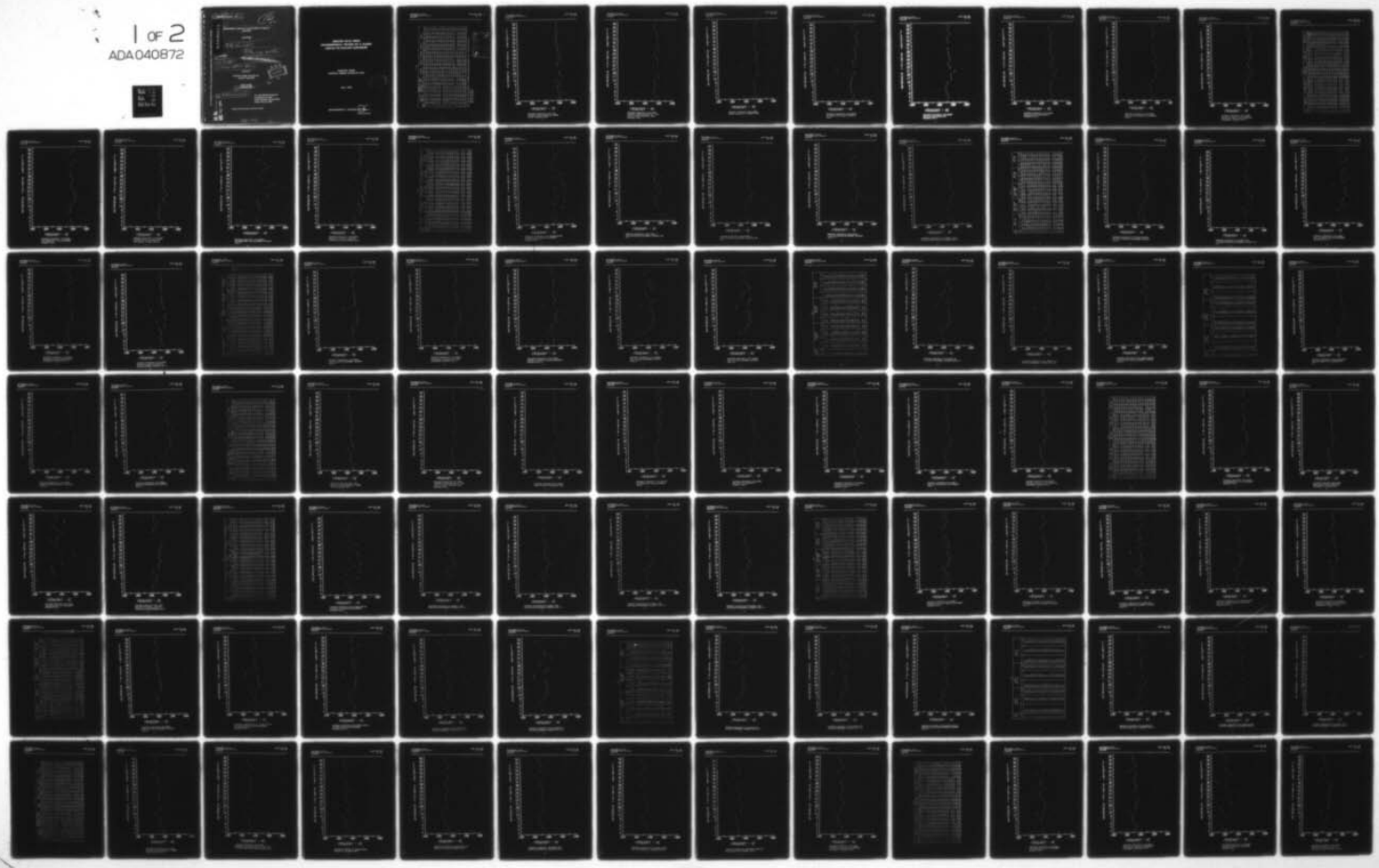
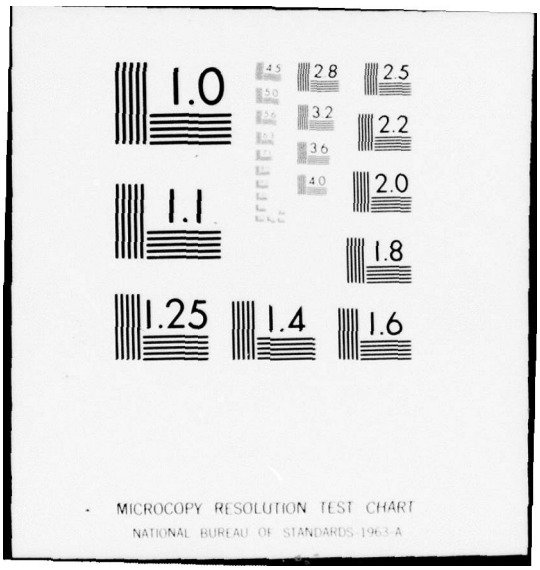
AD-A040 872 MCDONNELL DOUGLAS ASTRONAUTICS CO TITUSVILLE FLA F/G 9/5
ENVIRONMENTAL TESTING OF A FLUIDIC DIGITAL-TO-ANALOG CONVERTER.--ETC(U)
JUL 76 G W ROE DAAG39-76-C-0212
UNCLASSIFIED MDC-L0356-VOL-2 HDL-CR-76-212-1-VOL-2 NL

1 OF 2
ADA040872

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6.3
7.1
MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS 1963-A

(18) HDL-CR-76-212-1 (19) Vol-2

(12) NA

AD A040822

(6) ENVIRONMENTAL TESTING OF A FLUIDIC DIGITAL-TO-ANALOG CONVERTER,

VOLUME II.

(9) Final rept.,

(10) George W./Roe

(11) JULY 1976

(12) 122 p.

(14) MDC-L0356-Vol-2

Prepared by

McDonnell Douglas Astronautics Co.
Titusville, Florida 32780

Under Contract

(15) DAAG39-76-C-0212

(16) 1T162114A644

U.S. Army Material Development and Readiness Command
HARRY DIAMOND LABORATORIES
Adelphi, Maryland 20783

CR-76-212-1, Environmental Testing of a Fluidic Digital-to-Analog Converter, Volume II, by George W. Roe

405540

REDUCED DATA FROM ENVIRONMENTAL TESTING OF A FLUIDIC DIGITAL-TO-ANALOG CONVERTER

SUBMITTED UNDER
CONTRACT NUMBER DAAG39-76-C-0212

JULY 1976

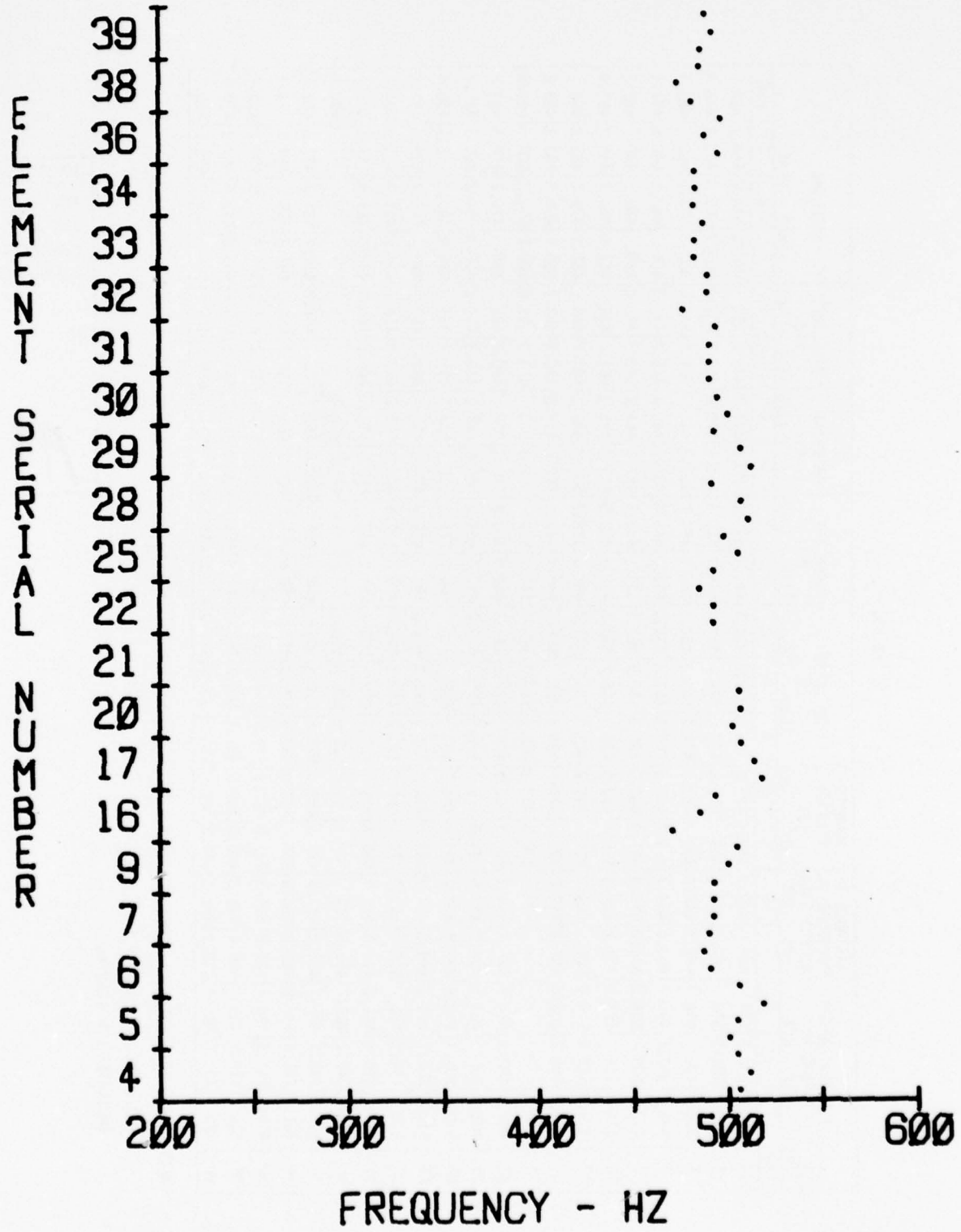
MCDONNELL DOUGLAS
CORPORATION

+5 PSI

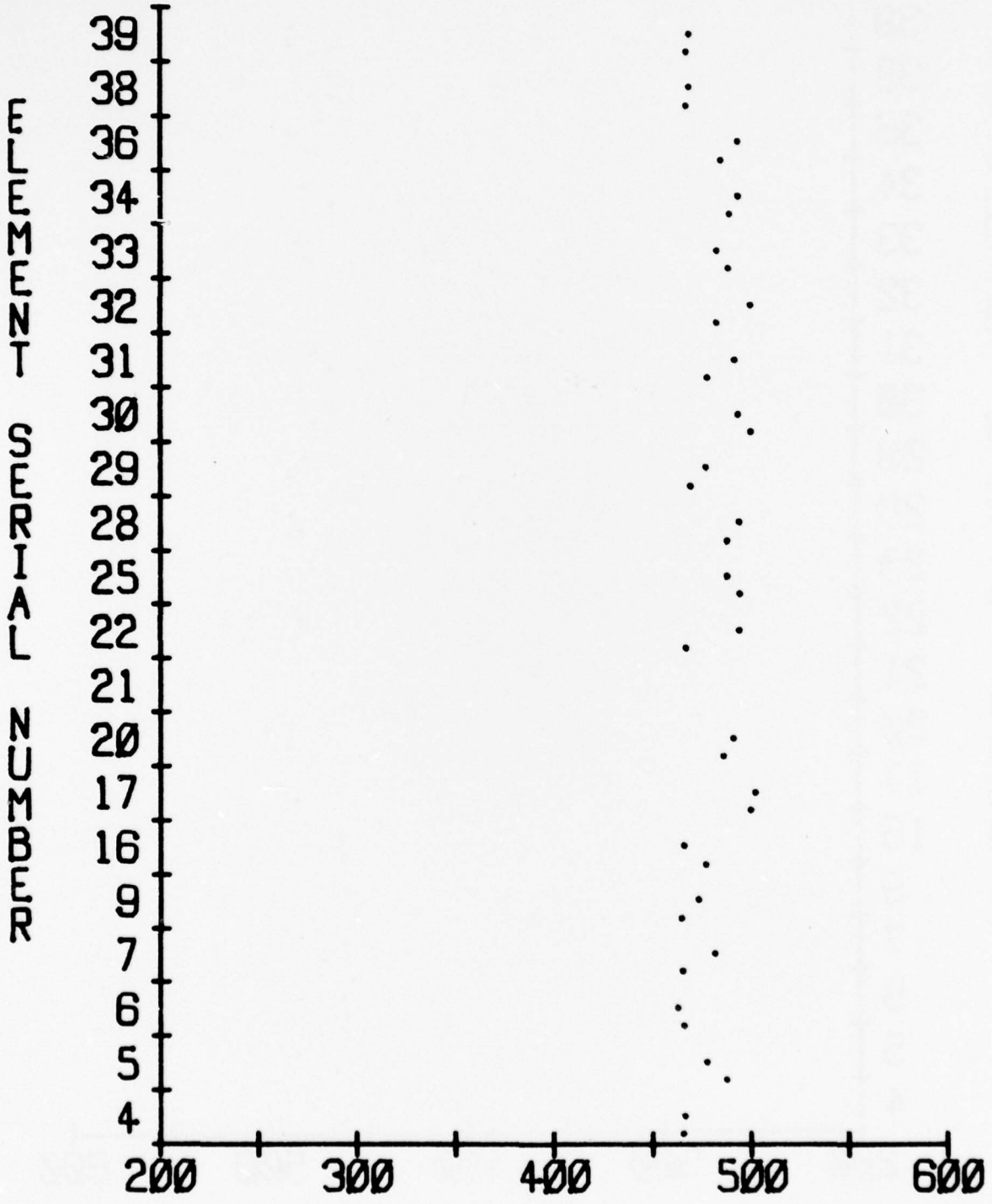
+5 PSI S/N	1ST TEST AFTER TUNING (C) 542 - 604			VARIANCE IN PRESSURE (D) 40 PSI ONLY 605 - 966		SCHMITT TRIGGER (D) 1009 - 1050		BASELINE (D) 1093 - 1155			BASELINE E-1 1156 - 1260			BASELINE E-2 1272 - 1376		BASELINE E-3 1377 - 1481		BASELINE F 1482 - 1544			
	1	2	3	1	2	1	2	1	2	3	1	2		1	2	1	2	1	2	3	AVG
4	505.8	510.8	504.2	465	466.3	462.5	477.5	465.8	466.7	466.7	461.2	460.8		470.8	467.5	448.3	450	443.3	454.2	464.2	469
5	500	504.2	518	487.5	477.1	465	485.8	480	485	485	464.2	460.8		489.2	470.8	457.5	463.3	466.7	465.8	465.8	478.5
6	505	490	486.7	465.8	462.5	460	461.7	464.2	463.3	462.5	462.5	454.2		468.3	465	451.7	450	457.5	455.8	450	465.1
7	489.2	491.7	491.7	465.4	481.7	471.7	460.8	460.8	461.7	454.2	452.5	445.8		453.3	466.7	446.7	453.3	450	447.5	440.8	462.4
9	492.5	500	504.2	464.2	473.3	455.8	460.8	457.5	462.5	463.3	450	452.5		457.5	464.2	445.8	445.8	450	450	450	463.2
16	470	485	493.3	476.7	465.8	460.8	463.3	465	464.2	462.5	458.3	462.5		479.2	468.3	464.2	465	462.5	456.7	456.7	467.4
17	518.3	513.3	506.7	500	501.7	485	494.2	473.3	475	471.7	487.5	488.3		509.2	499	487.5	490	482.5	479.2	469.2	491
20	501.7	506.7	505.8	485.8	490.8	490	500	494.2	485	485.8	486.7	485.8		489.2	483.3	490.8	493.3	486.7	480.8	483.3	490.8
21	-	-	-	-	*-	378.3	363.3	362.5	360.8	345	511.7	515		515.8	515	513.3	515.8	509.2	501.7	500	510.8
22	491.7	492.5	484.2	466.7	494.2	487.5	483.3	495	477.5	494.2	482.5	480.8		470.8	474	490.8	485	485	479.2	472.5	483.5
25	492.5	505	497.5	494.2	487.5	465.8	476.7	477.5	475	479.2	467.5	468.3		485.8	469.2	468.3	464.2	469.2	464.2	468.3	477.7
28	510.8	506.7	490.8	487.5	494.2	481.7	486.7	500	495	500	484.2	478.3		493.3	488.3	491.7	483.3	484.2	480.8	482.5	490.5
29	512.5	506.7	492.5	469.2	477.2	487.5	480	501.7	493.3	498.3	483.3	470.8		470.8	485	468.3	480	490	493.3	500	487.4
30	500	494.2	490	500	493.3	475	466.7	496.7	490.8	498	470	470.8		468.3	469.2	470.8	469.2	494.2	491.7	493.3	484.3
31	490	490	493.3	477.5	491.7	466.7	475	491.7	490	508.3	464.2	465		470.8	470	464.2	465.8	480.8	485.8	487.5	480.4
32	476	489.2	489.2	482.5	500	-	-	522.5	505.8	516.7	-	-		477.5	479.2	-	-	-	-	-	493.9
33	481.7	482.5	486.7	488.3	482.5	477.5	483.3	505.8	512.5	505	468.3	462.5		480.8	466.7	475	468.3	481.7	481.7	487.5	483.1
34	481.7	482.9	482.5	489.2	493.3	465	480.8	492.5	505.8	510.8	458.8	465.8		468.3	465	464.2	464.2	485.8	489.2	469.2	479.7
36	495	487.5	496.7	484.2	493.3	477.5	487.5	511.7	514.2	507.2	482.5	475		479.2	470.8	489.2	477.5	500.8	490.8	497.5	490.4
38	480.8	472.8	485	466.7	468.3	465.8	465.8	481.7	494.2	481.7	460.8	468.5		460.8	456.7	462.5	460.8	468.3	467.5	469.2	470.4
39	485	491.7	487.5	489.2	483.3	487.8	485	500	505.8	512.5	469.2	467.5		470	501.7	465.8	475	481.7	479.2	479.2	485.1

*UNIT 21 WAS NOT INITIALLY WORKING. UNIT STARTED TO WORK AND WAS THEN TUNED. AVG. IS FOR LAST 9 TESTS ONLY.

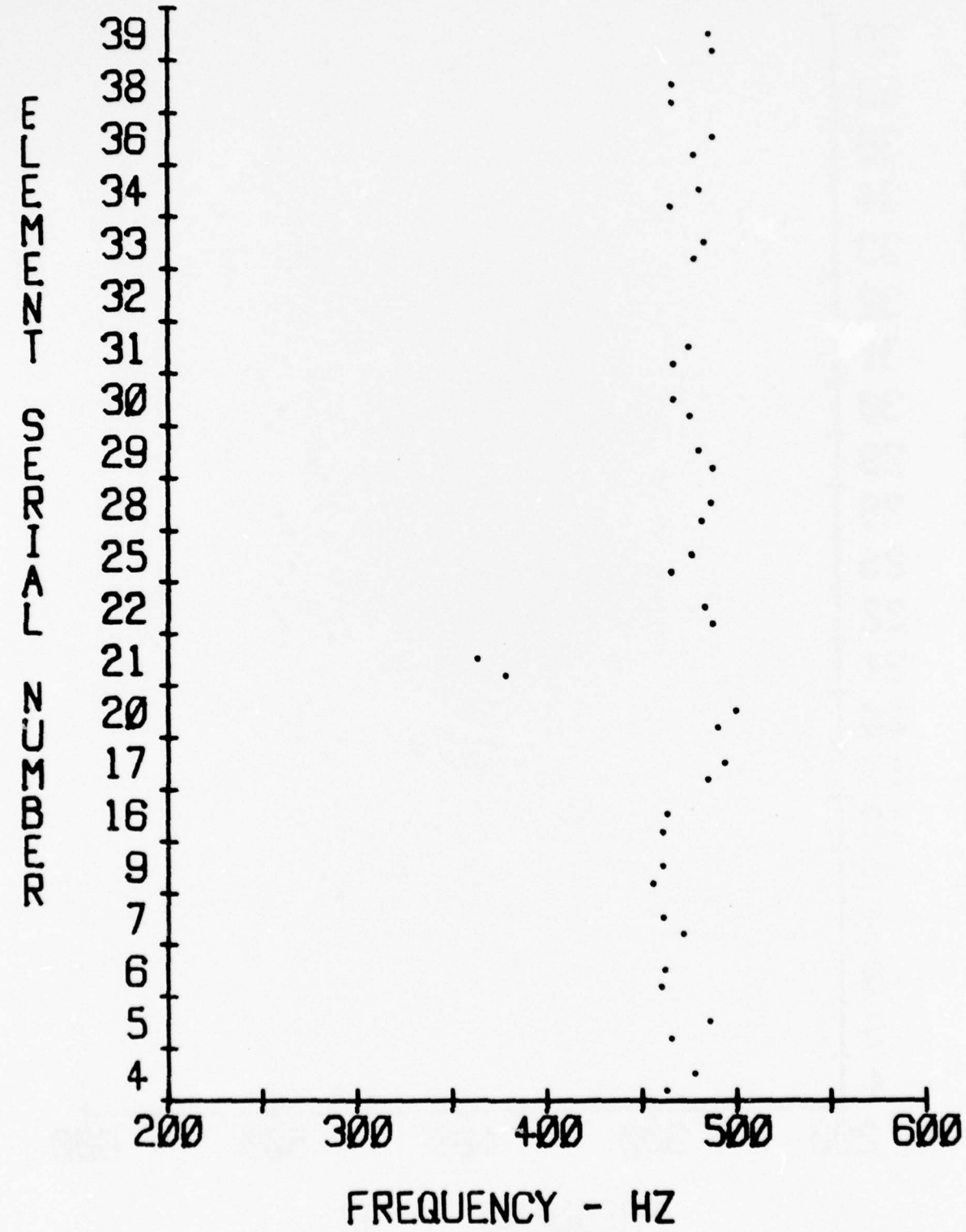
INDICATES HIGH READING
INDICATES LOW READING



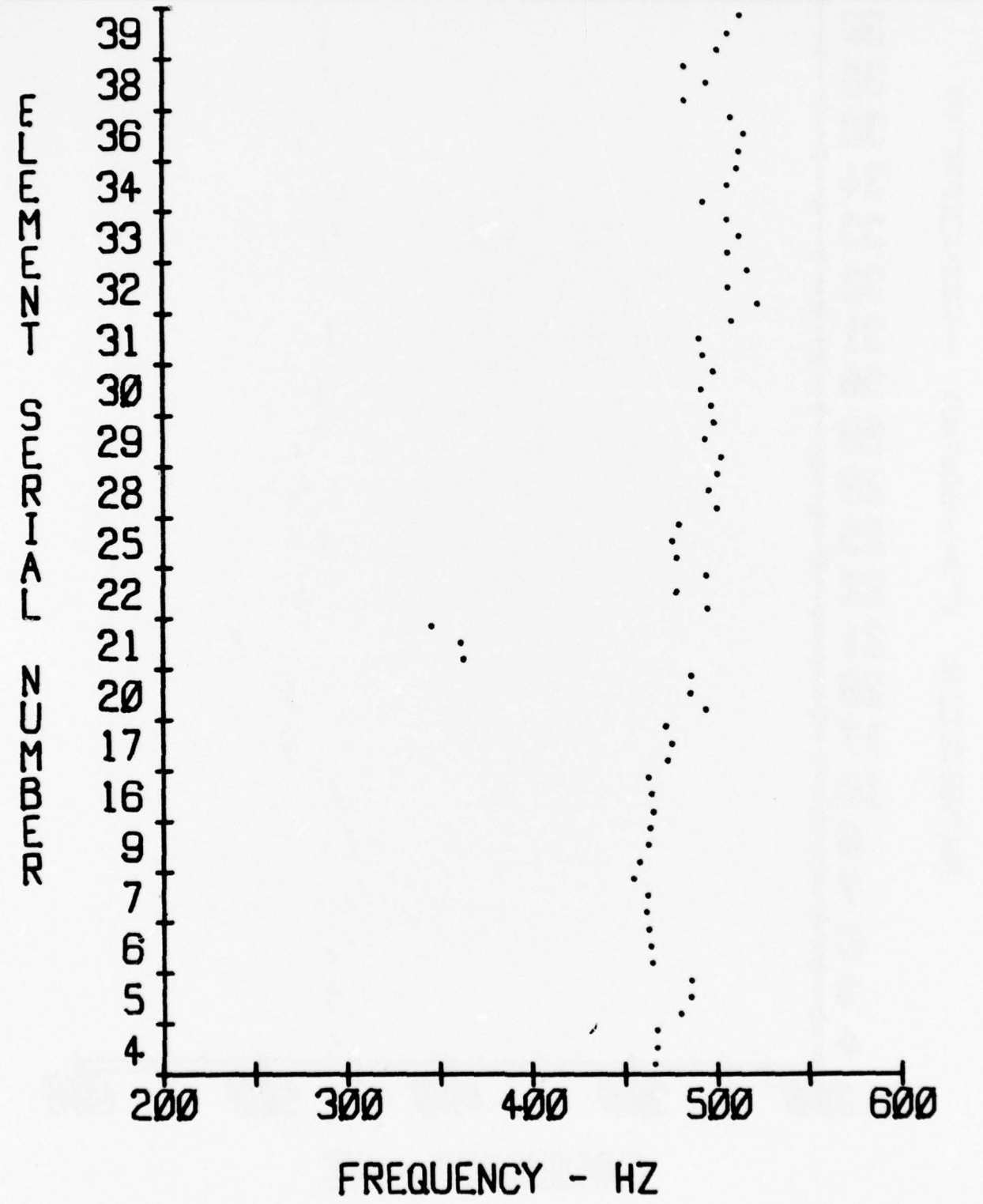
FREQUENCY VARIATION AT +5PSI, FIRST BASELINE AFTER ENVIRONMENTAL CHAMBER TUNING. REFERENCE TASK C



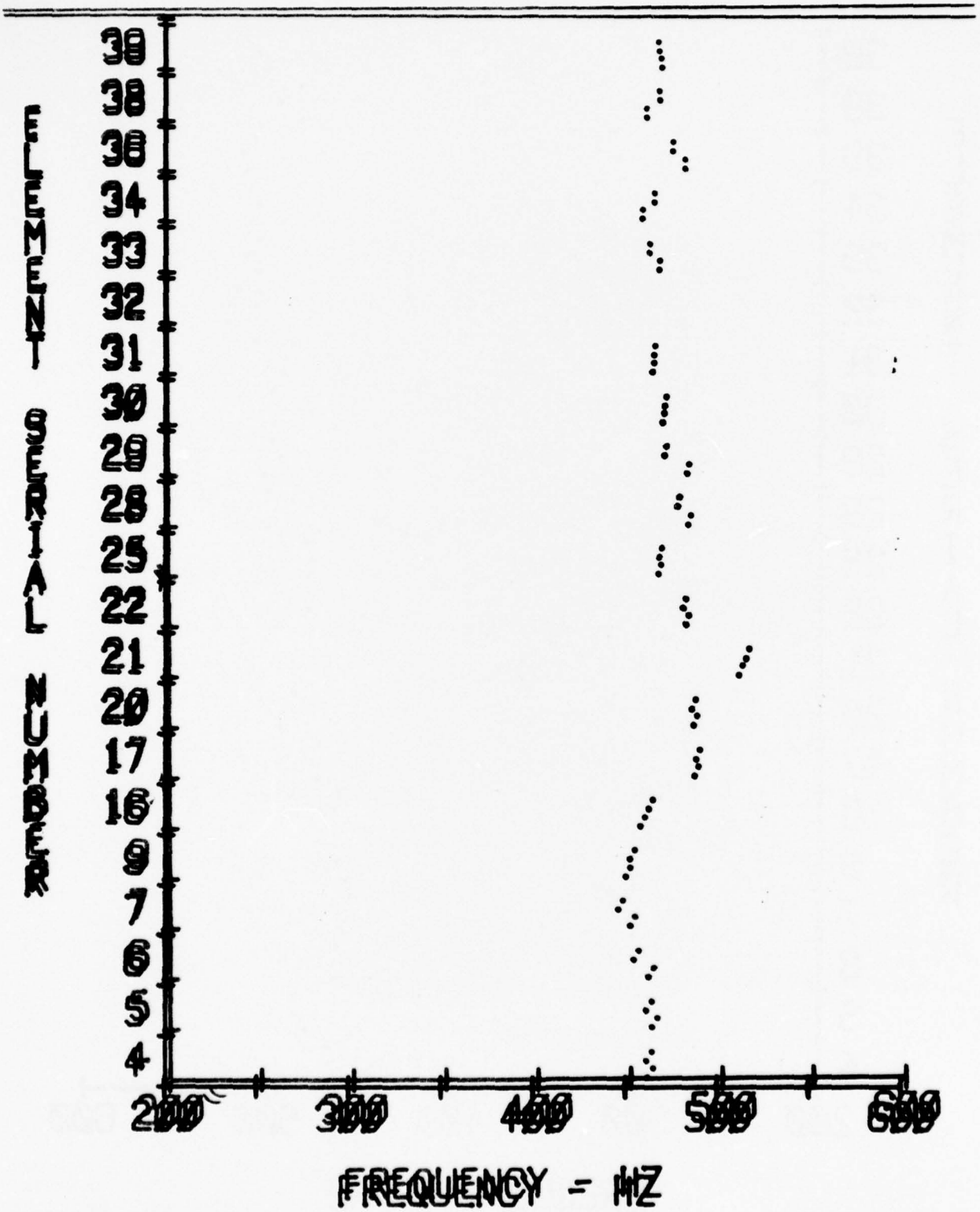
FREQUENCY VARIATION AT +5PSI DURING VARIANCE IN SUPPLY PRESSURE TEST. (THIS DATA AT A SUPPLY PRESSURE OF 40PSI) REFERENCE TASK D



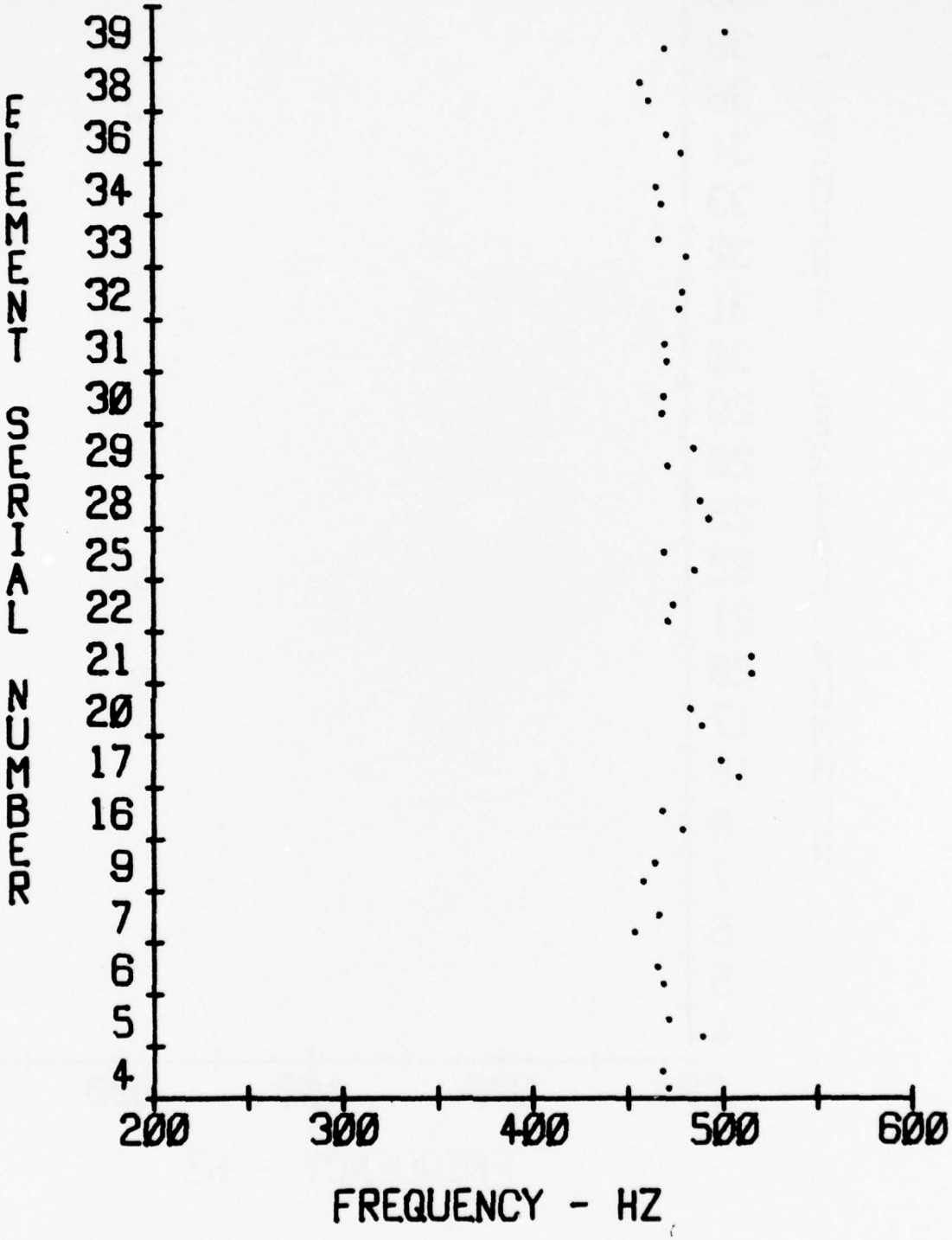
FREQUENCY VARIATION AT +5PSI DURING
SCHMITT TRIGGER TEST. REFERENCE TASK D



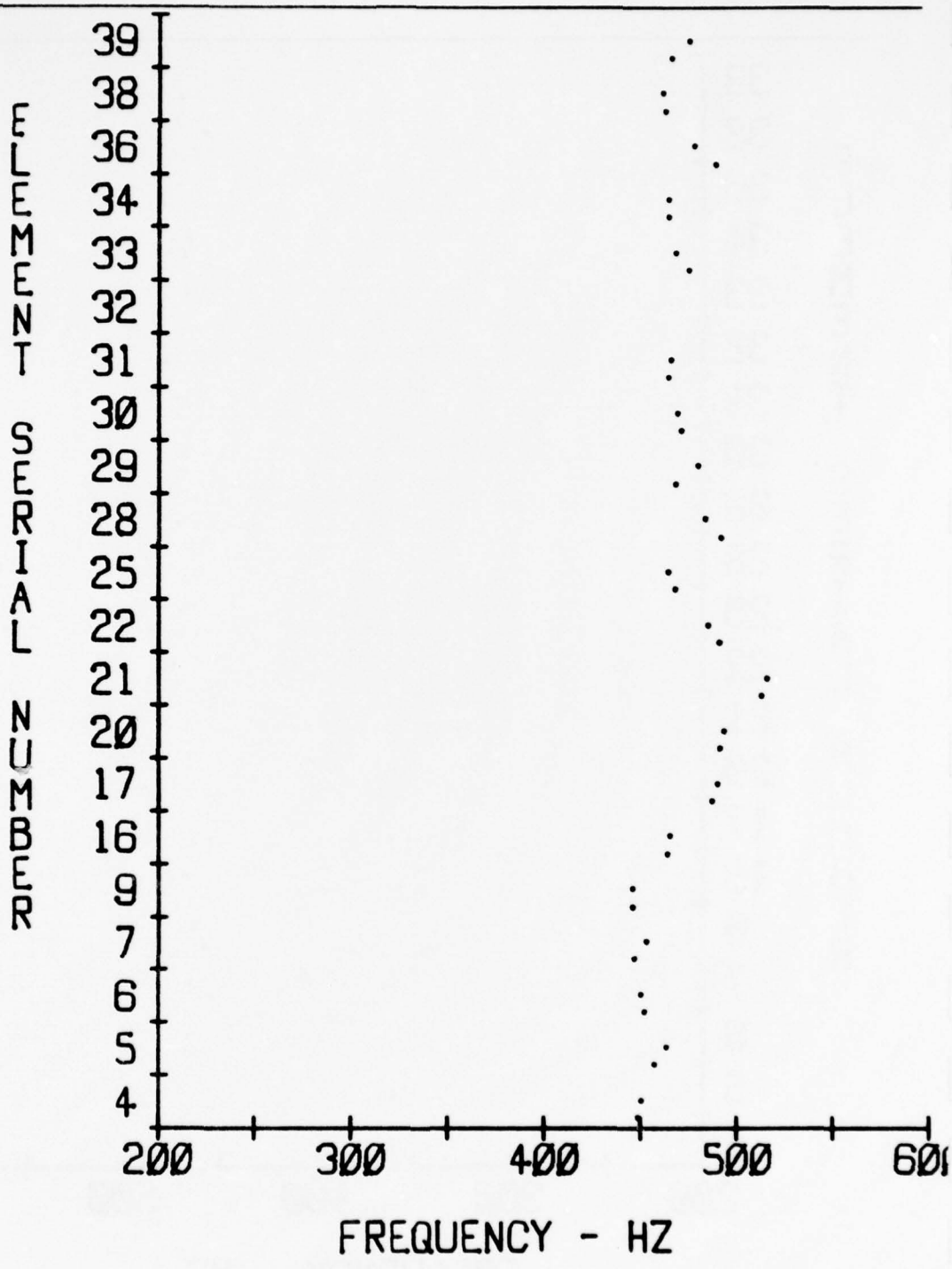
FREQUENCY VARIATION AT +5PSI BASELINE TEST PRIOR TO STEP PULSING. REFERENCE TASK D



FREQUENCY VARIATION AT +5PSI DURING
FIRST STEP PULSE BASELINE TEST.
REFERENCE TASK E-1



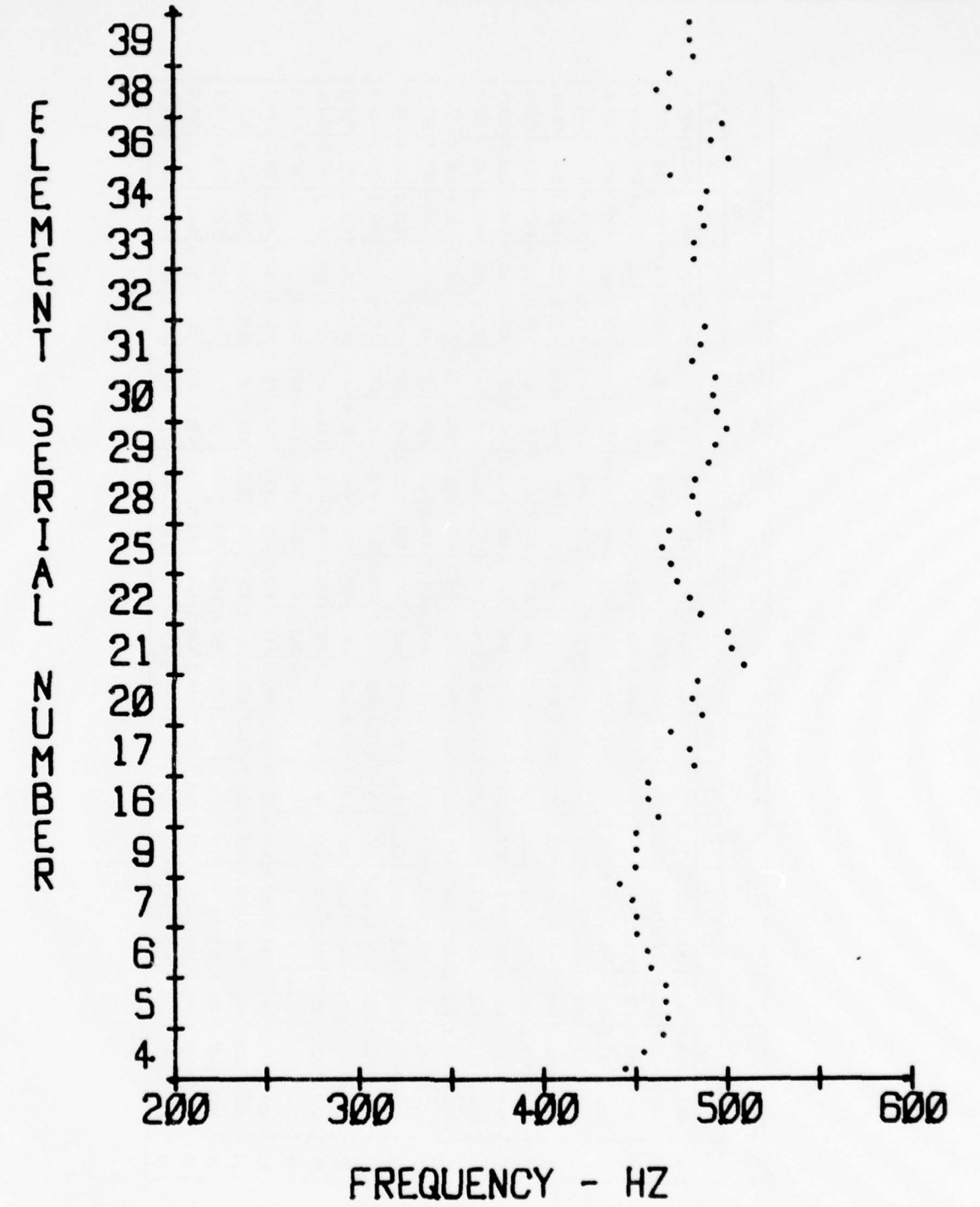
FREQUENCY VARIATION AT +5PSI DURING
SECOND STEP PULSE BASELINE TEST
REFERENCE TASK E-2



FREQUENCY VARIATION AT +5 PSI DURING
THIRD STEP PULSE BASELINE TEST, REFERENCE
TASK E-3

ENVIRONMENTAL TESTING
OF A FLUIDIC DIGITAL-TO-ANALOG
CONVERTER

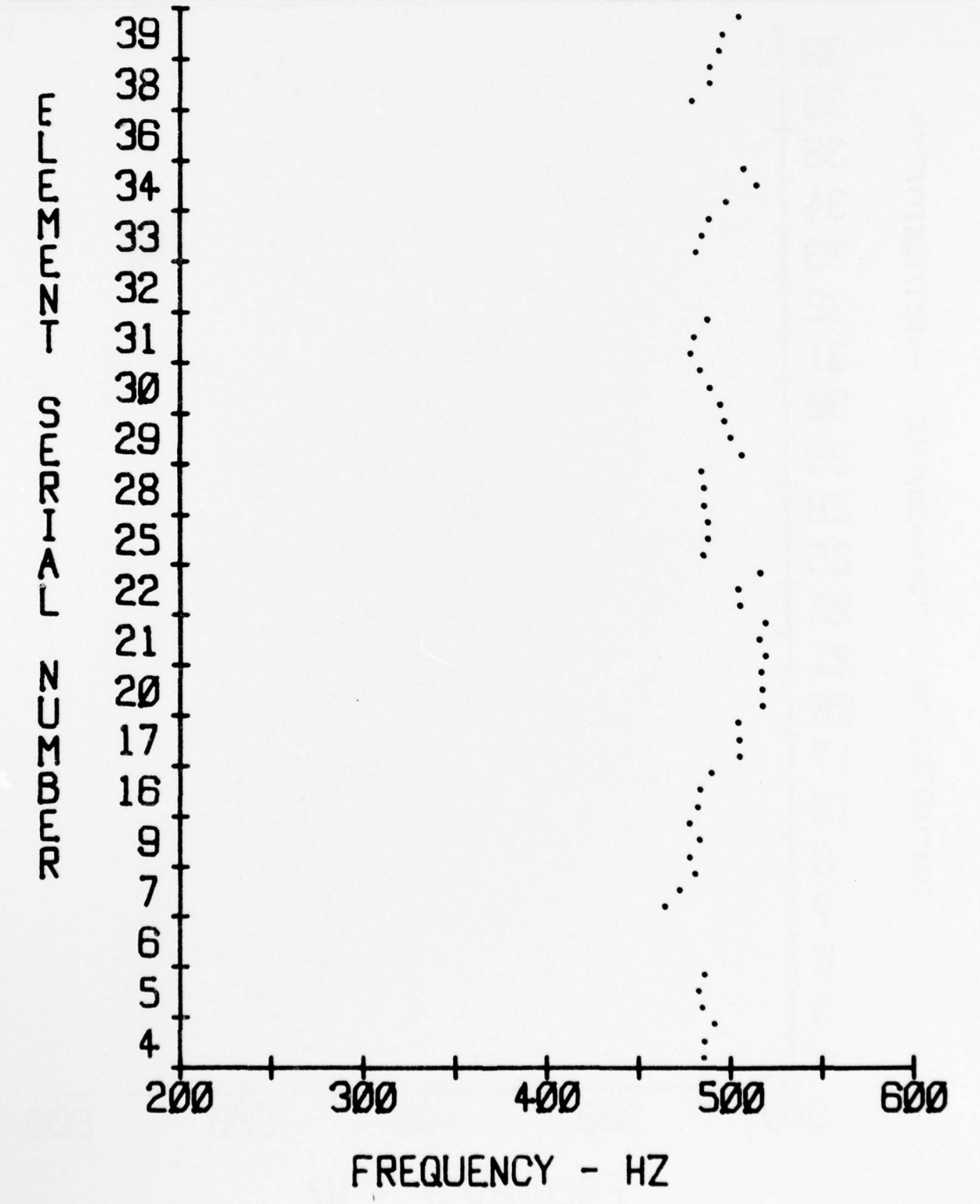
REPORT MDC LO356
JULY 1976



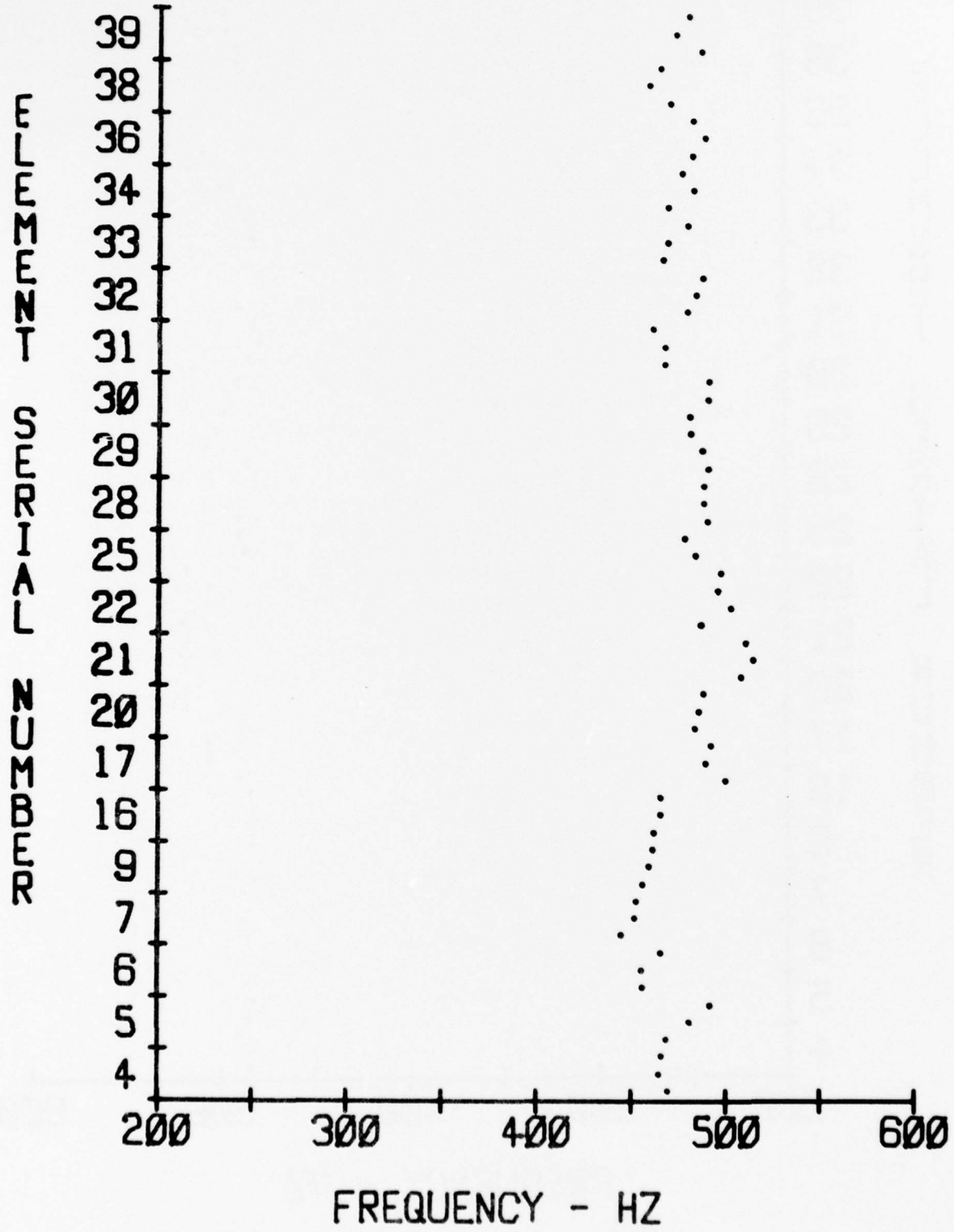
FREQUENCY VARIATION AT +5PSI DURING
BASELINE TEST PRIOR TO HIGH TEMPERATURE
ENVIRONMENT: REFERENCE TASK F-1

+5 PSI

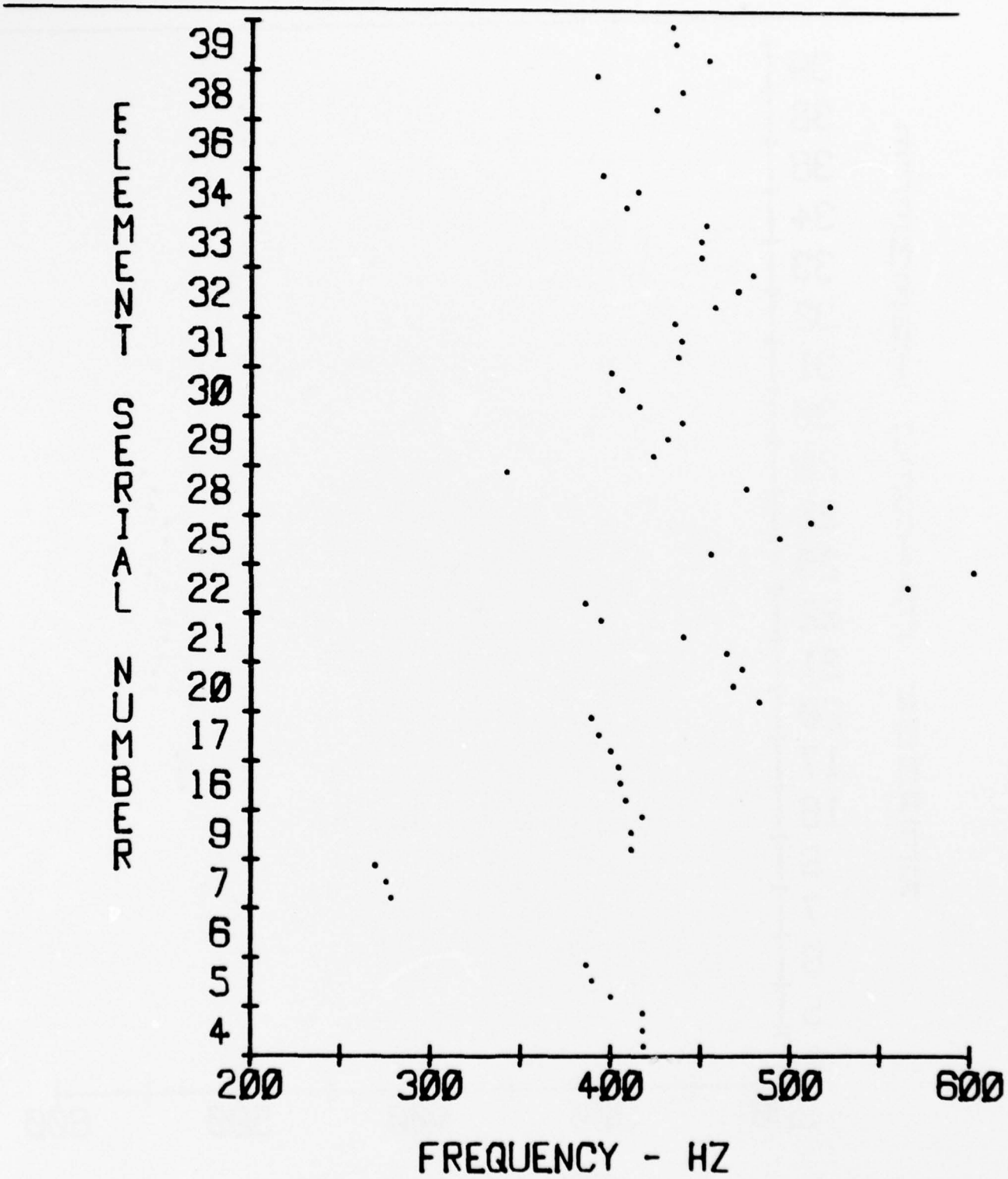
Test	BASELINE F-1 1482 - 1544				HIGH TEMP. +145°F F-2 1545 - 1601				BASELINE F-3 1602 - 1664				LOW TEMP. -40°F F-4 1665 - 1745				BASELINE F-5 1746 - 1808			
S/N	1	2	3	AVG	1	2	3	AVG	1	2	3	AVG	1	2	3	AVG	1	2	3	AVG
4	443.3	454.2	464.2	453.9	485.8	485.8	490.8	487.5	469.2	464.2	465.8	466.4	418.3	417.5	417.5	417.8	475	475	490.8	480.3
5	466.7	465.8	465.8	466.1	484.2	482.5	485.8	484.2	468.3	480.8	491.7	480.3	400	389.5	386.3	391.9	459.2	460	468.3	462.5
6	457.5	455.8	450	454.4	-	-	-	-	455.8	455.4	465.8	459	-	-	-	-	467.5	507.3	473.3	482.7
7	450	447.5	440.8	446.1	463.8	472.5	480.8	472.4	444.2	451.7	452.5	449.5	278.3	275	269.2	274.2	501.7	500	500	500.6
9	450	450	450	450	477.5	483.3	477.5	479.4	455.8	459.2	460.8	458.6	411.7	411.3	418.3	413.8	518.3	514.2	510	514.2
16	462.5	456.7	456.7	458.6	482.5	483.3	490	485.3	461.3	465.3	465	463.9	408.3	405	404.2	405.8	495.8	493.7	490	493.2
17	482.5	479.2	469.2	476.9	505	504.6	504.2	504.6	500	489.2	491.7	493.6	400	393.3	389.2	394.2	529.7	530.8	530.8	530.4
20	486.7	480.8	483.3	483.6	518.3	517.5	516.7	517.5	483.3	485	487.5	485.3	483.3	468.3	473.3	474.9	520.8	522.5	522.5	521.9
21	509.2	501.7	500	503.6	519.2	515.8	519.2	518.1	508.3	514.2	510	510.8	464.2	440	394.2	432.8	545	543.3	540	542.8
22	485	479.2	472.5	478.9	505	504.2	516.7	508.6	486.3	502.5	495	494.6	385.8	565.5	601.7	517.7	537.5	535.8	539.2	537.5
25	469.2	464.2	468.3	467.2	485.4	487.5	487.5	486.8	496.7	483.3	477.5	485.8	455	494.2	511.7	486.9	537.5	545.8	543.3	542.2
28	484.2	480.8	482.5	482.5	485.8	485.8	484.2	485.3	490	487.5	487.5	488.3	522.5	475	341.7	446.4	536	535.8	544.2	538.7
29	490	493.3	500	494.4	506.7	500	496.7	501.1	490	486.7	480.4	485.7	424	431.7	440	431.9	541.7	548.3	558.3	549.4
30	494.2	491.7	493.3	493.1	494.2	488.8	483.3	488.8	480	490	490	486.7	415.8	405.8	400	407.2	540	554.2	562.5	552.2
31	480.8	485.8	487.5	484.7	477.9	480	487.5	481.8	466.7	466.7	460.4	464.6	437.5	439.2	435	437.2	455	472.5	495.8	474.4
32	-	-	-	-	-	-	-	-	479.2	483.3	486.7	483.1	458.3	470.8	479.2	469.4	-	-	512.5	512.5
33	481.7	481.7	487.5	483.6	480.8	484.2	487.9	484.3	465.8	468.3	479.2	471.1	450	450	452.5	450.8	498.3	498.3	502.5	499.7
34	485.8	489.2	469.2	481.4	497.5	514.2	506.7	506.1	468.3	481.7	475	475	408.3	415	395	406.1	500	500	500	500
36	500.8	490.8	497.5	496.4	-	-	-	-	480.8	487.5	480.8	483	-	-	-	-	515	510	519.2	514.7
38	468.3	467.5	469.2	468.3	478.8	488.8	488.3	485.3	469.2	458.3	464.2	463.9	425	439.5	391.7	418.7	492.5	493.3	491.7	492.5
39	481.7	479.2	479.2	480	493.3	495	504.2	497.5	485.8	471.7	479.2	478.9	454.2	435	433.3	440.8	505	505.8	502.5	504.4



