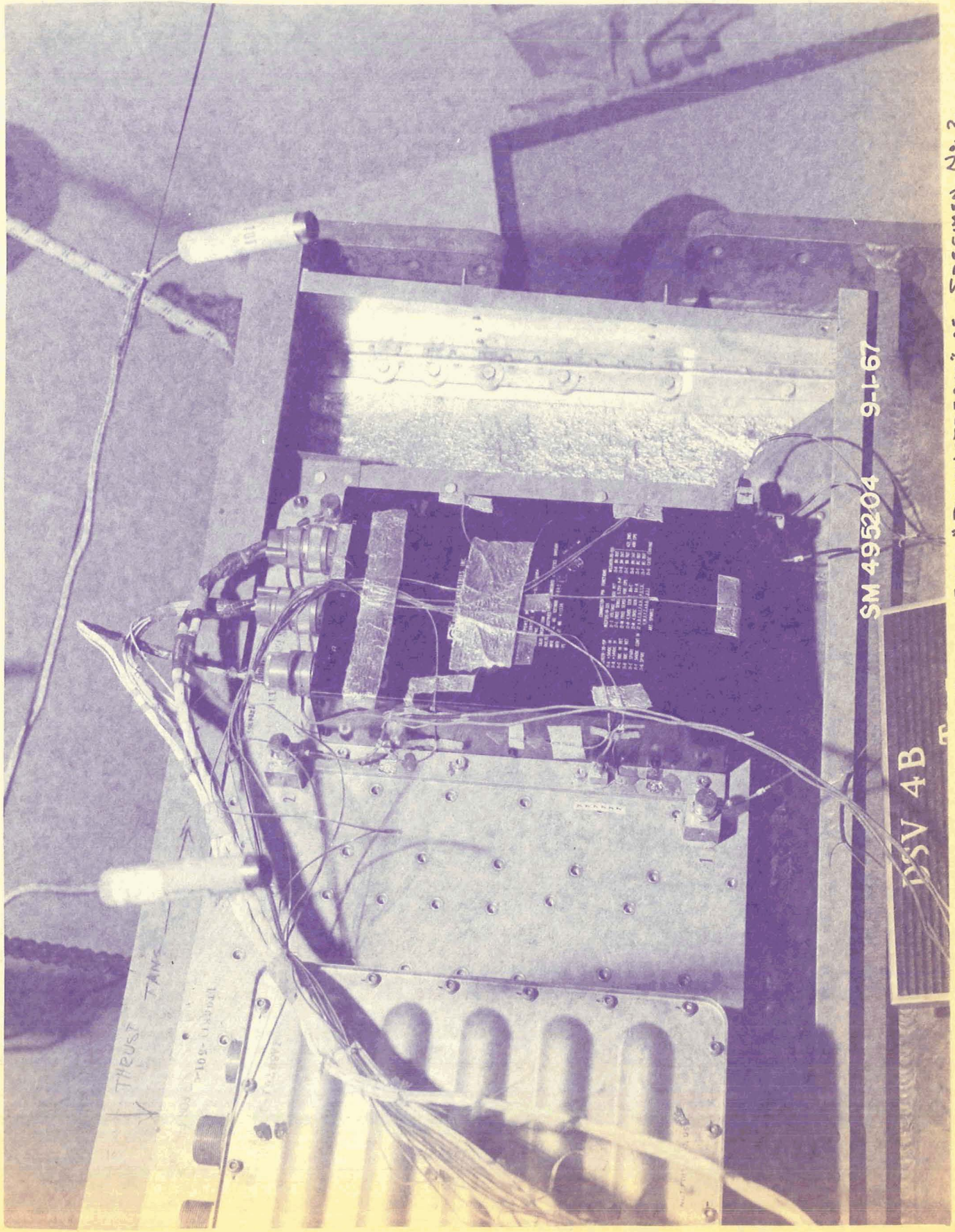
MICROPHONE PLACEMENT FOR SPECIMEN No. 2

FORM 25-S-1
(REV. 8-53)

PREPARED BY: [illegible]
CHECKED BY:
DATE: 9-15-67
TITLE: CHILLDOWN INVERTER ACOUSTICAL TEST

DOUGLAS AIRCRAFT COMPANY, INC.
Missile & Space Systems DIVISION

PAGE: B-13
MODEL: DSV-4B
REPORT NO.: TM-R-6065-2



ACCELEROMETER LOCATIONS AS VIEWED FROM "DOWNSTREAM" OF SPECIMEN No. 2

FORM 25-S-1
(REV. 8-53)

