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VOLUME IVB

SELF-TENSIONING ACOUSTICAL HORIZONTAL LINE ARRAY (SPRAY) DATA ANALYSIS (U)

FINAL REPORT OF BEARING STAKE TESTS JANUARY THRU MARCH 1976

9 JANUARY 1979

LEVEL II

DDC FILE COPY

PREPARED FOR

NAVAL AIR DEVELOPMENT CENTER
WARMINSTER, PENNSYLVANIA

UNDER CONTRACTS
N62269-77-C-0139
and
N62269-78-M-6884

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LEVEL III

VOLUME IVB

SELF-TENSIONING ACOUSTICAL HORIZONTAL LINE ARRAY (SPRAY) DATA ANALYSIS.

FINAL REPORT OF BEARING STAKE TESTS JANUARY THRU MARCH 1977.

Volume IVB. Data Points 10, 11 and 12 Raw Data

9 JANUARY 1979

515 p.

Distribution limited to U.S. Gov't. agencies only: T&E/ Proprietary Info.; 1 Feb. '79. Other requests for this document must be referred

NAVAL AIR DEVELOPMENT CENTER
WARMINSTER, PENNSYLVANIA 18974

UNDER CONTRACTS
N62269-77-C-0139
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IA	Summary - Test Results
IB	Detailed Description, Test Results
II	Data Analysis Facility and Data Reduction Methodology
IIIA	Data Points 1, 2 and 3 Raw Data
IIIB	Data Points 4, 5 and 6 Raw Data
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- Signal Level and SNR Calcualtions
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- Beamformed ALIU Plots

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NOTE ALI Plot Scales for Beamformed and Omni Data are NOT the same.

SNR comparisons cannot be taken directly from plot comparisons.

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- OMNI NOISE LEVELS

19 JANUARY 1977 DATA POINT 1

290 Hz	+64.6	dBreμPa/1 Hz
295 Hz	+64.2	dBreμPa/1 Hz

19 JANUARY 1977 DATA POINT 2

290 Hz	+64.7	dBreμPa/1 Hz
295 Hz	+65.4	dBreμPa/1 Hz

7 FEBRUARY 1977 DATA POINT 3

140 Hz	+74.5	dBreμPa/1 Hz
29[illegible] Hz	+67.5	dBreμPa/1 Hz

7 FEBRUARY 1977 DATA POINT 4

140 Hz	+73.3	dBreμPa/1 Hz
290 Hz	+65.6	dBreμPa/1 Hz

7 FEBRUARY 1977 DATA POINT 5

140 Hz	+76.6	dBreμPa/1 Hz
290 Hz	+68.4	dBreμPa/1 Hz

7 FEBRUARY 1977 — DATA POINT 6

140 Hz	+76.0	dBreμPa/1 Hz
290 Hz	+68.9	dBreμPa/1 Hz

8 FEBRUARY 1977 — DATA POINT 7

140 Hz	+70.1	dBreμPa/1 Hz
290 Hz	+62.2	dBreμPa/1 Hz

15 MARCH 1977 — DATA POINT 8

140 Hz	+67.3	dBreμPa/1 Hz
290 Hz	+61.6	dBreμPa/1 Hz

15 MARCH 1977 — DATA POINT 9

140 Hz	+68.2	dBreμPa/1 Hz
290 Hz	+65.2	dBreμPa/1 Hz

16 MARCH 1977 — DATA POINT 10

140 Hz	+74.2	dBreμPa/1 Hz
290 Hz	+64.6	dBreμPa/1 Hz

16 MARCH 1977 — DATA POINT 11

140 Hz	+70.2	dBreμPa/1 Hz
290 Hz	+62.2	dBreμPa/1 Hz

- OMNI NOISE LEVELS

16 MARCH 1977 DATA POINT 12

140 Hz	+72.0	dBrepμPa/1 Hz
290 Hz	+65.5	dBrepμPa/1 Hz

SECRET

O M N I

DATA POINT	OPERATIONAL DATA	AVG. SIGNAL LEVEL dBV	AVG. NOISE LEVEL dBV	BANDWIDTH CORRECTION (NCPS-77)	BANDWIDTH CONVERSION (To 1 Hz)	ARRAY SENSITIVITY (To dB re 1 μPa)	A^2D CONVERSION	SNR	LINEAR PROCESSING CORRECTION	CORRECTED SNR
	DATE: 1-11-77 TIME: 1551Z									
1	RANGE: 91 N.M. 280 HZ	-49.7	-57.7	-1.8	+15	+8	+100	7.0	-4.8	+2.2
	DEPTH: 1650 FM 296 HZ	-52.3	-57.1	-1.8	+15	+8	+100	3.8	-5.8	-2.0
	DATE: 1-11-77 TIME: 1600Z									
2	RANGE: 91 N.M. 280 HZ	-51.5	-56.6	-1.8	+15	+8	+100	5.0	-5.2	-.2
	DEPTH: 1650 FM 295 HZ	-51.2	-56.9	-1.8	+15	+8	+100	+7	-5.4	-.7
	DATE: 2-7-77 TIME: 0934Z									
3	RANGE: 175 N.M. 140 HZ	-32.5	-45.7	-1.8	+10	+12	+100	13.2	-4.2	9.0
	DEPTH: 1900 FM 290 HZ	-38.6	-48.7	-1.8	+10	+8	+100	10.1	-4.3	5.6
	DATE: 2-7-77 TIME: 1019Z									
4	RANGE: 159 N.M. 140 HZ	-34.4	-46.9	-1.8	+10	+12	+100	12.5	-4.2	8.3
	DEPTH: 1800 FM 280 HZ	-39.6	-50.6	-1.8	+10	+8	+100	11.0	-4.2	6.9
	DATE: 2-7-77 TIME: 1599Z									
5	RANGE: 110 N.M. 140 HZ	-30.0	-43.5	-1.8	+10	+12	+100	13.5	-4.2	9.3
	DEPTH: 1900 FM 280 HZ	-33.1	-47.8	-1.8	+10	+8	+100	14.7	-4.2	10.5
	DATE: 2-7-77 TIME: 2033Z									
6	RANGE: 70 N.M. 140 HZ	-24.7	-44.2	-1.8	+10	+12	+100	19.5	-4.0	15.5
	DEPTH: 1900 FM 280 HZ	-23.0	-47.3	-1.8	+10	+8	+100	24.3	-4.0	20.3

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OMNI

DATA POINT	OPERATIONAL DATA	AVG. SIGNAL LEVEL dBV	AVG. NOISE LEVEL dBV	BAND-WIDTH CORRECTION (MCPS-32)	BAND-WIDTH CONVERSION (TO 1 HZ)	ARRAY SENSITIVITY (TO dB/MB)	AP^2 CONVERSION (TO dB/μP^2)	SNR	LINEAR PROCESSING CORRECTION	CORRECTED SNR
	DATE: 2-8-77 TIME: 0202Z									
7	RANGE: 28 N.M. 140 HZ	-16.0	-50.1	-1.8	+10	+12	+100	34.1	-4.0	30.1
	DEPTH: 1900 FM 290 HZ	-17.5	-54.0	-1.8	+10	+8	+100	36.5	-4.0	32.5
	DATE: 3-15-77 TIME: 1501Z									
8	RANGE: 22 N.M 140 HZ	-19.4	-52.9	-1.8	+10	+12	+100	33.5	-4.0	29.5
	DEPTH: 2800 FM 290 HZ	-15.2	-54.6	-1.8	+10	+8	+100	39.4	-4.0	35.4
	DATE: 3-15-77 TIME: 2131Z									
9	RANGE: 72 N.M 140 HZ	-19.4	-52.0	-1.8	+10	+12	+100	36.6	-4.0	32.6
	DEPTH: 2800 FM 290 HZ	-12.5	-51.0	-1.8	+10	+8	+100	38.5	-4.0	34.5
	DATE: 3-16-77 TIME: 0633Z									
10	RANGE: 138 N.M. 140 HZ	-23.3	-44.0	-1.8	+10	+12	+100	22.7	-4.0	18.7
	DEPTH: 2800 FM 290 HZ	-38.0	-51.6	-1.8	+10	+8	+100	13.6	-4.2	9.4
	DATE: 3-16-77 TIME: 0935Z									
11	RANGE: 132 N.M. 140 HZ	-29.8	-50.0	-1.8	+10	+12	+100	20.2	-4.0	16.2
	DEPTH: 2800 FM 290 HZ	-41.5	-54.0	-1.8	+10	+8	+100	12.5	-4.2	8.3
	DATE: 3-16-77 TIME: 1148Z									
12	RANGE: 133 N.M. 140 HZ	-24.8	-48.2	-1.8	+10	+12	+100	23.4	-4.0	19.4
	DEPTH: 2800 FM 290 HZ	-38.6	-50.7	-1.8	+10	+8	+100	12.1	-4.2	7.9

SECRET

SECRET 16 ELEMENT ARRAY

	OPERATIONAL DATA	SIGNAL LEVEL dBV	MCPS-32 CAL CORRECTION	BEAM-FORMER ATTN	BEAM-FORMER CORRECTION	B+C	A+E	J+K	I+G	NOISE LEVEL dBV	MCPS-32 CAL CORRECTION	BEAM-FORMER ATTN	BEAM-FORMER CORRECTION	BAND-WIDTH CORRECTION	BAND-WIDTH CONVERSION	ARRAY SENSITIVITY	MPL CONVERSION	SNR H-F	LINEAR PROCESSING CORRECTION	CORRECTED SNR H+R	STEERING ANGLE	Q+L
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
	DATE: 1-19-77 TIME: 1551Z																					
1	RANGE: 91 N.M. 250 HR	-60.9	+10	+18	+.7	28	-32.9	28	-58.1	-78.1	+10	+18	+.7	-1.8	+15	+8	+100	17.7	-4.1	14.3	-59°	17.4
	DEPTH: 1450 FM 235 HR	-66.8	+10	+18	+.9	28	-40.8	28	-59.1	-78.1	+10	+18	+.9	-1.8	+15	+8	+100	9.3	-4.4	5.8	-59°	10.2
	DATE: 1-19-77 TIME: 1600Z																					
2	RANGE: 91 N.M. 250 HR	-77.1	NA	0	+.9	0	-39.1	0	-44.6	-66.6	NA	0	+.9	-1.8	+15	+8	+100	7.5	-4.9	3.6	58.5°	8.4
	DEPTH: 1150 FM 235 HR	-78.9	NA	0	+.9	0	-38.9	0	-44.6	-66.6	NA	0	+.9	-1.8	+15	+8	+100	5.9	-5.0	1.8	-58.5°	6.5
	DATE: 2-7-77 TIME: 0929Z																					
3	RANGE: 175 N.M. 140 HR	-36.2	+10	+18	+.2	28	-8.2	28	-31.8	-69.8	+10	+18	+.2	-1.8	+10	+12	+100	23.6	-4.0	19.6	25.5°	23.8
	DEPTH: 1900 FM 250 HR	-43.6	+10	+18	+.8	28	-15.6	28	-31.8	-66.8	+10	+18	+.8	-1.8	+10	+8	+100	23.3	-4.0	20.1	25.5°	24.1
	DATE: 2-7-77 TIME: 1012Z																					
4	RANGE: 159 N.M. 140 HR	-39.9	+10	+18	+.2	28	-11.4	28	-27.1	-66.1	+10	+18	+.2	-1.8	+10	+12	+100	15.7	-4.2	11.7	33.5°	16.9
	DEPTH: 1500 FM 250 HR	-46.2	+10	+18	+.6	28	-17.2	28	-32.8	-66.8	+10	+18	+.6	-1.8	+10	+8	+100	20.6	-4.0	17.2	35.5°	21.2
	DATE: 2-7-77 TIME: 1542Z																					
5	RANGE: 110 N.M. 170 HR	-29.6	+10	+18	+.2	28	-1.0	28	-33.1	-60.1	+10	+18	+.2	-1.8	+10	+12	+100	31.1	-4.0	27.3	45°	31.3
	DEPTH: 1600 FM 250 HR	-38.4	+10	+18	+.9	28	-10.4	28	-36.8	-69.8	+10	+18	+.9	-1.8	+10	+8	+100	26.4	-4.0	23.3	45°	27.3
	DATE: 2-7-77 TIME: 2033Z																					
6	RANGE: 70 N.M. 140 HR	-28.7	+10	+18	+.2	28	-.7	28	-28.7	-56.7	+10	+18	+.2	-1.8		+12	+100	28	-4.0	24.2	17°	28.2
	DEPTH: 1500 FM 250 HR	-25.3	+10	+18	+.6	28	+2.7	28	-31.2	-62.2	+10	+18	+.6	-1.8	+10	+8	+100	26.9	-4.0	33.5	17°	27.5

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16 ELEMENT ARRAY

DATA POINT	OPERATIONAL DATA	SIGNAL LEVEL dBV	MCPS-32 CAL CORRECTION	BEAM-FORMER ATTN.	BEAM-FORMER CORRECTION	B+C	A+E	J+K	I+G	NOISE LEVEL dBV	MCPS-32 CAL CORRECTION	BEAM-FORMER N.W.	BEAM-FORMER CORRECTION	BAND-WIDTH CORRECTION	BAND-WIDTH CONVERSION	ARRAY SENSITIVITY	MP2 CONVERSION	SNR H-F	LINEAR PROCESSING CORRECTION	CORRECTED SNR$_{L+R}$	STEERING ANGLE	Q+L
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
	DATE: 2-8-77 TIME: 02022																					
7	RANGE: 28 N.M. 140 HZ	-22.8	+10	+24	+.2	24	+1.2	24	-41.4	-65.4	+10	+24	+.2	-1.8	+10	+12	+100	43.6	-4.0	39.8	-21.5°	47.8
	DEPTH: 1980FM 290 HZ	-26.6	+10	+24	+.8	24	-2.6	24	-47.8	-71.8	+10	+24	+.8	-1.8	+10	+8	+100	45.2	-4.0	42.0	-21.5°	46.0
	295 HZ	-62.4	+10	+24	+.8	24	-38.4	24	-47.8	-71.8	+10	+24	+.8	-1.8	+10	+8	+100	9.4	-4.4	5.9	-21.5°	10.3
	DATE: 3-15-77 TIME: 15012																					
8	RANGE: 22 N.M. 140 HZ	-22.1	+10	+18	+.2	28	+5.4	28	-37.6	-61.6	+10	+18	+.2	-1.8	+10	+12	+100	39.5	-4.8	35.7	+30°	39.7
	DEPTH: 2800FM 290 HZ	-21.8	+10	+18	+.8	28	+6.2	28	-45.6	-73.6	+10	+18	+.8	-1.8	+10	+8	+100	51.8	-4.0	48.6	+30°	52.6
	295 HZ	-58.8	+10	+18	+.9	28	-30.8	28	-39.6	-67.6	+10	+18	+.9	-1.8	+10	+8	+100	8.8	-4.6	5.0	+30°	9.6
	DATE: 3-15-77 TIME: 21312																					
9	RANGE: 72 N.M. 140 HZ	-22.5	+10	+12	+.1	22	-.5	22	-36.3	-58.7	+10	+12	+.1	-1.8	+10	+12	+100	36.2	-4.0	32.3	+51.5°	36.3
	DEPTH: 2800FM 290 HZ	-17.3	+10	+12	+.6	22	+8.7	22	-43.2	-65.2	+10	+12	+.6	-1.8	+10	+8	+100	51.9	-4.0	48.5	+51.5°	52.5
	295 HZ	-51.9	+10	+12	+.7	22	-39.9	22	-42.8	64.8	+10	+12	+.7	-1.8	+10	+8	+100	12.9	-4.2	.7	+51.5°	4.9
	DATE: 3-16-77 TIME: 0633																					
10	RANGE: 128 N.M. 140 HZ	-16.8	+10	+12	+.2	22	+5.2	22	-23.6	-45.6	+10	+12	+.2	-1.8	+10	+12	+100	28.8	-4.0	25.0	+61°	29.0
	DEPTH: 2800FM 290 HZ	-35.8	+10	+12	+.8	22	-13.8	22	-37.4	-58.4	+10	+12	+.8	-1.8	+10	+8	+100	23.6	-4.0	20.4	+61°	24.4
	DATE: 3-16-77 TIME: 09352																					
11	RANGE: 122 N.M. 140 HZ	-28.8	+10	+18	+.2	28	-.8	28	-28.2	-56.2	+10	+18	+.2	-1.8	+10	+12	+100	27.4	-4.0	23.6	+63°	27.6
	DEPTH: 2800FM 290 HZ	-45.4	+10	+18	+.8	28	-17.4	28	-34.2	-64.2	+10	+18	+.8	-1.8	+10	+8	+100	18.8	-4.1	15.5	+63°	19.6
	DATE: 3-16-77 TIME: 11482																					
12	RANGE 122 N.M. 140 HZ	-22.8	+10	+18	+.2	28	+6.2	28	-27.1	-55.1	+10	+18	+.2	-1.8	+10	+12	+100	32.3	-4.0	28.5	+64°	33.5
	DEPTH: 2800FM 290 HZ	-39.9	+10	+18	+.8	28	-11.9	28	-29.8	-57.8	+10	+18	+.8	-1.8	+10	+8	+100	17.9	-4.2	14.5	+64°	18.7

SECRET

SECRET — 32 ELEMENT ARRAY

DATA POINT	OPERATIONAL DATA	SIGNAL LEVEL dBV	MCPS-32 CAL CORRECTION	BEAM-FORMER ATTN	BEAM-FORMER CORRECTION	B+C	A+E	J+K	I+G	NOISE LEVEL dBV	MCPS-32 CAL CORRECTION	BEAM-FORMER ATTN.	BEAM-FORMER CORRECTION	BAND-WIDTH CORRECTION	BAND-WIDTH CONVERSION	ARRAY SENSITIVITY	MPS CONVERSION	SNR H-F	LINEAR PROCESSING CORRECTION	CORRECT'D SNR J+R	STEERING ANGLE	Q+L
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
	DATE: 1-19-77 TIME: 1551Z																					
1	RANGE: 91 N.M. 280 HZ	-57.2	+10	+18	+.8	+28	-29.2	+28	-46.9	-74.9	+10	+18	+.8	-1.8	+15	+8	+100	17.7	-4.1	14.1	-59°	18.5
	DEPTH: 1650 FM 285 HZ	-65	+10	+18	+.8	+28	-37.0	+28	-46.8	-78.8	+10	+18	+.8	-1.8	+15	+8	+100	9.8	-4.9	6.2	-59°	10.6
	DATE: 1-19-77 TIME: 1600Z																					
2	RANGE: 91N.M. 280 HZ	-55.8	+10	+18	+.8	+28	-27.8	+28	-41	-69.0	+10	+18	+.8	-1.8	+15	+8	+100	13.2	-4.2	9.0	-58.5°	14.0
	DEPTH: 1650FM 285 HZ	-61.3	+10	+18	+.8	+28	-33.3	+28	-41	-69.0	+10	+18	+.8	-1.8	+15	+8	+100	7.7	-4.7	3.0	-58.5°	8.5
	DATE: 2-7-77 TIME: 0934Z																					
3	RANGE: 175 N.M. 190 HZ	-36.6	+10	+24	+.2	+34	-2.6	+34	-28.1	-61.1	+10	+24	+.2	-1.8	+10	+12	+100	24.5	-4.0	20.7	35.5°	24.7
	DEPTH: 1900FM 280 HZ	-45.2	+10	+24	+.8	+34	-11.2	+34	-35.1	-69.1	+10	+24	+.8	-1.8	+10	+8	+100	13.8	-4.0	10.7	35.5°	14.7
	DATE: 2-7-77 TIME: 1019Z																					
4	RANGE: 159 N.M. 140 HZ	-39.2	+10	+24	+.2	+34	-5.2	+34	-24.8	-58.8	+10	+24	+.2	-1.8	+10	+12	+100	19.6	-4.0	15.3	35.5°	19.8
	DEPTH: 1700 FM 280 HZ	-54.4	+10	+24	+.8	+34	-20.4	+34	-34.8	-68.8	+10	+24	+.8	-1.8	+10	+8	+100	14.4	-4.2	11.0	35.5°	15.2
	DATE: 2-7-77 TIME: 1549Z																					
5	RANGE: 110 N.M. 140 HZ	-31.3	+10	+24	+.2	+34	+2.7	+34	-26.8	-60.8	+10	+24	+.2	-1.8	+10	+12	+100	29.5	-4.0	25.7	49°	29.7
	DEPTH: 1900FM 290 HZ	-41.2	+10	+24	+.8	+34	-7.2	+34	-31.9	-65.9	+10	+24	+.8	-1.8	+10	+8	+100	23.7	-4.0	20.6	49°	30.6
	DATE: 2-7-77 TIME: 2033Z																					
6	RANGE: 70 N.M. 140 HZ	-29.8	+10	+24	+.2	+34	+4.2	+34	-26.3	-60.3	+10	+24	+.2	-1.8	+10	+12	+100	30.5	-4.0	26.7	17°	30.7
	DEPTH: 1900FM 280 HZ	-29.2	+10	+24	+.8	+34	+4.8	+35	-30.5	-65.5	+10	+24	+.8	-1.8	+10	+8	+100	35.3	-4.0	32.1	17°	36.1

SECRET

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32 ELEMENT ARRAY

DATA POINT	OPERATIONAL DATA	SIGNAL LEVEL dBV	MCDS-32 CAL CORRECTION	BEAM-FORMER ATTN.	BEAM-FORMER CORRECTION	B+C	A+E	J+K	I+G	NOISE LEVEL dBV	MCDS-32 CAL CORRECTION	BEAM-FORMER ATTN.	BEAM-FORMER CORRECTION	BANDWIDTH CORRECTION	BANDWIDTH CONVERSION	ARRAY SENSITIVITY	A/D CONVERSION	SNR H-F	LINEAR ARRAY CORRECTION	CORRECTED SNR D&R	STEERING ANGLE	Q+L
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
7	DATE: 2-8-77 TIME: 02027																					
	RANGE: 28 N.M. 140 HZ	-25.1	+10	+30	+.3	+40	+14.9	+40	-27.2	-67.2	+10	+30	+.3	-1.8	+10	+12	+100	42.1	-1.0	38.4	-21.5	42.4
	DEPTH: 1900 FM 240 HZ	-28.5	+10	+30	+.8	+40	+16.5	+40	-32.8	-73.8	+10	+30	+.8	-1.8	+10	+8	+100	45.3	-1.0	42.1	-21.5	46.1
	295 HZ	-64.7	+10	+30	+.8	+40	-24.7	+40	-33.6	-73.6	+10	+30	+.8	-1.8	+10	+8	+100	8.9	-4.4	5.3	-21.5	9.7
8	DATE: 3-1-77 TIME: 1501																					
	RANGE: 22 N.M. 140 HZ	-27.2	+10	+30	+.2	+40	+13.8	+40	-35.1	-77.1	+10	+30	+.2	-1.8	+10	+12	+100	47.9	-4.0	44.1	+30	48.1
	DEPTH: 2800 FM 240 HZ	-23.8	+10	+30	+.8	+40	+16.2	+40	-35.2	-75.2	+10	+30	+.8	-1.8	+10	+8	+100	51.4	-4.0	48.2	+30	52.2
	295 HZ	-60.9	+10	+30	+.8	+40	-20.4	+40	-36.4	-76.4	+10	+30	+.8	-1.8	+10	+8	+100	14.0	-4.2	10.6	+30	14.8
9	DATE: 3-10-77 TIME: 2131																					
	RANGE: 72 N.M. 140 HZ	-21.9	+10	+24	+.2	+34	+12.1	+34	-30.5	-64.5	+10	+24	+.2	-1.8	+10	+12	+100	42.6	-4.0	38.3	+51.5	42.8
	DEPTH: 2800 FM 240 HZ	-18.2	+10	+24	+.6	+34	+14.8	+34	-33.1	-67.1	+10	+24	+.6	-1.8	+10	+8	+100	53.9	-4.0	49.5	+61.5	53.5
	295 HZ	-52.7	+10	+24	+.6	+34	-18.7	+34	-31.2	-67.2	+10	+24	+.8	-1.8	+10	+8	+100	14.5	-4.2	11.1	+61.5	15.3
10	DATE: 3-11-77 TIME: 0637																					
	RANGE: 128 N.M. 140 HZ	-18.5	+10	+18	+.2	+28	+9.4	+28	-22	-50.0	+10	+18	+.2	-1.8	+10	+12	+100	32.4	-4.0	27.6	+61	31.6
	DEPTH: 2800 FM 240 HZ	-35.8	+10	+18	+.1	+28	-7.8	+28	-31.1	-58.1	+10	+18	+.1	-1.8	+10	+8	+100	23.5	-4.0	20.2	+61	23.2
11	DATE: 3-16-77 TIME: 0935																					
	RANGE: 122 N.M. 140 HZ	-30.6	+10	+24	+.3	+34	+3.4	+34	-31.6	-59.6	+10	+24	+.3	-1.8	+10	+12	+100	29.0	-4.0	25.3	+62	29.3
	DEPTH: 2800 FM 240 HZ	-45.6	+10	+24	+.7	+34	-11.6	+34	-33.9	-68.9	+10	+24	+.7	-1.8	+10	+8	+100	23.3	-4.0	20.0	+62	24.0
12	DATE: 3-16-77 TIME: 1198																					
	RANGE: 122 N.M. 140 HZ	-18.9	+10	+18	+.2	+28	+9.1	+28	-32.6	-50.6	+10	+18	+.2	-1.8	+10	+12	+100	31.7	-4.0	27.9	+62	31.9
	DEPTH: 2800 FM 240 HZ	-35.8	+10	+18	+.8	+26	-7.8	+28	-26.6	-58.6	+10	+18	+.8	-1.8	+10	+8	+100	18.8	-4.1	15.6	+62	19.6