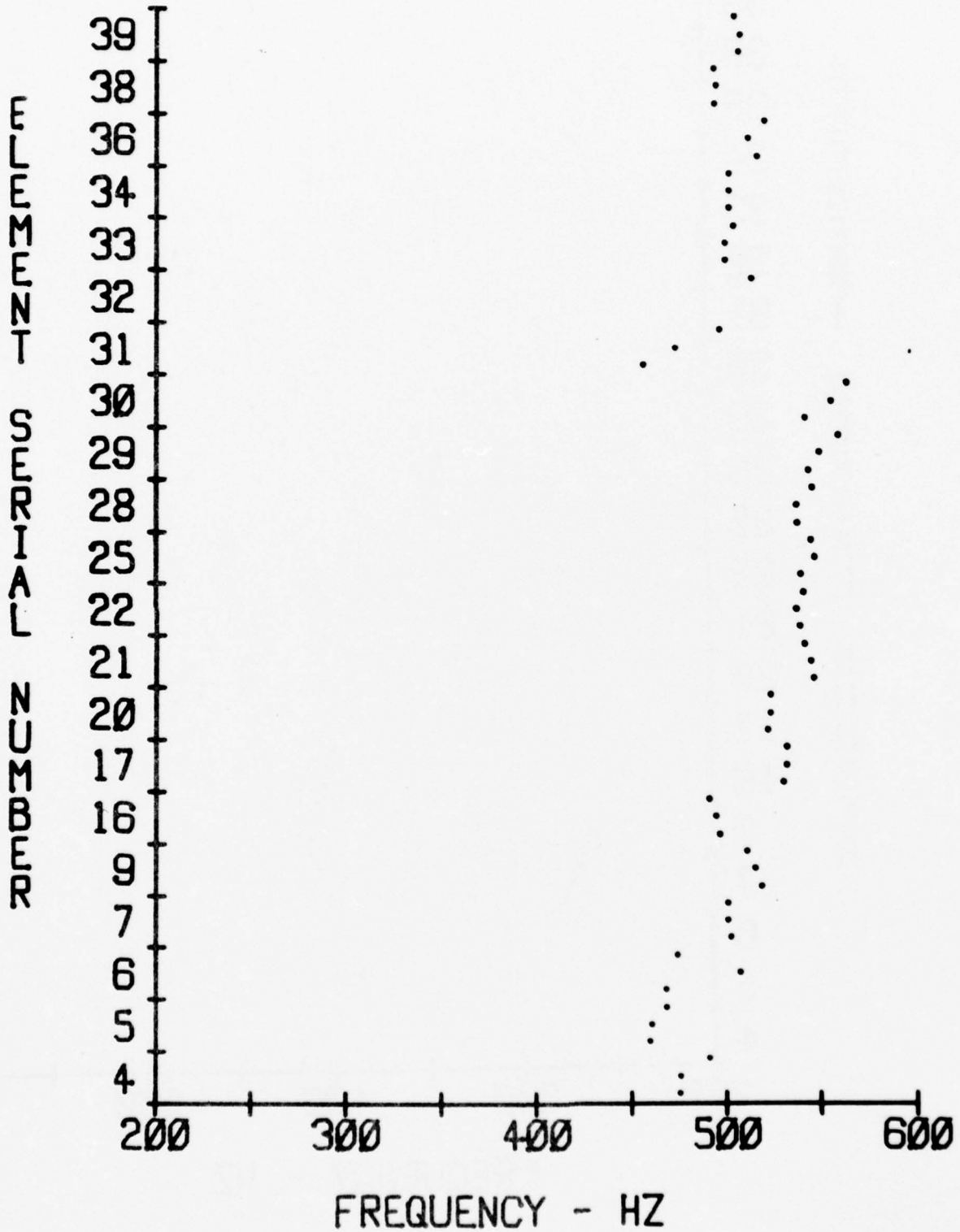
FREQUENCY VARIATION AT +5PSI DURING
HIGH TEMPERATURE (+145°F) ENVIRONMENT
REFERENCE TASK F-2



FREQUENCY VARIATION AT +5 PSI DURING
BASELINE PRIOR TO LOW TEMPERATURE
ENVIRONMENT: REFERENCE TASK F-3



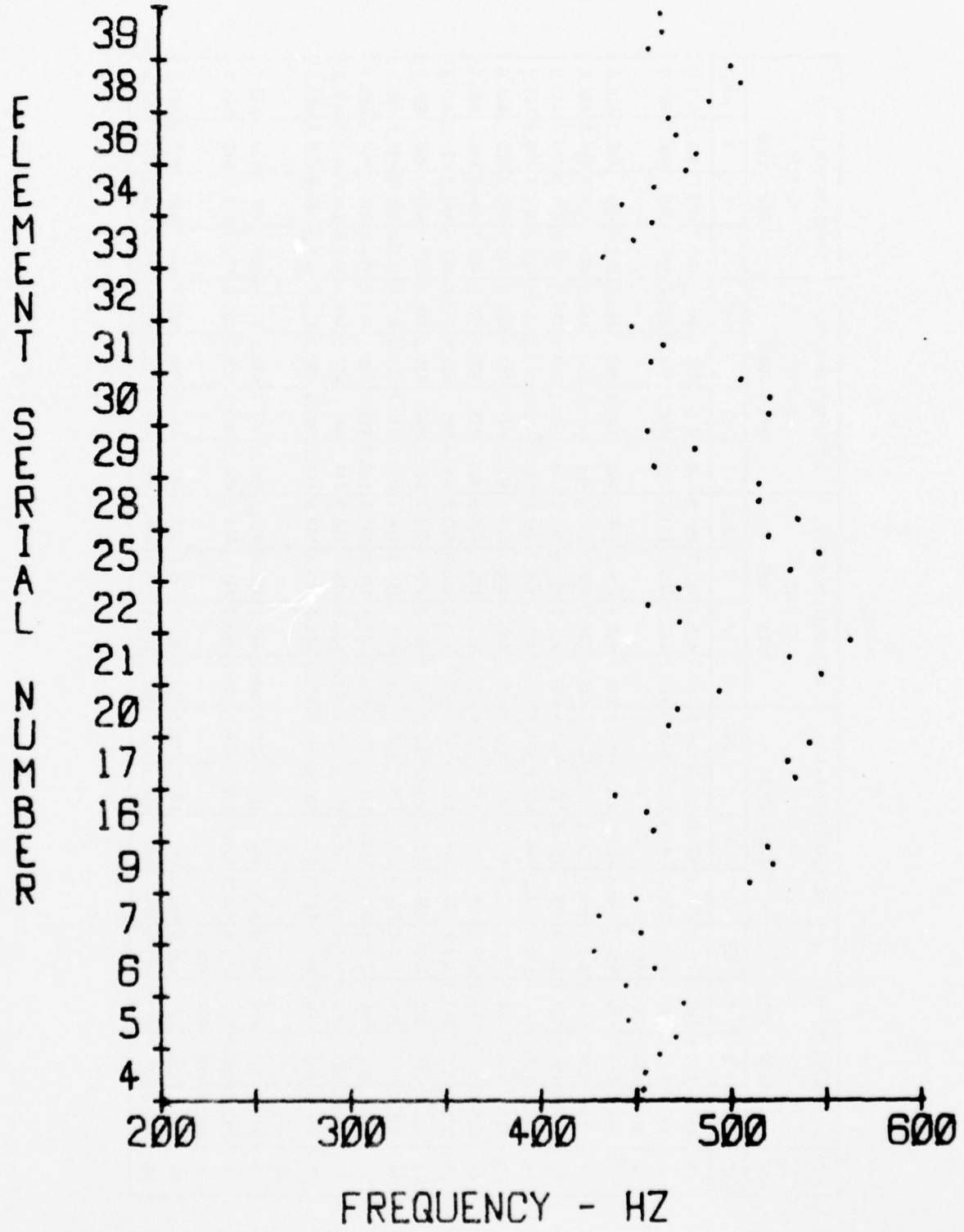
FREQUENCY VARIATION AT +5 PSI DURING
LOW TEMPERATURE (-40°F) ENVIRONMENT, REFERENCE
TASK F-4



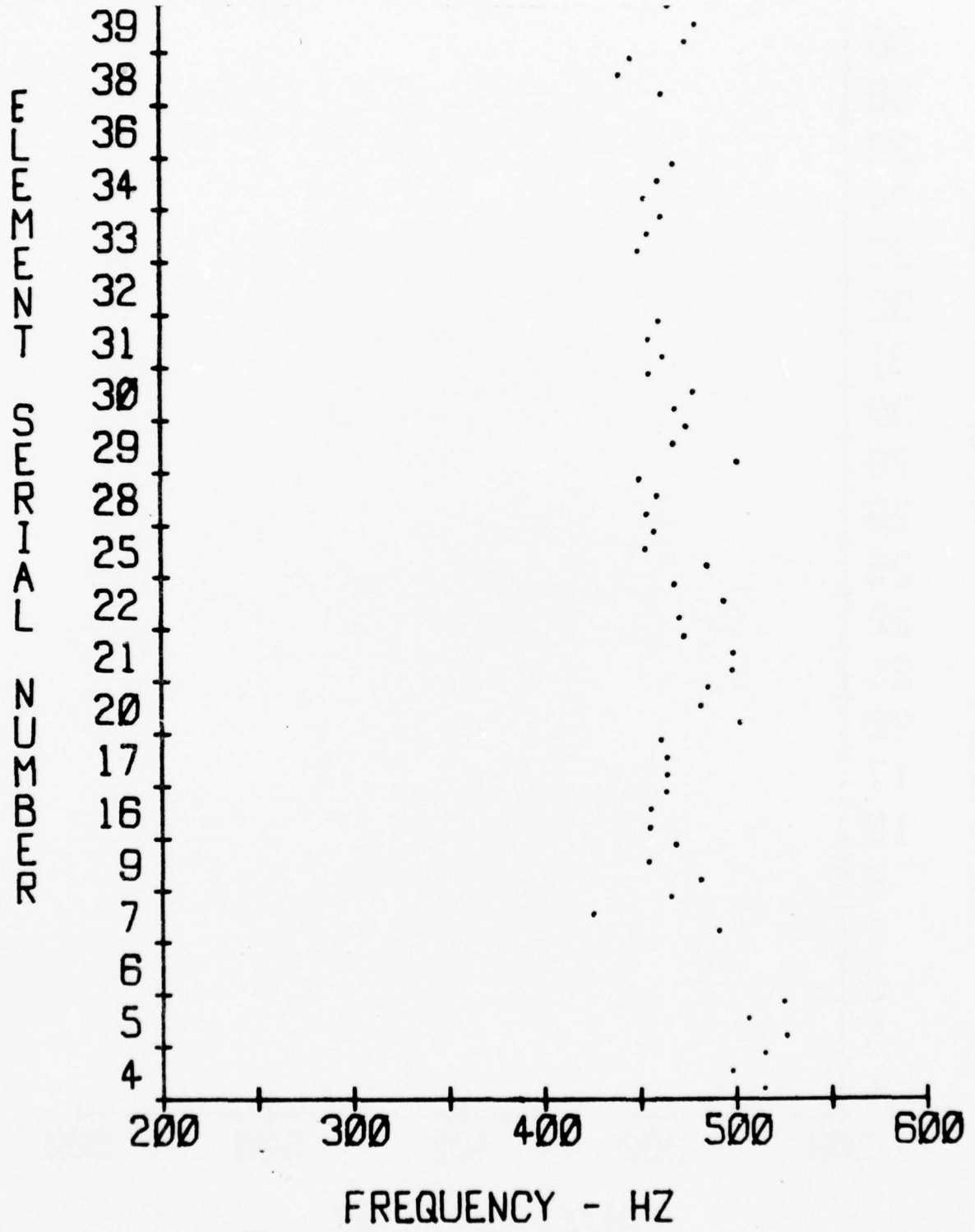
FREQUENCY VARIATION AT +5PSI DURING BASELINE TEST USING N_2 (AFTER LOW TEMPERATURE TESTING) REFERENCE TASK F-5

+5 PSI

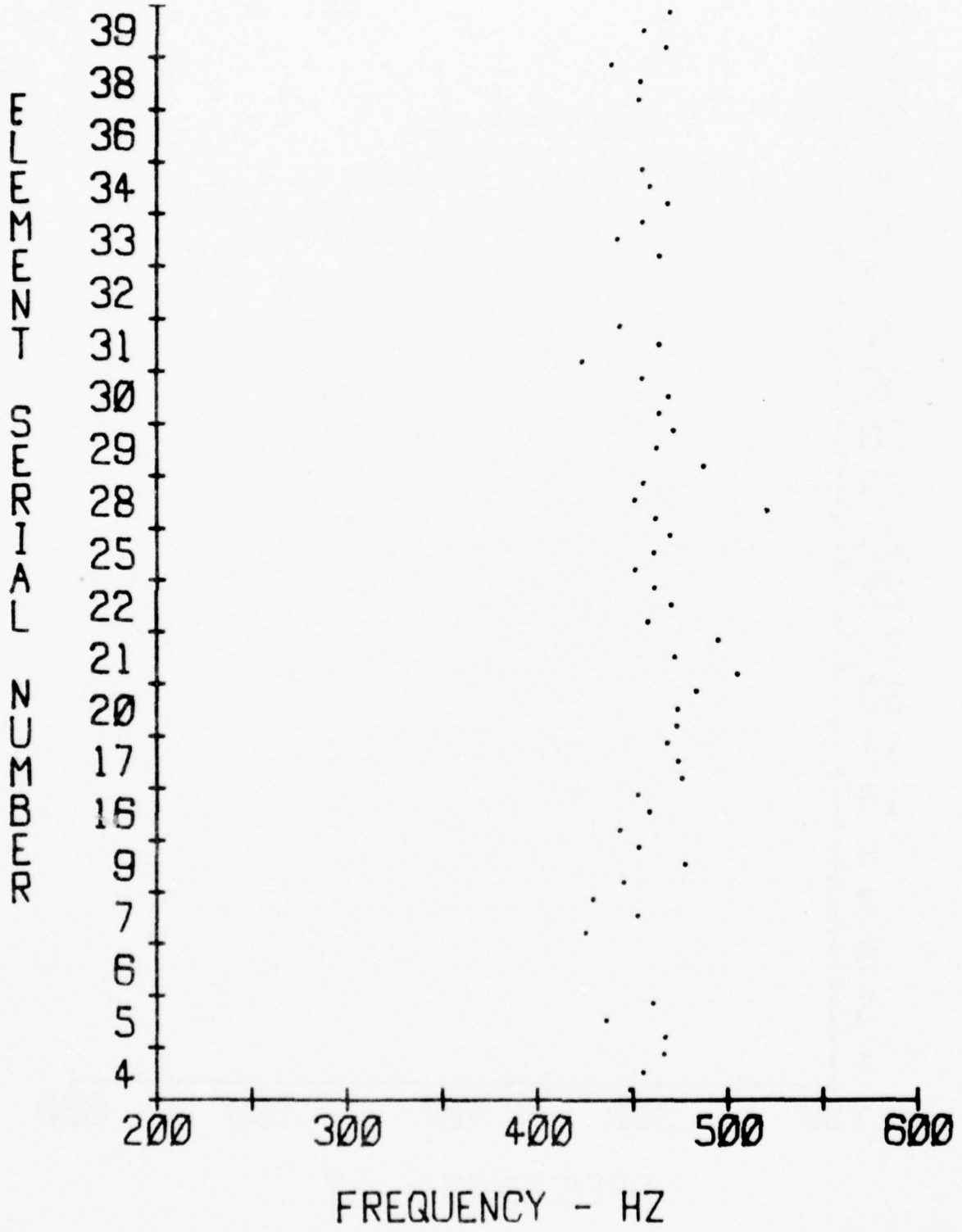
FREQ AT +5 PSI	BASELINE F-6 1809 - 1871				ACCELERATION F-7-1 +1 AXIS 1872 - 1928				ACCELERATION F-7-2 -1 AXIS 1929 - 1985				ACCELERATION F-7-3 -3 AXIS 1986 - 2042				ACCELERATION F-7-4 +3 AXIS 2043 - 2099			
S/N	1	2	3	AVG	1	2	3	AVG	1	2	3	AVG	1	2	3	AVG	1	2	3	AVG
4	453.3	454.5	462.5	456.8	514.7	497.5	515.3	509.2	448.3	455.8	466.7	456.9	440.8	450	432.5	441.1	481.7	459.2	462.5	467.8
5	470.8	445	475	463.6	526.7	506.3	525	519.3	466.7	435.8	460.8	454.4	439.2	446.7	465.8	450.6	485.8	450	466.7	467.5
6	444.2	460	427.5	443.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	452.8	430	450	444.3	490.8	425	466.7	460.8	425	452.5	429.2	435.6	460	420.8	450	443.6	462.5	435	436.3	444.6
9	510	522.5	519.2	517.2	481.7	454.2	469.2	468.4	445.8	478.3	452.7	458.9	452	469.5	450	457.2	451	471.7	451.7	458.1
16	459.2	455.8	439.2	451.4	455	455.8	464.2	458.3	443.3	459.2	452.5	451.7	439.2	469.2	443.8	450.7	444.2	471.3	445	453.5
17	534.2	530	541.7	535.3	464.2	464.2	460.8	463.1	476	474	468.3	472.8	472.5	480.8	479.2	477.5	469.2	467.5	470.8	469.2
20	467	471.7	494.2	477.6	502.8	481.7	485.8	490.1	473.3	474	484	477.1	506.7	477.5	483.3	489.2	489.2	468.3	500	485.8
21	548.3	530.8	563.3	547.5	499	499	473.3	490.4	505	471.7	495	490.6	485	485	491.7	487.2	486.2	484.5	485	485.2
22	473.3	456.7	473.3	467.8	470.8	494.2	468.2	477.8	458	470.8	460.8	463.2	455.8	485	462.5	467.8	467.5	464.7	470.8	467.7
25	531.7	547	520	532.9	485.8	453.3	458.3	465.8	451	461.2	470	460.7	443.3	450	455.8	449.7	481.7	449	466.7	465.8
28	535.8	515	515	521.9	454.2	460	450	454.7	461.7	451	455.5	456.1	456.7	433.7	452.5	447.6	465.8	468.3	435.8	456.6
29	460	481.7	456.7	466.1	501.7	468.3	475	481.7	487.5	462.5	471.7	473.9	460.8	465.8	465	463.9	479.2	460	457	465.4
30	520.8	520.8	505.8	515.8	469.2	479.2	455.8	468.1	463.8	469.2	455	462.7	474	441.7	467.5	461.1	440.8	444.2	452.5	445.8
31	458.5	465	448.3	457.3	463.3	455	460.8	459.7	423.3	464.2	443.3	443.6	443.2	462.5	433.3	446.3	444.2	440.8	451.7	445.6
32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
33	433.3	450	460	447.8	450	455	462.5	455.8	464.2	441.8	455.8	453.9	444.2	441.7	438.3	441.4	435	441.7	437.5	438.1
34	443.3	460.8	477.8	460.6	452.8	460.8	469.2	460.9	469.2	459.2	455	461.1	456.3	463.3	465.3	461.6	432.5	460.8	440	444.4
36	482.8	471.7	468.3	474.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
38	490	506.7	501	499.2	462.5	440	446.7	449.7	453.3	454.2	439.2	448.9	457.5	436.7	450	448.1	435	450	417.5	434.2
39	457.5	465	463.3	461.9	475	480	465.8	473.6	468.3	455.8	470	464.7	450	445.8	470.8	455.5	443.3	459.2	450	450.8



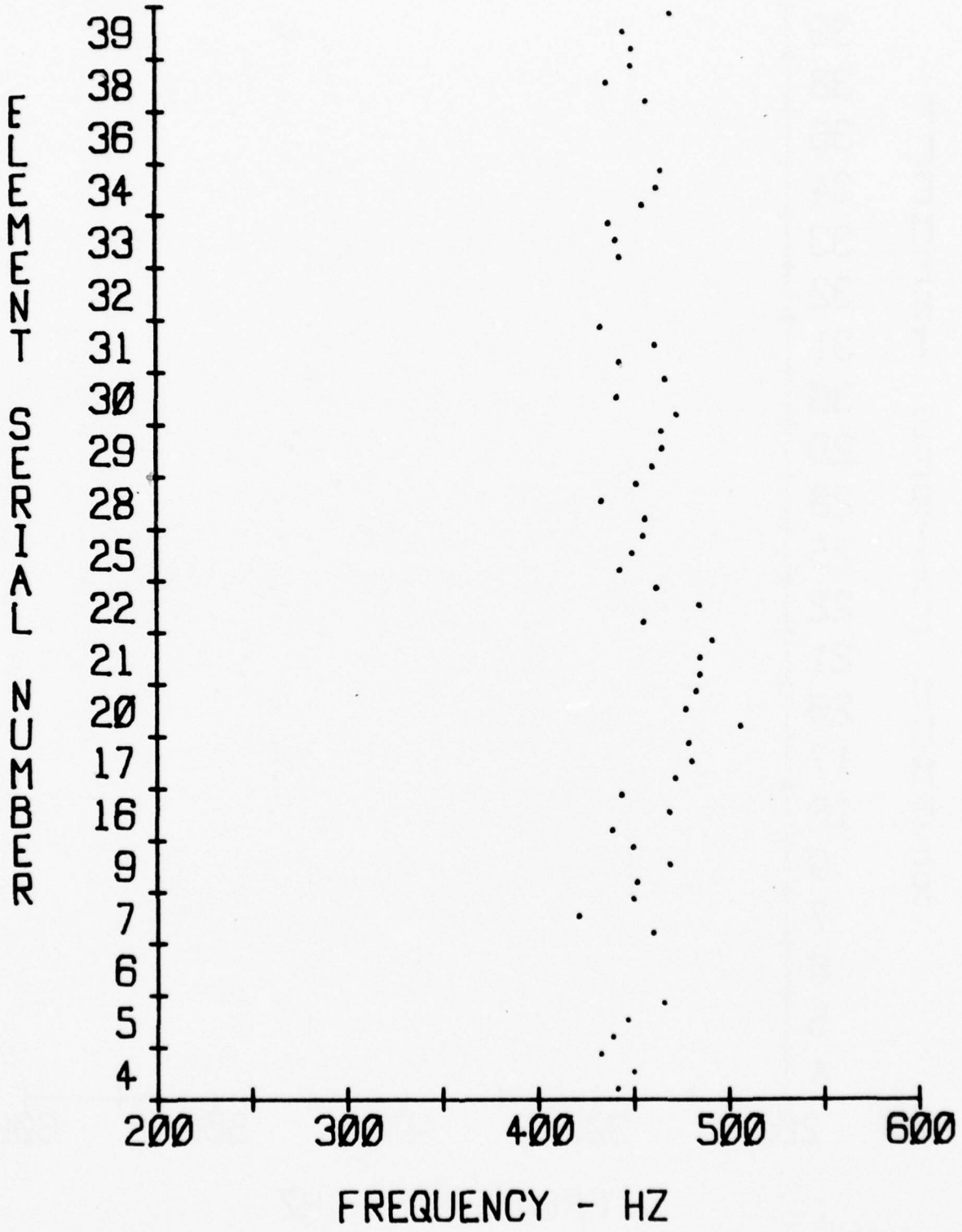
FREQUENCY VARIATION AT +5 PSI, DURING BASELINE
TEST PRIOR TO ACCELERATION ENVIRONMENT
REFERENCE TASK F-6.



FREQUENCY VARIATION AT +5PSI DURING +1
AXIS ACCELERATION ENVIRONMENT, REFERENCE TASK
F-7-1

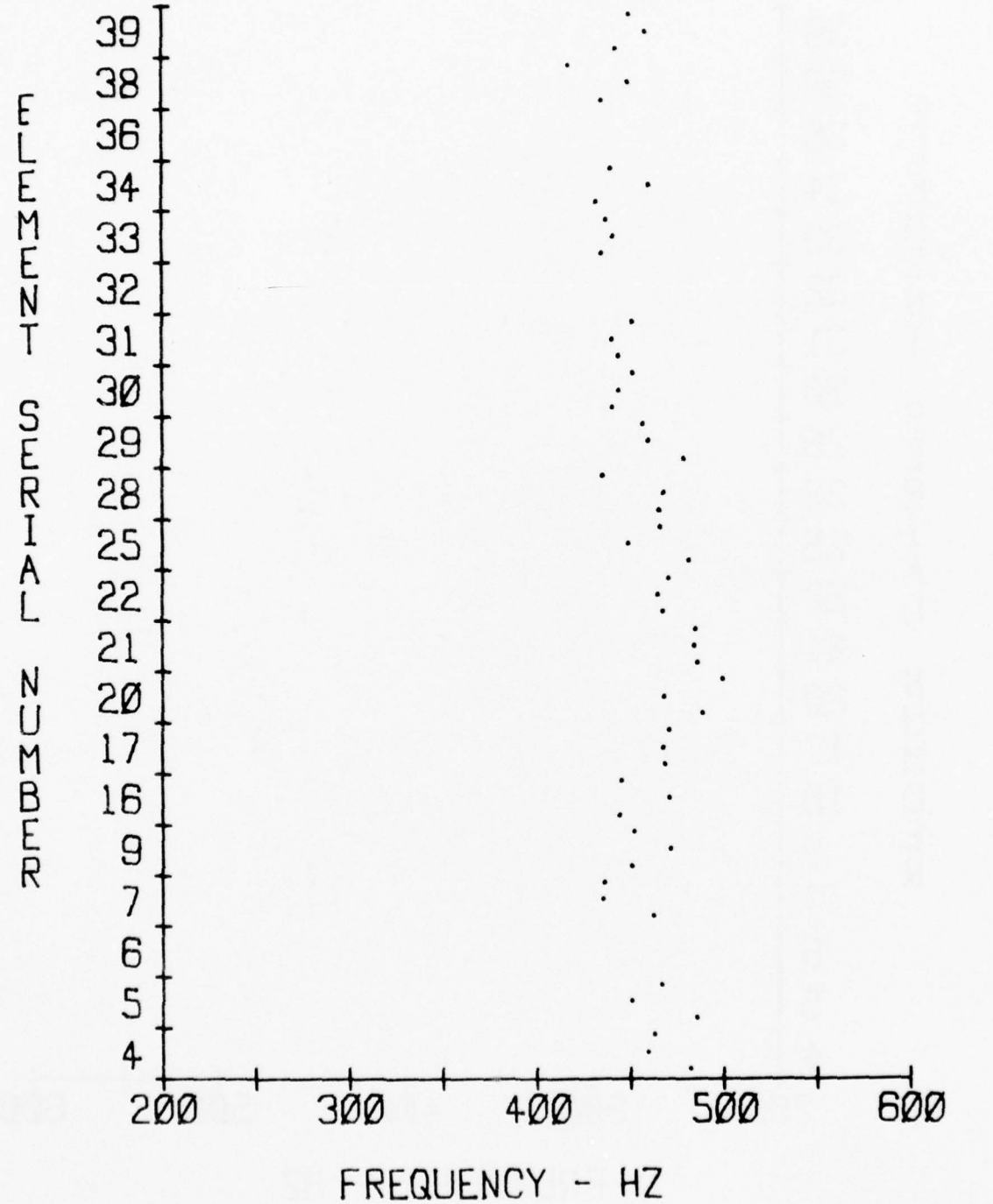


FREQUENCY VARIATION AT +5PSI DURING -1
AXIS ACCELERATION ENVIRONMENT, REFERENCE TASK
F-7-2



FREQUENCY VARIATION AT +5 PSI DURING
-3 AXIS ACCELERATION ENVIRONMENT, REFERENCE
TASK F-7-3.

FREQUENCY VARIATION AT +5PSI DURING
FREQUENCY VARIATION AT +5PSI DURING
FIRST STEP PULSE BASELINE TEST.
FIRST STEP PULSE BASELINE TEST.
REFERENCE TASK E-1

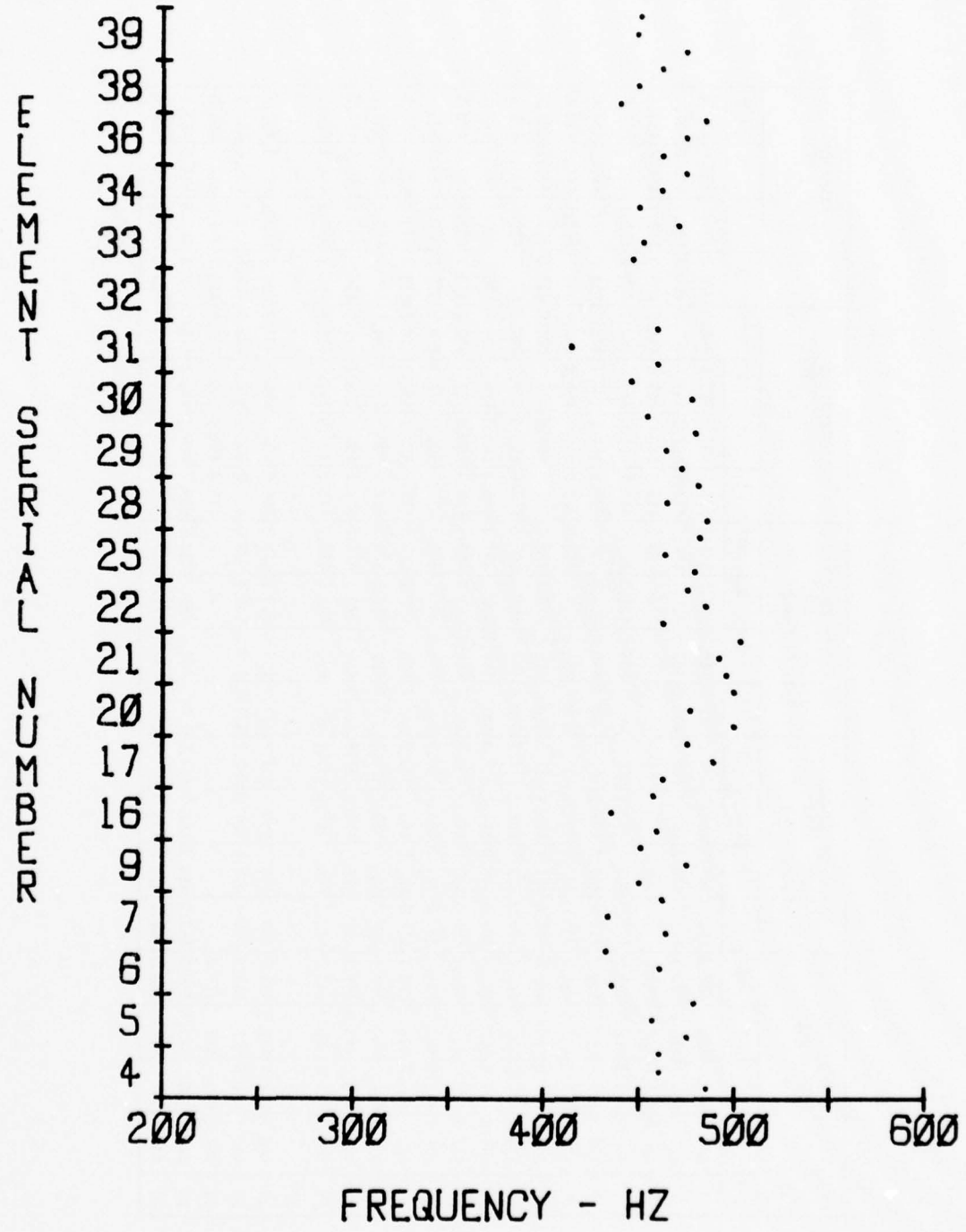


FREQUENCY VARIATION AT +5 PSI DURING +3 AXIS
ACCELERATION ENVIRONMENT REFERENCE TASK F-7-4

+5 PSI

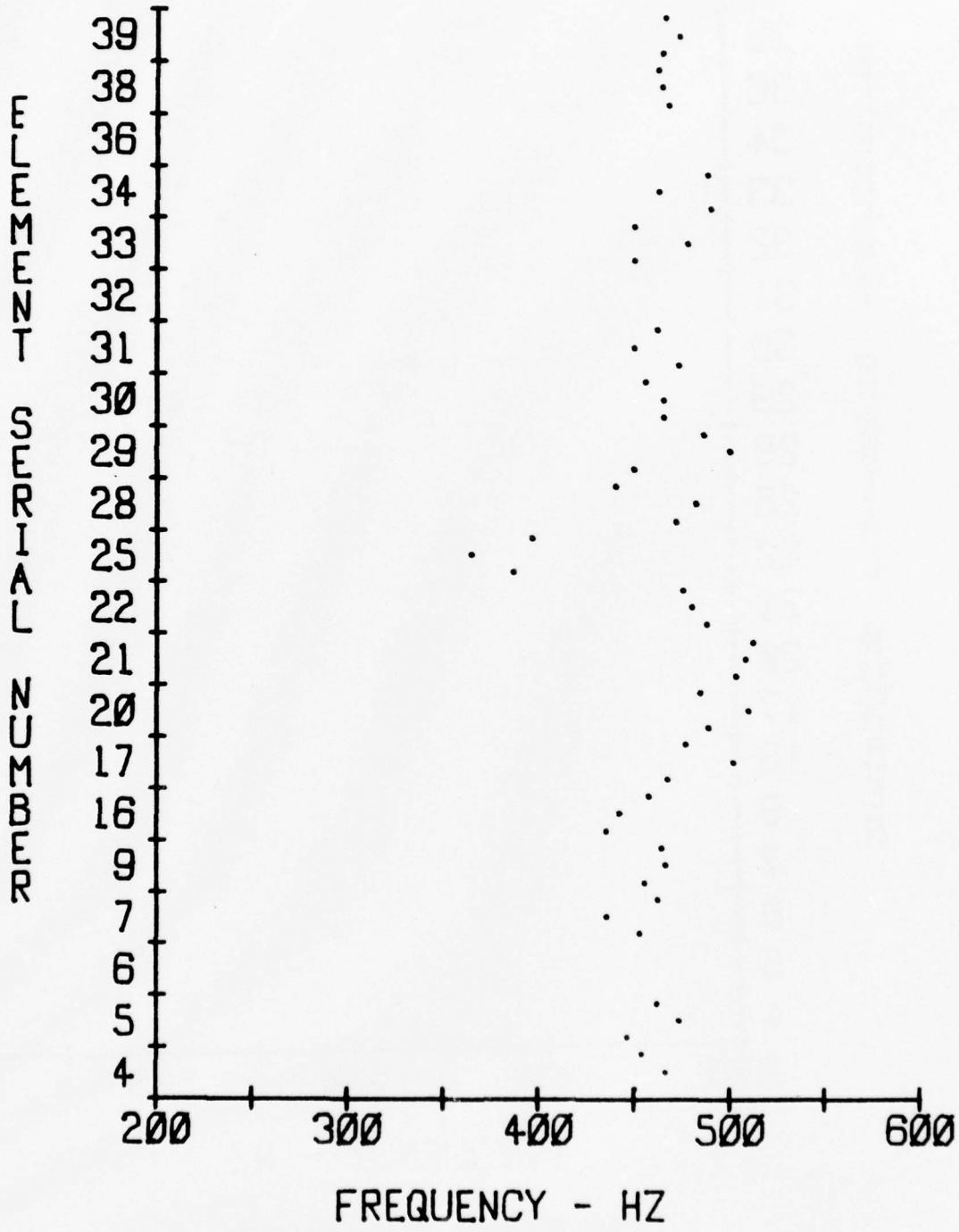
Freq. @ +5 PSI	Baseline F-8 2100 - 2162				Vibration Random 2163 - 2234 Axis 3 F-9-1				Vibration Random 2235 - 2306 Axis 1 F-9-2				Baseline 2307 - 2369 F-10				Baseline 2370 - 2252 F-11			
S/N	1	2	3	AVG	1	2	3	AVG	1	2	3	AVG	1	2	3	AVG	1	2	3	AVG
4	485	460	460	468.3	450	466.7	453.3	456.7	368.3	368.3	377.5	371.4	385.8	387.5	387.5	386.9	370.8	375	375	373.6
5	475	456.7	479.2	470.3	445.8	473.3	461.3	460.1	455.8	487.5	485	476.1	472.5	463.3	465.8	467.2	464.2	462	465.8	464
6	435.8	460.8	432.5	443	-	-	-	-	-	-	-	-	465	440	465	456.7	453.3	451.7	454.2	453.1
7	464.2	433.3	462.5	453.3	452.5	435	462.5	450	468.3	435	433.3	445.5	444.2	465	449	452.7	445.8	429.2	450	441.7
9	450	475	451	458.7	455	466.7	464.2	461.9	468.3	495.8	483.3	482.5	490.8	460.5	466.7	472.7	455.8	457.5	460	457.8
16	459.5	435	457.5	450.7	435	442.5	457.5	445	470	455.8	450	458.6	479.2	451	456.2	462.1	449	452.5	444.2	448.6
17	462.5	489.2	475	475.6	467.8	501.7	476.7	482.1	476	479.2	473.3	476.2	501	464.2	495	486.7	480.8	481.7	482.5	481.7
20	500	476.7	500	492.2	489.2	510	484.2	494.5	518.3	500	483.3	500.5	487.8	493.3	501.7	494.3	425	430	423.3	426.1
21	495.8	491.7	503.3	496.9	503.3	508.3	511.7	507.8	501	482.5	490	491.2	488.3	488.3	476	484.2	490	486.2	485	487.1
22	462.5	485	475	474.2	487.5	480	475	480.8	493.3	489.7	489.2	490.7	498.3	509.2	483	496.8	479.2	483.8	487.5	483.5
25	479.2	463.3	481.7	474.7	386.7	364.2	396.7	382.5	396.7	415.8	406.7	406.4	410	405	372.5	395.8	375	380.8	383.3	379.7
28	485	464.2	481	476.7	471.7	482.5	440	464.7	469.2	480	459.2	469.5	475	491.7	457.5	474.7	478.3	475	475	476.1
29	472.5	464.2	480	472.2	450	500	485.8	490.3	514.2	489.2	512.5	505.3	478.3	500	474	484.1	469.2	465.8	466.7	467.2
30	454.2	478.3	445.8	459.4	465	465	455.8	461.9	468.3	465	490	474.4	491.7	465.8	479.7	479.1	465	457.8	460.8	461.2
31	460	414.2	460	444.7	473.3	450	462.5	461.9	495	470.8	482.5	482.8	478.3	467.5	492.5	479.4	455.8	459.2	464.2	459.7
32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
33	446.7	452.5	470.8	456.7	450	478	450	459.3	471.7	485	463.3	473.3	464.2	475	485	474.7	459.2	460	453.3	457.5
34	450	462.5	475	462.5	490	462.5	488.3	480.3	491.7	510.8	506.7	503.1	479.2	506.7	461.7	482.5	455.8	453.3	455.8	454.9
36	462.5	475	485	474.2	-	-	-	-	-	-	-	-	480.8	491.7	485	485.8	466.7	465.8	465	465.8
38	440	450	462.5	450.8	467.5	464.3	461.7	464.5	450	444.2	466.7	453.6	439.2	466.7	438.3	448.1	462.5	452.5	444.2	453.1
39	475	449	451	458.3	464.2	473.3	465.8	467.8	500	490	479.2	489.7	485	475	491.7	483.9	465.8	466.7	464.2	465.6

FREQUENCY VARIATION AT +5 PSI DURING THIRD STEP PULSE BASELINE TEST, REFERENCE TASK E-3

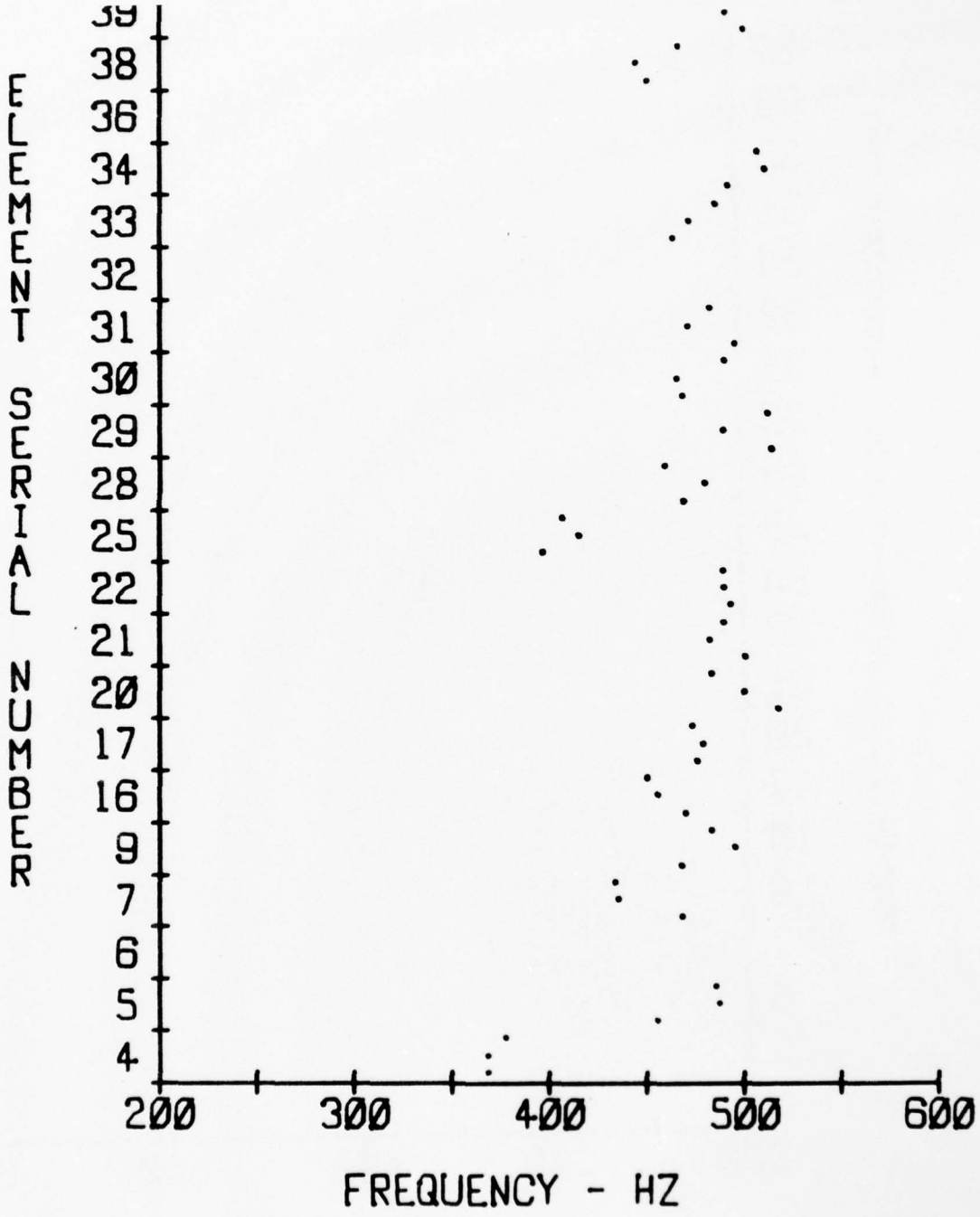


FREQUENCY VARIATION AT +5 PSI DURING BASELINE TEST PRIOR TO VIBRATION ENVIRONMENT, REFERENCE TASK F-8.

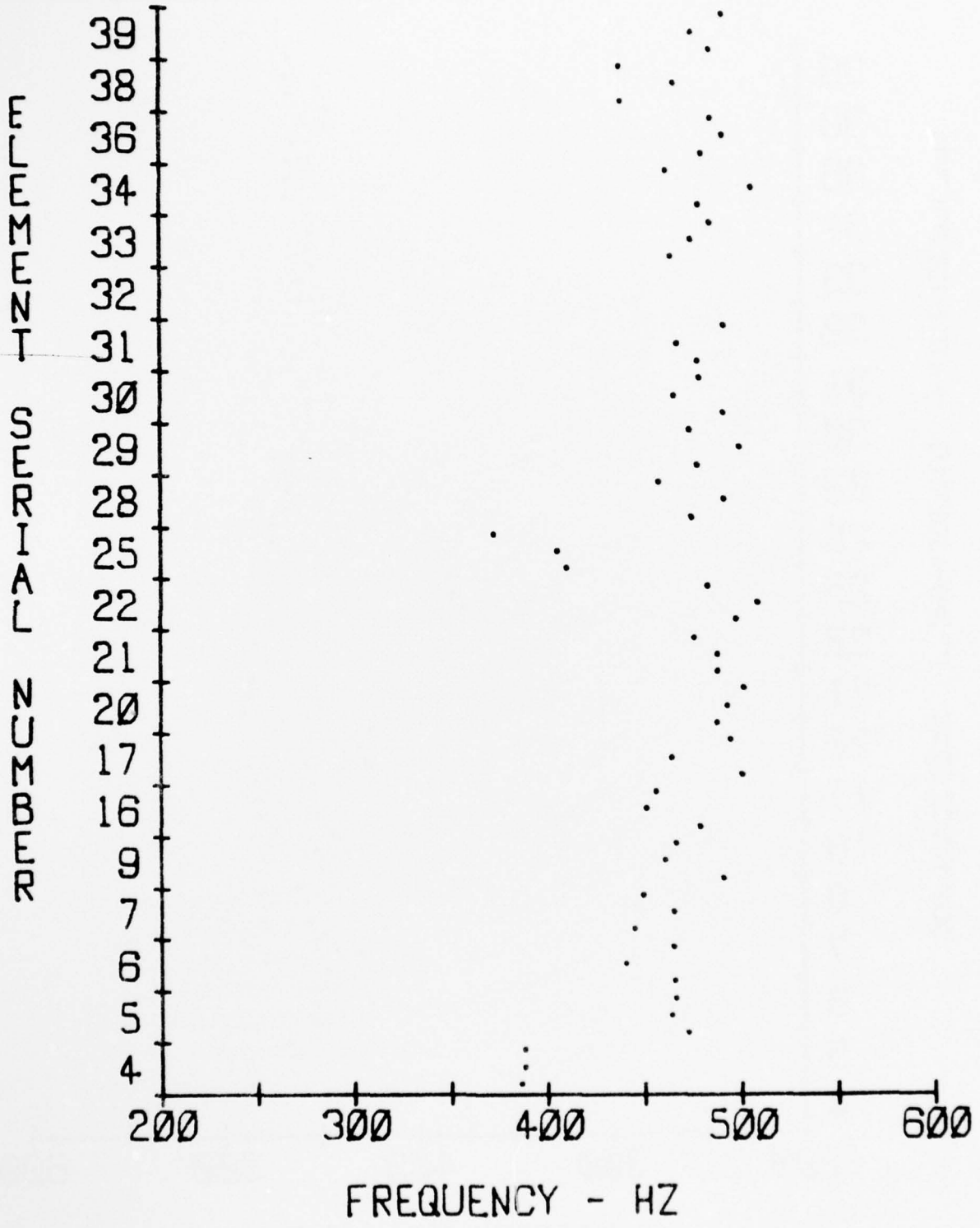
FREQUENCY VARIATION AT +5PSI DURING
BASELINE TEST PRIOR TO HIGH TEMPERATURE
ENVIRONMENT: REFERENCE TASK F-1



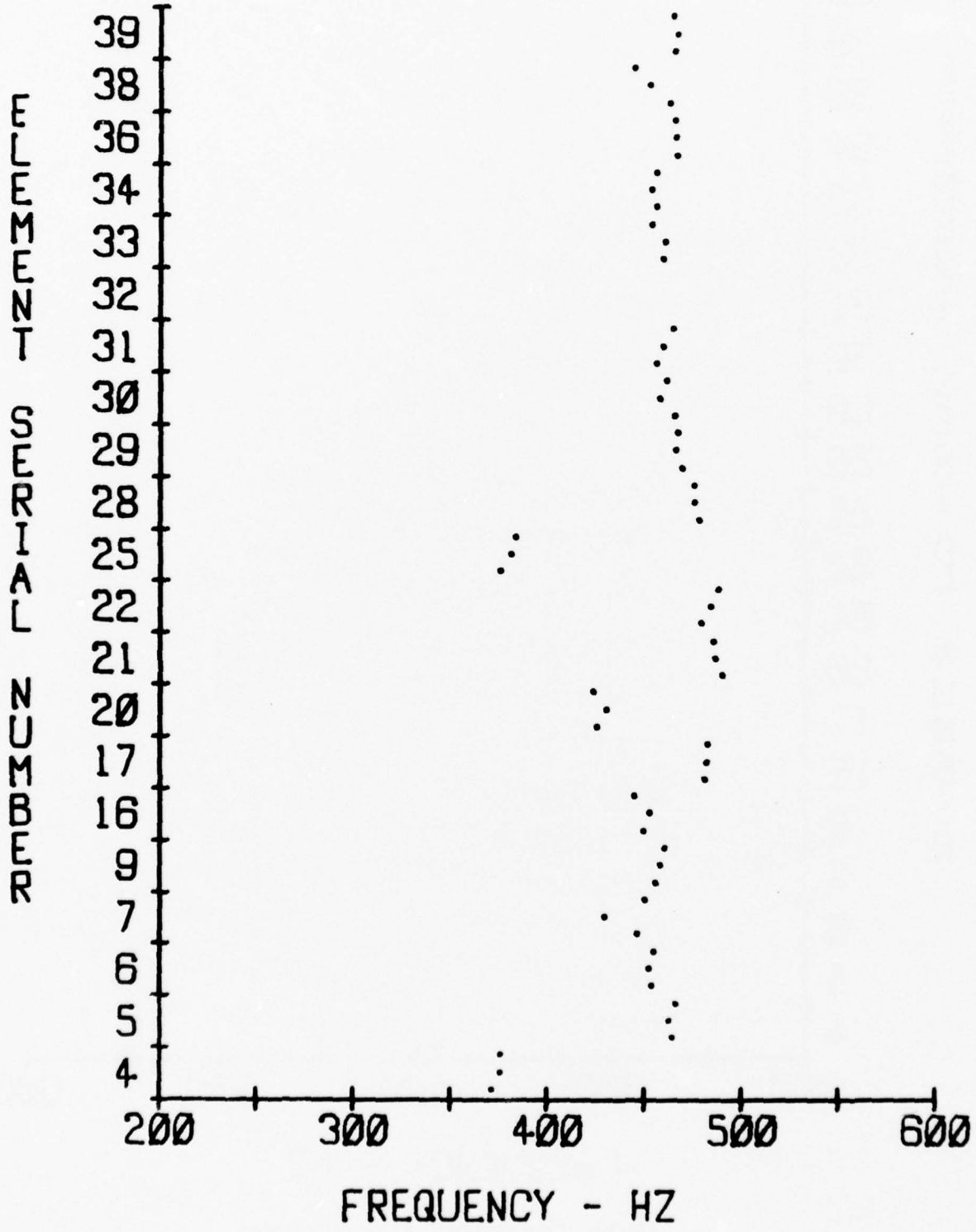
FREQUENCY VARIATION AT +5 PSI DURING AXIS
3 OF RANDOM VIBRATION ENVIRONMENT, REFERENCE TASK
F-9-1.



