M-ASTN-74-4

APRIL 1974

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GEORGE C. MARSHALL SPACE FLIGHT CENTER

DATA BOOK FOR 12.5-INCH DIAMETER SRB THERMAL MODEL WATER FLOTATION TEST - 1.29 PSIA, SERIES P022

NASA/MSFC

(NASA-TM-X-70407) DATA BOOK FOR 12.5-INCH DIAMETER SRB THERMAL MODEL WATER FLOTATION TEST; 1.29 psia, SERIES P022 (NASA) 220 p HC $7.25 CSCL 21H

N75-19346

Unclas

G3/20 12401

FLUID MECHANICS SECTION
FLUID MECHANICS & DYNAMICS BRANCH
PROPULSION & THERMODYNAMICS DIVISION
ASTRONAUTICS LABORATORY

NASA

TECHNICAL REPORT STANDARD TITLE PAGE

1. REPORT NO. M-ASTN-74-4	2. GOVERNMENT ACCESSION NO.	3. RECIPIENT'S CATALOG NO.
4. TITLE AND SUBTITLE Data Book for 12.5-Inch Diameter SRB Thermal Model Water Flotation Test - 1.29 PSIA, Series P022		5. REPORT DATE April 1974
		6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) Steve L. Allums		8. PERFORMING ORGANIZATION REPORT #
9. PERFORMING ORGANIZATION NAME AND ADDRESS George C. Marshall Space Flight Center Marshall Space Flight Center, AL 35812		10. WORK UNIT NO.
		11. CONTRACT OR GRANT NO.
12. SPONSORING AGENCY NAME AND ADDRESS National Aeronautics and Space Administration Washington, DC 20546		13. TYPE OF REPORT & PERIOD COVERED Miscellaneous
		14. SPONSORING AGENCY CODE

15. SUPPLEMENTARY NOTES

Prepared by Astronautics Laboratory, Science & Engineering

16. ABSTRACT

This report presents data acquired from tests conducted to determine how thermal conditions affect SRB (Space Shuttle Solid Rocket Booster) flotation at a scaled pressure of 1.29 psia. Included are acceleration, pressure, and temperature data recorded from initial water impact to final flotation position using a 12.5-inch diameter thermal model of the SRB. Nineteen valid tests were conducted during September 20-27, 1973. These thermal tests indicated the following basic differences relative to the ambient temperature and pressure model tests.

1. More water was taken on board during penetration.

2. Model flotation/sinking was temperature sensitive.

17. KEY WORDS thermal effects on rocket water impact thermal effects on rocket flotation scaled low pressure rocket flotation	18. DISTRIBUTION STATEMENT Unclassified-Unlimited James D Ledbetter for A. L. Worlund Chief, Fluid Mechanics & Dynamics Branch

19. SECURITY CLASSIF. (of this report)	20. SECURITY CLASSIF. (of this page)	21. NO. OF PAGES	22. PRICE
Unclassified	Unclassified	200	NTIS

MSFC - Form 3292 (Rev December 1972)

For sale by National Technical Information Service, Springfield, Virginia 22151

TABLE OF CONTENTS

		PAGE
SECTION I	INTRODUCTION	2
SECTION II	MODEL DESCRIPTION	3
SECTION III	TEST PROCEDURE	5
SECTION IV	DATA ACQUISITION AND INSTRUMENTATION	6
SECTION V	DATA PROCESSING AND EVALUATION	7
SECTION VI	DATA PRESENTATION	8
APPENDIX A	IMPACT PARAMETERS	A-i
APPENDIX B	TEST DATA	B-i

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LIST OF ILLUSTRATIONS

FIGURE	TITLE	PAGE
1	SRB TEST MODEL	10
2	MODEL DIMENSIONS	11
3	MODEL COORDINATE SYSTEM AND PARAMETER DEFINITION	12
4	ACCELEROMETER LOCATIONS	13
5	PRESSURE TRANSDUCER AND TEMPERATURE THERMOCOUPLE LOCATIONS	14

LIST OF TABLES

TABLE	TITLE	PAGE
I	INSTRUMENTATION PROGRAM	9

SUMMARY

This report presents data acquired from tests conducted to determine how thermal conditions affect SRB (Space Shuttle Solid Rocket Booster) flotation at a scaled pressure of 1.29 psia. Included are acceleration, pressure, and temperature data recorded from initial water impact to final flotation position using a 12.5-inch diameter thermal model of the SRB. Nineteen valid tests were conducted during September 20-27, 1973. These thermal tests indicated the following basic differences relative to the ambient temperature and pressure model tests.

1. More water was taken on board during penetration.

2. Model flotation/sinking was temperature sensitive.

SECTION I. INTRODUCTION

This report presents processed acceleration, pressure, strain, and photographic data recorded during water impact tests using a 12.5-inch thermal model of the Space Shuttle Solid Rocket Booster (SRB); see Figure 1. These tests were conducted from September 20-27, 1973. A description of the model, test procedure, instrumentation, and data acquisition systems is included.

These tests investigated thermal effects on a scale model SRB during impact, penetration, slapdown and final flotation at 1.29 psia by varying the model temperature at water entry. Entry dynamic conditions were varied by using different combinations of vertical velocities and water impact angles. Results from these tests will be used to develop analytical models for the full scale SRB and to indicate potential problem areas.

Nineteen valid drop tests were conducted.

SECTION II. MODEL DESCRIPTION

The test specimen was a model of the 142-inch diameter Space Shuttle SRB with a flared skirt and a full length nozzle. The model was a rigid body constructed of aluminum alloy 2219-T87 and contained three sections:

1. Cylindrical Section (four segments)
2. Motor Nozzle Section
3. Flared Skirt Section

Two model configurations were used:

1. Full Length Nozzle
2. Short Nozzle

Figure 2 shows the dimensions for each model configuration. The short nozzle was used to simulate the ejection of the nozzle extension. The dimensions and mass characteristics of the model were:

- Length:
  - Full Length Nozzle: 136.9 inches
  - Short Nozzle: 132.3 inches
- Body Diameter: 12.5 inches
- Skirt Diameter: 16.5 inches
- Weight:
  - Full Length Nozzle: 109.0 lbs
  - Short Nozzle: 105.8 lbs
- Pitch Mass Moment of Inertia:
  - Full Length Nozzle: 40.8 slug-ft^2
  - Short Nozzle: 40.6
- C.G. Location (aft of the nose plate)
  - Full Length Nozzle: 73.06 inches
  - Short Nozzle: 70.94 inches

Geometric patterns were placed on the model to aid in photographic data reduction. Twenty-four 120-watt heater strips (2.0-inch width) were placed around the cylindrical sections. Four 45-watt heaters were on the long nozzle and two on the short nozzle. The aft bulkhead had four 45-watt heaters installed. The power source was 208 volts, 3-phase (Y), 100 amps, 60 Hz. No heater strips were placed on the flared skirt. External insulation (Dow Corning Silicon Paint 93-027) was sprayed on the external surface of the model to a depth of .02 inch.

SECTION III. TEST PROCEDURE

Testing of the 12.5-inch diameter thermal model was conducted at the Naval Ordnance Laboratory (NOL) hydroballistics facility in White Oaks, Maryland. The model was suspended inside the NOL facility with a quick release device at the specific initial angle. The model height above the water surface was varied to yield the specified impact velocity. After the test tank was pumped down to 1.29 psia, power was applied to the heater strips. When the model reached the test temperature, the release mechanism was activated. The model was allowed to fall freely. The model impacted tail first with nominal vertical impact velocities of 23 to 30 ft/sec. The nominal off-vertical pitch angles were 0, 20, and 31 degrees. Average wall temperatures ranged from ambient to 153°F.

The procedure for drying out the inside of the model after each test was as follows:

1. Lift model from the water with the vent valve open.

2. Rotate model to horizontal position and attach a purge hose to vent valve.

3. Flow dry missile-grade air through model (13.4 ft^3/min) while applying power to heater strips.

4. After model reaches 212°F, continue purge for 10 minutes.

The test run number, nominal vertical velocity, initial impact angles and temperatures are shown in Appendix A. Figure 3 shows the coordinate system and defines the parameters used in the test program.

SECTION IV. DATA ACQUISITION AND INSTRUMENTATION

The data acquisition system consisted of acceleration, pressure, and strain gage transducers with associated signal conditioning electronics, multiplexing equipment, and analog tape recording system. An oscillograph recorder was used to display online measurements during each test.

Instrumentation consisted of six accelerometers, two ullage pressure transducers, two ullage and six wall mounted thermocouples, and one vacuum chamber pressure transducer.

Measurement identification numbers, transducer types, and other pertinent instrumentation details are given in Table I. Figures 4 and 5 show the instrumentation locations.

Two camera systems were used for photographic coverage. Two high speed (250 frames/second) cameras 90 degrees apart (in a horizontal plane) filmed impact and splashdown. The lens were centered at the water level for above and below water coverage. A low speed (40 frames/second) camera operated from impact until final flotation position.

All data acquisition systems were calibrated in accordance with approved laboratory practices and calibrations were maintained as required.

SECTION V. DATA PROCESSING AND EVALUATION

Onsite data evaluation was performed after each drop. All oscillograms were reviewed to determine the validity of each measurement and time slices were selected for time history plots. Analog data tapes from each test were sent to MSFC Computation Laboratory for reduction. A digitized time history plot for each valid data channel was made with a sufficient time slice to include model release, water impact, slapdown, and rebound conditions. An additional time history plot was made for the pressure and temperature channels which extended the previous time history plots to a total time of 15 to 30 seconds.

SECTION VI. DATA PRESENTATION

Model impact parameters obtained from photographic data reduction are presented in Appendix A. Parameters included are:

- Vertical impact angle (deg)
- Maximum penetration depth (ft)
- Vertical angle at maximum penetration (deg)

The impact velocities were calculated from accelerometer data which indicates release time and impact time.

Acceleration, pressure, and temperature data time history plots are presented in Appendix B. Acceleration (g), pressure (psig), and temperature (^{o}F) are presented as a function of time.

TABLE I. INSTRUMENTATION PROGRAM

MEASUREMENT NUMBER	MEASUREMENT TYPE	FREQUENCY RESPONSE (Hz)	FULL SCALE RANGE	SENSITIVE AXIS
EP001	Accelerometer	2-400	± 25G	Pitch
EY002	"	"	"	Yaw
EA003	"	"	"	Axial
EP004	"	"	"	Pitch
EY005	"	"	"	Yaw
EA006	"	"	"	Axial
D0001	Pressure	"	±5.00 psig	Internal
D0002	"	"	"	"
D0003	"	"	±5.00 psig	Chamber
C0001	Thermocouple	"	150°F	External Wall
C0002	"	"	"	Internal Wall
C0003	"	"	"	Ullage
C0004	"	"	"	Internal Wall
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C0007	"	"	"	" "
C0008	"	"	"	" "

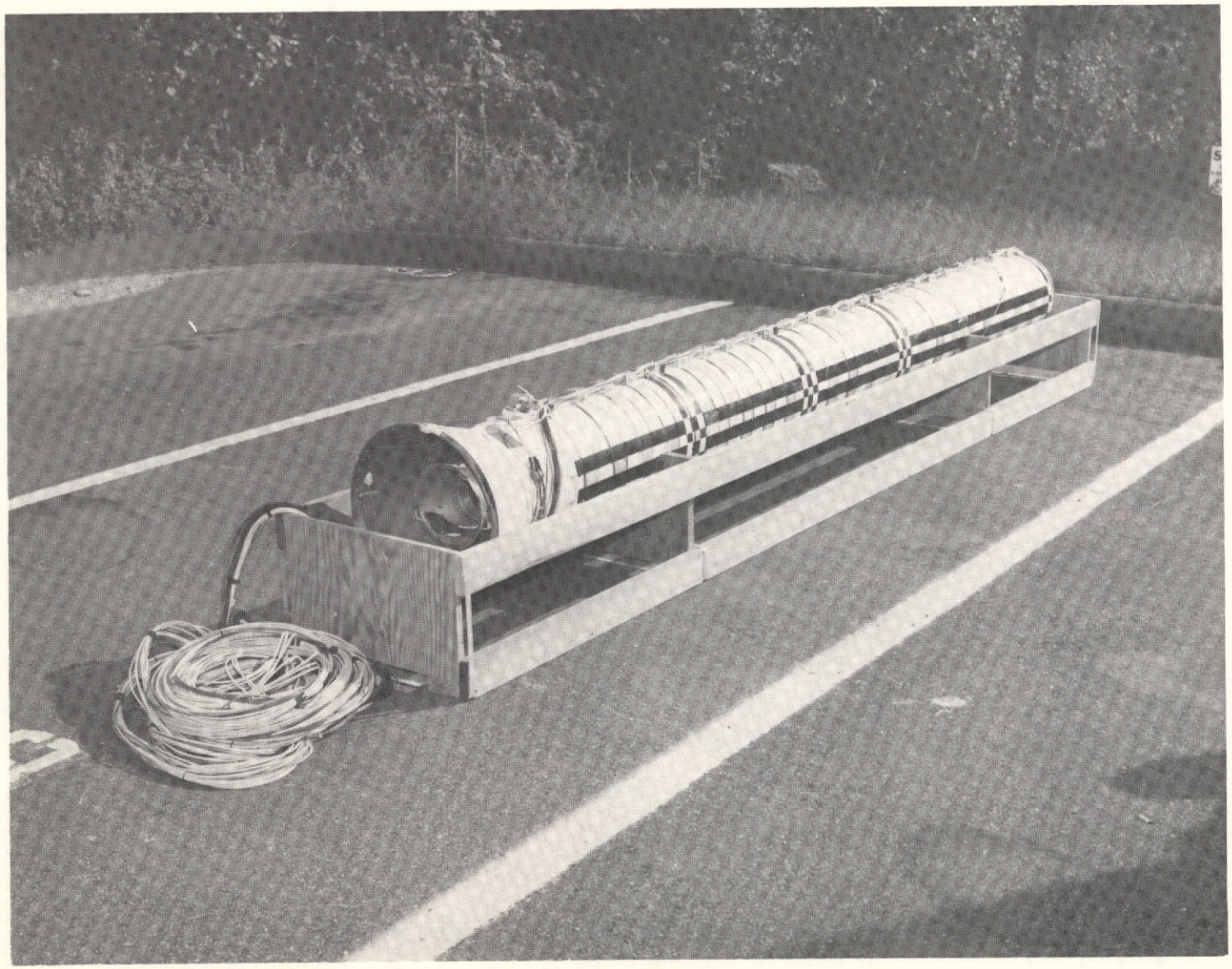
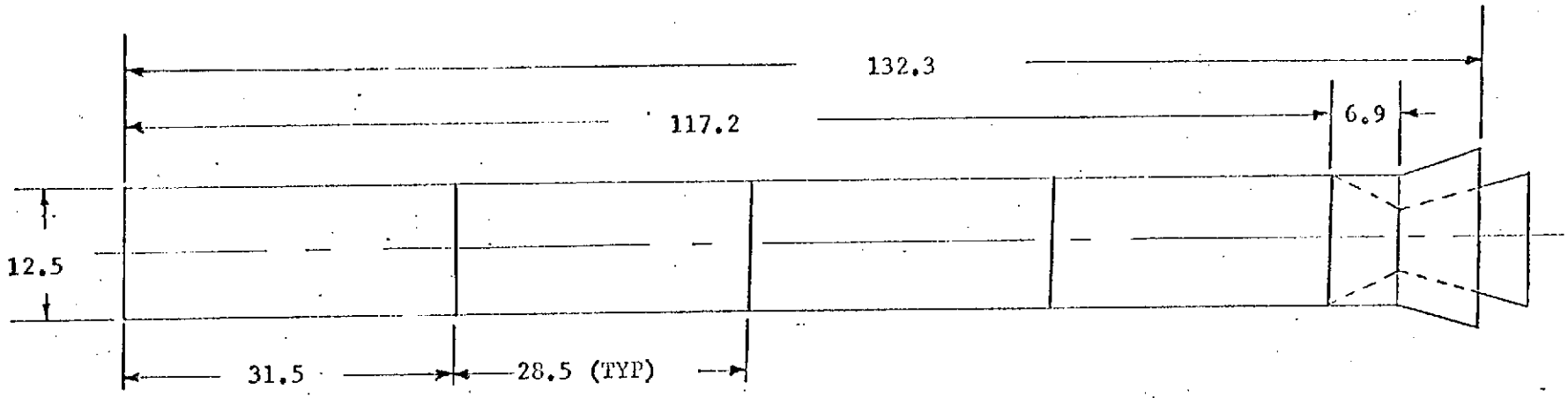
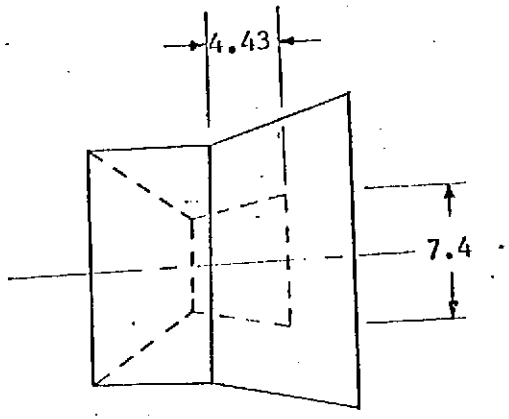


FIGURE 1. 12.5-INCH SRB THERMAL MODEL

NOTE: DIMENSIONS IN INCHES





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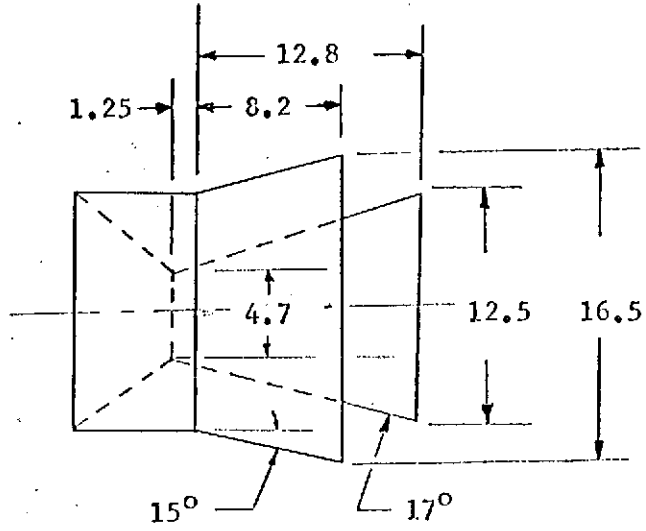

LONG NOZZLE

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OF POOR QUALITY

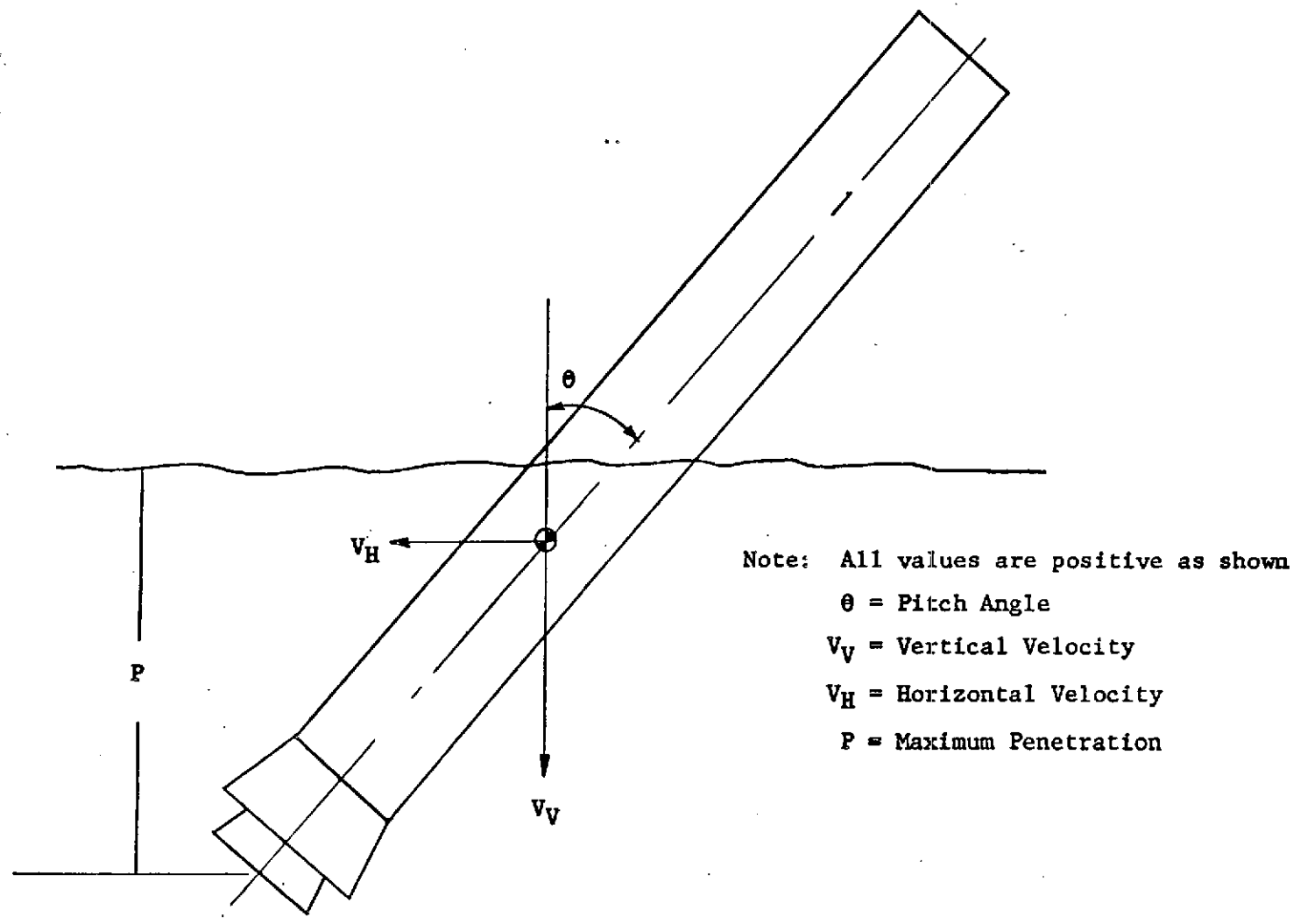

FIGURE 3. MODEL COORDINATE SYSTEM AND PARAMETER DEFINITION

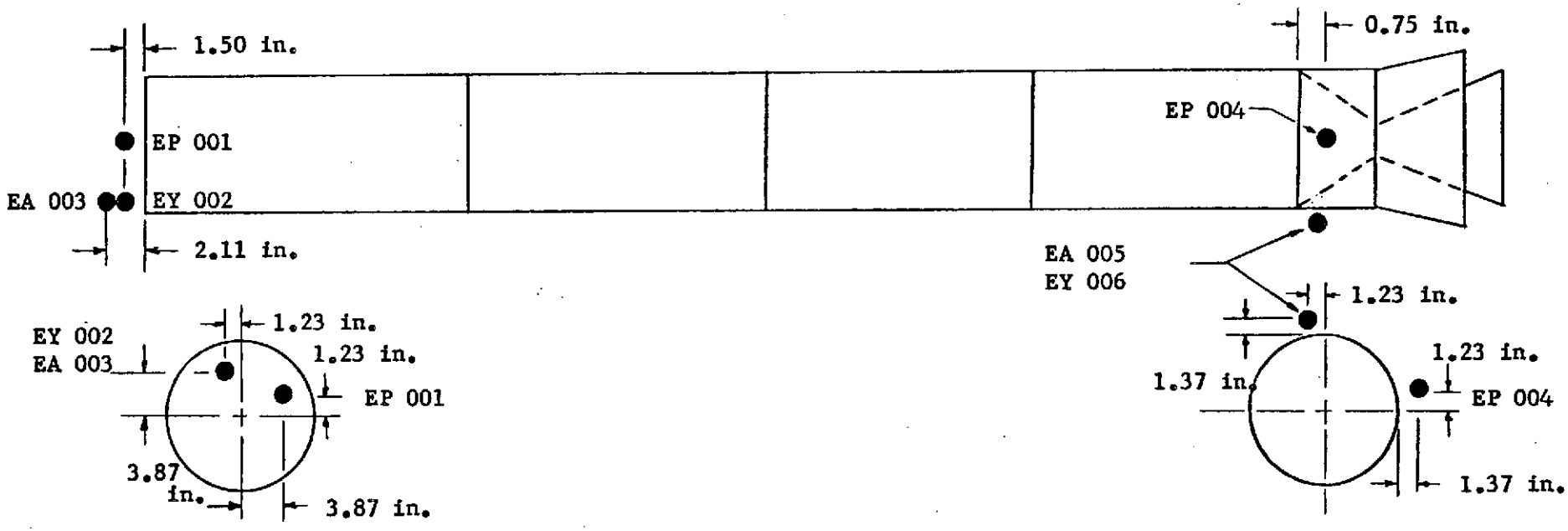

FIGURE 4. 12.5-INCH SRB THERMAL MODEL ACCELEROMETER LOCATIONS

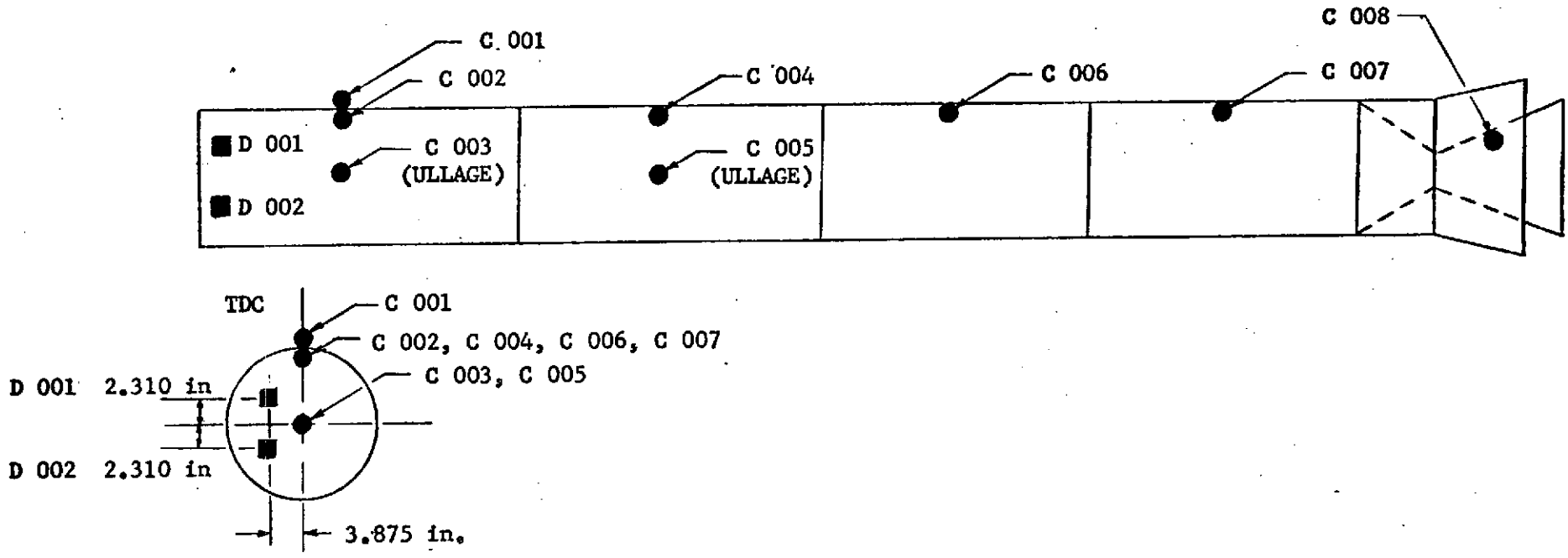

FIGURE 5. 12.5-INCH THERMAL SRB MODEL PRESSURE AND TEMPERATURE LOCATIONS

APPENDIX A

IMPACT AND PENETRATION DATA

12.5-INCH THERMAL MODEL SRB

TABLE I. IMPACT PARAMETERS

TEST NO.	IMPACT VELOCITY ft/sec	HORIZONTAL VELOCITY ft/sec	IMPACT ANGLE degrees	ANGLE AT MAXIMUM PENETRATION degrees	MAXIMUM PENETRATION / TIME ft / sec	AVERAGE WALL / ULLAGE TEMPERATURE °F	NOZZLE CONFIG-URATION
31	23.64	0	0.20	2.70	4.04 / 0.748	130.5 / 128.5	SHORT NOZZLE
32	23.64	0	-0.199	3.70	4.48 / 0.748	124.75 / 128.0	
33	23.74	0	32.10	60.10	2.14 / 0.30	130.5 / 134.5	
34	23.64	0	0.10	4.40	5.4 / 0.855	AMBIENT	
35	23.74	0	32.40	60.00	2.24 / 0.30	AMBIENT	
36	23.87	0	21.20	52.20	2.85 / 0.396	130.0 / 132.5	
37	23.74	0	0.40	7.10	4.93 / 1.00	118.5 / 119.5	
38	23.84	0	32.60	65.10	2.28 / 0.332	124.2 / 128.0	
39	23.74	0.21	0.20	3.70	3.79 / 0.632	158.3 / 164.5	
40	24.00	0	32.90	59.50	2.21 / 0.296	159.5 / 166.0	
43	29.53	0	32.5	58.90	2.32 / .244	118.5 / 123.5	
44	29.76	0.91	32.20	62.70	2.4 / 0.280	130.7 / 137.5	
45	23.81	0	0	1.80	4.42 / 0.756	120.2 / 129.0	
46	29.63	0	0.40	4.0	4.97 / 0.756	120.5 / 126.5	
47	23.16	0	0	1.20	6.33 / 0.868	118.5 / 121.0	LONG NOZZLE
48	24.06	0.71	31.80	68.60	2.58 / 0.396	118.2 / 122.0	
49	29.66	0	0.299	1.40	6.72 / 0.87	119.5 / 128.0	
50	30.30	0	31.20	61.20	2.67 / 0.288	118.7 / 117.0	
51	29.60	0	0.70	7.30	6.31 / 0.772	127.5 / 131.0	

APPENDIX B

ACCELERATION, PRESSURE, AND TEMPERATURE DATA

APPENDIX B

TABLE OF CONTENTS

Test Run No.	Page
P022-31	B-2
32	B-10
33	B-18
34	B-27
35	B-37
36	B-47
37	B-57
38	B-67
39	B-77
40	B-85
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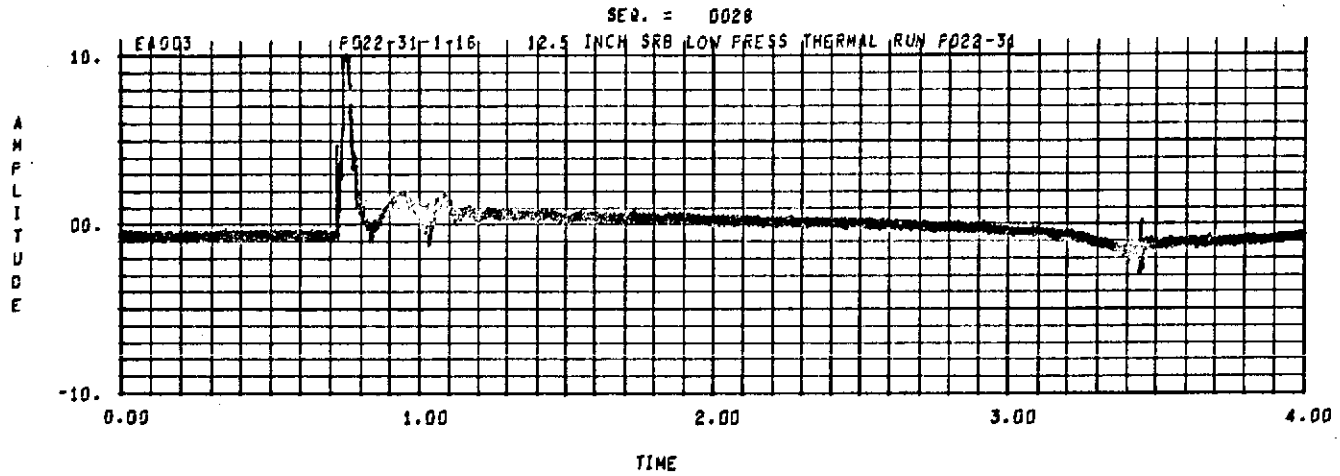
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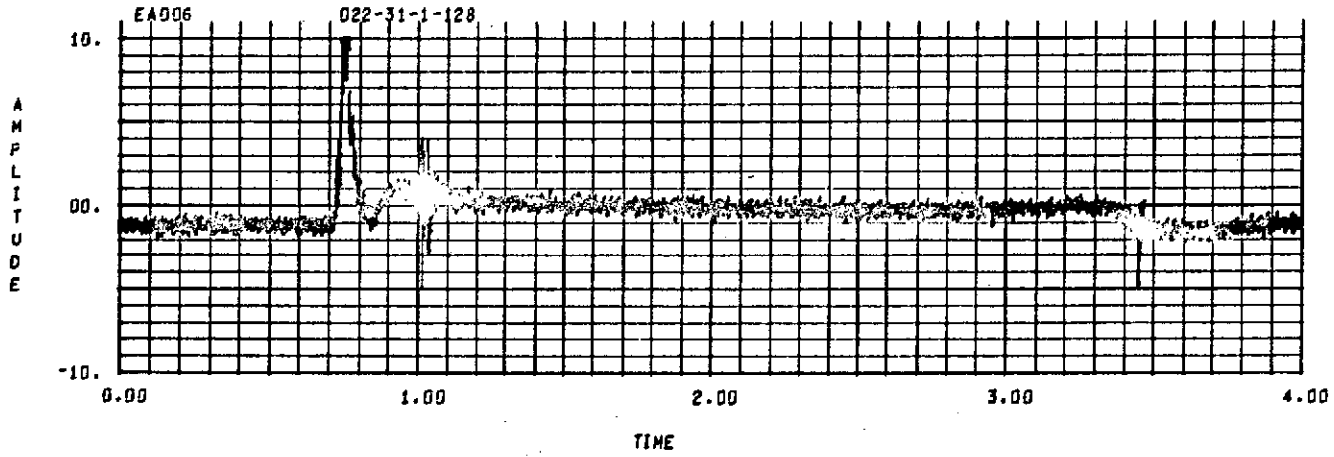
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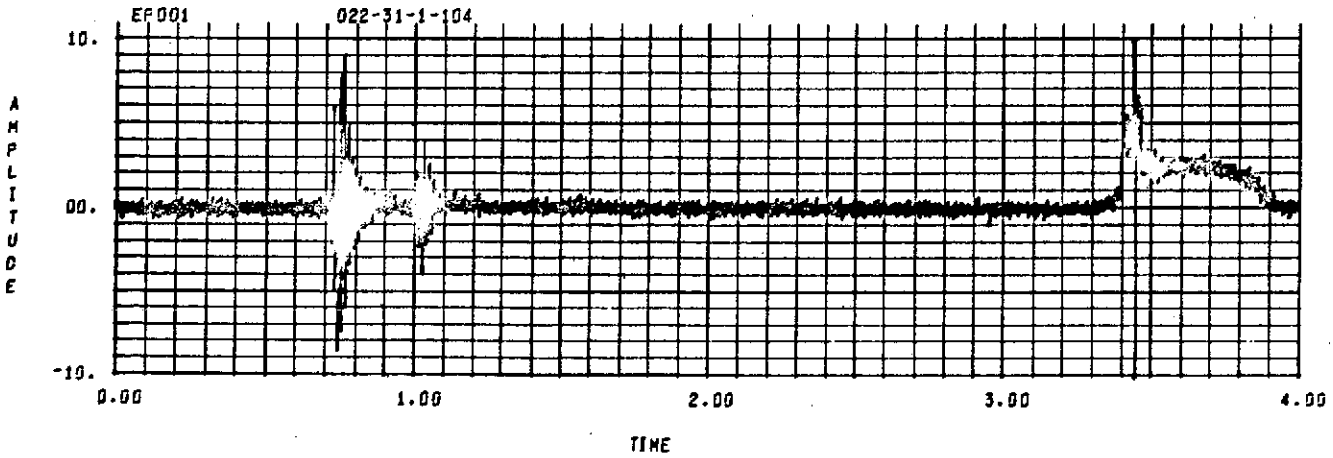
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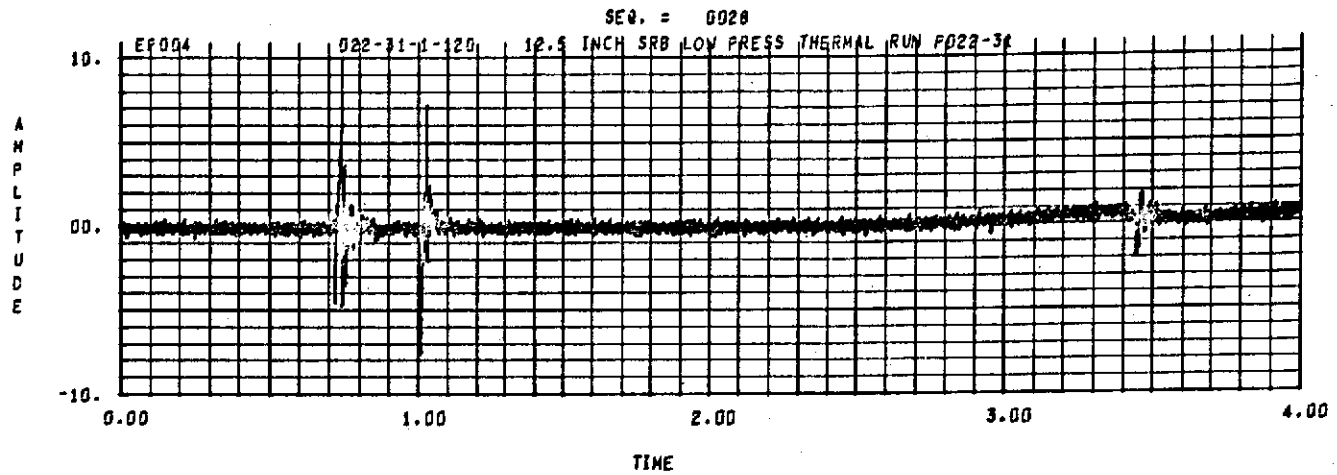
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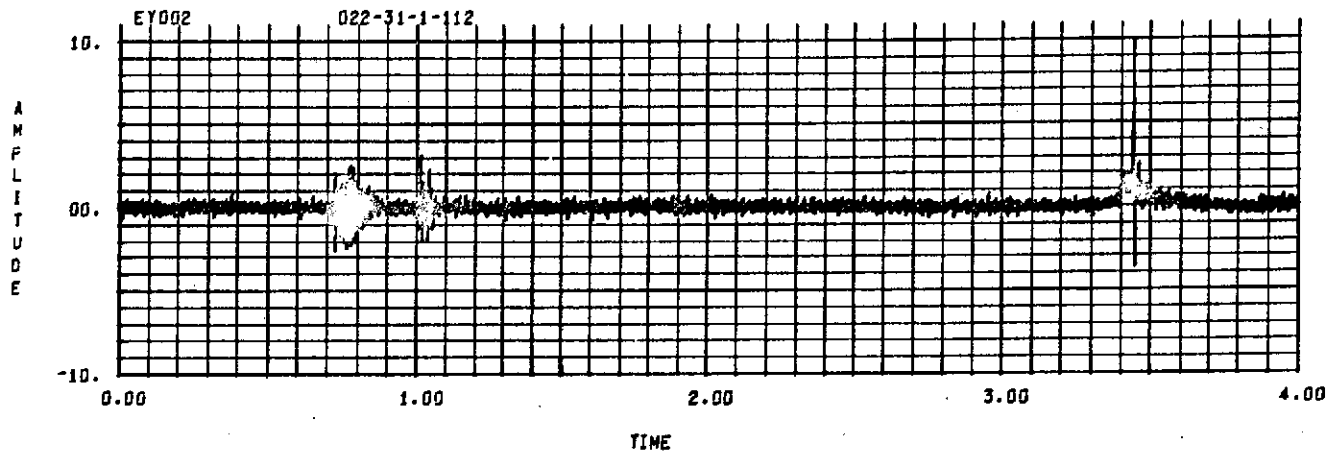
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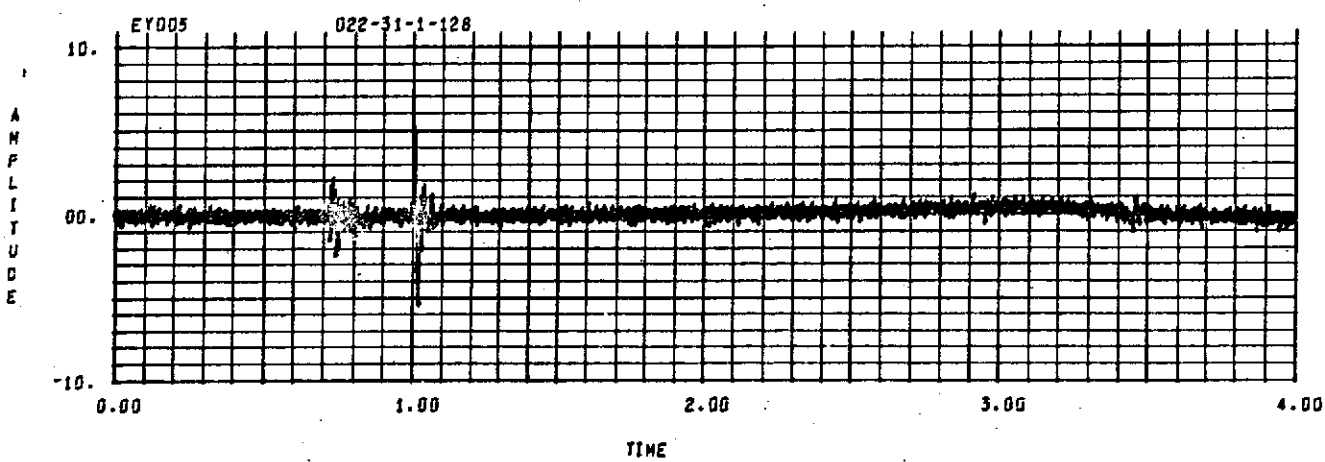
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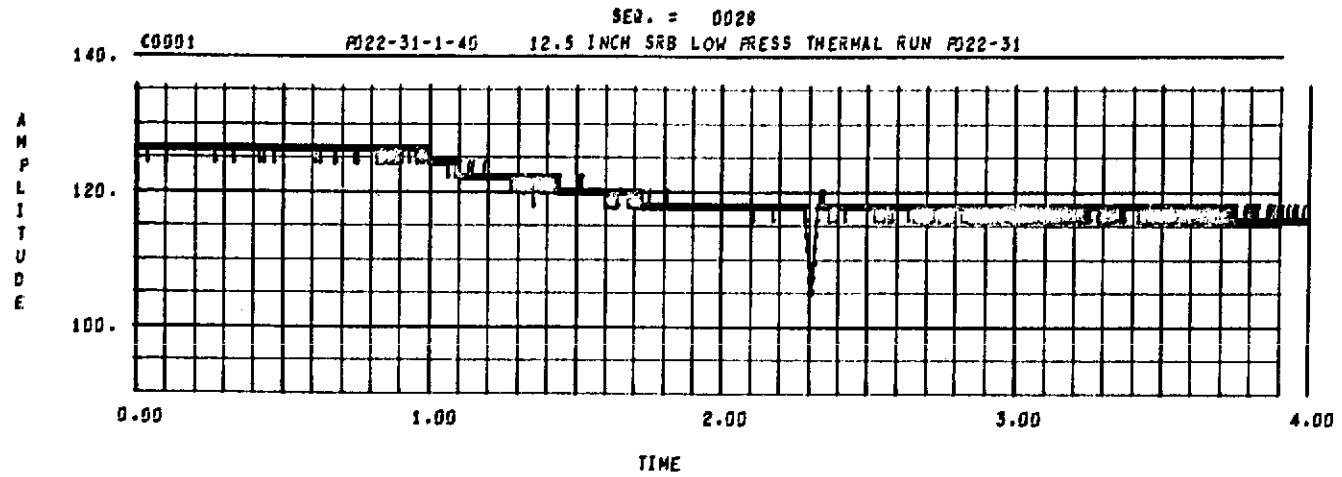
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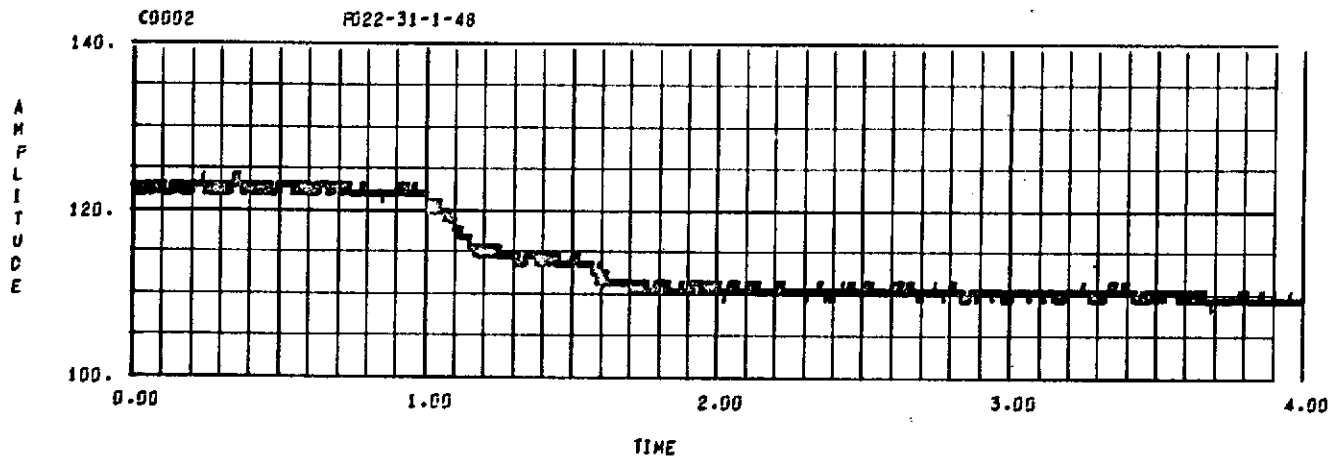
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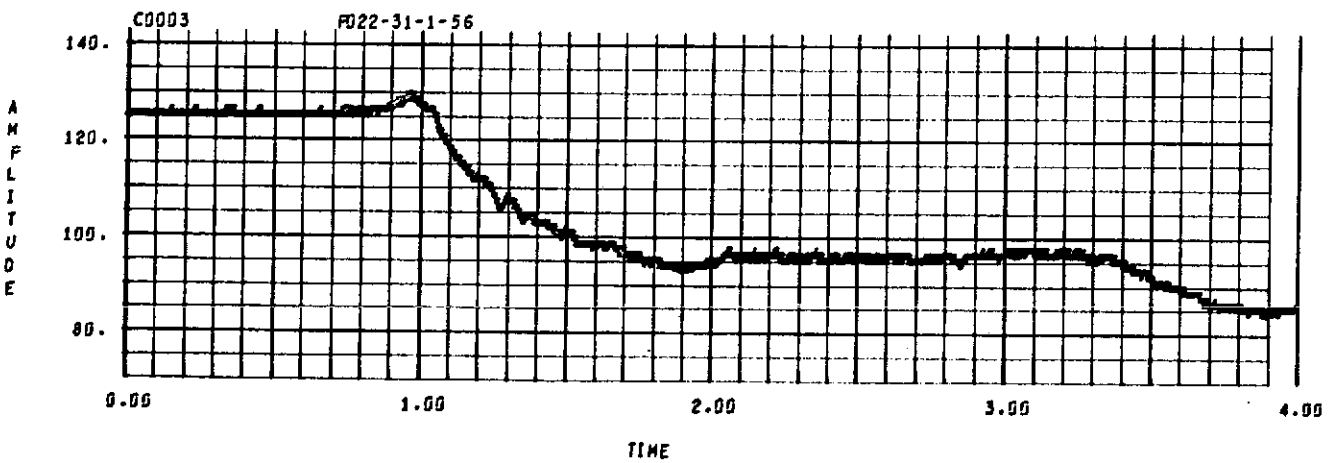
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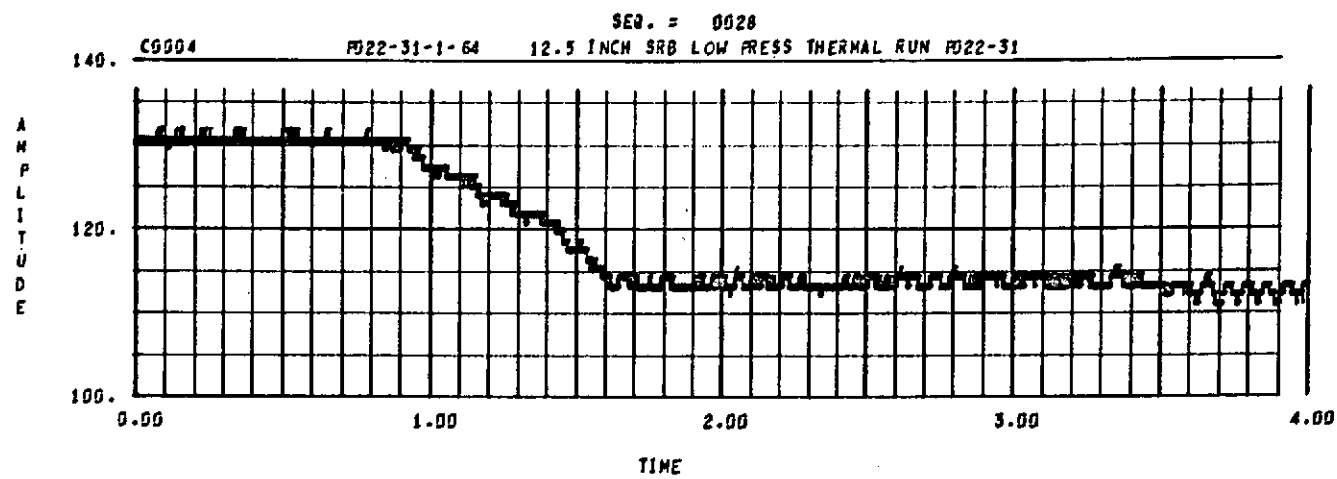
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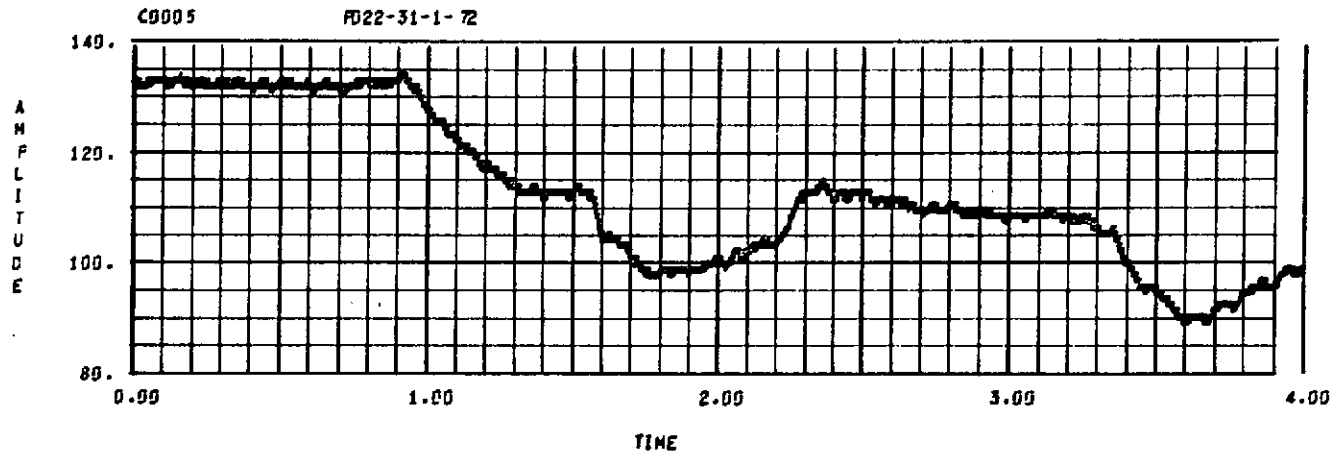
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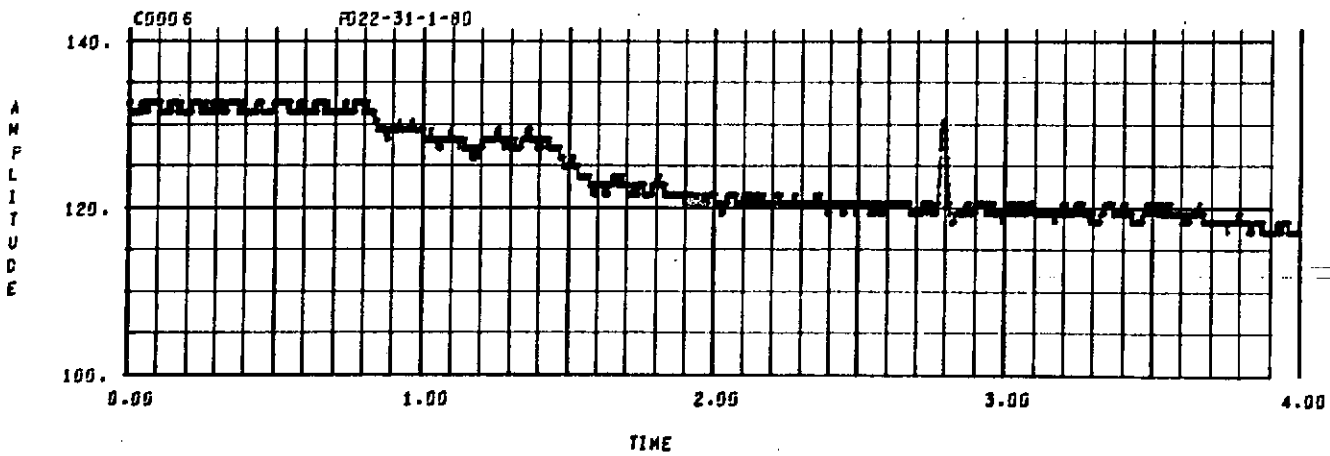
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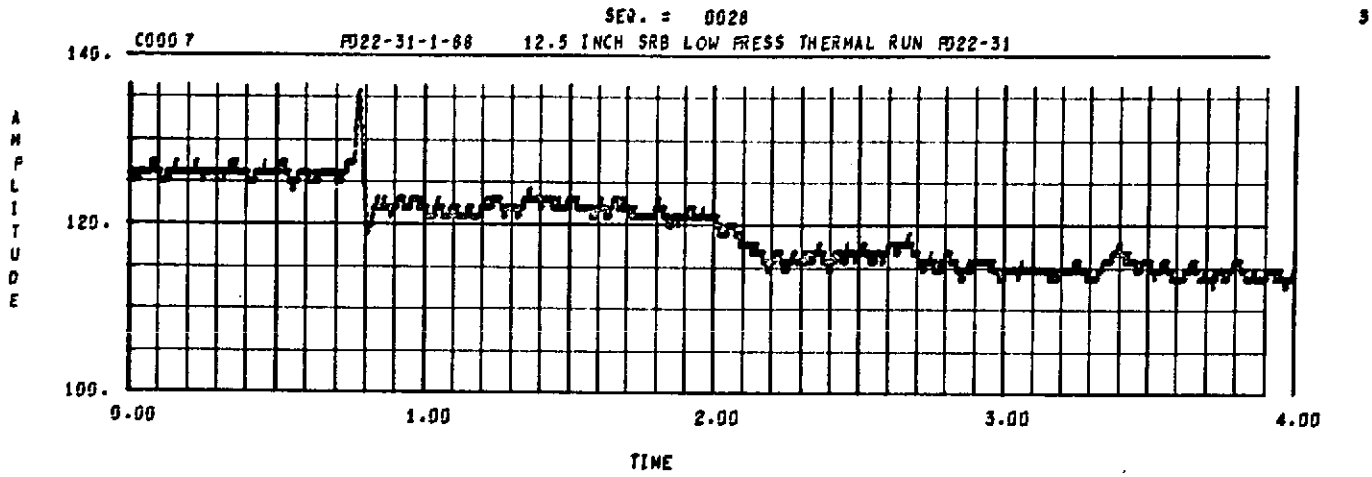
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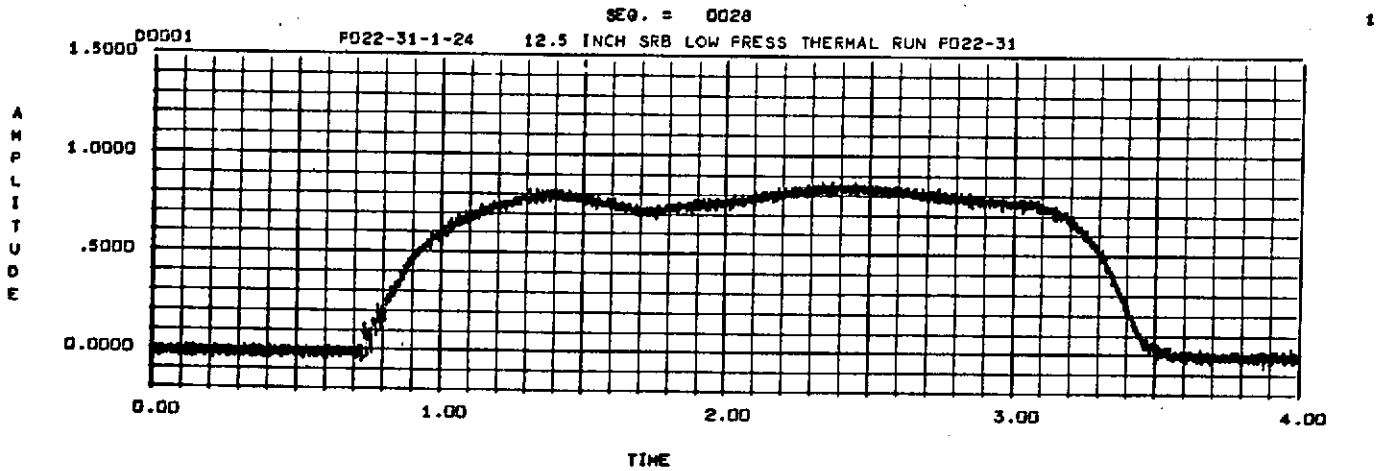
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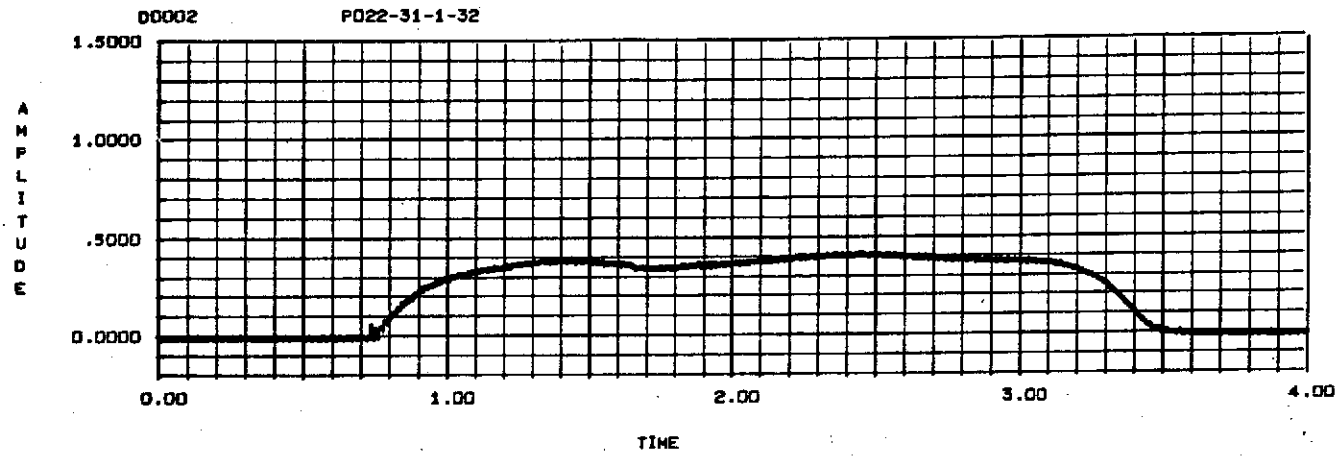
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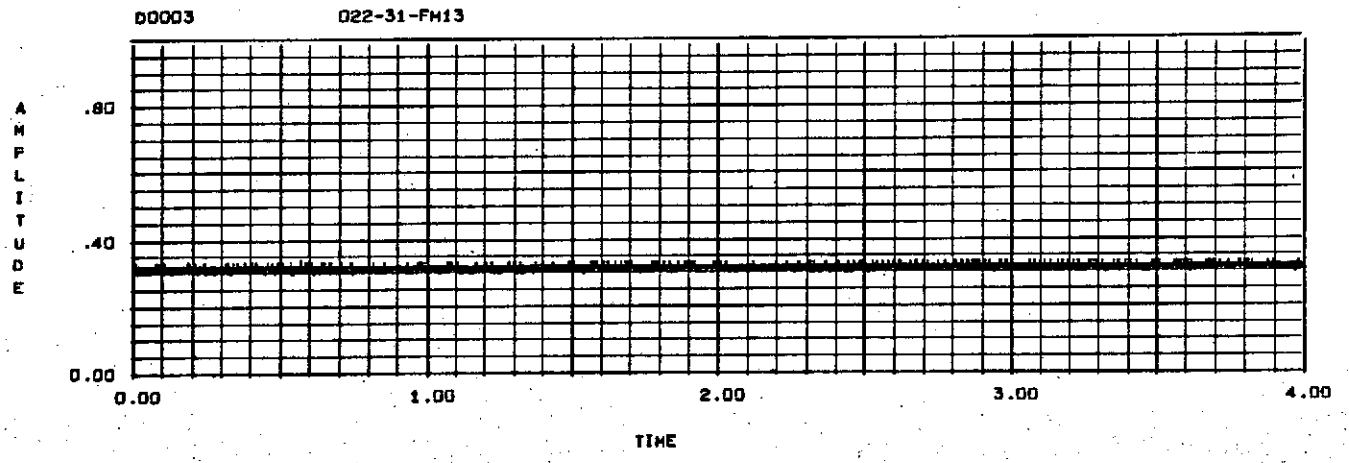
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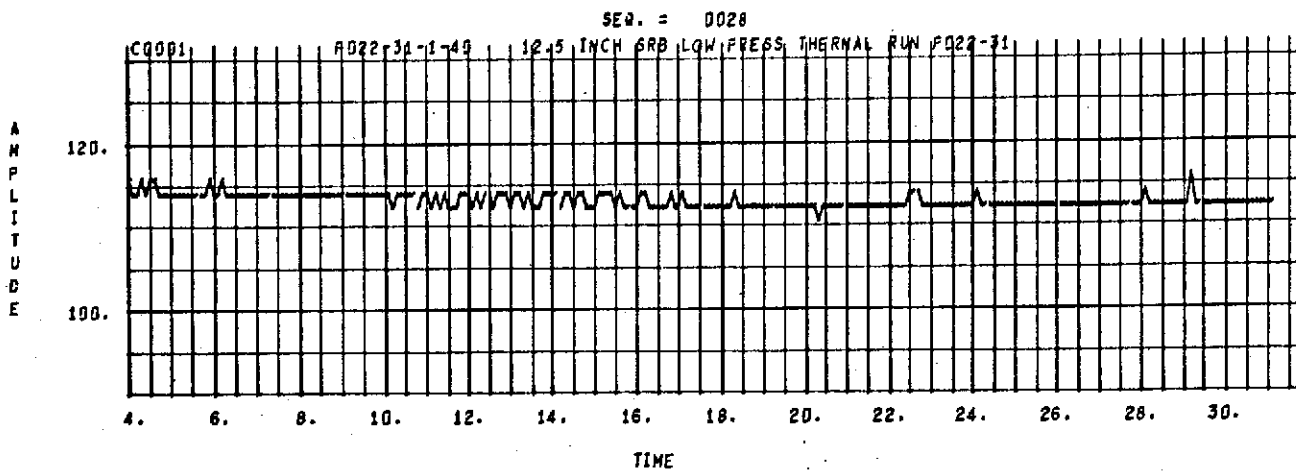
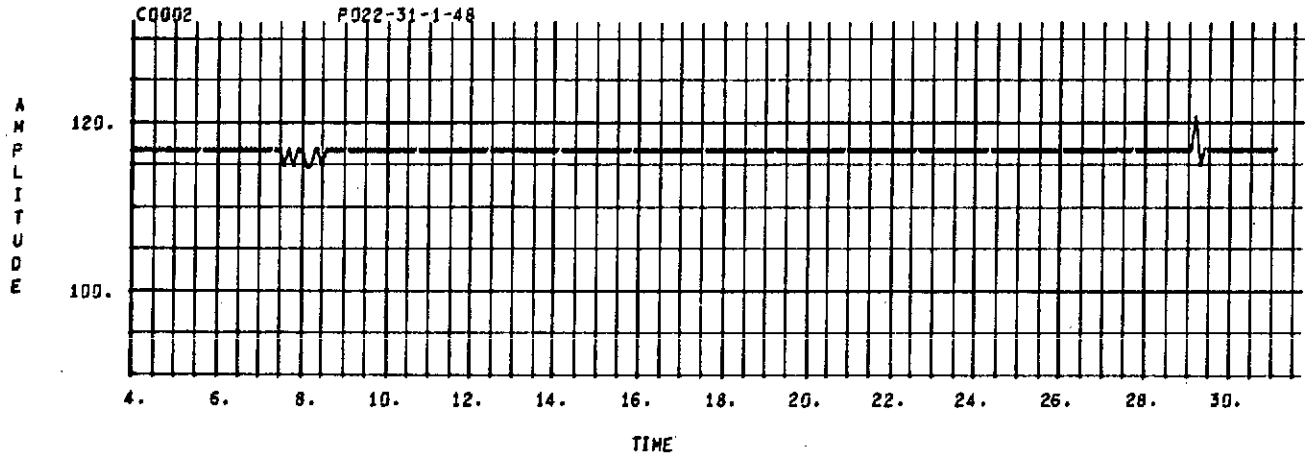
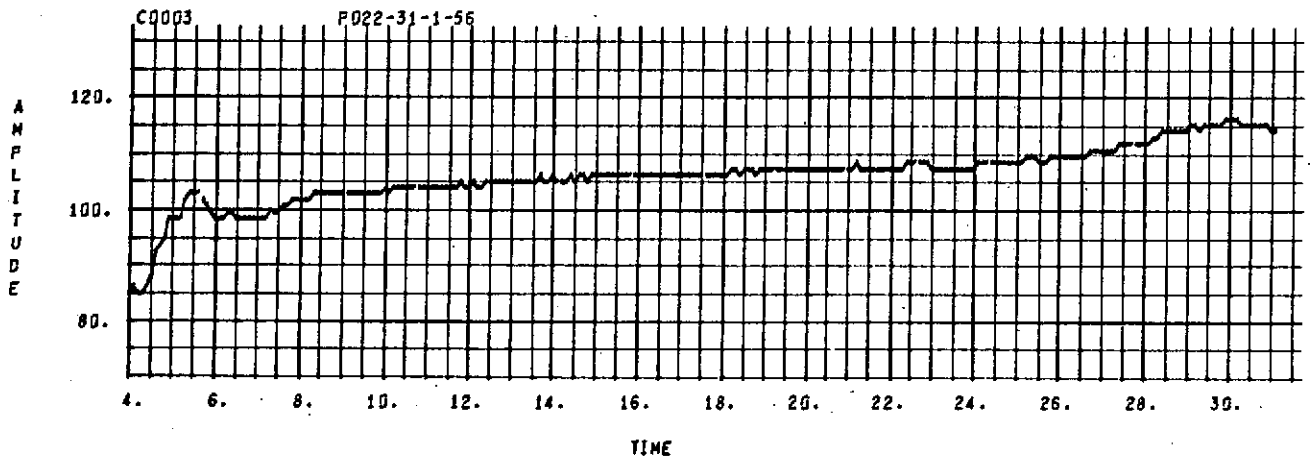
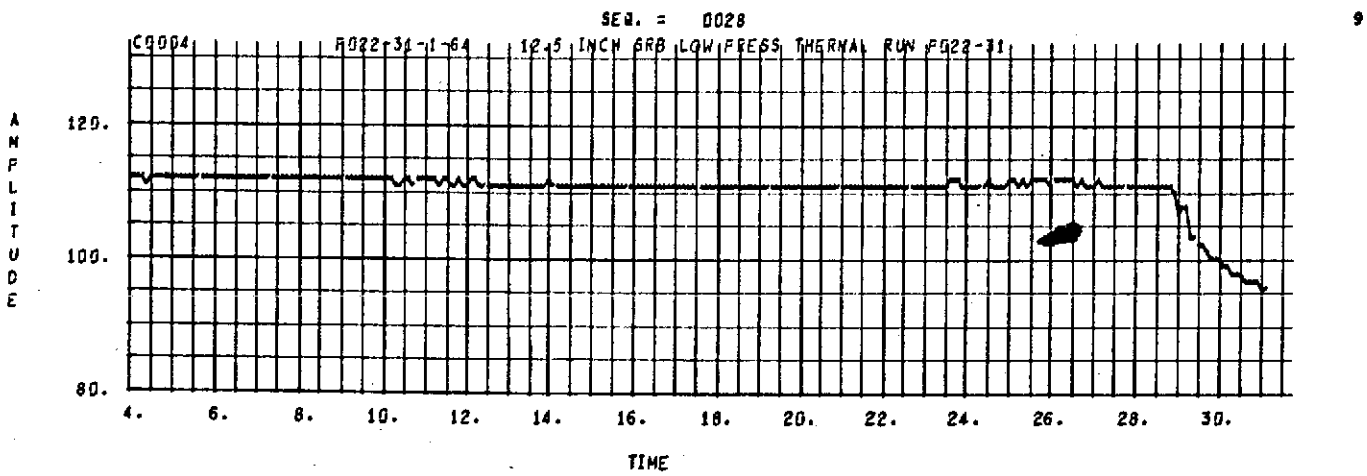

SEQ. = 0028
C0001
F022-31-1-40
12.5 INCH GRB LOW PRESS THERMAL RUN F022-31
120.
100.
AMPLITUDE
4.
6.
8.
10.
12.
14.
16.
18.
20.
22.
24.
26.
28.
30.
TIME


C0002
P022-31-1-48
AMPLITUDE
120.
100.
4. 6. 8. 10. 12. 14. 16. 18. 20. 22. 24. 26. 28. 30.
TIME


C0003
P022-31-1-56
AMPLITUDE
120.
100.
80.
4. 6. 8. 10. 12. 14. 16. 18. 20. 22. 24. 26. 28. 30.
TIME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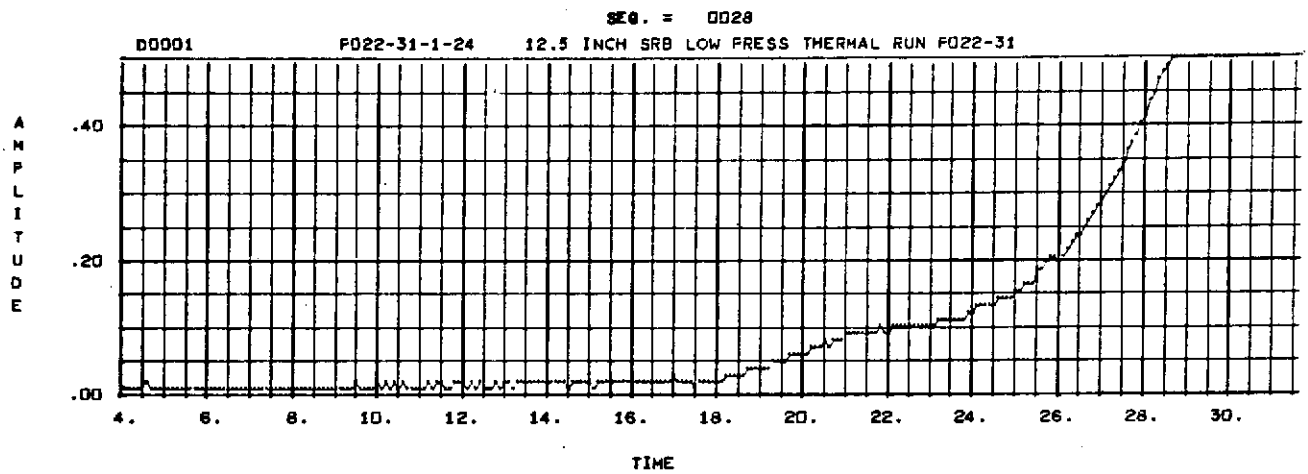
C0004
P022-31-1-64
12.5 INCH GRB LOW PRESS THERMAL RUN P022-31
AMPLITUDE
120.
100.
80.
4. 6. 8. 10. 12. 14. 16. 18. 20. 22. 24. 26. 28. 30.
TIME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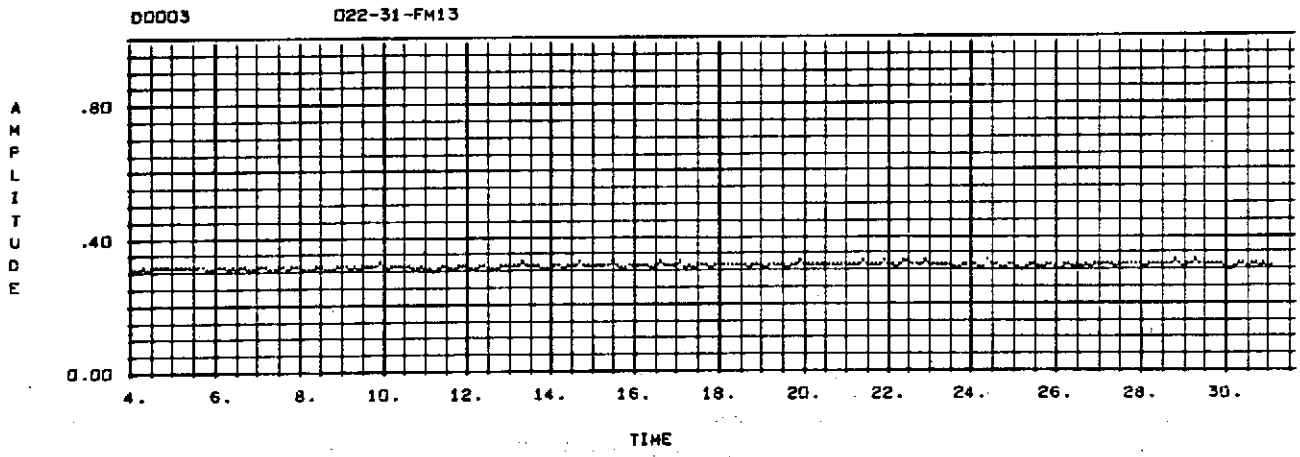
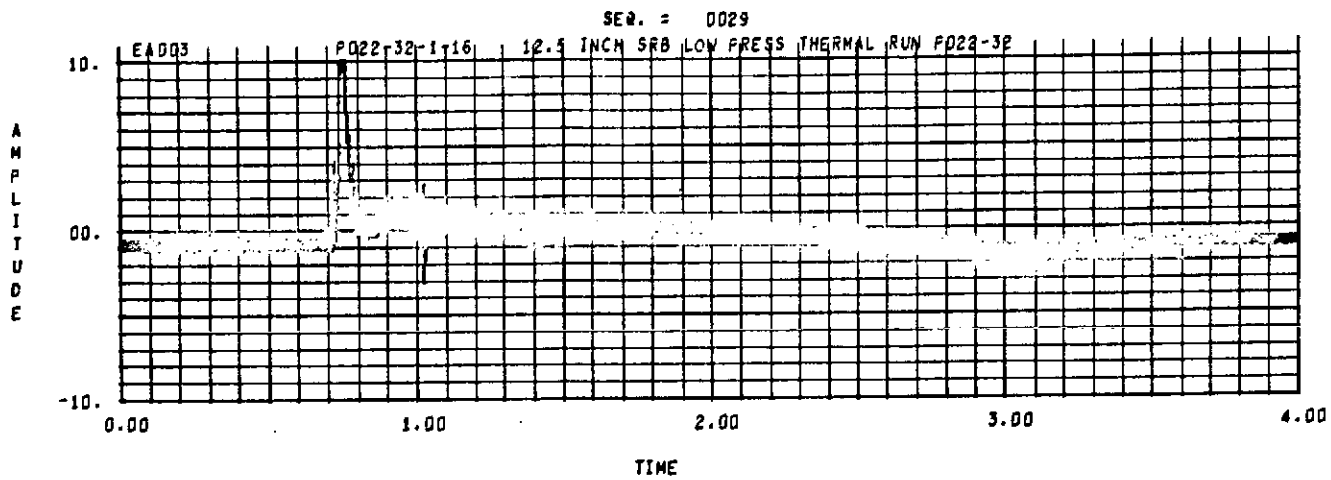
D0001
F022-31-1-24
12.5 INCH SRB LOW PRESS THERMAL RUN F022-31
AMPLITUDE
.40
.20
.00
4.
6.
8.
10.
12.
14.
16.
18.
20.
22.
24.
26.
28.
30.
TIME


D0003
022-31-FM13
AMPLITUDE
.80
.40
0.00
4.
6.
8.
10.
12.
14.
16.
18.
20.
22.
24.
26.
28.
30.
TIME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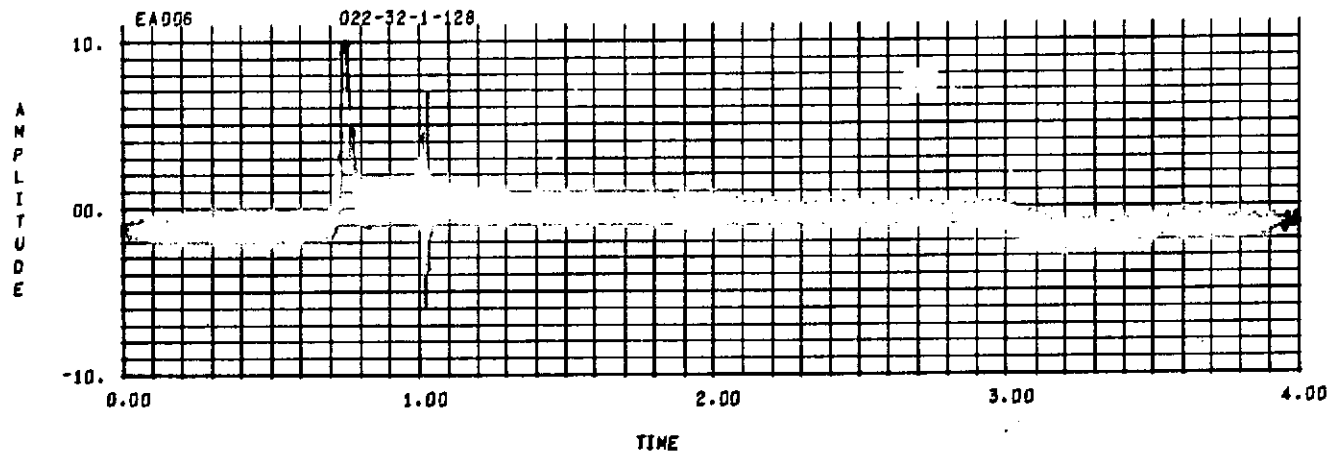
EA003
P022-32-1-16
12.5 INCH SRB LOW PRESS THERMAL RUN F022-32
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME


EA006
022-32-1-128
10.
00.
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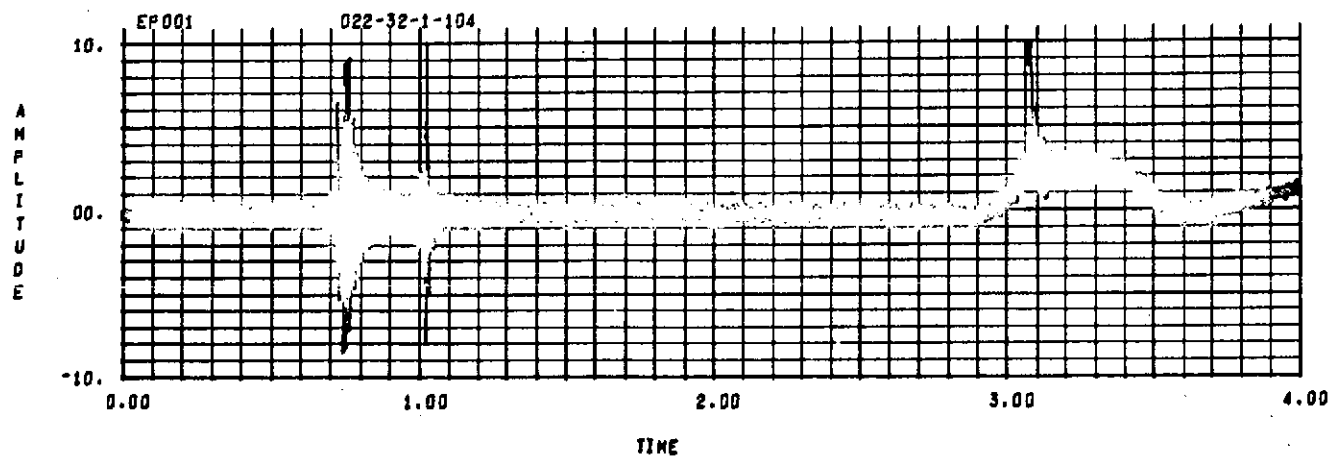
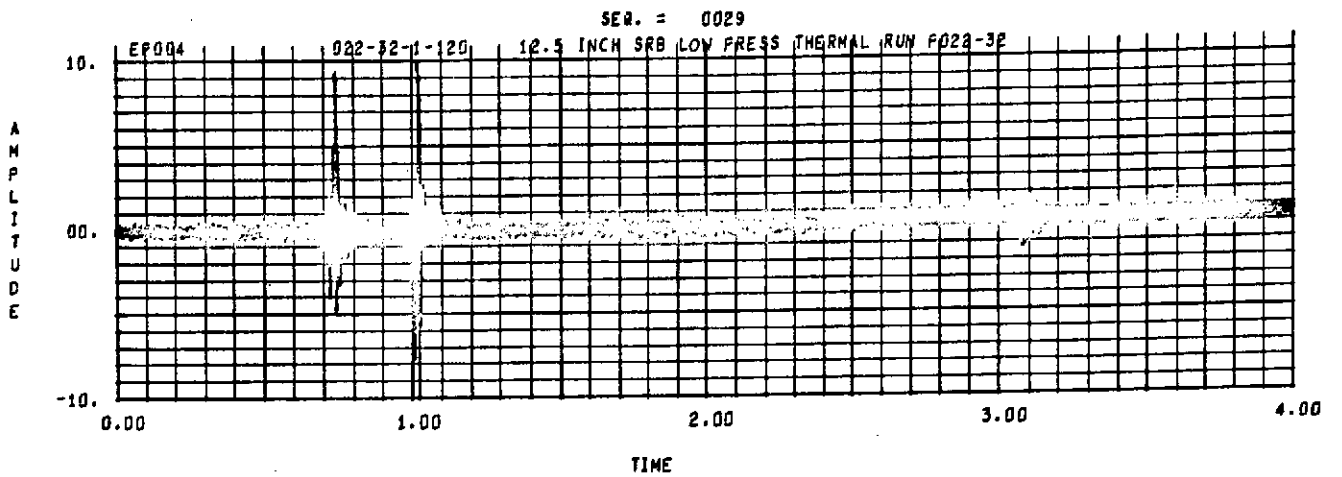
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME


EP001
022-32-1-104
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME


SER. = 0029
EF004
022-32-1-120
12.5 INCH SRB LOW PRESS THERMAL RUN F022-32
10.
00.
-10.
AMPLITUDE
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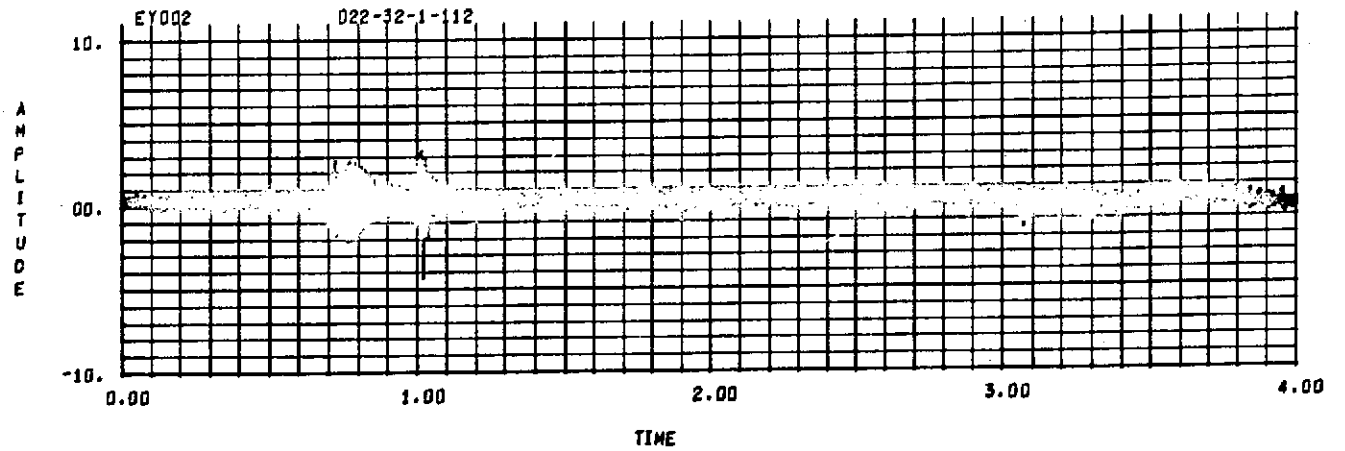
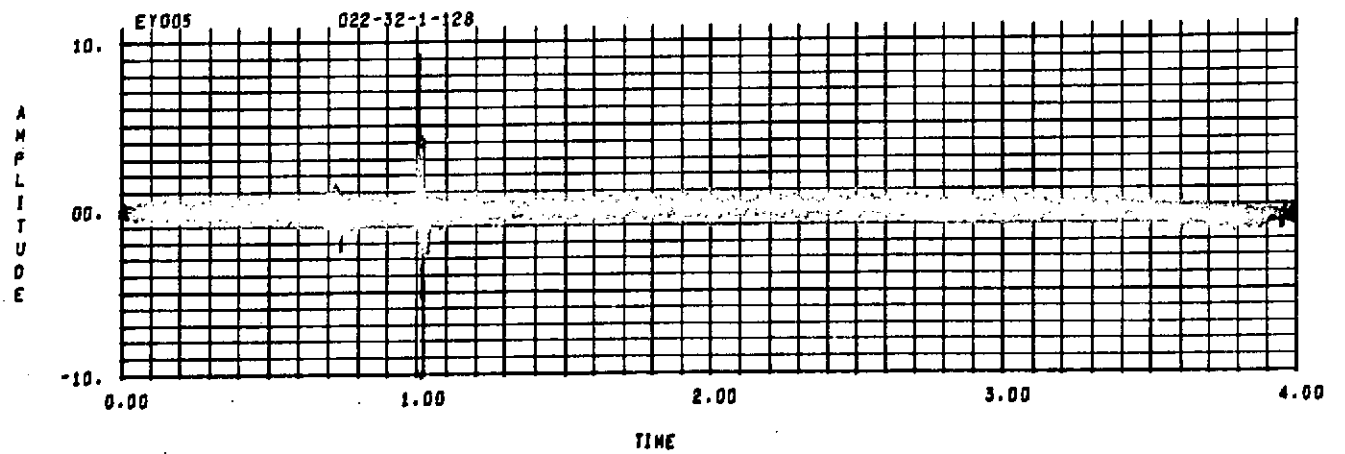
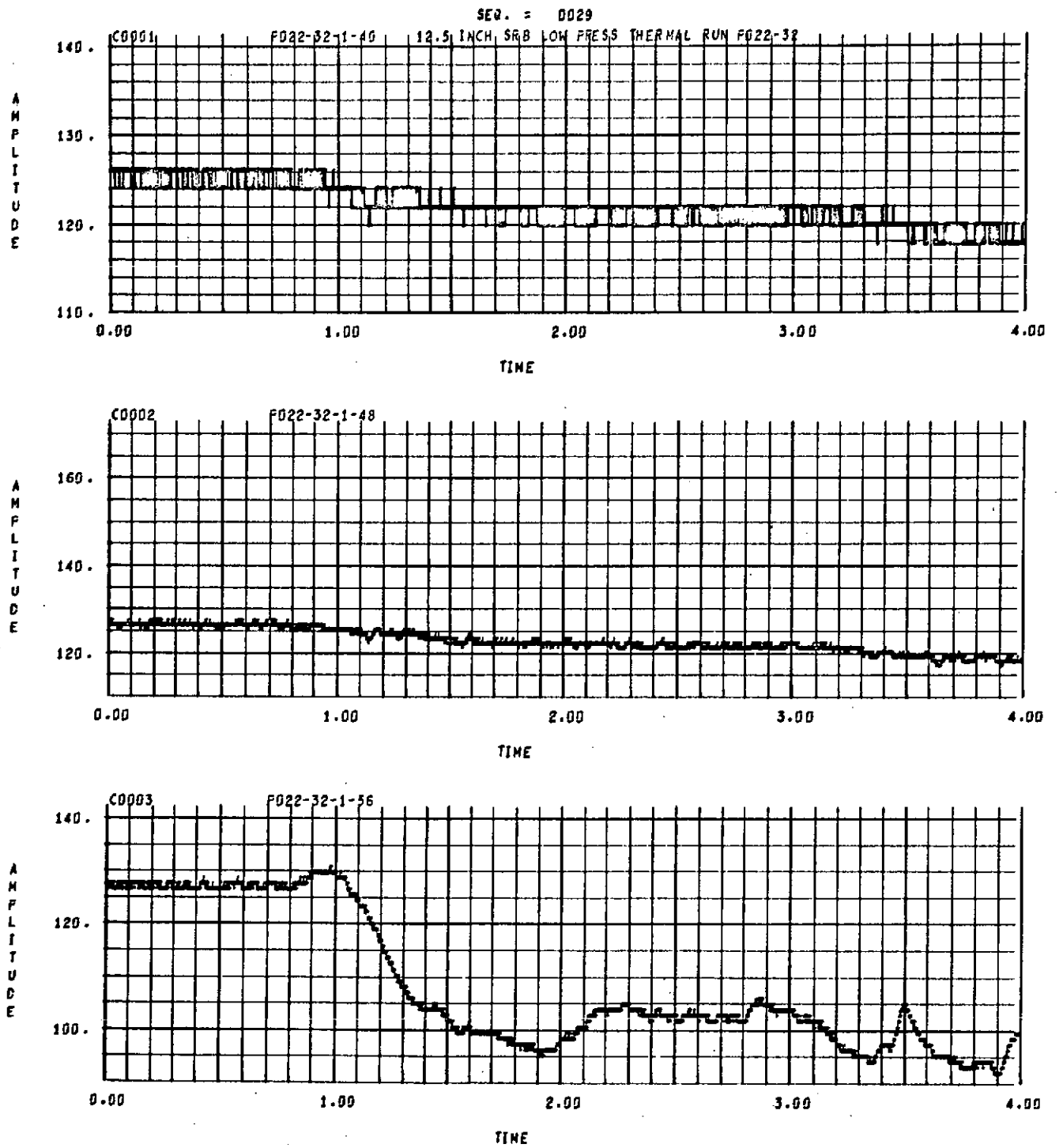
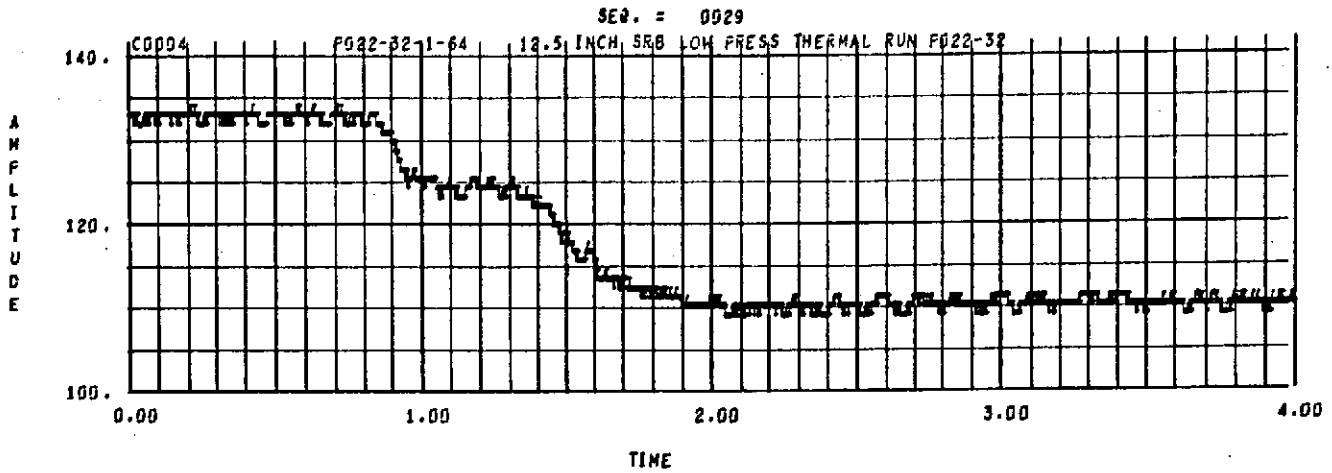
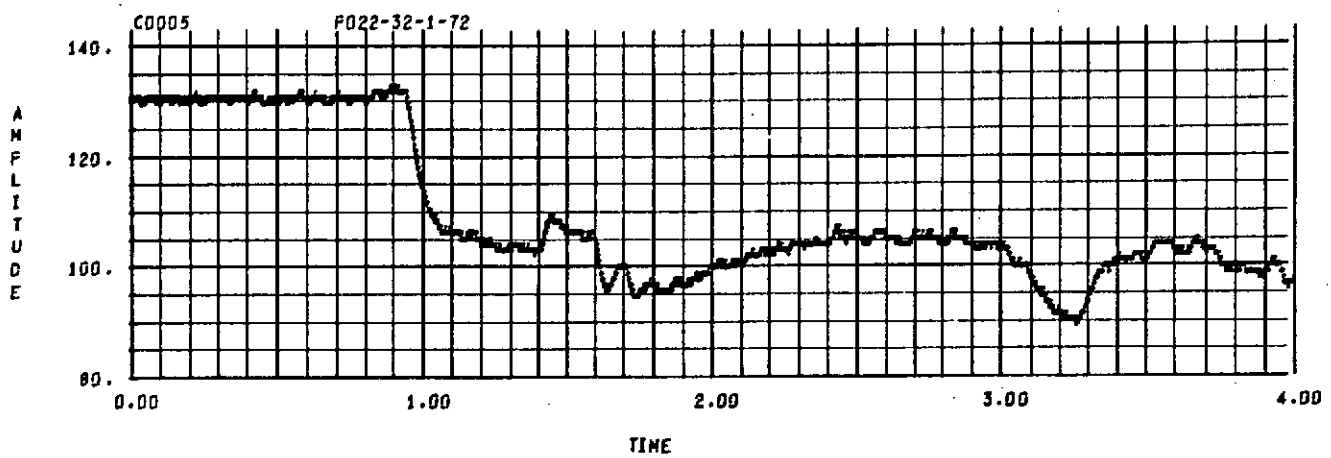
1.00
2.00
3.00
4.00
TIME

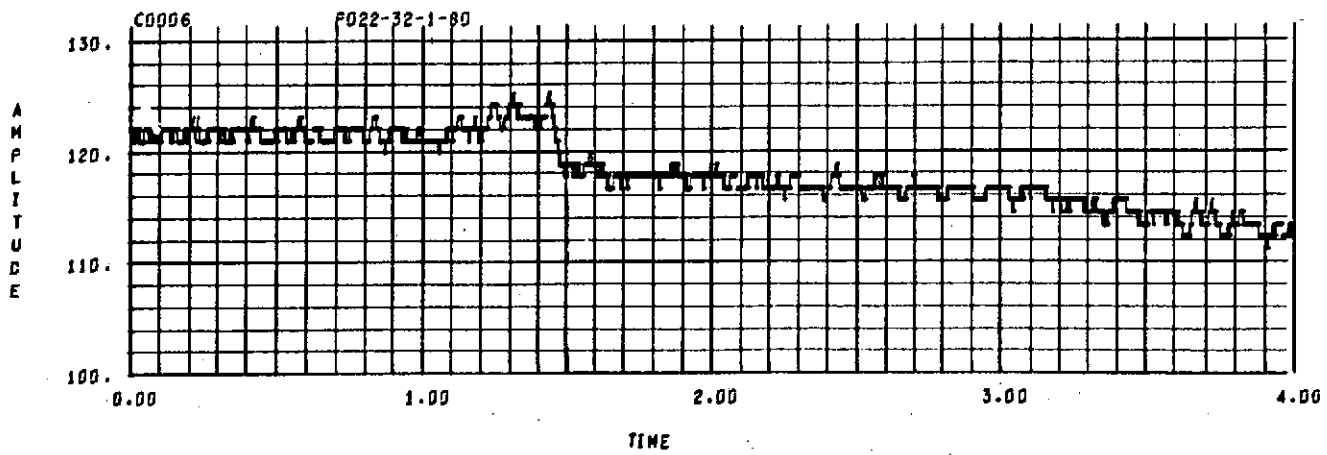

EY002
022-32-1-112
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

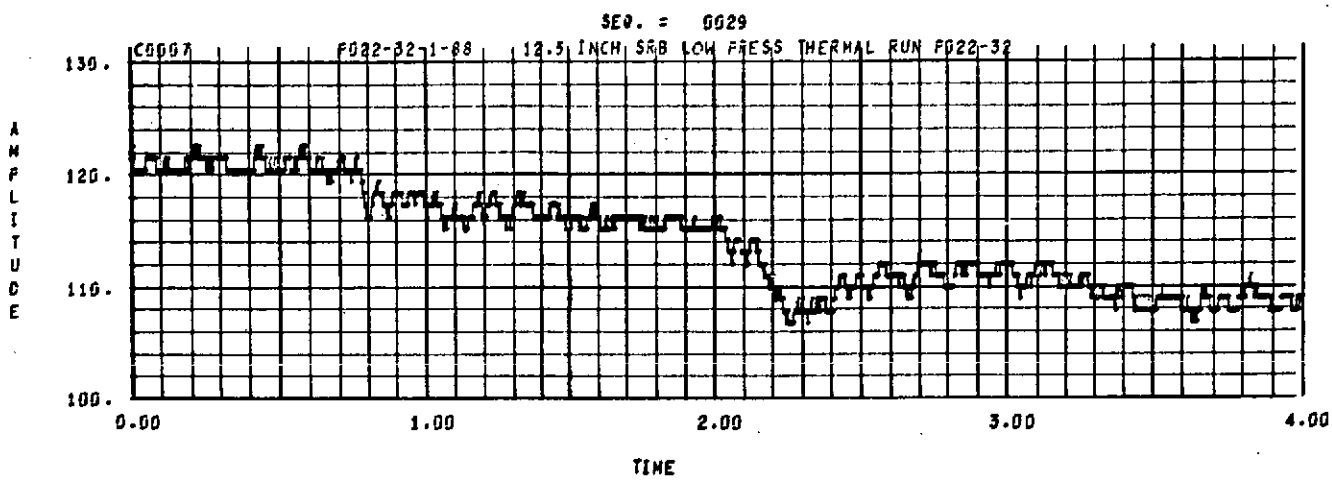

EY005
022-32-1-128
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

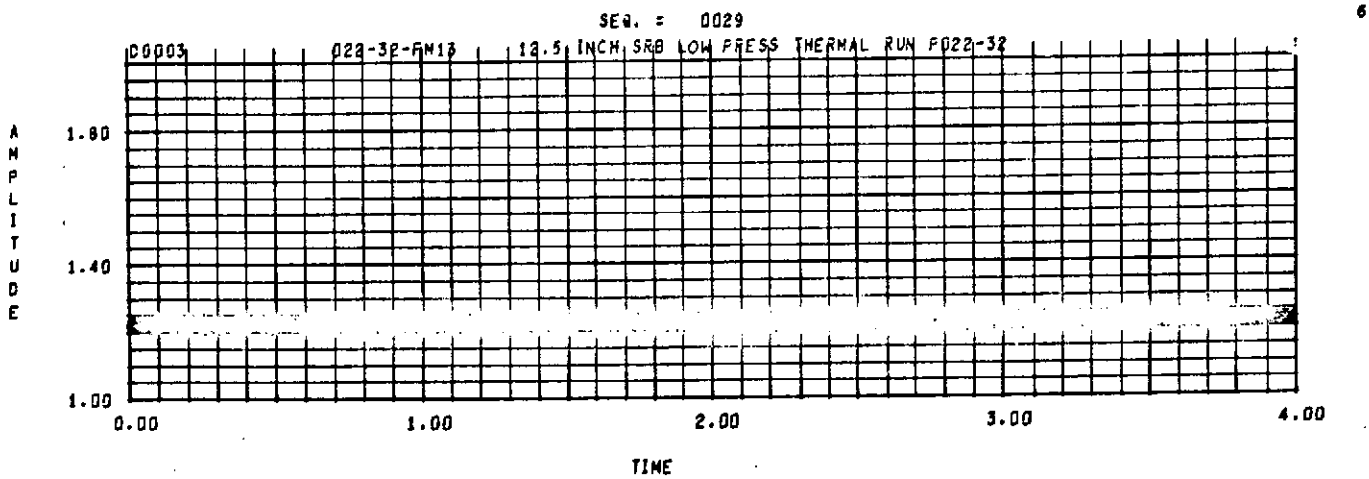

SEQ. = 0029
C0001
F022-32-1-40
12.5 INCH SRB LOW PRESS THERMAL RUN F022-32
AMPLITUDE
140.
130.
120.
110.
0.00
1.00
2.00
3.00
4.00
TIME
C0002
F022-32-1-48
AMPLITUDE
160.
140.
120.
0.00
1.00
2.00
3.00
4.00
TIME
C0003
F022-32-1-56
AMPLITUDE
140.
120.
100.
0.00
1.00
2.00
3.00
4.00
TIME

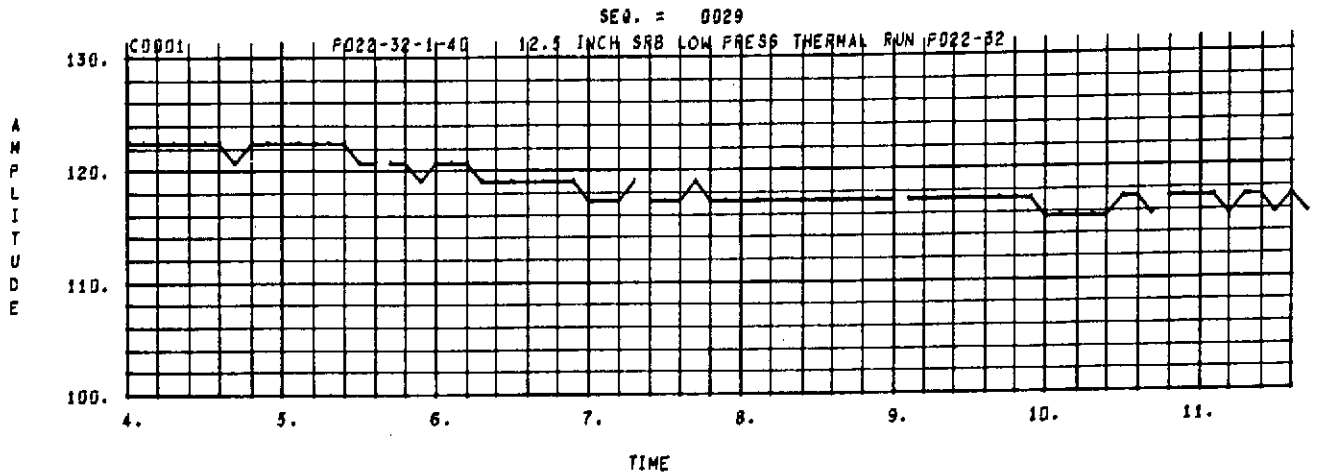

SEQ. = 0029
C0004
F022-32-1-64
12.5 INCH SRB LOW PRESS THERMAL RUN F022-32
AMPLITUDE
140.
120.
100.
0.00
1.00
2.00
3.00
4.00
TIME

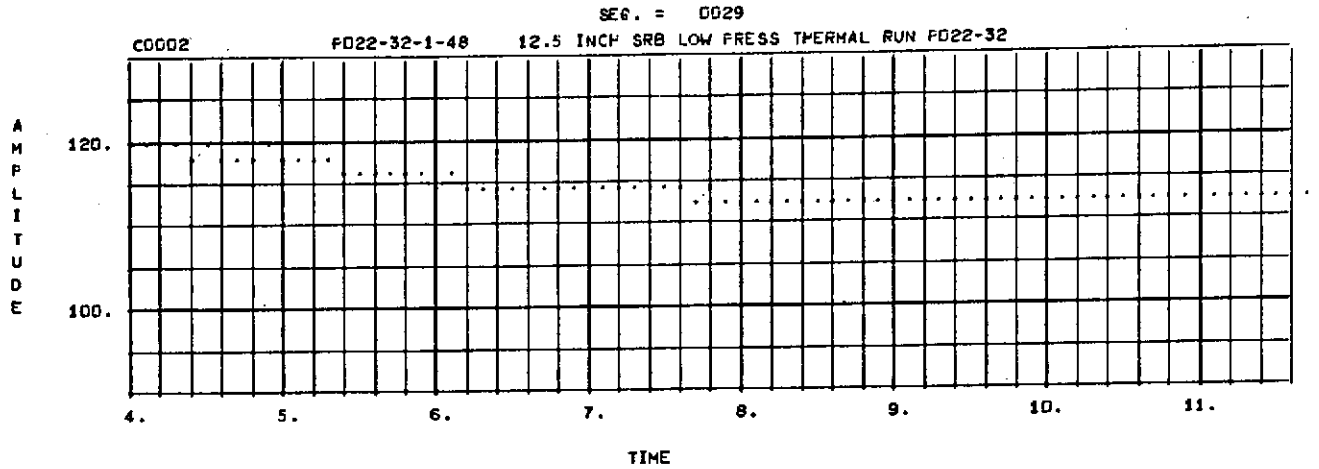

C0005
F022-32-1-72
AMPLITUDE
140.
120.
100.
80.
0.00
1.00
2.00
3.00
4.00
TIME

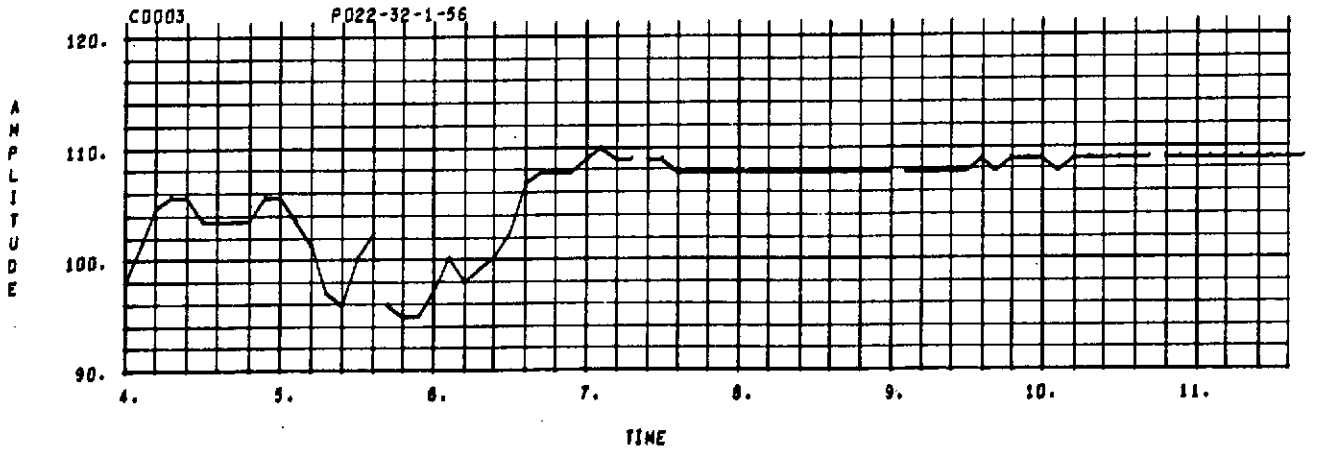

C0006
F022-32-1-80
AMPLITUDE
130.
120.
110.
100.
0.00
1.00
2.00
3.00
4.00
TIME

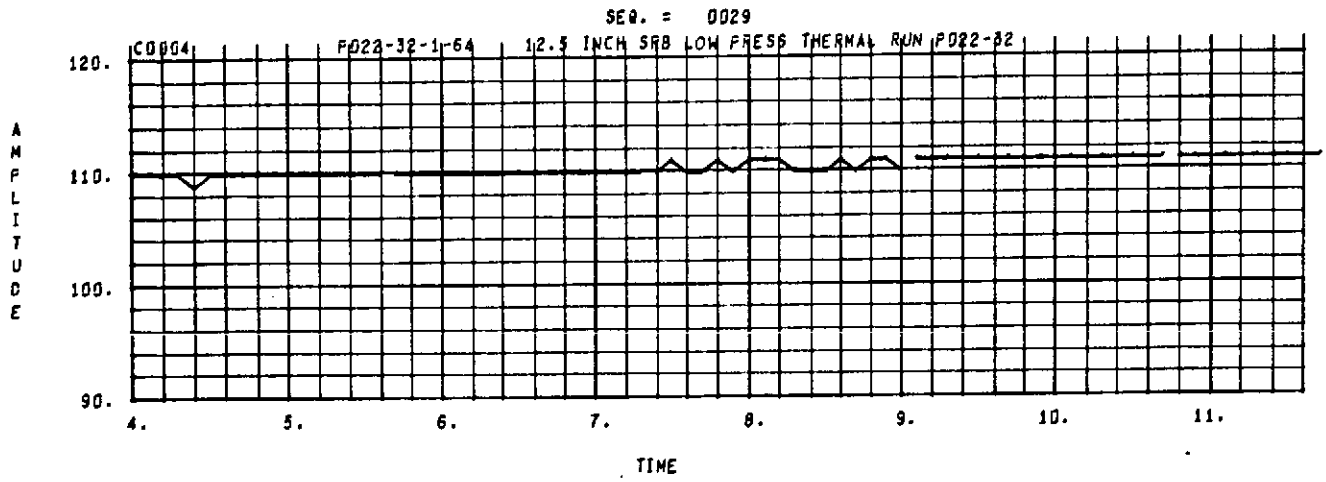

SEQ. = 0029
3
C0007
F022-32-1-88
12.5 INCH SRB LOW PRESS THERMAL RUN F022-32
130.
120.
110.
100.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

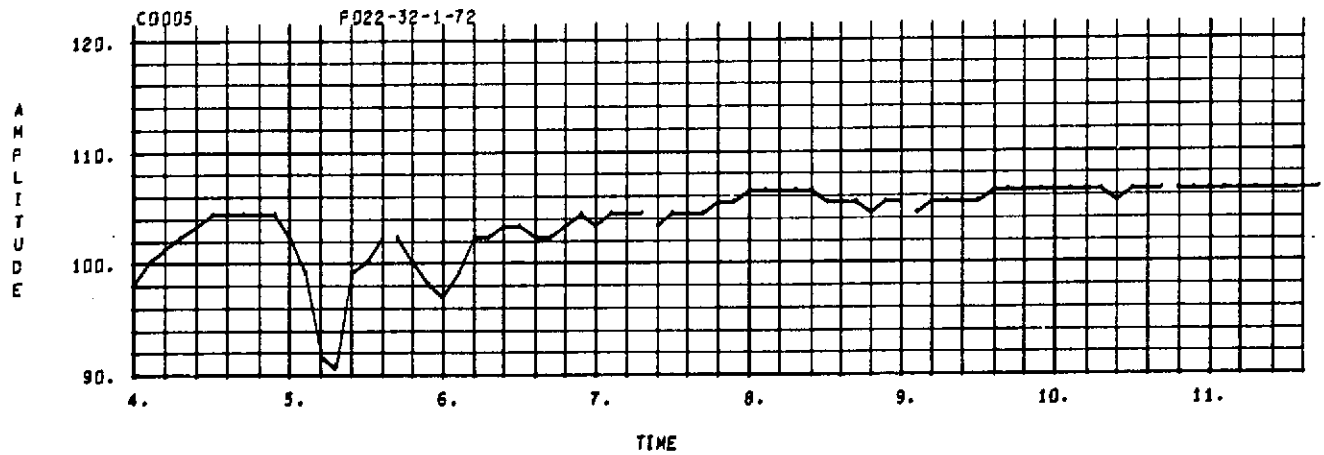

SEQ. = 0029
6
C0003
022-32-AM13
12.5 INCH SRB LOW PRESS THERMAL RUN F022-32
1.80
1.40
1.00
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

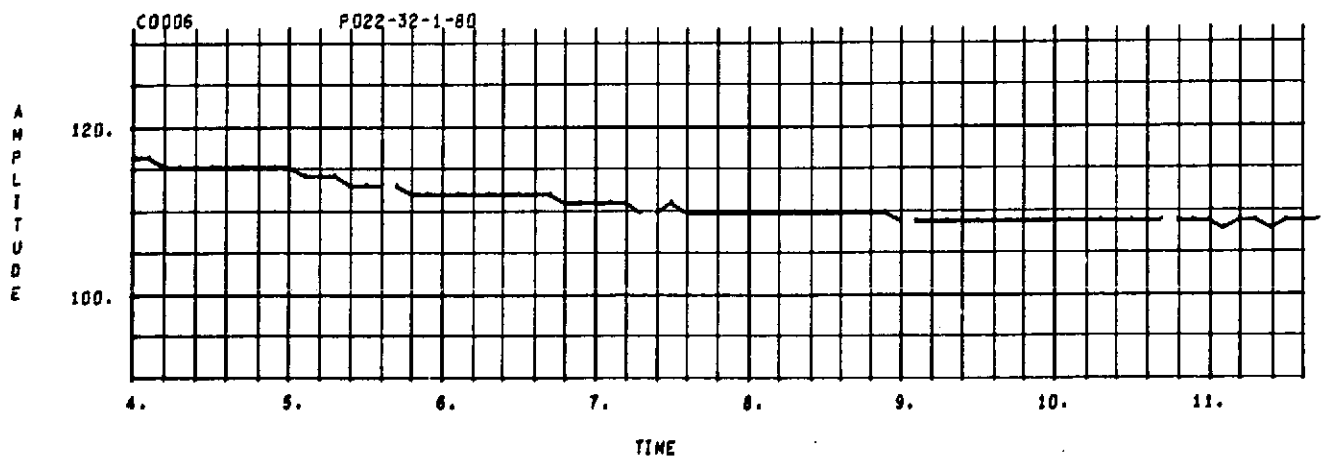

SEQ. = 0029
C0001
F022-32-1-40
12.5 INCH SRB LOW PRESS THERMAL RUN F022-32
AMPLITUDE
130.
120.
110.
100.
4.
5.
6.
7.
8.
9.
10.
11.
TIME


SEQ. = 0029
C0002
F022-32-1-48
12.5 INCH SRB LOW PRESS THERMAL RUN F022-32
AMPLITUDE
120.
100.
4.
5.
6.
7.
8.
9.
10.
11.
TIME

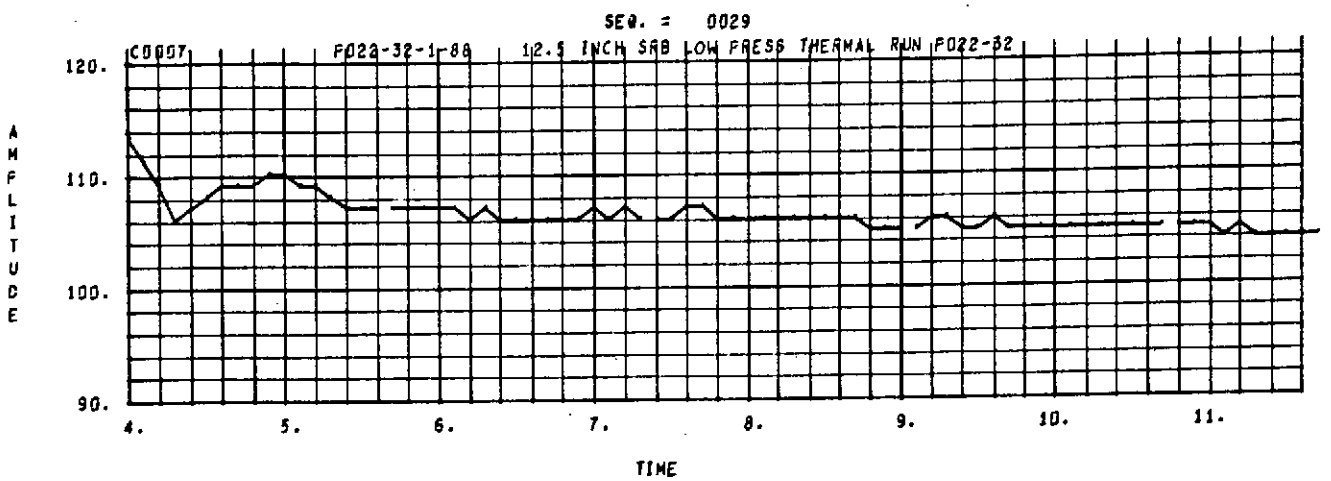

C0003
F022-32-1-56
AMPLITUDE
120.
110.
100.
90.
4.
5.
6.
7.
8.
9.
10.
11.
TIME


SEQ. = 0029
C0004
P022-32-1-64
12.5 INCH SRB LOW PRESS THERMAL RUN P022-32
AMPLITUDE
120.
110.
100.
90.
4.
5.
6.
7.
8.
9.
10.
11.
TIME

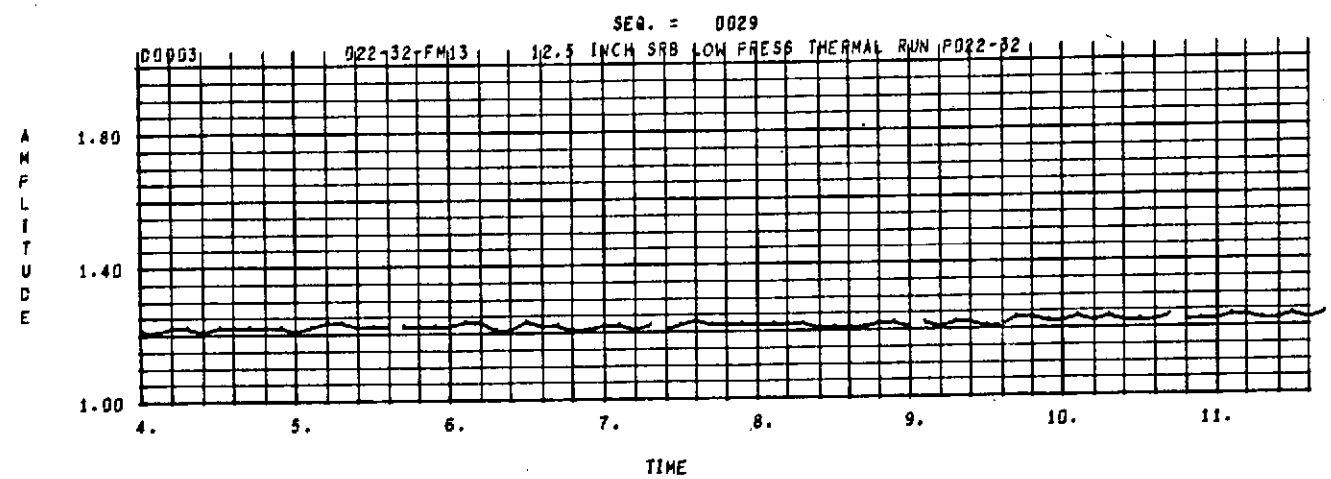

C0005
P022-32-1-72
AMPLITUDE
120.
110.
100.
90.
4.
5.
6.
7.
8.
9.
10.
11.
TIME

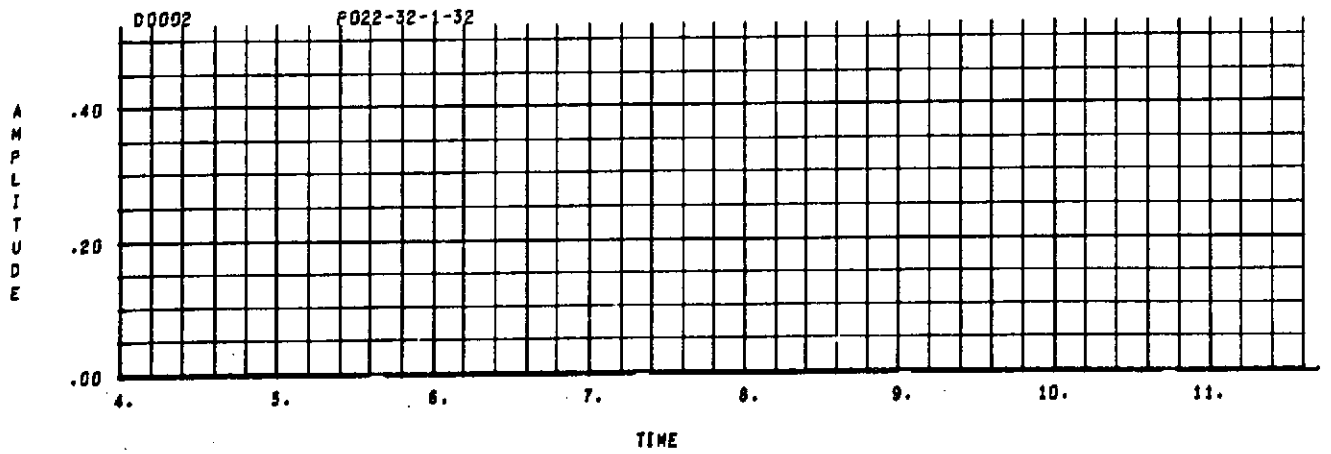

C0006
P022-32-1-80
AMPLITUDE
120.
100.
4.
5.
6.
7.
8.
9.
10.
11.
TIME

10


SEQ. = 0029
C0007
F022-32-1-88
12.5 INCH SRB LOW PRESS THERMAL RUN F022-32
AMPLITUDE
120.
110.
100.
90.
4.
5.
6.
7.
8.
9.
10.
11.
TIME

11


SEQ. = 0029
D0003
022-32-FM13
12.5 INCH SRB LOW PRESS THERMAL RUN F022-32
AMPLITUDE
1.80
1.40
1.00
4.
5.
6.
7.
8.
9.
10.
11.
TIME


D0002
F022-32-1-32
AMPLITUDE
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.20
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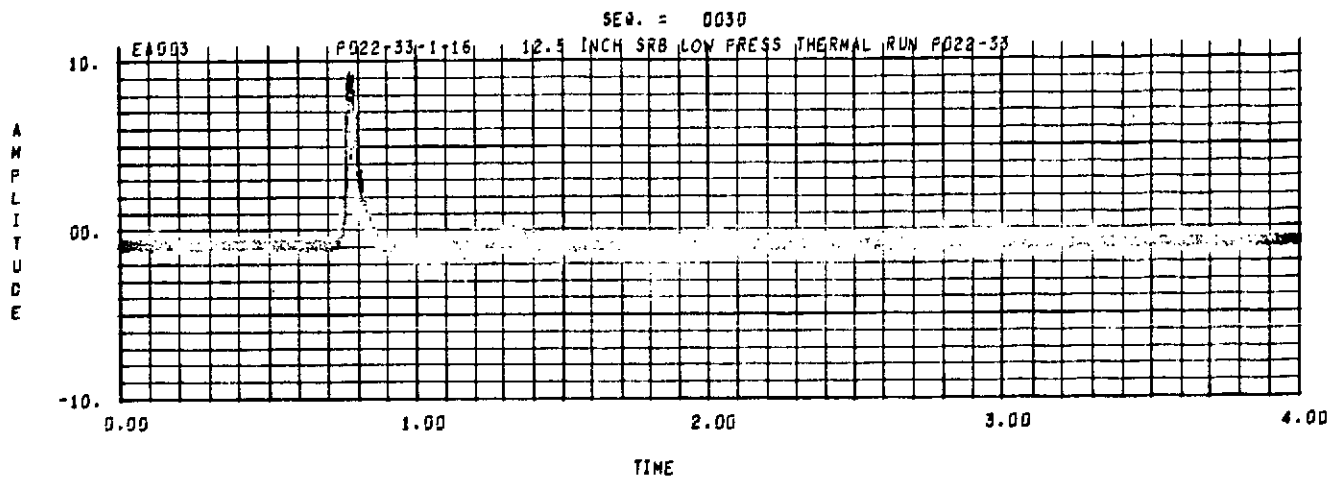
5.
6.
7.
8.
9.
10.
11.
TIME


SEQ. = 0030
EA003
P022-33-1-16
12.5 INCH SRB LOW PRESS THERMAL RUN P022-33
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00.
-10.
AMPLITUDE
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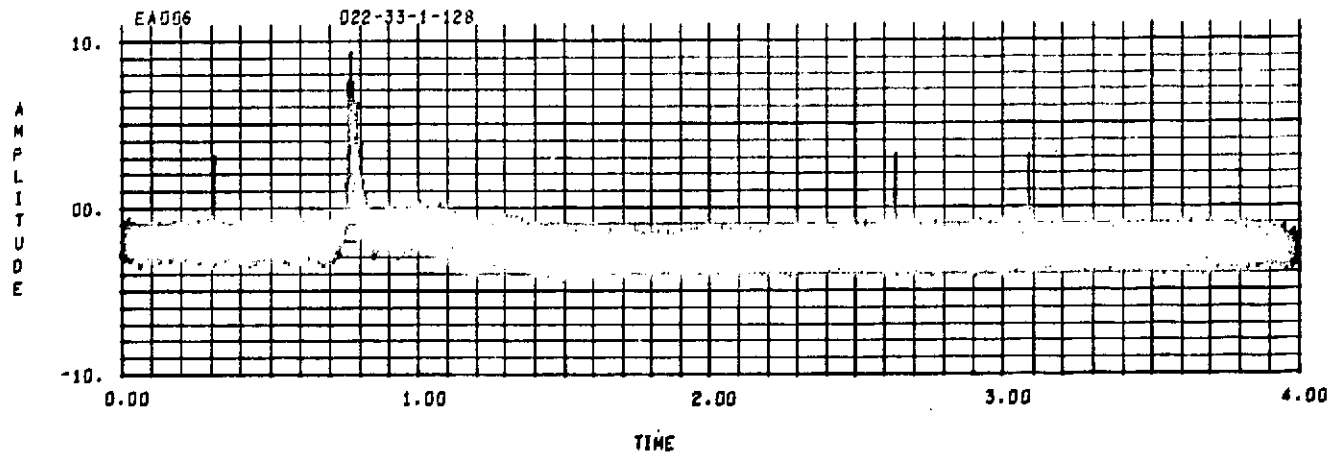
1.00
2.00
3.00
4.00
TIME


EA006
022-33-1-128
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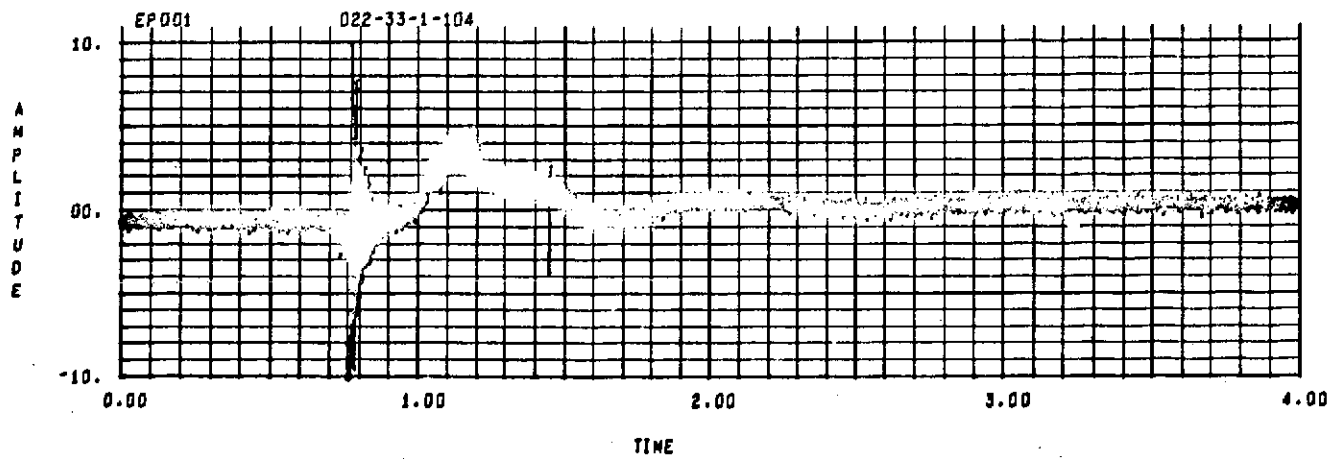
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME