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MAX. ELEMENT ARRAY

DATA POINT	OPERATIONAL DATA	SIGNAL LEVEL dBV	MCPS-32A CAL CORRECTION	BEAM-FORMER ATTN.	BEAM-FORMER CORRECTION	B+C	A+E	J+K	I+J	NOISE LEVEL dBV	MCPS-32 CAL CORRECTION	CHANNEL ATTN.	BEAM-FORMER CORRECTION	BANDWIDTH CORRECTION	BANDWIDTH CONVERSION	ARRAY SENSITIVITY	MP2 CONVERSION	SNR H-F	LINEAR PROCESSING CORRECTION	CORRECTED SNR U+R	STEERING ANGLE	Q+L
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
1	DATE: 1-9-77 TIME: 1551Z RANGE: 91 N.M. 290 HZ	-20.4	NA	0	+.8	0	-28.4	0	-43.7	-43.7	NA	0	+.8	-1.8	+10	+8	+100	15.3	-4.2	11.9	-59°	16.1
	DEPTH: 1650FM 295 HZ	-37.1	NA	0	+.8	0	-37.1	0	-43.7	-43.7	NA	0	+.8	-1.8	+10	+8	+100	6.6	-4.9	3.5	-58°	7.4
2	DATE: 1-9-77 TIME: 1600Z RANGE: 71 N.M. 290 HZ	-1.0	HO	+24	+.8	+24	-25.0	+24	-39.4	-73.4	+10	+24	+.8	-1.8	+10	+8	+100	14.4	-4.2	11.0	-58.6°	15.2
	DEPTH: 1650FM 295 HZ	-11.2	HO	+24	+.8	+24	-32.2	+24	-38.4	-73.4	+10	+24	+.8	-1.8	+10	+8	+100	7.2	-4.8	3.2	-58.5°	8.0
3	DATE: 2-7-77 TIME: 0939Z RANGE: 175 N.M. 140 HZ	-37.5	HO	+30	+.2	+40	+2.5	+40	-25.8	-65.8	+10	+30	+.2	-1.8	+10	+12	+100	28.3	-4.0	24.5	25.5°	28.5
	DEPTH: 1800FM 290 HZ	-47.4	HO	+30	+.8	+40	-7.4	+40	-33.2	-73.2	+10	+30	+.8	-1.8	+10	+8	+100	25.8	-4.0	22.6	25.5°	26.6
4	DATE: 2-7-77 TIME: 1011Z RANGE: 159 N.M. 140 HZ	-42.4	HO	+30	+.2	+40	-2.4	+40	-23.6	-63.6	+10	+30	+.2	-1.8	+10	+12	+100	21.2	-4.0	17.4	35.5°	31.4
	DEPTH: 1800FM 290 HZ	-51.9	HO	+30	+.8	+40	-11.9	+40	-31.9	-71.9	+10	+30	+.8	-1.8	+10	+8	+100	19.5	-4.0	16.3	35.5°	20.3
5	DATE: 2-7-77 TIME: 1549Z RANGE: 110 N.M. 140 HZ	-36.2	HO	+30	+.2	+40	-3.8	+40	-24.2	-64.2	+10	+30	+.2	-1.8	+10	+12	+100	28.0	-4.0	24.2	49°	32.2
	DEPTH: 1800FM 290 HZ	-47.8	HO	+30	+.8	+40	-3.8	+40	-29.2	-69.2	+10	+30	+.8	-1.8	+10	+8	+100	25.4	-4.0	22.2	49°	25.2
6	DATE: 2-7-77 TIME: 2033Z RANGE: 70 N.M. 140 HZ	-32.8	+10	+30	+.2	+40	+7.2	+40	-26.8	-66.8	+10	+30	+.2	-1.8	+10	+12	+100	34.0	-4.0	30.2	17°	34.2
	DEPTH: 1800FM 290 HZ	-34.1	+10	+30	+.8	+40	+5.9	+40	-28.8	-68.8	+10	+30	+.8	-1.8	+10	+8	+100	35.7	-4.0	32.5	17°	35.5

SECRET

SECRET

MAX. ELEMENT ARRAY

POINT	OPERATIONAL DATA	SIGNAL LEVEL dBV	MCPS-32 CAL CORRECTION	BEAM-FORMER ATTN.	BEAM-FORMER CORRECTION	B+C	A+E	J+K	I+G	NOISE LEVEL dBV	MCPS-32 CAL CORRECTION	BEAM-FORMER ATTN.	BEAM-FORMER CORRECTION	BAND-WIDTH CORRECTION	BAND-WIDTH CONVERSION	ARRAY SENSITIVITY	MP2 CONVERSION	SNR N-F	LINEAR FREQUENCY CORRECTION	CORRECTED SNR. LIER	STEERING ANGLE	Q+L
		A	B	C	D	E	F	G	H	I	J	R	L	M	N	O	P	Q	R	S	T	U
	DATE: 2-8-77 TIME: 0202Z																					
7	RANGE: 28 N.M. 140 HZ	-33.8	+10	+30	+.2	+40	18.7	+40	-35.5	-65.5	+10	+30	+.2	-1.8	+10	+12	+100	44.2	-4.0	40.4	-31.5	44.4
	DEPTH: 1900 FM 290 HZ	-28.8	+10	+30	+.8	+40	11.2	+40	-31.6	-71.6	+10	+30	+.8	-1.8	+10	+8	+100	42.8	-4.0	38.6	-31.5	43.6
	295 HZ	-150	+10	+30	+.9	+40	-25.0	+40	-32.3	-72.3	+10	+30	+.9	-1.8	+10	+8	+100	7.3	-4.8	2.4	-31.5	8.2
	DATE: 3-15-77 TIME: 1501Z																					
8	RANGE: 22 N.M. 140 HZ	-27.0	+10	+30	+.2	+40	13.0	+40	-31.6	-71.6	+10	+30	+.2	-1.8	+10	+12	+100	44.6	-4.0	40.8	+20.0	44.8
	DEPTH: 2800 FM 290 HZ	-24.0	+10	+30	+.8	+40	16.0	+40	-33.4	-77.4	+10	+30	+.8	-1.8	+10	+8	+100	49.4	-4.0	46.2	+20.0	50.2
	295 HZ	-60.0	+10	+30	+.8	+40	-20.0	+40	-33.1	-73.1	+10	+30	+.8	-1.8	+10	+8	+100	13.1	-4.2	9.7	+20.0	13.9
	DATE: 3-15-77 TIME: 2131Z																					
9	RANGE: 72 N.M. 140 HZ	-21.8	+10	+30	+.2	+40	16.2	+40	-29.2	-69.2	+10	+30	+.2	-1.8	+10	+12	+100	45.4	-4.0	41.6	+51.5	45.6
	DEPTH: 2800 FM 290 HZ	-18.2	+10	+30	+.9	+40	21.8	+40	-31.4	-71.4	+10	+30	+.9	-1.8	+10	+8	+100	53.2	-4.0	50.1	+51.6	54.1
	295 HZ	-56.3	+10	+30	+.8	+40	-16.3	+40	-31.4	-71.4	+10	+30	+.8	-1.8	+10	+8	+100	15.1	-4.2	11.7	+51.5	15.9
	DATE: 3-16-77 TIME: 0633Z																					
10	RANGE: 128 N.M. 140 HZ	-21.6	+10	+24	+.2	+34	13.4	+34	-20.9	-54.4	+10	+24	+.2	-1.8	+10	+12	+100	32.8	-4.0	29.0	+6.1	33.0
	DEPTH: 2800 FM 290 HZ	-31.6	+10	+24	+.9	+34	-5.6	+34	-30.8	-64.8	+10	+24	+.9	-1.8	+10	+8	+100	25.2	-4.0	22.1	+6.1	28.1
	DATE: 3-16-77 TIME: 0935Z																					
11	RANGE: 122 N.M. 140 HZ	-30.4	+10	+24	+.2	+34	3.6	+34	-23.6	-57.6	+10	+24	+.2	-1.8	+10	+12	+100	30.2	-4.0	26.2	+6.2	30.2
	DEPTH: 2800 FM 290 HZ	-42.4	+10	+24	+.8	+34	-8.4	+34	-32.1	-66.1	+10	+24	+.8	-1.8	+10	+8	+100	23.7	-4.0	20.5	+6.2	24.5
	DATE: 3-16-77 TIME: 1148Z																					
12	RANGE: 1220 N.M. 140 HZ	-23.6	+10	+24	+.2	+34	+10.4	+34	-19.6	-57.6	+10	+24	+.2	-1.8	+10	+12	+100	30.0	-4.0	26.2	+6.4	30.4
	DEPTH: 2800 FM 290 HZ	-31.2	+10	+24	+.8	+34	-5.2	+34	-23.2	-57.2	+10	+24	+.8	-1.8	+10	+8	+100	18.0	-4.1	14.7	+6.4	18.8

SECRET

SECTION 2

NOISE SPECTRAL DENSITY CALCULATIONS FOR SPRAY/BEARING STAKE (U)

DATA POINT 10 DATE 3-16-77 TIME 06332

FREQUENCY 140 HZ

INDICATED NOISE LEVEL dBV $\frac{1/10}{ABW}$			-46.0
SYSTEM SENSITIVITY dB/μB	-(-12)	=	-34.0
BANDWIDTH CONVERSION TO 1 HZ BAND	+8.2	=	-25.8
CONVERSION TO dBreμPa/1HZ	+100	=	+74.2

UNCLASSIFIED

UNCLASSIFIED

UNCLASSIFIED

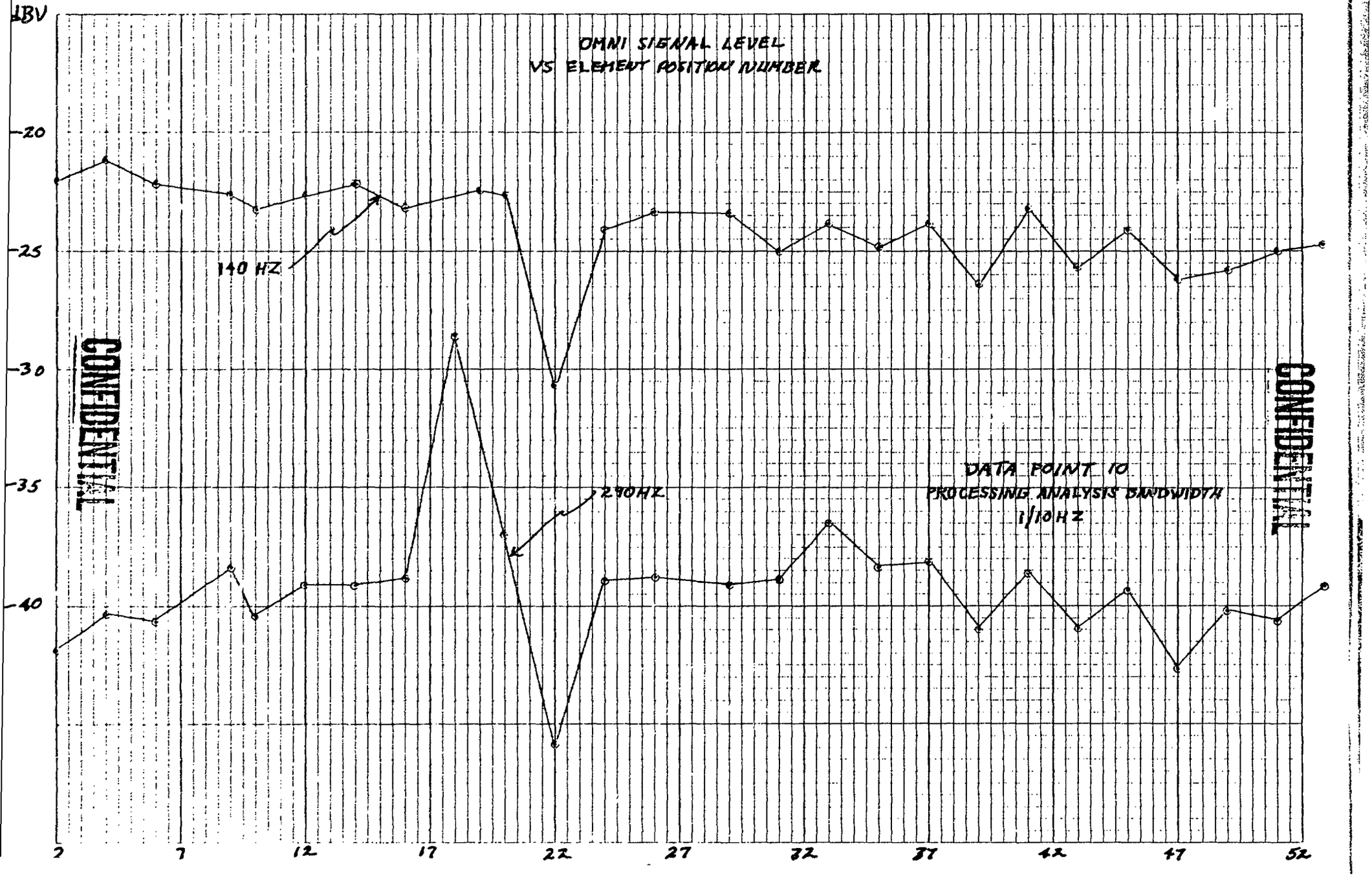
NOISE SPECTRAL DENSITY CALCULATIONS FOR SPRAY/BEARING STAKE (U)

DATA POINT 10 DATE 3-16-77 TIME 0633Z

FREQUENCY 290 HZ

INDICATED NOISE LEVEL dBV $\frac{1/10}{ABW}$		-51.6
SYSTEM SENSITIVITY dB/μB	-(-8)	= -43.6
BANDWIDTH CONVERSION TO 1 HZ BAND	+8.2	= -35.4
CONVERSION TO dBreμPa/1HZ	+100	= +64.6

K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
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46 0703

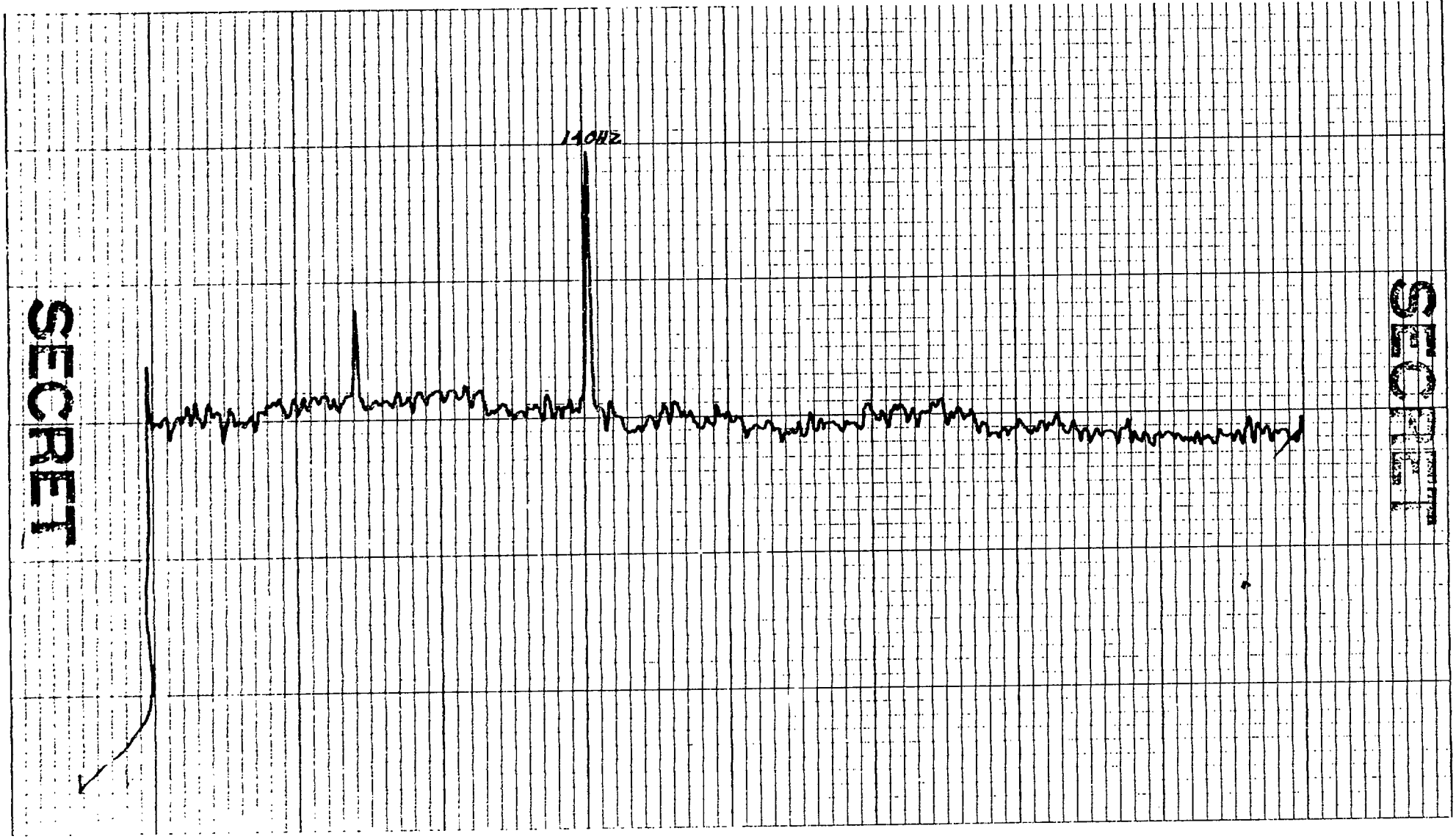
CONTROL: 346 - 6633 (27)
OMNI SPECTRUM (ELEMENT 2)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3 1677 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
_____ DEG AZ STEERING

REEL: M19 INDEX 1637

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



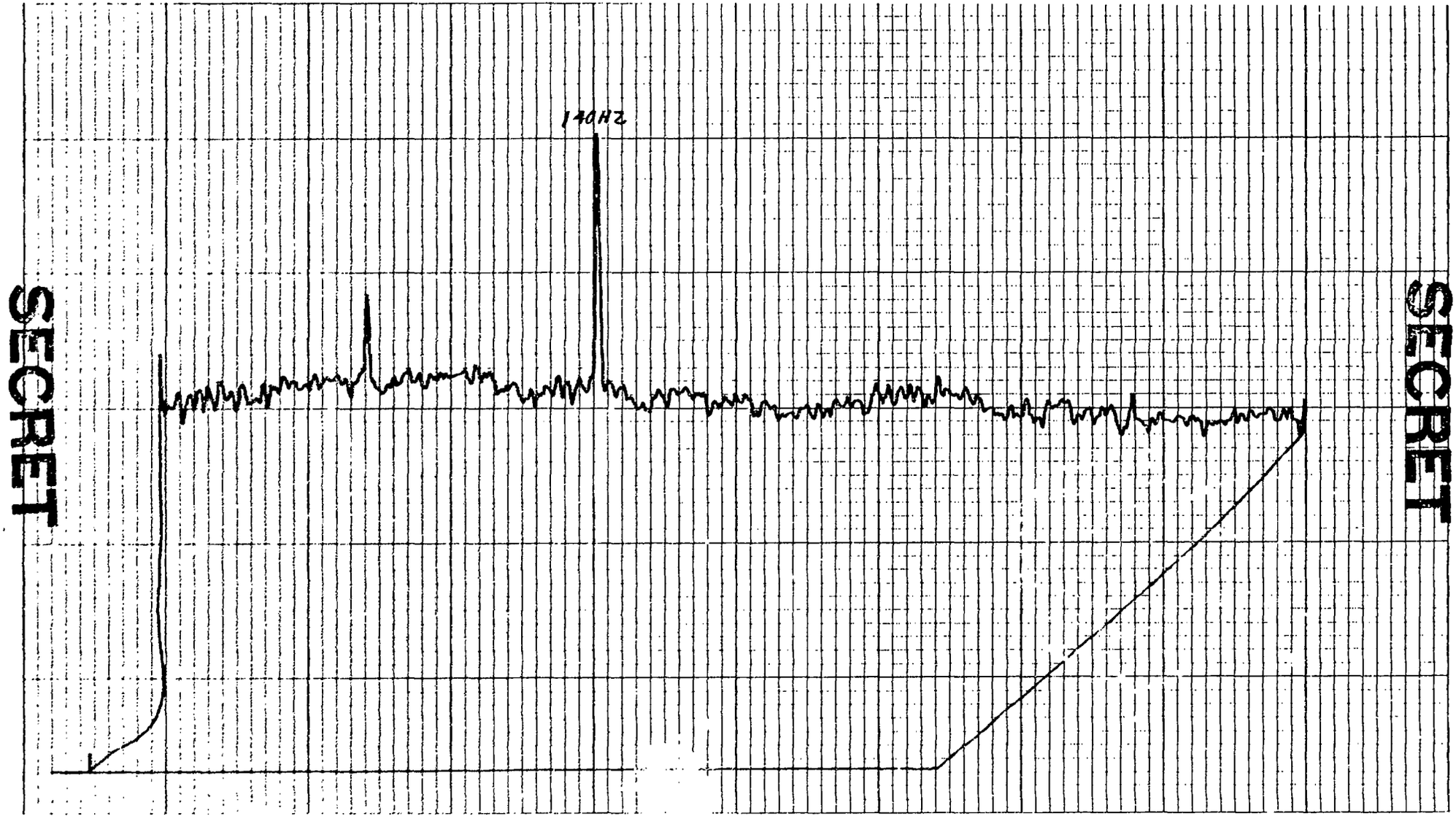
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

CONTROL: 3-16 -0633 (28)
OMNI SPECTRUM(ELEMENT 4)
EXERCISE:BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 -0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER & WTG: HANNING



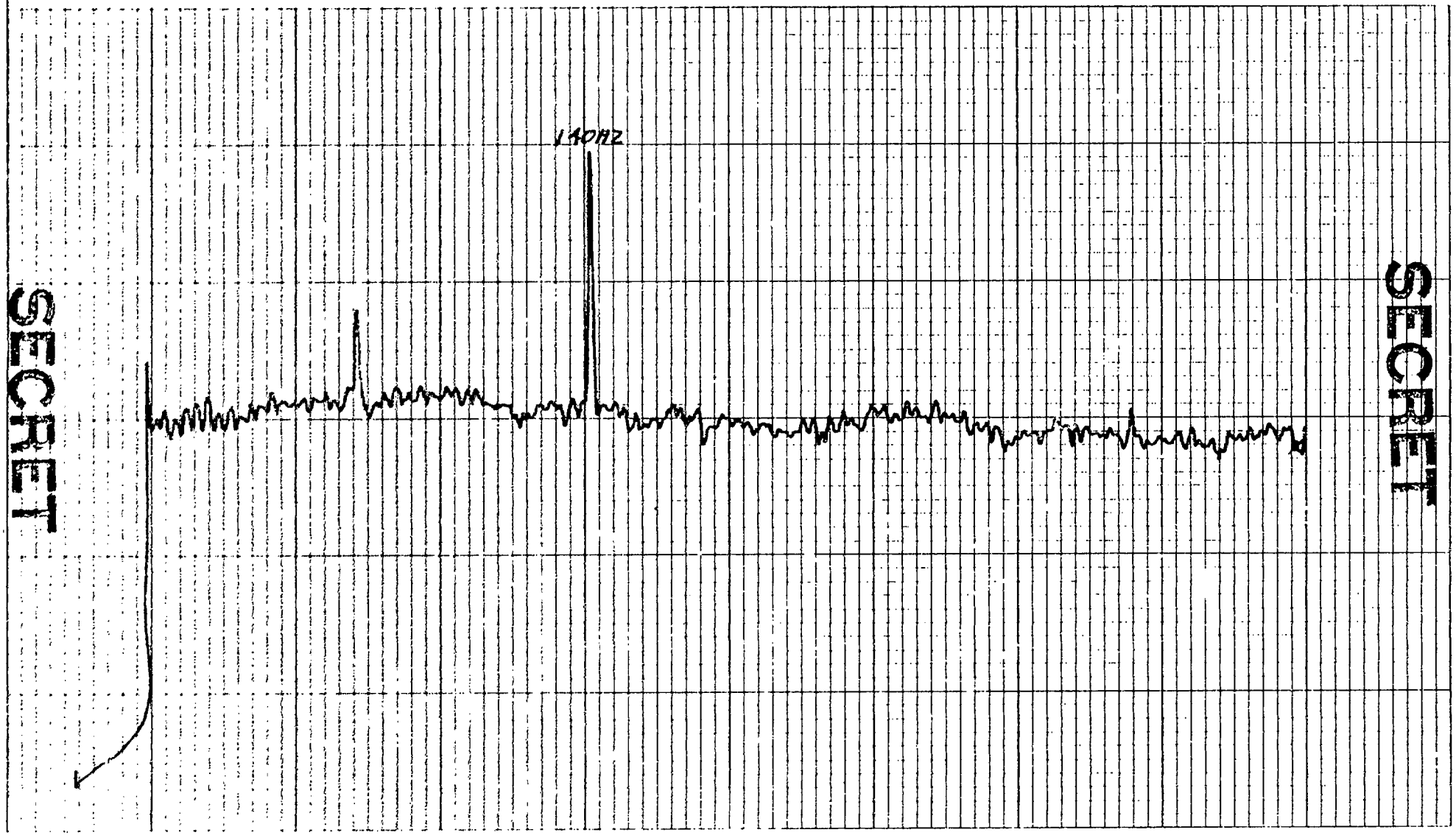
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

CONTROL: 3-16-0633 (29)
OMNI SPECTRUM (ELEMENT 6)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 -0633Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING

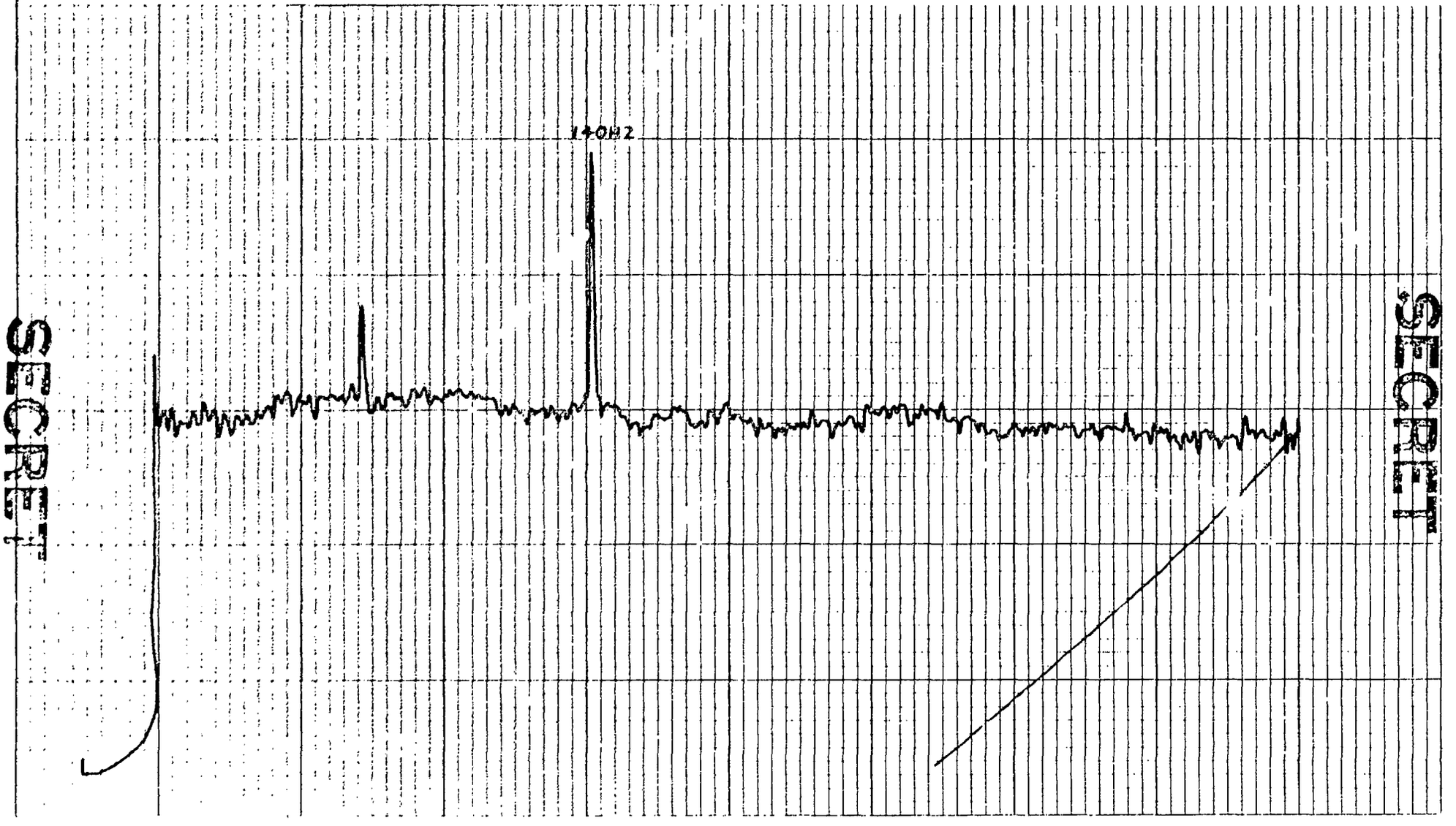


K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO

CONTROL: 0633 - 49 (DP10)
OMNI SPECTRUM (ELEMENT 9)
EXERCISE: BEARING STAKE
CENTER FREQ: 140 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: - DB
FILTER WTG: HANNING



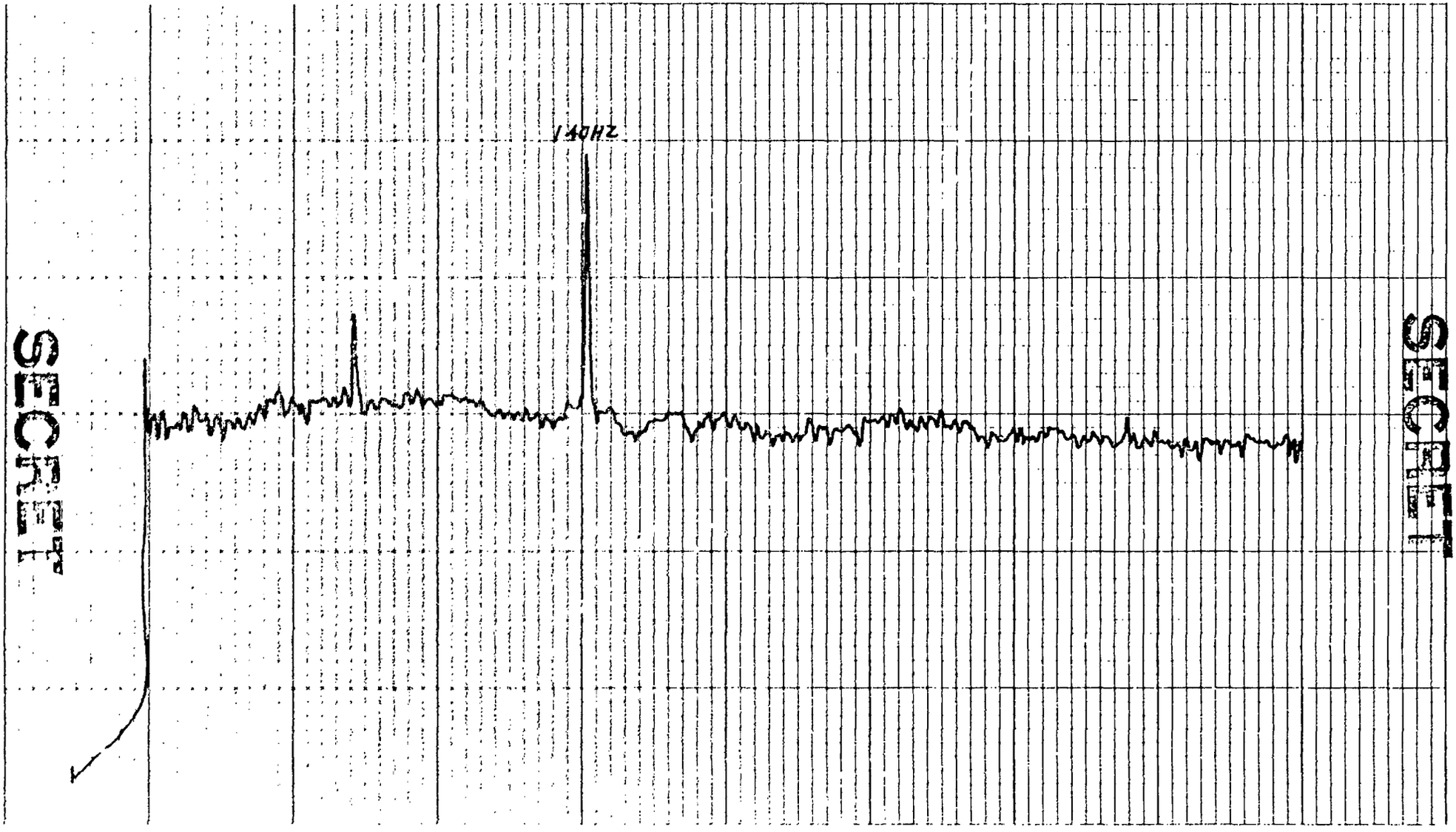
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

CONTROL: 3-16-0633 (31)
OMNI SPECTRUM (ELEMENT 10)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 -0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
___ DEG AZ STEERING

REEL: M19 INDEX/637
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH

46 0703

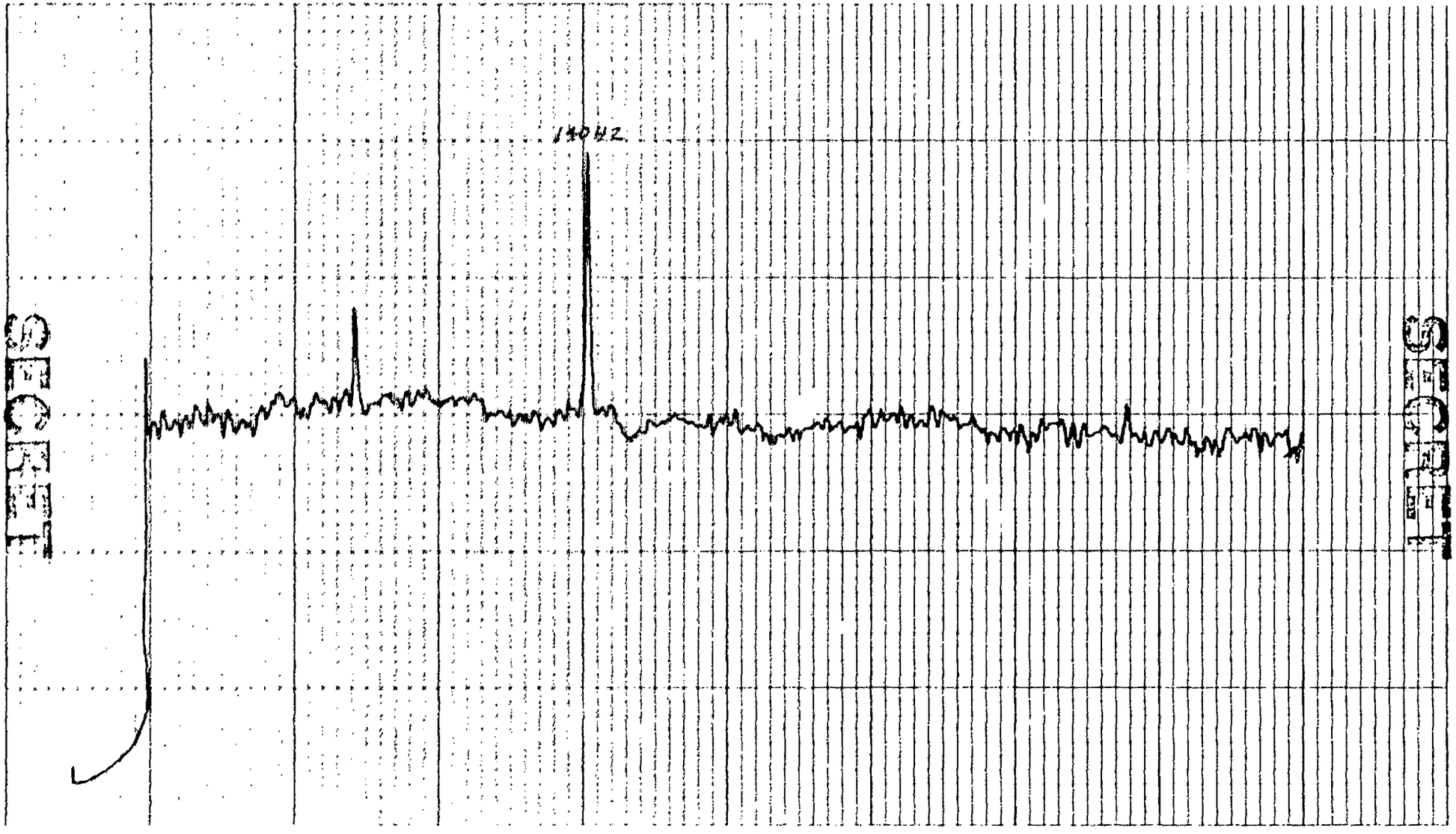
CONTROL: 376-0633 (32)
OMNI SPECTRUM (ELEMENT 12)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 376-77-0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
____ DEG AZ STEERING

REEL: M19 INDEX 1637

INTEGRATION TIME 320 SECS ATTEN: - DB
FILTER WTG: HANNING



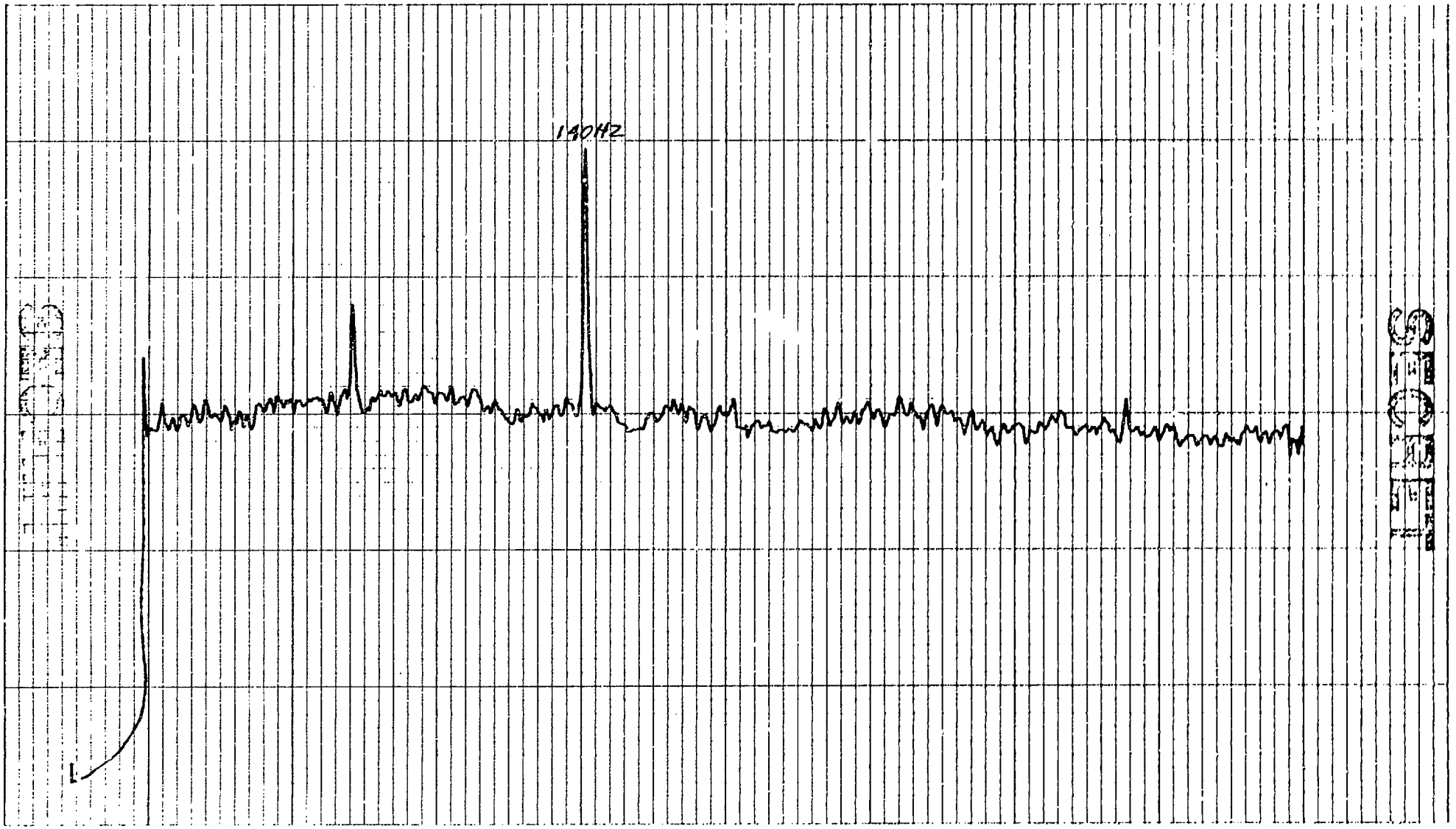
K+E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 3-16 - 0633 (33)
OMNI SPECTRUM (ELEMENT 14)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 - 0633Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



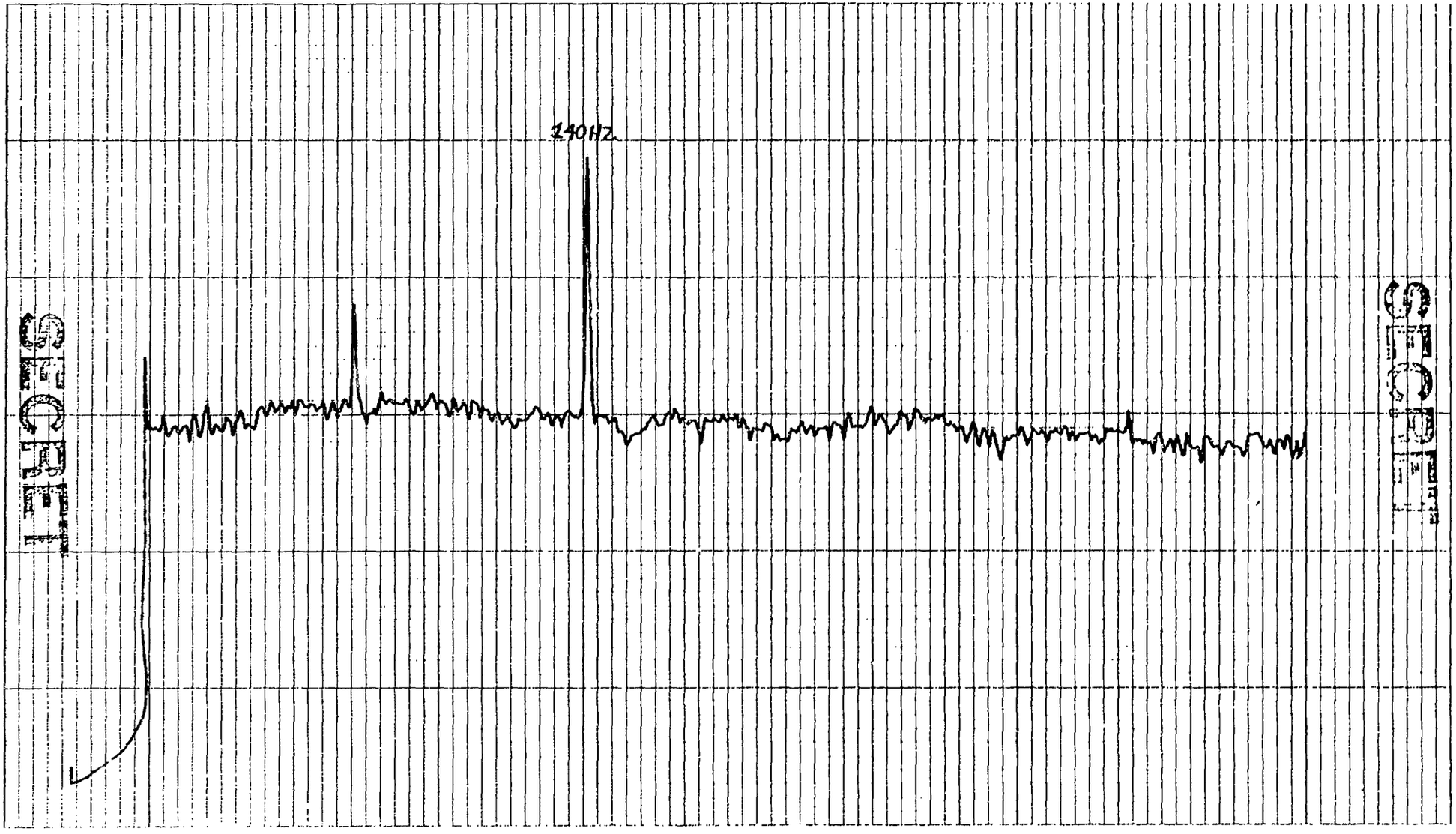
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

CONTROL: 3-16 -0633 (34)
OMNI SPECTRUM(ELEMENT 16)
EXERCISE:BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 -0633Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M19 INDEX: 1637
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



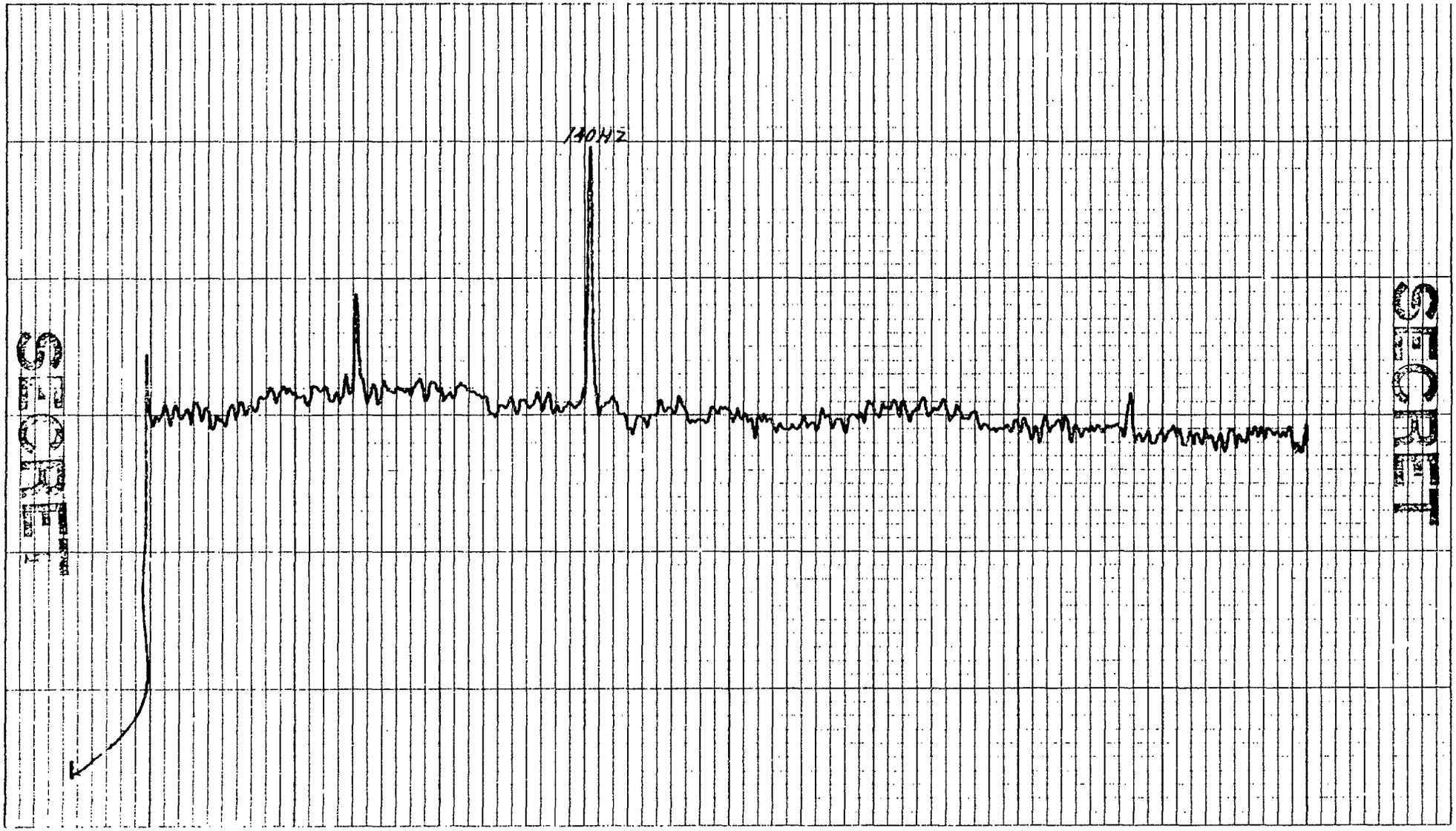
K+E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 3-16-0633 (35)
OMNI SPECTRUM (ELEMENT 19)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

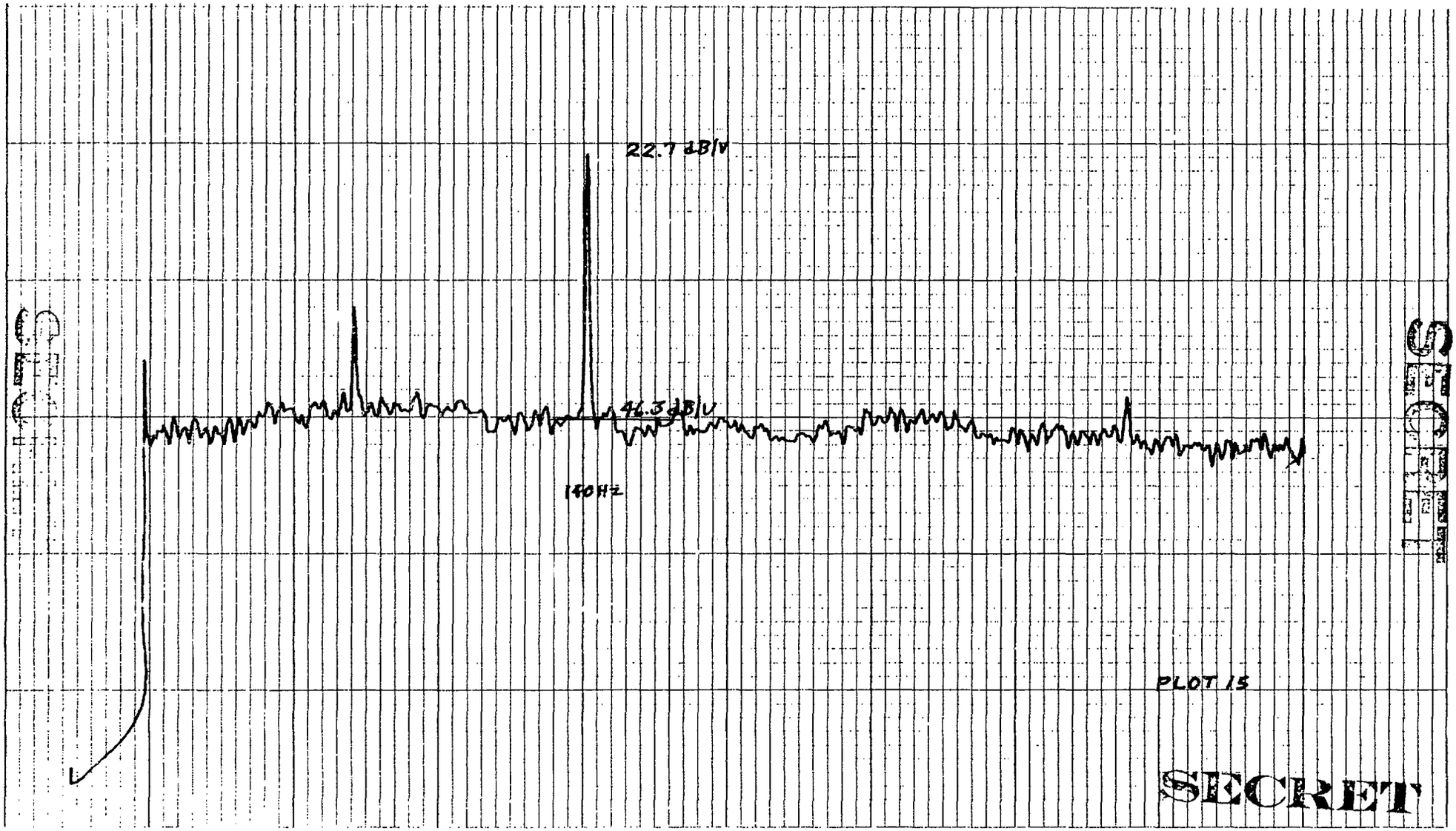
46 0703

SECRET

CONTROL: 0633-49 (DP10)
OMNI SPECTRUM (ELEMENT 20)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