FREQUENCY VARIATION AT +5 PSI DURING
AXIS 1 OF RANDOM VIBRATION ENVIRONMENT
REFERENCE TASK F-9-2



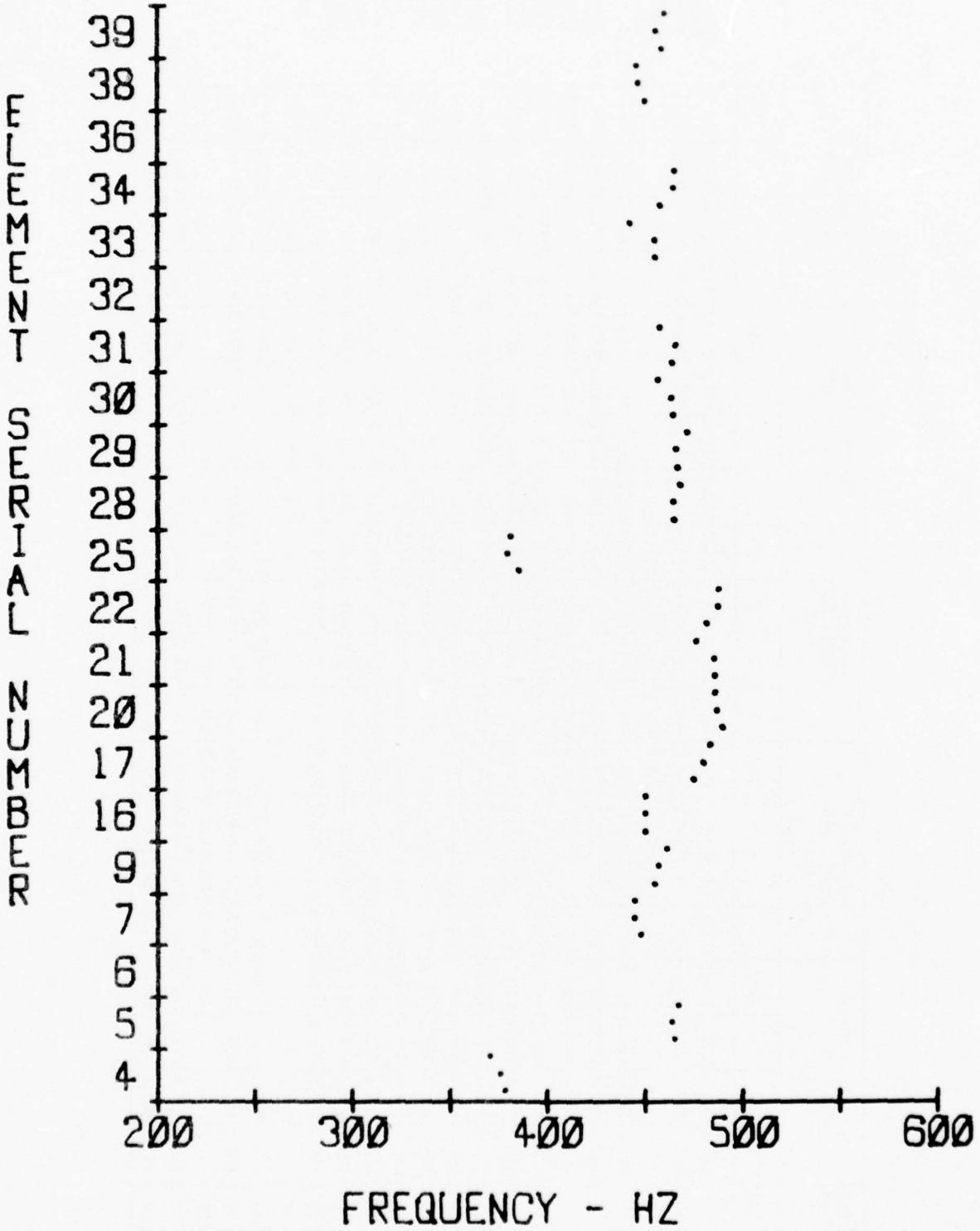
FREQUENCY VARIATION AT +5 PSI DURING
BASELINE TEST, AFTER RANDOM VIBRATION
ENVIRONMENT REFERENCE TASK F-10



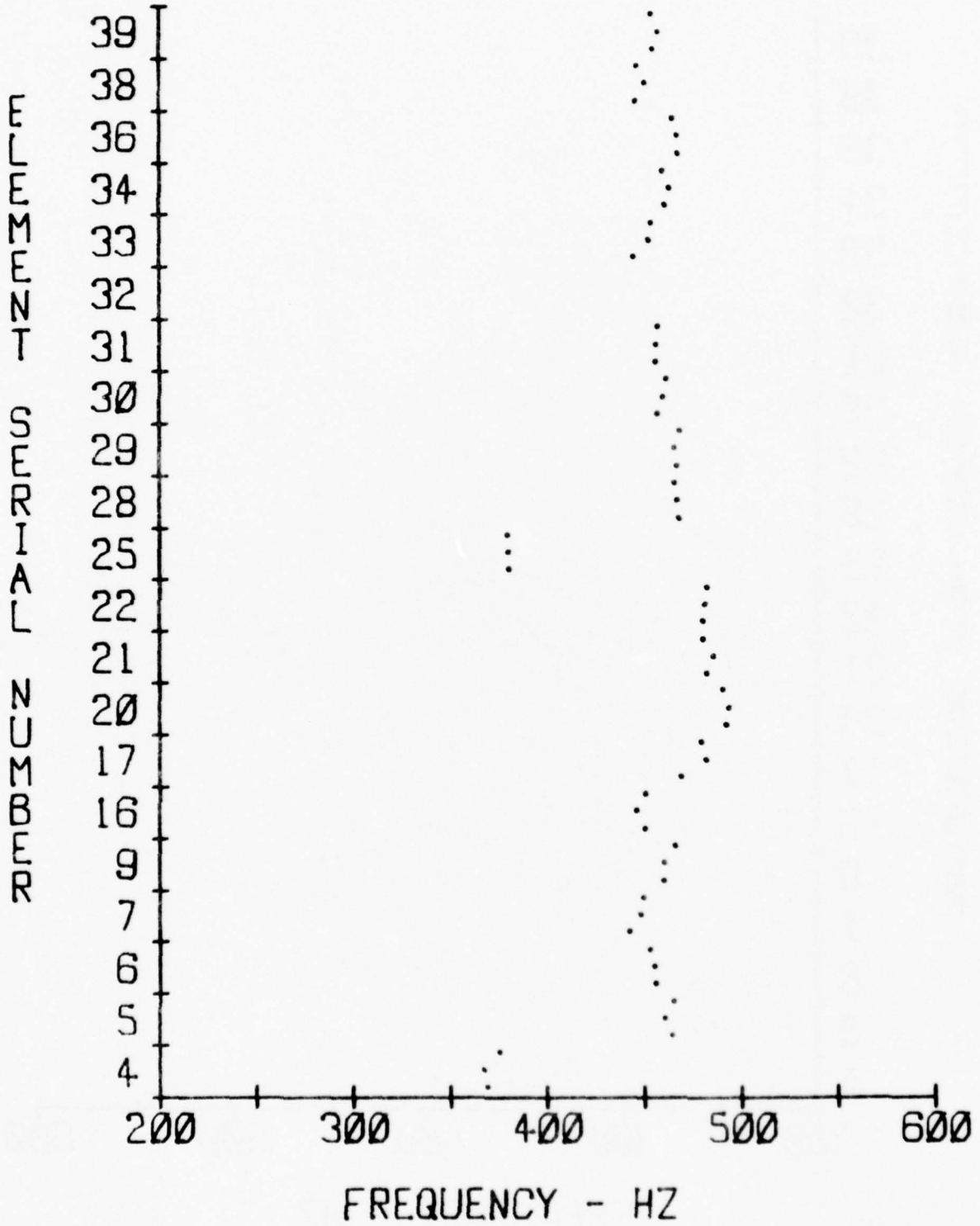
FREQUENCY VARIATION AT +5 PSI DURING
BASELINE TEST PRIOR TO ACOUSTICAL
NOISE ENVIRONMENT, REFERENCE TASK F-11

+5 PSI

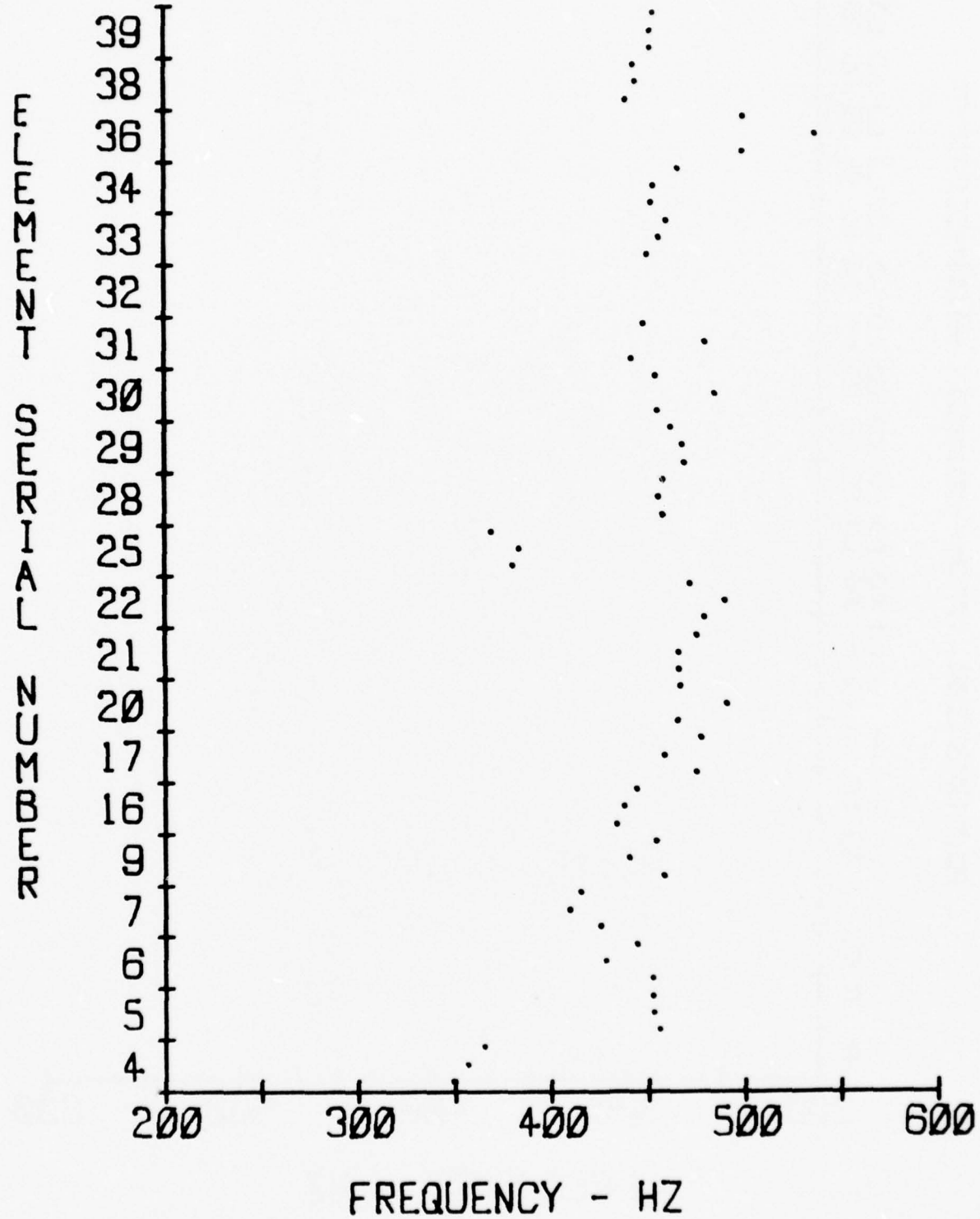
Freq. @ +5 PSI	Acoustical Noise 2370 - 2552 F-12				Baseline 2370 - 2552 F-13				Baseline 2553 - 2615 F-14				Altitude 90K Ft 2616 - 2906 F-15-1				Altitude 50K Ft 2616 - 2906 F-15-2			
S/N	1	2	3	AVG	1	2	3	AVG	1	2	3	AVG	1	2	3	AVG	1	2	3	AVG
4	377.8	375	370	374.3	368.7	366.7	375	370.1	348.3	356.7	365	356.7	305.8	324	306.7	312.2	315.8	320.8	304.2	313.6
5	465	463.3	466.7	465	464.2	460	464.2	462.8	455.8	452.5	451.7	453.3	416.7	387.5	395	399.7	390	402.5	410.8	401.1
6	-	-	-	-	455	454.7	452.5	454.1	451.7	427.5	444.2	441.1	-	-	-	-	-	-	-	-
7	447.5	444.2	444.2	445.3	441.7	448.3	449	446.3	425	409.2	416	416.4	385.8	365	378.3	376.4	374	384.2	366.7	374.9
9	455	456.7	460.8	457.5	460	460	465.8	461.9	458.3	440	454.2	450.8	416.7	411.3	406.3	411.4	401.7	400	414.2	405.3
16	450	450	450	450	450	445.8	450	448.6	433.3	437.5	444.2	438.3	425	431.7	418.3	425	435	422.5	421.7	426.4
17	475	480	483.3	479.4	469.2	481.7	479.2	476.7	475	458.3	477.5	470.3	433.3	450	440.8	441.4	445	451.7	431.7	442.8
20	490	486.7	485.8	487.5	492.5	493.3	490	491.9	465	490.8	466.7	474.2	438.3	442	443.3	441.2	450	430	431.7	437.2
21	485.8	485	476	482.3	481.7	485	480	482.2	465.8	465.8	475	468.9	423.3	443.3	429.2	431.9	439.2	440.8	427.5	435.8
22	481.7	487.5	487.5	485.6	480	480.8	481.7	480.8	479.2	490	471.3	480.2	437.5	421.7	431.7	430.3	423.3	443.3	424	430.2
25	385	379.2	380.8	381.7	380	379.5	379.2	379.6	380	383.3	369.2	377.5	360	325	350	345	348	343.3	345.8	345.7
28	465	464.2	468.3	465.8	468.3	466.7	465	466.7	458.3	455.8	458.3	457.5	425	423.3	441.7	430	418.3	426	437.5	427.3
29	466.7	465.8	471.7	468.1	466.7	465	468.3	466.7	469.5	468.3	461.7	466.5	440	457.5	425	440.8	441.7	450	440	443.9
30	464.2	463.3	456.7	461.4	456.7	459.2	460.8	458.9	455	485	454.2	464.7	394.2	390	387.5	390.6	392.5	383.3	382.5	386.1
31	464.2	465.8	457.5	462.5	455.8	455.8	456.7	456.1	441.7	480.7	448.3	456.9	391.7	387.5	415.8	398.3	387.5	405	387.5	393.3
32	-	-	-	-	-	-	-	-	-	-	-	-	425	439.2	447.5	437.2	440	440	439.2	439.7
34	458.3	465	465	462.8	460.8	462.5	459.2	460.8	452.5	453.3	466.7	457.5	406.3	420.8	416.7	420.6	430	424	420.8	424.9
36	-	-	-	-	467.5	466.7	464.5	466.2	500	537.5	500	512.5	-	-	-	-	-	-	-	-
38	450	446.7	445.8	447.5	445	450	445.8	446.9	439.2	444.2	443	442.1	375	376.7	391.7	381.1	400	375	383.3	386.1
39	459.2	455.8	460	458.3	454.7	456.7	453.3	454.9	452.5	452	453.3	452.6	422.5	408.3	441.3	424	400	425	446.7	423.9



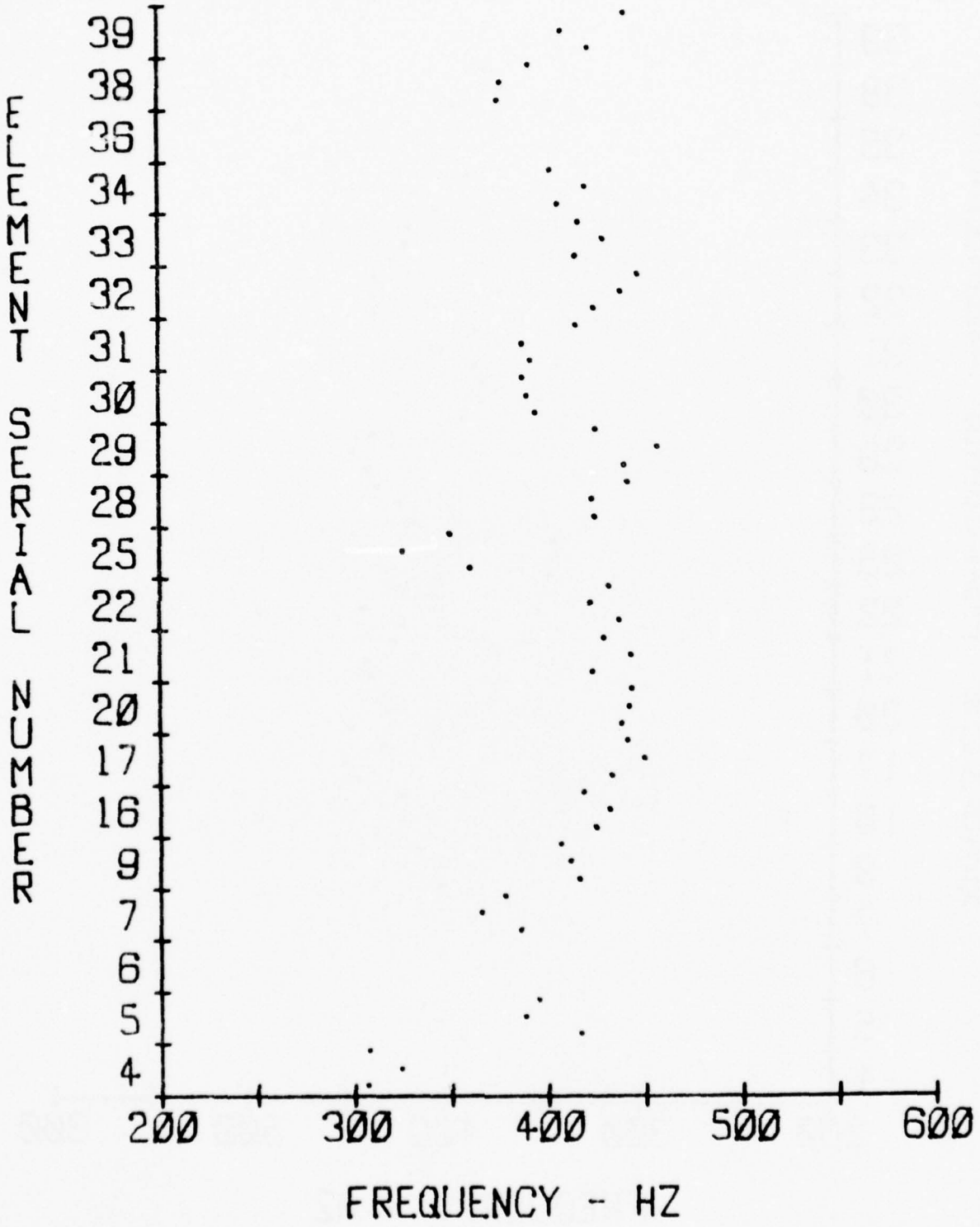
FREQUENCY VARIATION AT +5 PSI DURING
ACOUSTICAL NOISE ENVIRONMENT, REFERENCE
TASK F-12



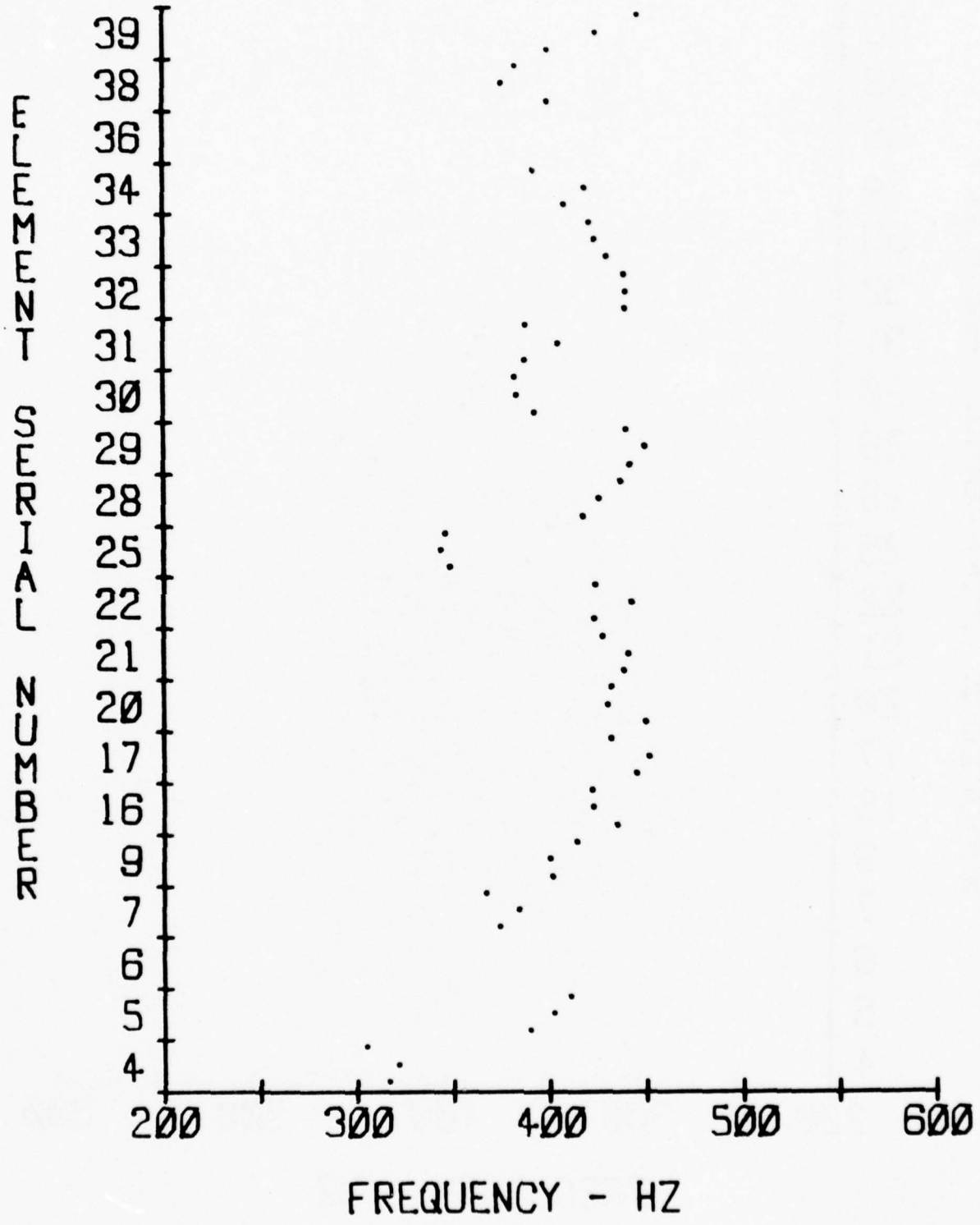
FREQUENCY VARIATION AT +5 PSI DURING
BASELINE TEST AFTER ACOUSTICAL NOISE
ENVIRONMENT, REFERENCE TASK F-13



FREQUENCY VARIATION AT +5 PSI, DURING
BASELINE TEST PRIOR TO ALTITUDE ENVIRONMENT
REFERENCE TASK F-14



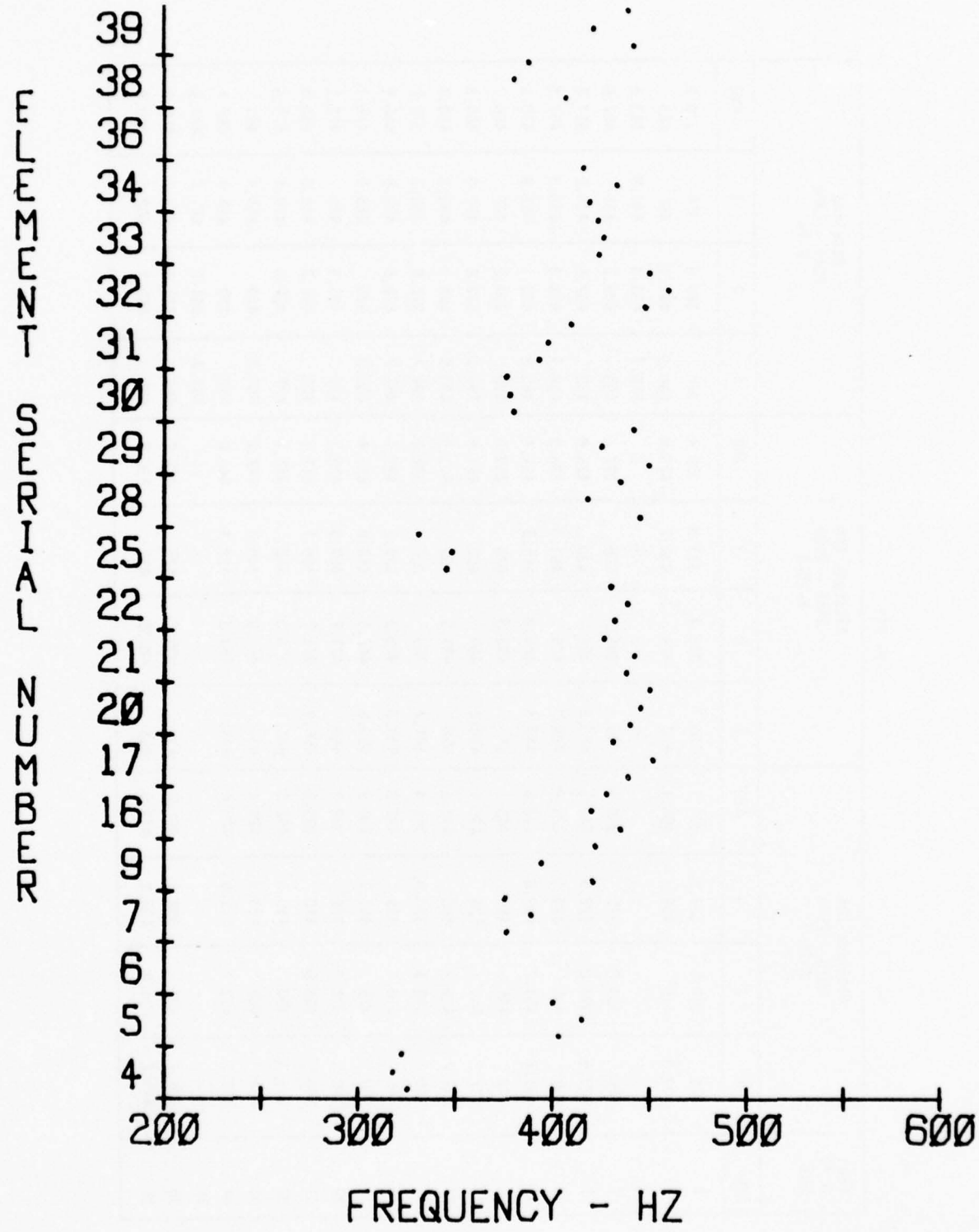
FREQUENCY VARIATION AT +5 PSI, DURING
90K FT ALTITUDE ENVIRONMENT, REFERENCE
TASK F-15-1



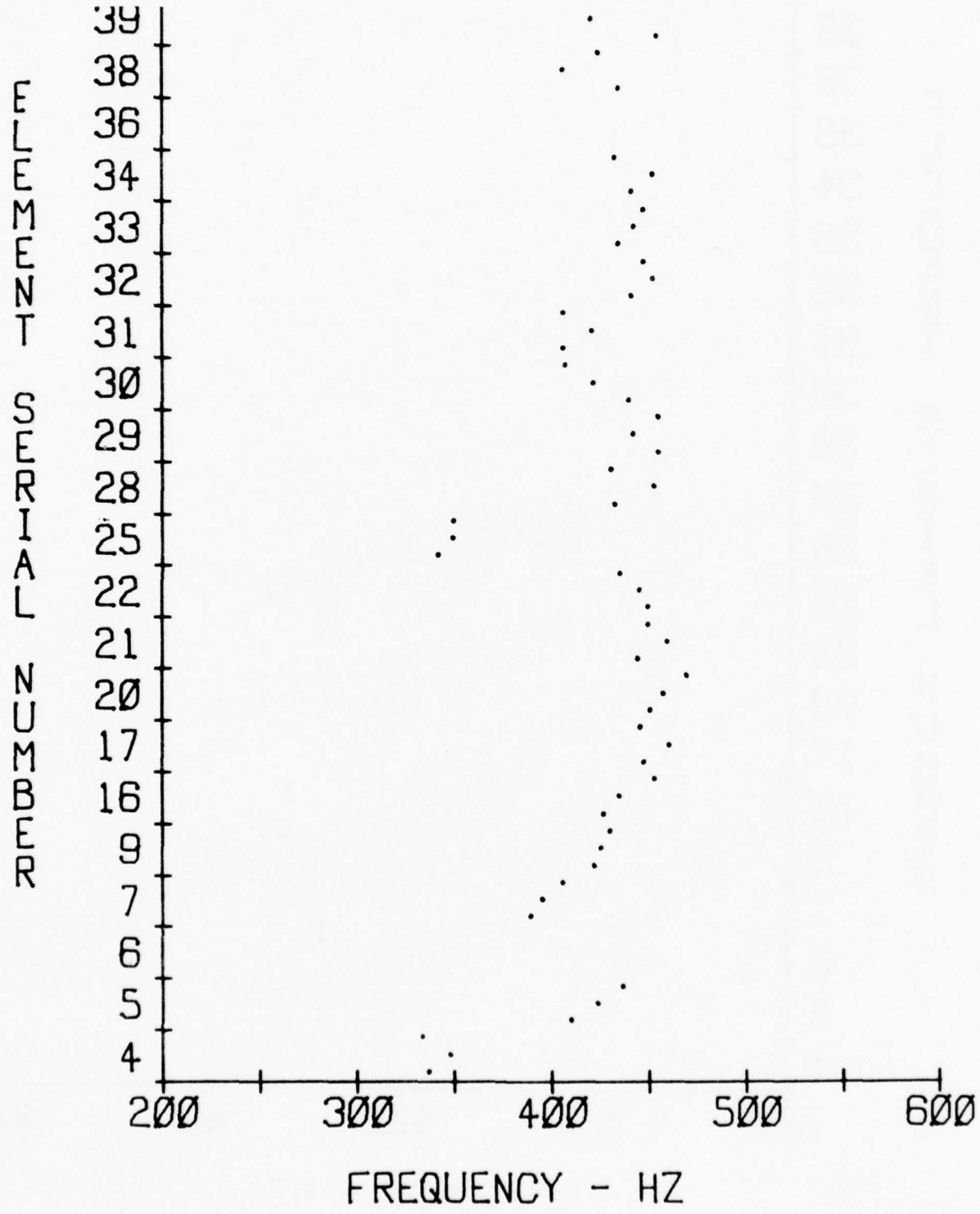
FREQUENCY VARIATION AT +5 PSI, DURING
50K FT ALTITUDE ENVIRONMENT, REFERENCE
TASK F-15-2

+5 PSI

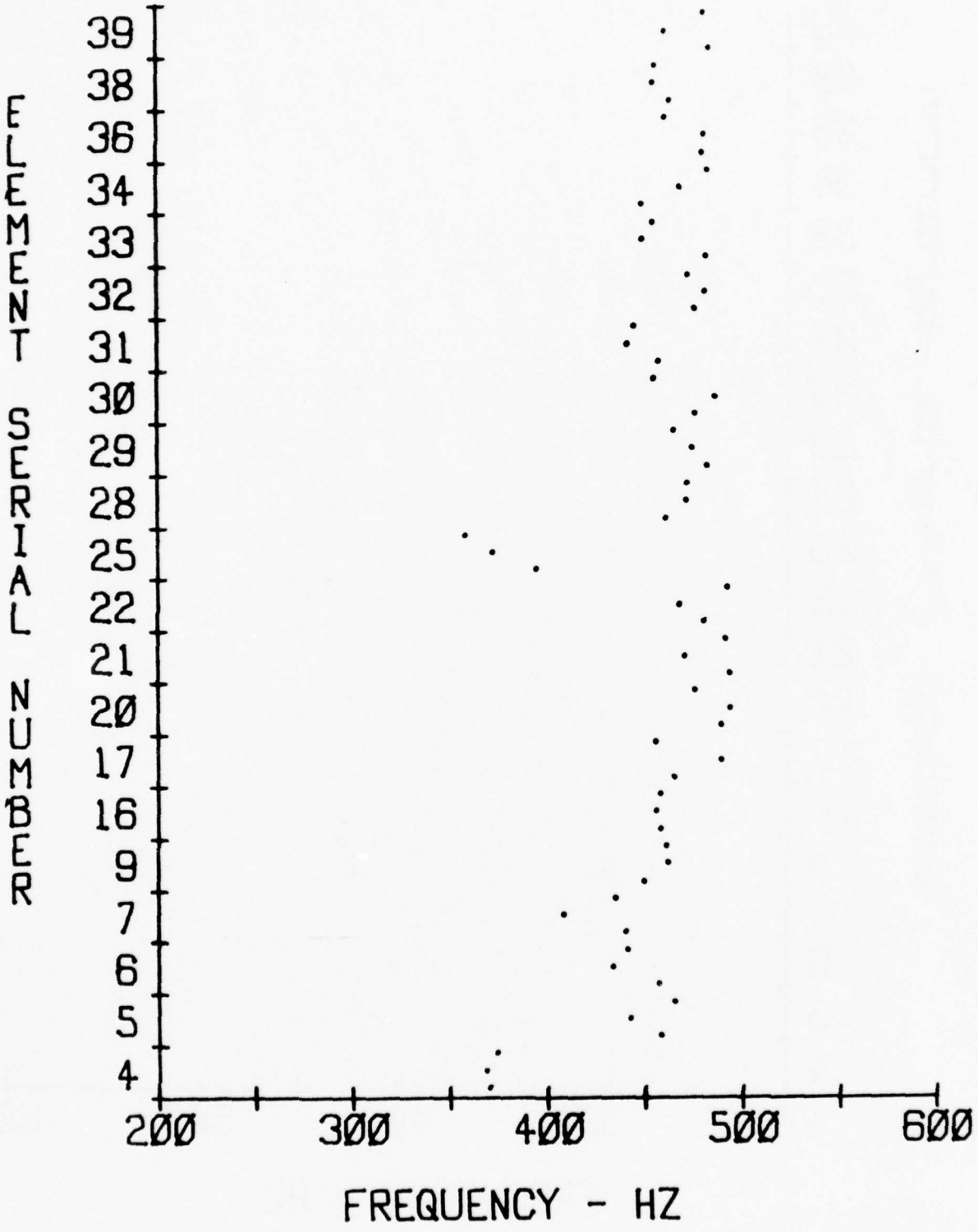
Freq. @ +5 PSI	Altitude 25K 2616 - 2906 F-15-3				Altitude 10K 2616 - 2906 F-15-4				Baseline 2616 - 2906 F-16			
S/N	1	2	3	AVG	1	2	3	AVG	1	2	3	AVG
4	325	317.5	322.5	321.7	336.7	348.3	333.3	339.4	370	368.3	374	370.8
5	403.3	415	400	406.1	410	424	436.7	423.6	458.3	441.7	465	455
6	-	-	-	-	-	-	-	-	456.7	433.3	440.8	443.6
7	376	389.2	375	380.1	389.2	395.8	406	397	440	408.3	435	427.8
9	420.8	394.2	422.5	412.5	422.5	425	430	425.8	450	462.5	460.8	457.8
16	435	420	428.3	427.8	426.7	435	453.3	438.3	458.3	455.8	458.3	457.5
17	439.2	451.7	430.8	440.6	447.5	460.8	445.8	451.4	465.8	490	455.8	470.5
20	440	445	450	445	451	458.3	470	459.8	490	494.2	476	486.7
21	437.5	441.7	426	435.1	444.2	460	450	451.4	494.2	470.8	492.5	485.8
22	431.7	439.2	430	433.6	450	445.5	435	443.5	480.8	468.3	493.3	480.8
25	345	348.3	330.8.	341.4	341.7	350	350	347.2	394.7	372.5	358.3	375.2
28	445	418.3	435	432.8	433.3	453.3	430.8	439.1	461.7	472.5	472.5	468.9
29	450	425	441.7	438.9	455.8	442.5	455.8	451.4	483.3	475	465.8	474.7
30	380	378.3	376	378.1	440	421.7	407.5	423.1	477	487.5	455	473.2
31	393.3	397.5	410	400.3	406.7	421.7	406.7	411.7	458	441.7	445.8	448.5
32	448.3	460	450	452.8	441.7	453.3	448	447.7	477	482.5	473.4	477.6
33	424	426	423.3	424.4	435	443.3	448.3	442.2	483.3	450	455.8	463
34	419.2	433.3	415.8	422.8	441.7	453.3	433.3	442.8	450	470	484.2	468.1
36	-	-	-	-	-	-	-	-	481.3	481.7	461.7	474.9
38	406.7	380	388.3	391.7	435	406.7	425	422.2	464.2	455.8	456.7	458.9
39	441.7	420.8	439.2	433.9	455	420.8	435	436.9	485	461.7	482.5	476.4



FREQUENCY VARIATION AT +5 PSI DURING 25K
FT ALTITUDE ENVIRONMENT, REFERENCE TASK F-15-3



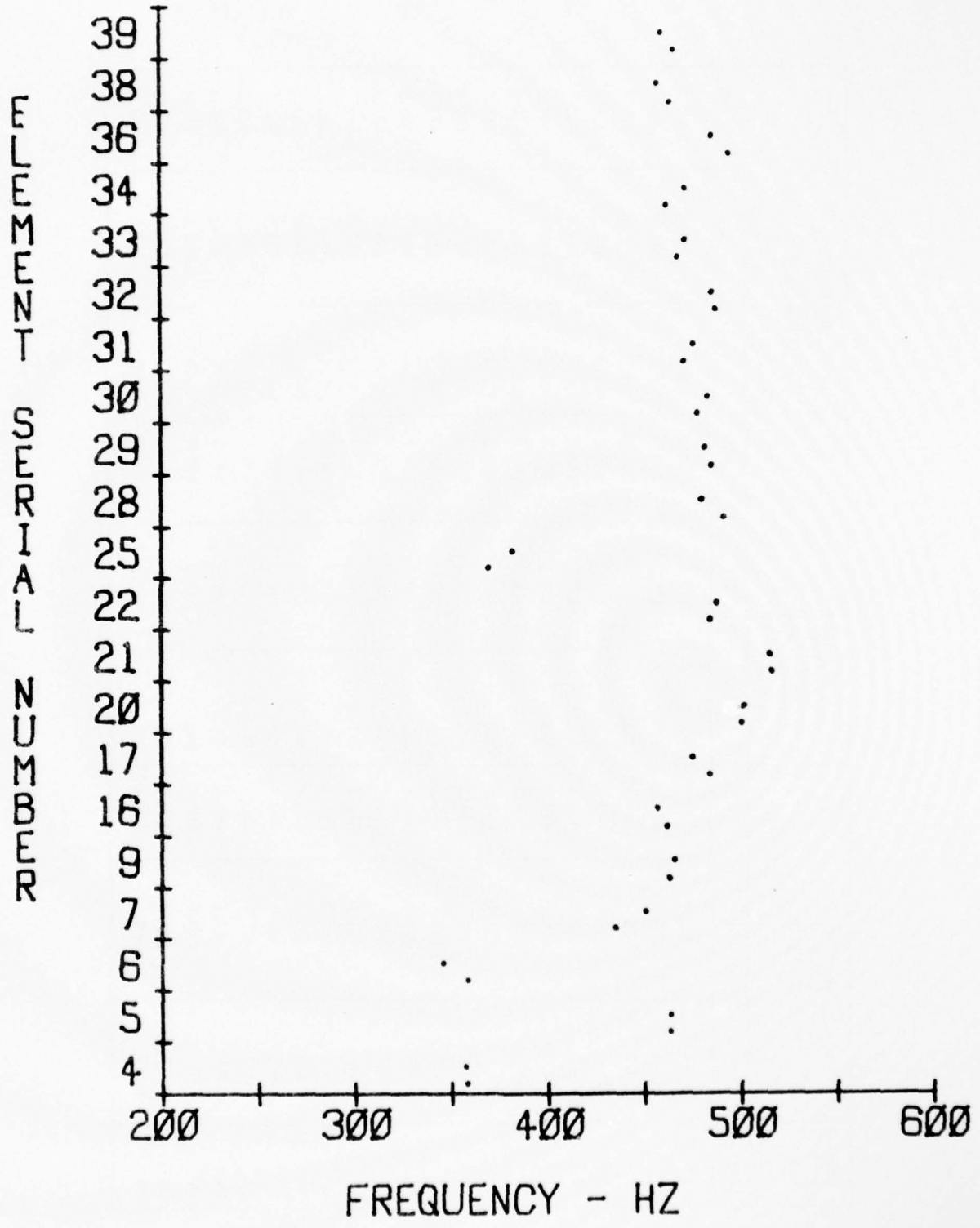
FREQUENCY VARIATION AT +5 PSI, DURING 10K FT
ALTITUDE ENVIRONMENT, REFERENCE TASK F-15-4



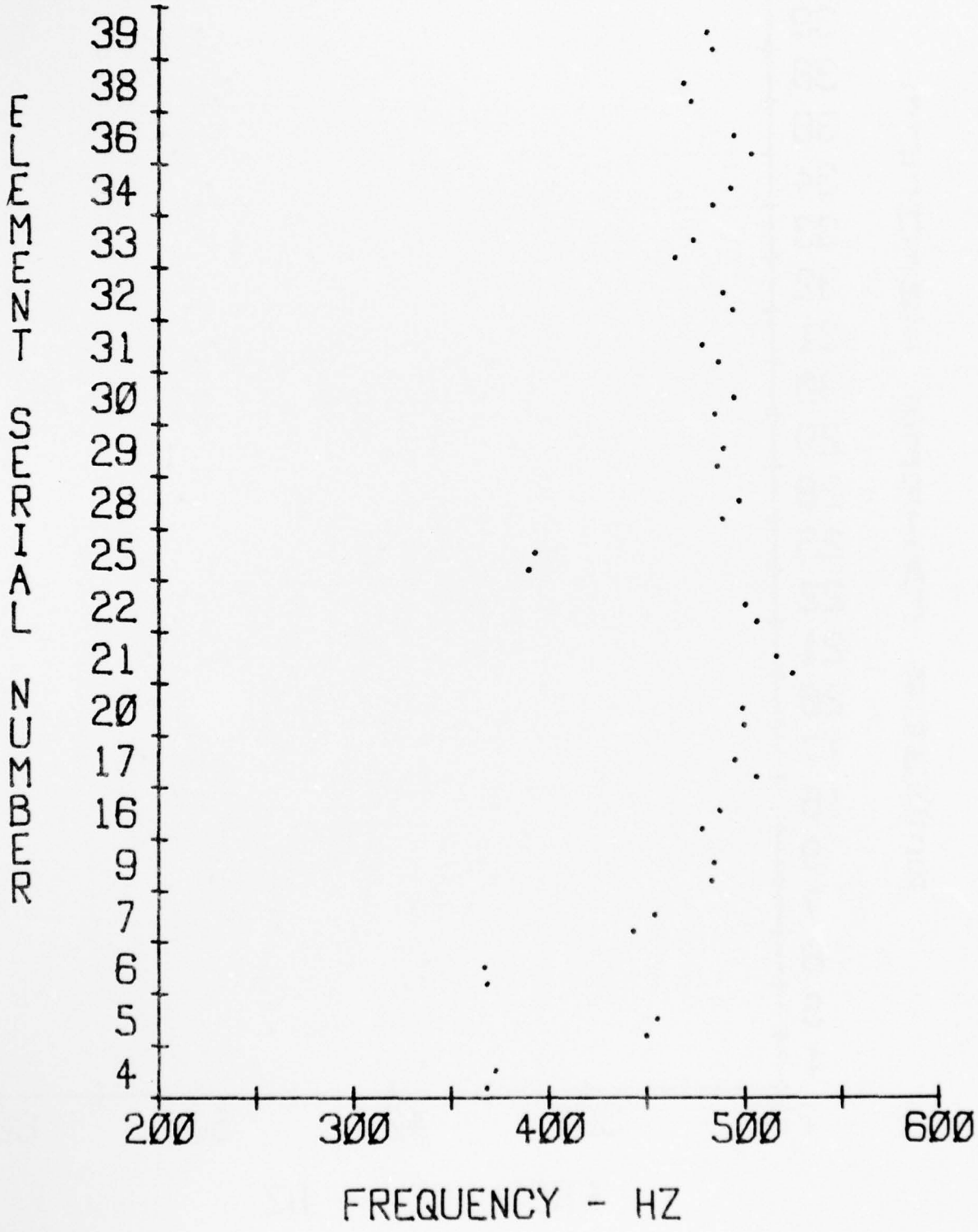
FREQUENCY VARIATION AT +5 PSI DURING BASELINE TESTING AFTER ALTITUDE ENVIRONMENT, REFERENCE TASK F-16

+5 PSI

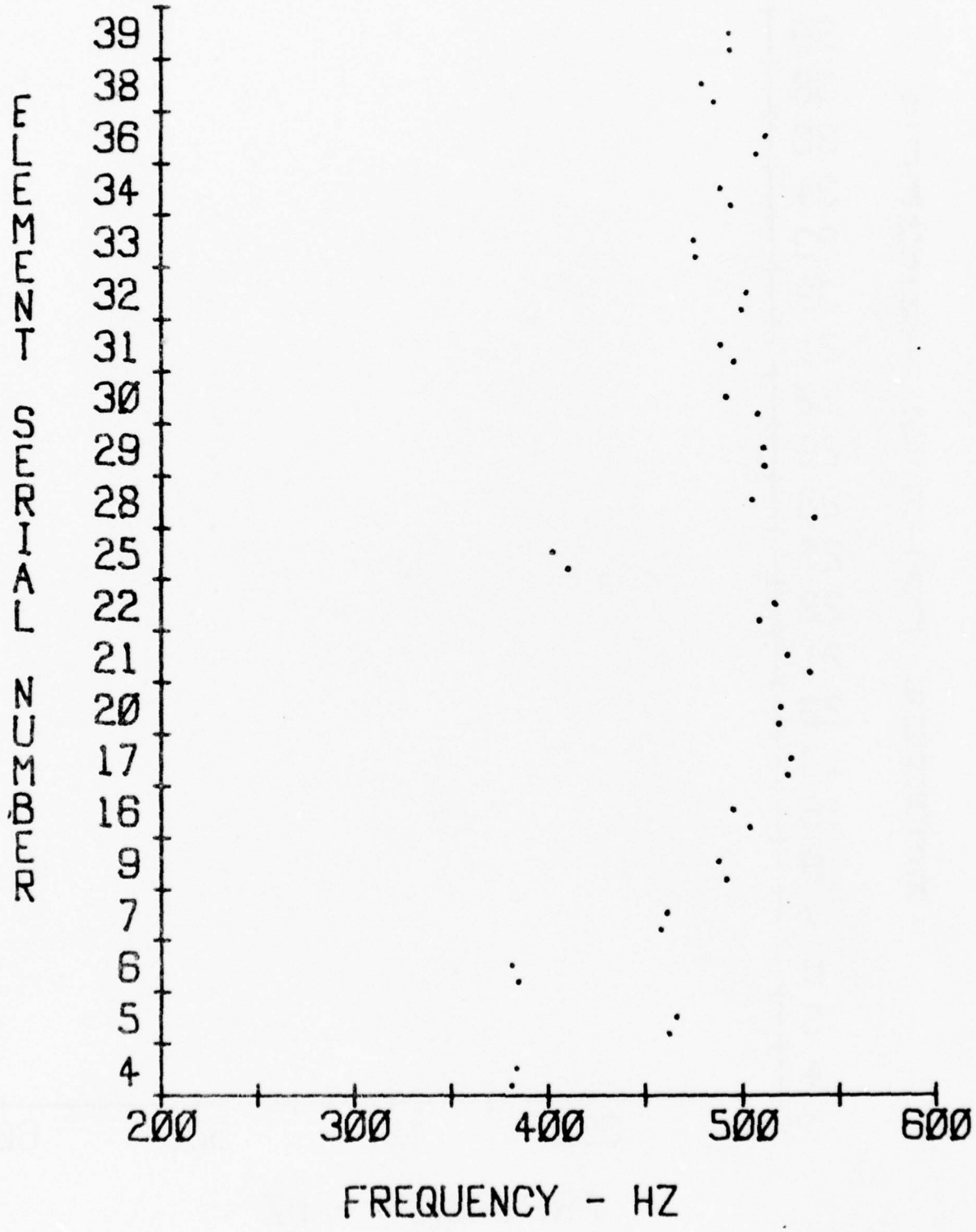
Freq. @ +5 PSI	Baseline E-2-1 2907 - 3018			Baseline E-2-2 3019 - 3123			Baseline E-2-3 3124 - 3228		
S/N	1	2	AVG	1	2	AVG	1	2	AVG
4	357.8	356.7	357.3	368.3	372.5	370.4	380.8	383.3	382.1
5	463.3	463.3	463.3	450	455	452.5	462.5	465.8	464.2
6	358.3	345	351.7	368.3	366.7	367.5	384.2	380.8	382.5
7	435	451	443	443.3	454.2	448.8	458.3	460.8	459.6
9	463.3	465.8	464.6	483.3	484.2	483.8	491.7	487.5	489.6
16	461.7	456.7	459.2	478.3	487.5	482.9	504.2	495	499.6
17	484.2	475	479.6	506.7	495	500.9	524	525	524.5
20	501	501.7	501.4	500	499	499.5	519.2	520	519.6
21	516.7	515	515.9	525	516.7	520.9	535	523.3	529.2
22	484.2	488.3	486.3	506.7	501	503.9	509.2	517.5	513.4
25	369.7	382.5	376.1	390	393.3	391.7	410	401.7	405.9
28	491.7	480	485.9	490	498	494	537.5	505	521.3
29	485	481.7	483.4	486.7	490	488.4	511.7	510.8	511.2
30	478.3	483.3	480.8	485	495.8	490.4	508.3	491.7	500
31	470.8	476	473.4	487.5	479.2	483.4	495.9	489.2	492.6
32	488.3	485.8	487.1	495	490	492.5	500	502.5	501.3
33	468.3	471.7	470	465	475	470	476	475	475.5
34	462.5	472.5	467.5	485	494.2	489.6	494.7	489.2	491.9
36	495	485.8	490.4	505	495.8	500.4	508.3	512.5	510.4
38	464.2	457.5	460.9	474	470	472	485	479.2	482.1
39	466.7	460	463.4	485	481.7	483.4	494.2	493.3	493.8



FREQUENCY VARIATION AT +5 PSI, DURING FIRST STEP PULSE BASELINE TEST, REFERENCE TASK E-2-1



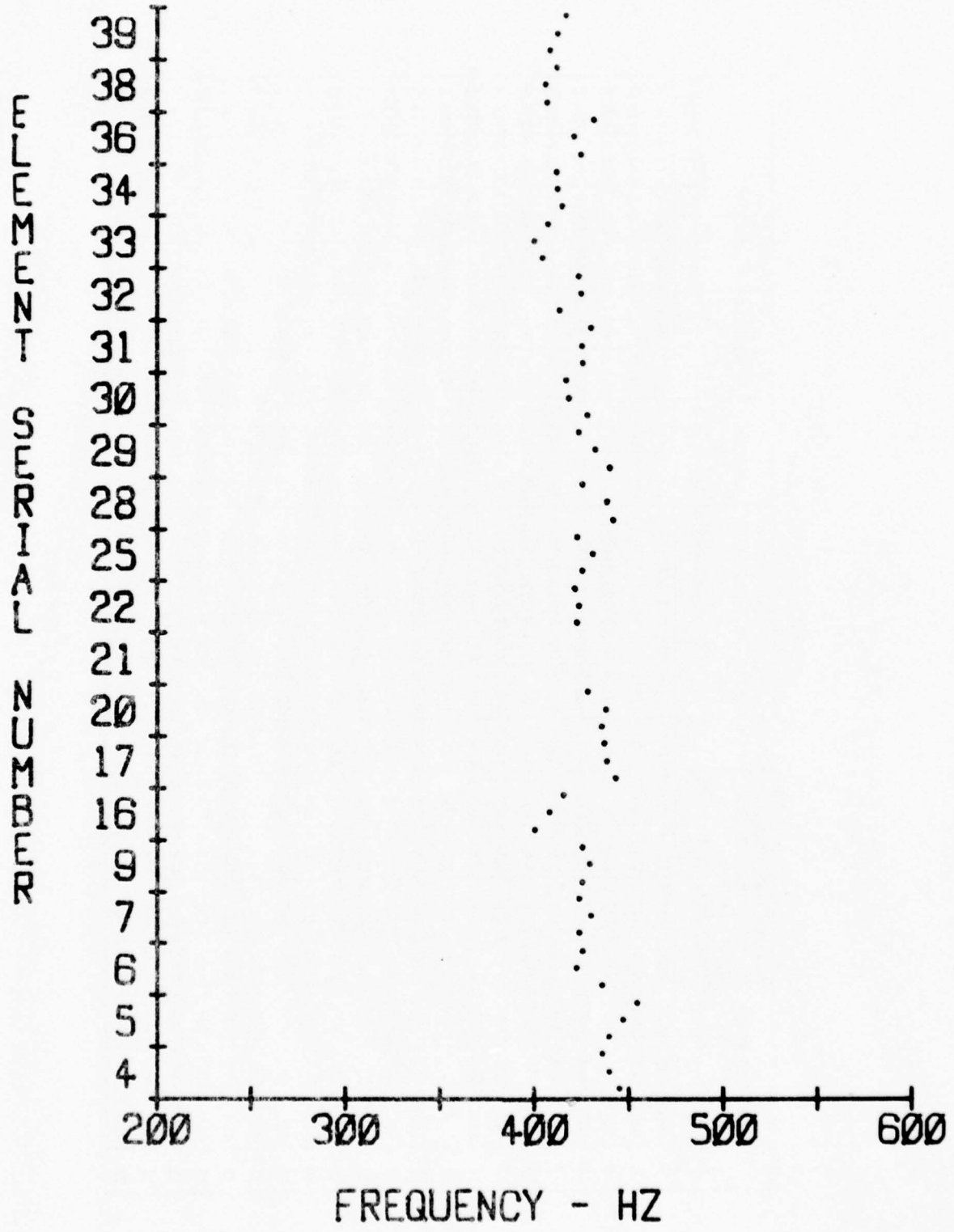
FREQUENCY VARIATION AT +5 PSI, DURING
SECOND STEP PULSE BASELINE TEST. REFERENCE
TEST E-2-2



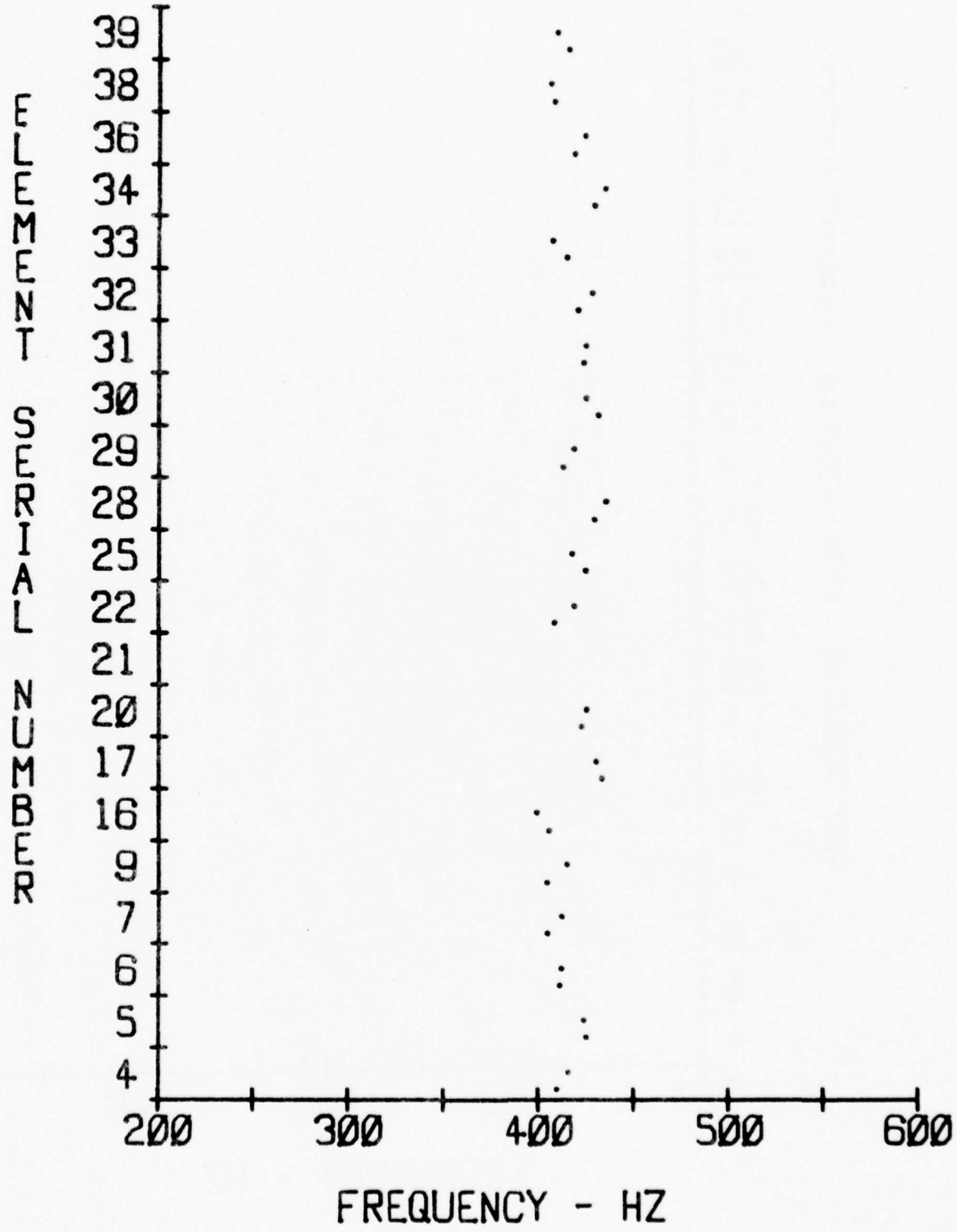
FREQUENCY VARIATION AT +5 PSI DURING
THIRD STEP PULSE BASELINE TEST, REFERENCE
TASK E-2-3

0 PSI

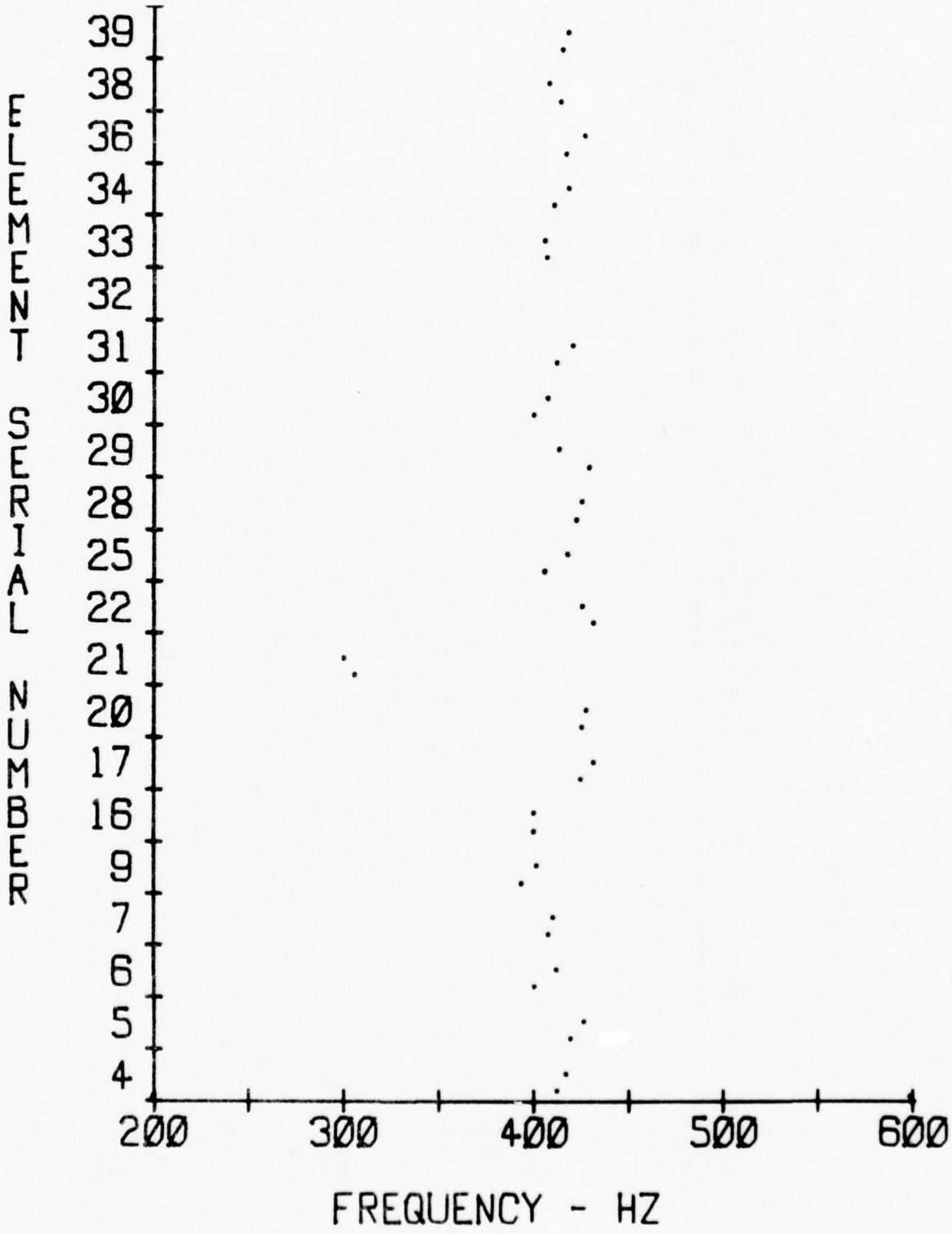
0_{PSI}	1ST TEST AFTER TUNING (C) 542 - 604			VARIANCE IN PRESSURE (D) 40 PSI ONLY 605 - 966		SCHMITT TRIGGER (D) 1009 - 1050		BASELINE (D) 1093 - 1155			BASELINE E-1 1156 - 1260		BASELINE E-2 1272 - 1376		BASELINE E-3 1377 - 1481		BASELINE F 1482 - 1544			
S/N	1	2	3	1	2	1	2	1	2	3	1	2	1	2	1	2	1	2	3	AVG
4	444.2	439.2	435	409.2	415.8	411.7	416.7	415	414.2	415.8	410.8	405.4	419.2	418.3	395	394.2	401.7	401.7	410.8	414.4
5	439.2	446.7	454.2	425	423.3	419.2	426.7	420.8	423.3	426.7	411.7	410	430.8	422.5	405	412.5	423.3	415.8	414.2	423.7
6	435	421.7	425	410.8	411.7	400	412.5	410	407.5	410.8	409.2	401	417.5	411.7	402.5	400	401	405	395.8	409.9
7	423.3	430	423.3	404.2	412.5	407.5	410	405	406.7	399.2	398.3	387.5	400.8	410	389.2	391.7	394.2	389.2	385	403.6
9	425	429.2	425	404.2	415.2	393.3	401.7	400	401.7	405.8	413.3	395	400	405.8	390.8	382.5	392.5	389.2	395.8	403.5
16	400	408.3	415.8	405	399	400	400	400	400	393.3	391.7	393.3	406.7	402.5	397.5	400	394.2	388.3	385	398.9
17	443.3	438.3	436.7	433.3	430	425	431.7	414.2	408.3	415.8	423.3	423.3	435	436.3	425	428.3	419.2	418.3	415.8	426.4
20	435	437.5	428.3	422.5	425	425	427.5	425	422.5	423.3	420.8	421.7	431.7	423.3	430.8	427.5	420	420.8	420.8	425.7
21	-	-	-	-	*-	305.8	300	291.7	293.3	288.3	439.2	445.8	445	445.8	443.3	446.7	444.8	440	433.3	442.7
22	422.5	423.3	420.8	408.3	419.2	431.7	425	424.2	419.2	422.5	420.8	416.7	420.8	420	427.5	418.3	425	419.2	419.2	421.3
25	425	430.8	422.5	425	417.5	405.8	418.3	421.7	417.5	420	412.5	411.7	413.3	412.5	413.3	406.7	415	405.8	410.8	416.1
28	441.7	438.3	425	430	435.8	422.5	425	435	430	431.7	425	420.8	430	425	425	423.3	422.5	423.3	420.8	427.9
29	440	431.7	423.3	413.3	419.2	429.2	413.3	433.3	423.3	426.7	419.2	416.7	417.5	414.2	413.2	418.3	430.8	435	435	423.8
30	428.3	418.3	416.6	431.7	425	400	407.5	419.2	417.5	420	411.7	406.7	404.2	400	405	401.7	423.3	427.5	420.8	415
31	426	425	430	424	425	412.5	420.8	427.9	425	435.8	410.8	410.8	417.5	415	412.5	412.5	425	425	429.2	421.6
32	413.3	425	423.3	420.8	429.2	-	-	447.5	443.3	441.7	-	-	416.7	418.3	-	-	-	-	-	427.9
33	404.2	400	407.5	415	407.5	406.7	405.8	428.3	424	427.5	398.3	394.6	405.8	398.3	401.7	397.5	410	409.2	415.8	408.3
34	415	412.5	411.7	430	435	410.8	419.2	430	430	438.3	404.8	405.8	410.8	408.3	405	407.5	420	415.8	415.8	417.1
36	425	420.8	431.7	419.2	425	417.2	427.5	441.7	444.2	439.2	420.8	414.2	416.7	416.7	423.3	414.2	446.7	425	434.2	426.5
38	406.7	405.8	412.5	408.8	406.7	414.2	408.3	416.7	424	420.8	402.5	407.5	400	401.7	400	401.7	406.7	409.2	415.8	408.9
39	408.3	412.5	416.7	416.7	410	415.8	418.3	420	425	434.2	405.8	405.8	410.8	409.2	404.2	407.5	414.2	413.8	412.5	413.7