EP001
022-33-1-104
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00.
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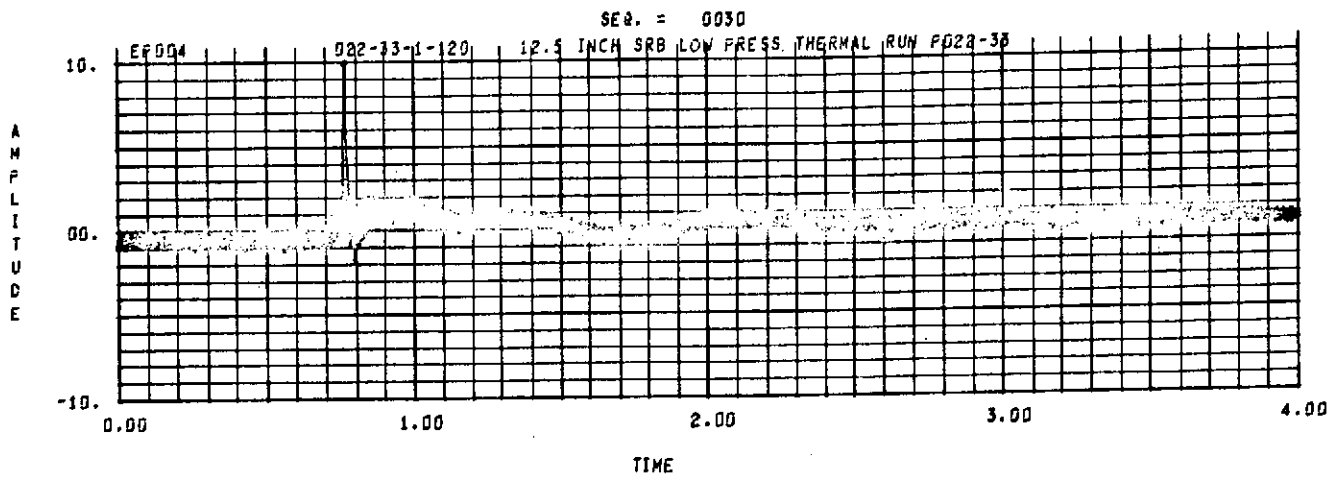
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME


SEQ. = 0030
EF004
022-33-1-120
12.5 INCH SRB LOW PRESS. THERMAL RUN F022-33
10.
00.
-10.
AMPLITUDE
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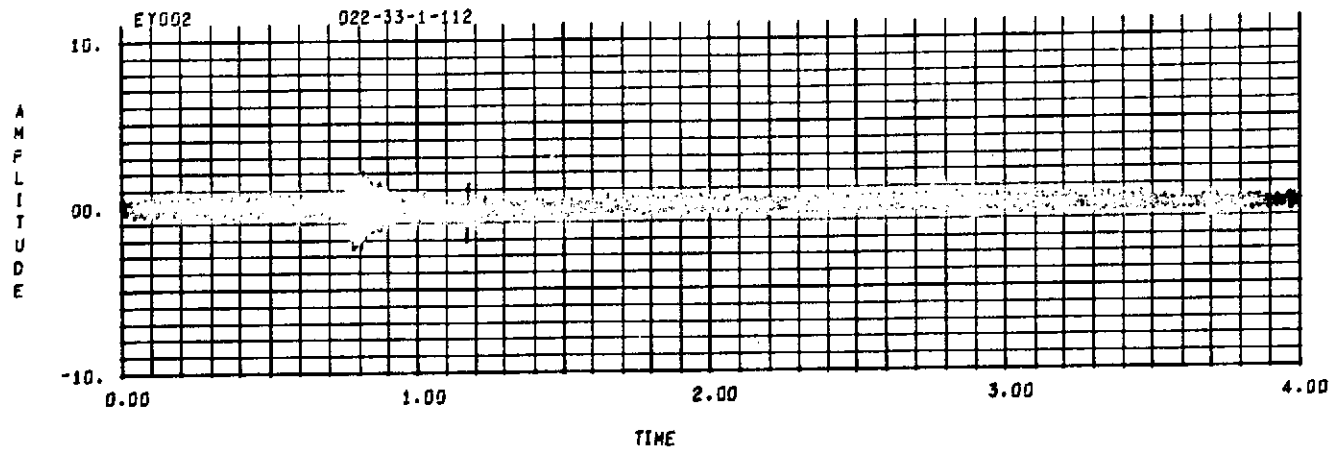
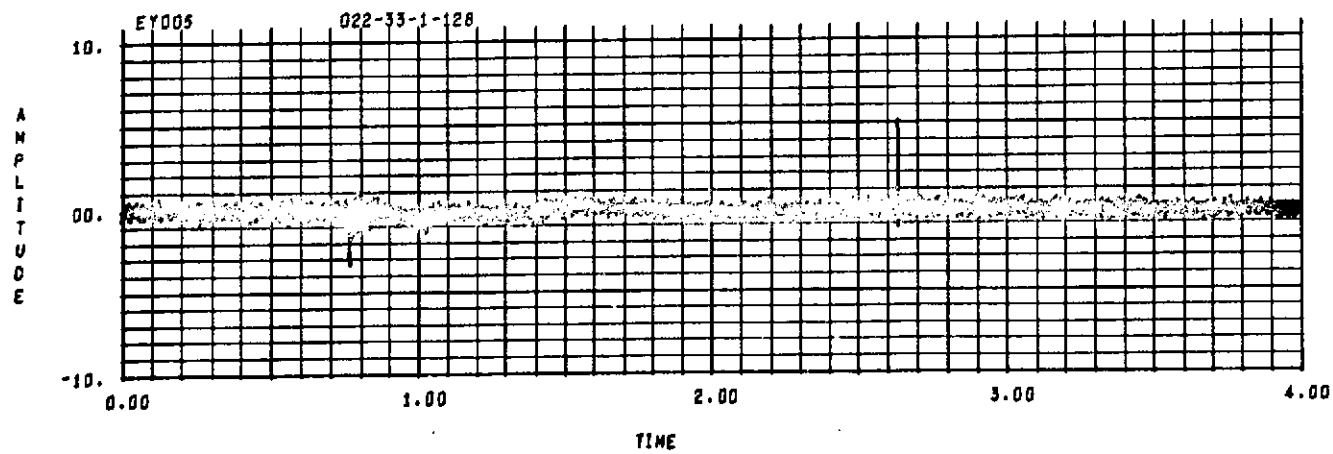
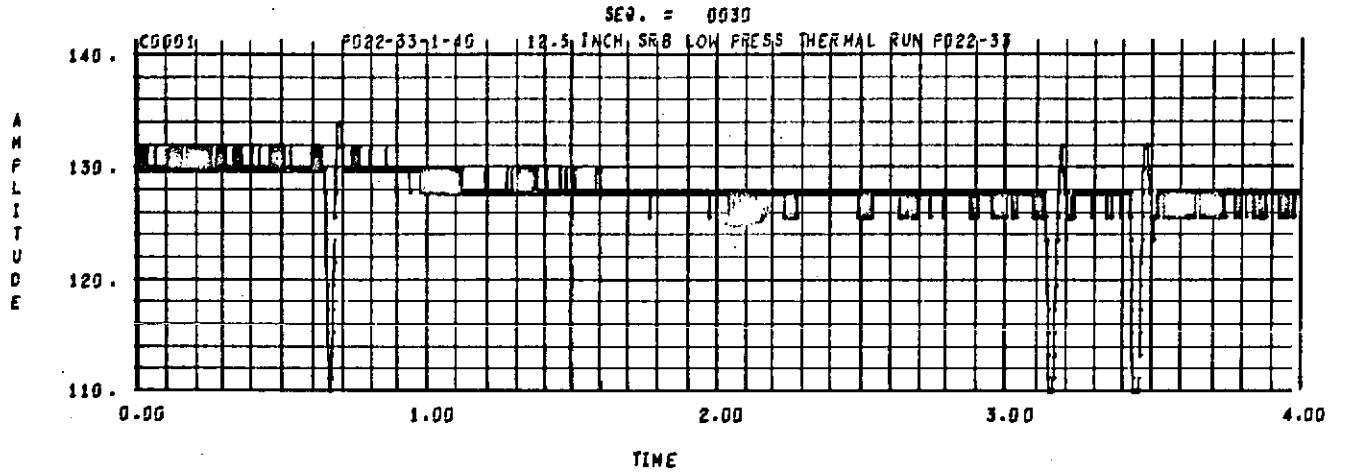
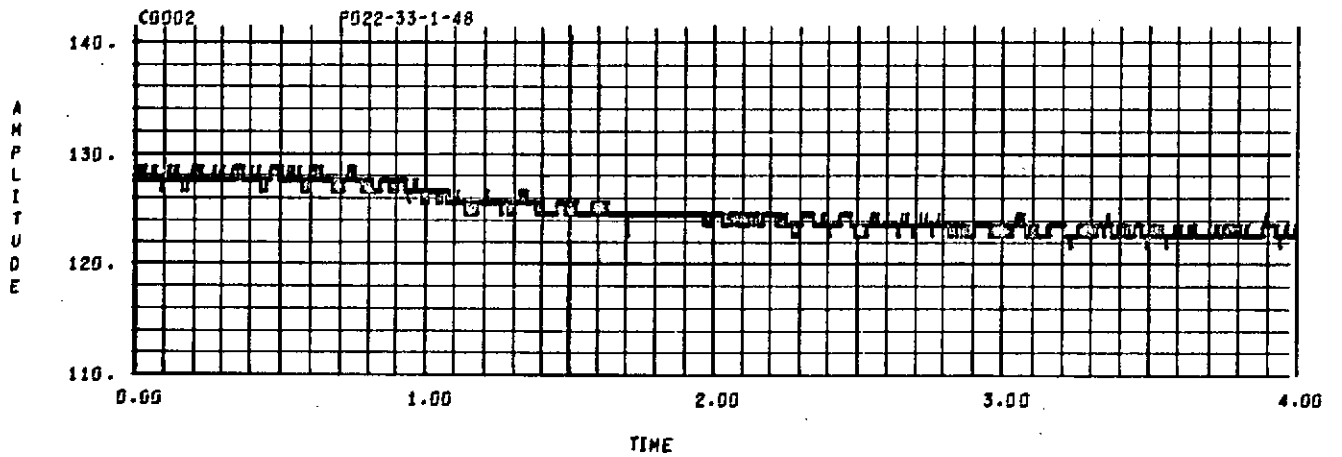
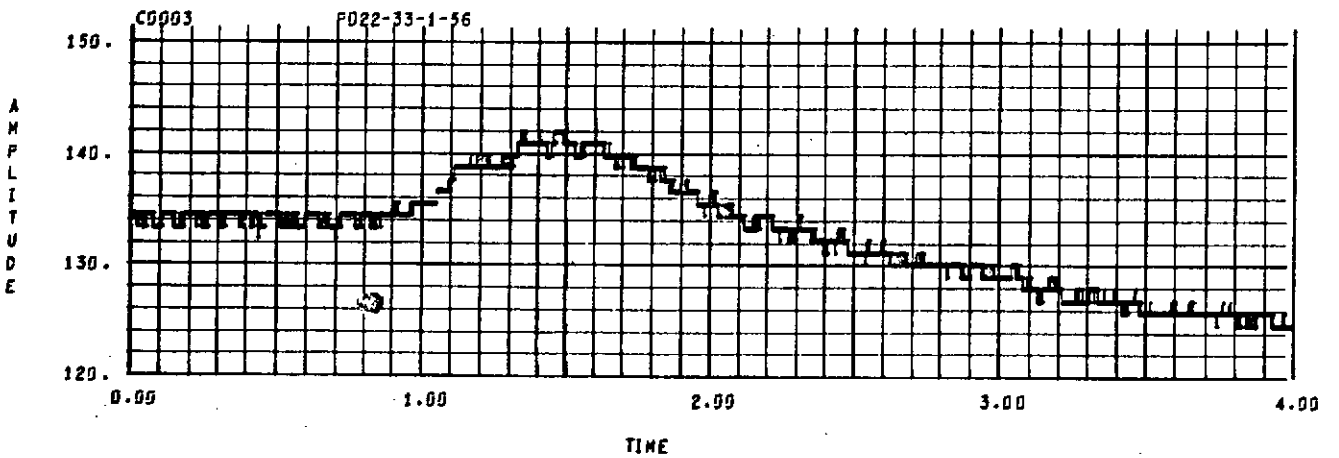
1.00
2.00
3.00
4.00
TIME

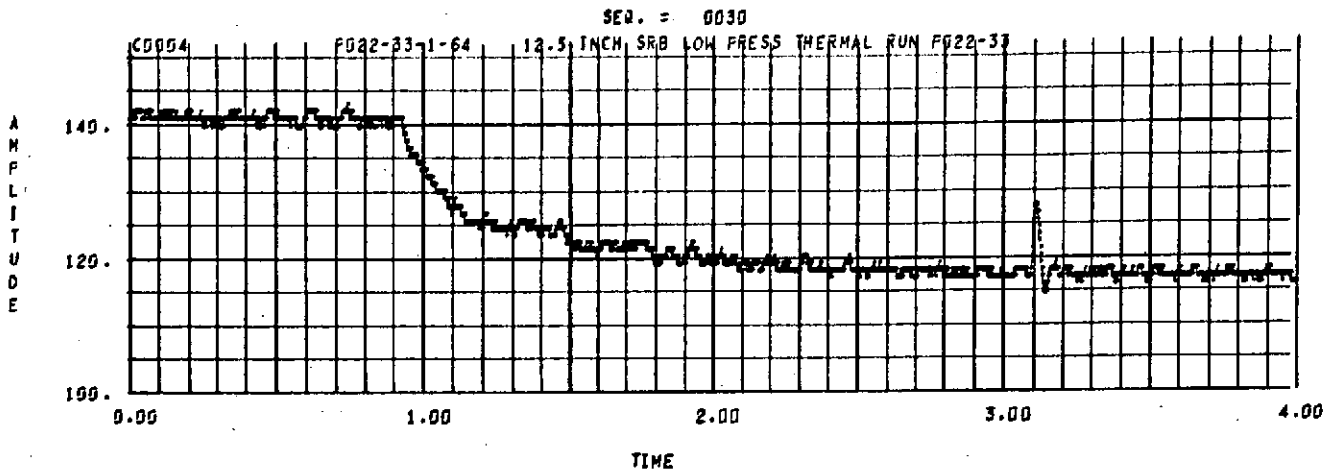

EY002
022-33-1-112
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

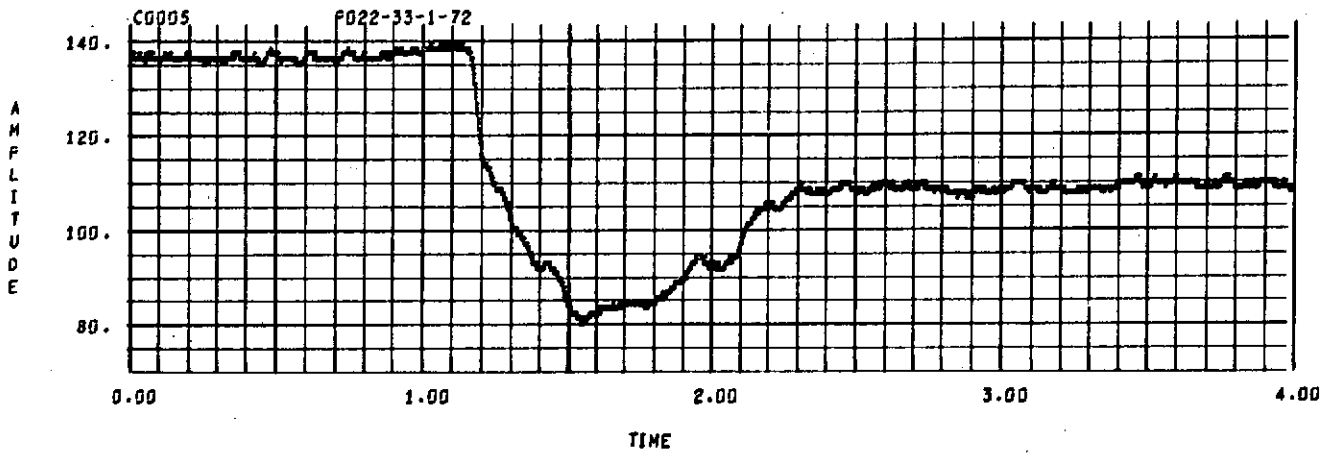

EY005
022-33-1-128
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

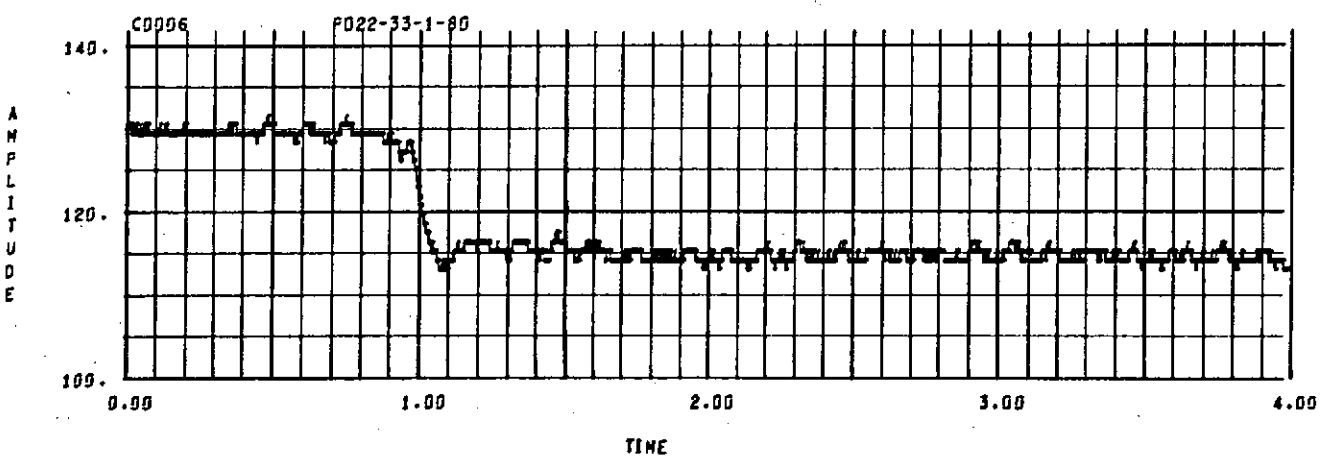

SEQ. = 0030
C0001
F022-33-1-46
12.5 INCH SRB LOW PRESS THERMAL RUN F022-33
AMPLITUDE
140.
130.
120.
110.
0.00
1.00
2.00
3.00
4.00
TIME

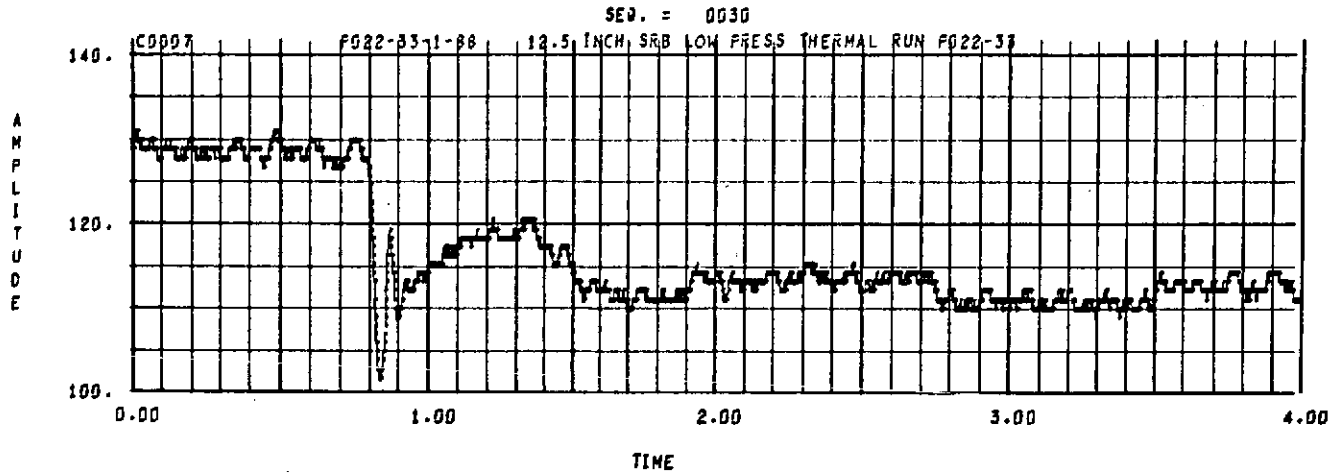

C0002
F022-33-1-48
AMPLITUDE
140.
130.
120.
110.
0.00
1.00
2.00
3.00
4.00
TIME

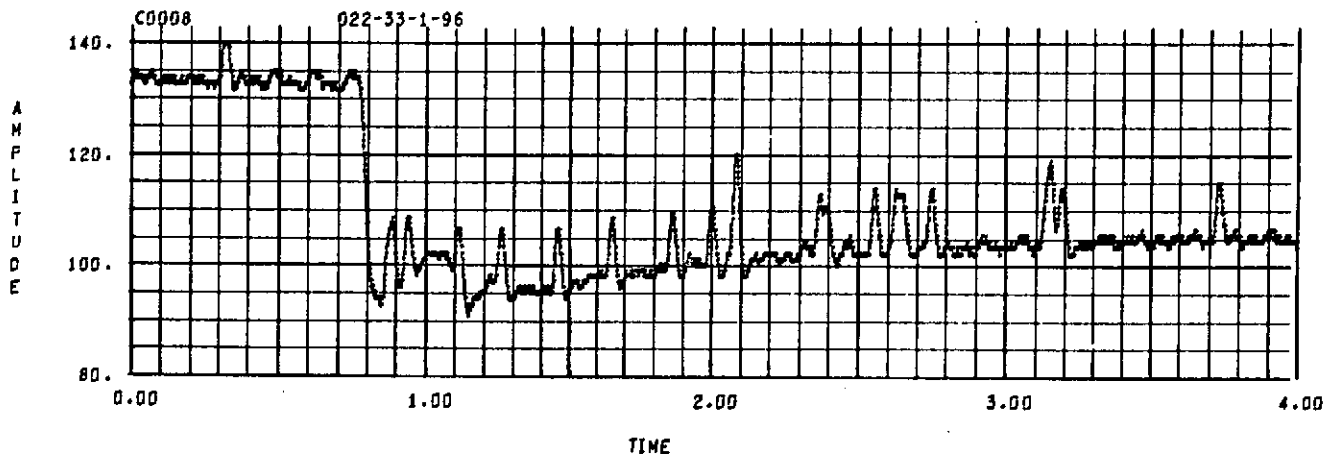

C0003
F022-33-1-56
AMPLITUDE
150.
140.
130.
120.
0.00
1.00
2.00
3.00
4.00
TIME

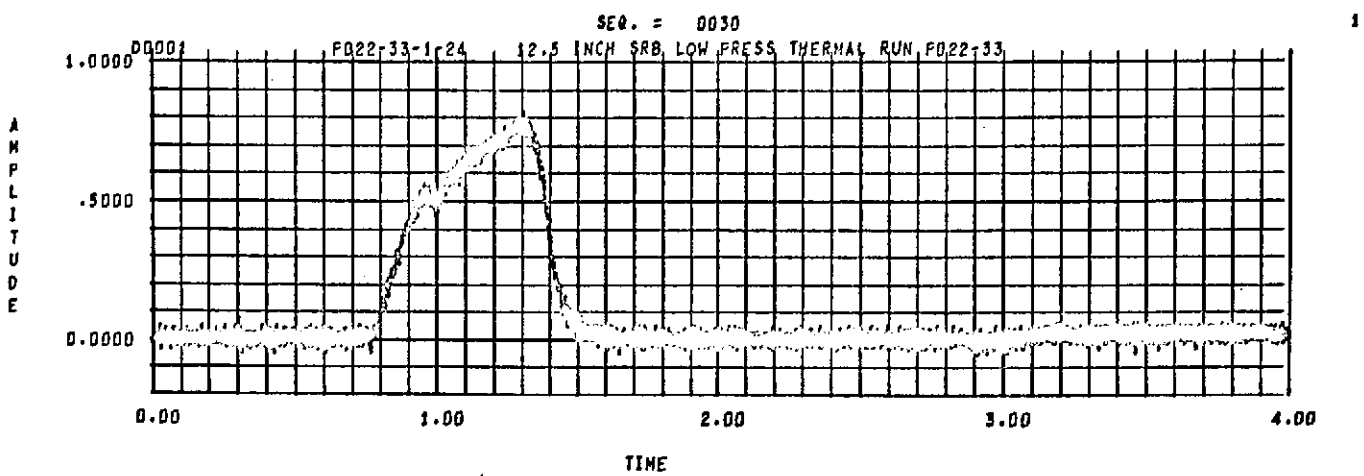

SEQ. = 0030
C0004
F022-33-1-64
12.5 INCH SRB LOW PRESS THERMAL RUN F022-33
AMPLITUDE
140.
120.
100.
0.00
1.00
2.00
3.00
4.00
TIME


C0005
F022-33-1-72
AMPLITUDE
140.
120.
100.
80.
0.00
1.00
2.00
3.00
4.00
TIME


C0006
F022-33-1-80
AMPLITUDE
140.
120.
100.
0.00
1.00
2.00
3.00
4.00
TIME


SEQ. = 0030
3
C0007
F022-33-1-88
12.5 INCH SRB LOW PRESS THERMAL RUN F022-33
140.
120.
100.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME


C0008
022-33-1-96
140.
120.
100.
80.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME


SEQ. = 0030
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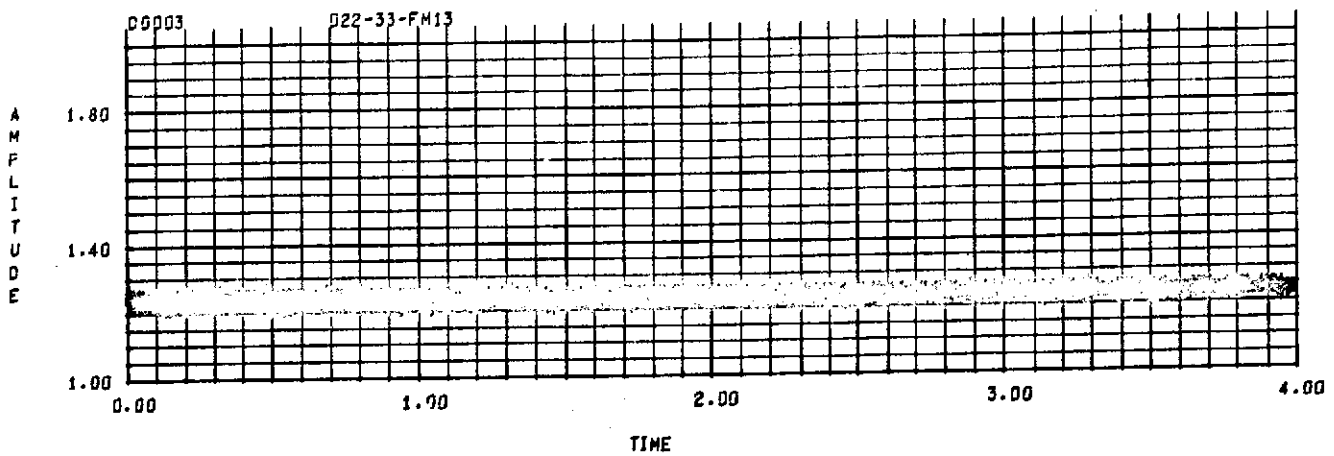
D0001
F022-33-1-24
12.5 INCH SRB LOW PRESS THERMAL RUN F022-33
1.0000
.5000
0.0000
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME


00003
022-33-FM13
AMPLITUDE
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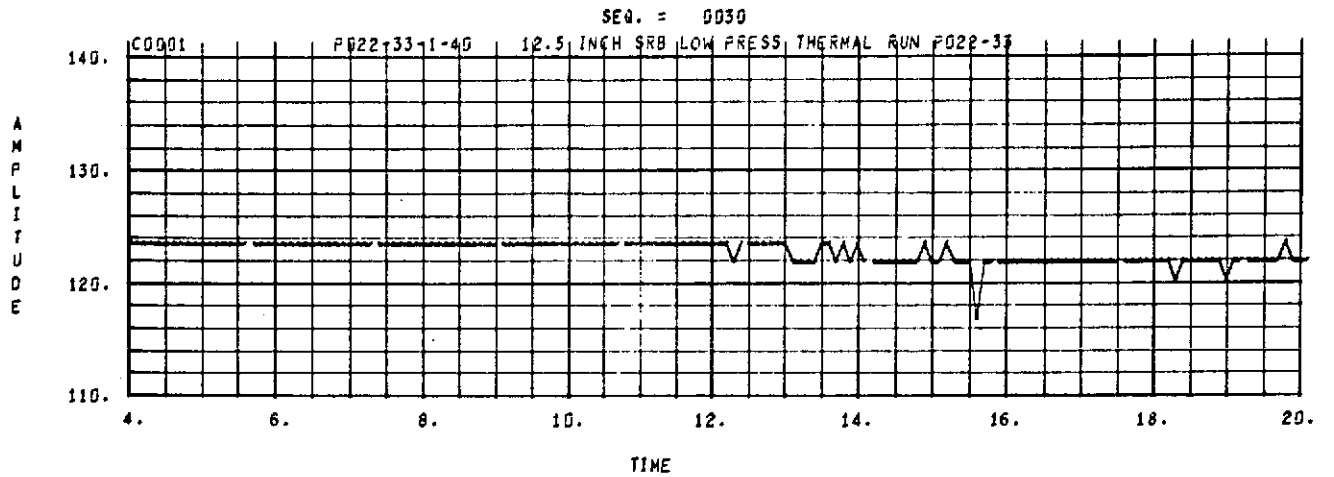
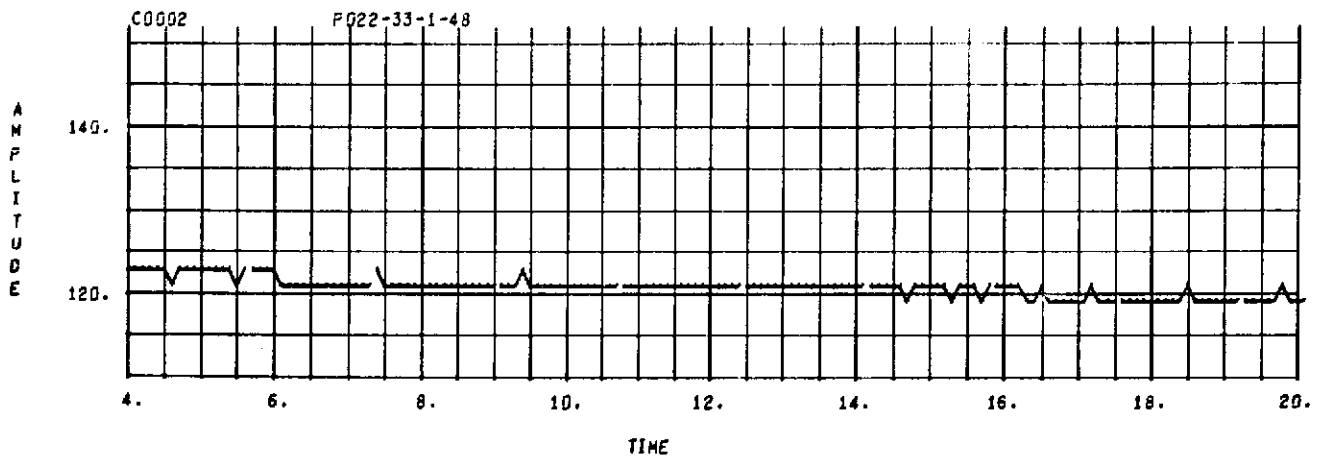
1.40
1.00
0.00
1.00
2.00
3.00
4.00
TIME


SEQ. = 0030
C0001
P022-33-1-40
12.5 INCH SRB LOW PRESS THERMAL RUN P022-33
AMPLITUDE
140.
130.
120.
110.
4.
6.
8.
10.
12.
14.
16.
18.
20.
TIME


C0002
P022-33-1-48
AMPLITUDE
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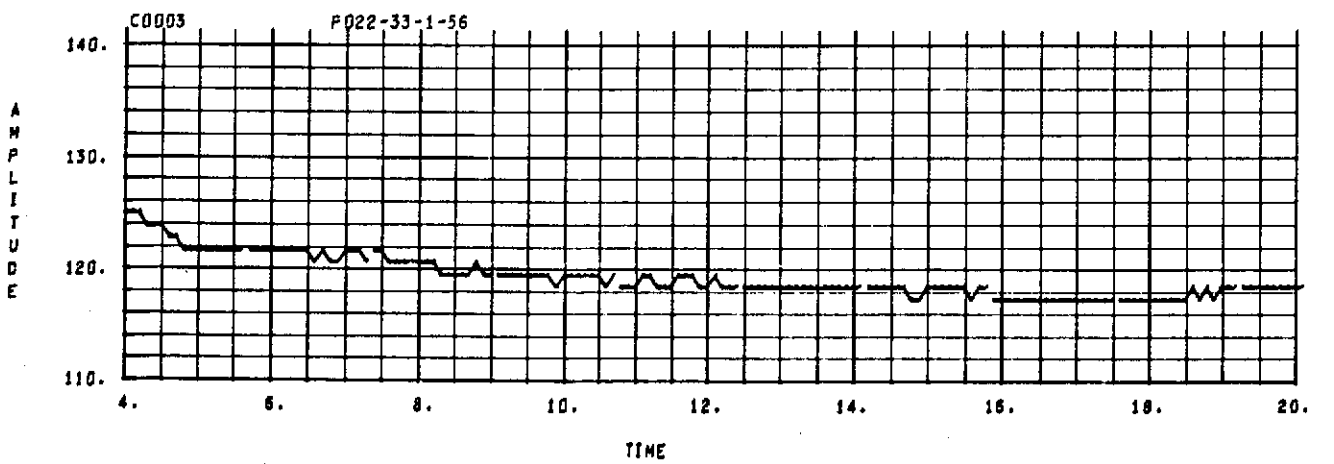
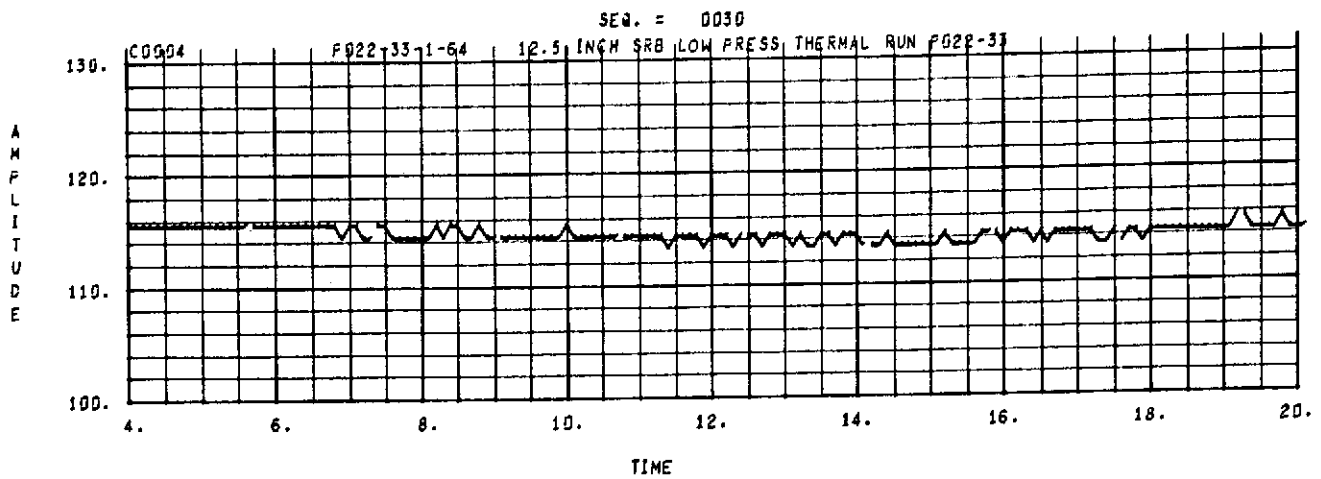
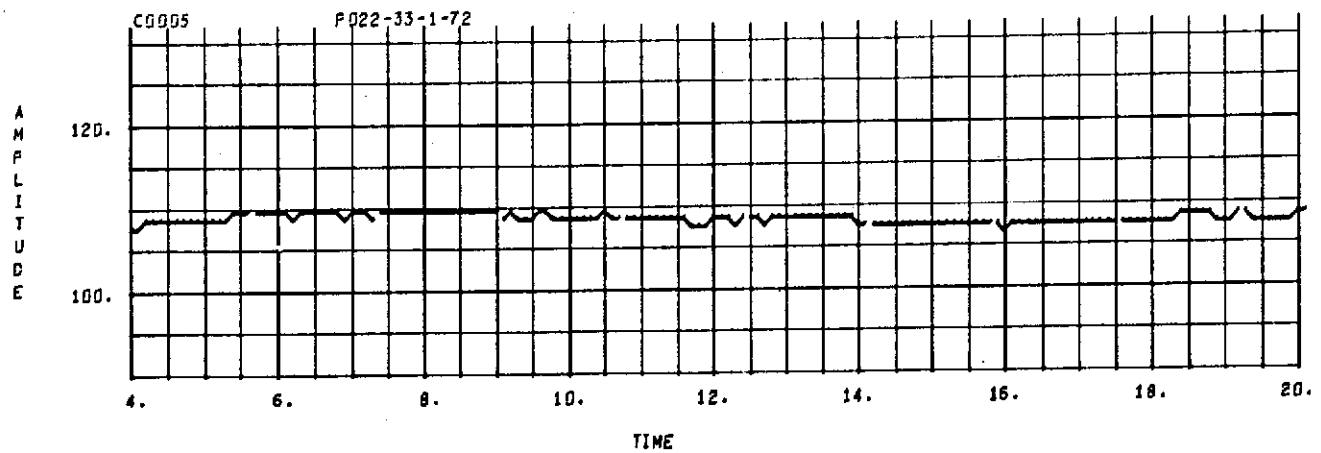
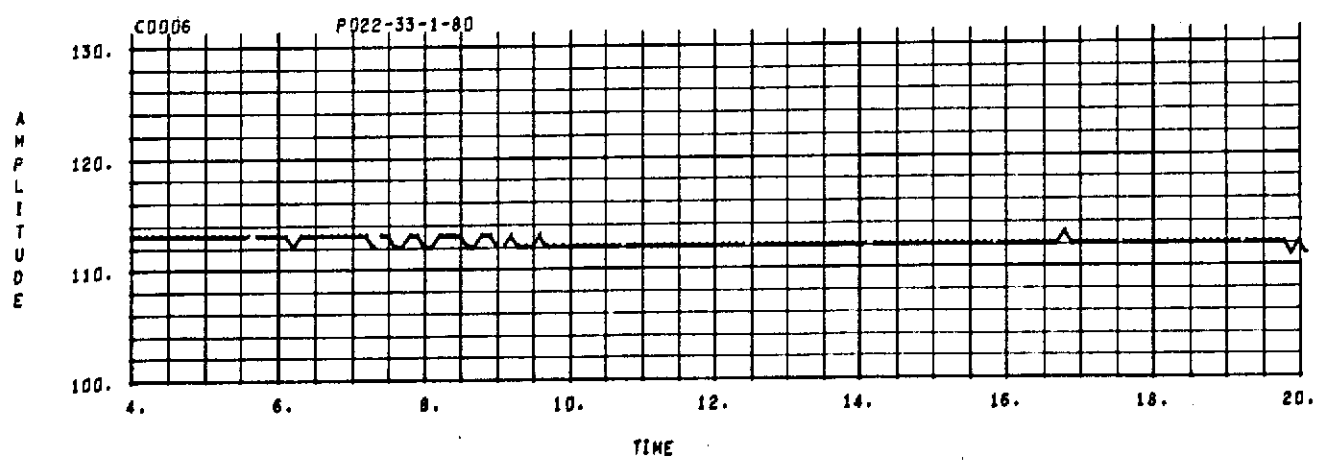
120.
4.
6.
8.
10.
12.
14.
16.
18.
20.
TIME


C0003
P022-33-1-56
AMPLITUDE
140.
130.
120.
110.
4.
6.
8.
10.
12.
14.
16.
18.
20.
TIME


SEQ. = 0030
C0004
P022-33-1-64
12.5 INCH SRB LOW PRESS THERMAL RUN P022-33
AMPLITUDE
130.
120.
110.
100.
4.
6.
8.
10.
12.
14.
16.
18.
20.
TIME


C0005
P022-33-1-72
AMPLITUDE
120.
100.
4.
6.
8.
10.
12.
14.
16.
18.
20.
TIME


C0006
P022-33-1-80
AMPLITUDE
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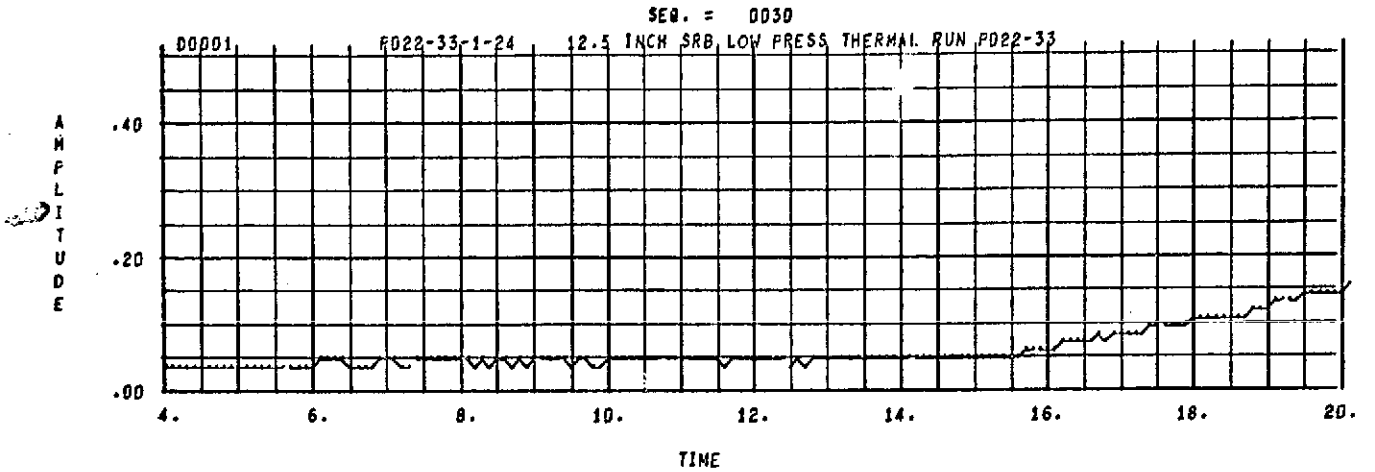
120.
110.
100.
4.
6.
8.
10.
12.
14.
16.
18.
20.
TIME


SEQ. = 0030
D0001
F022-33-1-24
12.5 INCH SRB LOW PRESS THERMAL RUN F022-33
AMPLITUDE
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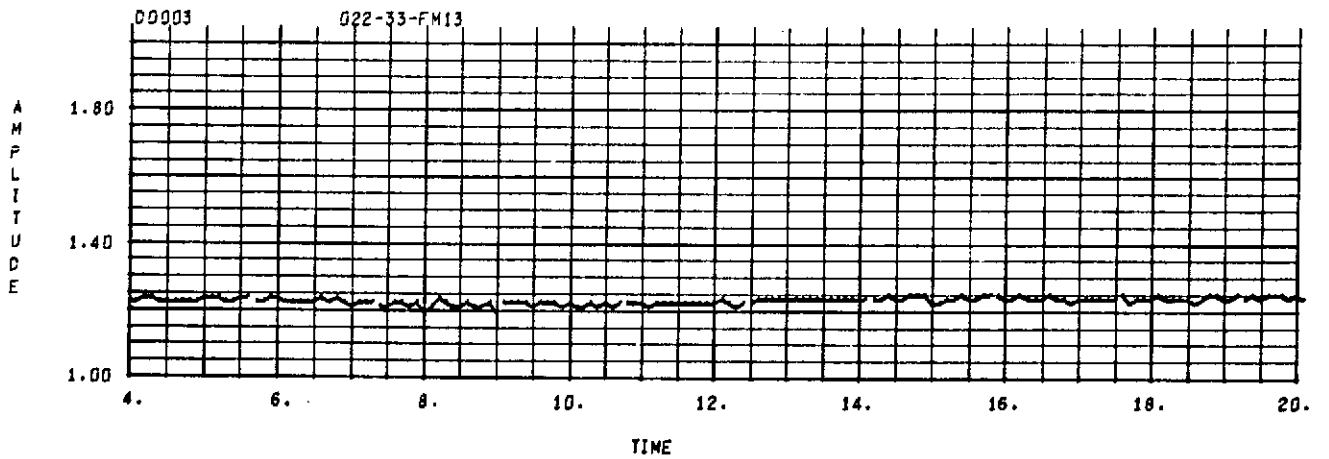
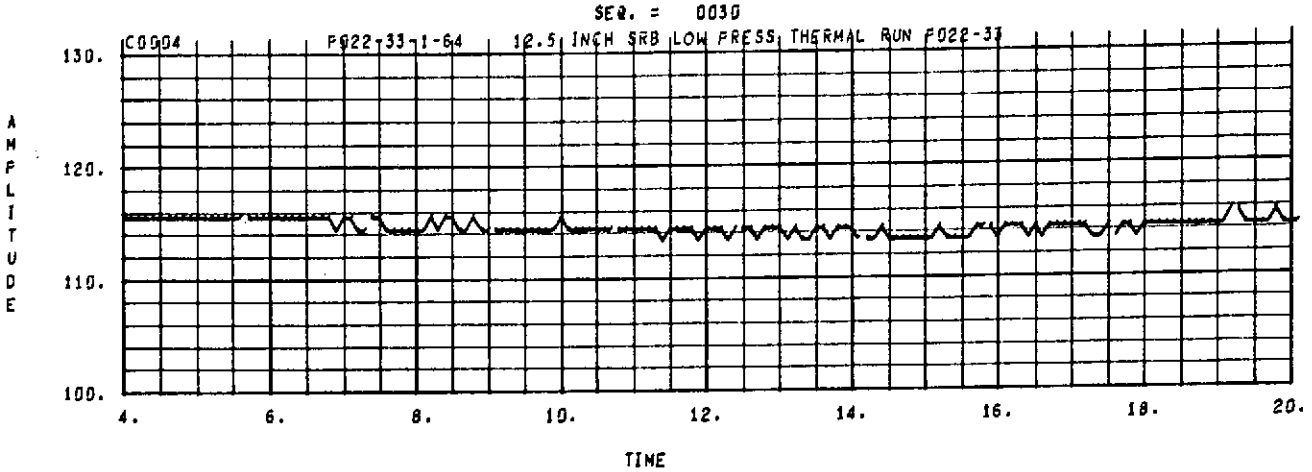
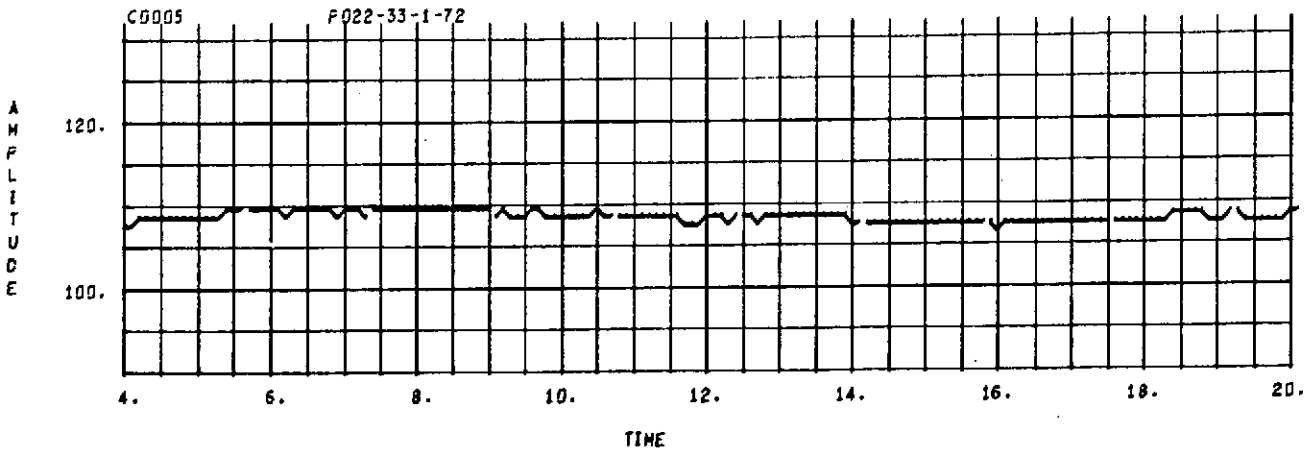
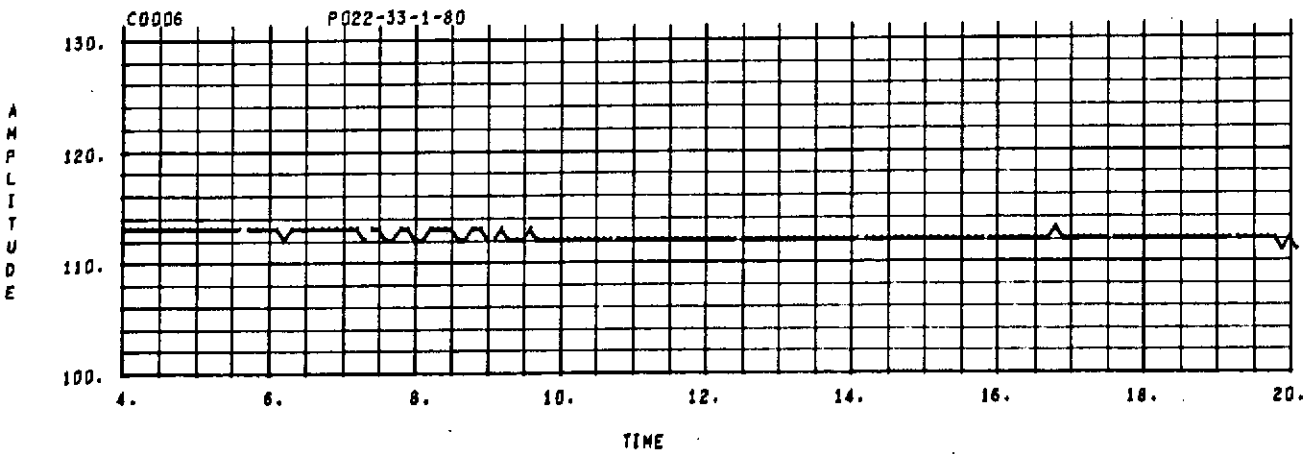
.20
.00
4.
6.
8.
10.
12.
14.
16.
18.
20.
TIME

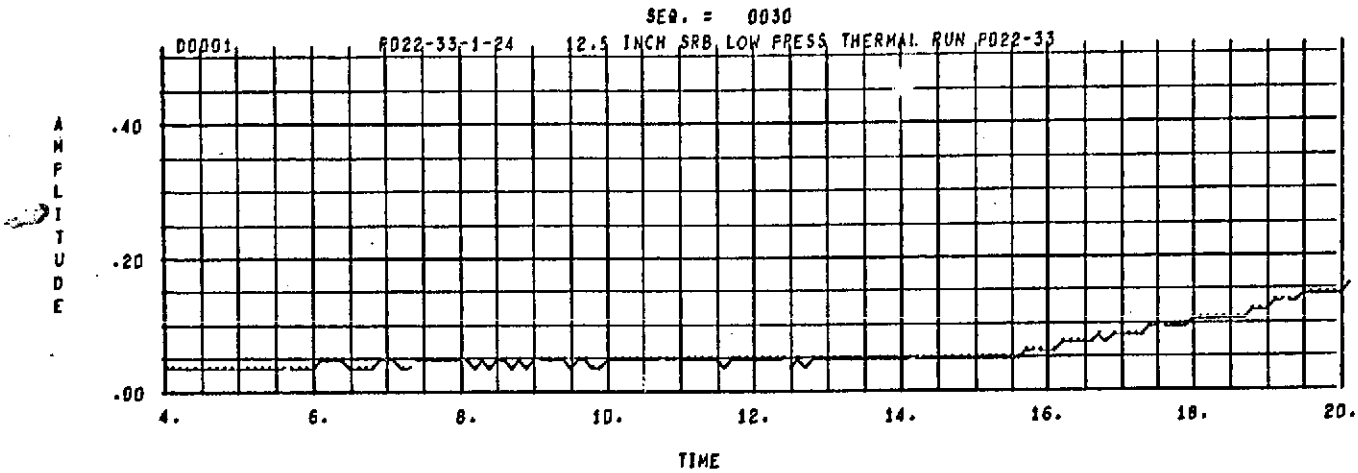

D0003
022-33-FM13
AMPLITUDE
1.80
1.40
1.00
4.
6.
8.
10.
12.
14.
16.
18.
20.
TIME

SEQ. = 0030


C0004
P022-33-1-64
12.5 INCH SRB LOW PRESS THERMAL RUN P022-33
AMPLITUDE
130.
120.
110.
100.
4.
6.
8.
10.
12.
14.
16.
18.
20.
TIME


C0005
P022-33-1-72
AMPLITUDE
120.
100.
4.
6.
8.
10.
12.
14.
16.
18.
20.
TIME


C0006
P022-33-1-80
AMPLITUDE
130.
120.
110.
100.
4.
6.
8.
10.
12.
14.
16.
18.
20.
TIME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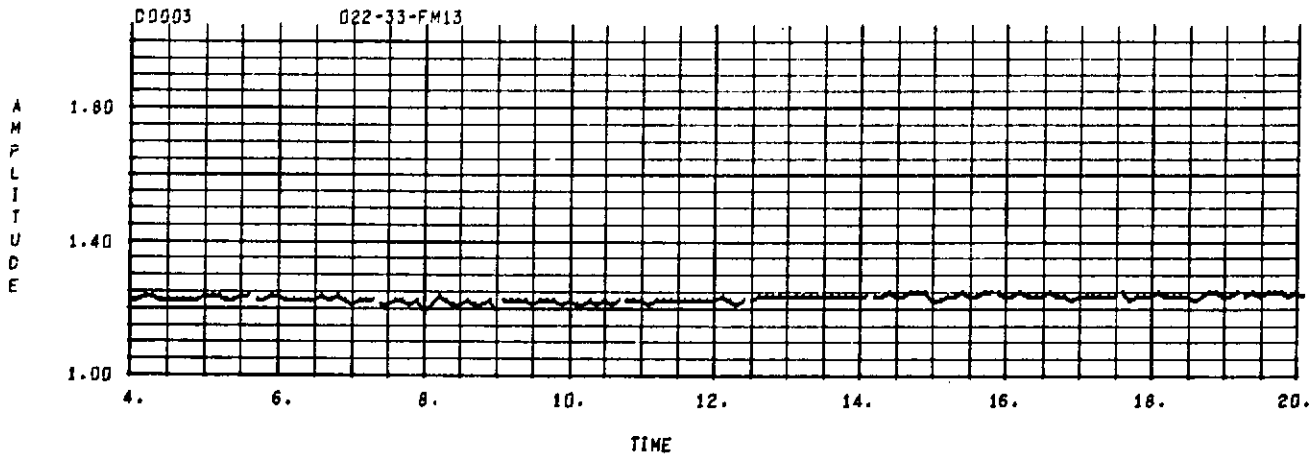
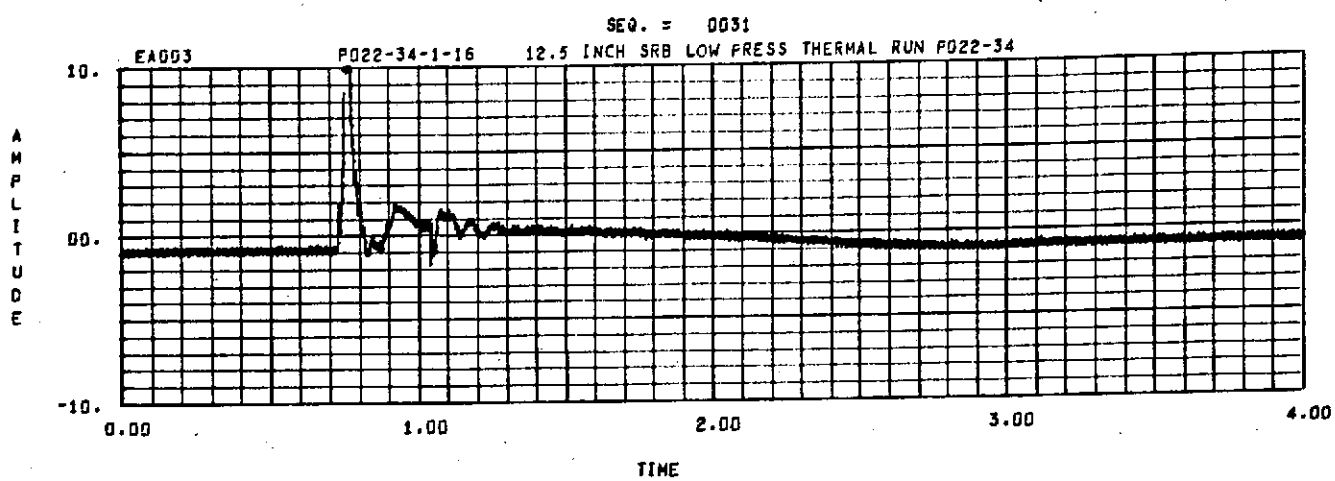
D0001
F022-33-1-24
12.5 INCH SRB LOW PRESS THERMAL RUN F022-33
AMPLITUDE
.40
.20
.00
4.
6.
8.
10.
12.
14.
16.
18.
20.
TIME


D0003
022-33-FM13
AMPLITUDE
1.80
1.40
1.00
4.
6.
8.
10.
12.
14.
16.
18.
20.
TIME


SEQ. = 0031
EA003
P022-34-1-16
12.5 INCH SRB LOW PRESS THERMAL RUN P022-34
10.
00.
-10.
AMPLITUDE
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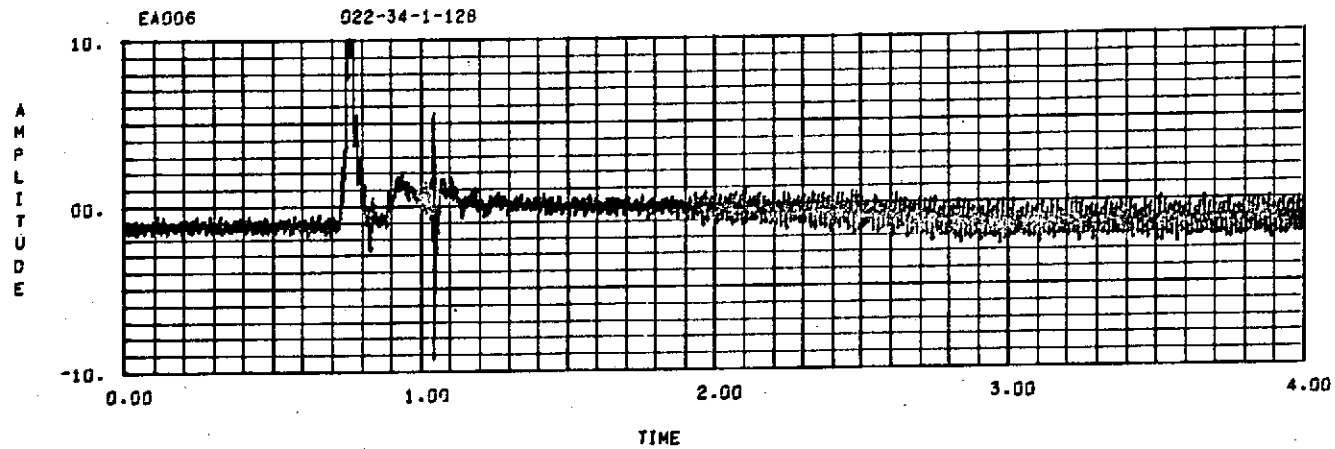
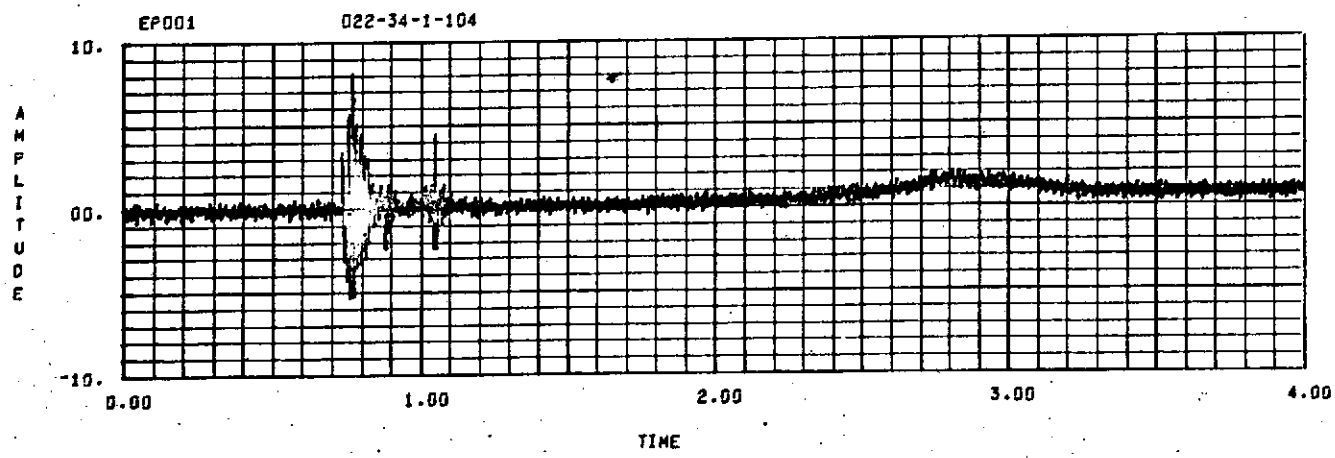
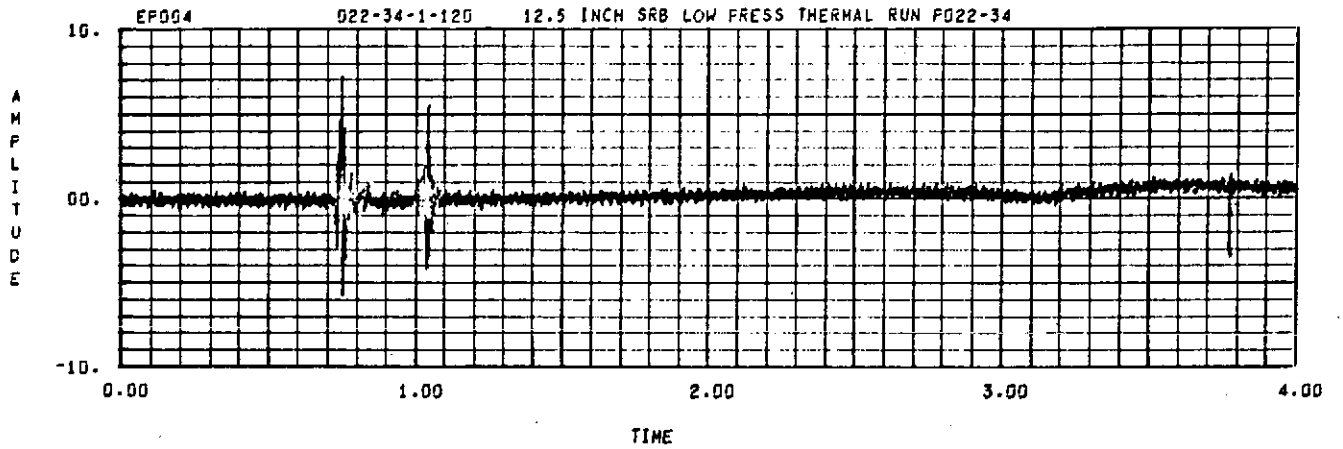
1.00
2.00
3.00
4.00
TIME


EA006
022-34-1-128
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

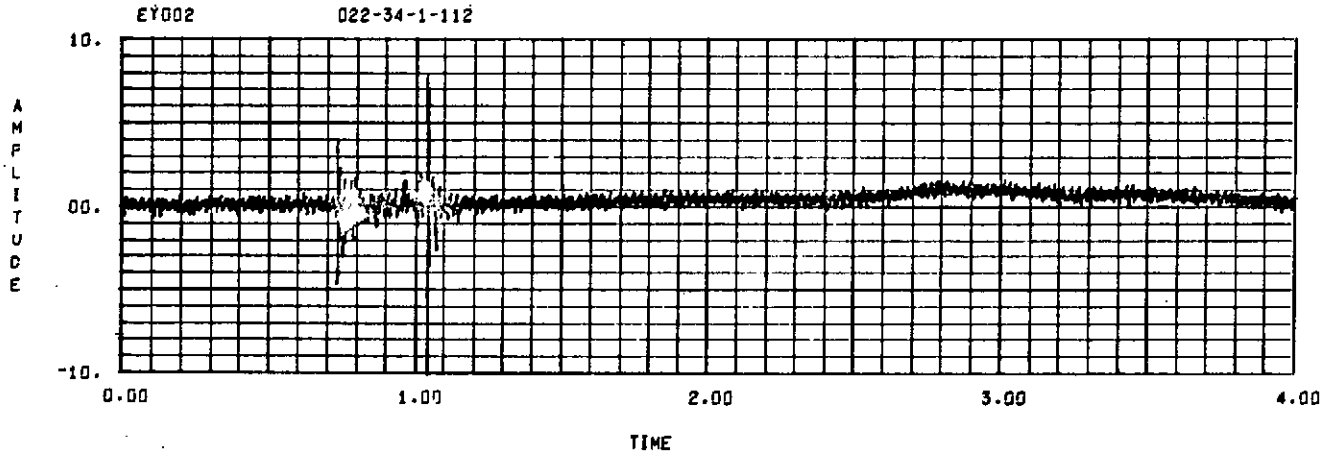

EP001
022-34-1-104
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

SEQ. = 0031

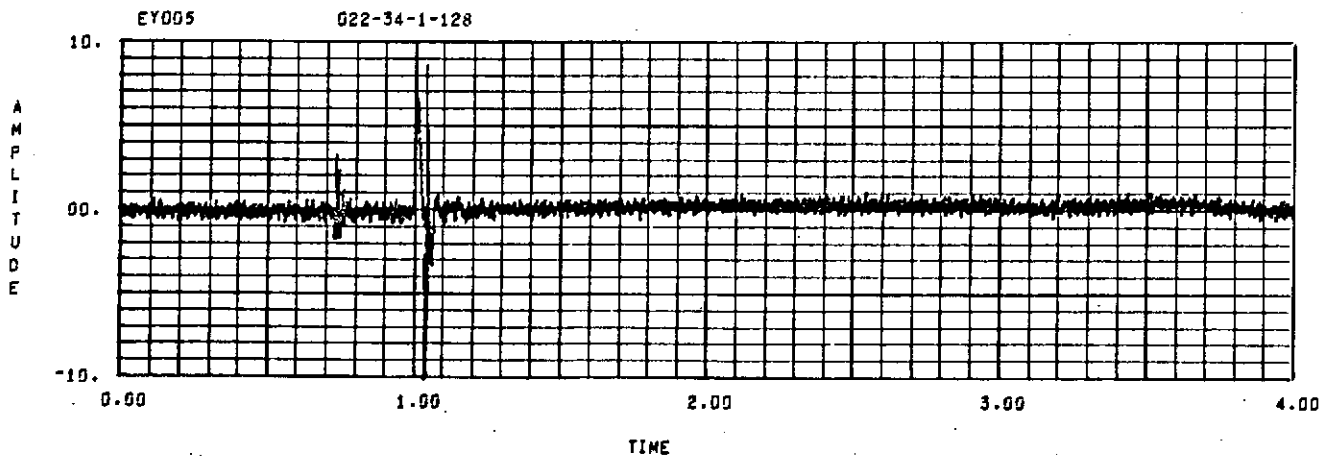
EF004 022-34-1-120 12.5 INCH SRB LOW PRESS THERMAL RUN F022-34



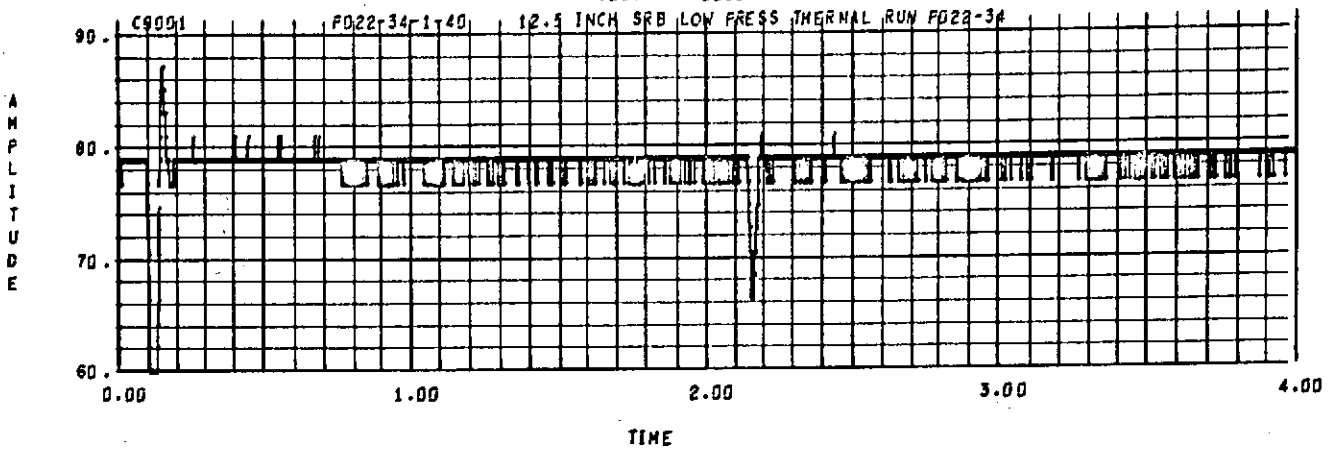
EY002 022-34-1-112

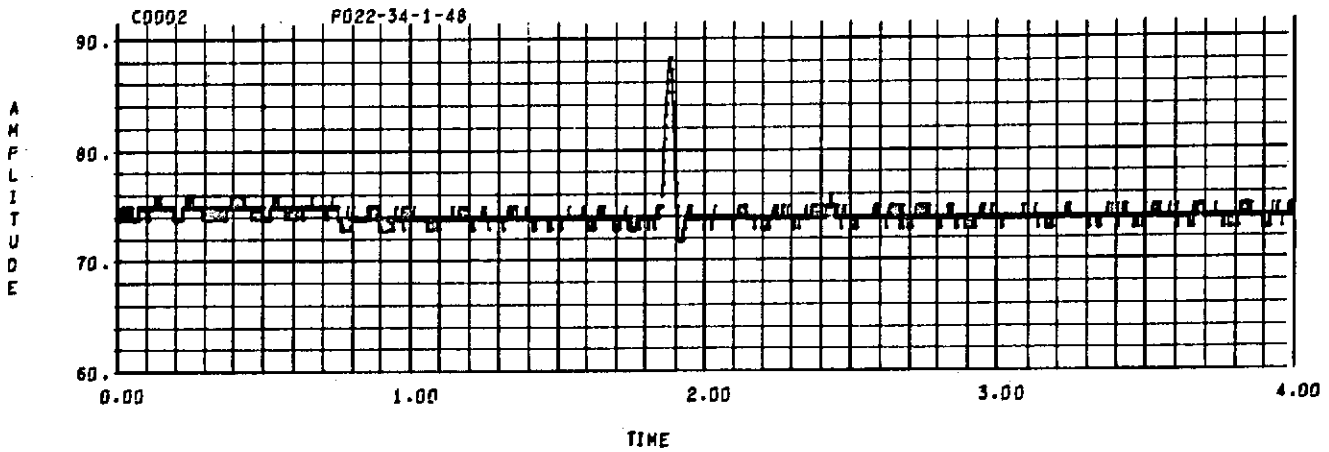


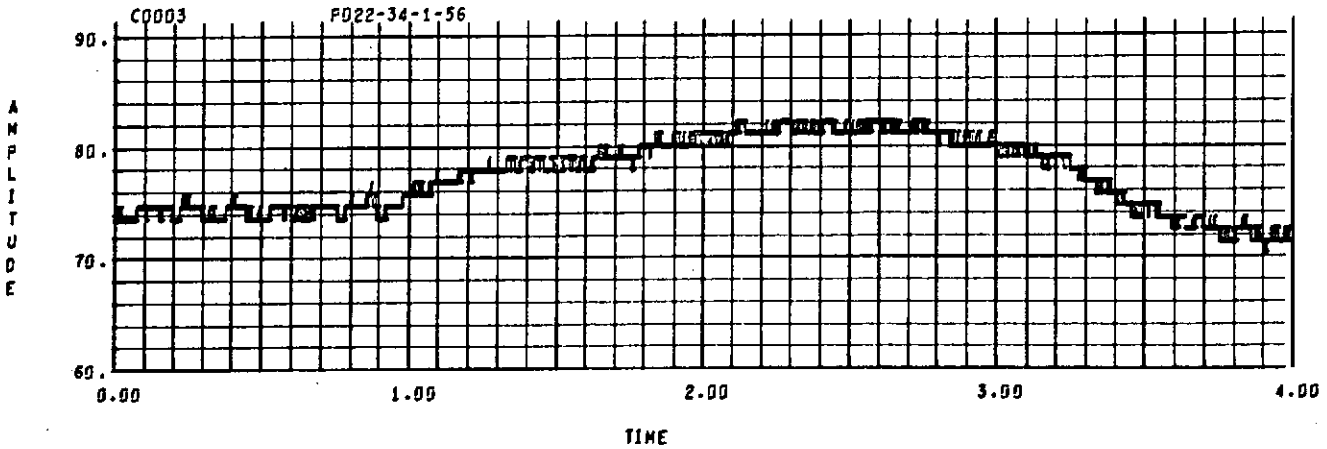
EY005 022-34-1-128



SEQ. = 0031


C0001
F022-34-1-40
12.5 INCH SRB LOW PRESS THERMAL RUN F022-34
AMPLITUDE
90.
80.
70.
60.
0.00
1.00
2.00
3.00
4.00
TIME


C0002
F022-34-1-48
AMPLITUDE
90.
80.
70.
60.
0.00
1.00
2.00
3.00
4.00
TIME


C0003
F022-34-1-56
AMPLITUDE
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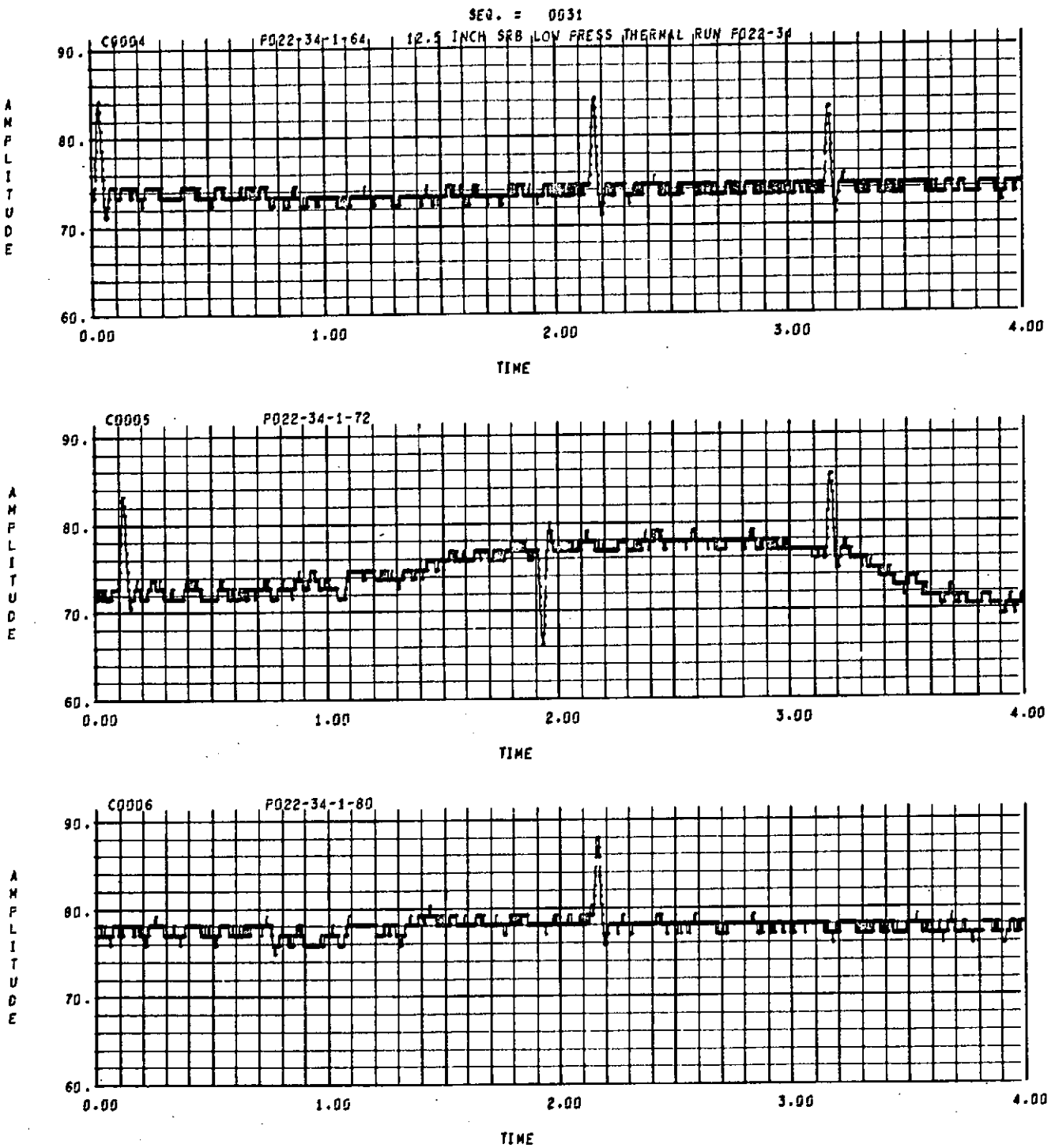
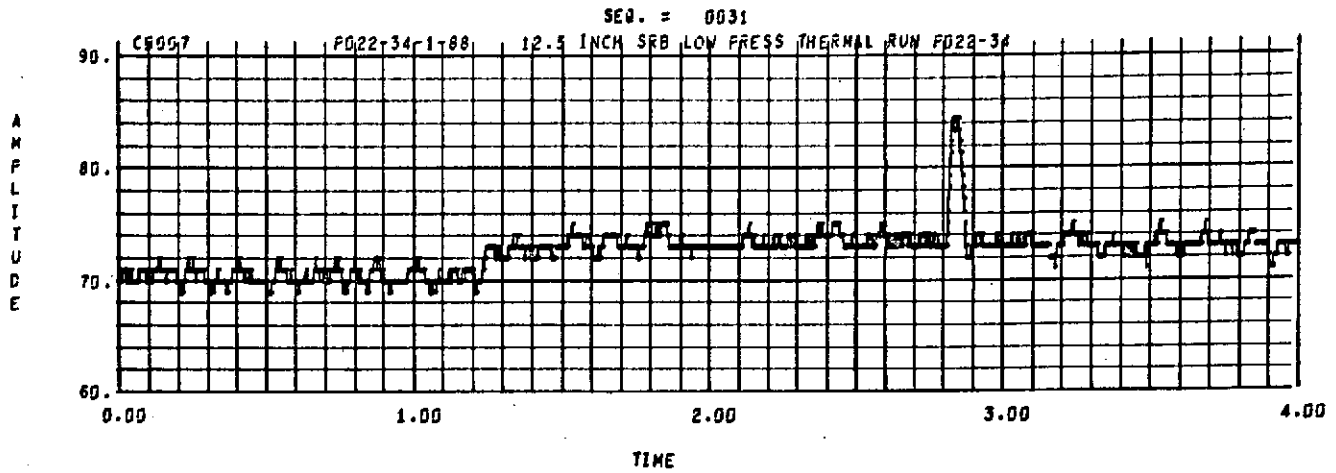
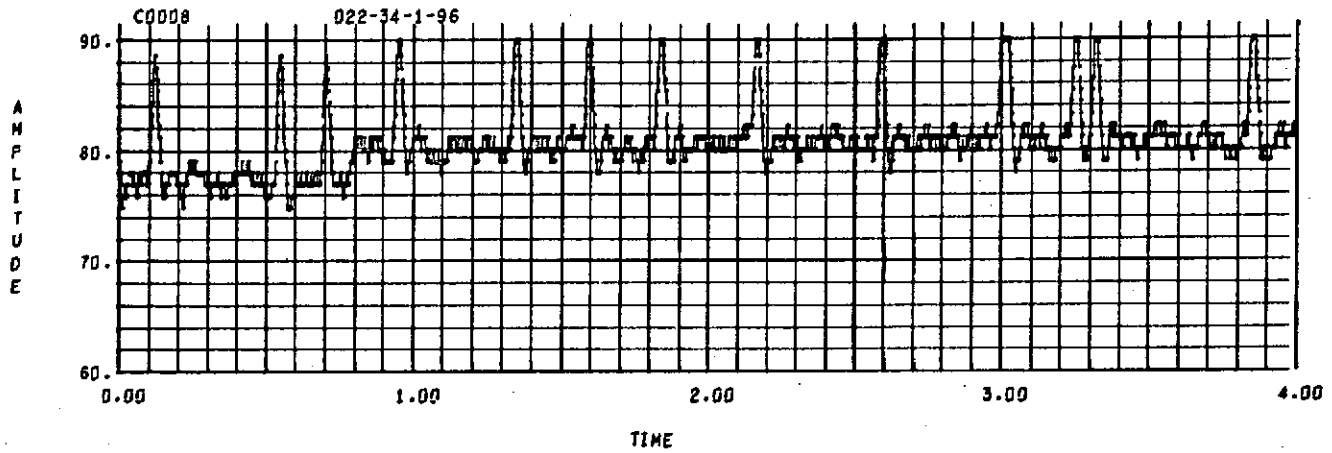
80.
70.
60.
0.00
1.00
2.00
3.00
4.00
TIME


SEQ. = 0031
C0004
F022-34-1-64
12.5 INCH SRB LOW PRESS THERMAL RUN F022-34
AMPLITUDE
90.
80.
70.
60.
0.00
1.00
2.00
3.00
4.00
TIME
C0005
F022-34-1-72
AMPLITUDE
90.
80.
70.
60.
0.00
1.00
2.00
3.00
4.00
TIME
C0006
F022-34-1-80
AMPLITUDE
90.
80.
70.
60.
0.00
1.00
2.00
3.00
4.00
TIME


SEQ. = 0031
C0007
FD22-34-1-88
12.5 INCH SRB LOW PRESS THERMAL RUN FD22-34
AMPLITUDE
90.
80.
70.
60.
0.00
1.00
2.00
3.00
4.00
TIME


C0008
D22-34-1-96
AMPLITUDE
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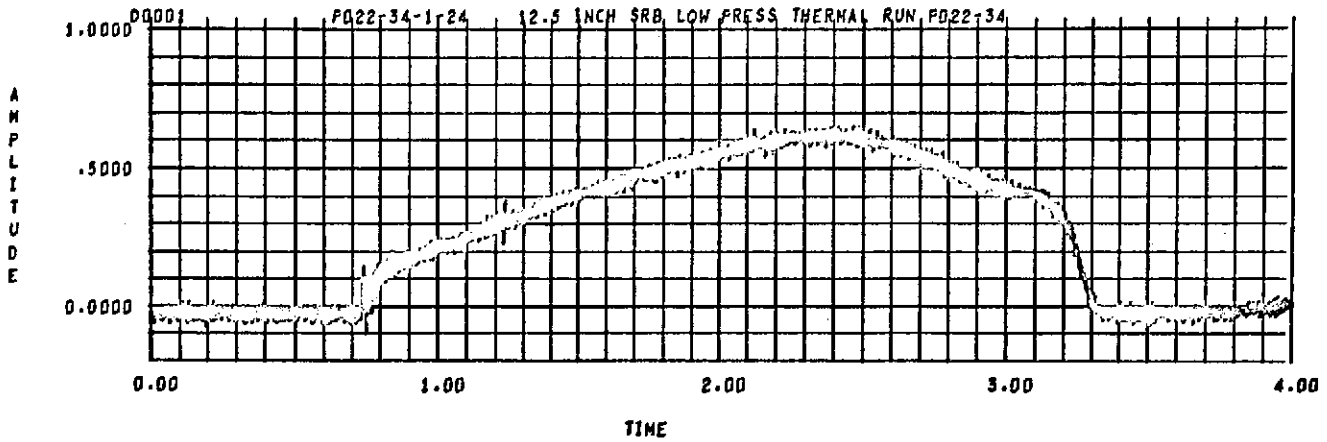
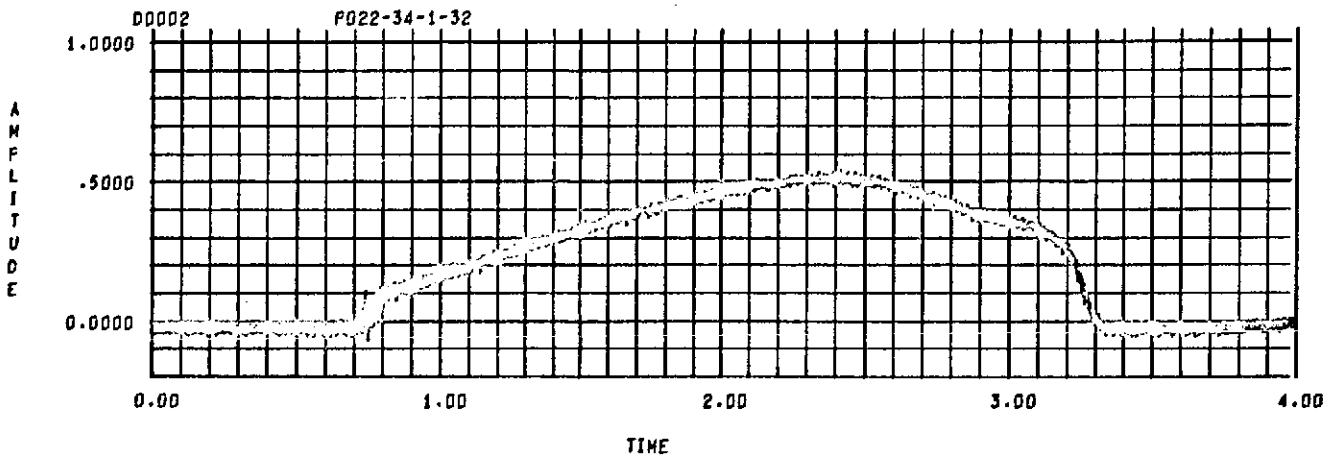
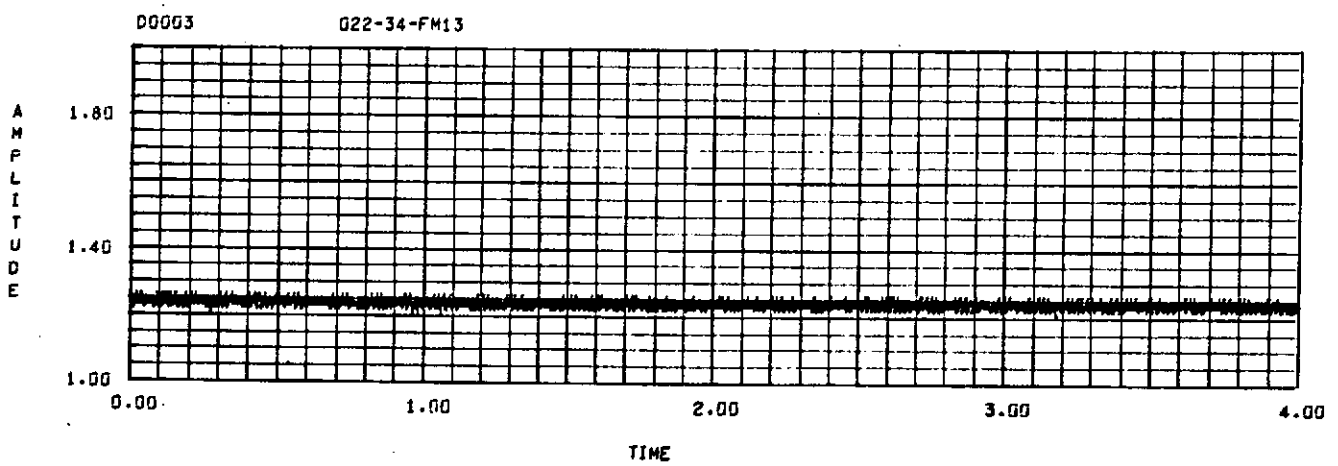
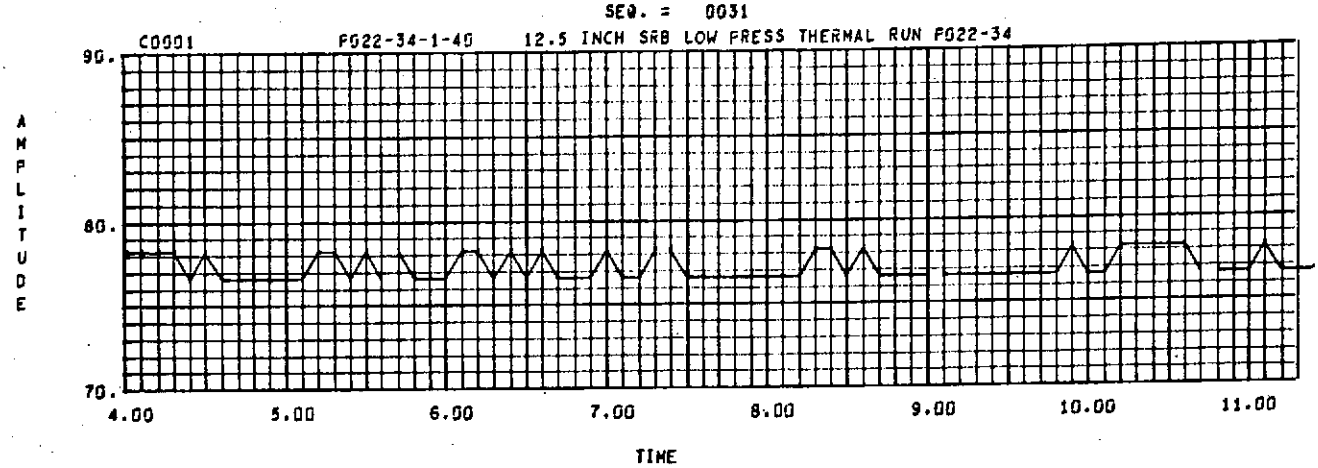
80.
70.
60.
0.00
1.00
2.00
3.00
4.00
TIME

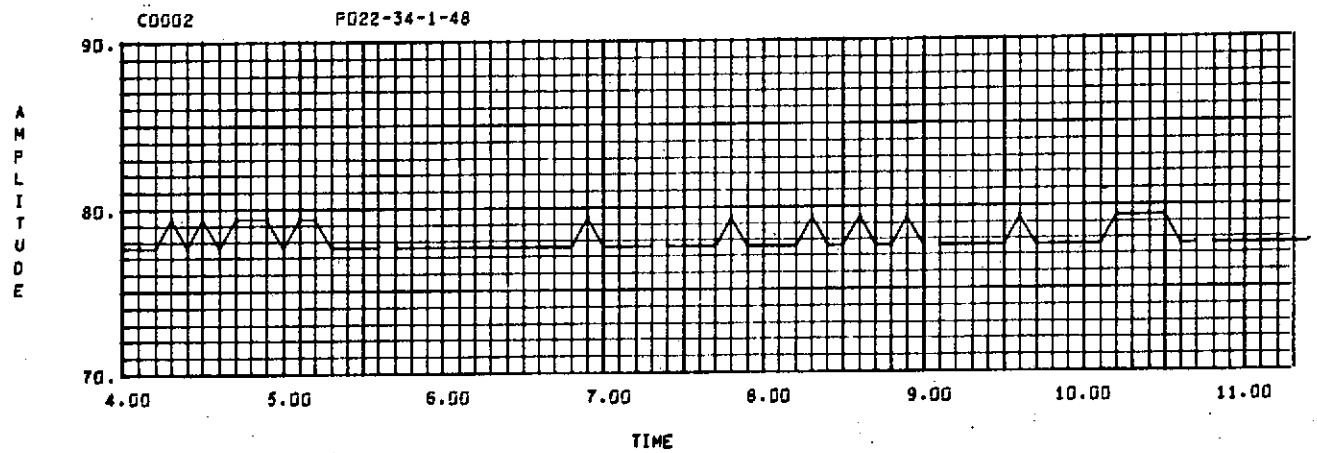

D0001
FD22-34-1-24
12.5 INCH SRB LOW PRESS THERMAL RUN FD22-34
AMPLITUDE
1.0000
.5000
0.0000
0.00
1.00
2.00
3.00
4.00
TIME

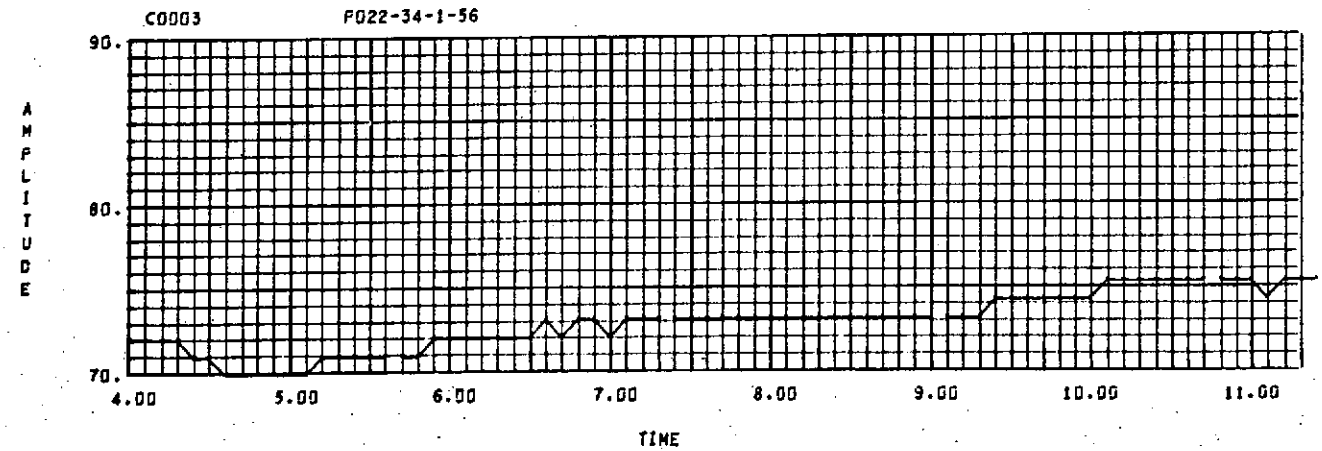

D0002
P022-34-1-32
1.0000
.5000
0.0000
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME


D0003
022-34-FM13
1.80
1.40
1.00
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

SEQ. = 0031

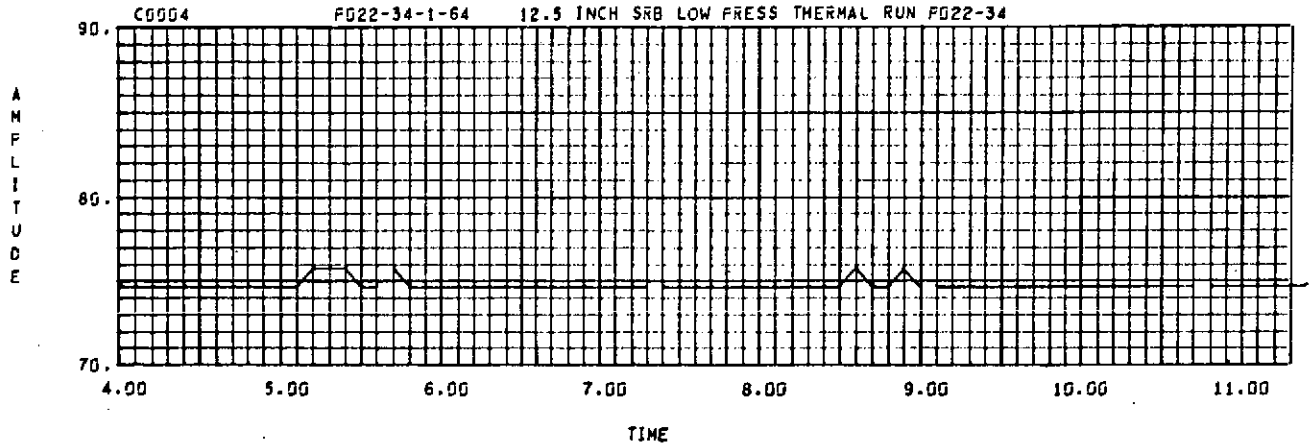

C0001
P022-34-1-40
12.5 INCH SRB LOW PRESS THERMAL RUN P022-34
90.
80.
70.
AMPLITUDE
4.00
5.00
6.00
7.00
8.00
9.00
10.00
11.00
TIME


C0002
P022-34-1-48
90.
80.
70.
AMPLITUDE
4.00
5.00
6.00
7.00
8.00
9.00
10.00
11.00
TIME

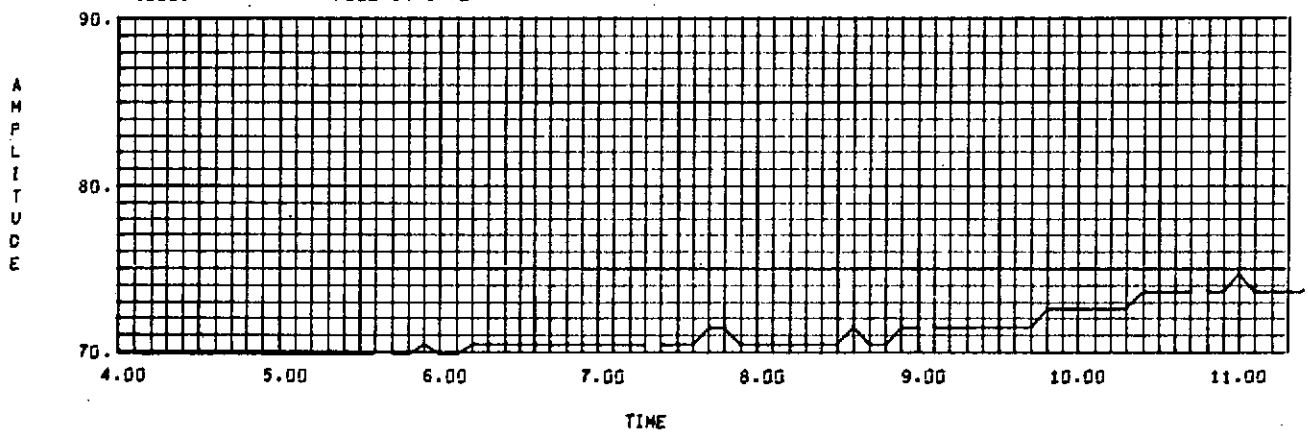

C0003
P022-34-1-56
90.
80.
70.
AMPLITUDE
4.00
5.00
6.00
7.00
8.00
9.00
10.00
11.00
TIME

SEQ. = 0031

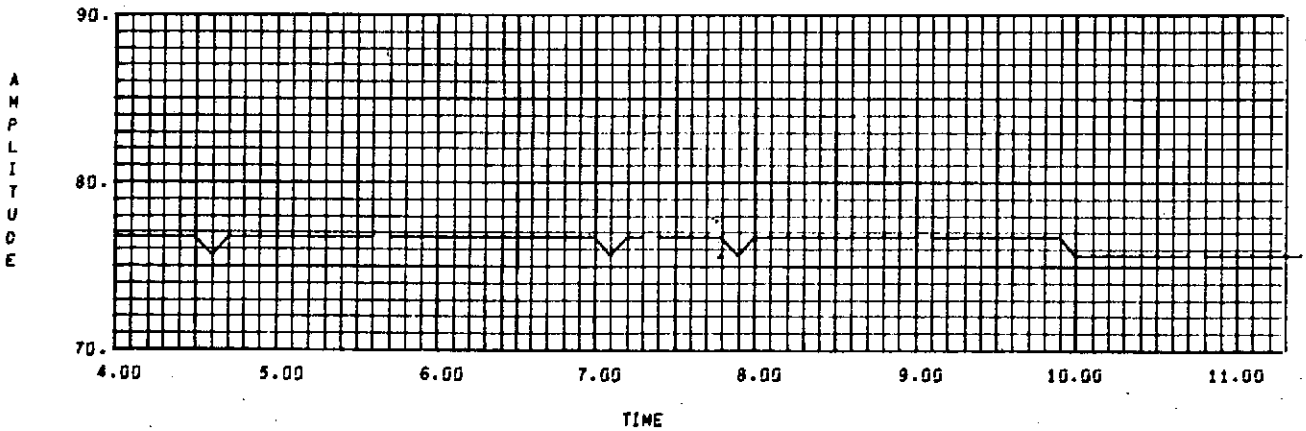
C0004 F022-34-1-64 12.5 INCH SRB LOW PRESS THERMAL RUN F022-34



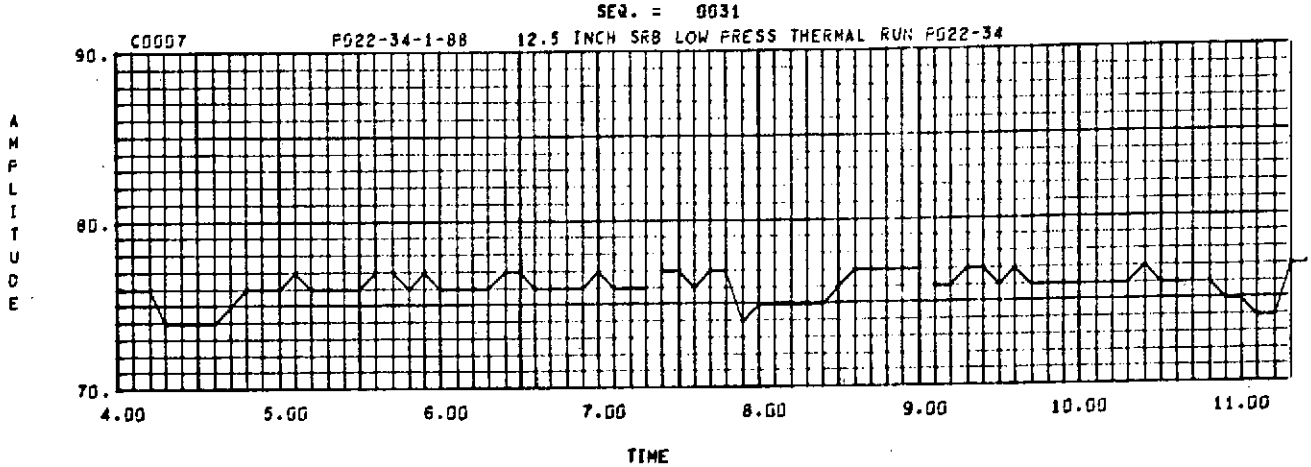
C0005 F022-34-1-72

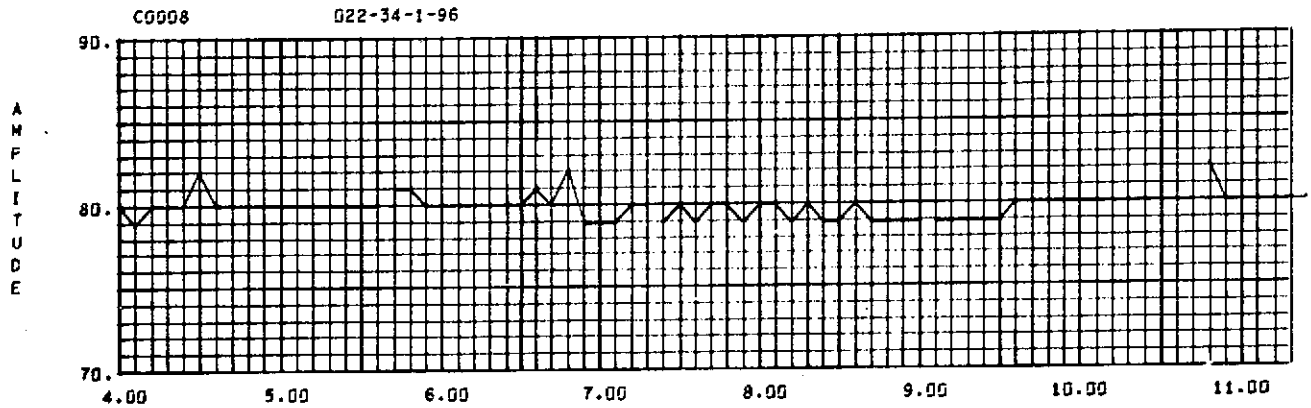


C0006 F022-34-1-80



SEQ. = 0031


C0007
F022-34-1-88
12.5 INCH SRB LOW PRESS THERMAL RUN F022-34
90.
80.
70.
AMPLITUDE
4.00
5.00
6.00
7.00
8.00
9.00
10.00
11.00
TIME


C0008
022-34-1-96
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80.
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AMPLITUDE
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5.00
6.00
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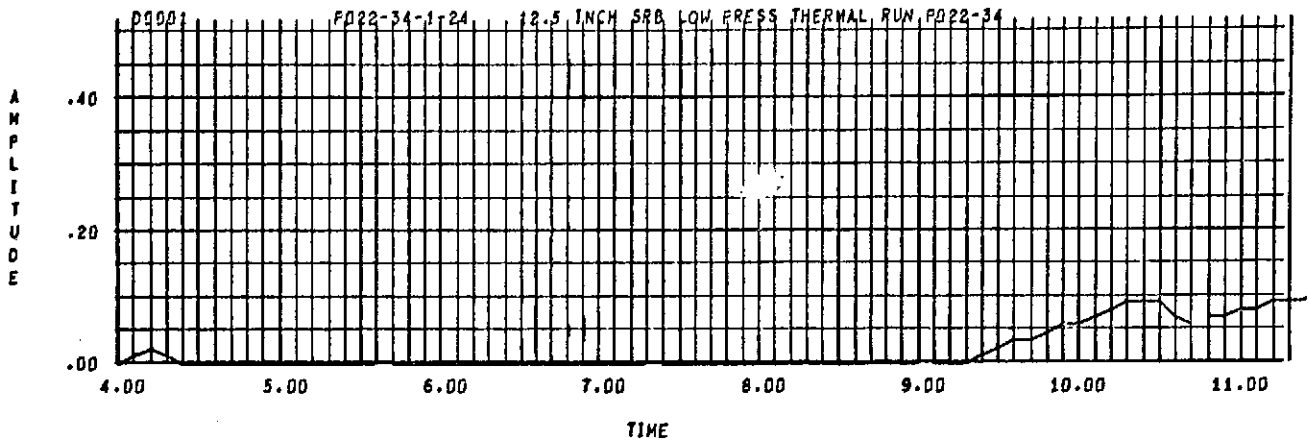
8.00
9.00
10.00
11.00


D0001
F022-34-1-24
12.5 INCH SRB LOW PRESS THERMAL RUN F022-34
.40
.20
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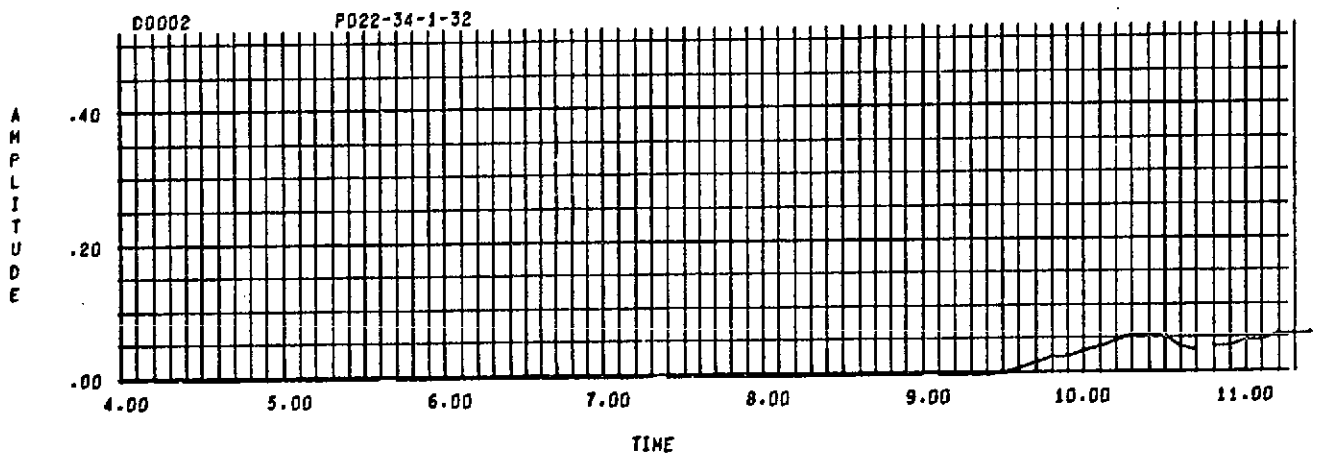
AMPLITUDE
4.00
5.00
6.00
7.00
8.00
9.00
10.00
11.00
TIME


00002
P022-34-1-32
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.20
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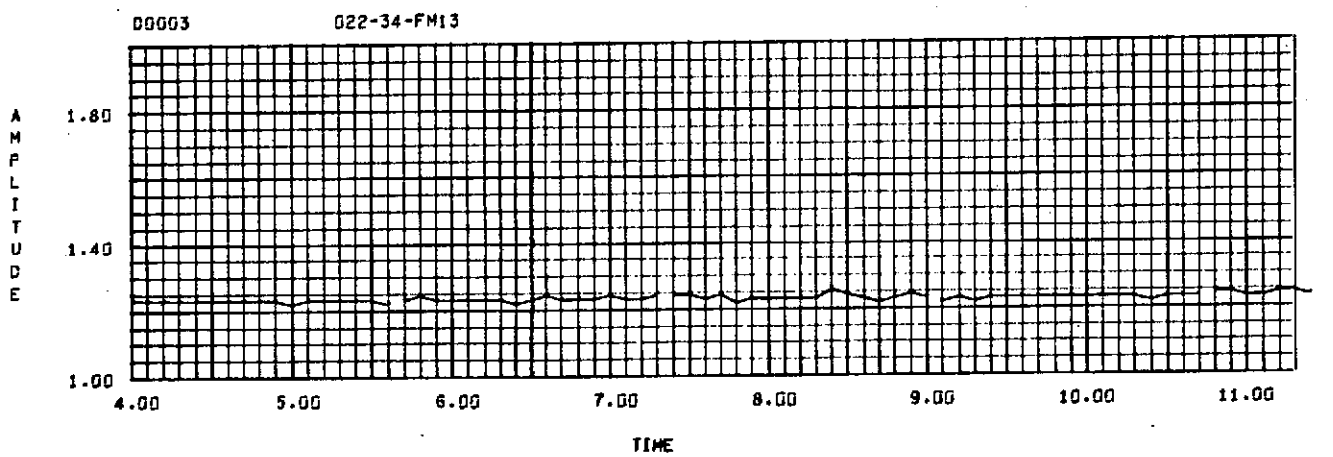
4.00
5.00
6.00
7.00
8.00
9.00
10.00
11.00
TIME


00003
022-34-FM13
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1.40
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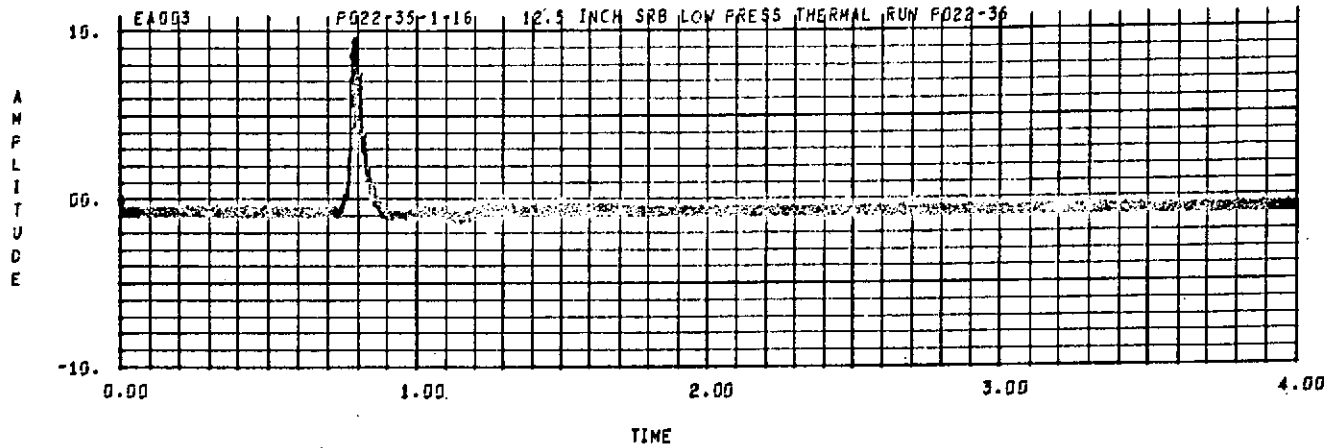
4.00
5.00
6.00
7.00
8.00
9.00
10.00
11.00
TIME

SEQ. = 0032


EA003
F022-35-1-16
12.5 INCH SRB LOW PRESS THERMAL RUN F022-36
10.
00.
-10.
AMPLITUDE
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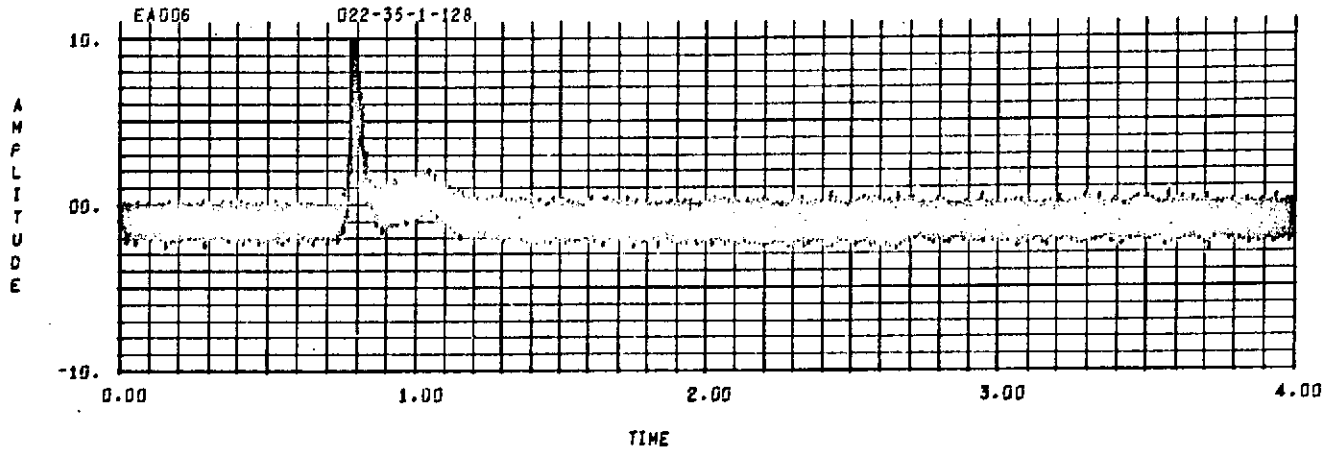
2.00
3.00
4.00
TIME


EA006
022-35-1-128
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AMPLITUDE
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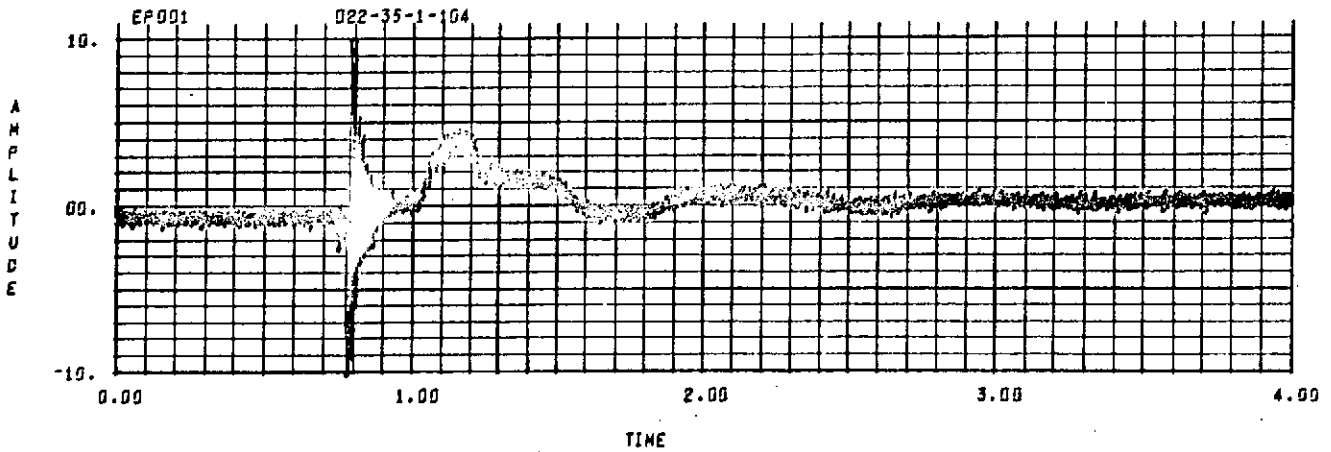
1.00
2.00
3.00
4.00
TIME


EP001
022-35-1-104
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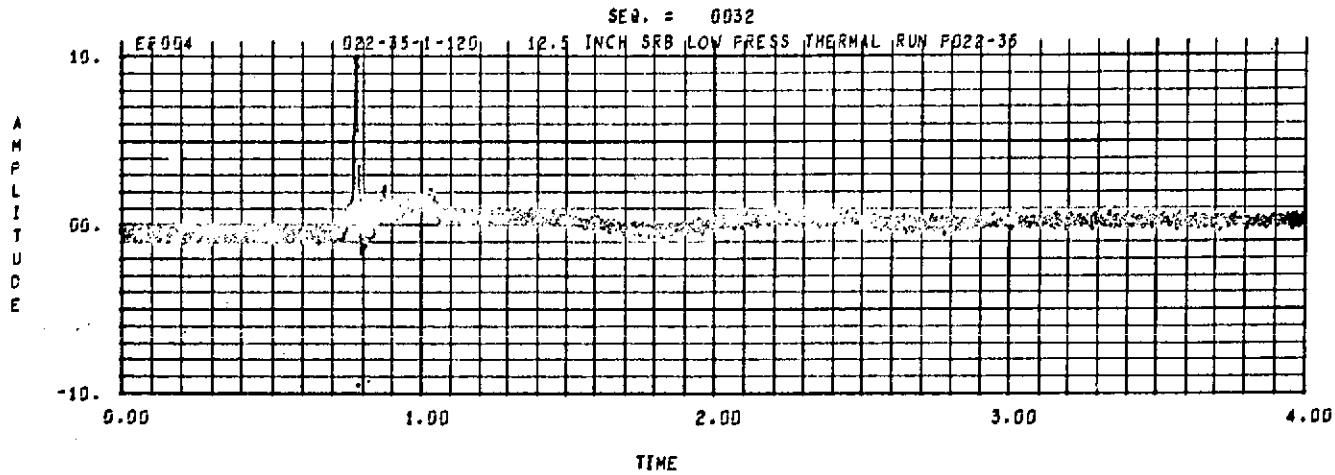
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME


SEQ. = 0032
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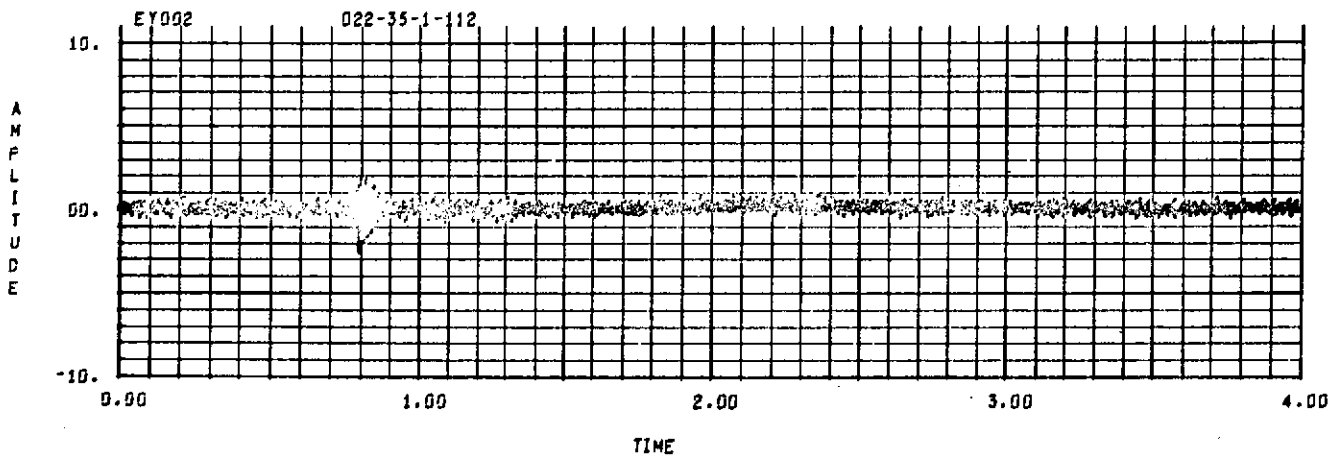
022-35-1-120
12.5 INCH SRB LOW PRESS THERMAL RUN F022-35
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME


EY002
022-35-1-112
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00.
-10.
AMPLITUDE
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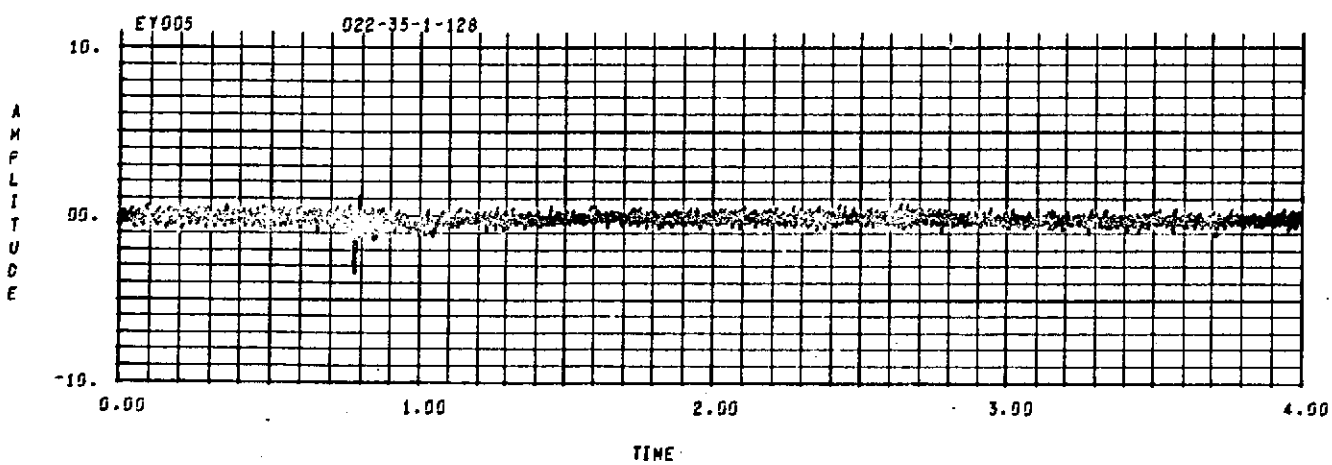
2.00
3.00
4.00
TIME


EY005
022-35-1-128
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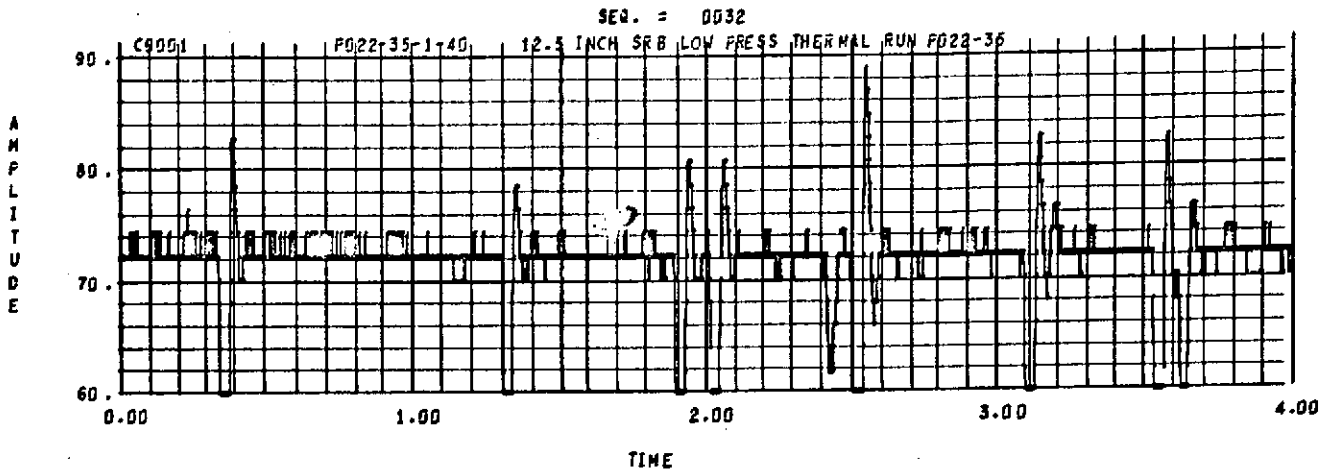
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME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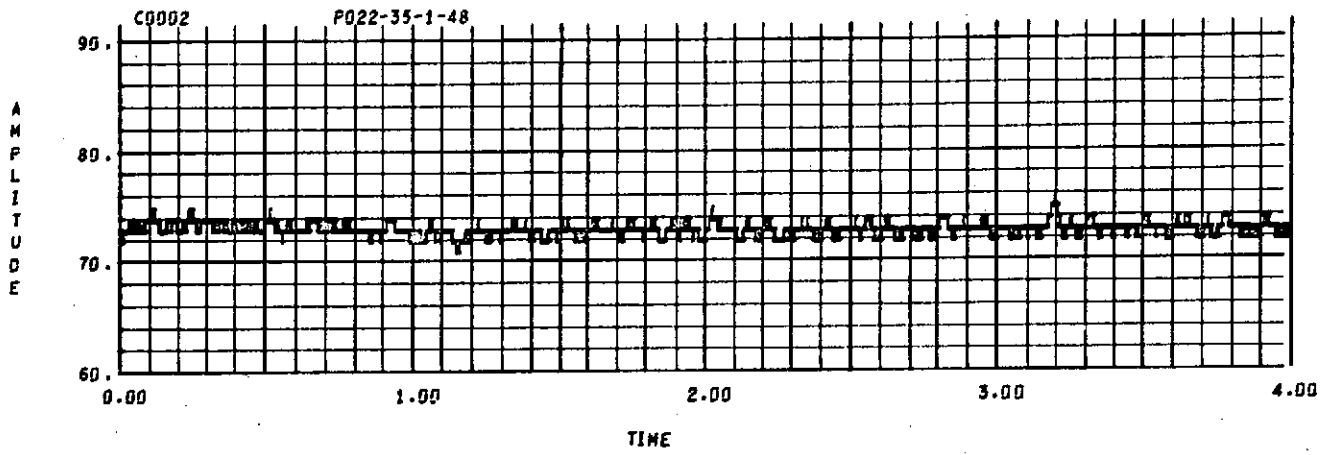
C0001
F022-35-1-40
12.5 INCH SRB LOW PRESS THERMAL RUN F022-36
AMPLITUDE
90.
80.
70.
60.
0.00
1.00
2.00
3.00
4.00
TIME