PREPARED BY: Ray

CHECKED BY:

DATE: 9-15-67

TITLE: CHILLDOWN INVERTER ACOUSTICAL TEST

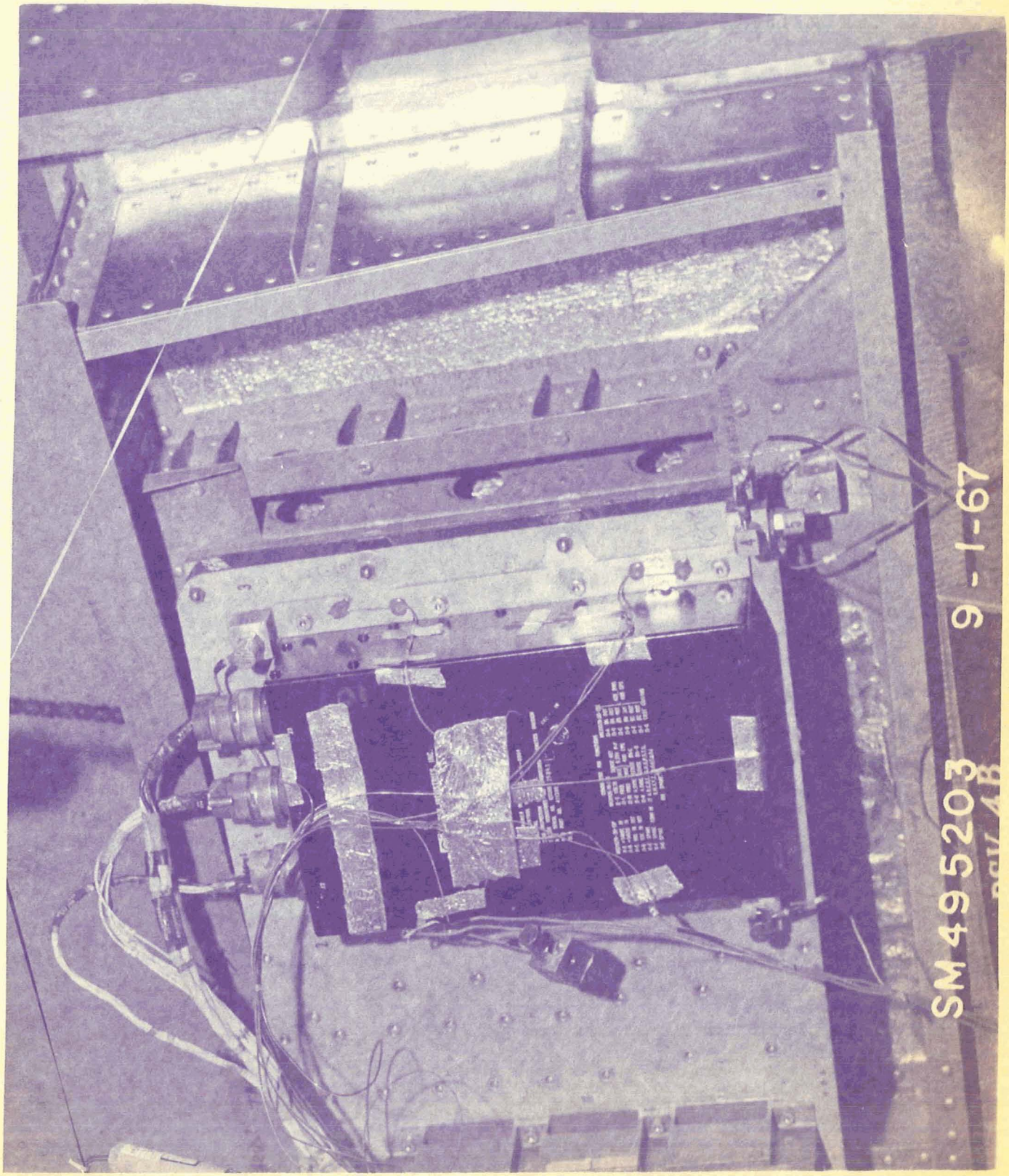
DOUGLAS AIRCRAFT COMPANY, INC.