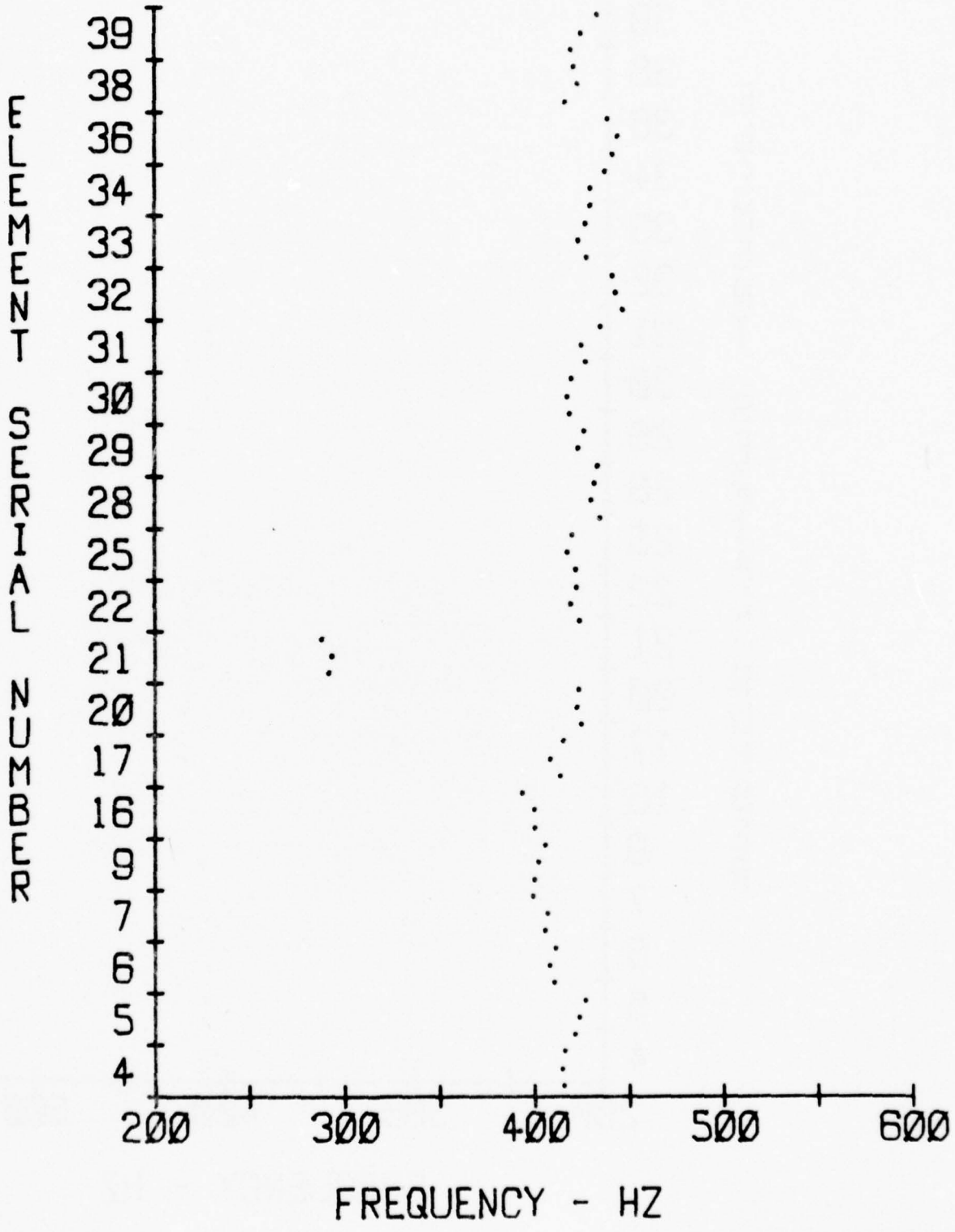
FREQUENCY VARIATION AT OPSL FIRST
BASELINE AFTER ENVIRONMENTAL CHAMBER
TUNING, REFERENCE TASK C



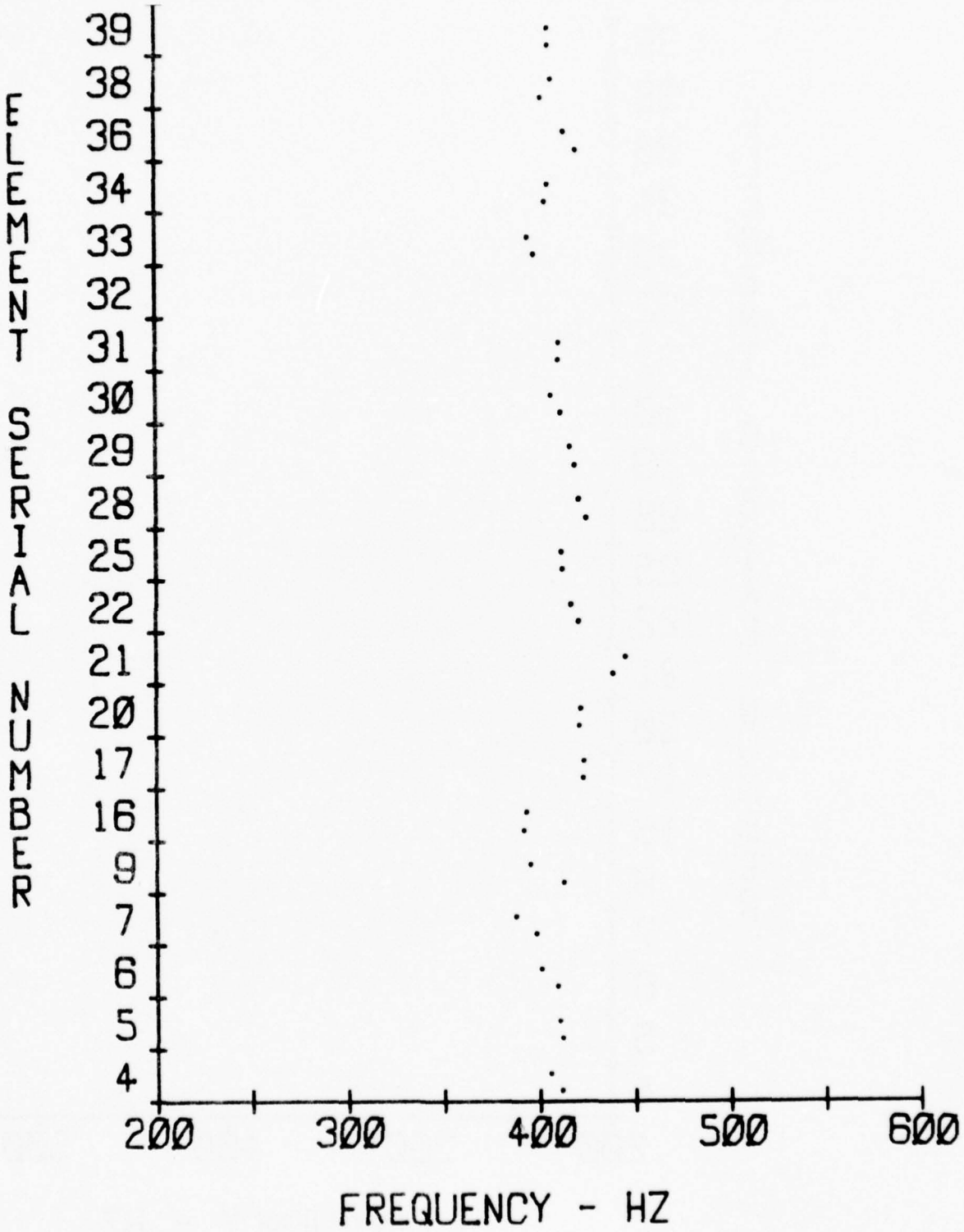
FREQUENCY VARIATION AT 0PSI DURING VARIANCE IN SUPPLY PRESSURE TEST (THIS DATA AT A SUPPLY PRESSURE OF 40PSI)
REFERENCE TASK D



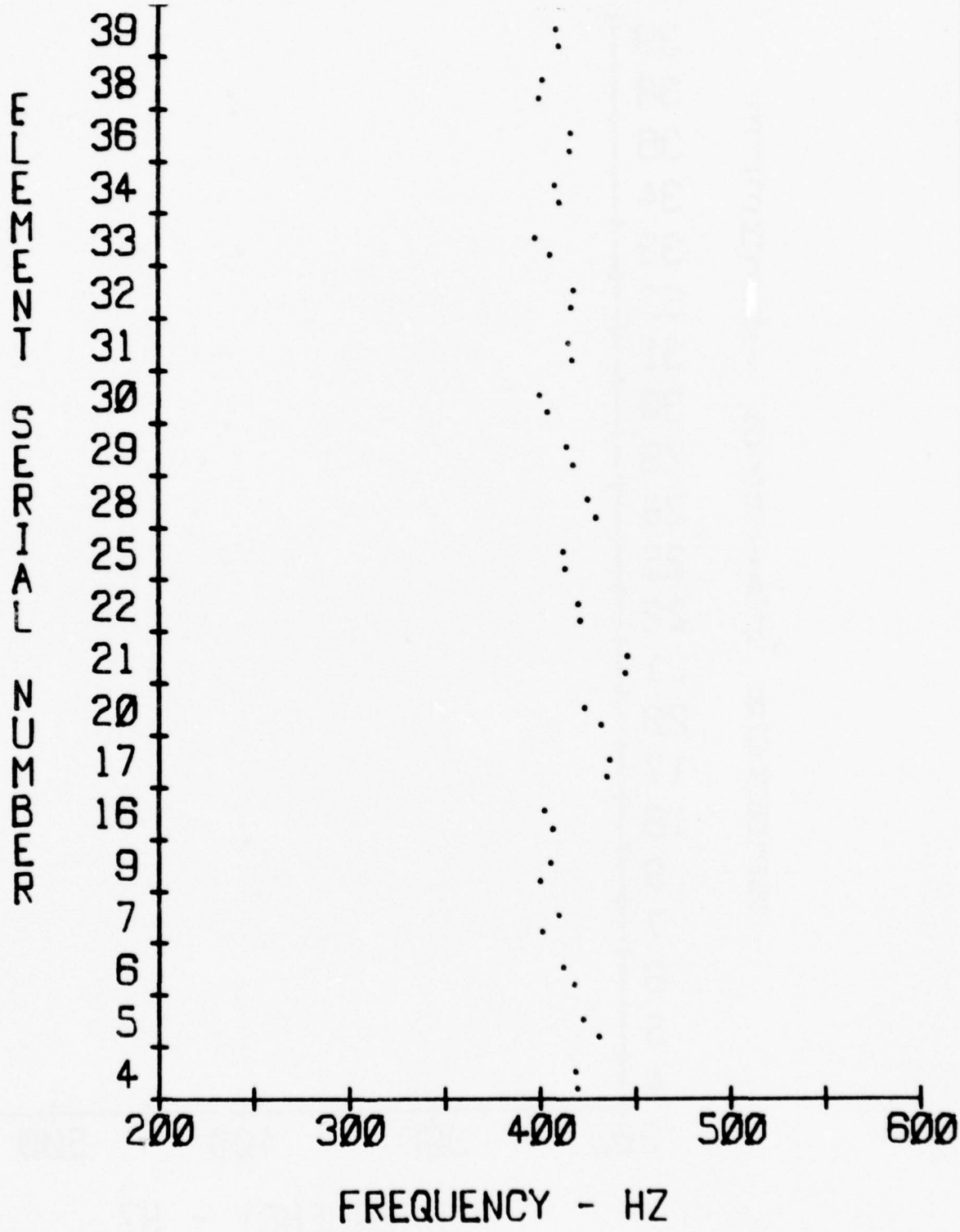
FREQUENCY VARIATION AT 0 PSI DURING
SCHMITT TRIGGER TEST REFERENCE TASK D



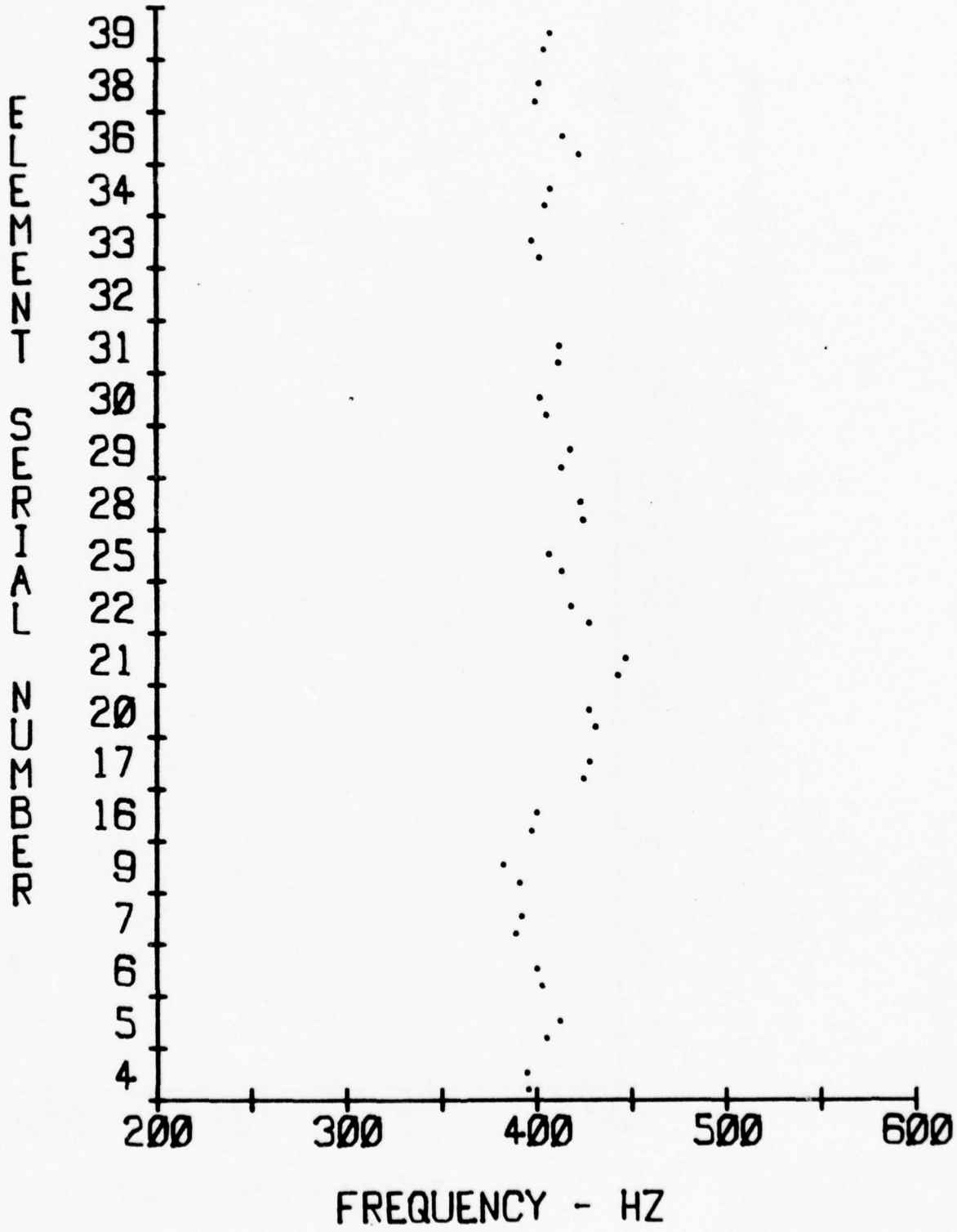
FREQUENCY VARIATION AT 0 PSI BASELINE TEST PRIOR TO STEP PULSING, REFERENCE TASK D



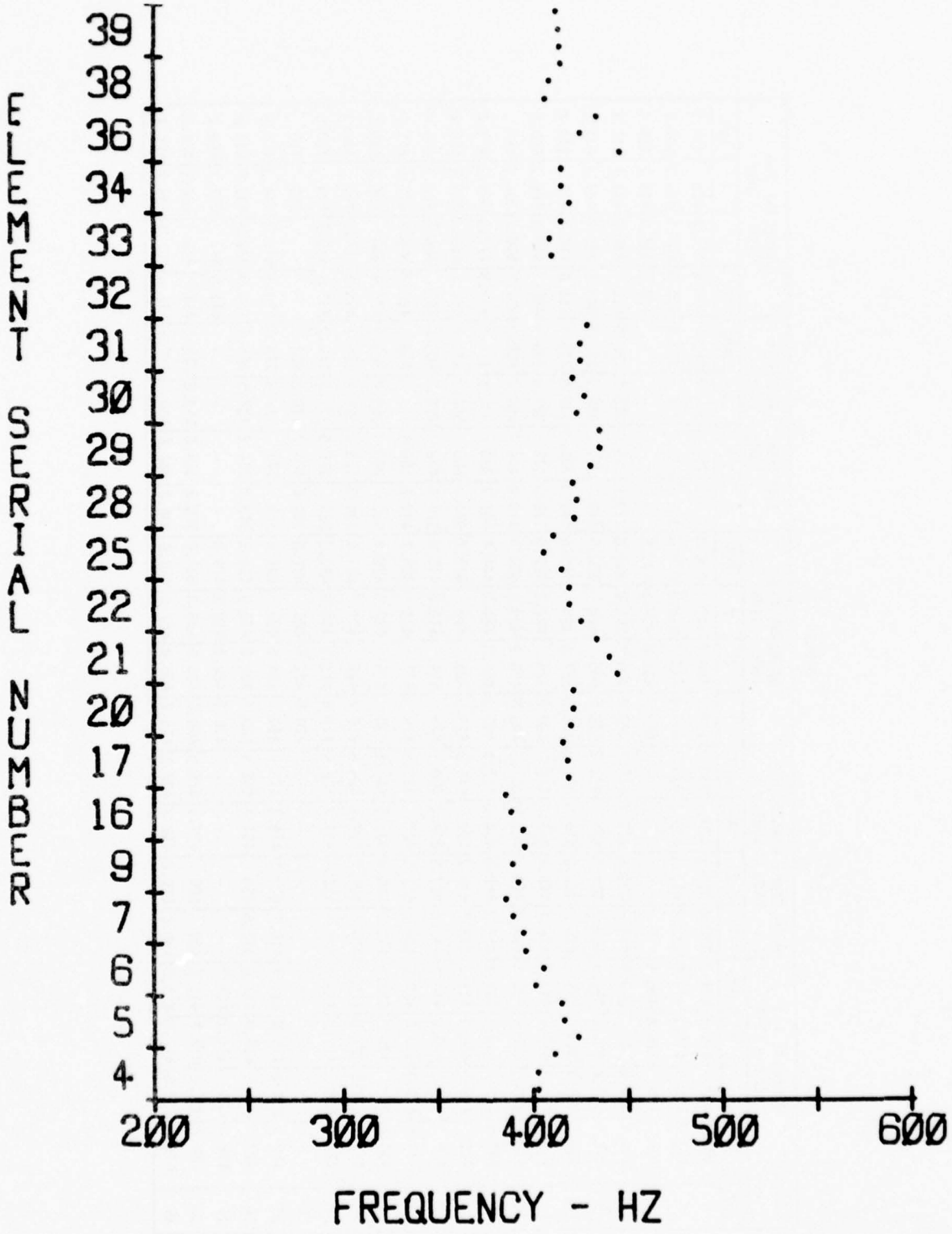
FREQUENCY VARIATION AT 0 PSI DURING
FIRST STEP PULSE BASELINE TEST
REFERENCE TASK E-1



FREQUENCY VARIATION AT 0 PSI DURING
SECOND STEP PULSE BASELINE TEST
REFERENCE TASK E-2



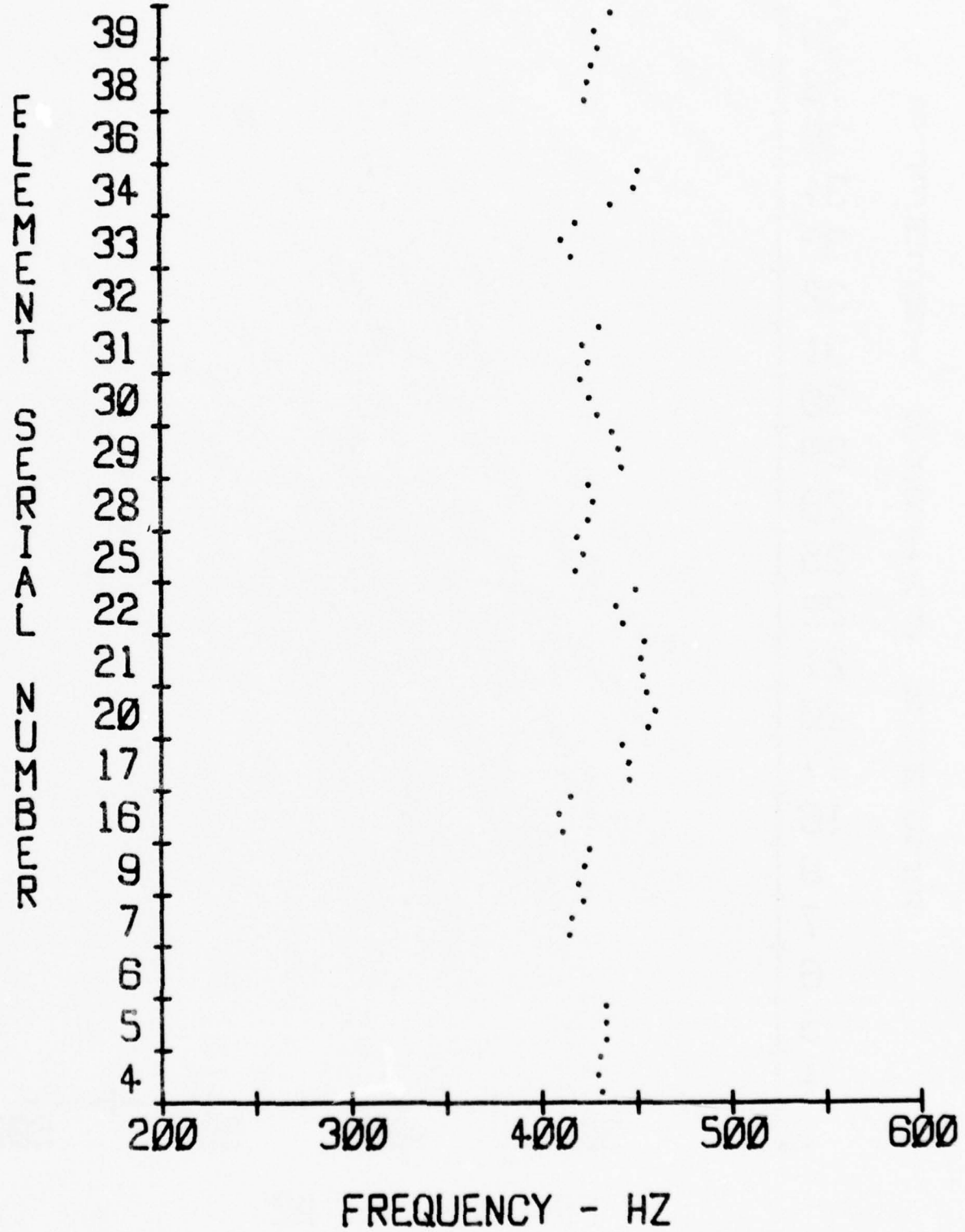
FREQUENCY VARIATION AT 0 PSI DURING
THIRD STEP PULSE BASELINE TEST, REFERENCE
TASK E-3



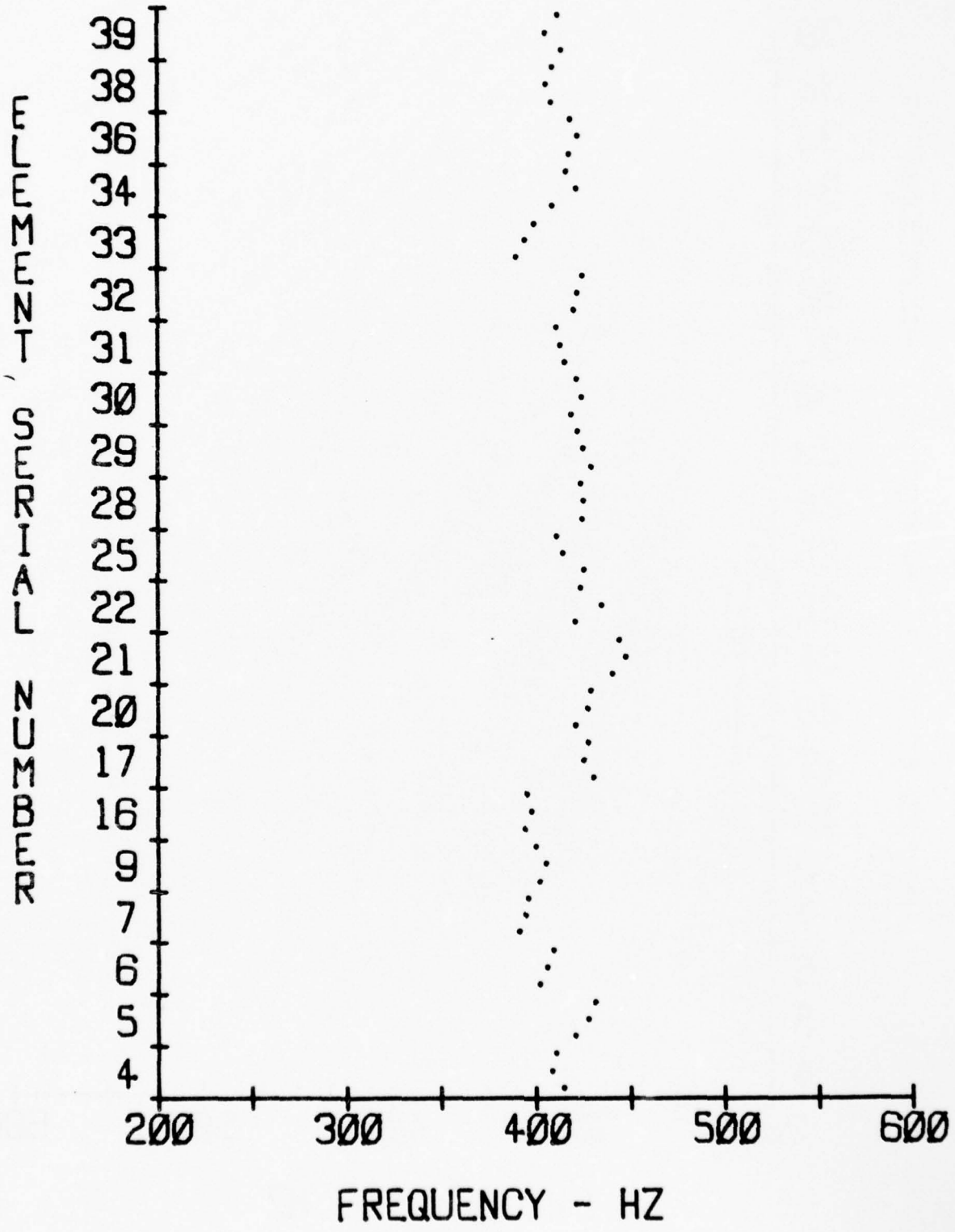
FREQUENCY VARIATION AT 0PSI DURING
BASELINE TEST PRIOR TO HIGH TEMPERATURE
ENVIRONMENT REFERENCE TASK F-1

0 PSI

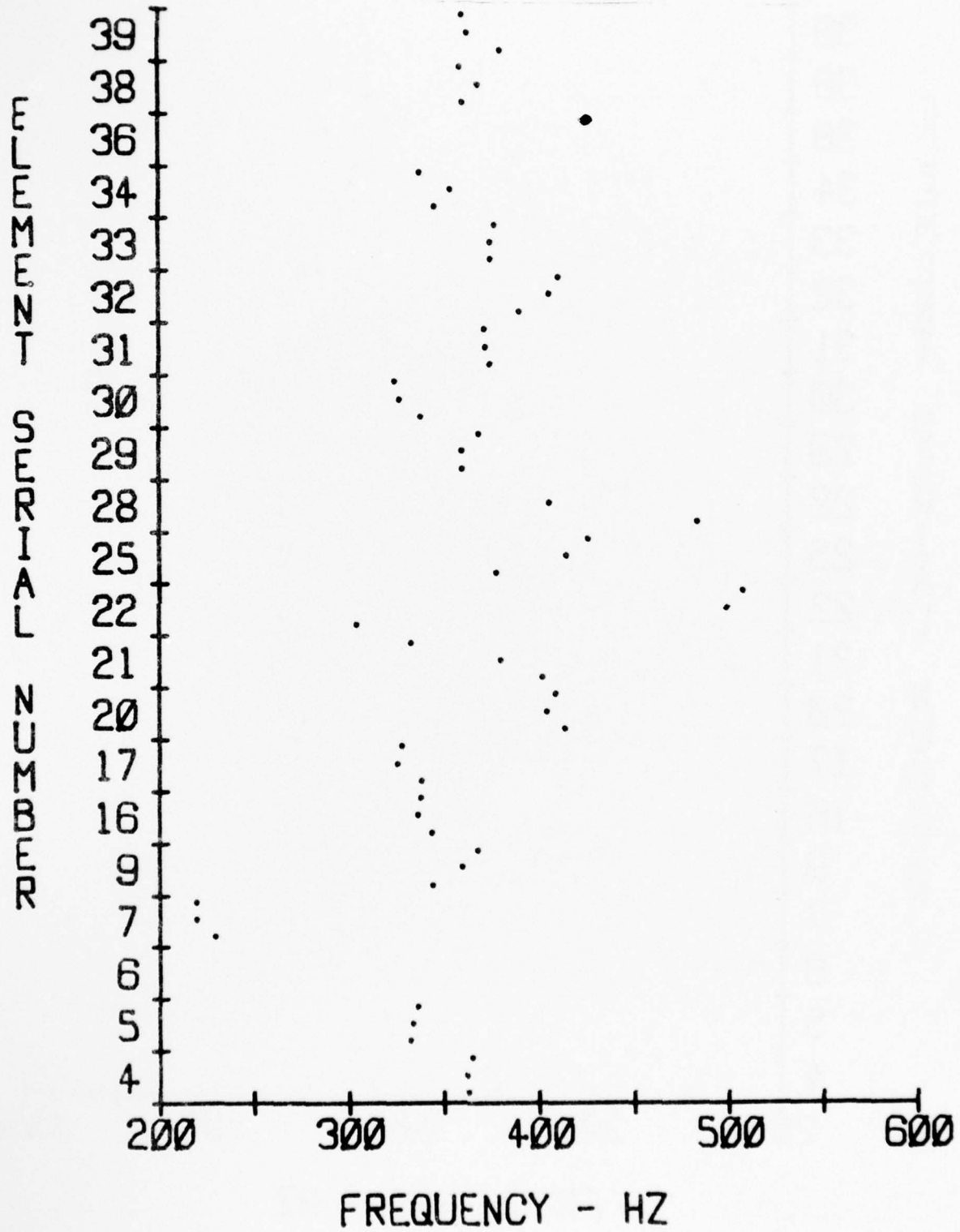
Test	BASELINE F-1 1482 - 1544				HIGH TEMP. +145°F F-2 1545 - 1601				BASELINE F-3 1602 - 1664				LOW TEMP. -40°F F-4 1665 - 1745				BASELINE F-5 1746 - 1808			
S/N	1	2	3	AVG	1	2	3	AVG	1	2	3	AVG	1	2	3	AVG	1	2	3	AVG
4	401.7	401.7	410.8	404.7	430.8	429.2	430	430	414.2	408.3	410	410.8	362.5	361.3	364.2	362.7	415.8	410.8	425	417.2
5	423.3	415.8	414.2	417.8	433.3	433.3	433.3	433.3	420.8	428.3	430.8	426.6	331.7	333.3	335.8	335.6	405.8	407.5	414.2	409.2
6	401	405	395.8	400.6	-	-	-	-	401.7	405.8	409.2	405.6	-	-	-	-	408.3	435.8	414.2	419.4
7	394.2	389.2	385	389.5	414.2	415.8	421.7	417.2	390.8	394.2	395.8	393.6	229.2	219.2	219.2	222.5	435	434.2	431.7	433.6
9	392.5	389.2	395.8	392.5	419.2	422.5	425	422.2	402.5	405	400	402.5	344.2	360	368.3	357.5	443.3	443.3	443.3	443.3
16	394.2	388.3	385	389.2	410.8	409.2	415.8	411.9	394.2	397.5	395	395.6	343.3	336.3	337.5	339	415.8	414.5	410	413.4
17	419.2	418.3	415.8	417.8	446.7	445.8	442.5	445	430.8	425	427.5	427.8	338.3	325	327.5	330.3	458	458.3	459.2	458.5
20	420	420.8	420.8	420.5	456.7	460	455.8	457.5	420.8	428.3	429.2	426.1	414.2	404.2	409.2	409.2	454.2	456.7	454.2	455
21	444.8	440	433.3	439.4	453.3	452.5	454.2	453.3	440.8	448.3	444.2	444.4	401.7	380	332.8	371.5	472.8	472.8	469.2	471.6
22	425	419.2	419.2	421.1	443.3	439.2	450	444.2	420.8	435	424	426.6	304.2	500	508.3	437.5	466.7	458.3	465.8	463.6
25	415	405.8	410.8	410.5	418.3	422.5	419.2	420	425	414.2	410.8	416.7	377.5	415	426.7	406.4	467	466.7	462.5	465.4
28	422.5	423.3	420.8	422.2	425	427.5	425	425.8	425	425	424	424.7	484.2	405.8	-	445	468.3	469.2	477.5	471.7
29	430.8	435	435	433.6	443.3	440.8	437.5	440.5	430	425	422.5	425.8	360	360	369.2	363.1	477.5	480	484.2	480.6
30	423.3	427.5	420.8	423.9	430	425.7	420.8	425.5	419.2	425	421.7	421.9	338.3	326.7	324.2	329.7	469.5	481.7	490	480.3
31	425	425	429.2	426.4	425	422.5	431.7	426.4	415.8	413.3	410.8	413.3	375	372.5	371.7	373.1	395.8	411.7	425	410.8
32	-	-	-	-	-	-	-	-	420.8	422.5	425	422.8	390.8	406.7	410.8	402.8	-	-	450	450
33	410	409.2	415.8	411.7	416.7	411.3	419.2	415.7	390	394.6	400	394.9	375	375	377.5	375.8	418.3	418.3	418.3	418.3
34	420	415.8	415.8	417.2	437.5	450	451.7	446.4	409.6	422.5	416.7	416.3	345.8	354.2	337.5	345.8	430.8	433.7	430.8	431.8
36	446.7	425	434.2	435.3	-	-	-	-	418.3	422.5	418.8	419.9	-	-	-	-	445.8	447	451.7	448.2
38	406.7	409.2	415.8	410.6	424	425	427.5	425.5	408.8	405.8	409.2	407.9	360.8	369.2	359.2	363.1	425	425	424.2	424.7
39	414.2	413.8	412.5	413.5	430.8	429.2	438.3	432.8	414.2	405.8	412.5	410.8	380.8	362.8	360	367.9	425	427.5	426.7	426.4



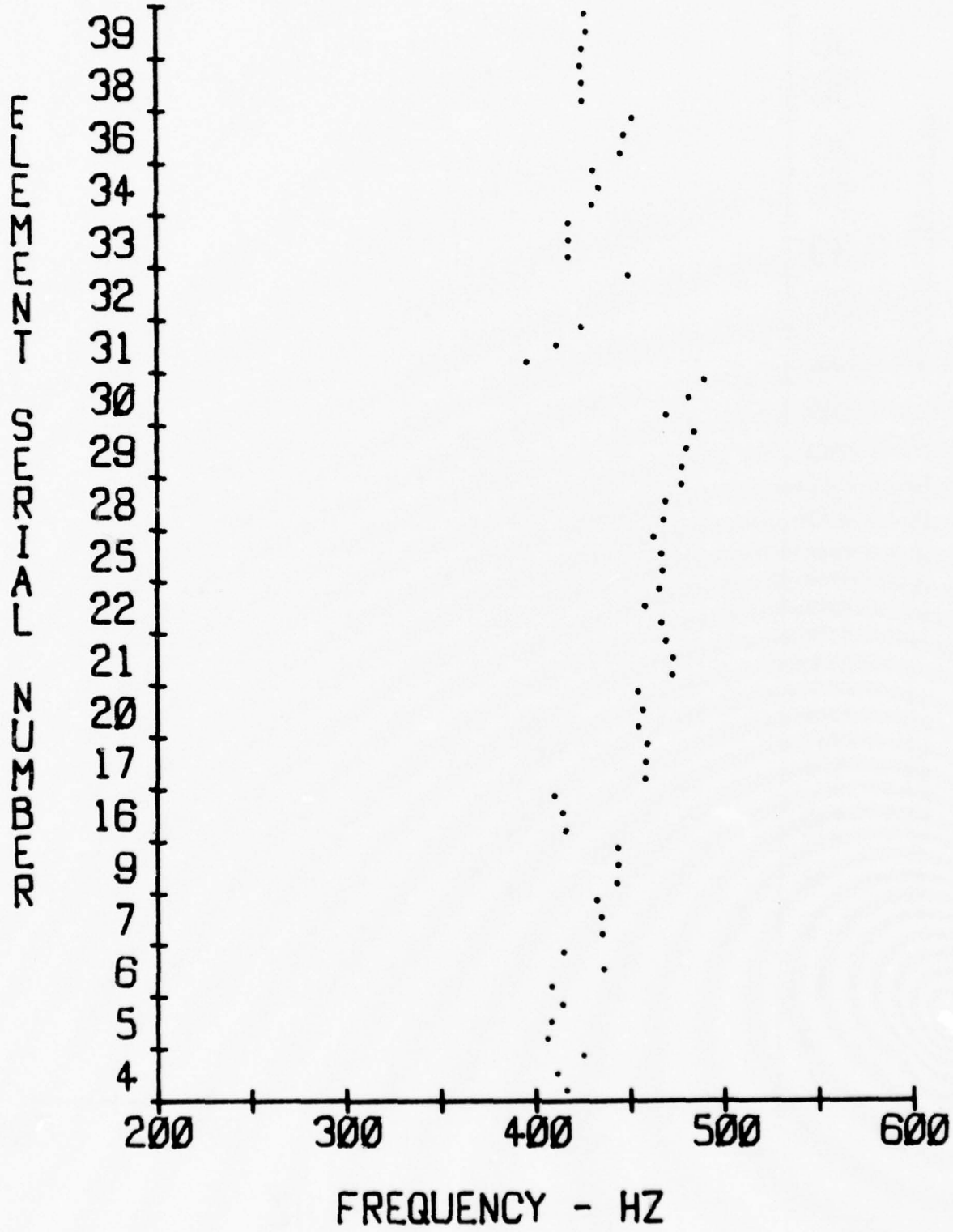
FREQUENCY VARIATION AT 0PSI DURING
HIGH TEMPERATURE (+145°F) ENVIRONMENT
REFERENCE TASK F-2



FREQUENCY VARIATION AT 0PSI DURING
BASELINE PRIOR TO LOW TEMPERATURE
ENVIRONMENT: REFERENCE TASK F-3



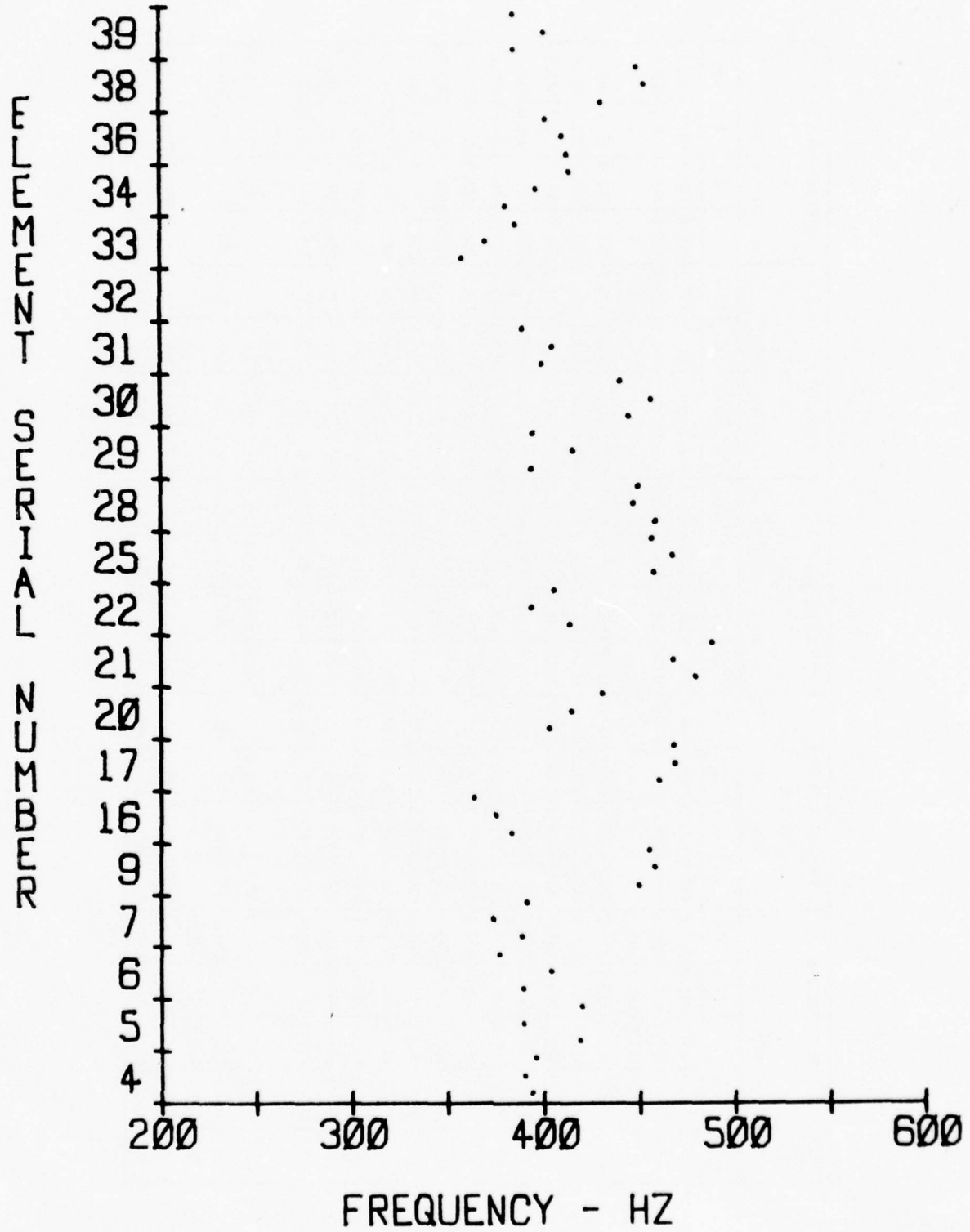
FREQUENCY VARIATION AT 0PSI DURING
LOW TEMPERATURE (-40°F) ENVIRONMENT
REFERENCE TASK F-4



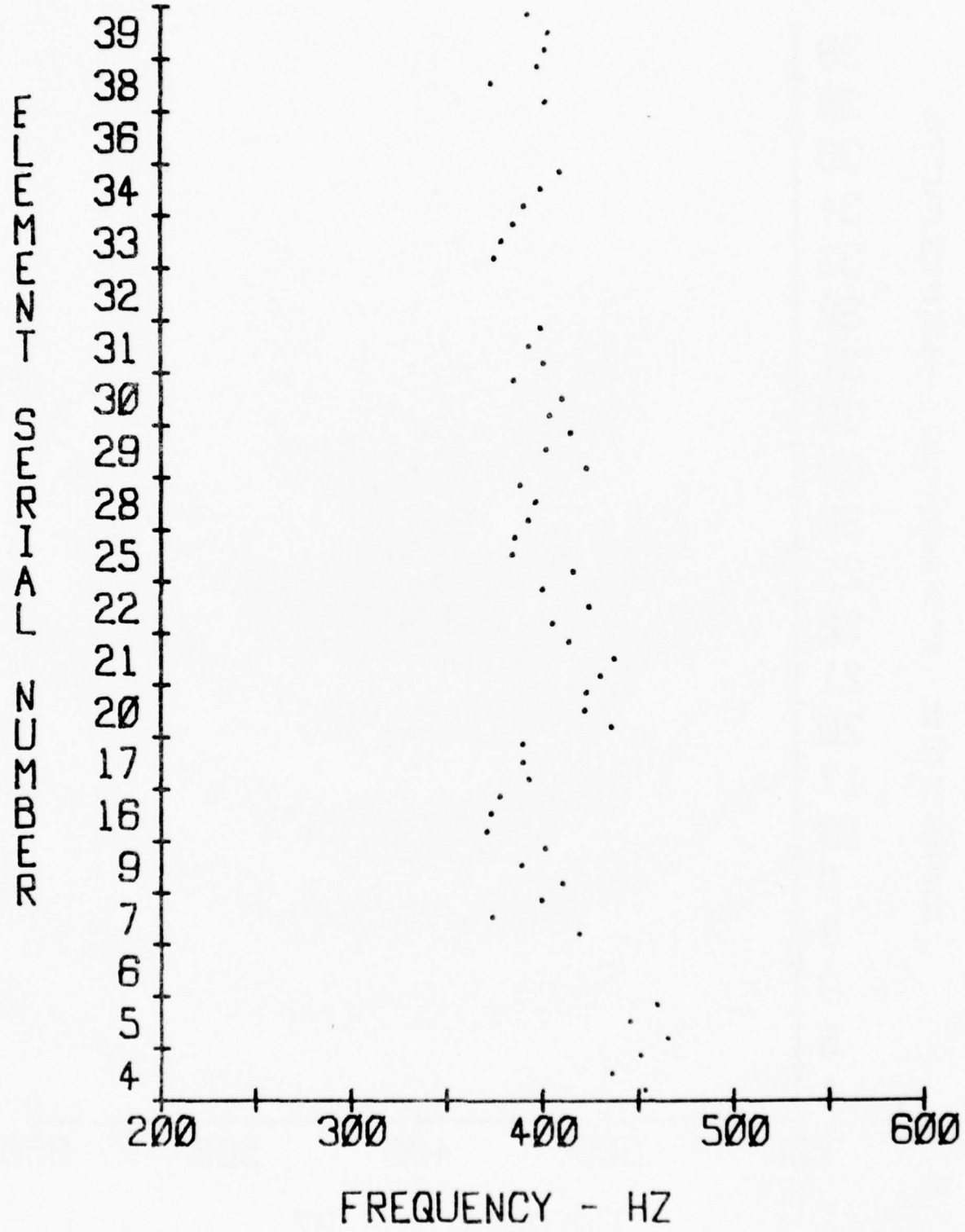
FREQUENCY VARIATION AT 0PSI DURING BASELINE TEST USING N_2 (AFTER LOW TEMPERATURE TESTING) REFERENCE TASK F-5

0 PSI

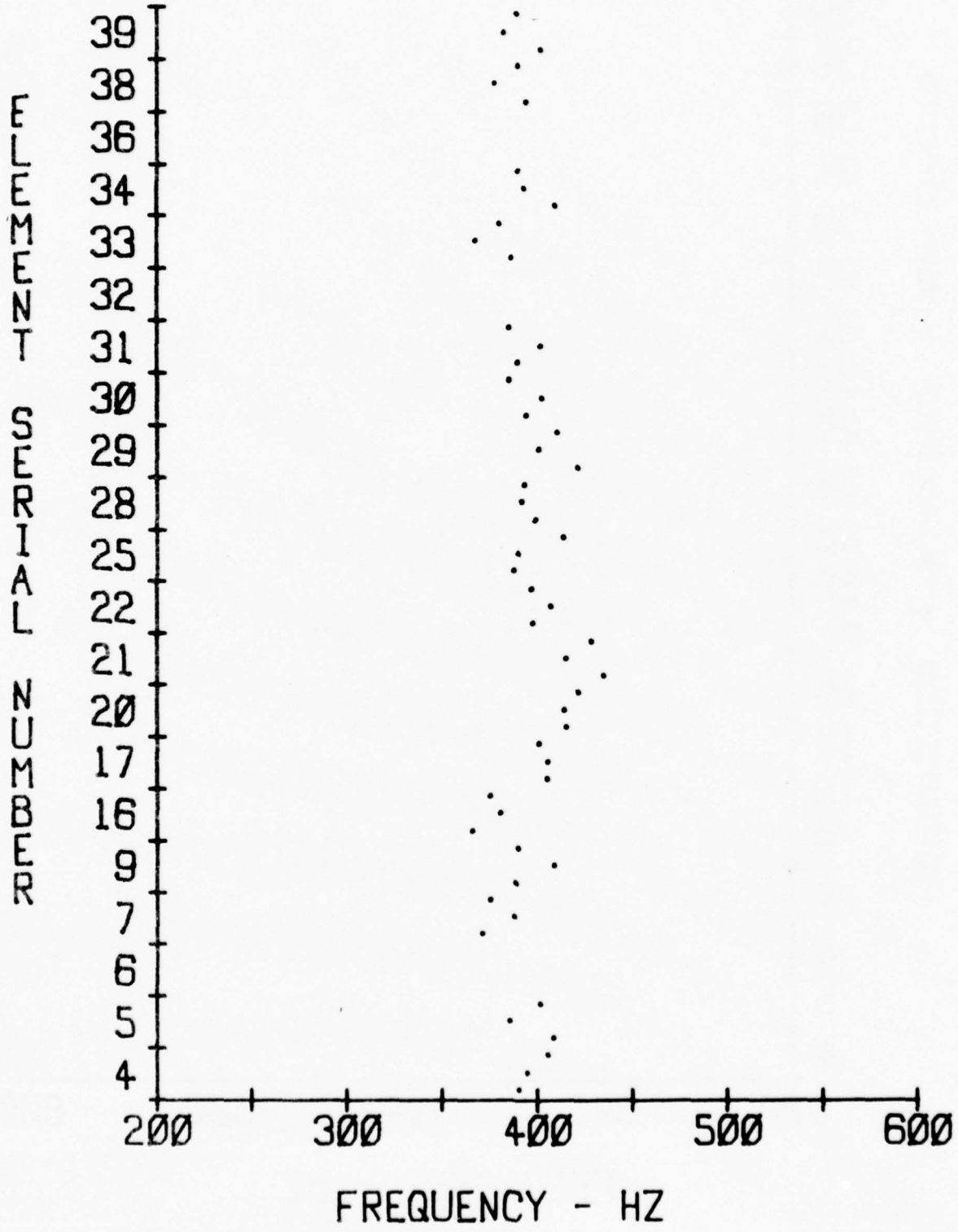
FREQ AT 0 PSI	BASELINE F-6 1809 - 1871				ACCELERATION F-7-1 +1 AXIS 1872 - 1928				ACCELERATION F-7-2 -1 AXIS 1929 - 1985				ACCELERATION F-7-3 -3 AXIS 1986 - 2042				ACCELERATION F-7-4 +3 AXIS 2043 - 2099			
S/N	1	2	3	AVG	1	2	3	AVG	1	2	3	AVG	1	2	3	AVG	1	2	3	AVG
4	393.3	389.5	395.8	392.9	452.8	435.8	451	446.5	390	394.2	405.8	396.7	384.2	390	384.2	386.1	412.5	393.3	400	401.9
5	419.2	389.2	420	409.5	465	445	460	456.7	408.3	385	401.7	398.3	385.8	390	410	395.3	422.5	393.3	408.3	408
6	389.2	404.2	376.7	390	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	389.2	373.8	391.7	384.9	419.2	374	400	397.7	370.8	388.3	375	378	400	371.2	386	385.7	399	380.8	385	388.3
9	450	458.7	455	454.6	410.8	389.2	401.7	400.6	389.2	409.2	390	396.1	390.5	403	389.2	394.2	390	406.7	389.7	395.5
16	383.3	375	364	374.1	370.8	373.3	378.3	374.1	365.8	380.8	375	373.9	365.8	385.8	364.2	371.9	365.8	389.2	366.7	373.9
17	460.8	469.2	468.3	466.1	393.3	390	390	391.1	405.8	405.8	401	404.2	399	412.5	408.3	406.6	400	400	405.8	401.9
20	403.3	415.8	431.2	416.8	436.7	422.5	423.3	427.5	415.8	414.2	421.7	417.2	433	412.5	423.3	422.9	420.8	405	432.5	419.4
21	480	468.3	489.2	479.2	430.8	438.3	414.2	427.8	435	415	429.2	426.4	423.3	422.5	427.5	424.4	424	418.3	420.8	421
22	414.5	394.3	406.7	405.2	405.8	425	400	410.3	397.5	407.5	397.2	400.7	394.2	416.7	394.5	401.8	401.7	400	408.3	403.3
25	459.2	468.3	457	461.5	416.7	384.5	385.8	395.7	387.5	390	414.2	397.2	380.8	389.2	390.5	386.8	412.5	383.3	396.7	397.5
28	459.2	447.5	450	452.2	393.3	396.7	388.5	392.8	399	391.7	393.3	394.7	393.3	380	394.2	389.2	400	412.5	379.2	397.2
29	394.2	416.7	395	401.9	424	402.5	415.8	414.1	421.7	401	410.8	411.2	401.7	401	403	401.9	415.8	401.7	395.8	404.4
30	445.8	457.5	440.8	448	404.2	410.8	385	400	394.2	403	385	394.1	400.5	380.7	394.7	391.9	382.5	377.5	385	381.7
31	400	405.8	390	398.6	401.2	393.3	400	398.2	390	402.5	385	392.5	385	404.7	383.3	391	387.5	381.7	390.8	386.7
32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
33	394.3	370.8	396.7	371.9	375	379.2	385.8	380	396.7	367.5	380.5	378.2	370.5	368.3	369.2	369.3	351	365	363.3	359.8
34	380.8	397.5	415	397.8	390.8	400	410	400.3	410	393.3	390	397.8	395.8	402	402	399.9	370	401	380.8	383.9
36	413.3	410.8	402.5	408.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
38	431.7	454.2	450	445.3	401.7	373.3	398.3	391.1	394.2	377.5	390.7	387.5	394.2	380.8	385	386.7	375	383.3	361.3	373.2
39	385.8	402	385	390.9	401.7	403.3	392.5	399.2	402.5	382.5	390	391.7	381.3	381.7	400	387.7	370.8	392.5	380.8	381.4



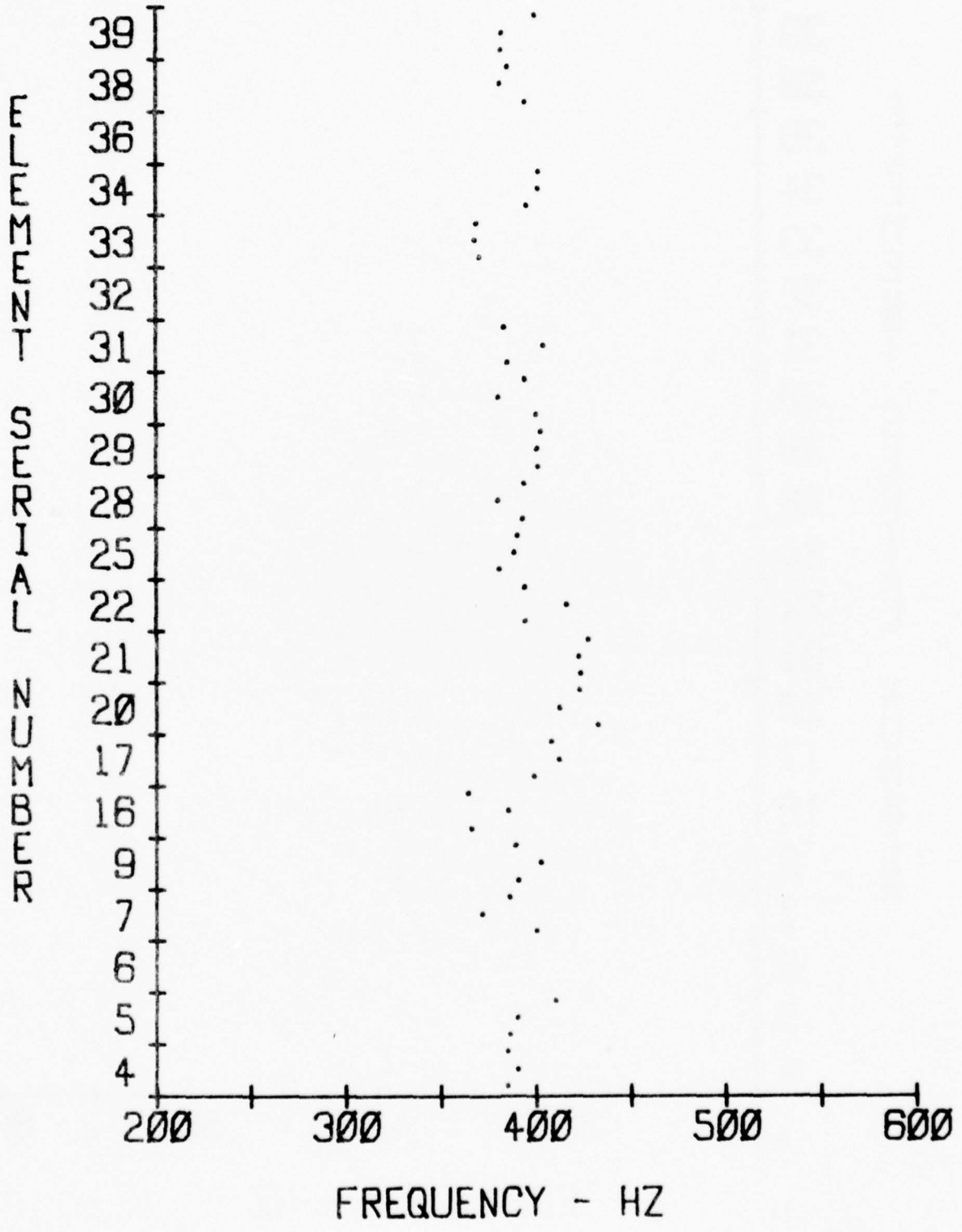
FREQUENCY VARIATION AT 0 PSI, DURING BASELINE TEST PRIOR TO ACCELERATION ENVIRONMENT REFERENCE TASK F-6.