C0002
F022-35-1-48
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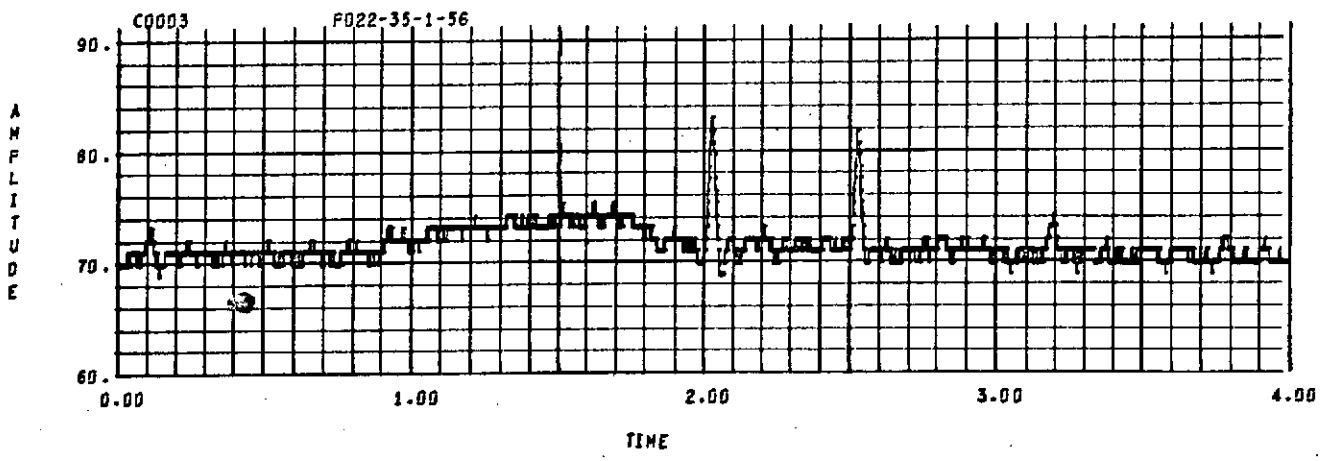
70.
60.
0.00
1.00
2.00
3.00
4.00
TIME


C0003
F022-35-1-56
AMPLITUDE
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80.
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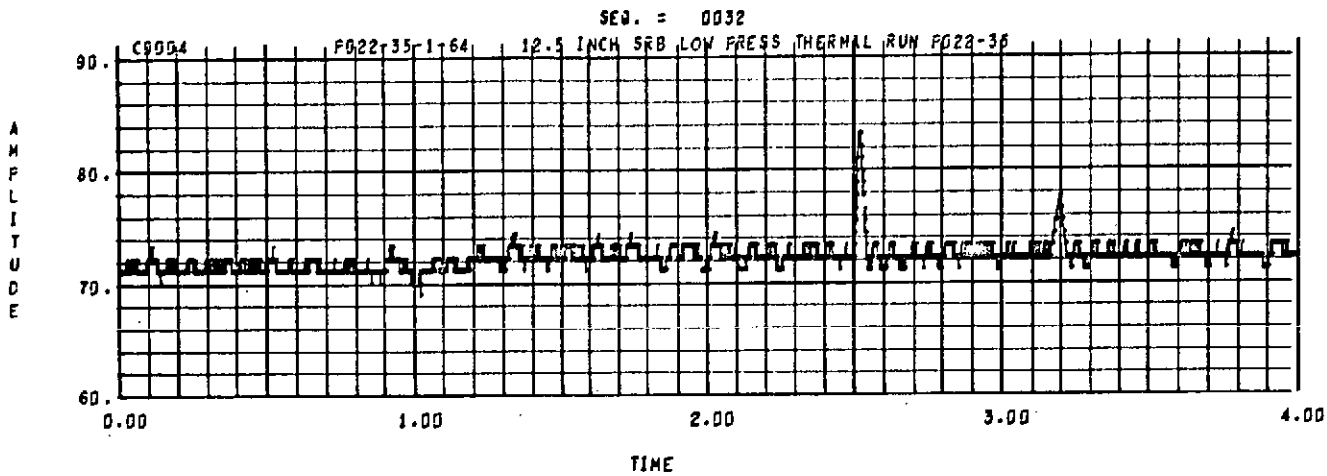
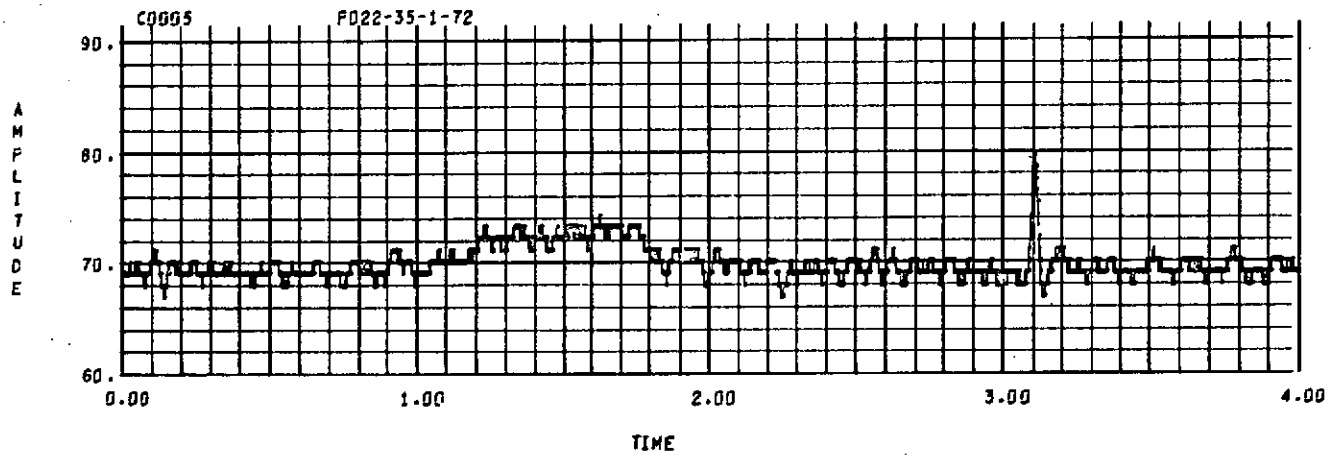
60.
0.00
1.00
2.00
3.00
4.00
TIME


SEQ. = 0032
C0004
F022-35-1-64
12.5 INCH SRB LOW PRESS THERMAL RUN F022-36
AMPLITUDE
90.
80.
70.
60.
0.00
1.00
2.00
3.00
4.00
TIME


C0005
F022-35-1-72
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60.
0.00
1.00
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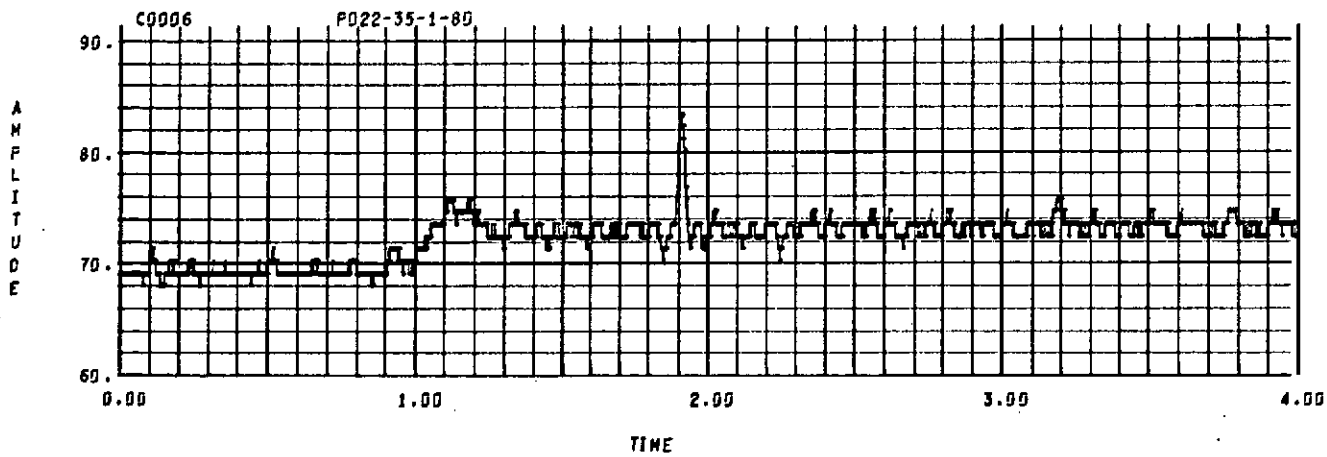
3.00
4.00
TIME


C0006
F022-35-1-80
AMPLITUDE
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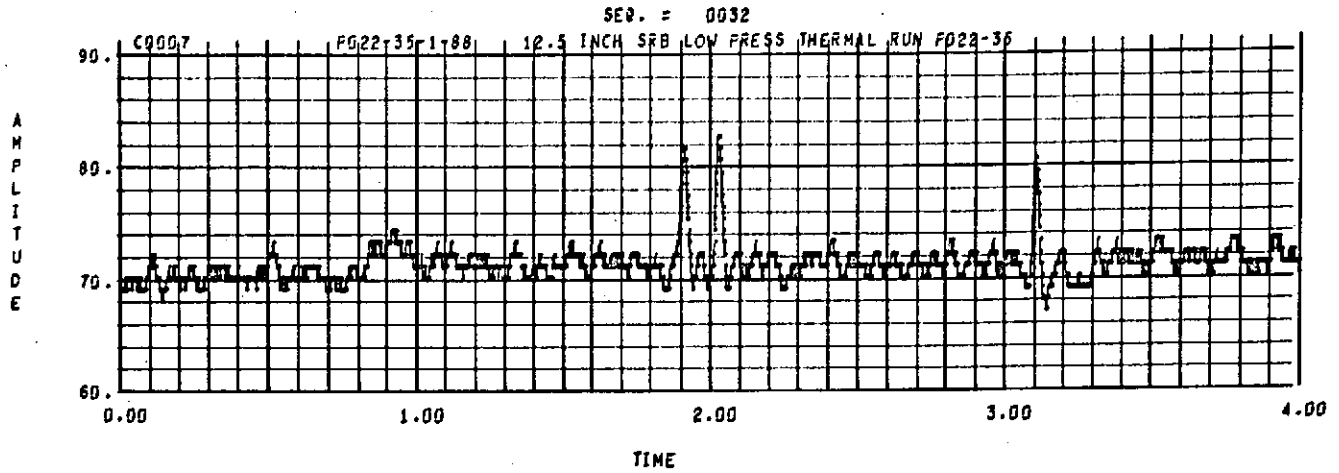
80.
70.
60.
0.00
1.00
2.00
3.00
4.00
TIME


SEQ. = 0032
C0007
FO22-35-1-88
12.5 INCH SRB LOW PRESS THERMAL RUN FO22-35
AMPLITUDE
90.
80.
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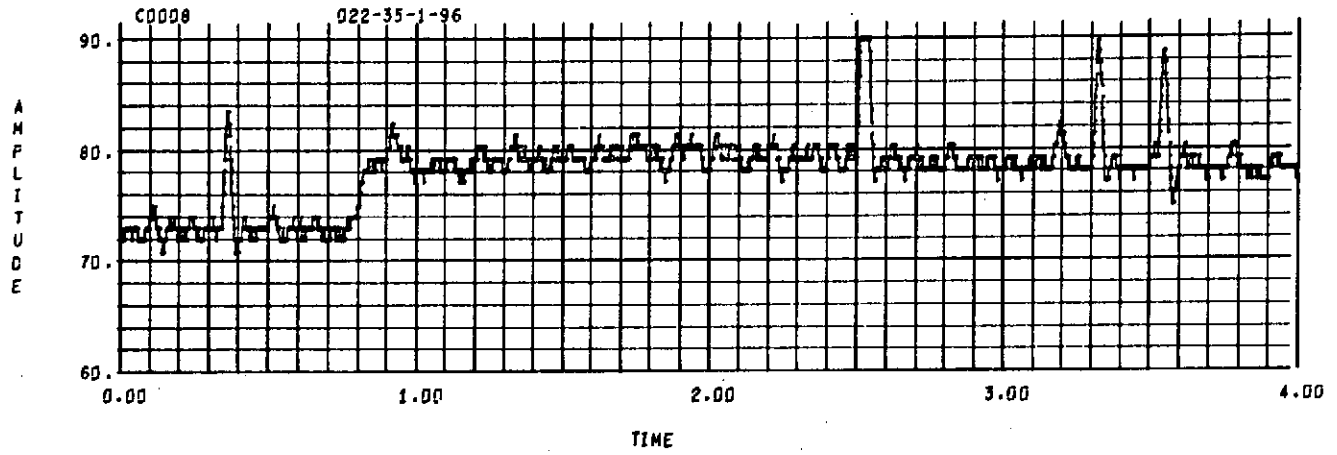
1.00
2.00
3.00
4.00
TIME


C0008
022-35-1-96
AMPLITUDE
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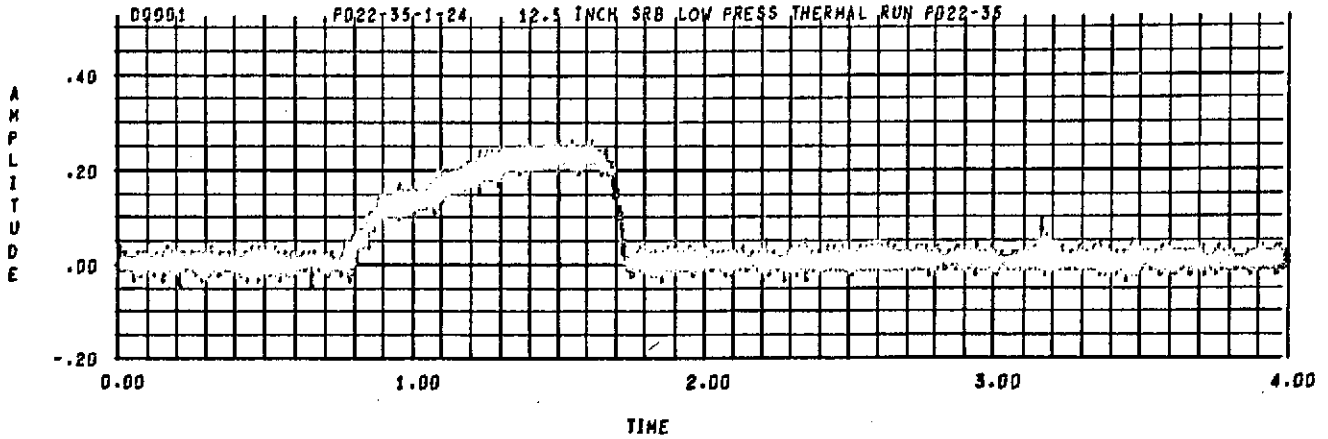
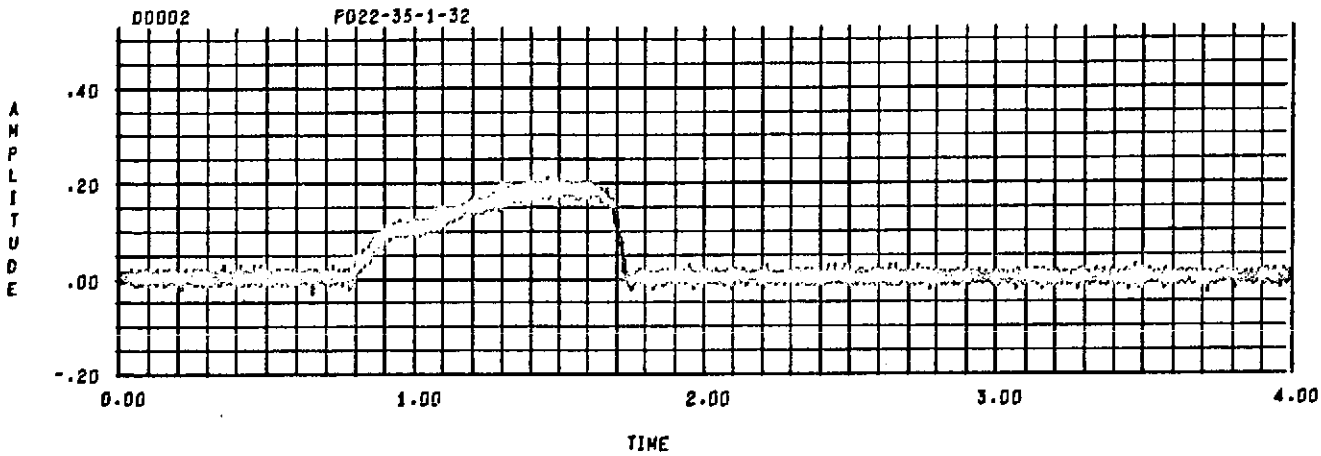
80.
70.
60.
0.00
1.00
2.00
3.00
4.00
TIME


D0001
FO22-35-1-24
12.5 INCH SRB LOW PRESS THERMAL RUN FO22-35
AMPLITUDE
.40
.20
.00
-.20
0.00
1.00
2.00
3.00
4.00
TIME


D0002
F022-35-1-32
AMPLITUDE
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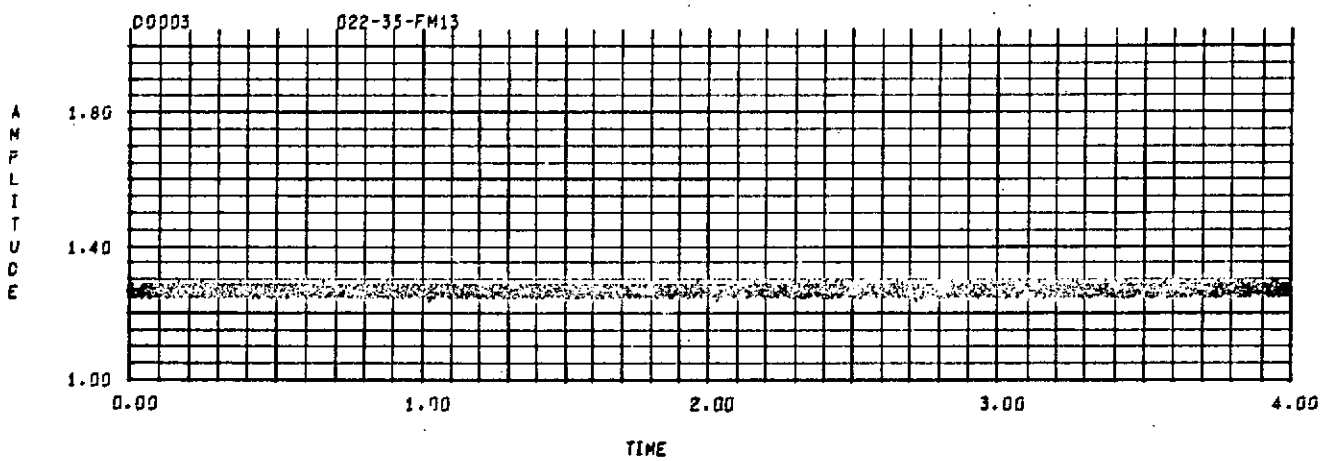
-.20
0.00
1.00
2.00
3.00
4.00
TIME


D0003
022-35-FM13
AMPLITUDE
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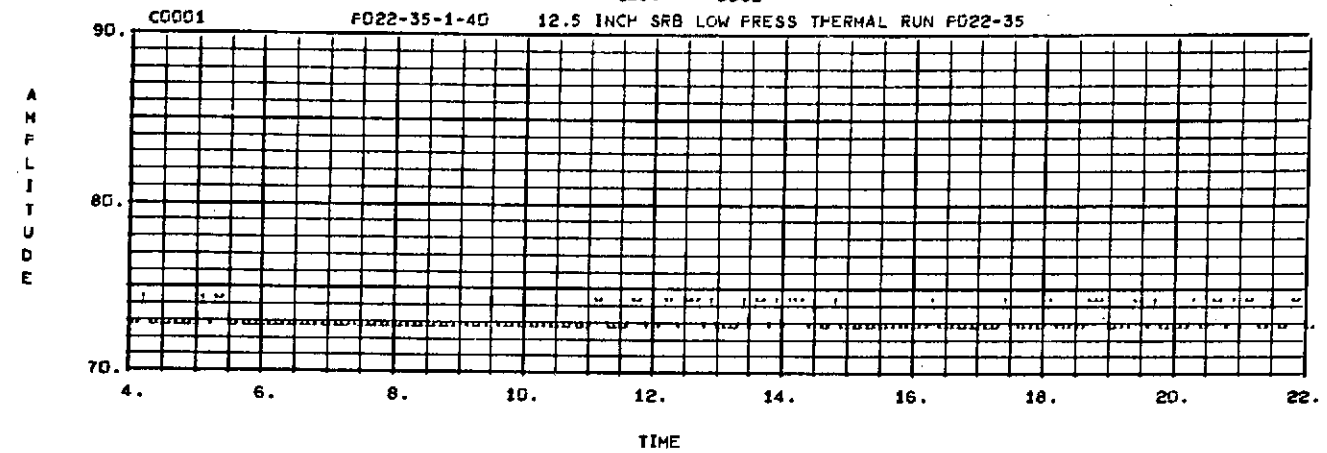
1.40
1.00
0.00
1.00
2.00
3.00
4.00
TIME

SEG. = 0032


C0001
P022-35-1-40
12.5 INCH SRB LOW PRESS THERMAL RUN P022-35
AMPLITUDE
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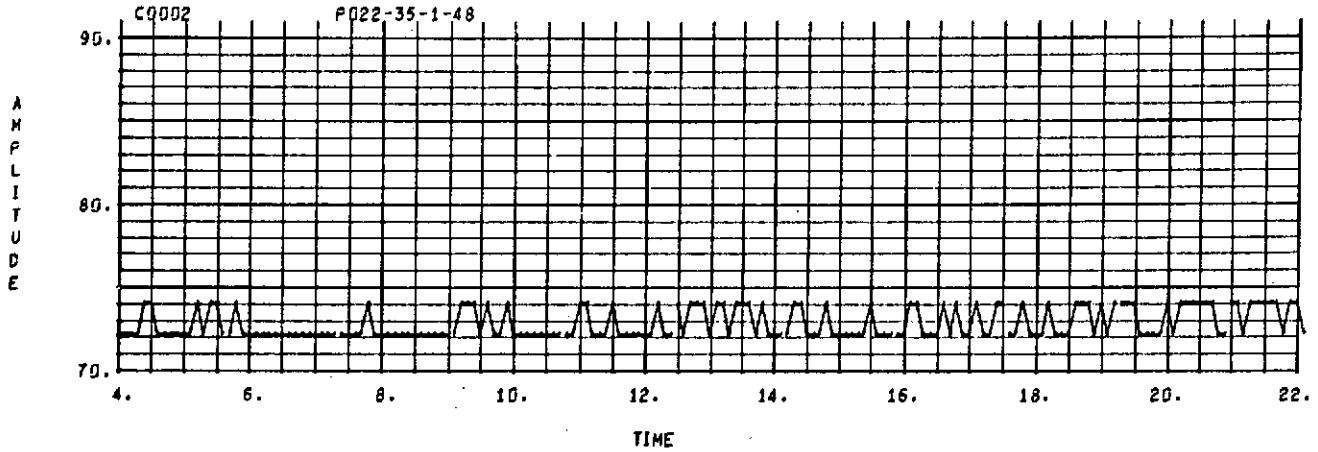
70.
4.
6.
8.
10.
12.
14.
16.
18.
20.
22.
TIME


C0002
P022-35-1-48
AMPLITUDE
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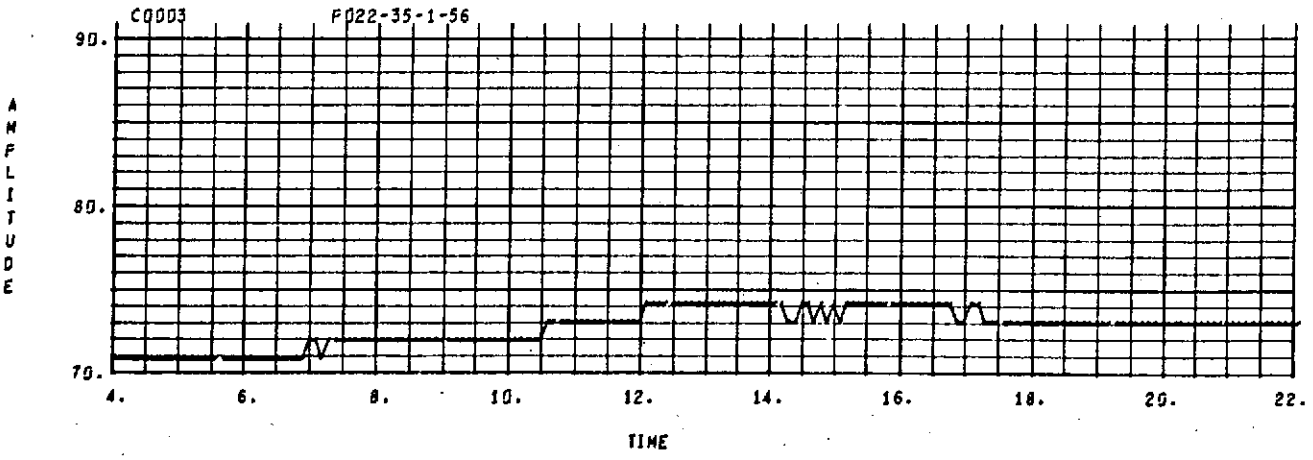
6.
8.
10.
12.
14.
16.
18.
20.
22.
TIME


C0003
P022-35-1-56
AMPLITUDE
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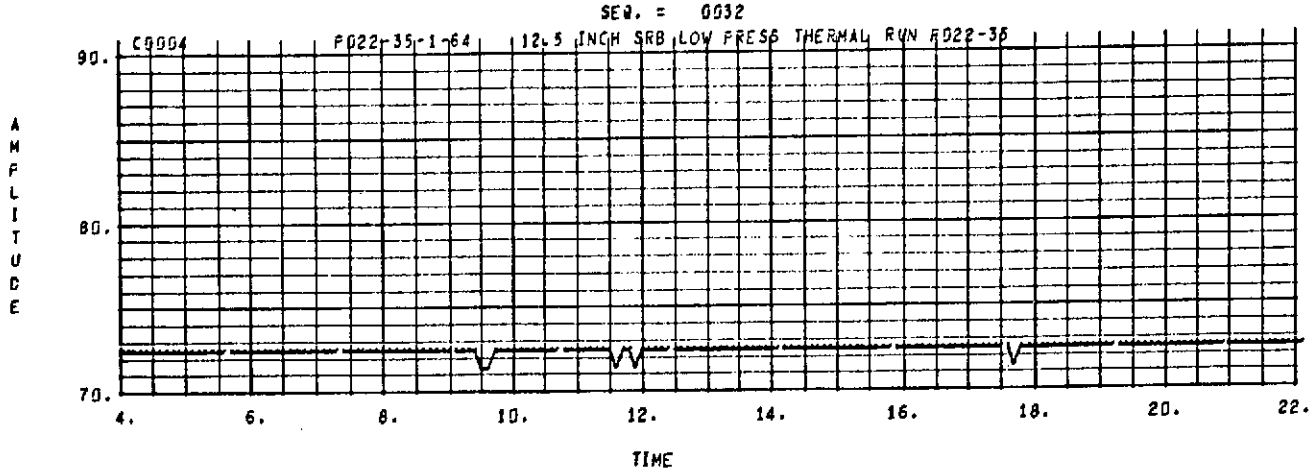
8.
10.
12.
14.
16.
18.
20.
22.
TIME

SEQ. = 0032


C0004
F022-35-1-64
12.5 INCH SRB LOW PRESS THERMAL RUN F022-35
AMPLITUDE
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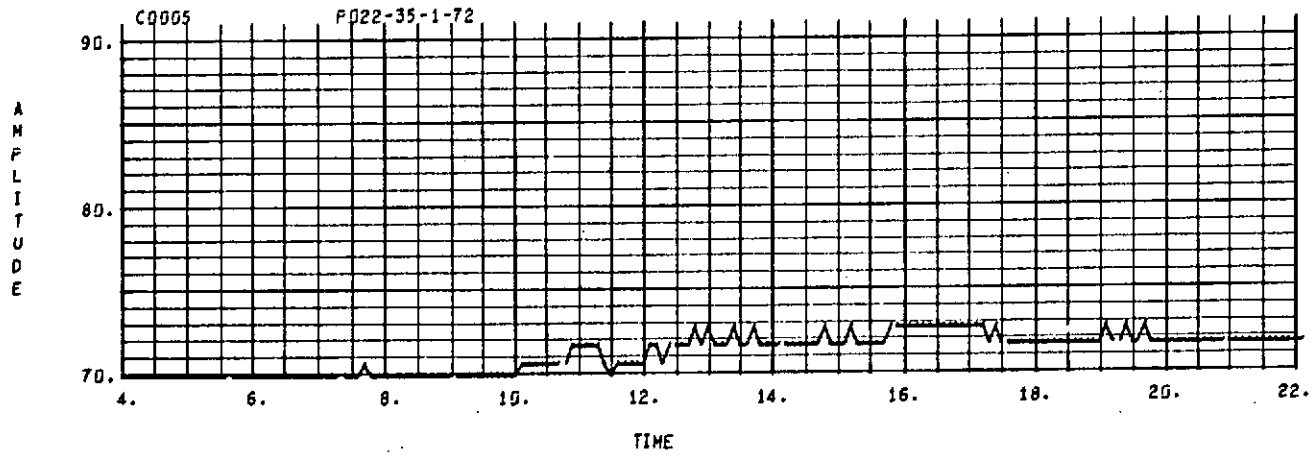
70.
4.
6.
8.
10.
12.
14.
16.
18.
20.
22.
TIME


C0005
F022-35-1-72
AMPLITUDE
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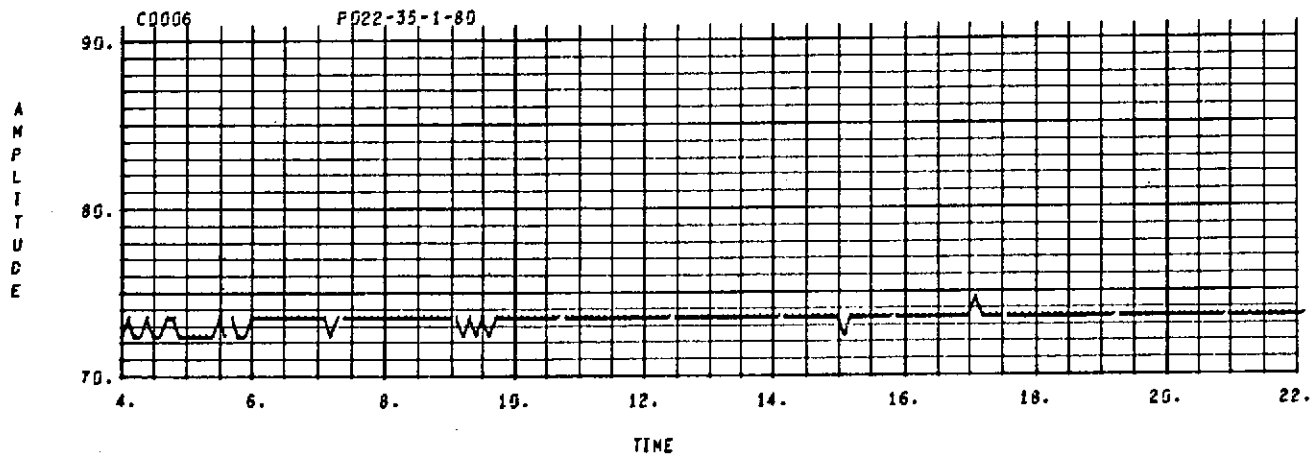
80.
70.
4.
6.
8.
10.
12.
14.
16.
18.
20.
22.
TIME


C0006
F022-35-1-80
AMPLITUDE
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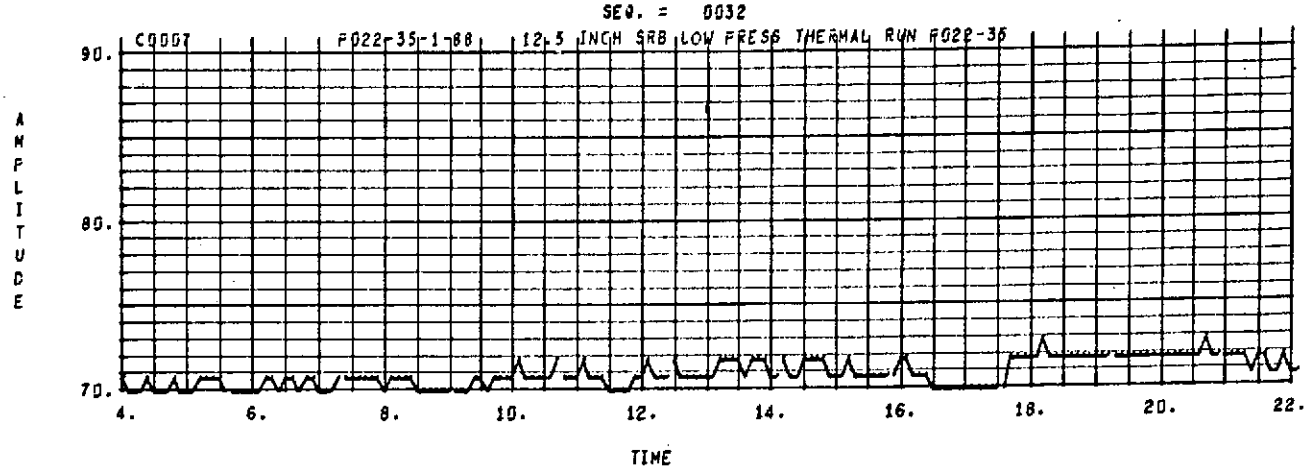
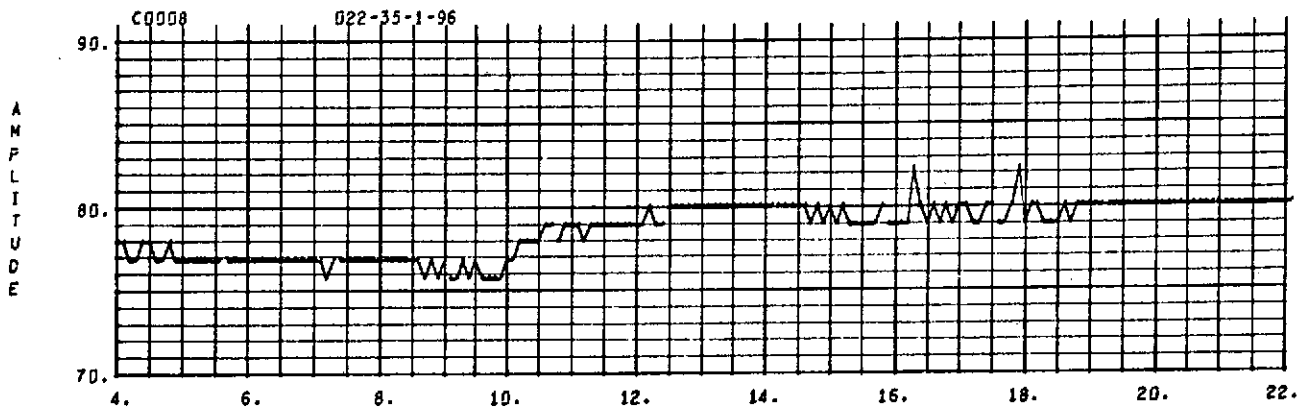
10.
12.
14.
16.
18.
20.
22.
TIME

SEQ. = 0032


C0007
F022-35-1-88
12.5 INCH SRB LOW PRESS THERMAL RUN F022-35
AMPLITUDE
90.
80.
70.
4.
6.
8.
10.
12.
14.
16.
18.
20.
22.
TIME


C0008
022-35-1-96
AMPLITUDE
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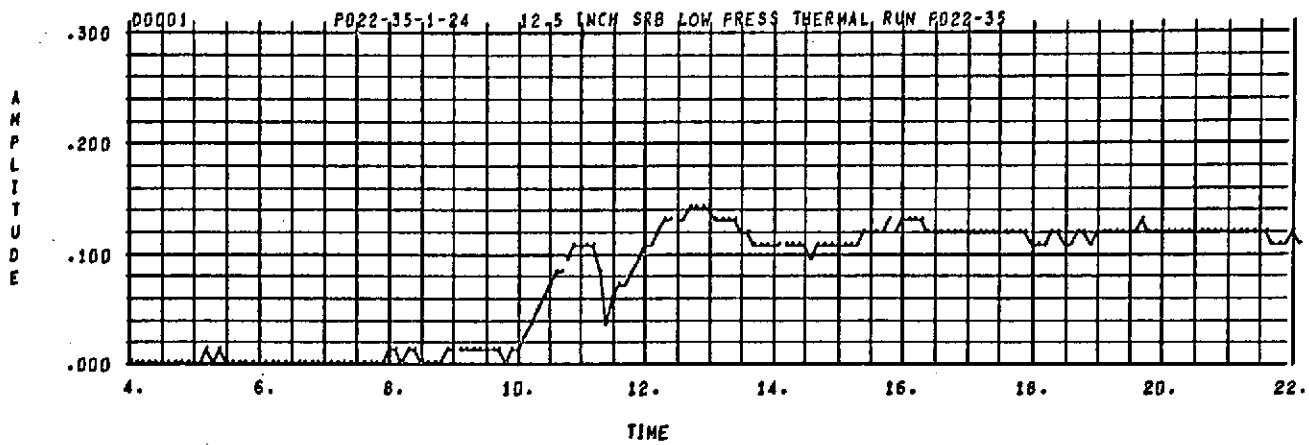
70.
4.
6.
8.
10.
12.
14.
16.
18.
20.
22.


D0001
F022-35-1-24
12.5 INCH SRB LOW PRESS THERMAL RUN F022-35
AMPLITUDE
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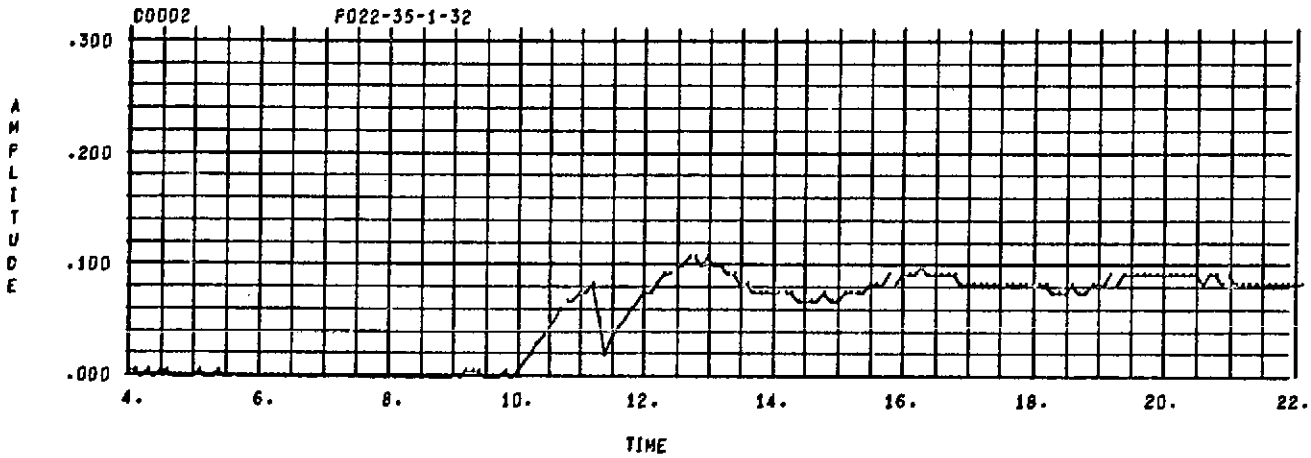
.200
.100
.000
4.
6.
8.
10.
12.
14.
16.
18.
20.
22.
TIME


C0002
F022-35-1-32
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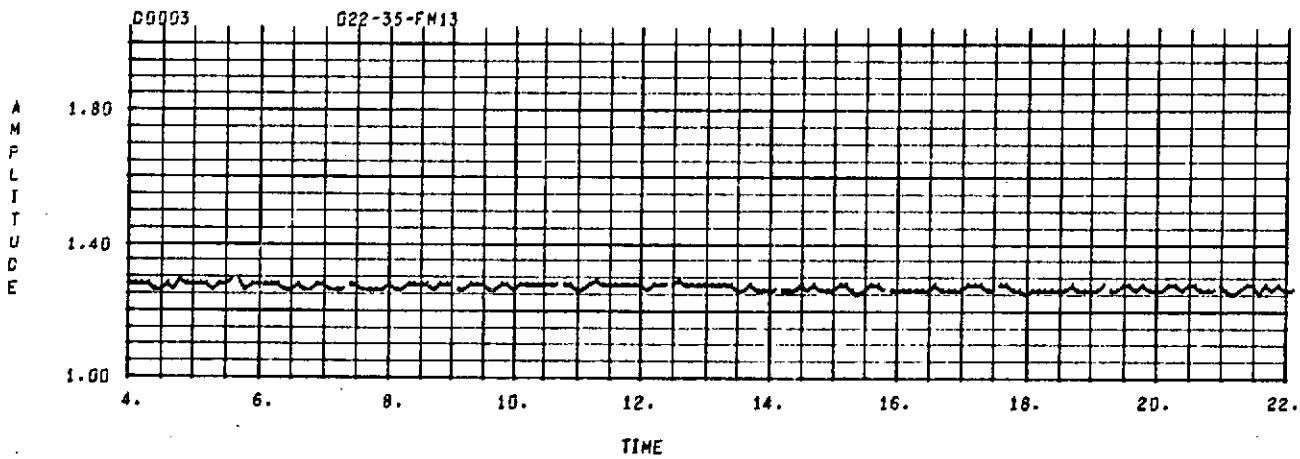
.200
.100
.000
AMPLITUDE
4.
6.
8.
10.
12.
14.
16.
18.
20.
22.
TIME


C0003
G22-35-FM13
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1.40
1.00
AMPLITUDE
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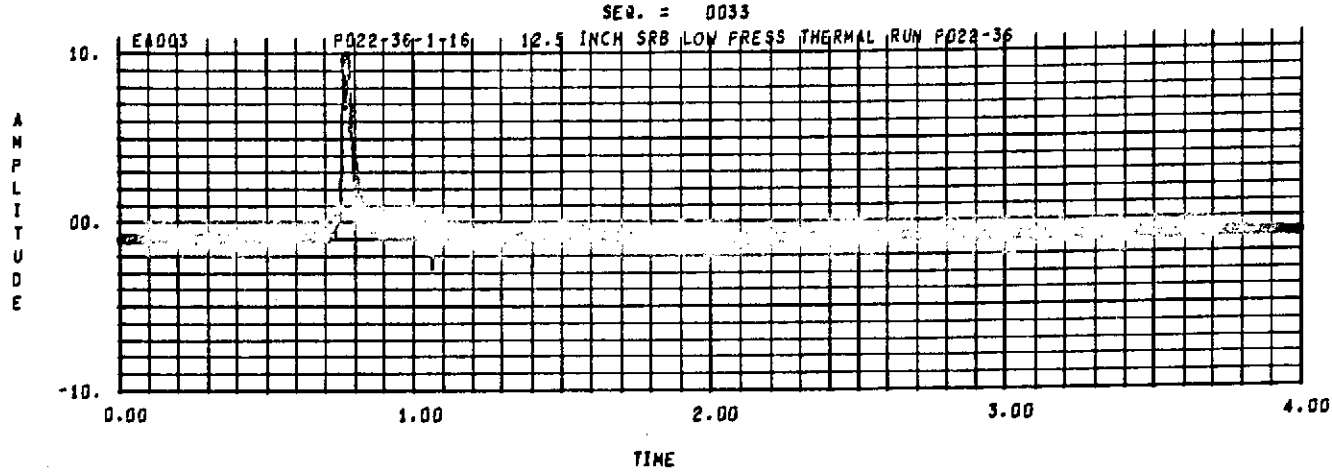
6.
8.
10.
12.
14.
16.
18.
20.
22.
TIME

SEQ. = 0033


EA003
P022-36-1-16
12.5 INCH SRB LOW PRESS THERMAL RUN P022-36
10.
00.
-10.
AMPLITUDE
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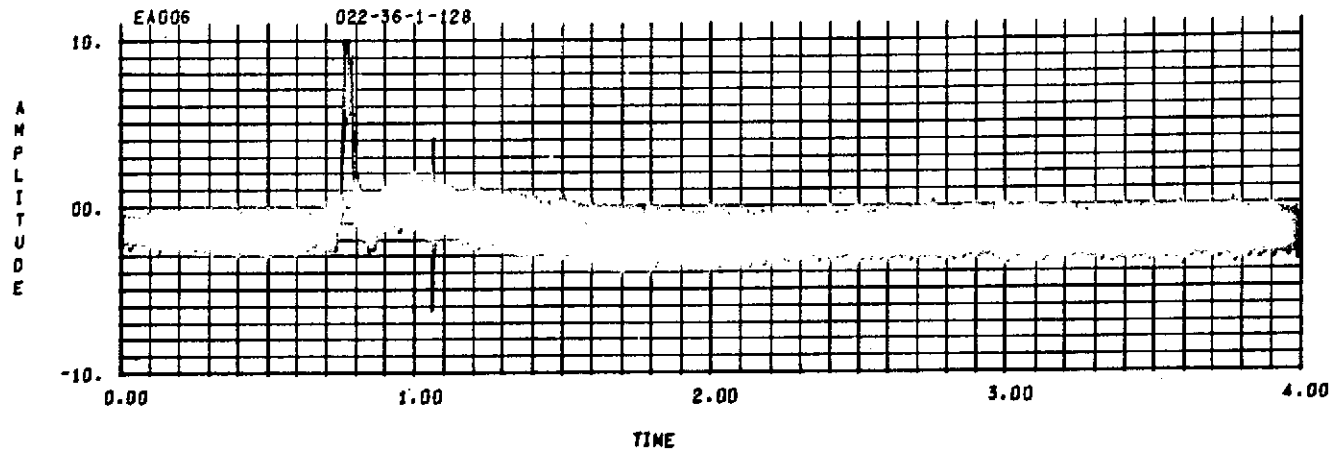
1.00
2.00
3.00
4.00
TIME


EA006
022-36-1-128
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-10.
AMPLITUDE
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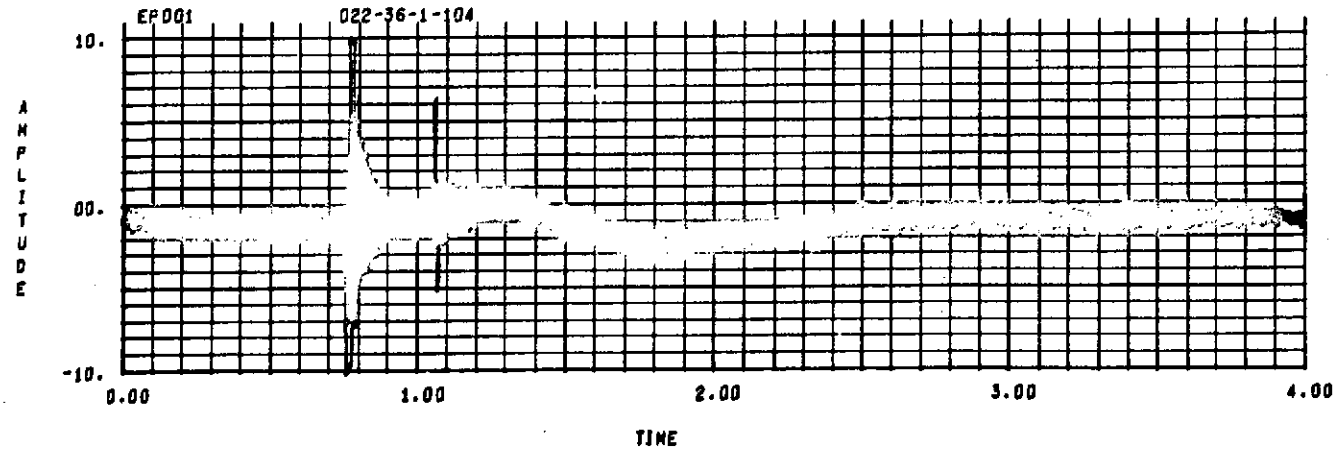
1.00
2.00
3.00
4.00
TIME


EP001
022-36-1-104
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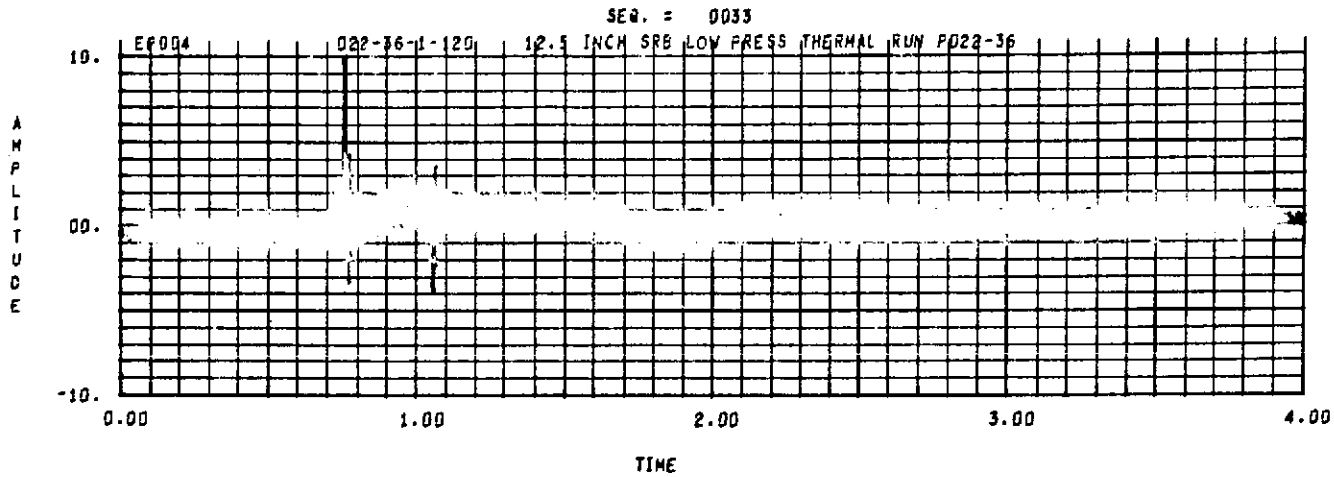
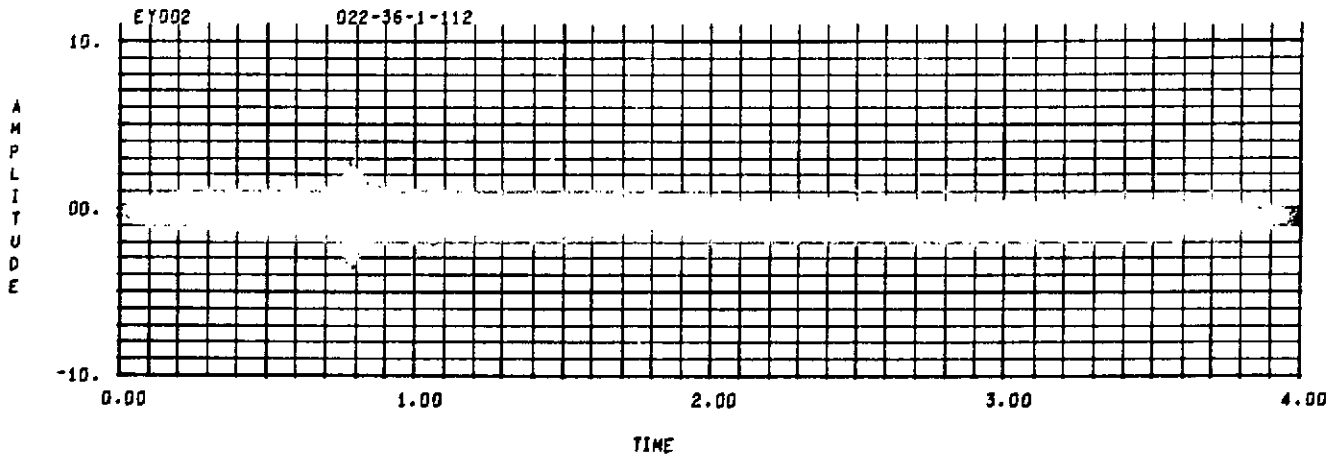
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME


SEQ. = 0033
EF004
022-36-1-120
12.5 INCH SRB LOW PRESS THERMAL RUN F022-36
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME


EY002
022-36-1-112
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00.
-10.
AMPLITUDE
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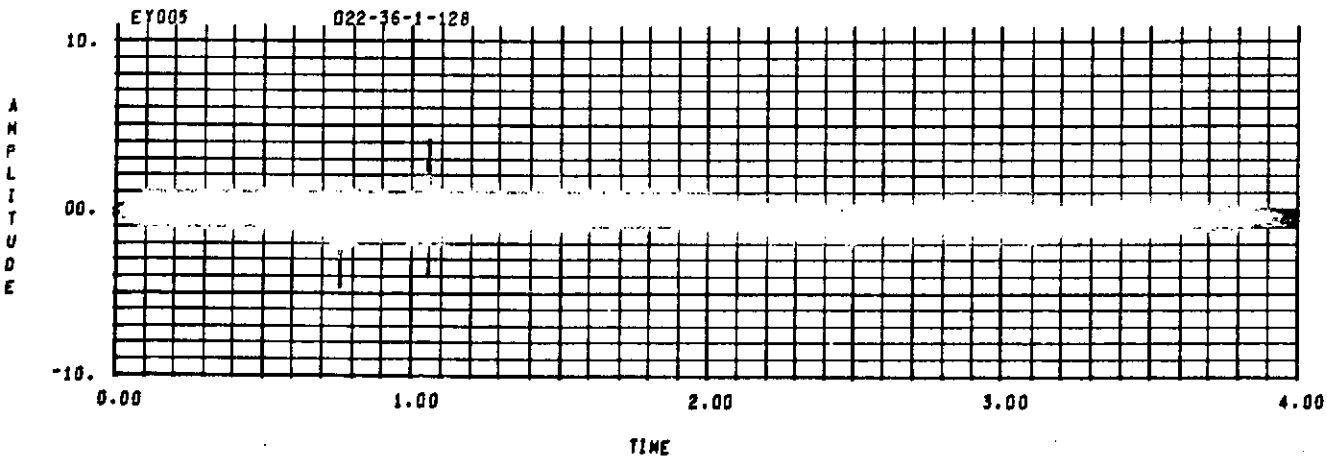
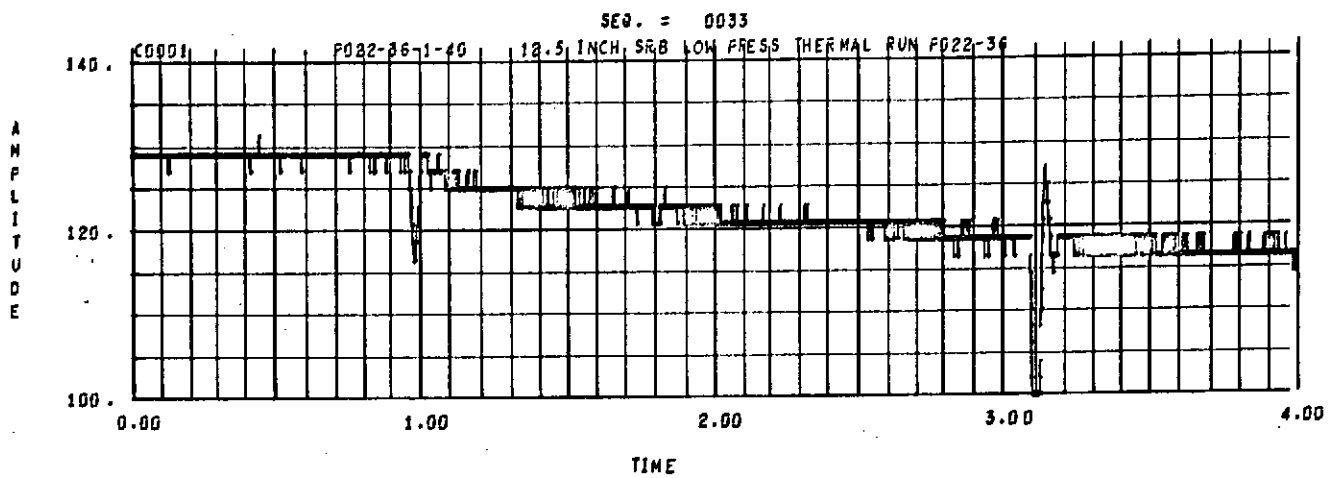
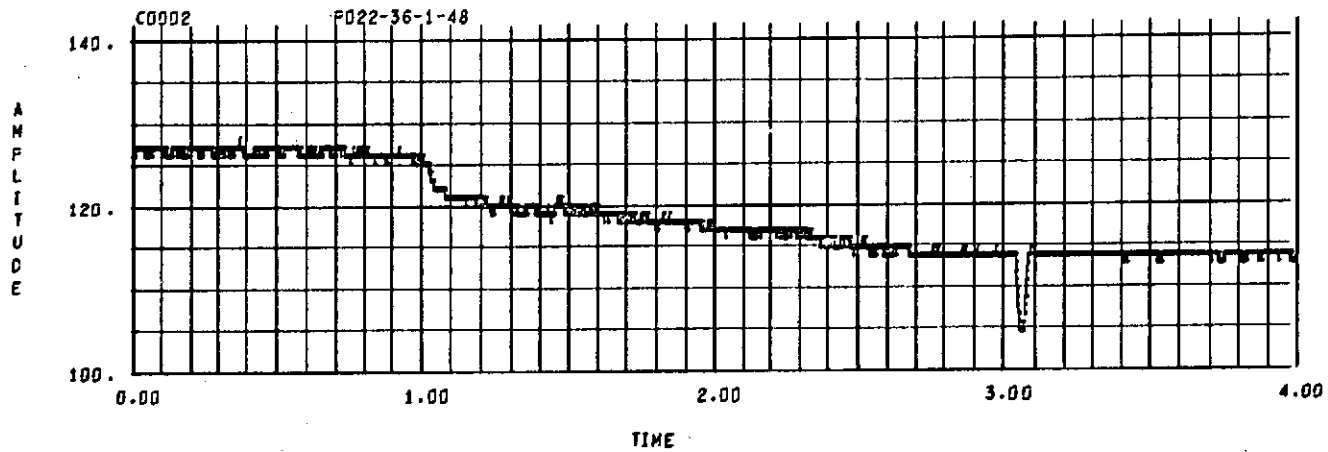
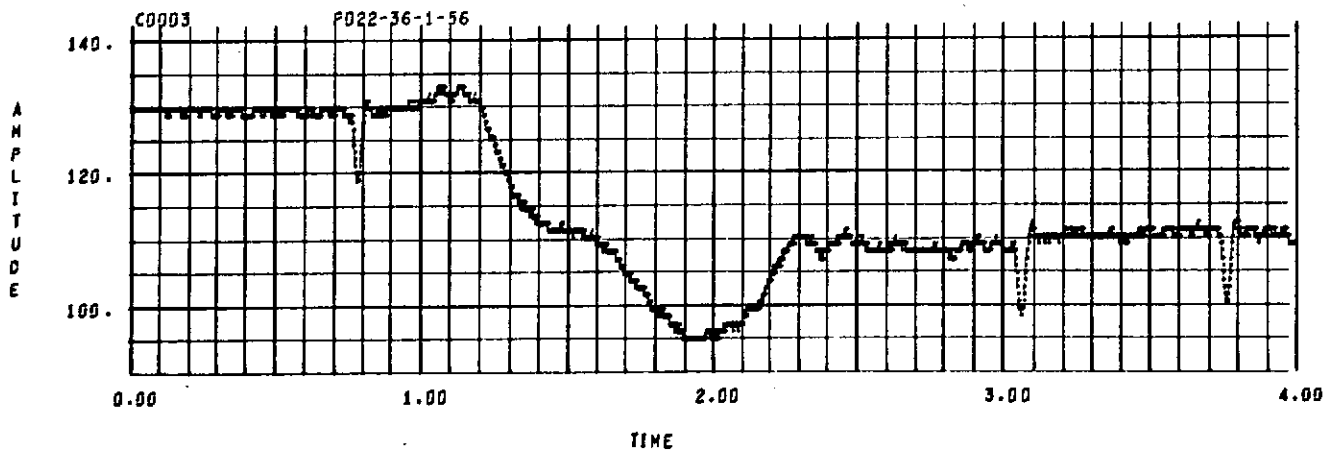
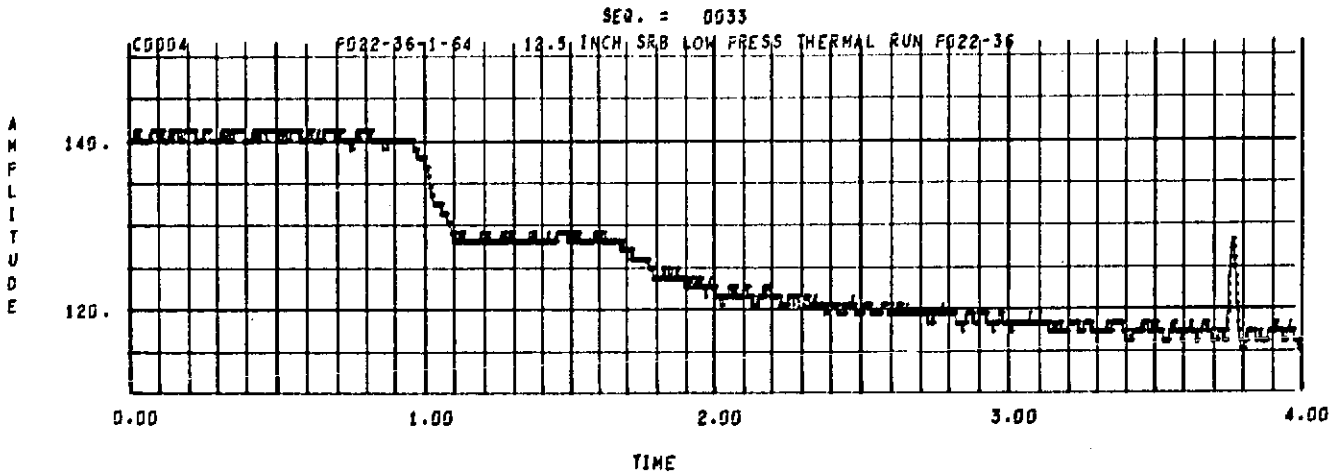
1.00
2.00
3.00
4.00
TIME

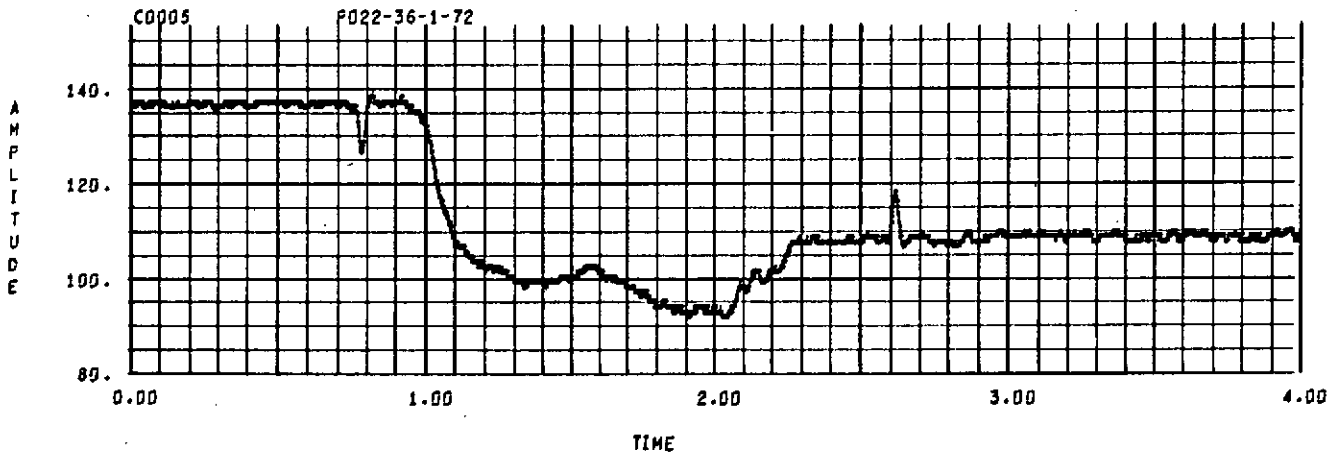

EY005
022-36-1-128
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

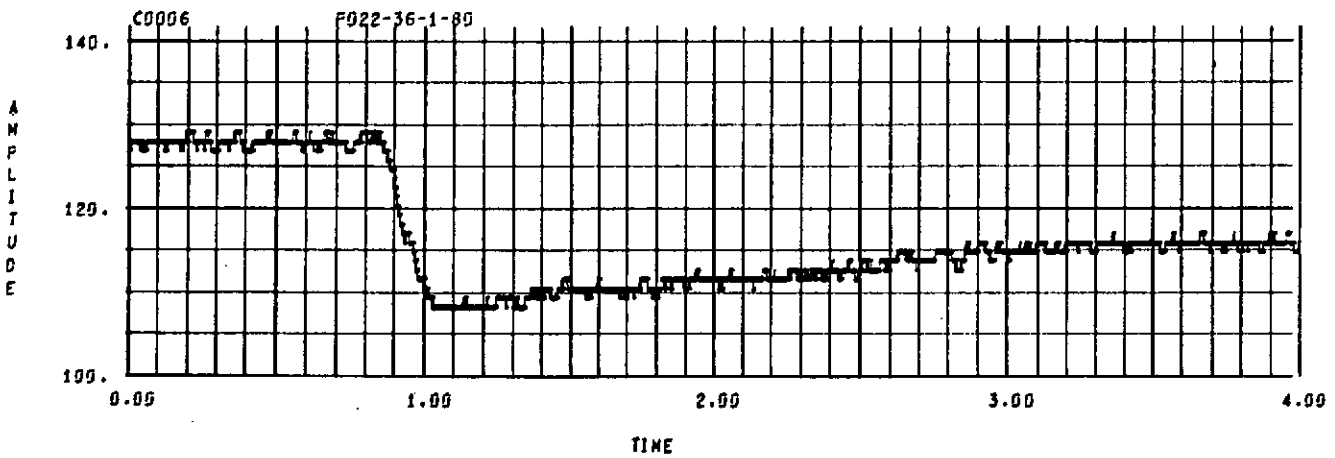

SEQ. = 0033
C0001
P022-36-1-40
18.5 INCH SRB LOW PRESS THERMAL RUN P022-36
AMPLITUDE
140.
120.
100.
0.00
1.00
2.00
3.00
4.00
TIME


C0002
P022-36-1-48
AMPLITUDE
140.
120.
100.
0.00
1.00
2.00
3.00
4.00
TIME

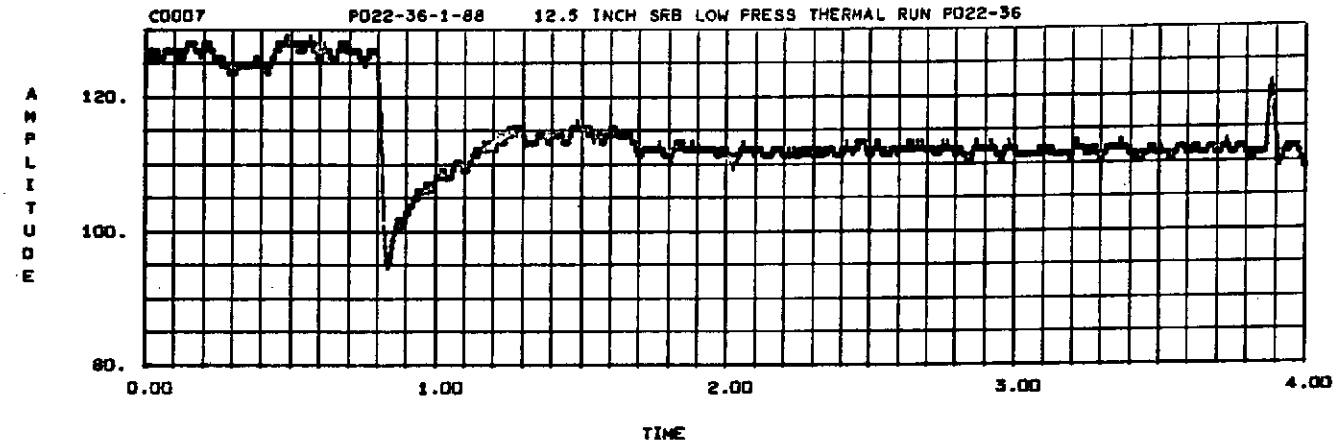

C0003
P022-36-1-56
AMPLITUDE
140.
120.
100.
0.00
1.00
2.00
3.00
4.00
TIME

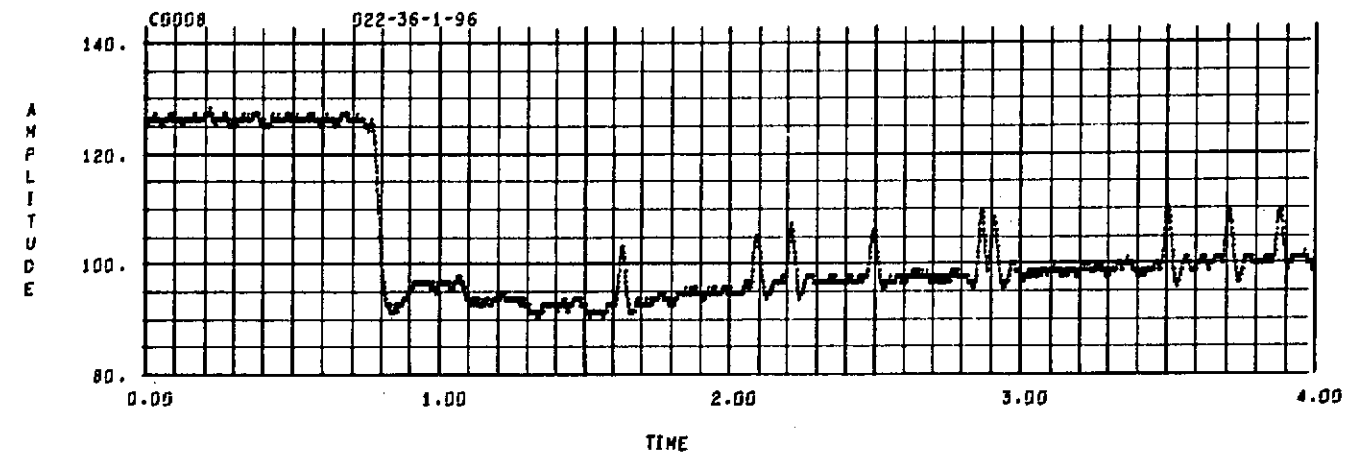

SEQ. = 0033
C0004
F022-36-1-64
12.5 INCH SRB LOW PRESS THERMAL RUN F022-36
AMPLITUDE
140.
120.
0.00
1.00
2.00
3.00
4.00
TIME


C0005
F022-36-1-72
AMPLITUDE
140.
120.
100.
80.
0.00
1.00
2.00
3.00
4.00
TIME

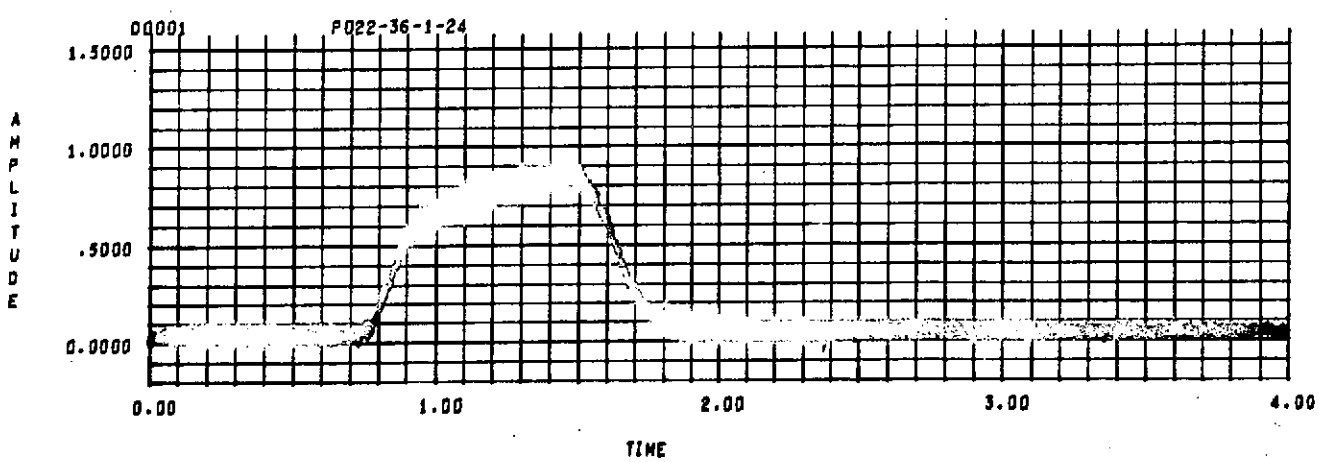

C0006
F022-36-1-80
AMPLITUDE
140.
120.
100.
0.00
1.00
2.00
3.00
4.00
TIME

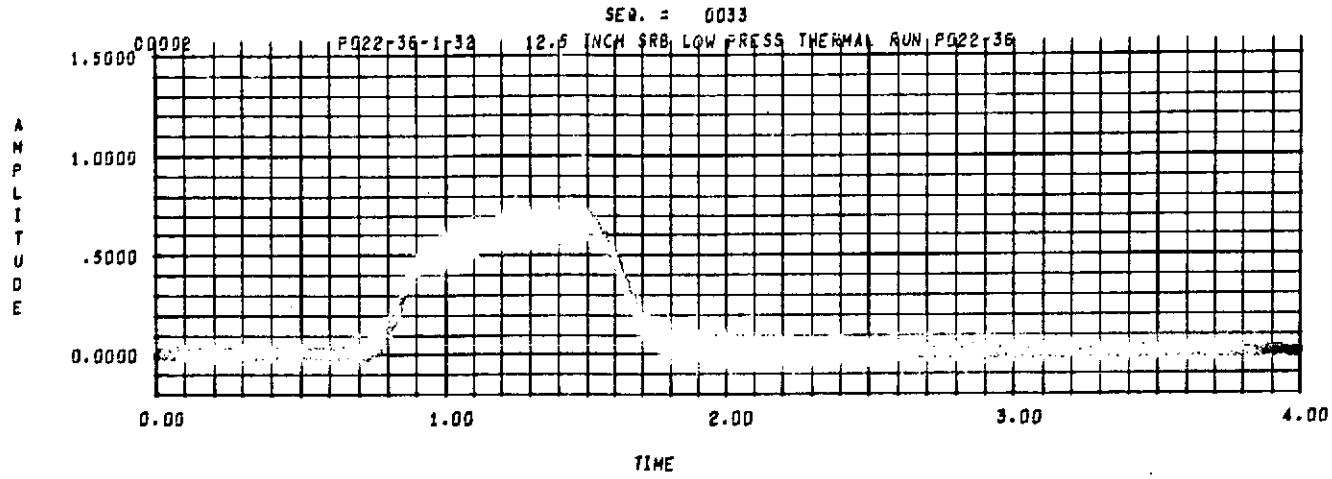
SEQ. = 0033

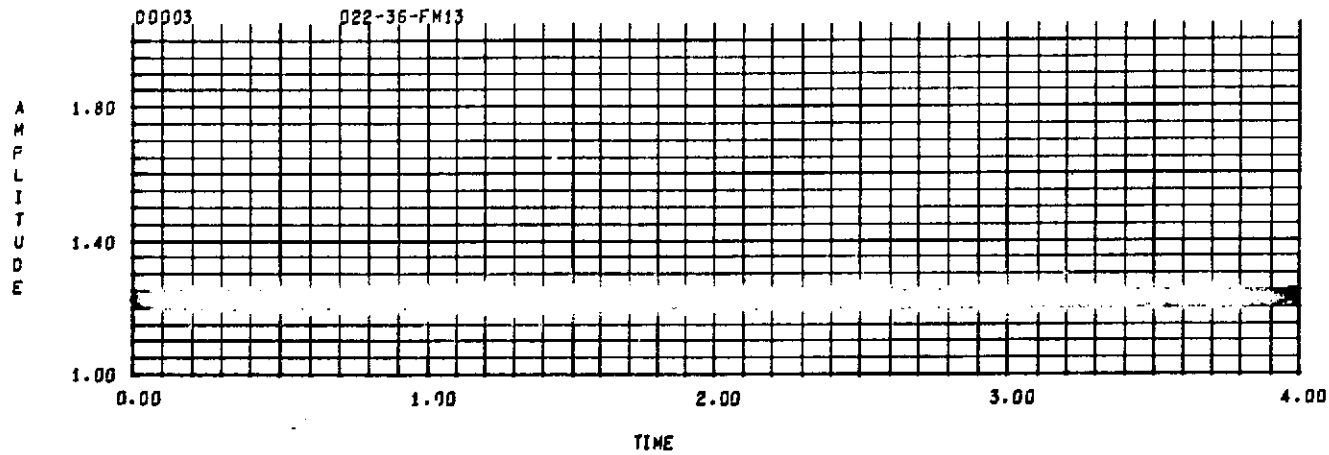




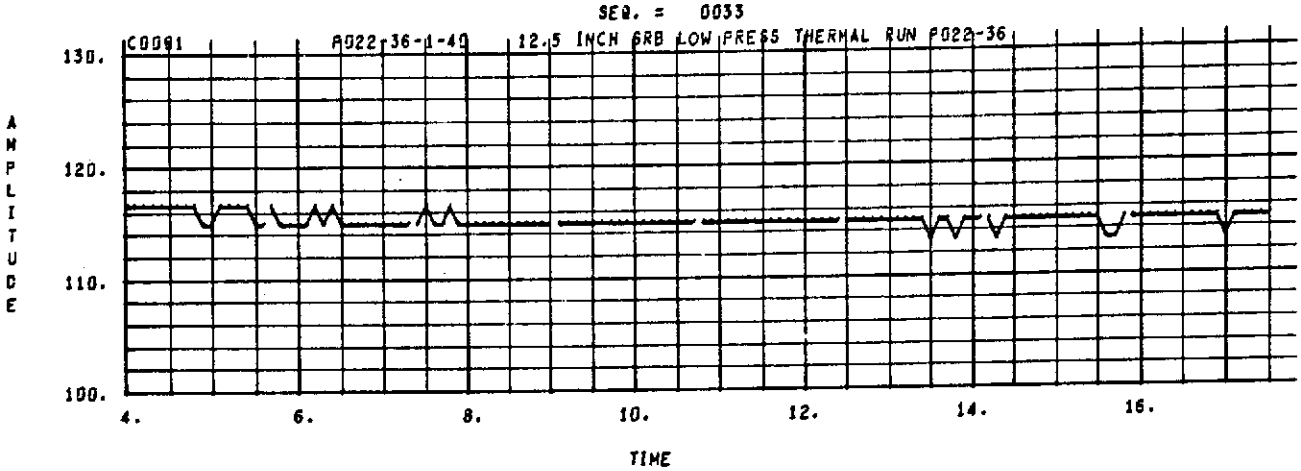
TIME

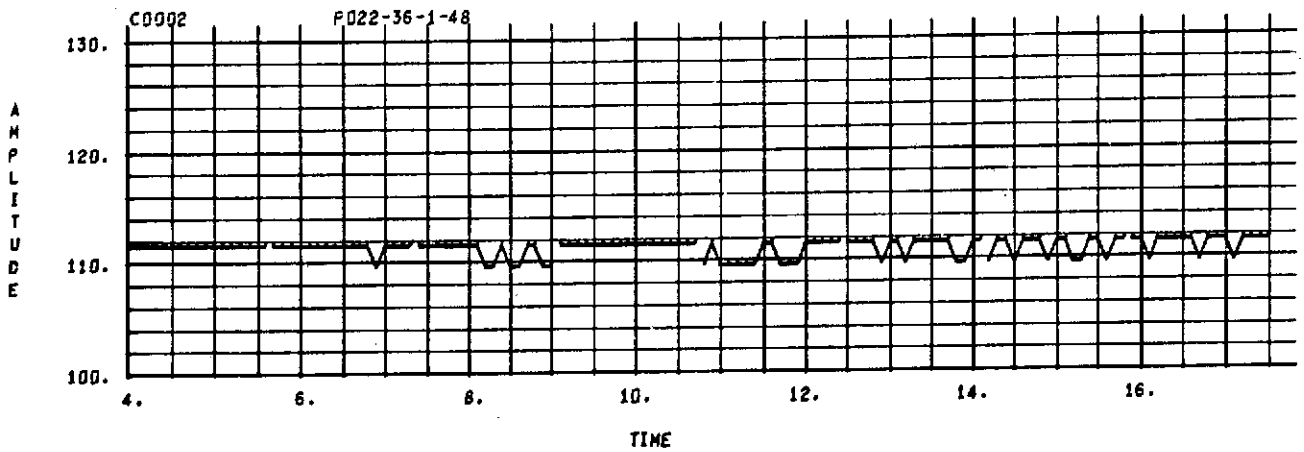


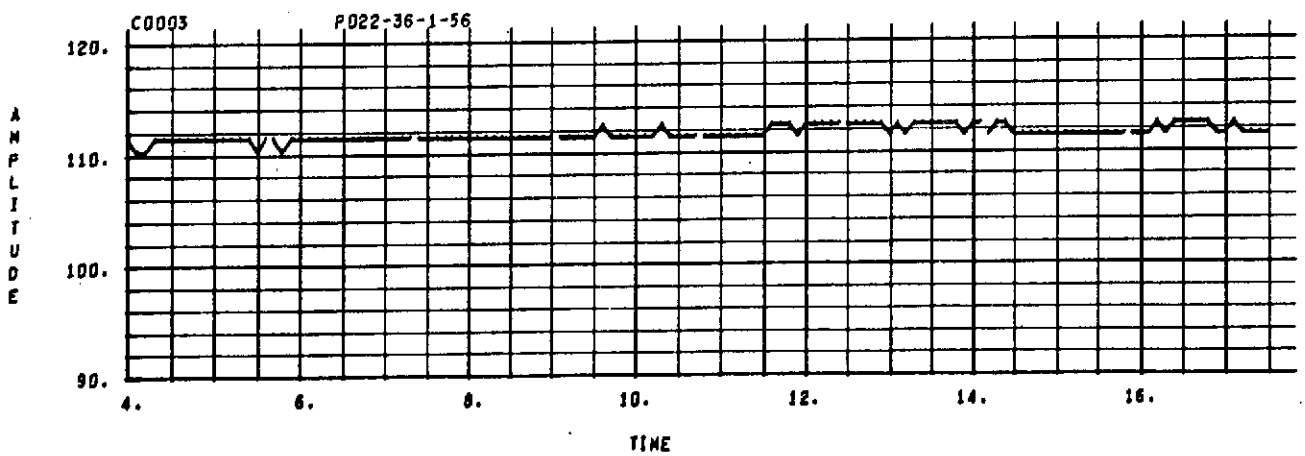

SEQ. = 0033
00002
P022r36-1r32
12.6 INCH SRB LOW PRESS THERMAL RUN P022r36
1.5000
1.0000
.5000
0.0000
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME


00003
022-36-FM13
1.80
1.40
1.00
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

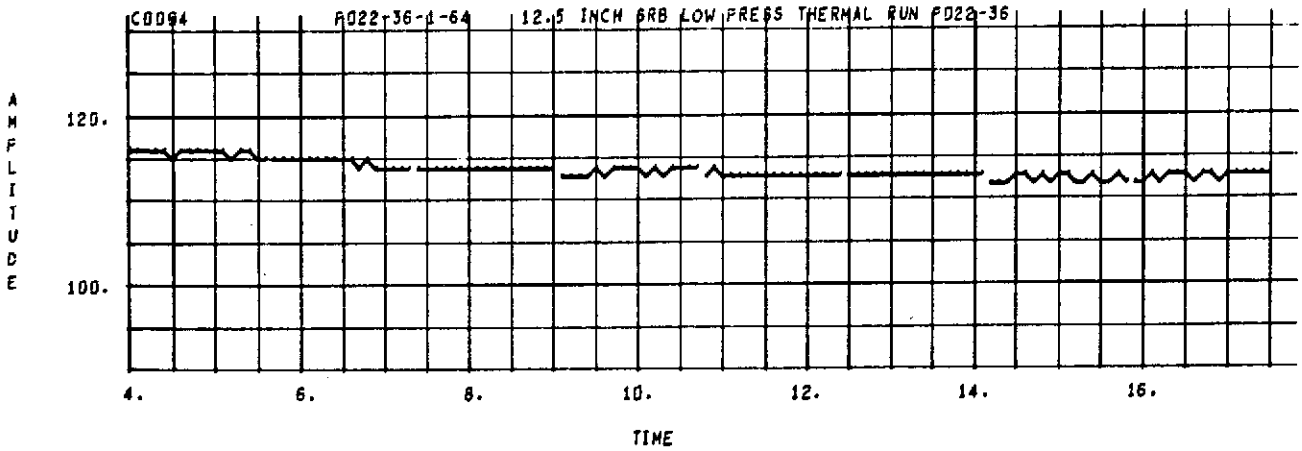
SEQ. = 0033

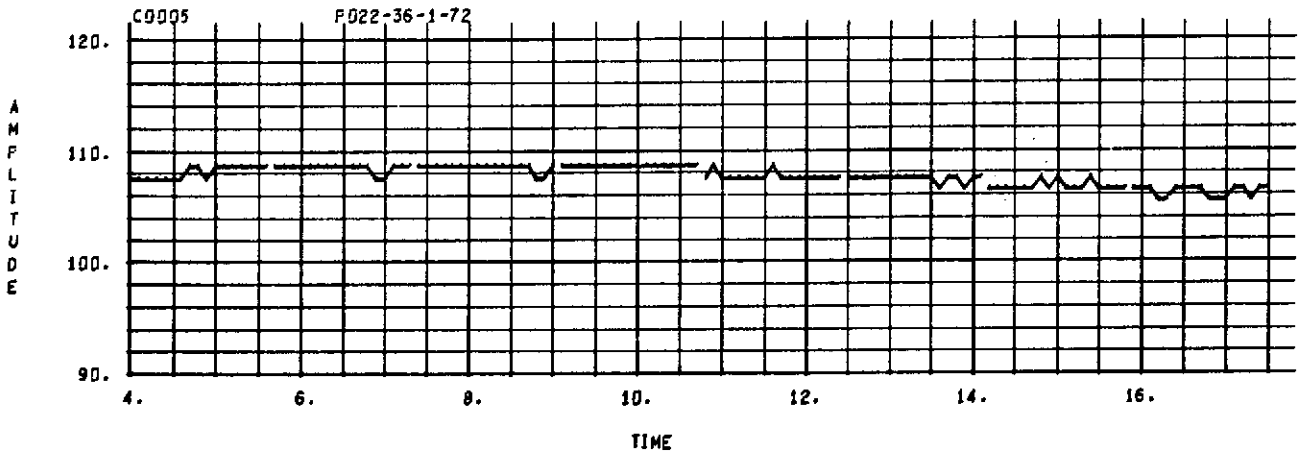

C0001
P022-36-1-40
12.5 INCH GRB LOW PRESS THERMAL RUN P022-36
130.
120.
110.
100.
AMPLITUDE
4.
6.
8.
10.
12.
14.
16.
TIME

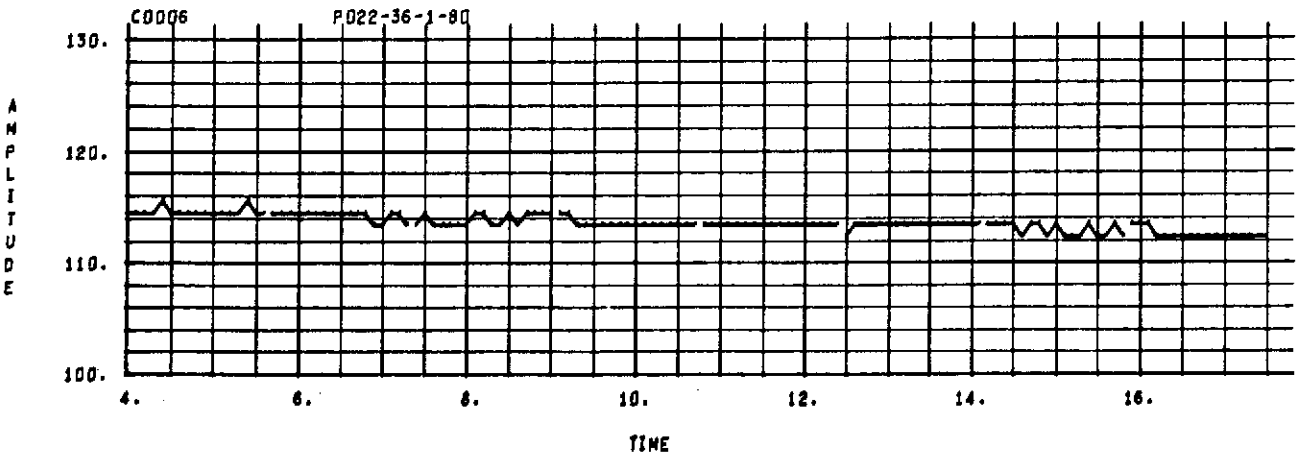

C0002
P022-36-1-48
130.
120.
110.
100.
AMPLITUDE
4.
6.
8.
10.
12.
14.
16.
TIME

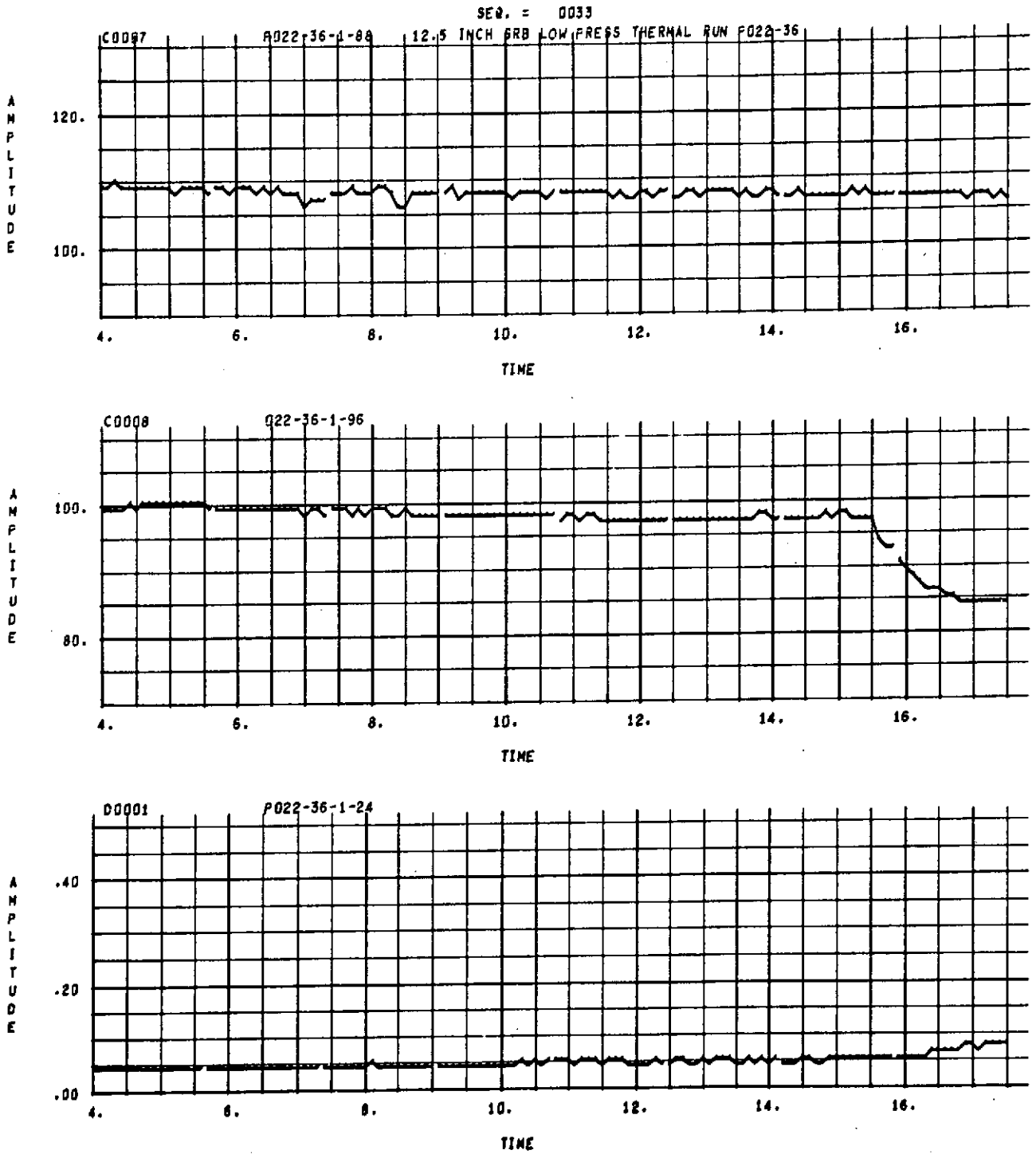

C0003
P022-36-1-56
120.
110.
100.
90.
AMPLITUDE
4.
6.
8.
10.
12.
14.
16.
TIME

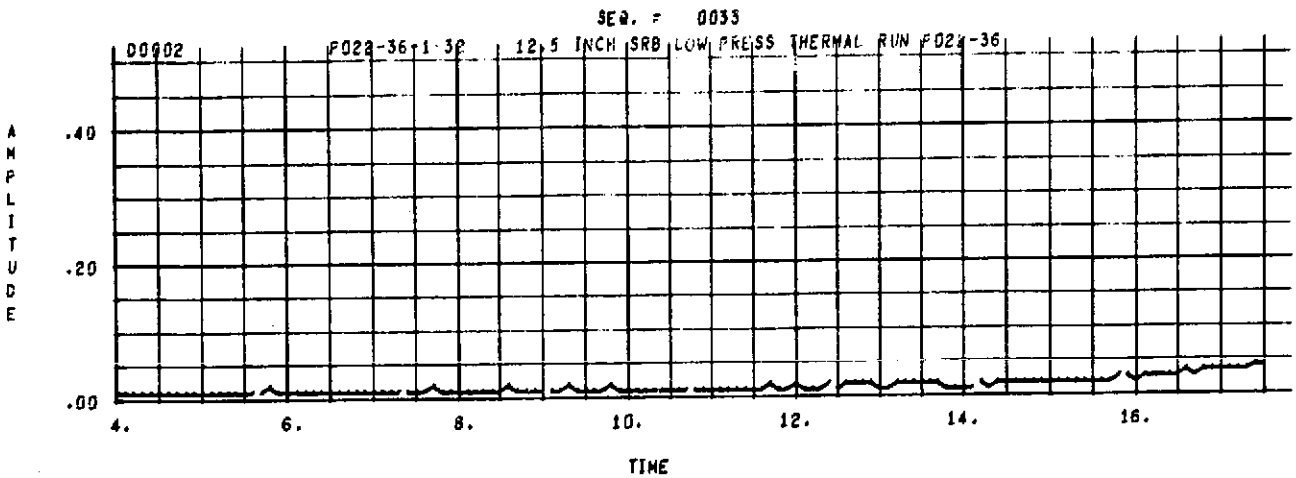
SEQ. = 0033

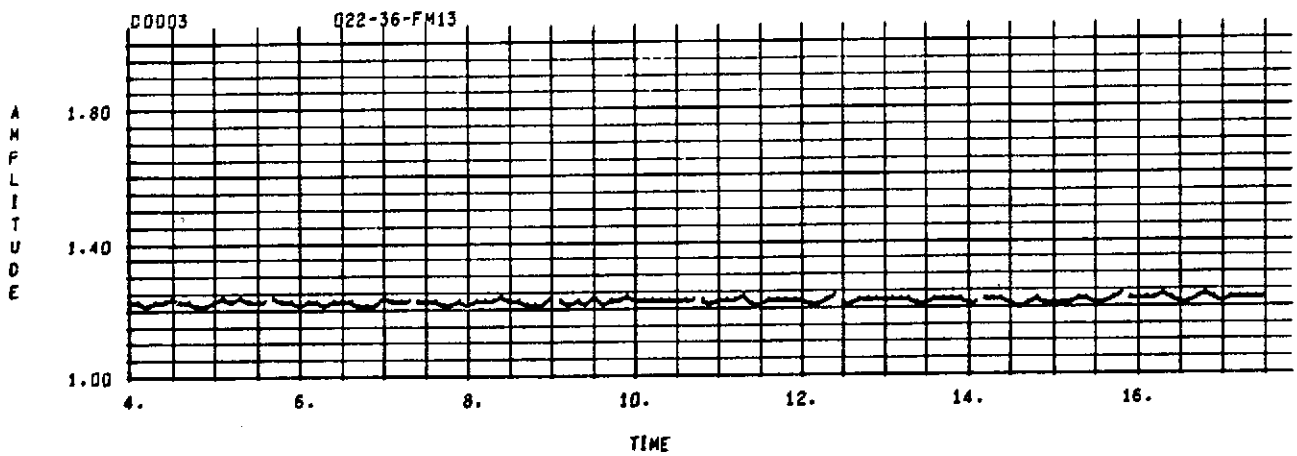

C0004
P022-36-1-64
12.5 INCH SRB LOW PRESS THERMAL RUN P022-36
AMPLITUDE
120.
100.
4.
6.
8.
10.
12.
14.
16.
TIME

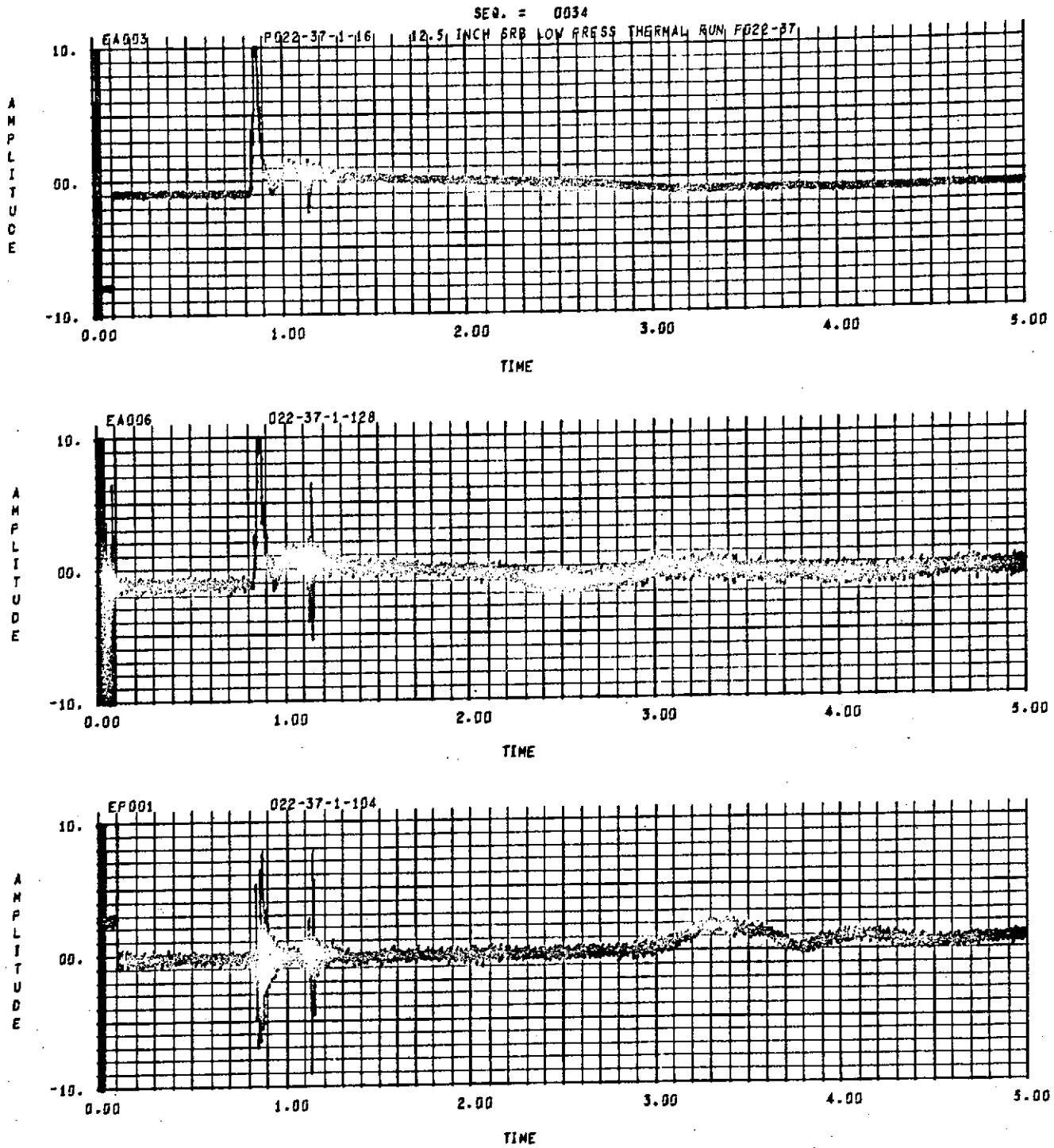

C0005
P022-36-1-72
AMPLITUDE
120.
110.
100.
90.
4.
6.
8.
10.
12.
14.
16.
TIME

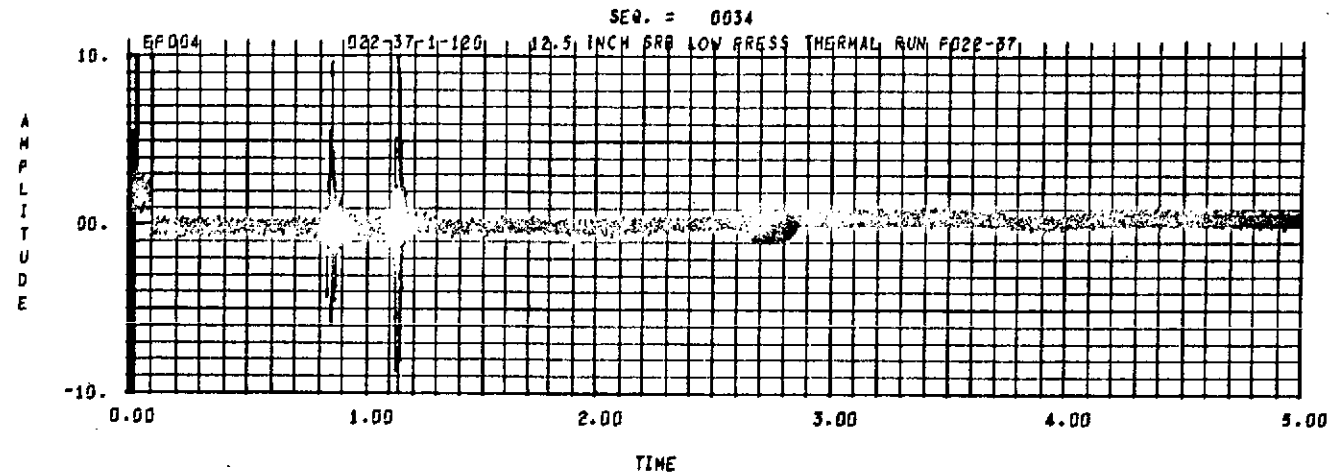

C0006
P022-36-1-80
AMPLITUDE
130.
120.
110.
100.
4.
6.
8.
10.
12.
14.
16.
TIME

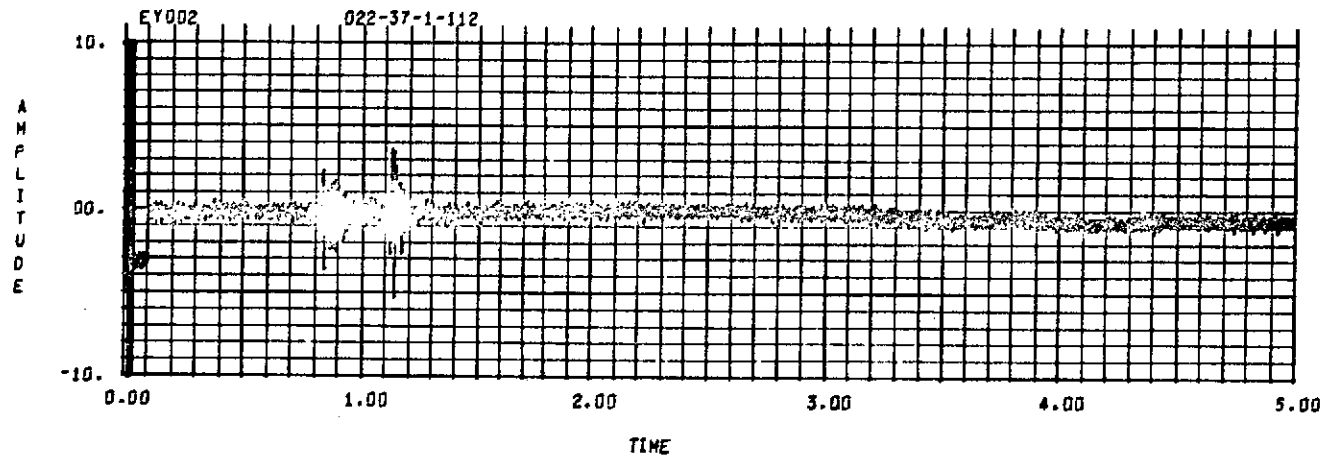

SEQ. = 0033
C0007
A022-36-1-88
12.5 INCH GRB LOW PRESS THERMAL RUN F022-36
AMPLITUDE
120.
100.
4.
6.
8.
10.
12.
14.
16.
TIME
C0008
Q22-36-1-96
AMPLITUDE
100.
80.
4.
6.
8.
10.
12.
14.
16.
TIME
D0001
P022-36-1-24
AMPLITUDE
.40
.20
.00
4.
6.
8.
10.
12.
14.
16.
TIME

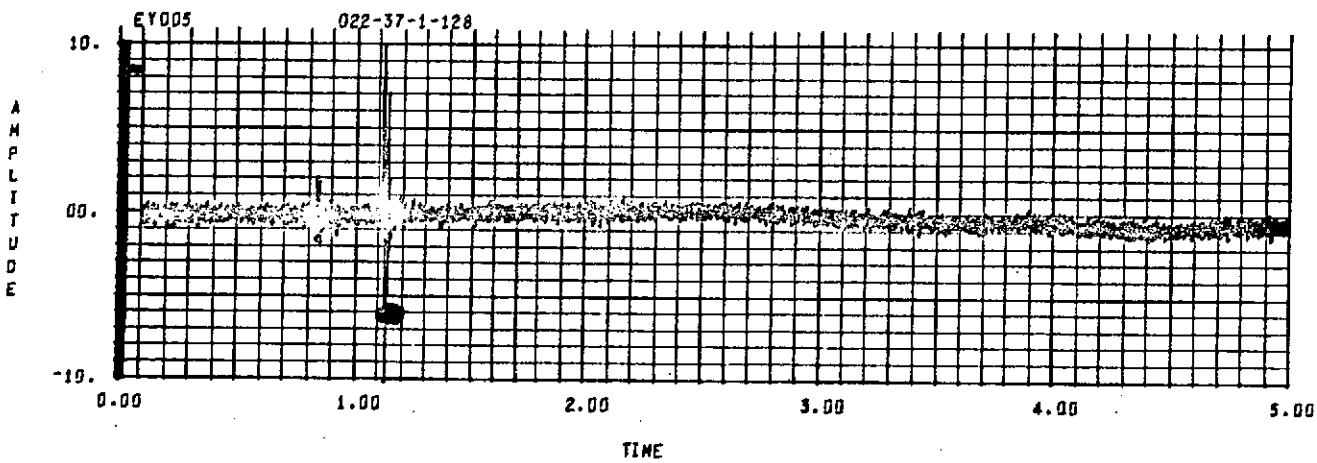

SEQ. # 0033
00002
F022-36 1-30
12.5 INCH SRB LOW PRESS THERMAL RUN F022-36
AMPLITUDE
.40
.20
.00
4.
6.
8.
10.
12.
14.
16.
TIME

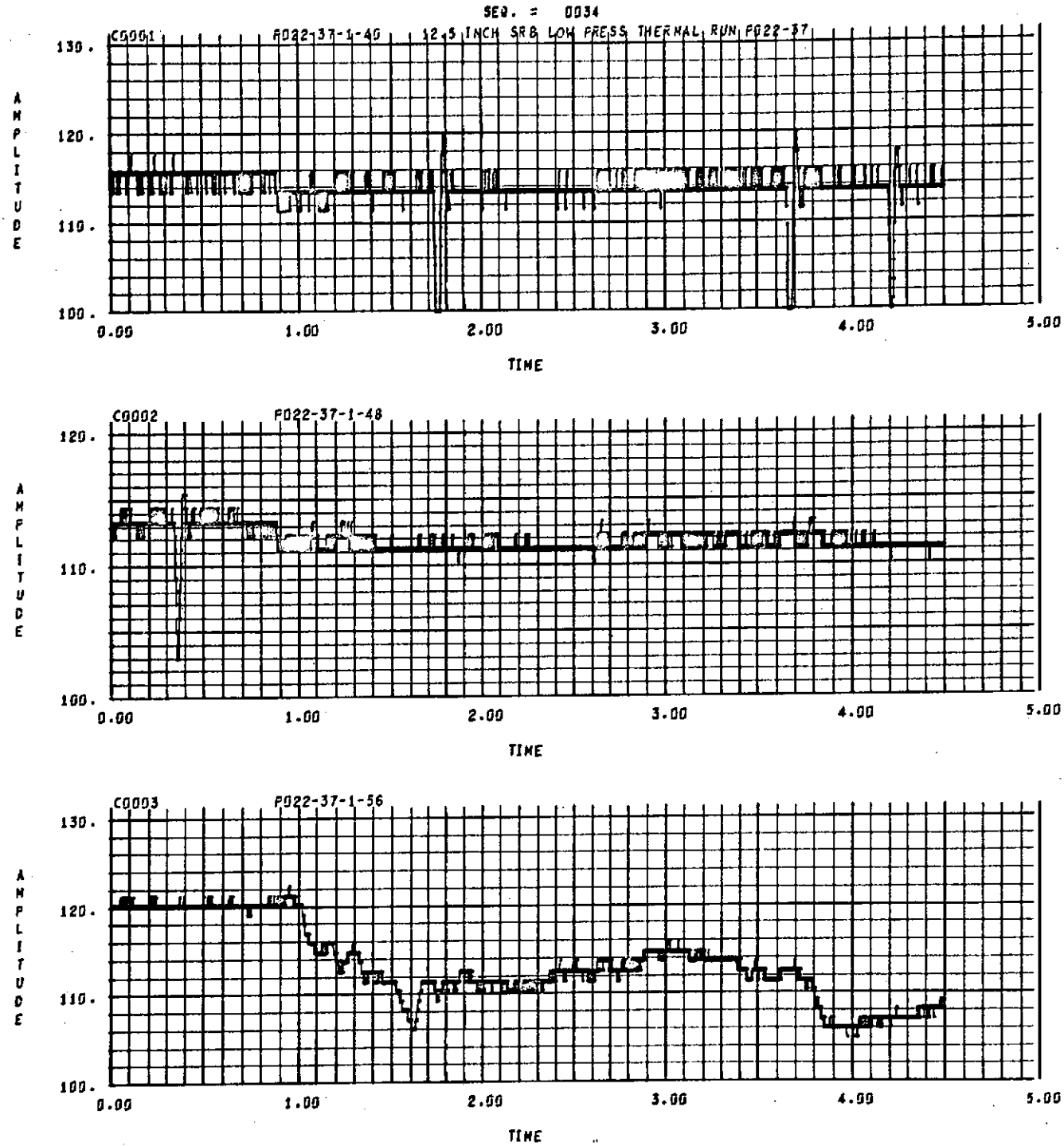

00003
022-36-FM13
AMPLITUDE
1.80
1.40
1.00
4.
6.
8.
10.
12.
14.
16.
TIME

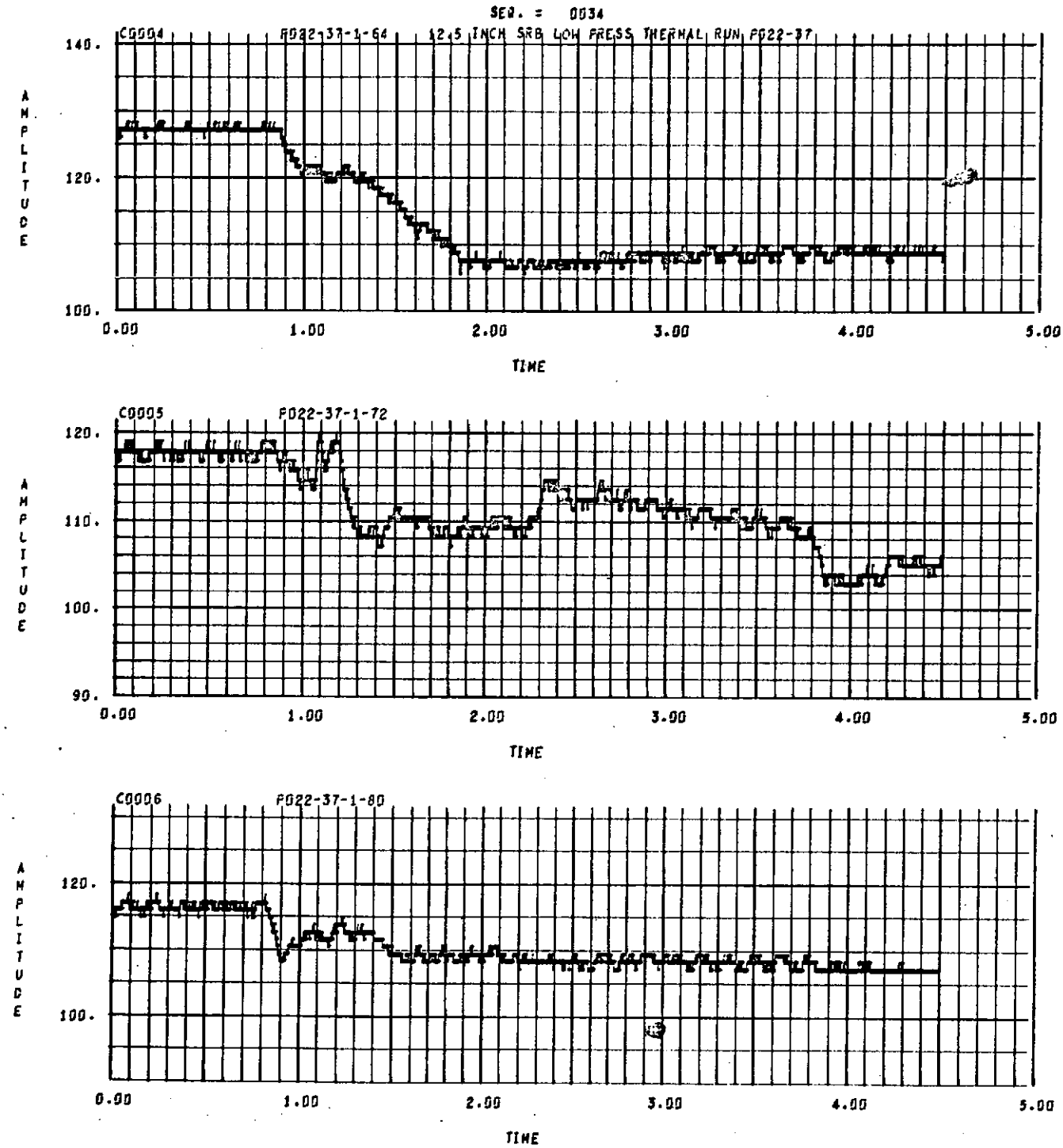

SEQ. = 0034
EA003
P022-37-1-16
12.5 INCH SRB LOW PRESS THERMAL RUN F022-37
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
5.00
TIME
EA006
022-37-1-128
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
5.00
TIME
EF001
022-37-1-104
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
5.00
TIME

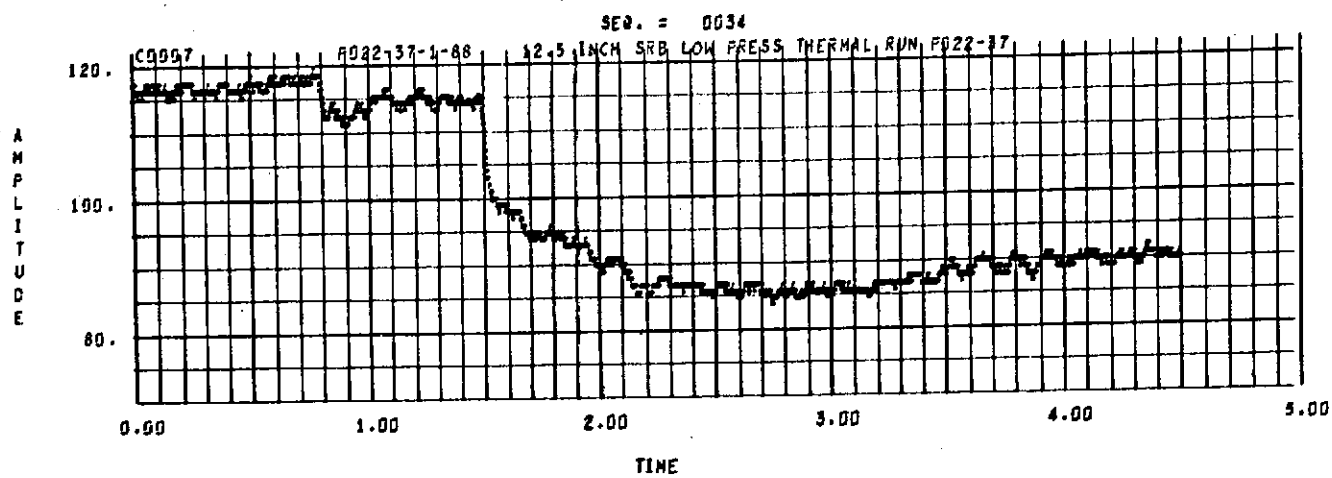

SEQ. = 0034
EF004
022-37-1-120
12.5 INCH SRB LOW PRESS THERMAL RUN F022-37
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
5.00
TIME

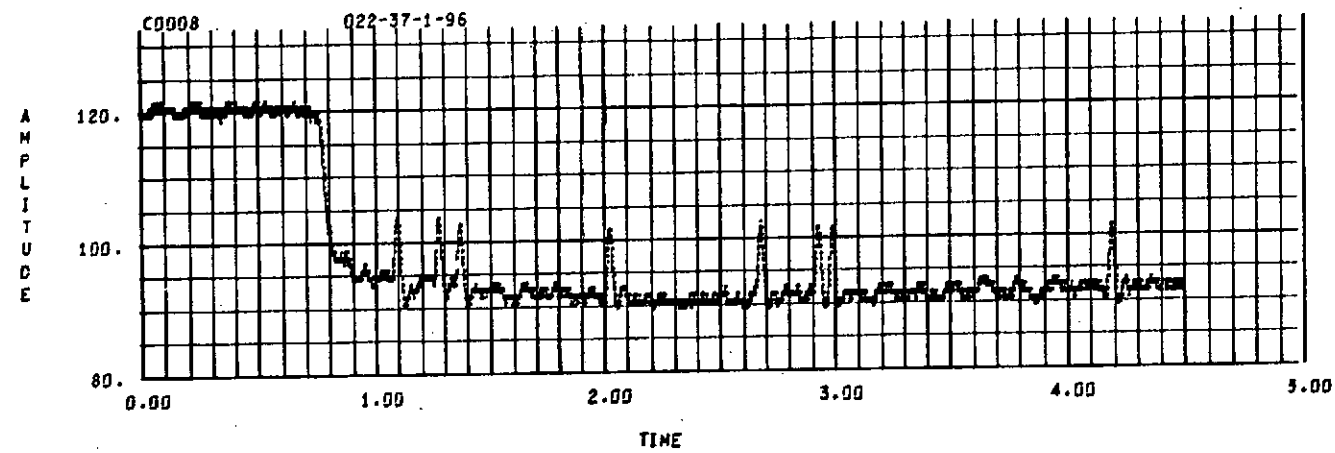

EY002
022-37-1-112
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
5.00
TIME

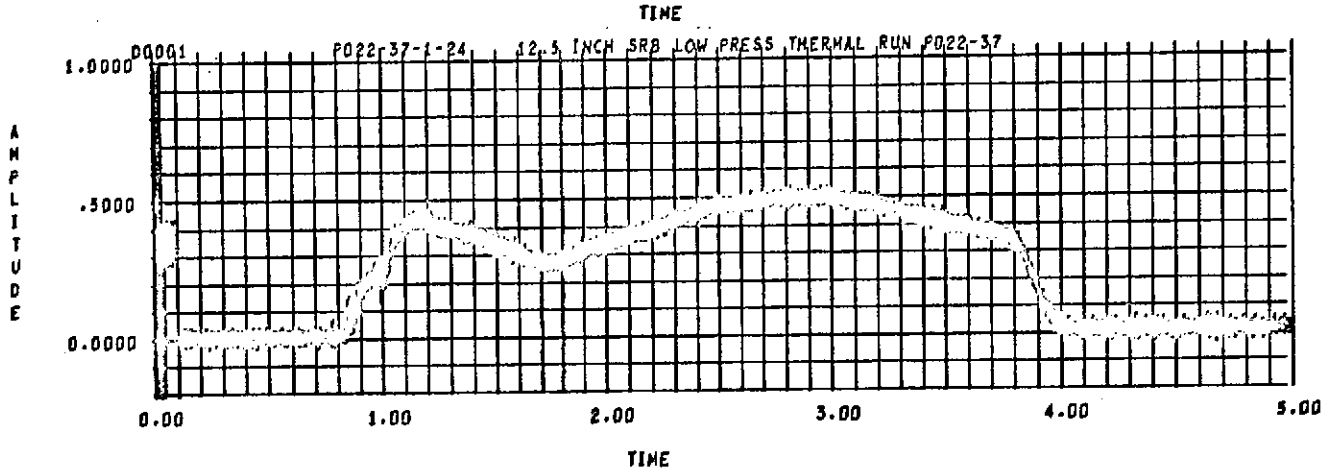

EY005
022-37-1-128
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
5.00
TIME

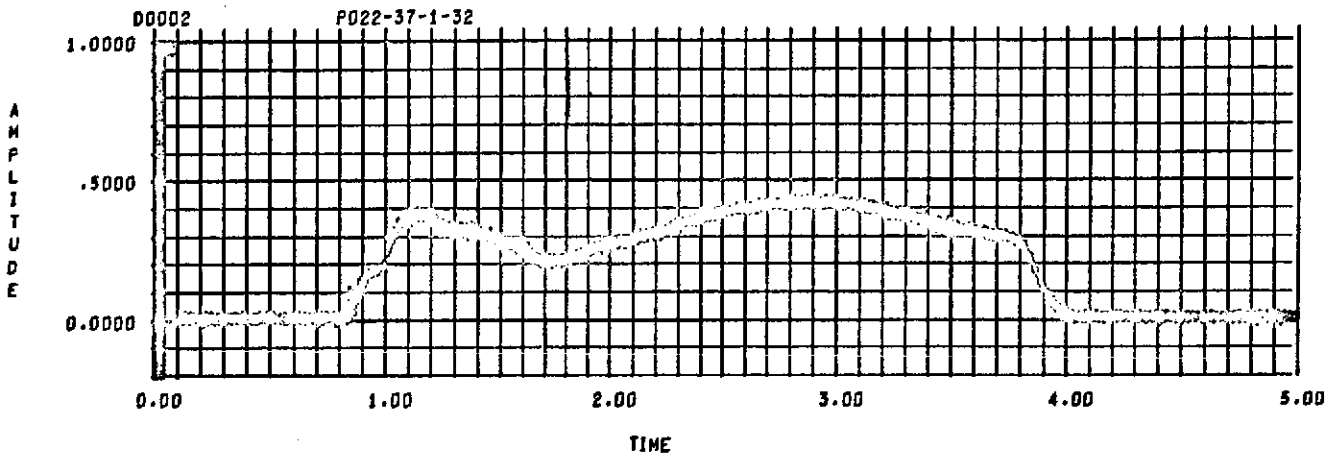

SEQ. = 0034
C0001
F022-37-1-46
12.5 INCH SRB LOW PRESS THERMAL RUN F022-37
130.
120.
110.
100.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
5.00
TIME
C0002
F022-37-1-48
120.
110.
100.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
5.00
TIME
C0003
F022-37-1-56
130.
120.
110.
100.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
5.00
TIME

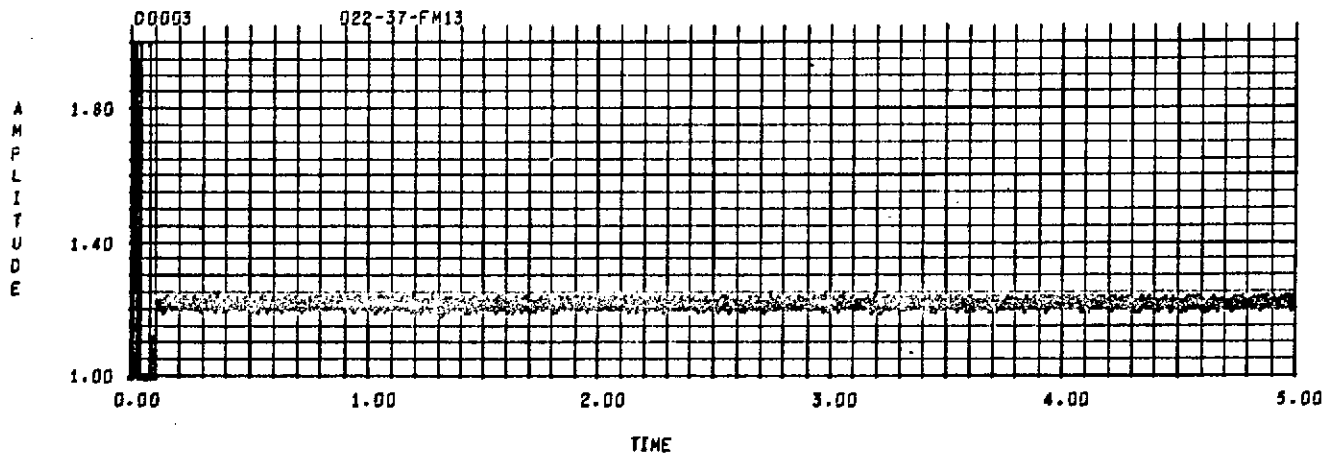

SEQ. = 0034
C0004
F022-37-1-64
12.5 INCH SRB LOW PRESS THERMAL RUN F022-37
140.
120.
100.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
5.00
TIME
C0005
F022-37-1-72
120.
110.
100.
90.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
5.00
TIME
C0006
F022-37-1-80
120.
100.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
5.00
TIME


SEQ. = 0034
C0007
F022-37-1-88
12.5 INCH SRB LOW PRESS THERMAL RUN F022-37
120.
100.
80.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
5.00
TIME


C0008
022-37-1-96
120.
100.
80.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
5.00
TIME


D0001
F022-37-1-24
12.5 INCH SRB LOW PRESS THERMAL RUN F022-37
1.0000
.5000
0.0000
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
5.00
TIME


D0002
P022-37-1-32
1.0000
.5000
0.0000
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
5.00
TIME


D0003
Q22-37-FM13
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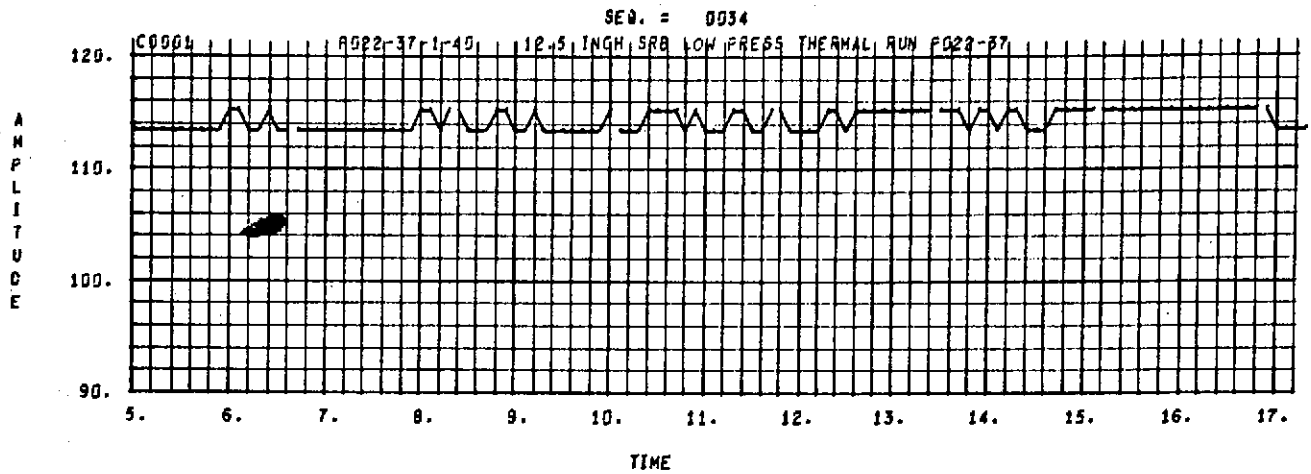
1.40
1.00
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
5.00
TIME