MISSILE & SPACE SYSTEMS DIVISION

PAGE: B-14

MODEL: DSV-4B

REPORT NO.: TM-R-6065-2



ACCELEROMETER LOCATIONS AS VIEWED FROM "UPSTREAM" OF SPECIMEN NO. 2
WITH A-2 NOT MOUNTED IN PLACE

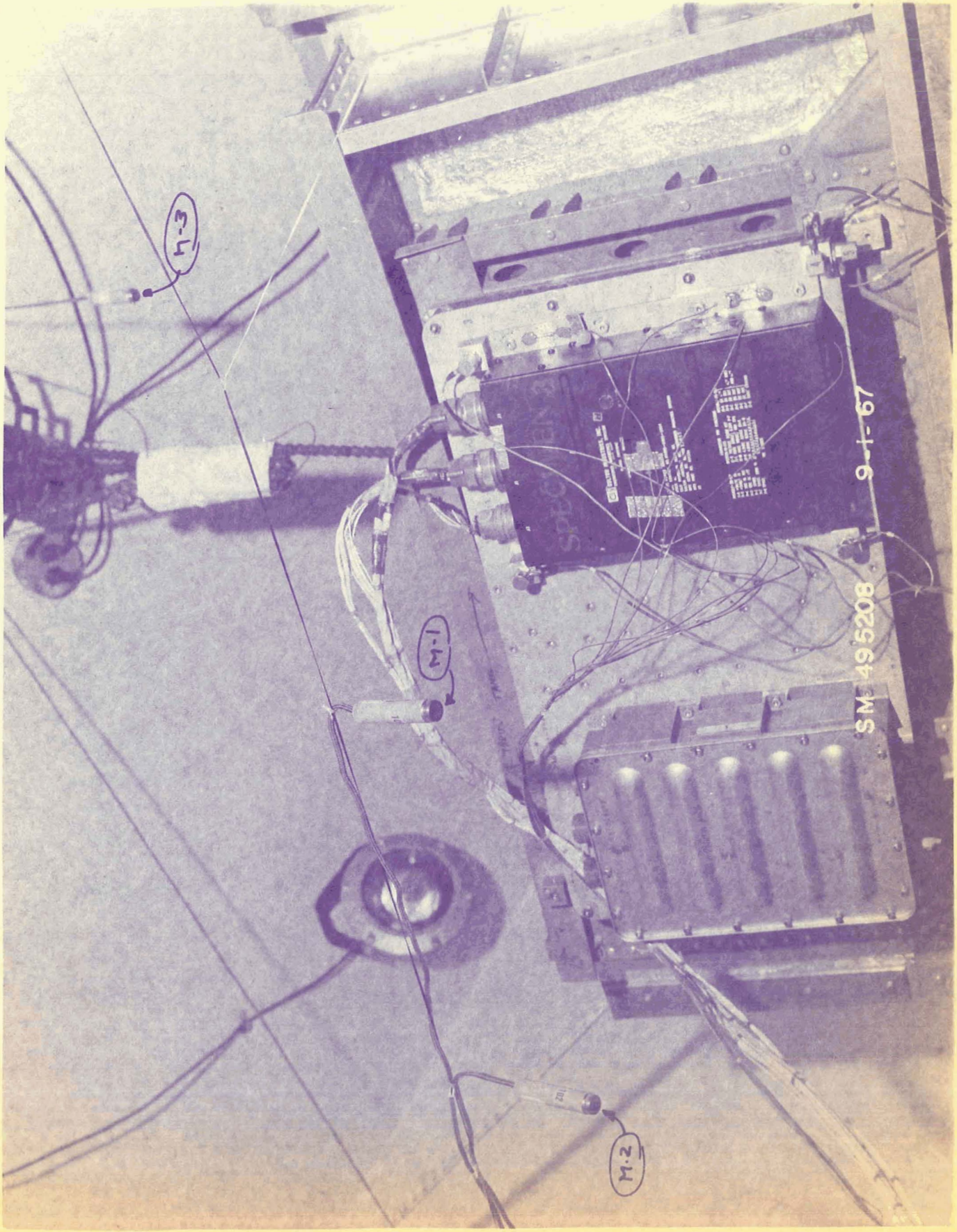
FORM 25-S-1
(REV. 8-53)

PREPARED BY: Raj...
CHECKED BY:
DATE: 9-15-67
TITLE: CHILLDOWN INVERTER ACOUSTICAL TEST

DOUGLAS AIRCRAFT COMPANY, INC.