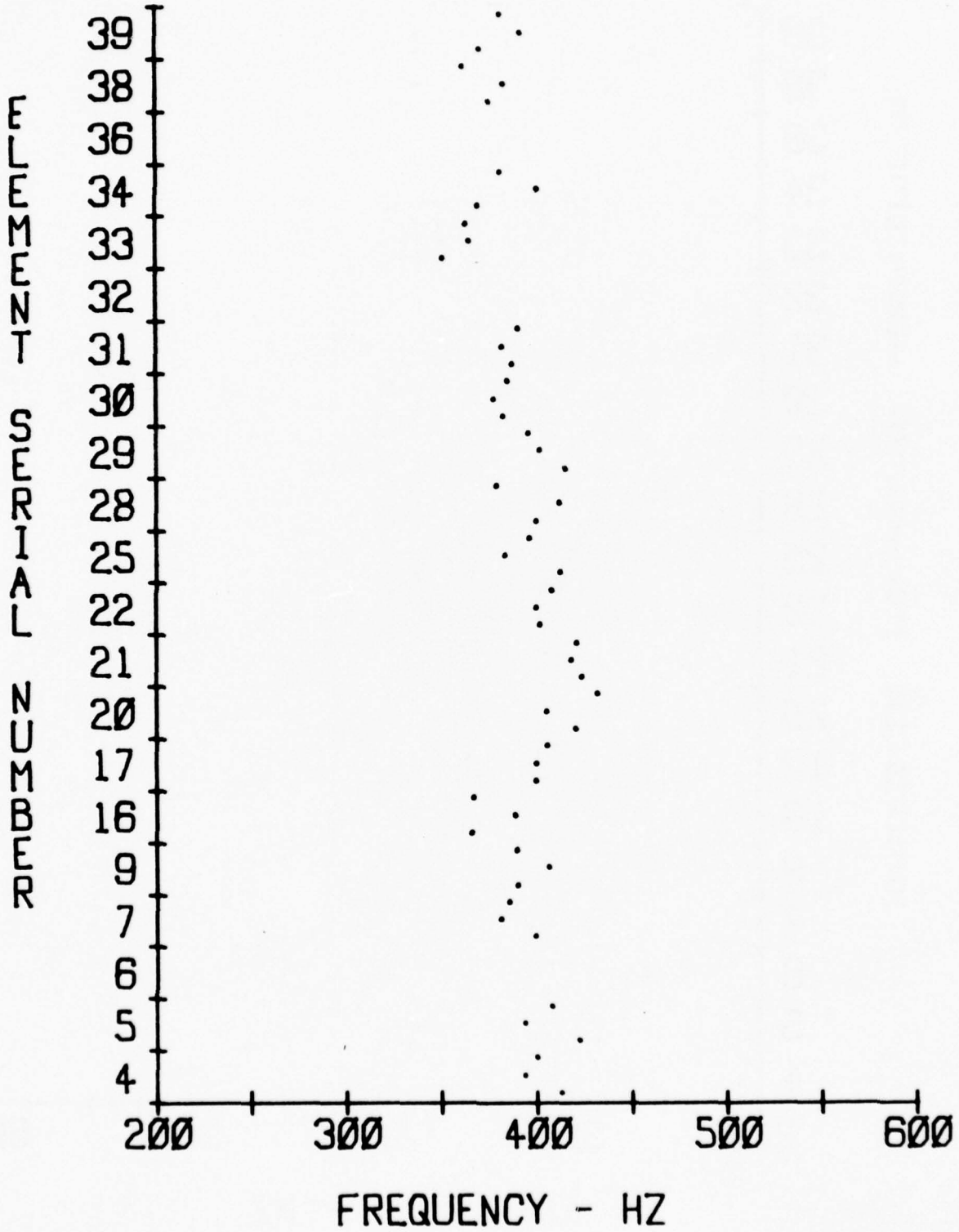
FREQUENCY VARIATION AT 0 PSI DURING +1 AXIS
ACCELERATION ENVIRONMENT, REFERENCE TASK F-7-1.



FREQUENCY VARIATION AT 0 PSI DURING -1 AXIS
ACCELERATION ENVIRONMENT, REFERENCE TASK F-7-2



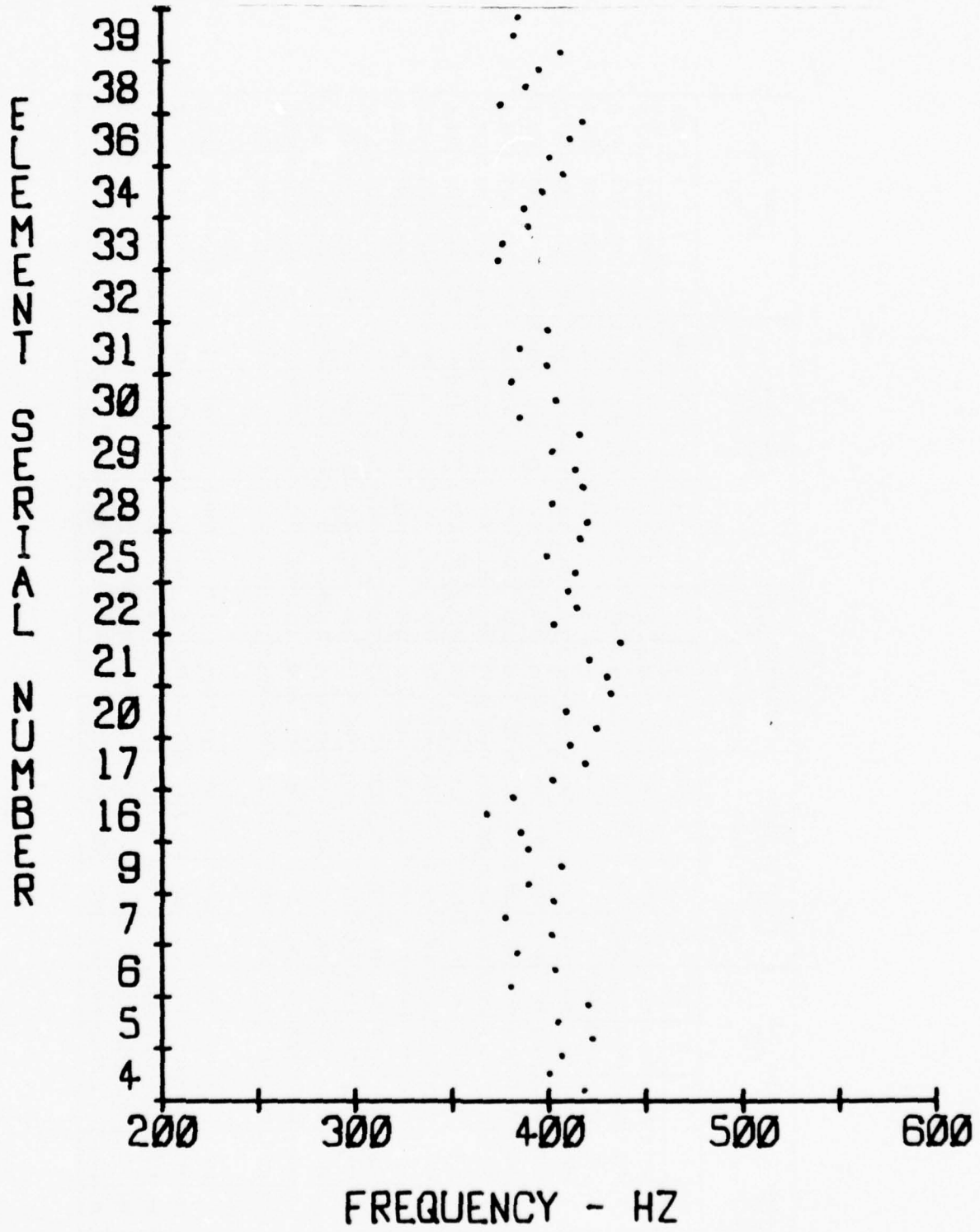
FREQUENCY VARIATION AT 0 PSI DURING -3 AXIS
ACCELERATION ENVIRONMENT, REFERENCE TASK F-7-3.



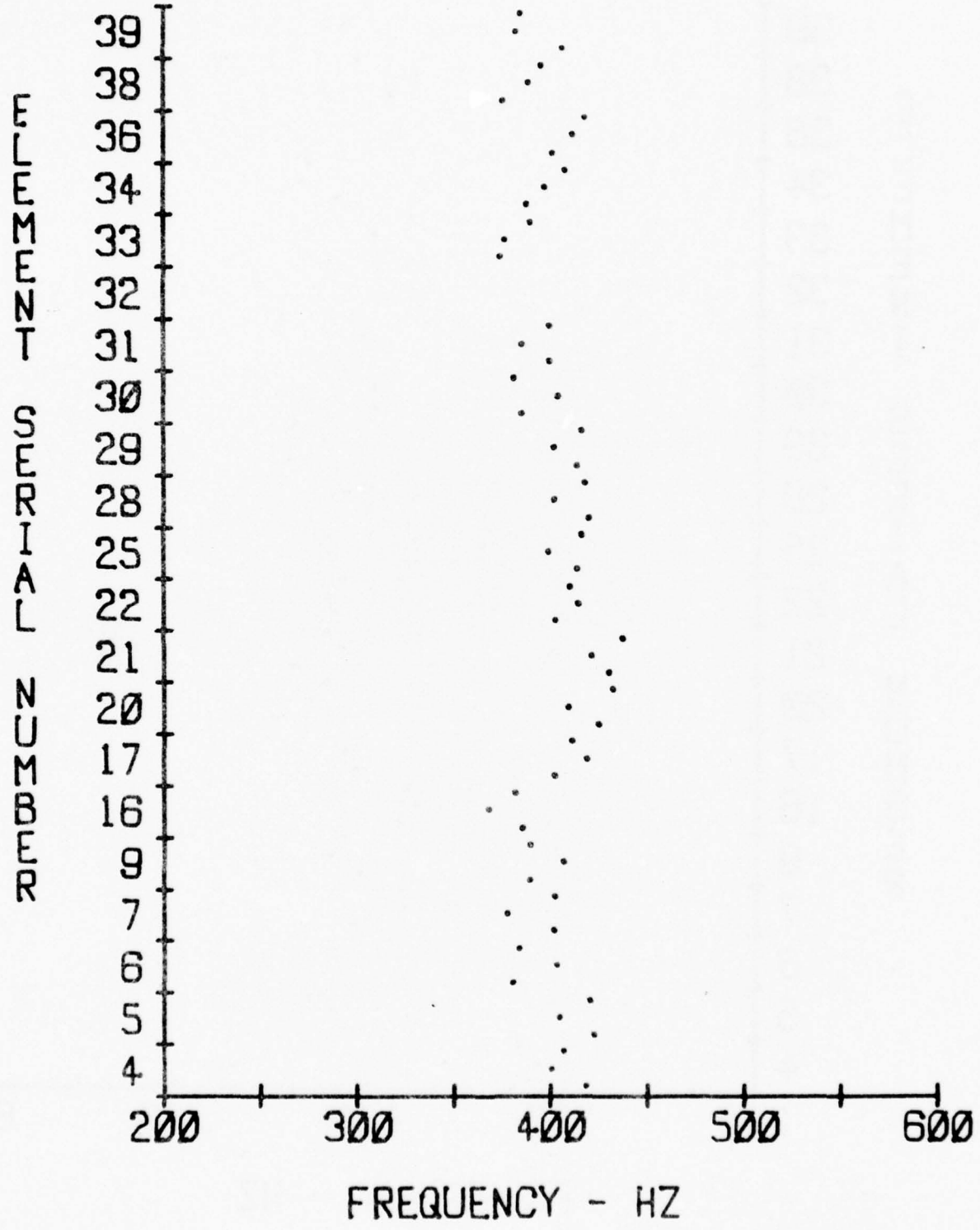
FREQUENCY VARIATION AT 0 PSI DURING +3 AXIS
ACCELERATION ENVIRONMENT, REFERENCE TASK F-7-4.

0 PSI

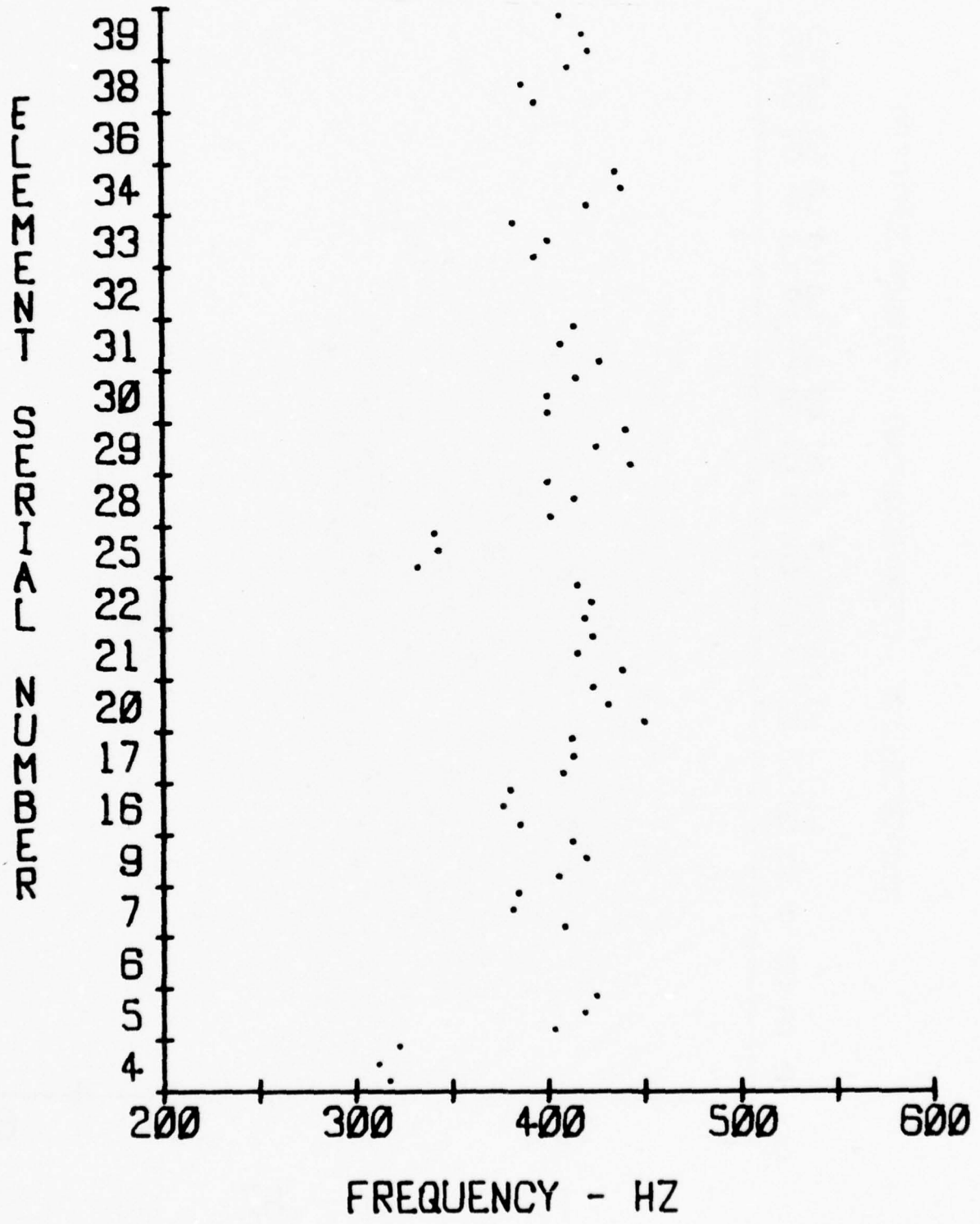
Freq @ 0 PSI	Baseline F-8 2100 - 2162				Vibration Random 2163 - 2234 Axis 3 F-9-1				Vibration Random 2235 - 2306 Axis 1 F-9-2				Baseline 2307 - 2369 F-10				Baseline 2370 - 2552 F-11			
S/N	1	2	3	AVG	1	2	3	AVG	1	2	3	AVG	1	2	3	AVG	1	2	3	AVG
4	417.5	400	406.7	408.1	390.3	400	395.7	395.3	316.7	310.8	322.5	316.7	331.7	333.3	331.7	332.2	317.5	322.5	318.3	319.4
5	422.5	404.2	420.4	415.7	394.2	413.3	404.2	403.9	403.3	419.2	425	415.8	416.7	410	415	413.9	409.2	411.3	414.2	411.6
6	380	403.3	383.3	388.9	-	-	-	-	-	-	-	-	403.3	388.3	405.8	399.1	395.8	394.2	400	396.7
7	401.7	377	402.5	393.7	399	383.3	402.5	394.9	408.3	381.2	384.2	391.2	385.8	405.8	395	395.5	385	371.7	387.5	381.4
9	389.2	406.7	389.2	395	391.7	401	400	397.6	405.8	420	412.5	412.8	415	395.8	401	403.9	399	399	400	399.3
16	385	367.5	381.7	378.1	362.5	369.2	383.3	371.7	385	376	380	380.3	399	377.5	380.8	385.8	379.2	380	375	378.1
17	402.5	419.2	410.8	410.8	407.5	428.3	405.8	413.7	408.3	413.3	412.5	411.4	430	404.2	423.3	419.2	415	413.7	416.7	415.1
20	425	409	432.5	422.2	423.3	443.3	417.5	428	450	430.8	423.3	434.7	423.3	432.5	437.5	431.1	369.2	369.2	366.7	368.4
21	430	420.8	437.5	429.2	434.2	439.2	441.7	438.4	439.2	415	424	426.1	432.5	425	418.3	425.3	422.5	421.7	423.3	422.5
22	402.5	414.7	410	409.1	419.2	410.8	414.2	414.7	419.2	422.5	415	418.9	425	441.7	410.8	425.8	412.5	414.2	415	413.9
25	413.7	399	416.7	409.8	319.2	308.3	332.5	320	331.7	343.3	340.8	338.6	342.6	335.8	311.7	330	319.2	323.3	323.3	321.9
28	420	401.7	418.3	413.3	405.8	410	385	400.3	401.7	414.2	400	405.3	408.3	421.7	400	410	415	410	409.2	411.4
29	413.7	401.7	416.7	410.7	395	431.7	414.2	413.6	443.3	425	440.8	436.4	412.5	430.8	414.2	419.2	405	401.7	401.7	402.8
30	385	404.2	380.8	390	399	400	392.5	397.2	400	400	415.3	405.1	421.7	400	407.5	409.7	400	394.2	391.7	395.3
31	400	385	400	395	410	389.2	409.2	402.8	427.5	406.7	414.2	416.1	419.2	407.5	423.3	416.7	398.3	400	401.7	400
32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
33	374	376	390	380	375	400	370	381.7	393.3	401	381.7	392	380.8	394.3	401.7	392.3	380.8	381.7	375	379.2
34	387.5	397.5	408.3	397.8	426.7	400	416.7	414.5	420.8	439.2	435	431.7	412.5	435.8	404.2	417.5	393.3	393.3	390	392.2
36	401	412	418.3	410.4	-	-	-	-	-	-	-	-	415	425	420	420	402.5	401.7	406.7	403.6
38	375	389.2	395.8	386.7	409.2	400	401.7	403.6	393.3	386.7	411.3	397.1	375	410	374	386.3	390	389.2	385.8	388.3
39	406.7	381.7	384.2	390.9	392.5	401	400	397.8	421.9	418.3	406.7	415.6	415	404.2	420.8	413.3	394.2	393.3	394.2	393.9



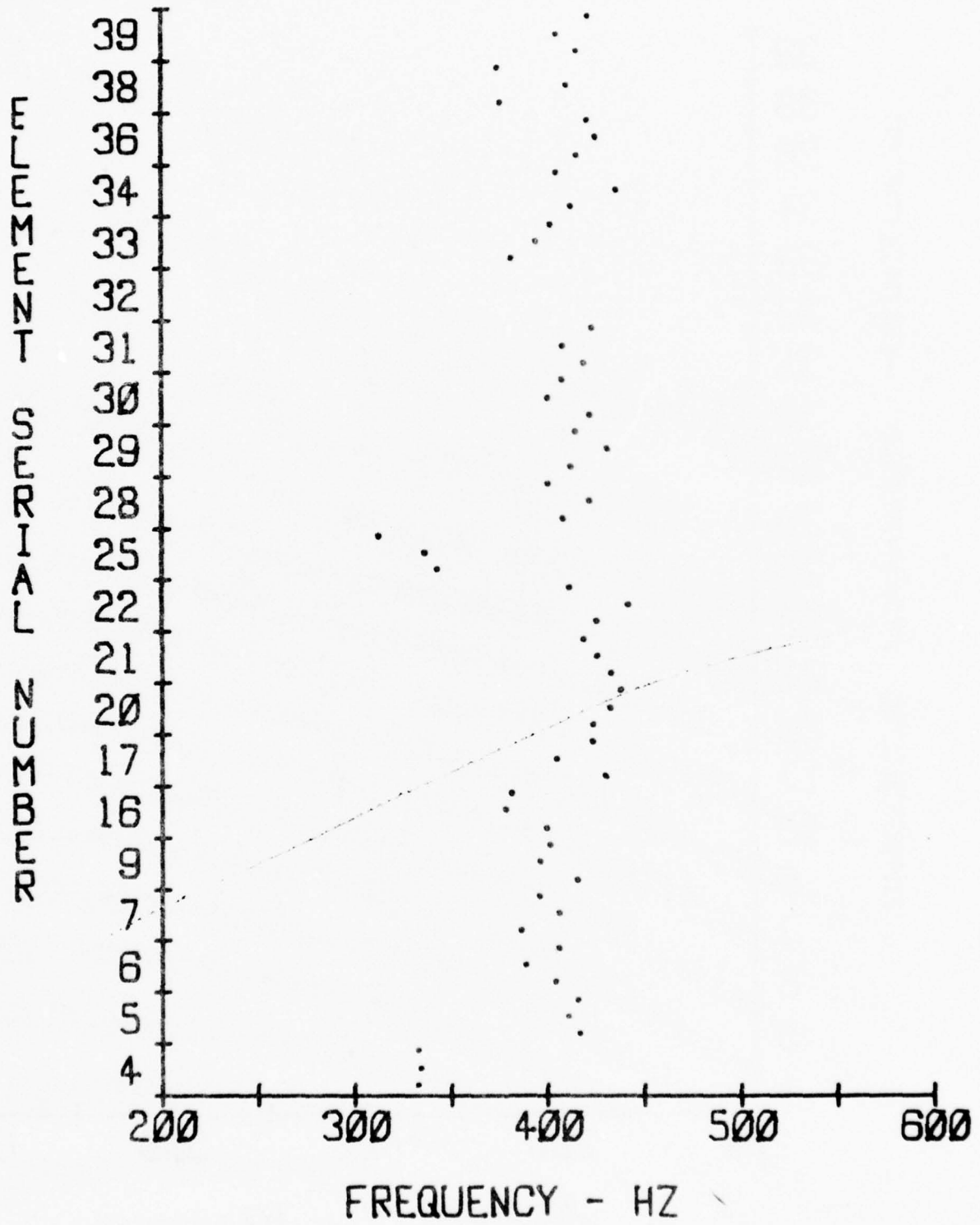
FREQUENCY VARIATION AT 0 PSI DURING
BASELINE TEST PRIOR TO VIBRATION ENVIRONMENT.
REFERENCE TASK F-8



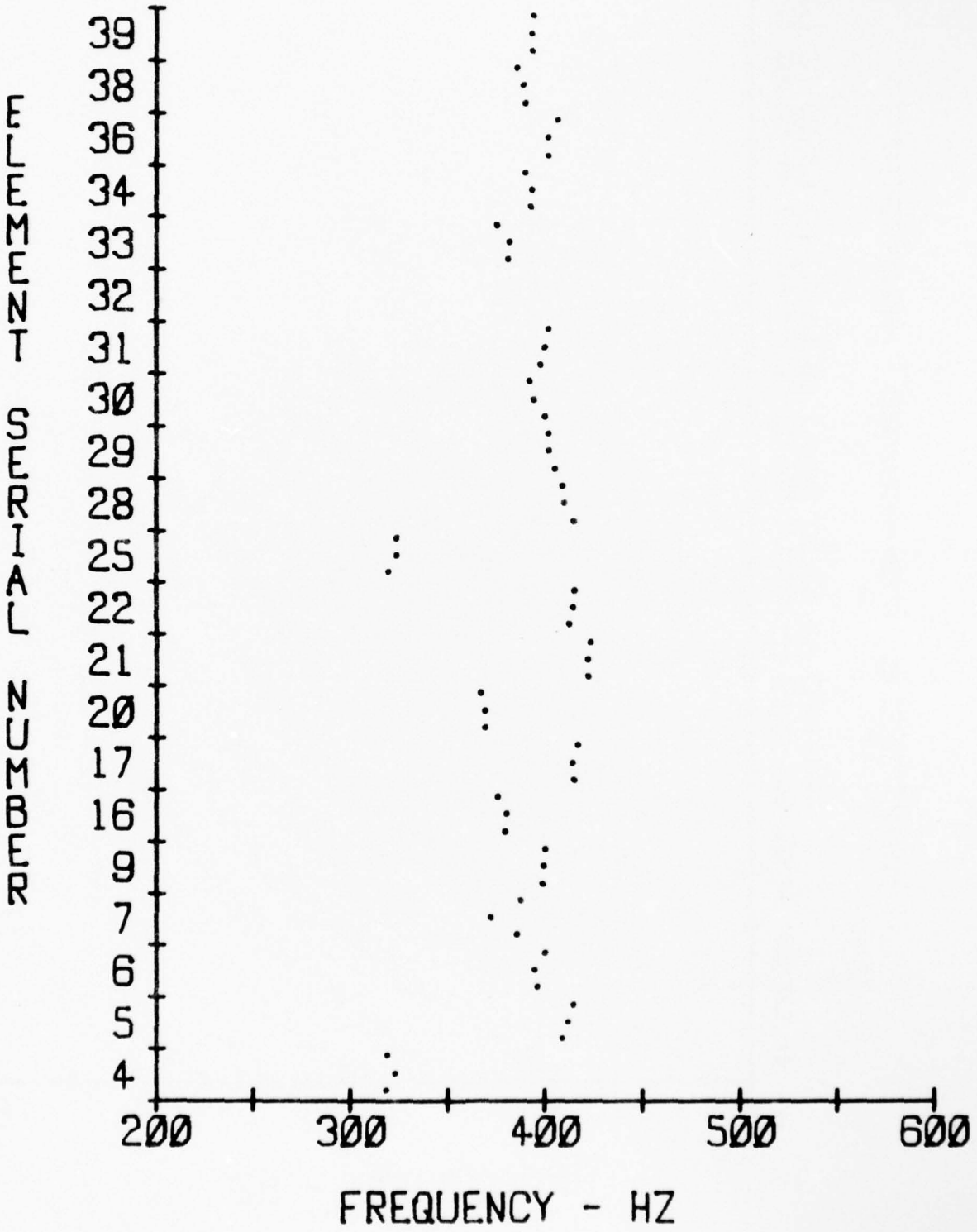
FREQUENCY VARIATION AT 0 PSI DURING AXIS 3
OF RANDOM VIBRATION ENVIRONMENT, REFERENCE
TASK F-9-1



FREQUENCY VARIATION AT 0 PSI DURING AXIS 1
OF RANDOM VIBRATION ENVIRONMENT, REFERENCE
TASK F-9-2



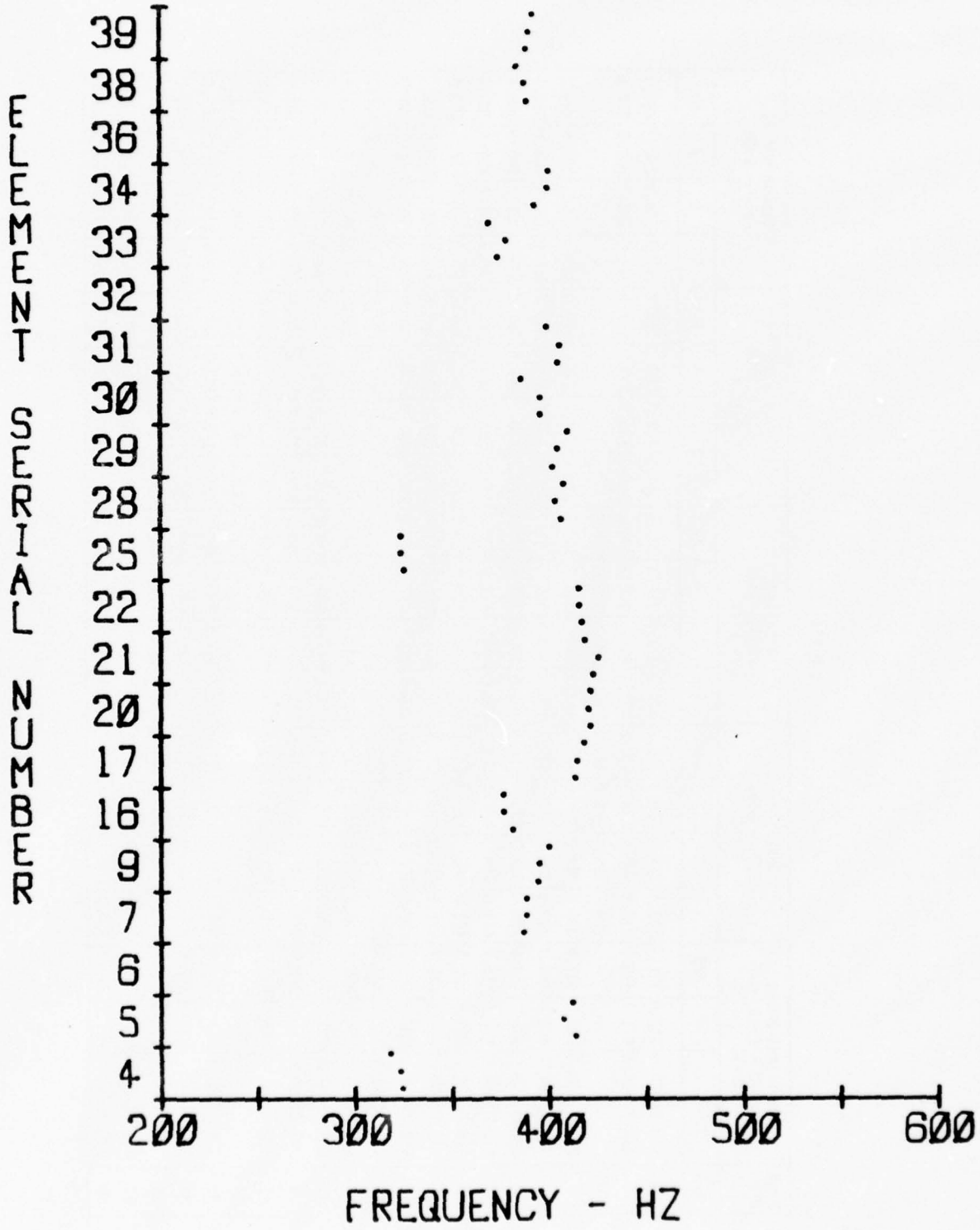
FREQUENCY VARIATION AT 0 PSI DURING BASELINE TEST, AFTER RANDOM VIBRATION ENVIRONMENT, REFERENCE TASK F-10



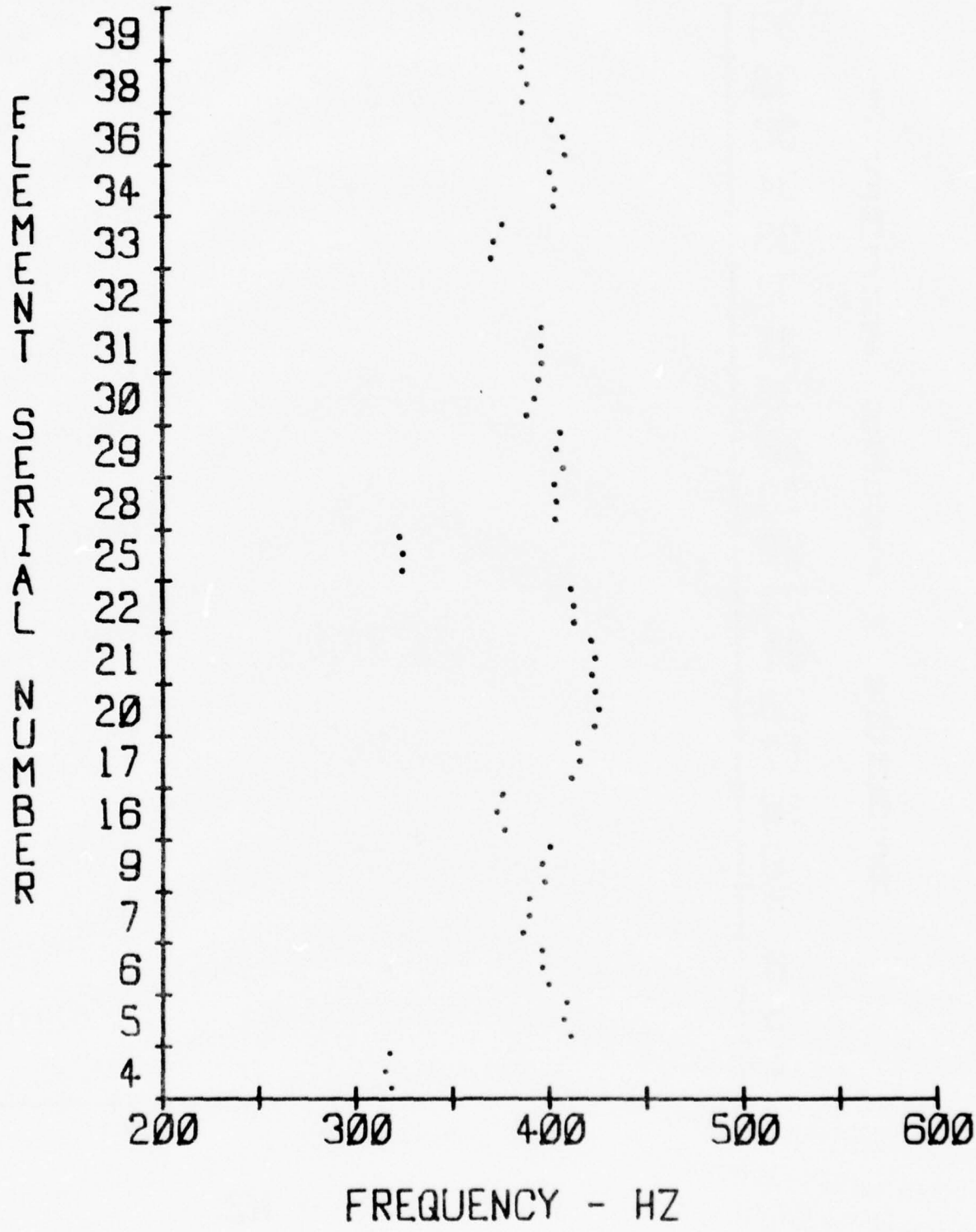
FREQUENCY VARIATION AT 0 PSI DURING
BASELINE TEST PRIOR TO ACOUSTICAL NOISE
ENVIRONMENT, REFERENCE TASK F-11

0 PSI

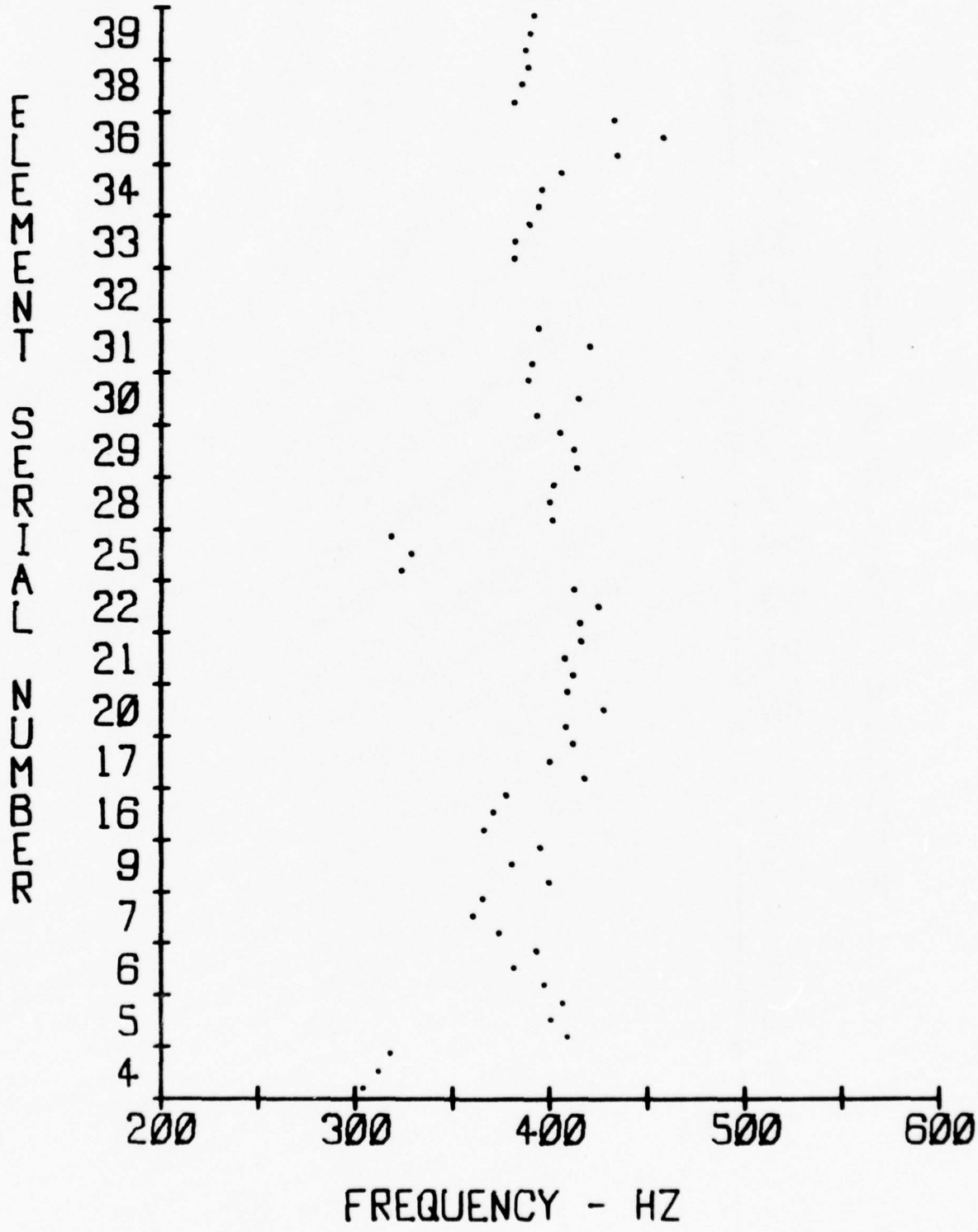
Freq @ 0 PSI	Acoustical Noise 2370 - 2552 F-12				Baseline 2370 - 2552 F-13				Baseline 2553 - 2615 F-14				Altitude 90K Ft 2616 - 2906 F-15-1				Altitude 50K Ft 2616 - 2906 F-15-2			
S/N	1	2	3	AVG	1	2	3	AVG	1	2	3	AVG	1	2	3	AVG	1	2	3	AVG
4	323.3	322.5	317.5	321.1	317.5	314.2	316.7	316.1	303.3	311.7	317.5	310.8	248.3	273.3	250	257.2	261.3	272.5	250	261.3
5	413.7	406.7	411.7	410.7	410.8	406.7	408.3	408.6	409.2	400	406.7	405.3	366.7	336.7	350	351.1	341.7	353.3	362.5	352.5
6	-	-	-	-	399	395.8	395.8	396.9	396.7	380.8	393.3	390.3	-	-	-	-	-	-	-	-
7	386.7	388.3	388.3	387.8	385.8	389.2	389.2	388.1	373.3	360	365	366.1	339.2	317.5	330	328.9	325	339.2	320.8	328.3
9	394.2	394.7	400	396.3	397.5	395.8	400	397.7	400	380	395	391.7	365	366.7	357.5	363.1	355.8	350	362.5	356.1
16	380.8	376	376	377.6	376	372.2	375	374.4	365.8	370.8	377.5	371.4	370	370	362.5	367.5	375	365	365.8	368.6
17	413.8	414.2	417.5	415.2	411.2	415	414.2	413.5	418.3	400	412.5	410.3	375	388.3	385.8	383	385.8	391.7	369.7	382.4
20	420.8	420	420.8	420.5	423.3	425	423.3	423.9	408	428.3	409.2	415.2	381.7	384.2	388.3	384.7	390	371.7	375	378.9
21	422.5	425	418.3	421.9	421.2	423.3	420.8	421.8	411.7	407.5	416.7	411.9	368.3	383.8	368.3	373.5	383.3	383	370.8	379
22	416.7	415	415	415.6	412.5	412.5	410.8	411.9	415.8	425	412.5	417.8	375	361.7	368.3	368.3	364.2	384.2	366.7	371.7
25	325	323.3	323.3	323.9	323.3	324	321.7	323	323.3	329.2	318.3	323.6	302.5	275	300	292.5	289.2	285	289.2	287.8
28	406.7	403.3	407.5	405.8	403.3	403.3	402.5	403	401.7	400	401.7	401.1	370.8	361.7	375	369.2	355.8	365.8	375	365.5
29	401.7	404.2	410	405.3	406.7	403.3	405	405	414.2	412.5	405	410.6	376	394.2	365	378.4	382.5	394.2	383.3	386.7
30	395.8	395.8	385.8	392.5	388.3	391.7	394.2	391.4	393.3	415	389.2	399.2	330	329.2	314.2	324.5	327.5	323.3	314.2	321.7
31	405	405.8	399	403.3	395.8	395.8	395.8	395.8	390.8	420.8	394.2	401.9	343.3	328.4	345	338.9	330	353.3	331.7	338.3
32	-	-	-	-	-	-	-	-	-	-	-	-	369.2	406.7	414.2	396.7	412.5	406.7	411.7	410.3
33	374	378.3	369.2	373.8	369.7	370.8	375	371.8	381.7	382.5	390	384.7	358.3	370.8	363.3	364.1	370.8	370	367	369.3
34	393.3	400	400	397.8	402.5	402.5	400	401.7	394.2	396.3	406.7	399.1	353.3	363.3	350	355.5	355.8	367.5	339	354.1
36	-	-	-	-	408.3	406.7	401	405.3	435	459.2	433.3	442.5	-	-	-	-	-	-	-	-
38	389.2	387.5	383.8	386.8	385.8	388.3	385	386.4	381.7	385.8	389.2	385.6	295.8	305.8	330	310.5	341.7	294.5	310	315.4
39	389.2	390	391.7	390.3	385.8	385	383.3	384.7	387.5	390	391.7	389.7	350	344.2	360	351.4	335	353.3	360.8	349.7



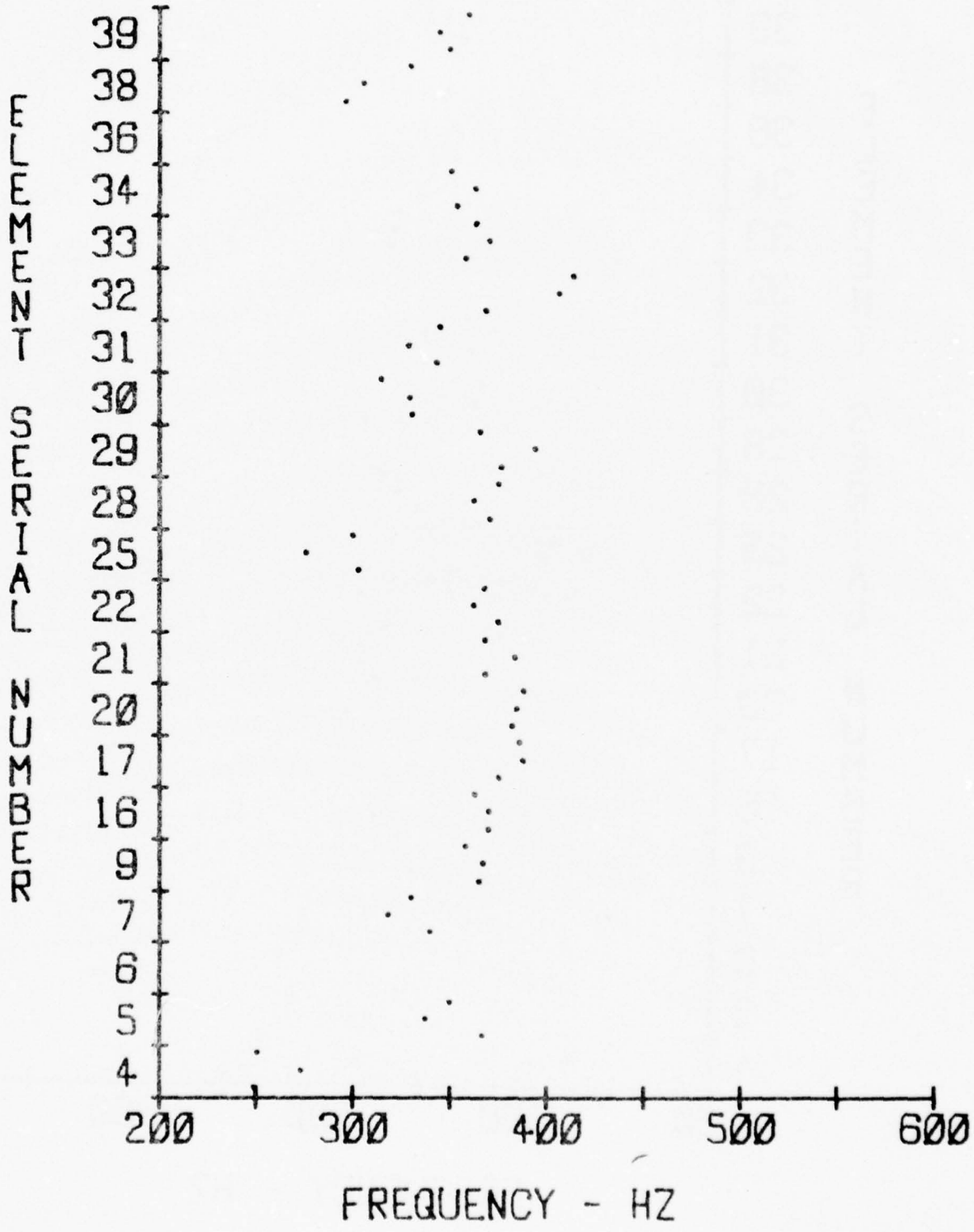
FREQUENCY VARIATION AT 0 PSI DURING
ACOUSTICAL NOISE ENVIRONMENT, REFERENCE
TASK F-12



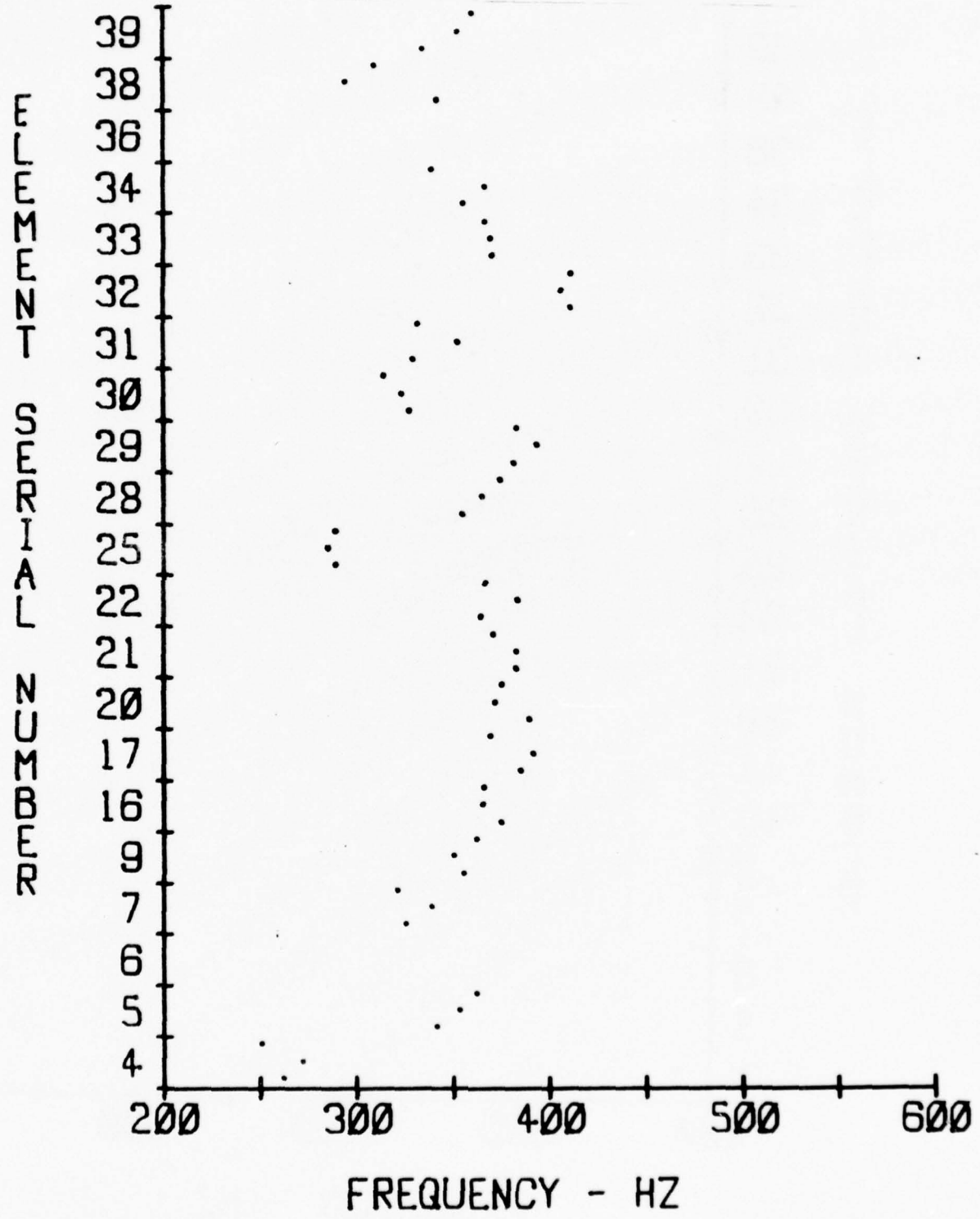
FREQUENCY VARIATION AT 0 PSI. DURING BASELINE TEST AFTER ACOUSTICAL NOISE ENVIRONMENT, REFERENCE TASK F-13



FREQUENCY VARIATION AT 0 PSI DURING BASELINE
TEST PRIOR TO ALTITUDE ENVIRONMENT
REFERENCE TASK F-14



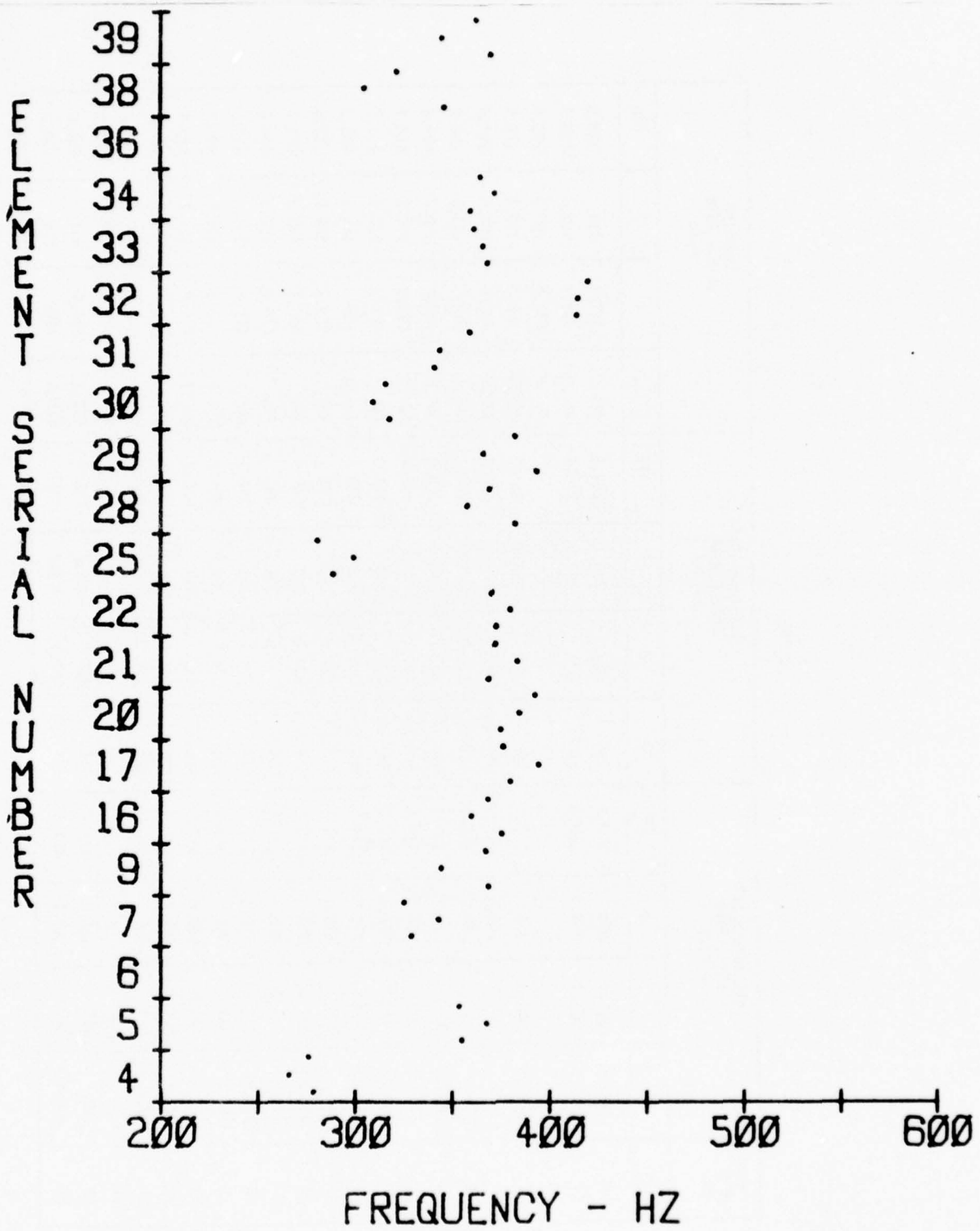
FREQUENCY VARIATION AT 0 PSI, DURING 90K FT
ALTITUDE ENVIRONMENT, REFERENCE TASK F-15-1



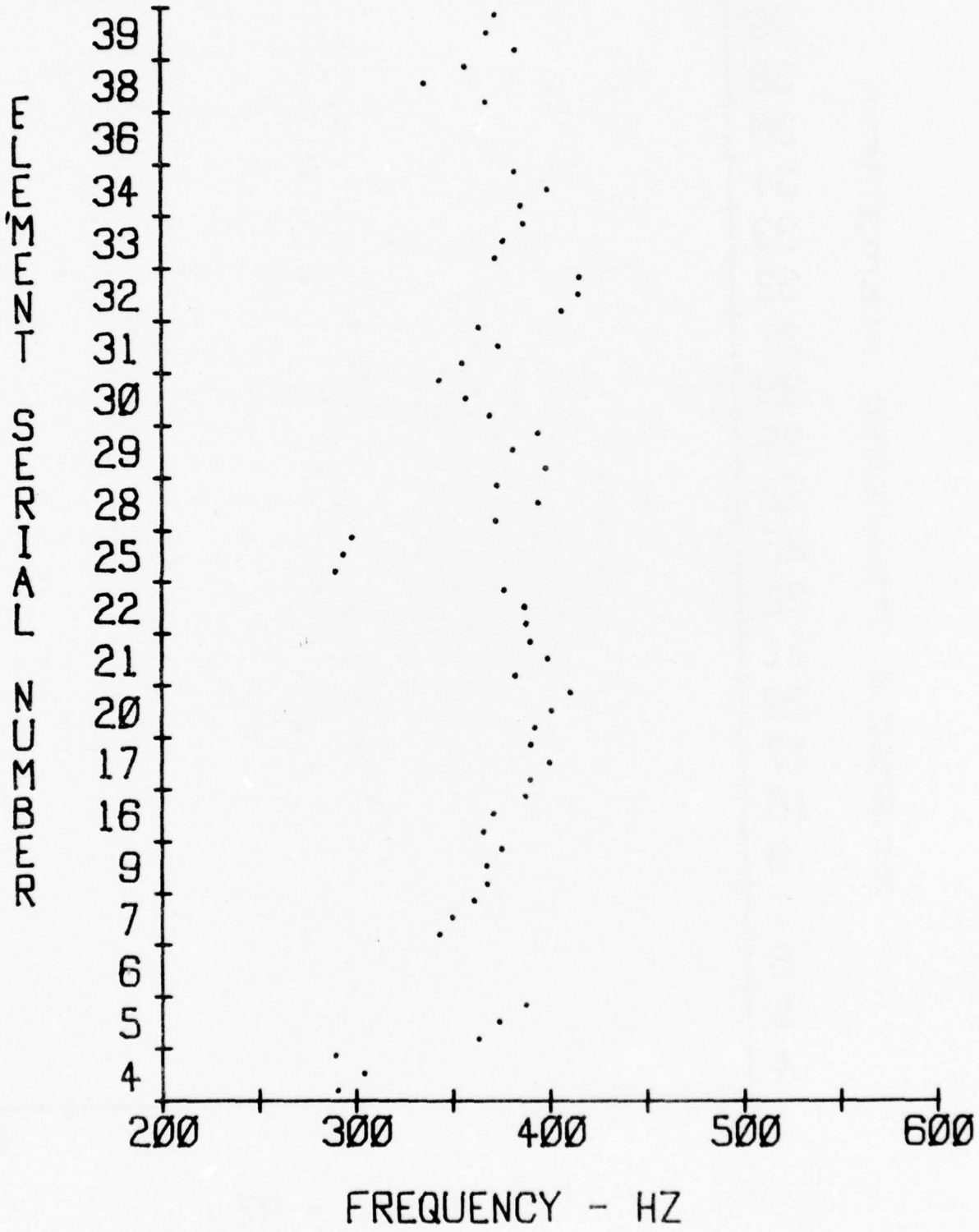
FREQUENCY VARIATION AT 0 PSI, DURING 50K FT
ALTITUDE ENVIRONMENT, REFERENCE TASK F-15-2