SEQ. = 0034
C0004
F022-37-1-40
12.5 INCH SRB LOW PRESS THERMAL RUN F022-37
AMPLITUDE
120.
110.
100.
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7.
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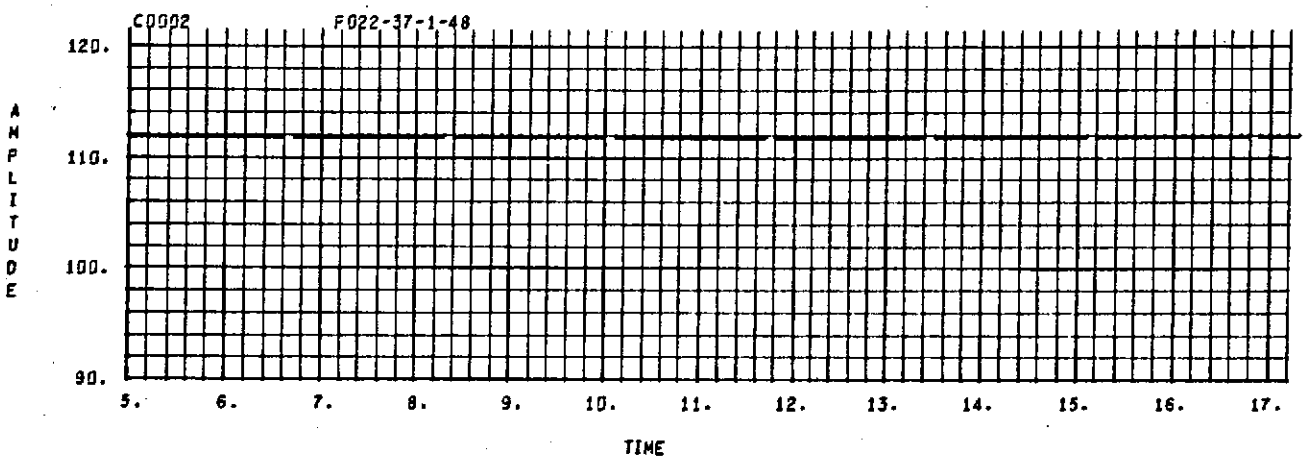
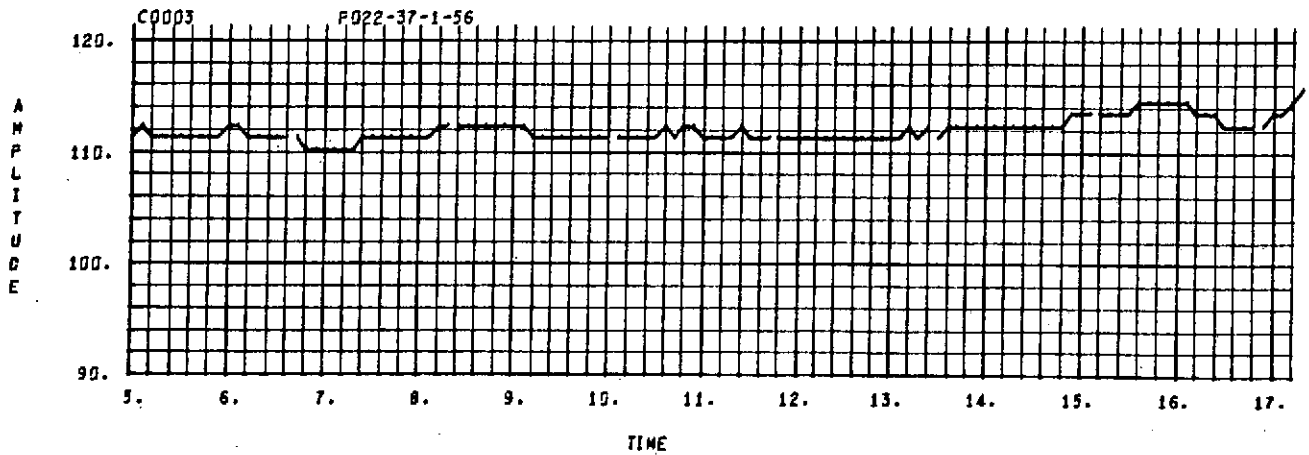
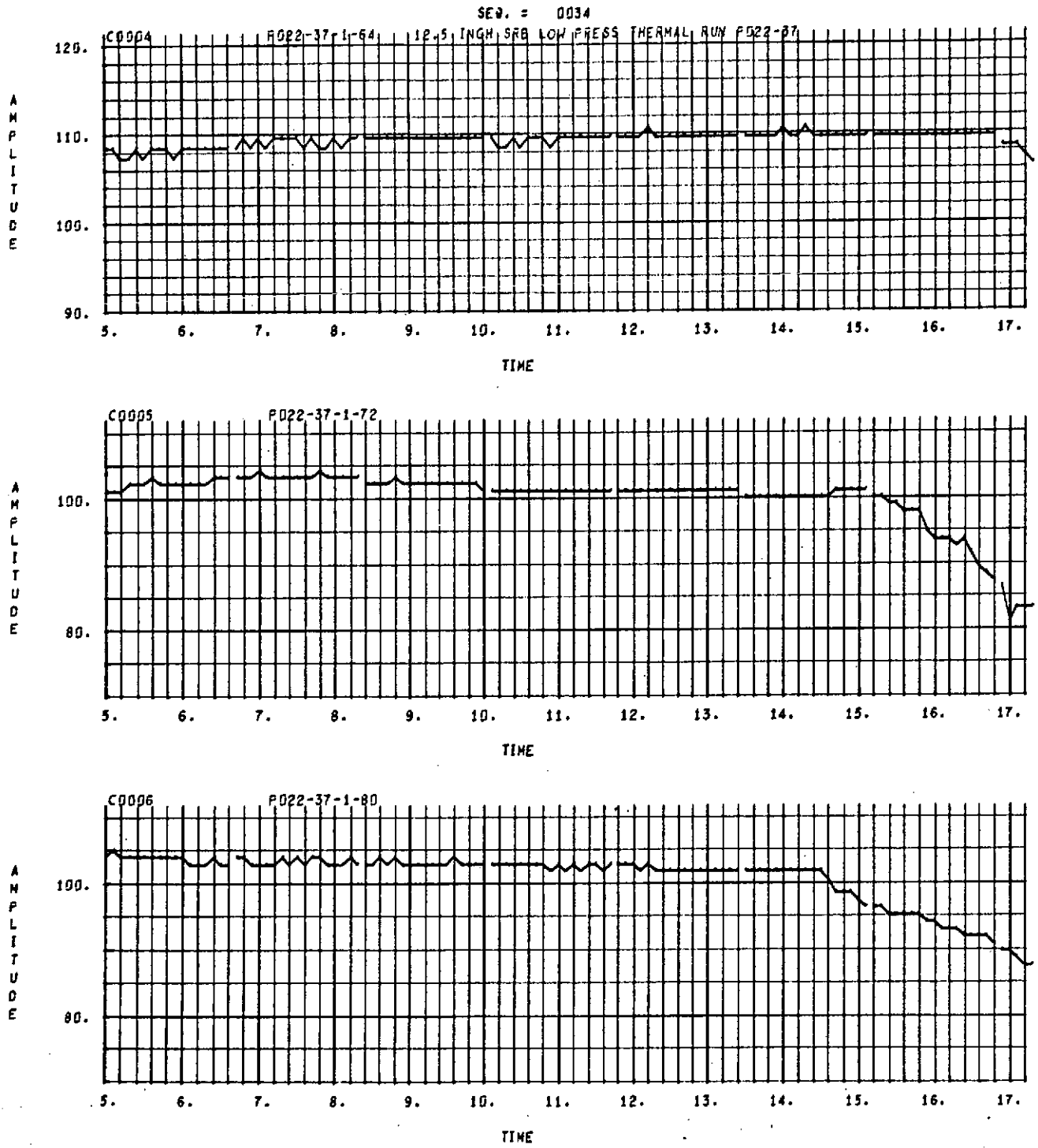
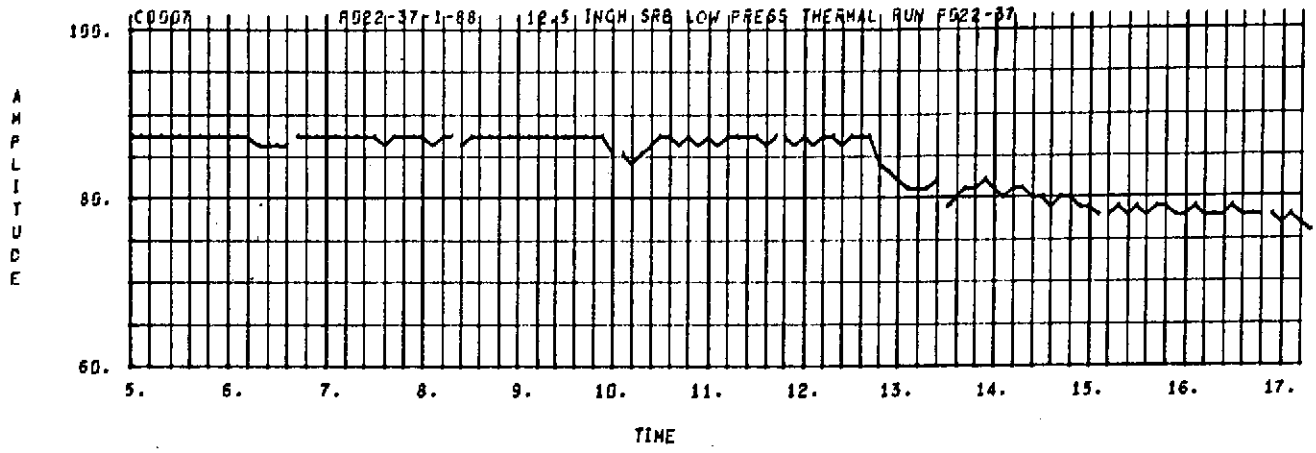
14.
15.
16.
17.
TIME

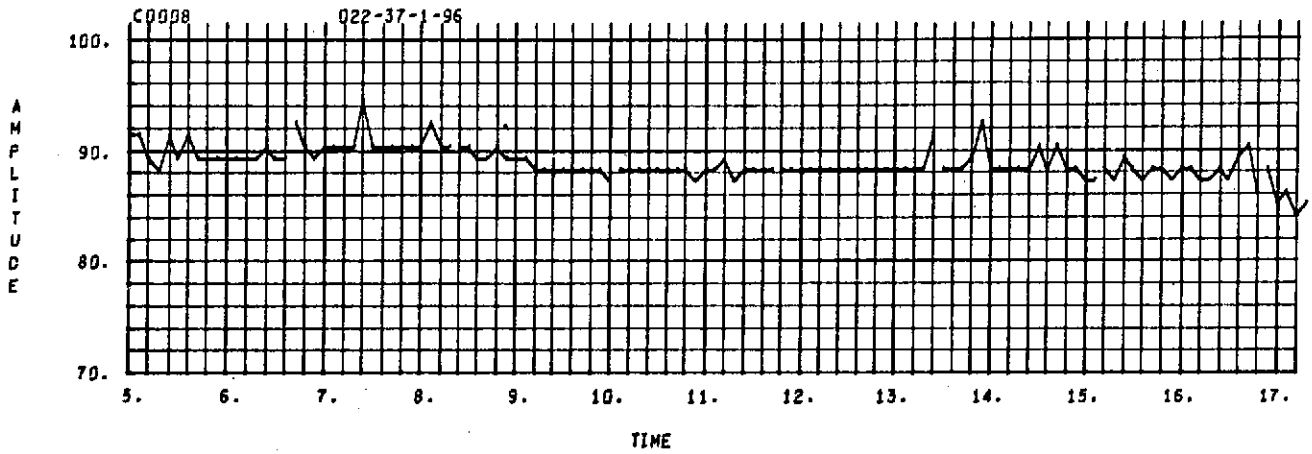

C0002
F022-37-1-48
AMPLITUDE
120.
110.
100.
90.
5.
6.
7.
8.
9.
10.
11.
12.
13.
14.
15.
16.
17.
TIME

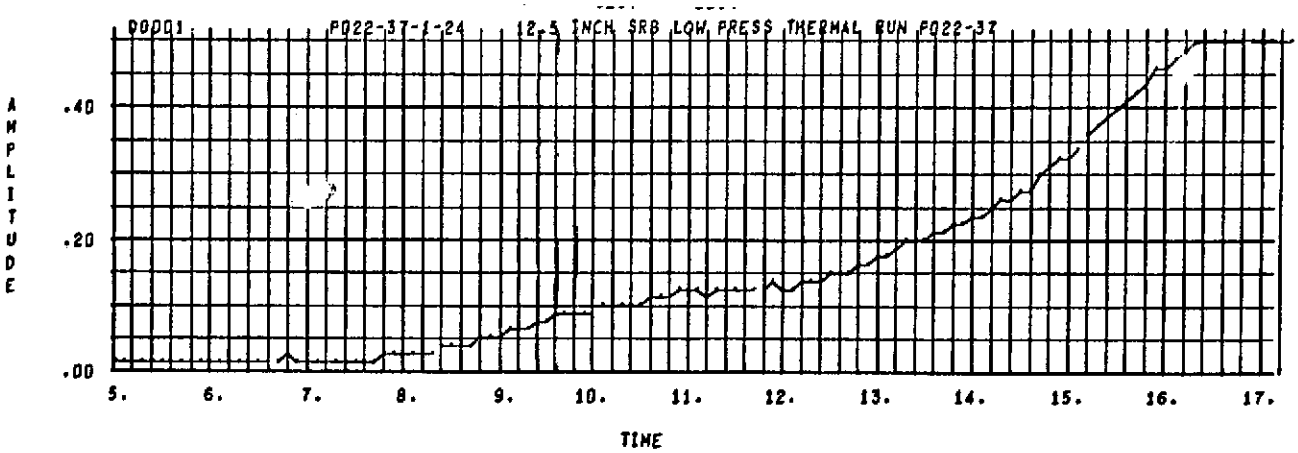

C0003
F022-37-1-56
AMPLITUDE
120.
110.
100.
90.
5.
6.
7.
8.
9.
10.
11.
12.
13.
14.
15.
16.
17.
TIME

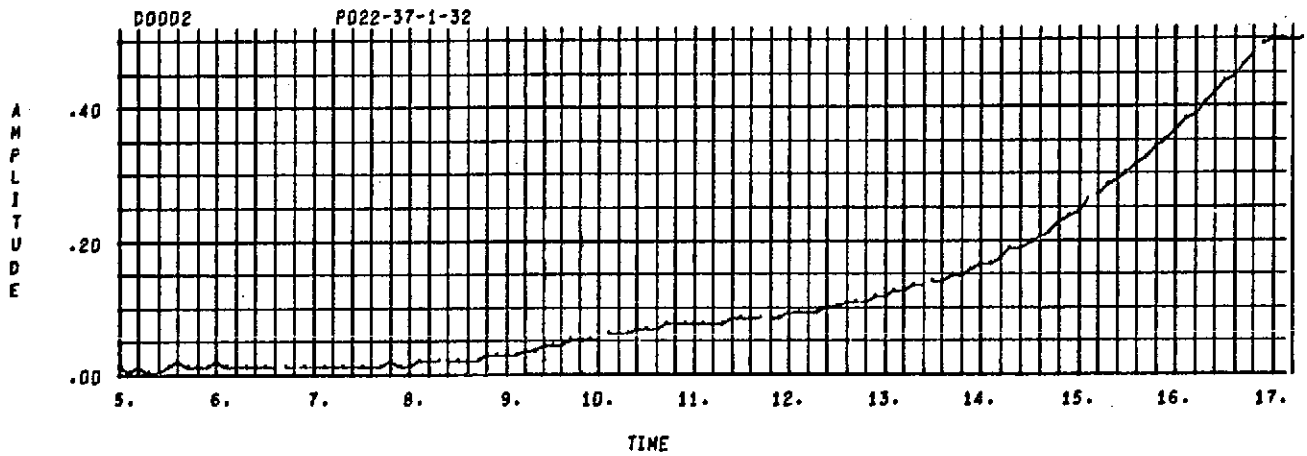

SEQ. = 0034
C0004
P022-37-1-64
12.5 INCH SRB LOW PRESS THERMAL RUN P022-37
120.
110.
100.
90.
AMPLITUDE
5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17.
TIME
C0005
P022-37-1-72
100.
80.
AMPLITUDE
5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17.
TIME
C0006
P022-37-1-80
100.
80.
AMPLITUDE
5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17.
TIME

SEQ. = 0034


C0007
F022-37-1-88
12.5 INCH SRB LOW PRESS THERMAL RUN F022-37
100.
80.
60.
AMPLITUDE
5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17.
TIME


C0008
022-37-1-96
100.
90.
80.
70.
AMPLITUDE
5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17.
TIME


D0001
F022-37-1-24
12.5 INCH SRB LOW PRESS THERMAL RUN F022-37
.40
.20
.00
AMPLITUDE
5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17.
TIME


D0002
P022-37-1-32
AMPLITUDE
.40
.20
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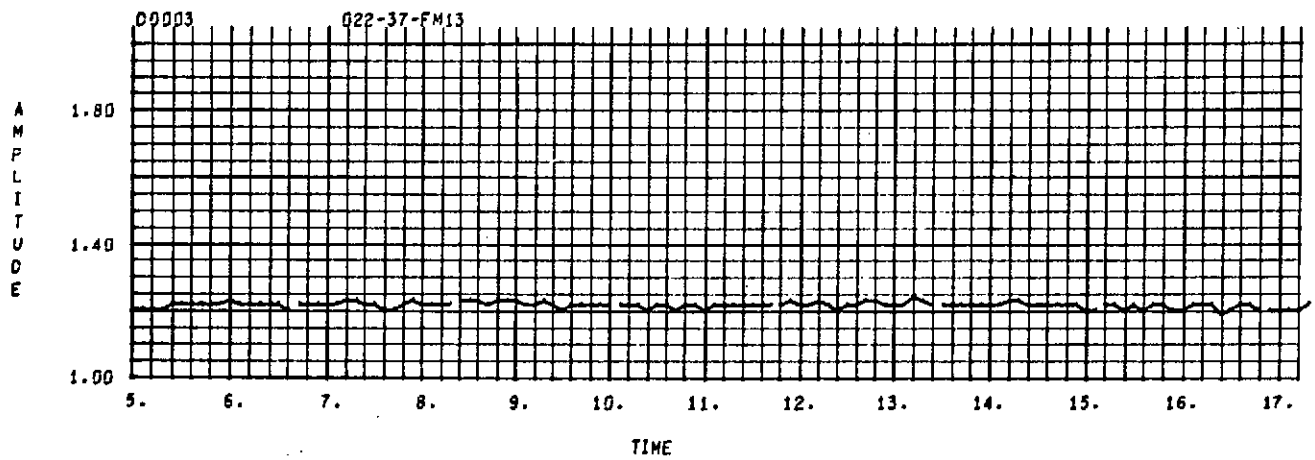
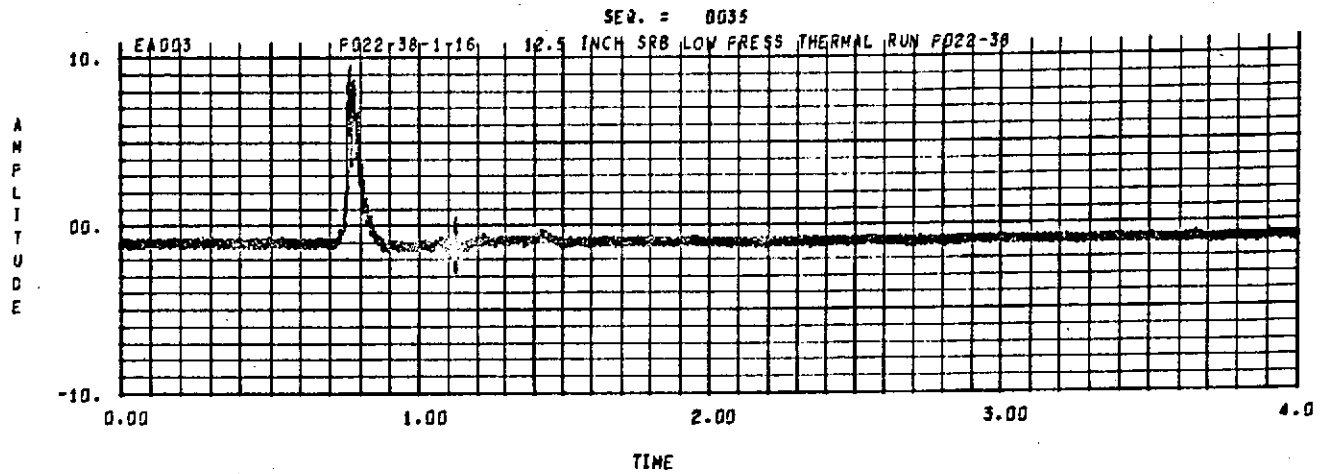
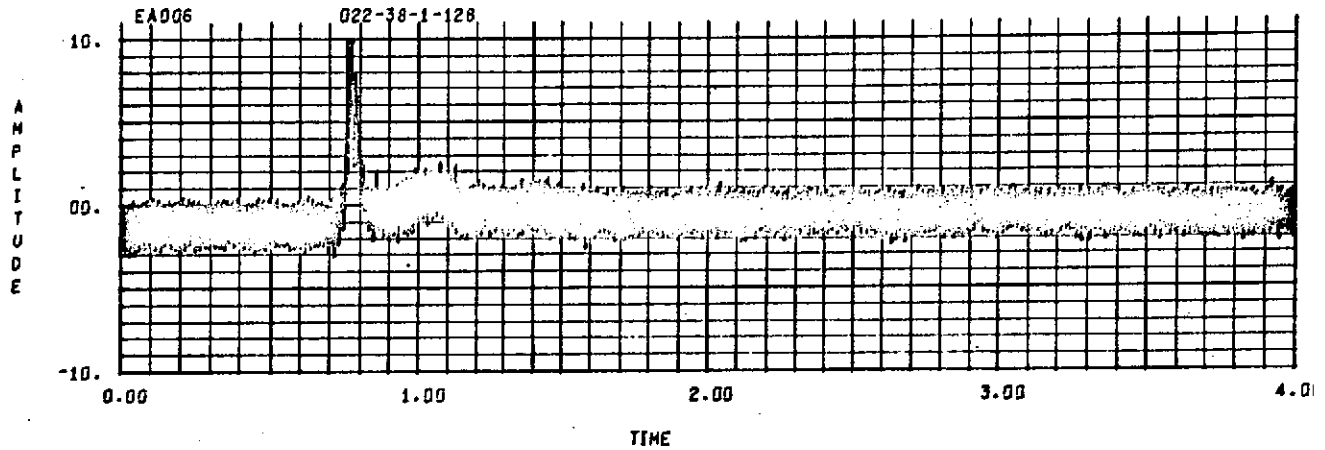
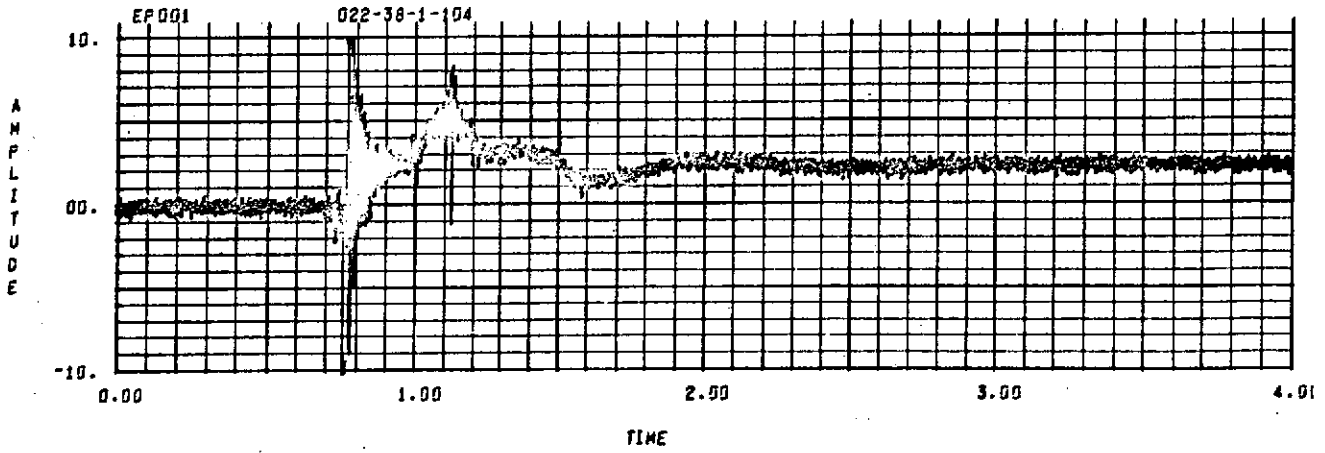
5.
6.
7.
8.
9.
10.
11.
12.
13.
14.
15.
16.
17.
TIME


D0003
G22-37-FM13
AMPLITUDE
1.80
1.40
1.00
5.
6.
7.
8.
9.
10.
11.
12.
13.
14.
15.
16.
17.
TIME

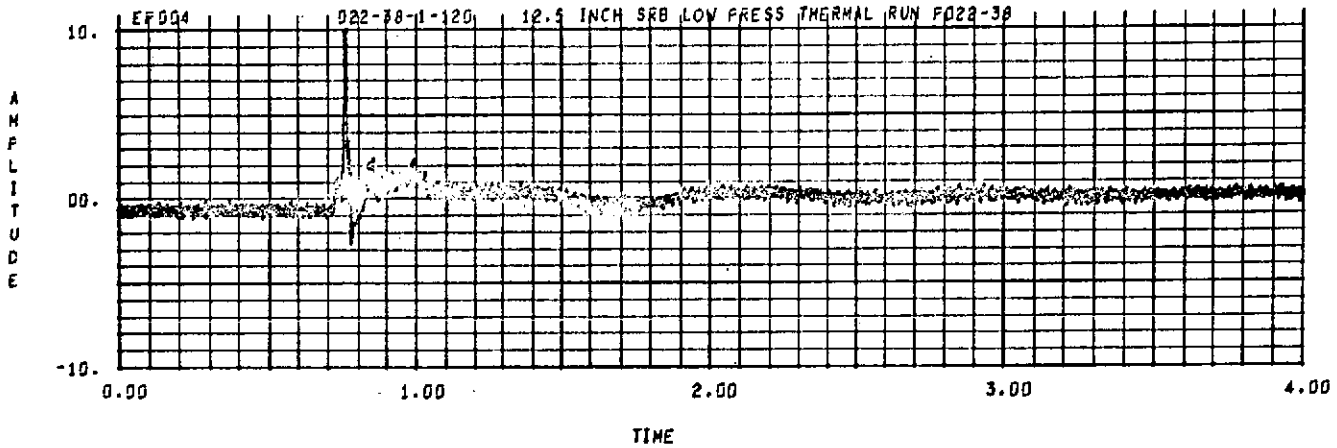

SEQ. = 0035
EA003
F022-38-1-16
12.5 INCH SRB LOW PRESS THERMAL RUN F022-38
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.0
TIME

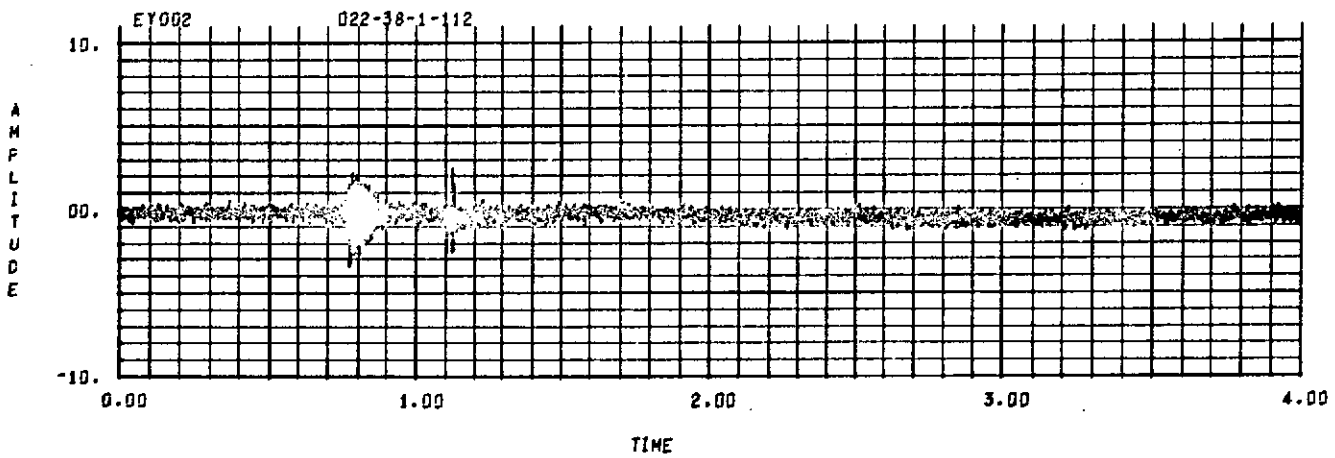

EA006
022-38-1-128
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.0
TIME

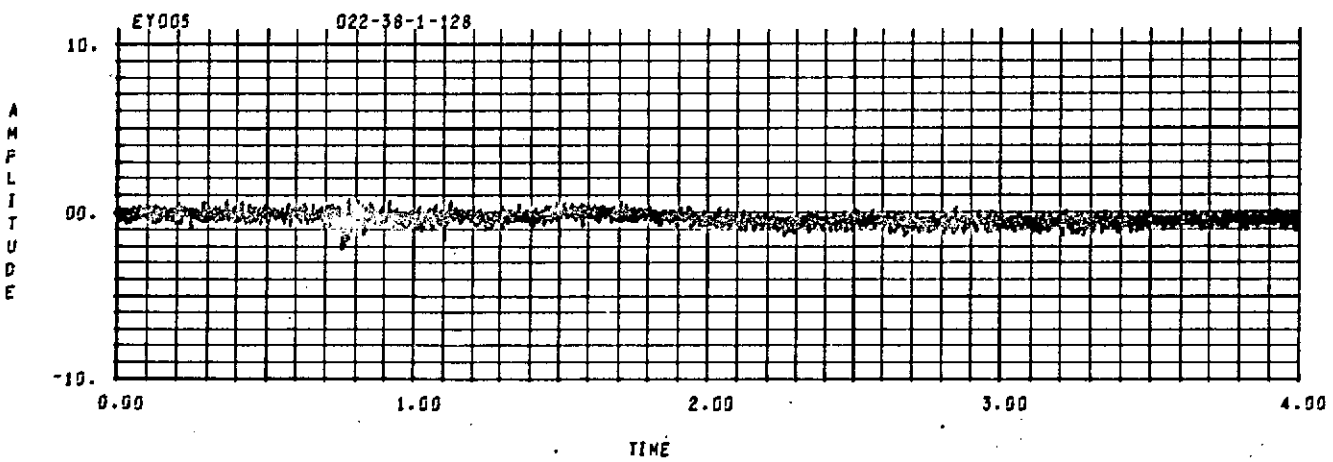

EP001
022-38-1-104
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.0
TIME

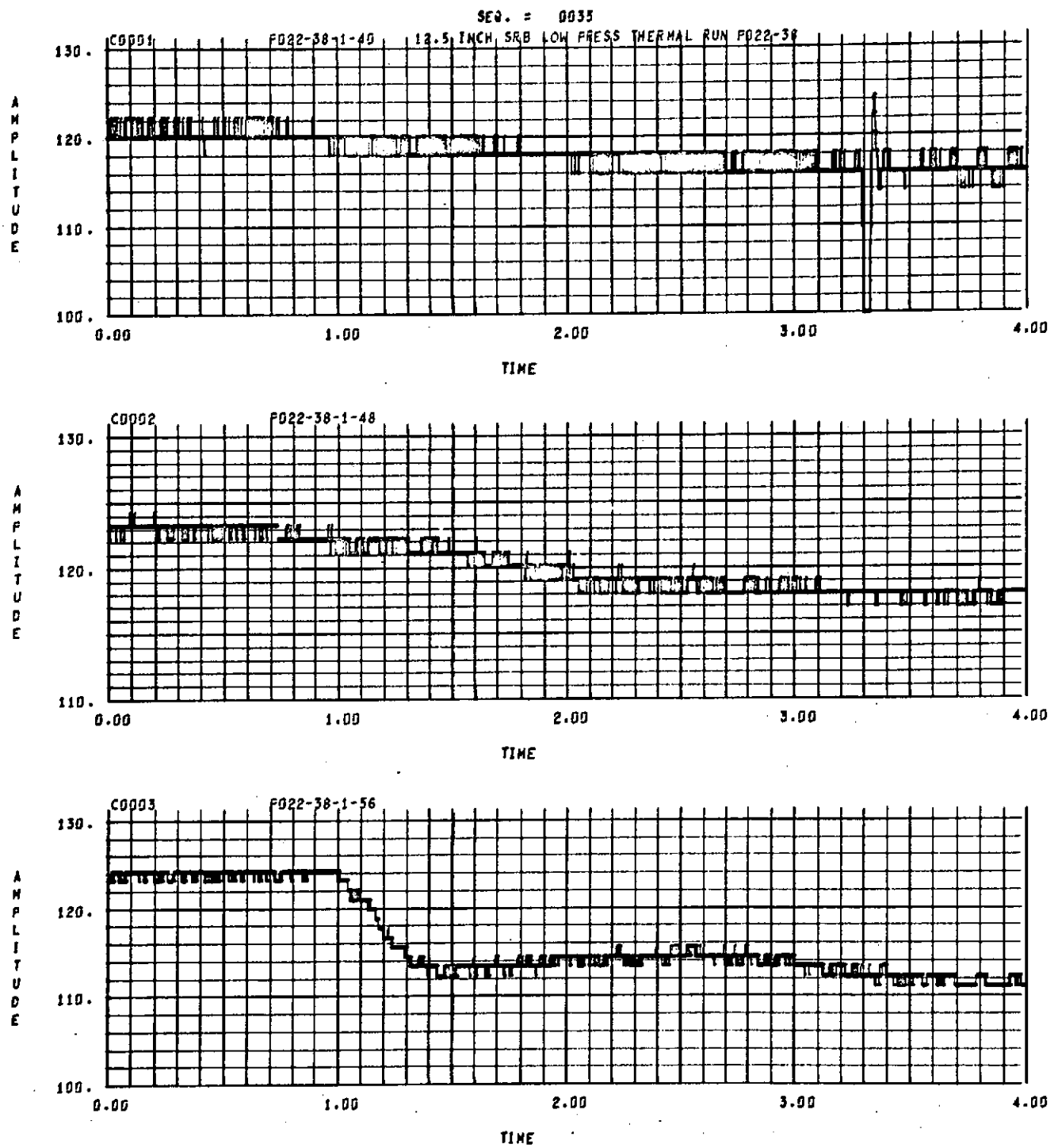
SEQ. = 0035

2

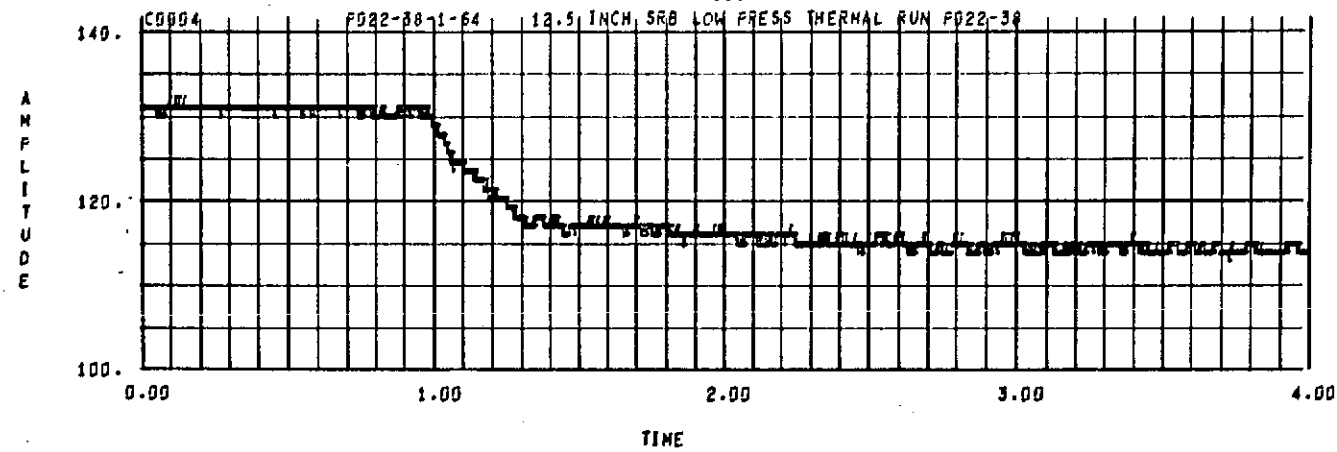

EF004
022-38-1-120
12.5 INCH SRB LOW PRESS THERMAL RUN F022-38
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

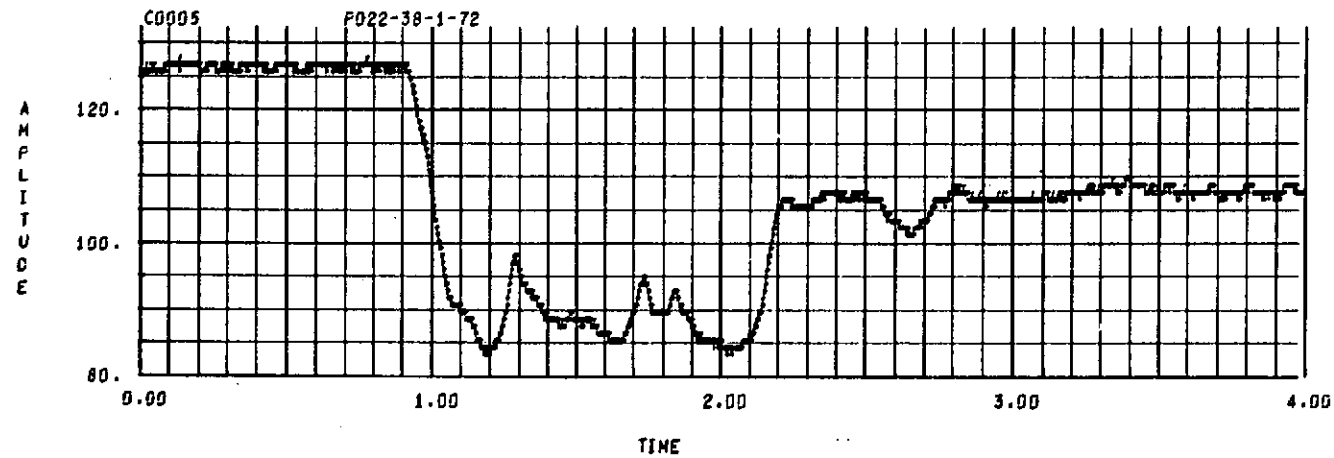

EY002
022-38-1-112
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

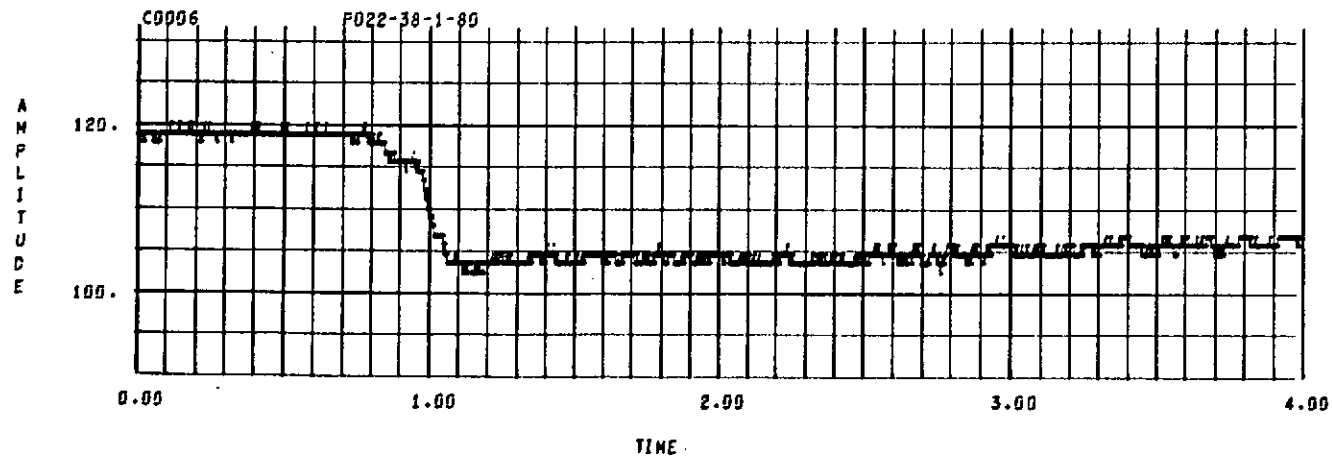

EY005
022-38-1-128
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

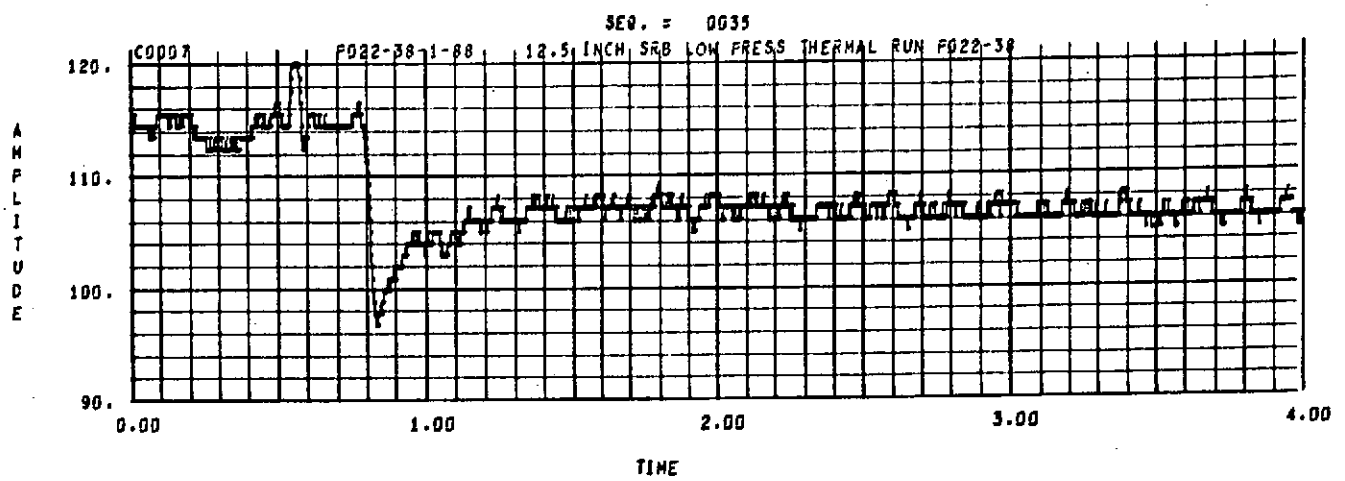

SEQ. = 0035
C0001
F022-38-1-40
12.5 INCH SRB LOW PRESS THERMAL RUN F022-38
AMPLITUDE
130.
120.
110.
100.
0.00
1.00
2.00
3.00
4.00
TIME
C0002
F022-38-1-48
AMPLITUDE
130.
120.
110.
0.00
1.00
2.00
3.00
4.00
TIME
C0003
F022-38-1-56
AMPLITUDE
130.
120.
110.
100.
0.00
1.00
2.00
3.00
4.00
TIME

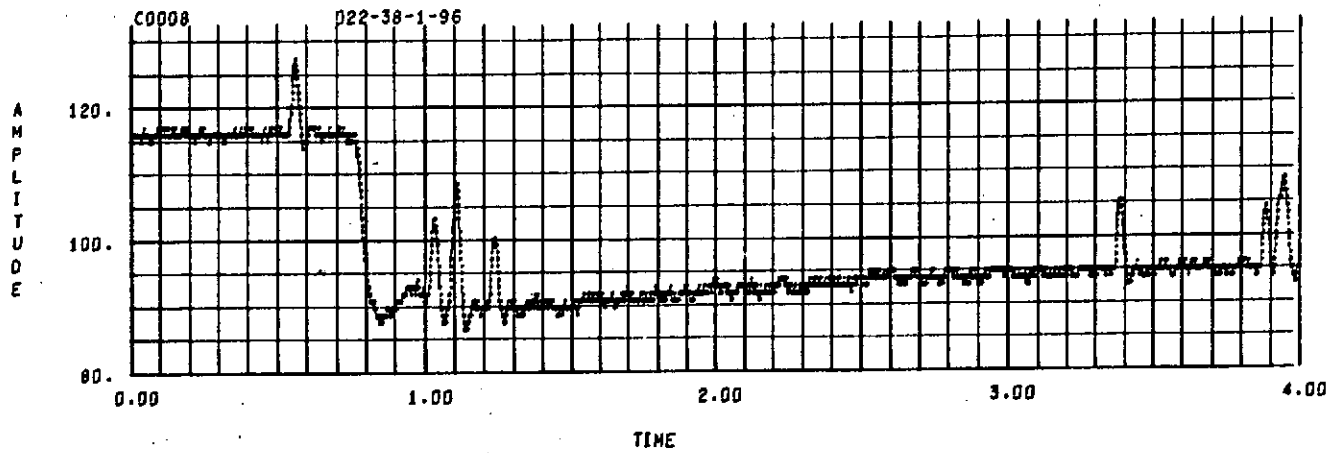
SEQ. = 0035 2

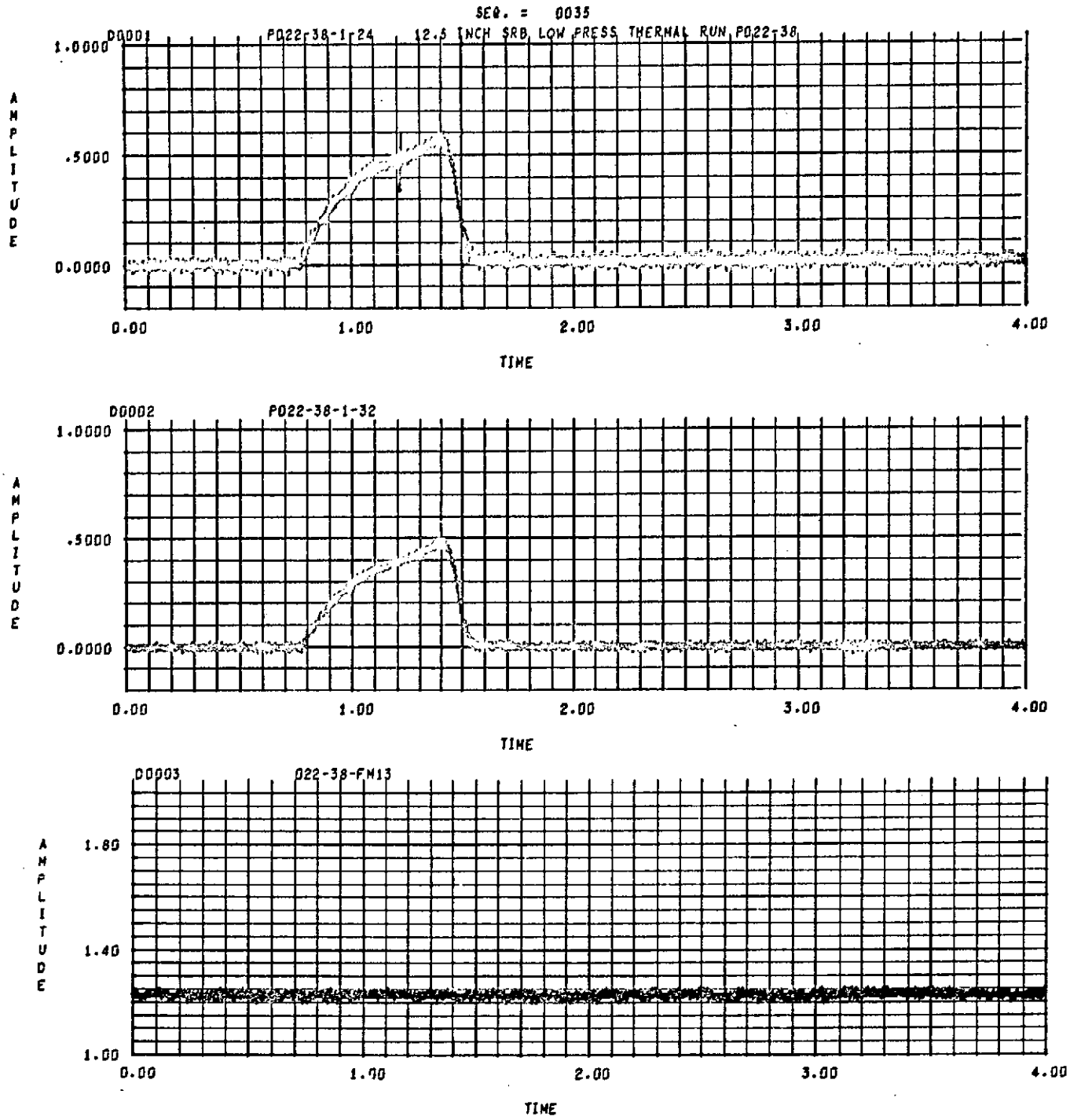

C0004
F022-38-1-64
12.5 INCH SRB LOW PRESS THERMAL RUN F022-38
140.
120.
100.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME


C0005
F022-38-1-72
120.
100.
80.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

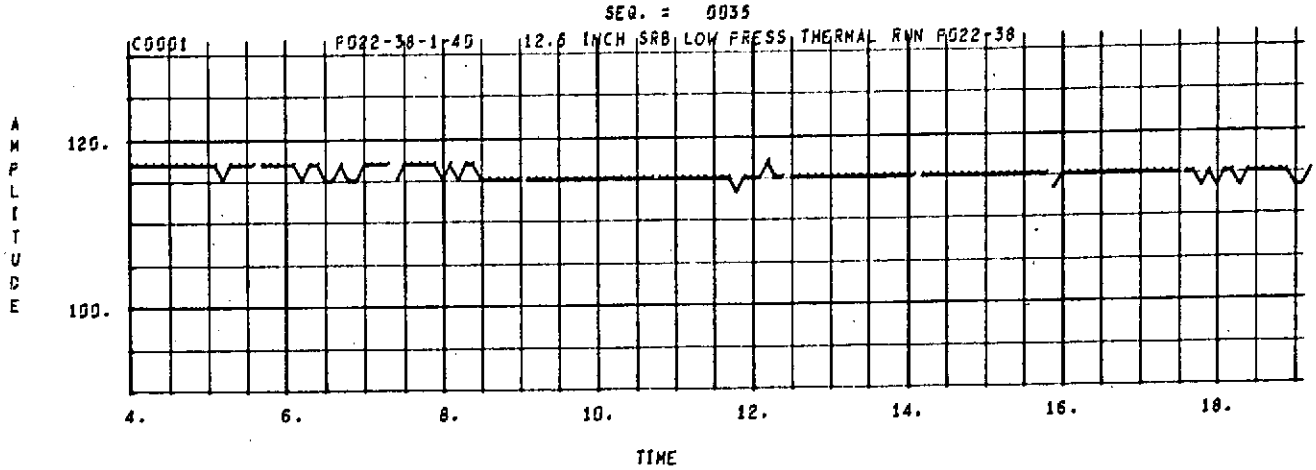

C0006
F022-38-1-80
120.
100.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

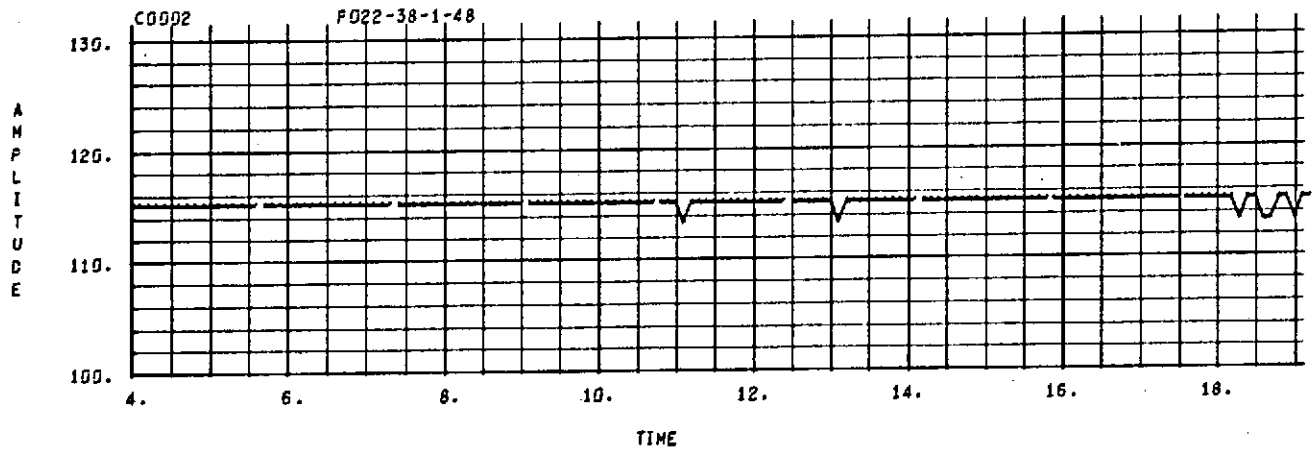

SEQ. = 0035
C0007
F022-38-1-88
12.5 INCH SRB LOW PRESS THERMAL RUN F022-38
AMPLITUDE
120.
110.
100.
90.
0.00
1.00
2.00
3.00
4.00
TIME

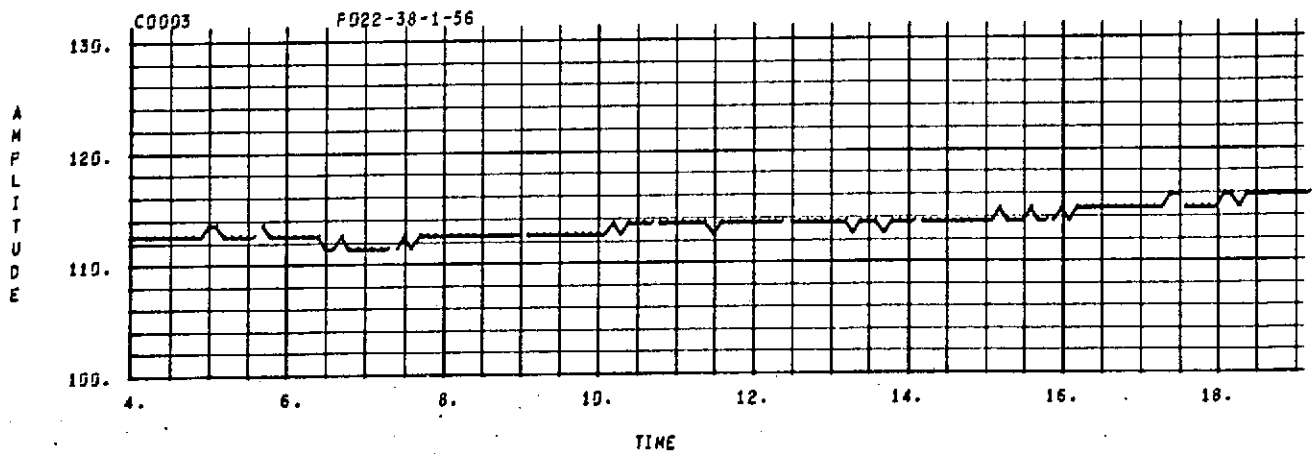

C0008
022-38-1-96
AMPLITUDE
120.
100.
80.
0.00
1.00
2.00
3.00
4.00
TIME


SEQ. = 0035
D0001
P022-38-1-24
12.5 INCH SRB LOW PRESS THERMAL RUN P022-38
1.0000
.5000
0.0000
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME
D0002
P022-38-1-32
1.0000
.5000
0.0000
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME
D0003
022-38-FM13
1.80
1.40
1.00
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

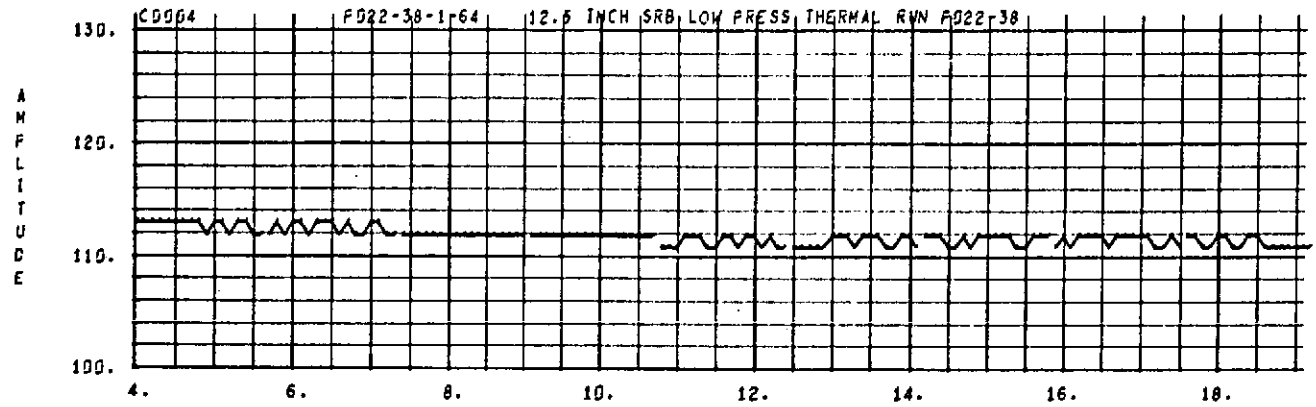
SEQ. = 0035

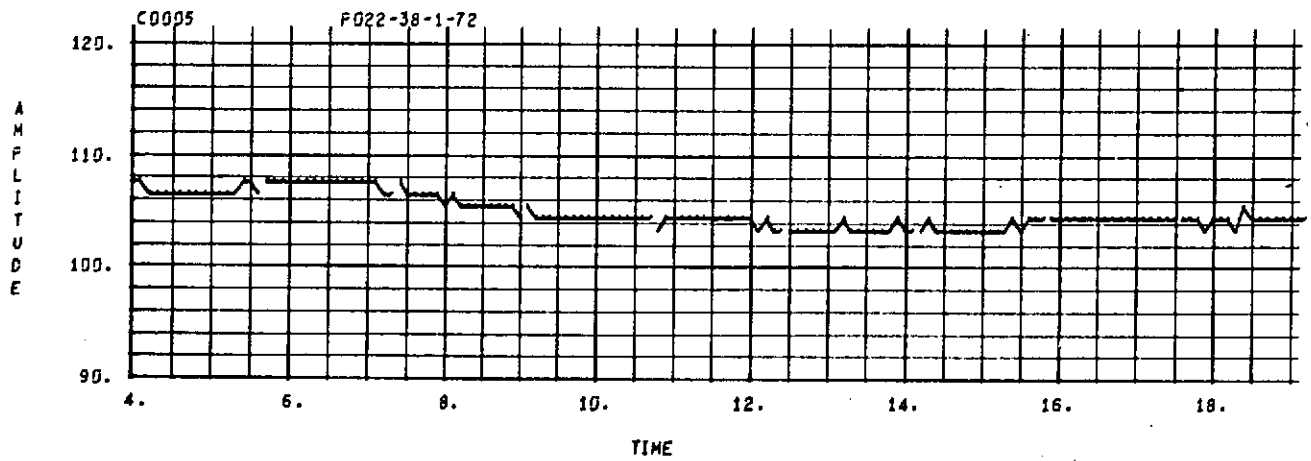

C0001
F022-38-1-40
12.6 INCH SRB LOW PRESS THERMAL RUN F022-38
AMPLITUDE
120.
100.
4.
6.
8.
10.
12.
14.
16.
18.
TIME

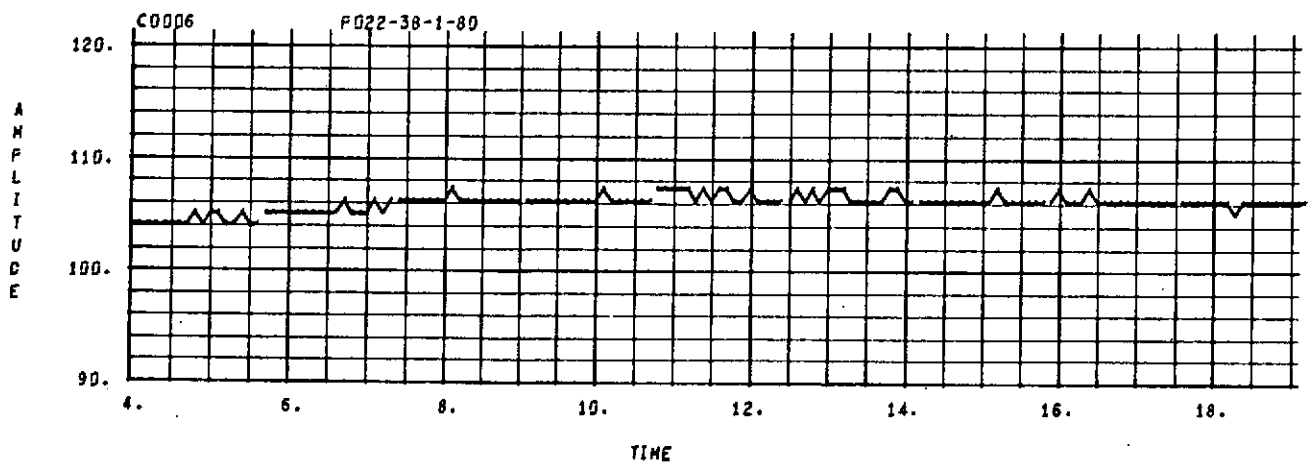

C0002
F022-38-1-48
AMPLITUDE
130.
120.
110.
100.
4.
6.
8.
10.
12.
14.
16.
18.
TIME

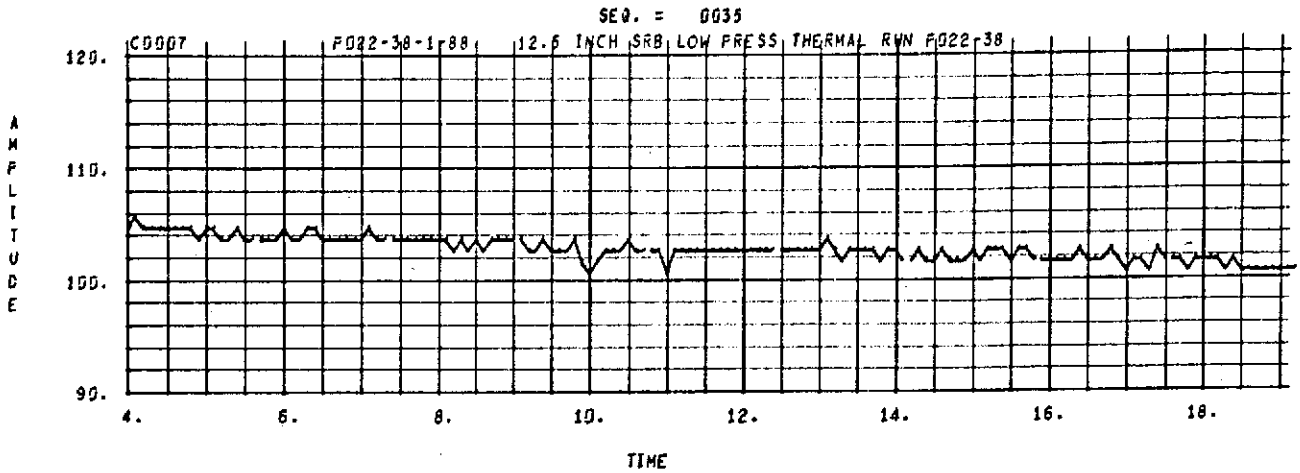

C0003
F022-38-1-56
AMPLITUDE
130.
120.
110.
100.
4.
6.
8.
10.
12.
14.
16.
18.
TIME

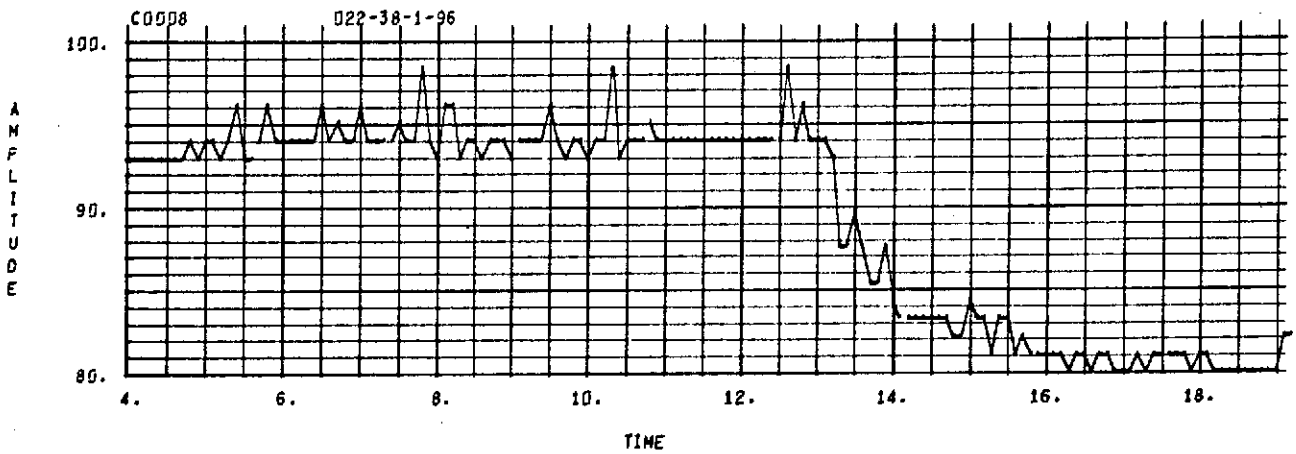
SEQ. = 0035


C0004
F022-38-1-64
12.5 INCH SRB LOW PRESS THERMAL RUN F022-38
130.
120.
110.
100.
AMPLITUDE
4.
6.
8.
10.
12.
14.
16.
18.
TIME

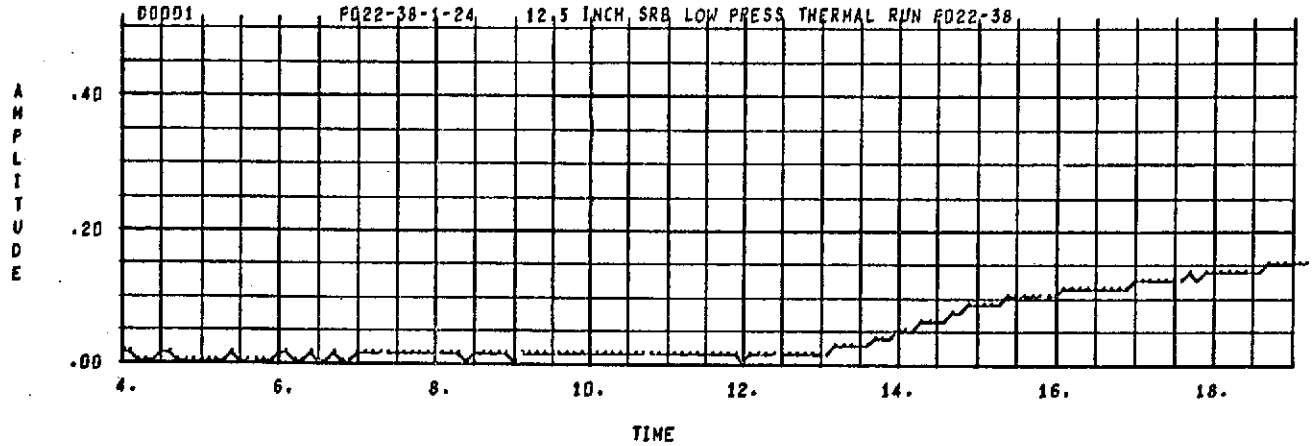

C0005
F022-38-1-72
120.
110.
100.
90.
AMPLITUDE
4.
6.
8.
10.
12.
14.
16.
18.
TIME

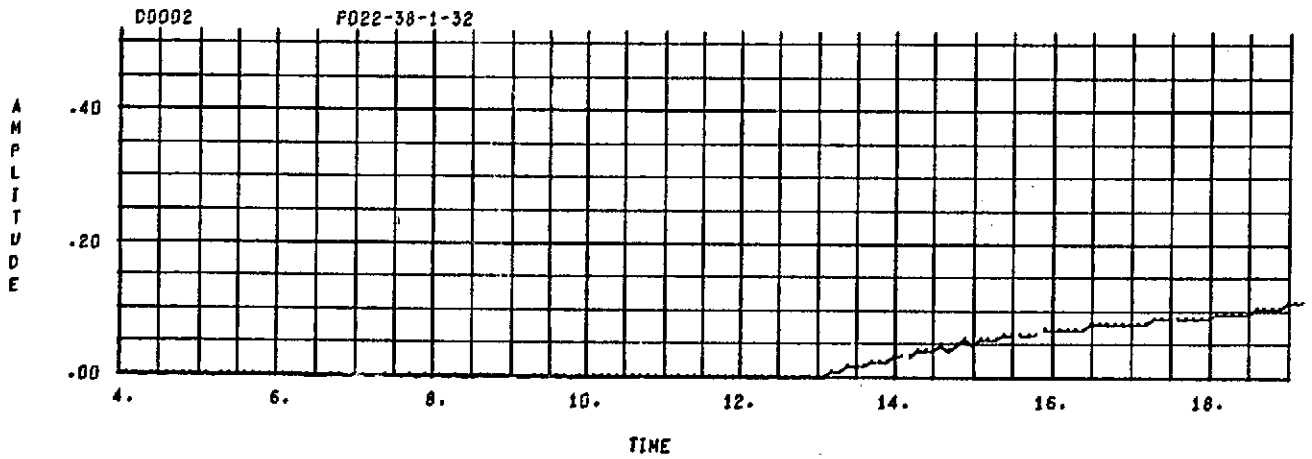

C0006
F022-38-1-80
120.
110.
100.
90.
AMPLITUDE
4.
6.
8.
10.
12.
14.
16.
18.
TIME

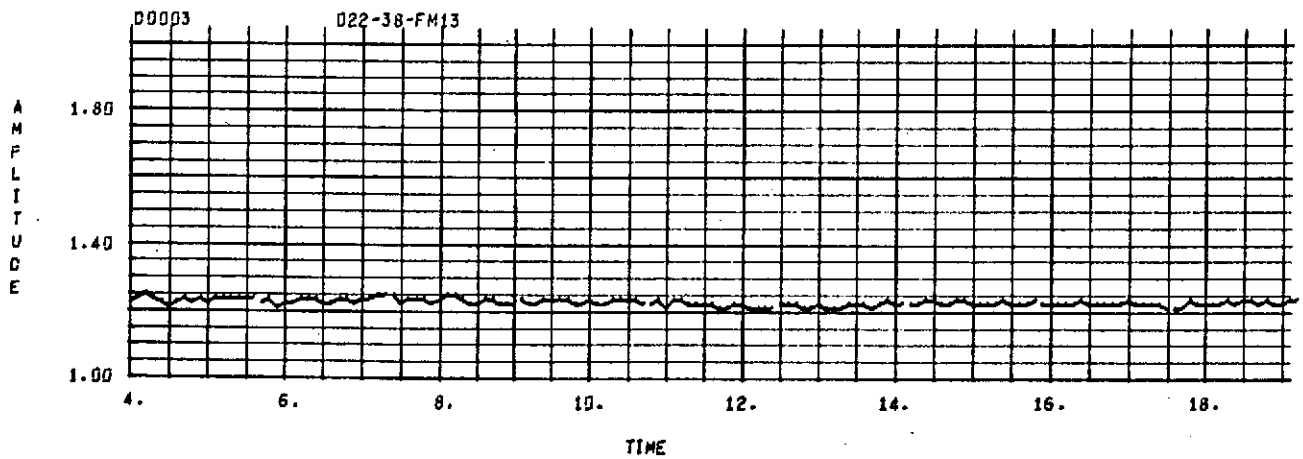

SEQ. = 0035
C0007
F022-38-1-88
12.5 INCH SRB LOW PRESS THERMAL RUN F022-38
120.
110.
100.
90.
AMPLITUDE
4.
6.
8.
10.
12.
14.
16.
18.
TIME

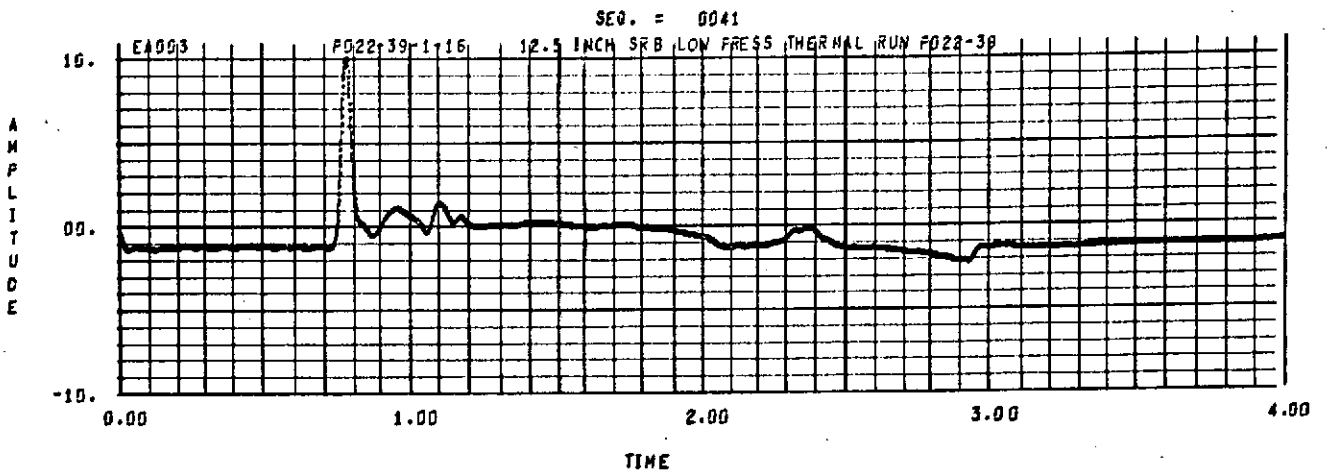

C0008
022-38-1-96
100.
90.
80.
AMPLITUDE
4.
6.
8.
10.
12.
14.
16.
18.
TIME

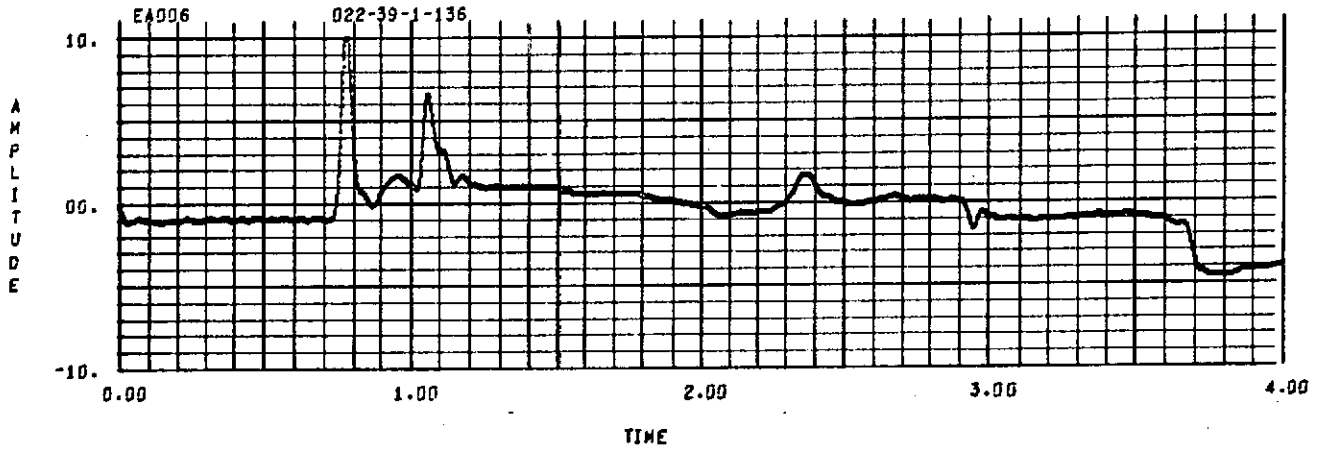
SEQ. = 0035

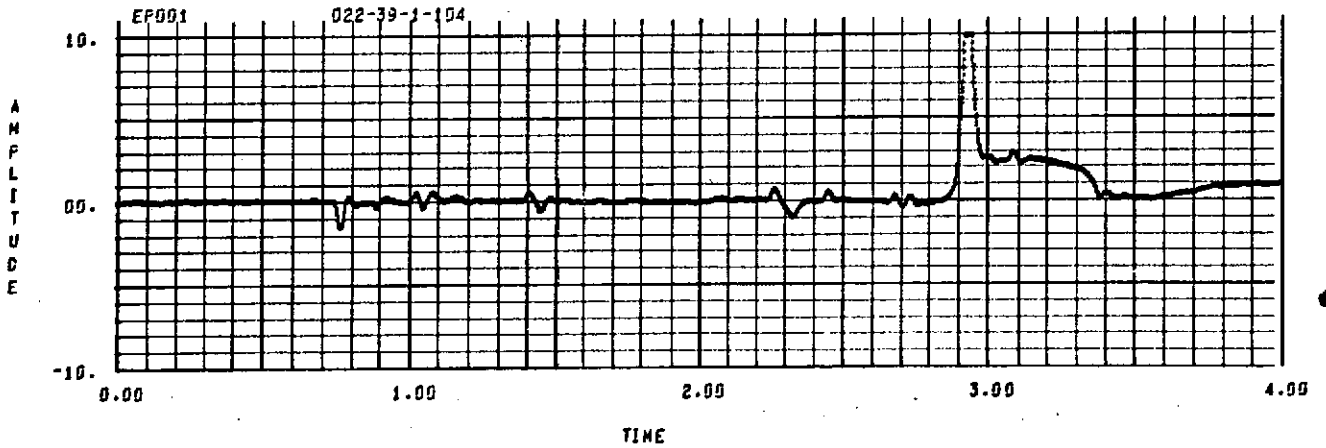

D0001
F022-38-1-24
12.5 INCH SRB LOW PRESS THERMAL RUN F022-38
AMPLITUDE
.40
.20
.00
4.
6.
8.
10.
12.
14.
16.
18.
TIME

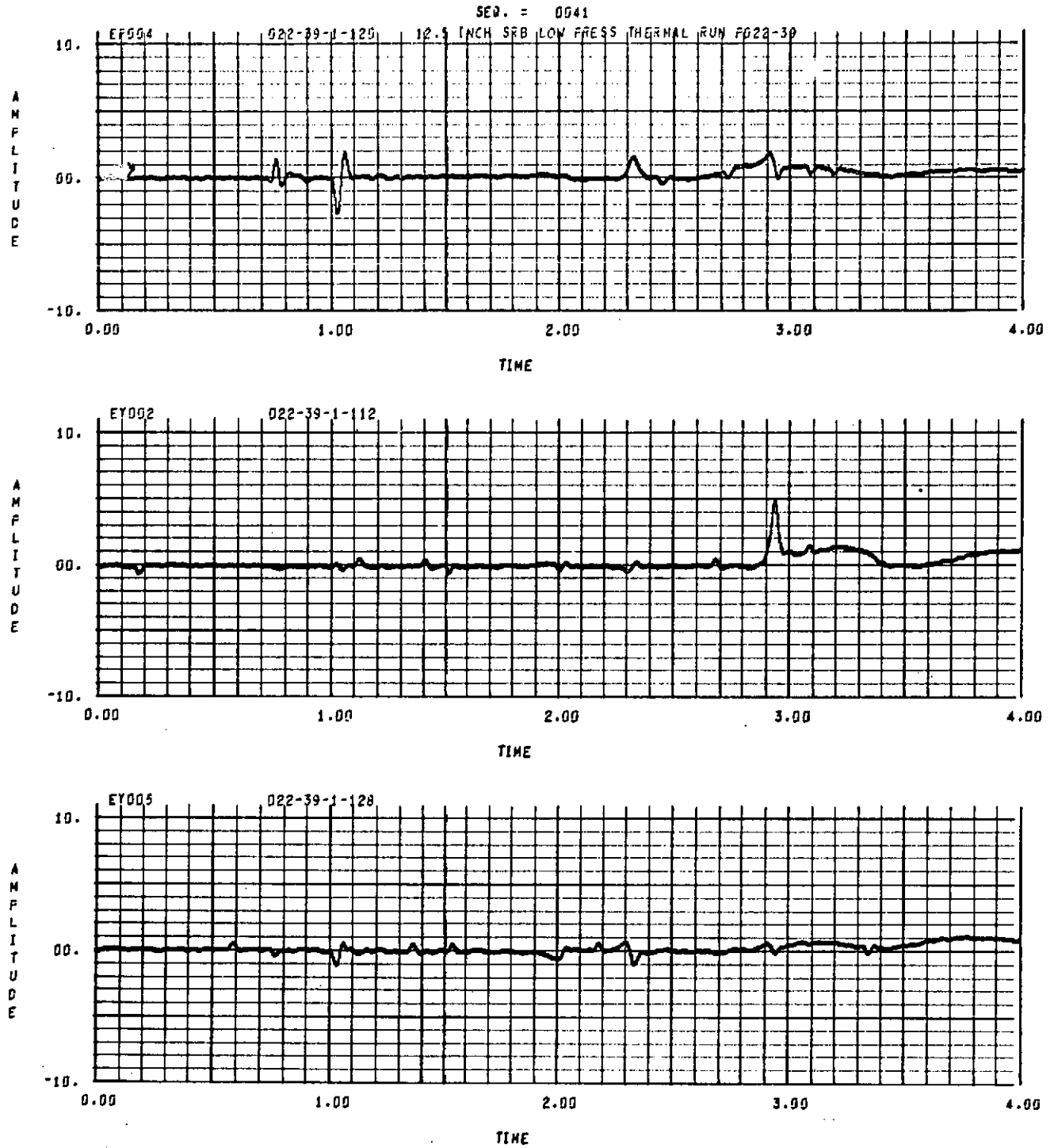

D0002
F022-38-1-32
AMPLITUDE
.40
.20
.00
4.
6.
8.
10.
12.
14.
16.
18.
TIME

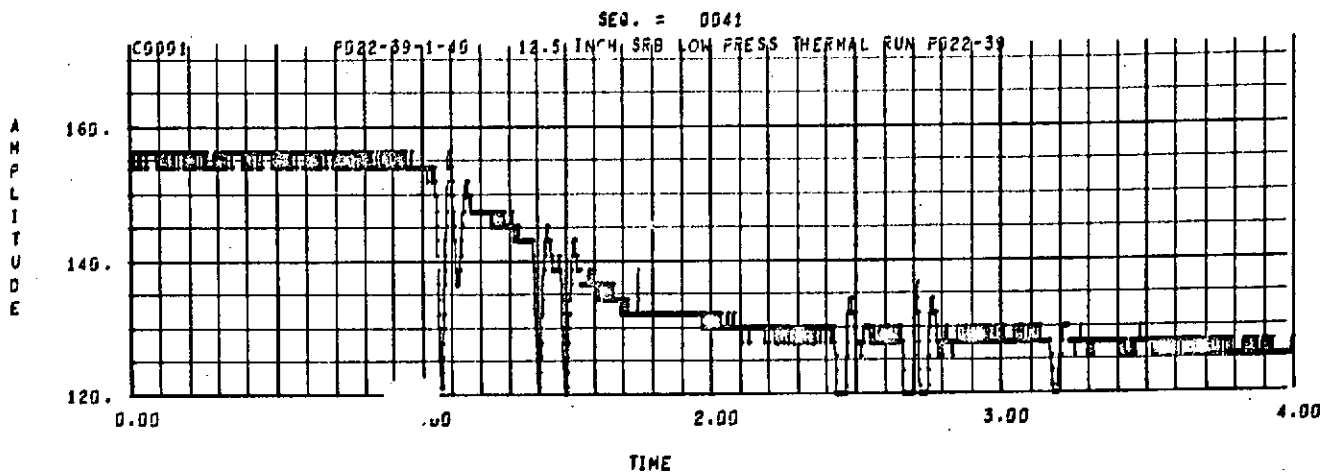

D0003
D22-38-FM13
AMPLITUDE
1.80
1.40
1.00
4.
6.
8.
10.
12.
14.
16.
18.
TIME

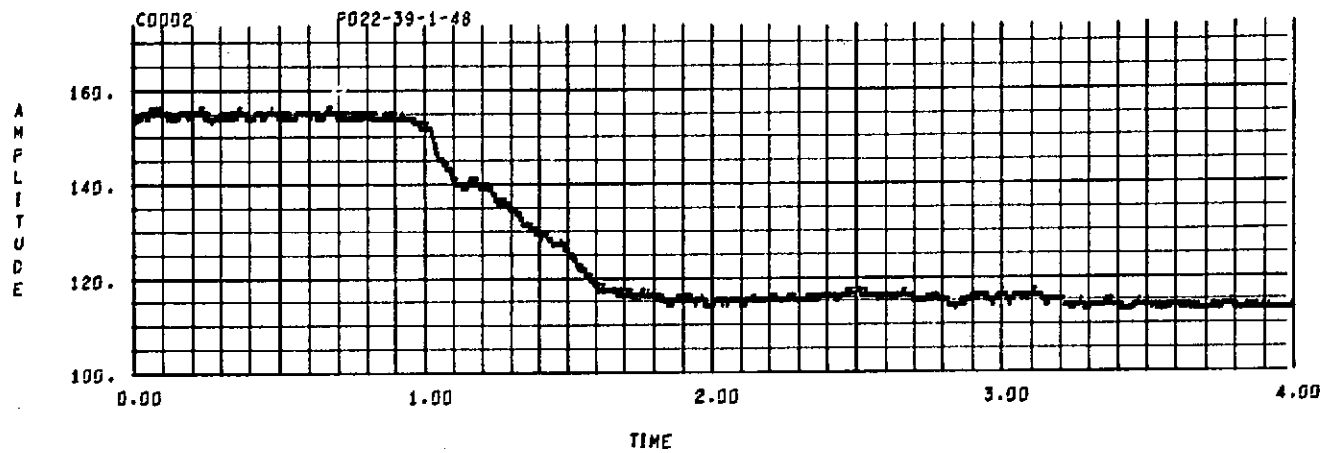

SEQ. = 0041
EA003
F022-39-1-16
12.5 INCH SRB LOW PRESS THERMAL RUN F022-39
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

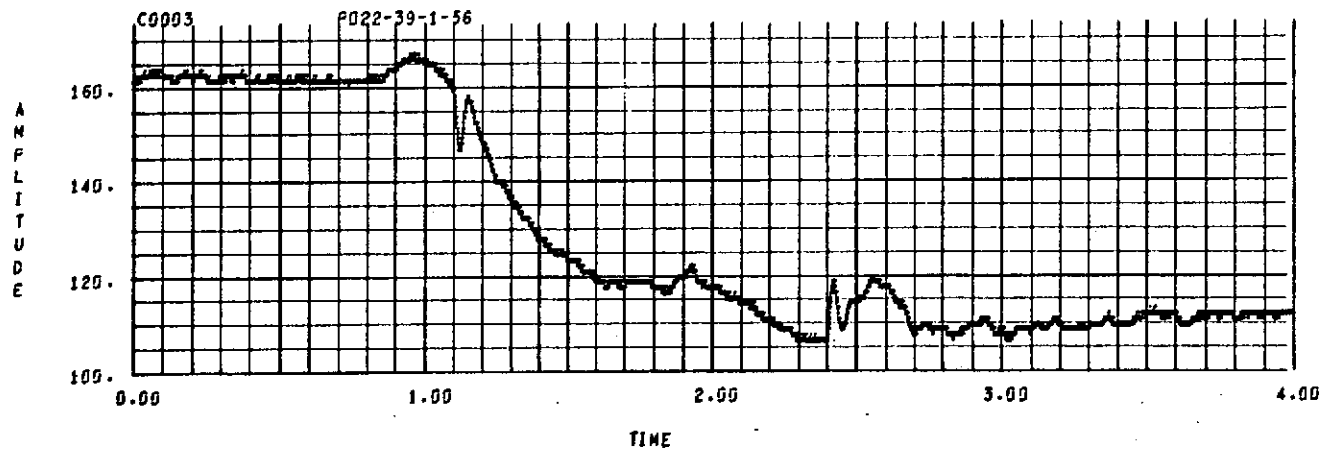

EA006
022-39-1-136
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

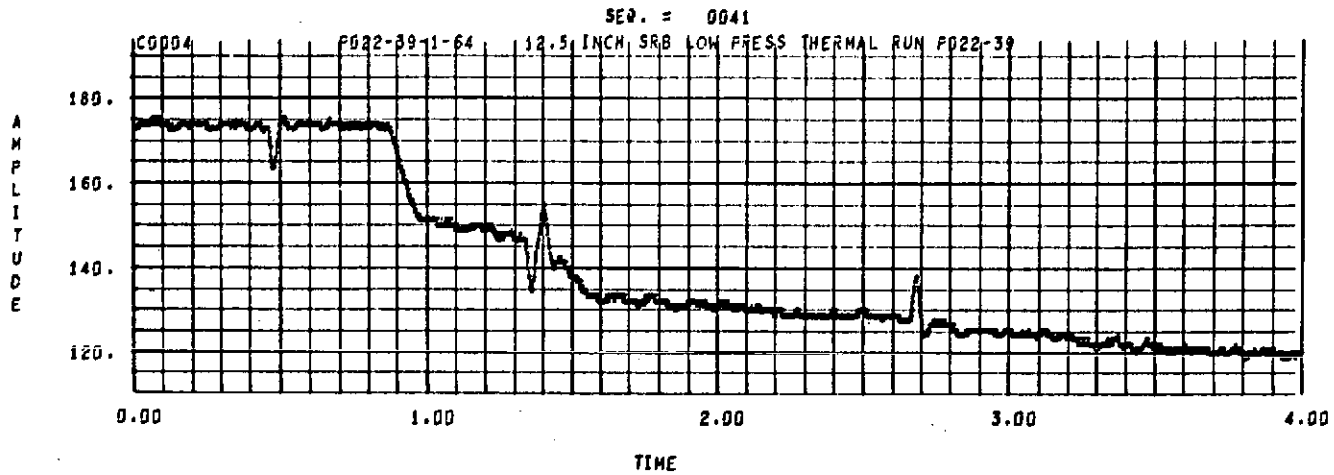

EF001
022-39-1-104
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

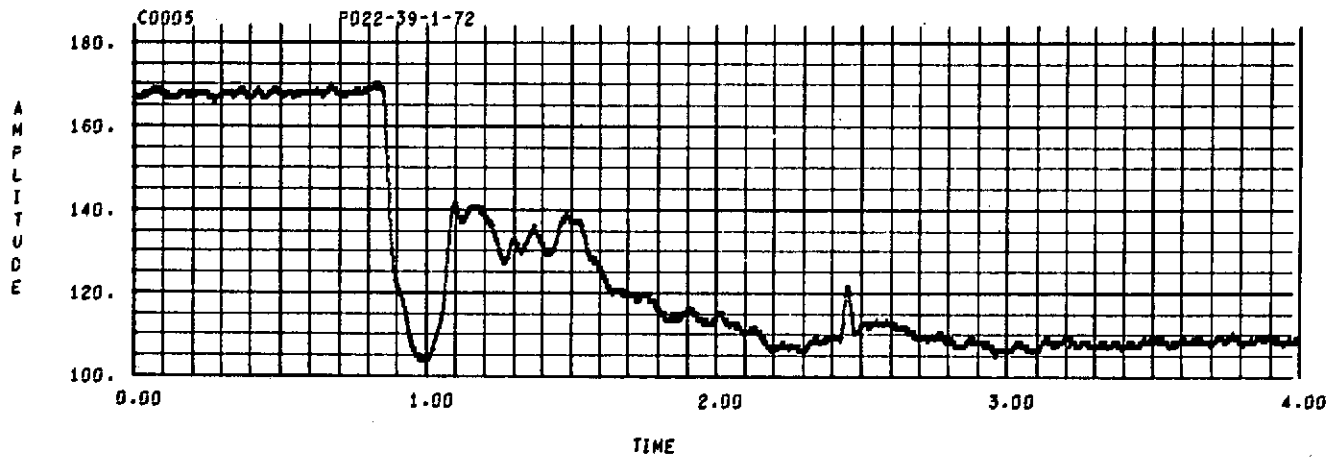

SEQ. = 0041
EF004
022-39-1-125
12.5 INCH SRB LOW PRESS THERMAL RUN F022-30
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME
EY002
022-39-1-112
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME
EY005
022-39-1-128
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

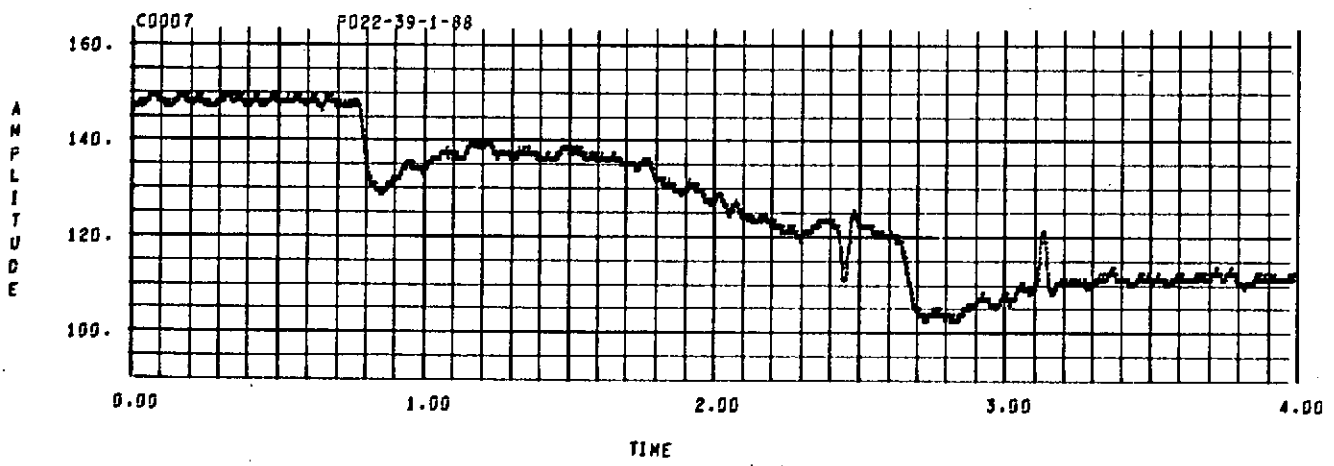

SEQ. = 0041
C0001
P022-39-1-46
12.5 INCH SRB LOW PRESS THERMAL RUN P022-39
AMPLITUDE
160.
140.
120.
0.00
2.00
3.00
4.00
TIME

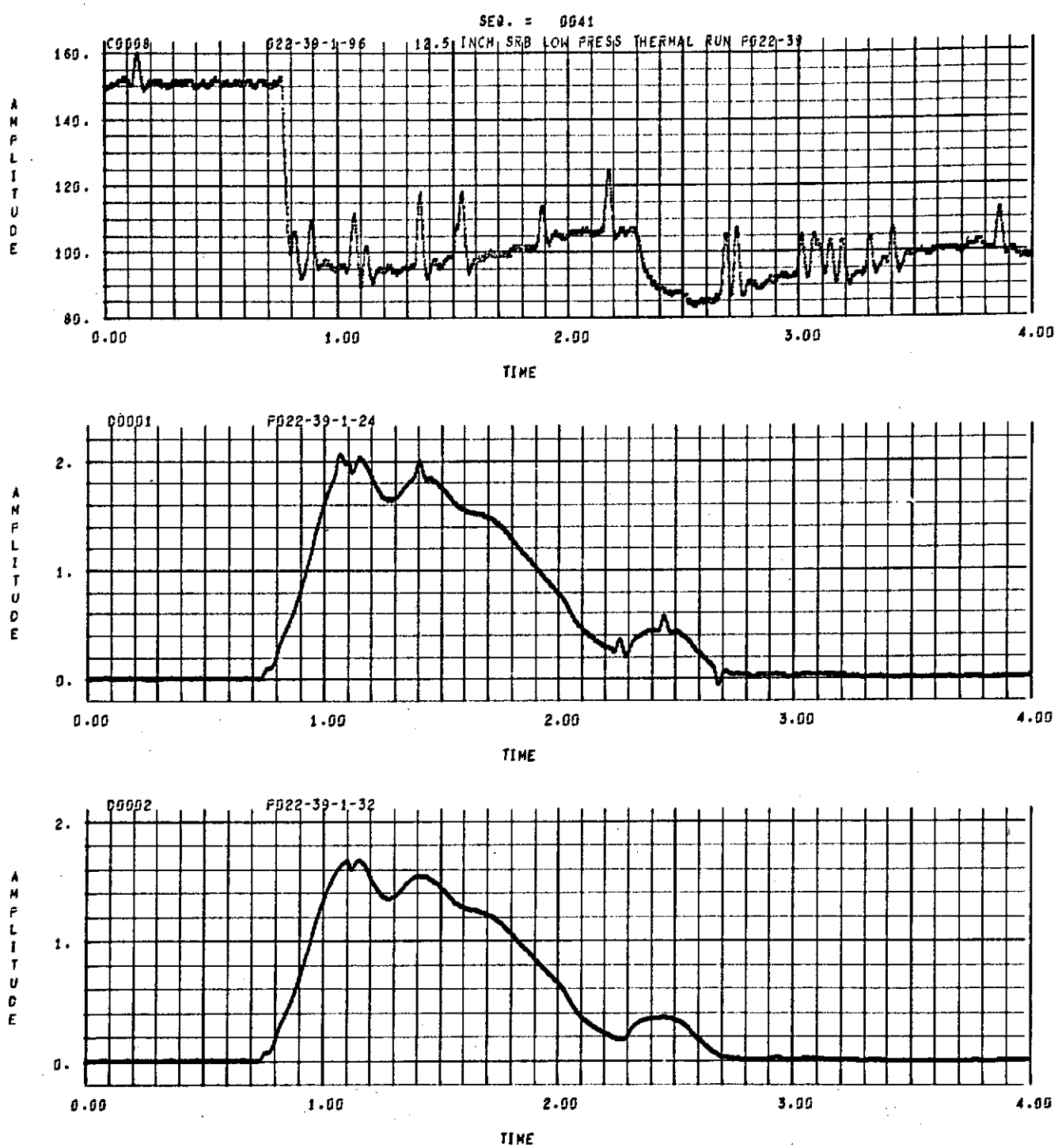

C0002
P022-39-1-48
AMPLITUDE
160.
140.
120.
100.
0.00
1.00
2.00
3.00
4.00
TIME


C0003
P022-39-1-56
AMPLITUDE
160.
140.
120.
100.
0.00
1.00
2.00
3.00
4.00
TIME

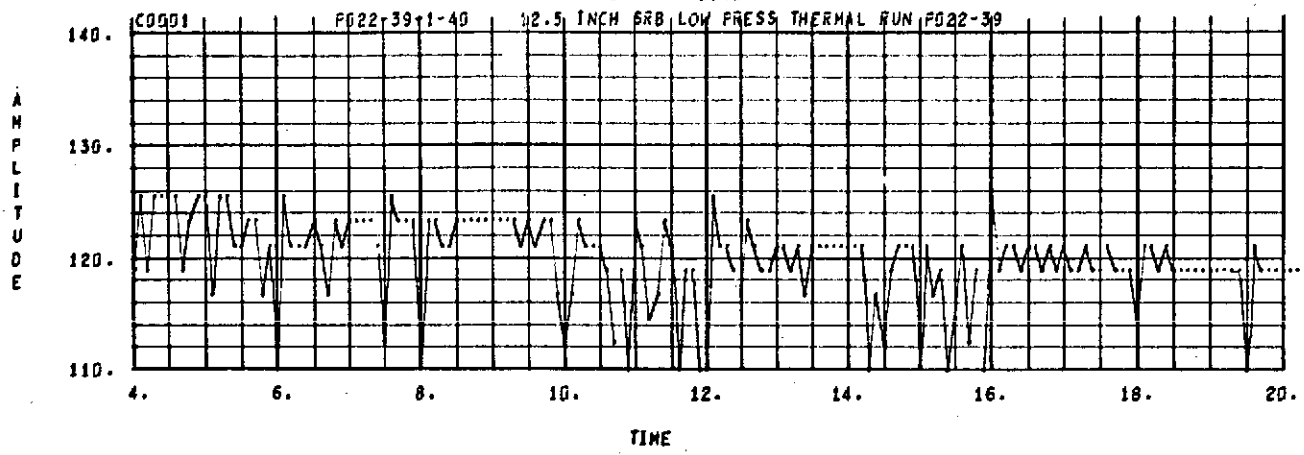

SEQ. = 0041
C0004
P022-39-1-64
12.5 INCH SRB LOW PRESS THERMAL RUN P022-39
AMPLITUDE
180.
160.
140.
120.
0.00
1.00
2.00
3.00
4.00
TIME

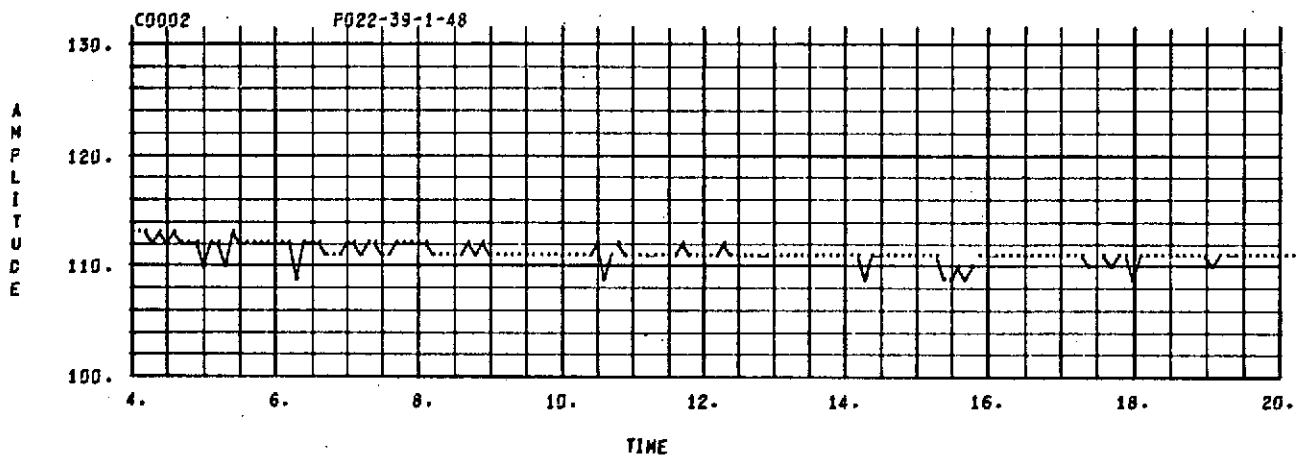

C0005
P022-39-1-72
AMPLITUDE
180.
160.
140.
120.
100.
0.00
1.00
2.00
3.00
4.00
TIME

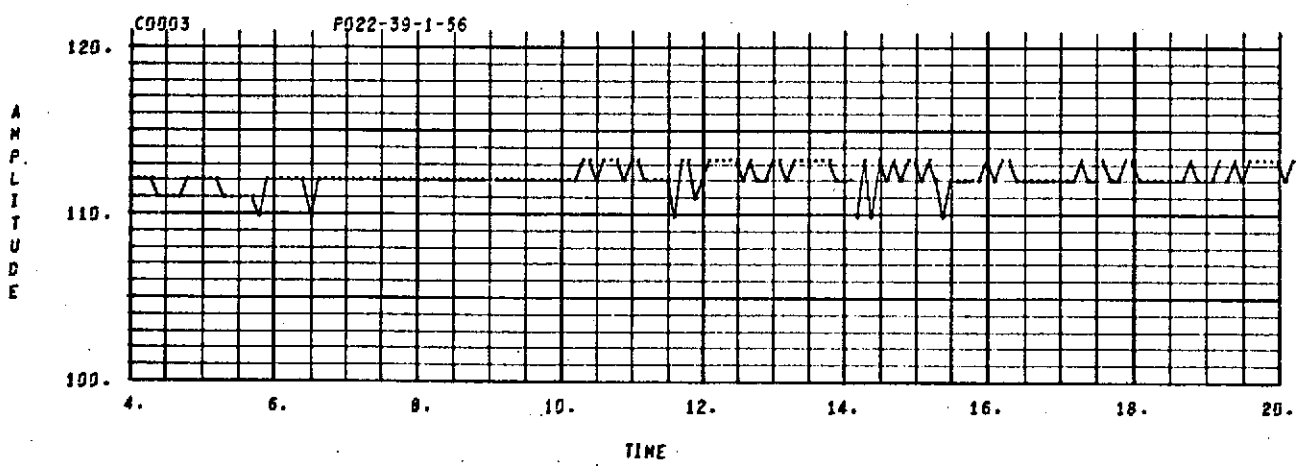

C0007
P022-39-1-88
AMPLITUDE
160.
140.
120.
100.
0.00
1.00
2.00
3.00
4.00
TIME


SEQ. = 0041
C0008
022-39-1-96
12.5 INCH SRB LOW PRESS THERMAL RUN F022-39
160.
140.
120.
100.
80.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME
00001
F022-39-1-24
2.
1.
0.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME
00002
F022-39-1-32
2.
1.
0.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

SEQ. = 0041


C0001
F022-39-1-40
12.5 INCH GRB LOW PRESS THERMAL RUN F022-39
AMPLITUDE
140.
130.
120.
110.
4.
6.
8.
10.
12.
14.
16.
18.
20.
TIME


C0002
F022-39-1-48
AMPLITUDE
130.
120.
110.
100.
4.
6.
8.
10.
12.
14.
16.
18.
20.
TIME


C0003
F022-39-1-56
AMPLITUDE
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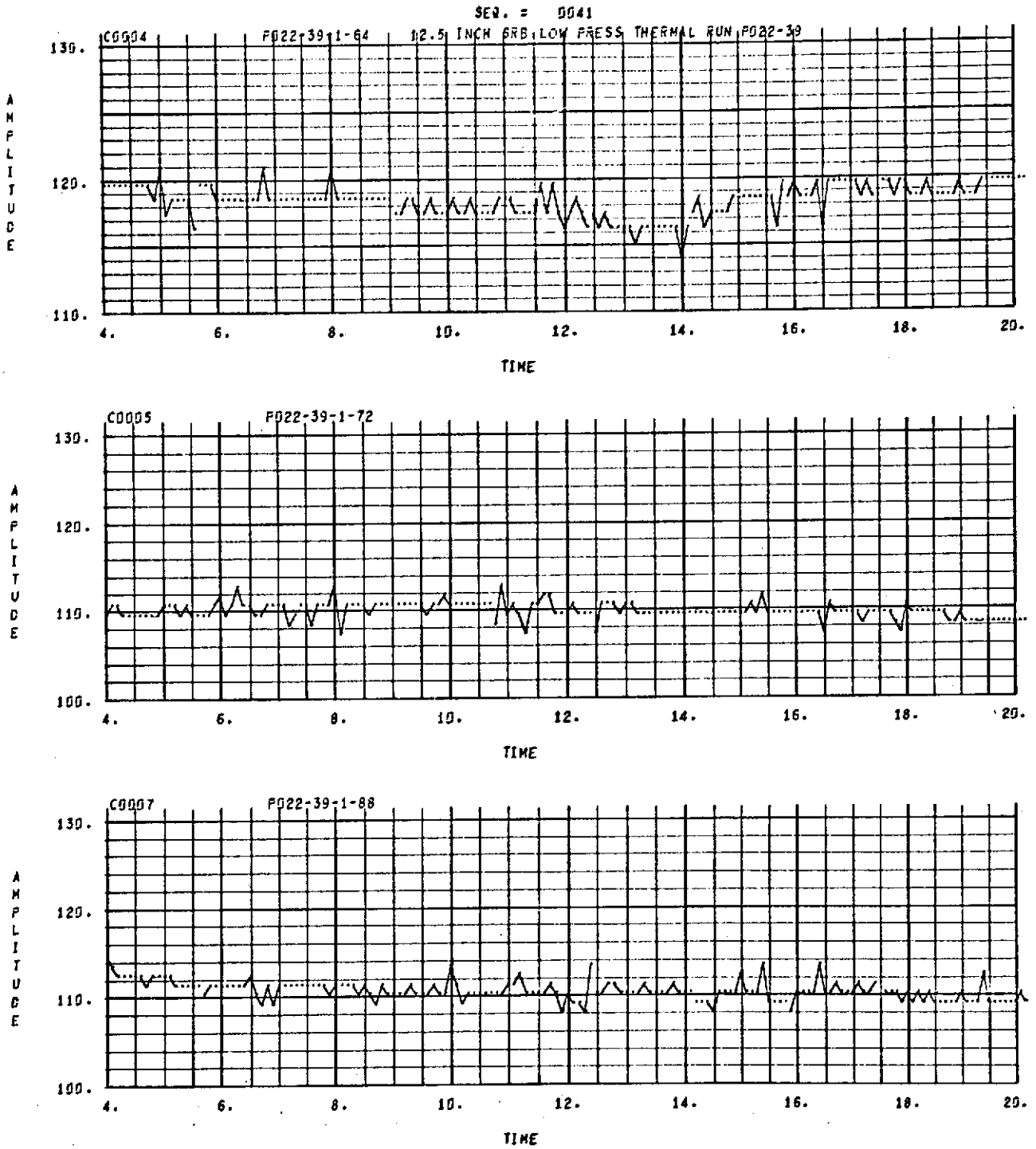
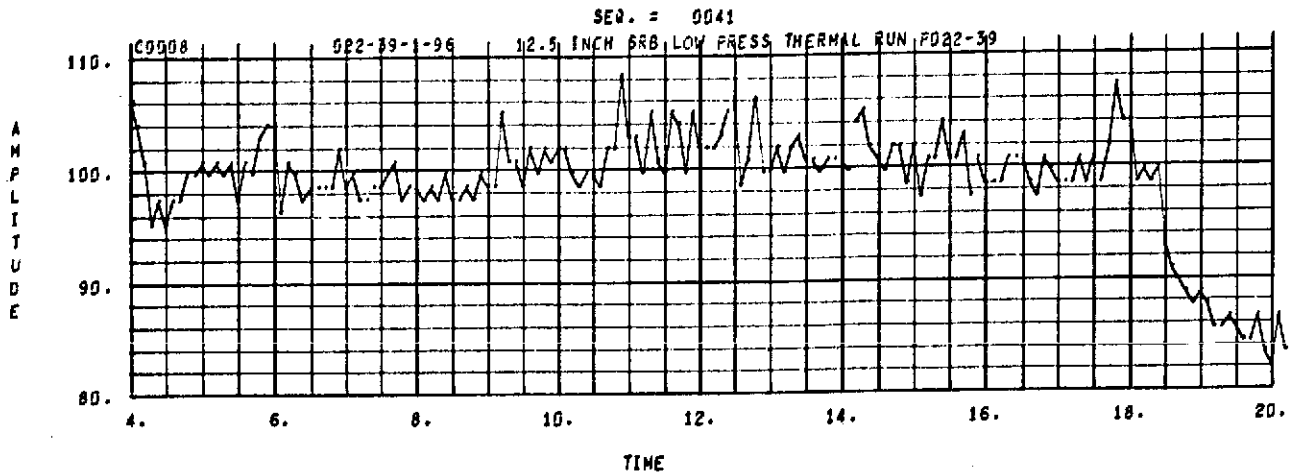
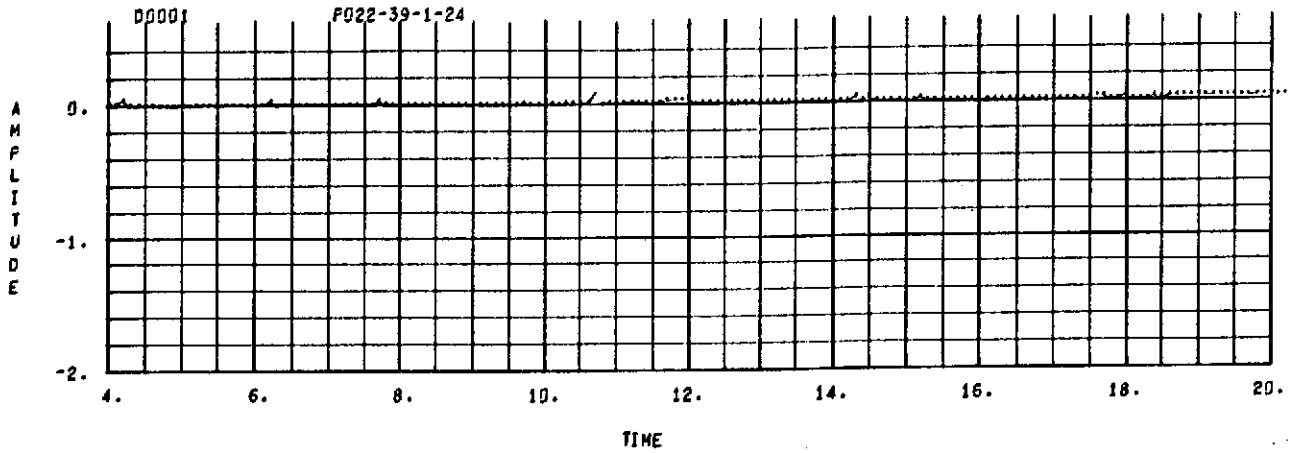
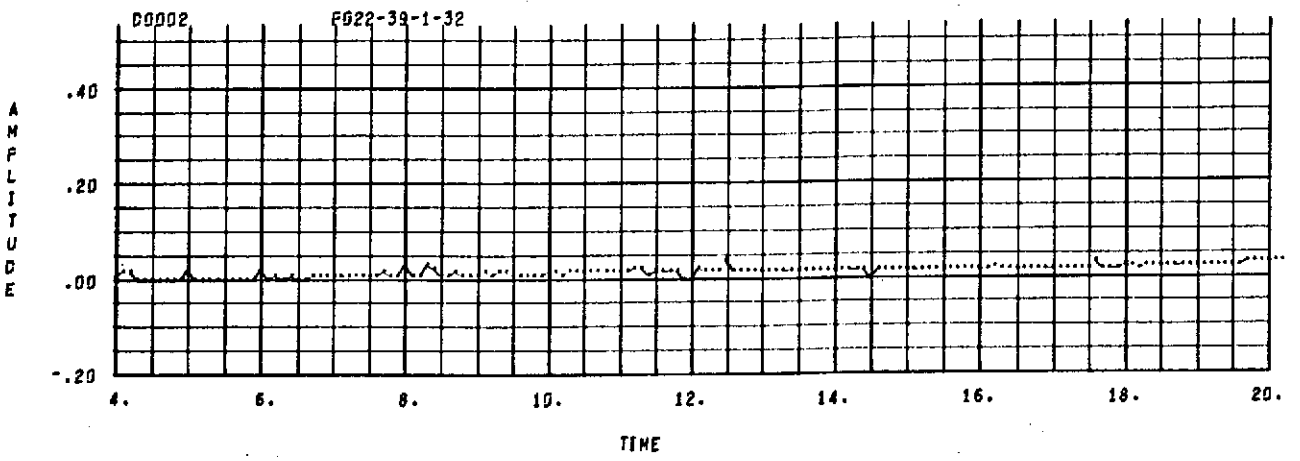
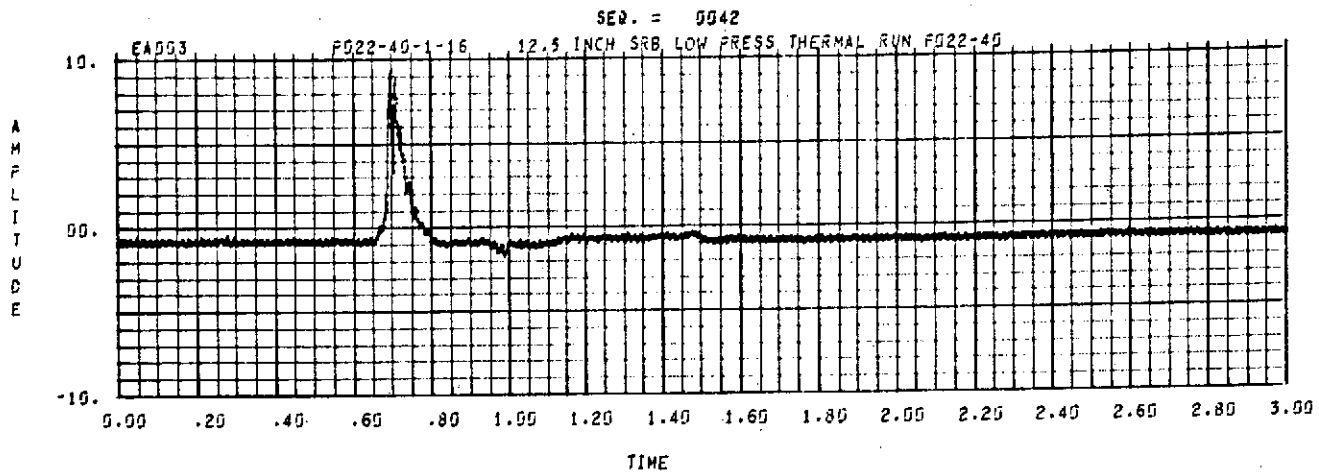
110.
100.
4.
6.
8.
10.
12.
14.
16.
18.
20.
TIME

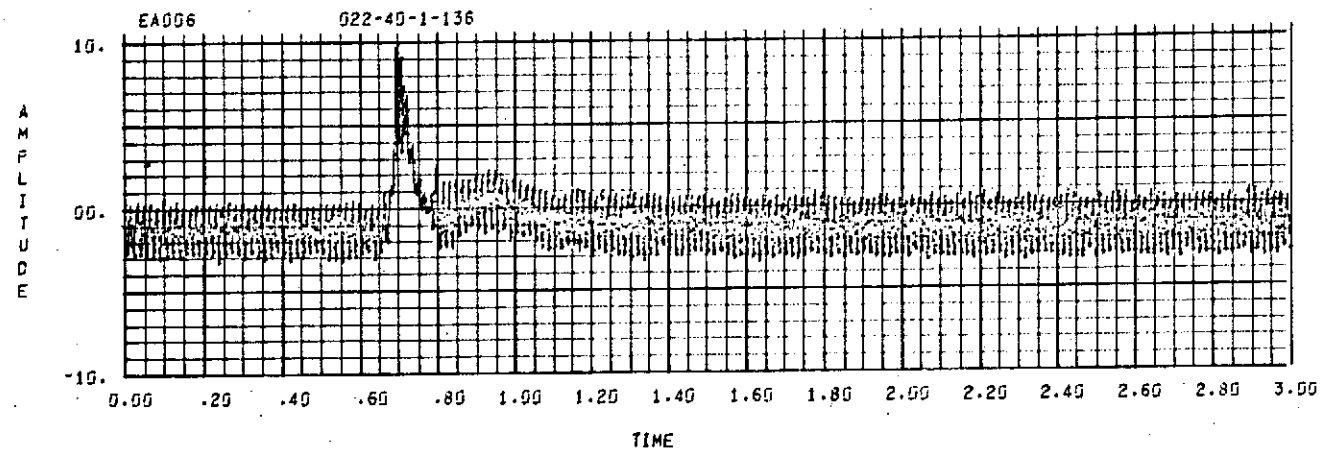

SEQ. = 0041
C0004
F022-39-1-64
12.5 INCH GRB LOW PRESS THERMAL RUN F022-39
AMPLITUDE
130.
120.
110.
4.
6.
8.
10.
12.
14.
16.
18.
20.
TIME
C0005
F022-39-1-72
AMPLITUDE
130.
120.
110.
100.
4.
6.
8.
10.
12.
14.
16.
18.
20.
TIME
C0007
F022-39-1-88
AMPLITUDE
130.
120.
110.
100.
4.
6.
8.
10.
12.
14.
16.
18.
20.
TIME

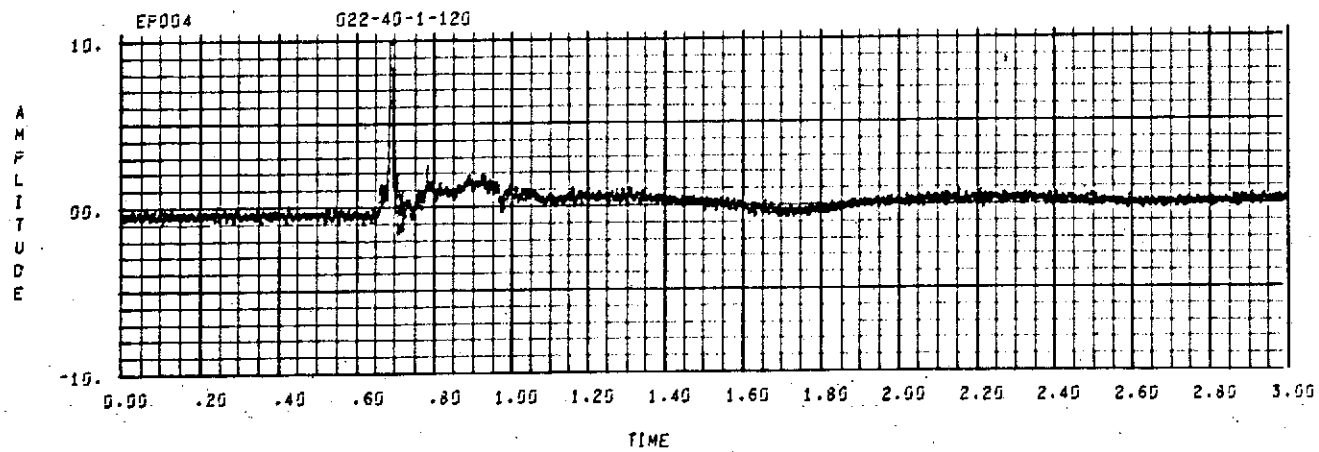

SEQ. = 0041
C0008
F022-39-1-96
12.5 INCH SRB LOW PRESS THERMAL RUN F022-39
AMPLITUDE
110.
100.
90.
80.
4.
6.
8.
10.
12.
14.
16.
18.
20.
TIME

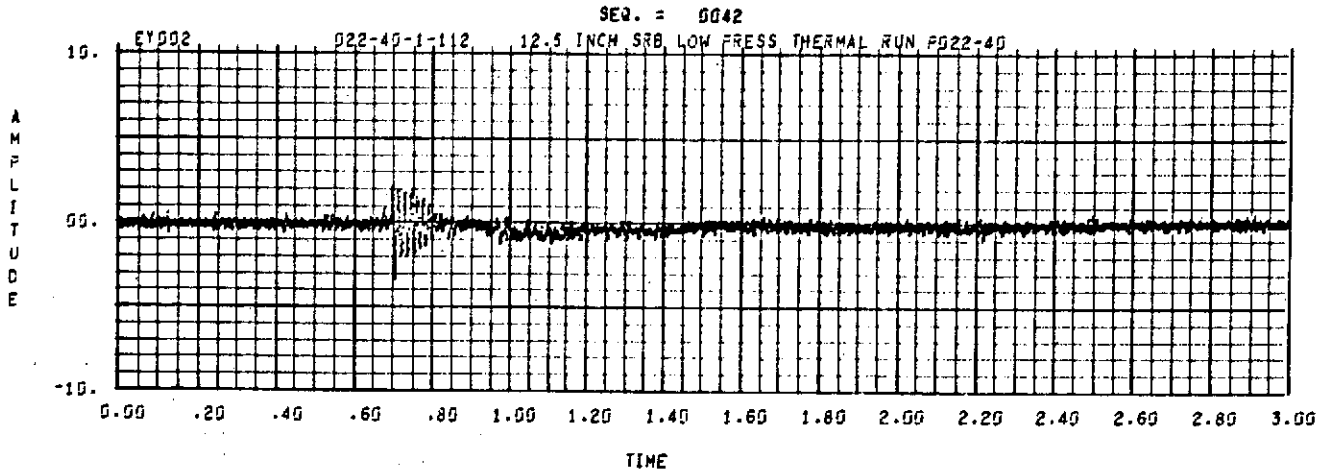

D0001
F022-39-1-24
AMPLITUDE
0.
-1.
-2.
4.
6.
8.
10.
12.
14.
16.
18.
20.
TIME


D0002
F022-39-1-32
AMPLITUDE
.40
.20
.00
-.20
4.
6.
8.
10.
12.
14.
16.
18.
20.
TIME


SEQ. = 0042
EA003
F022-40-1-16
12.5 INCH SRB LOW PRESS THERMAL RUN F022-40
10.
00.
-10.
AMPLITUDE
0.00 .20 .40 .60 .80 1.00 1.20 1.40 1.60 1.80 2.00 2.20 2.40 2.60 2.80 3.00
TIME


EA006
022-40-1-136
10.
00.
-10.
AMPLITUDE
0.00 .20 .40 .60 .80 1.00 1.20 1.40 1.60 1.80 2.00 2.20 2.40 2.60 2.80 3.00
TIME


EP004
022-40-1-120
10.
00.
-10.
AMPLITUDE
0.00 .20 .40 .60 .80 1.00 1.20 1.40 1.60 1.80 2.00 2.20 2.40 2.60 2.80 3.00
TIME


SEQ. = 0042
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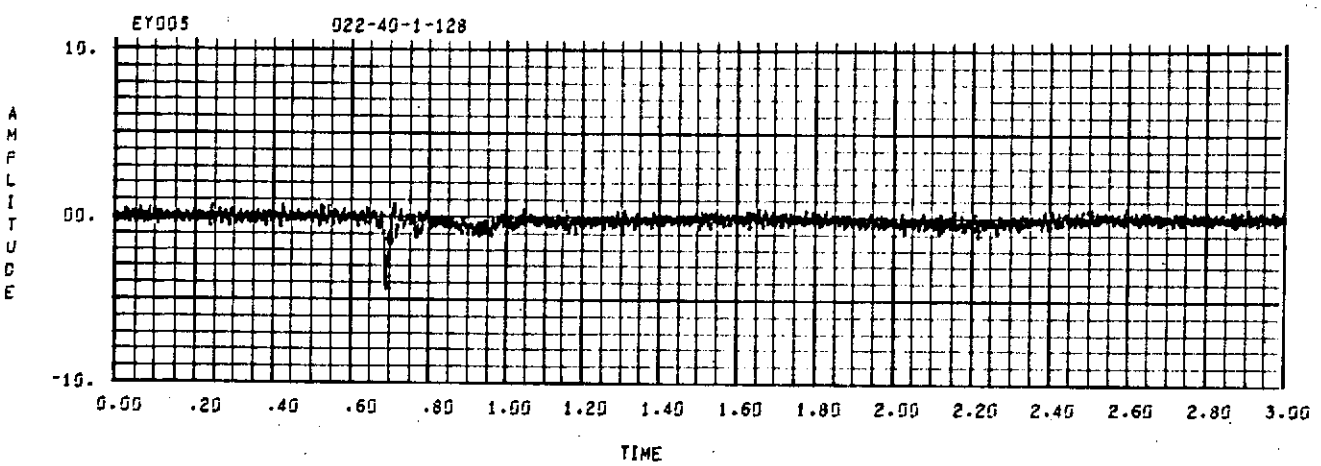
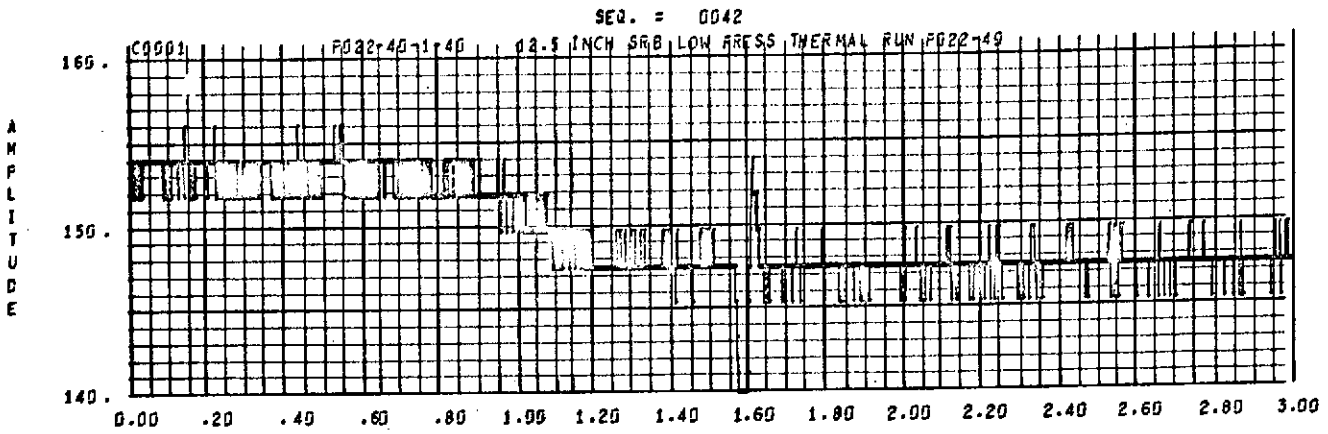
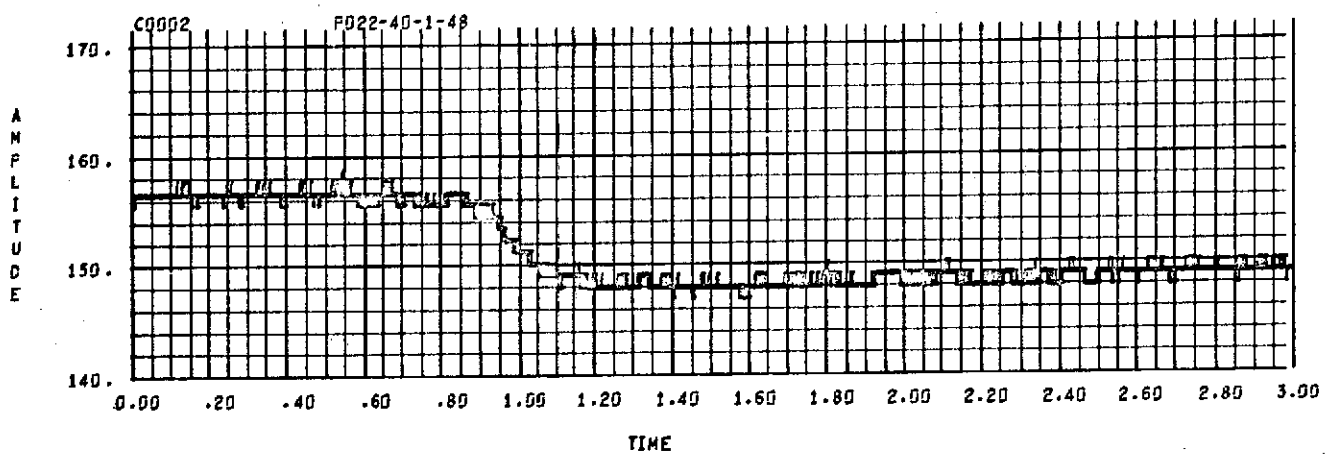
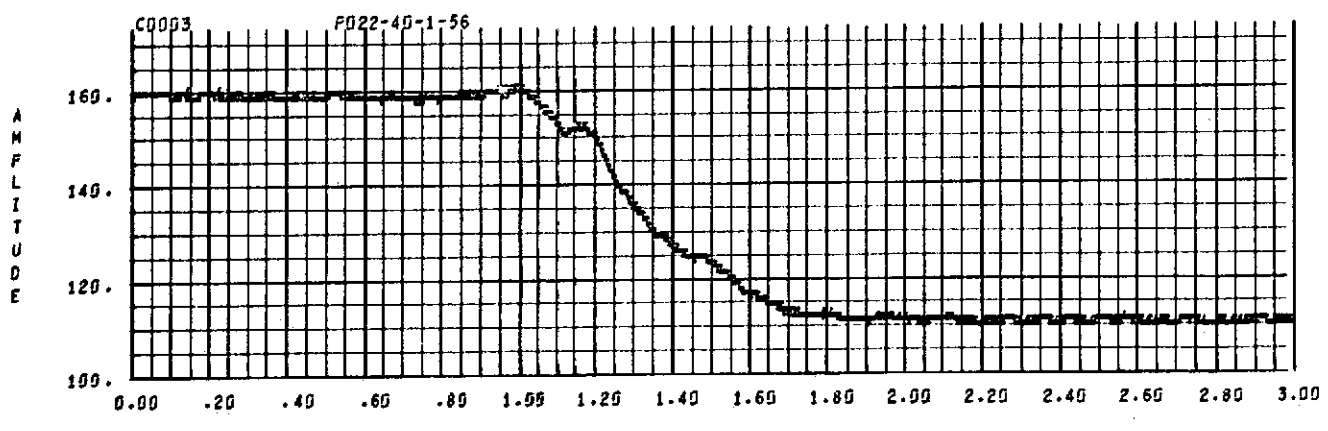
EY002
022-40-1-112
12.5 INCH SRB LOW PRESS THERMAL RUN F022-40
10.
00.
-10.
AMPLITUDE
0.00
.20
.40
.60
.80
1.00
1.20
1.40
1.60
1.80
2.00
2.20
2.40
2.60
2.80
3.00
TIME