MISSILE & SPACE SYSTEMS DIVISION

PAGE: B-15
MODEL: DSV-4B
REPORT NO.: TM-R-6065-2



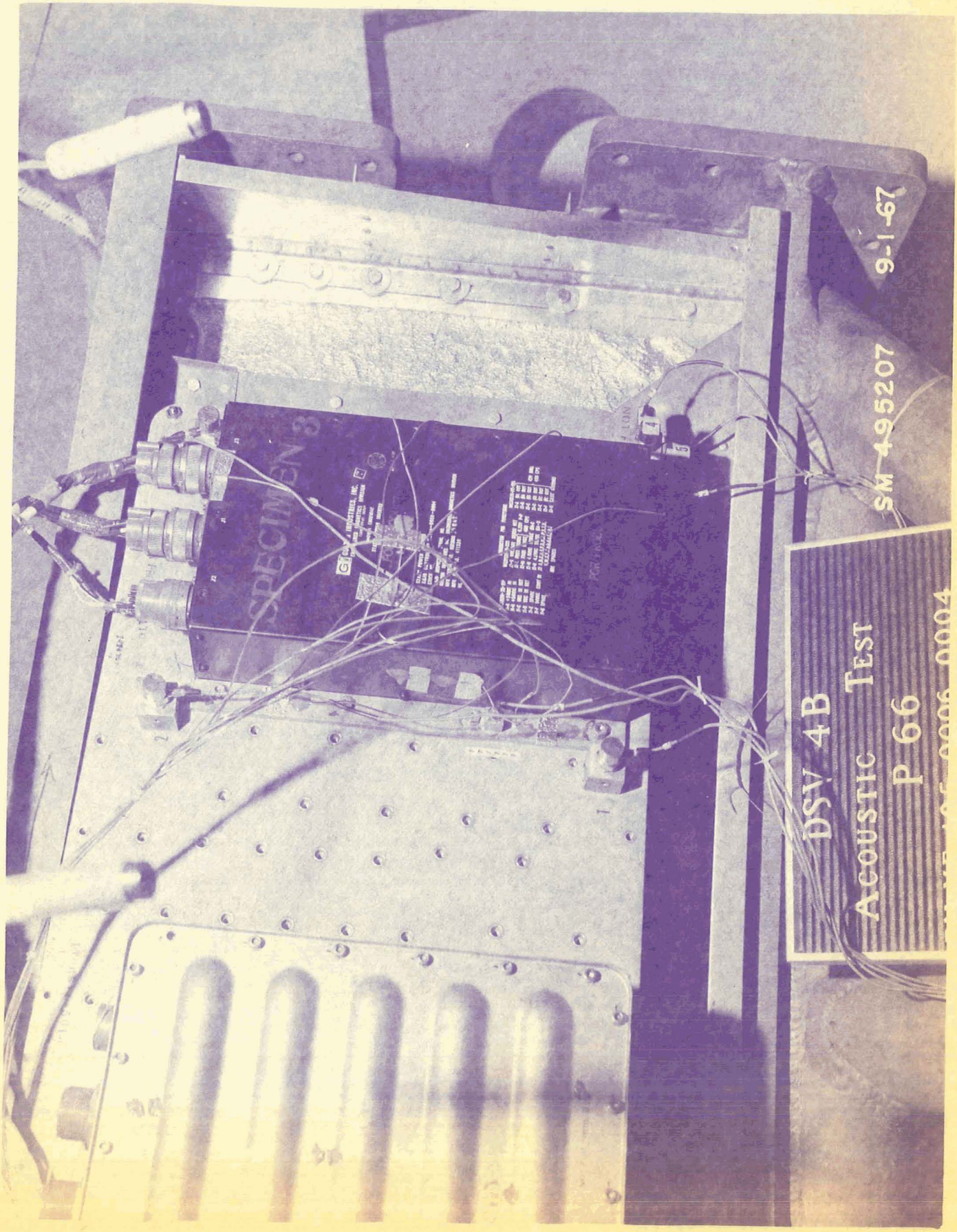
MICROPHONE PLACEMENT FOR SPECIMEN No. 3

FORM 25-S-1
(REV. 8-53)