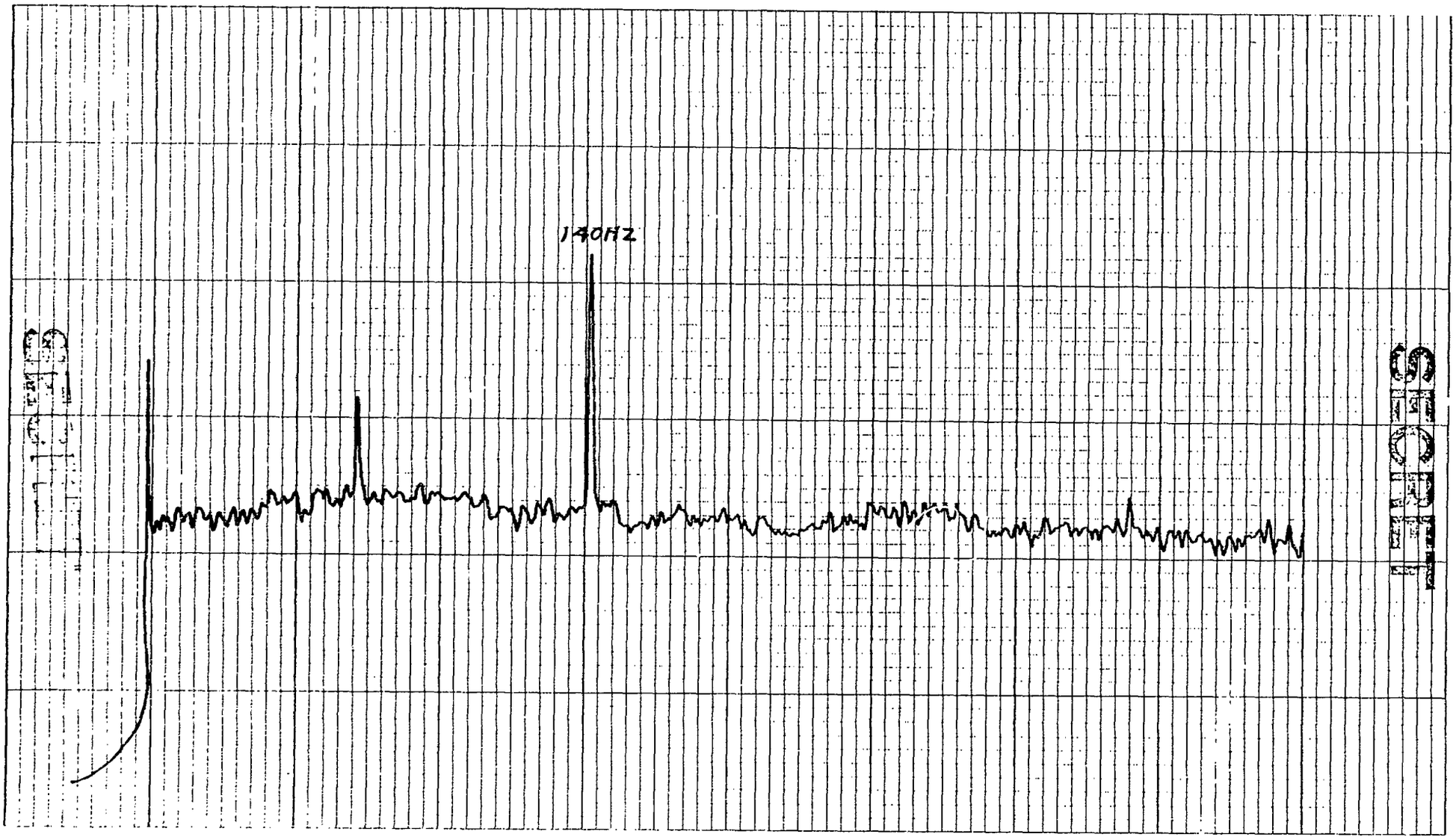
CONTROL: 346 -1633 (37)
OMNI SPECTRUM (ELEMENT 22)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 346-77 -0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M19 INDEX 1637

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING

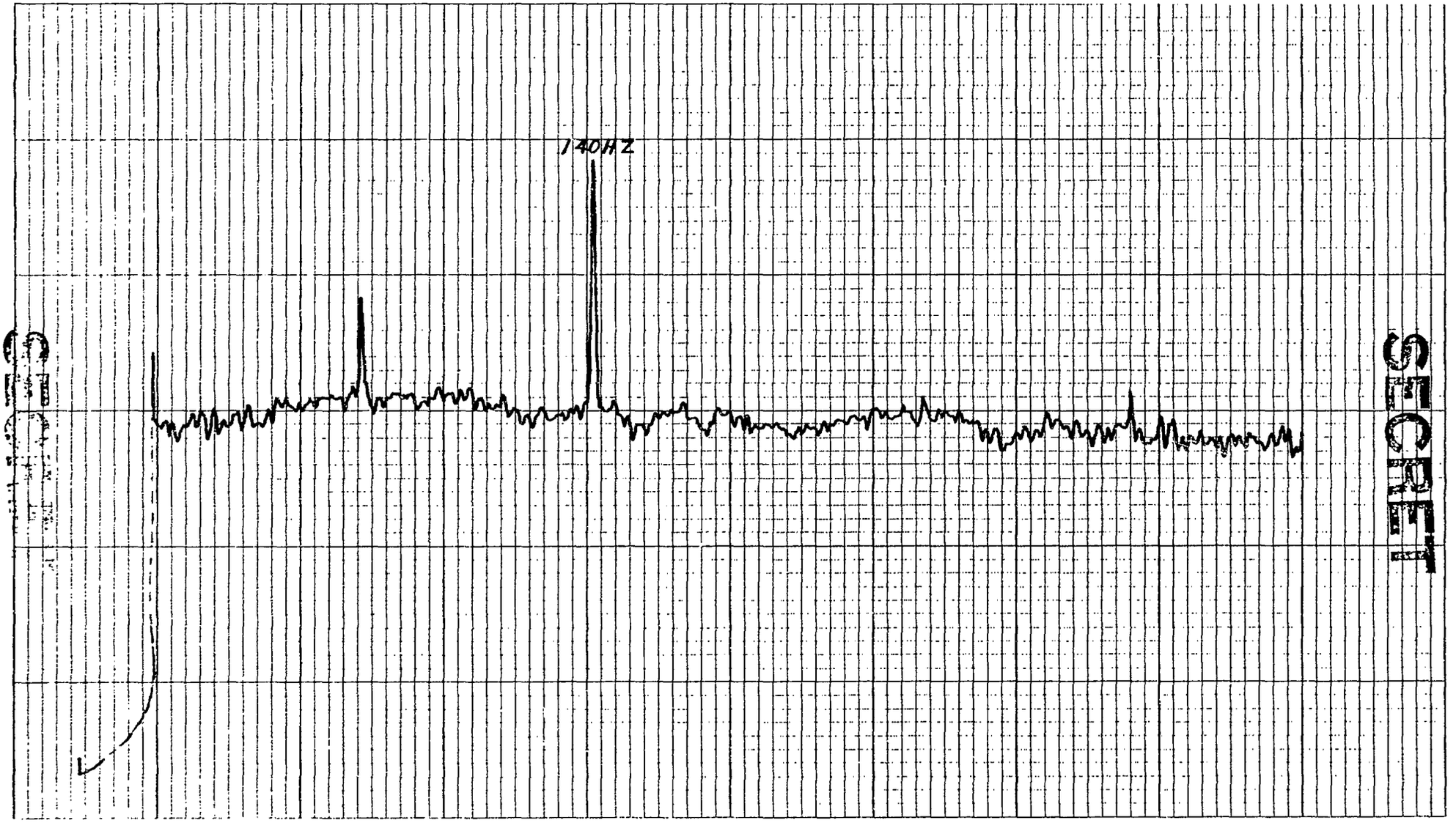


K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 3-16 -0633 (38)
OMNI SPECTRUM (ELEMENT 26)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-11-77 -0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



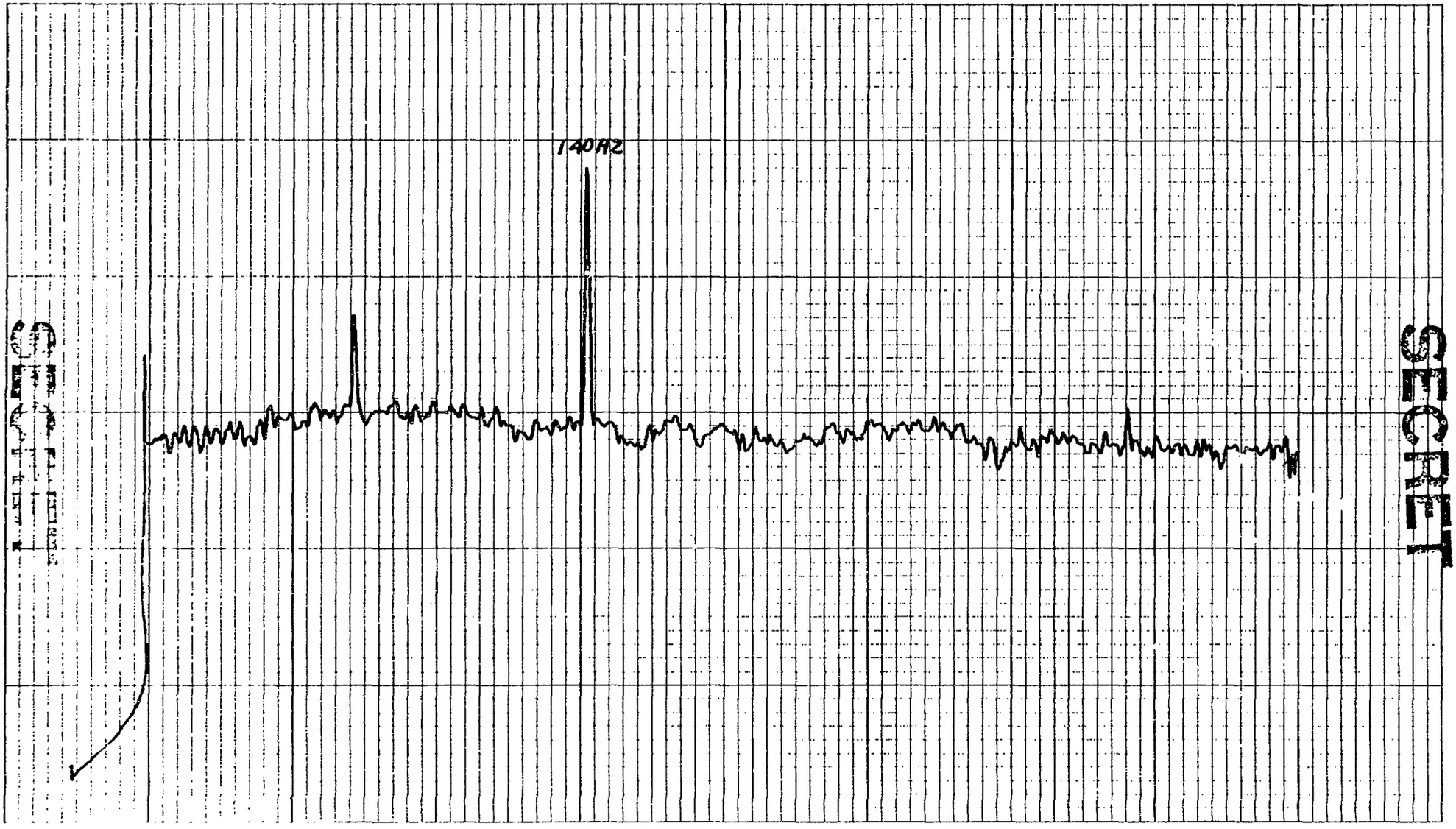
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 3-16-0633 (39)
OMNI SPECTRUM (ELEMENT 24)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77-0633Z
ANALYSIS BANDWIDTH: 1/10HZ
____ DEG AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



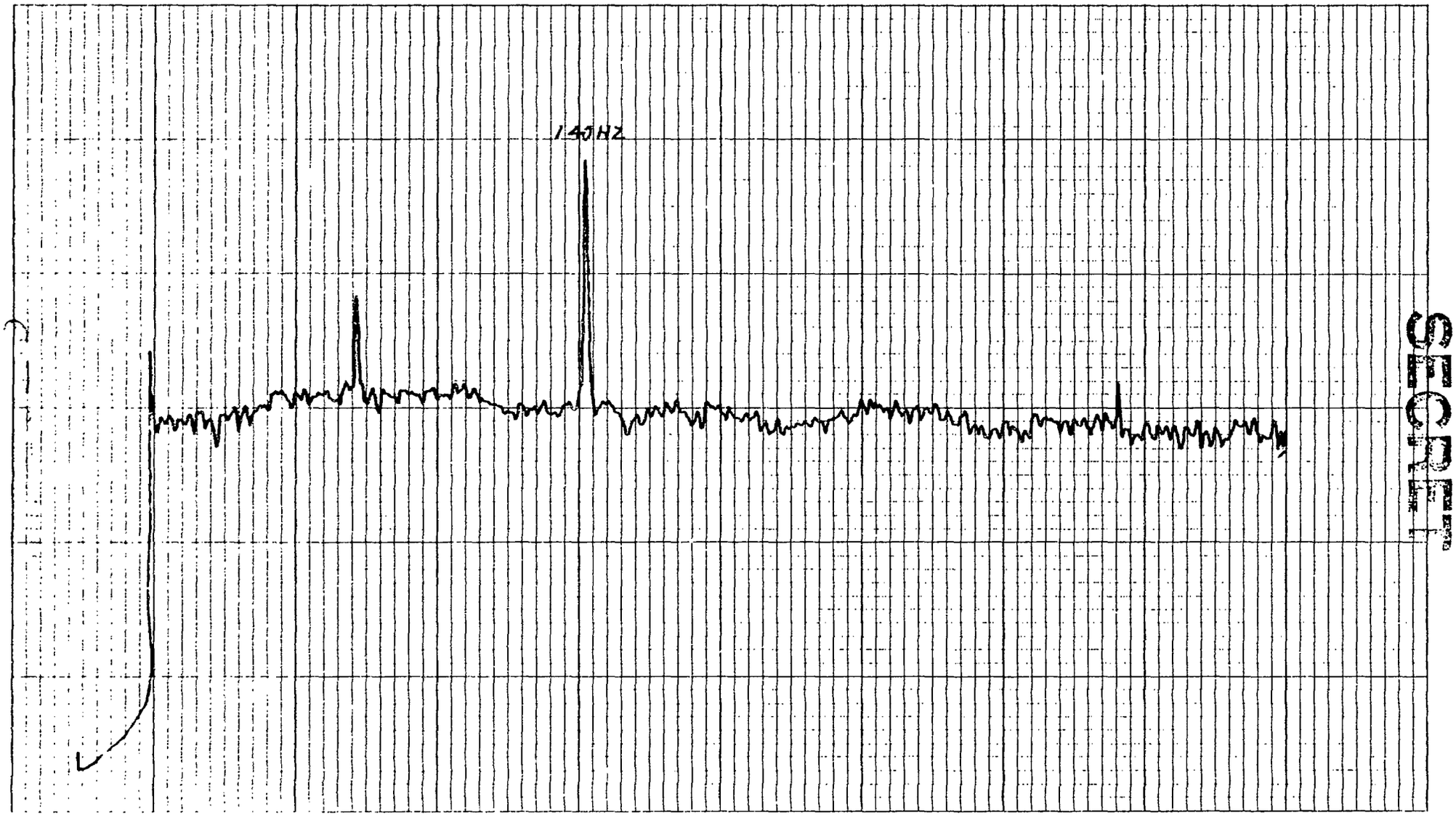
K+E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 3-16 -0633 (40)
OMNI SPECTRUM(ELEMENT 29)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 -0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
___ DEG AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



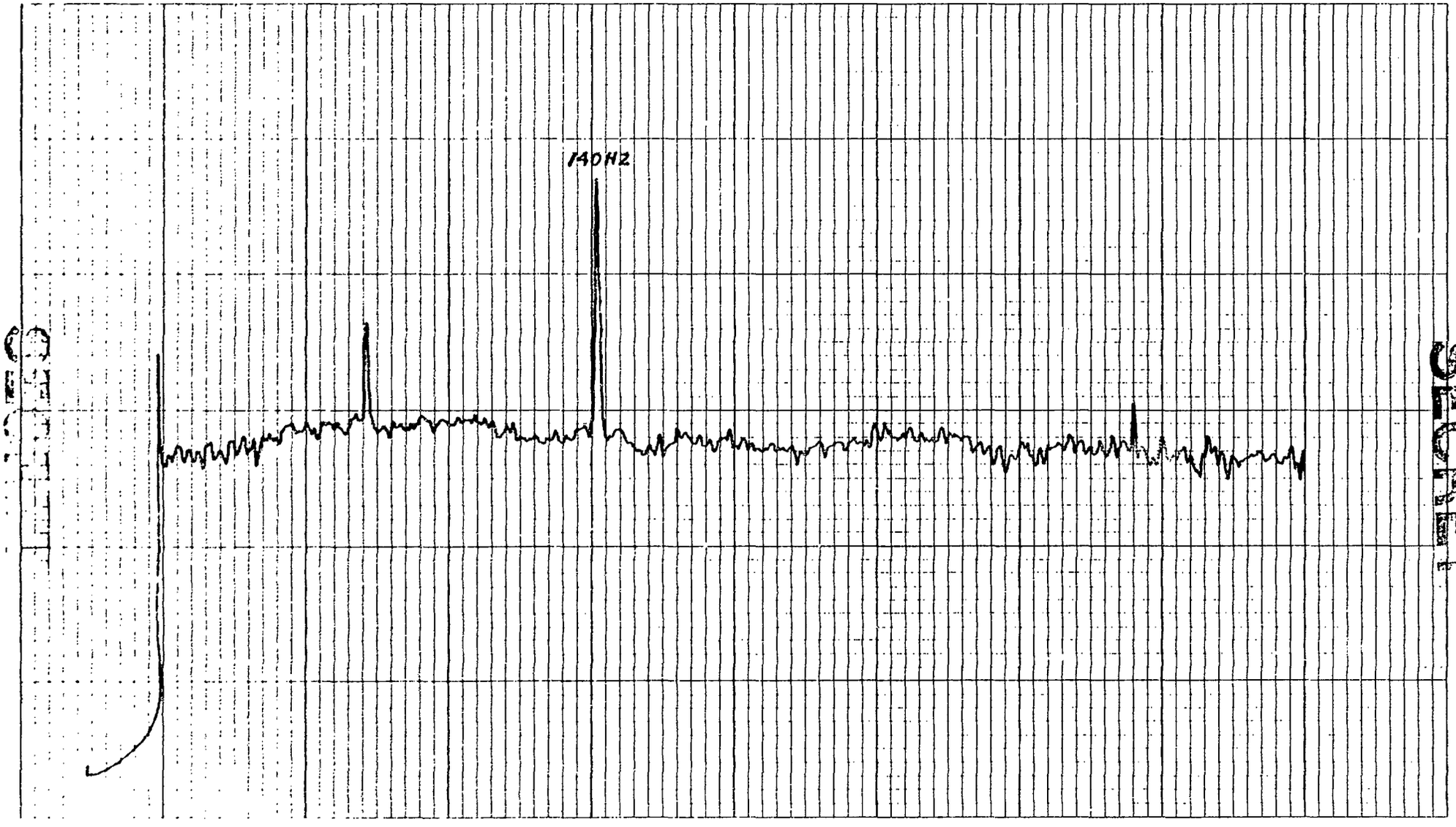
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

CONTROL: 3-16-0633 (41)
OMNI SPECTRUM(ELEMENT 31)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 -0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
___ DEG AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



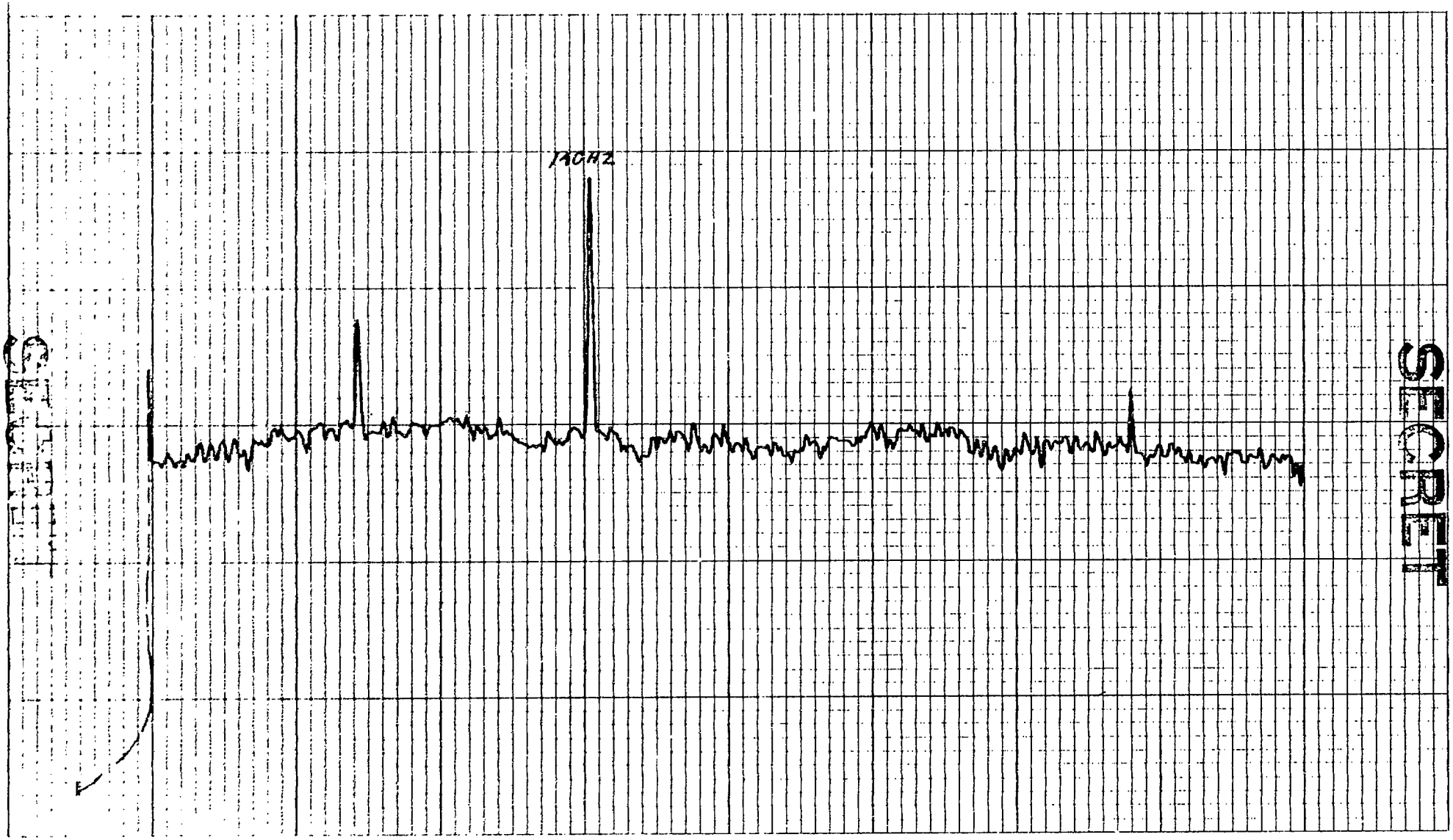
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

CONTROL: 3-16 -0633 (42)
OMNI SPECTRUM(ELEMENT 33)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 -0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