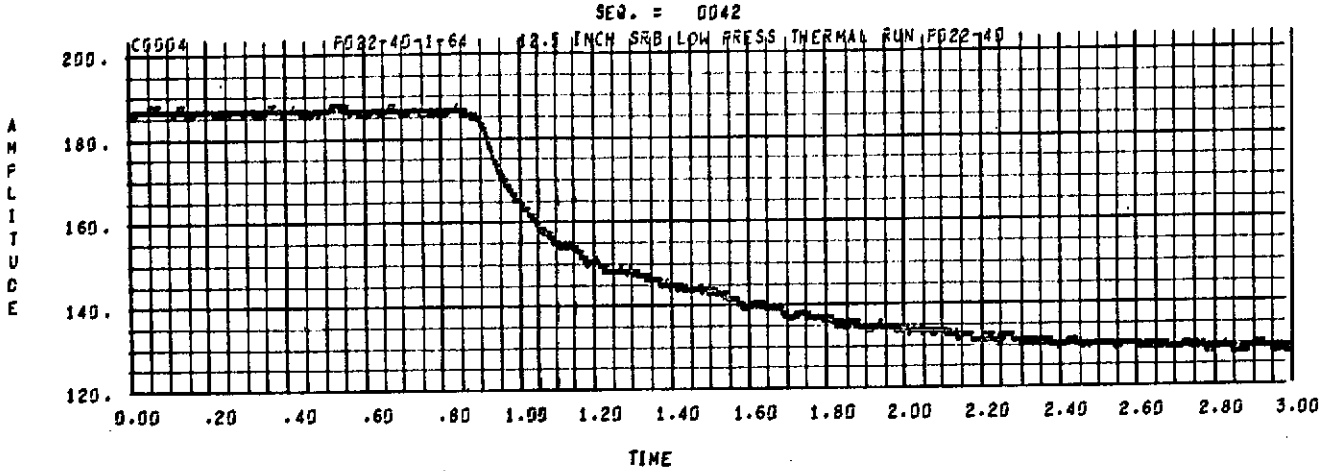

EY005
022-40-1-128
10.
00.
-10.
AMPLITUDE
0.00
.20
.40
.60
.80
1.00
1.20
1.40
1.60
1.80
2.00
2.20
2.40
2.60
2.80
3.00
TIME

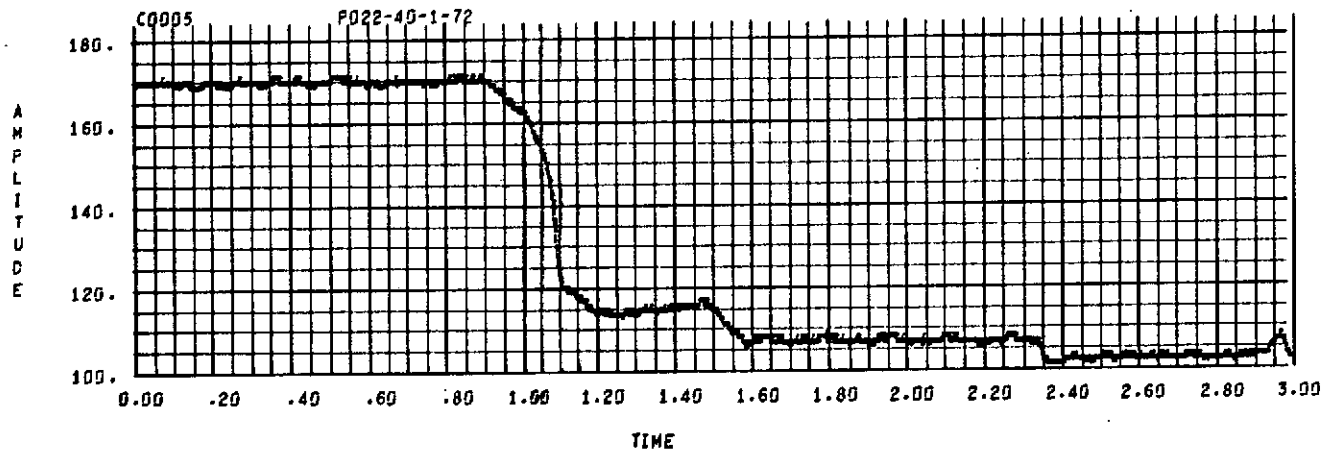

SEQ. = 0042
C0001
F022-40-1-40
12.5 INCH SRB LOW PRESS THERMAL RUN F022-40
AMPLITUDE
160.
150.
140.
0.00
.20
.40
.60
.80
1.00
1.20
1.40
1.60
1.80
2.00
2.20
2.40
2.60
2.80
3.00
TIME

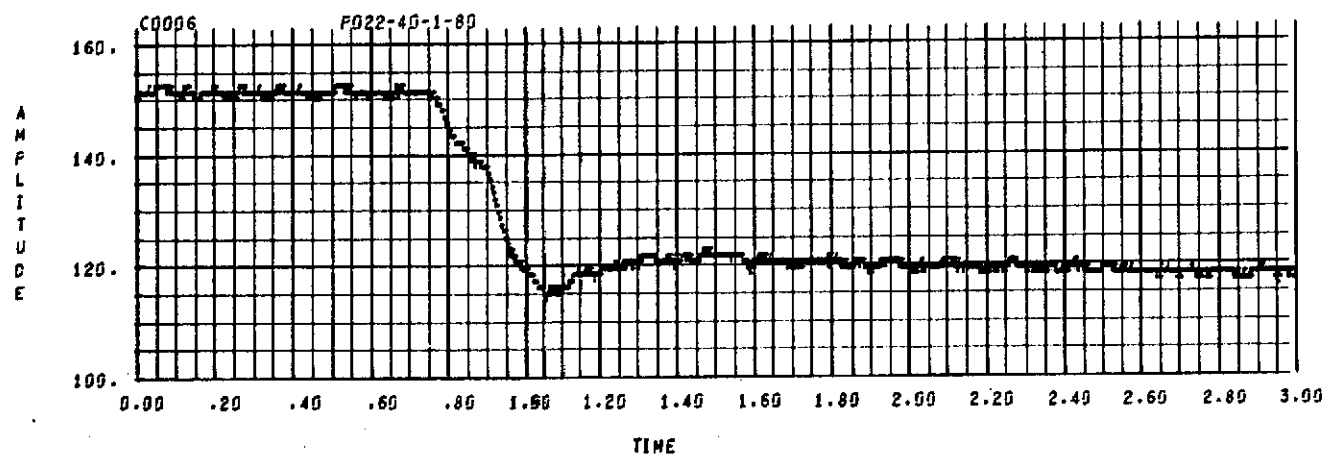

C0002
F022-40-1-48
AMPLITUDE
170.
160.
150.
140.
0.00
.20
.40
.60
.80
1.00
1.20
1.40
1.60
1.80
2.00
2.20
2.40
2.60
2.80
3.00
TIME

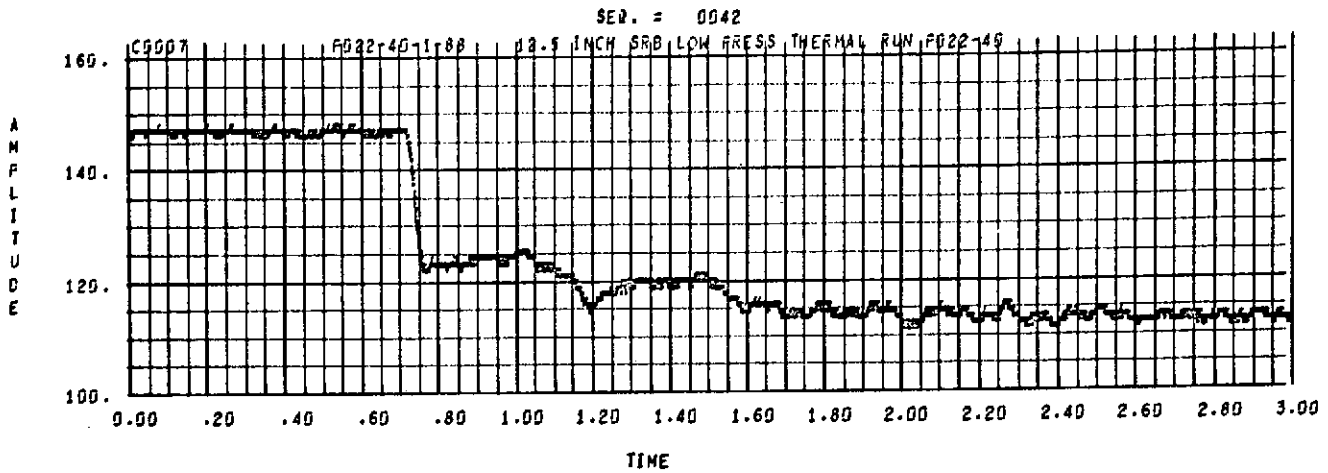

C0003
F022-40-1-56
AMPLITUDE
160.
140.
120.
100.
0.00
.20
.40
.60
.80
1.00
1.20
1.40
1.60
1.80
2.00
2.20
2.40
2.60
2.80
3.00
TIME

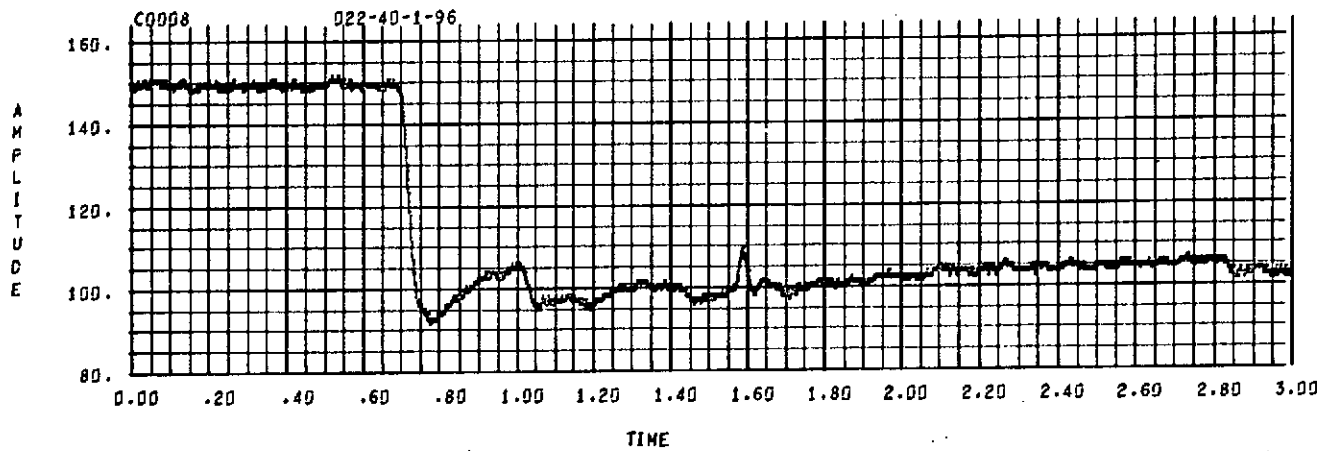
SEQ. = 0042

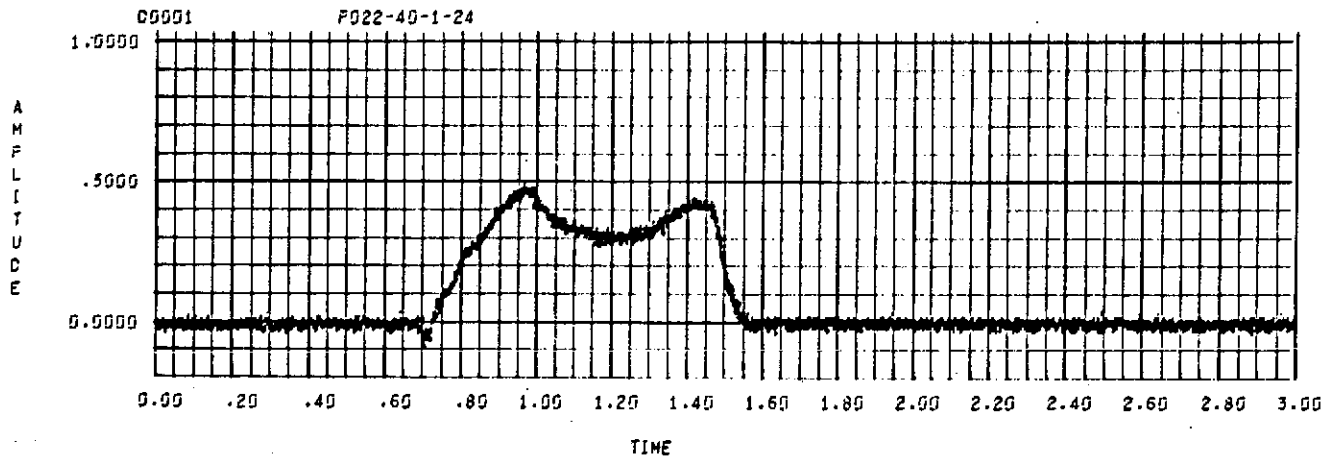

C0004
F022-40-1-64
12.5 INCH SRB LOW PRESS THERMAL RUN F022-40
AMPLITUDE
200.
180.
160.
140.
120.
0.00
.20
.40
.60
.80
1.00
1.20
1.40
1.60
1.80
2.00
2.20
2.40
2.60
2.80
3.00
TIME

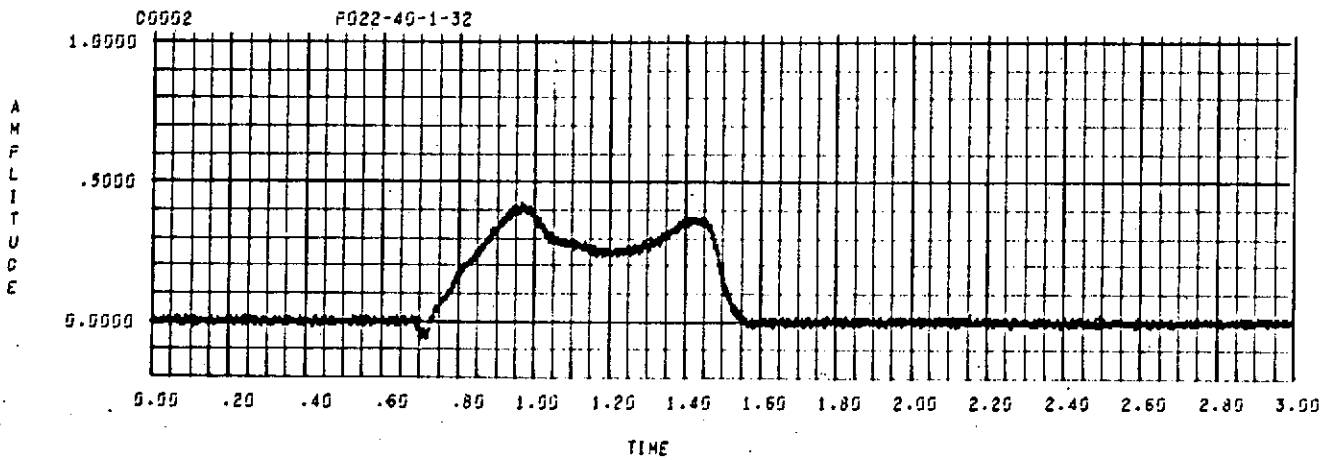

C0005
F022-40-1-72
AMPLITUDE
180.
160.
140.
120.
100.
0.00
.20
.40
.60
.80
1.00
1.20
1.40
1.60
1.80
2.00
2.20
2.40
2.60
2.80
3.00
TIME


C0006
F022-40-1-80
AMPLITUDE
160.
140.
120.
100.
0.00
.20
.40
.60
.80
1.00
1.20
1.40
1.60
1.80
2.00
2.20
2.40
2.60
2.80
3.00
TIME

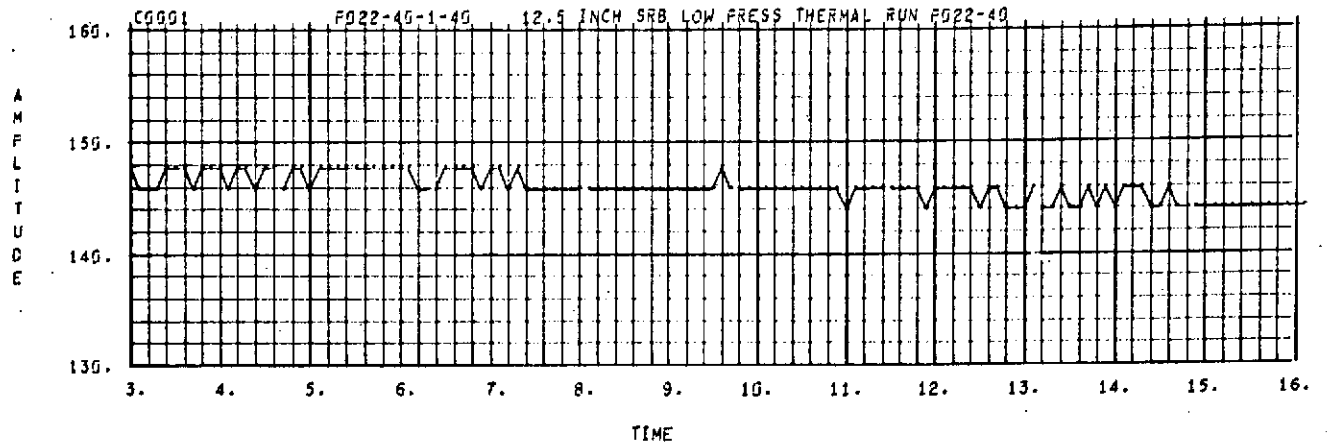

SEQ. = 0042
C0007
F022-40-1-88
03.5 INCH SRB LOW PRESS THERMAL RUN F022-40
AMPLITUDE
160.
140.
120.
100.
0.00
.20
.40
.60
.80
1.00
1.20
1.40
1.60
1.80
2.00
2.20
2.40
2.60
2.80
3.00
TIME

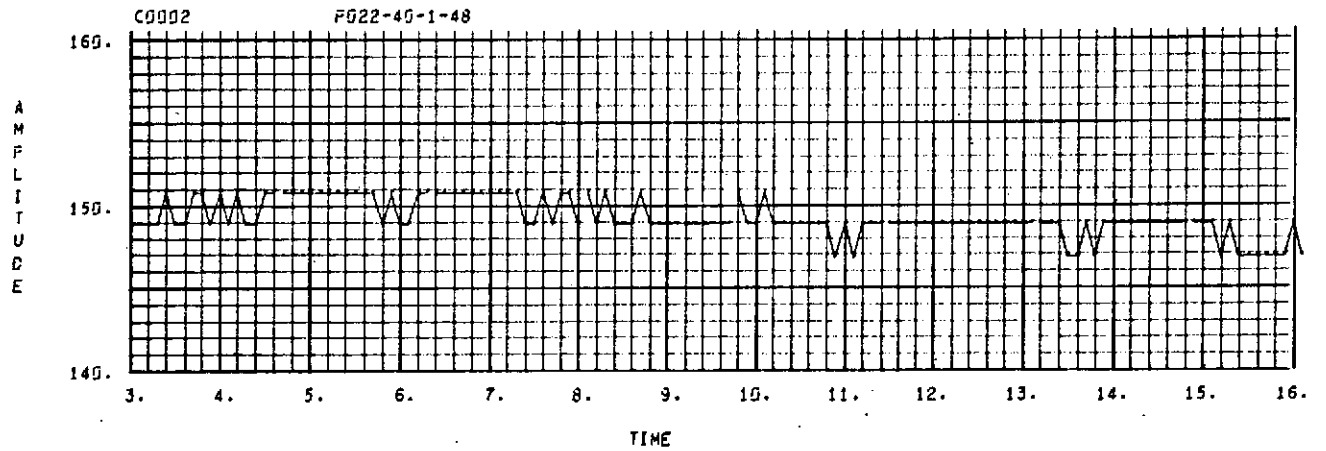

C0008
022-40-1-96
AMPLITUDE
160.
140.
120.
100.
80.
0.00
.20
.40
.60
.80
1.00
1.20
1.40
1.60
1.80
2.00
2.20
2.40
2.60
2.80
3.00
TIME

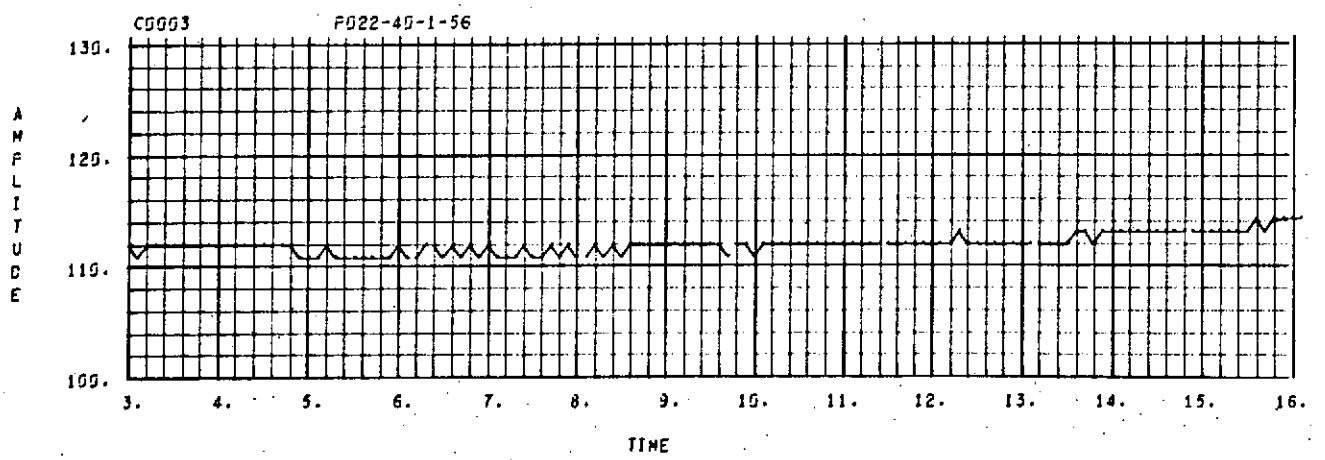

C0001
F022-40-1-24
1.0000
.5000
0.0000
AMPLITUDE
0.00 .20 .40 .60 .80 1.00 1.20 1.40 1.60 1.80 2.00 2.20 2.40 2.60 2.80 3.00
TIME


C0002
F022-40-1-32
1.0000
.5000
0.0000
AMPLITUDE
0.00 .20 .40 .60 .80 1.00 1.20 1.40 1.60 1.80 2.00 2.20 2.40 2.60 2.80 3.00
TIME

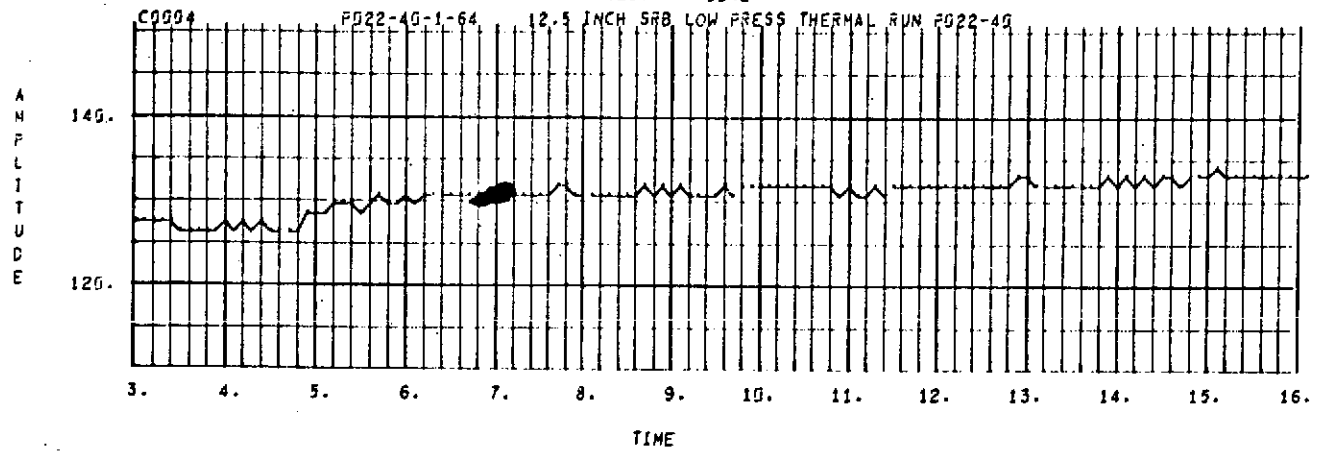
SEQ. = 0042

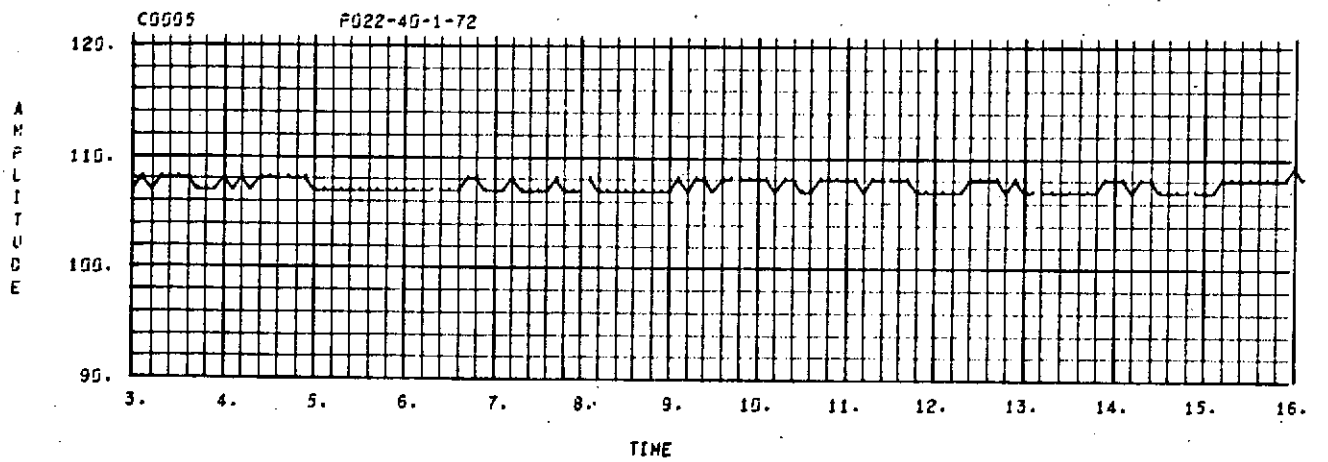

C0001
F022-40-1-40
12.5 INCH SRB LOW PRESS THERMAL RUN F022-40
160.
150.
140.
130.
AMPLITUDE
3.
4.
5.
6.
7.
8.
9.
10.
11.
12.
13.
14.
15.
16.
TIME

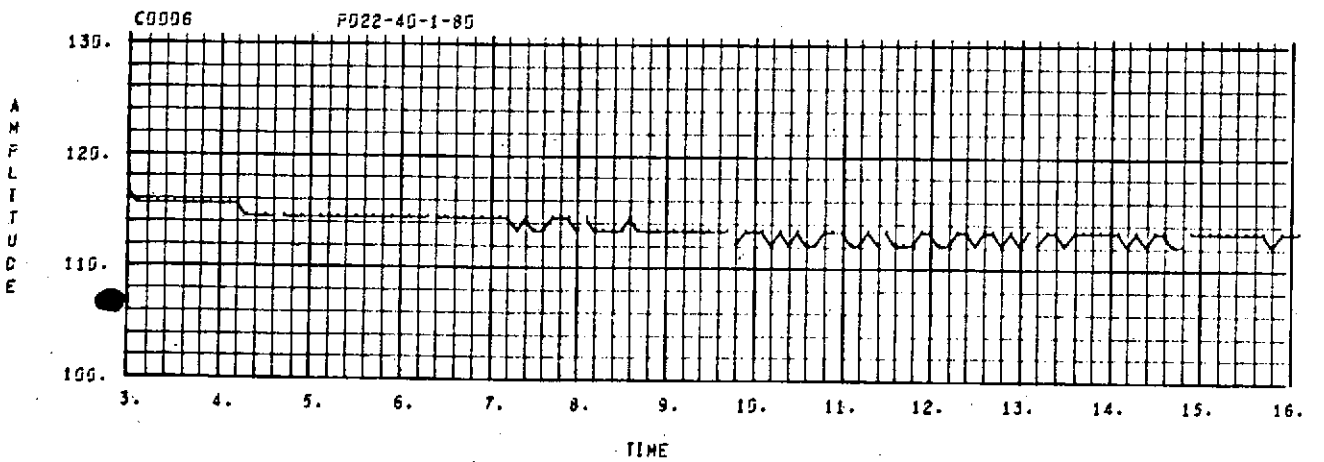

C0002
F022-40-1-48
160.
150.
140.
AMPLITUDE
3.
4.
5.
6.
7.
8.
9.
10.
11.
12.
13.
14.
15.
16.
TIME

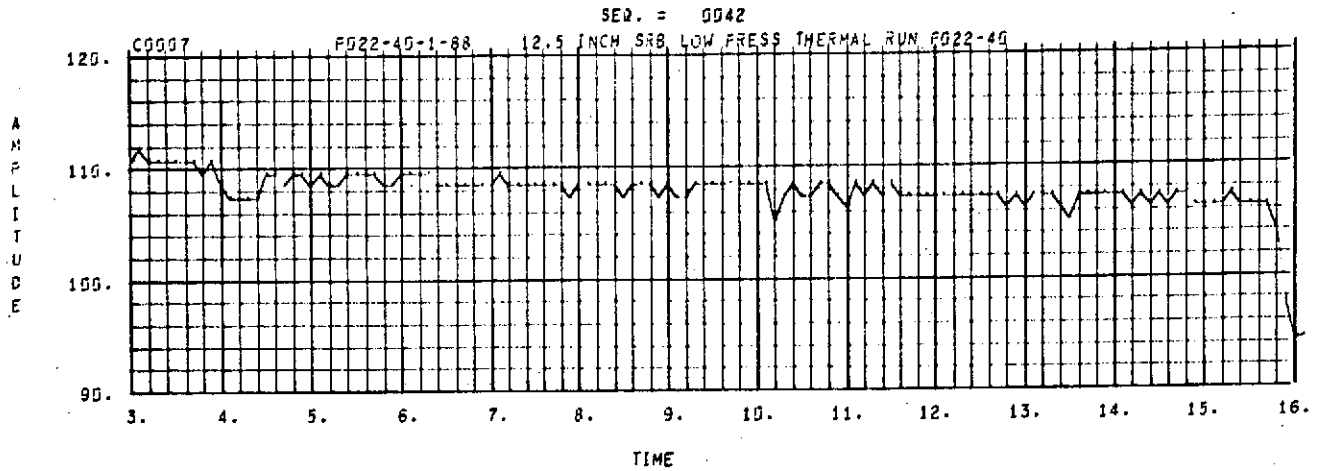

C0003
F022-40-1-56
130.
120.
110.
100.
AMPLITUDE
3.
4.
5.
6.
7.
8.
9.
10.
11.
12.
13.
14.
15.
16.
TIME

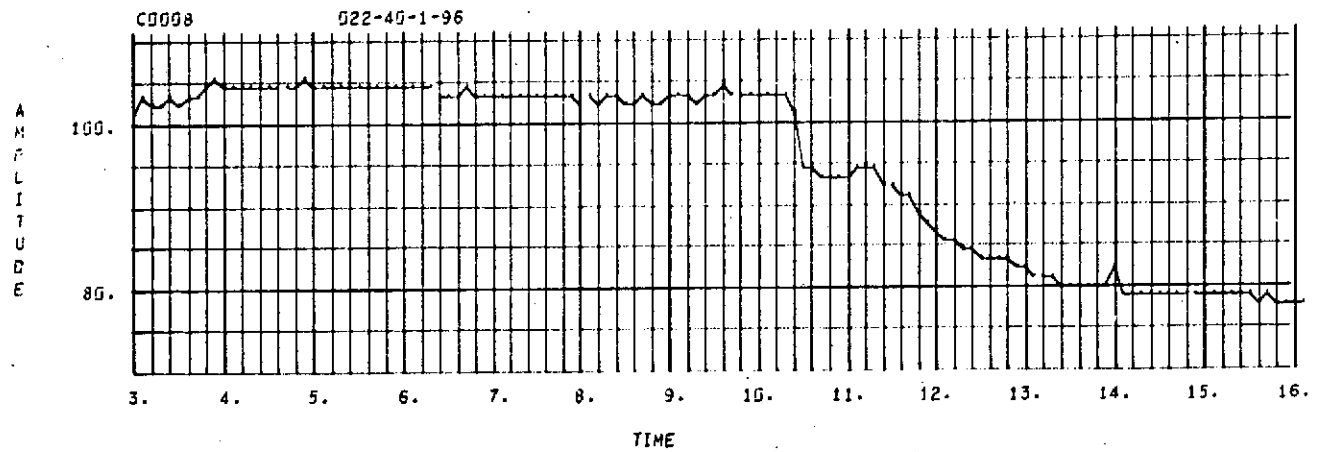
SEQ. = 0042

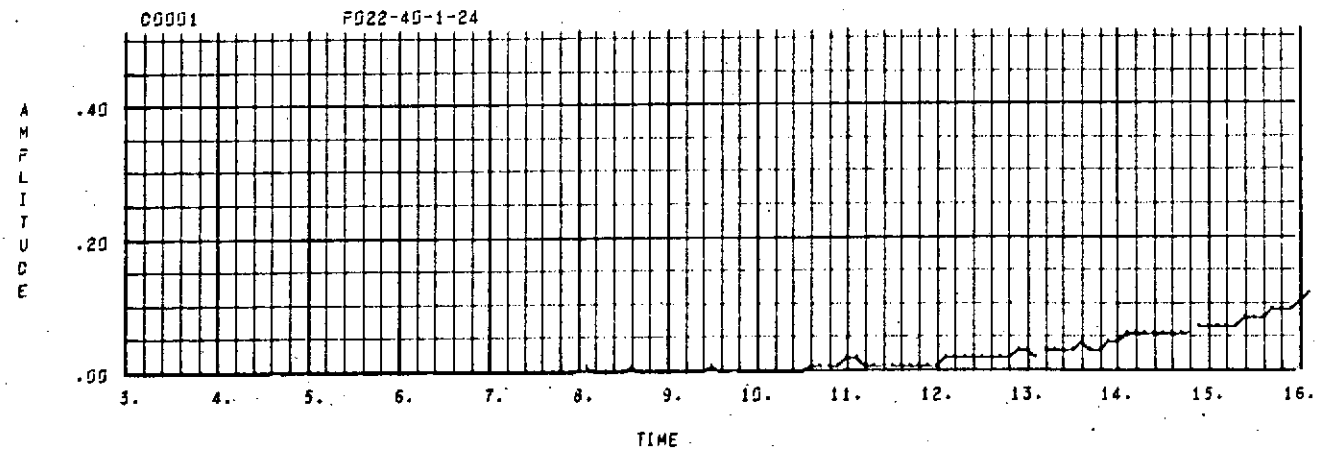

C0004
F022-40-1-64
12.5 INCH SRB LOW PRESS THERMAL RUN F022-40
AMPLITUDE
140.
120.
3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16.
TIME

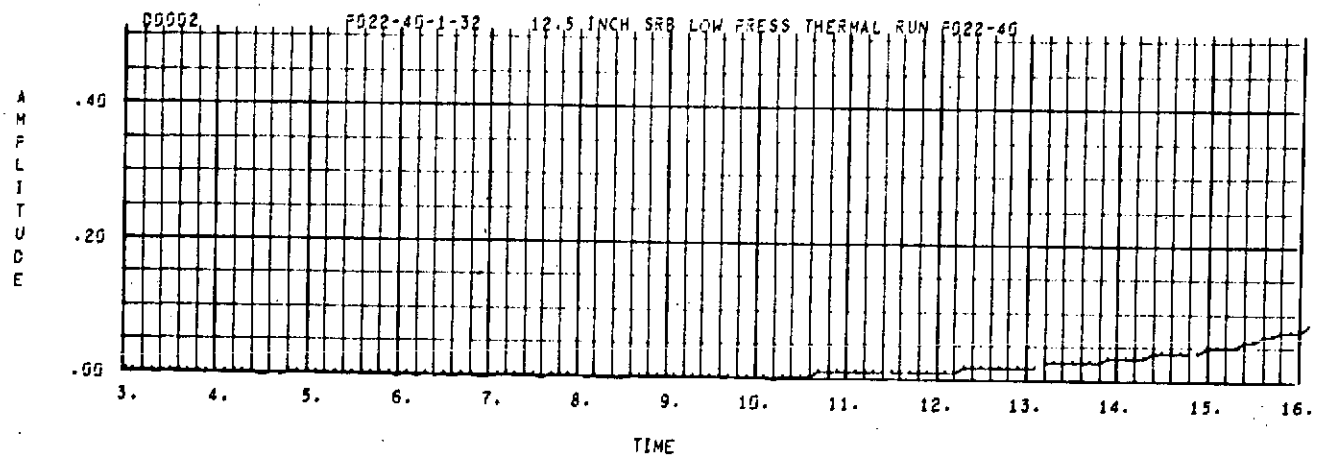

C0005
F022-40-1-72
AMPLITUDE
120.
110.
100.
90.
3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16.
TIME


C0006
F022-40-1-80
AMPLITUDE
130.
120.
110.
100.
3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16.
TIME


SEQ. = 0042
C0007
F022-40-1-88
12.5 INCH SRB LOW PRESS THERMAL RUN F022-40
120.
110.
100.
90.
AMPLITUDE
3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16.
TIME


C0008
022-40-1-96
100.
80.
AMPLITUDE
3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16.
TIME


C0001
F022-40-1-24
.40
.20
.00
AMPLITUDE
3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16.
TIME


00002
F022-40-1-32
12.5 INCH SRB LOW PRESS THERMAL RUN F022-40
AMPLITUDE
.40
.20
.00
3.
4.
5.
6.
7.
8.
9.
10.
11.
12.
13.
14.
15.
16.
TIME

PAGES B-96 THROUGH B-113

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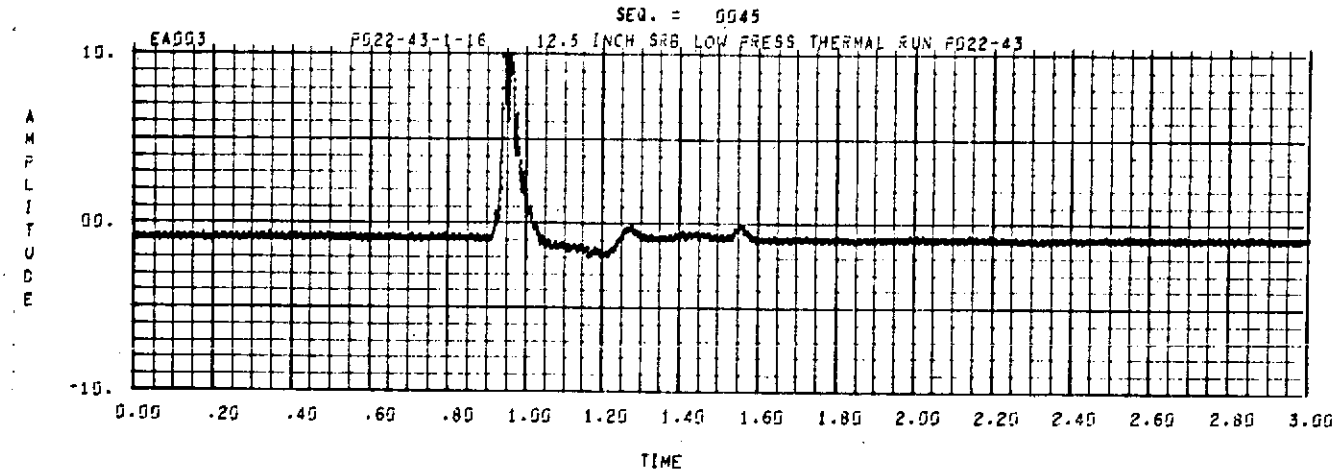
SEQ. = 0045
EA003
F022-43-1-16
12.5 INCH SRB LOW PRESS THERMAL RUN F022-43
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00.
-10.
AMPLITUDE
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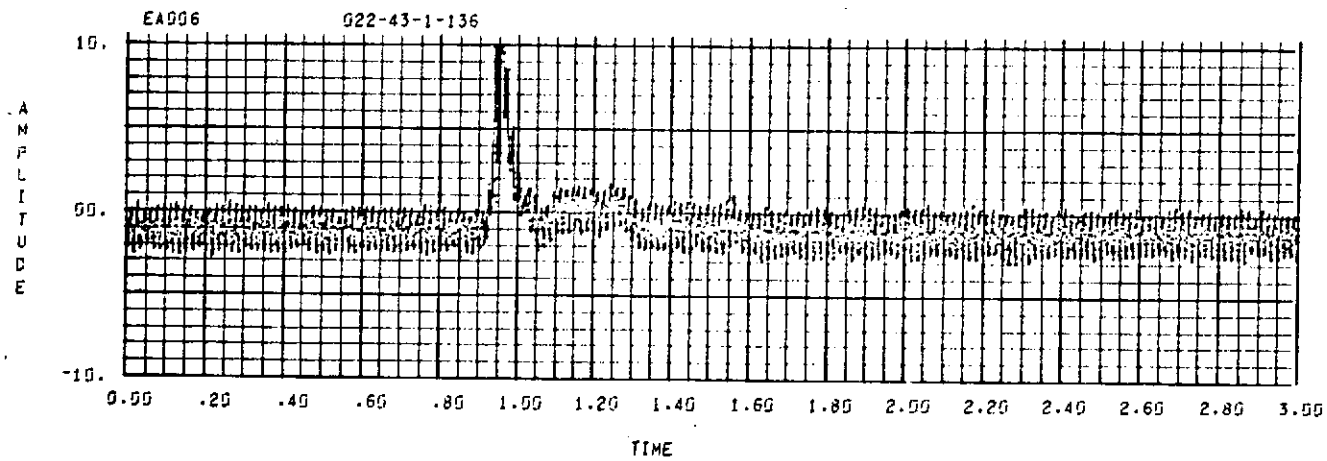
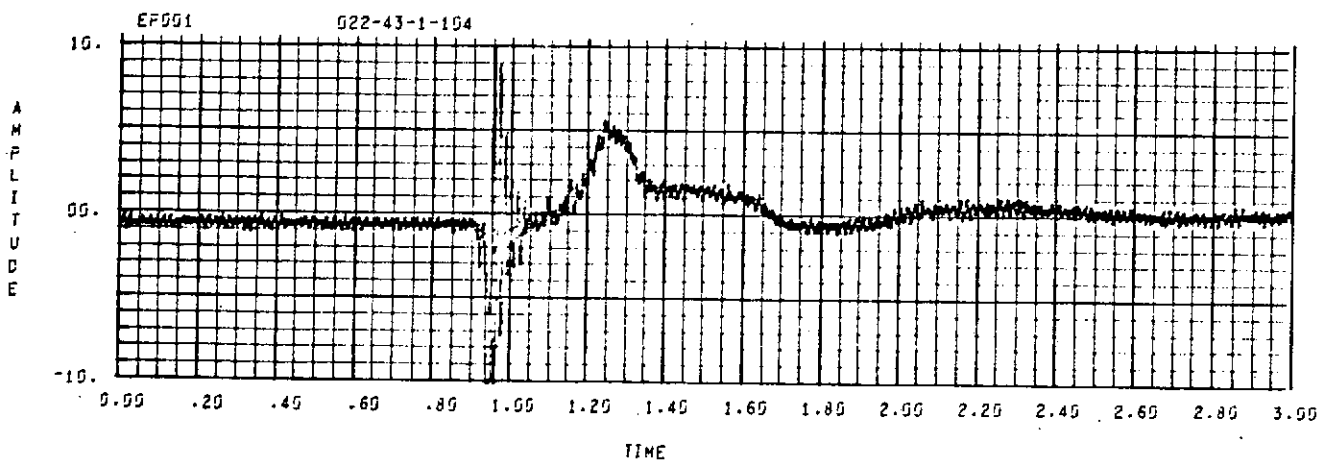
TIME


EA006
022-43-1-136
10.
00.
-10.
AMPLITUDE
0.00 .20 .40 .60 .80 1.00 1.20 1.40 1.60 1.80 2.00 2.20 2.40 2.60 2.80 3.00
TIME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022-43-1-104
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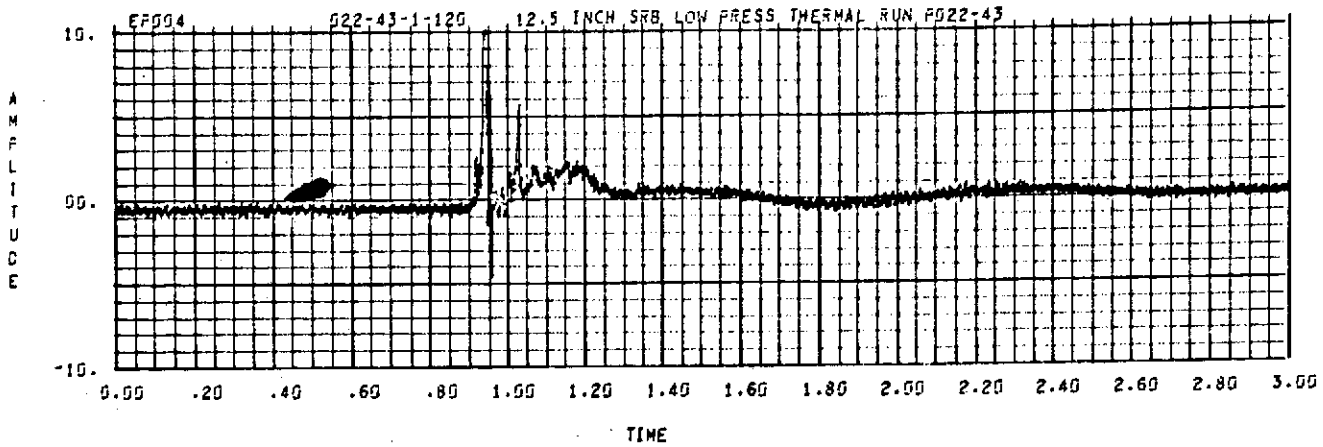
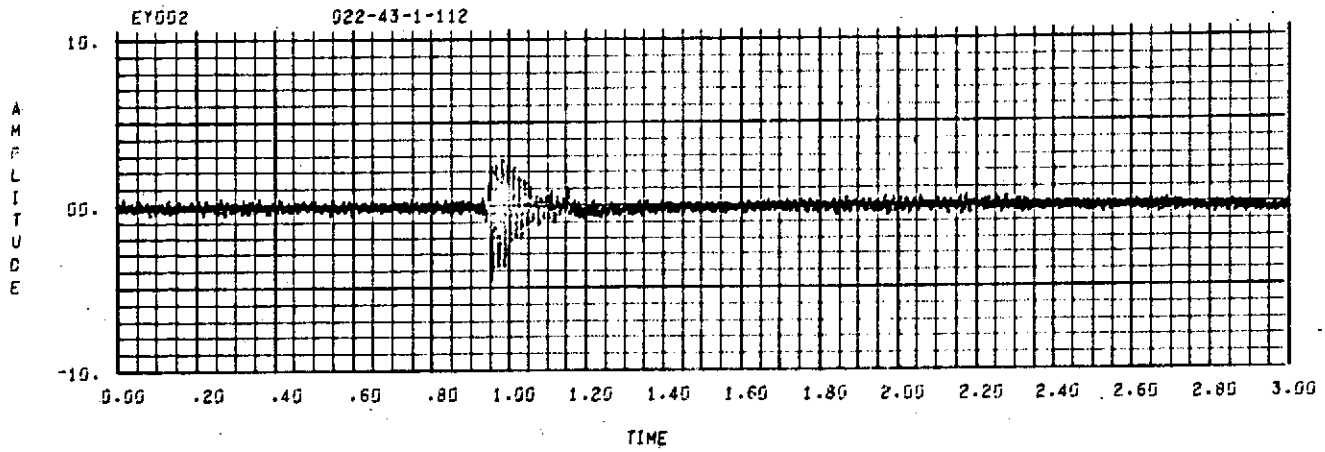
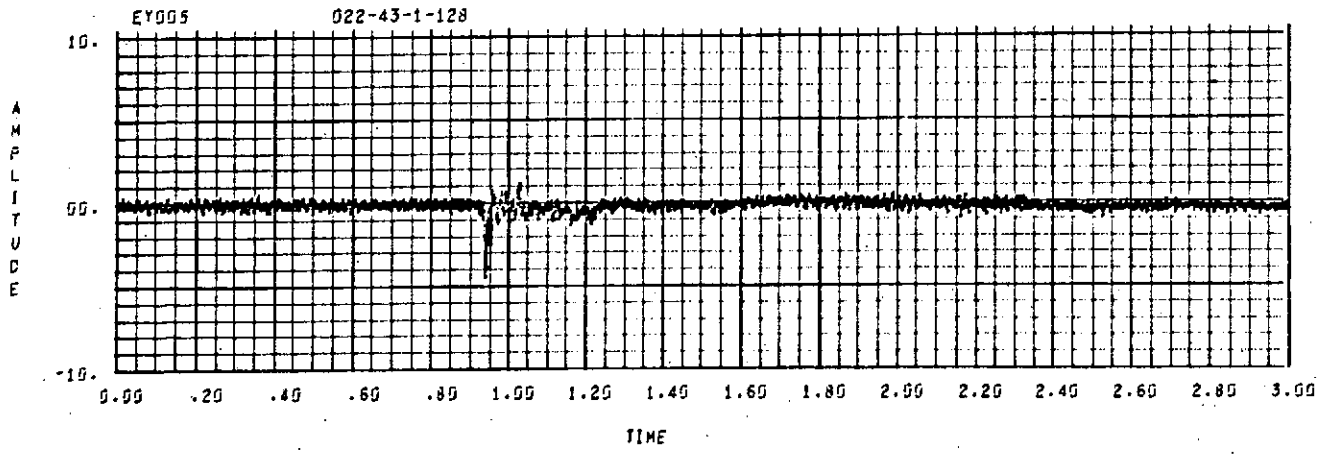
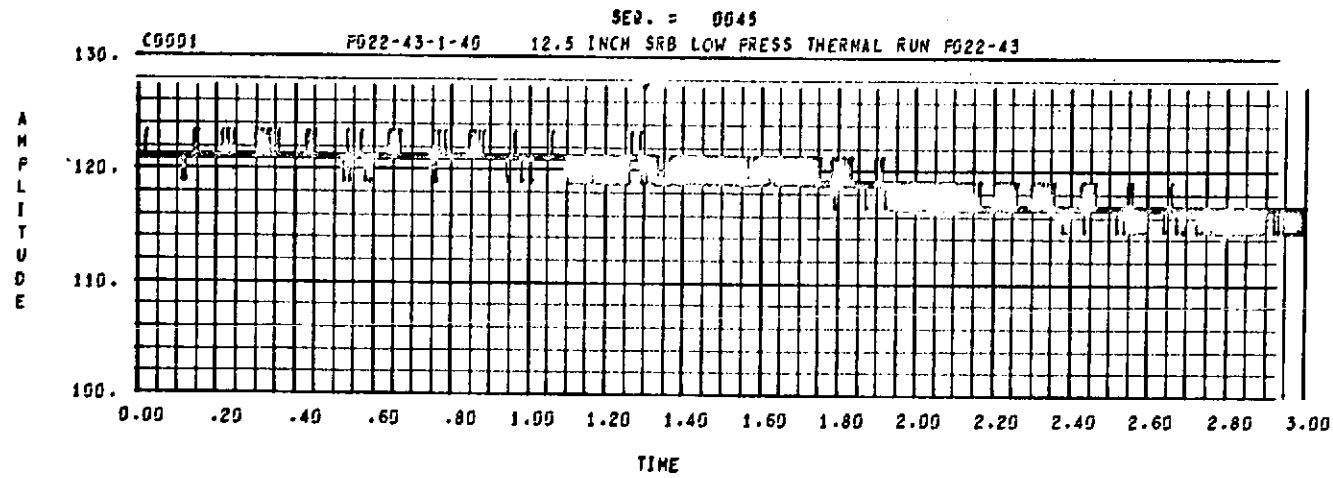
-10.
AMPLITUDE
0.00 .20 .40 .60 .80 1.00 1.20 1.40 1.60 1.80 2.00 2.20 2.40 2.60 2.80 3.00
TIME

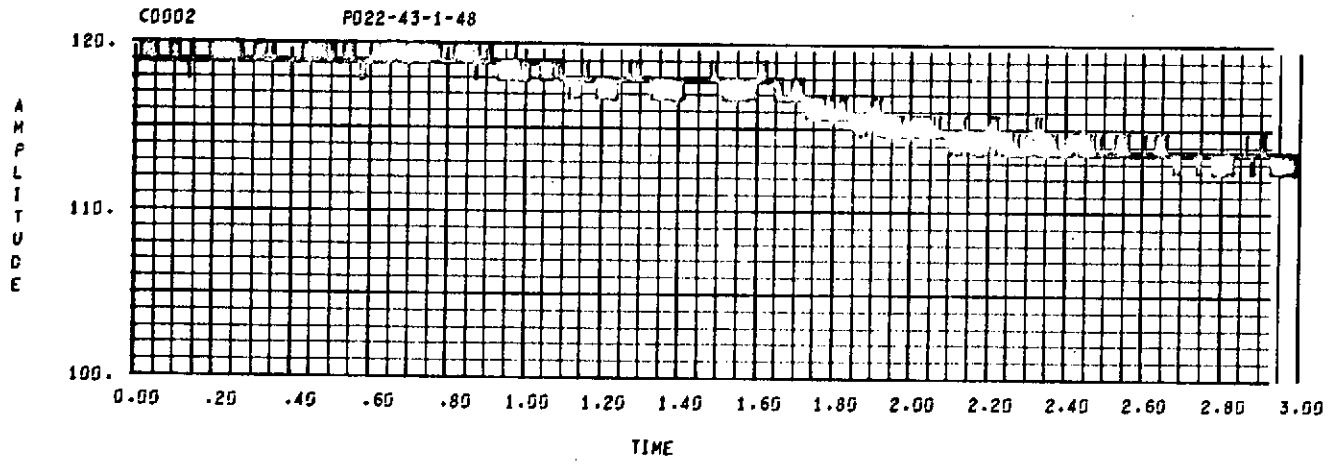
SEQ. = 0045

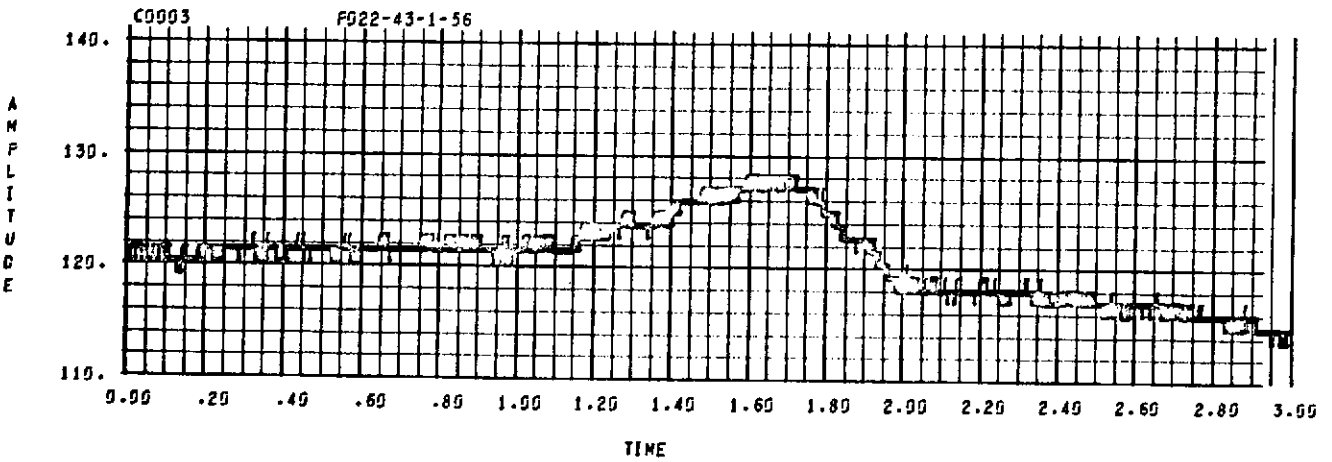

EF004
022-43-1-120
12.5 INCH SRB LOW PRESS THERMAL RUN F022-43
10.
00.
-10.
AMPLITUDE
0.00 .20 .40 .60 .80 1.00 1.20 1.40 1.60 1.80 2.00 2.20 2.40 2.60 2.80 3.00
TIME


EY002
022-43-1-112
10.
00.
-10.
AMPLITUDE
0.00 .20 .40 .60 .80 1.00 1.20 1.40 1.60 1.80 2.00 2.20 2.40 2.60 2.80 3.00
TIME


EY005
022-43-1-128
10.
00.
-10.
AMPLITUDE
0.00 .20 .40 .60 .80 1.00 1.20 1.40 1.60 1.80 2.00 2.20 2.40 2.60 2.80 3.00
TIME

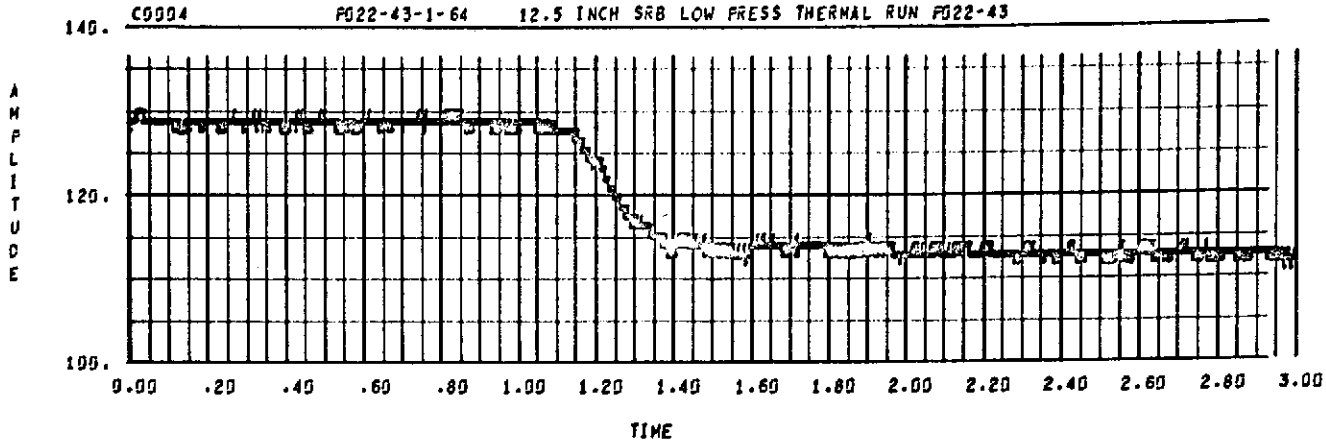

SEQ. = 0045
C0001
F022-43-1-40
12.5 INCH SRB LOW PRESS THERMAL RUN F022-43
AMPLITUDE
130.
120.
110.
100.
0.00 .20 .40 .60 .80 1.00 1.20 1.40 1.60 1.80 2.00 2.20 2.40 2.60 2.80 3.00
TIME


C0002
F022-43-1-48
AMPLITUDE
120.
110.
100.
0.00 .20 .40 .60 .80 1.00 1.20 1.40 1.60 1.80 2.00 2.20 2.40 2.60 2.80 3.00
TIME

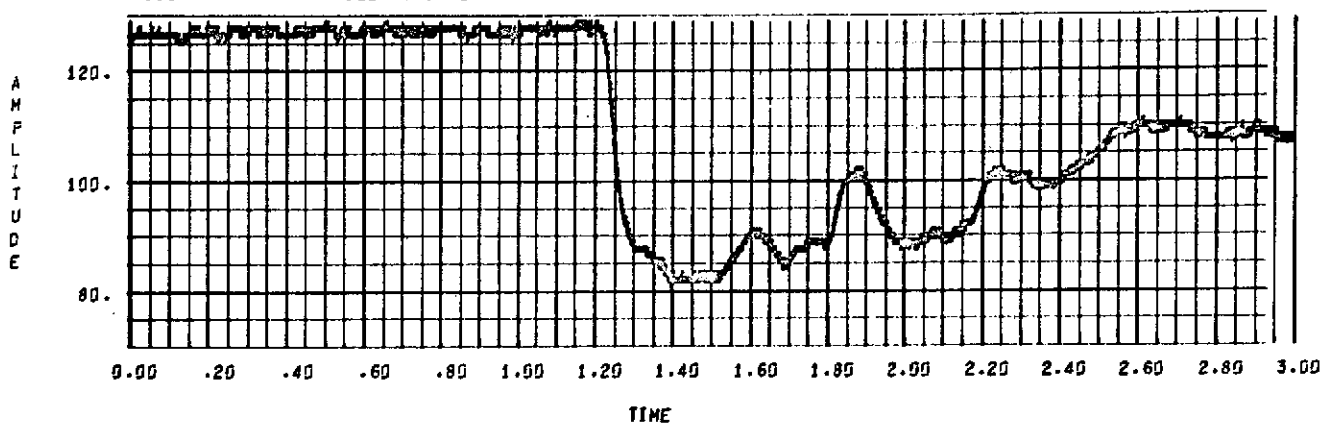

C0003
F022-43-1-56
AMPLITUDE
140.
130.
120.
110.
0.00 .20 .40 .60 .80 1.00 1.20 1.40 1.60 1.80 2.00 2.20 2.40 2.60 2.80 3.00
TIME

SER. = 0045

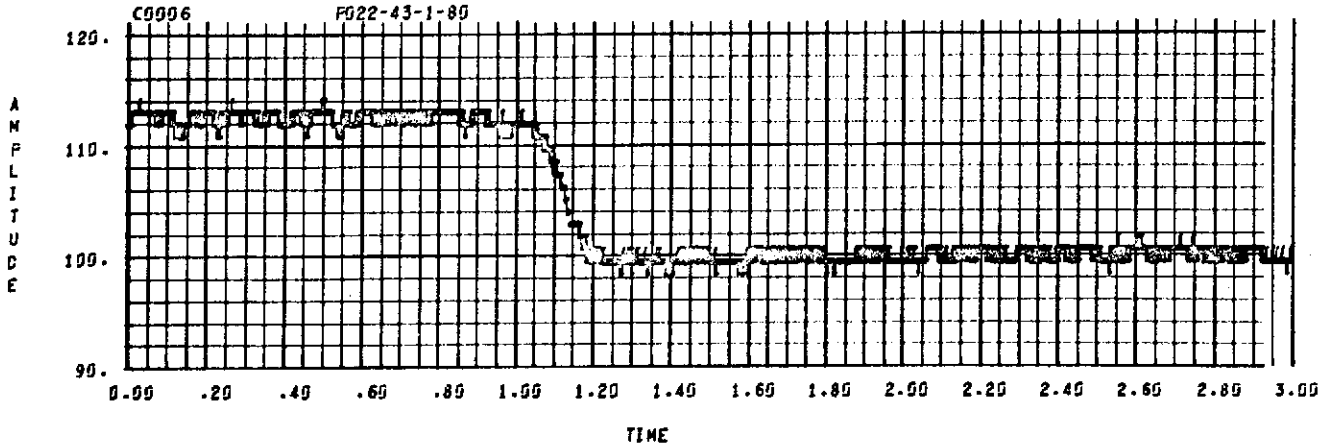
C0004 F022-43-1-64 12.5 INCH SRB LOW PRESS THERMAL RUN F022-43

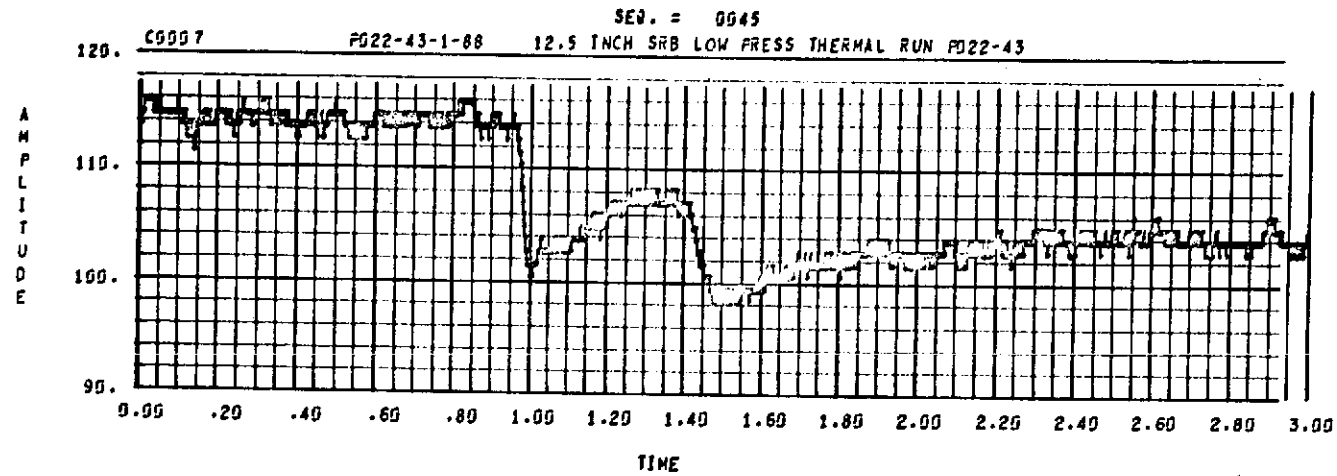


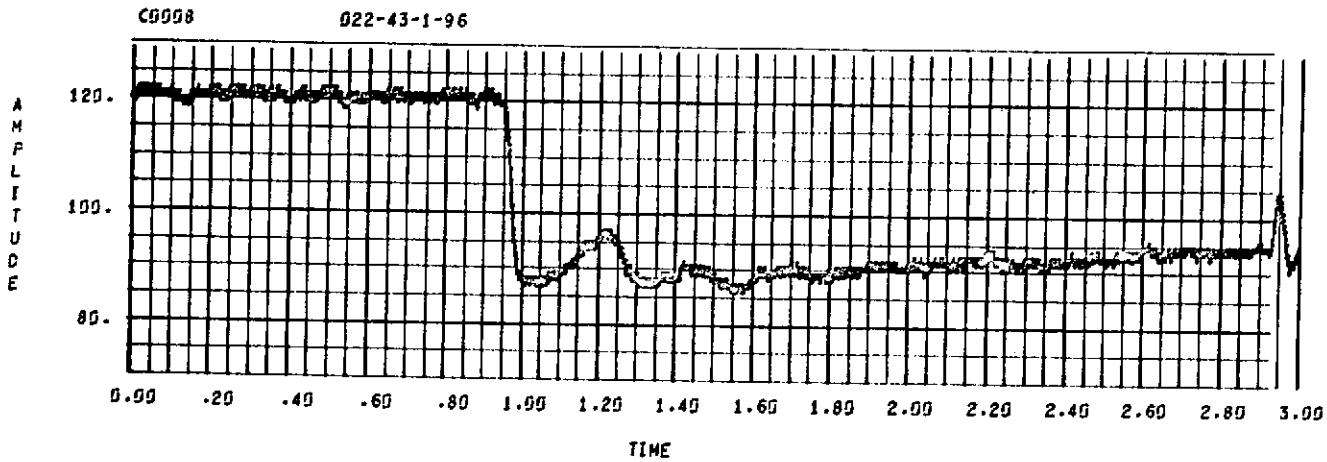
C0005 F022-43-1-72

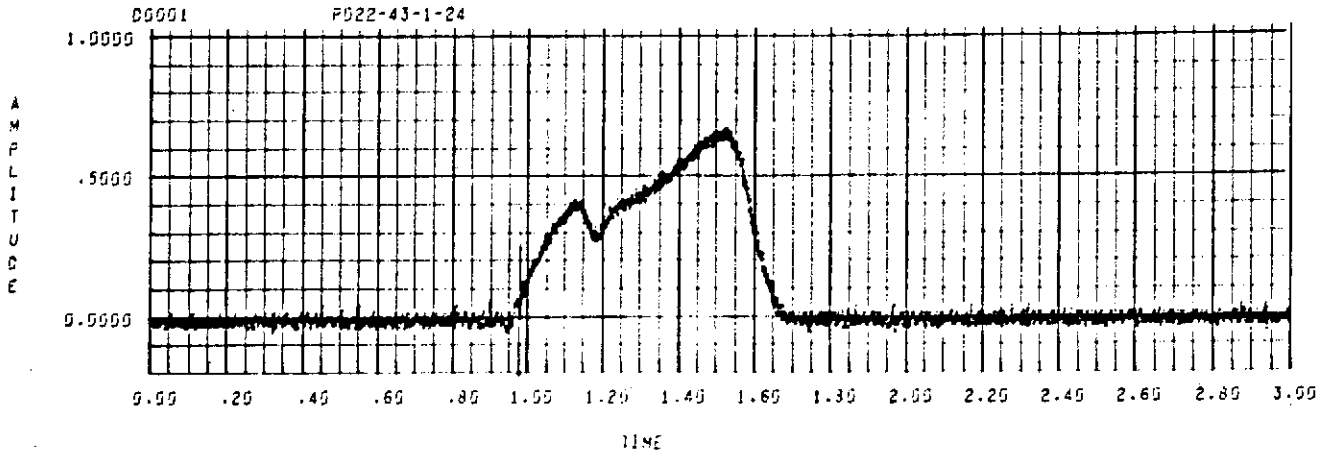


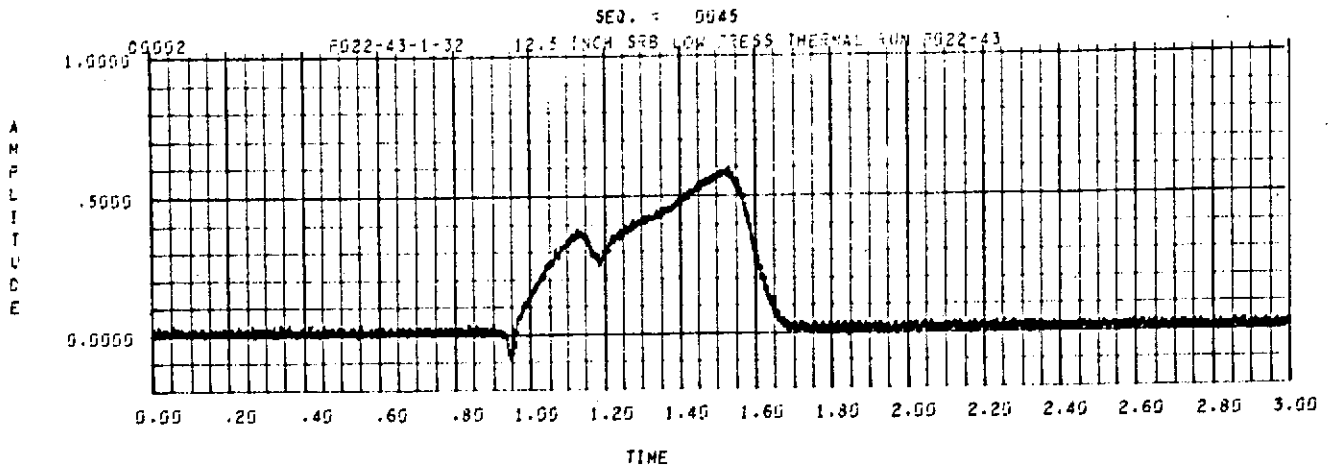
C0006 F022-43-1-80



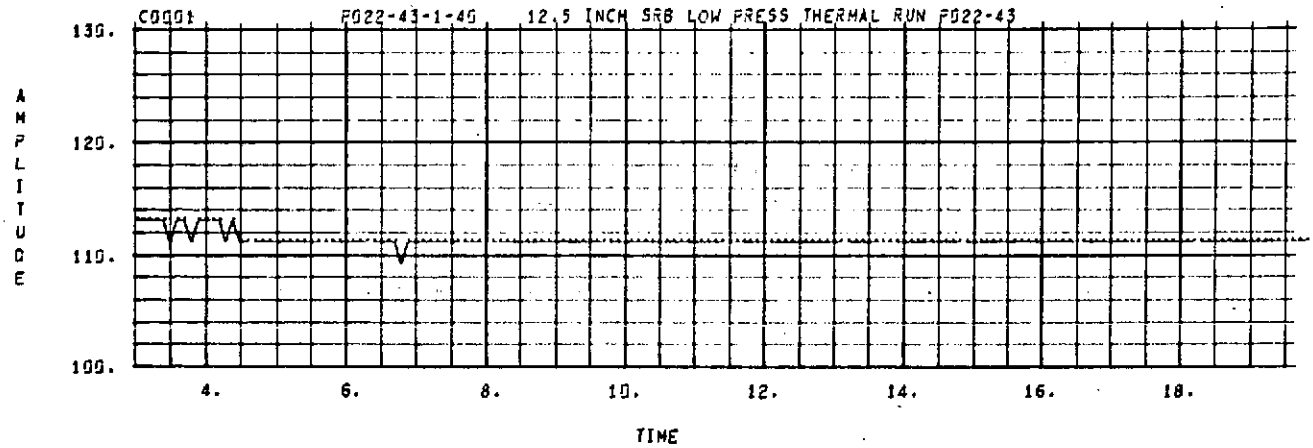

SEQ. = 0045
C0007
F022-43-1-88
12.5 INCH SRB LOW PRESS THERMAL RUN F022-43
AMPLITUDE
120.
110.
100.
90.
0.00
.20
.40
.60
.80
1.00
1.20
1.40
1.60
1.80
2.00
2.20
2.40
2.60
2.80
3.00
TIME

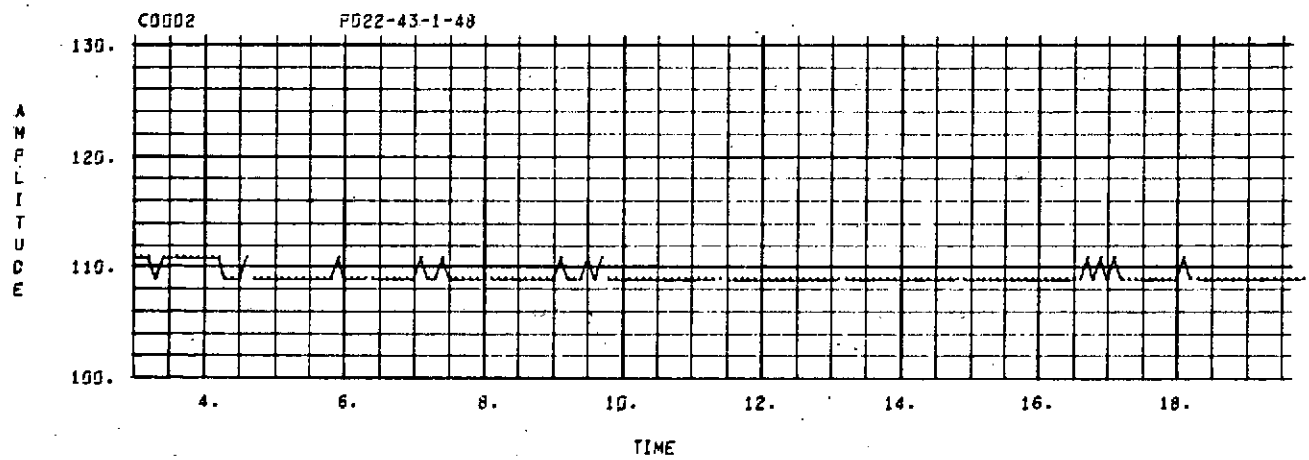

C0008
022-43-1-96
AMPLITUDE
120.
100.
80.
0.00
.20
.40
.60
.80
1.00
1.20
1.40
1.60
1.80
2.00
2.20
2.40
2.60
2.80
3.00
TIME

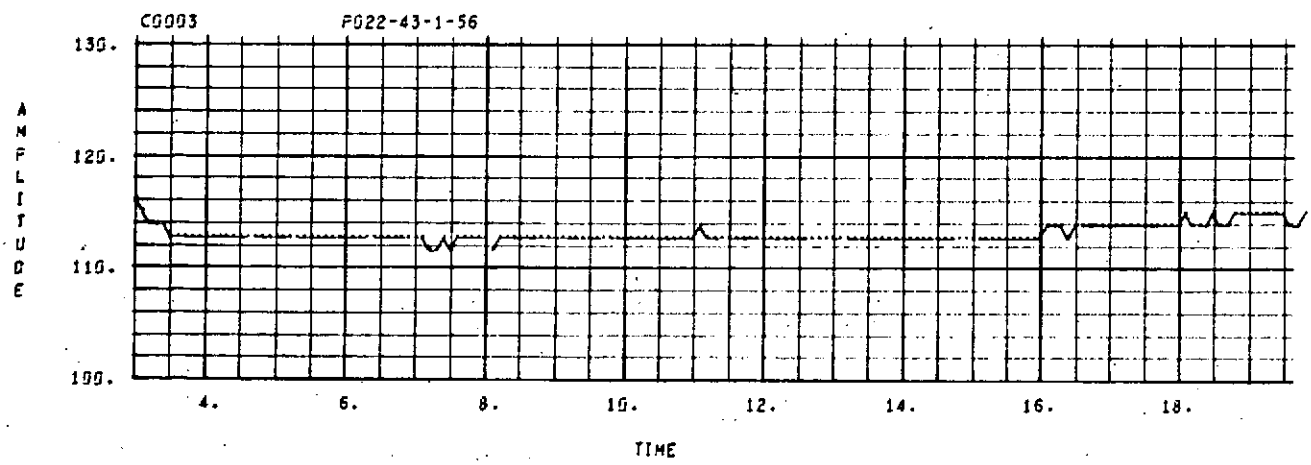

00001
F022-43-1-24
1.0000
.5000
0.0000
AMPLITUDE
0.00 .20 .40 .60 .80 1.00 1.20 1.40 1.60 1.80 2.00 2.20 2.40 2.60 2.80 3.00
TIME

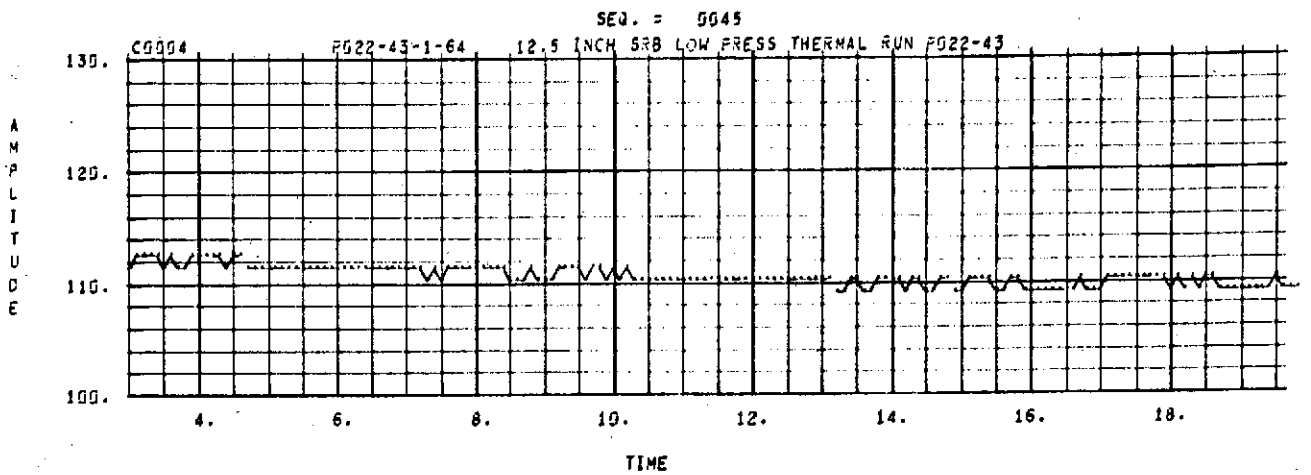

SEQ. = 0045
00002
F022-43-1-32
1.0000
.5000
0.0000
AMPLITUDE
0.00 .20 .40 .60 .80 1.00 1.20 1.40 1.60 1.80 2.00 2.20 2.40 2.60 2.80 3.00
TIME

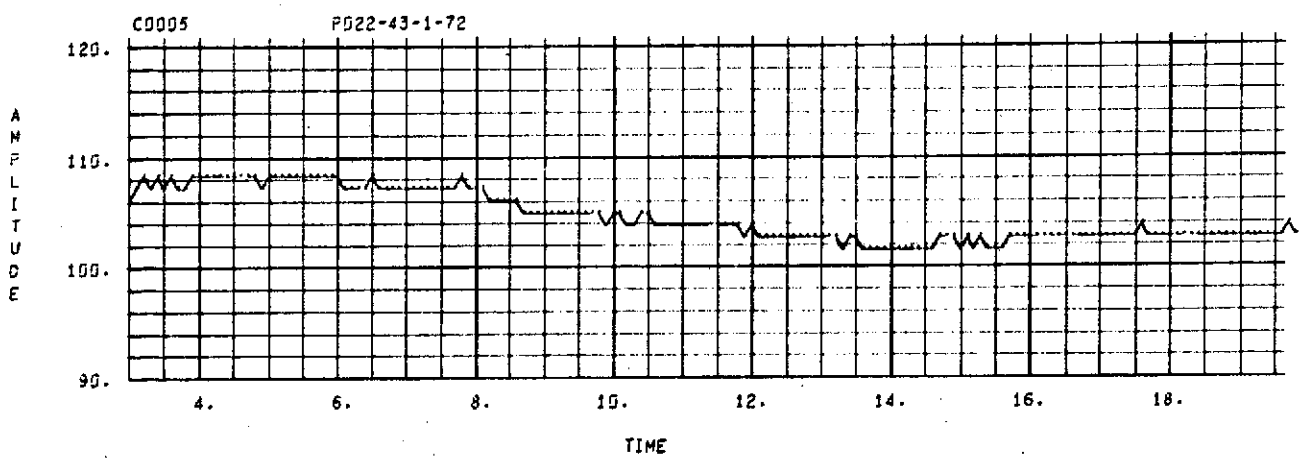
SEQ. = 0045

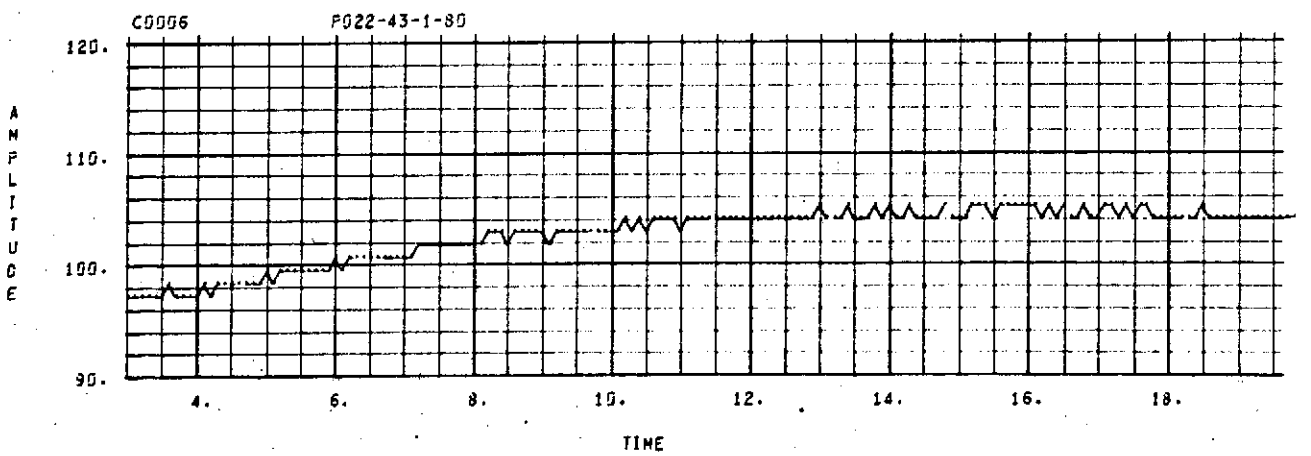

C0001
F022-43-1-46
12.5 INCH SRB LOW PRESS THERMAL RUN F022-43
130.
120.
110.
100.
AMPLITUDE
4.
6.
8.
10.
12.
14.
16.
18.
TIME

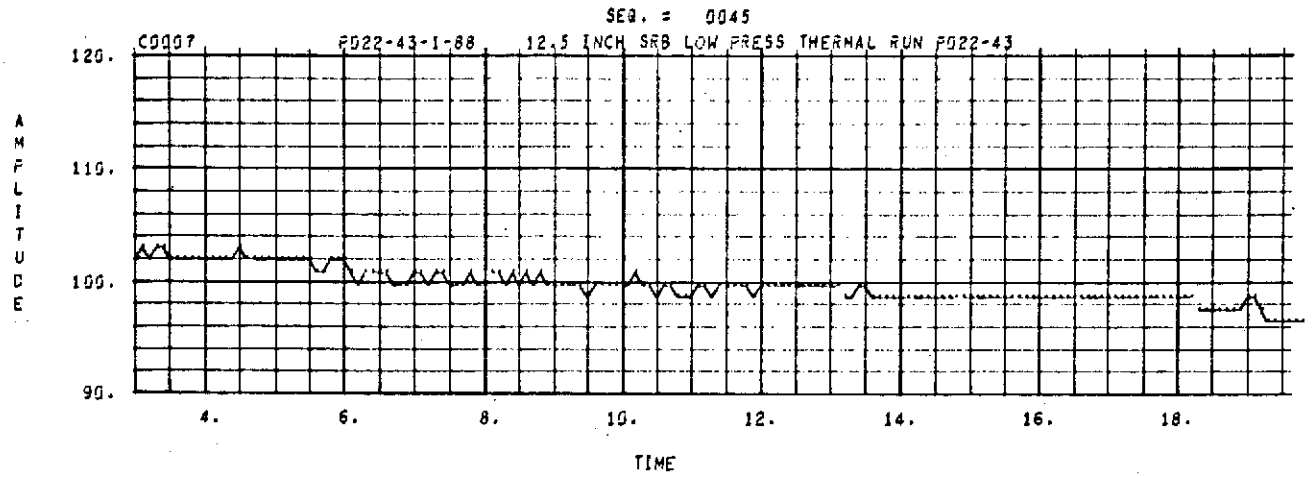

C0002
F022-43-1-48
130.
120.
110.
100.
AMPLITUDE
4.
6.
8.
10.
12.
14.
16.
18.
TIME

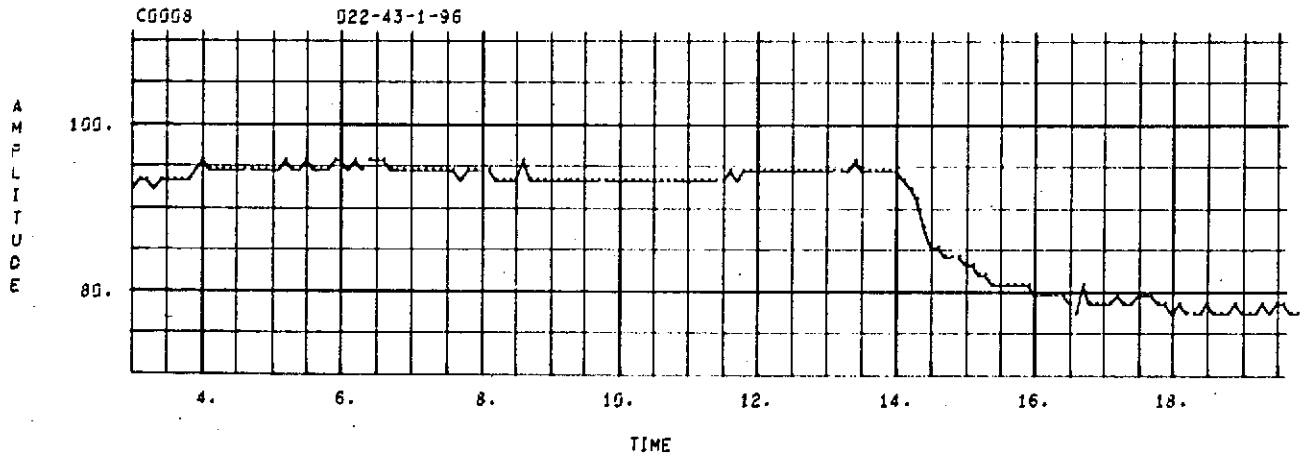

C0003
F022-43-1-56
130.
120.
110.
100.
AMPLITUDE
4.
6.
8.
10.
12.
14.
16.
18.
TIME

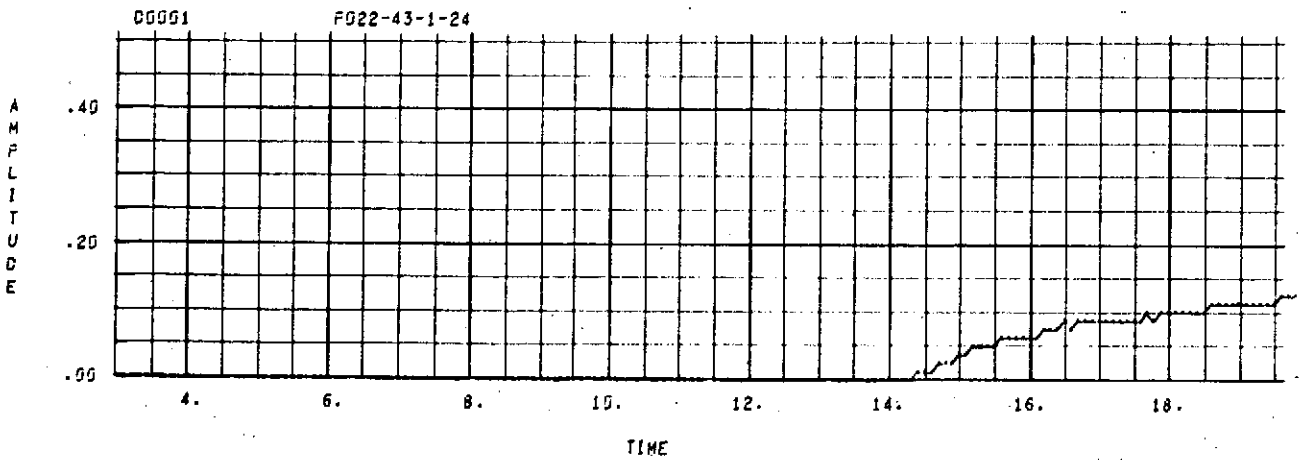

SEQ. = 0045
C0004
P022-43-1-64
12.5 INCH SRB LOW PRESS THERMAL RUN P022-43
130.
120.
110.
100.
AMPLITUDE
4.
6.
8.
10.
12.
14.
16.
18.
TIME

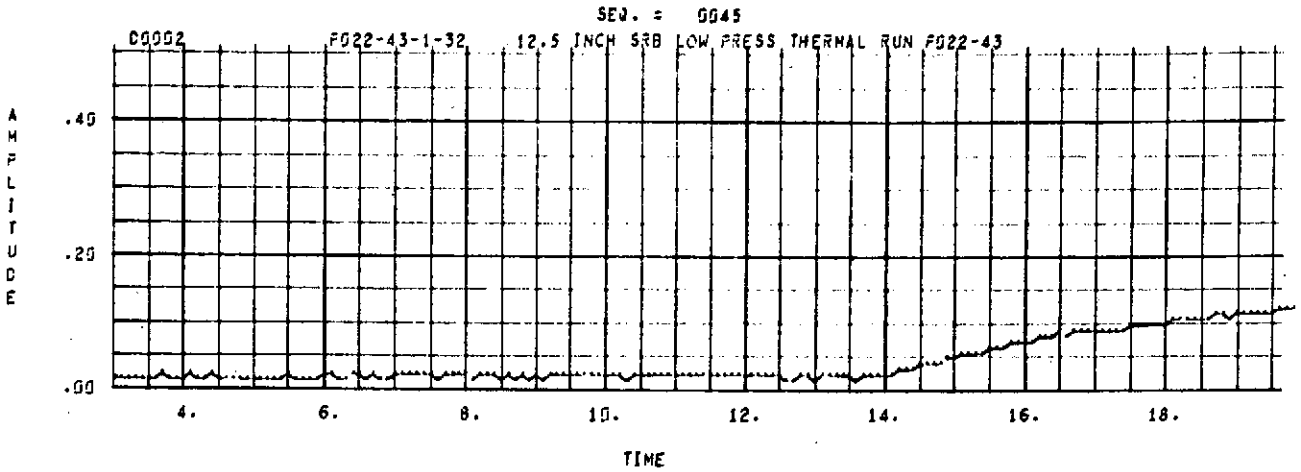

C0005
P022-43-1-72
120.
110.
100.
90.
AMPLITUDE
4.
6.
8.
10.
12.
14.
16.
18.
TIME

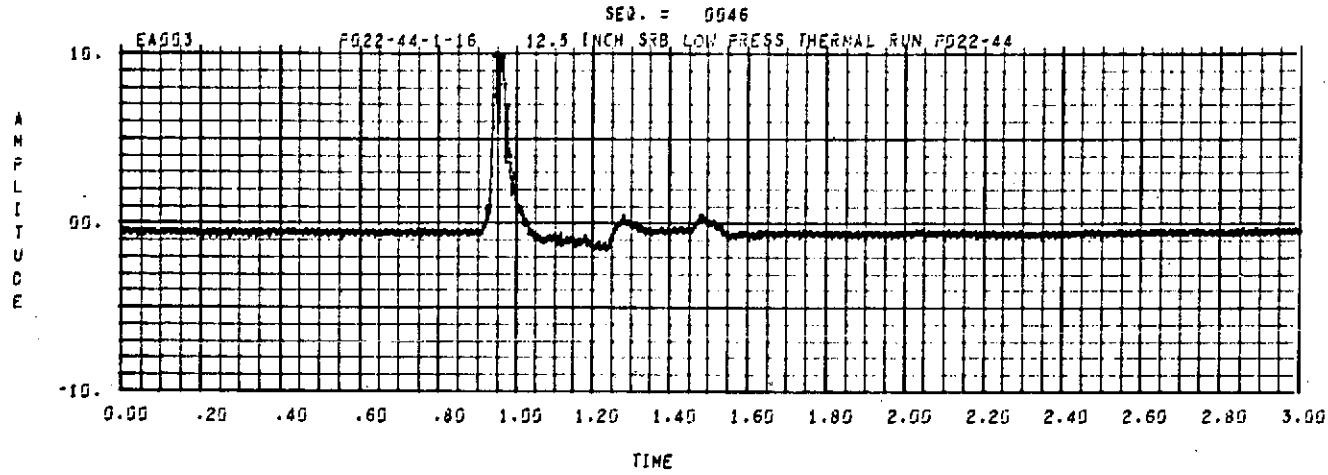

C0006
P022-43-1-80
120.
110.
100.
90.
AMPLITUDE
4.
6.
8.
10.
12.
14.
16.
18.
TIME

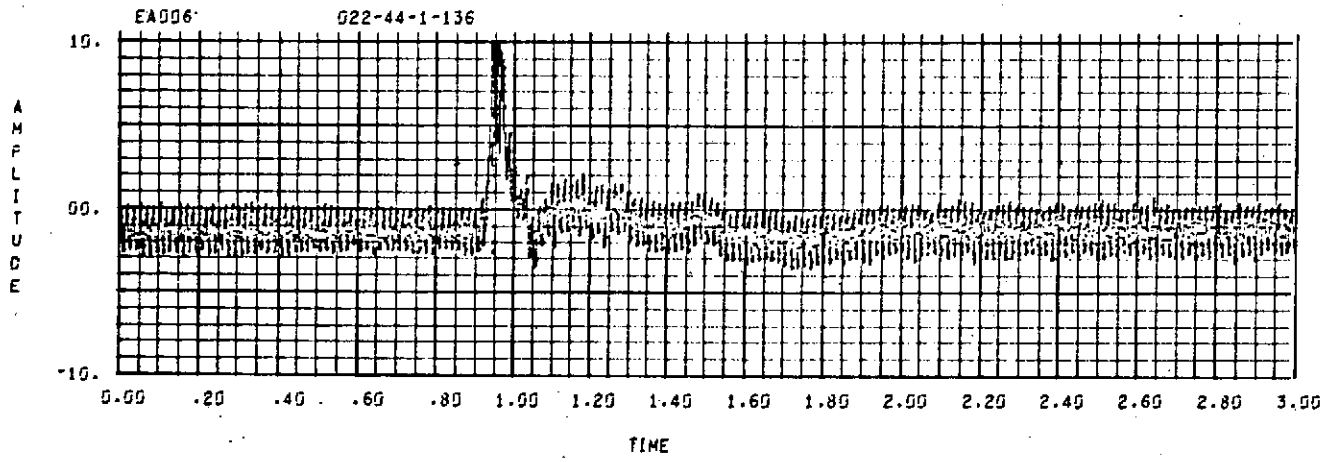

SEQ. = 0045
C0007
F022-43-1-88
12.5 INCH SRB LOW PRESS THERMAL RUN F022-43
120.
110.
100.
90.
AMPLITUDE
4.
6.
8.
10.
12.
14.
16.
18.
TIME

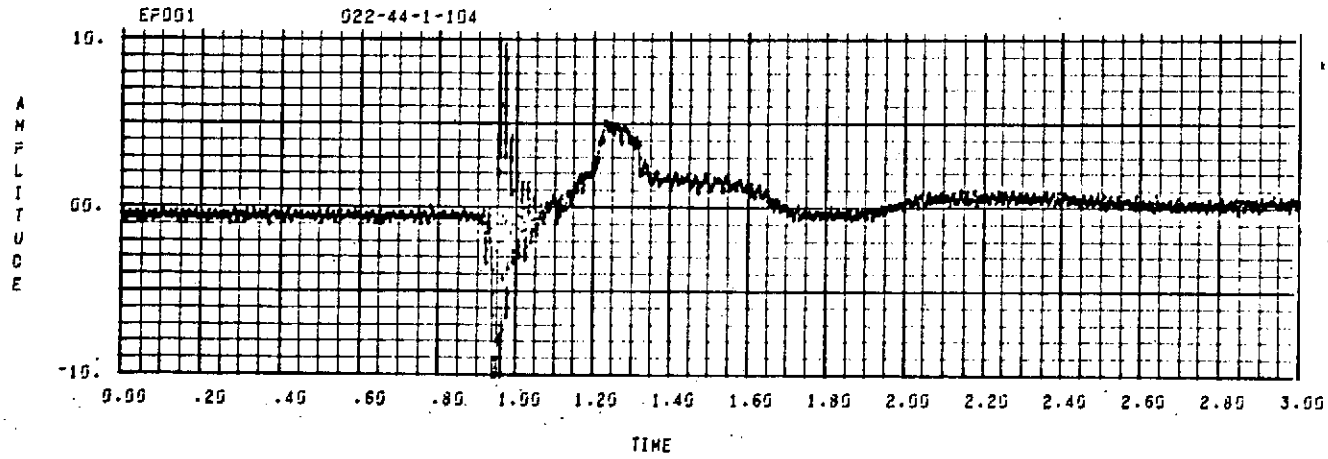

C0008
022-43-1-96
100.
80.
AMPLITUDE
4.
6.
8.
10.
12.
14.
16.
18.
TIME

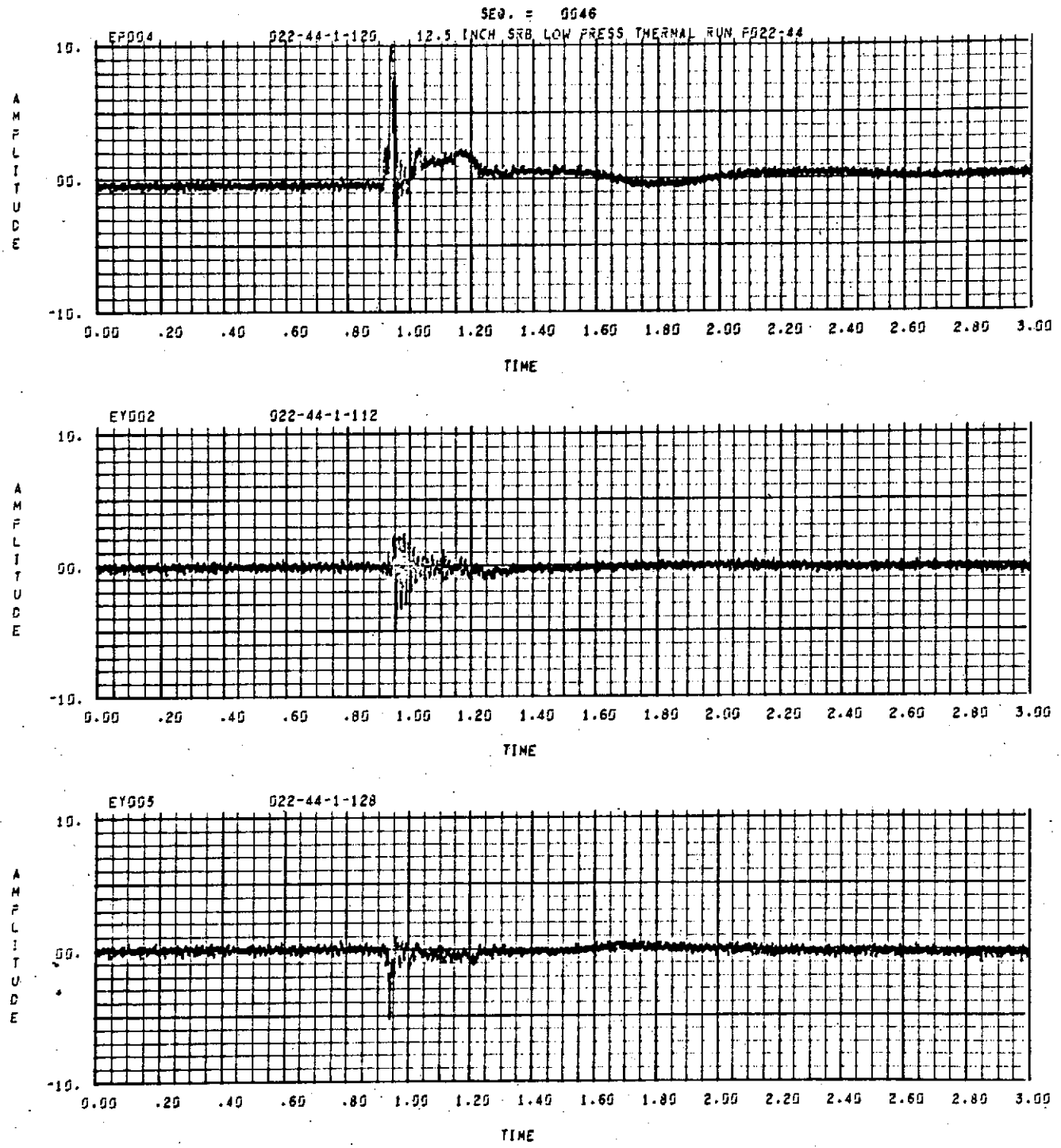

C0001
F022-43-1-24
.40
.20
.00
AMPLITUDE
4.
6.
8.
10.
12.
14.
16.
18.
TIME

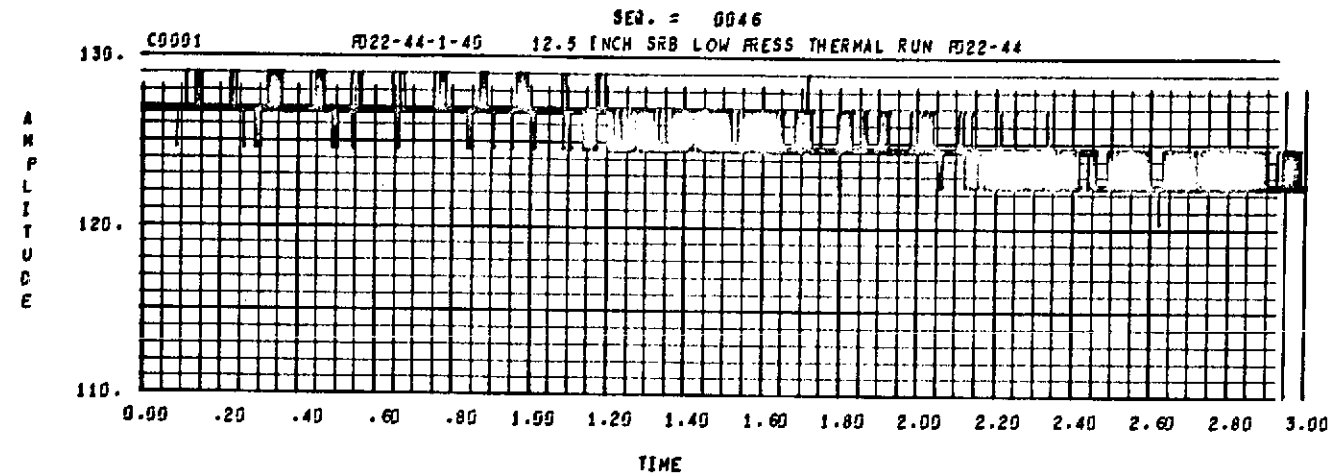

SEQ. = 0045
C0002
F022-43-1-32
12.5 INCH SRB LOW PRESS THERMAL RUN F022-43
AMPLITUDE
.40
.20
.00
4.
6.
8.
10.
12.
14.
16.
18.
TIME

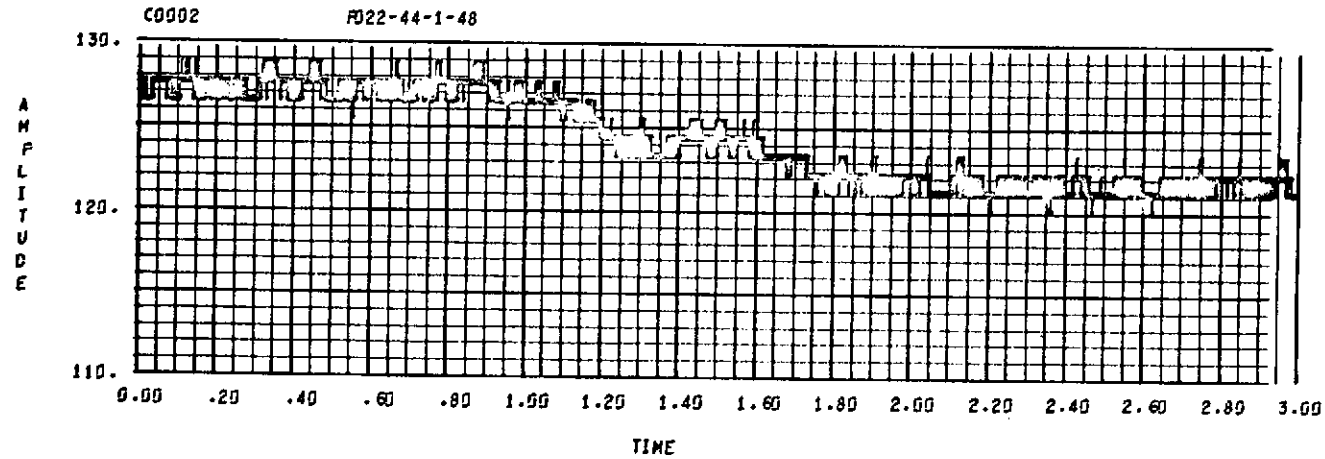

SEQ. = 0046
EA003
F022-44-1-16
12.5 INCH SRB LOW PRESS THERMAL RUN F022-44
10.
00.
-10.
AMPLITUDE
0.00 .20 .40 .60 .80 1.00 1.20 1.40 1.60 1.80 2.00 2.20 2.40 2.60 2.80 3.00
TIME

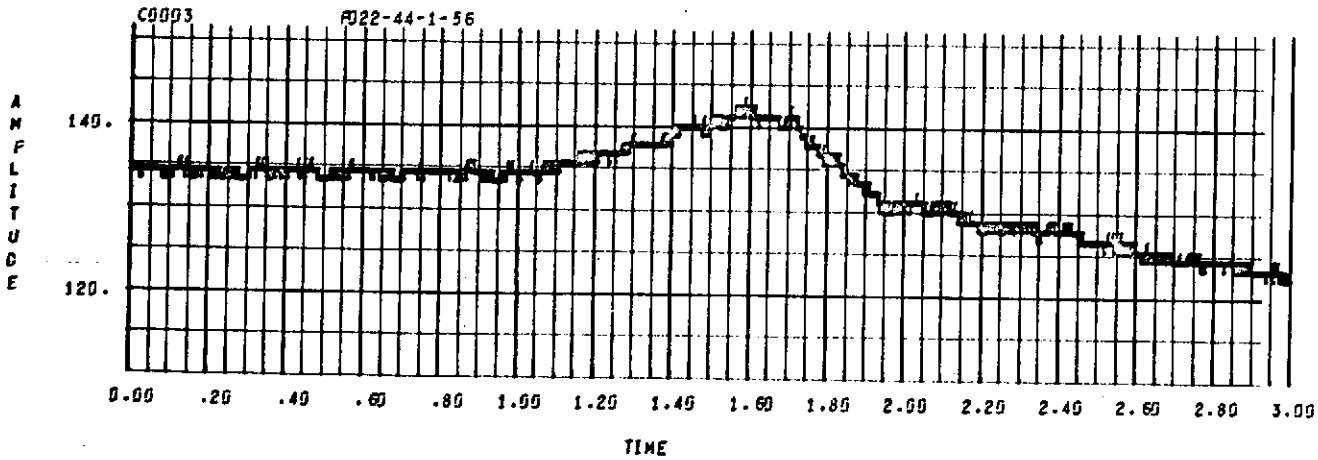

EA006
022-44-1-136
10.
00.
-10.
AMPLITUDE
0.00 .20 .40 .60 .80 1.00 1.20 1.40 1.60 1.80 2.00 2.20 2.40 2.60 2.80 3.00
TIME


EF001
022-44-1-104
10.
00.
-10.
AMPLITUDE
0.00 .20 .40 .60 .80 1.00 1.20 1.40 1.60 1.80 2.00 2.20 2.40 2.60 2.80 3.00
TIME


SEQ. = 0046
EP004
022-44-1-120
12.5 INCH SRB LOW PRESS THERMAL RUN F022-44
AMPLITUDE
10.
00.
-10.
0.00 .20 .40 .60 .80 1.00 1.20 1.40 1.60 1.80 2.00 2.20 2.40 2.60 2.80 3.00
TIME
EY002
022-44-1-112
AMPLITUDE
10.
00.
-10.
0.00 .20 .40 .60 .80 1.00 1.20 1.40 1.60 1.80 2.00 2.20 2.40 2.60 2.80 3.00
TIME
EY005
022-44-1-128
AMPLITUDE
10.
00.
-10.
0.00 .20 .40 .60 .80 1.00 1.20 1.40 1.60 1.80 2.00 2.20 2.40 2.60 2.80 3.00
TIME

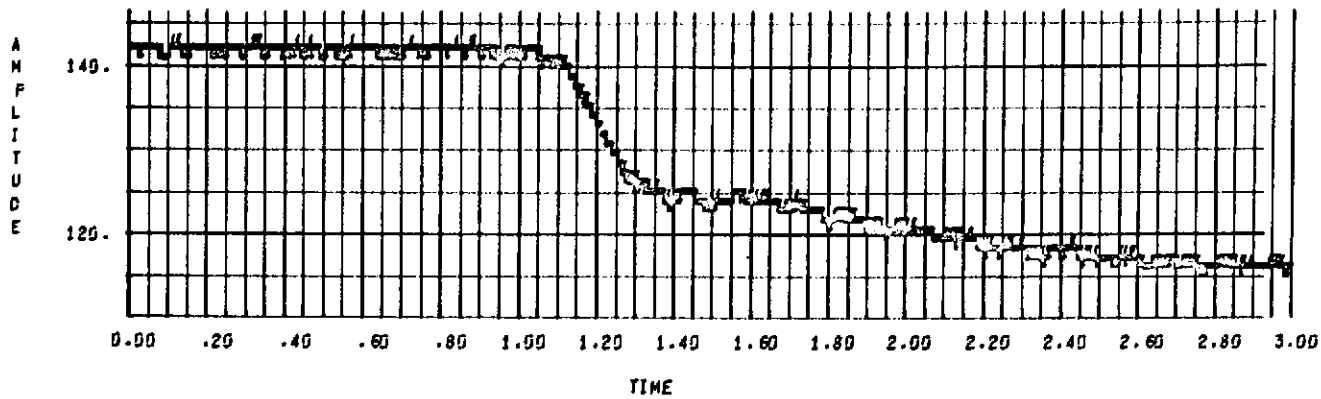

SEQ. = 0046
C0001
F022-44-1-46
12.5 INCH SRB LOW PRESS THERMAL RUN F022-44
130.
120.
110.
AMPLITUDE
0.00 .20 .40 .60 .80 1.00 1.20 1.40 1.60 1.80 2.00 2.20 2.40 2.60 2.80 3.00
TIME


C0002
F022-44-1-48
130.
120.
110.
AMPLITUDE
0.00 .20 .40 .60 .80 1.00 1.20 1.40 1.60 1.80 2.00 2.20 2.40 2.60 2.80 3.00
TIME

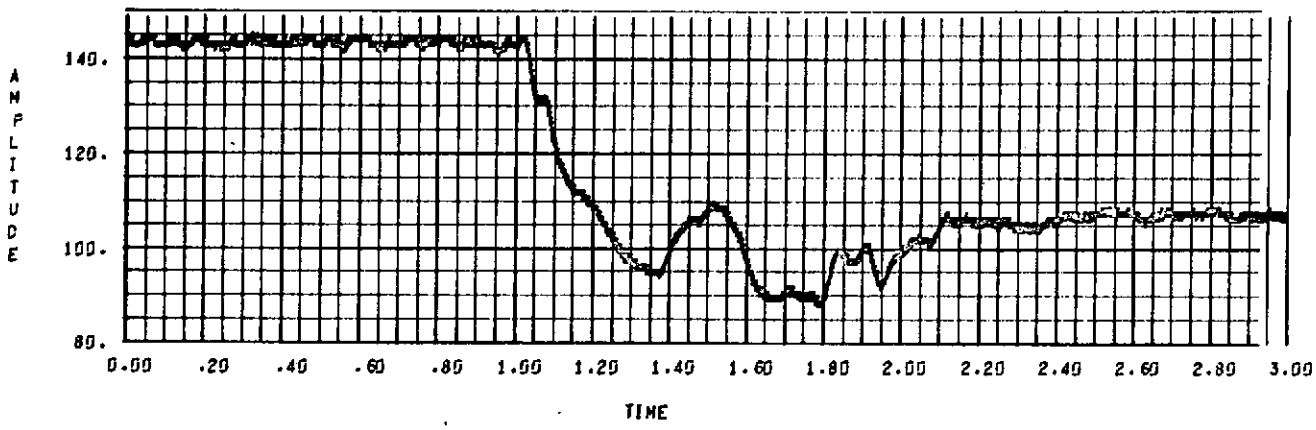

C0003
F022-44-1-56
140.
120.
AMPLITUDE
0.00 .20 .40 .60 .80 1.00 1.20 1.40 1.60 1.80 2.00 2.20 2.40 2.60 2.80 3.00
TIME

SEQ. = 0046 2

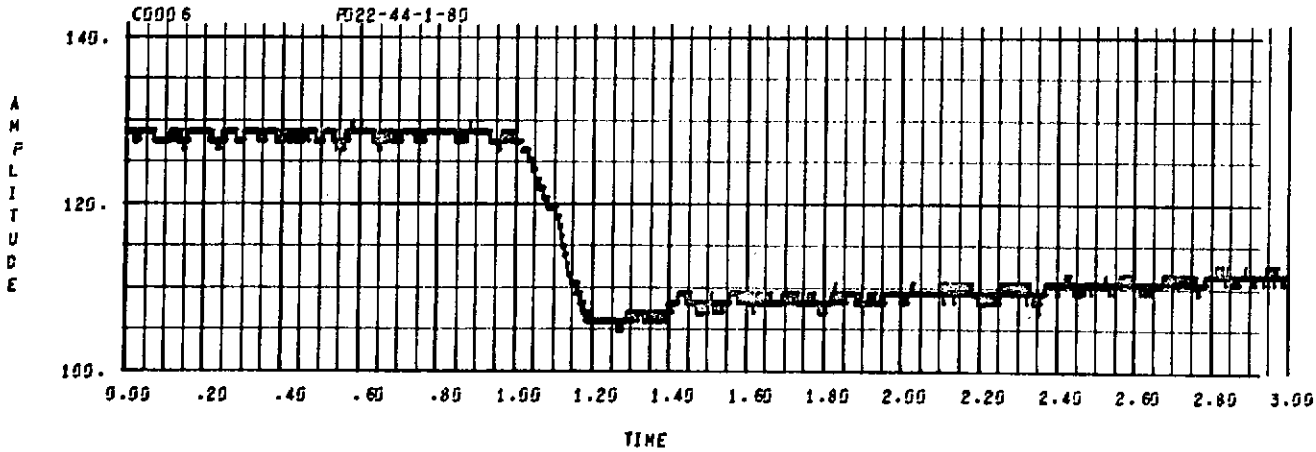
C0004 F022-44-1-64 12.5 INCH SRB LOW PRESS THERMAL RUN F022-44

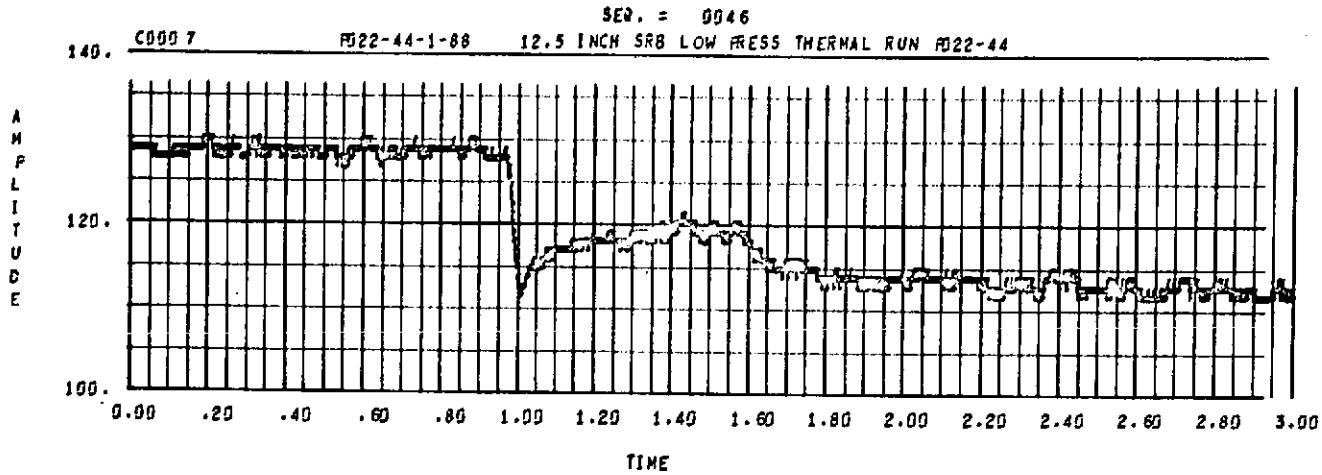


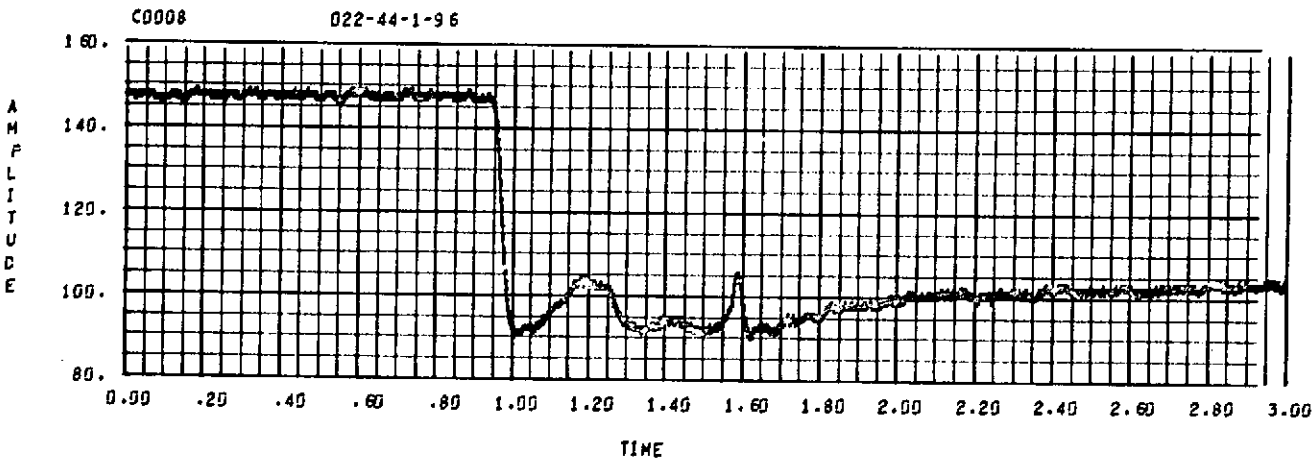
C0005 F022-44-1-72

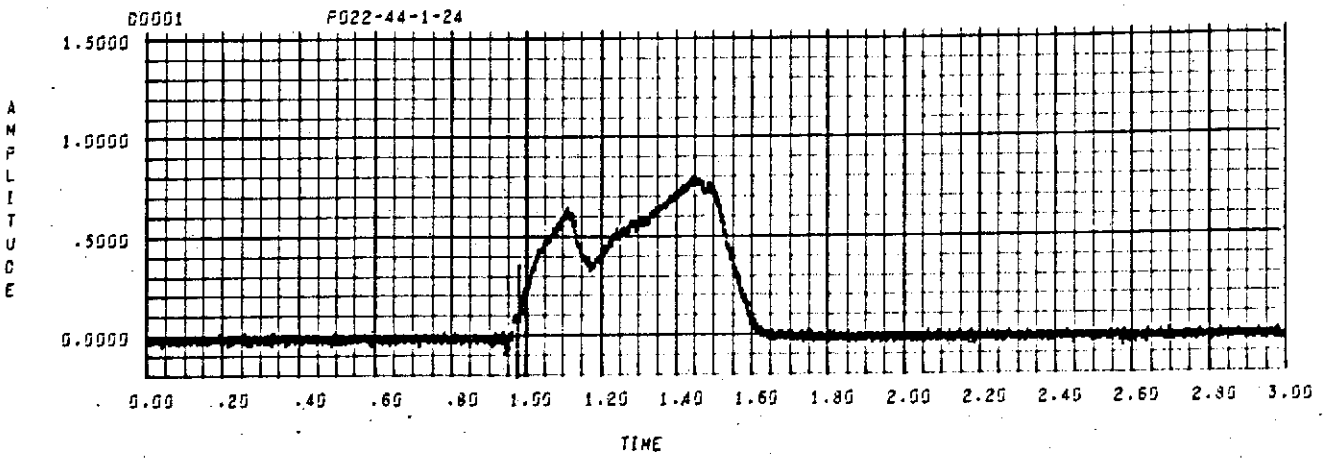


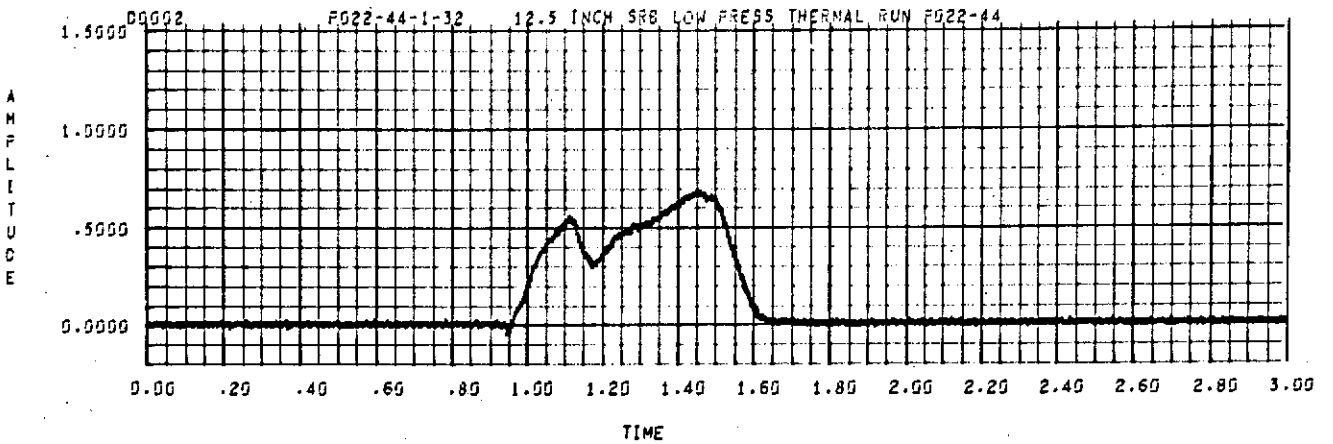
C0006 F022-44-1-80



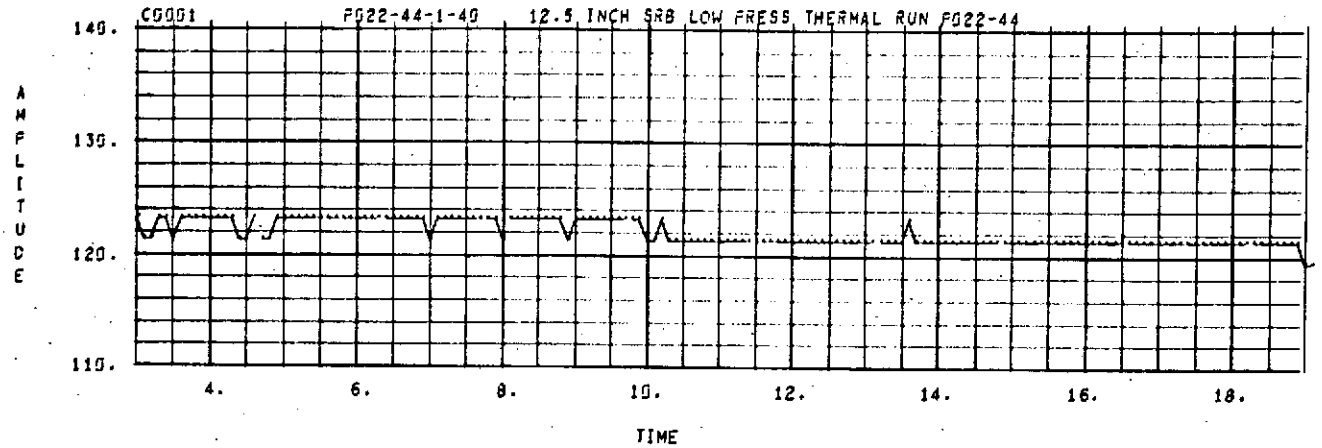

SER. = 0046
C0007
M022-44-1-88
12.5 INCH SRB LOW PRESS THERMAL RUN M022-44
AMPLITUDE
140.
120.
100.
0.00
.20
.40
.60
.80
1.00
1.20
1.40
1.60
1.80
2.00
2.20
2.40
2.60
2.80
3.00
TIME