0 PSI

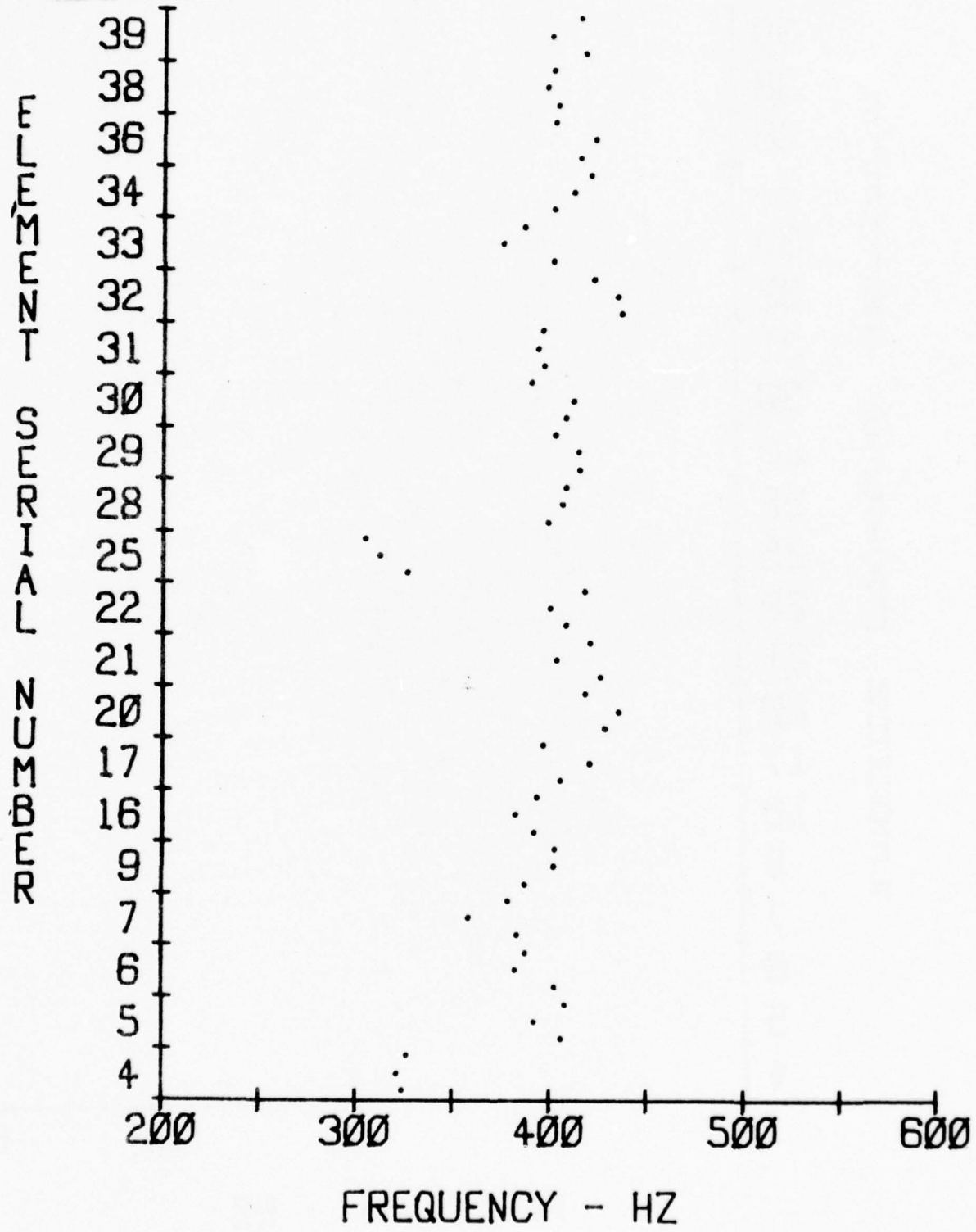
Freq. @ 0 PSI	Altitude 25KFT 2616 - 2906 F-15-3				Altitude 10KFT 2616 - 2906 F-15-4				Baseline 2616 - 2906 F-16			
S/N	1	2	3	AVG	1	2	3	AVG	1	2	3	AVG
4	278.3	265.8	276	273.4	290	304.2	289.2	294.5	324	320.8	326	323.6
5	355	368.3	353.3	358.9	363.3	374	387.5	374.9	406.3	391.7	408.3	402.1
6	-	-	-	-	-	-	-	-	402.5	382.5	387.5	390.8
7	329.2	343.3	325	332.5	343	350	360.8	351.3	383.3	358.3	379.2	373.6
9	369.2	344.2	368.3	360.6	368.3	367.5	375	370.3	387.5	402.5	402.5	397.5
16	376	360	369.2	368.4	365.8	370.8	387.5	374.7	391.7	382.5	393.7	389.2
17	380.8	395	376.7	384.2	390	400	390	393.3	405.8	420.8	396.7	407.8
20	375	385	393.3	384.4	392.5	401	410.8	401.4	428.4	435.8	418.3	427.5
21	369.2	384.2	372.5	375.3	382.5	399	390	390.5	426	403.3	420.8	416.7
22	373.3	380.8	370.8	374.9	387.5	386.7	376	383.4	408.3	400	418.3	408.9
25	289.2	300	280.8	290	289.2	293.3	298	293.5	326	311.7	304.2	313.9
28	383.3	358.3	370	370.5	372.5	394.2	373	379.9	399	406.7	408.3	404.7
29	394.2	366.7	383.3	381.4	398	380.8	394.2	391	415	414.2	402.5	410.6
30	318.3	310	316.7	315	369.2	356.7	343	356.3	408.3	411.7	390	403.3
31	341.7	344.2	360	348.6	355	374	363.3	364.1	396.7	393.3	395.8	395.3
32	415	415.8	420.8	417.2	406.7	415	415	412.2	436.7	434.2	421.7	430.9
33	369.2	366.7	361.7	365.9	371.7	376	386.7	378.1	401	375	386.7	387.6
34	360	373	365	366	385	399	381.7	388.6	402	412.5	420.8	411.8
36	-	-	-	-	-	-	-	-	415	423.3	402	413.4
38	346.7	305	322.5	324.7	367	335	356.7	352.9	408.3	397.5	401	400.6
39	370.8	345	363.3	359.7	383	367.5	371.7	374	417.5	400	415	410.8



FREQUENCY VARIATION AT 0 PSI DURING 25K FT
ALTITUDE ENVIRONMENT, REFERENCE TASK F-15-3



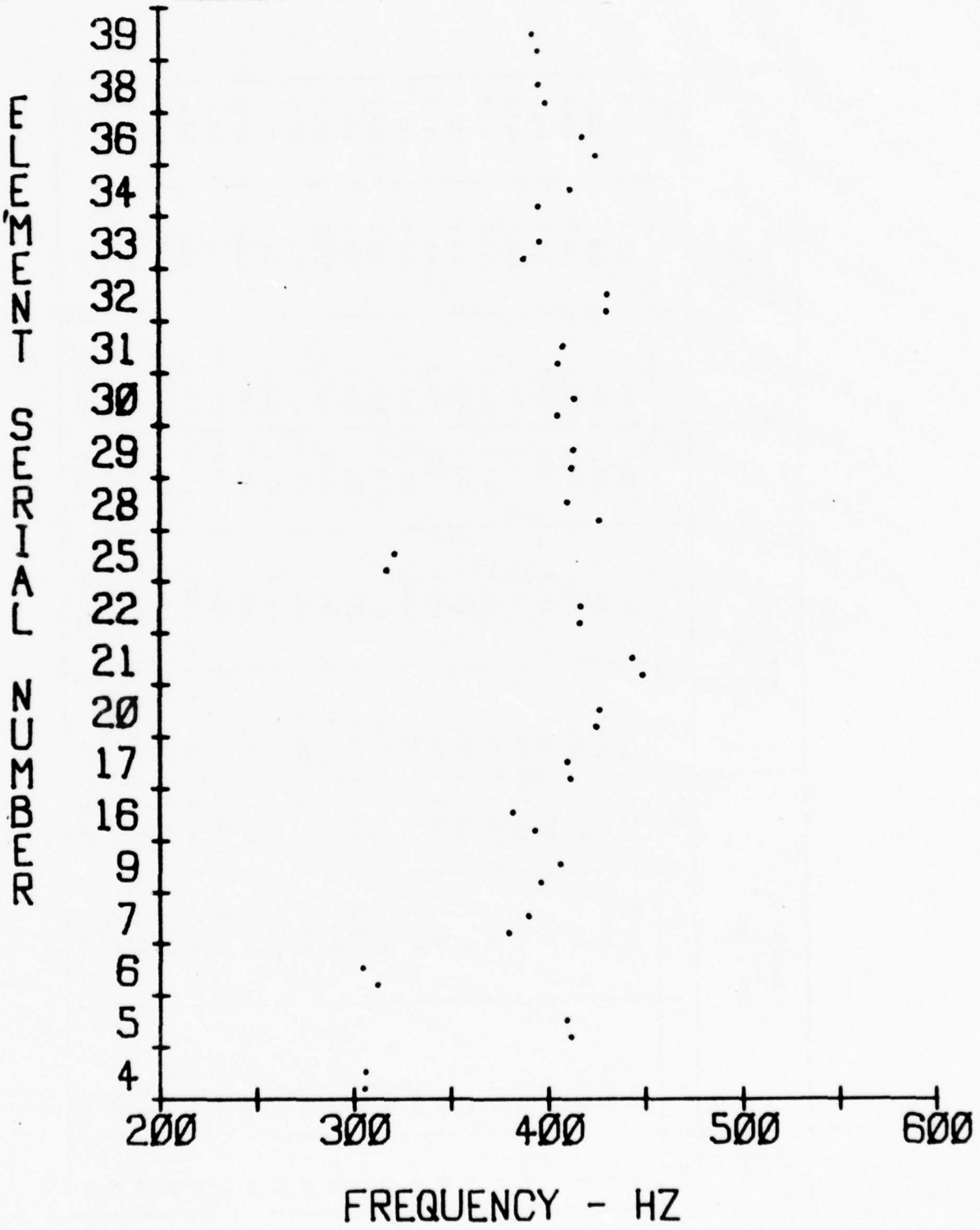
FREQUENCY VARIATION AT +0 PSI DURING 10K FT
ALTITUDE ENVIRONMENT, REFERENCE TASK F-15-4



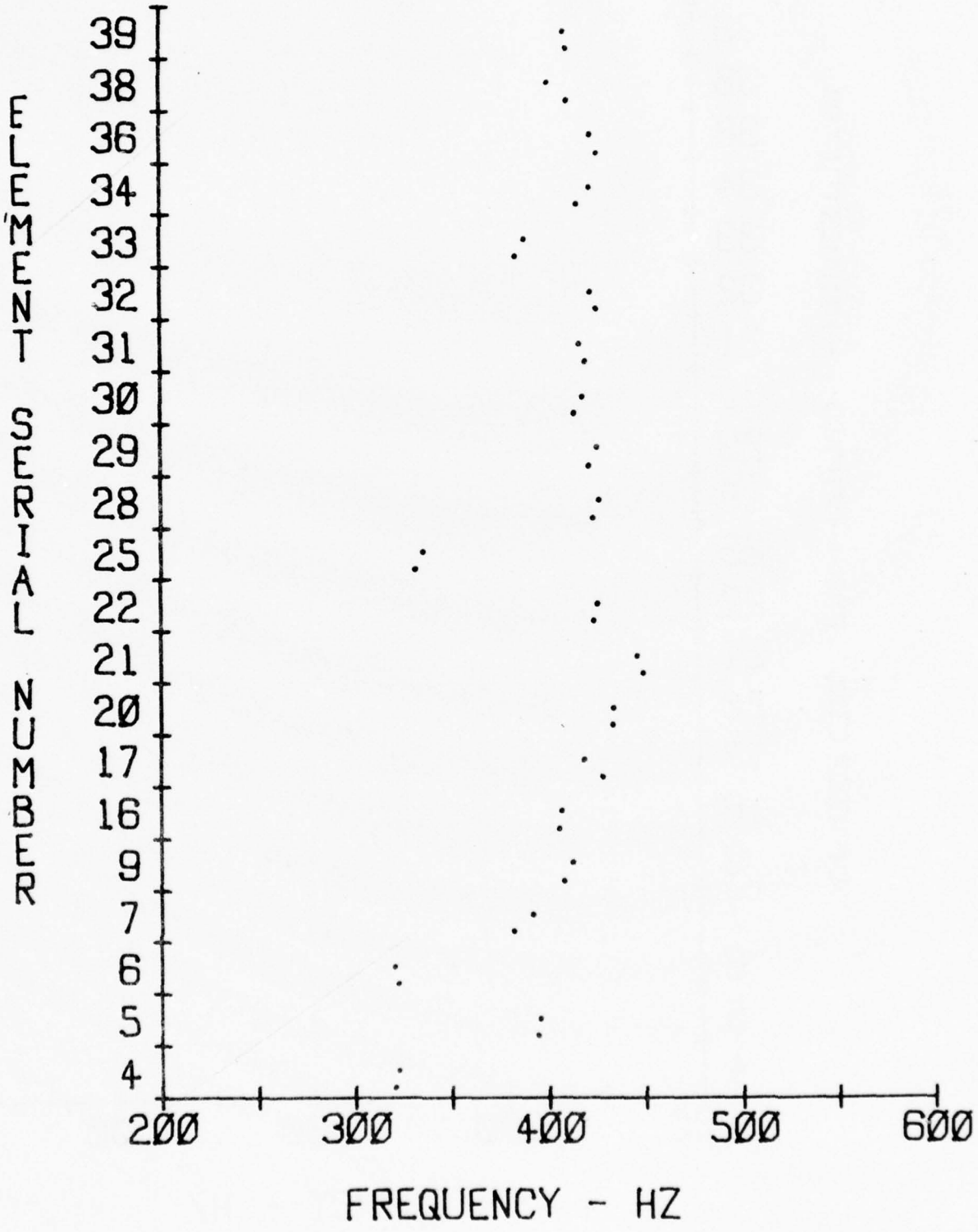
FREQUENCY VARIATION AT 0 PSI DURING BASELINE TESTING AFTER ALTITUDE ENVIRONMENT, REFERENCE TASK F-16

0 PSI

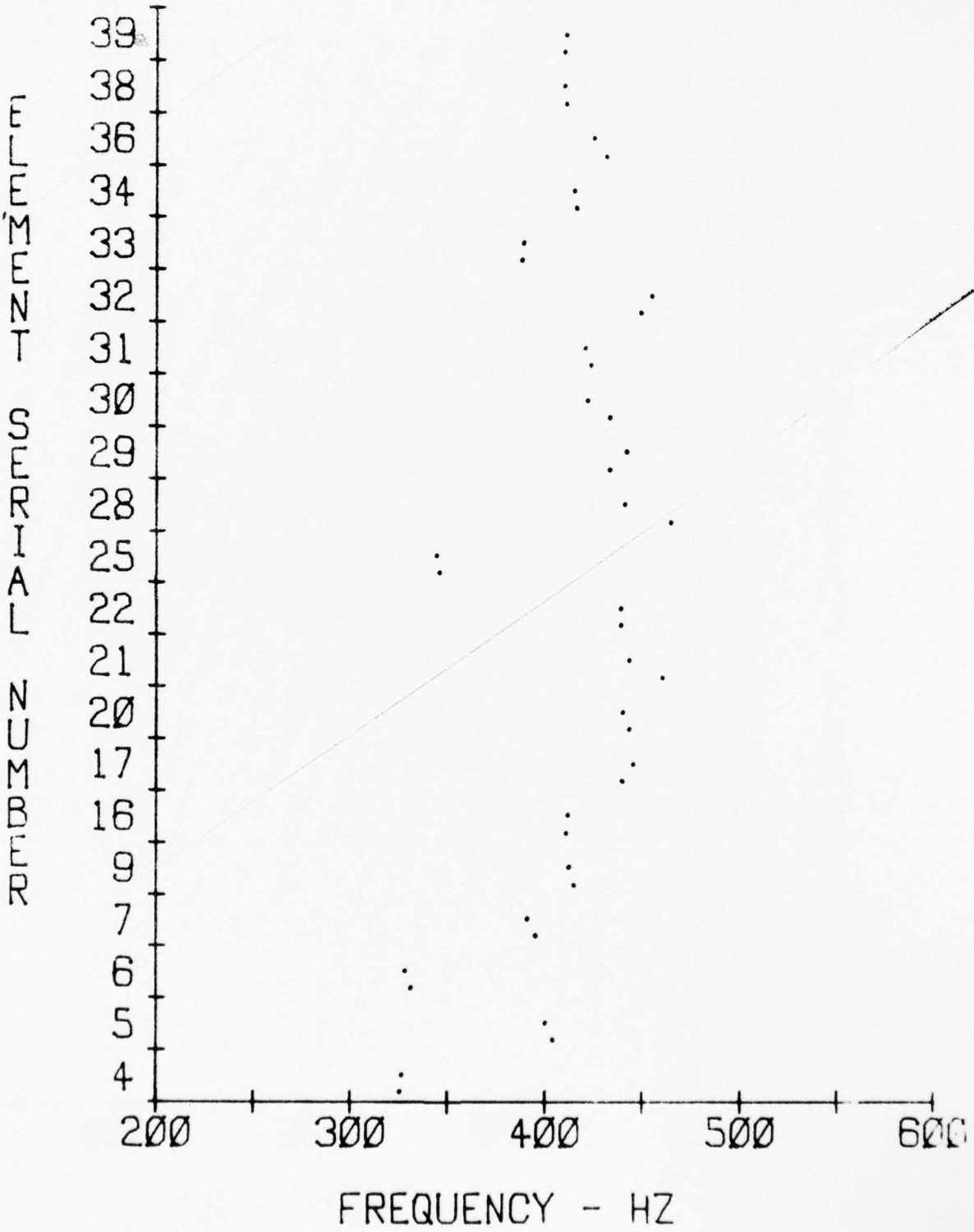
Freq. @ 0 PSI	Baseline E-2-1 2907 - 3018			Baseline E-2-2 3019 - 3123			Baseline E-2-3 3124 - 3228		
S/N	1	2	AVG	1	2	AVG	1	2	AVG
4	305	305.8	305.4	320	321.7	320.9	325	326	325.5
5	411.7	409.2	410.5	394.2	395	394.6	404.2	400	402.1
6	311.7	304.2	309.9	321.7	320	320.9	330.8	328.3	329.6
7	380	390	385	381.7	391.7	386.7	395.8	390.8	393.3
9	396.7	406.7	401.7	408.3	412.5	410.4	415	412.5	413.8
16	393.3	381.7	387.5	405	406.7	405.9	410.8	411.7	411.3
17	411.7	410	410.9	428.3	418.3	423.3	440	445.8	442.9
20	425	426.7	425.9	433.3	433.3	433.3	443.3	440	441.7
21	449	443.3	446.2	449	445.8	447.4	460.8	443.3	452.1
22	416.7	416.7	416.7	423.3	425	424.2	439.2	439.2	439.2
25	316.7	320.8	318.8	330.8	335	332.9	345.8	344.2	345
28	426.7	410	418.4	423.3	426	424.7	465	440.8	452.9
29	412.5	413.3	412.9	420.8	425	422.9	433.3	442.5	437.9
30	405	414.2	409.6	413.3	417.5	415.4	433.3	421.7	427.5
31	405.8	408.3	407.1	419.2	416.2	417.7	424	420.8	422.4
32	430.8	430.8	430.8	425	421.7	423.4	450	455	452.5
33	388.3	396.7	392.5	383.3	388.3	385.8	388.3	389.2	388.8
34	395.8	412.5	404.2	415	421.7	418.4	416.7	415	415.9
36	425	418.3	421.7	425	421.7	423.4	431.7	425	428.4
38	399	395.5	397.3	410	400	405	410.8	410	410.4
39	395	392.5	393.8	410	408.3	409.2	410	411	410.5



FREQUENCY VARIATION AT 0 PSI DURING FIRST
STEP PULSE BASELINE TEST, REFERENCE TASK E-2-1



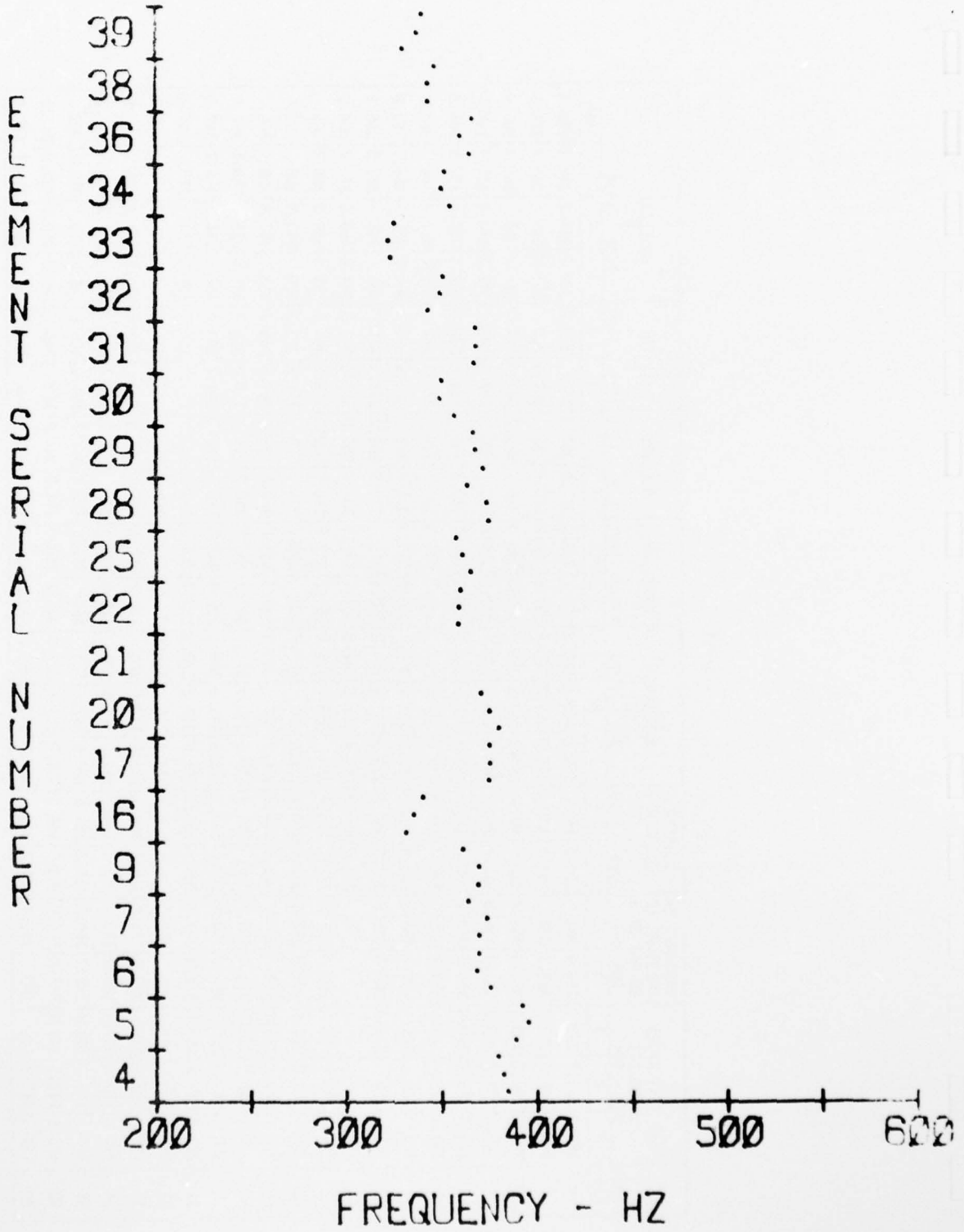
FREQUENCY VARIATION AT 0 PSI DURING SECOND
STEP PULSE BASELINE TEST, REFERENCE TASK E-2-2



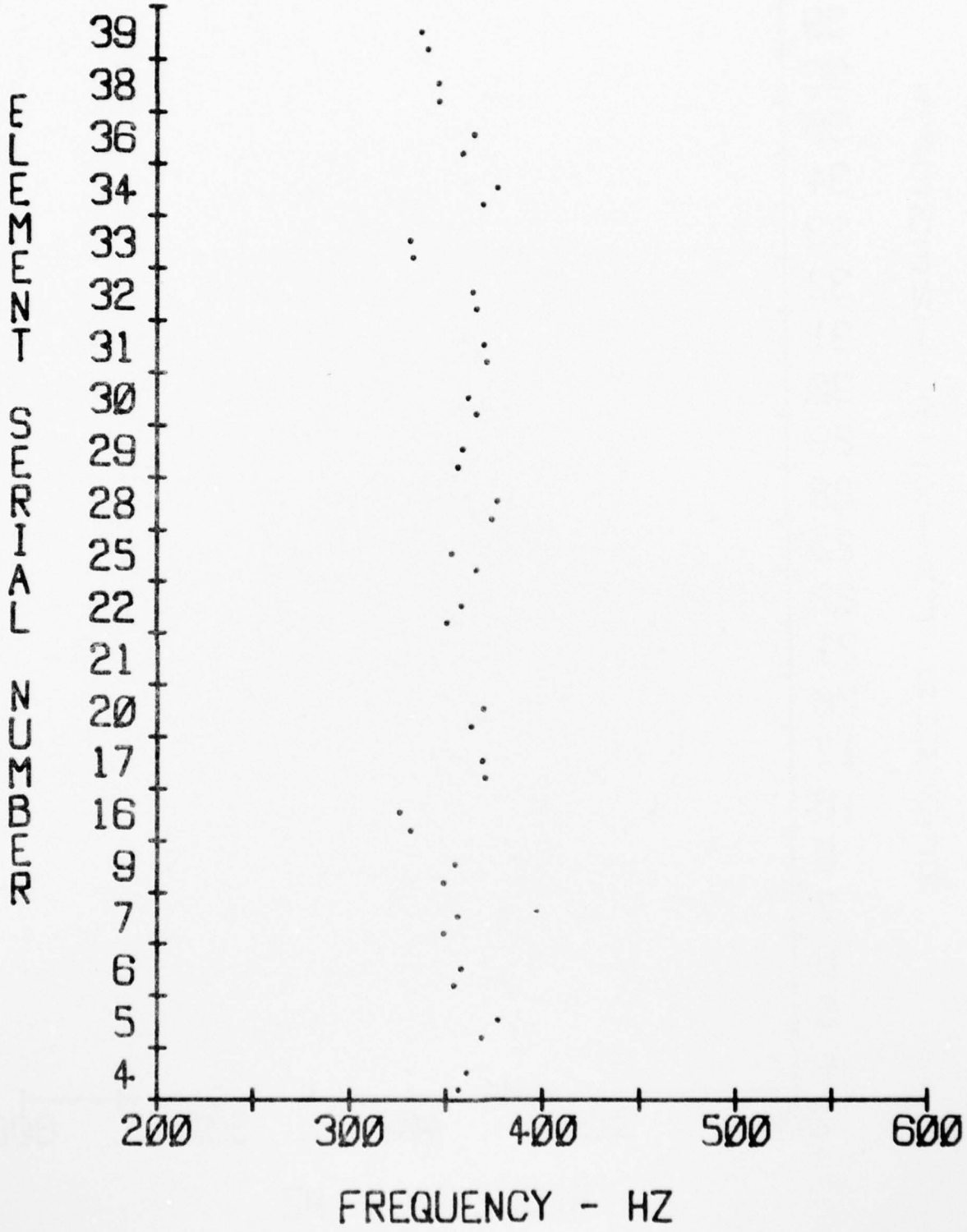
FREQUENCY VARIATION AT 0 PSI DURING THIRD
STEP PULSE BASELINE TEST, REFERENCE TASK E-2-3

-5 PSI

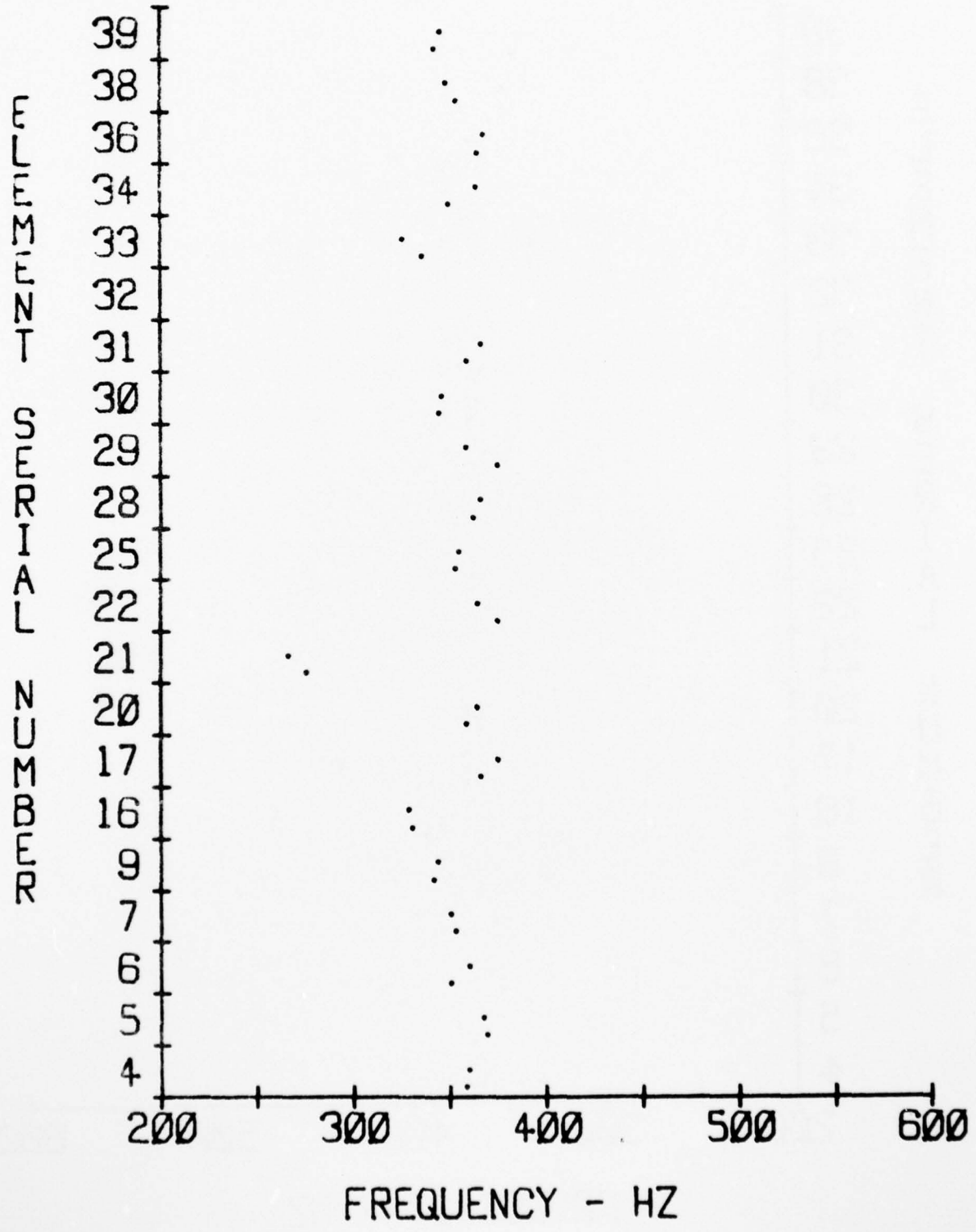
-5 PSI S/N	1ST TEST AFTER TUNING (C) 542 - 604			VARIANCE IN PRESSURE (D) 40 PSI ONLY 605 966		SCHMITT TRIGGER (D) 1009 - 1050		BASELINE (D) 1093 - 1155			BASELINE E-1 1156 - 1260		BASELINE E-2 1272 - 1376		BASELINE E-3 1377 - 1481		BASELINE F 1482 - 1544			
	1	2	3	1	2	1	2	1	2	3	1	2	1	2	1	2	1	2	3	AVG
4	384.2	381.7	379.2	355.8	360	357.5	359.2	360.8	358.3	359.2	355	348.3	362.5	363.3	340	339.2	344.2	344.2	356.7	356.4
5	389.2	395	391.7	368.3	376.7	369.2	366.7	365.8	369.2	370.8	357.9	360.8	370.8	378.3	352.5	360	365.8	365.8	365.8	370.5
6	375	368.3	369.2	353.3	357.1	350	360	354.2	353.3	355	355.8	345	365	359.2	347.5	344.2	344.2	350	345.8	355.4
7	369.2	373.3	363.3	348.3	355.8	352.5	350	347.5	350	341.7	342.5	335.8	350	350	337.5	343.3	342.5	340.8	331.7	348.7
9	369.2	369.2	360.8	348.3	354.2	340.8	343.3	339.2	342.5	344.2	335.8	337.5	343.3	345.8	335.8	330.8	339.2	332.9	337.5	344.8
16	330.8	335	340	330.8	325	330	328.3	330.8	330.8	324.5	325	325	337.5	330	328.3	327.5	326.7	321.7	320	328.8
17	375	375	375	370	368.3	366.3	375	335.8	342.1	341.7	360.4	363.3	375.8	382.5	362.5	366.7	364.5	356.7	355.8	363.8
20	380	375	370.8	362.5	369.2	358.3	364.2	363.3	360.8	364.2	360.8	365	370.8	369.2	373.3	366.7	365	365	362.5	366.7
21	-	-	-	-	*-	275	265.8	244.2	252.5	242.5	381.7	387.5	386.7	385.8	387.5	392.5	384.2	380.8	376.7	384.8
22	359.2	359.2	360	350	357.9	375	364.2	355	355.8	355.8	364.2	359.2	366.7	359.2	368.3	362.5	362.5	359.2	365.8	361
25	365	360.8	357.5	365.8	352.5	352.5	354.2	355.8	350	351.7	350	352.5	354.6	350	355.8	343.3	350	343.3	350	353.4
28	375	374	363.3	374	376	362.5	365.8	374.2	370	363.3	367.5	359.2	369.2	368.3	367.5	366.7	363.3	367.5	365	368
29	372.5	367.5	366.7	355.8	358.3	375	358.3	370.8	360.8	371.7	361.7	359.2	360.8	356.7	354.2	356.7	372.5	375	369.2	364.4
30	356.7	349	350	365.8	360.8	344.2	345.8	348.3	345.8	349	350.8	345.8	340	340	344.2	343.3	360	355.8	351.7	349.8
31	367.5	368.3	368.3	370.8	369.2	359.2	366.7	365.8	369.2	373.3	353.3	354.2	360.8	361.7	355	355	369.2	370	370	364.6
32	343.3	350	351	365	363.3	-	-	377.5	376	370.8	-	-	350	355.8	-	-	-	-	-	360.3
33	323.3	322.5	325	332.5	330.8	335.8	325	345.8	332.9	340	319.2	320.8	325	318.3	325	322.5	330.8	333.3	335	328.6
34	355	350	351.7	369.2	376.7	350	364.2	365	367.5	374	348.3	343.3	350	347.5	351.7	350	365	358.3	350	357.2
36	365	360	366.7	358.3	364.2	364.2	367.5	377.5	387.5	375	360	357.5	359.2	364.2	364.2	355.8	378.3	375	369.2	366.8
38	343.3	343.3	346.7	345.8	345.8	353.3	348.3	354.2	357.5	352.5	341.7	350	344.2	344.2	340	345.8	349.2	348.3	355.8	347.9
39	330	337.5	340	340	336.7	341.7	345	341.7	345.8	355.8	333.8	334.2	336.7	335.8	330	337.5	340.8	343.3	341.7	339.4



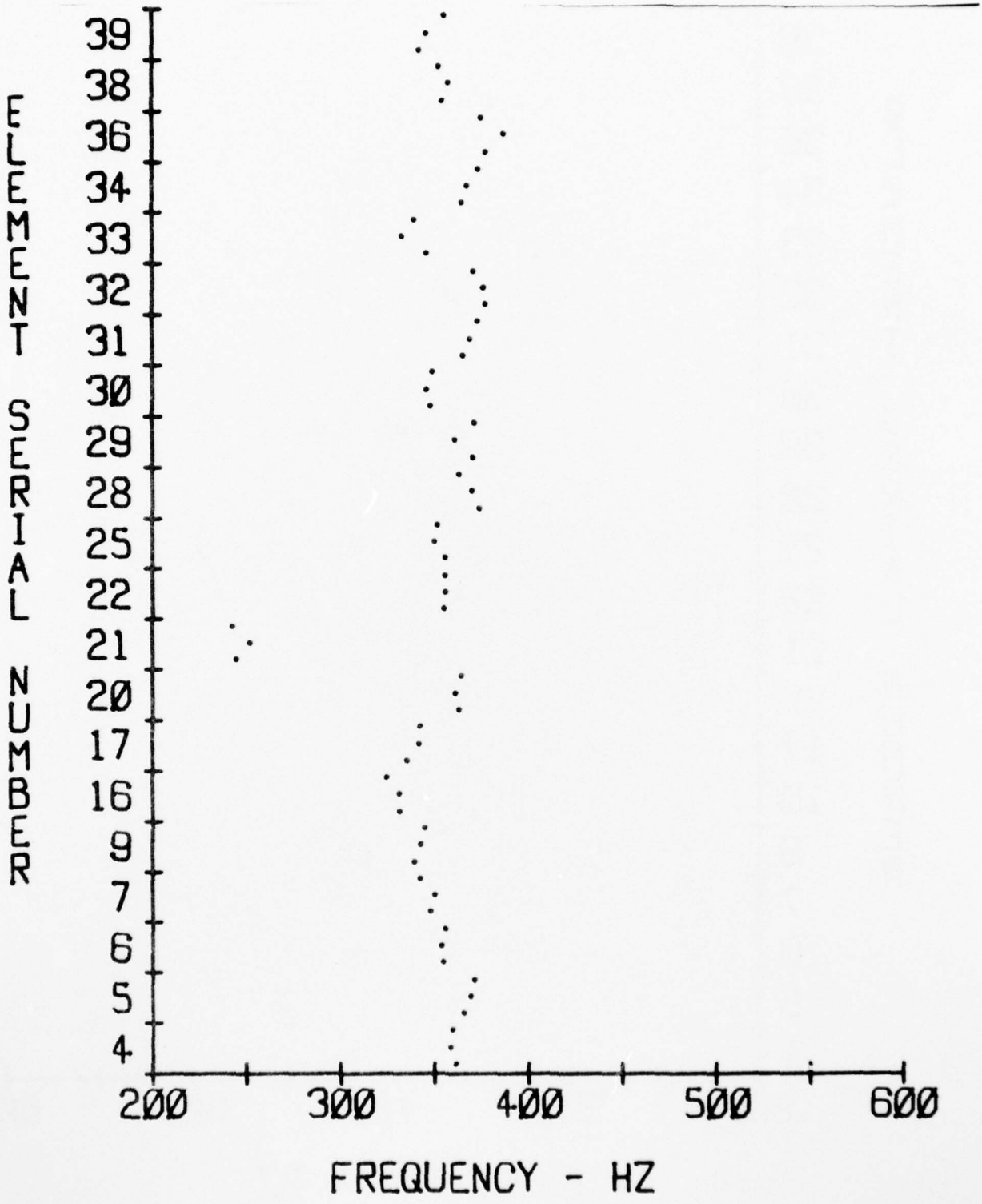
FREQUENCY VARIATION AT -5 PSI. FIRST BASELINE AFTER ENVIRONMENTAL CHAMBER TUNING, REFERENCE TASK C



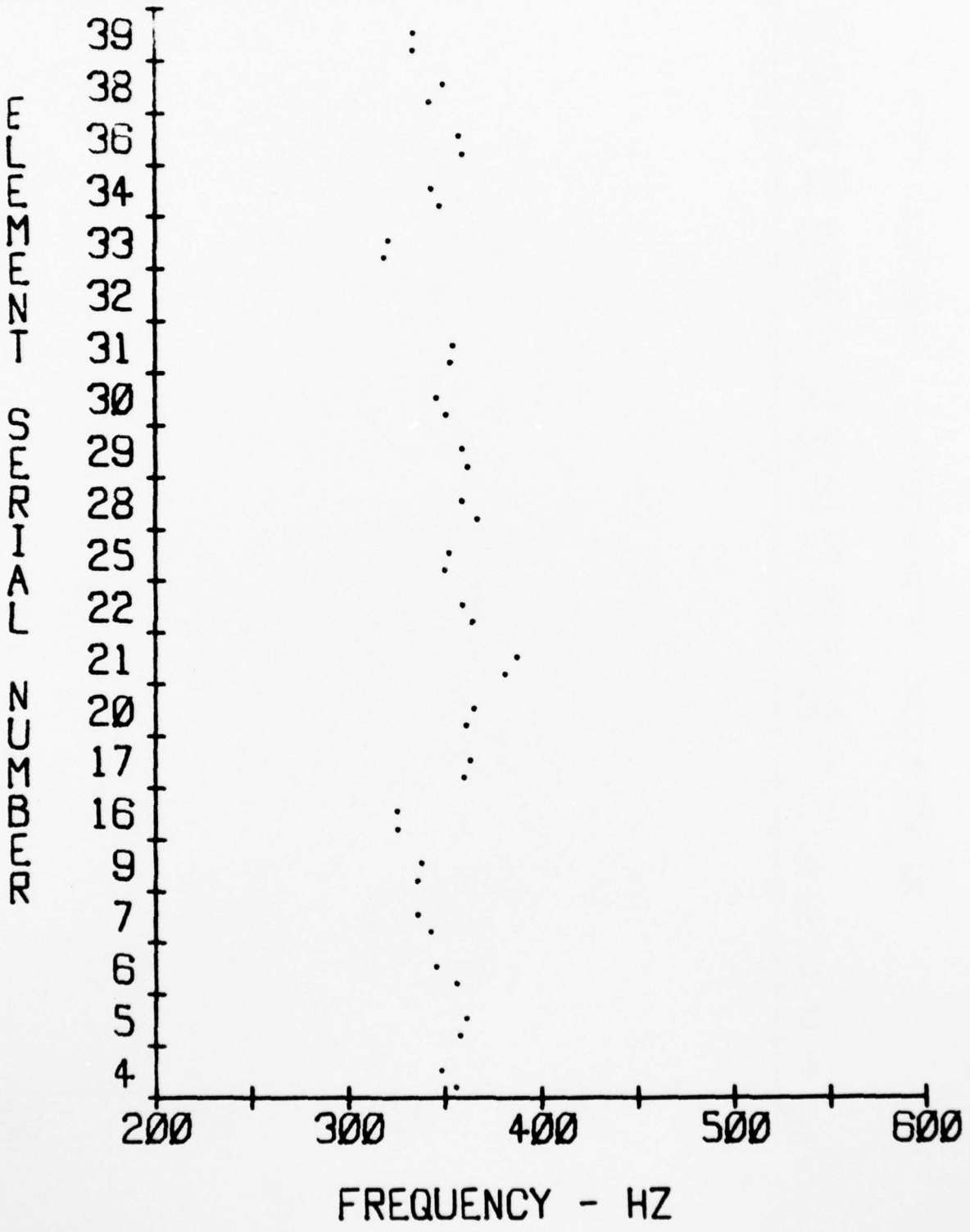
FREQUENCY VARIATION AT -5PSI DURING
VARIANCE IN SUPPLY PRESSURE TEST. (THIS DATA
AT A SUPPLY PRESSURE OF 40PSI) REFERENCE TASK D



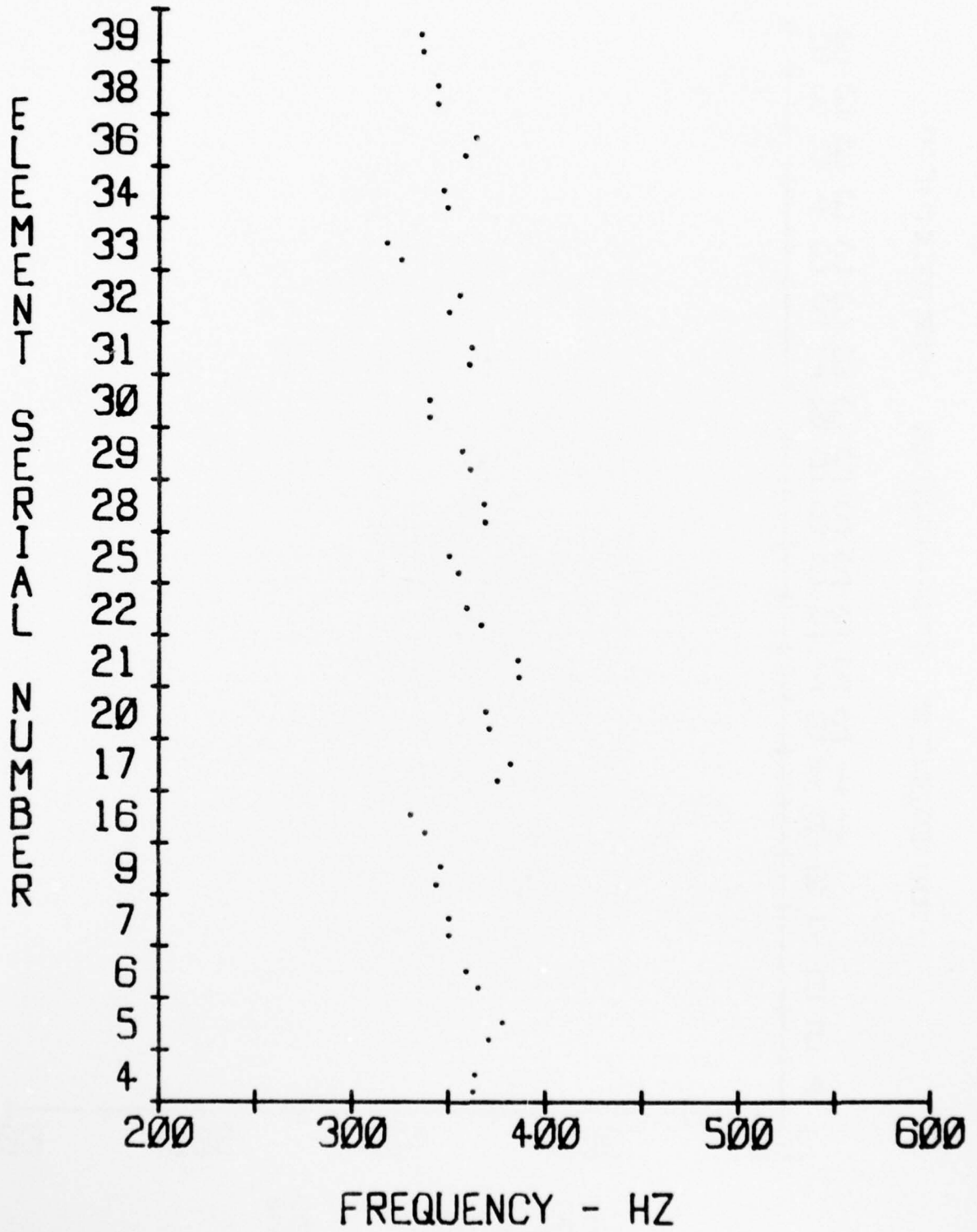
FREQUENCY VARIATION -5PSI DURING SCHMITT
TRIGGER TEST. REFERENCE TASK D



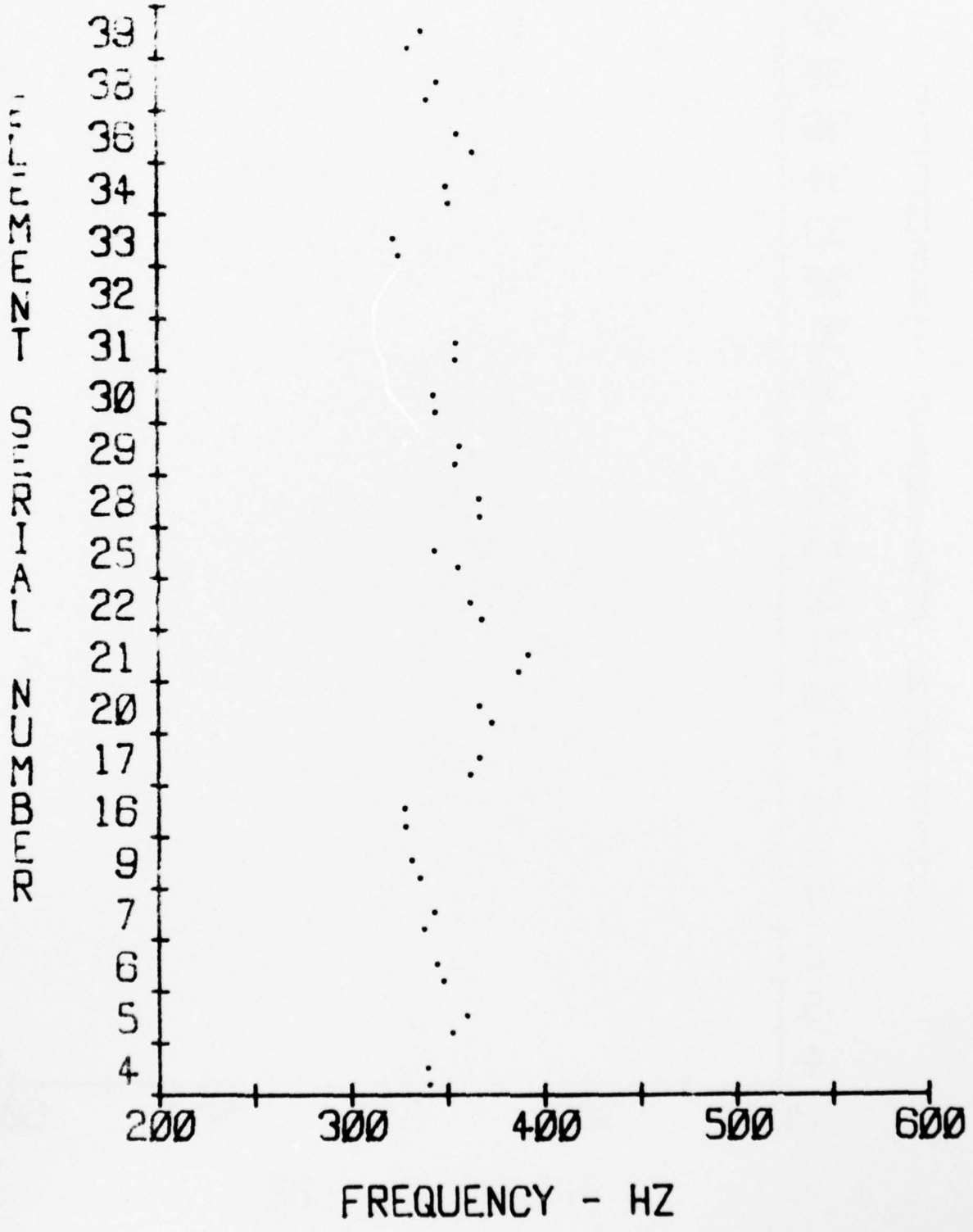
FREQUENCY VARIATION AT -5PSI BASELINE TEST
PRIOR TO STEP PULSING, REFERENCE TASK D



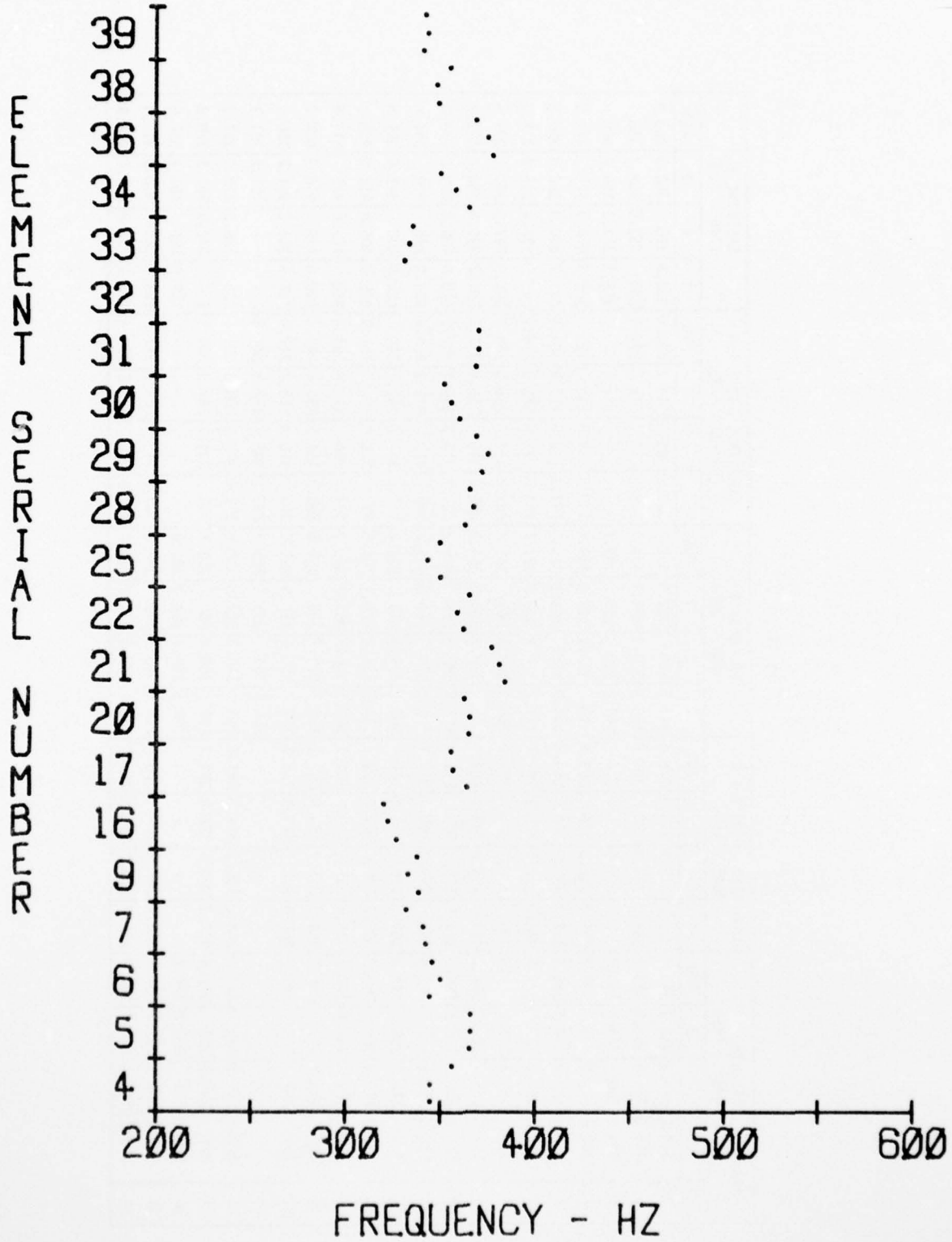
FREQUENCY VARIATION AT -5PSI DURING FIRST
STEP PULSE BASELINE TEST, REFERENCE TASK E-1



FREQUENCY VARIATION AT -5PSI DURING SECOND
STEP PULSE BASELINE TEST, REFERENCE TASK E-2



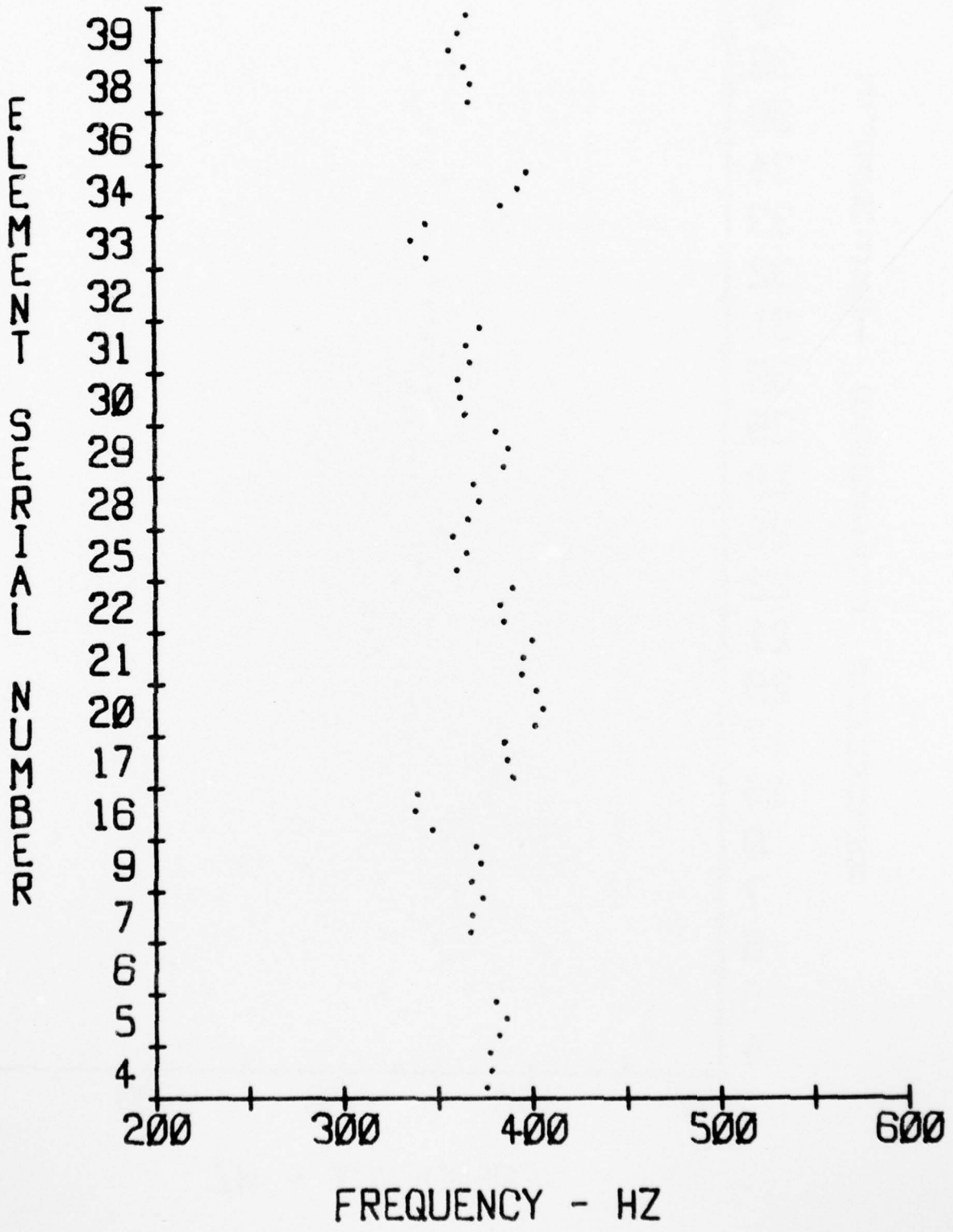
FREQUENCY VARIATION AT -5PSI DURING THIRD STEP
PULSE BASELINE TEST, REFERENCE TASK E-3