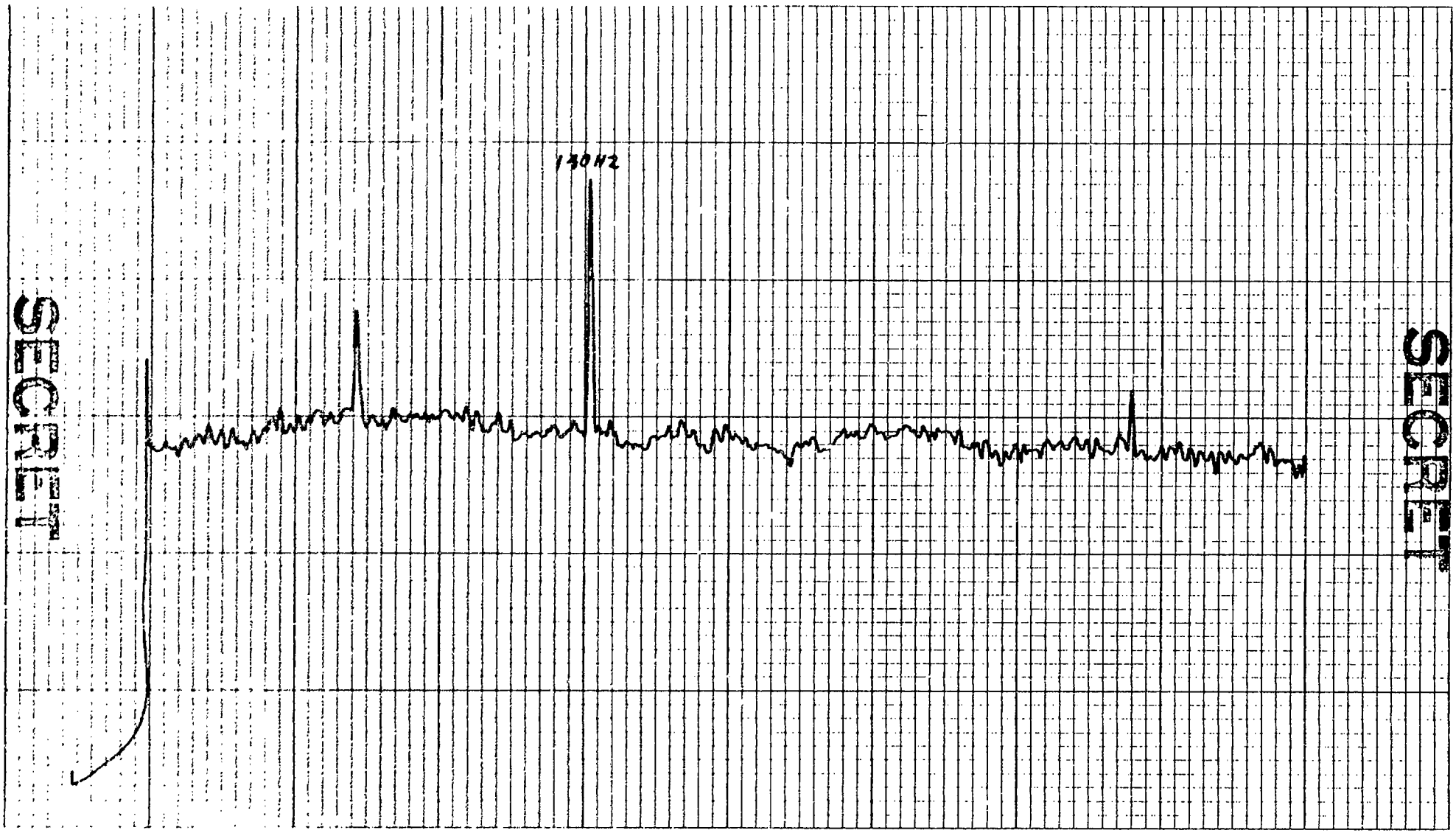
CONTROL: 3-16 -0633 (43)
OMNI SPECTRUM (ELEMENT 35)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3716 -0633Z
ANALYSIS BANDWIDTH: 1/10HZ
____ DEG AZ STEERING

REEL: M19 INDEX 1637

INTEGRATION TIME 320 SECS ATTEN: 6 DB
FILTER WTG: HANNING

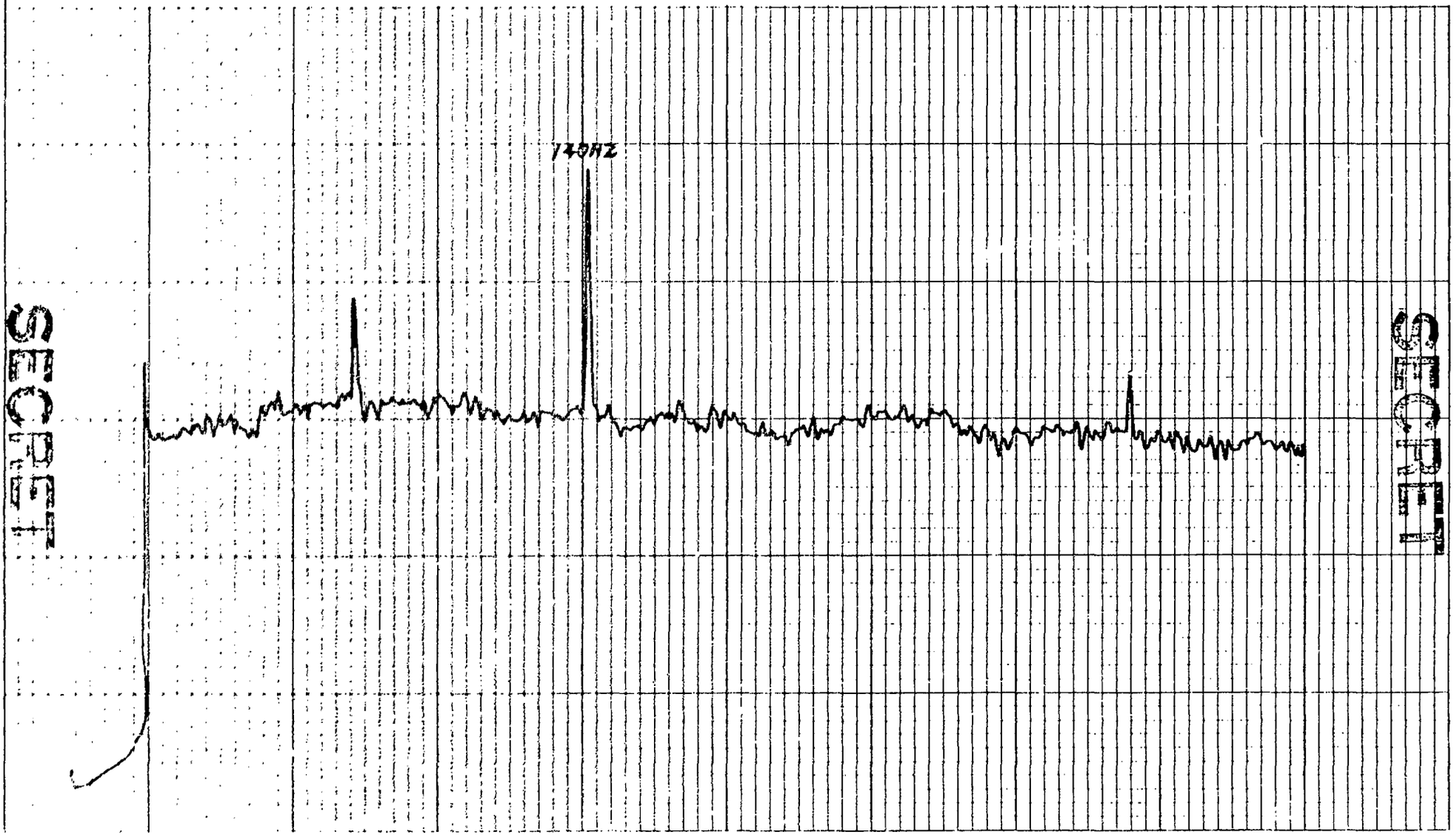


K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 3-16-0633 (44)
OMNI SPECTRUM (ELEMENT 37)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 -0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



K+E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

CONTROL: 3-16 -0633 (45)
OMNI SPECTRUM(ELEMENT 39)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 -0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
_____ DEG AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: __ DB
FILTER WTG: HANNING

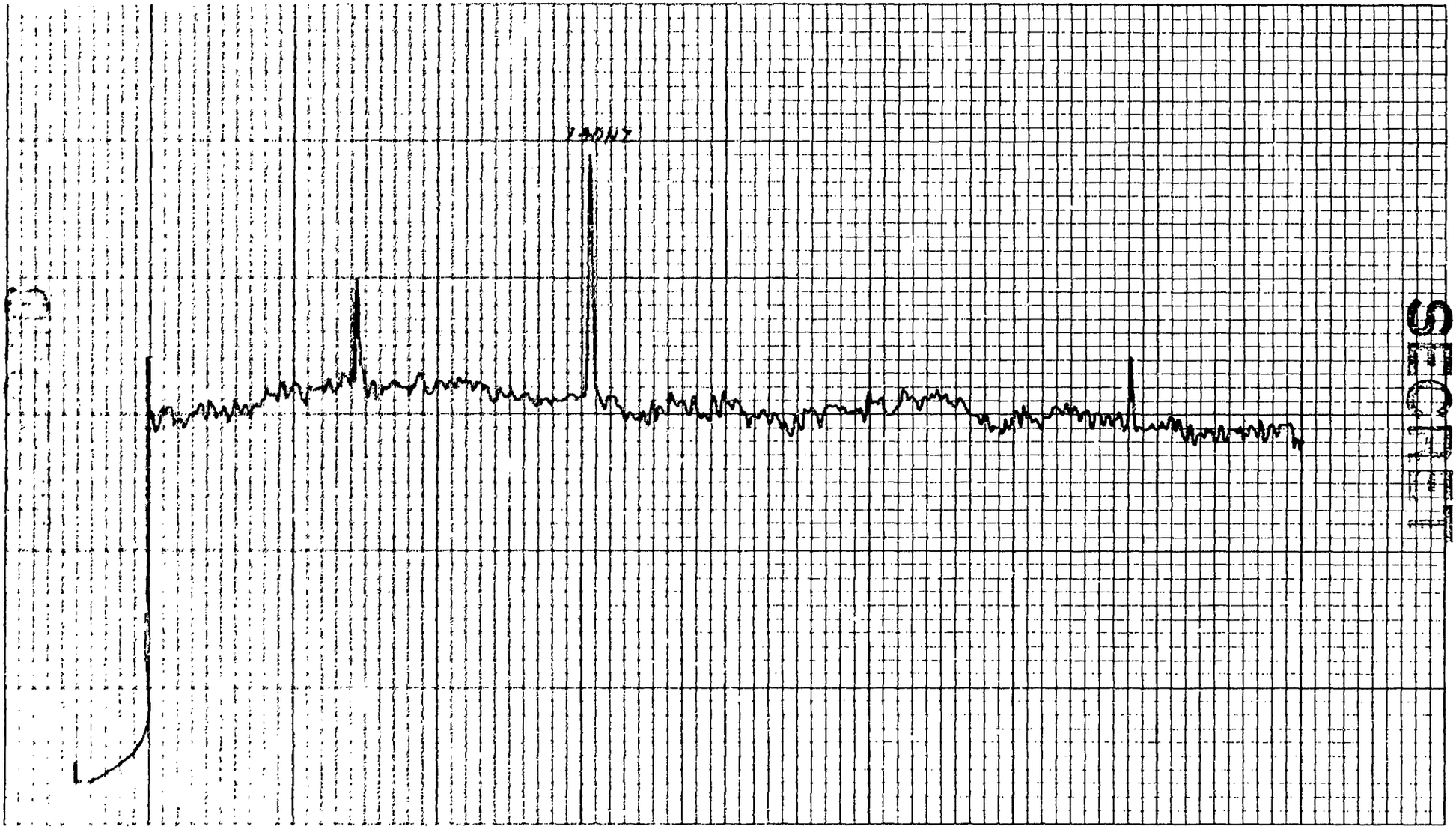
K&E 10 X 10 TO THE INCH • 7 × 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

CONTROL: J-16 - 0633 (46)
OMNI SPECTRUM (ELEMENT 41)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH
KEUFFEL & ESSER CO. MADE IN U.S.A.

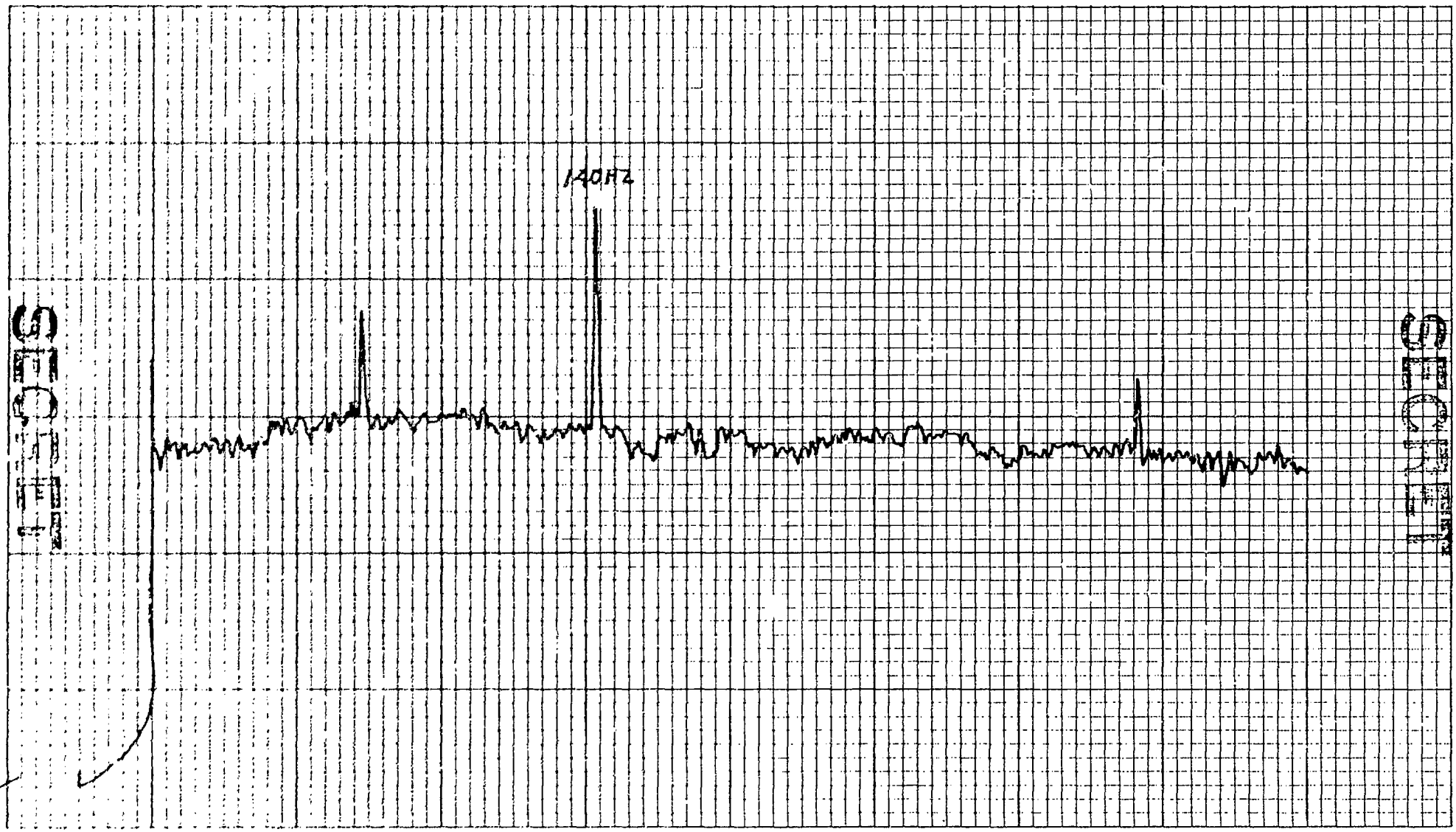
CONTROL: 3-16 -0133 (47)
OMNI SPECTRUM (ELEMENT 43)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-16-77 -0133 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M19 INDEX 1637

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH / X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

CONTROL: 3-16 -0633 (48)
OMNI SPECTRUM(ELEMENT 45)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 -0633Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEC AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING

K•E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 3-16 -0133 (19)
OMNI SPECTRUM (ELEMENT 47)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-16-77 -0133 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M19 INDEX 1637

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING

K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 3-16-0633 (50)
OMNI SPECTRUM (ELEMENT 49)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-16-77 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M19 INDEX 1637

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING

K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

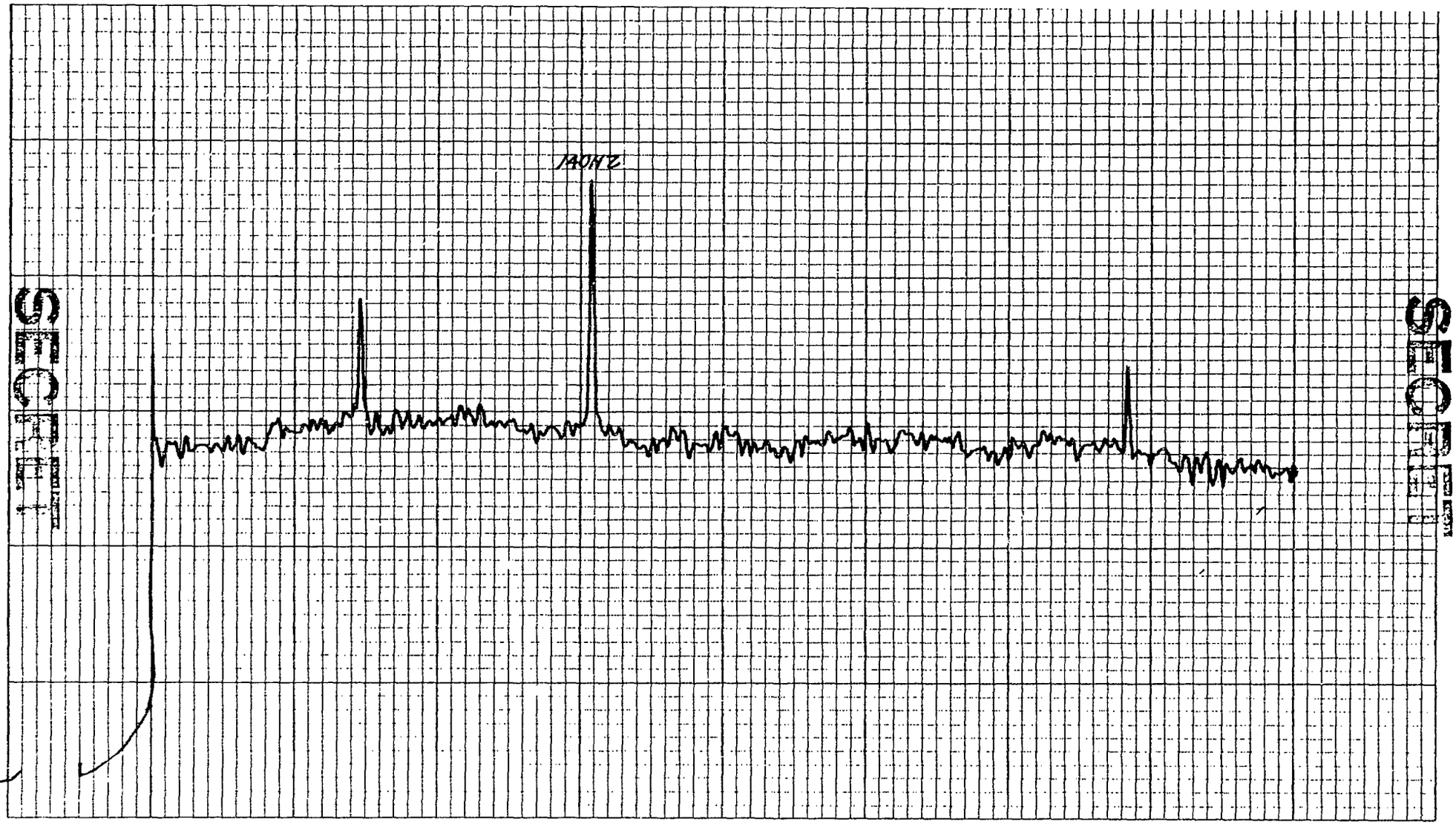
CONTROL: 346-0633 (51)
OMNI SPECTRUM(ELEMENT 51)
EXERCISE:BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-16-77 -0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M19 INDEX 1637

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

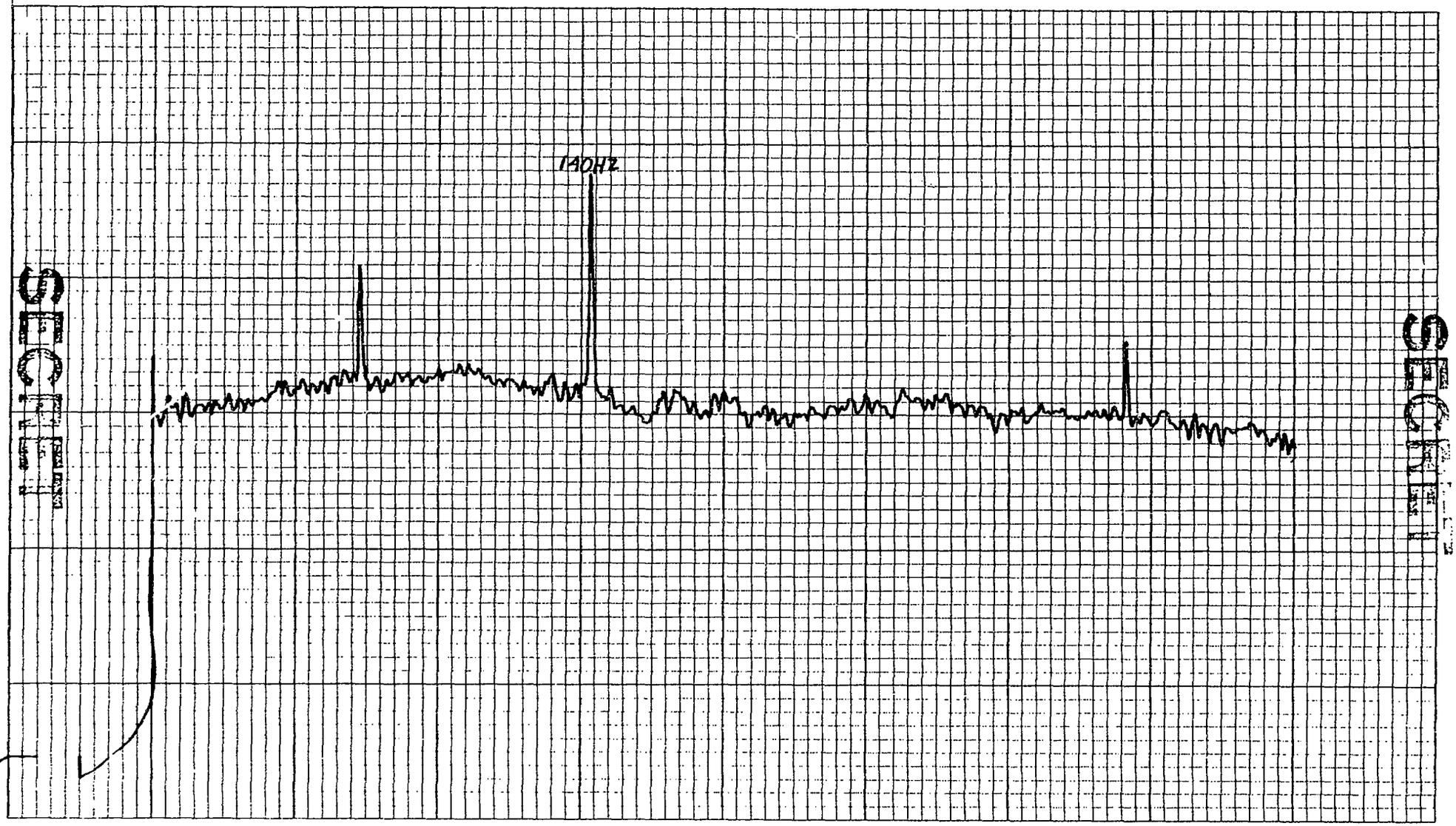
CONTROL: 3-16 -0633 (52)
OMNI SPECTRUM(ELEMENT 53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-16-77 -0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
____ DEG AZ STEERING

REEL: M19 INDEX/637

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



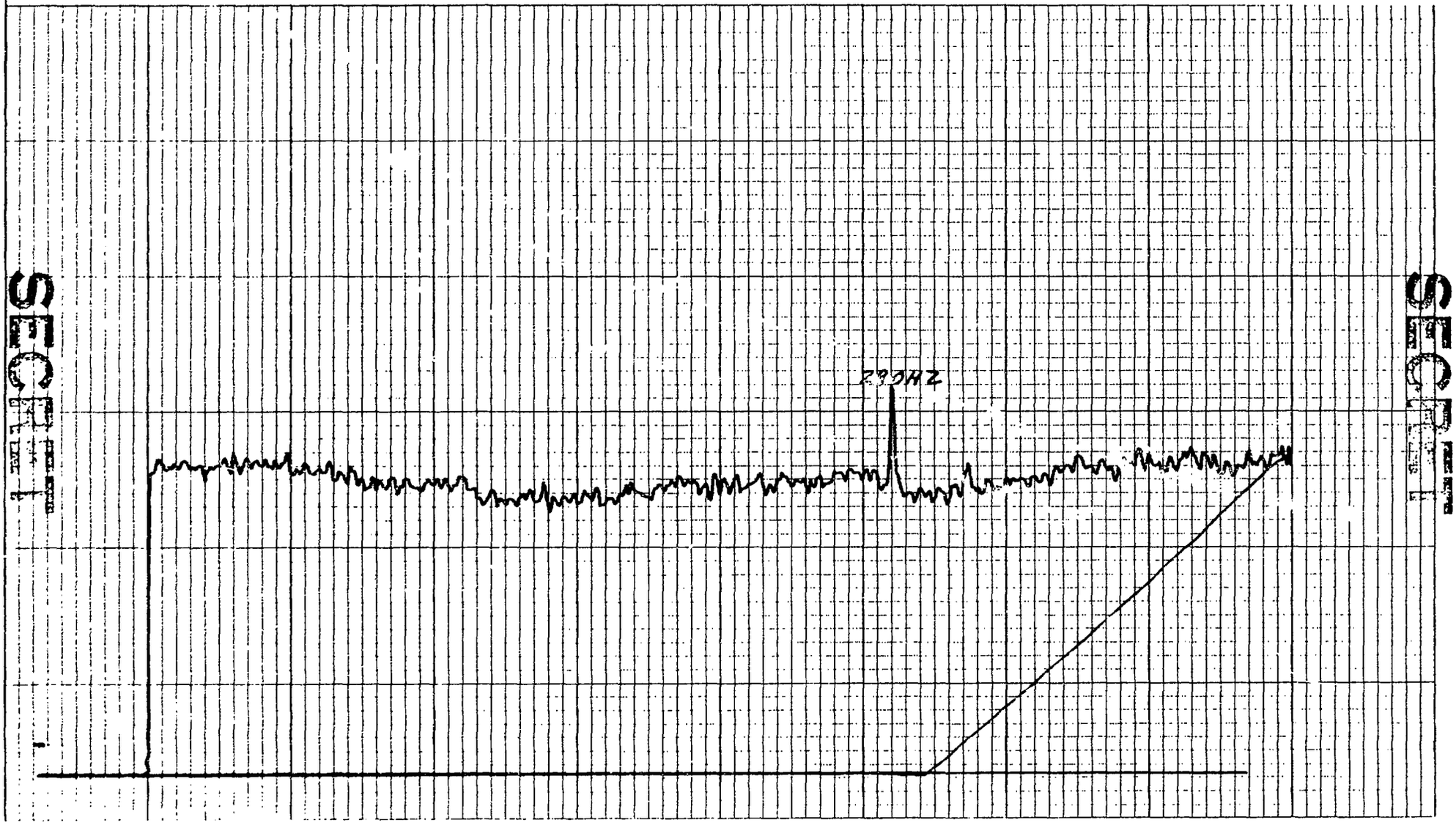
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