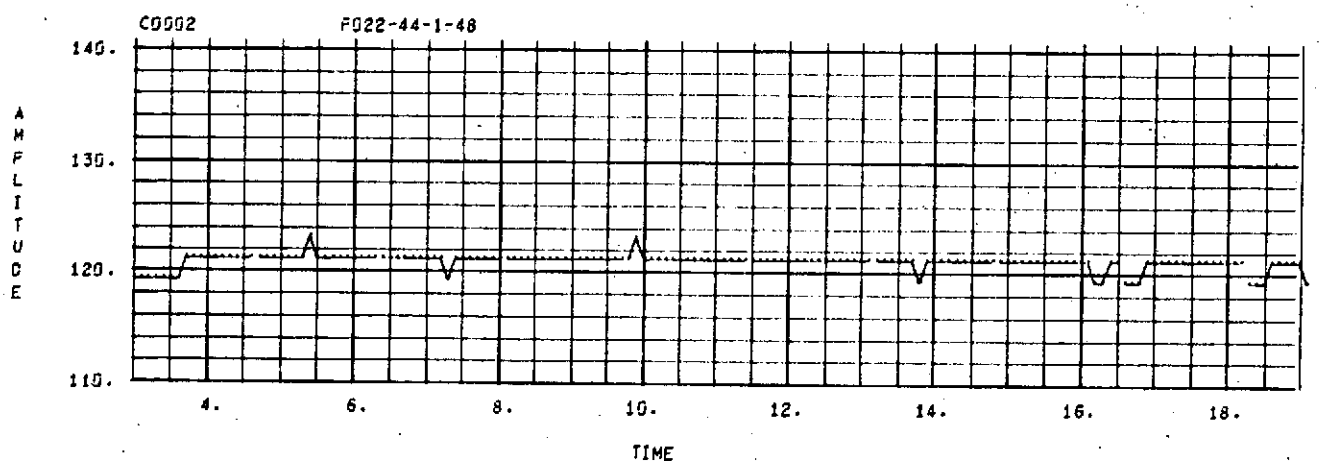

C0008
022-44-1-96
AMPLITUDE
160.
140.
120.
100.
80.
0.00
.20
.40
.60
.80
1.00
1.20
1.40
1.60
1.80
2.00
2.20
2.40
2.60
2.80
3.00
TIME

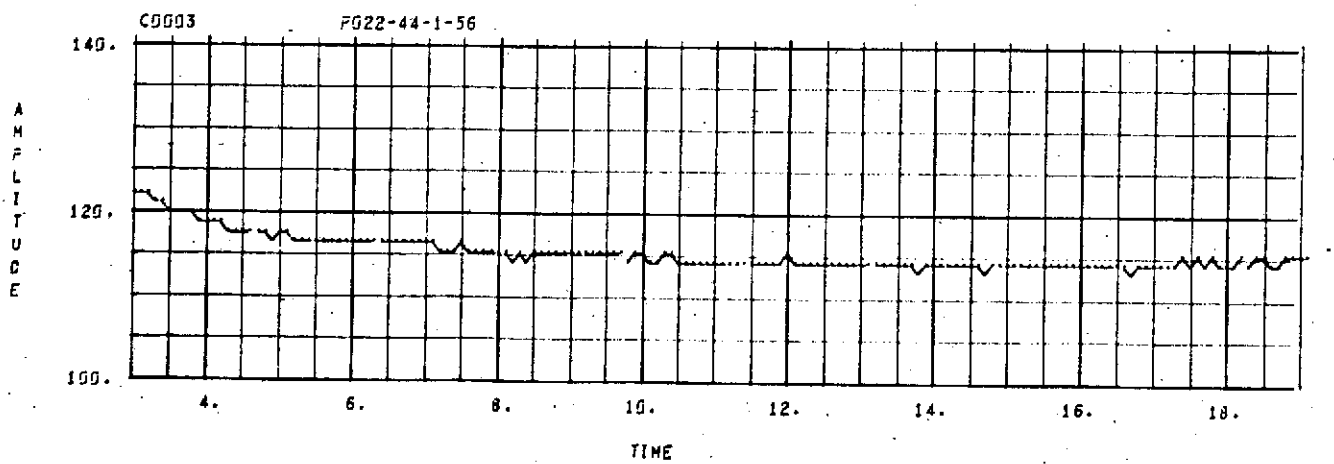

00001
F022-44-1-24
1.5000
1.0000
.5000
0.0000
AMPLITUDE
0.00 .20 .40 .60 .80 1.00 1.20 1.40 1.60 1.80 2.00 2.20 2.40 2.60 2.80 3.00
TIME


00002
F022-44-1-32
12.5 INCH SRB LOW PRESS THERMAL RUN F022-44
1.5000
1.0000
.5000
0.0000
AMPLITUDE
0.00 .20 .40 .60 .80 1.00 1.20 1.40 1.60 1.80 2.00 2.20 2.40 2.60 2.80 3.00
TIME

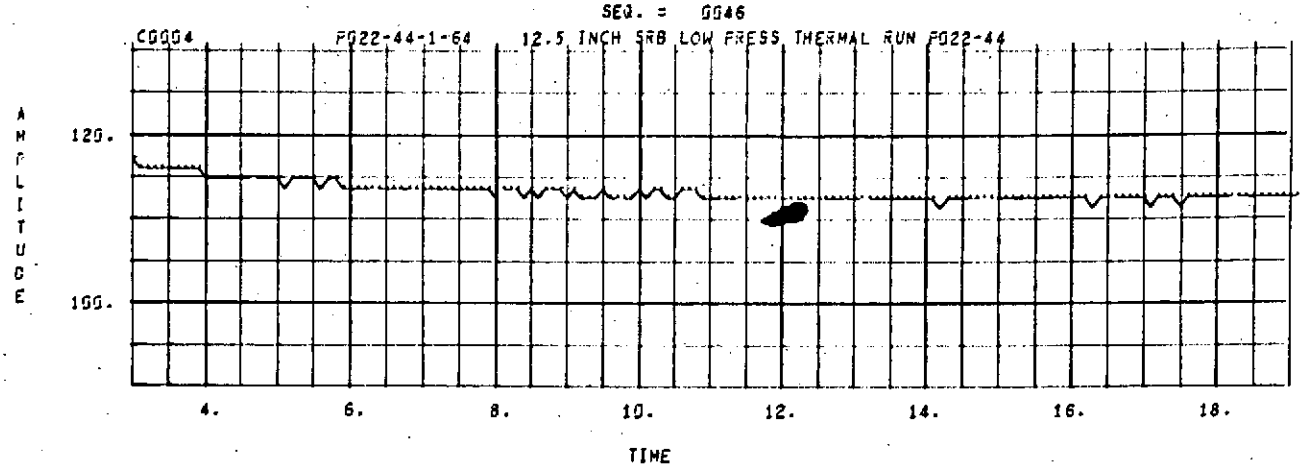
SEQ. = 0046


C0001
F022-44-1-40
12.5 INCH SRB LOW PRESS THERMAL RUN F022-44
140.
130.
120.
110.
AMPLITUDE
4.
6.
8.
10.
12.
14.
16.
18.
TIME


C0002
F022-44-1-48
140.
130.
120.
110.
AMPLITUDE
4.
6.
8.
10.
12.
14.
16.
18.
TIME


C0003
F022-44-1-56
140.
120.
100.
AMPLITUDE
4.
6.
8.
10.
12.
14.
16.
18.
TIME

SEQ. = 0046


C0004
F022-44-1-64
12.5 INCH SRB LOW PRESS THERMAL RUN F022-44
AMPLITUDE
120.
100.
4.
6.
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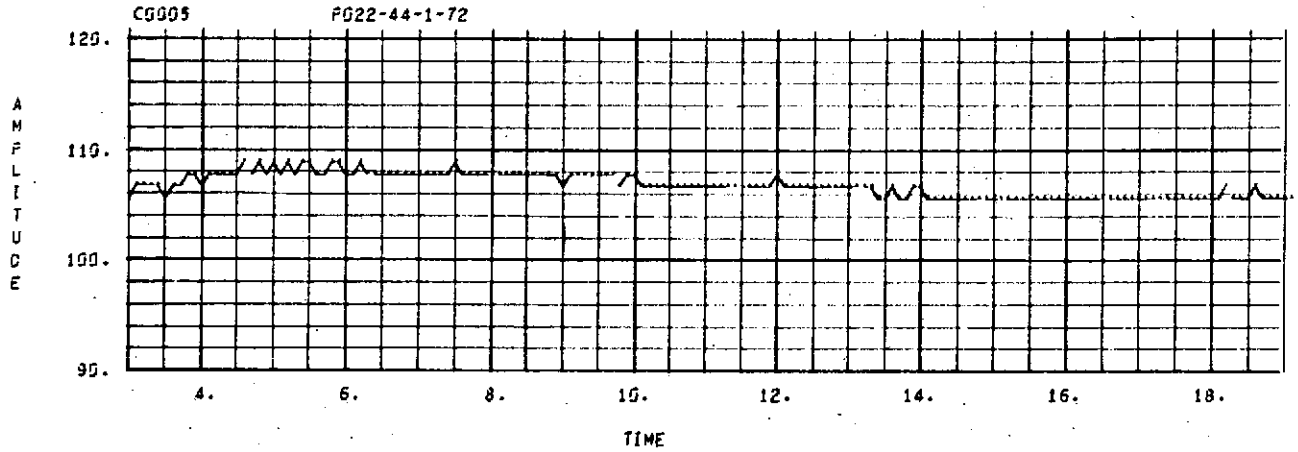
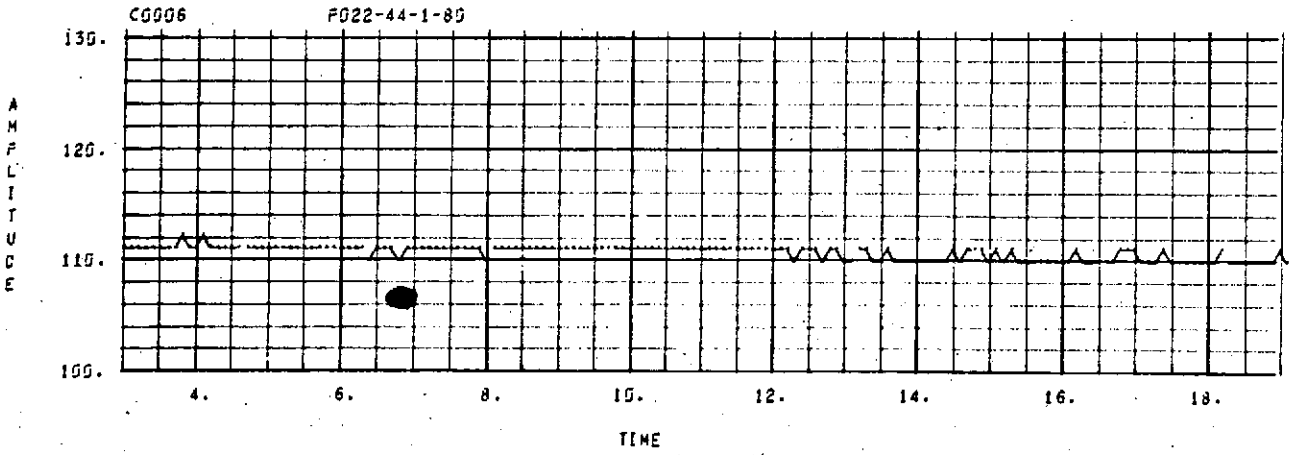
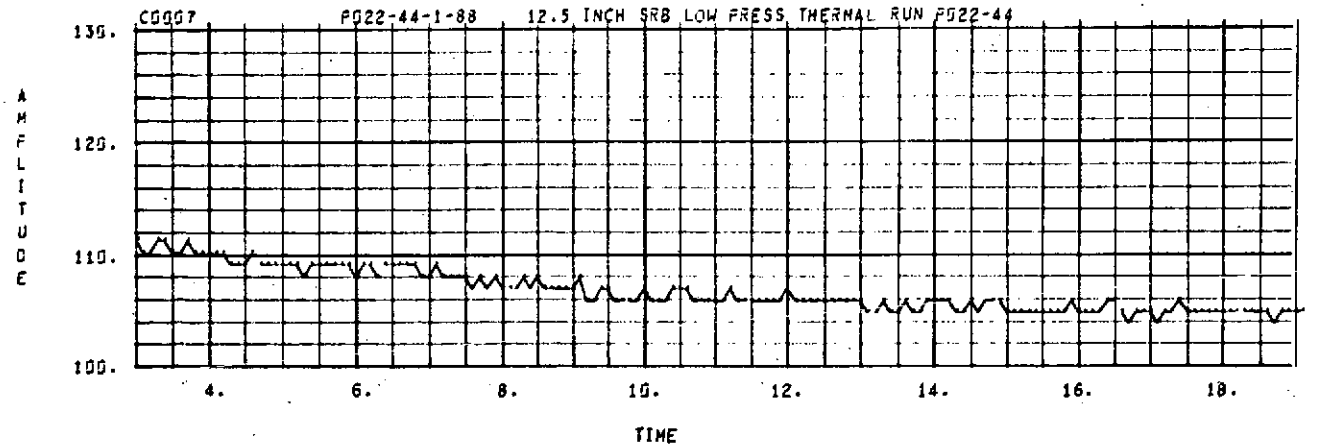
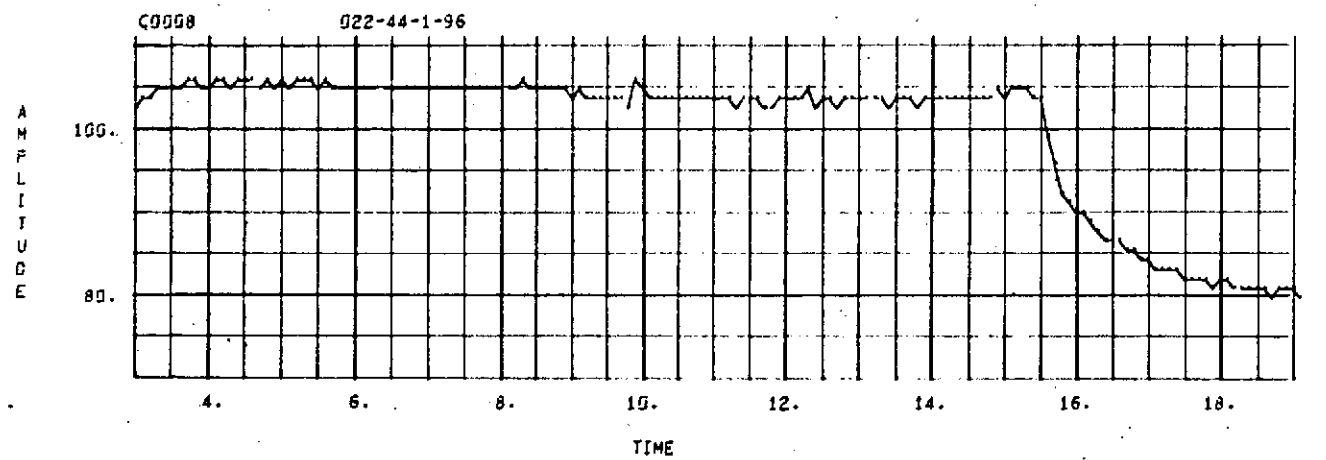
10.
12.
14.
16.
18.
TIME

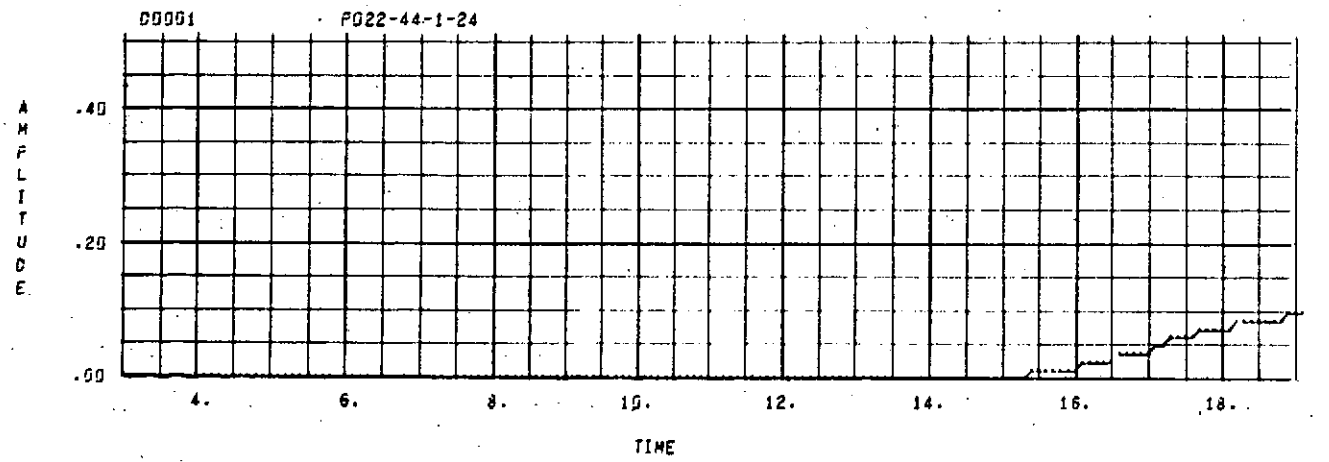

C0005
F022-44-1-72
AMPLITUDE
120.
110.
100.
90.
4.
6.
8.
10.
12.
14.
16.
18.
TIME


C0006
F022-44-1-80
AMPLITUDE
130.
120.
110.
100.
4.
6.
8.
10.
12.
14.
16.
18.
TIME

SEQ. = 0046 10


C0007
P022-44-1-88
12.5 INCH SRB LOW PRESS THERMAL RUN P022-44
AMPLITUDE
130.
120.
110.
100.
4.
6.
8.
10.
12.
14.
16.
18.
TIME


C0008
022-44-1-96
AMPLITUDE
100.
80.
4.
6.
8.
10.
12.
14.
16.
18.
TIME


C0001
P022-44-1-24
AMPLITUDE
.40
.20
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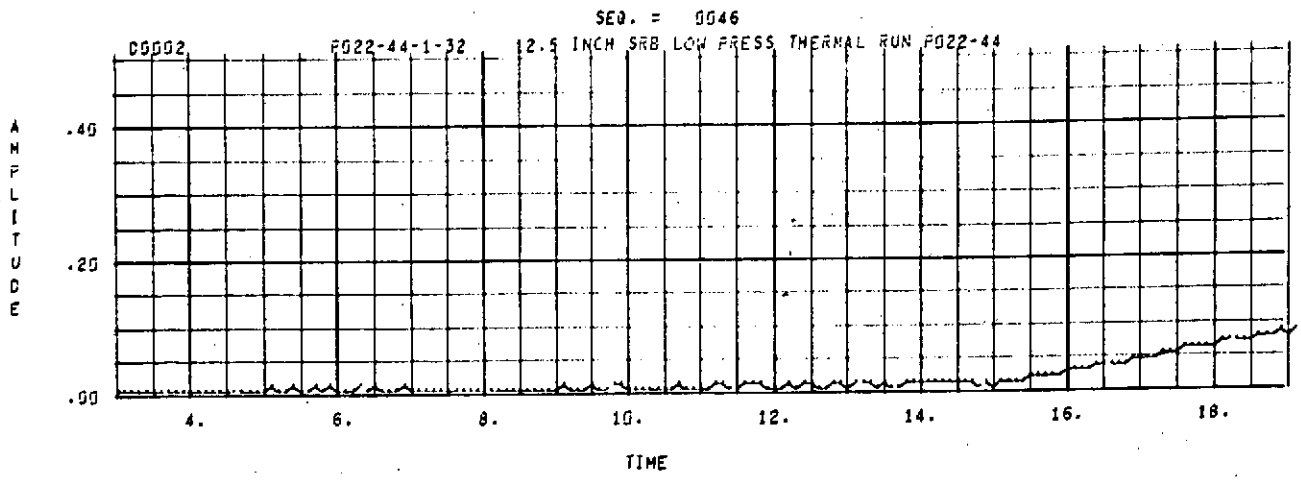
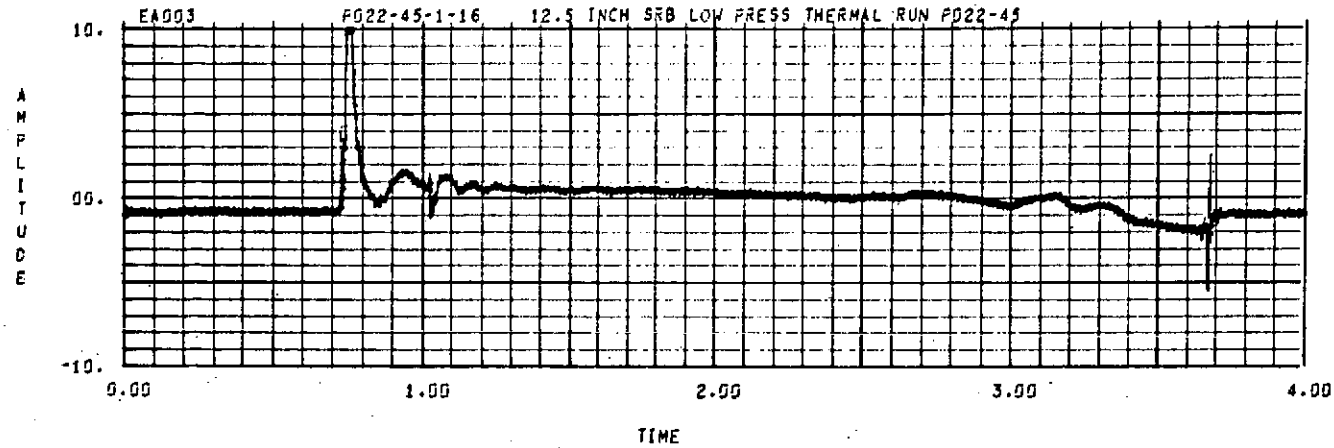
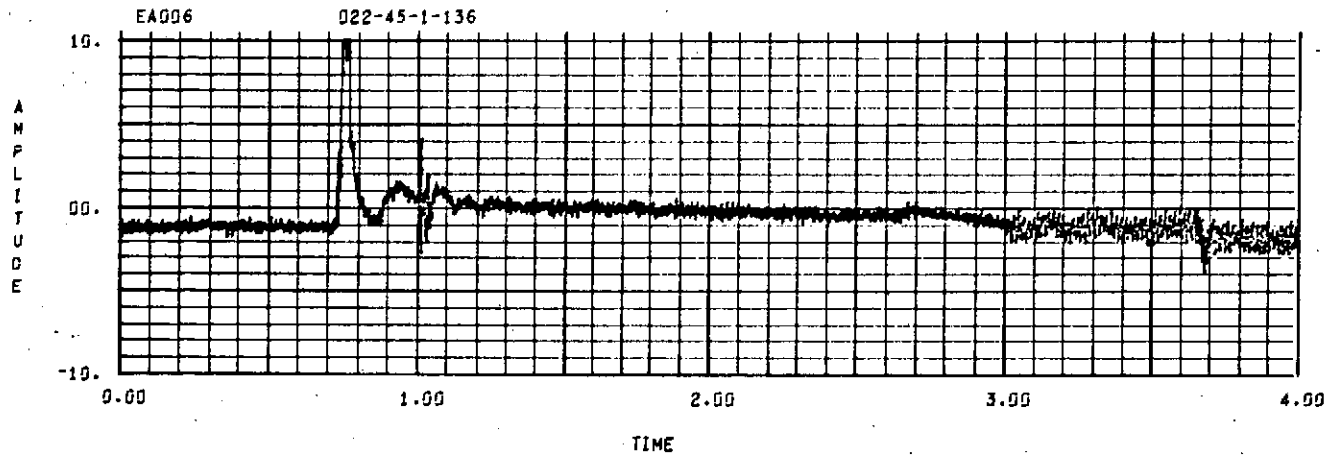
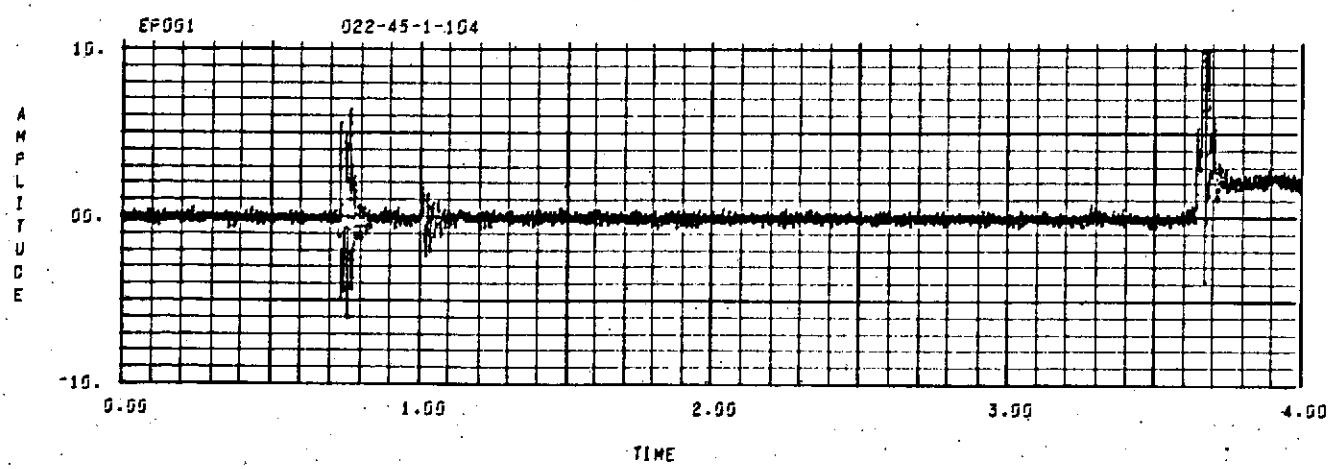
4.
6.
8.
10.
12.
14.
16.
18.
TIME


SEQ. = 0046
C0002
F022-44-1-32
12.5 INCH SRB LOW PRESS THERMAL RUN F022-44
AMPLITUDE
.40
.20
.00
4.
6.
8.
10.
12.
14.
16.
18.
TIME

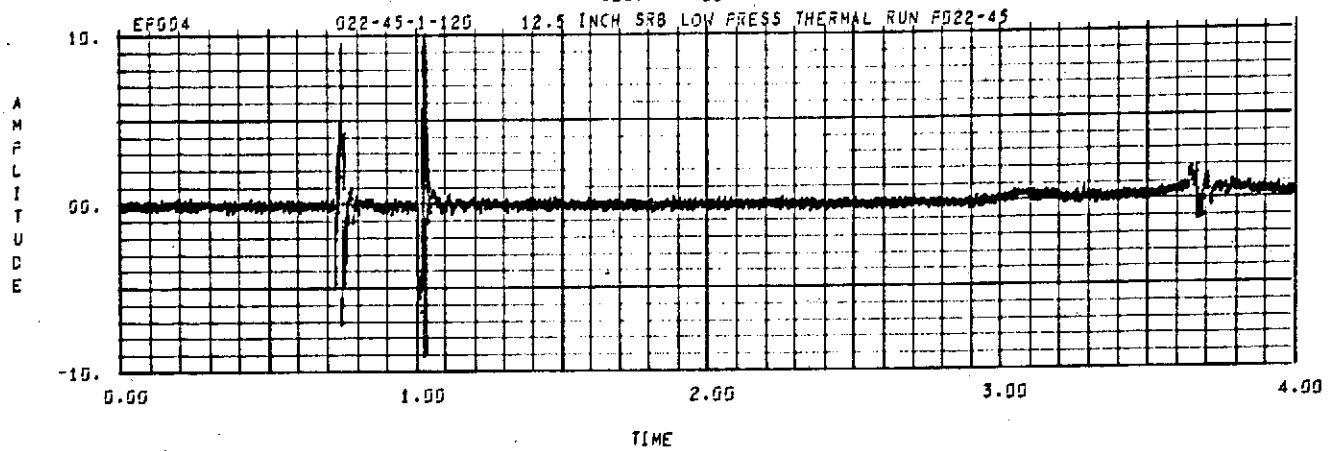
SEQ. = 0047

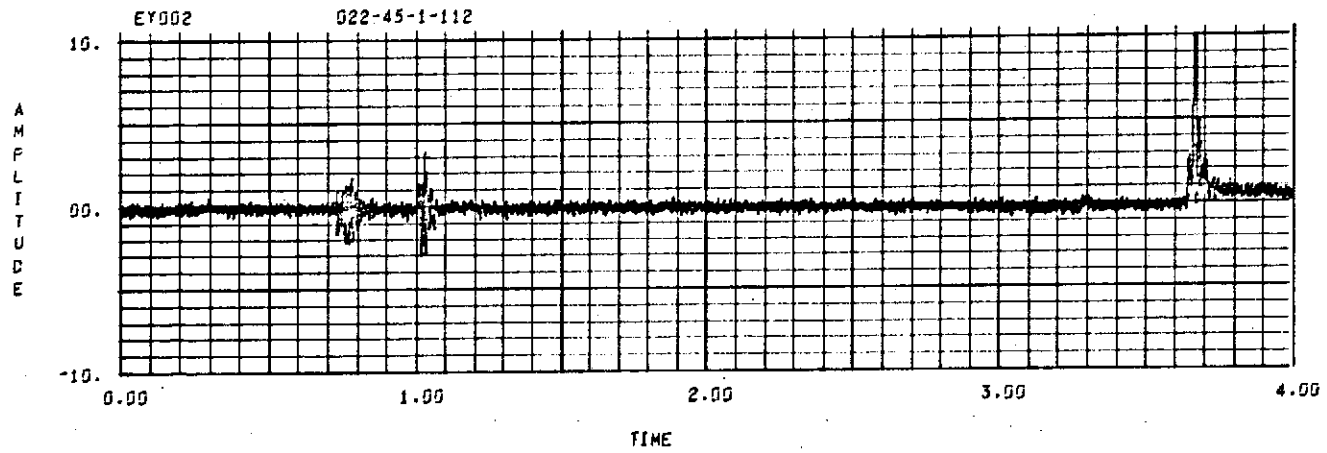

EA003
F022-45-1-16
12.5 INCH SRB LOW PRESS THERMAL RUN F022-45
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

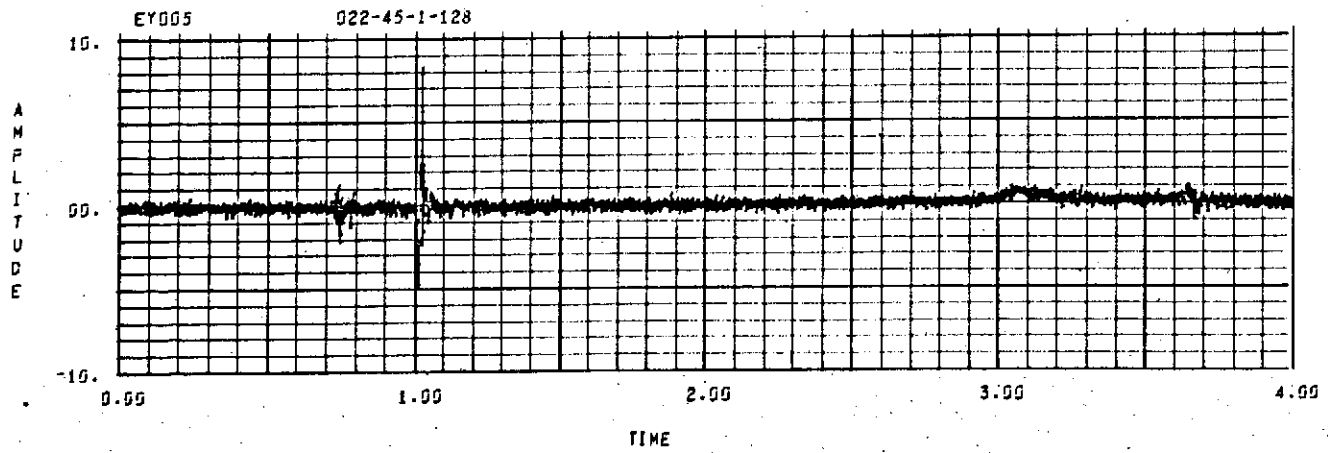

EA006
022-45-1-136
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME


EF001
022-45-1-104
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

SEQ. = 0047


EF004
022-45-1-120
12.5 INCH SRB LOW PRESS THERMAL RUN F022-45
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME


EY002
022-45-1-112
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME


EY005
022-45-1-128
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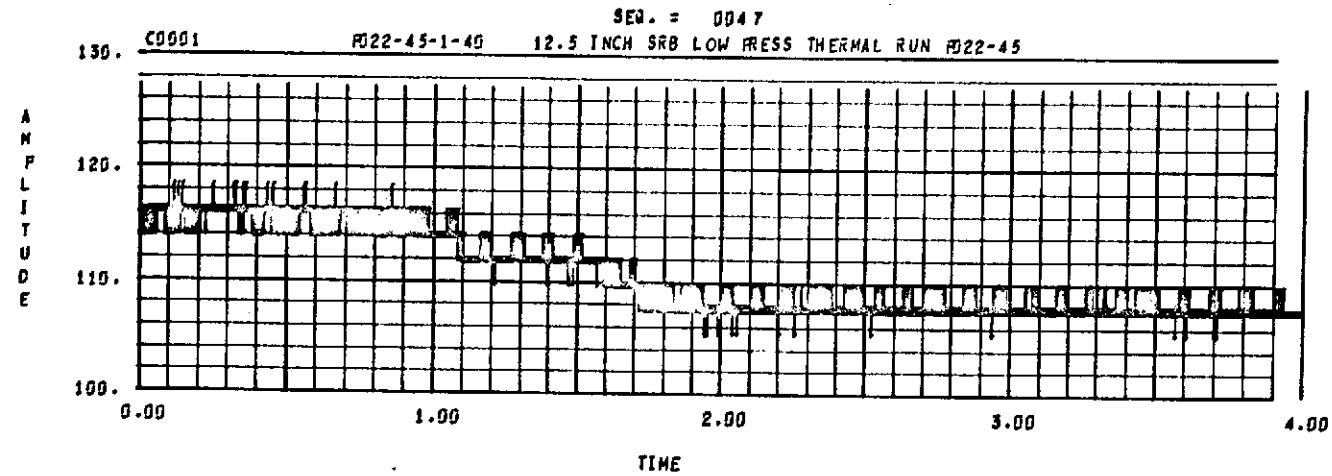
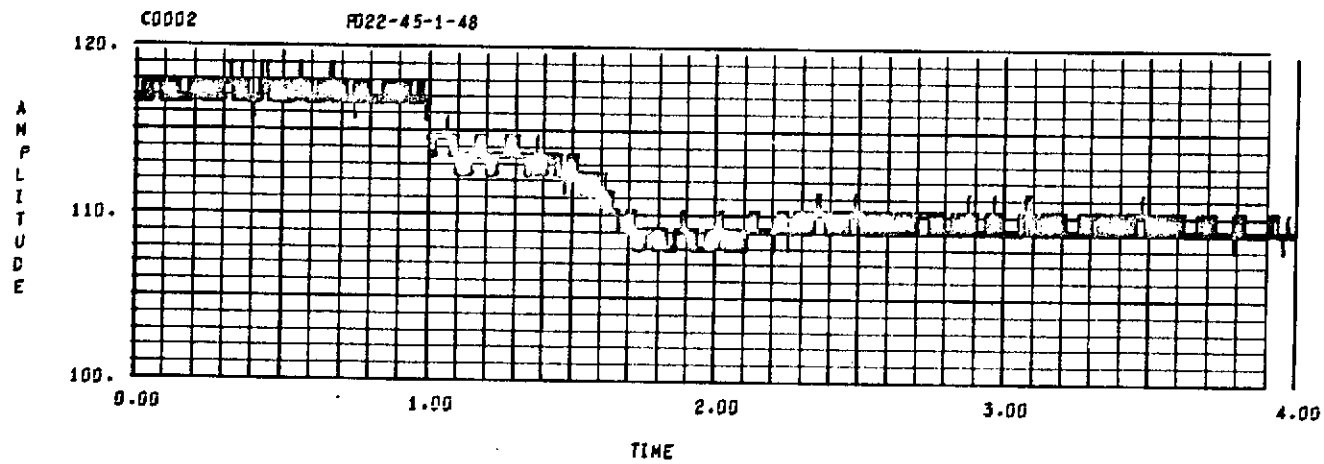
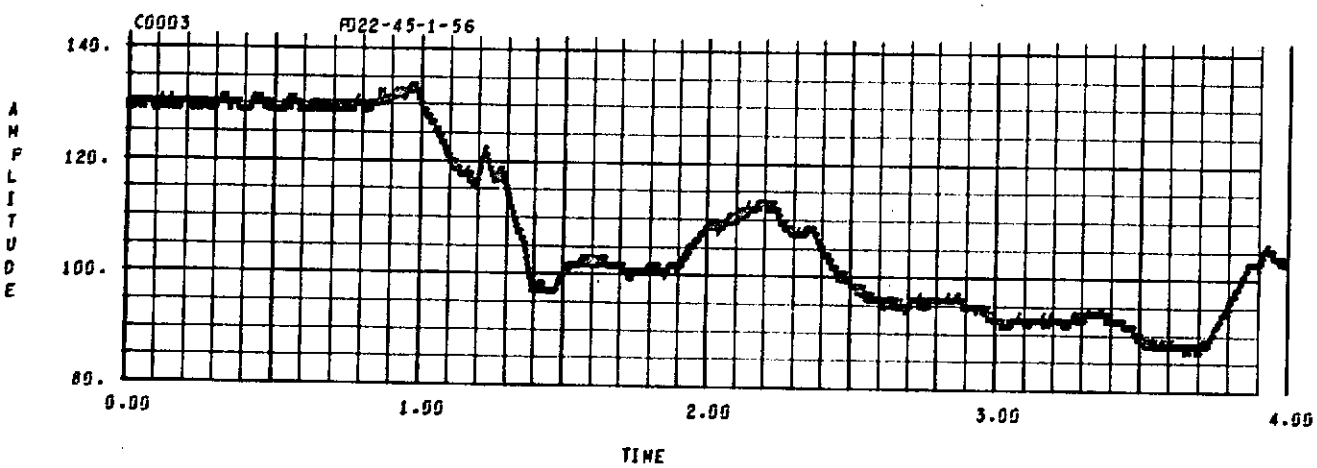
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME


SEQ. = 0047
C0001
FD22-45-1-40
12.5 INCH SRB LOW PRESS THERMAL RUN FD22-45
130.
120.
110.
100.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME


C0002
FD22-45-1-48
120.
110.
100.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME


C0003
FD22-45-1-56
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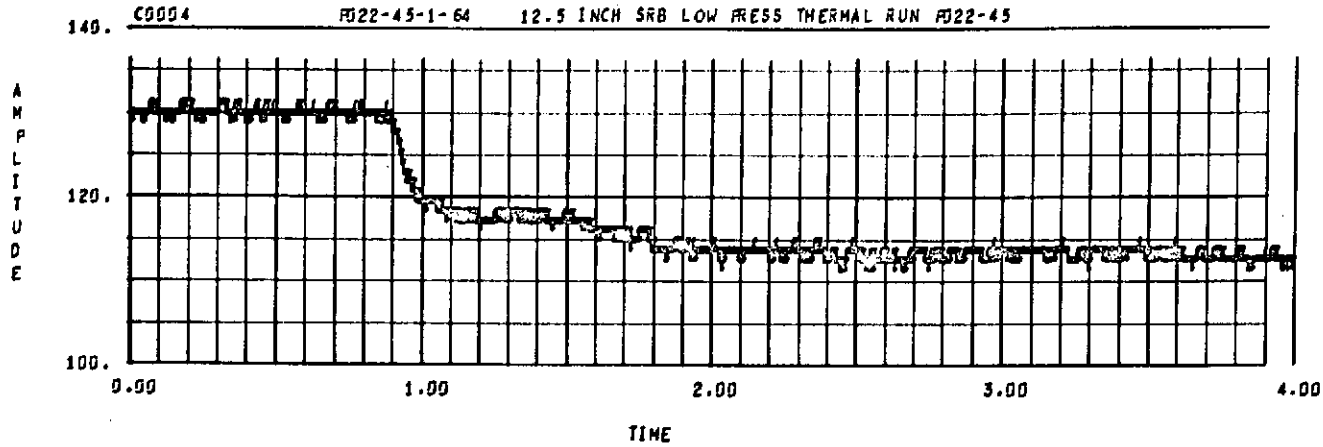
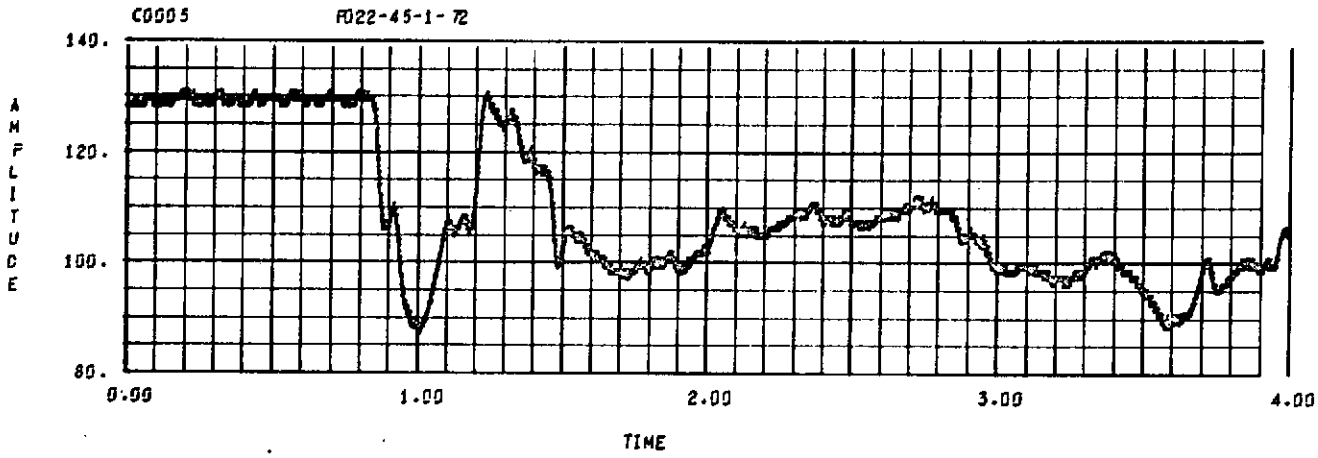
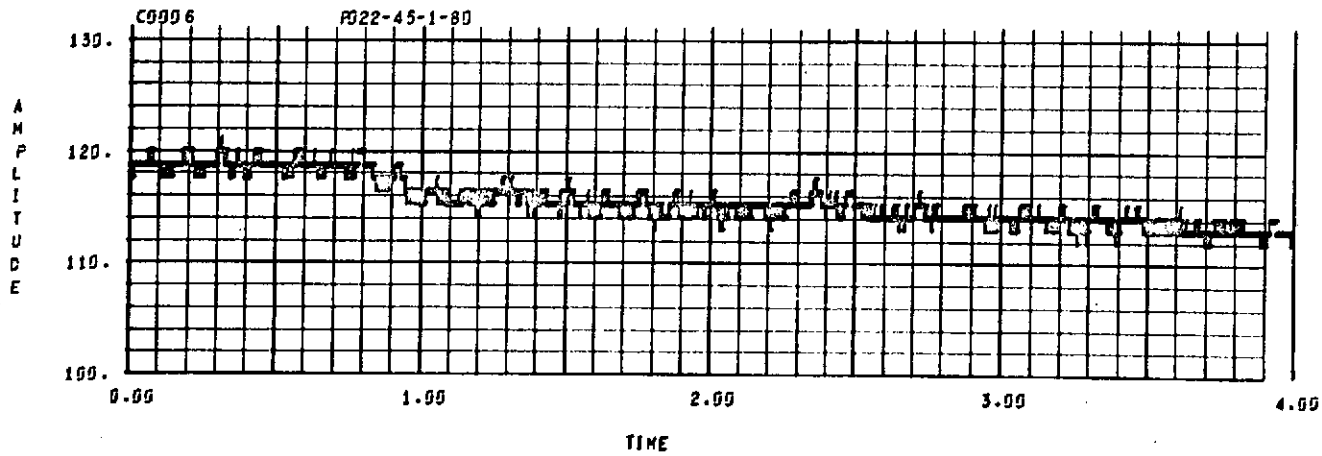
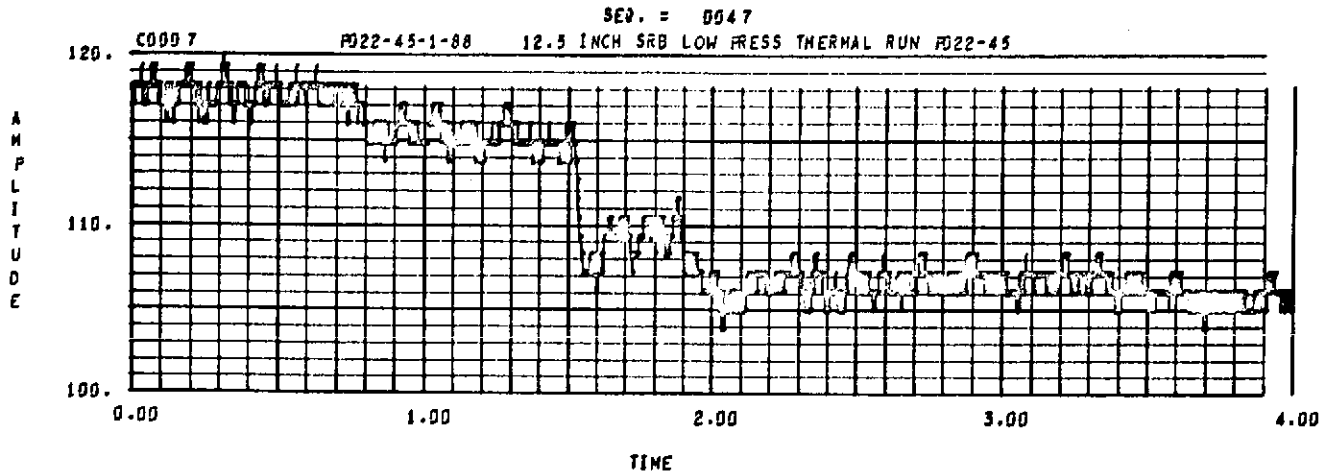
120.
100.
80.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

SEQ. = 0047


C0004
F022-45-1-64
12.5 INCH SRB LOW PRESS THERMAL RUN F022-45
140.
120.
100.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME


C0005
F022-45-1-72
140.
120.
100.
80.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME


C0006
F022-45-1-80
130.
120.
110.
100.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME


SEQ. = 0047
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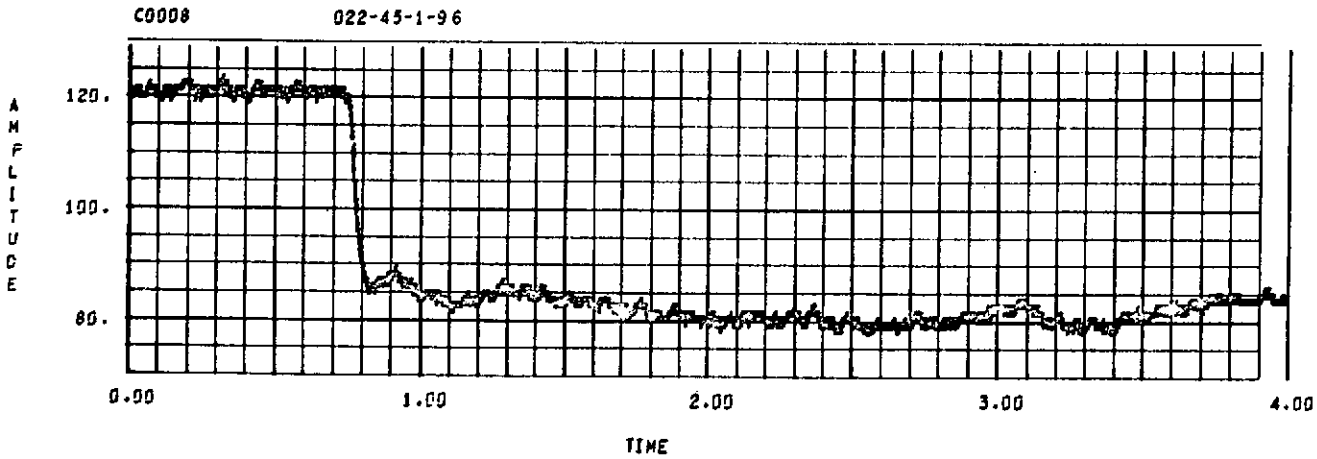
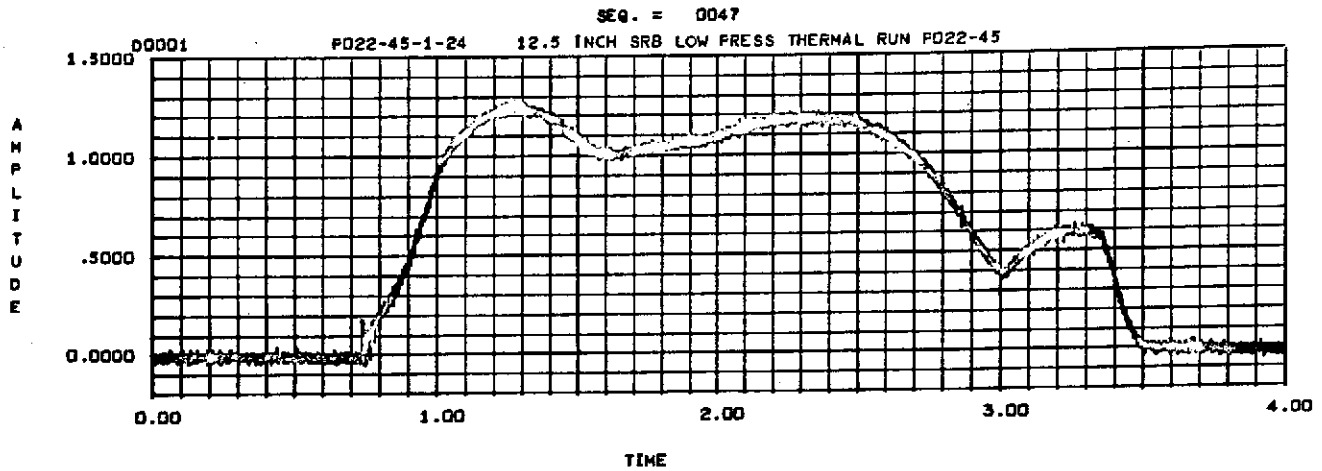
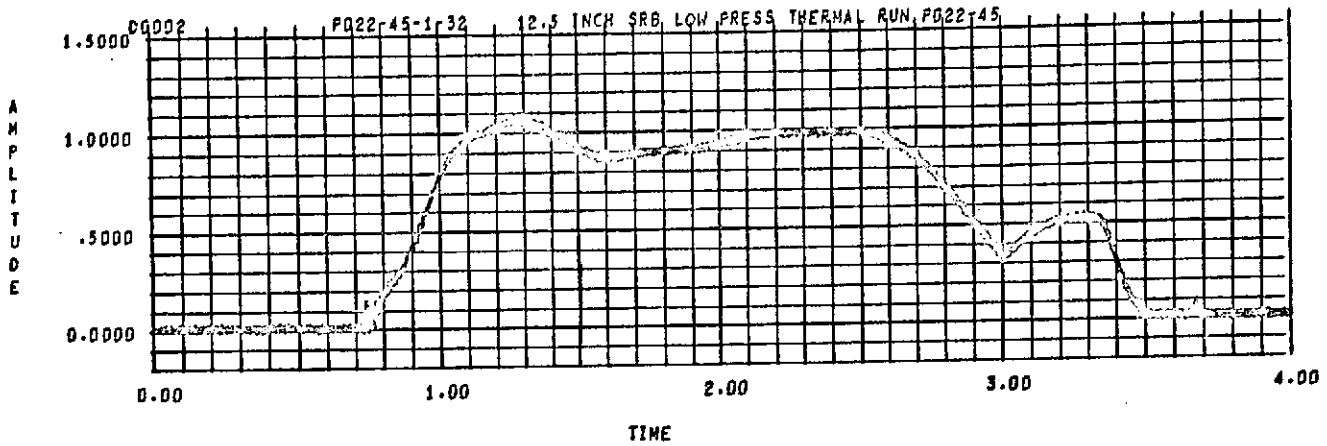
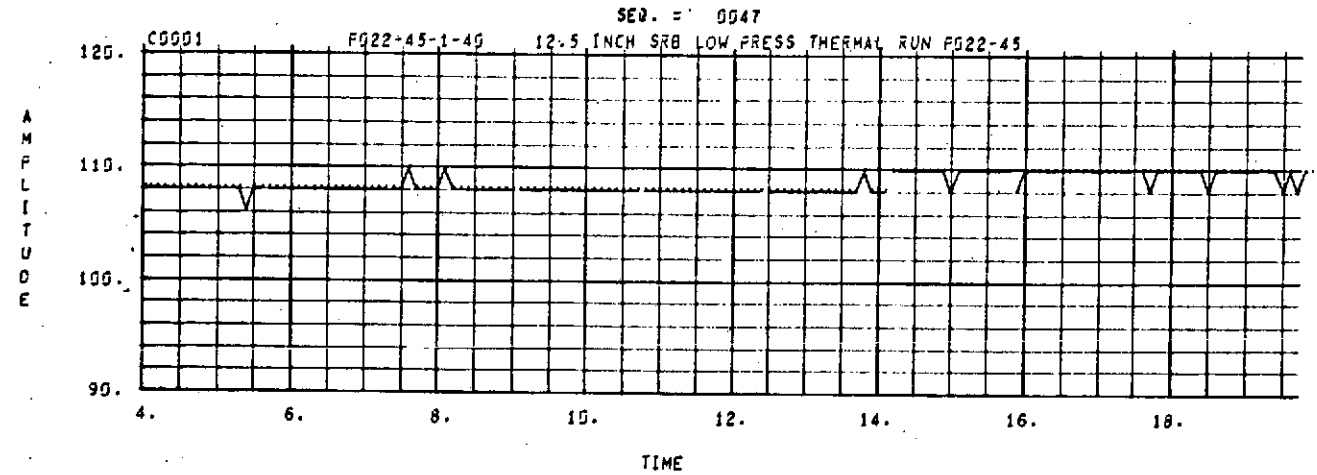
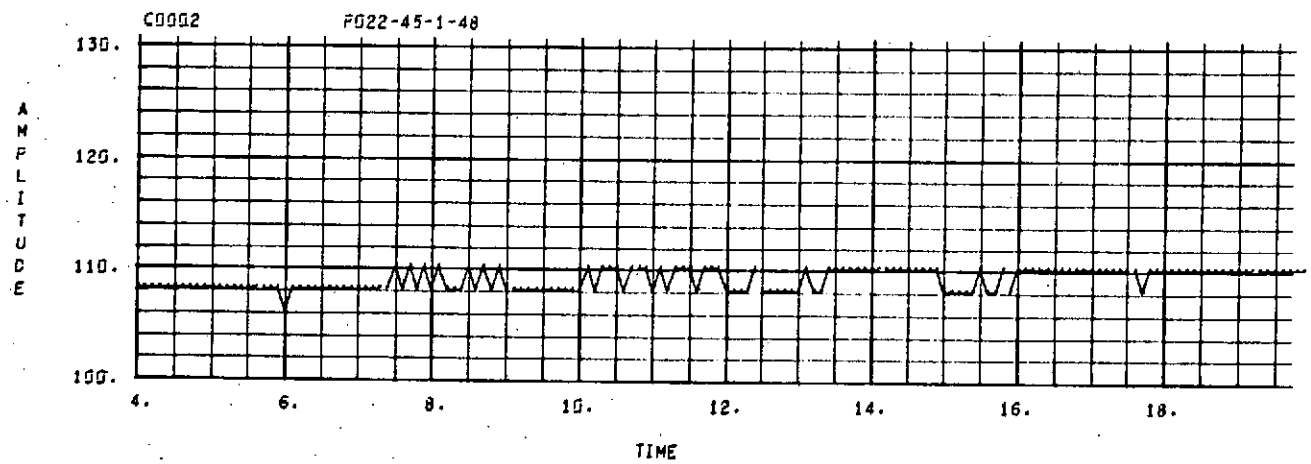
C0007
F022-45-1-88
12.5 INCH SRB LOW PRESS THERMAL RUN F022-45
120.
110.
100.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME


C0008
022-45-1-96
120.
100.
80.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME


SEQ. = 0047
00001
F022-45-1-24
12.5 INCH SRB LOW PRESS THERMAL RUN F022-45
1.5000
1.0000
.5000
0.0000
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME


00002
F022-45-1-32
12.5 INCH SRB LOW PRESS THERMAL RUN F022-45
1.5000
1.0000
.5000
0.0000
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME


SEQ. = 0047
C0001
F022-45-1-40
12.5 INCH SRB LOW PRESS THERMAL RUN F022-45
AMPLITUDE
120.
110.
100.
90.
4.
6.
8.
10.
12.
14.
16.
18.
TIME


C0002
F022-45-1-48
AMPLITUDE
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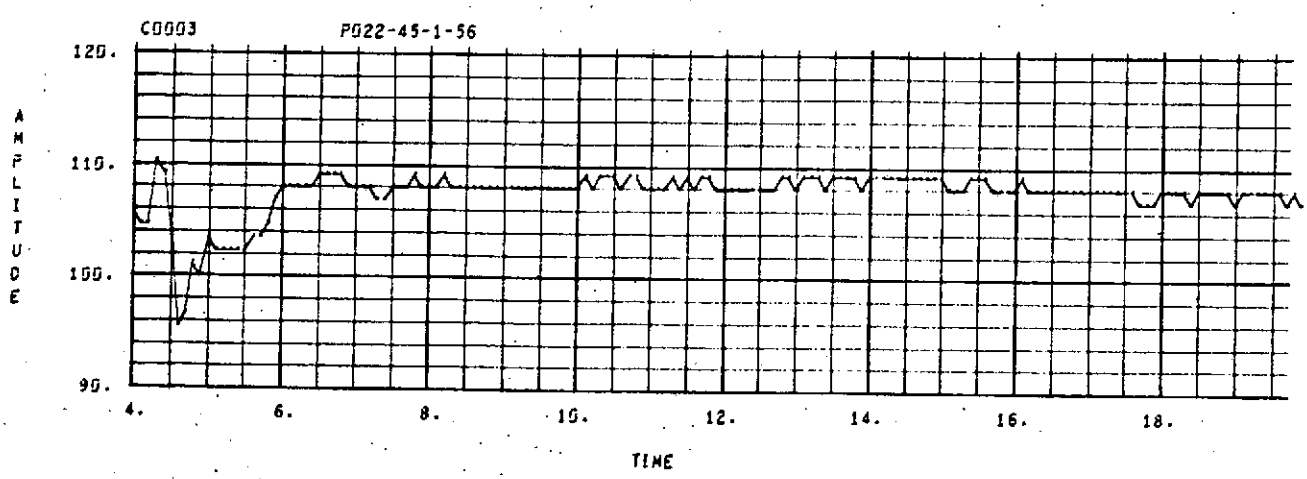
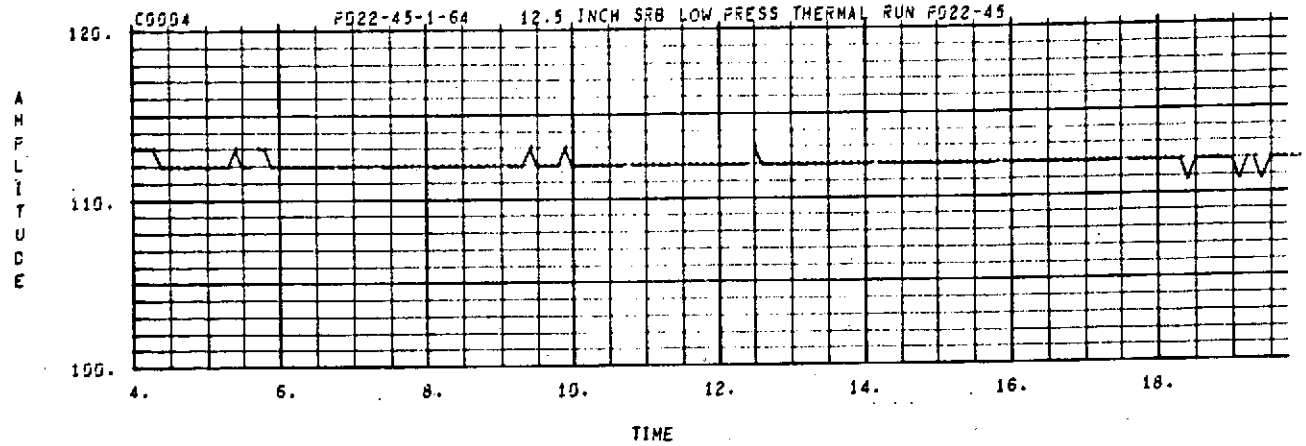
120.
110.
100.
4.
6.
8.
10.
12.
14.
16.
18.
TIME


C0003
F022-45-1-56
AMPLITUDE
120.
110.
100.
90.
4.
6.
8.
10.
12.
14.
16.
18.
TIME

SEQ. = 0047


C0004
F022-45-1-64
12.5 INCH SRB LOW PRESS THERMAL RUN F022-45
120.
110.
100.
AMPLITUDE
4.
6.
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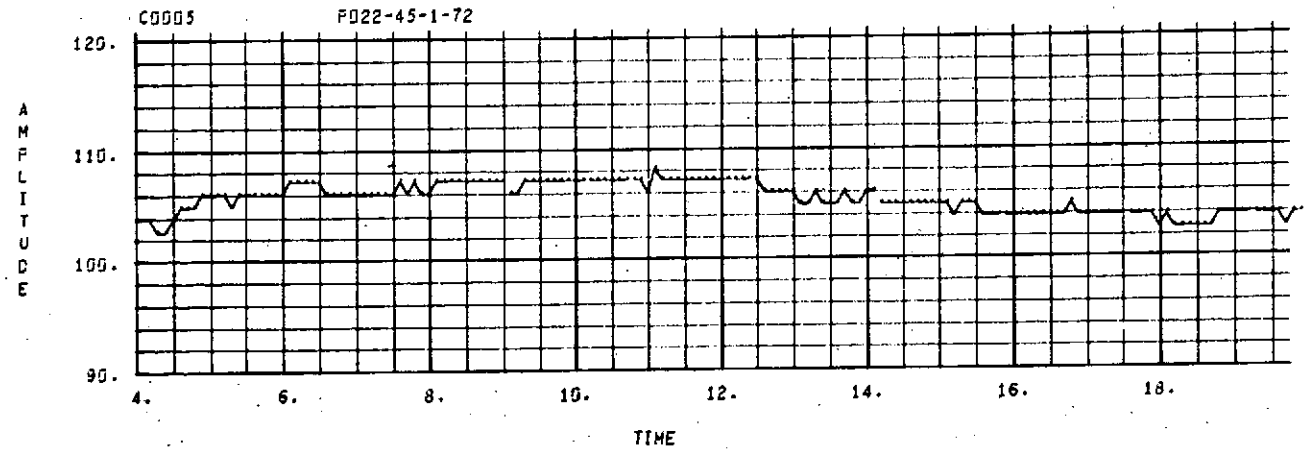
10.
12.
14.
16.
18.
TIME


C0005
F022-45-1-72
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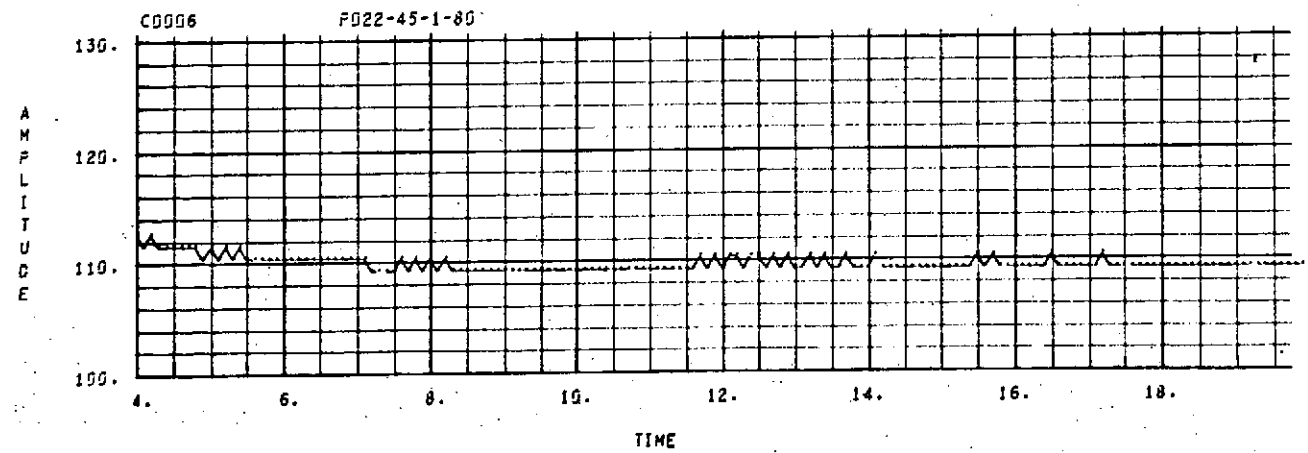
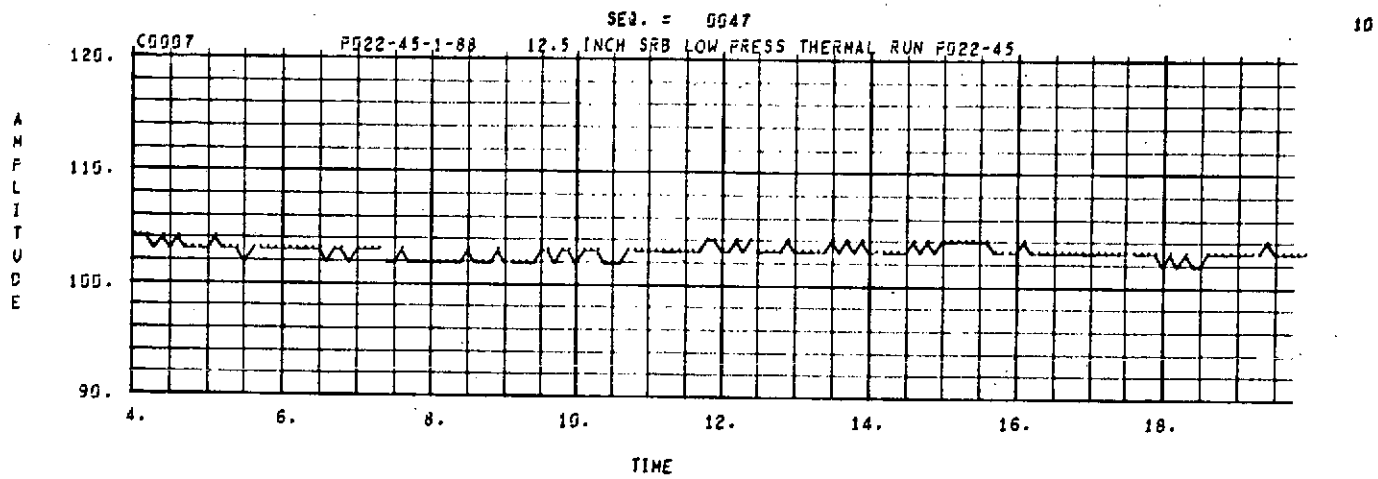
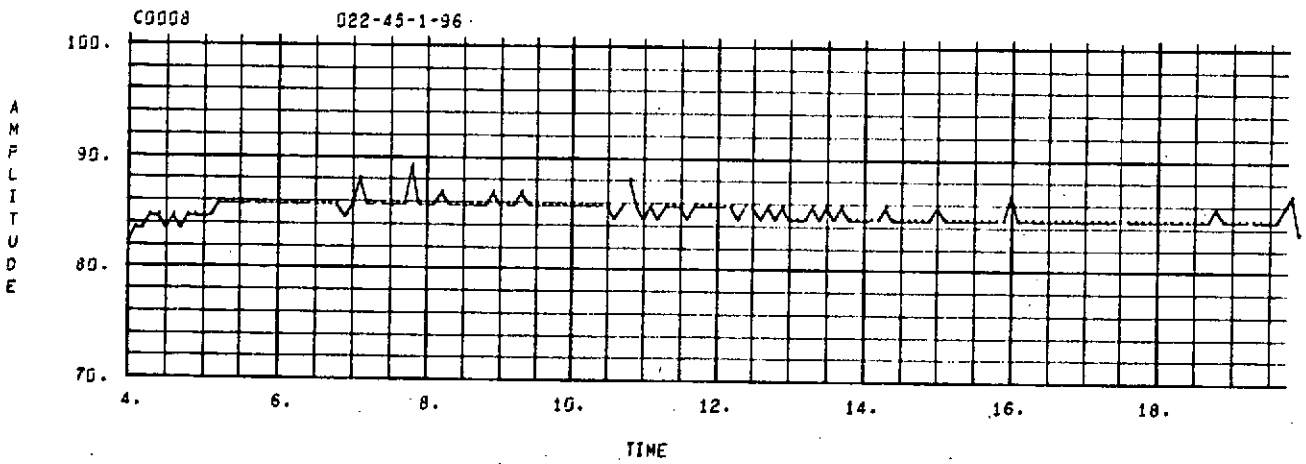
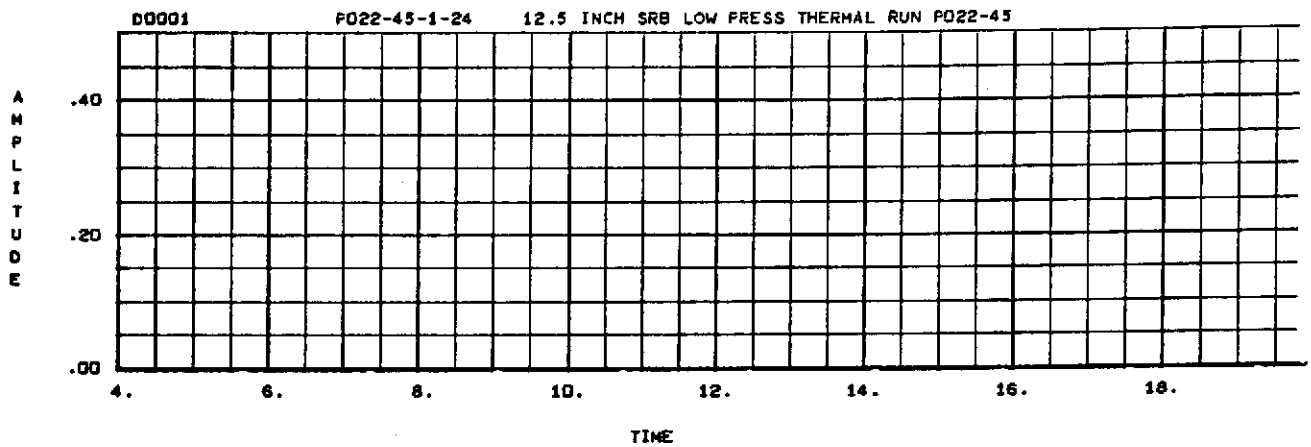
110.
100.
90.
AMPLITUDE
4.
6.
8.
10.
12.
14.
16.
18.
TIME

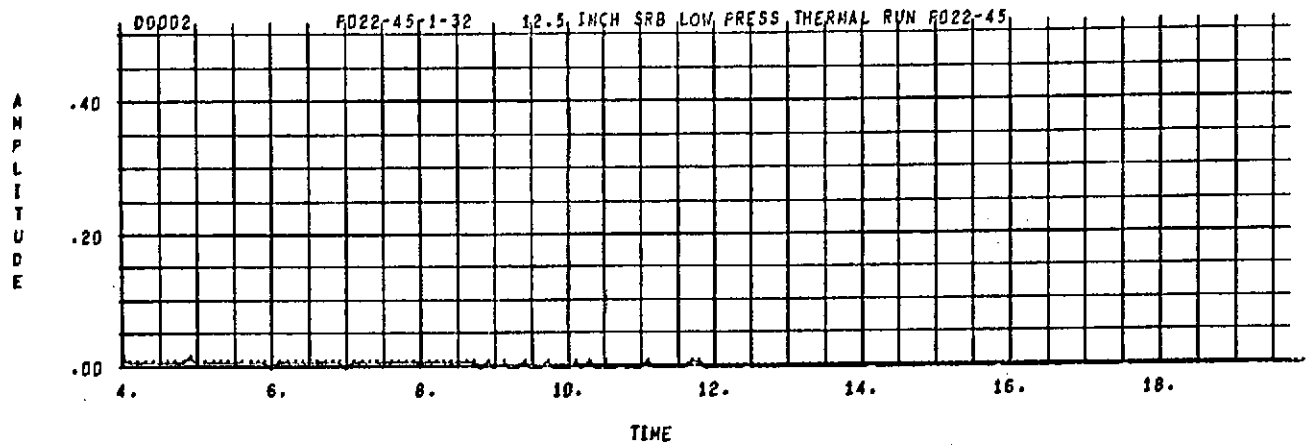

C0006
F022-45-1-80
130.
120.
110.
100.
AMPLITUDE
4.
6.
8.
10.
12.
14.
16.
18.
TIME

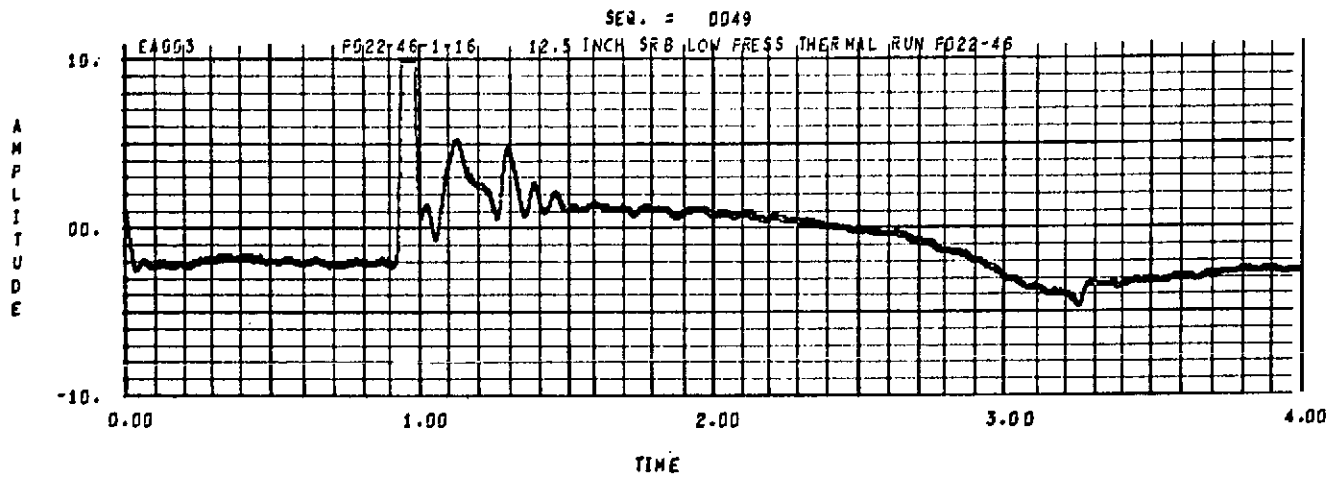

SEQ. = 0047
10
C0007
F022-45-1-88
12.5 INCH SRB LOW PRESS THERMAL RUN F022-45
120.
110.
100.
90.
AMPLITUDE
4.
6.
8.
10.
12.
14.
16.
18.
TIME


C0008
022-45-1-96
100.
90.
80.
70.
AMPLITUDE
4.
6.
8.
10.
12.
14.
16.
18.
TIME

SEQ. = 0047


D0001
F022-45-1-24
12.5 INCH SRB LOW PRESS THERMAL RUN F022-45
AMPLITUDE
.40
.20
.00
4.
6.
8.
10.
12.
14.
16.
18.
TIME


D0002
F022-45-1-32
12.5 INCH SRB LOW PRESS THERMAL RUN F022-45
AMPLITUDE
.40
.20
.00
4.
6.
8.
10.
12.
14.
16.
18.
TIME


SEQ. = 0049
EA003
F022-46-1-16
12.5 INCH SRB LOW PRESS THERMAL RUN F022-46
10.
00.
-10.
AMPLITUDE
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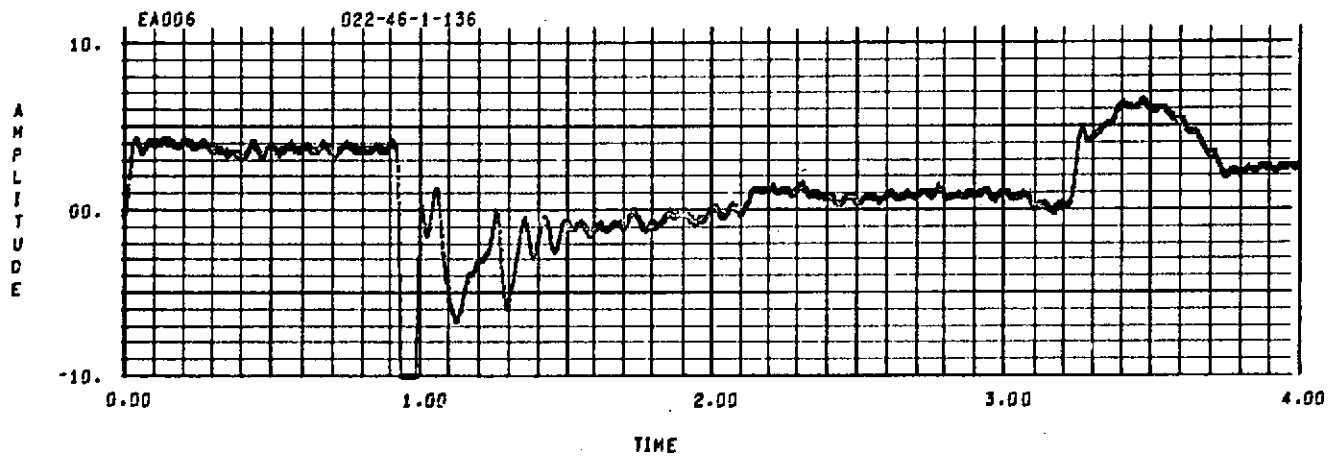
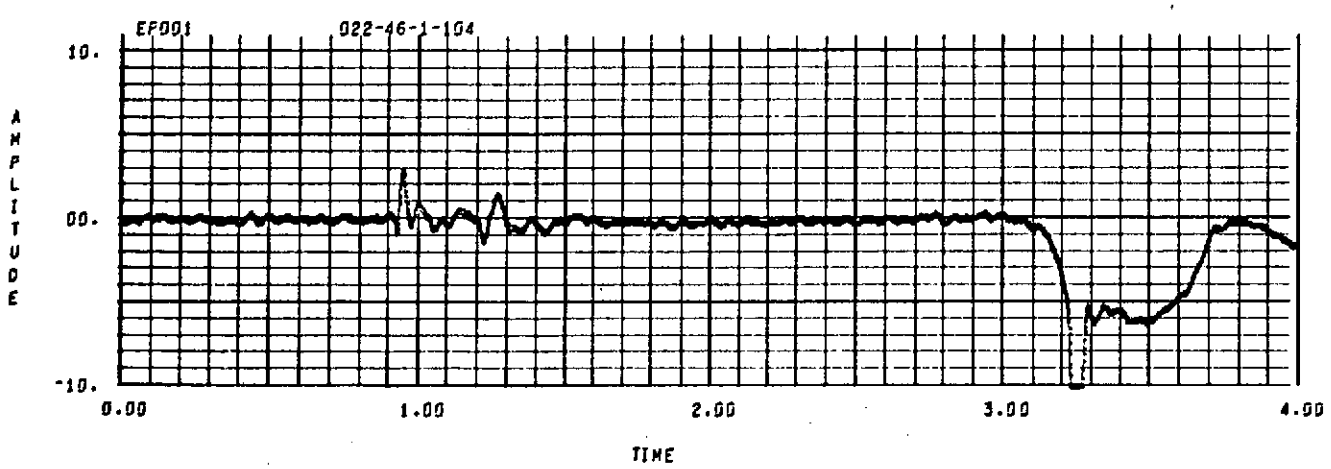
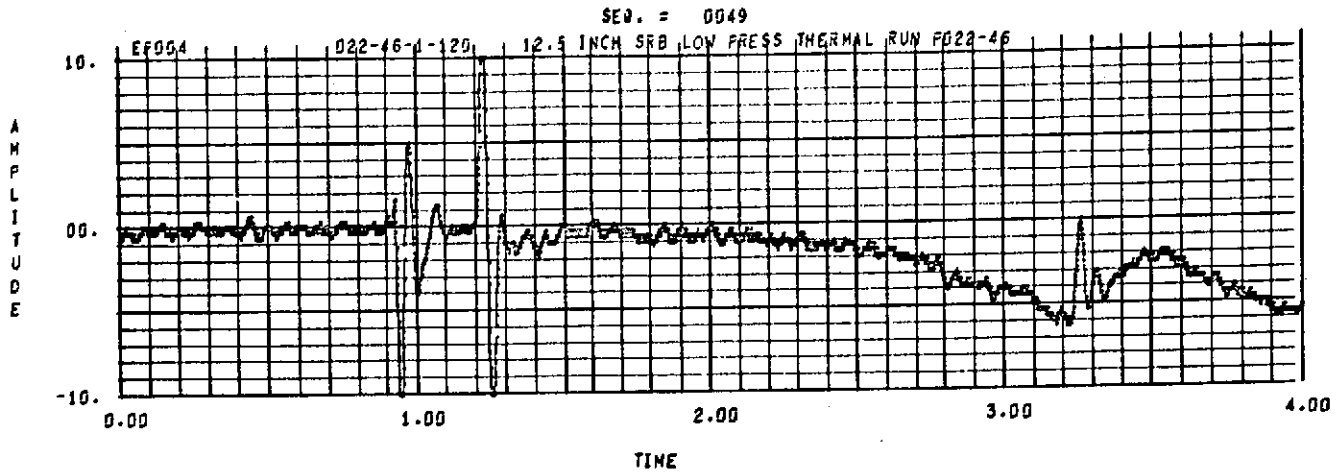
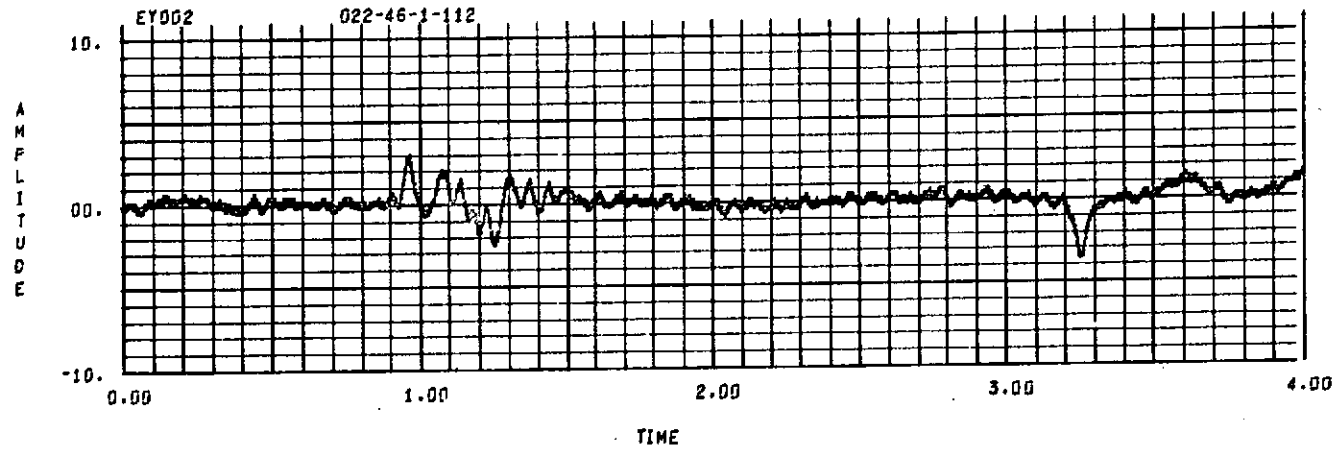
1.00
2.00
3.00
4.00
TIME


EA006
022-46-1-136
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME


EF001
022-46-1-104
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME


SEQ. = 0049
EF004
022-46-1-120
12.5 INCH SRB LOW PRESS THERMAL RUN F022-46
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME


EY002
022-46-1-112
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00.
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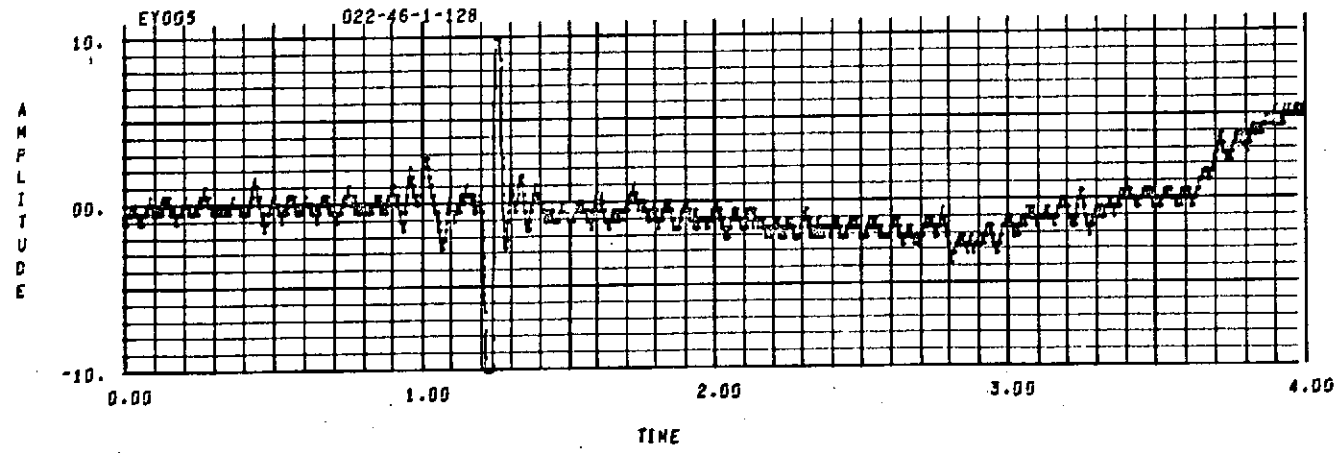
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME


EY005
022-46-1-128
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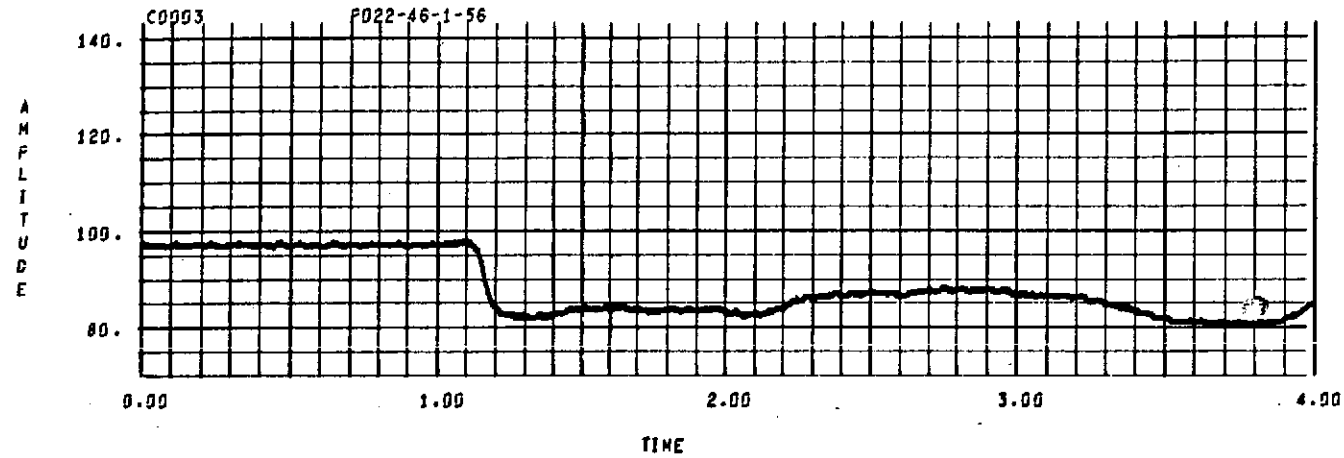
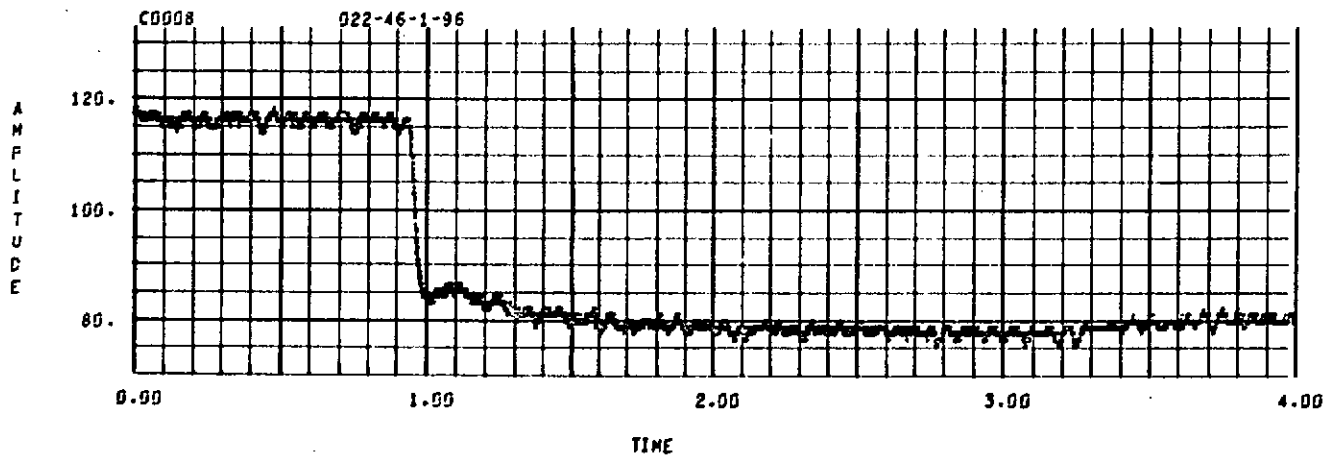
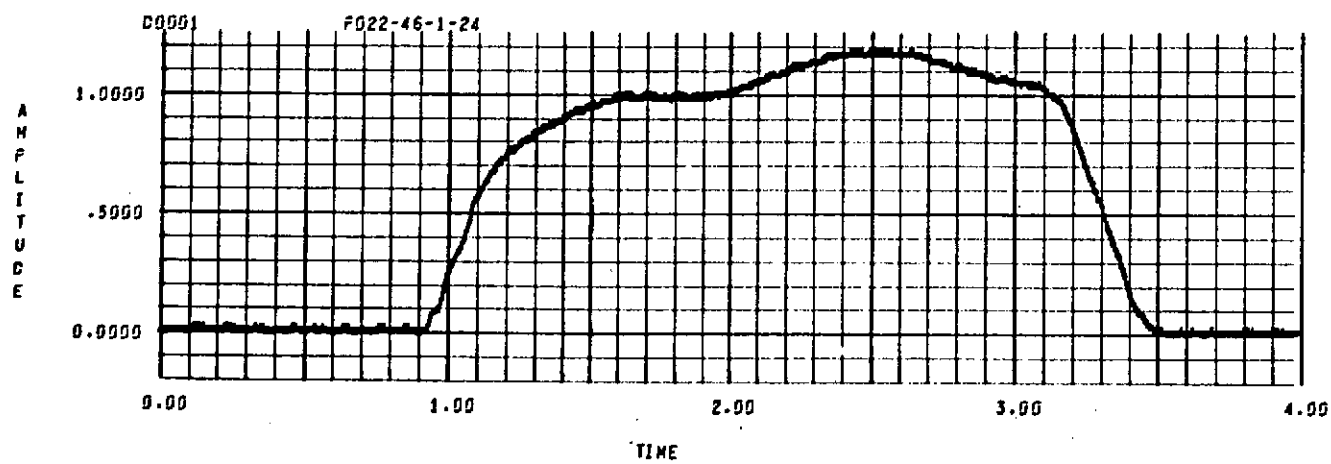
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME


C0003
F022-46-1-56
140.
120.
100.
80.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME


C0008
022-46-1-96
120.
100.
80.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME


C0001
F022-46-1-24
1.0000
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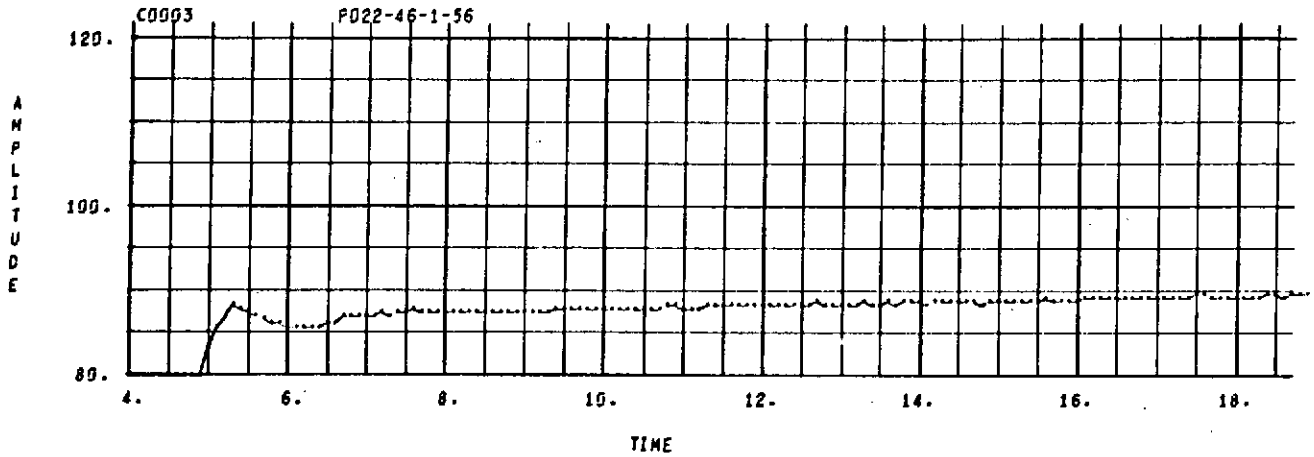
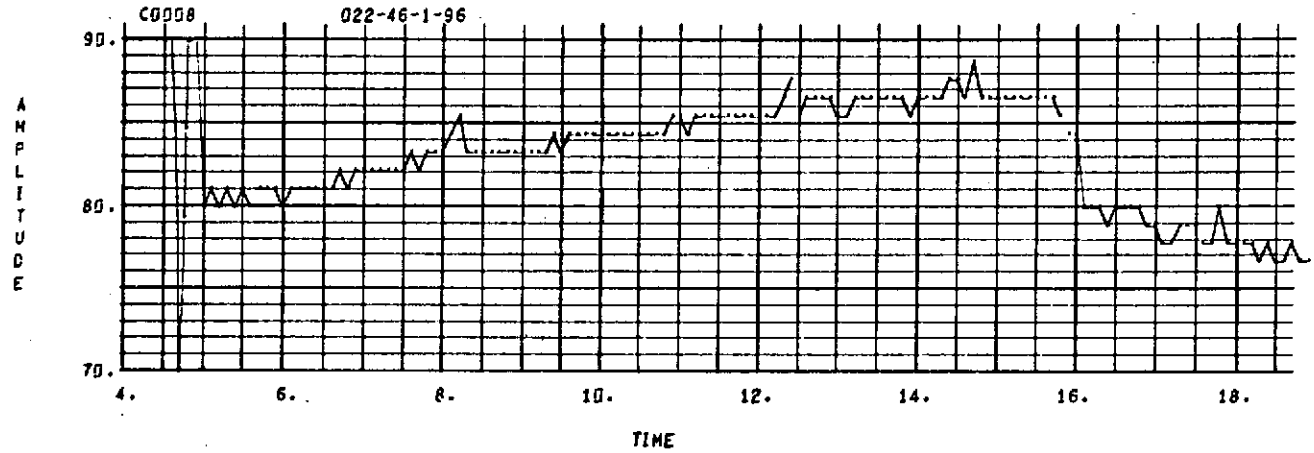
0.0000
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME


C0003
F022-46-1-56
120.
100.
80.
AMPLITUDE
4.
6.
8.
10.
12.
14.
16.
18.
TIME


C0008
022-46-1-96
90.
80.
70.
AMPLITUDE
4.
6.
8.
10.
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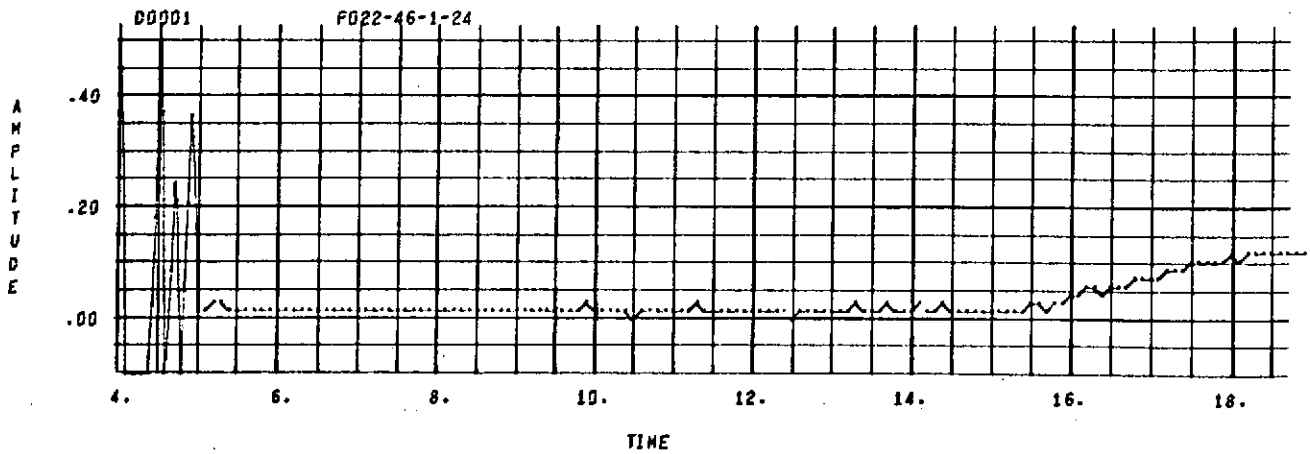
16.
18.
TIME


D0001
F022-46-1-24
.40
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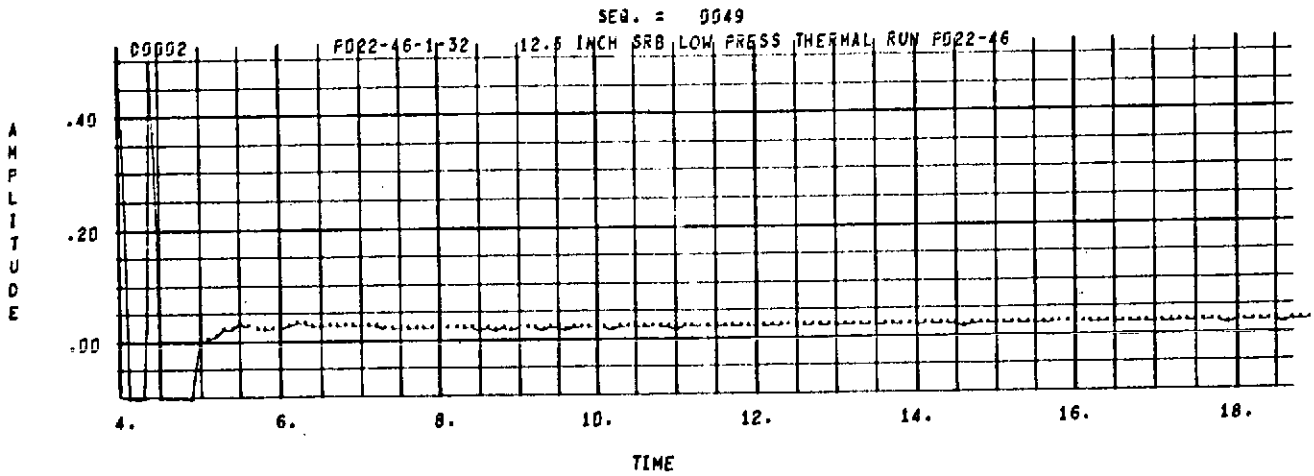
AMPLITUDE
4.
6.
8.
10.
12.
14.
16.
18.
TIME


SEQ. = 0049
C0002
F022-46-1-32
12.5 INCH SRB LOW PRESS THERMAL RUN F022-46
AMPLITUDE
.40
.20
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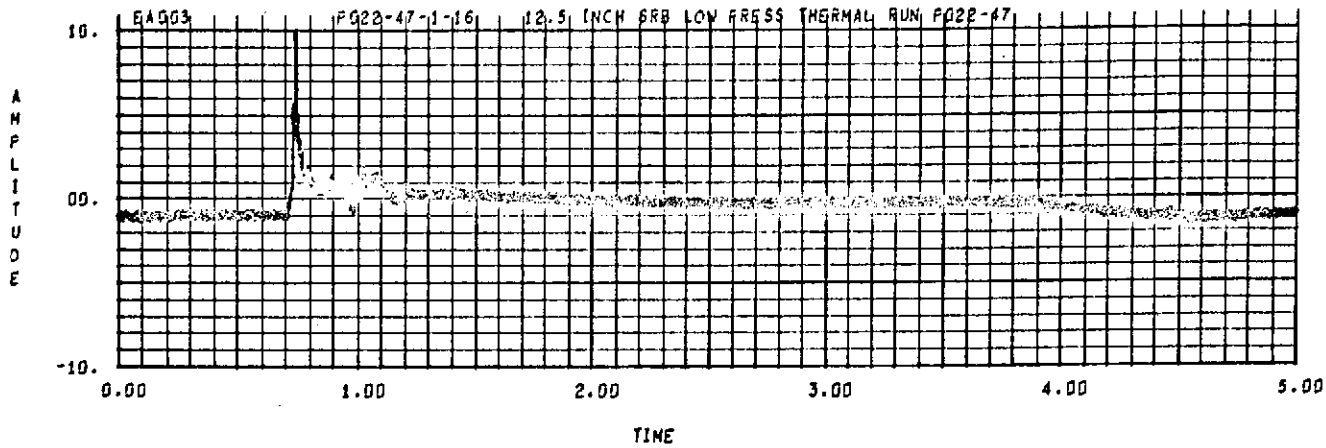
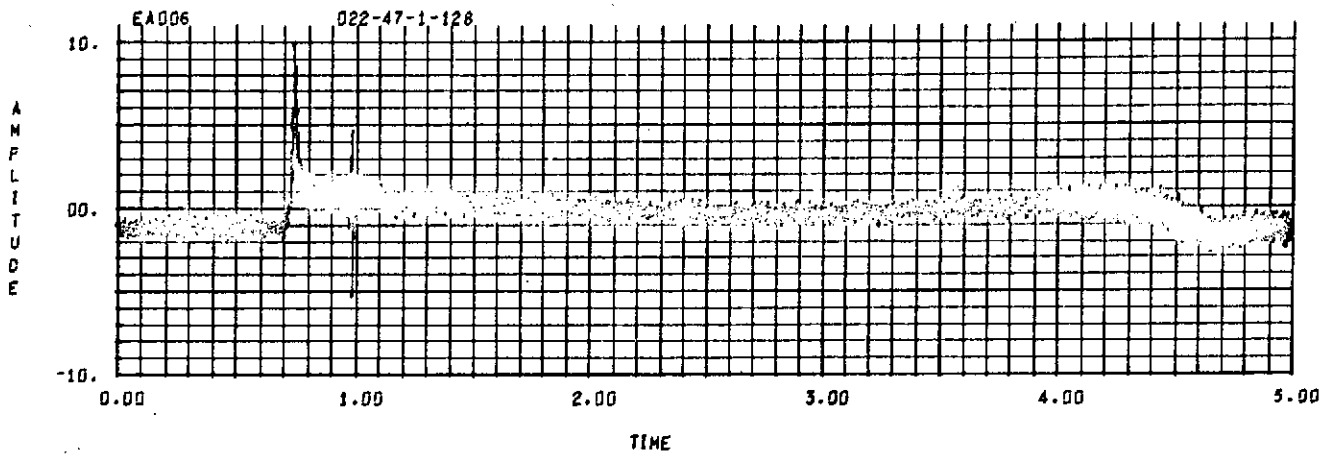
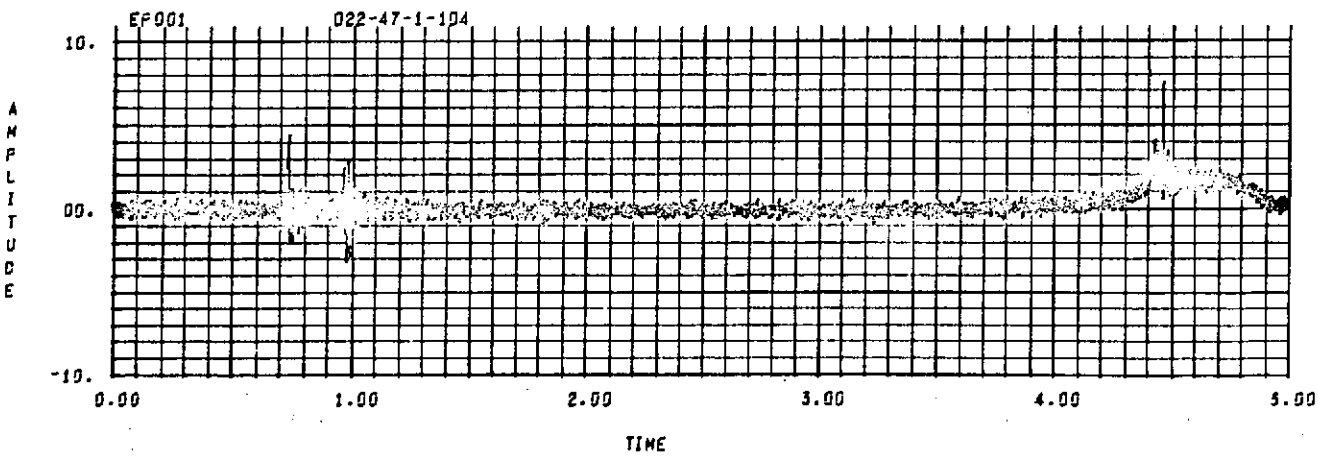
4.
6.
8.
10.
12.
14.
16.
18.
TIME

SEQ. = 0036

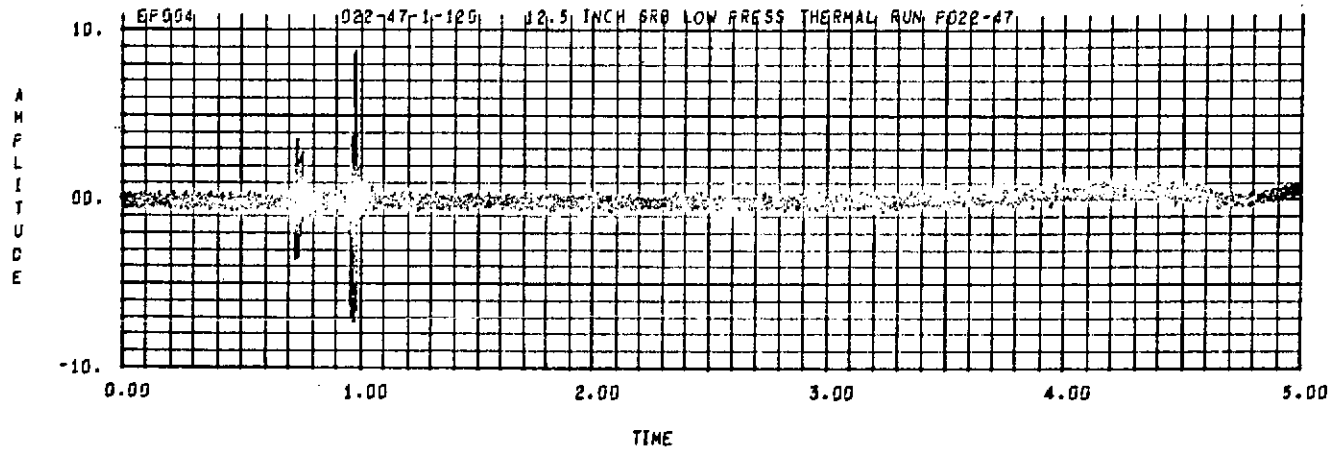

EA003
F022-47-1-16
12.5 INCH SRB LOW PRESS THERMAL RUN F022-47
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
5.00
TIME

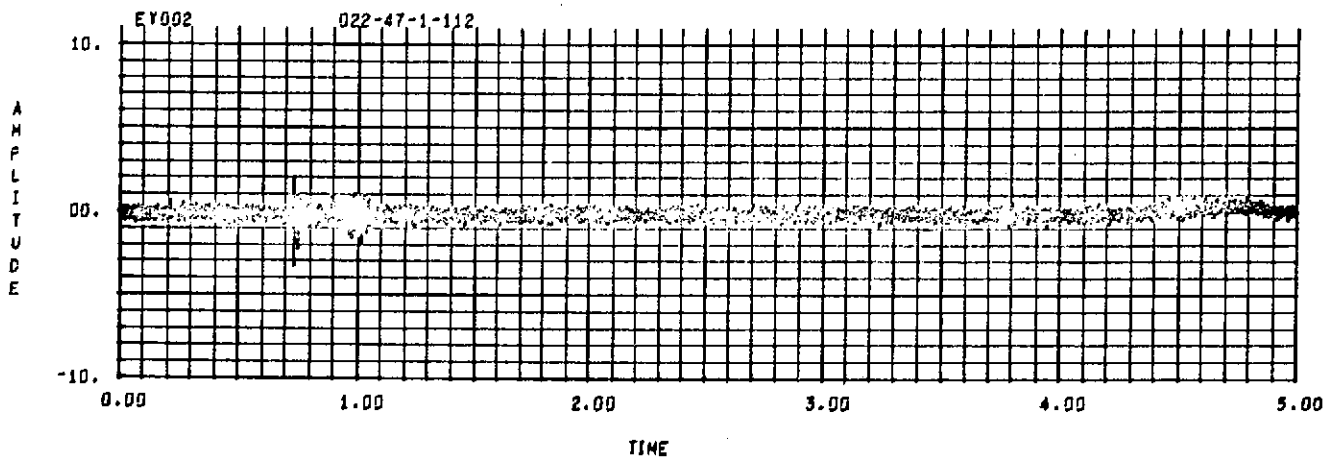

EA006
022-47-1-128
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
5.00
TIME


EF001
022-47-1-104
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
5.00
TIME

SEQ. = 0036

2


EF004
022-47-1-120
12.5 INCH SRB LOW PRESS THERMAL RUN F022-47
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
5.00
TIME


EY002
022-47-1-112
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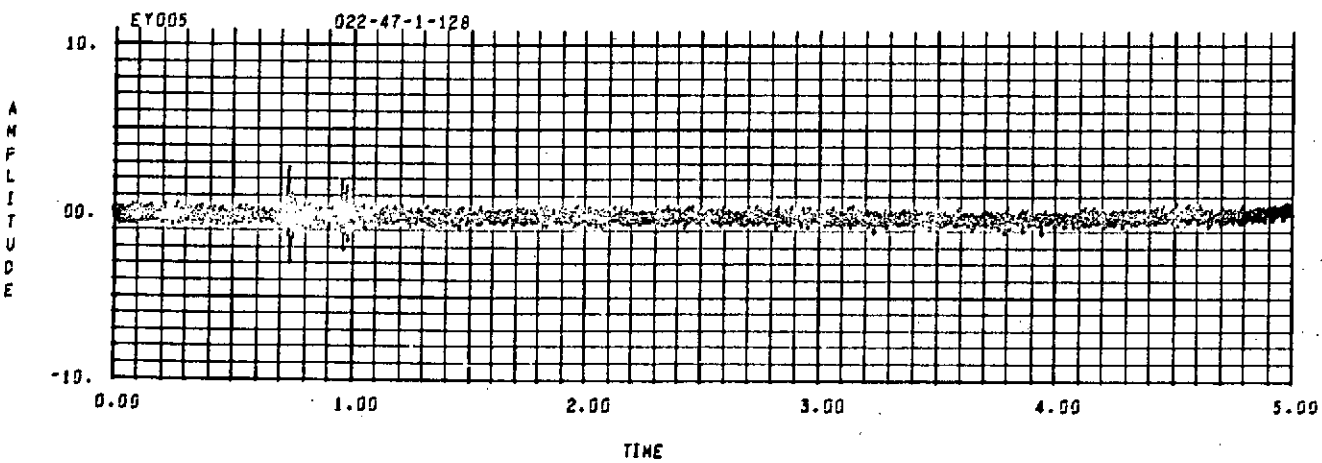
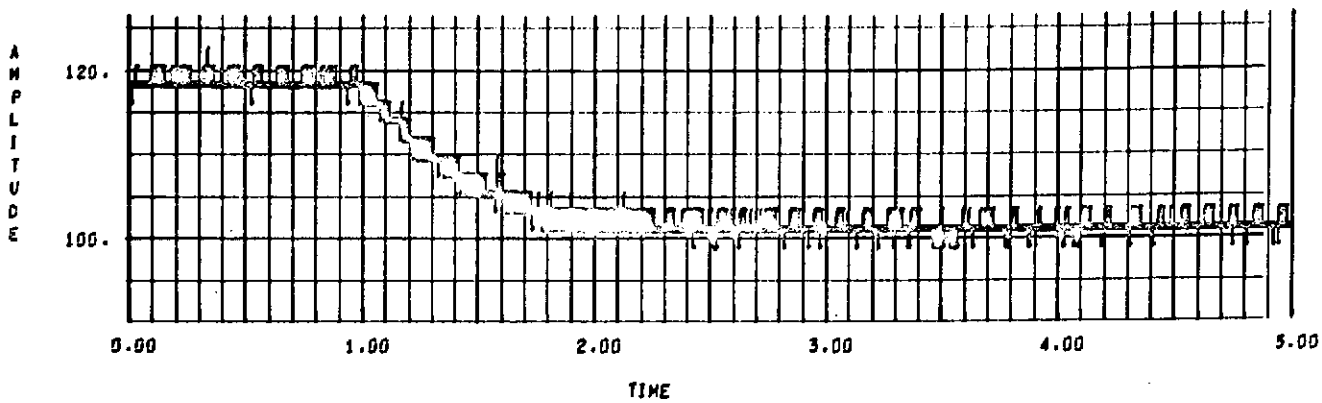
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
5.00
TIME

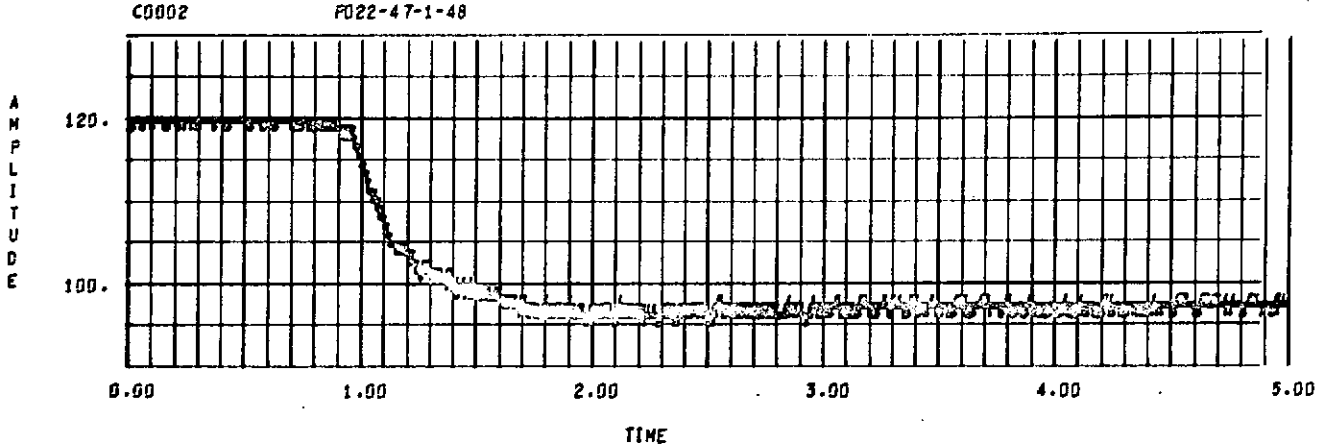

EY005
022-47-1-128
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
5.00
TIME

SEQ. = 0036

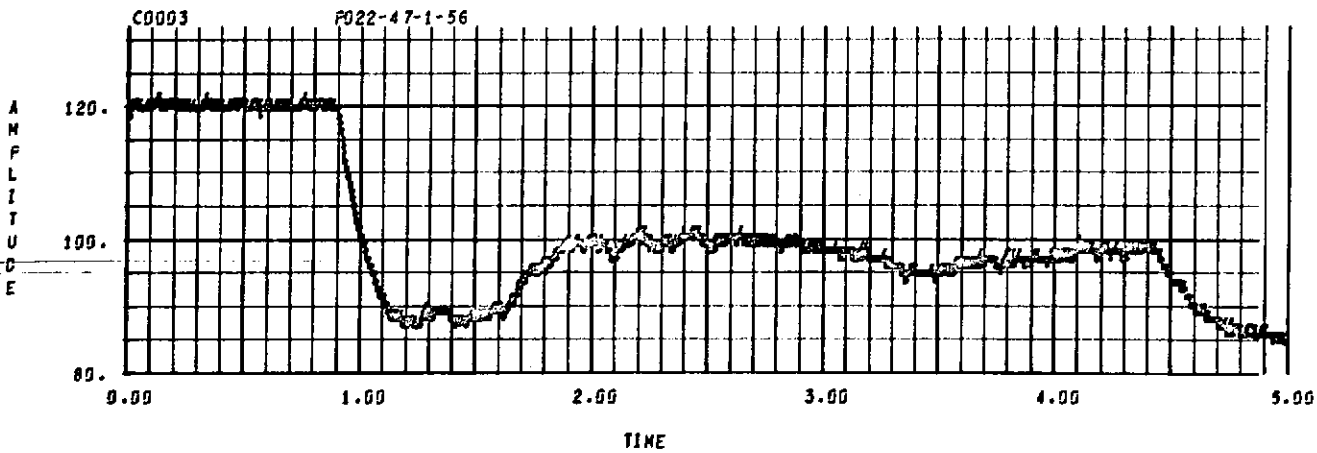
C0001 P022-47-1-40 12.5 INCH SRB LOW PRESS THERMAL RUN P022-47



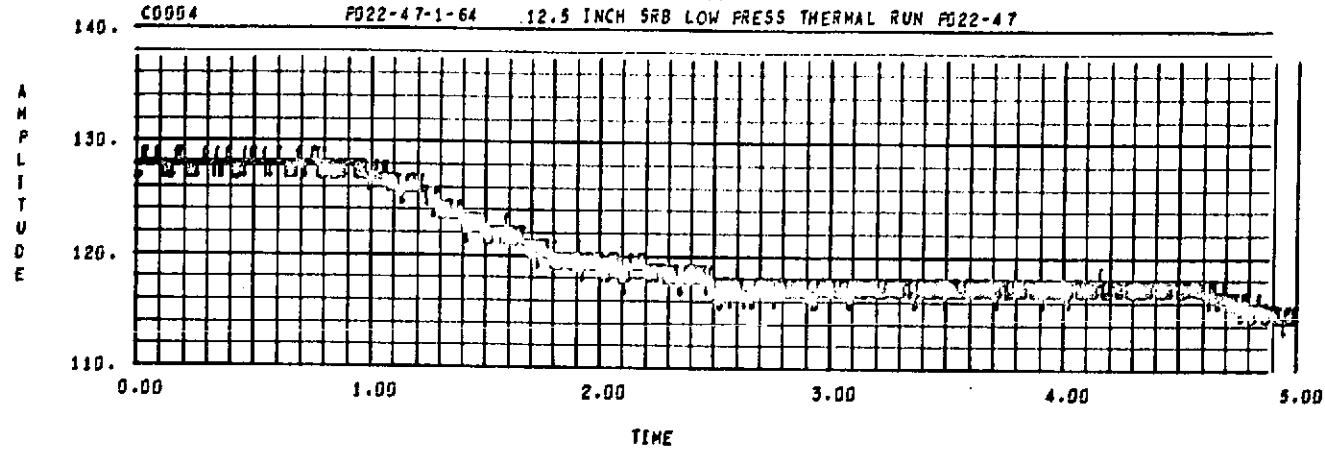
C0002 P022-47-1-48

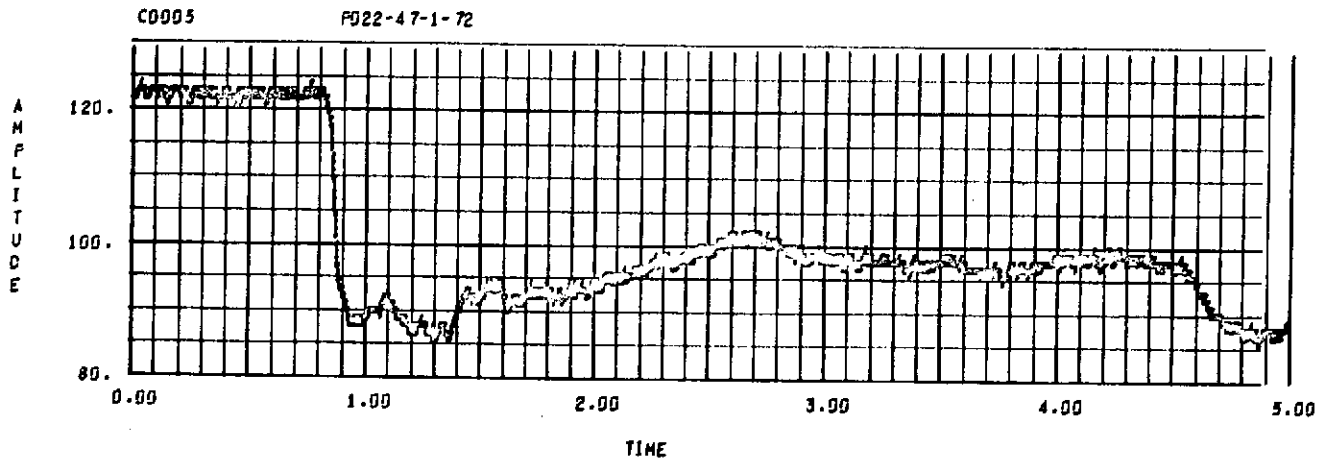


C0003 P022-47-1-56



SEQ. = 0036


C0004
F022-47-1-64
12.5 INCH SRB LOW PRESS THERMAL RUN F022-47
140.
130.
120.
110.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
5.00
TIME


C0005
F022-47-1-72
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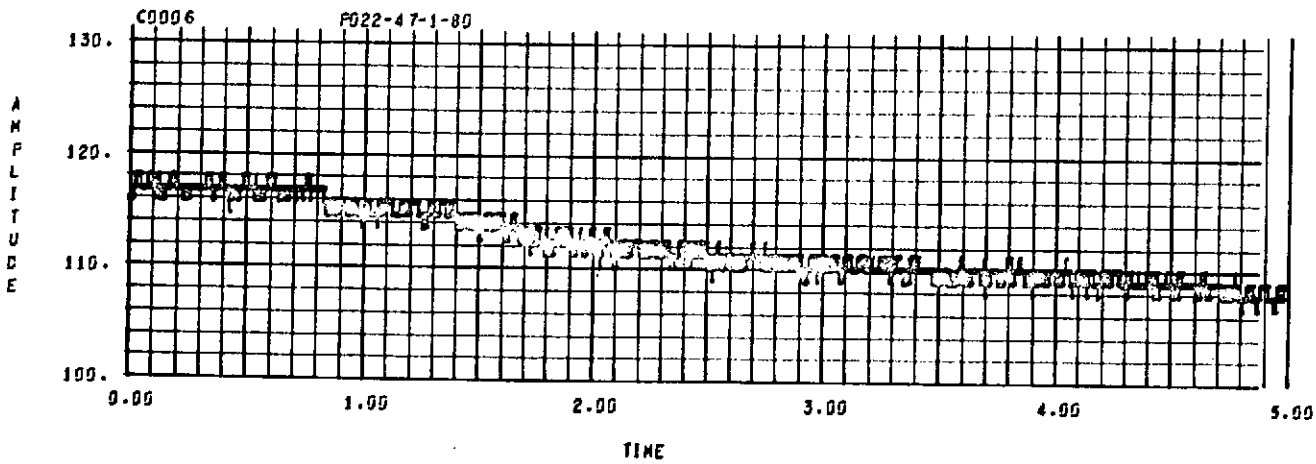
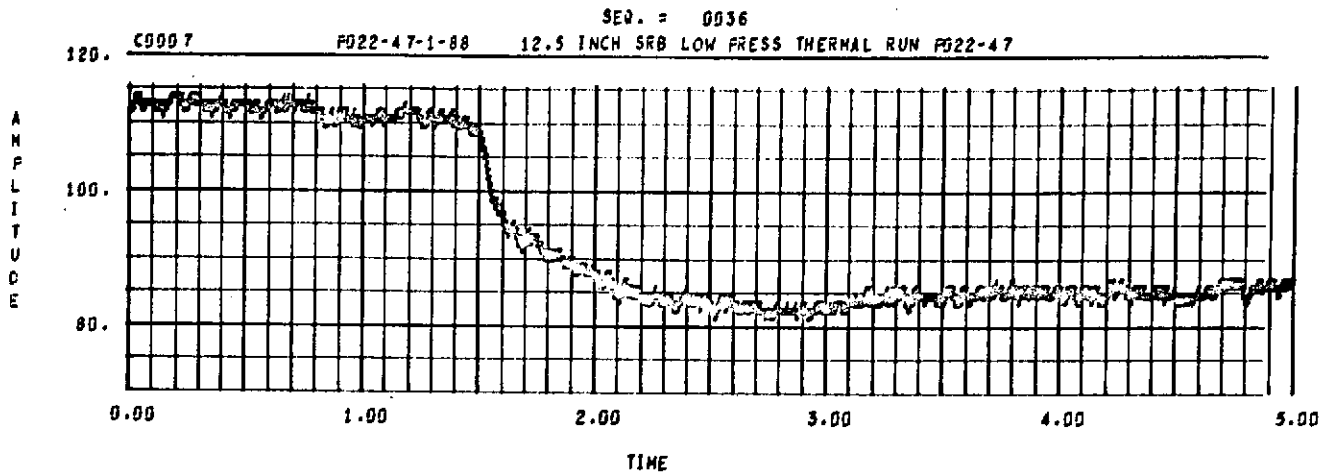
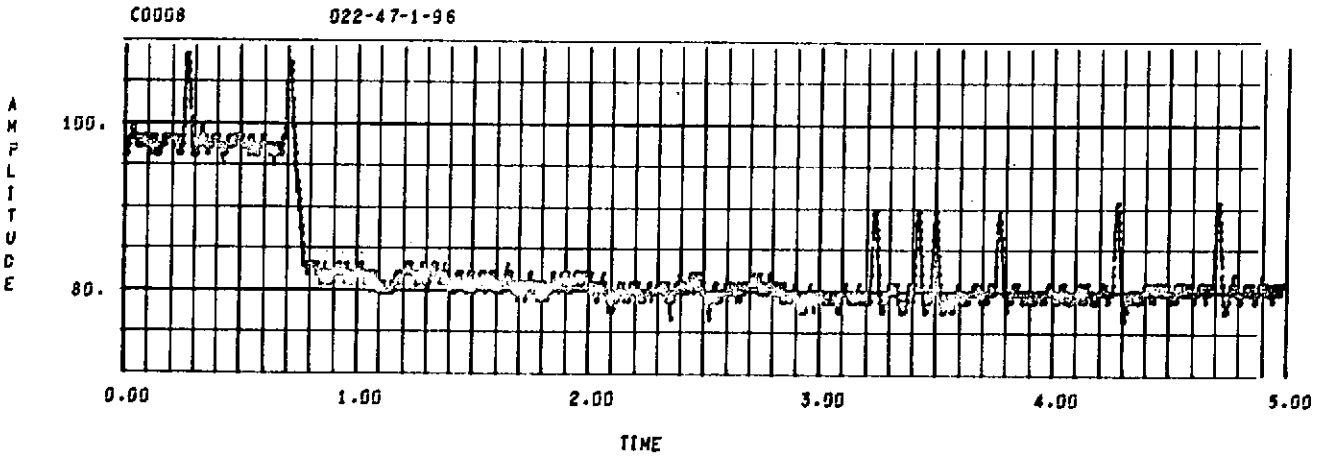
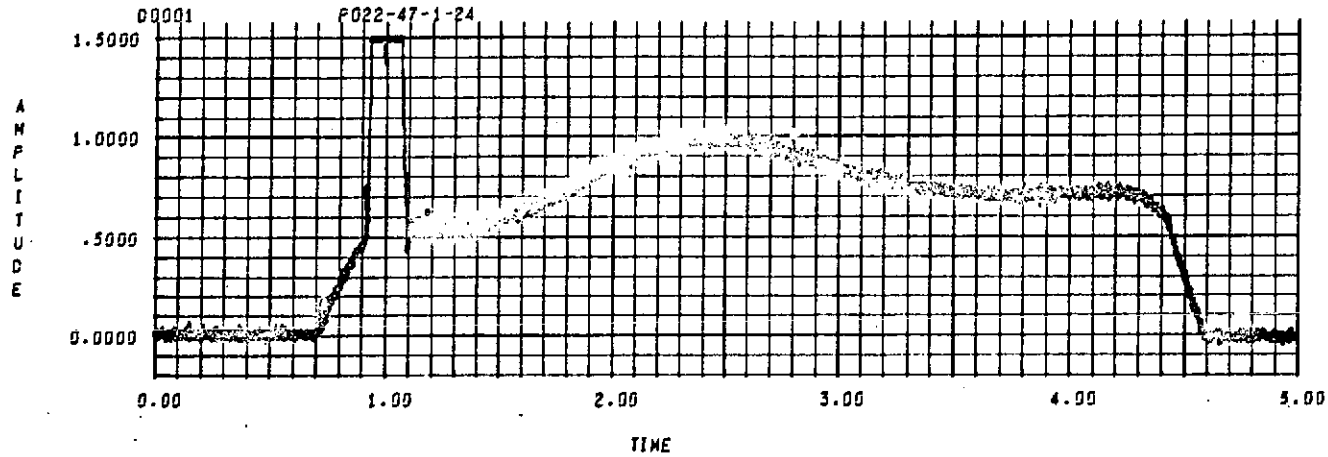
100.
80.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
5.00
TIME