PREPARED BY: Rg'...
CHECKED BY:
DATE: 9-15-67
TITLE: CHILLDOWN INVERTER ACOUSTICAL TEST

DOUGLAS AIRCRAFT COMPANY, INC.
MISSILE & SPACE SYSTEMS DIVISION

PAGE: B-16
MODEL: DSV-4B
REPORT NO.: TM-R-6065-2



ACCELEROMETER LOCATIONS AS VIEWED FROM "DOWNSTREAM" OF SPECIMEN No. 3

FORM 25-S-1
(REV. 8-53)

PREPARED BY: Rgj

CHECKED BY:

DATE: 9-15-67

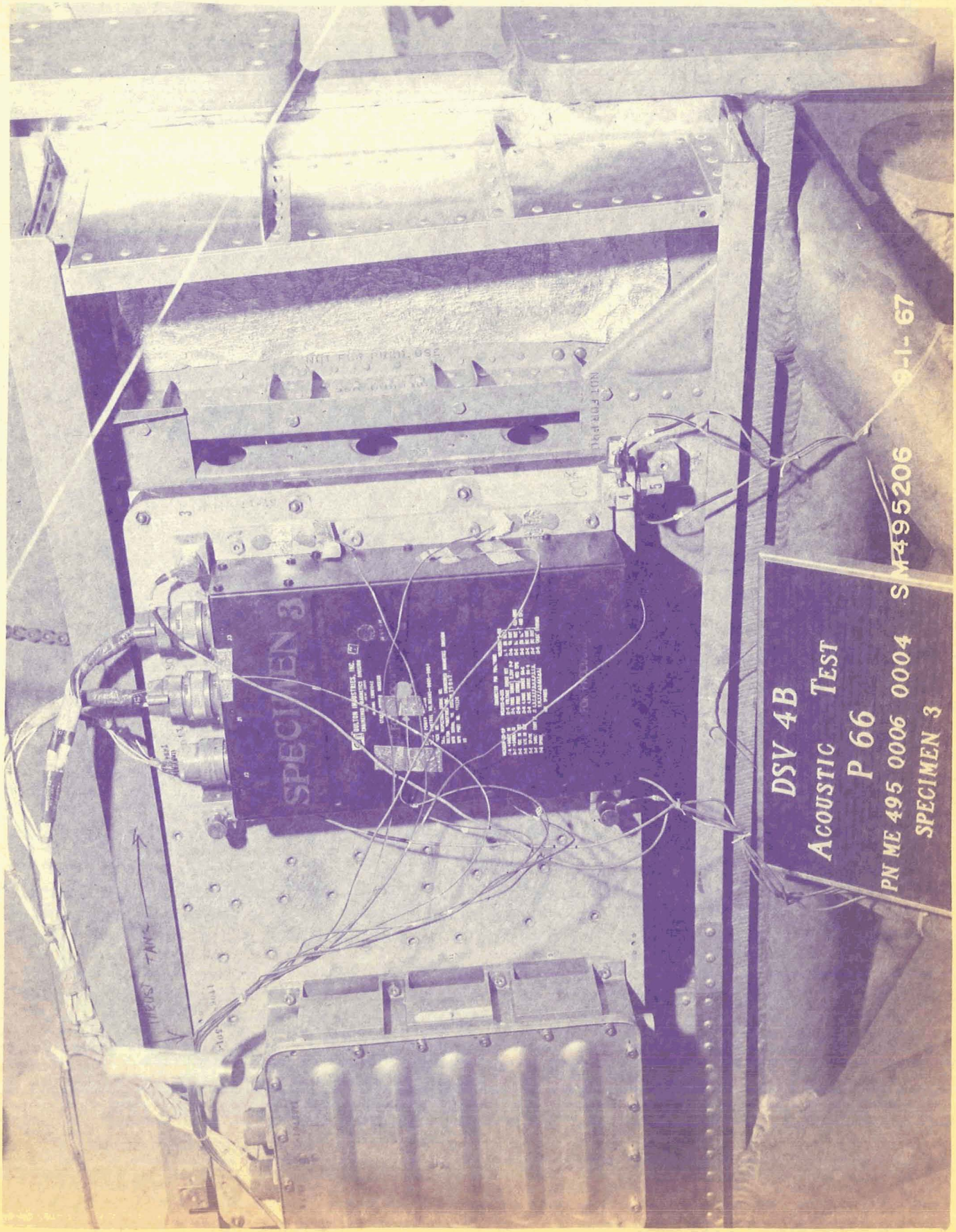
TITLE: CHILLDOWN INVERTER ACOUSTICAL TEST

DOUGLAS AIRCRAFT COMPANY, INC.