1

CONTROL: 3-16-0633 (1)
OMNI SPECTRUM (ELEMENT 2)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 -0633Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING

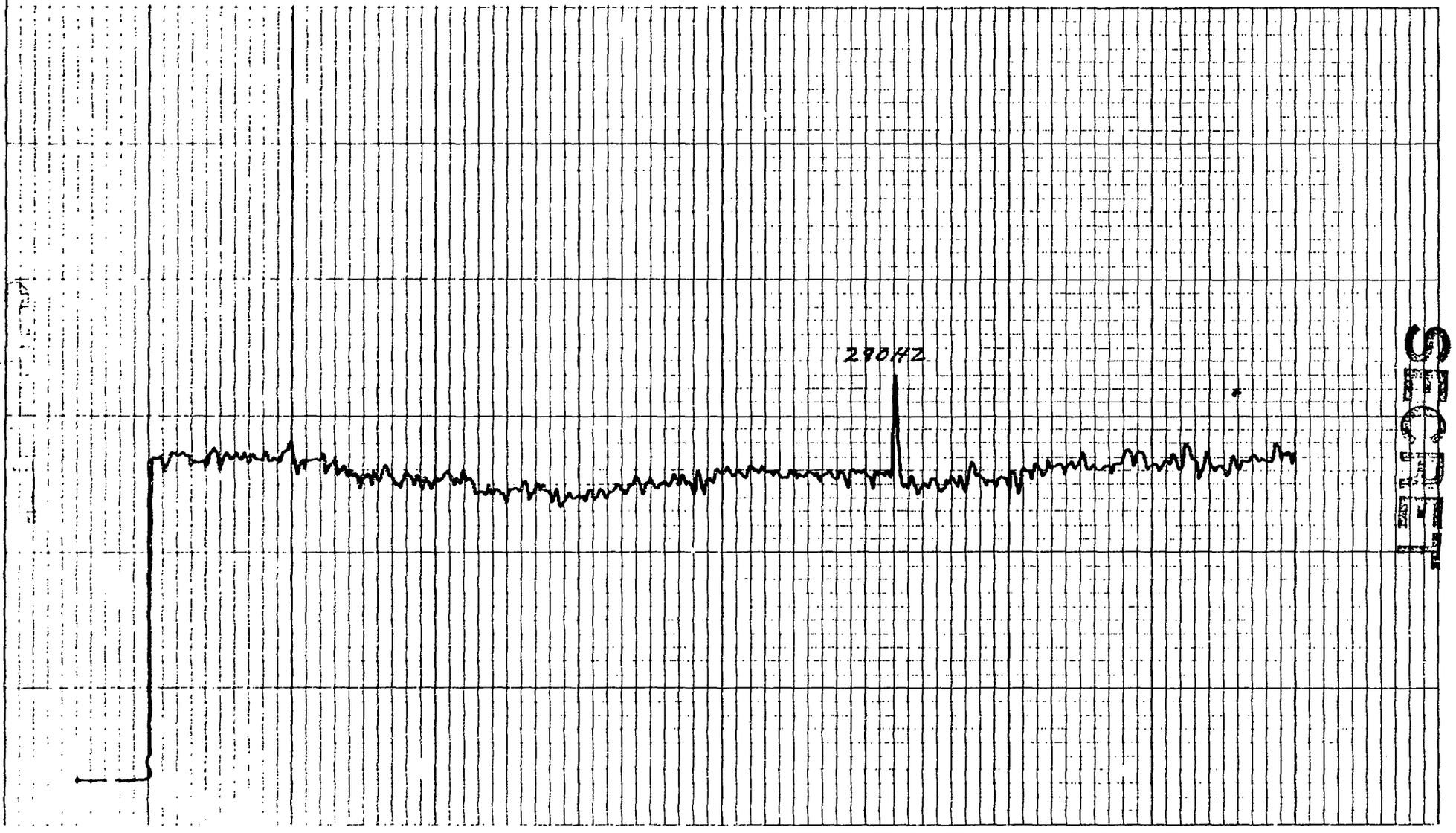


K&E 10 X 10 TO THE INCH • X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 346-0633 (2)
OMNI SPECTRUM(ELEMENT 4)
EXERCISE:BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 03 4 6-77 -0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



K•E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

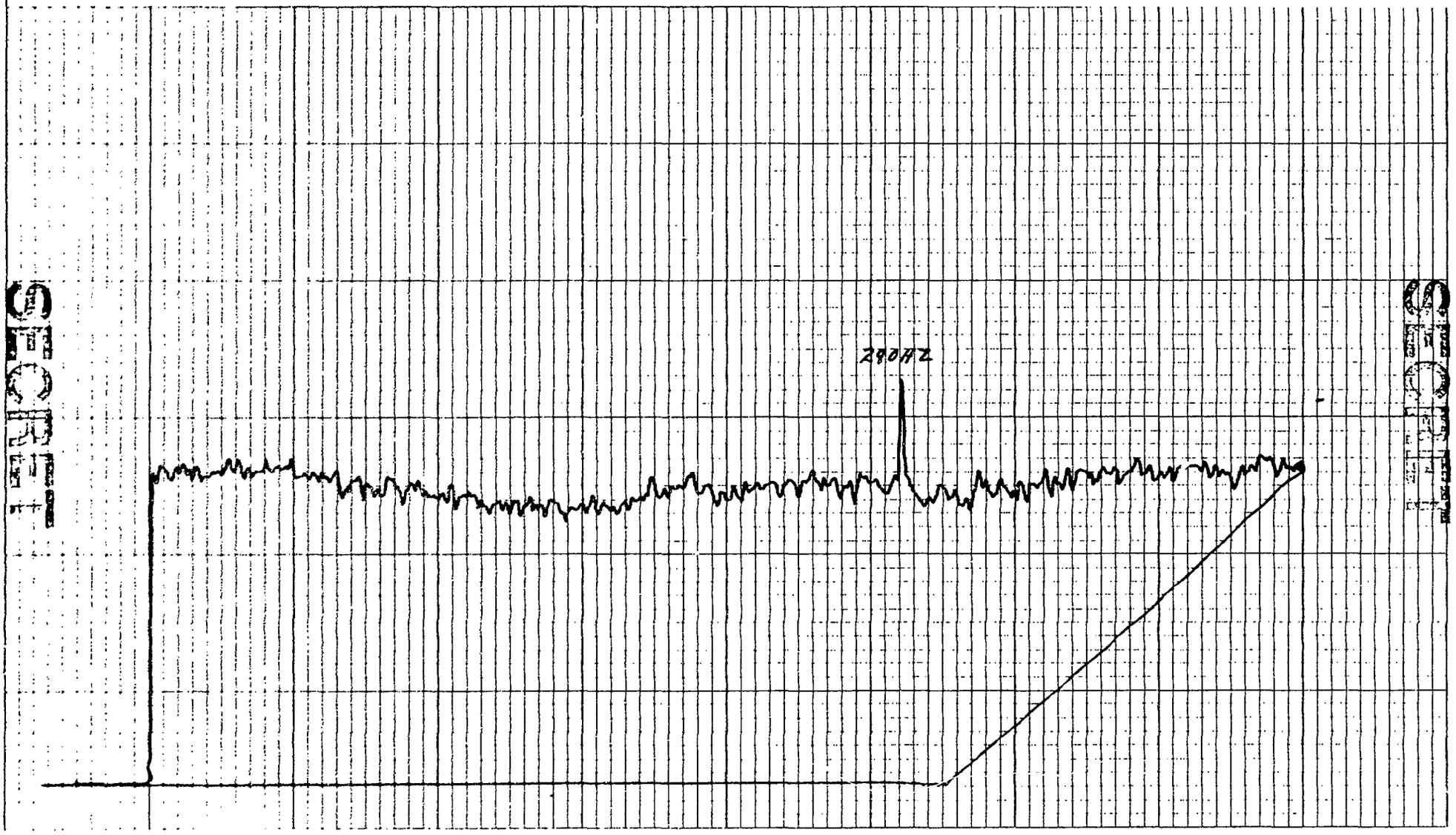
CONTROL: 3-16 -0633 (3)
OMNI SPECTRUM (ELEMENT 6)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-16-33 -0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
____ DEG AZ STEERING

REEL: M19 INDEX 1637

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 1 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

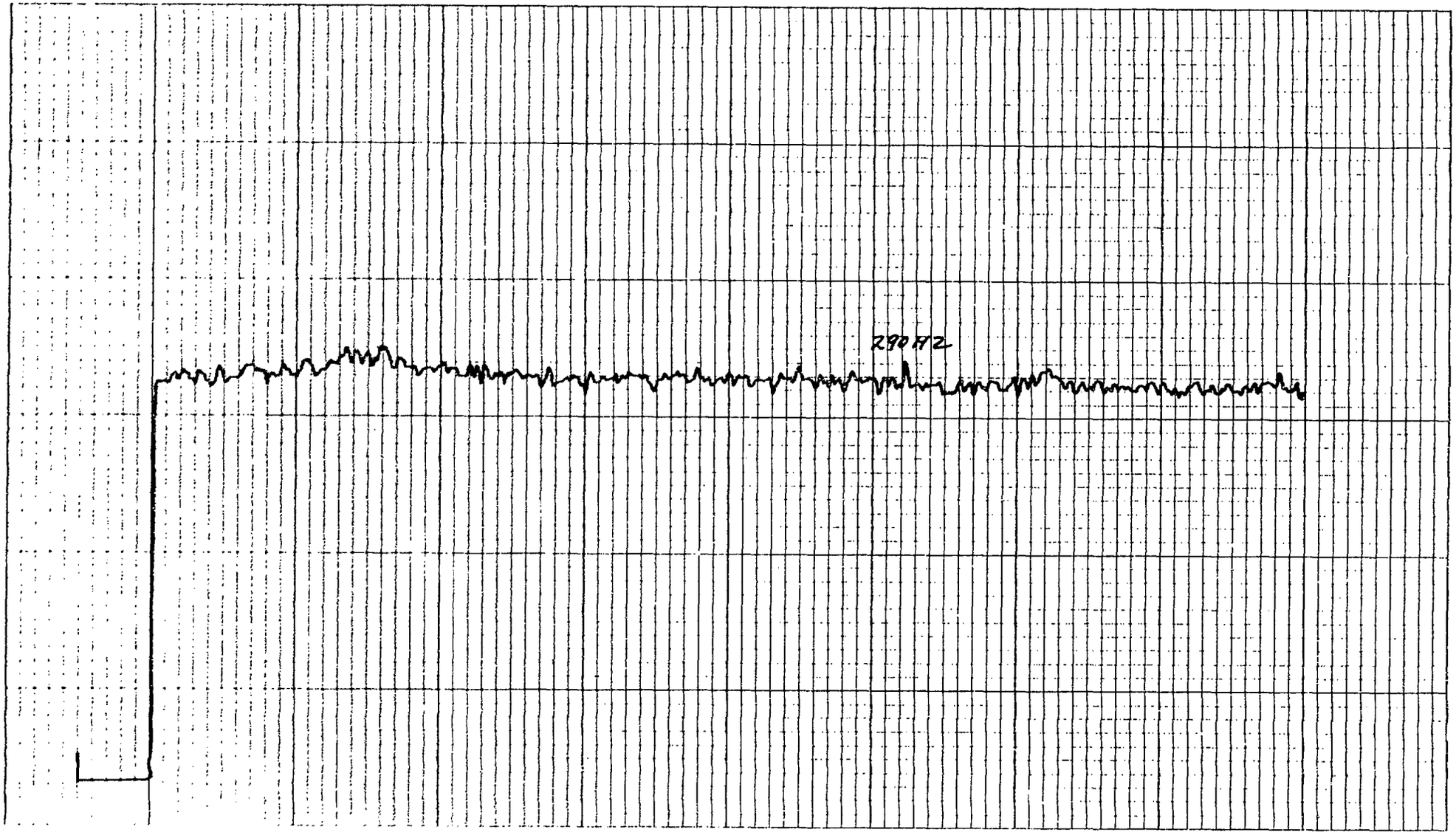
CONTROL: 316-0633 (4)
OMNI SPECTRUM(ELEMENT 9)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 316-77 -0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
____ DEG AZ STEERING

REEL: M19 INDEX 1637

INTEGRATION TIME 320 SECS ATTEN: __ DB
FILTER WTG: HANNING

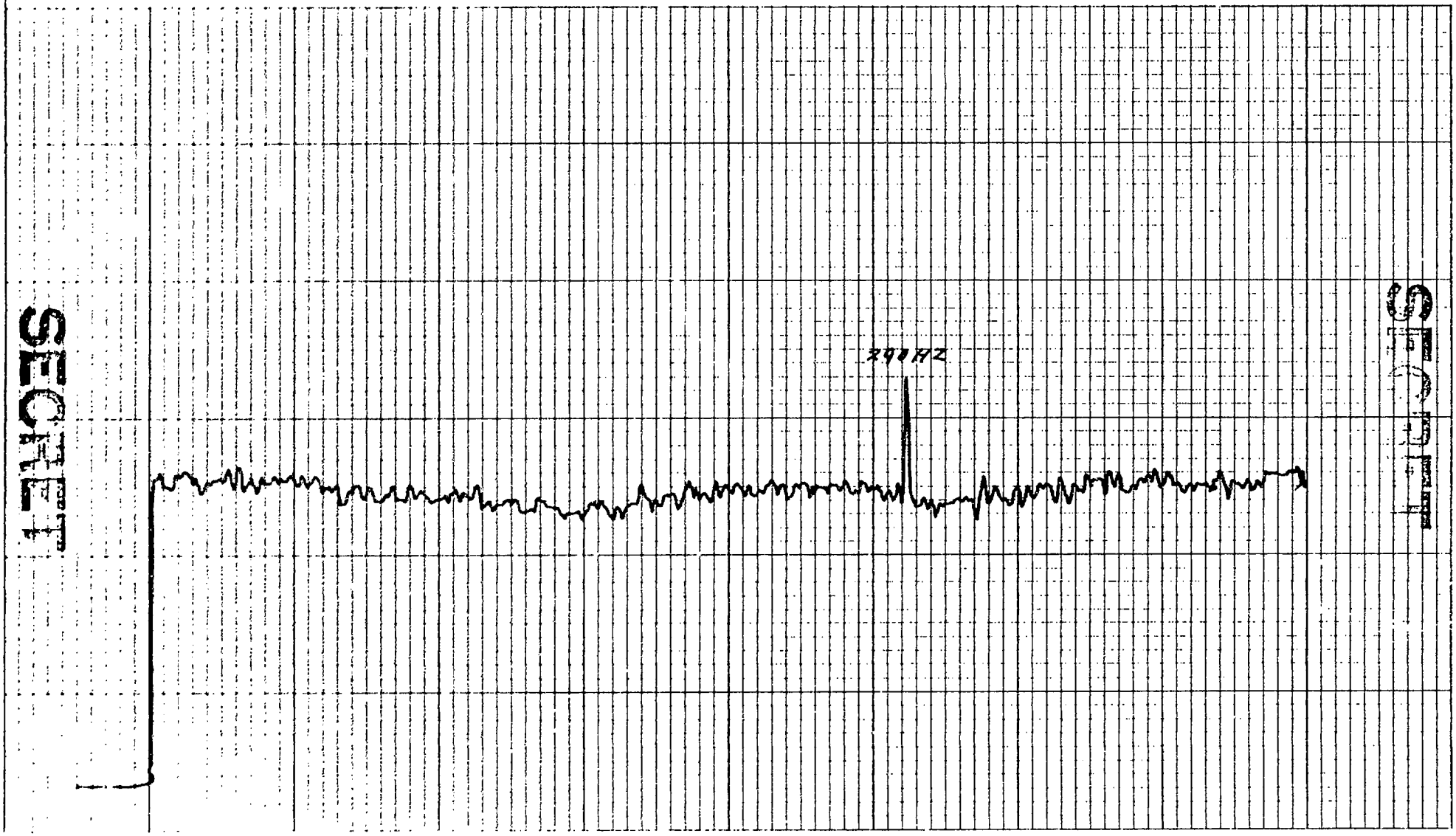


K·E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 3-16-0633 (5)
OMNI SPECTRUM (ELEMENT 10)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 -0633Z
ANALYSIS BANDWIDTH: 1/10HZ
___ DEG AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



SECRET

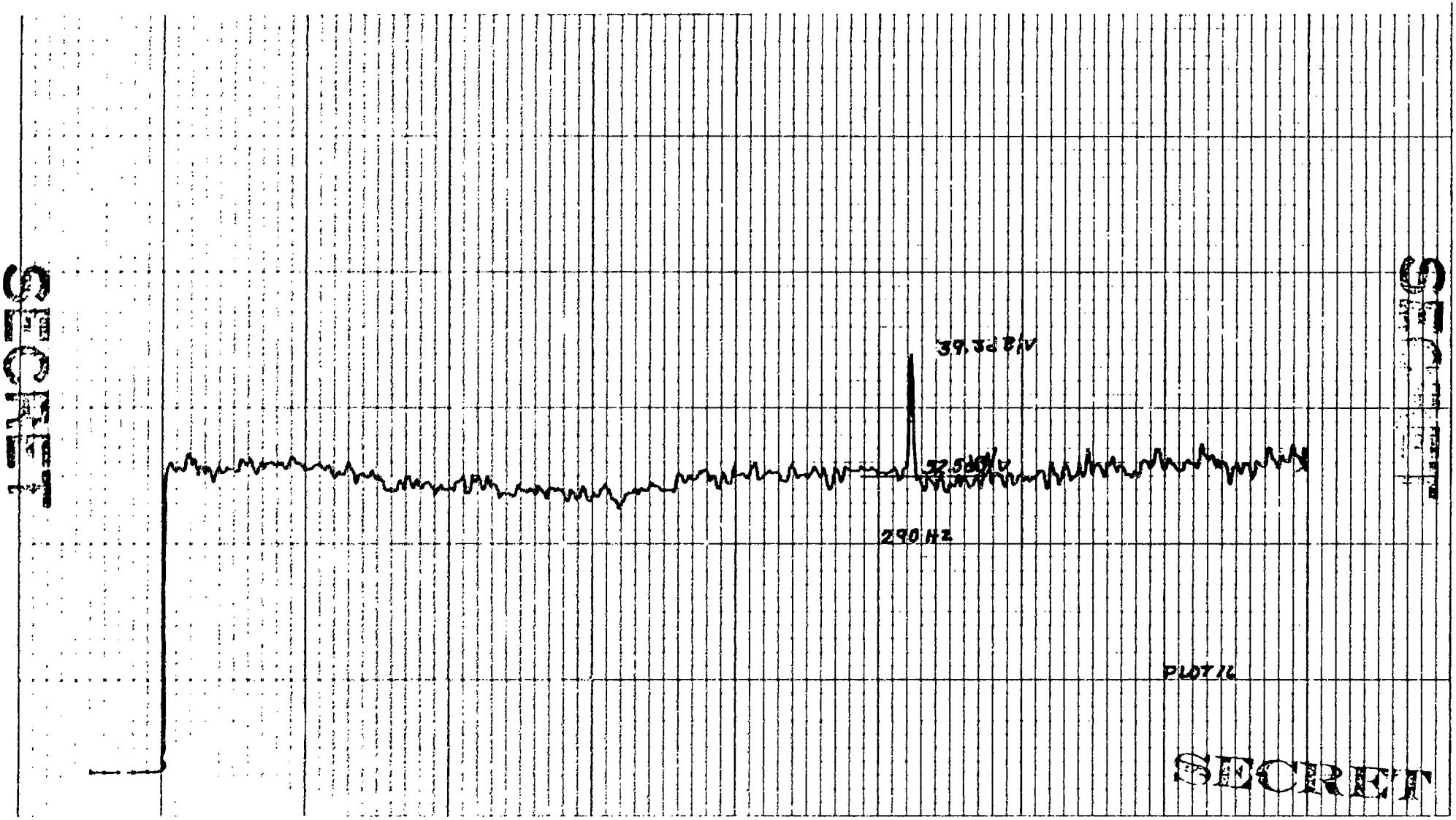
46 0703

CONTROL: 0633 - 49 (DP10)
OMNI SPECTRUM (ELEMENT 12)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 -0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

INTEGRATION TIME 320 SECS

REEL: M19 INDEX 1637
ATTEN: — DB
FILTER WTG: HANNING

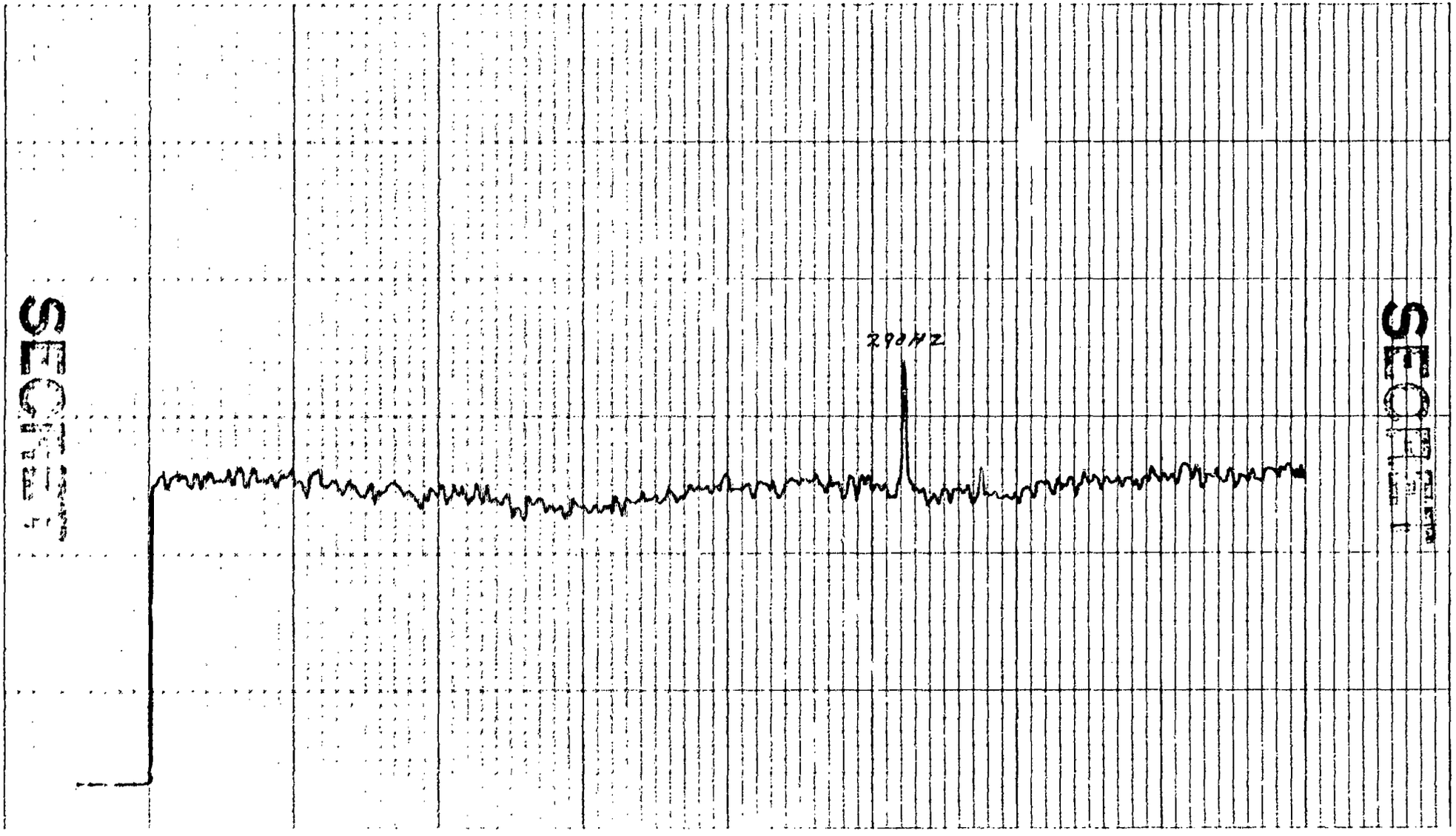


K&E 10 X 10 TO THE INCH

CONTROL: 3-16 -0633 (7)
OMNI SPECTRUM(ELEMENT 14)
EXERCISE: BEARING STAKE
CENTER FREQ: 260 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 -0833 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEC AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