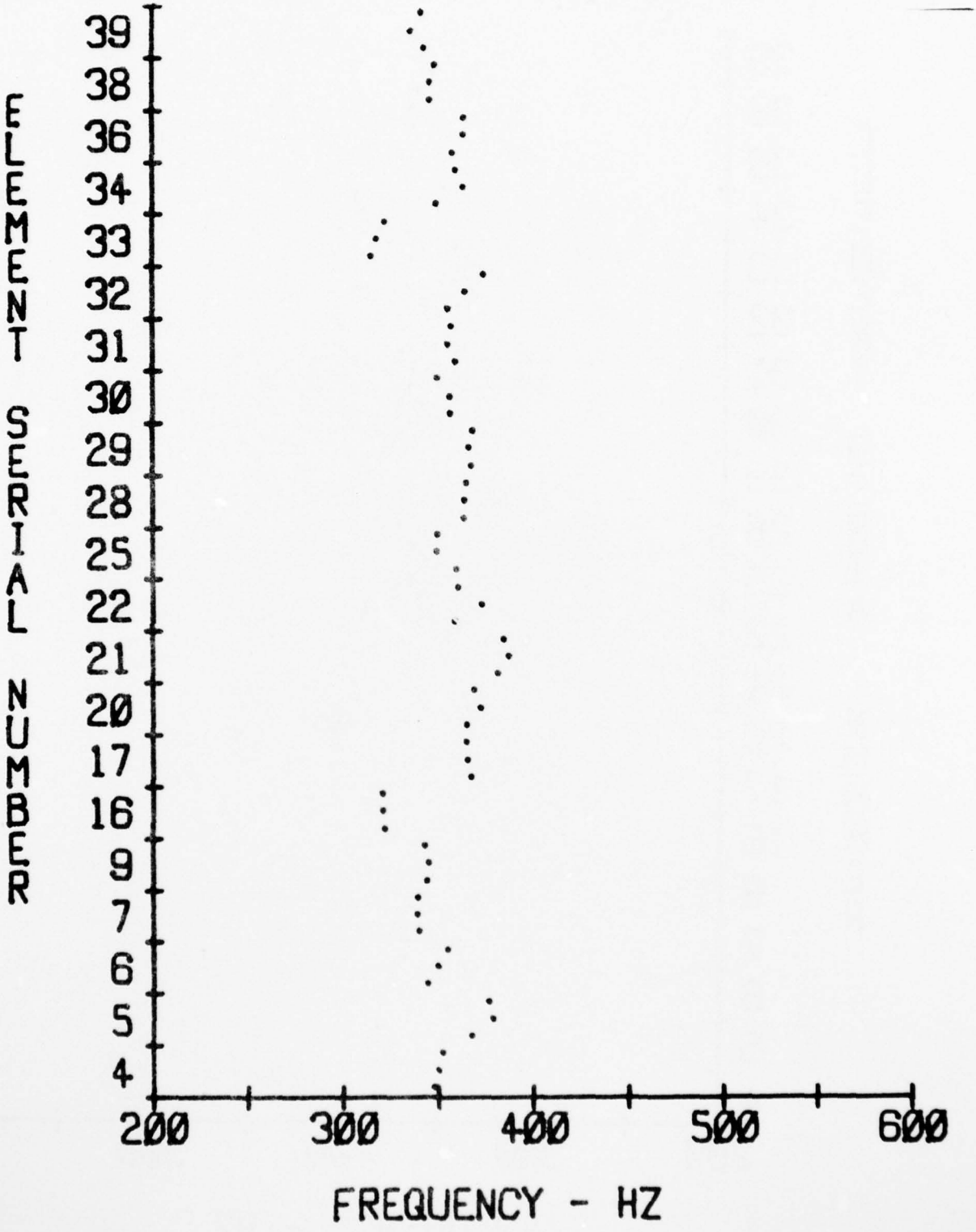
FREQUENCY VARIATION AT -5PSI DURING
BASELINE TEST PRIOR TO HIGH TEMPERATURE
ENVIRONMENT: REFERENCE TASK F-1

-5 PSI

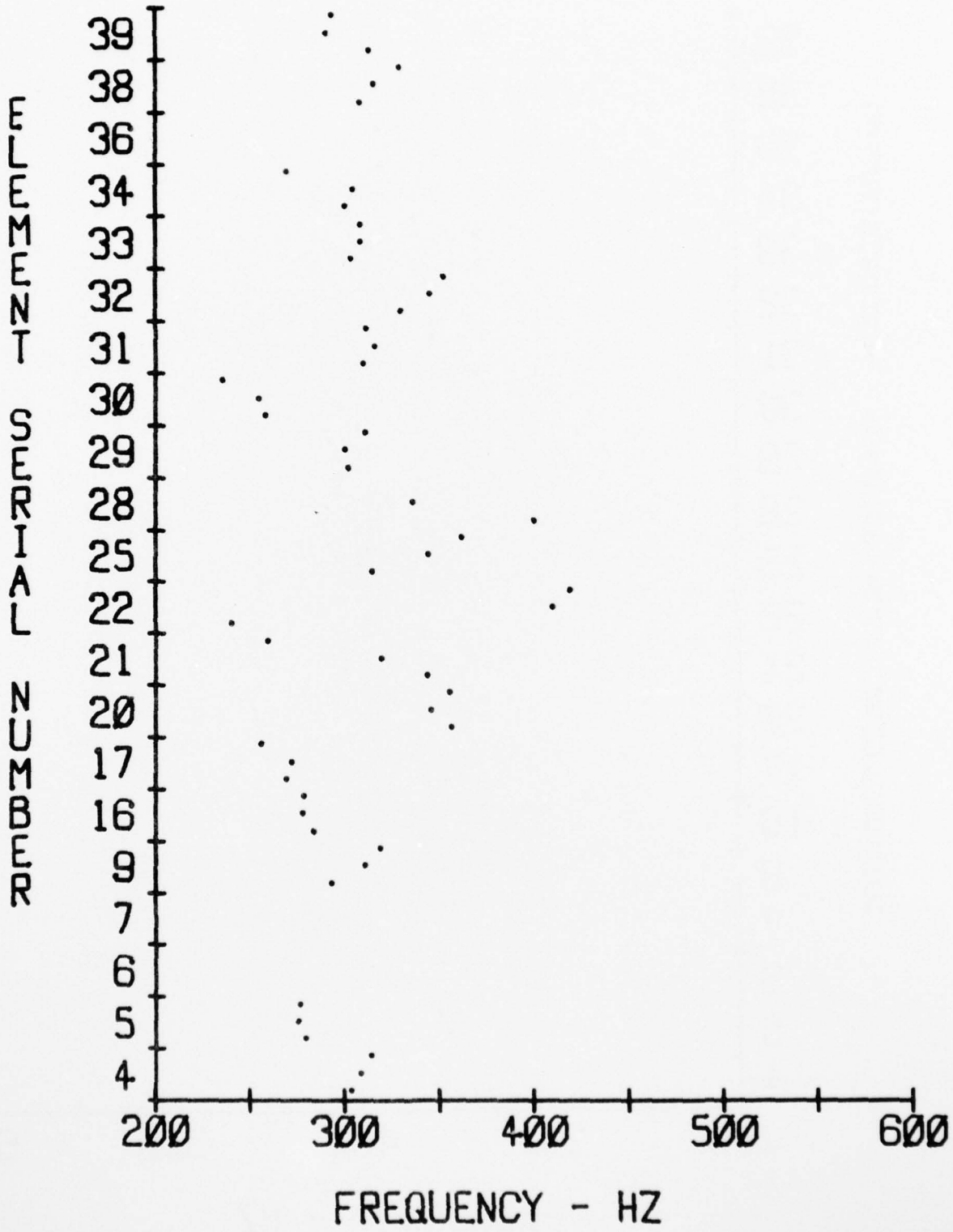
Test	BASELINE F-1 1482 - 1544				HIGH TEMP. +145°F F-2 1545 - 1601				BASELINE F-3 1602 - 1664				LOW TEMP. -40°F F-4 1665 - 1745				BASELINE F-5 1746 - 1808			
S/N	1	2	3	AVG	1	2	3	AVG	1	2	3	AVG	1	2	3	AVG	1	2	3	AVG
4	344.2	344.2	356.7	348.4	375	377.5	376.7	376.4	347.5	350	352.5	350	303.3	308.3	314.2	308.6	355.8	360	368.3	361.4
5	365.8	365.8	365.8	365.8	381.7	385.8	380	382.5	368.3	379.2	376.7	374.7	279.2	275	276	276.7	350	352.5	358.7	353.7
6	344.2	350	345.8	346.7	-	-	-	-	344.2	350	355	349.7	-	-	-	-	352.5	373.3	356.7	360.8
7	342.5	340.8	331.7	338.3	366.7	367.5	374	369.4	340	339.2	339.6	339.6	130.8	138.3	130	133	378.3	378.3	375	377.2
9	339.2	332.9	337.5	336.5	367.1	372.5	370	369.9	344.2	345	343.3	344.2	293.3	310.8	319.2	307.8	383.3	380.8	380.8	381.6
16	326.7	321.7	320	322.8	346.7	337.5	339.2	341.1	321.7	320.8	320.8	321.1	283.3	277.5	278.3	279.7	340	335.8	335.8	337.2
17	364.5	356.7	355.8	358.9	390	386.7	385	387.2	368.3	365.8	365	366.4	269.2	271.7	255.8	265.6	392.3	392.5	390	391.6
20	365	365	362.5	364.2	401.7	405.8	401.7	403.1	365	373.3	369.6	369.3	356.7	345	355.8	352.5	391.7	395.8	393.3	393.6
21	384.2	380.8	376.7	380.6	394.2	395	400	396.4	382.5	388.3	385	385.3	343.3	319.2	259.2	307.2	410.8	408.3	409.2	409.4
22	362.5	359.2	365.8	362.5	385	383.3	390	386.1	359.2	374	360.8	364.7	240	410	419.2	356.4	394.2	395	400	396.4
25	350	343.3	350	347.8	360	365	358.3	361.1	360	349.5	350	353.2	314.2	344.2	361.7	340	402.5	400	395.8	399.4
28	363.3	367.5	365	365.3	366.7	371.7	369.2	369.2	364.2	364.2	365.4	364.6	400	335.8	-	367.9	405.8	405.8	412.5	408
29	372.5	375	369.2	372.2	385.8	387.5	380.8	384.7	368.3	366.7	369.2	368.1	301.7	300	310.8	304.2	410	410.8	415	411.9
30	360	355.8	351.7	355.8	364.2	361.7	360.8	362.2	356.7	356.7	350	354.5	258.3	254.2	235.4	249.3	400.8	410	418.3	409.7
31	369.2	370	370	369.7	367.5	365	373.3	368.6	360	355.8	357.5	357.8	310	316.3	310.8	312.4	337.5	354.2	361.2	350.9
32	-	-	-	-	-	-	-	-	355.8	365	375	365.3	330	345	352.5	342.5	-	-	391.7	391.7
33	330.8	333.3	335	333	344.2	336.3	344.2	341.6	315	318.3	322.5	318.6	303.3	308.3	308.3	306.6	335	338.3	338.3	337.2
34	365	358.3	350	357.8	384.2	393.3	397.5	391.7	350	364.2	360	358.1	300	304.2	269.2	291.1	372	370.8	368.3	370.4
36	378.3	375	369.2	374.2	-	-	-	-	358.3	364.2	364.2	362.2	-	-	-	-	389.2	385	389.3	387.8
38	349.2	348.3	355.8	351.1	366.7	367.5	364.2	366.1	346.3	346.3	349	347.2	308.3	315	329.2	317.5	363.3	360	360.8	361.4
39	340.8	343.3	341.7	341.9	356.7	360.8	365.8	361.1	343.3	336.3	341.7	340.4	312.5	290	292.8	298.4	353.3	355.8	355.8	354.9



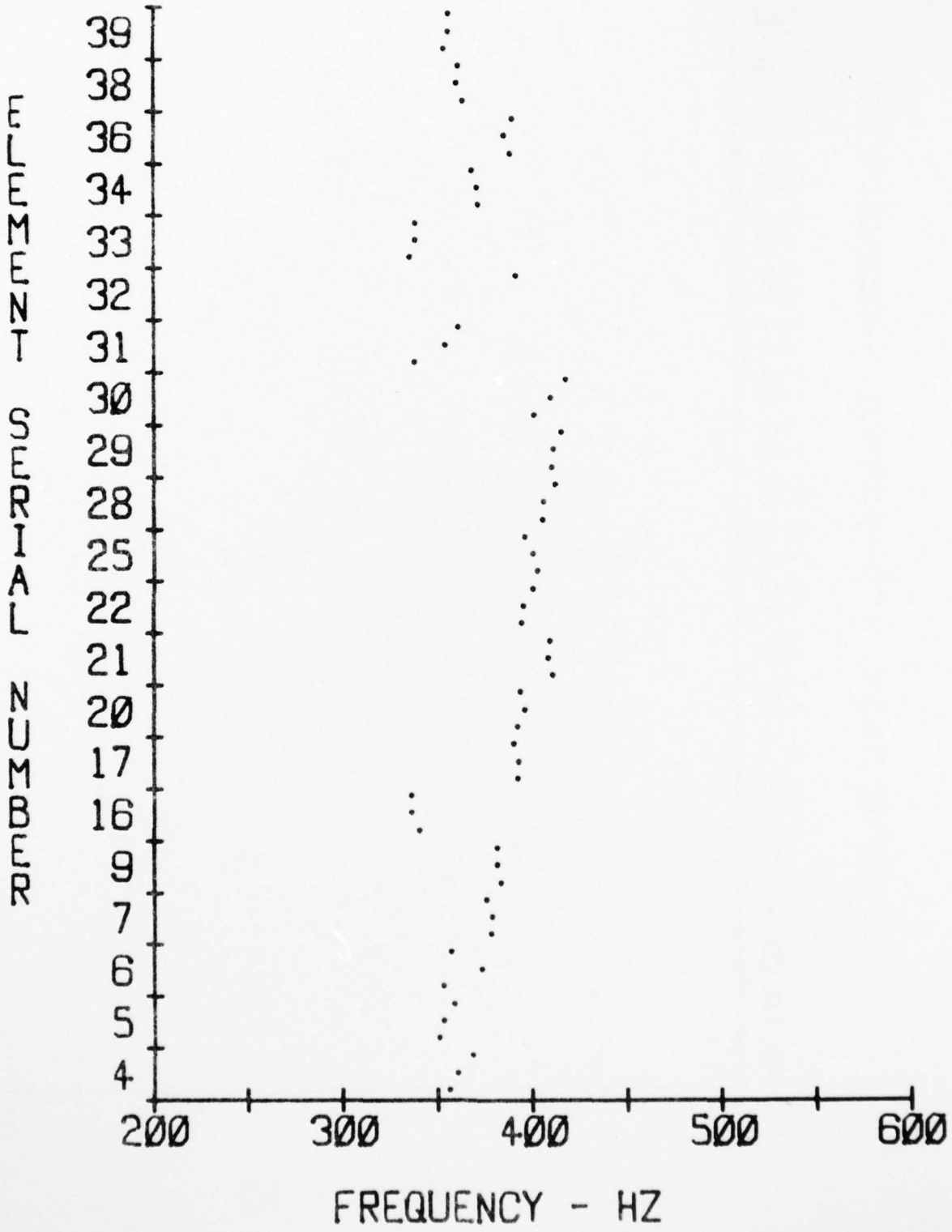
FREQUENCY VARIATION AT -5PSI DURING
HIGH TEMPERATURE (+145°F) ENVIRONMENT
REFERENCE TASK F-2



FREQUENCY VARIATION AT -5PSI DURING
BASELINE TEST PRIOR TO LOW TEMPERATURE
ENVIRONMENT: REFERENCE TASK F-3



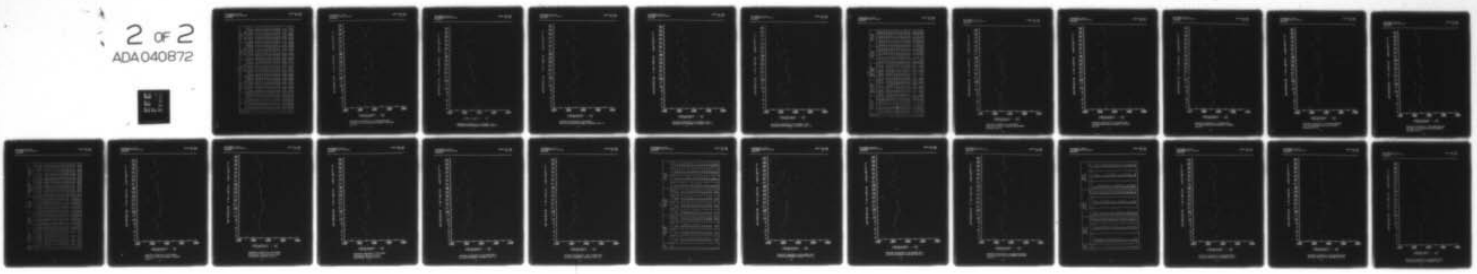
FREQUENCY VARIATION AT -5PSI DURING
LOW TEMPERATURE (-40°F) ENVIRONMENT
REFERENCE TASK F-4



FREQUENCY VARIATION AT -5PSI DURING BASELINE TEST USING N_2 (AFTER LOW TEMPERATURE TESTING) REFERENCE TASK F-5

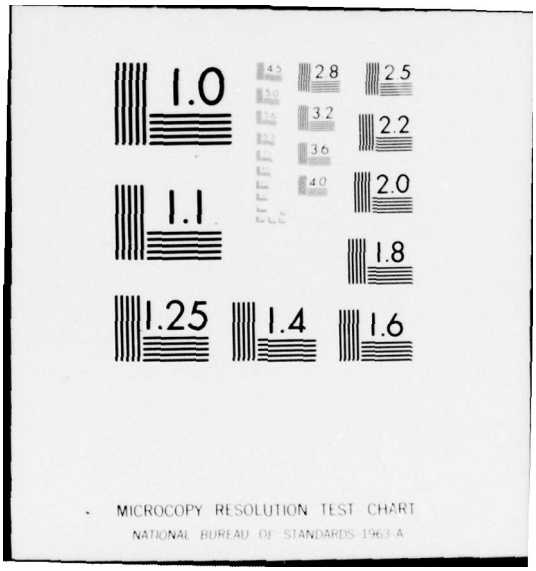
AD-A040 872 MCDONNELL DOUGLAS ASTRONAUTICS CO TITUSVILLE FLA F/G 9/5
ENVIRONMENTAL TESTING OF A FLUIDIC DIGITAL-TO-ANALOG CONVERTER.--ETC(U)
JUL 76 G W ROE DAAG39-76-C-0212
UNCLASSIFIED MDC-L0356-VOL-2 HDL-CR-76-212-1-VOL-2 NL

2 OF 2
ADA040872



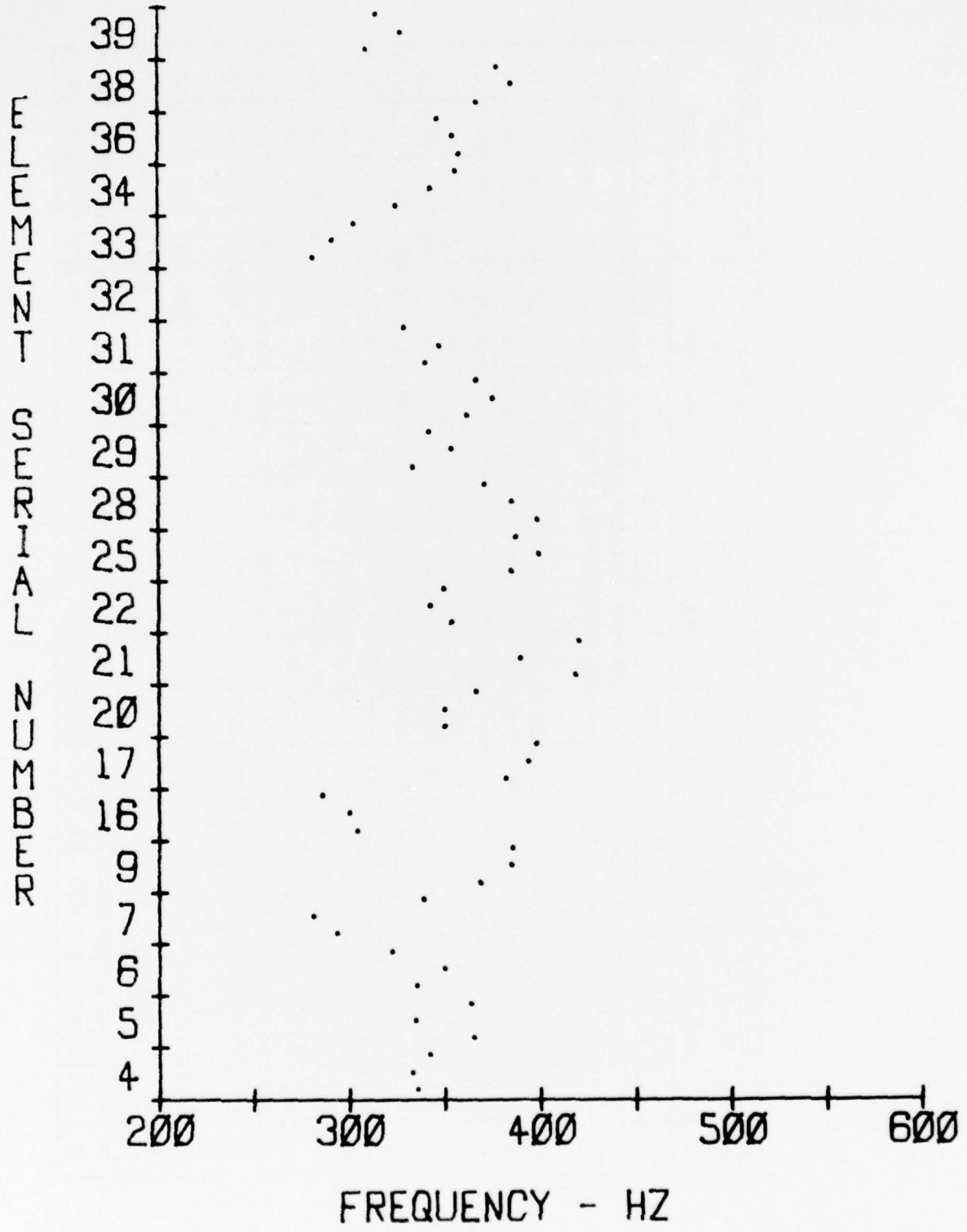
END

DATE
FILMED
7-77

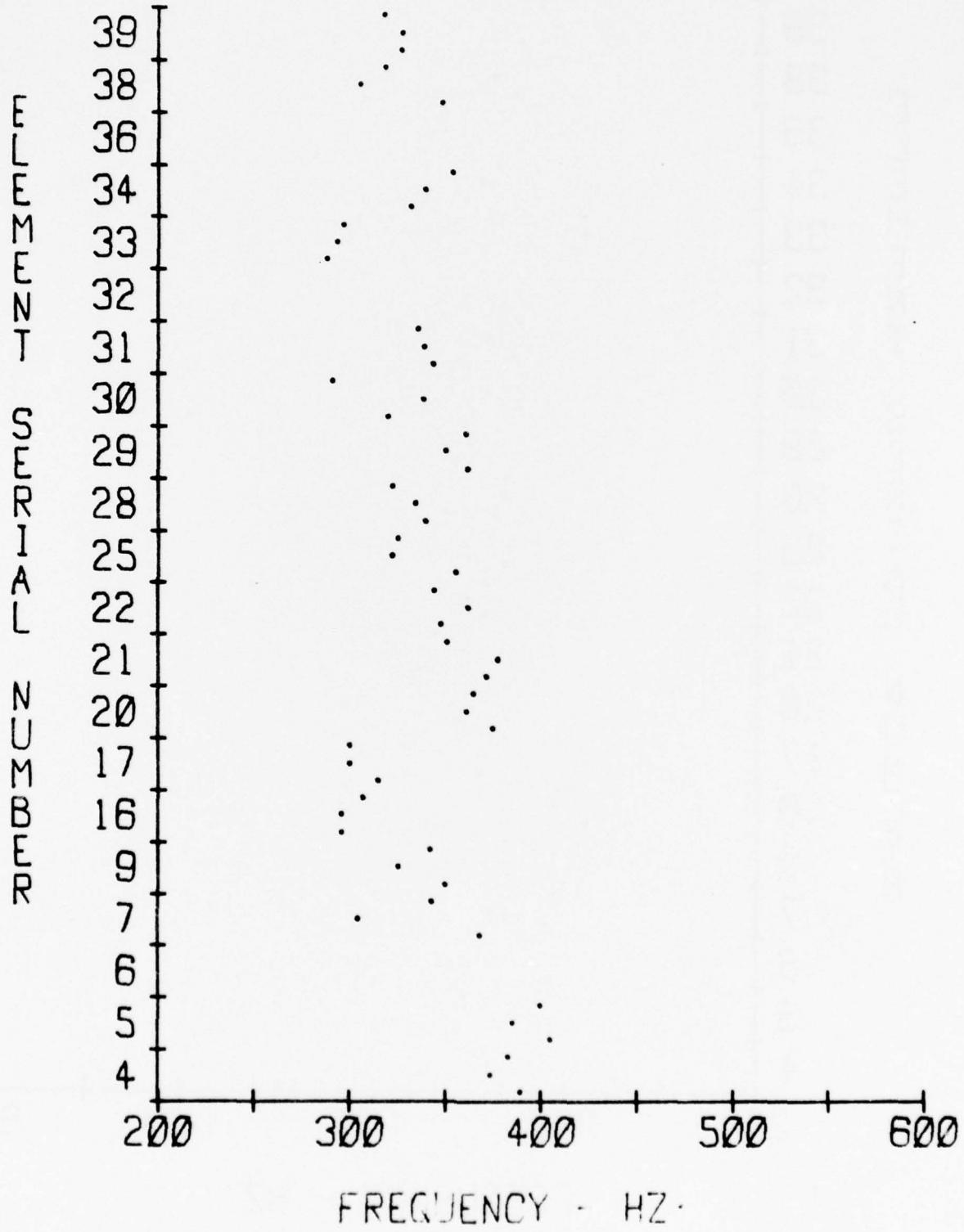

1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0
4.5
5.0
MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

-5 PSI

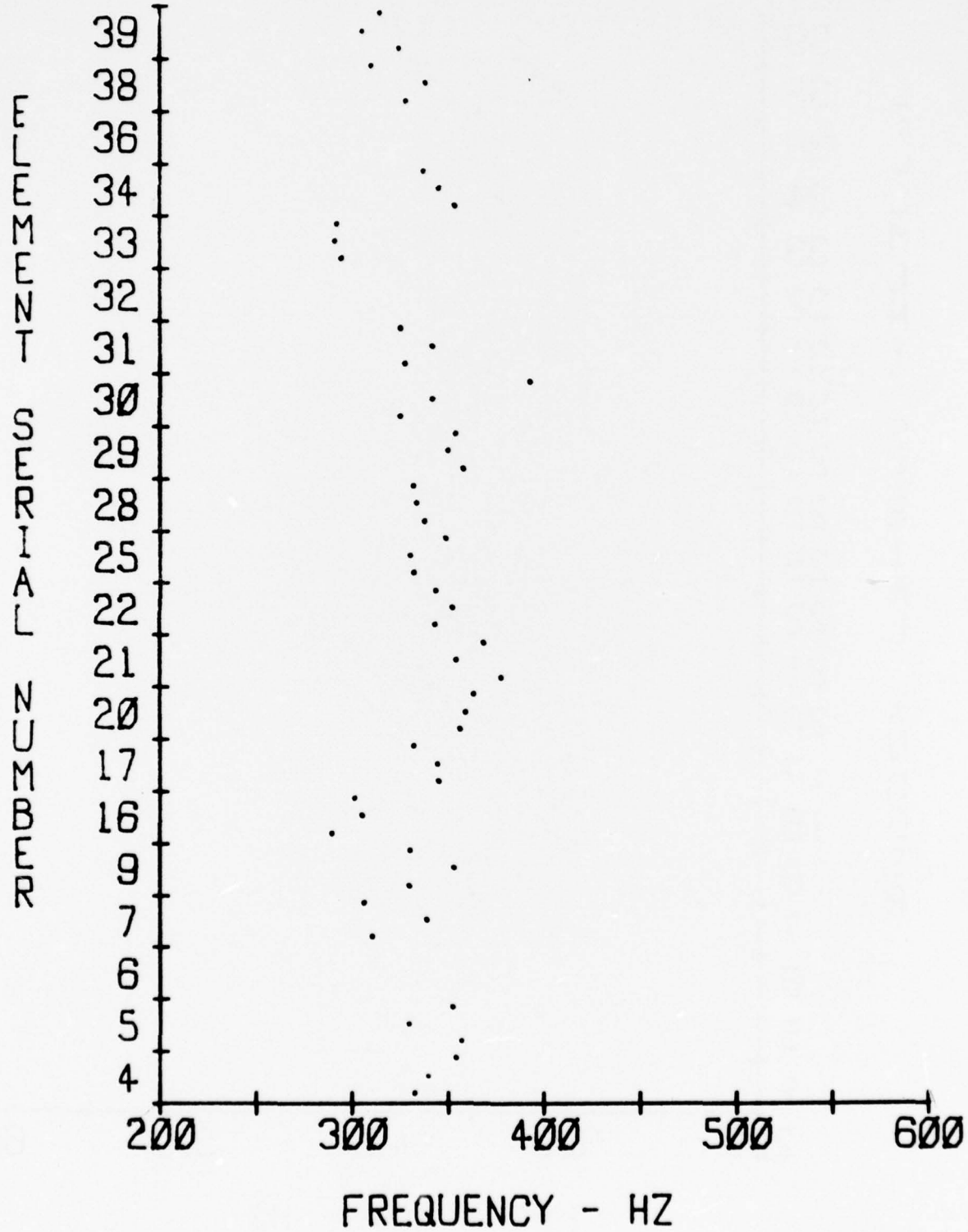
FREQ AT -5 PSI	BASELINE F-6 1809 - 1871				ACCELERATION F-7-1 +1 AXIS 1872 - 1928				ACCELERATION F-7-2 -1 AXIS 1929 - 1985				ACCELERATION F-7-3 -3 AXIS 1986 - 2042				ACCELERATION F-7-4 +3 AXIS 2043 - 2099			
S/N	1	2	3	AVG	1	2	3	AVG	1	2	3	AVG	1	2	3	AVG	1	2	3	AVG
4	335	332.5	341.7	336.4	389.2	373.3	383.3	381.9	331.7	340	354.2	341.9	325	325	323.3	324.4	353.3	331.7	345.8	343.6
5	365	334.2	363.7	354.3	405	385.3	400	396.8	356.7	329.2	352.5	346.1	335	338.3	354.2	342.5	365	338.3	354.2	352.5
6	335	350	321.7	335.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	293.3	280.8	339.2	304.4	368	304.2	343.3	338.5	310	339.2	305.8	318.3	344.2	292.5	333	335.6	340	312	331.7	327.9
9	369.2	385	385	379.7	350	325	342.5	339.2	330	353.3	330	337.8	330.3	344.5	326	333.6	328.3	346.7	331.7	335.6
16	304.2	300	285.8	296.7	295.8	295.8	307.2	299.6	289.2	305	301	298.4	289.2	310	281.7	293.6	287.5	308.3	287.5	294.4
17	382.5	394.2	398.3	391.7	315	300	300	305	345	344.2	331.7	340.3	300	325	325	316.7	315	300	349	321.3
20	350	350	366.7	355.6	375	360.8	364.7	366.8	356.7	359.2	363.3	359.7	370.8	356.7	363.7	363.7	360.8	352.5	366.2	359.8
21	419.2	390	420.8	410	371.7	377.5	351	366.7	378.3	354.2	369.2	367.2	325	304.2	363.3	330.8	366.7	359.2	364.5	363.5
22	353.3	342.5	350	348.6	347.5	362.5	344.2	351.4	343.3	352.5	343.3	346.4	335.8	355	339.2	343.3	343.3	339.2	345	342.5
25	385	400	387.5	390.8	355.8	321.7	325	334.2	331.7	330	349	336.9	319.2	331.3	330.8	327.1	343.3	322.5	338.3	334.7
28	399	385	370.8	384.9	340	334.2	322.5	332.2	337.5	333.3	331.7	334.2	325	300	333.7	319.6	349	350	300	333
29	333.3	354.2	341.7	343.1	361.7	350	360.8	357.5	358.8	350	354.2	354.3	345.8	347.5	354.2	349.2	354.2	346.2	335.8	345.4
30	362.5	376	366.7	368.4	320	339.2	290.8	316.7	325	342.5	393.3	353.6	327.5	300	316.7	314.7	290.8	290	290.8	290.5
31	340	348.3	329.2	339.2	344.2	339.2	335.8	339.7	327.8	342.5	325	331.8	329.2	345	326.7	333.6	330	322.5	332.2	328.2
32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
33	280.8	291.7	303.3	291.9	288.3	293.3	296.7	292.7	294.2	290.8	291.7	292.2	293.3	287.5	294.2	291.7	275	286.3	281.7	281
34	325	343.3	356.7	341.7	332.5	340	354.2	342.2	354.2	345	337.2	345.5	337.5	351	350	346.2	314.2	341.7	319.2	325
36	358.3	354.2	346.7	353.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
38	367.5	385.8	378.3	377.3	348.3	305	319.2	324.2	328.3	339.2	310	325.8	330	323	326.7	326.6	318.3	318.8	285	307.4
39	309.2	327.8	314.2	317.1	327.5	327.8	317.5	324.3	325	305	315	315	300	299	318.3	305.8	287.5	315.8	291.7	298.3



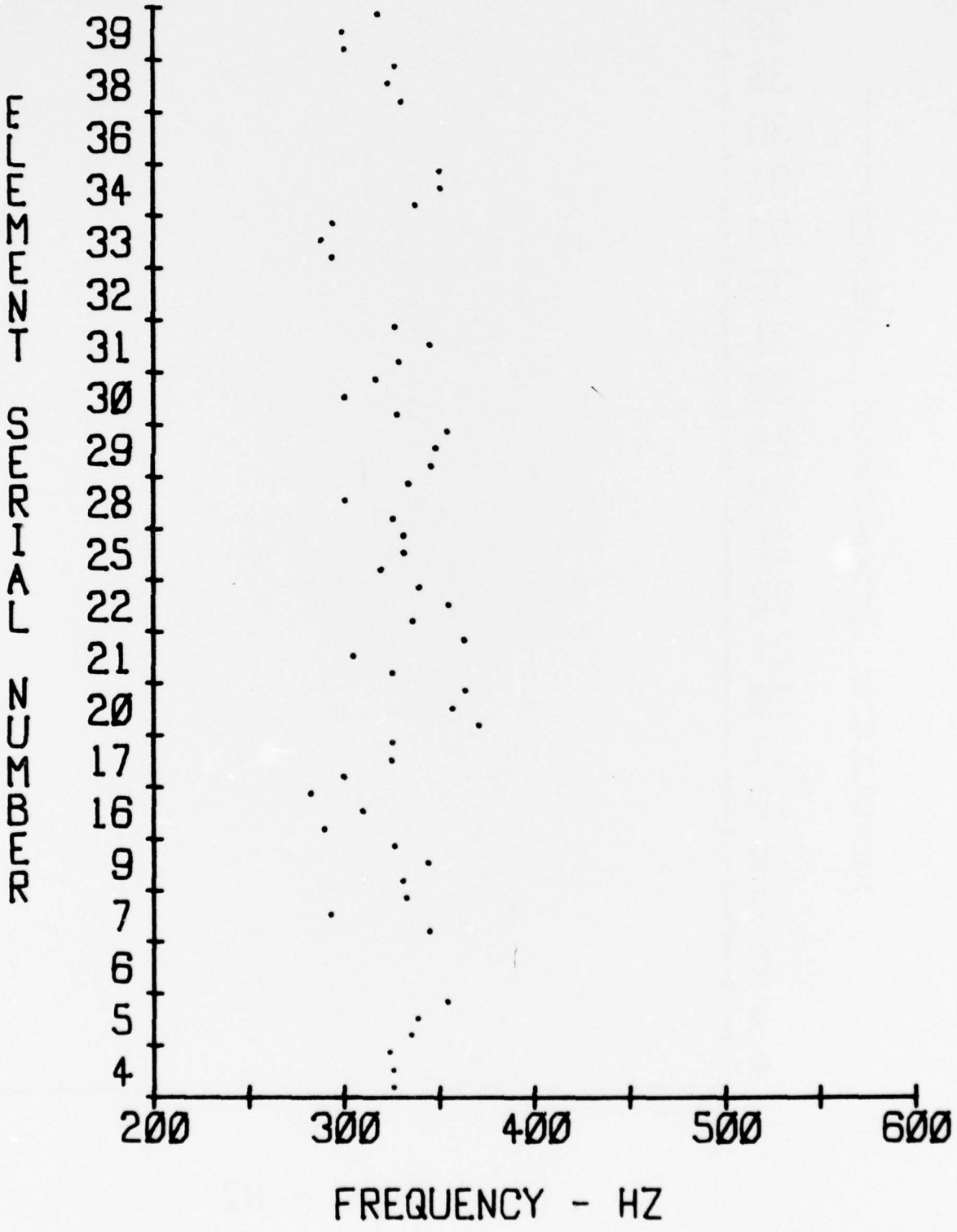
FREQUENCY VARIATION AT -5 PSI DURING BASELINE TEST PRIOR TO ACCELERATION ENVIRONMENT. REFERENCE TASK F-6.



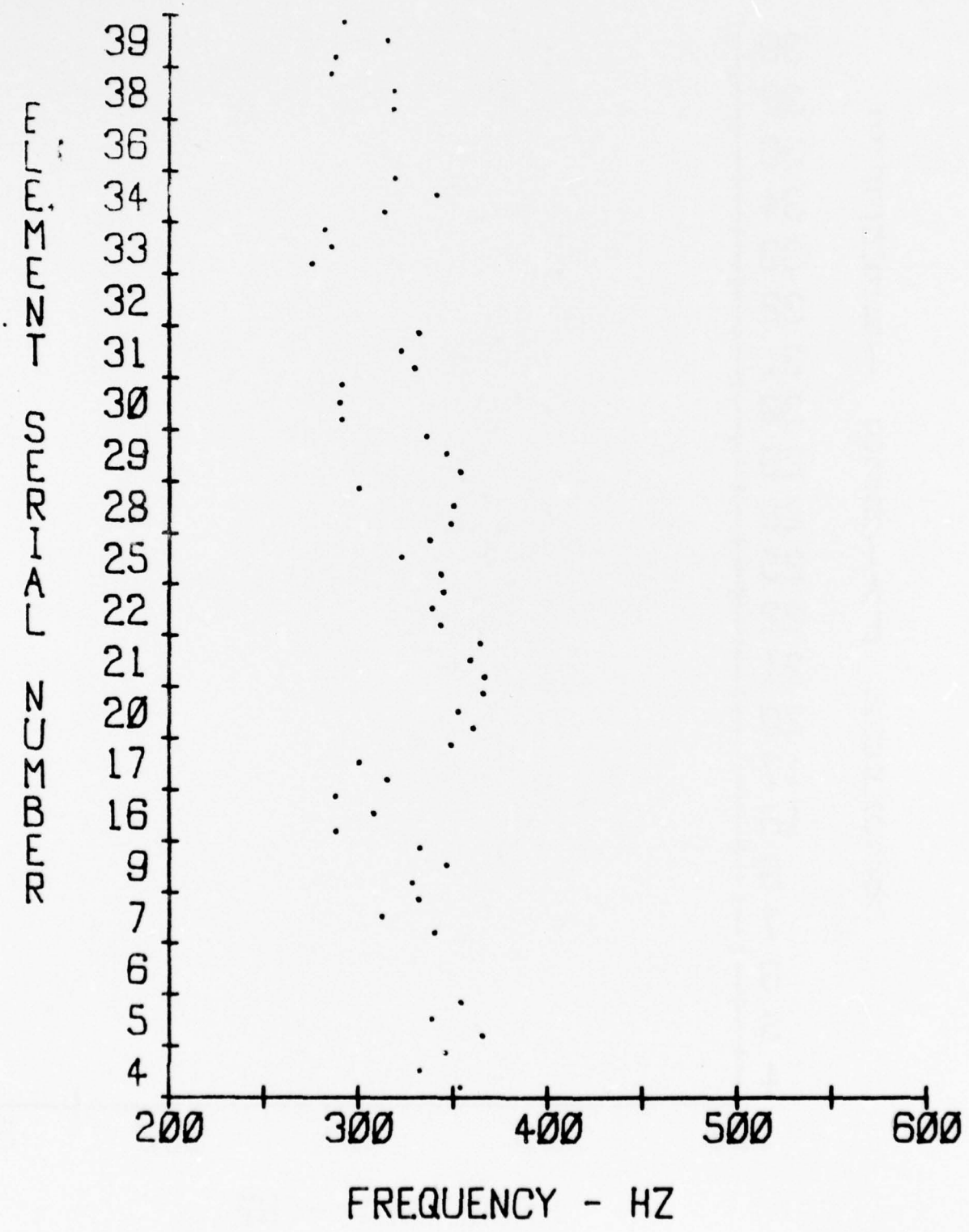
FREQUENCY VARIATION AT -5 PSI DURING +1 AXIS
ACCELERATION ENVIRONMENT, REFERENCE TASK F-7-1.



FREQUENCY VARIATION AT -5 PSI DURING -1
AXIS ACCELERATION ENVIRONMENT, REFERENCE TASK F-7-2.



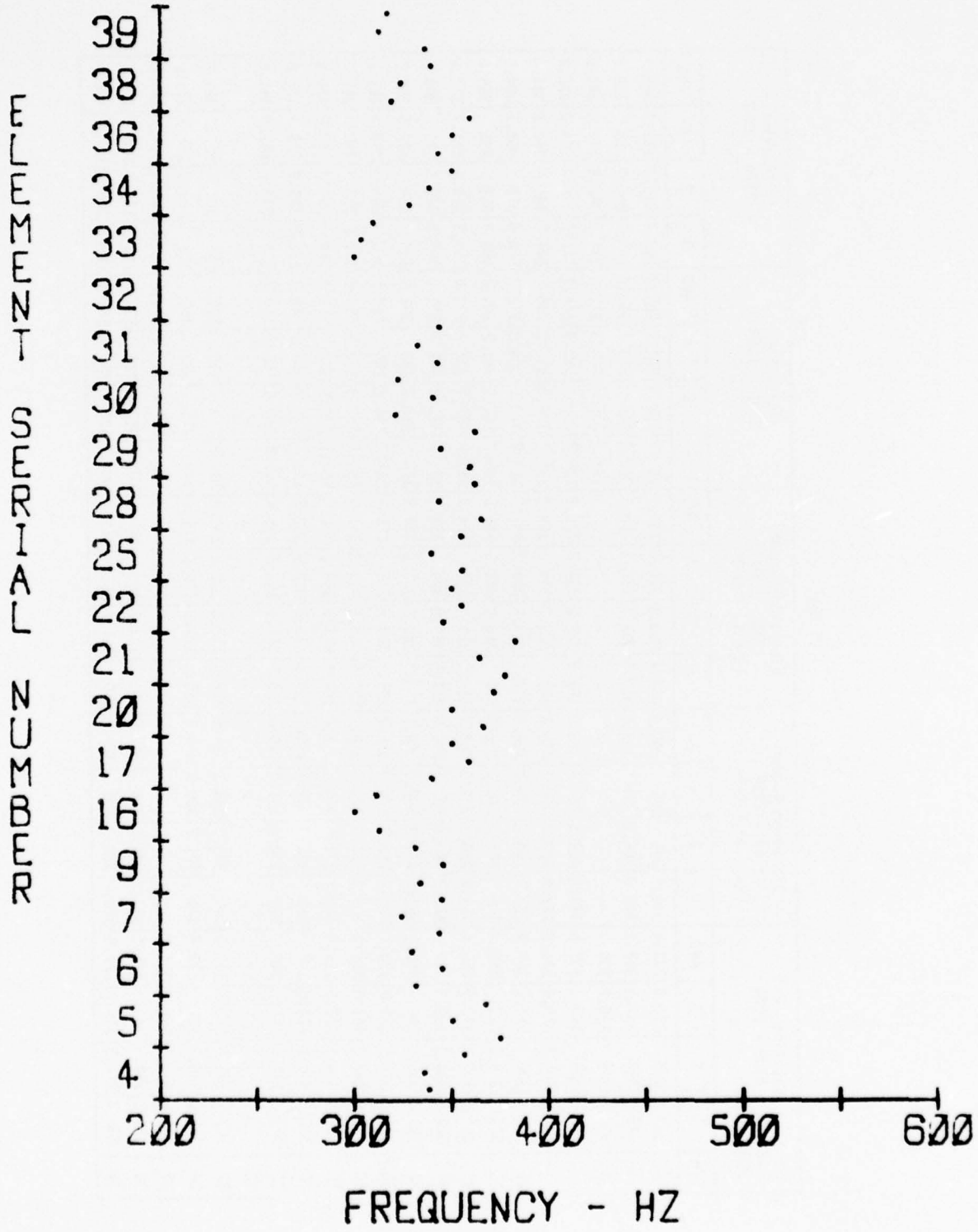
FREQUENCY VARIATION AT -5 PSI DURING -3 AXIS
ACCELERATION ENVIRONMENT, REFERENCE TASK F-7-3.



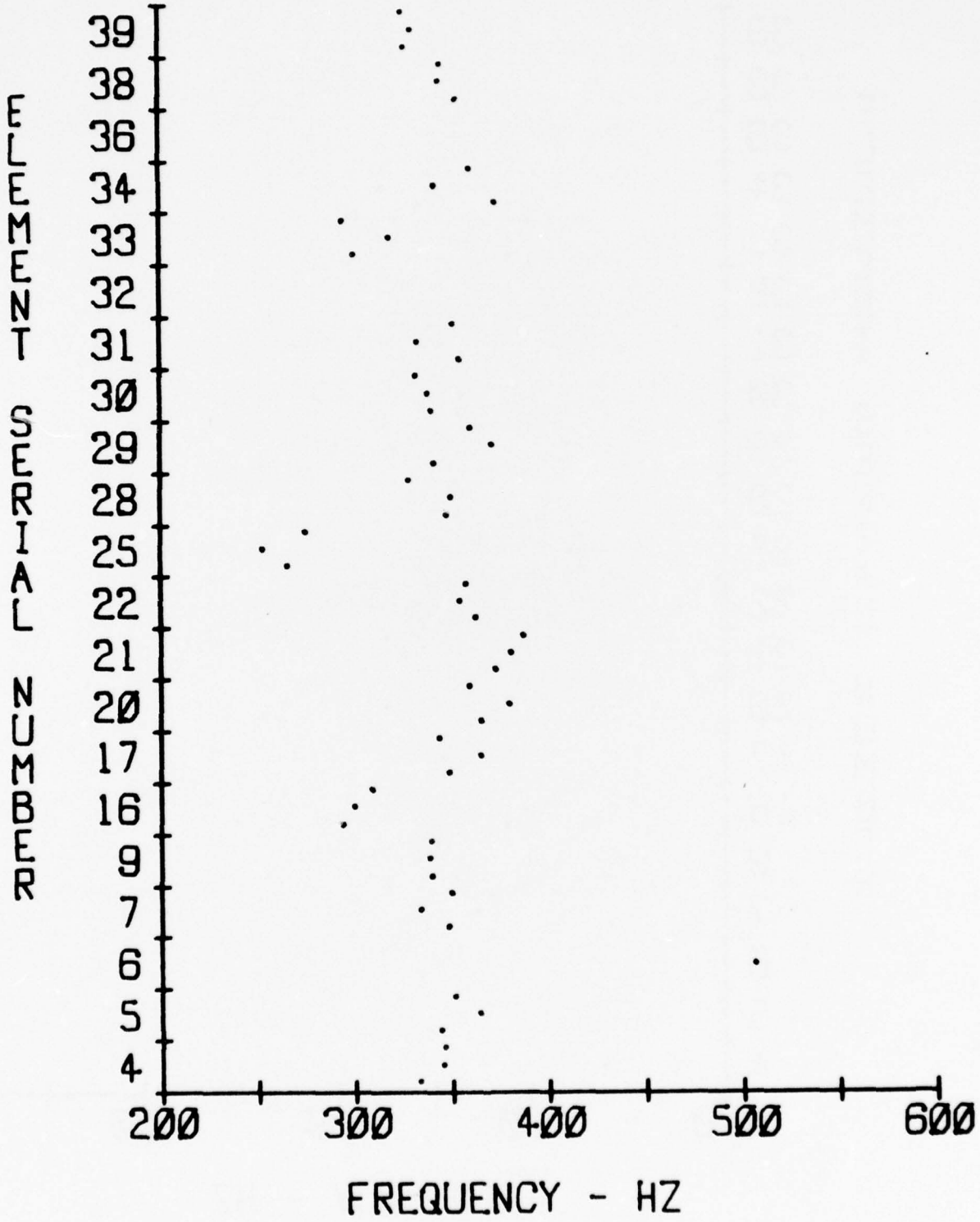
FREQUENCY VARIATION AT -5 PSI DURING +3 AXIS
ACCELERATION ENVIRONMENT, REFERENCE TASK F-7-4.