C0006
F022-47-1-80
130.
120.
110.
100.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
5.00
TIME


SEQ. = 0036
C0007
F022-47-1-88
12.5 INCH SRB LOW PRESS THERMAL RUN F022-47
120.
100.
80.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
5.00
TIME


C0008
022-47-1-96
100.
80.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
5.00
TIME


D0001
F022-47-1-24
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1.0000
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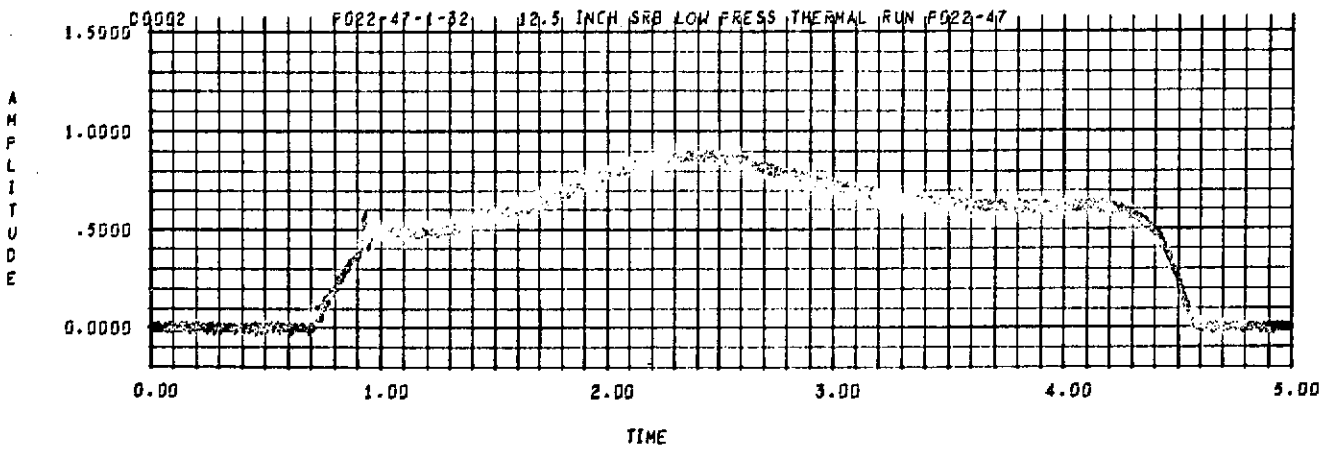
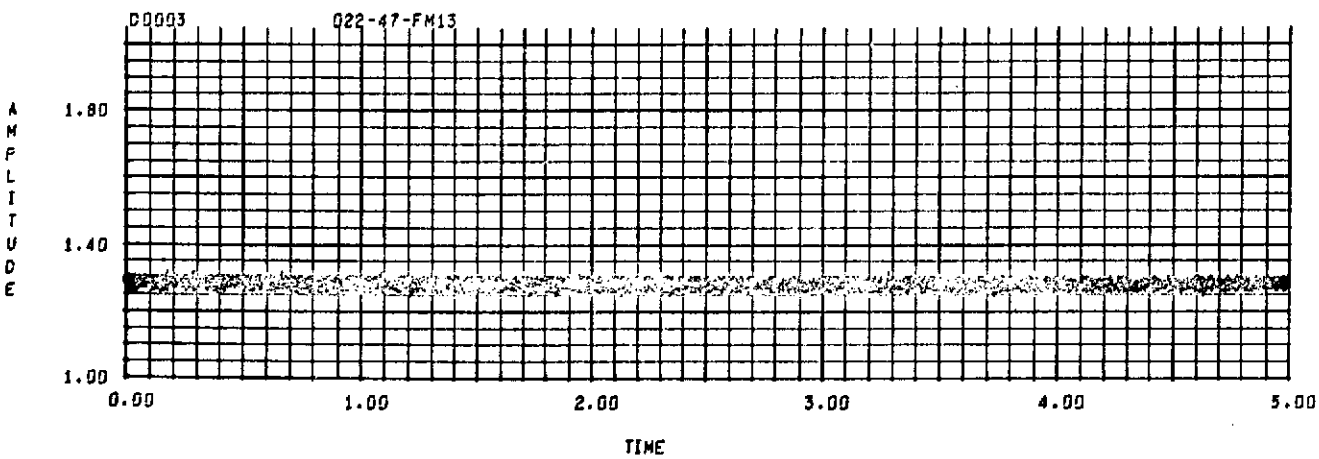
0.0000
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
5.00
TIME


D0002
F022-47-1-32
12.5 INCH SRB LOW PRESS THERMAL RUN F022-47
1.5000
1.0000
.5000
0.0000
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
5.00
TIME


D0003
022-47-FM13
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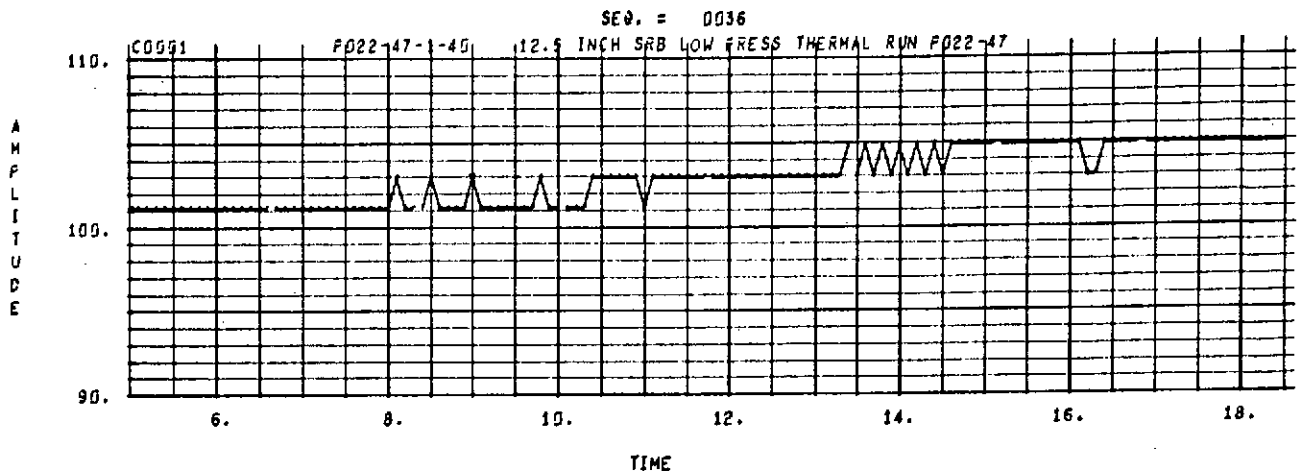
1.40
1.00
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
5.00
TIME


SEQ. = 0036
C0001
F022-47-1-40
12.5 INCH SRB LOW PRESS THERMAL RUN F022-47
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100.
90.
AMPLITUDE
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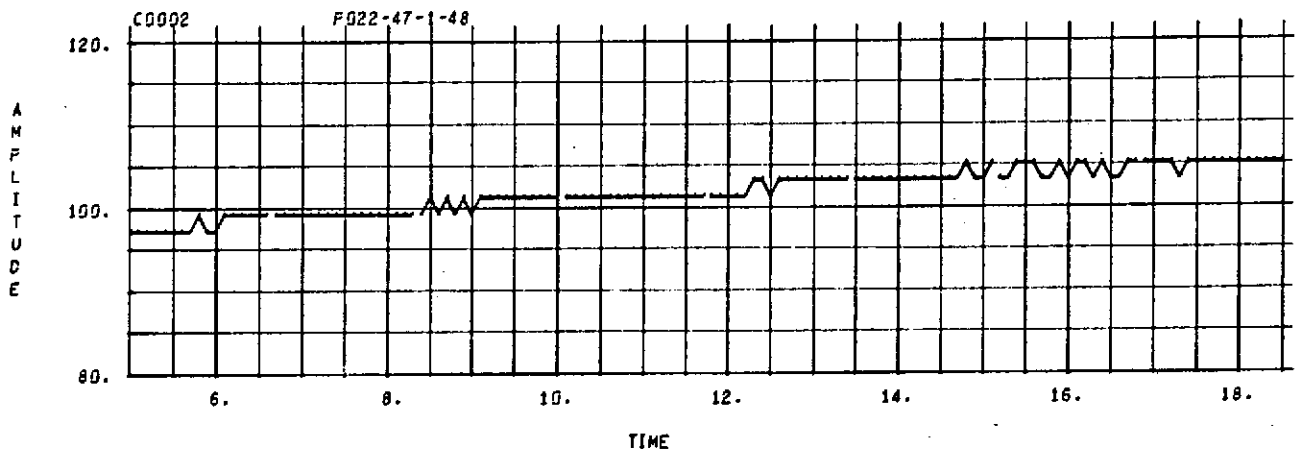
12.
14.
16.
18.
TIME


C0002
F022-47-1-48
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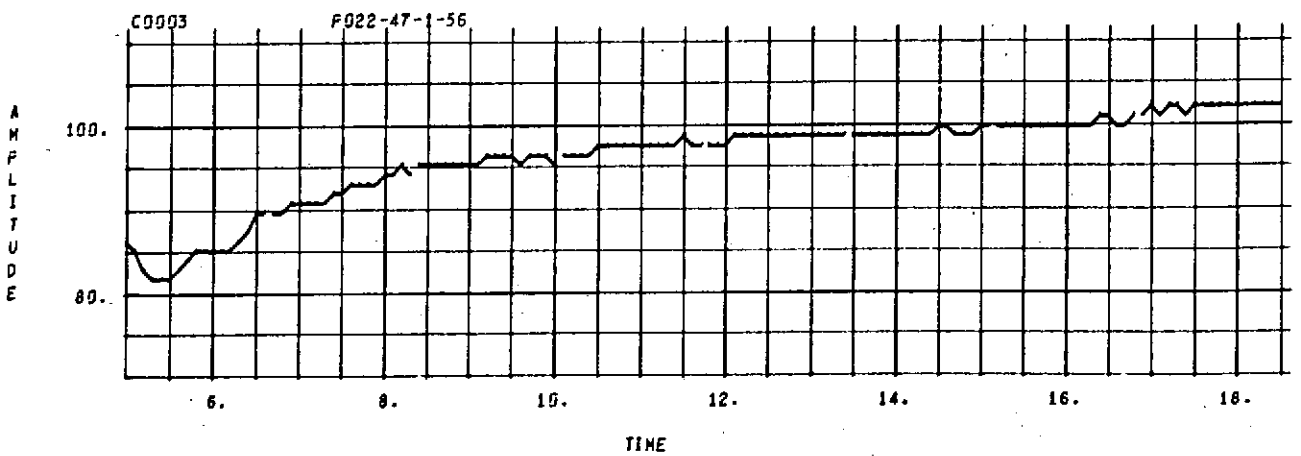
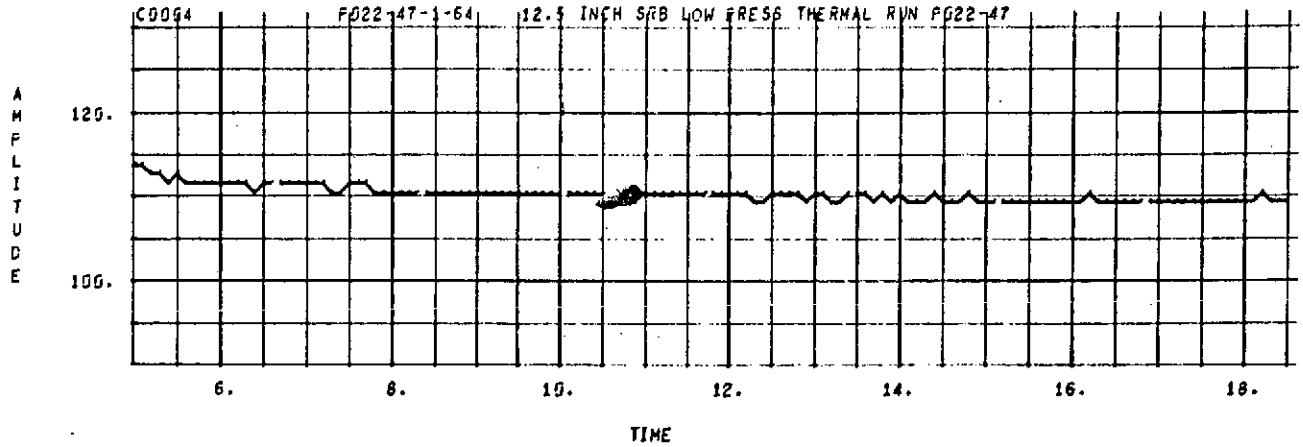
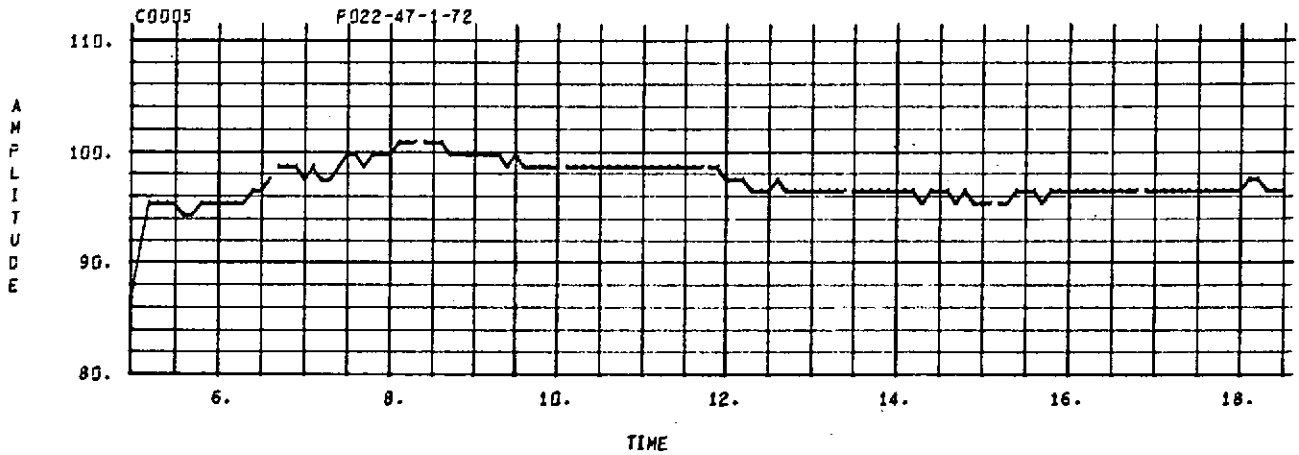
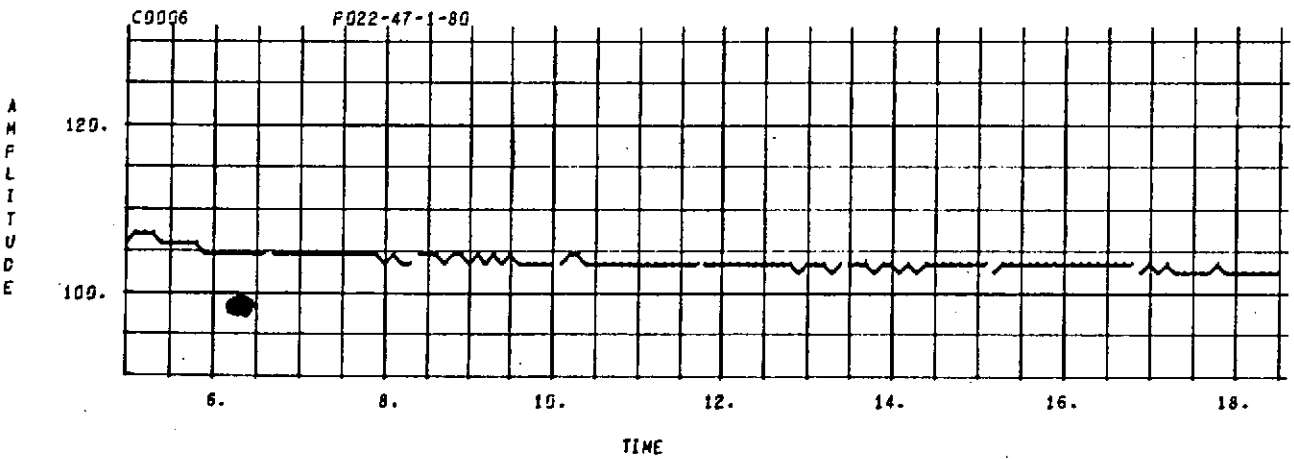
100.
80.
AMPLITUDE
6.
8.
10.
12.
14.
16.
18.
TIME


C0003
F022-47-1-56
100.
80.
AMPLITUDE
6.
8.
10.
12.
14.
16.
18.
TIME

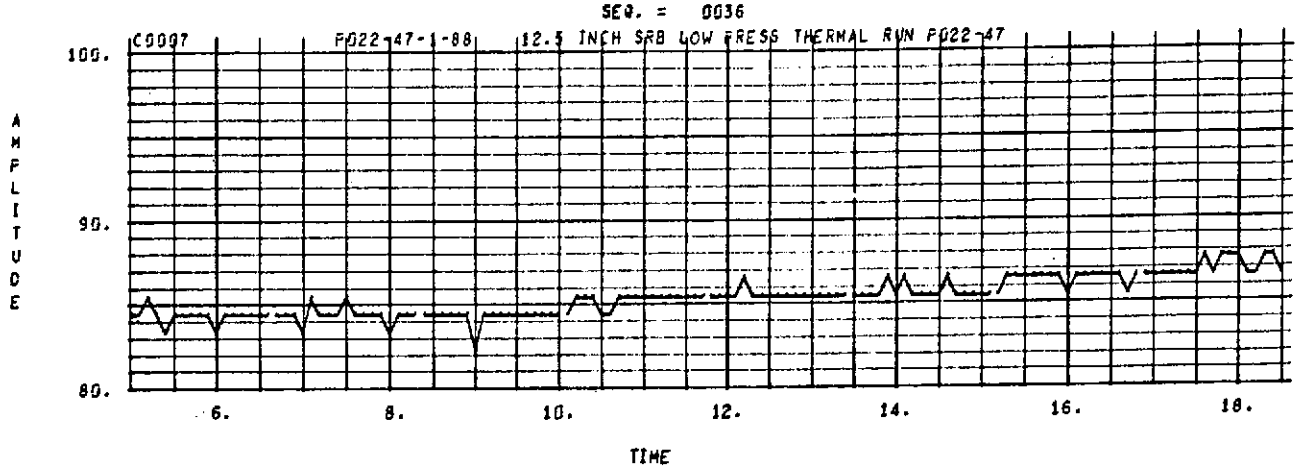
SEQ. = 0036

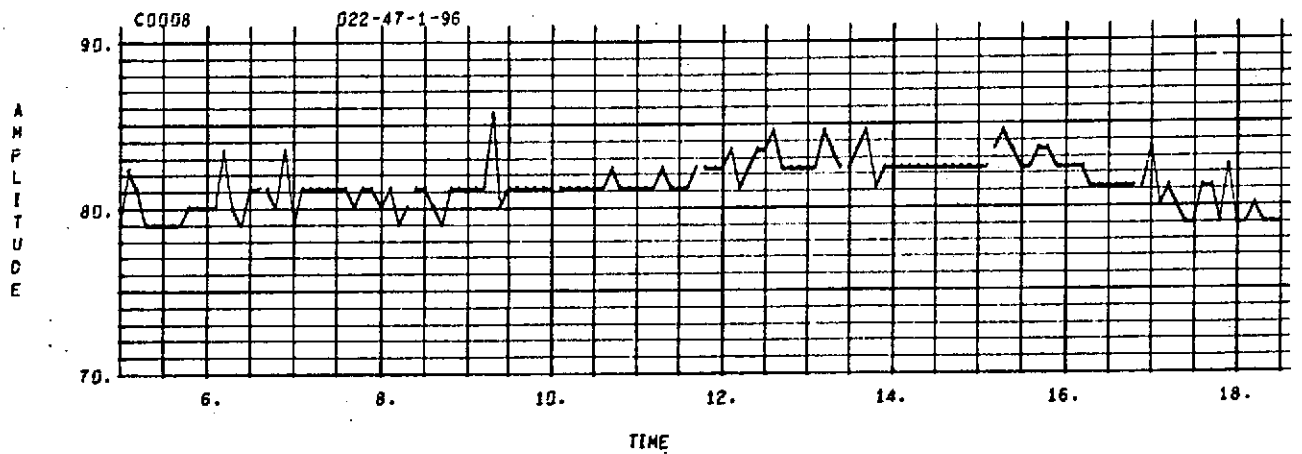

C0004
F022-47-1-64
12.5 INCH SRB LOW PRESS THERMAL RUN F022-47
AMPLITUDE
120.
100.
6.
8.
10.
12.
14.
16.
18.
TIME

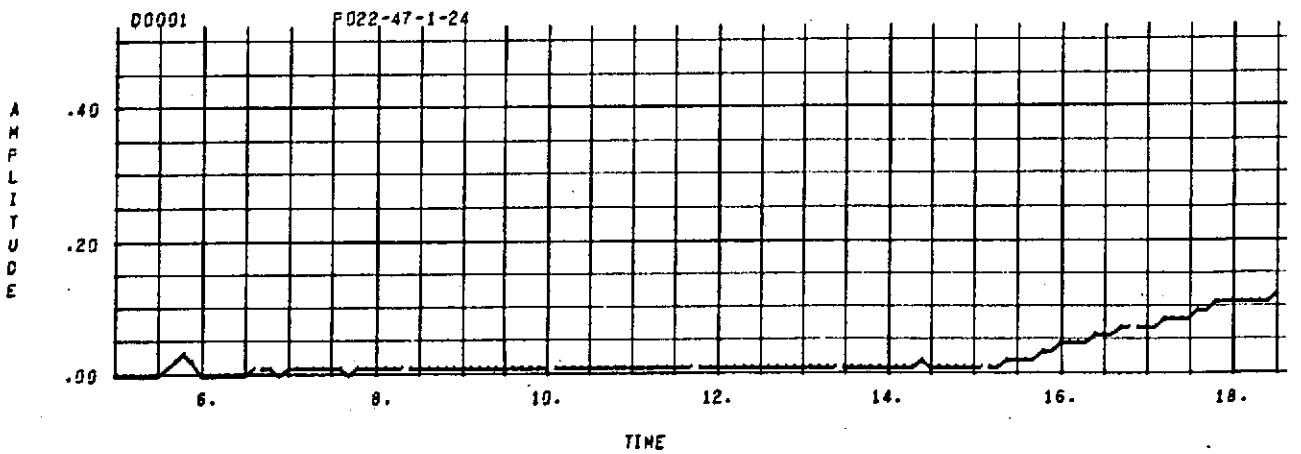

C0005
F022-47-1-72
AMPLITUDE
110.
100.
90.
80.
6.
8.
10.
12.
14.
16.
18.
TIME


C0006
F022-47-1-80
AMPLITUDE
120.
100.
6.
8.
10.
12.
14.
16.
18.
TIME

SEQ. = 0036

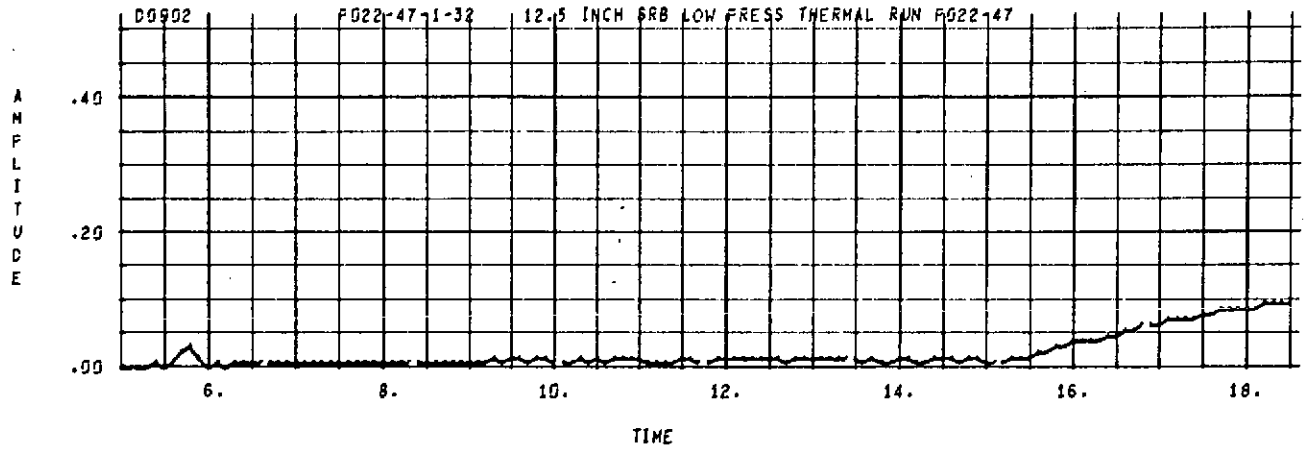

C0007
F022-47-1-88
12.5 INCH SRB LOW PRESS THERMAL RUN F022-47
100.
90.
80.
AMPLITUDE
6.
8.
10.
12.
14.
16.
18.
TIME

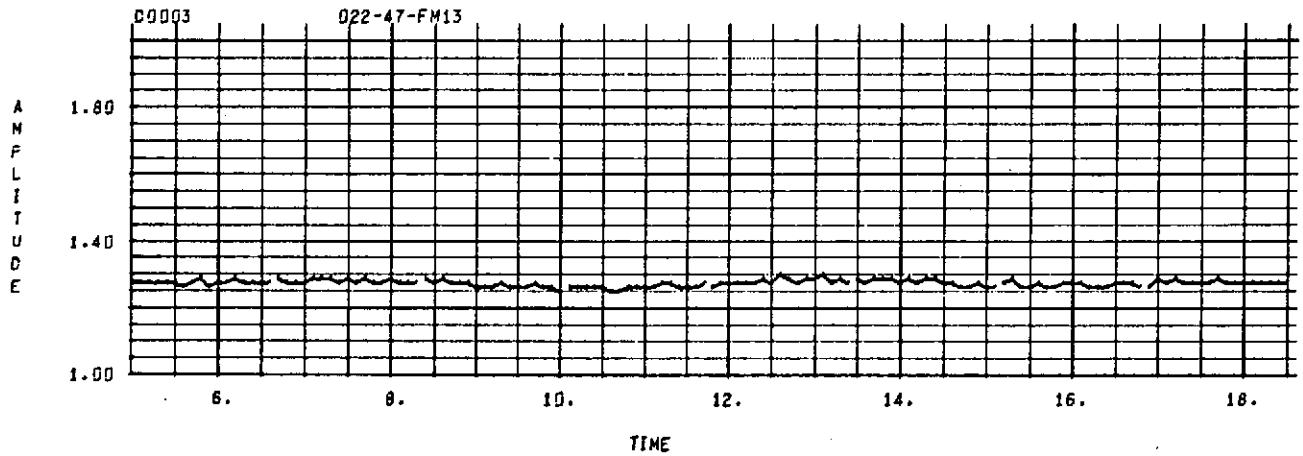

C0008
022-47-1-96
90.
80.
70.
AMPLITUDE
6.
8.
10.
12.
14.
16.
18.
TIME


D0001
F022-47-1-24
.40
.20
.00
AMPLITUDE
6.
8.
10.
12.
14.
16.
18.
TIME

SEQ. = 0036

11


D0902
F022-47-1-32
12.5 INCH SRB LOW PRESS THERMAL RUN F022-47
AMPLITUDE
.40
.20
.00
6.
8.
10.
12.
14.
16.
18.
TIME


D0003
022-47-FM13
AMPLITUDE
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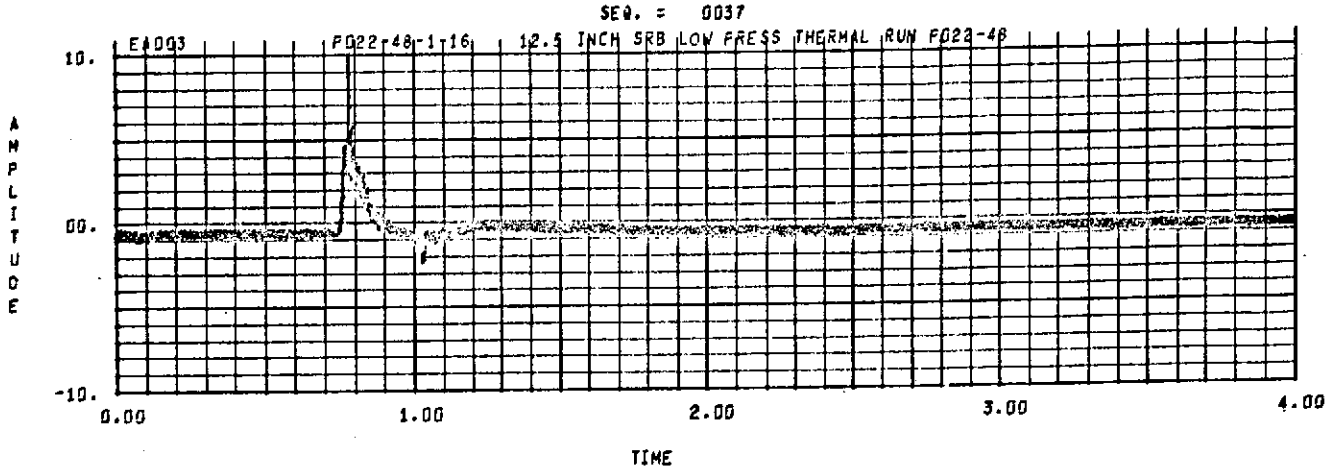
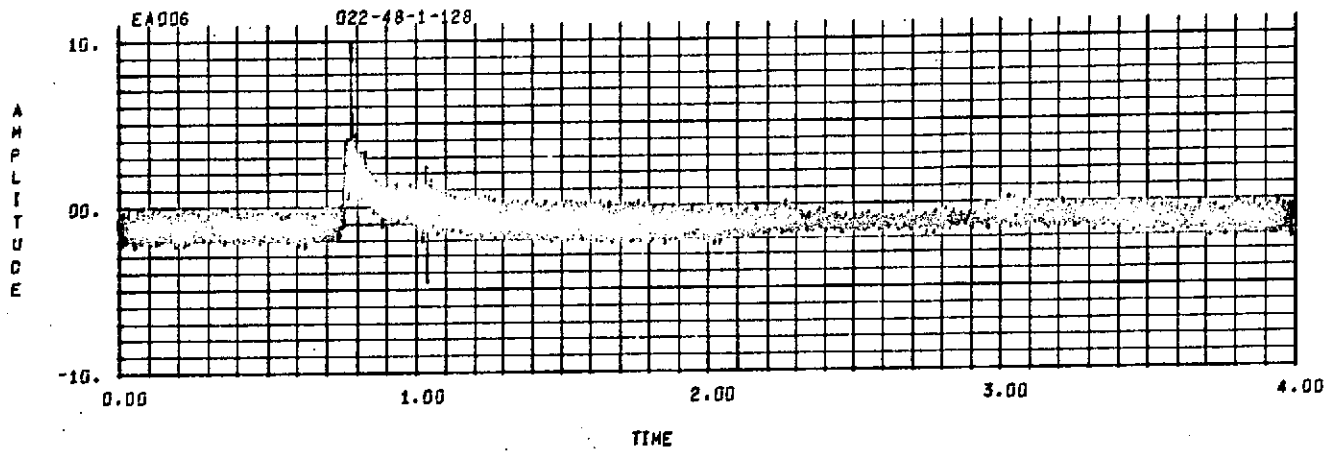
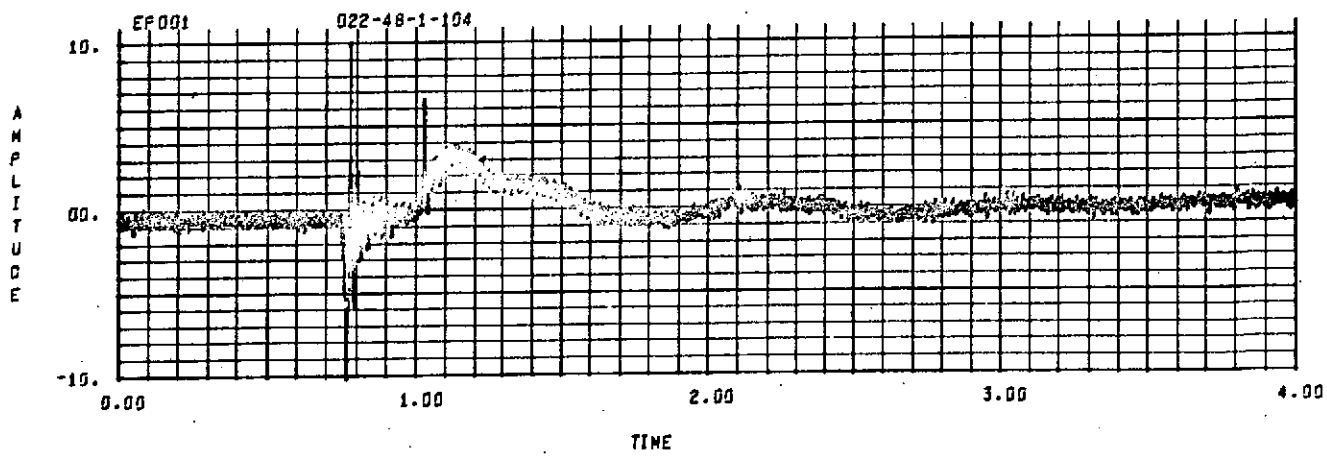
1.40
1.00
6.
8.
10.
12.
14.
16.
18.
TIME

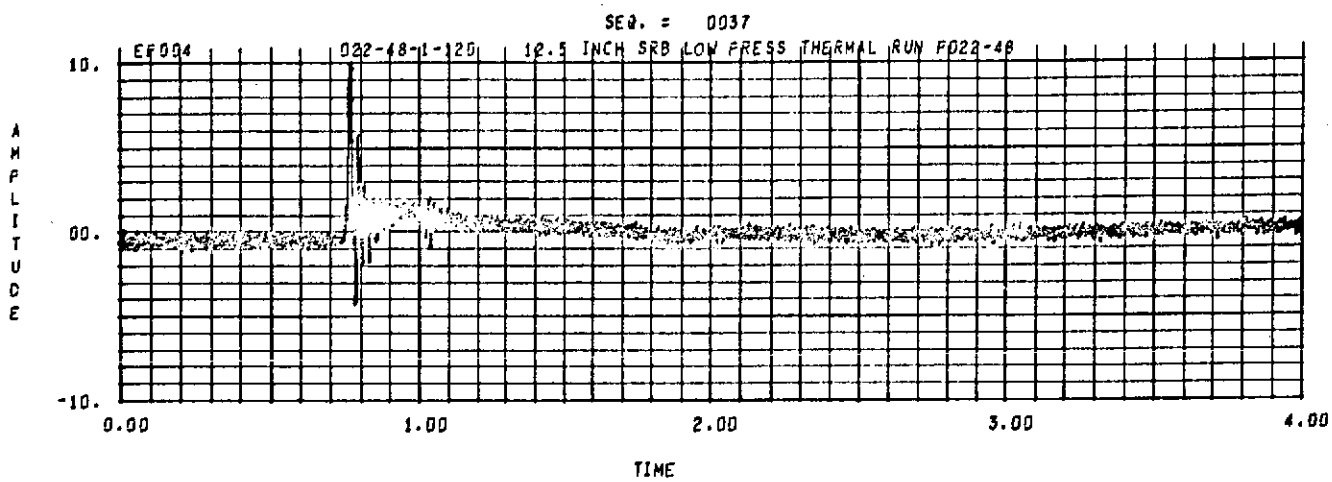
SEQ. = 0037

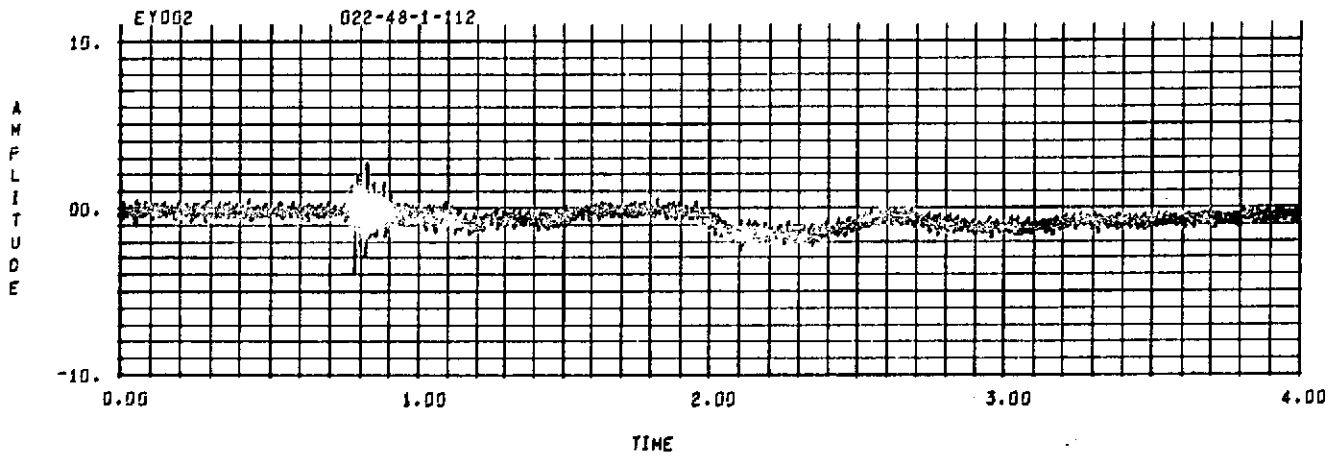

EA003
F022-48-1-16
12.5 INCH SRB LOW PRESS THERMAL RUN F022-48
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

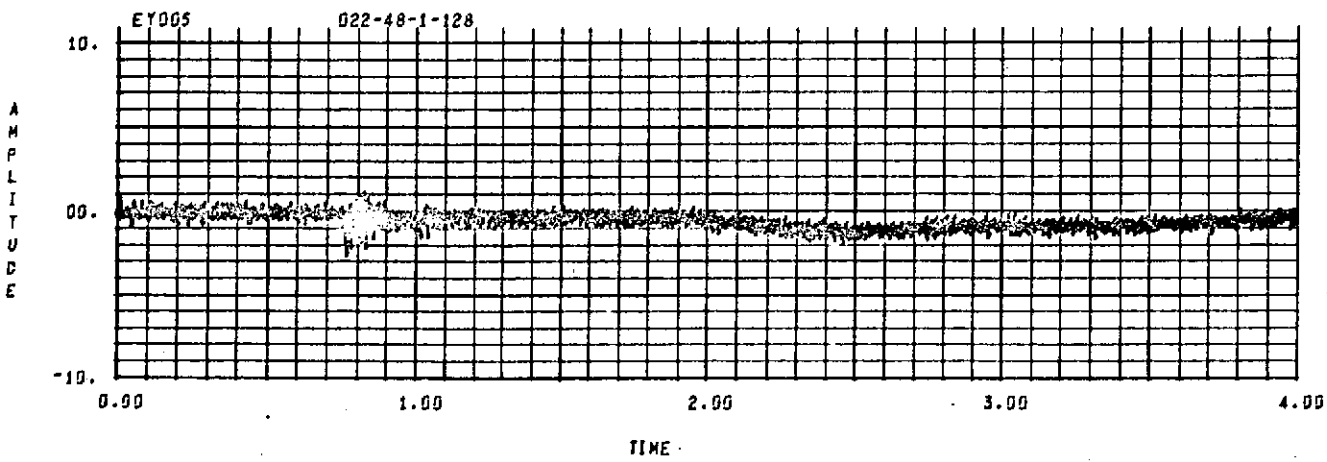

EA006
022-48-1-128
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

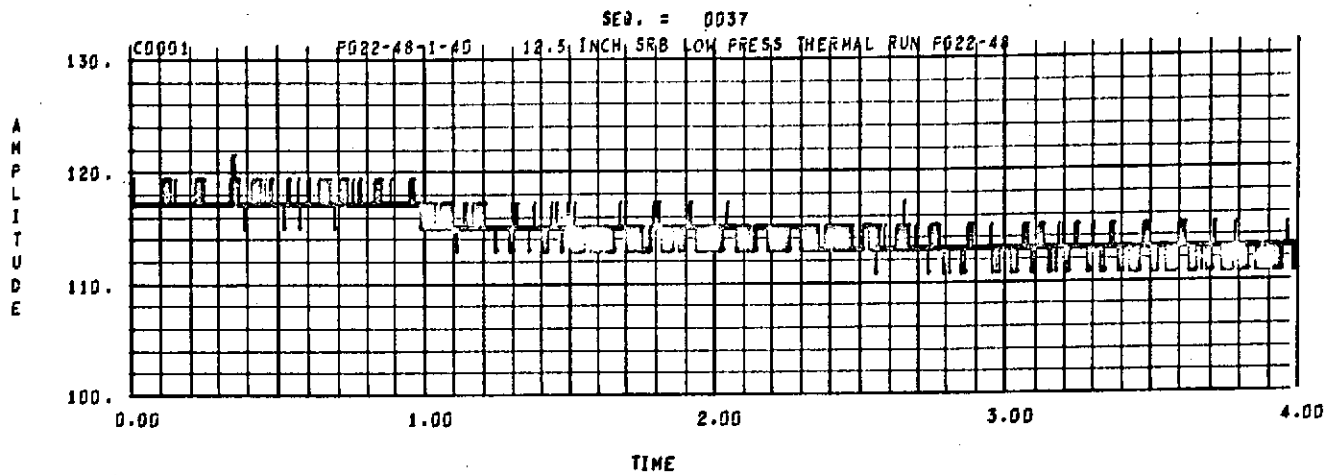

EF001
022-48-1-104
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

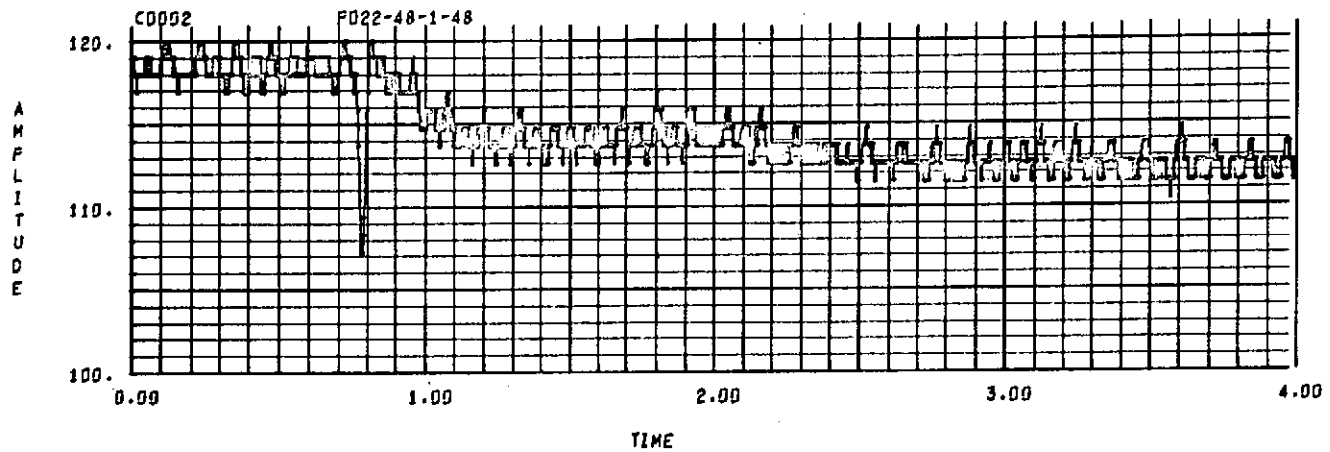
SEQ. = 0037

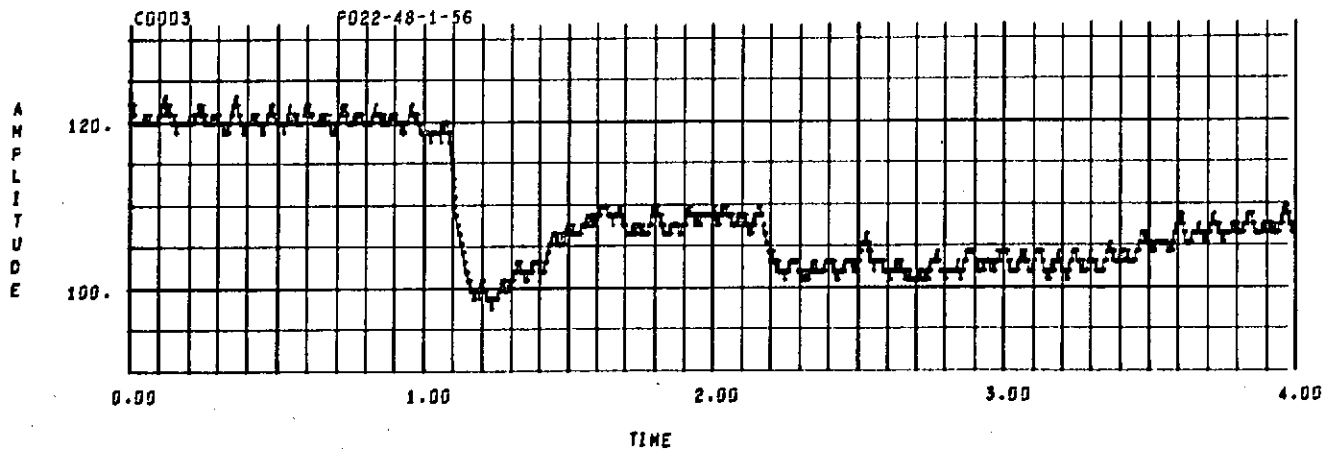

EF004
022-48-1-120
12.5 INCH SRB LOW PRESS THERMAL RUN F022-48
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

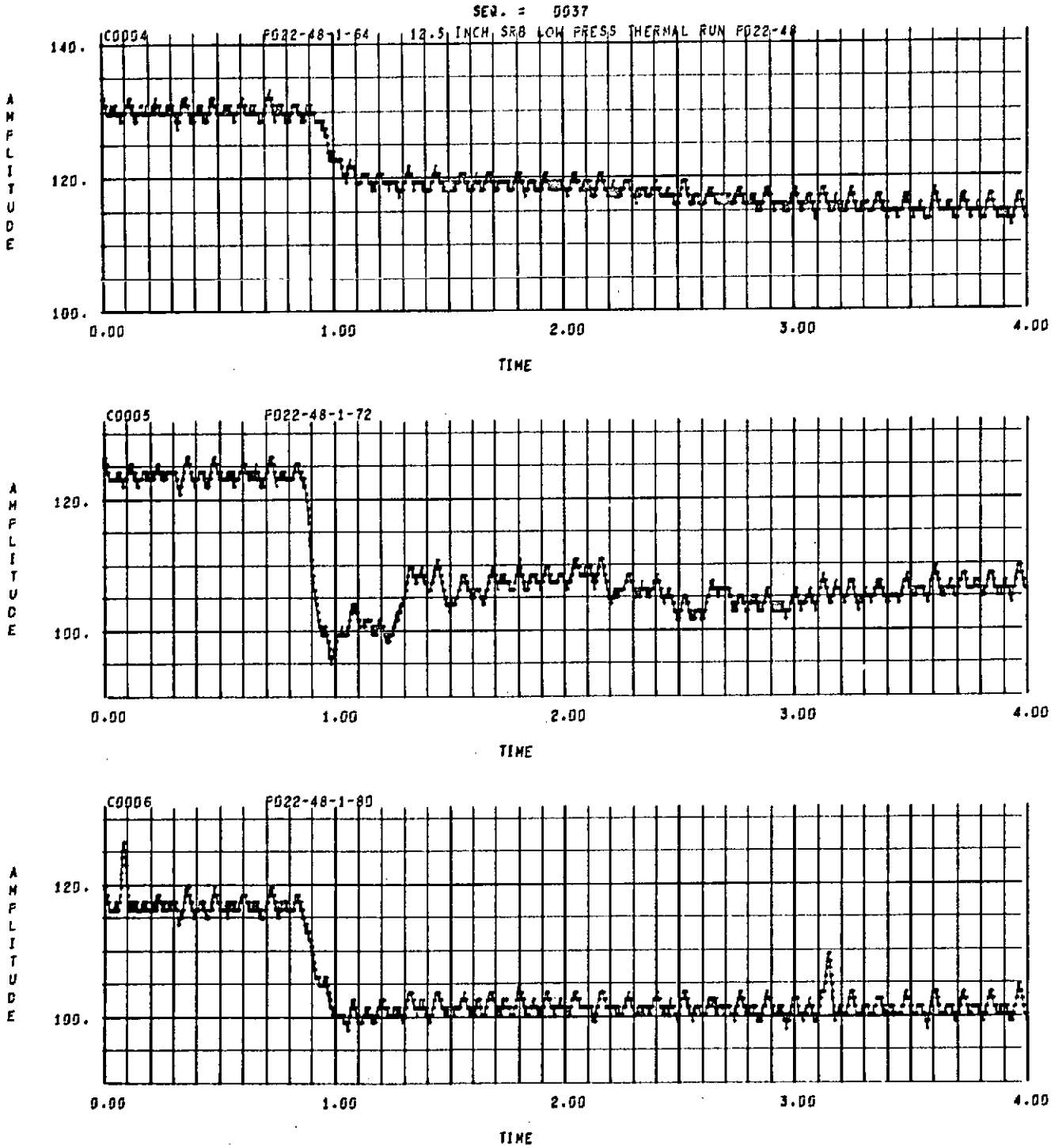

EY002
022-48-1-112
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

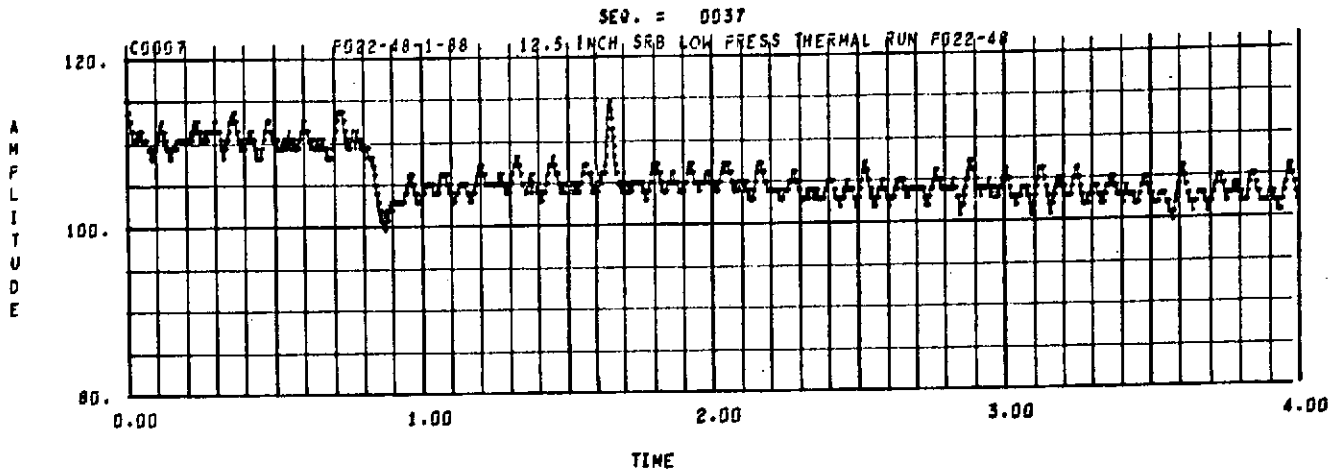

EY005
022-48-1-128
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

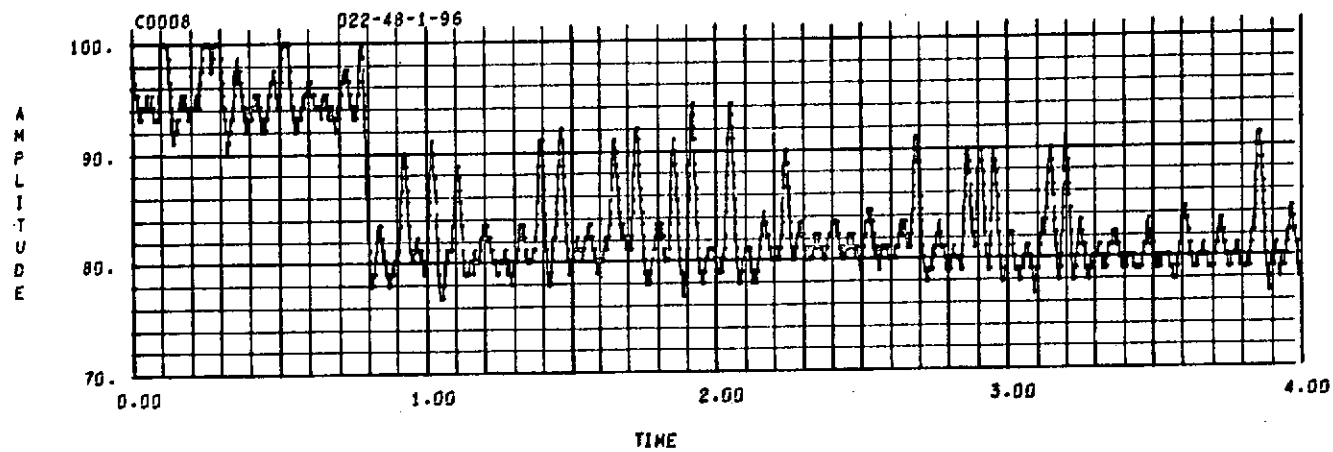

SEQ. = 0037
C0001
F022-48-1-40
12.5 INCH SRB LOW PRESS THERMAL RUN F022-48
130.
120.
110.
100.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

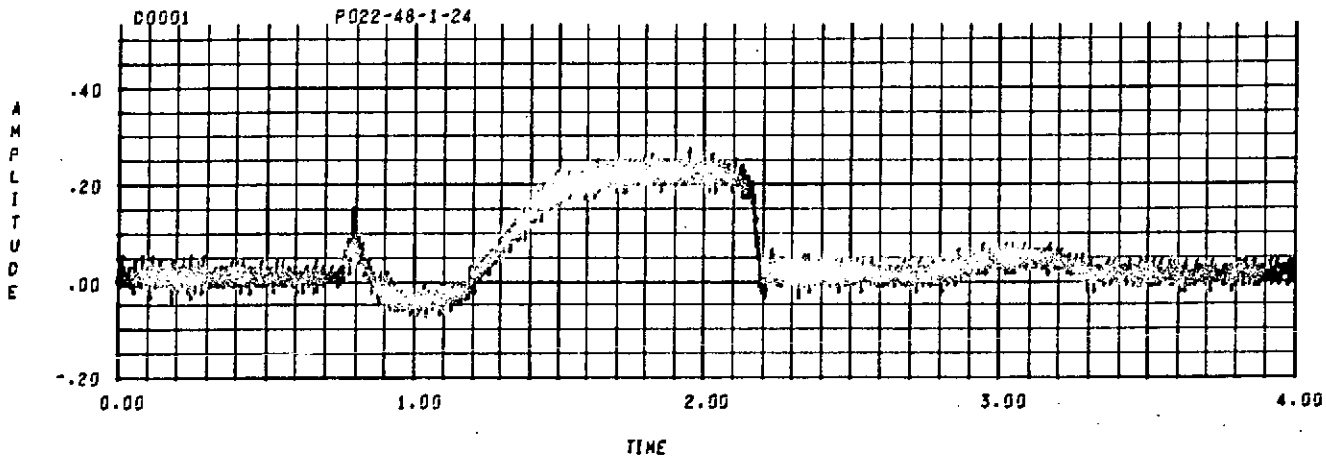

C0002
F022-48-1-48
120.
110.
100.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

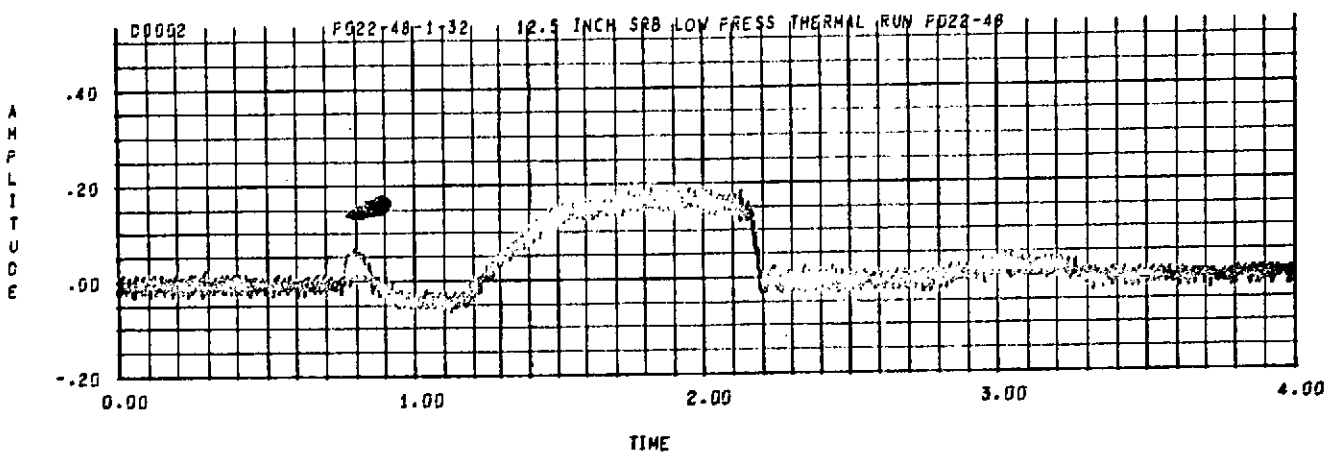

C0003
F022-48-1-56
120.
100.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

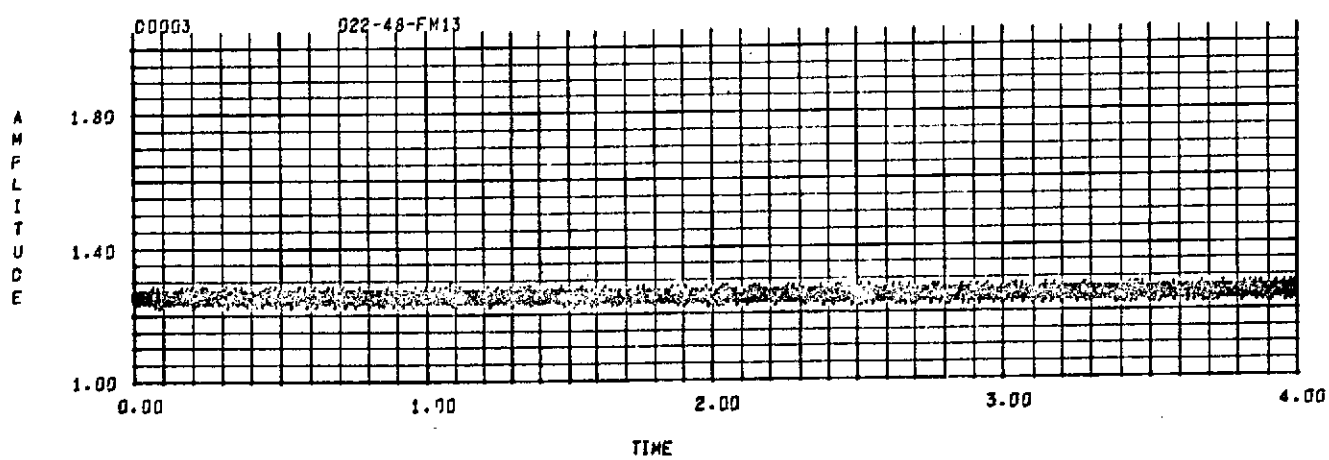

SEQ. = 0037
C0004
F022-48-1-64
12.5 INCH SRB LOW PRESS THERMAL RUN F022-48
140.
120.
100.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME
C0005
F022-48-1-72
120.
100.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME
C0006
F022-48-1-80
120.
100.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

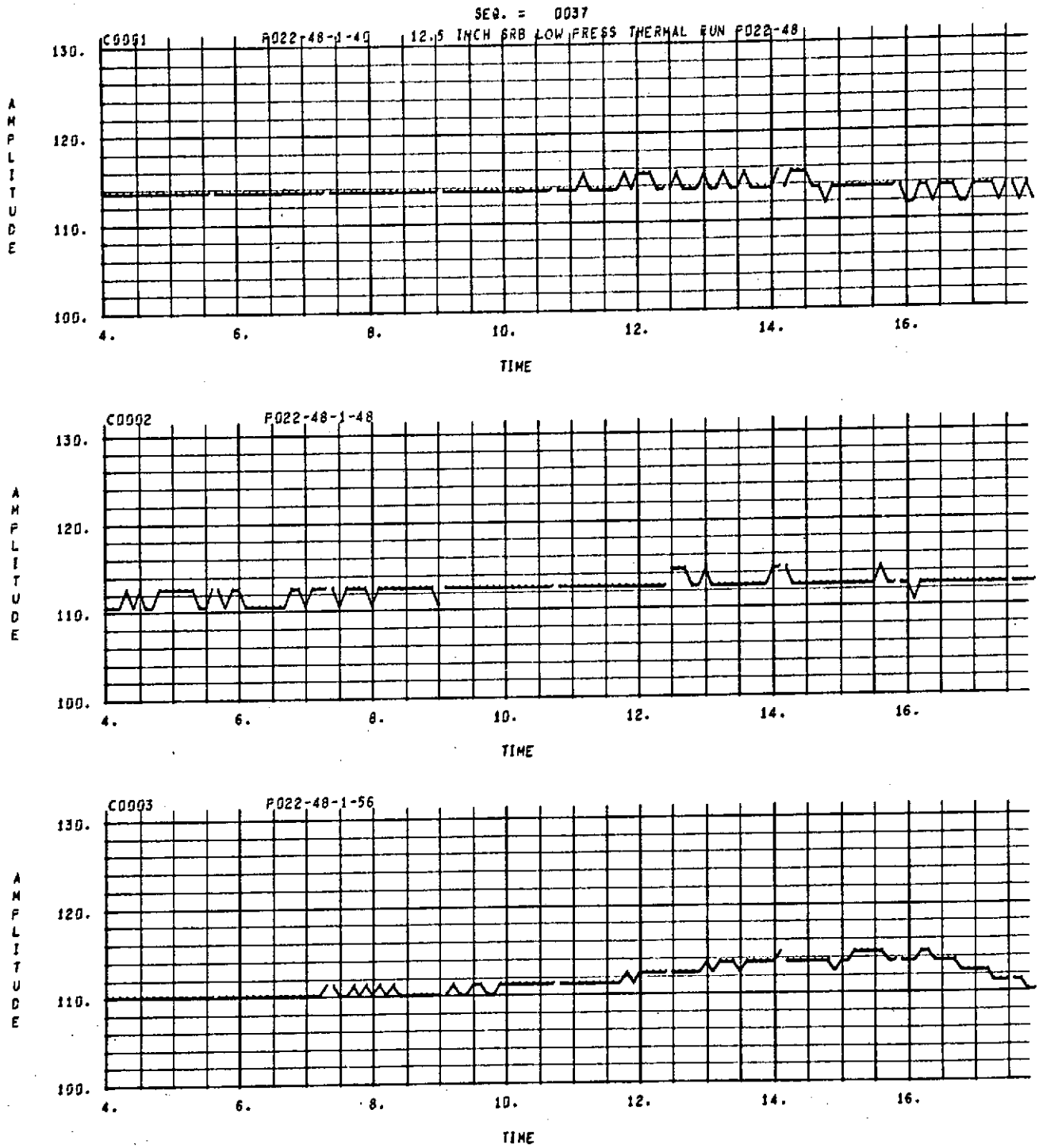

SEQ. = 0037
C0007
F022-48-1-88
12.5 INCH SRB LOW PRESS THERMAL RUN F022-48
120.
100.
80.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

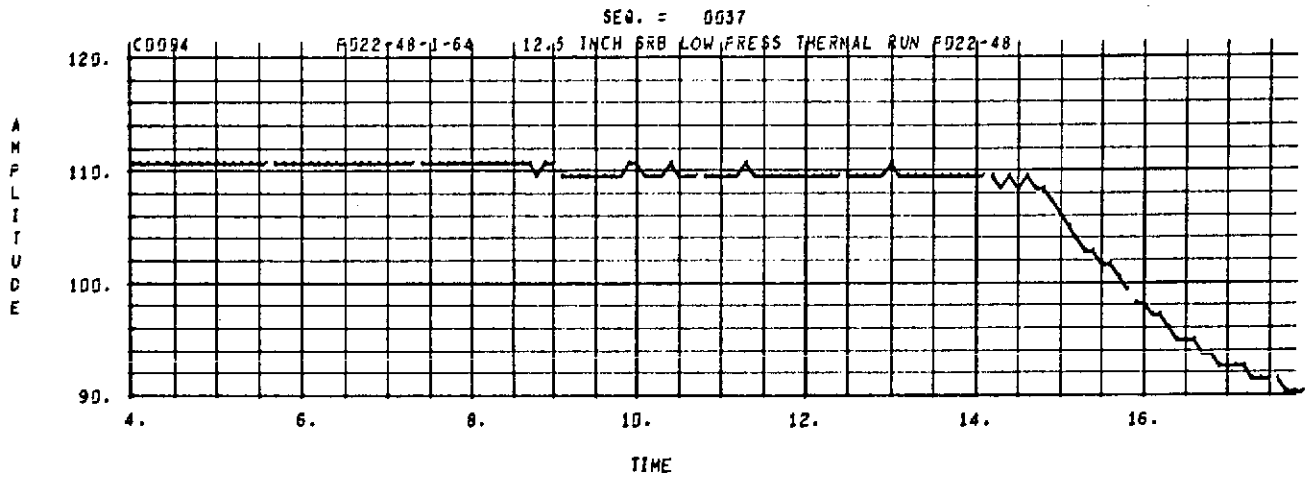

C0008
022-48-1-96
100.
90.
80.
70.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

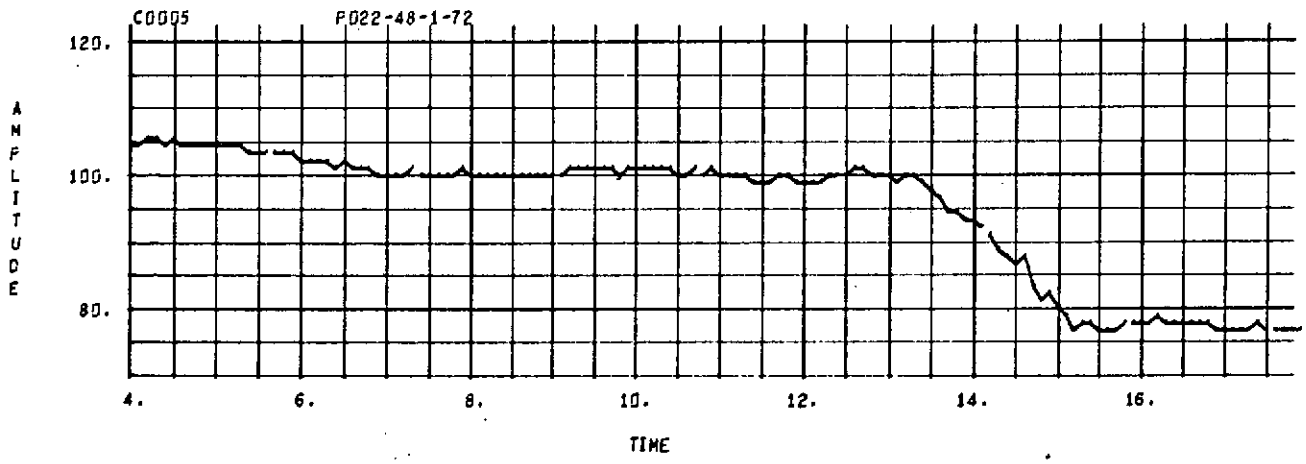

C0001
P022-48-1-24
AMPLITUDE
.40
.20
.00
-.20
0.00
1.00
2.00
3.00
4.00
TIME

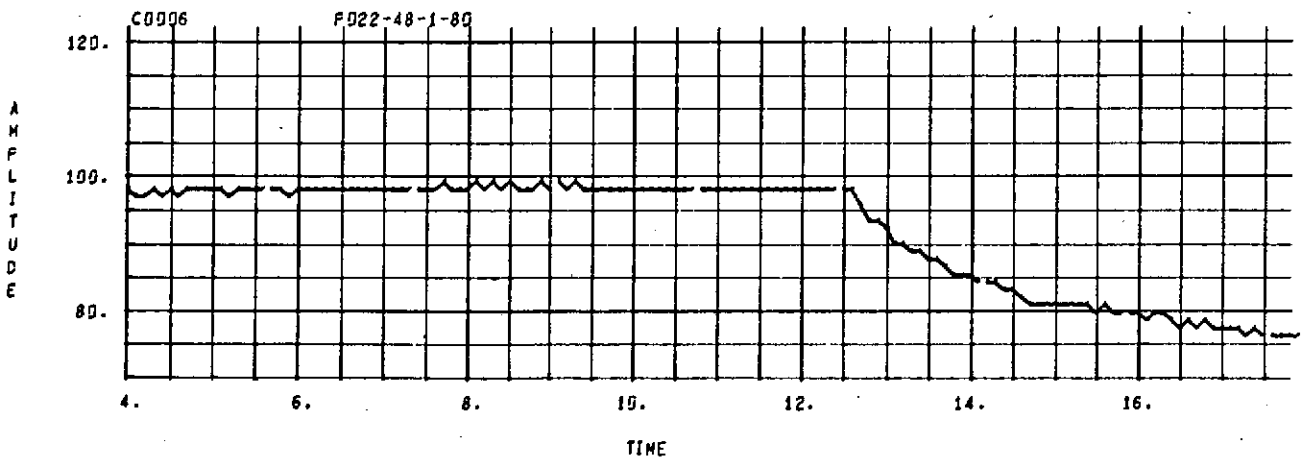

C0002
P022-48-1-32
12.5 INCH SRB LOW PRESS THERMAL RUN P022-48
AMPLITUDE
.40
.20
.00
-.20
0.00
1.00
2.00
3.00
4.00
TIME

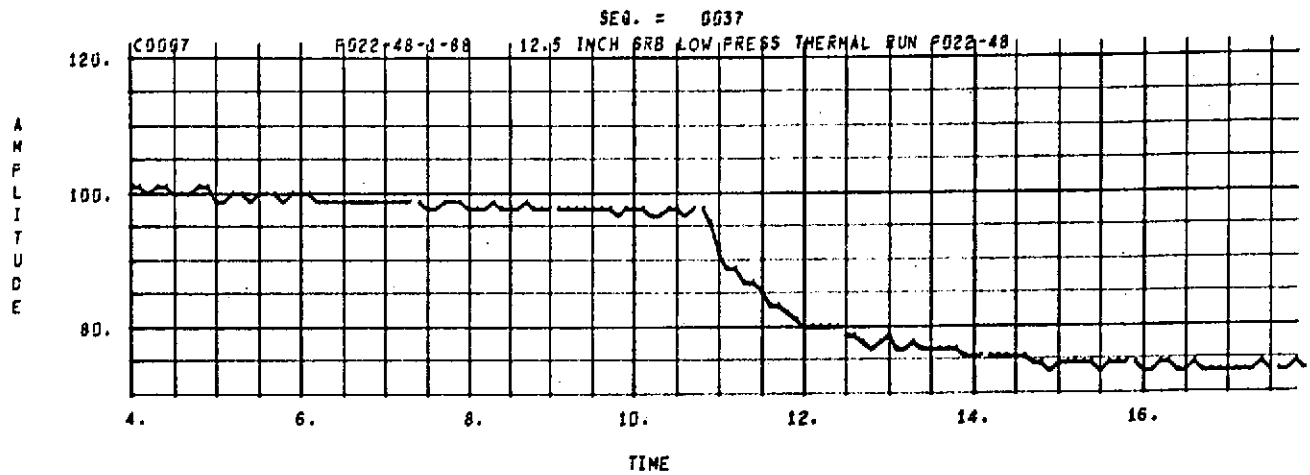

C0003
022-48-FM13
AMPLITUDE
1.80
1.40
1.00
0.00
1.00
2.00
3.00
4.00
TIME

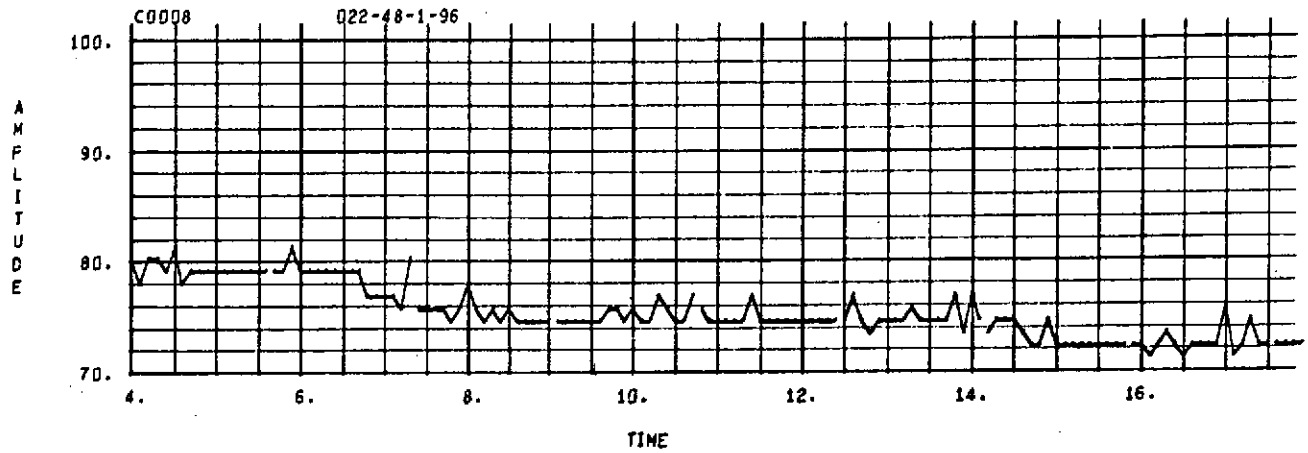

SEQ. = 0037
C0001
P022-48-1-40
12.5 INCH SRB LOW PRESS THERMAL RUN P022-48
130.
120.
110.
100.
AMPLITUDE
4.
6.
8.
10.
12.
14.
16.
TIME
C0002
P022-48-1-48
130.
120.
110.
100.
AMPLITUDE
4.
6.
8.
10.
12.
14.
16.
TIME
C0003
P022-48-1-56
130.
120.
110.
100.
AMPLITUDE
4.
6.
8.
10.
12.
14.
16.
TIME

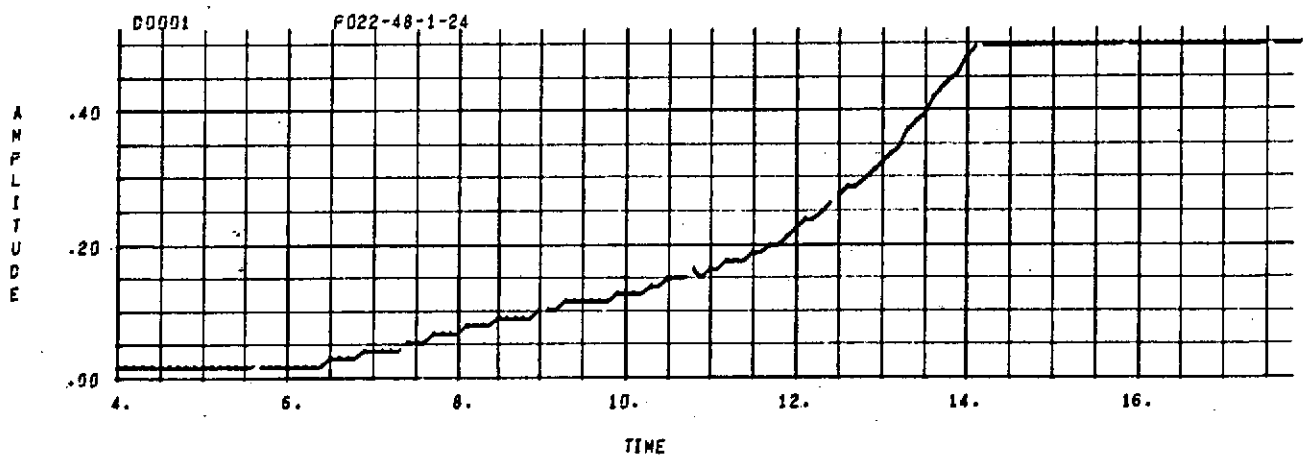

SEQ. = 0037
C0094
F022-48-1-64
12.5 INCH SRB LOW PRESS THERMAL RUN F022-48
120.
110.
100.
90.
AMPLITUDE
4.
6.
8.
10.
12.
14.
16.
TIME

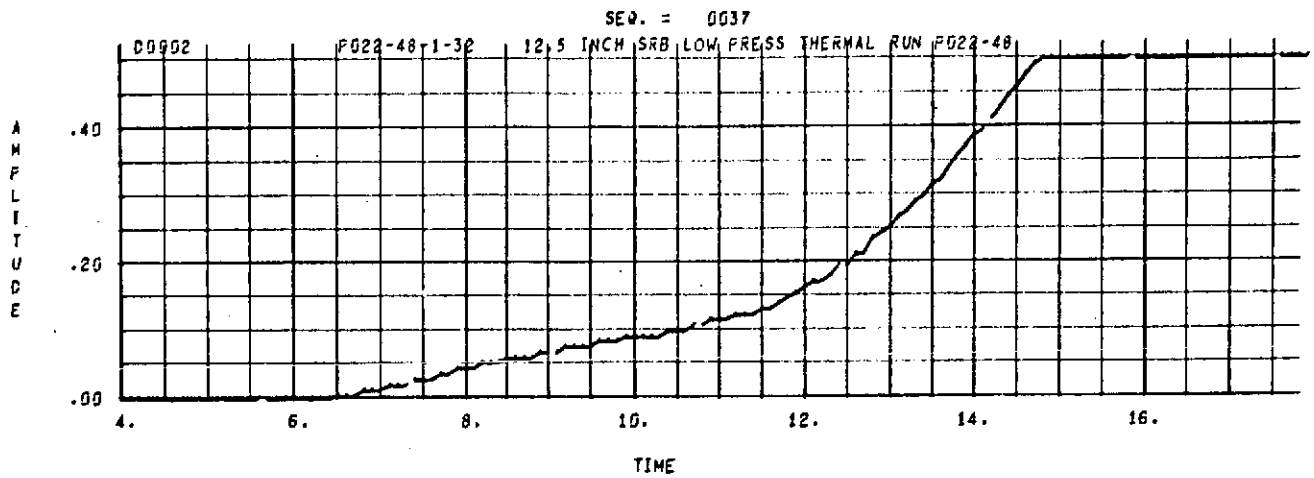

C0005
F022-48-1-72
120.
100.
80.
AMPLITUDE
4.
6.
8.
10.
12.
14.
16.
TIME

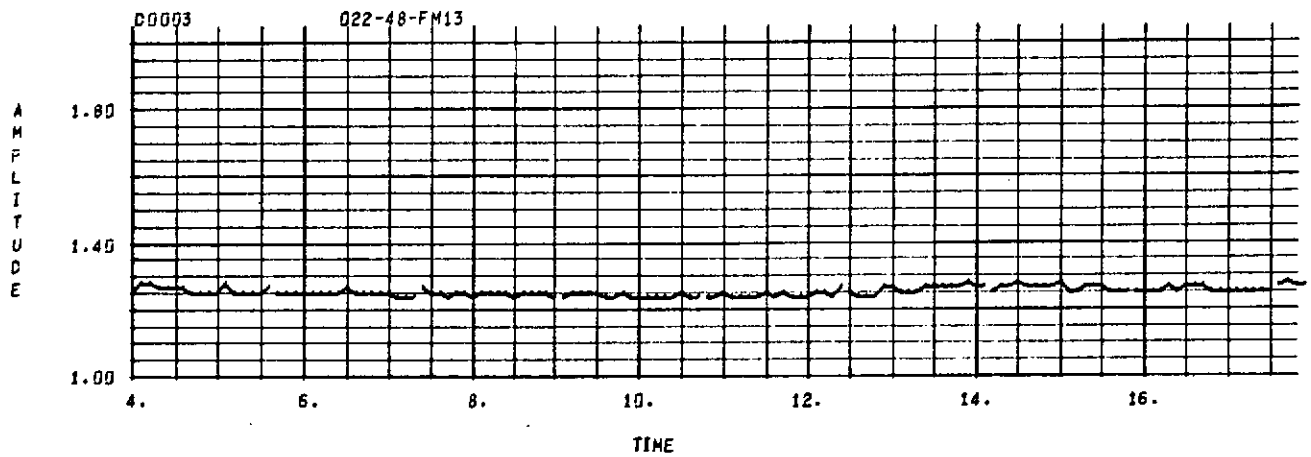

C0006
F022-48-1-80
120.
100.
80.
AMPLITUDE
4.
6.
8.
10.
12.
14.
16.
TIME


SEQ. = 0037
C0007
F022-48-1-88
12.5 INCH SRB LOW PRESS THERMAL RUN F022-48
120.
100.
80.
AMPLITUDE
4.
6.
8.
10.
12.
14.
16.
TIME


C0008
022-48-1-96
100.
90.
80.
70.
AMPLITUDE
4.
6.
8.
10.
12.
14.
16.
TIME


D0001
F022-48-1-24
.40
.20
.00
AMPLITUDE
4.
6.
8.
10.
12.
14.
16.
TIME


SEQ. = 0037
D0002
F022-48-1-30
12.5 INCH SRB LOW PRESS THERMAL RUN F022-48
AMPLITUDE
.40
.20
.00
4.
6.
8.
10.
12.
14.
16.
TIME


D0003
022-48-FM13
AMPLITUDE
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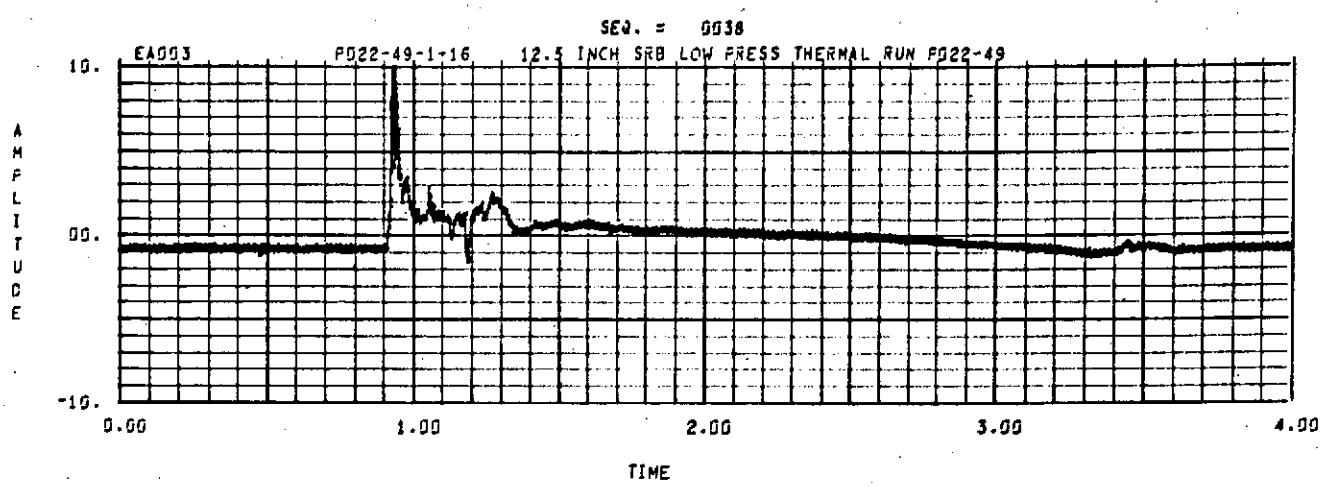
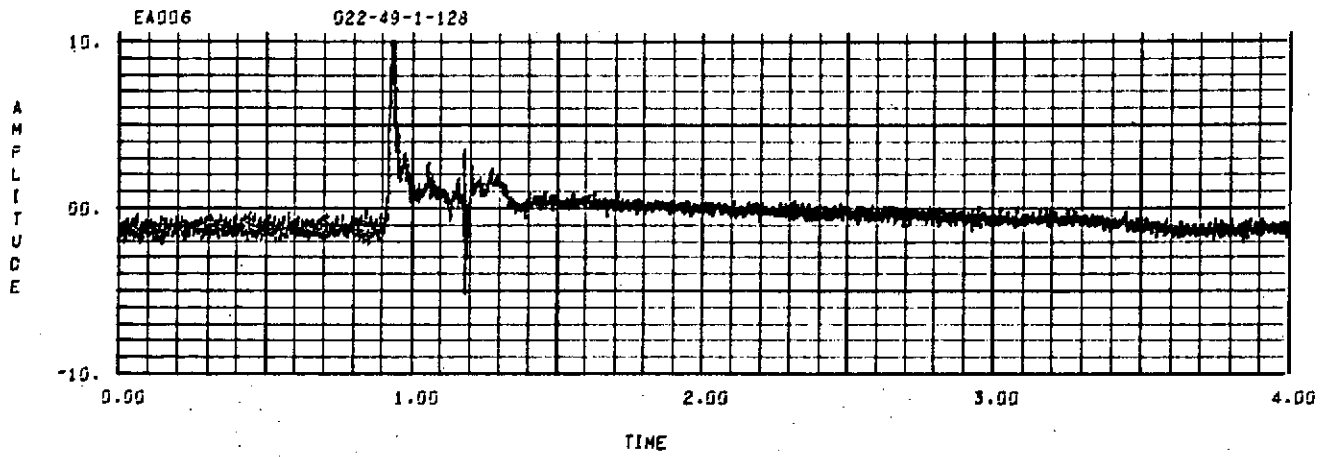
1.40
1.00
4.
6.
8.
10.
12.
14.
16.
TIME


SEQ. = 0038
EA003
F022-49-1-16
12.5 INCH SRB LOW PRESS THERMAL RUN F022-49
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME


EA006
022-49-1-128
10.
00.
-10.
AMPLITUDE
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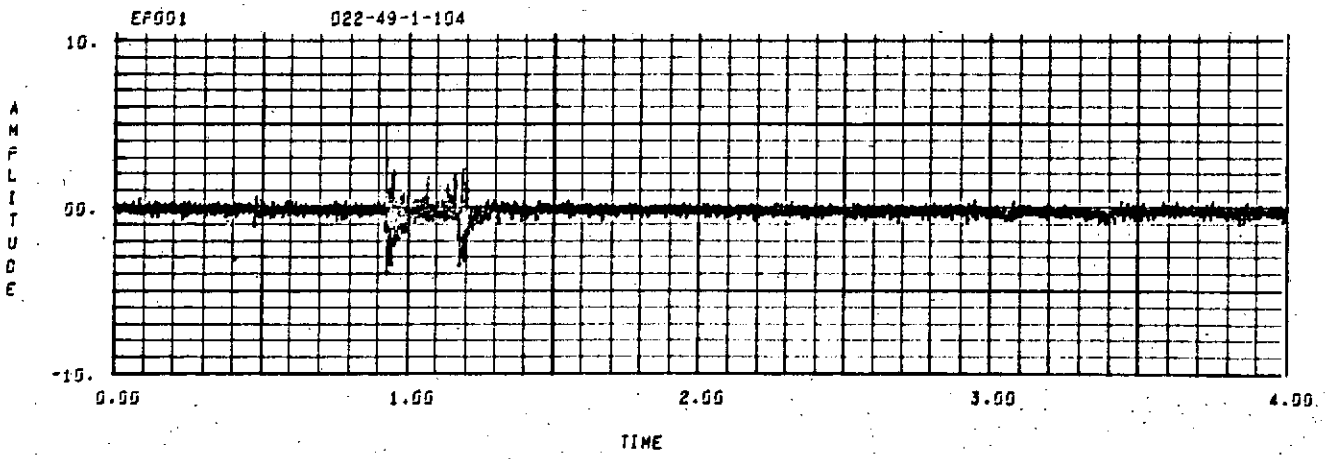
1.00
2.00
3.00
4.00
TIME


EF001
022-49-1-104
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00.
-10.
AMPLITUDE
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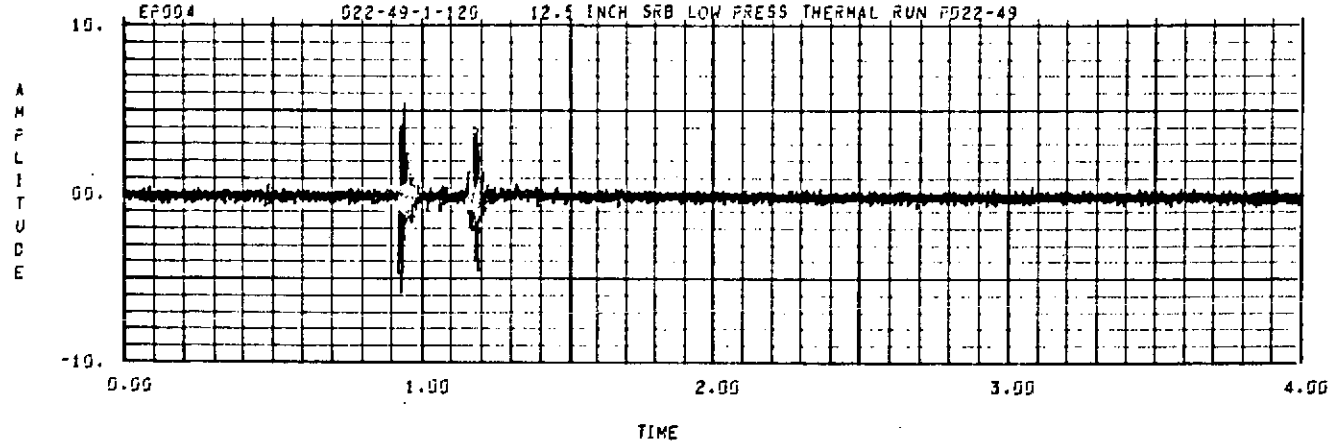
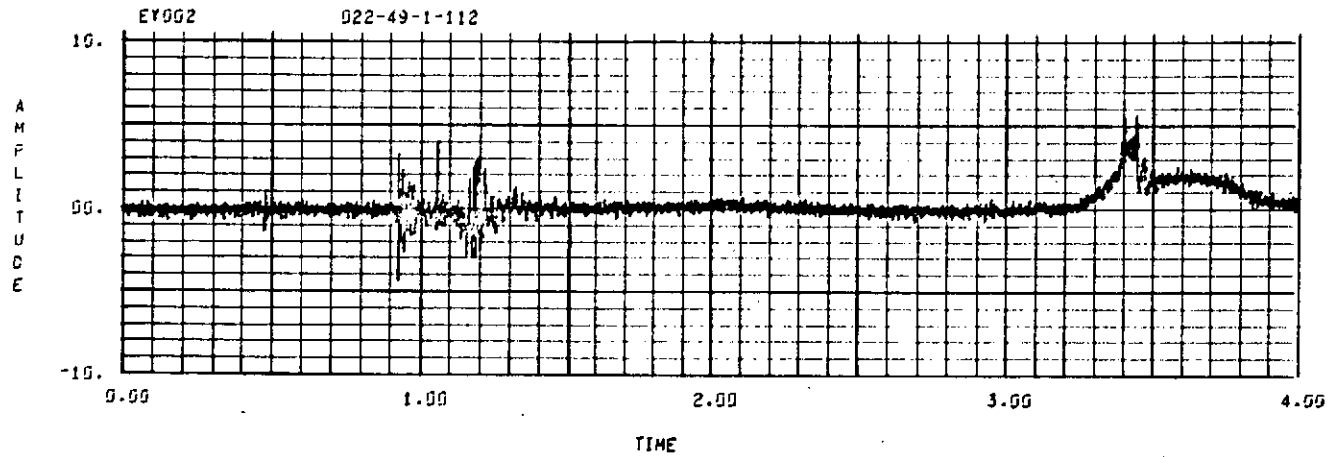
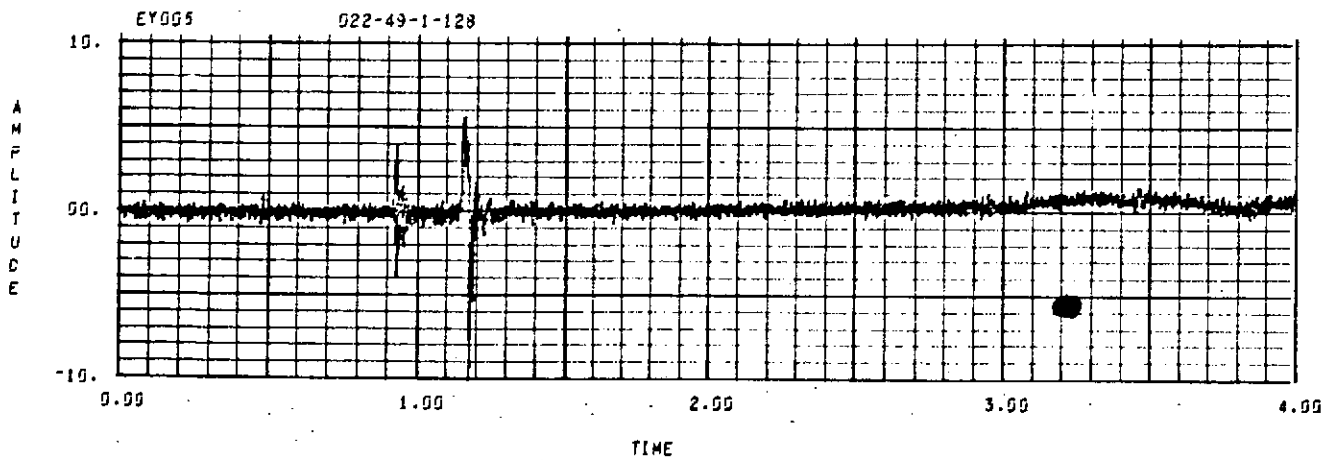
1.00
2.00
3.00
4.00
TIME

SEQ. = 0038


EF004
022-49-1-120
12.5 INCH SRB LOW PRESS THERMAL RUN F022-49
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME


EY002
022-49-1-112
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME


EY005
022-49-1-128
10.
00.
-10.
AMPLITUDE
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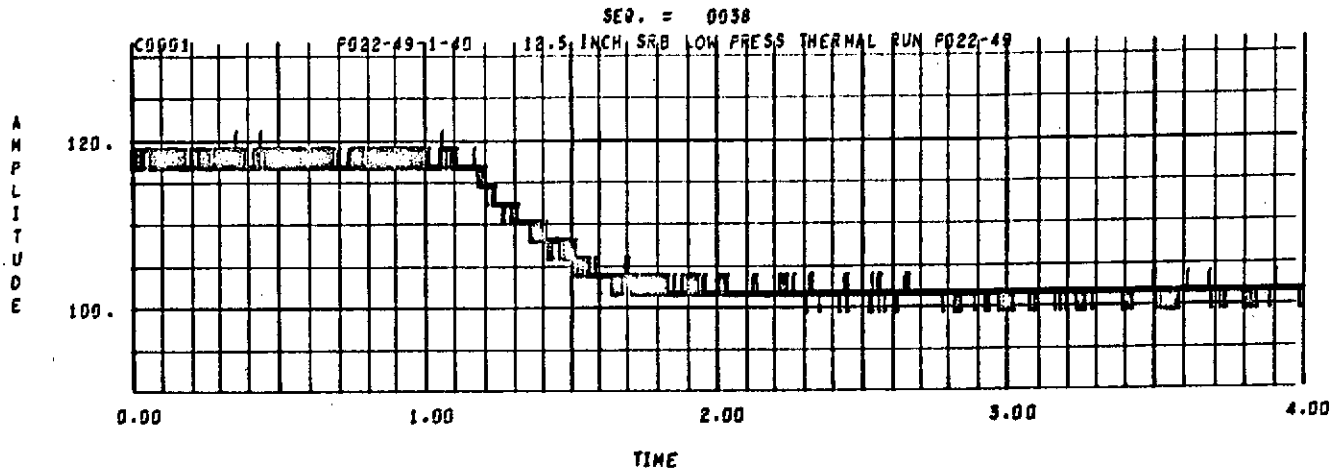
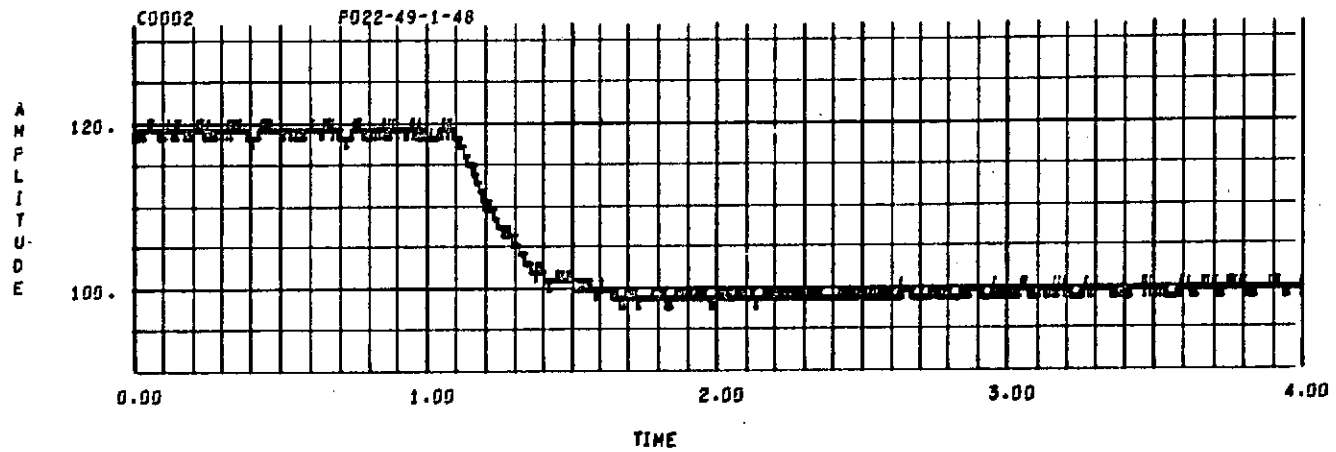
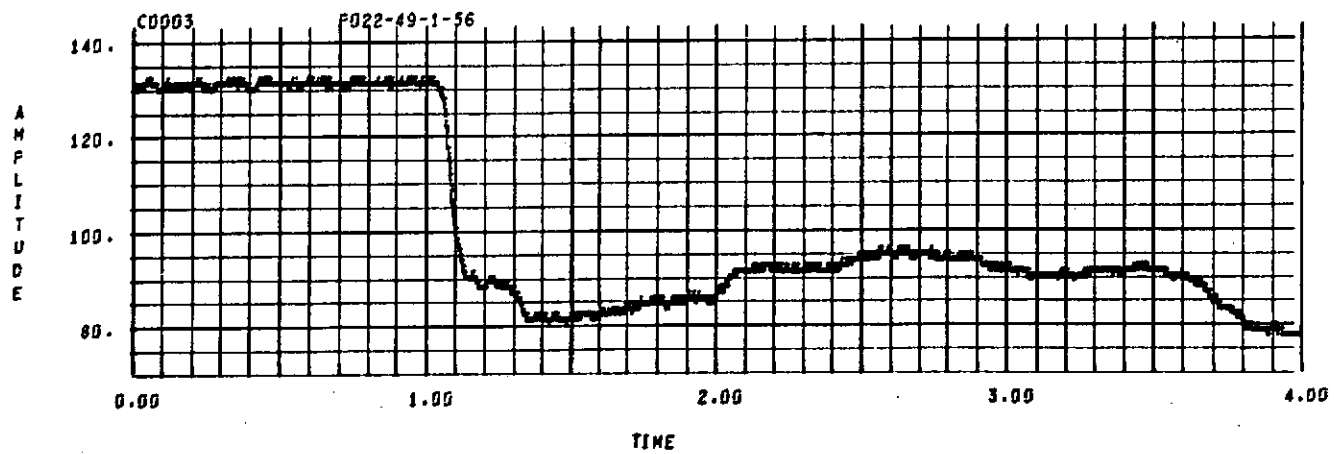
1.00
2.00
3.00
4.00
TIME

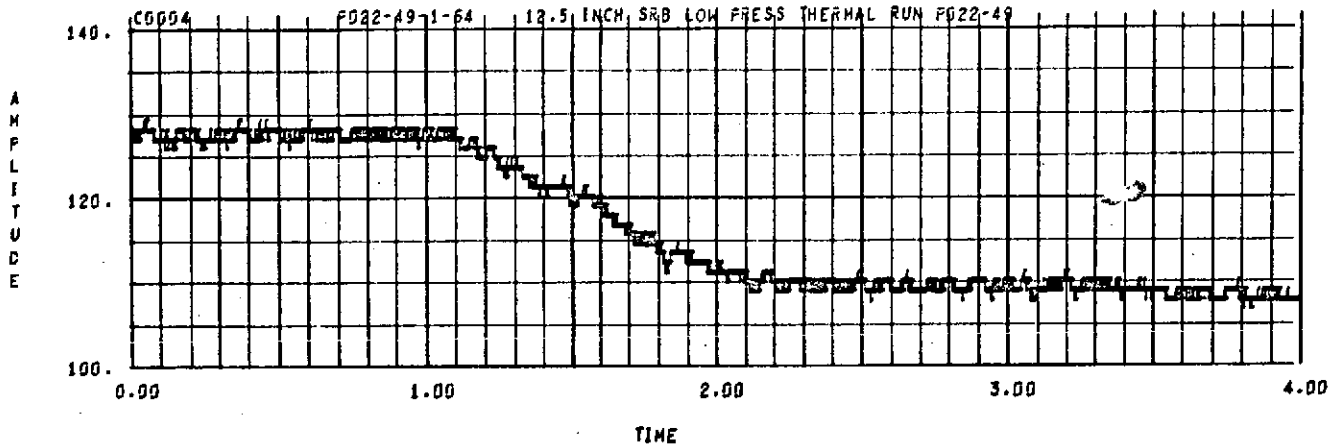

SEQ. = 0038
C0001
F022-49-1-40
12.5 INCH SRB LOW PRESS THERMAL RUN F022-49
AMPLITUDE
120.
100.
0.00
1.00
2.00
3.00
4.00
TIME

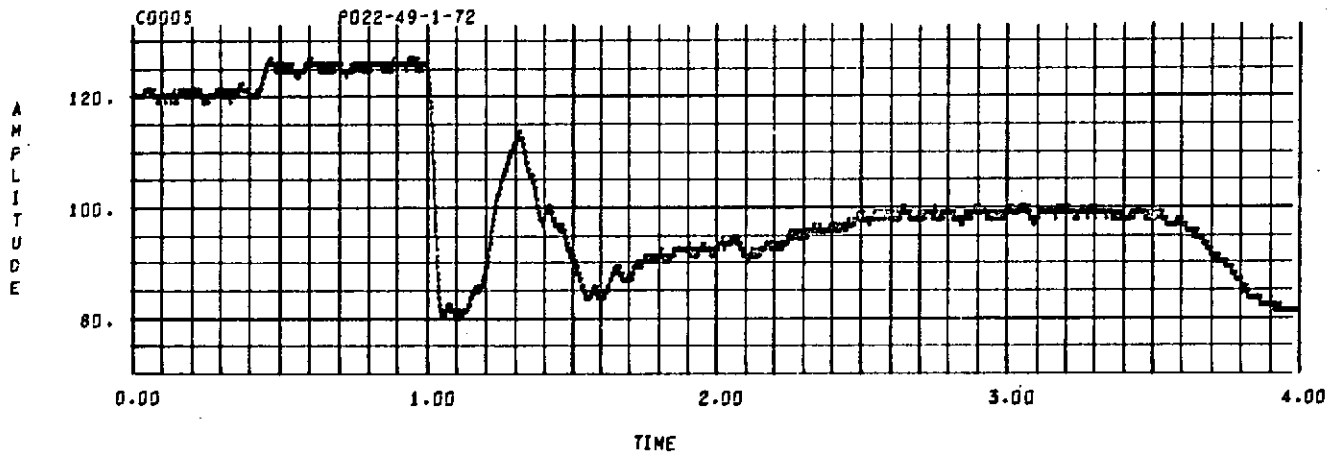

C0002
F022-49-1-48
AMPLITUDE
120.
100.
0.00
1.00
2.00
3.00
4.00
TIME

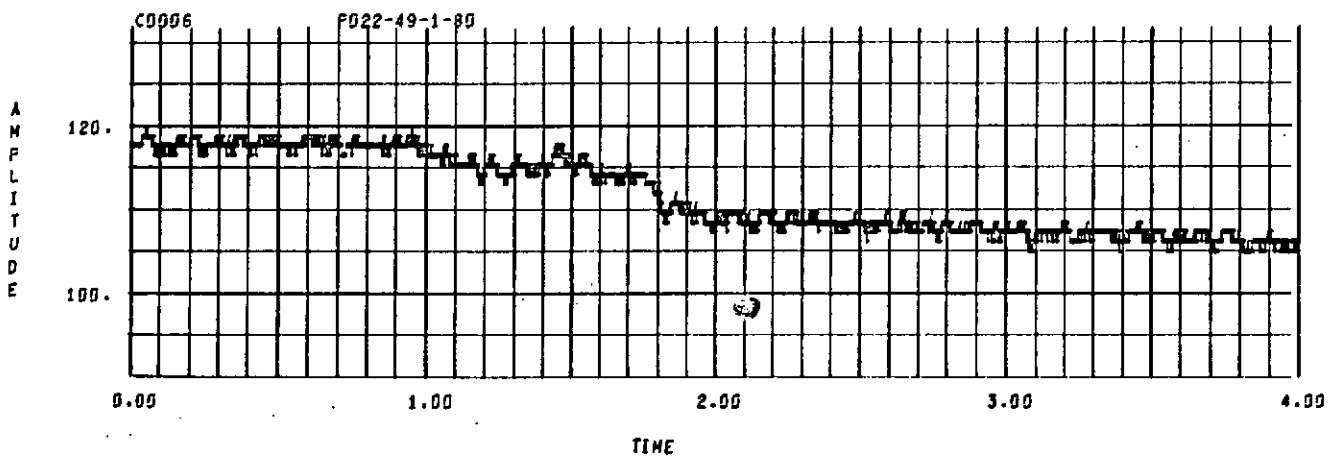

C0003
F022-49-1-56
AMPLITUDE
140.
120.
100.
80.
0.00
1.00
2.00
3.00
4.00
TIME

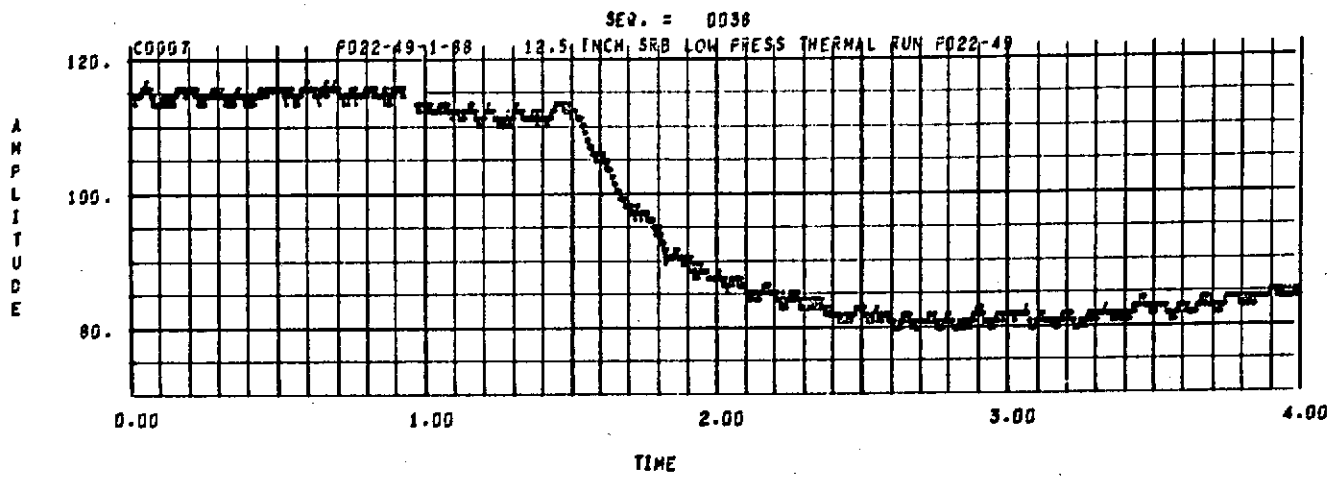
SEQ. = 0038

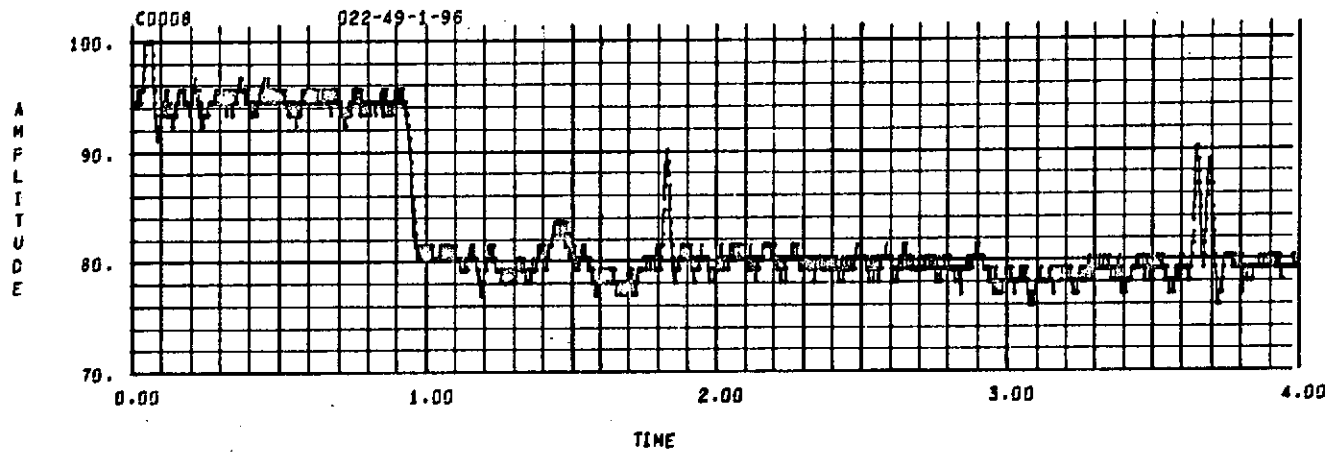
2

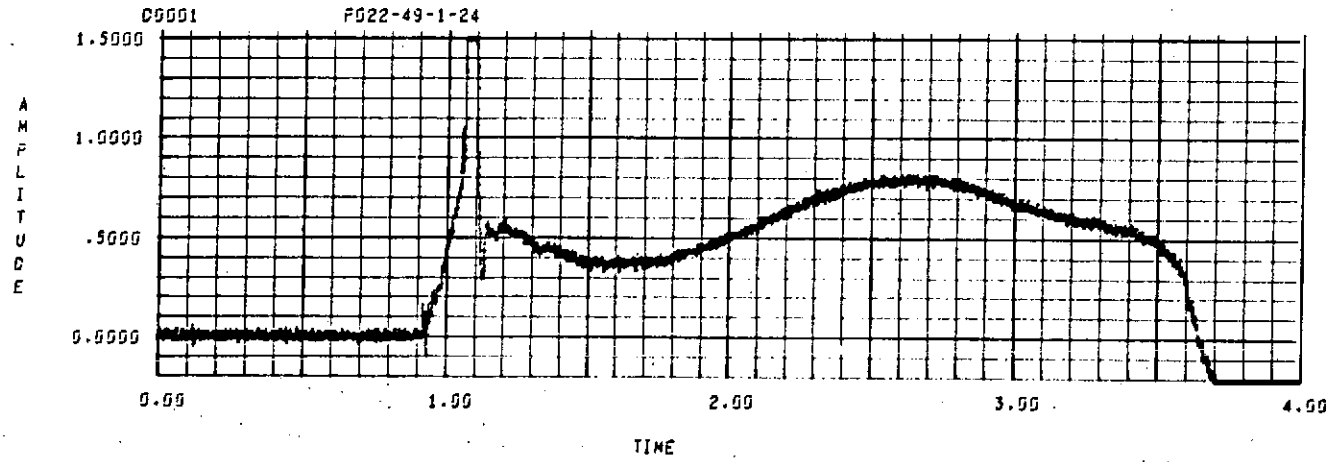

C0004
P022-49-1-64
12.5 INCH SRB LOW PRESS THERMAL RUN P022-49
140.
120.
100.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

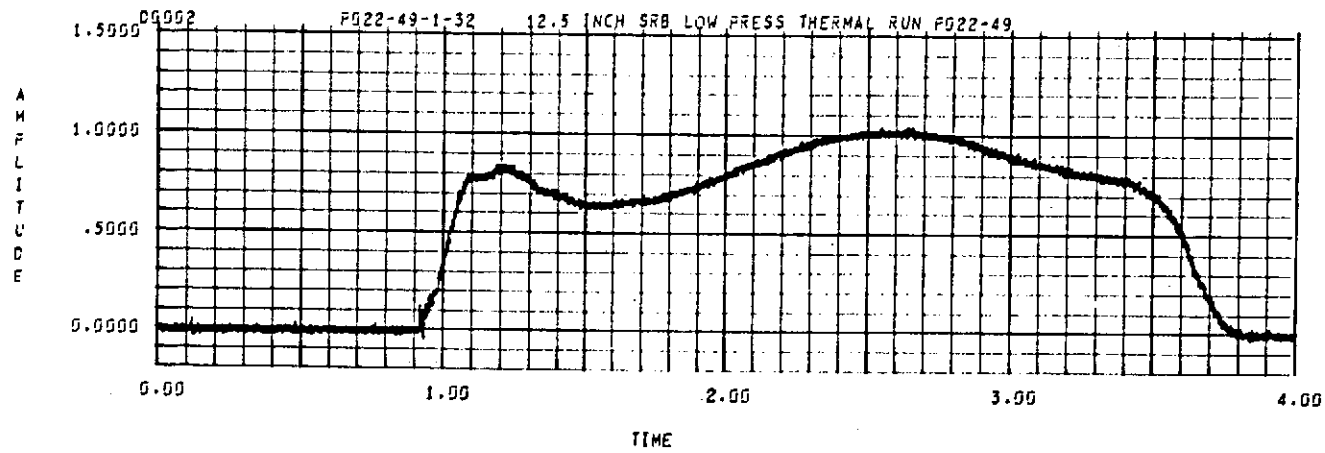

C0005
P022-49-1-72
120.
100.
80.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

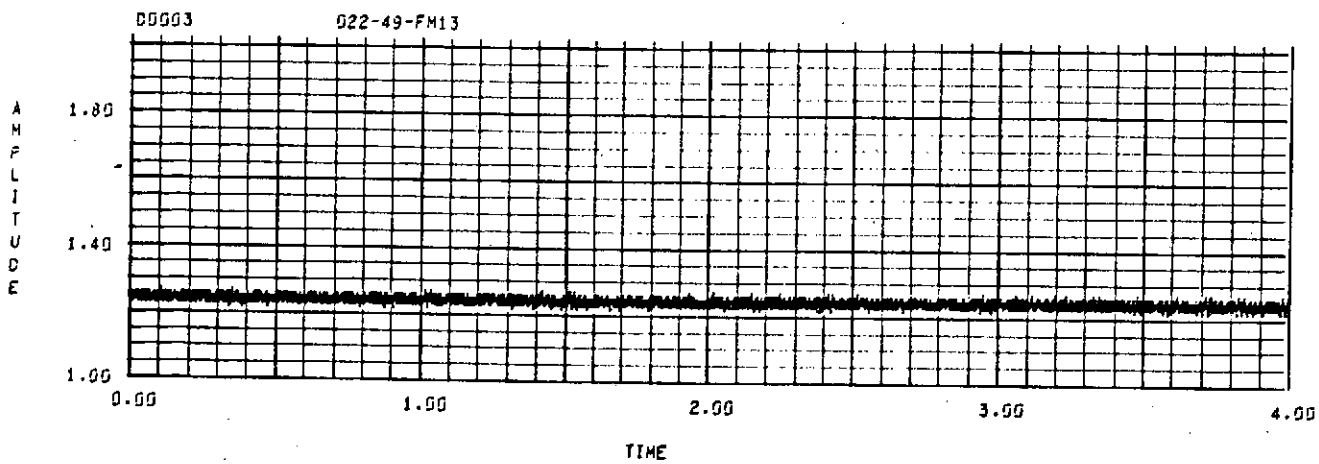

C0006
P022-49-1-80
120.
100.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME


SEQ. = 0038
C0007
F022-49-1-88
12.5 INCH SRB LOW PRESS THERMAL RUN F022-49
120.
100.
80.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

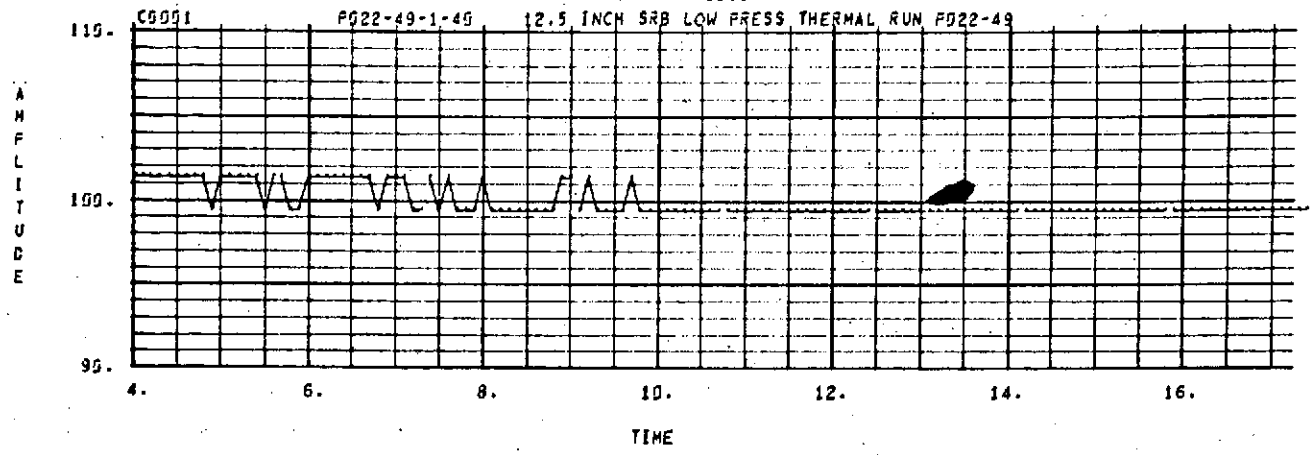

C0008
022-49-1-96
100.
90.
80.
70.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

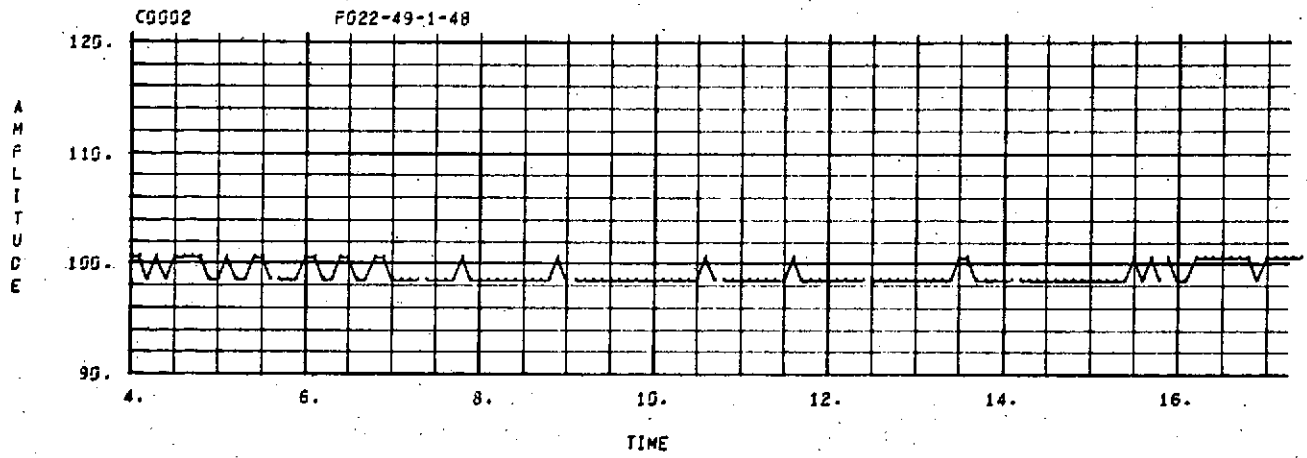

00001
F022-49-1-24
1.5000
1.0000
.5000
0.0000
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

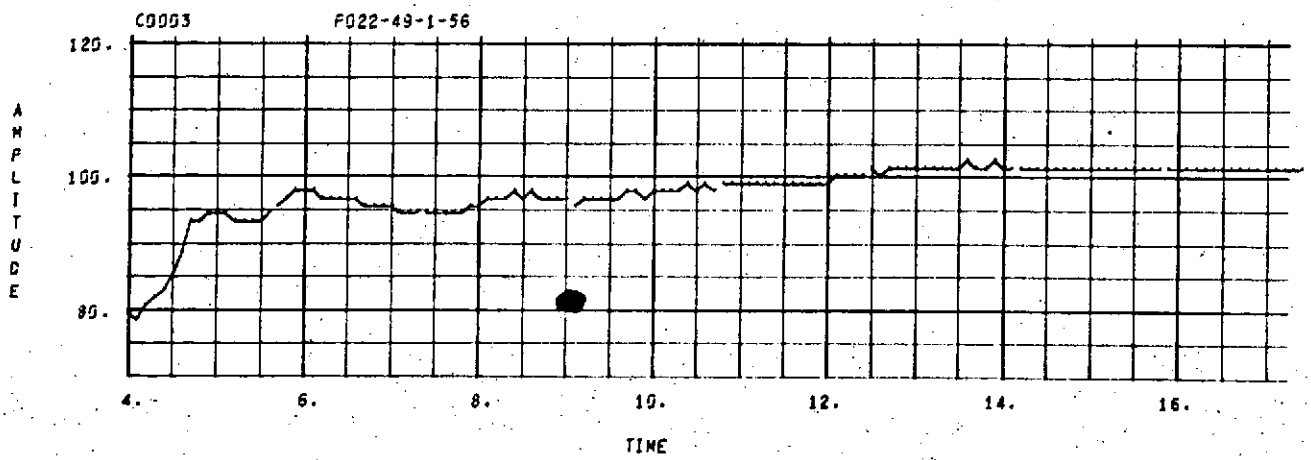

00002
F022-49-1-32
12.5 INCH SRB LOW PRESS THERMAL RUN F022-49
1.5000
1.0000
.5000
0.0000
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

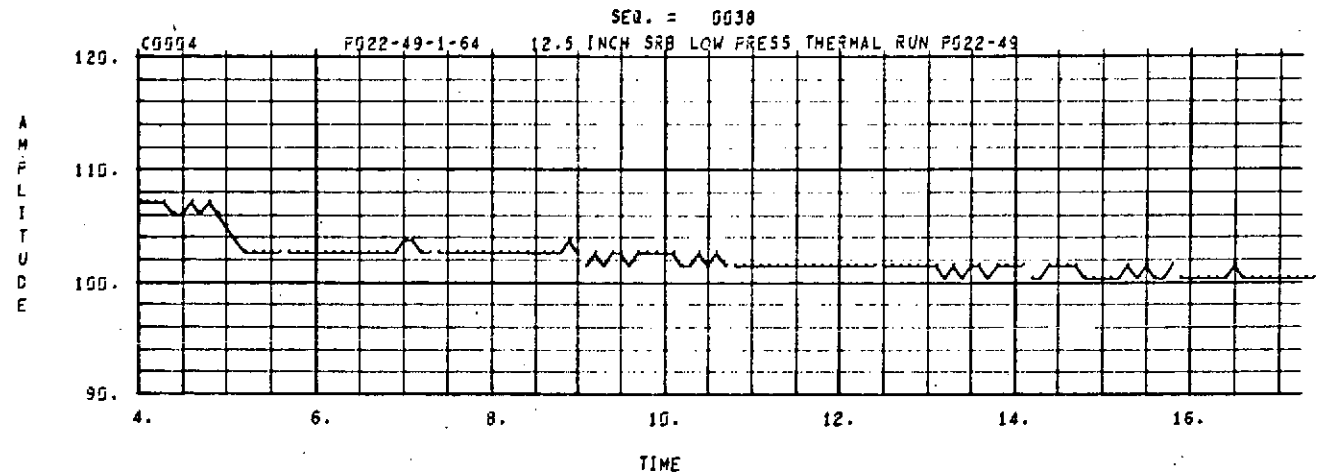

00003
022-49-FM13
1.80
1.40
1.00
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