K+E 10 X 10 TO THE INCH KEUFFEL & ESSER CO

46 0703

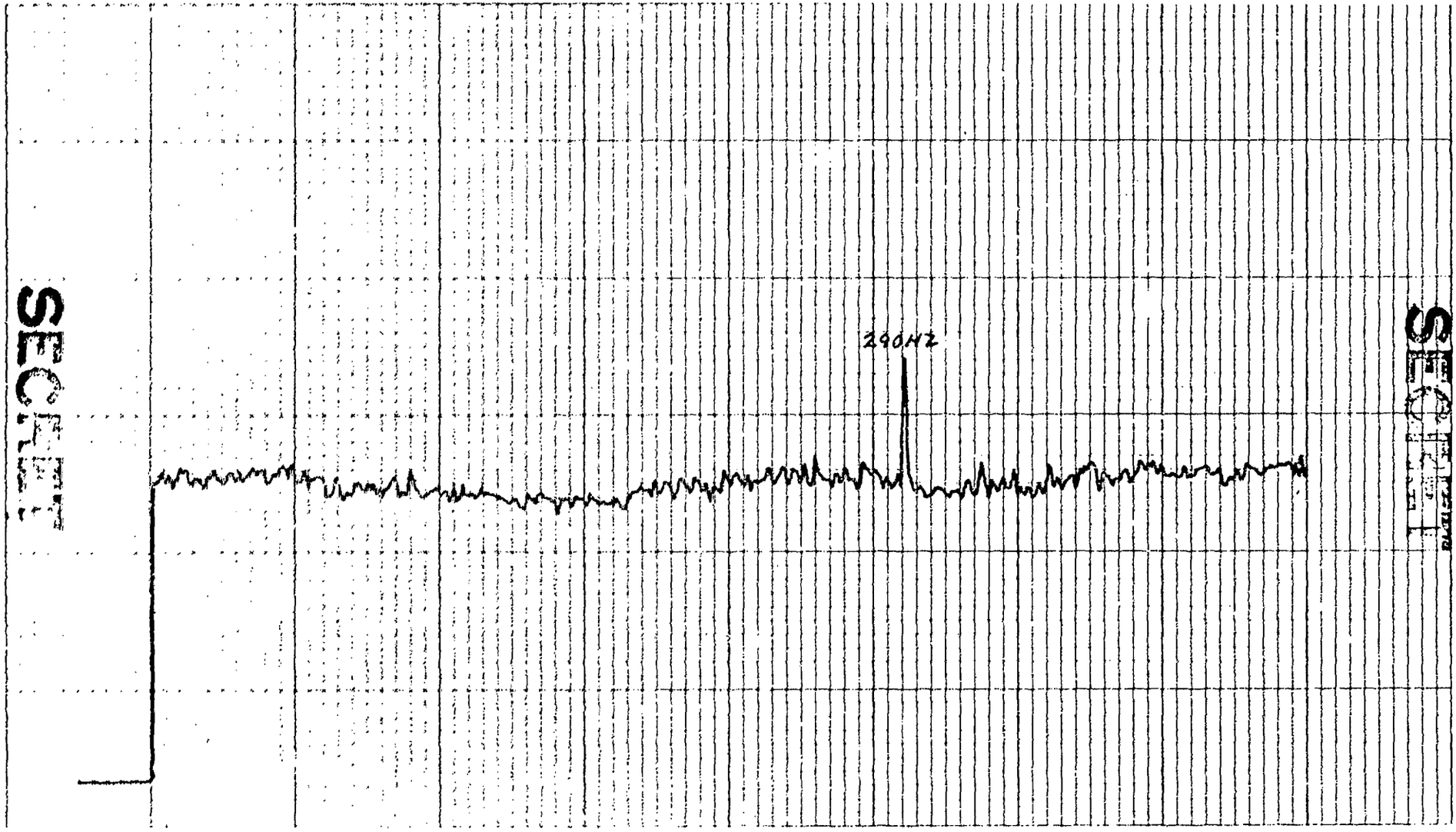
CONTROL: 3-16-0633(8)
OMNI SPECTRUM(ELEMENT 16)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-16-77 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
____ DEG AZ STEERING

REEL: N19 INDEX 1637

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



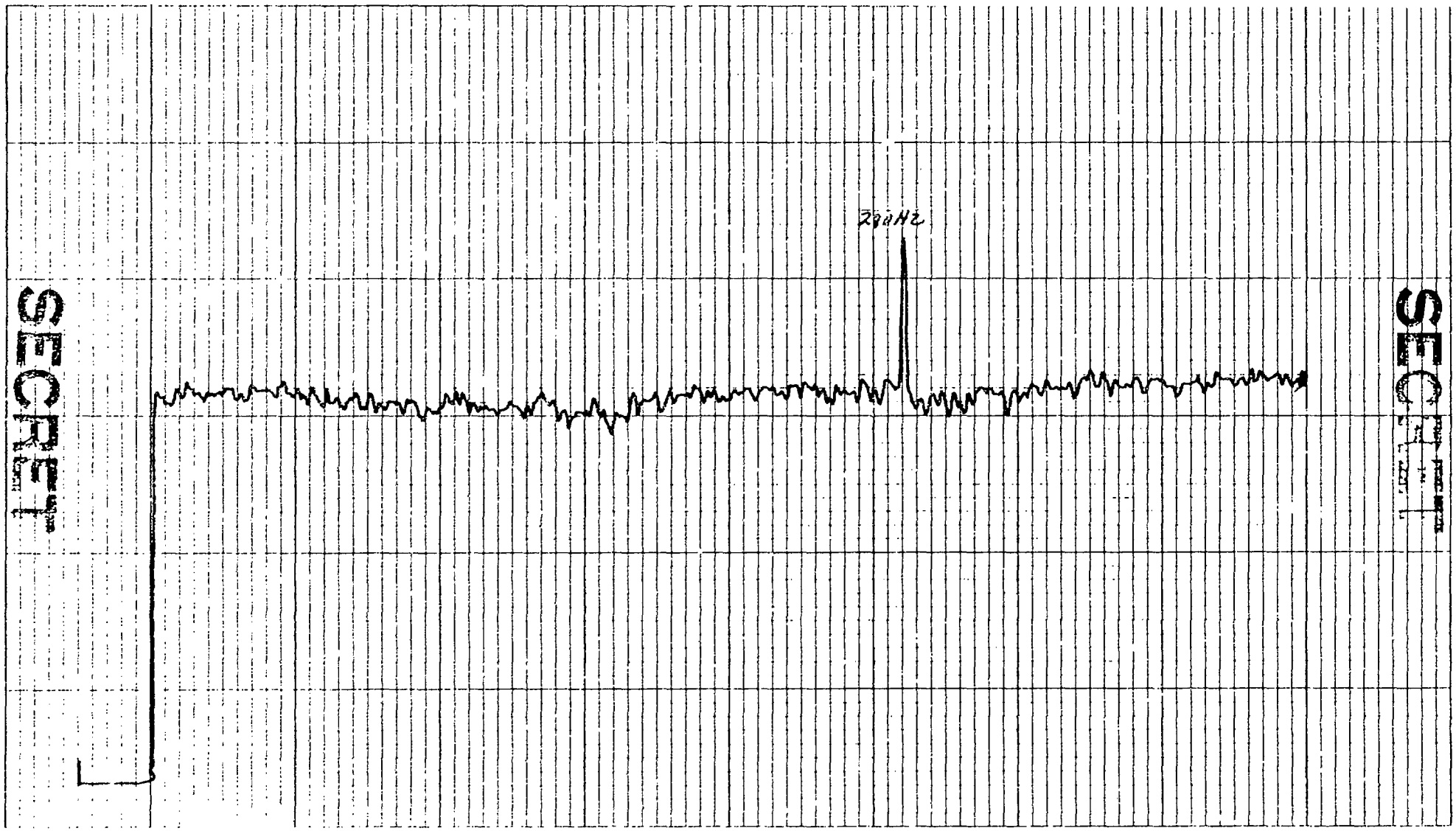
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 3-14 -0633 (9)
OMNI SPECTRUM(ELEMENT 18)
EXERCISE:BEARING STAKE
CENTER FREQ: 290 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 -0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
____ DEG AZ STEERING

REEL: M19 INDEX 1637

INTEGRATION TIME 320 SECS ATTEN: ~ DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

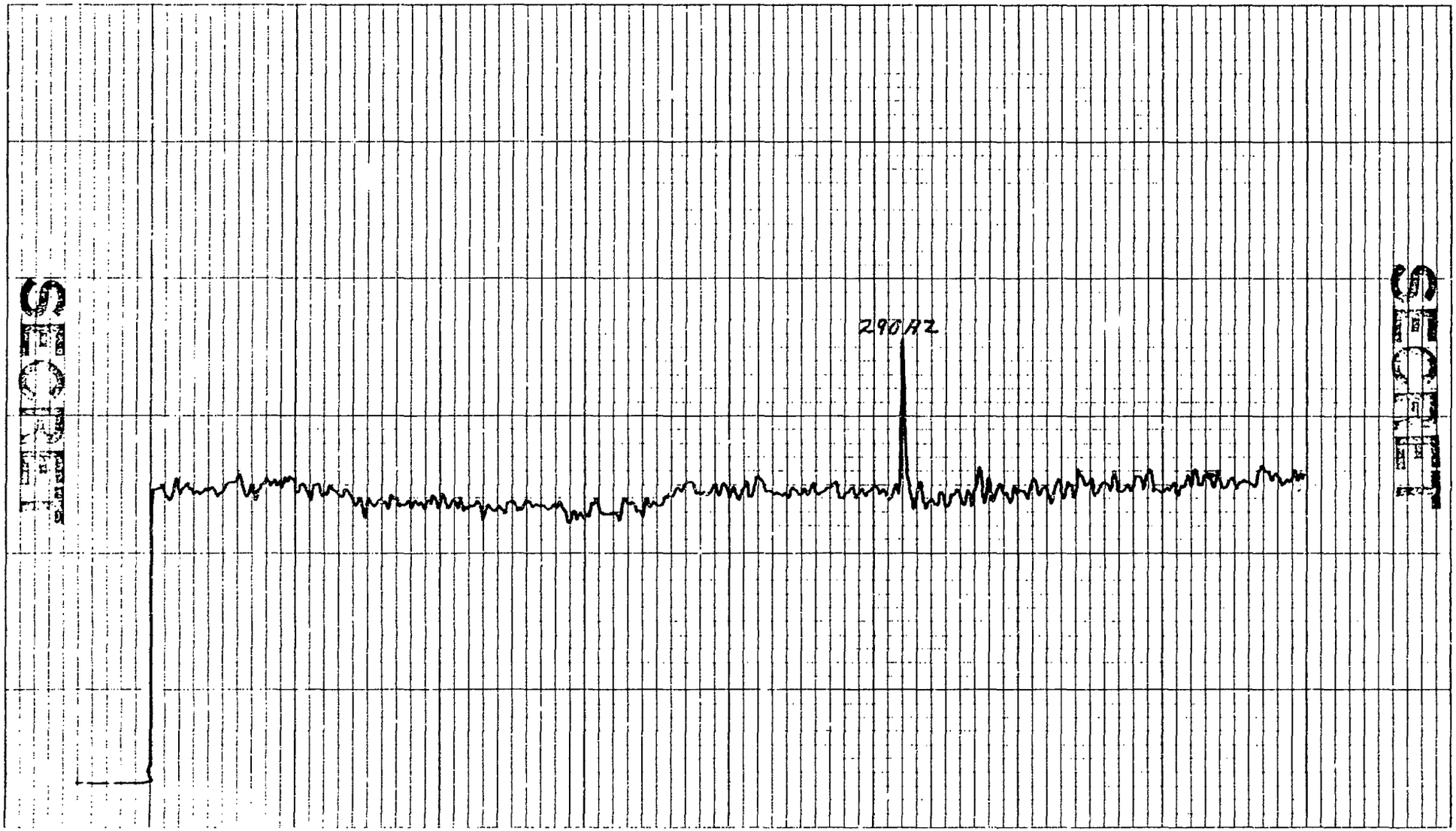
CONTROL: 3-16-0633 (16)
OMNI SPECTRUM(ELEMENT 20)
EXERCISE:BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-16-77 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M19 INDEX 1637

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

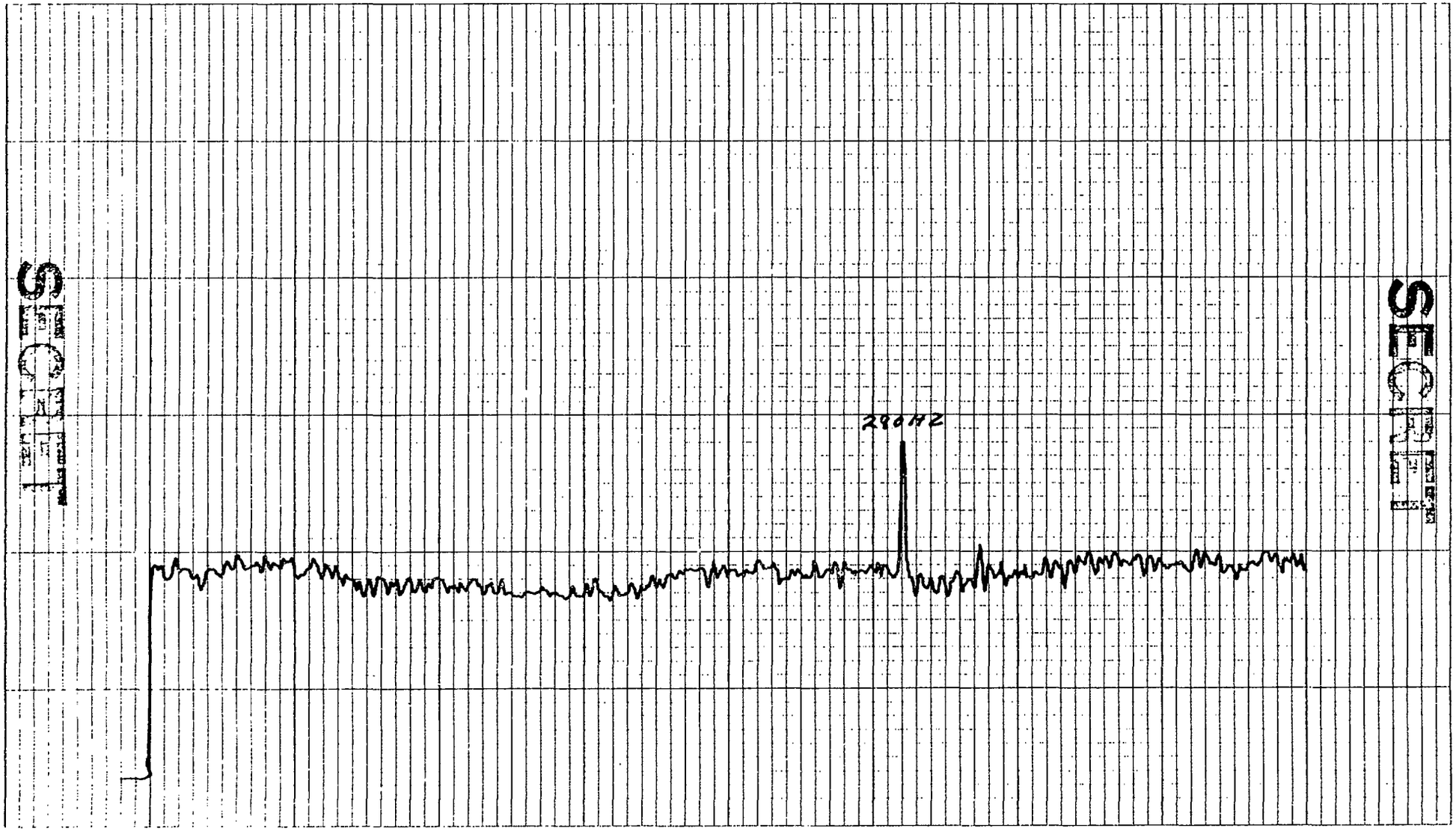
CONTROL: 3-14 -0633 (11)
OMNI SPECTRUM(ELEMENT 22)
EXERCISE:BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-16-77 -0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
_____ DEG AZ STEERING

REEL: M19 INDEX 1637

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

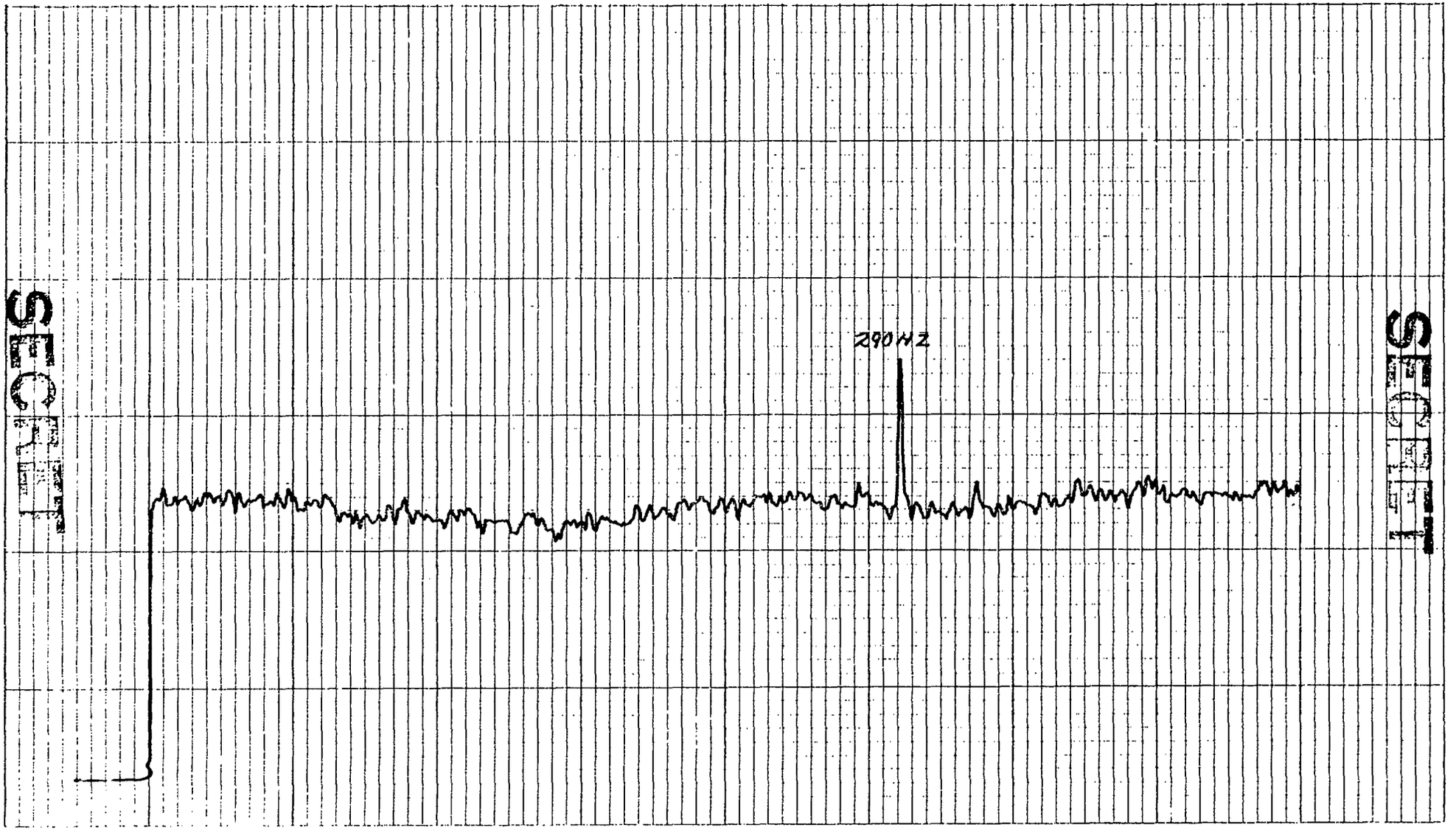
CONTROL: 3-16 -0633 (12)
OMNI SPECTRUM(ELEMENT 24)
EXERCISE:BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-16-77 -0633Z
ANALYSIS BANDWIDTH: 1/10HZ
____ DEG AZ STEERING

REEL: M19 INDEX 1637

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING

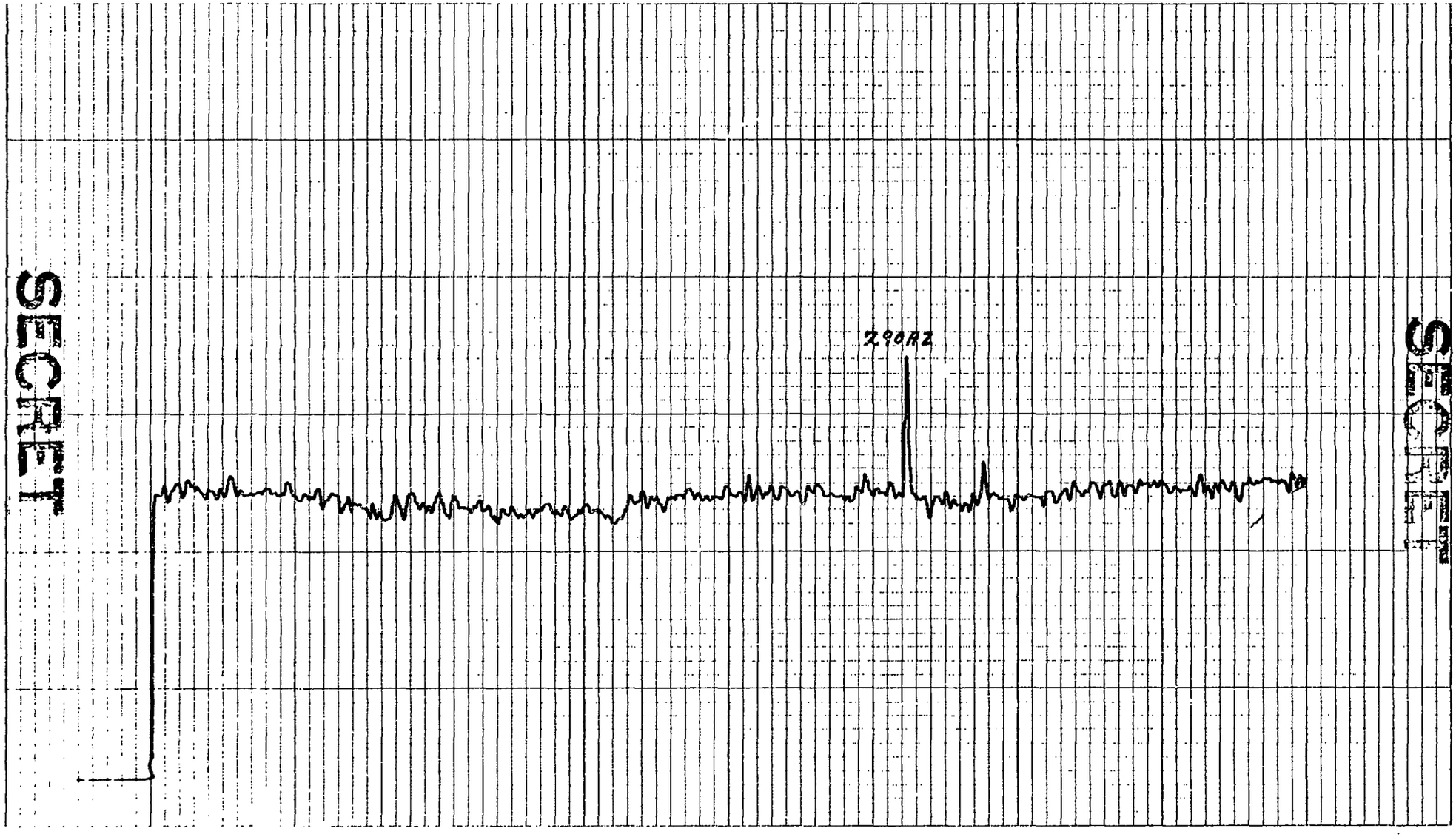


K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 3-16-0633 (13)
OMNI SPECTRUM (ELEMENT 26)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



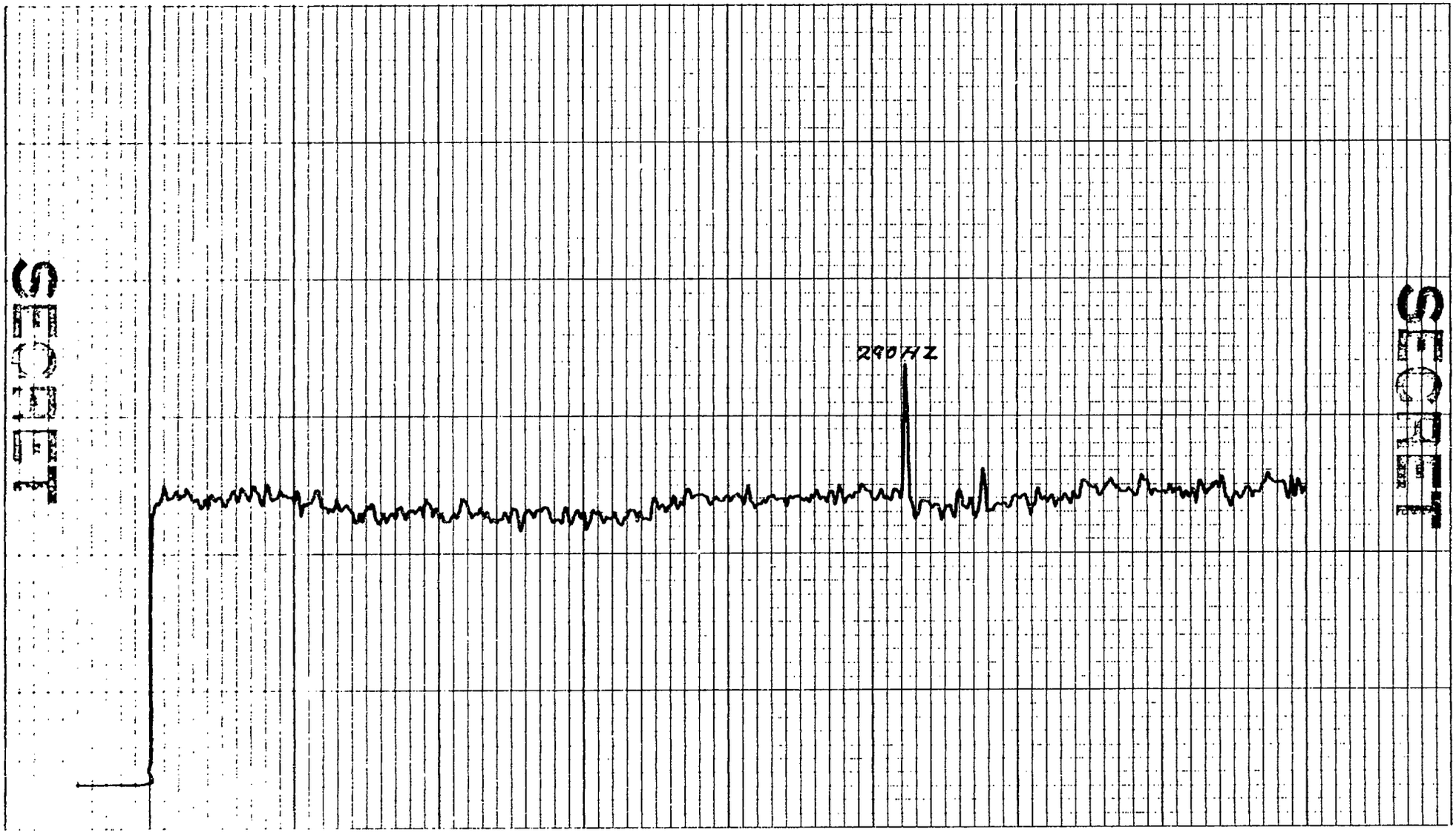
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 3-16-0633 (14)
OMNI SPECTRUM(ELEMENT 29)
EXERCISE:BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77-0633Z
ANALYSIS BANDWIDTH:1/10HZ
— DEG AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