-5 PSI

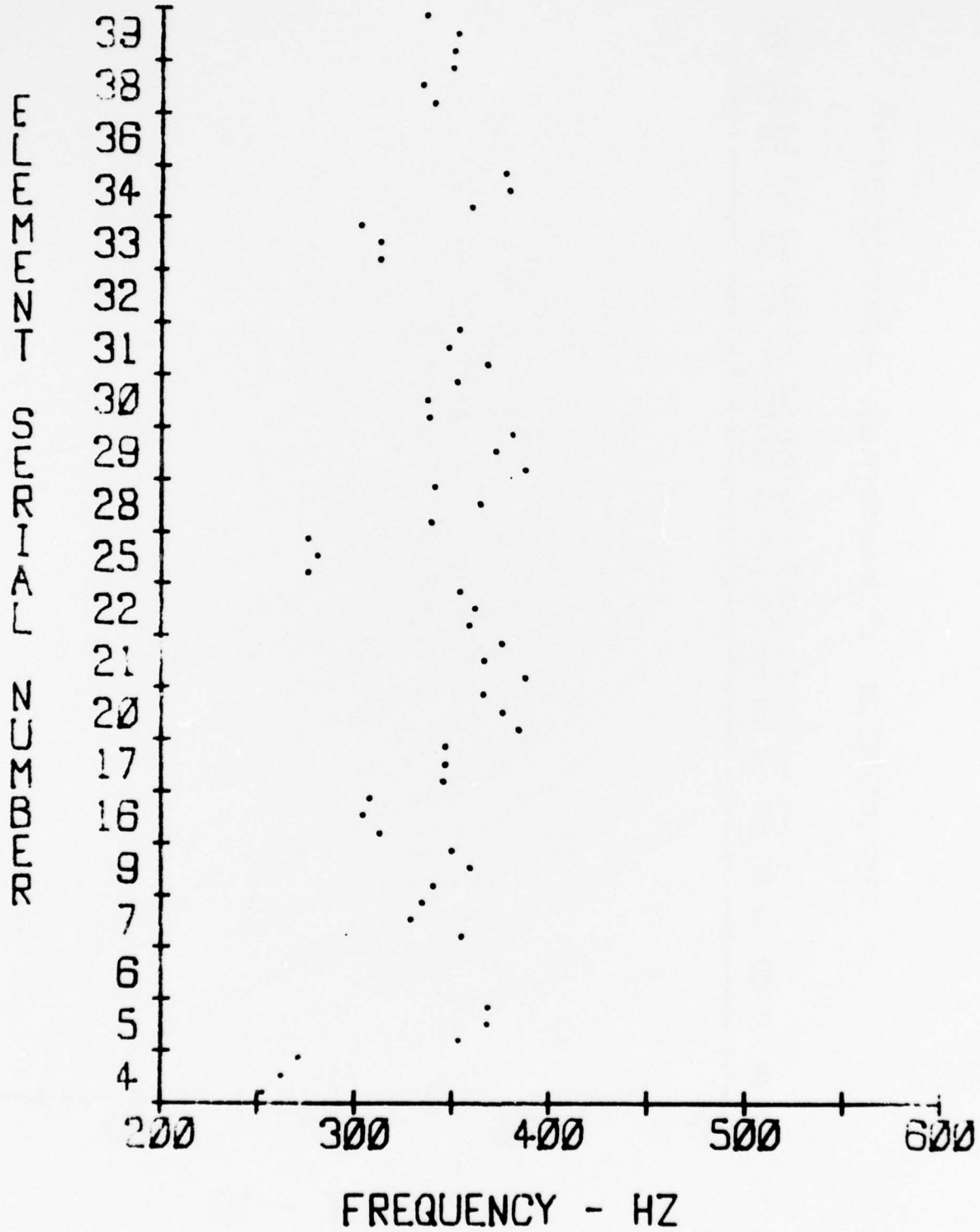
Freq. @-5 PSI	Baseline F-8 2100 - 2162				Vibration Random 2163 - 2234 Axis 3 F-9-1				Vibration Random 2235 - 2306 Axis 1 F-9-2				Baseline 2307 - 2369 F-10				Baseline 2370 - 2552 F-11			
S/N	1	2	3	AVG	1	2	3	AVG	1	2	3	AVG	1	2	3	AVG	1	2	3	AVG
4	337.5	335	356.7	343.1	332.5	345	345	340.8	251.7	262.5	270.8	261.7	281.7	281.7	281.7	281.7	265.8	271.7	266.7	268.1
5	375	350	367.5	364.2	343.3	364.2	351	352.8	353.3	368.3	368.3	363.3	365.8	355	361.7	360.8	359.2	356.7	360	358.6
6	330.8	345	329.2	335	-	-	-	-	-	-	-	-	344.2	335	348.3	342.5	341.7	342.5	344.2	342.8
7	343.7	324	345	337.6	347.5	333.3	350	343.6	354.2	328.3	334.2	338.9	339.2	350	343.3	344.2	336.2	324.2	336.3	332.2
9	333.3	345.8	330.8	336.6	339.2	338.3	339.2	338.9	340	359.2	349	349.4	355	338.3	341.7	345	341.7	341.7	340.8	341.4
16	312.5	300	311.2	307.9	293.3	300	309.2	300.8	311.7	303.3	306.7	307.2	320.8	310	305.8	312.2	310.8	310	306.7	309.2
17	340	359.2	350	349.7	349	365	343.3	352.4	345	345.8	345.8	345.5	366.7	344.2	361.2	357.4	356.7	355	355	355.6
20	366.7	350	372.5	363.1	365.8	380	359.2	368.3	384.2	375	365	374.7	365.8	371.7	375	370.8	314.2	315.8	311.7	313.9
21	367.5	364.2	383.3	375	373.3	380.8	387.5	380.5	387.5	365.8	375	376.1	381.7	373.3	369.7	374.9	363.3	372.5	370	368.6
22	345.8	355.5	350	350.4	362.5	354.2	357.5	358.1	358.3	360.8	353.3	357.5	360	380.8	348	362.9	350	355	357.5	354.2
25	355.8	339.2	355.3	350.1	265	252.5	275	264.2	275	280	275	276.7	281.7	284.2	255	273.6	265	268.3	268.3	267.2
28	365.8	343.3	362.5	357.2	348.3	350	328.3	342.2	339.2	364.2	340.3	347.9	354.2	368.3	340.8	354.4	354.2	350	350	351.4
29	359.5	344.5	362.5	355.5	341.7	371.7	360	357.8	387.5	371.7	380.8	380	354.7	370.8	360	361.8	349	345.8	342.5	345.8
30	320.8	340.8	322.5	328	340	338.3	331.7	336.7	337.5	336.7	352.5	342.2	360	334.2	345.8	346.7	335.8	329.2	333.3	332.8
31	343.3	332.5	344.2	340	355	332.8	351.7	346.5	368.3	347.5	353.3	356.4	360.8	345.8	365	357.2	338.3	340.8	345.8	341.6
32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
33	300	303.3	310	304.4	300	319.2	294.2	304.5	312.5	312.5	302.5	309.2	304.2	310	315	309.7	305	305.8	301.7	304.2
34	329.2	339.2	351	339.8	374	341.7	360.8	358.8	360	379.2	376.7	371.9	355	375	350	360	335	328.3	337.5	333.6
36	343.3	351.1	360	351.7		-	-	-	-	-	-	-	355	364.2	363.3	360.8	342.5	346.7	344.2	344.5
38	319.2	324	340	327.7	353.3	344.2	345	347.5	340	333.7	350	341.2	320	350	320.8	330.3	339.2	333.3	324	332.2
39	336.3	312.5	316.7	321.8	326.7	330	325	327.2	350	351.7	335.8	345.8	346.7	337.5	356.7	346.9	321.7	325	321.7	322.8



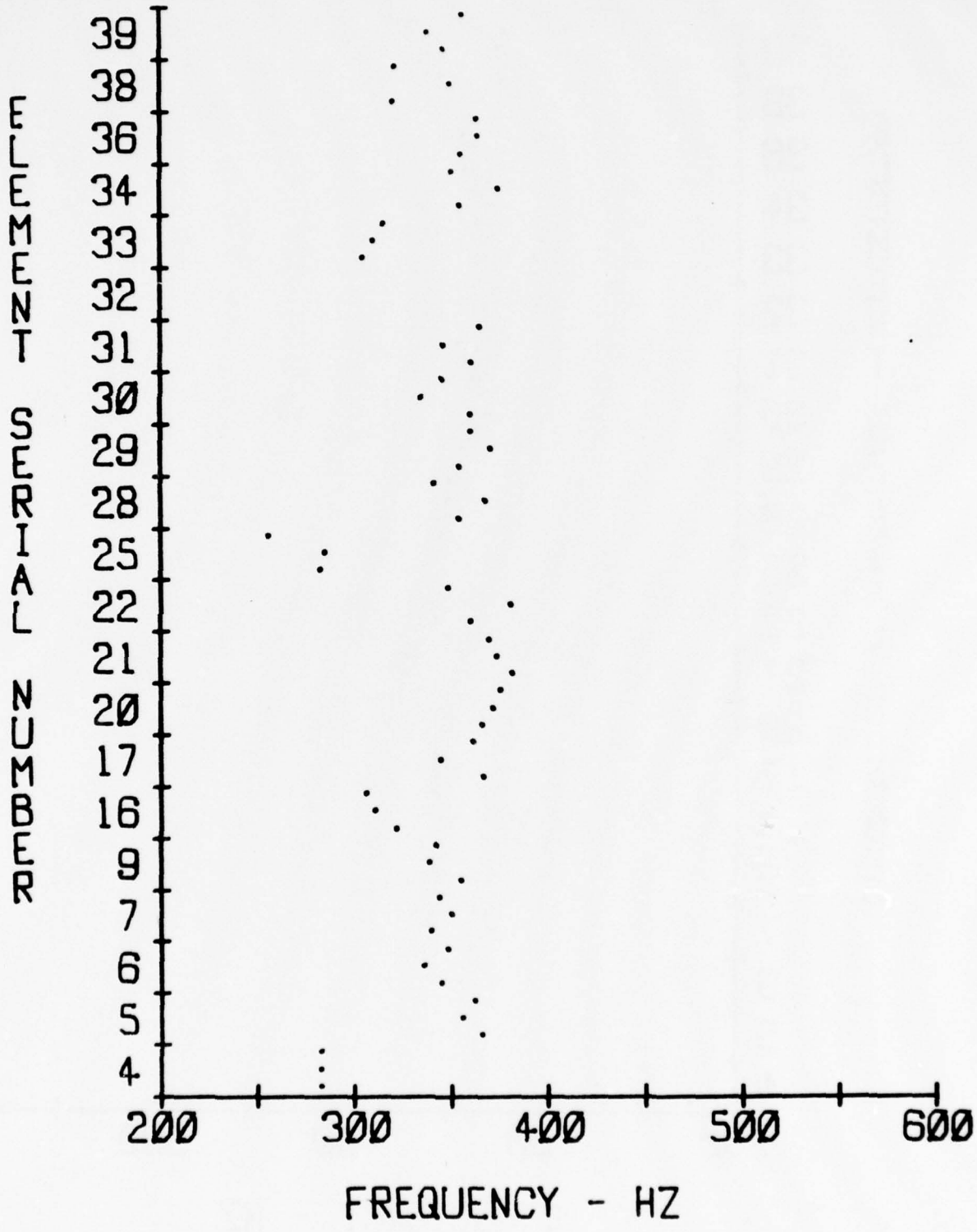
FREQUENCY VARIATION AT -5 PSI DURING
BASELINE TEST PRIOR TO VIBRATION ENVIRONMENT,
REFERENCE TASK F-8



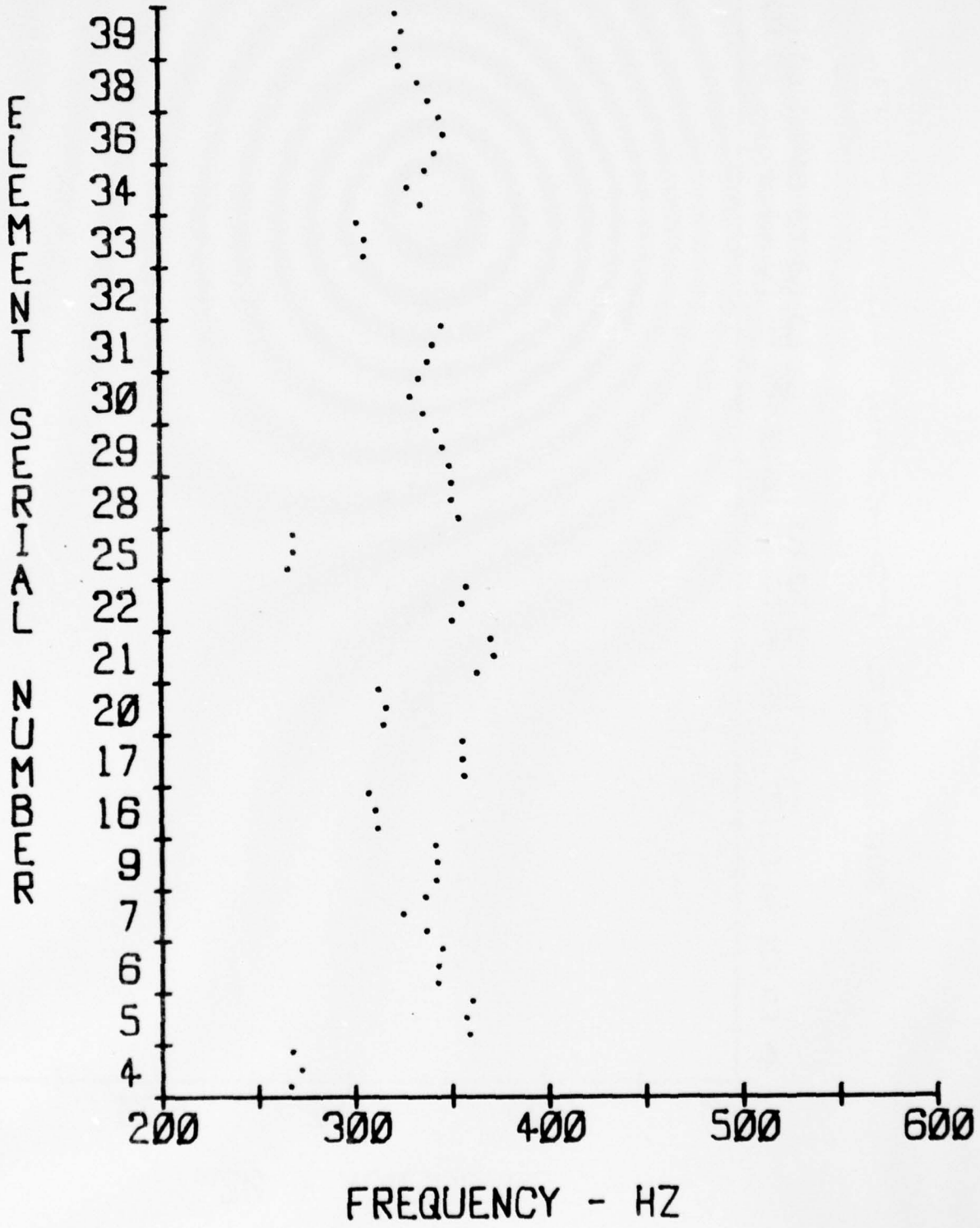
FREQUENCY VARIATION AT -5 PSI DURING AXIS 3
OF RANDOM VIBRATION ENVIRONMENT, REFERENCE
TASK F-9-1



FREQUENCY VARIATION AT -5 PSI DURING AXIS
1 OF RANDOM VIBRATION ENVIRONMENT, REFERENCE
TASK F-9-2



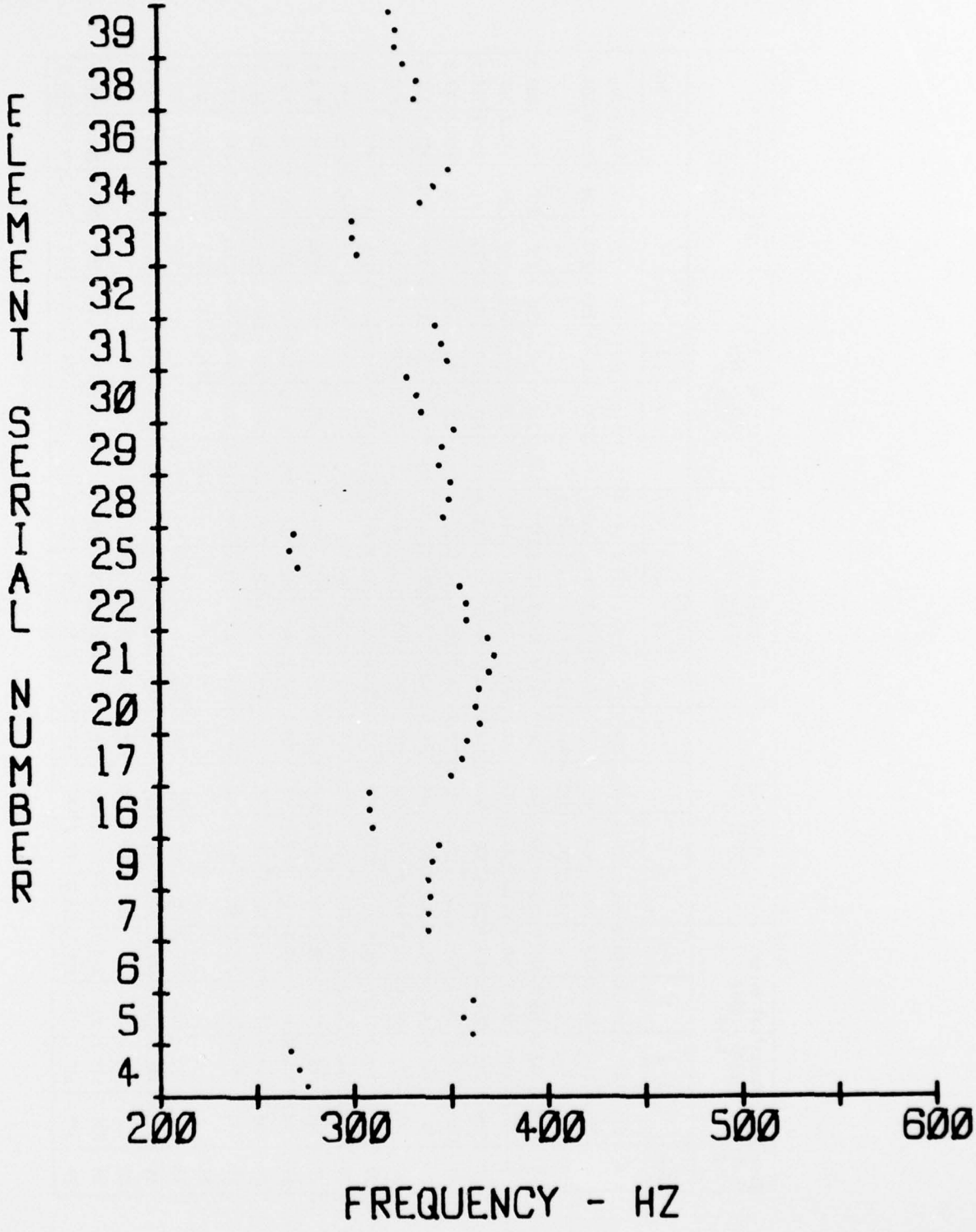
FREQUENCY VARIATION AT -5 PSI DURING BASELINE TEST, AFTER RANDOM VIBRATION ENVIRONMENT REFERENCE TASK F-10



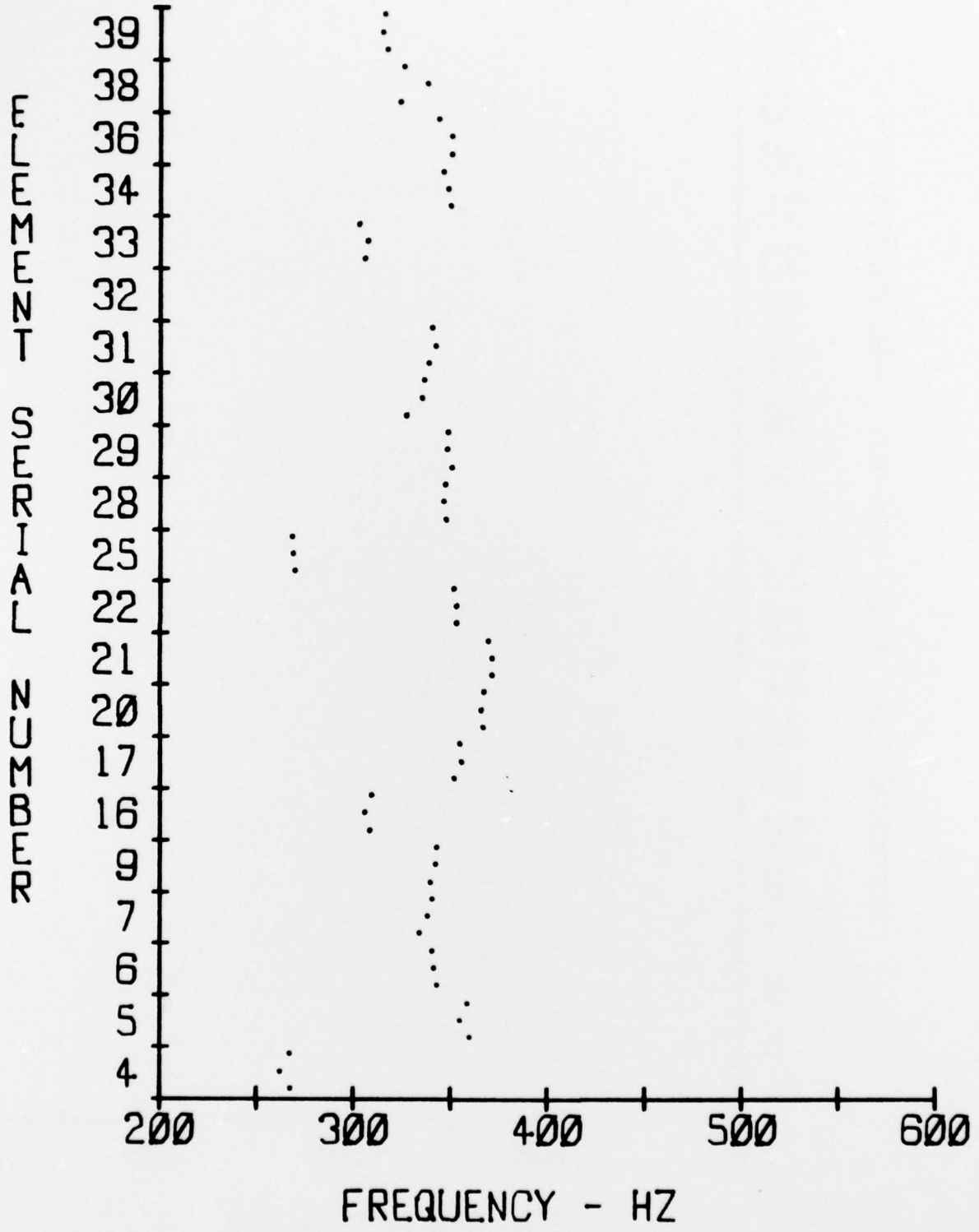
FREQUENCY VARIATION AT -5 PSI DURING BASELINE TEST PRIOR TO ACOUSTICAL NOISE ENVIRONMENT, REFERENCE TASK F-11

-5 PSI

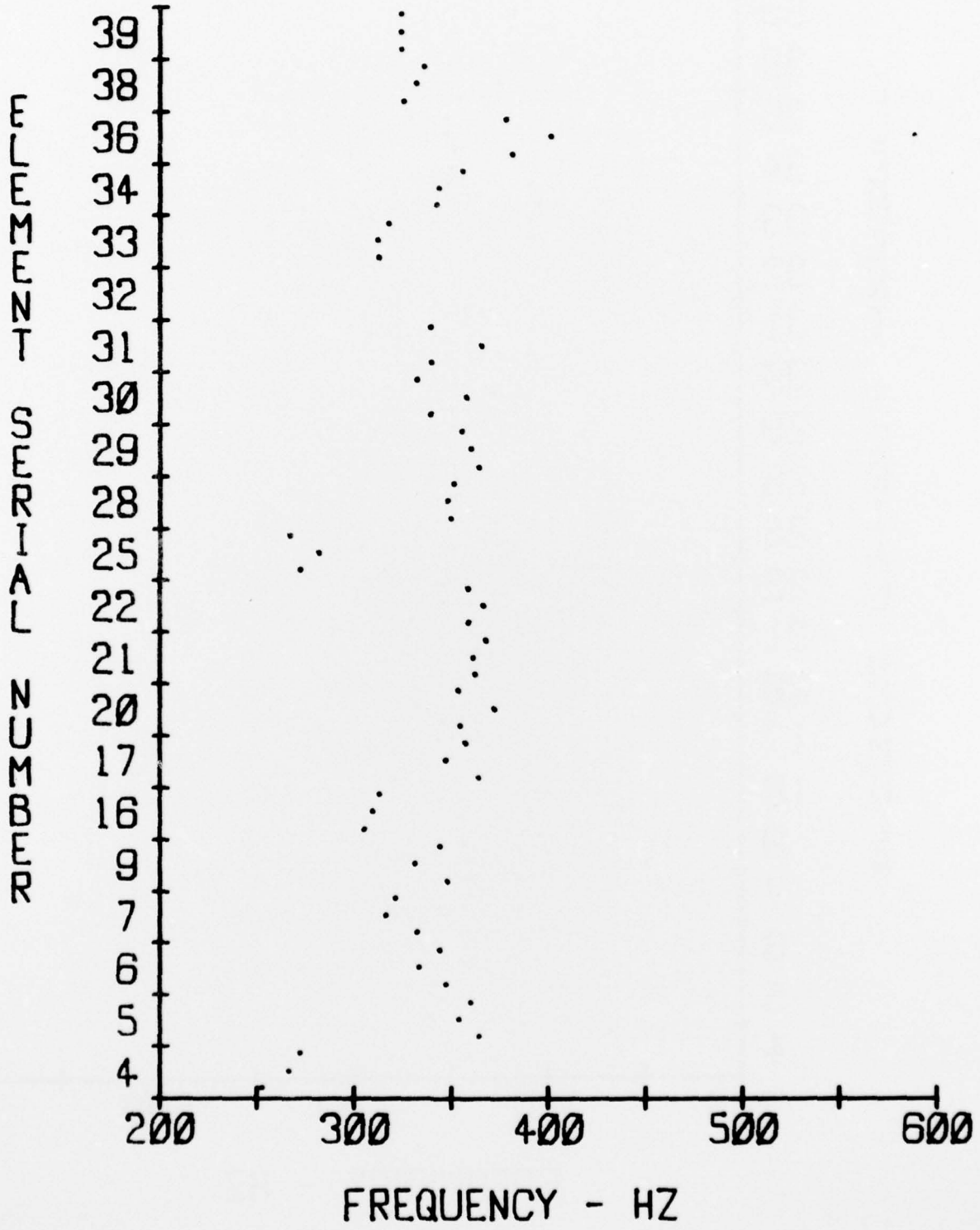
Freq. @ -5 PSI	Acoustical Noise 2370 - 2552 F-12				Baseline 2370 - 2552 F-13				Baseline 2553 - 2615 F-14				Altitude = 90K FT 2616 - 2906 F-15-1				Altitude 50 K FT 2616 - 2906 F-15-2			
S/N	1	2	3	AVG	1	2	3	AVG	1	2	3	AVG	1	2	3	AVG	1	2	3	AVG
4	275	270.8	266.7	270.8	266.7	261.2	266.7	264.9	251.7	266.7	271.7	263.4	171.7	216.7	166.7	185	200	218.3	166.7	195
5	360.8	355.8	360.8	359.1	360	354.2	358.3	357.5	364.2	353.3	360	359.2	319.2	290	301.7	303.6	291.7	305	315.8	304.2
6	-	-	-	-	342.5	340.8	340	341.1	346.7	333	344.2	341.3	-	-	-	-	-	-	-	-
7	337.5	337.5	338.8	337.9	333.3	337.5	340	336.9	331.7	315.8	320.8	322.8	296.7	276	287.5	286.7	285	300	280	288.3
9	337.5	340	343.3	340.3	339.2	341.7	342.5	341.1	348.3	330.8	344.2	341.1	319.2	320.8	309.2	316.4	309.2	304.2	316.7	310
16	309.2	307.5	307.5	308.1	307.5	305	308.8	307.1	304.7	309.2	312.5	308.8	320	316.7	310	315.6	323.3	315	314.2	317.5
17	350	355.8	358.3	354.7	352	355	354.2	353.7	364.5	346.7	357.5	356.2	320.8	335.8	335	330.5	331.7	340	311.7	327.8
20	365	362.5	364.2	363.9	366.7	365	366.7	366.1	354.2	372.5	353.3	360	326	331.7	335	330.9	335.8	318.3	321.7	325.3
21	370	372.5	369.2	370.6	370.8	370.8	369.2	370.3	362.5	360.8	368.3	363.9	320	333.3	318.3	323.9	336.7	330	323.3	330
22	358.3	358.3	354.2	356.9	352.5	352.5	351	352	358.8	366.7	358.3	361.3	319.2	312.5	316.7	316.1	315	331.7	317.5	321.4
25	270.8	266.7	269.2	268.9	269.2	268.3	267.5	268.3	271.7	281.7	266.7	273.4	245	214.2	241.7	233.6	231.7	226.7	230	229.5
28	346.7	349	350	348.6	347.5	345.8	346.7	346.7	350	347.5	351	349.5	317.5	307.5	323	316	304.2	312.5	324	313.6
29	344.2	345.8	352.5	347.5	350	347.5	348.3	348.6	364.2	360	355	359.7	325	343.3	314.2	327.5	333.3	343.3	333.3	336.6
30	335	333	327.5	331.8	326.7	335	335.8	332.5	339.2	358.3	331.7	343.1	250	256.7	225	243.9	251.7	248.3	225	241.7
31	349	345.8	342.5	345.8	338.3	341.7	340	340	340	365.8	339.2	348.3	268.3	200	269.2	245.8	218.3	285.8	239.2	247.5
32	-	-	-	-	-	-	-	-	-	-	-	-	276	326	337.5	313.2	325	333.3	326	328.1
33	302.5	300	300	300.8	305	306.7	302.5	304.7	312.5	311.7	318.3	314.2	289.2	305.8	298	297.7	300	309.2	295	301.4
34	335.8	342.5	350	342.8	350	348.3	345.8	348	343	343.3	356.3	347.5	288.3	301.7	291.7	293.9	290.8	306.7	275	290.8
36	-	-	-	-	350	350	343.3	347.8	381.7	401.7	378.3	387.2	-	-	-	-	-	-	-	-
38	331.7	333.3	326	330.3	323.4	338.3	325	328.9	325	332.5	335.8	331.1	201.7	187.5	230.8	206.7	260	213.3	204	225.8
39	321.7	322.5	319.2	321.1	316.7	314.2	315	315.3	324	324	324	324	225	204.2	233.3	220.8	168.3	218.3	244.2	210.3



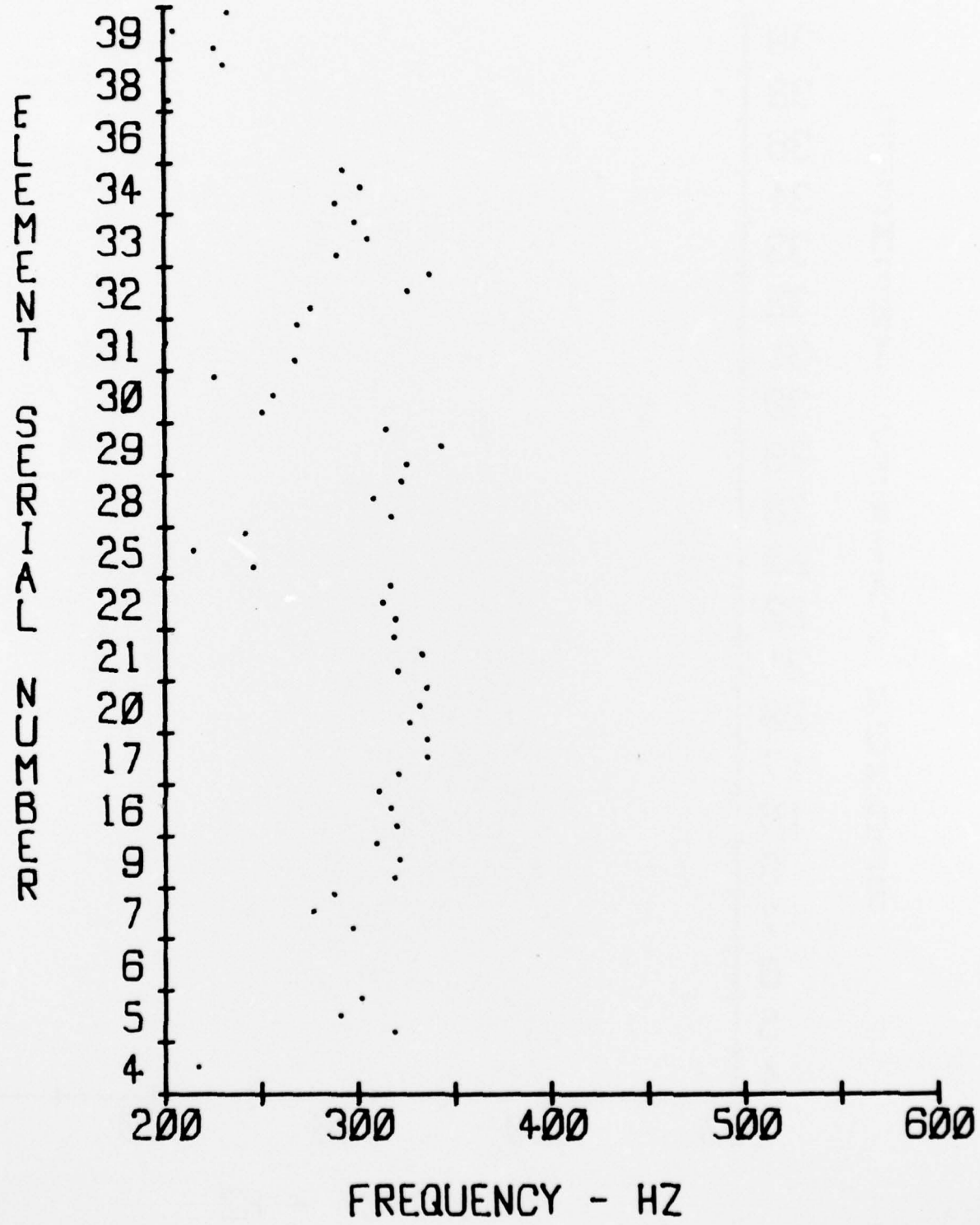
FREQUENCY VARIATION AT -5 PSI DURING
ACOUSTICAL NOISE ENVIRONMENT, REFERENCE
TASK F-12



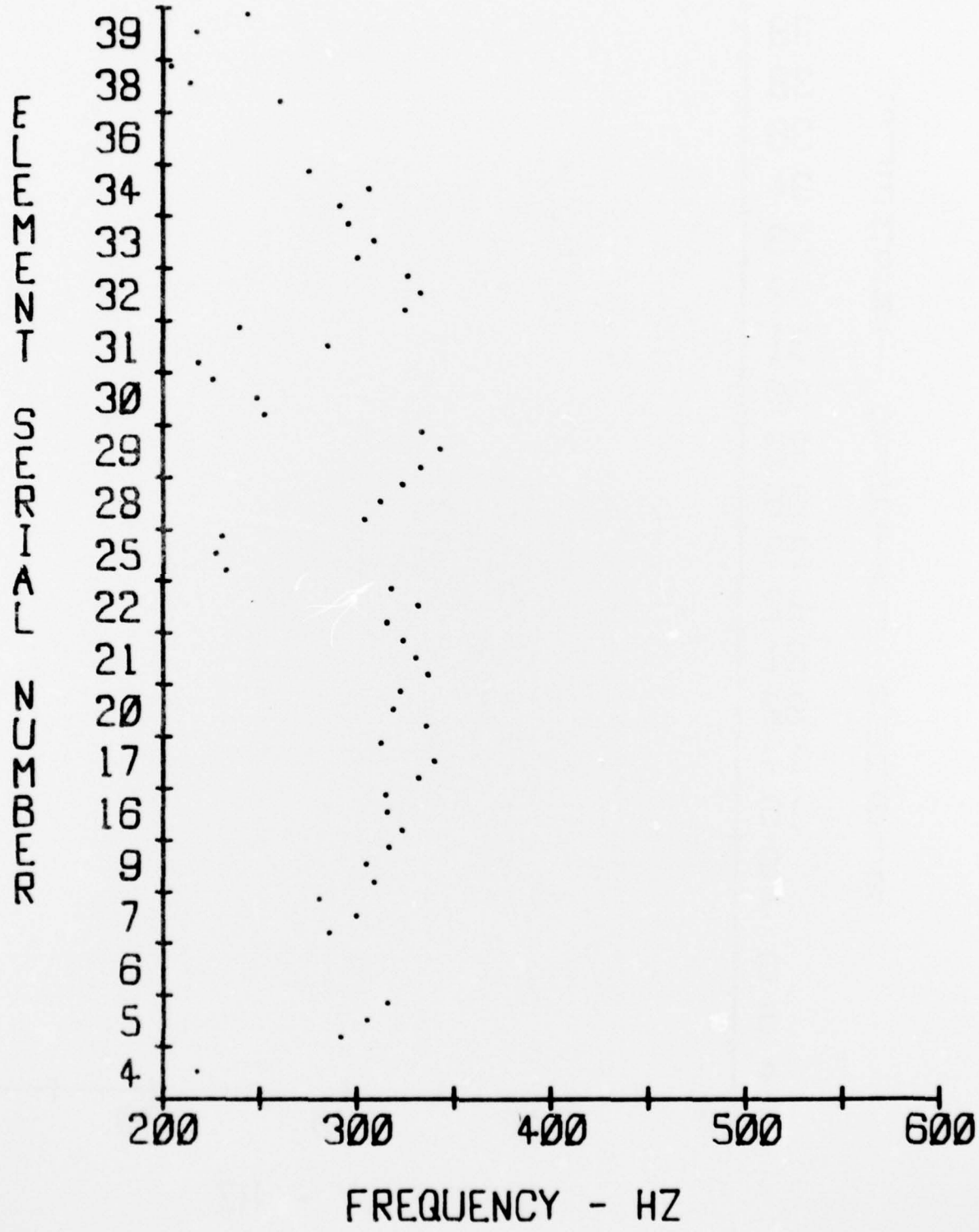
FREQUENCY VARIATION AT -5 PSI DURING
BASELINE TEST AFTER ACOUSTICAL NOISE
ENVIRONMENT, REFERENCE TASK F-13



FREQUENCY VARIATION AT -5 PSI DURING
BASELINE TEST PRIOR TO ALTITUDE
ENVIRONMENT, REFERENCE TASK F-14



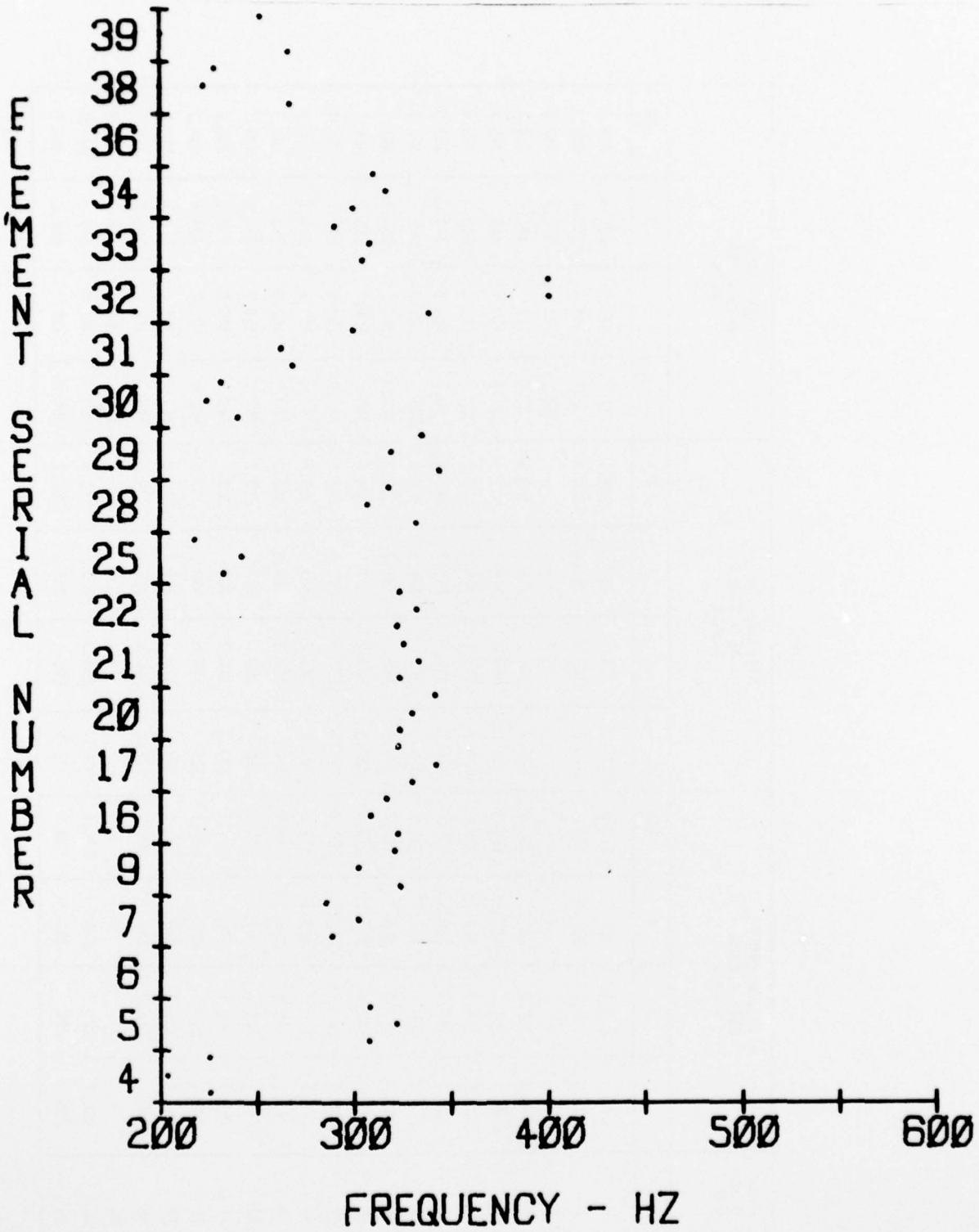
FREQUENCY VARIATION AT -5 PSI DURING 90K FT
ALTITUDE ENVIRONMENT, REFERENCE TASK F-15-1



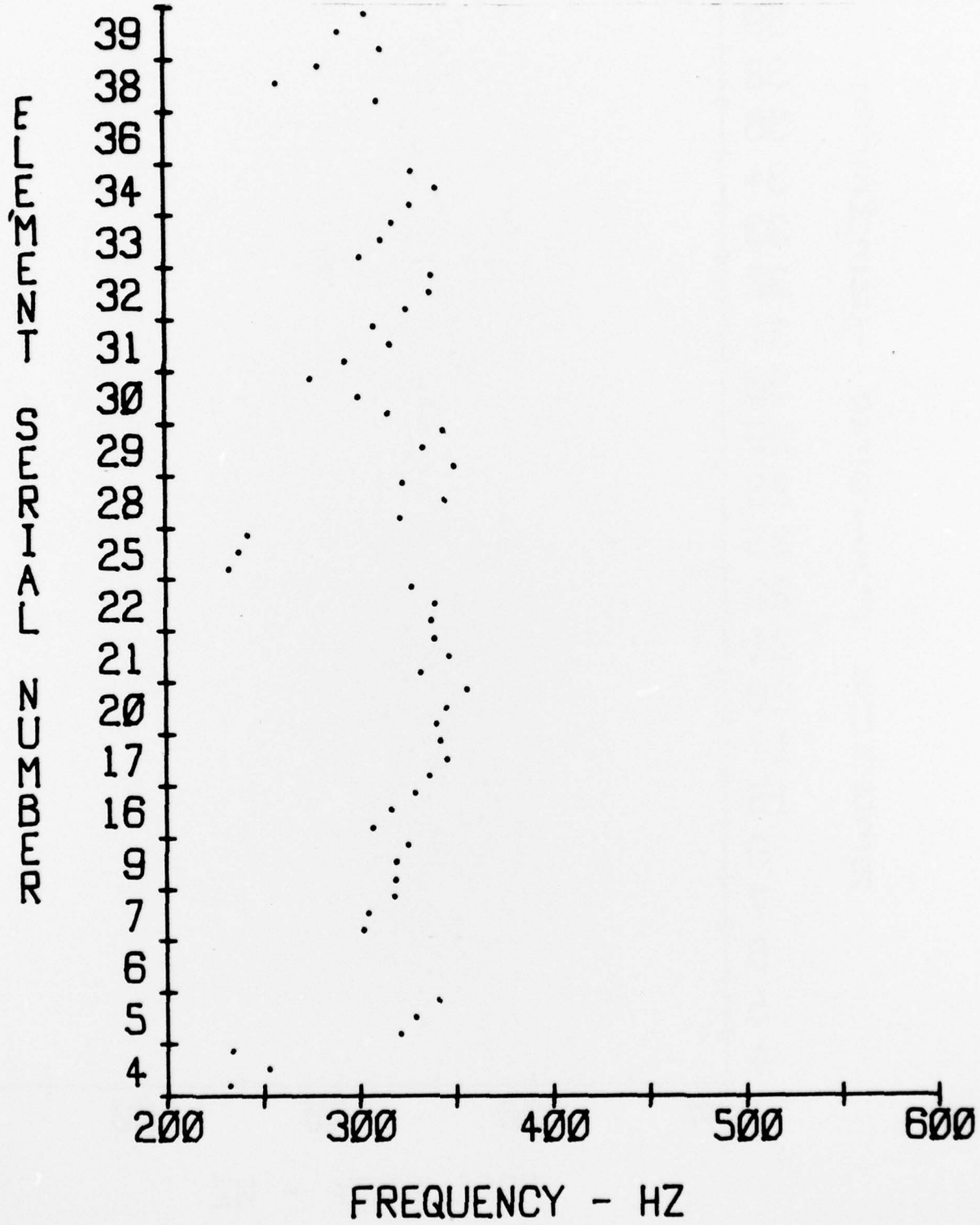
FREQUENCY VARIATION AT -5 PSI. DURING 50K FT
ALTITUDE ENVIRONMENT, REFERENCE TASK F-15-2

-5 PSI

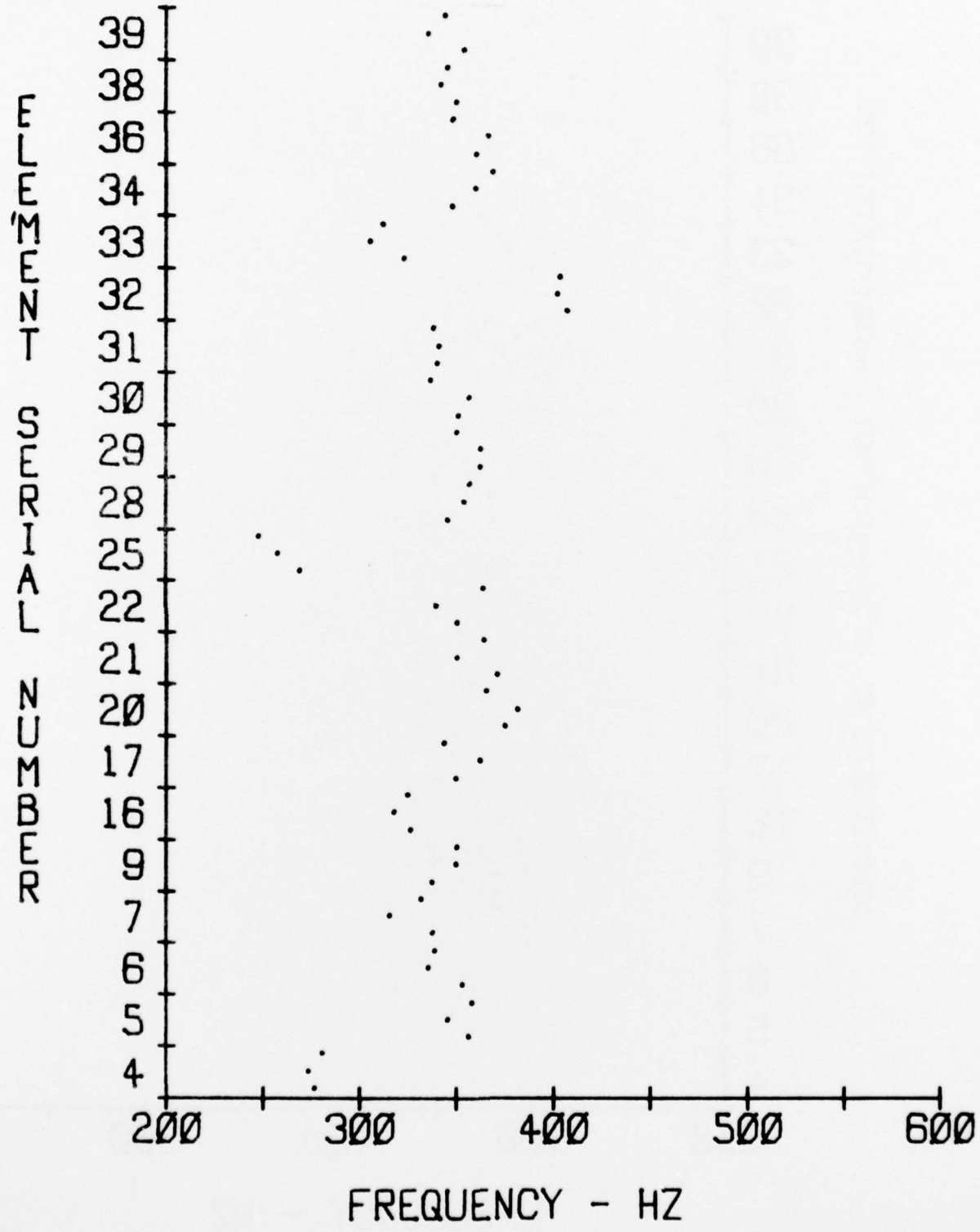
Freq. @ -5 PSI	Altitude 25KFT 2616 - 2906 F-15-3				Altitude 10K 2616 - 2906 F-15-4				Baseline 2616 - 2906 F-16			
S/N	1	2	3	AVG	1	2	3	AVG	1	2	3	AVG
4	225	203.3	225	217.8	231.7	253	233.3	239.3	276	273.3	280.8	276.7
5	307.5	321.7	307.5	312.2	320.8	329.2	340.8	330.3	356.7	345	358.3	353.3
6	-	-	-	-	-	-	-	-	353	335	338.7	342.2
7	288.3	302.5	285	291.9	301.7	304.2	318.3	308.1	337.5	315	331.7	328.1
9	324	301.7	320.8	315.5	318.8	319.2	325	321	337.5	350	350	345.8
16	322.5	308.3	316.7	315.8	306.7	316.7	329.2	317.5	326	317.5	325	322.8
17	330	342.5	322.5	331.7	336.7	345.8	341.7	341.4	350	362.5	343.3	351.9
20	323.3	330	341.7	331.7	340	345	356.3	347.1	375	381.7	365	373.9
21	323.3	333.3	325	327.2	331.7	346.7	339.2	339.2	370.8	350	364.2	361.7
22	321.7	332.5	323.3	325.8	337.5	339.2	327	334.6	350	339.2	364.2	351.1
25	232.5	242.5	217.5	230.8	232.5	237.5	242.5	237.5	269.2	257.5	247.5	258.1
28	332.5	306.7	318.3	319.2	321.7	344.7	323	329.8	345.8	354.2	356.7	352.2
29	344.2	319.2	335	332.8	350	333.3	344.2	342.5	362.5	362.5	350	358.3
30	240	224	231.7	231.9	315	300	275	296.7	351	356.7	336.7	348.1
31	269.2	262.5	300	277.2	293.3	316.7	308	306	340	340.8	338.3	339.7
32	339.2	401	400	380.1	325	337.5	338.3	333.6	407.5	401.7	403.4	404.2
33	304.2	308.3	290	300.8	301	312.5	318.3	310.6	323	305	312.5	313.5
34	300	316.7	310	308.9	327.5	340.8	328.3	332.2	348	360	369.2	359.1
36	-	-	-	-	-	-	-	-	360	366.7	348	358.2
38	266.7	221.7	228	238.8	310	258.3	280	282.8	350	341.7	345	345.6
39	266.7	200	251.7	239.5	312.5	290	304.2	302.2	354.2	335	344.2	344.5



FREQUENCY VARIATION AT -5 PSI DURING 25K FT
ALTITUDE ENVIRONMENT, REFERENCE TASK F-15-3



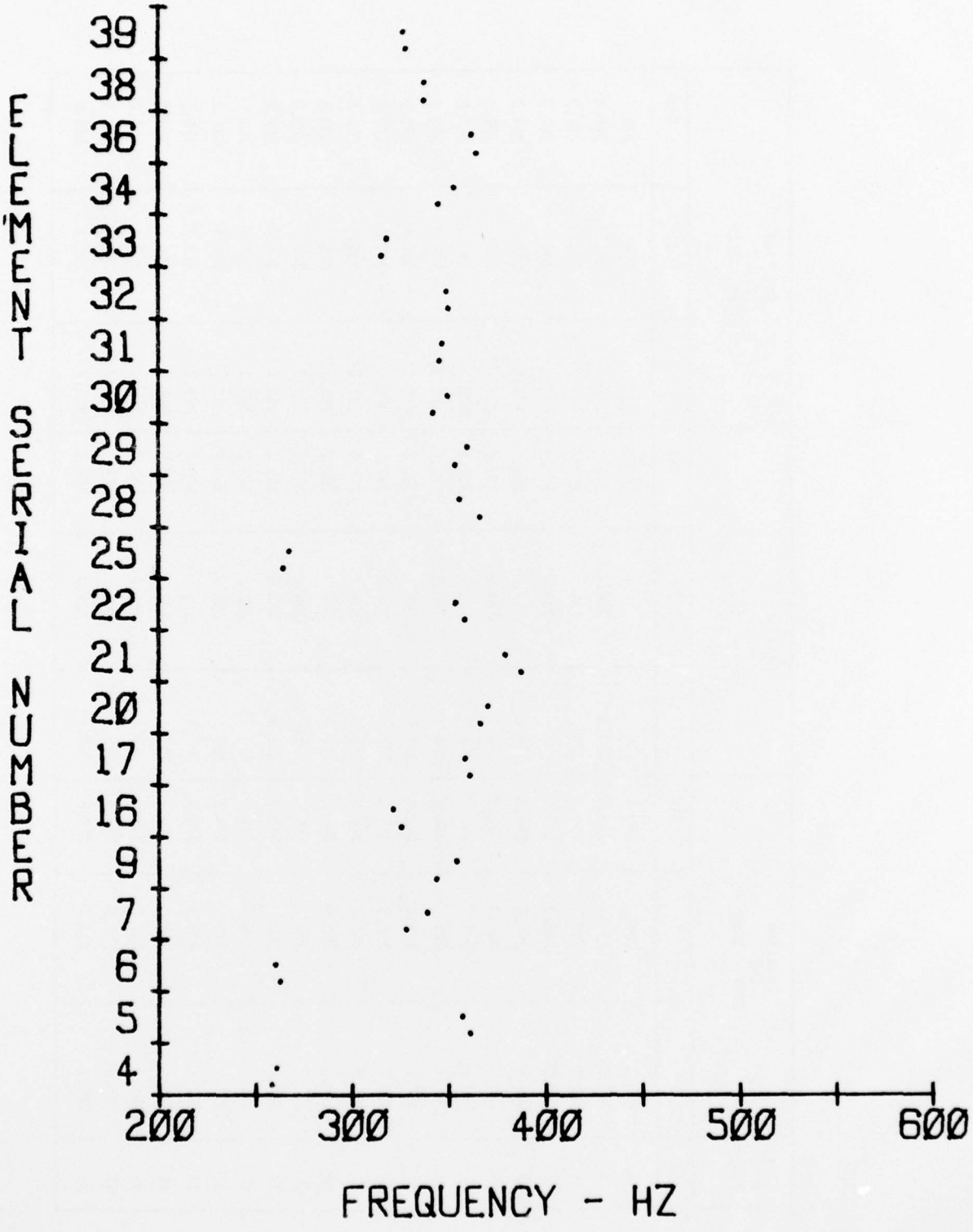
FREQUENCY VARIATION AT -5 PSI DURING 10K FT
ALTITUDE ENVIRONMENT, REFERENCE TASK F-15-4



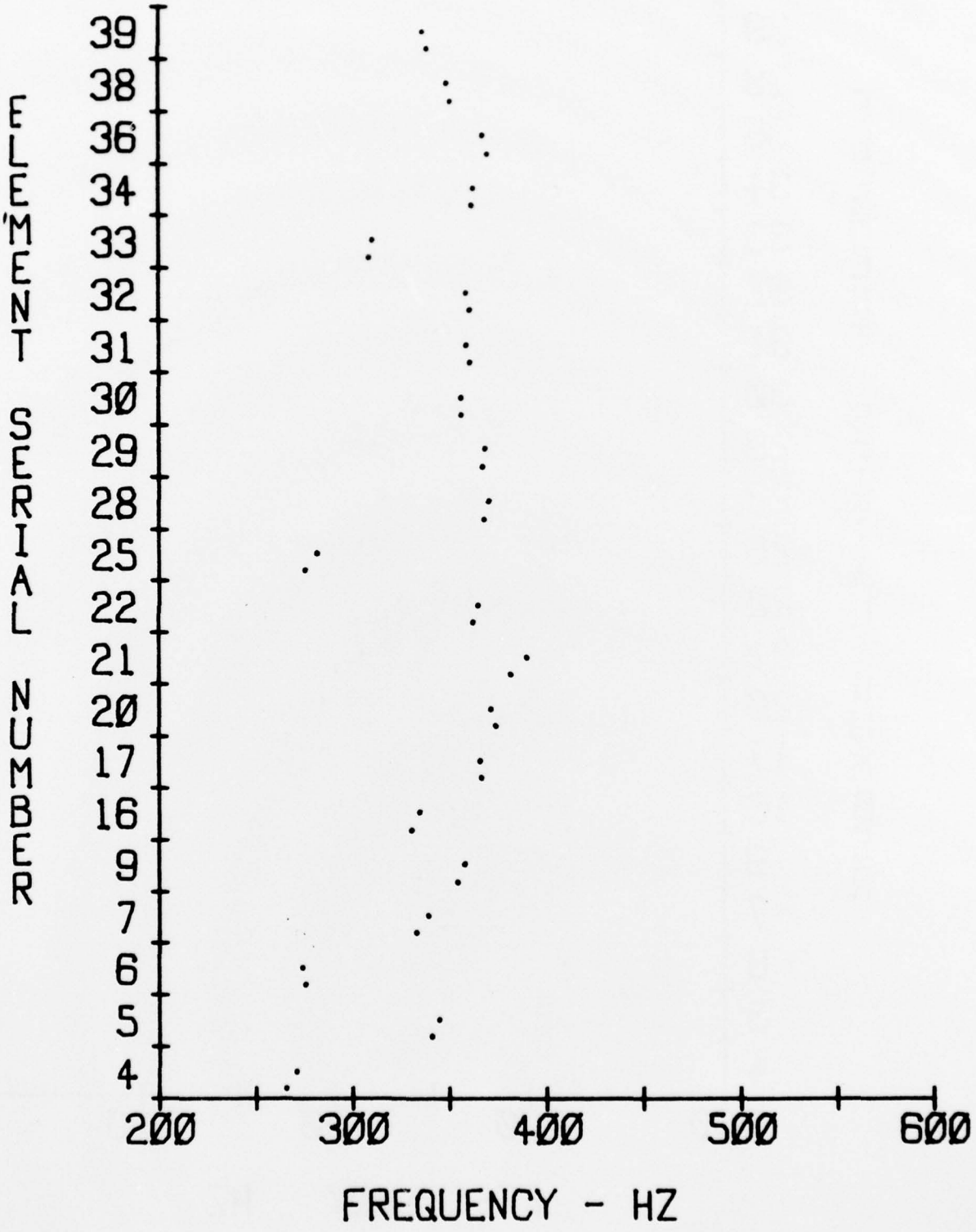
FREQUENCY VARIATION AT -5 PSI DURING BASELINE TESTING AFTER ALTITUDE ENVIRONMENT, REFERENCE TASK F-16

-5 PSI

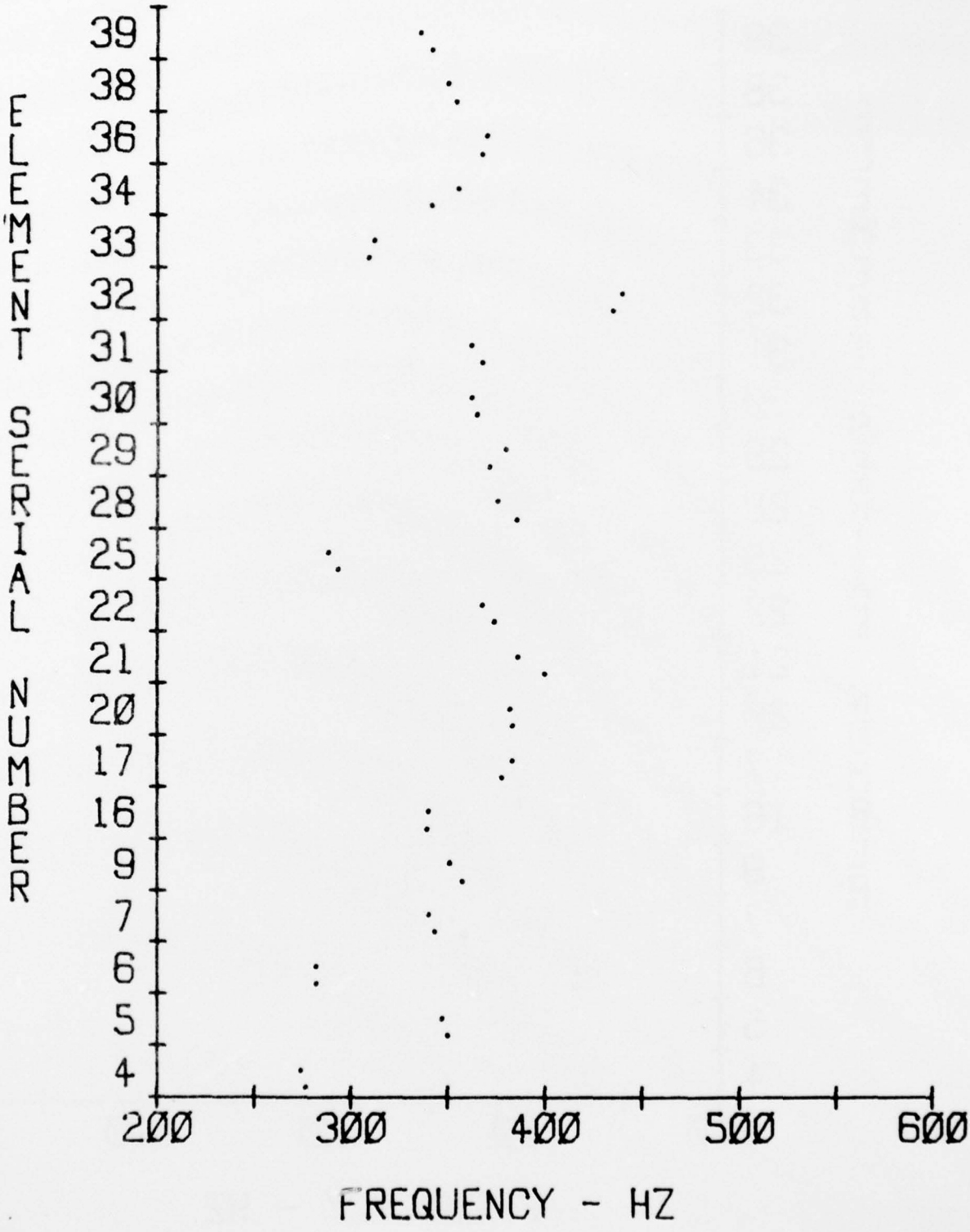
Freq. @ -5 PSI	Baseline E-2-1 2907 - 3018			Baseline E-2-2 3019 - 3123			Baseline E-2-3 3124 - 3228		
S/N	1	2	AVG	1	2	AVG	1	2	AVG
4	258.3	260.5	259.4	265	270.8	267.9	276	274	275
5	360.8	356.7	358.8	340.8	344.2	342.5	350	346.7	348.4
6	262.5	260	261.3	275	274	274.5	281.7	281.7	281.7
7	328.3	339.2	333.8	333	339.2	336.1	343.3	340	341.7
9	343.3	354.2	348.8	354.2	357.5	355.9	357.5	351	354.3
16	325	320.8	322.9	330	334.2	332.1	339.2	340	339.6
17	360.8	358.3	359.6	366.7	365.8	366.3	378.3	383.3	380.8
20	366.7	370	368.4	374	370.8	372.4	383.3	381.7	382.5
21	387.5	379.2	383.4	381.7	390	385.9	400	385.8	392.9
22	358.3	353.3	355.8	361.7	364.2	362.9	374	367.5	370.8
25	264.2	267.5	265.9	275	281.7	278.4	293.3	288.3	290.8
28	366.7	355.8	361.3	368.3	370	369.2	385.8	375	380.4
29	353.3	360	356.7	366.7	368.3	367.5	370.8	380	375.4
30	341.7	350	345.9	355.8	355.8	355.8	364.7	361.7	363.2
31	345	346.7	345.9	360	358.3	359.2	368.3	361.7	365
32	350	349	349.5	360	358.3	359.2	435	439.7	437.4
33	315	318.3	316.7	308.3	310	309.2	309.2	311.7	310.5
34	345	353.3	349.2	361.3	361.7	361.5	341.7	355.8	348.8
36	365	361.7	363.4	369.7	366.7	368.2	368.3	370	369.2
38	337.5	337.5	337.5	350	348	349	354.2	350	352.1
39	328.3	326.7	327.5	338.3	335.8	337.1	341.7	335.8	338.8



FREQUENCY VARIATION AT -5 PSI DURING FIRST
STEP PULSE BASELINE TEST, REFERENCE TASK E-2-1



FREQUENCY VARIATION AT -5 PSI DURING SECOND
STEP PULSE BASELINE TEST, REFERENCE TASK E-2-2



FREQUENCY VARIATION AT -5 PSI DURING THIRD
STEP PULSE BASELINE TEST, REFERENCE TASK E-2-3