MISSILE & SPACE SYSTEMS DIVISION

MODEL: DSV-4B

REPORT NO.: TM-R-6065-2



ACCELEROMETER LOCATIONS AS VIEWED FROM "UPSTREAM" OF SPECIMEN NO. 3

FORM 850-2 (11-66)

DOUGLAS	DOUGLAS AIRCRAFT CO, INC. MISSILE & SPACE SYSTEMS DIVISION SANTA MONICA, CALIFORNIA	QUALIFICATION STATEMENT	[XX] QUAL TEST [ ] FORMAL QUAL

PROGRAM Saturn S-IVB

TEST PLAN AND ITEM NUMBER DAC 56625 P-66

TEST PLAN LINE ITEM TITLE S-II CHILLDOWN INVERTER

PART NO. North American Aviation ME 495-0006-0004

TECHNICAL MEMORANDUM NUMBER(S) TM DSV-4B-EE-R6065, REVA -1, -2, -3, -4

N70-75945

ENGINEERING RESOLUTIONS AND CONCLUSIONS

Three (3) S-II Chilldown Inverters, North American Aviation P/N ME 495-0006-0004, were subjected to Qualification testing in accordance with McDonnell Douglas Test Procedure Drawing 1T24579, Revision A.

A failure occured on Specimen #1, S/N 15840, which caused reduced voltage and distorted waveform on two output phases of the inverter, during the acoustical noise test. (Reference FARR A264511).

The failure was isolated to the Westinghouse transistor EM 710438 H-1, used in the Q-7 Phase A Driver Package by Engineered Magnetics, where noise spikes were observed between 50 and 100 Hz at 10 g's. The transistor was shipped to Westinghouse on September 1, 1967, for analysis but no failure was corroborated. The transistor was returned to Engineered Magnetics with half of the case cut away and the emitter-to-collector shorted. No cross sectional microscopic examination of the emitter terminal and lead was accomplished. (Reference Gulton Industries Report #FA 1887, dated 25 August, 1967).

The transistor was subsequently returned to Westinghouse in November of 1968 for further tests including horizontal sectioning of the emitter and base terminals. Again, no anomaly was discovered.

(Continued on Page 2)

(USE CONTINUATION SHEET AS NECESSARY)

STATEMENT OF QUALIFICATION

Based on the Qualification tests results presented in attached report and the conclusions stated above, it is the conclusion of the McDonnell Douglas Astronautics Company that the S-II Chilldown Inverter, North American Aviation P/N ME 495-0006-0004 is not qualified for use on the Saturn S-IVB Vehicles.

DESIGN TECHNOLOGY	RELIABILITY ENGINEERING	PROJECT OFFICE-TEST
[signature] 3-5-69	R. Hutson 5-5-69 BRW 5-5-69 ASA-WA Keller 5-5-69	RJW-5-69 5/7/69 J. C. R. Tiedeman

QUALIFICATION STATEMENT
TEST PLAN AND ITEM NUMBER
P-66

ENGINEERING RESOLUTIONS
AND CONCLUSIONS (continued)

The Gulton Industries Report #FA 1887 is to be revised to include the latest analysis on the failed transistor by Westinghouse and its affect on the cause and corrective action sections.

Another Q-7 package was installed in the Specimen #1 and the acoustical noise test was repeated with no further anomalies. The inverters must therefore be considered to have completed the defined Qualification tests.

In addition, the Contractor has reviewed the use of the S-II Chilldown Inverter on the S-IVB stages and has determined two areas of concern (Reference MDAC-WD Letter A3-250-KDLD-L-3450, dated August 28, 1968). Until further analysis and tests have proven that the unit is capable of starting the LOX Chilldown Pump under worst case conditions, and until the inverter's compatibility with the S-IVB is proven operationally, the inverter must be considered unqualified for use on an S-IVB stage.

Since MSFC Change Order 1997 has cancelled the S-IVB static firing test with the SII inverters installed, it is assumed that customer agreement with the above premise has been secured.