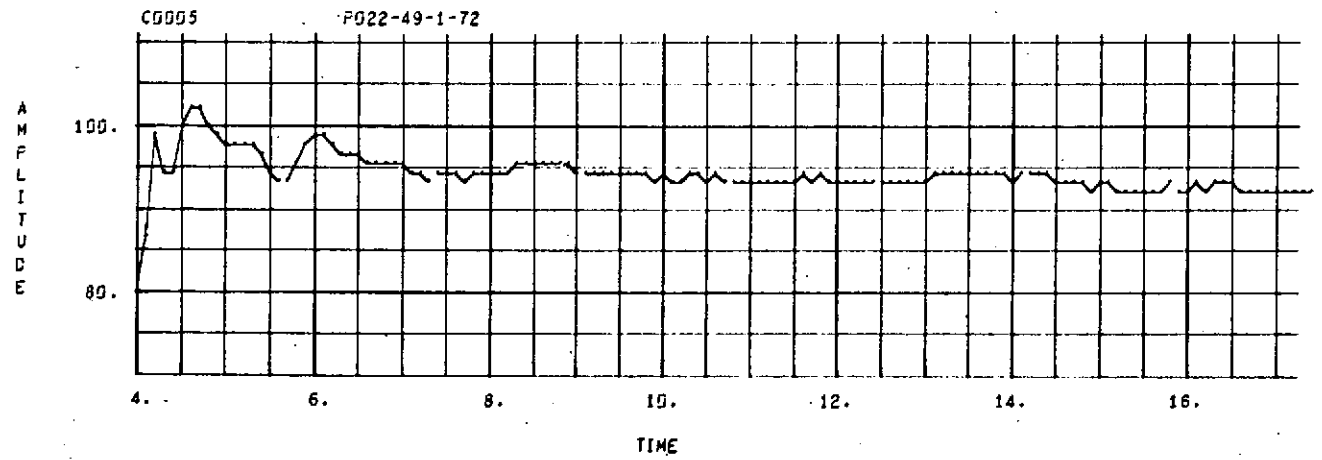
SEQ. = 0038

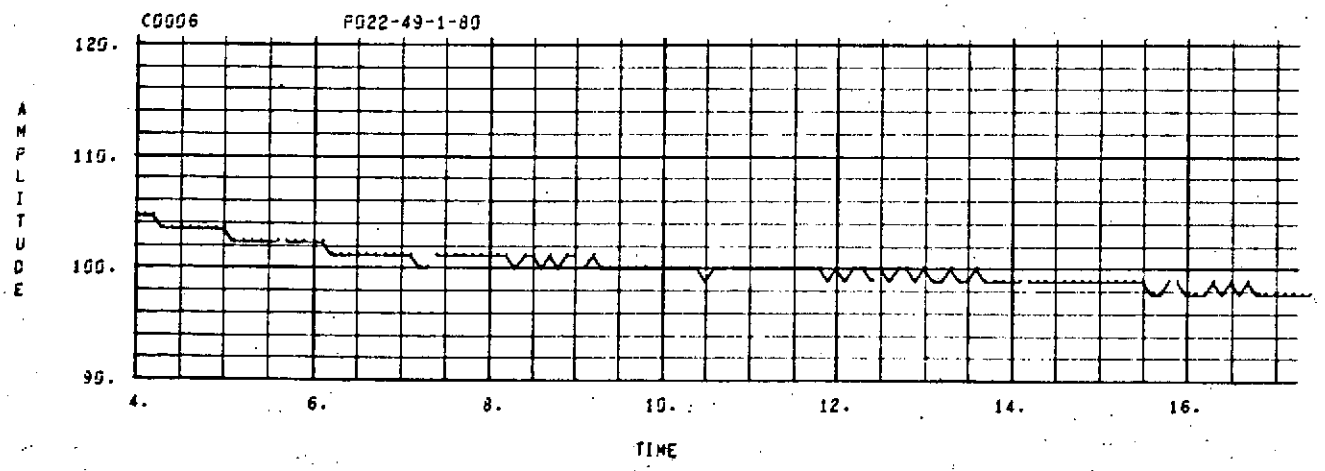

C0001
F022-49-1-49
12.5 INCH SRB LOW PRESS THERMAL RUN F022-49
110.
100.
90.
AMPLITUDE
4.
6.
8.
10.
12.
14.
16.
TIME


C0002
F022-49-1-48
120.
110.
100.
90.
AMPLITUDE
4.
6.
8.
10.
12.
14.
16.
TIME


C0003
F022-49-1-56
120.
100.
80.
AMPLITUDE
4.
6.
8.
10.
12.
14.
16.
TIME


SEQ. = 0038
C0004
F022-49-1-64
12.5 INCH SRB LOW PRESS THERMAL RUN F022-49
120.
110.
100.
90.
AMPLITUDE
4.
6.
8.
10.
12.
14.
16.
TIME


C0005
F022-49-1-72
100.
80.
AMPLITUDE
4.
6.
8.
10.
12.
14.
16.
TIME


C0006
F022-49-1-80
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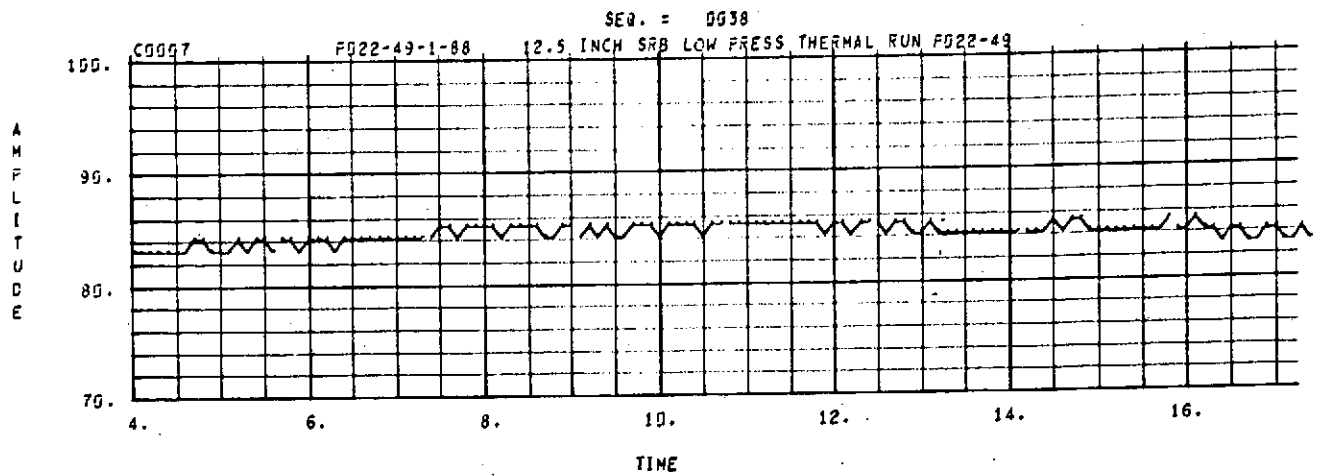
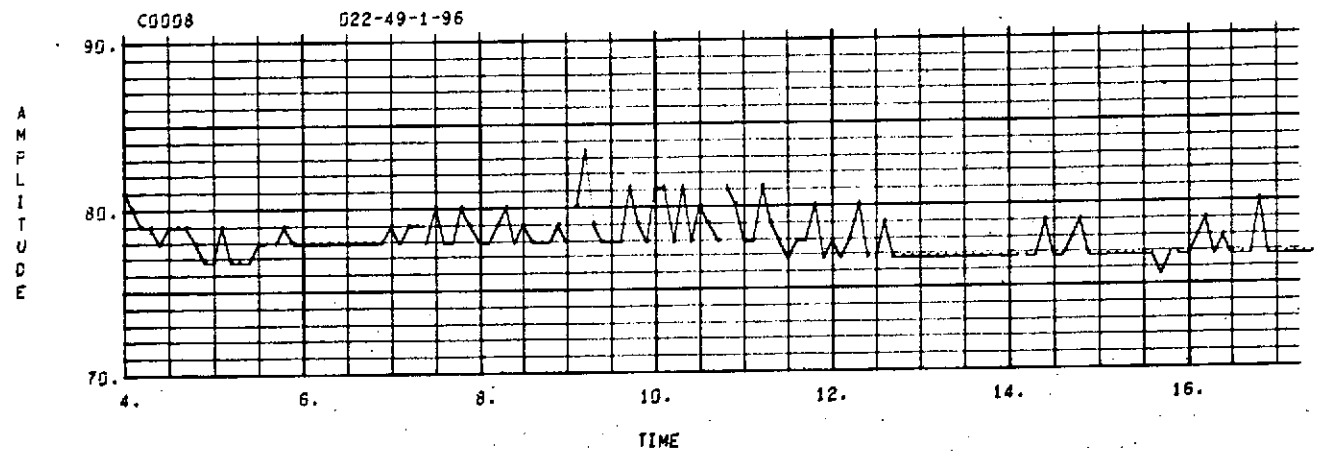
110.
100.
90.
AMPLITUDE
4.
6.
8.
10.
12.
14.
16.
TIME


SEQ. = 0038
C0007
F022-49-1-88
12.5 INCH SRB LOW PRESS THERMAL RUN F022-49
AMPLITUDE
100.
90.
80.
70.
4.
6.
8.
10.
12.
14.
16.
TIME


C0008
022-49-1-96
AMPLITUDE
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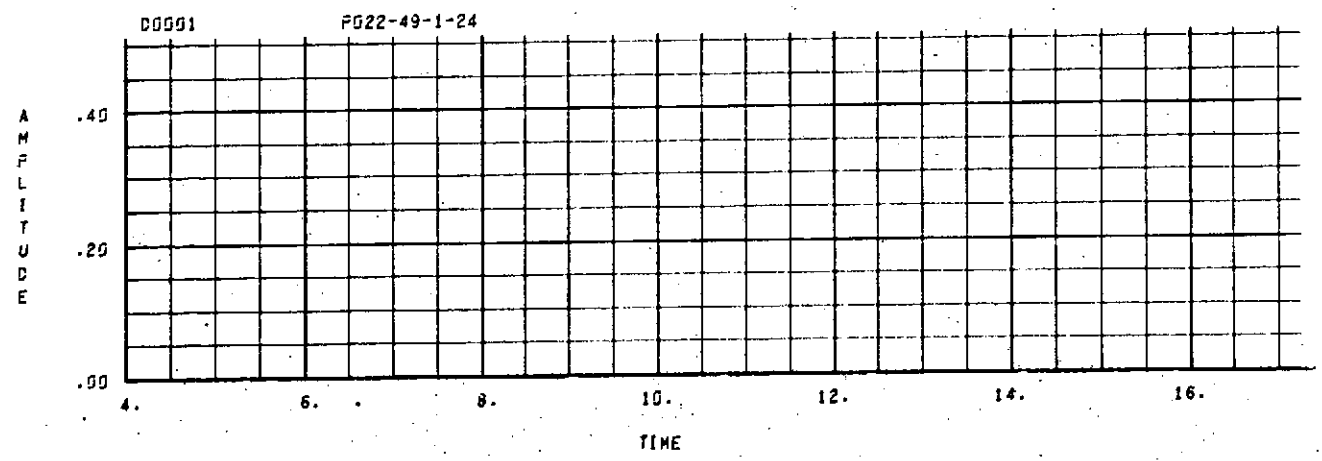
80.
70.
4.
6.
8.
10.
12.
14.
16.
TIME


D0001
F022-49-1-24
AMPLITUDE
.40
.20
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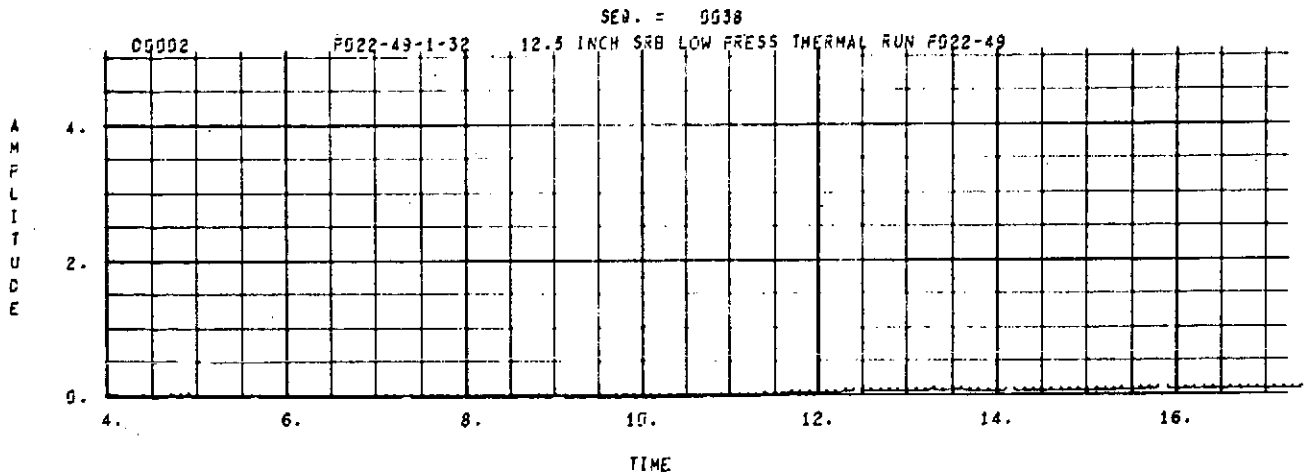
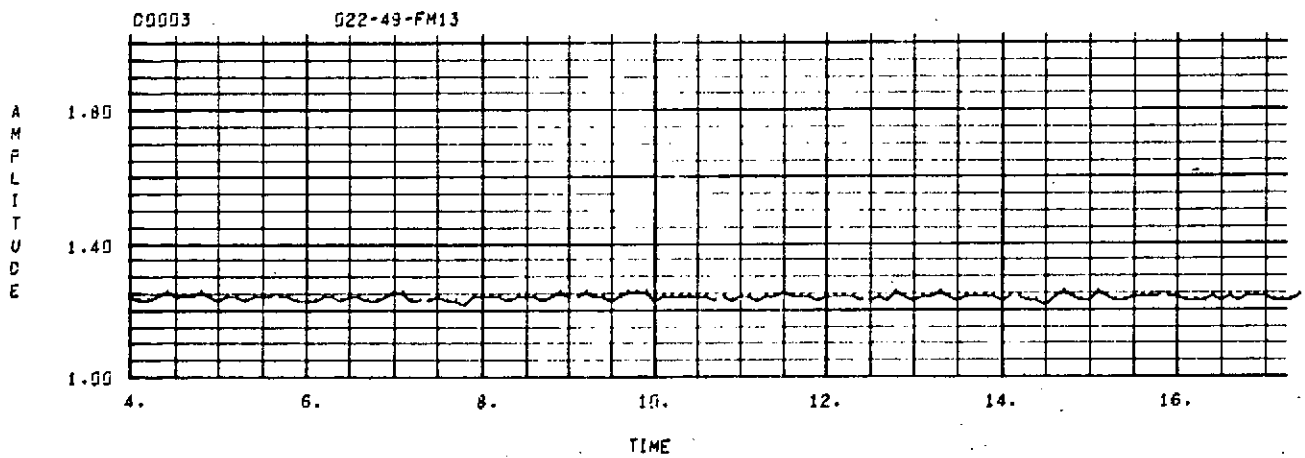
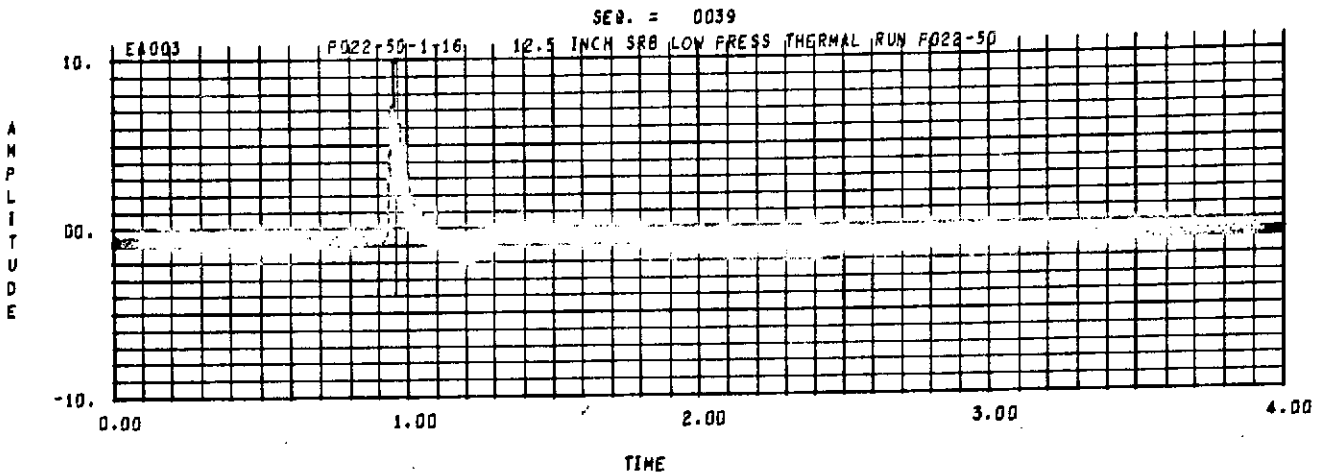
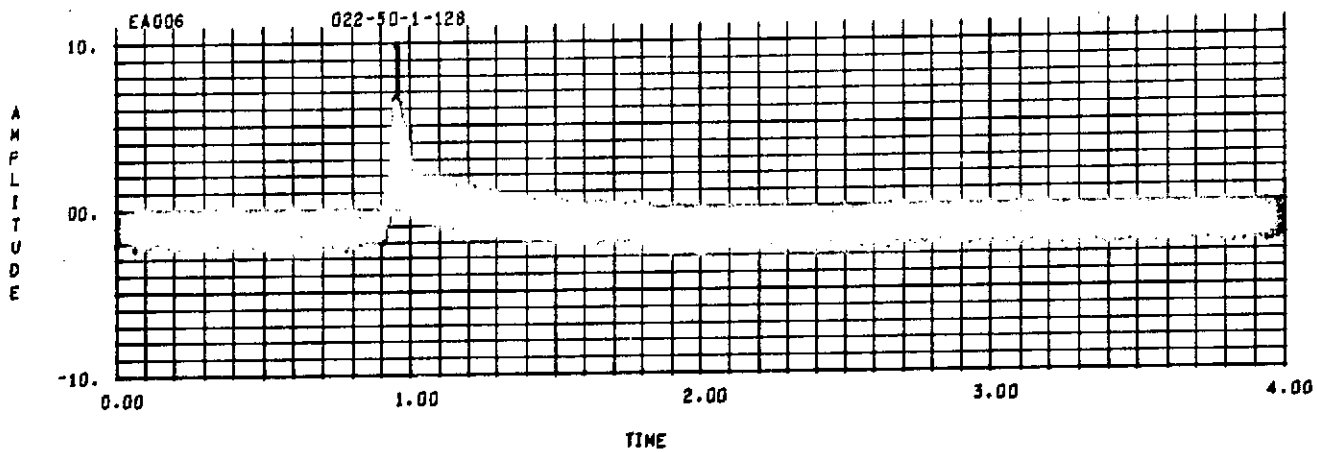
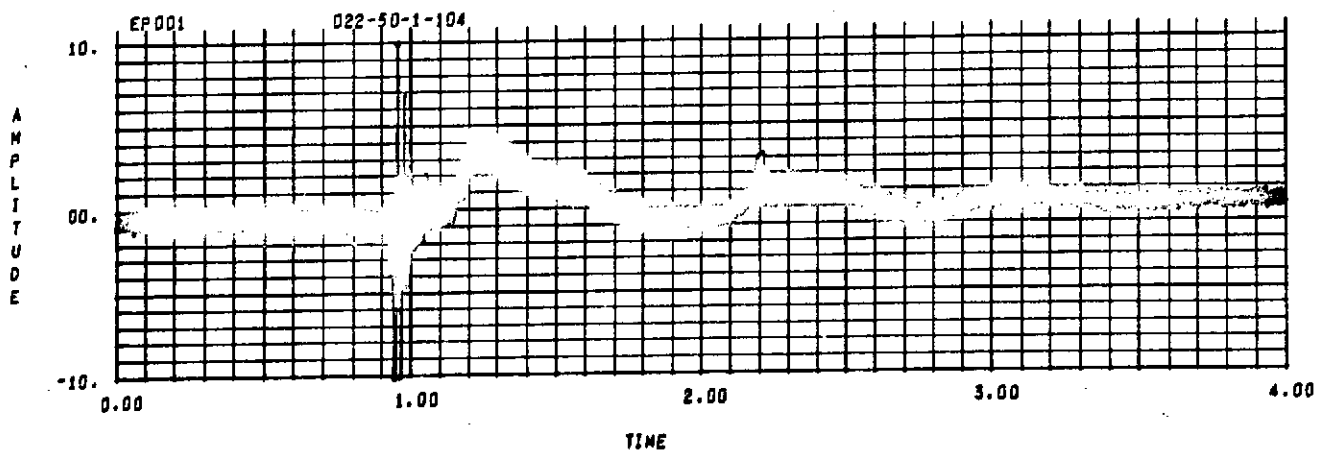
4.
6.
8.
10.
12.
14.
16.
TIME

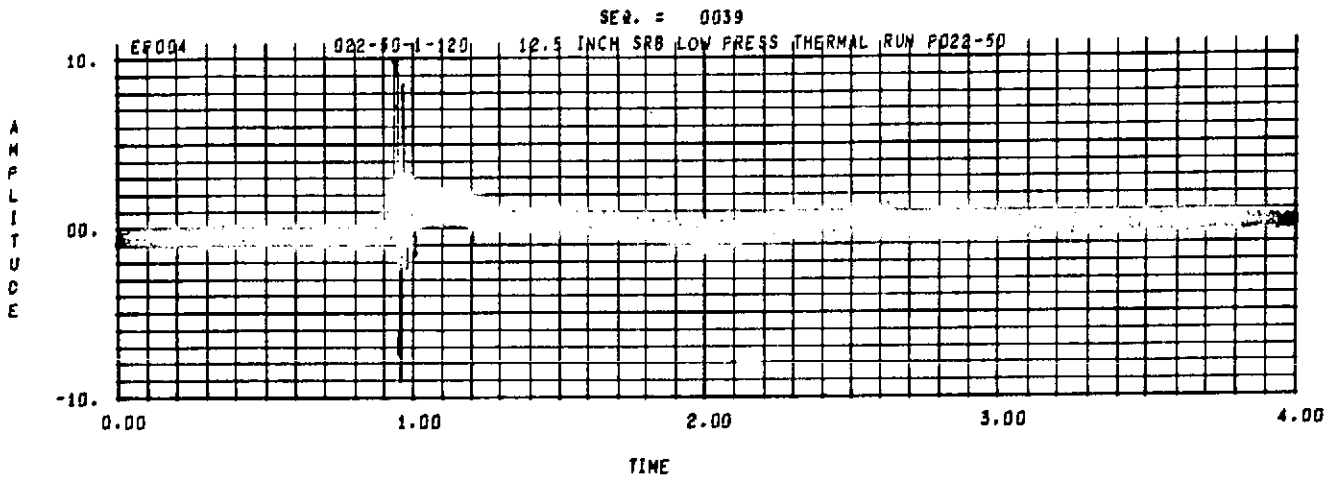

SEQ. = 0038
00002
F022-49-1-32
12.5 INCH SRB LOW PRESS THERMAL RUN F022-49
AMPLITUDE
4.
2.
0.
4.
6.
8.
10.
12.
14.
16.
TIME

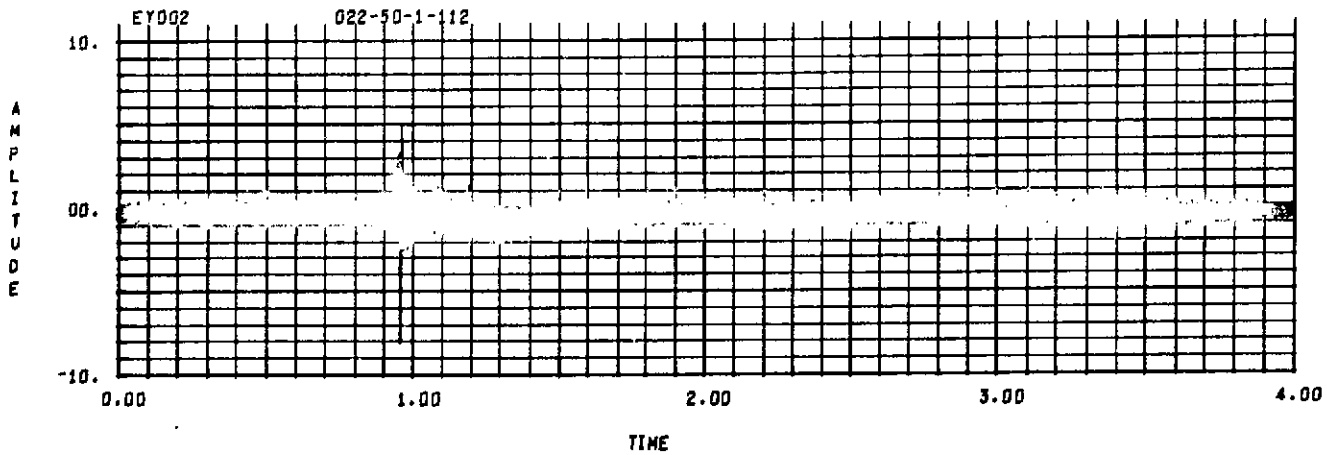

00003
022-49-FM13
AMPLITUDE
1.80
1.40
1.00
4.
6.
8.
10.
12.
14.
16.
TIME

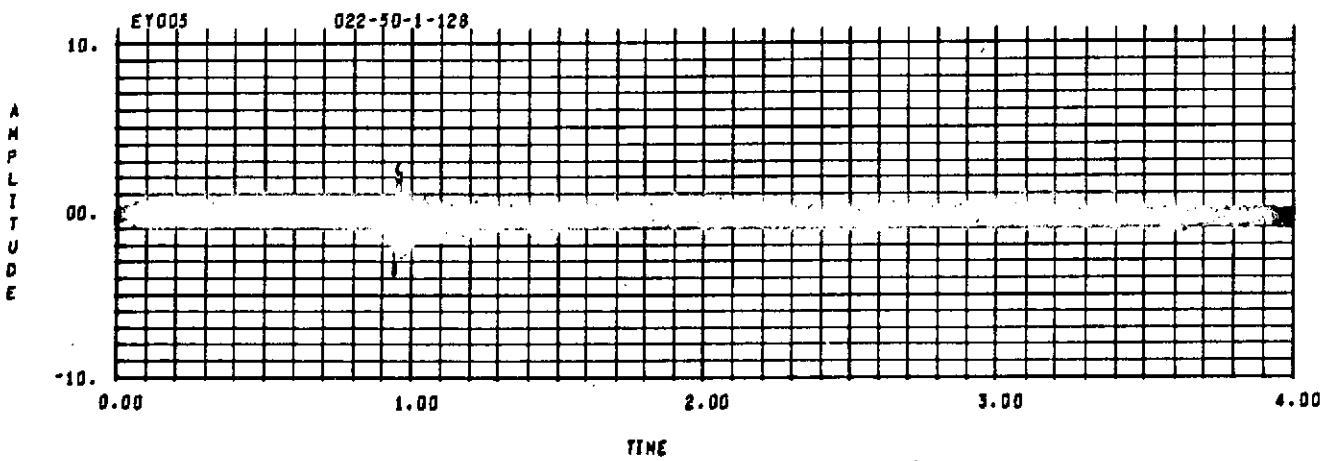

SEQ. = 0039
EA003
F022-50-1-116
12.5 INCH SRB LOW PRESS THERMAL RUN F022-50
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

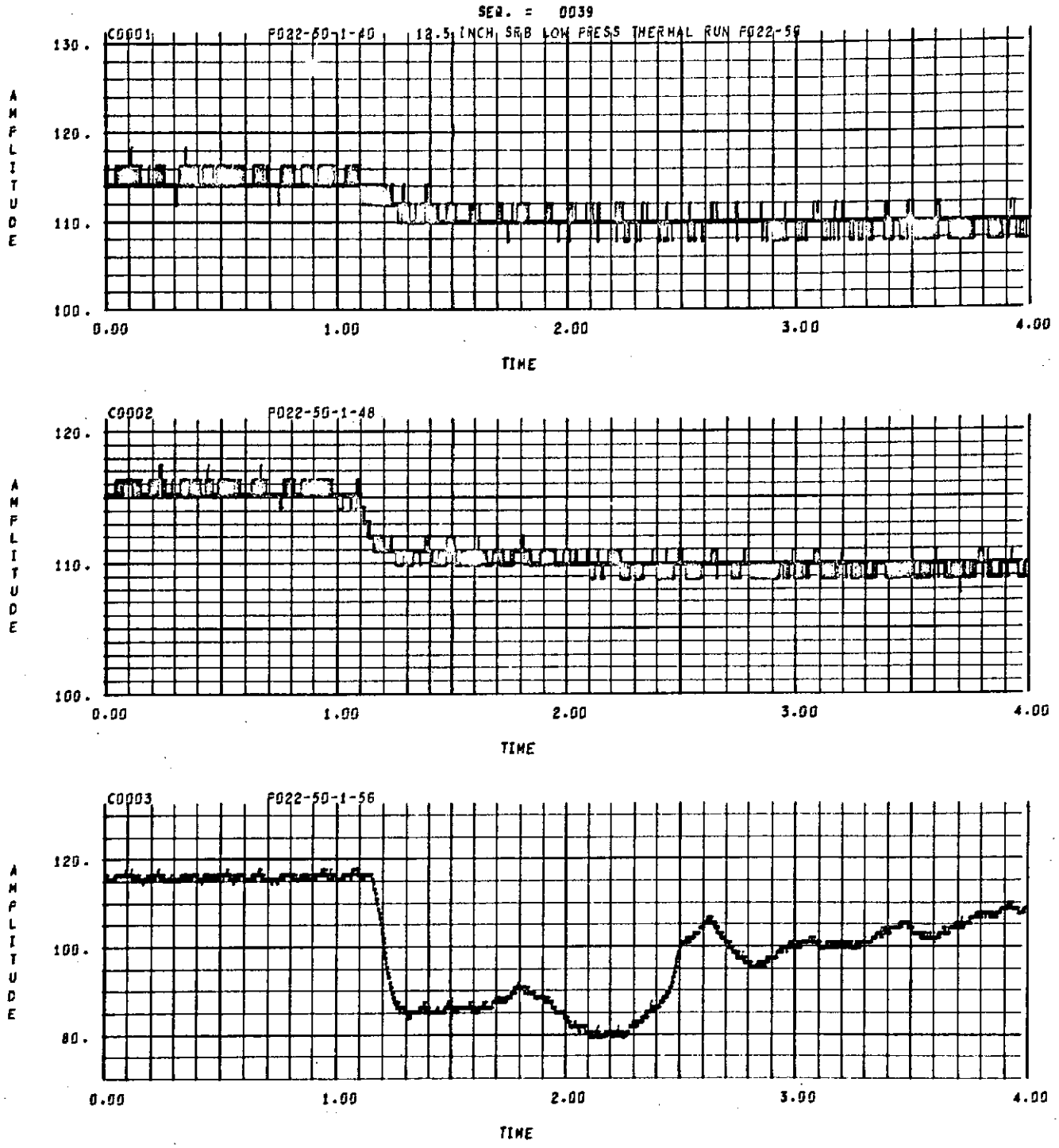

EA006
022-50-1-128
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

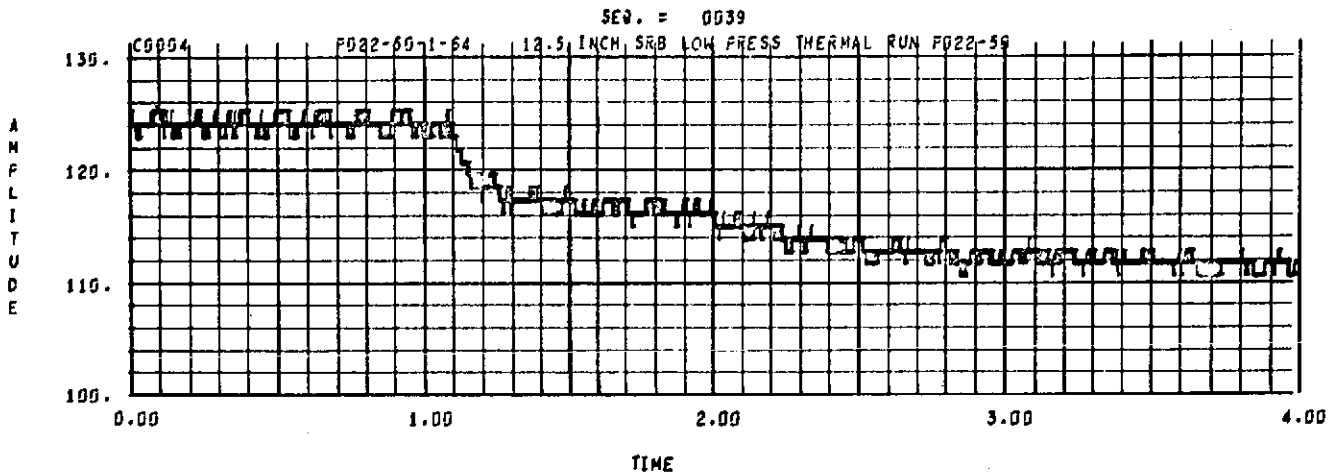

EP001
022-50-1-104
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

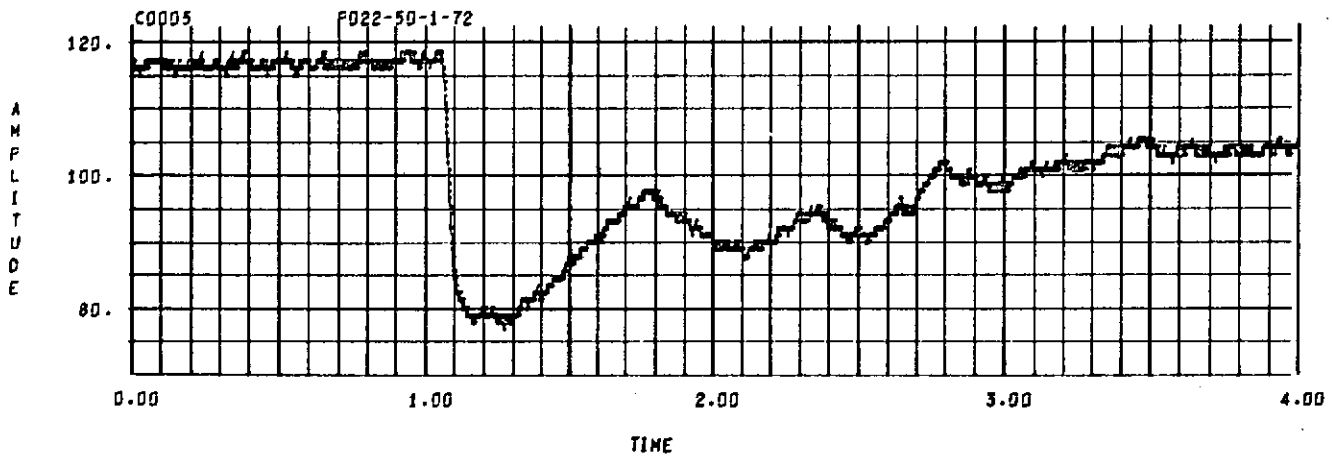

SEQ. = 0039
EF004
022-50-1-120
12.5 INCH SRB LOW PRESS THERMAL RUN P022-50
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

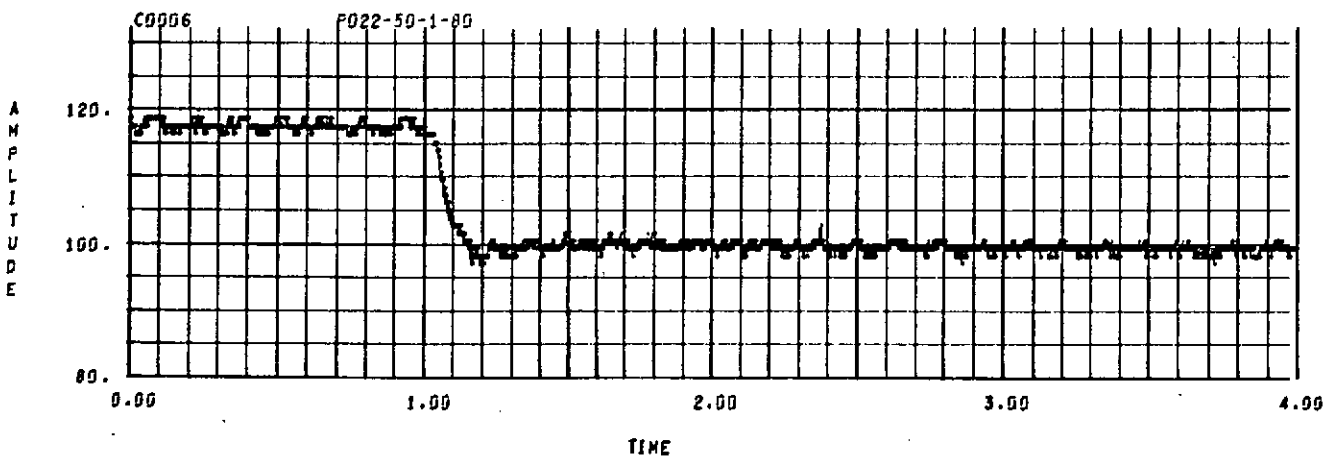

EY002
022-50-1-112
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME


EY005
022-50-1-128
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME


SER. = 0039
C0001
F022-50-1-40
12.5 INCH SRB LOW PRESS THERMAL RUN F022-50
AMPLITUDE
130.
120.
110.
100.
0.00
1.00
2.00
3.00
4.00
TIME
C0002
F022-50-1-48
AMPLITUDE
120.
110.
100.
0.00
1.00
2.00
3.00
4.00
TIME
C0003
F022-50-1-56
AMPLITUDE
120.
100.
80.
0.00
1.00
2.00
3.00
4.00
TIME


SEQ. = 0039
2
C0004
F022-50-1-64
13.5 INCH SRB LOW PRESS THERMAL RUN F022-59
AMPLITUDE
130.
120.
110.
100.
0.00
1.00
2.00
3.00
4.00
TIME


C0005
F022-50-1-72
AMPLITUDE
120.
100.
80.
0.00
1.00
2.00
3.00
4.00
TIME


C0006
F022-50-1-80
AMPLITUDE
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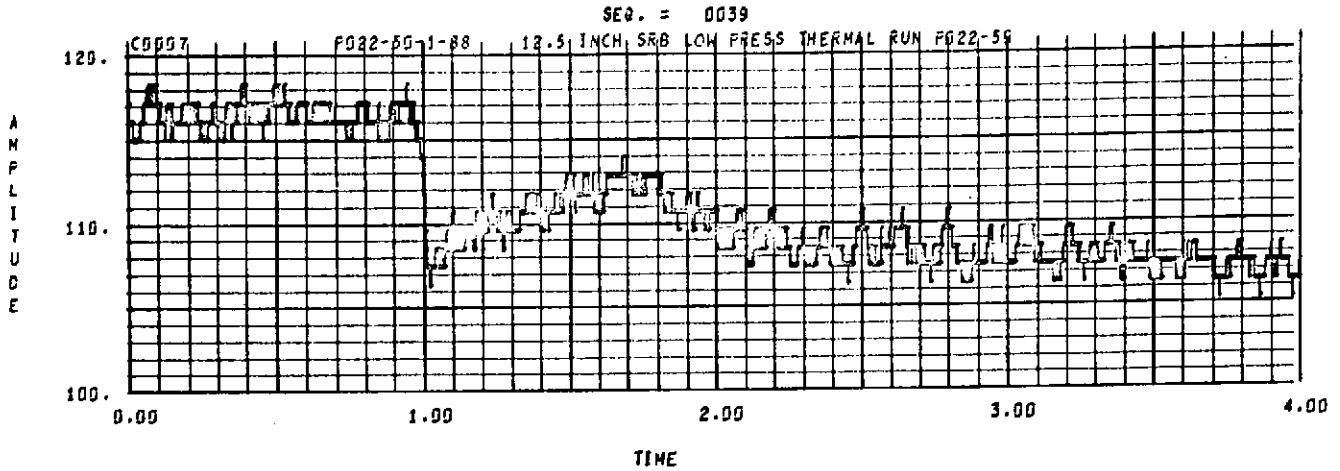
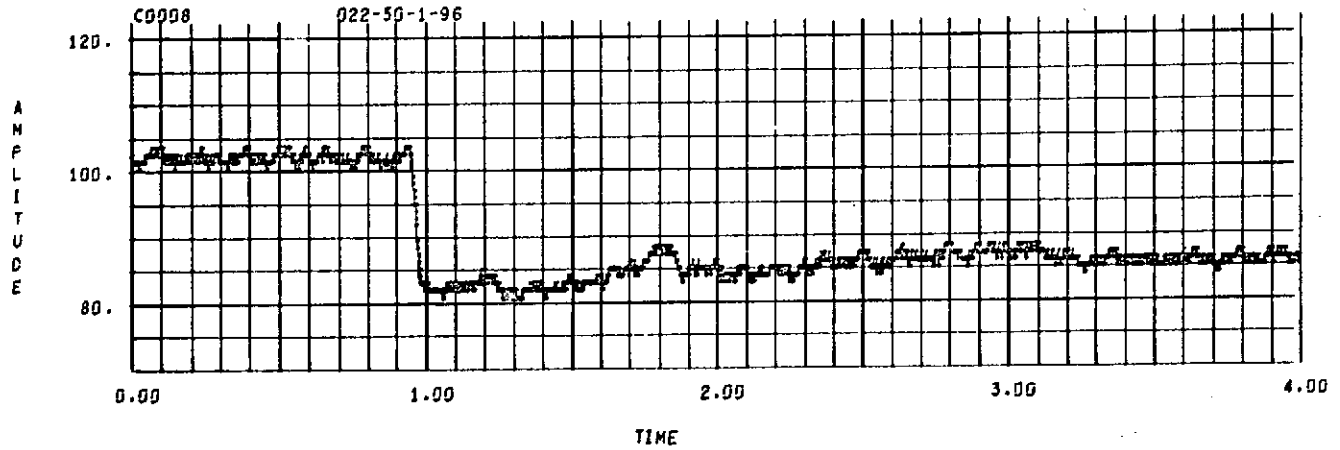
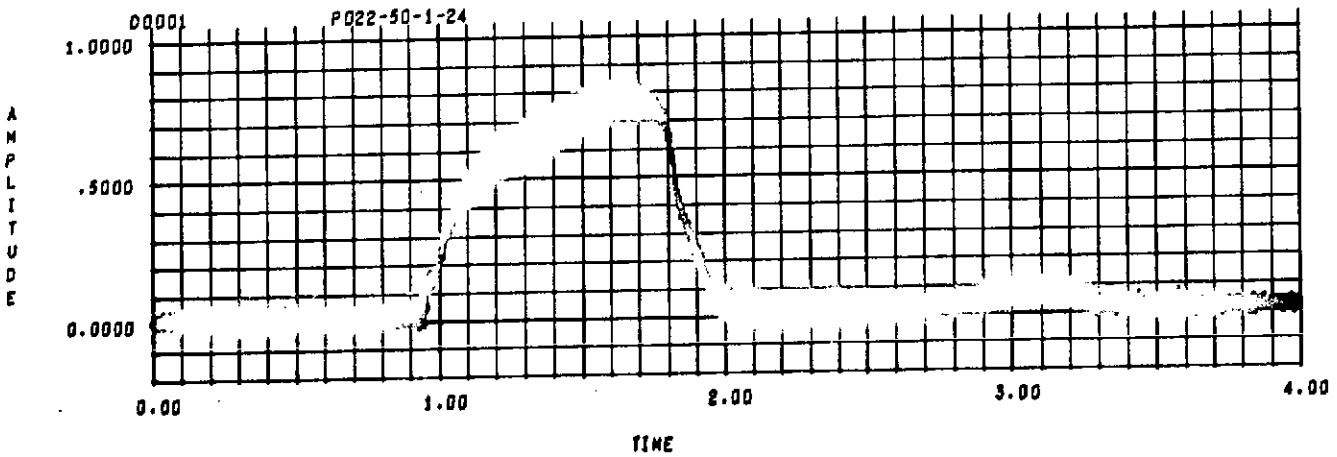
100.
80.
0.00
1.00
2.00
3.00
4.00
TIME


SEQ. = 0039
C0007
F022-50-1-88
12.5 INCH SRB LOW PRESS THERMAL RUN F022-59
120.
110.
100.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME


C0008
022-50-1-96
120.
100.
80.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME


D0001
P022-50-1-24
1.0000
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0.0000
AMPLITUDE
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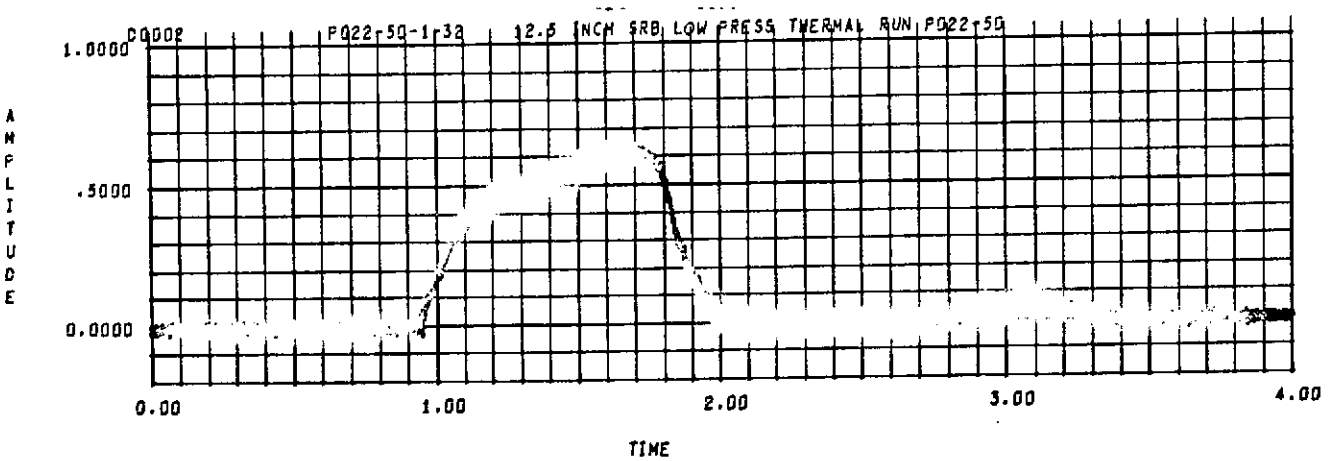
1.00
2.00
3.00
4.00
TIME


D0002
P022-50-1-32
12.5 INCH SRB LOW PRESS THERMAL RUN P022-50
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AMPLITUDE
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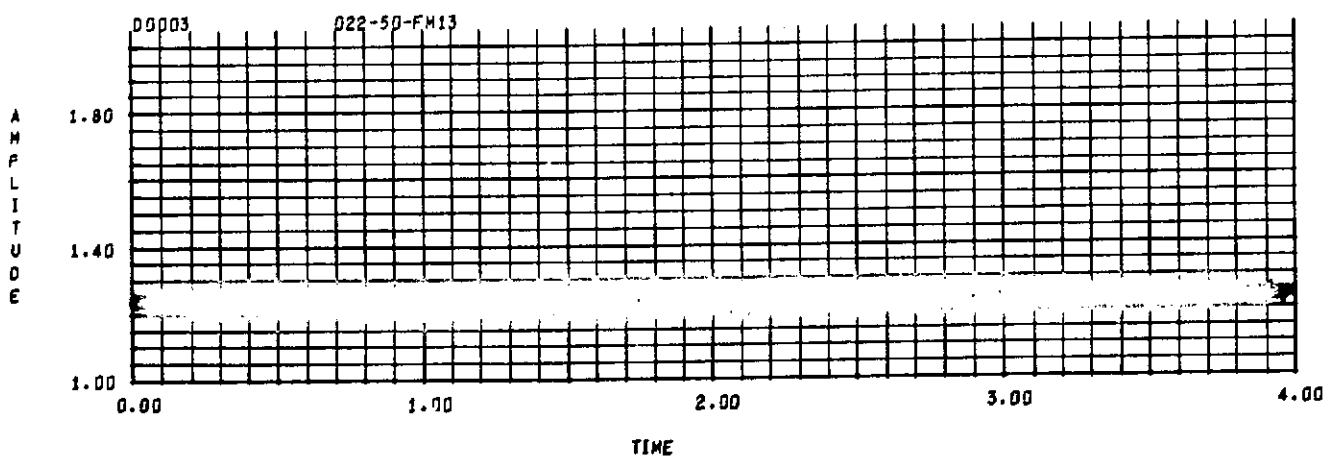
1.00
2.00
3.00
4.00
TIME


D0003
022-50-FM13
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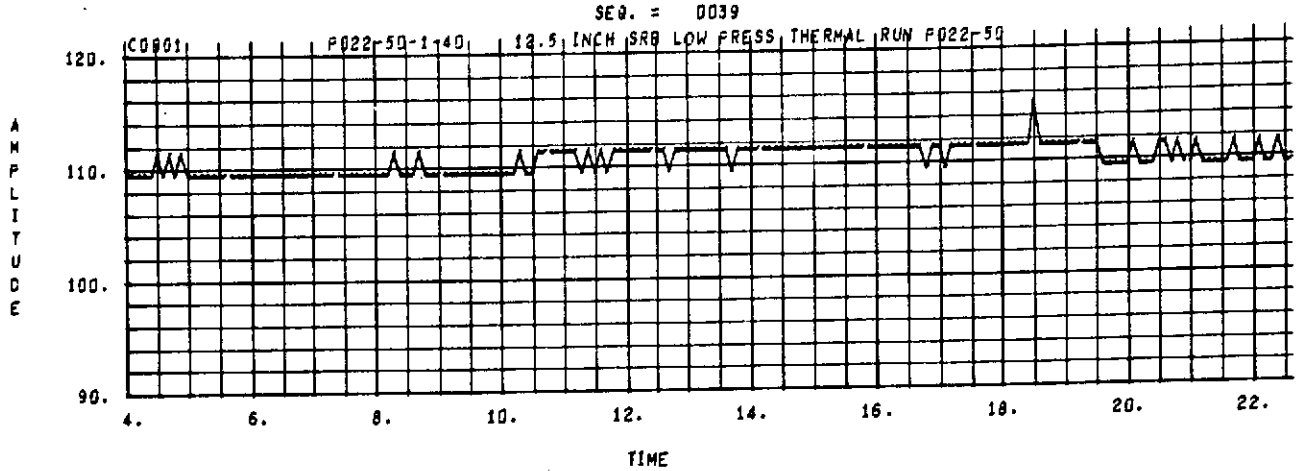
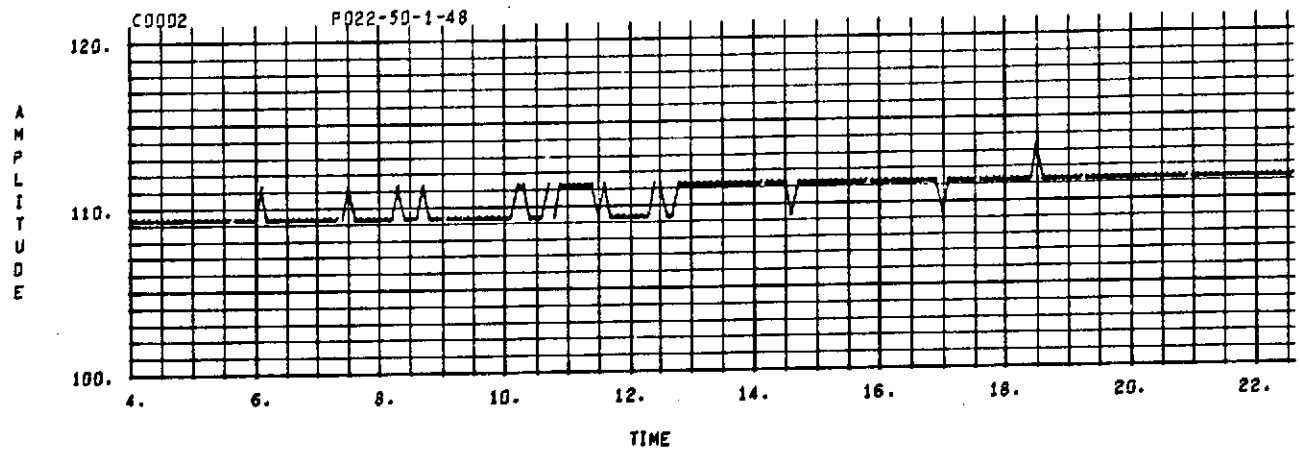
1.40
1.00
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

SEQ. = 0039


C0001
P022-50-1-40
12.5 INCH SRB LOW PRESS THERMAL RUN P022-50
120.
110.
100.
90.
AMPLITUDE
4.
6.
8.
10.
12.
14.
16.
18.
20.
22.
TIME


C0002
P022-50-1-48
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110.
100.
AMPLITUDE
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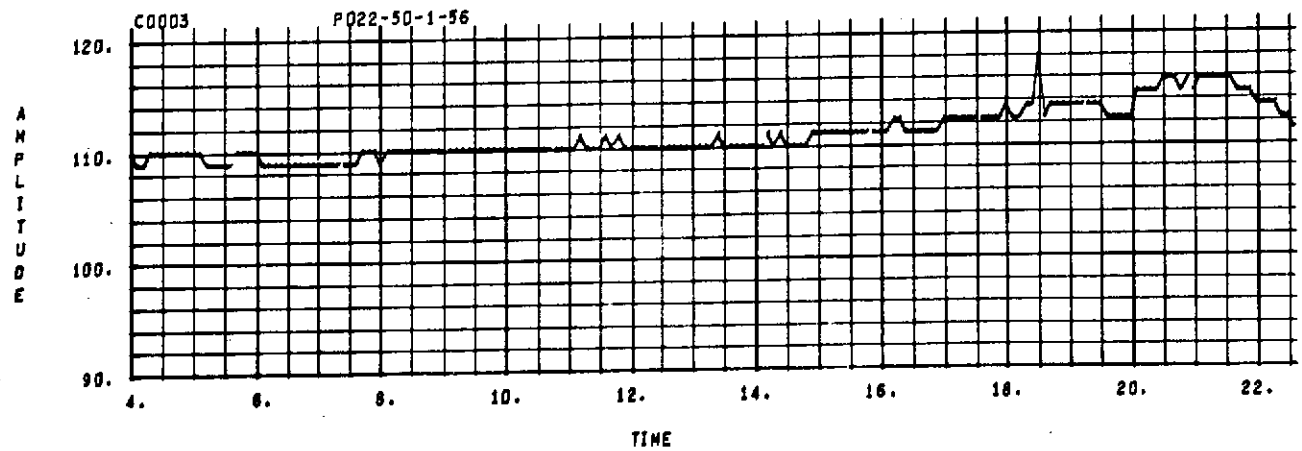
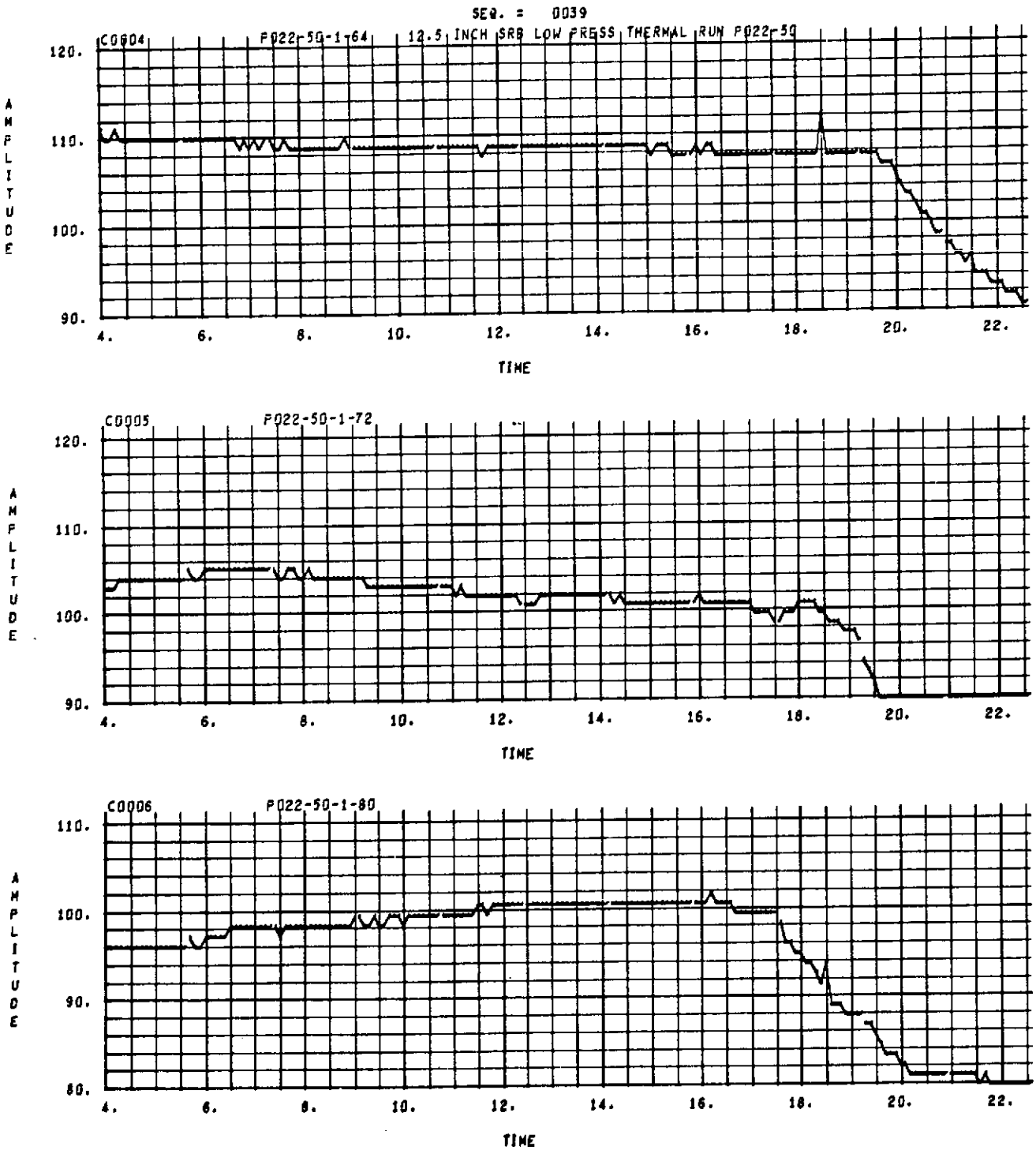
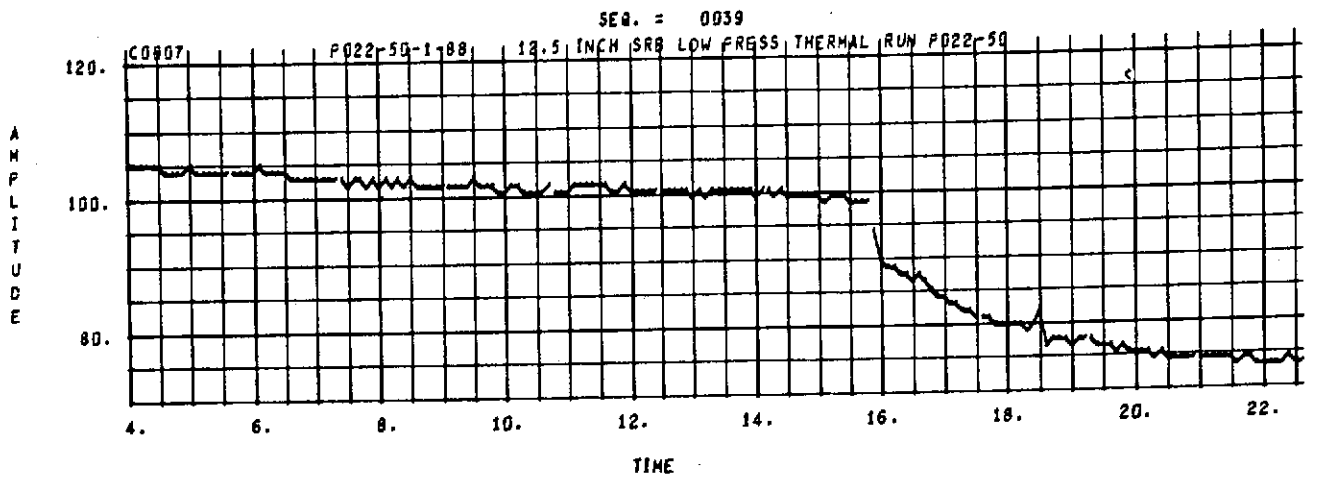
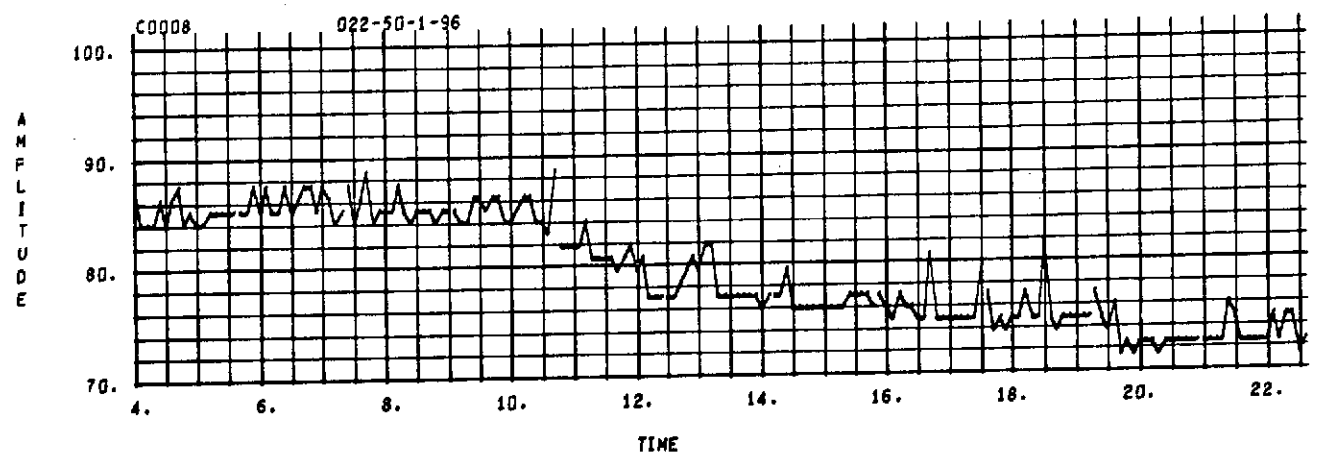
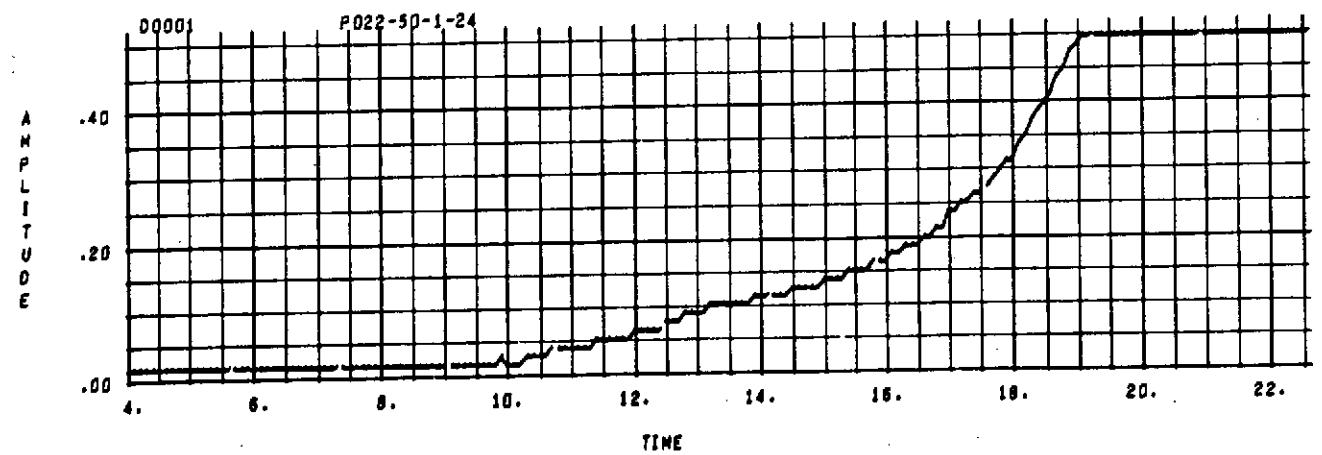
6.
8.
10.
12.
14.
16.
18.
20.
22.
TIME


C0003
P022-50-1-56
120.
110.
100.
90.
AMPLITUDE
4.
6.
8.
10.
12.
14.
16.
18.
20.
22.
TIME


SEQ. = 0039
C0004
P022-50-1-64
12.5 INCH SRB LOW PRESS THERMAL RUN P022-50
AMPLITUDE
120.
110.
100.
90.
4.
6.
8.
10.
12.
14.
16.
18.
20.
22.
TIME
C0005
P022-50-1-72
AMPLITUDE
120.
110.
100.
90.
4.
6.
8.
10.
12.
14.
16.
18.
20.
22.
TIME
C0006
P022-50-1-80
AMPLITUDE
110.
100.
90.
80.
4.
6.
8.
10.
12.
14.
16.
18.
20.
22.
TIME


SEQ. = 0039
C0007
P022-50-1-88
12.5 INCH SRB LOW PRESS THERMAL RUN P022-50
120.
100.
80.
AMPLITUDE
4.
6.
8.
10.
12.
14.
16.
18.
20.
22.
TIME


C0008
022-50-1-96
100.
90.
80.
70.
AMPLITUDE
4.
6.
8.
10.
12.
14.
16.
18.
20.
22.
TIME


D0001
P022-50-1-24
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.20
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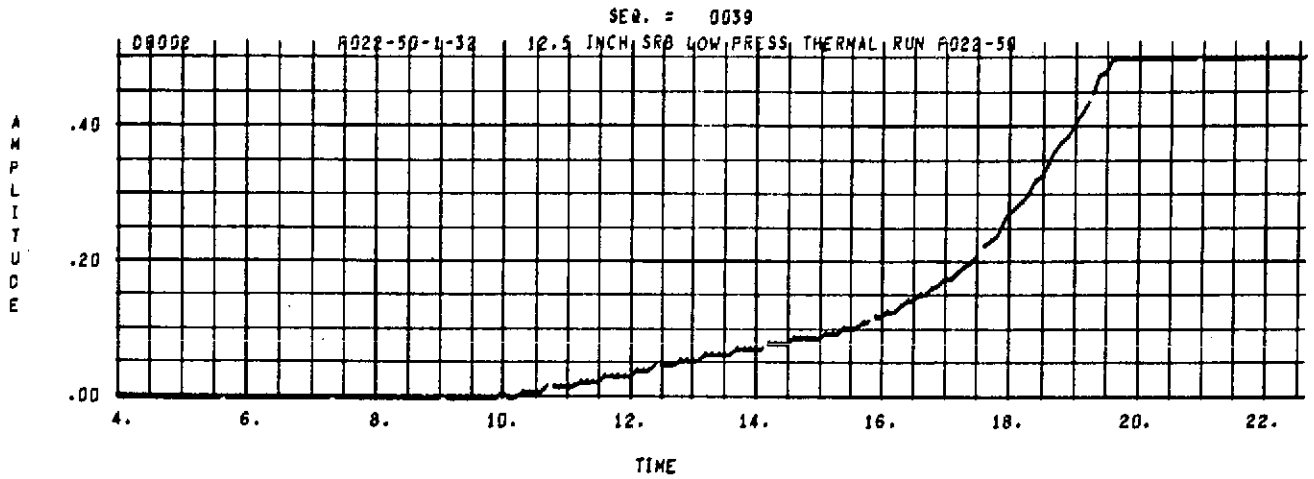
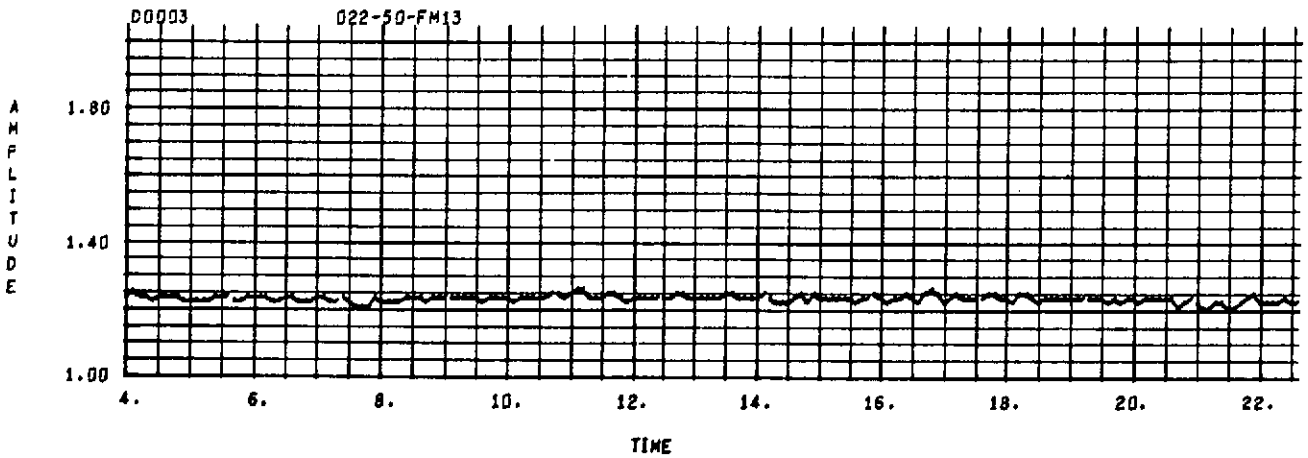
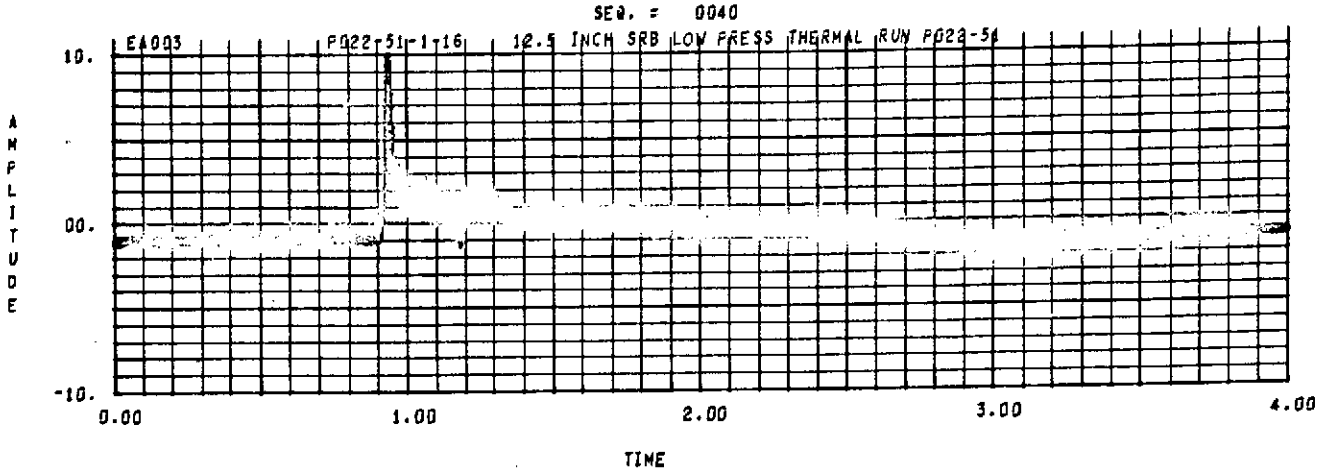
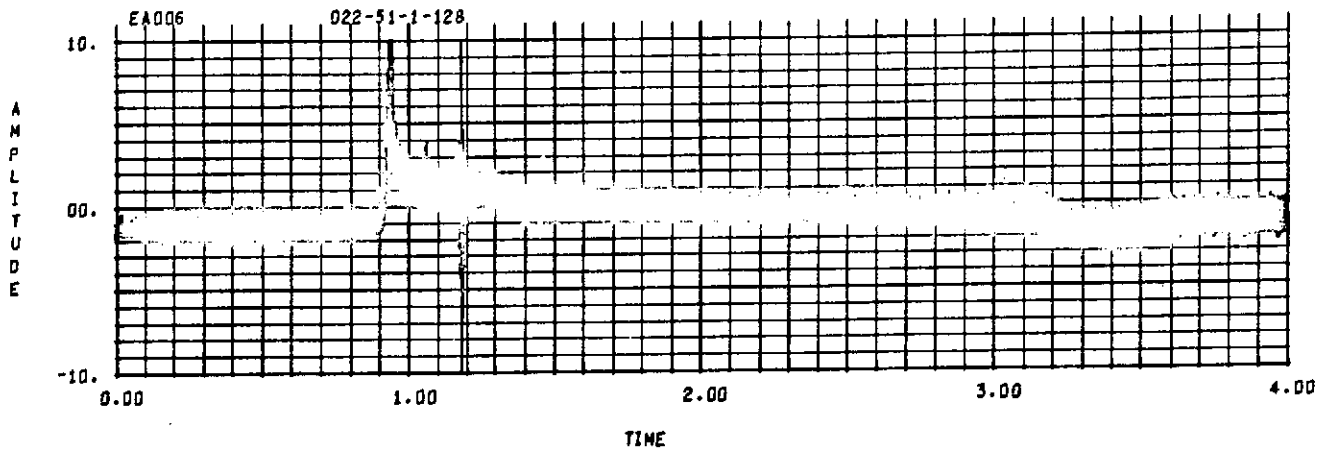
AMPLITUDE
4.
6.
8.
10.
12.
14.
16.
18.
20.
22.
TIME

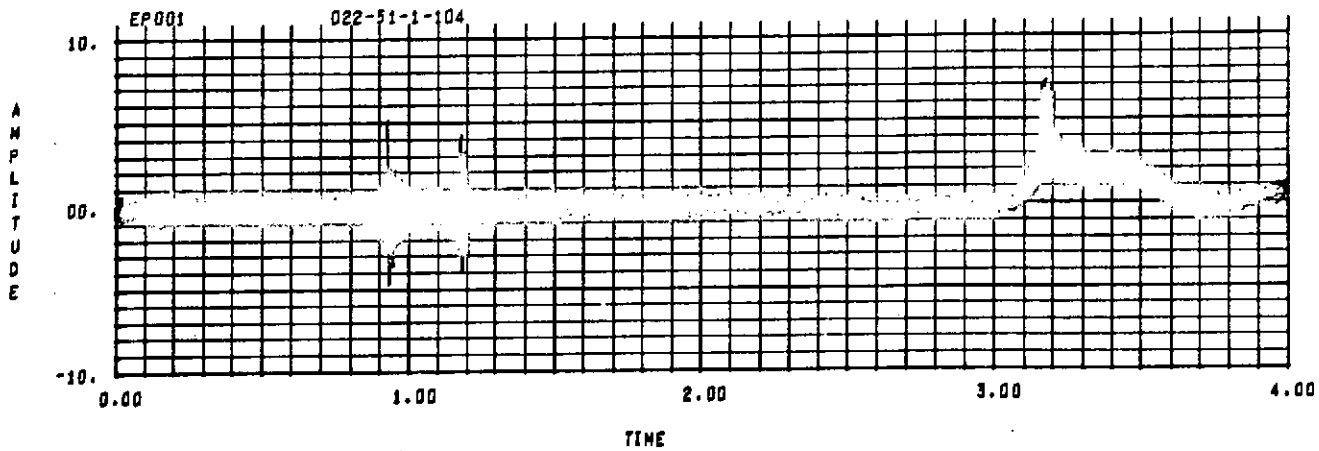

SEQ. = 0039
D0002
A022-50-1-32
12.5 INCH SRB LOW PRESS THERMAL RUN A023-50
AMPLITUDE
.40
.20
.00
4.
6.
8.
10.
12.
14.
16.
18.
20.
22.
TIME

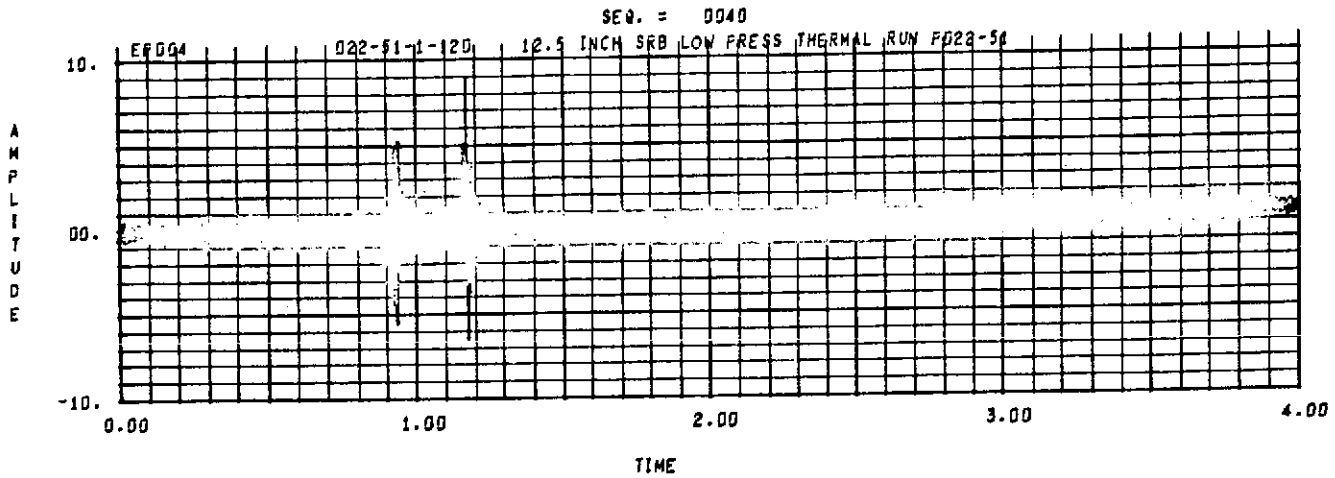

D0003
022-50-FM13
AMPLITUDE
1.80
1.40
1.00
4.
6.
8.
10.
12.
14.
16.
18.
20.
22.
TIME

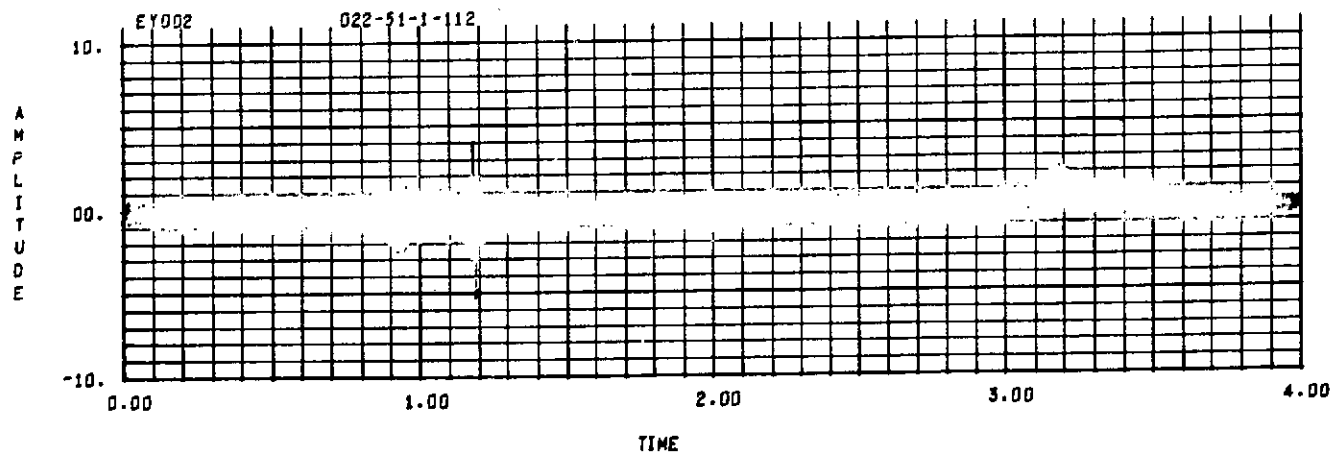
SEQ. = 0040

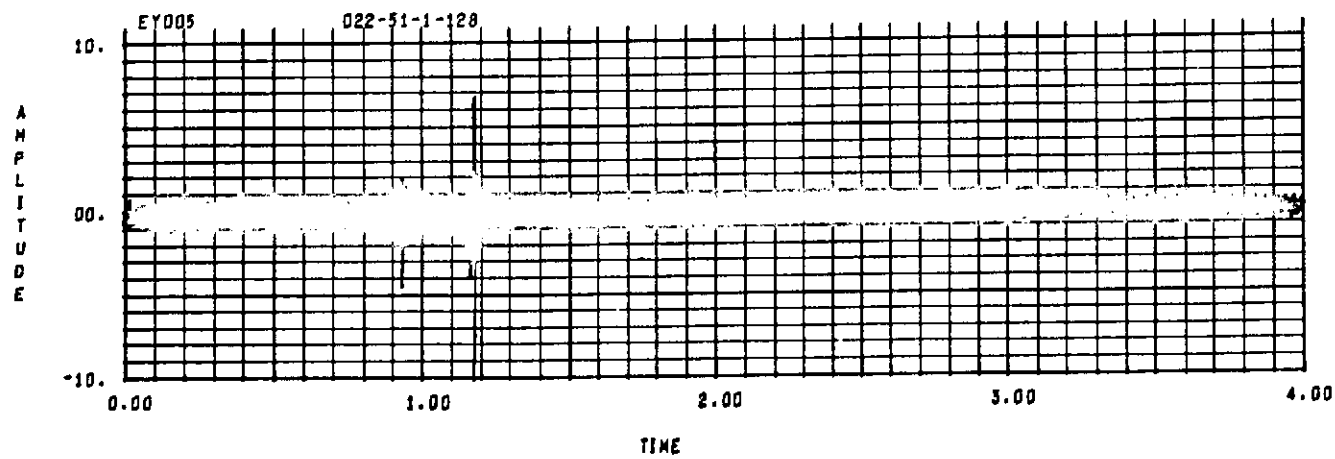

EA003
P022-51-1-16
12.5 INCH SRB LOW PRESS THERMAL RUN P022-51
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME


EA006
022-51-1-128
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

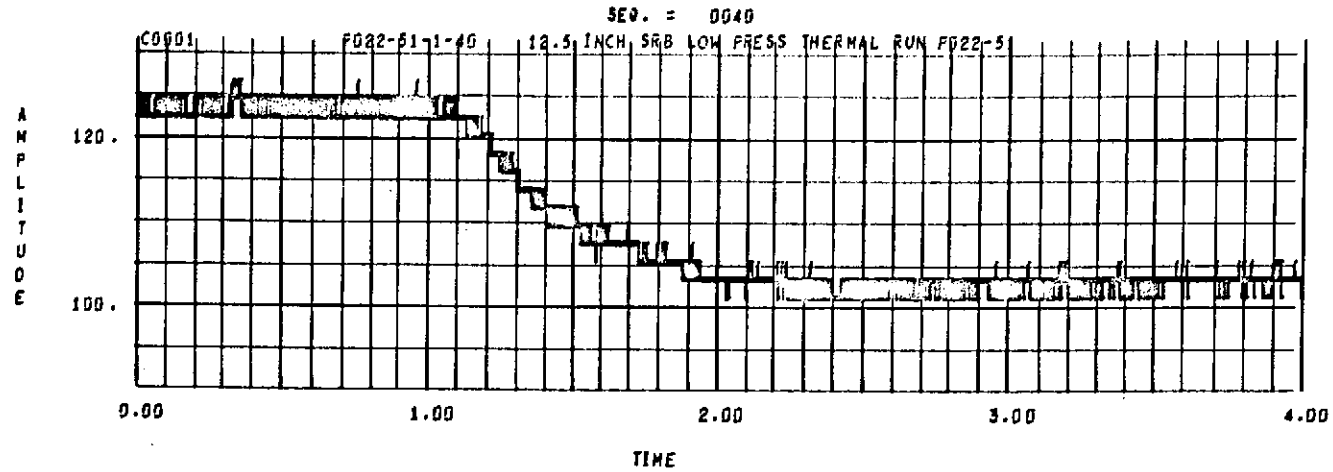

EP001
022-51-1-104
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

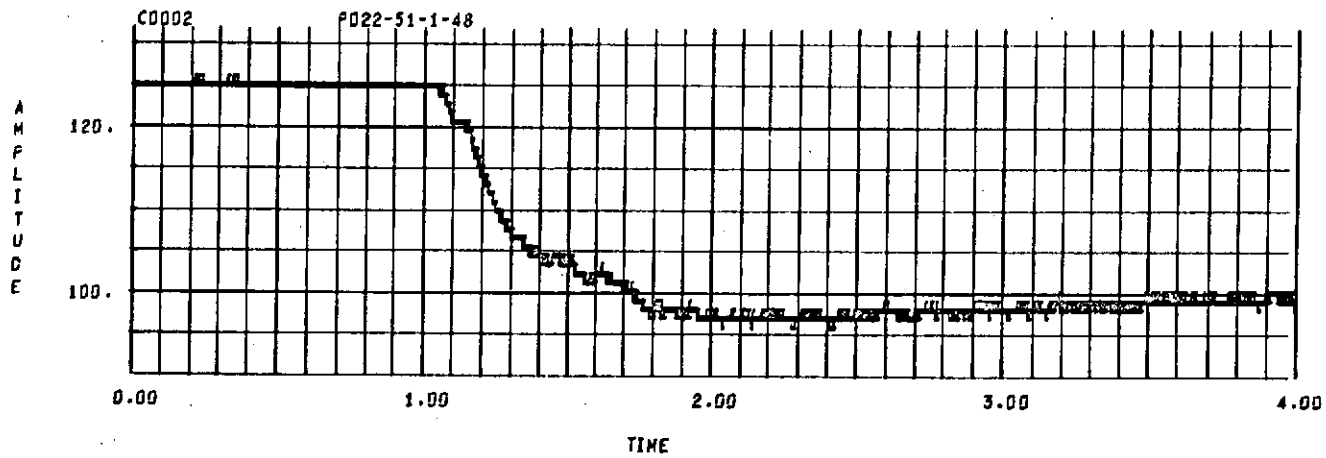

SEQ. = 0040
EF004
022-51-1-120
12.5 INCH SRB LOW PRESS THERMAL RUN F023-50
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

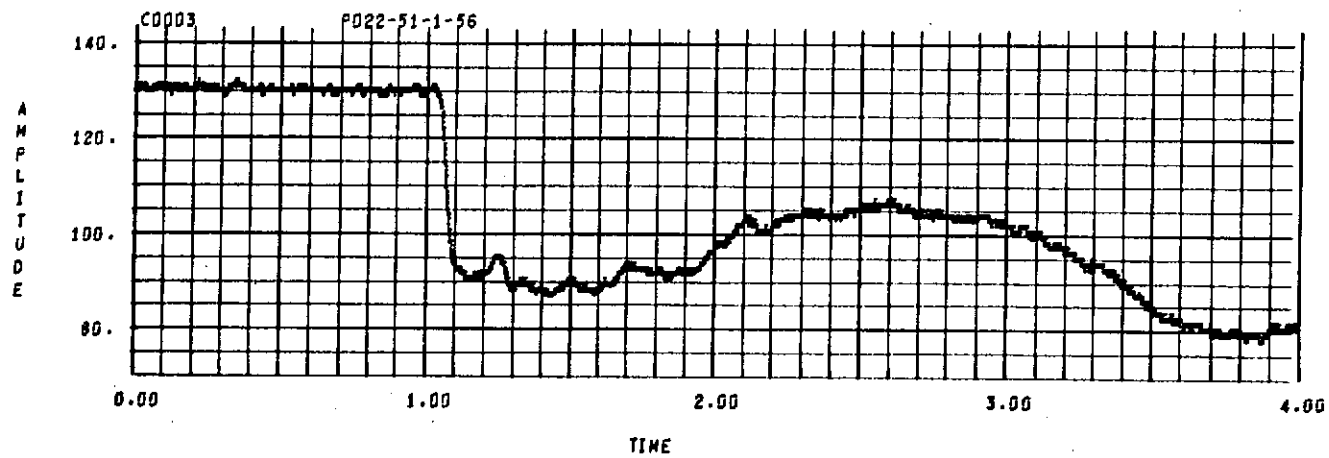

EY002
022-51-1-112
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

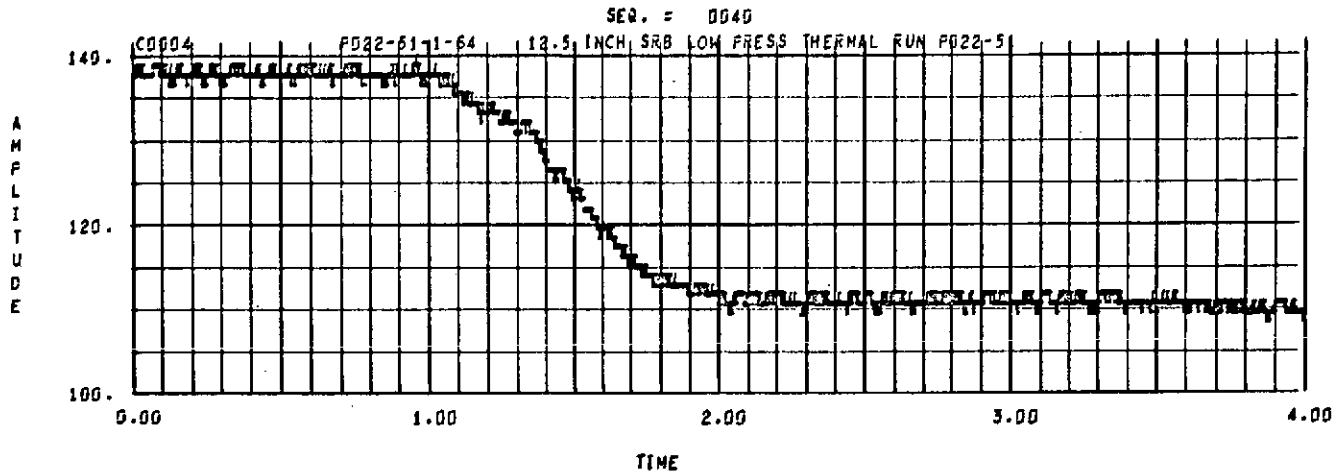

EY005
022-51-1-128
10.
00.
-10.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

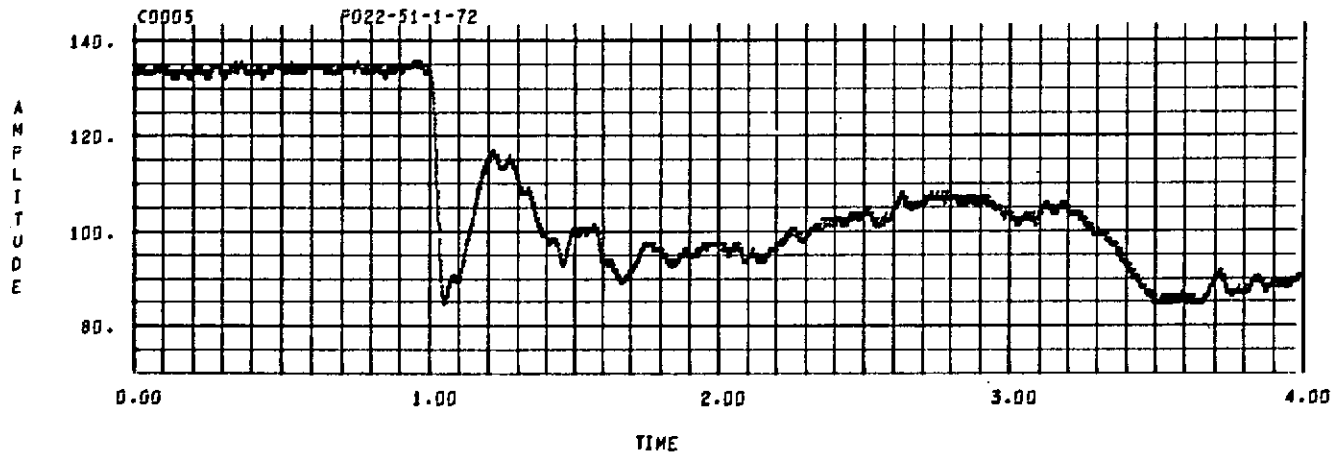
C-3

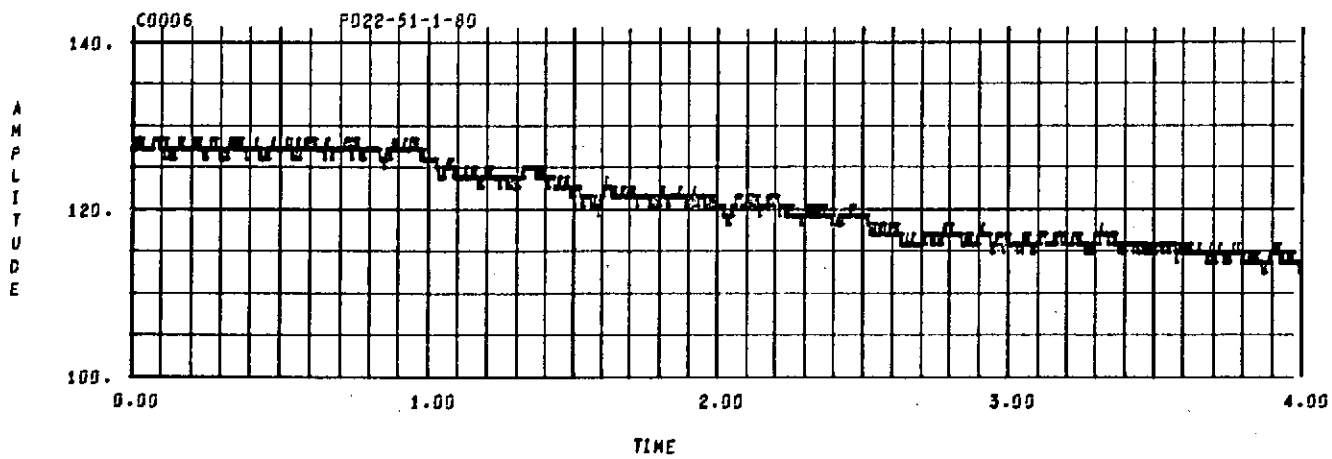

SEQ. = 0040
C0001
F022-51-1-40
12.5 INCH SRB LOW PRESS THERMAL RUN F022-5
AMPLITUDE
120.
100.
0.00
1.00
2.00
3.00
4.00
TIME

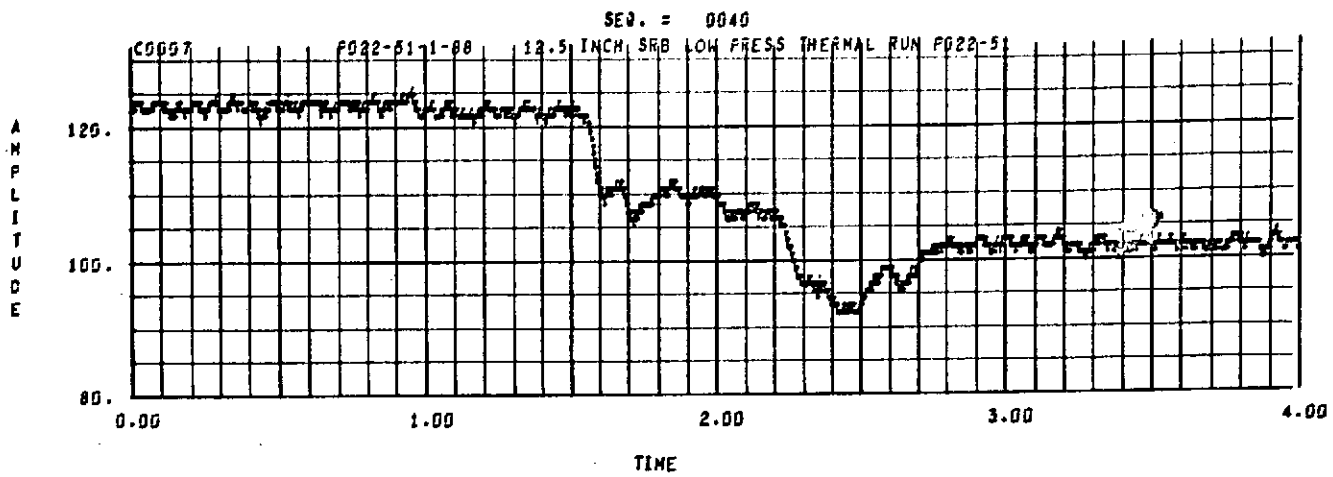

C0002
F022-51-1-48
AMPLITUDE
120.
100.
0.00
1.00
2.00
3.00
4.00
TIME

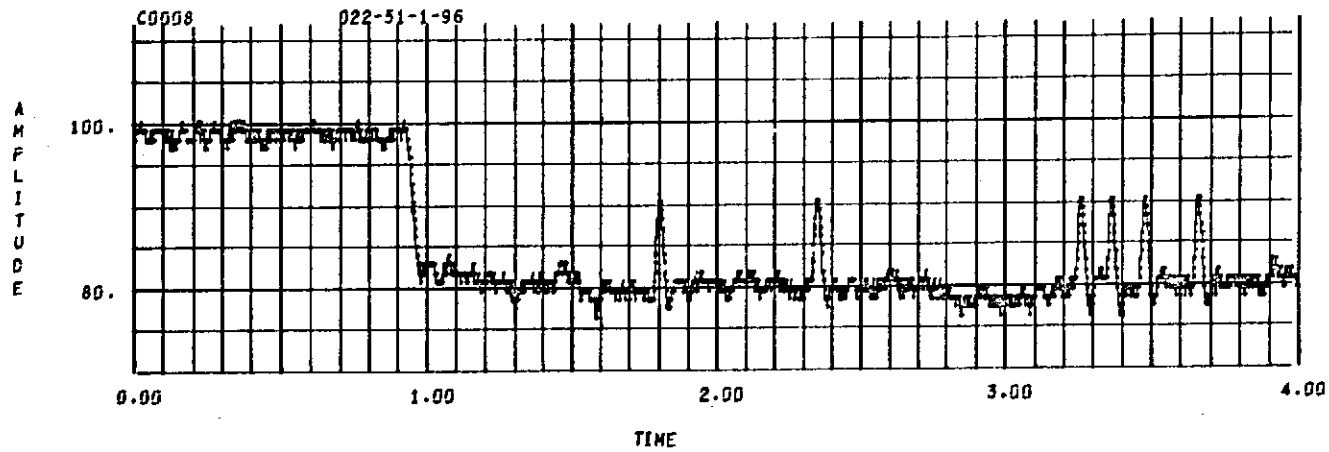

C0003
F022-51-1-56
AMPLITUDE
140.
120.
100.
80.
0.00
1.00
2.00
3.00
4.00
TIME

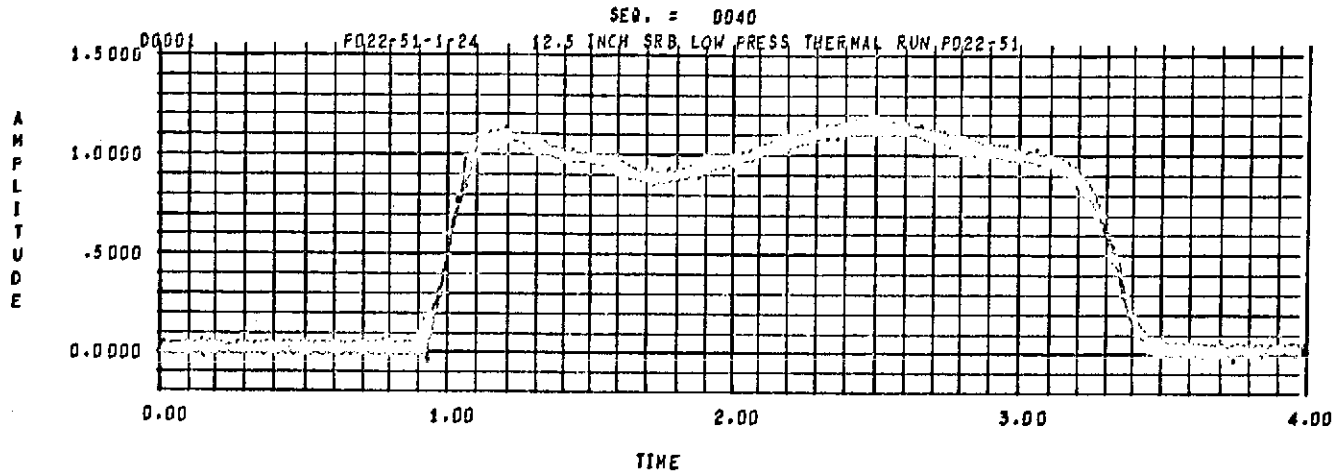

SEQ. = 0040
C0004
P022-51-1-64
12.5 INCH SRB LOW PRESS THERMAL RUN P022-5
140.
120.
100.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

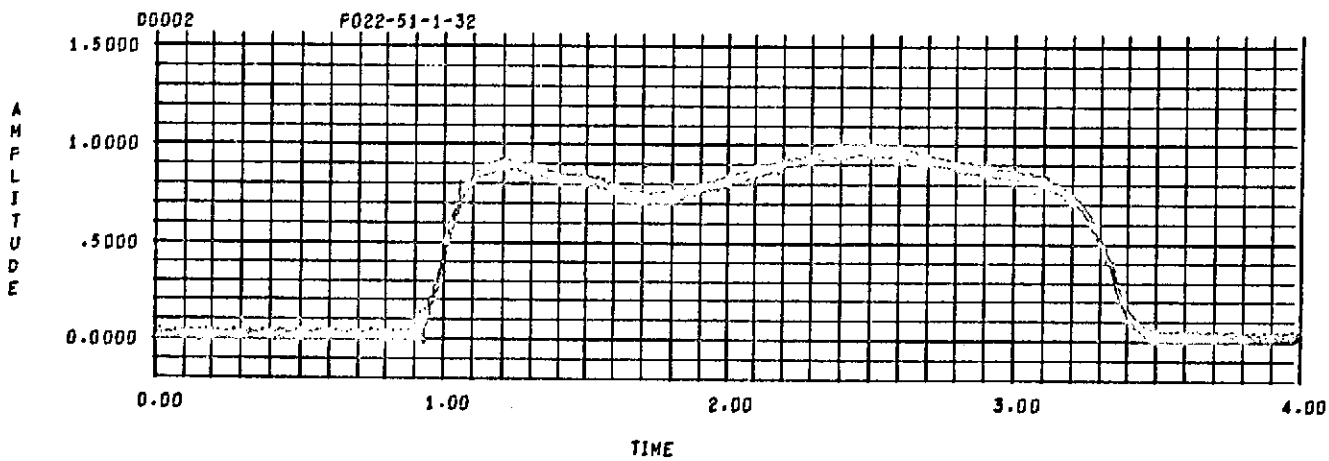

C0005
P022-51-1-72
140.
120.
100.
80.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

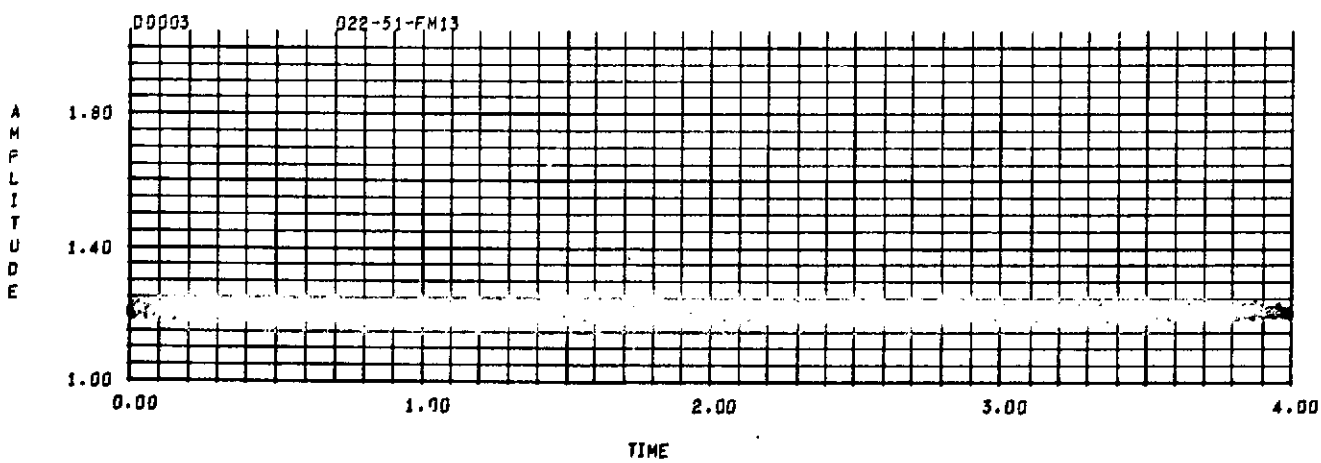

C0006
P022-51-1-80
140.
120.
100.
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

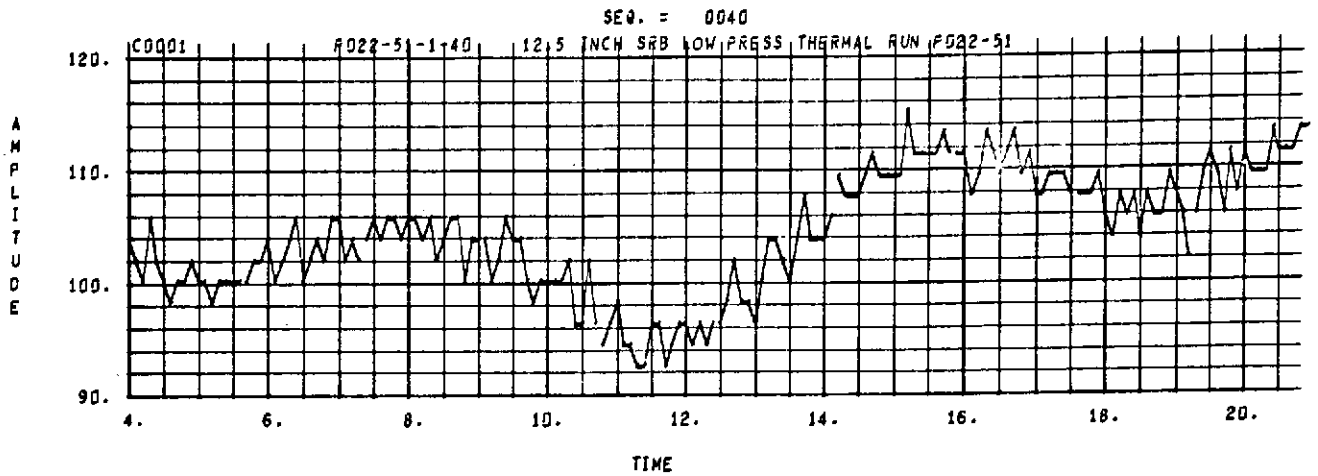

SEQ. = 0040
C0007
F022-51-1-88
12.5 INCH SRB LOW PRESS THERMAL RUN F022-51
AMPLITUDE
120.
100.
80.
0.00
1.00
2.00
3.00
4.00
TIME

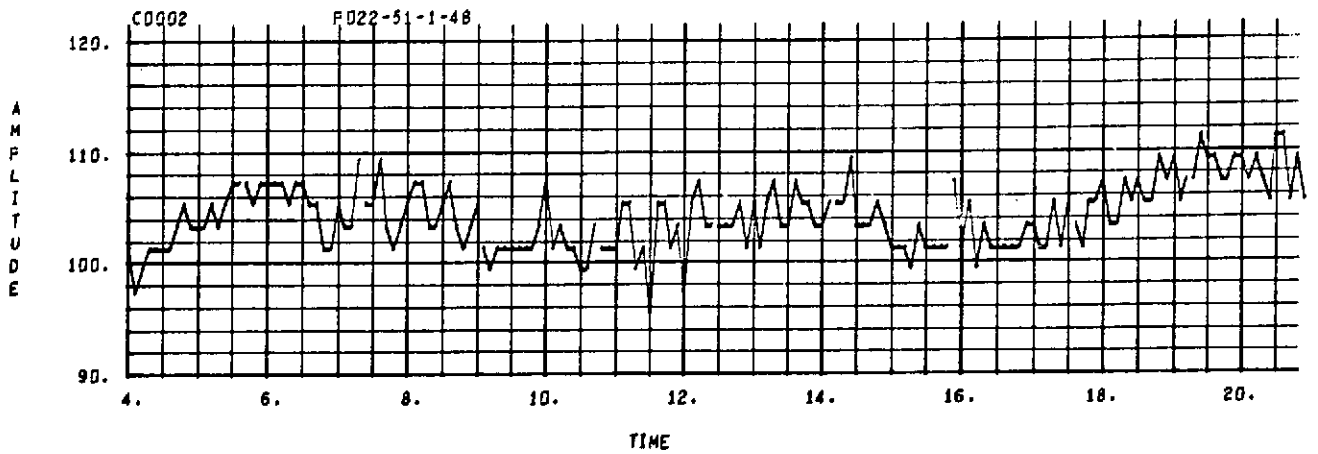

C0008
022-51-1-96
AMPLITUDE
100.
80.
0.00
1.00
2.00
3.00
4.00
TIME

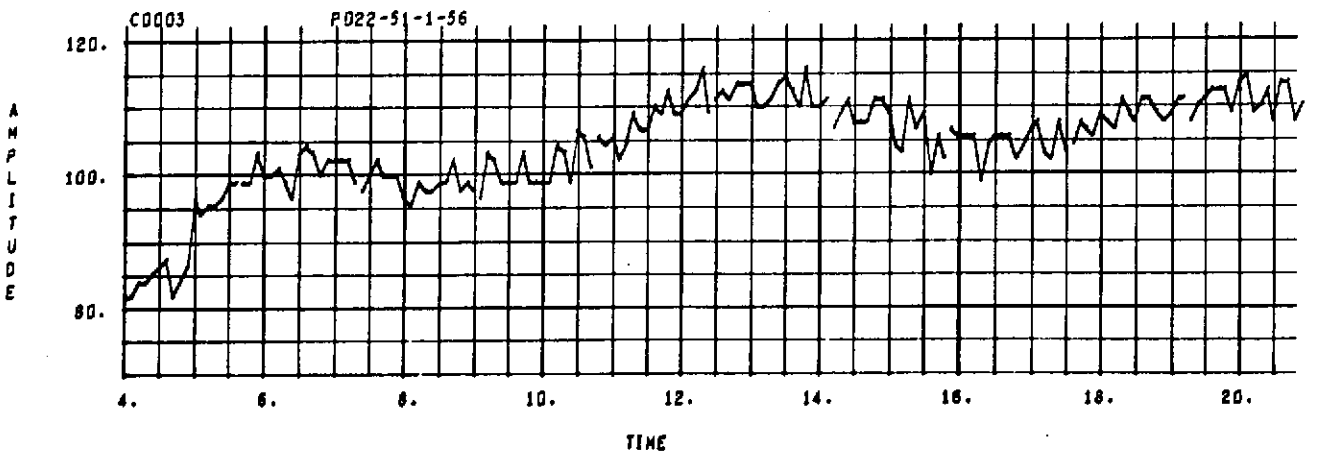

SEQ. = 0040
00001
F022-51-1-24
12.5 INCH SRB LOW PRESS THERMAL RUN F022-51
1.5000
1.0000
.5000
0.0000
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME


00002
F022-51-1-32
1.5000
1.0000
.5000
0.0000
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

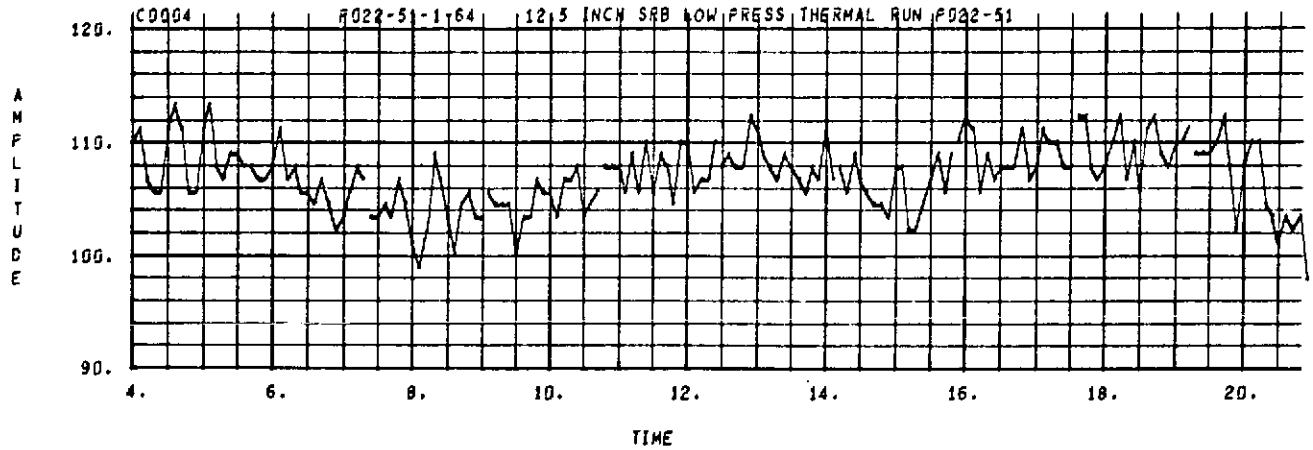

00003
022-51-FM13
1.80
1.40
1.00
AMPLITUDE
0.00
1.00
2.00
3.00
4.00
TIME

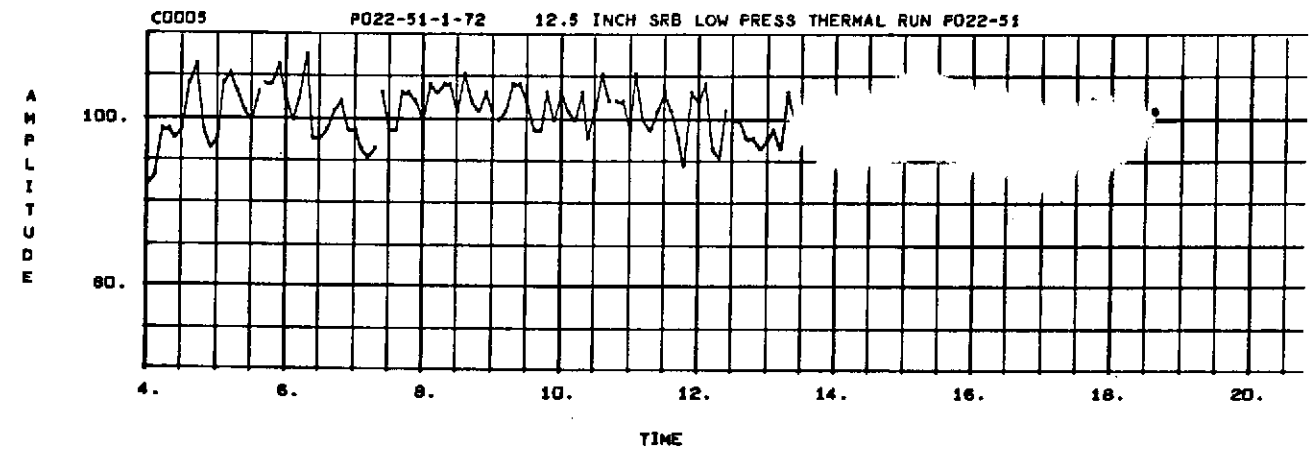

SEQ. = 0040
C0001
F022-51-1-40
12.5 INCH SRB LOW PRESS THERMAL RUN F022-51
AMPLITUDE
120.
110.
100.
90.
4.
6.
8.
10.
12.
14.
16.
18.
20.
TIME

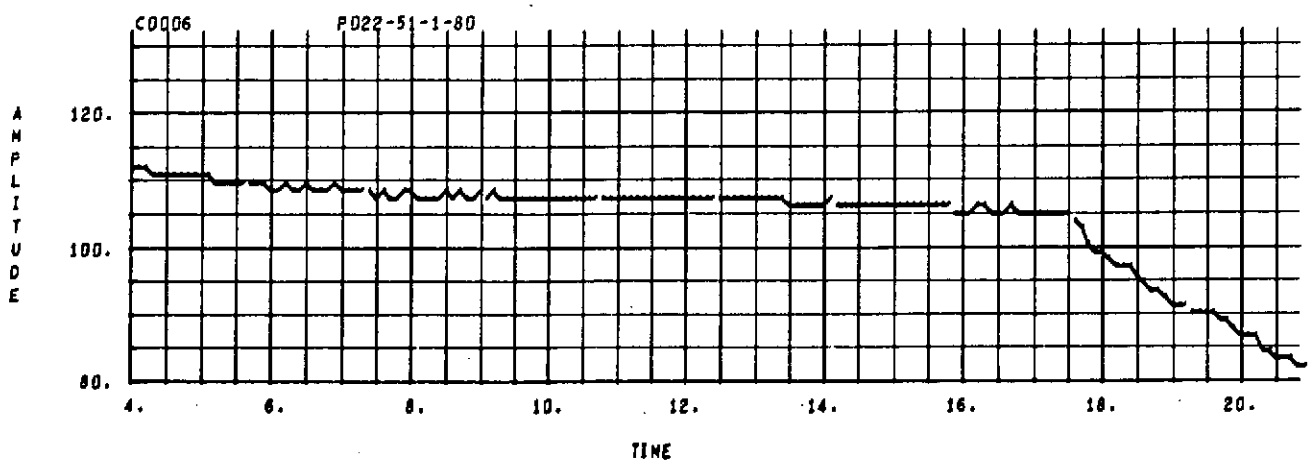

C0002
F022-51-1-48
AMPLITUDE
120.
110.
100.
90.
4.
6.
8.
10.
12.
14.
16.
18.
20.
TIME


C0003
F022-51-1-56
AMPLITUDE
120.
100.
80.
4.
6.
8.
10.
12.
14.
16.
18.
20.
TIME

SEQ. = 0040


C0004
P022-51-1-64
12.5 INCH SRB LOW PRESS THERMAL RUN P022-51
AMPLITUDE
120.
110.
100.
90.
4.
6.
8.
10.
12.
14.
16.
18.
20.
TIME


C0005
P022-51-1-72
12.5 INCH SRB LOW PRESS THERMAL RUN P022-51
AMPLITUDE
100.
80.
4.
6.
8.
10.
12.
14.
16.
18.
20.
TIME


C0006
P022-51-1-80
AMPLITUDE
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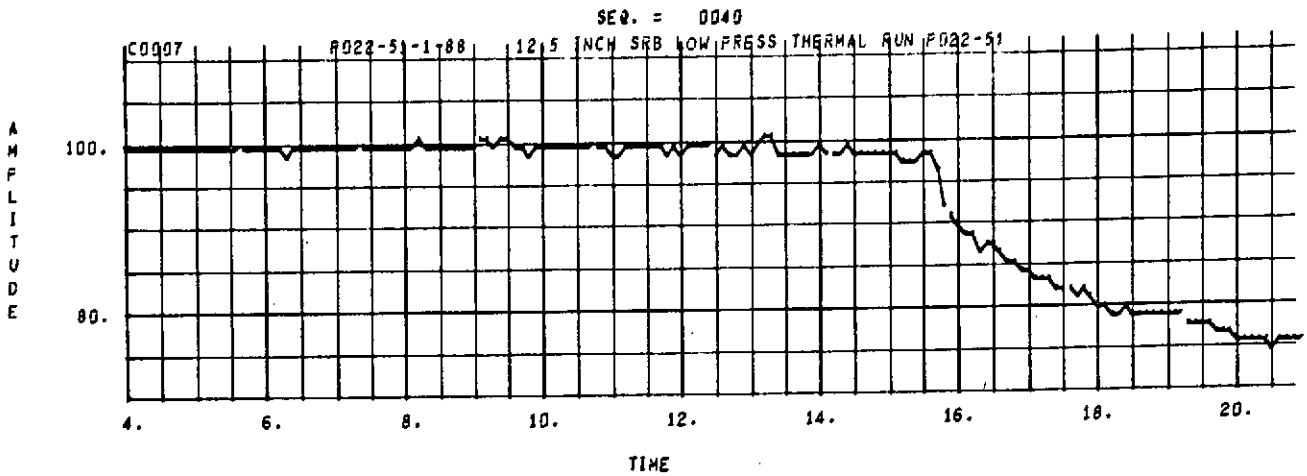
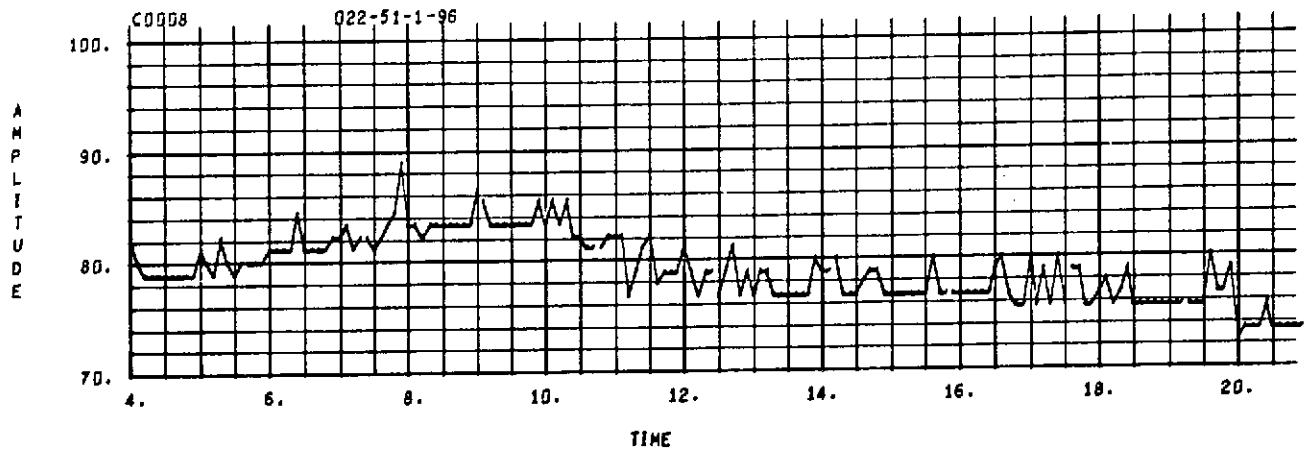
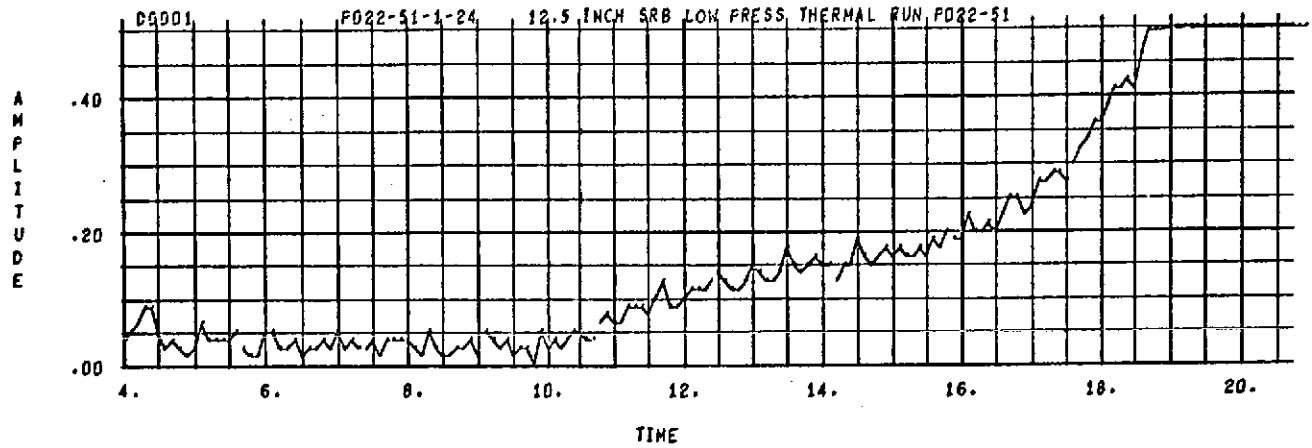
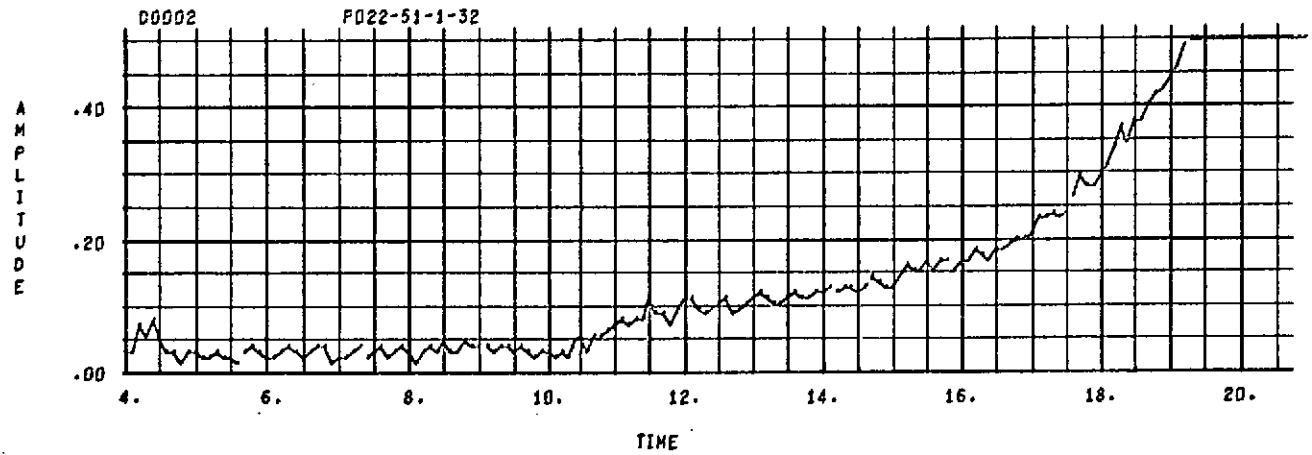
100.
80.
4.
6.
8.
10.
12.
14.
16.
18.
20.
TIME

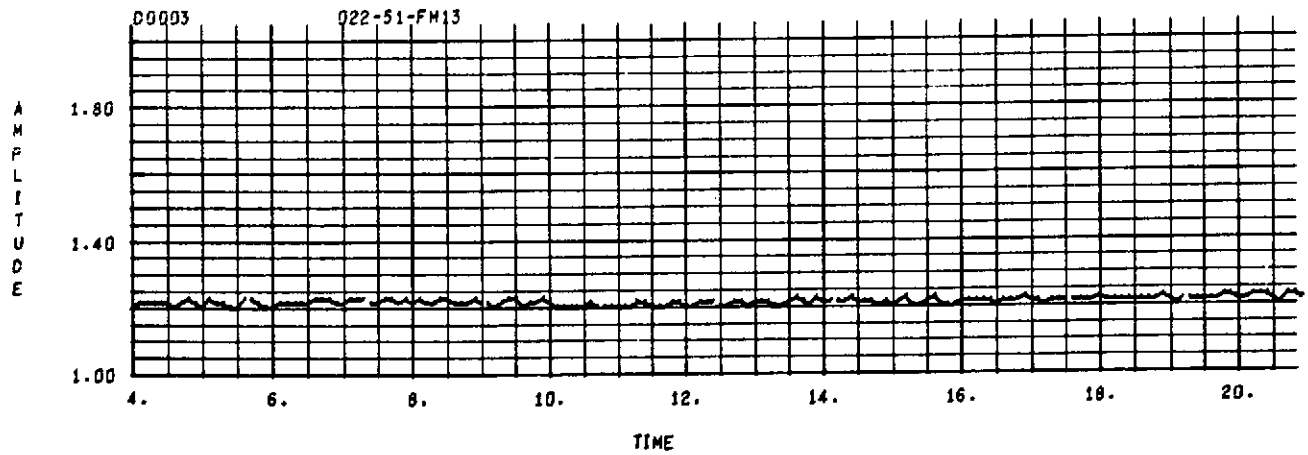

SEQ. = 0040
C0007
R022-51-1-88
12.5 INCH SRB LOW PRESS THERMAL RUN F022-51
AMPLITUDE
100.
80.
4.
6.
8.
10.
12.
14.
16.
18.
20.
TIME


C0008
022-51-1-96
AMPLITUDE
100.
90.
80.
70.
4.
6.
8.
10.
12.
14.
16.
18.
20.
TIME

SEQ. = 0040


D0001
F022-51-1-24
12.5 INCH SRB LOW PRESS THERMAL RUN F022-51
AMPLITUDE
.40
.20
.00
4.
6.
8.
10.
12.
14.
16.
18.
20.
TIME


D0002
F022-51-1-32
AMPLITUDE
.40
.20
.00
4.
6.
8.
10.
12.
14.
16.
18.
20.
TIME


D0003
022-51-FM13
AMPLITUDE
1.80
1.40
1.00
4.
6.
8.
10.
12.
14.
16.
18.
20.
TIME

APPROVAL

DATA BOOK FOR 12.5-INCH DIAMETER
SRB THERMAL MODEL WATER FLOTATION TEST - 1.29 PSIA, SERIES P022

by
S. L. Allums

The information in this report has been reviewed and approved for technical accuracy.

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