K·E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

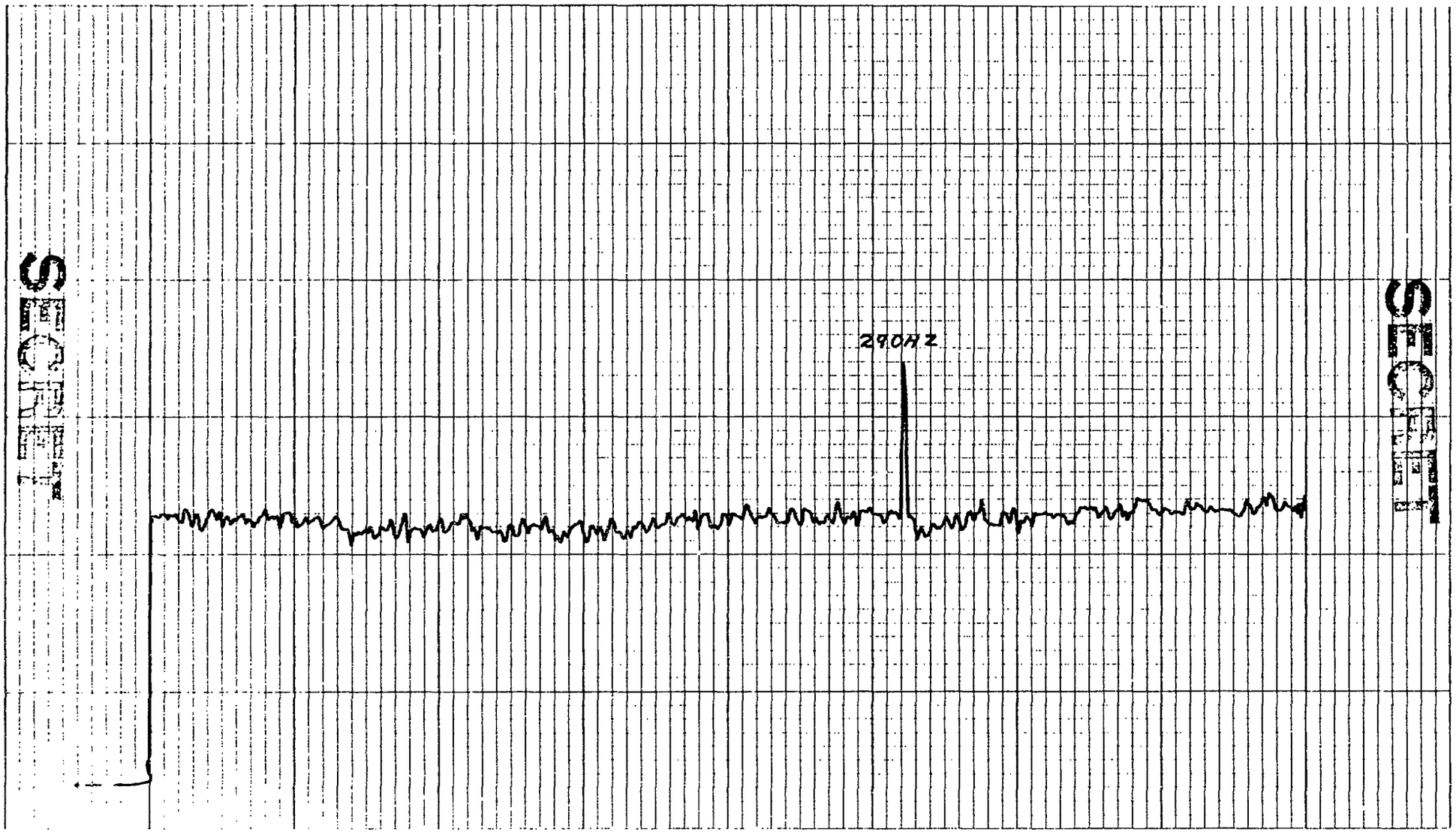
CONTROL: 3-16-0633 (15)
OMNI SPECTRUM(ELEMENT 31)
EXERCISE: BEARING STAKE
CENTER FREQ: 281 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-16-77 -0633Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M19 INDEX 1437

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

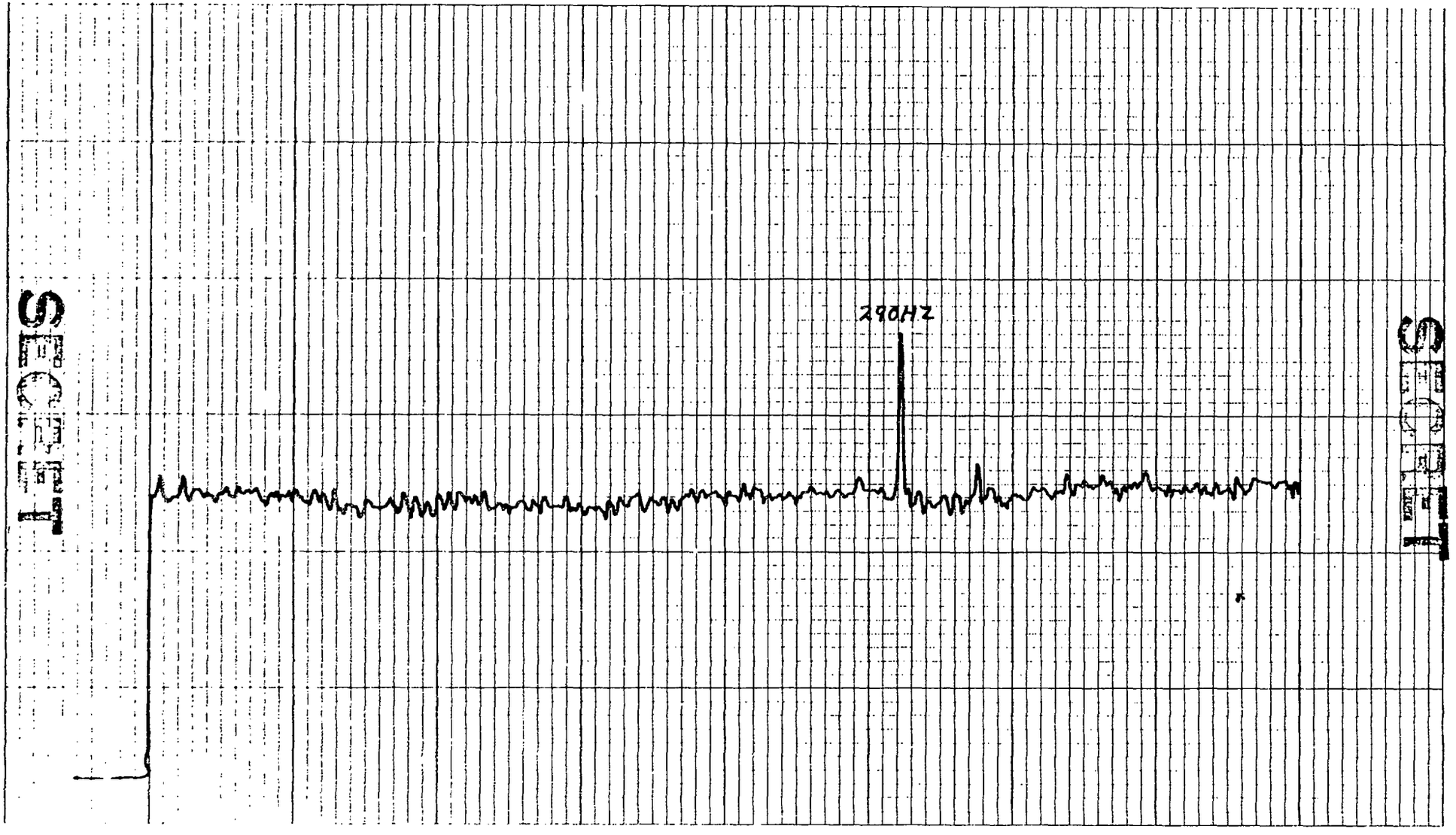
CONTROL: 3-16 - 0633 (16)
OMNI SPECTRUM (ELEMENT 33)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-16-77 -0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
___ DEG AZ STEERING

REEL: M19 INDEX 1637

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING

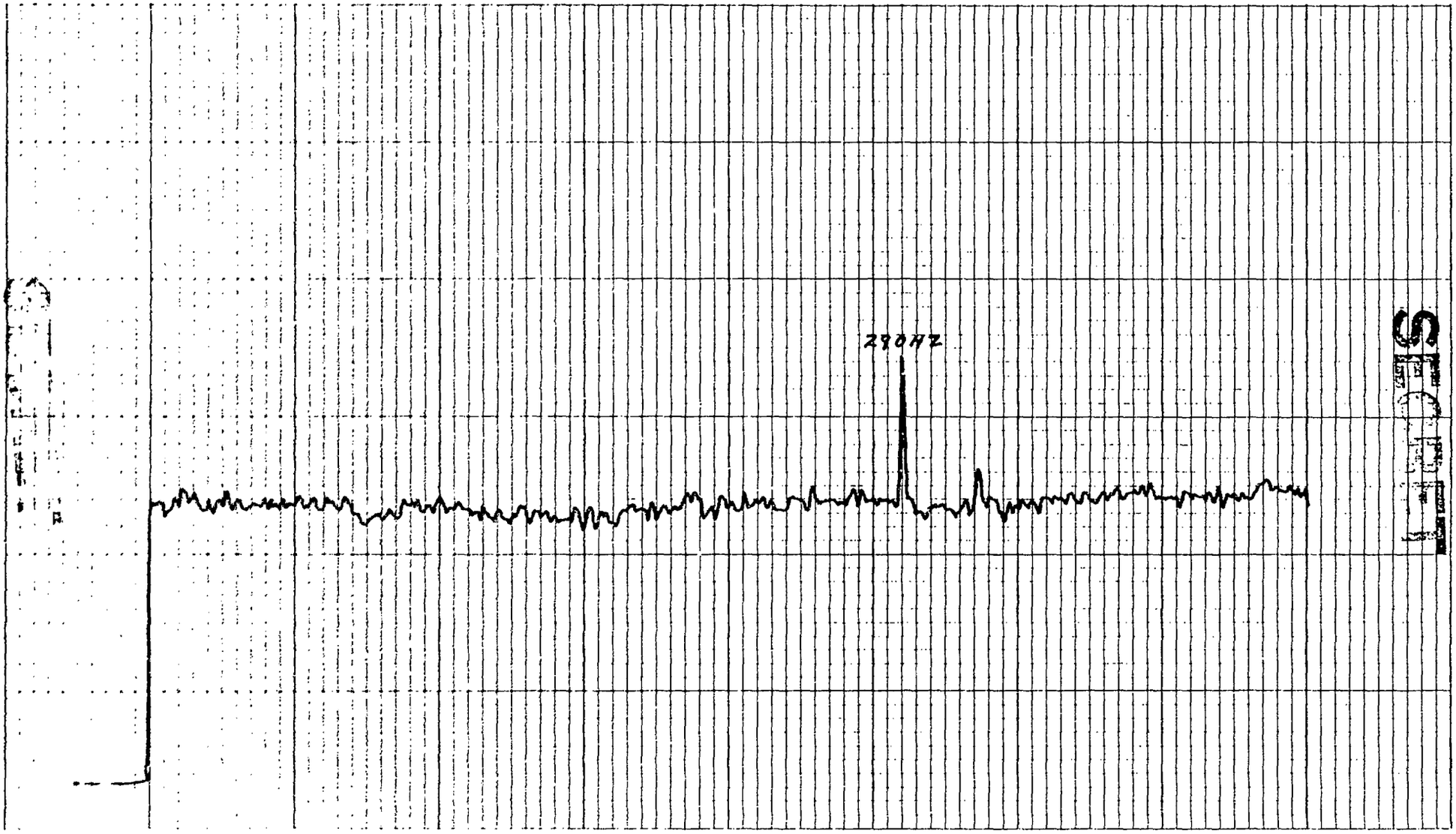


K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 376 -0633 (17)
OMNI SPECTRUM (ELEMENT 35)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 -0633Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

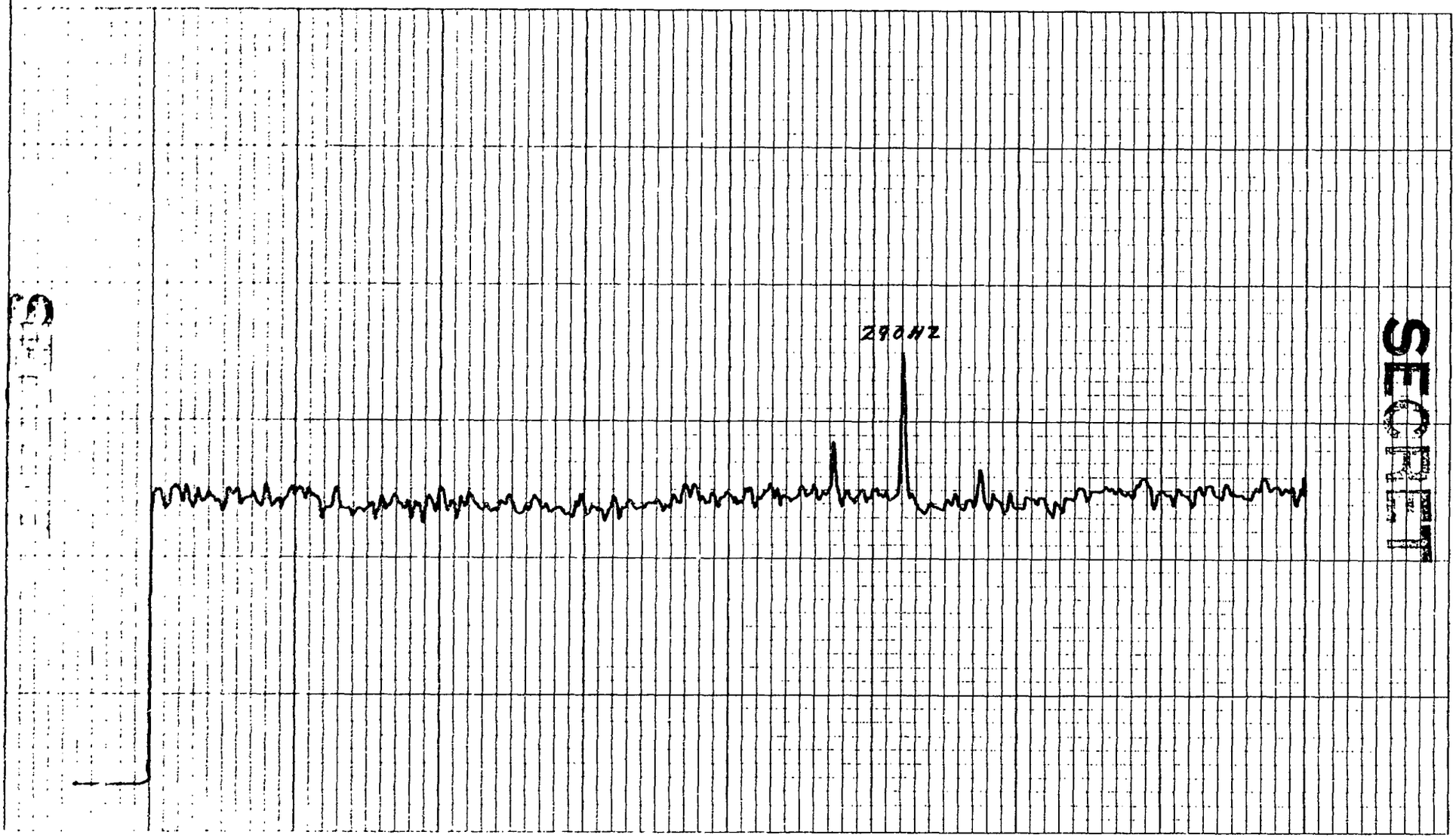
CONTROL: 3-16 -0633 (18)
OMNI SPECTRUM(ELEMENT 37)
EXERCISE:BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-16-77 -0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M19 INDEX 1637

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING

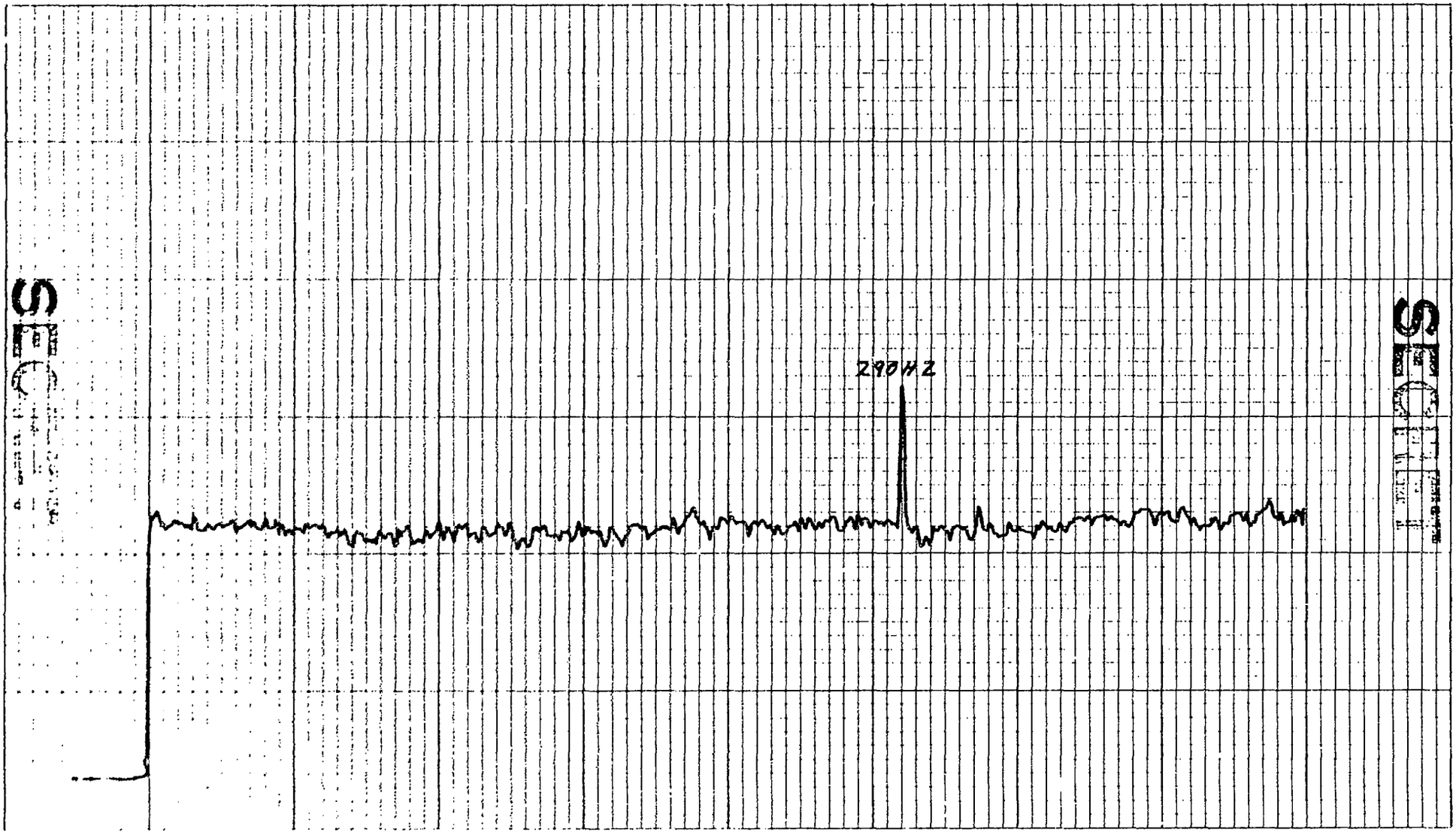


K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 3-16 -0633 (19)
OMNI SPECTRUM(ELEMENT 39)
EXERCISE:BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

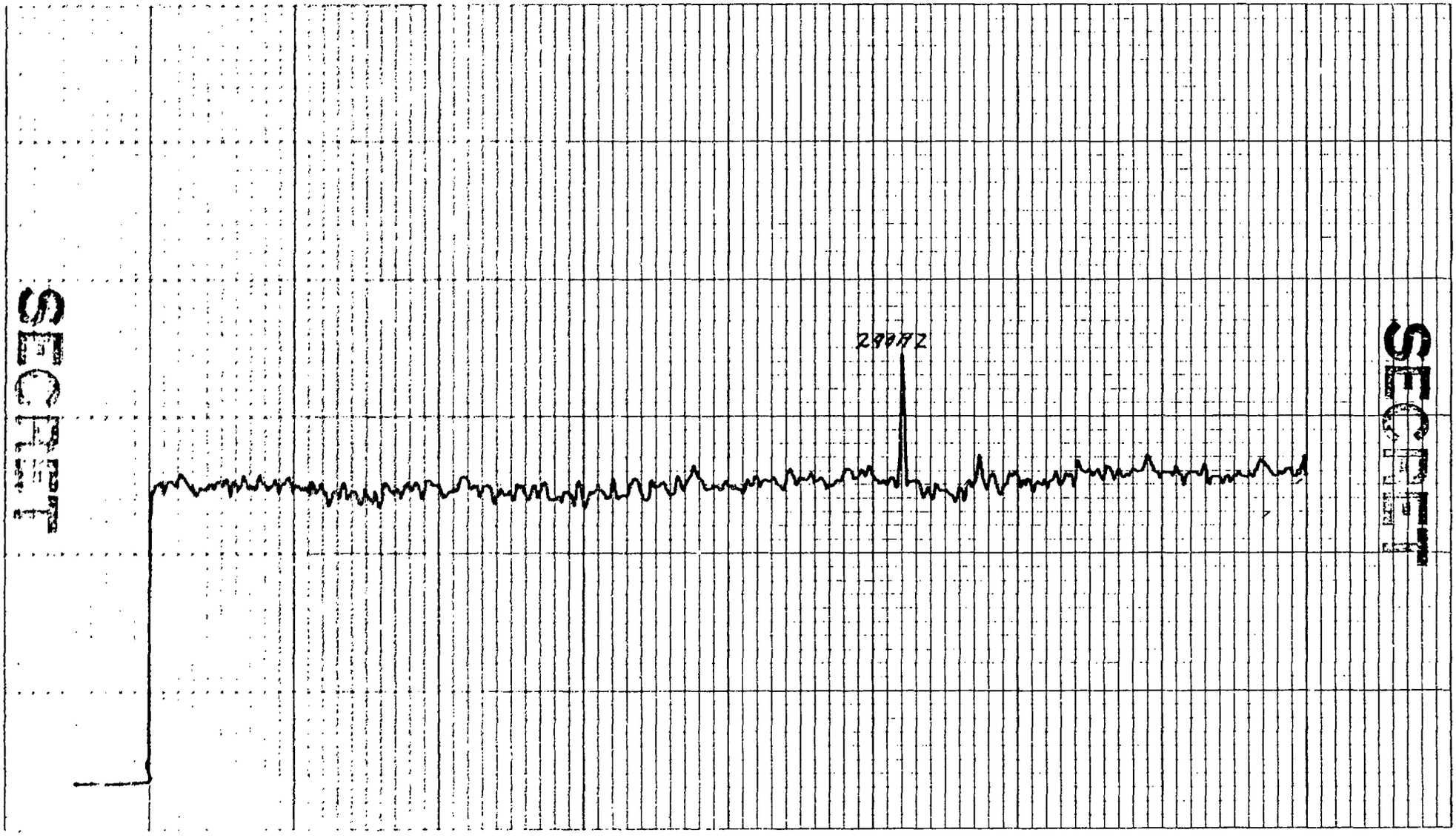
CONTROL: 346 -0633 (20)
OMNI SPECTRUM (ELEMENT 41)
EXERCISE: BEARING STAKE
CENTER FREQ: 200 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 346-77 -0633Z
ANALYSIS BANDWIDTH: 1/10HZ
____ DEG AZ STEERING

REEL: M19 INDEX 1637

INTEGRATION TIME 320 SECS ATTEN: - DB
FILTER WTG: HANNING



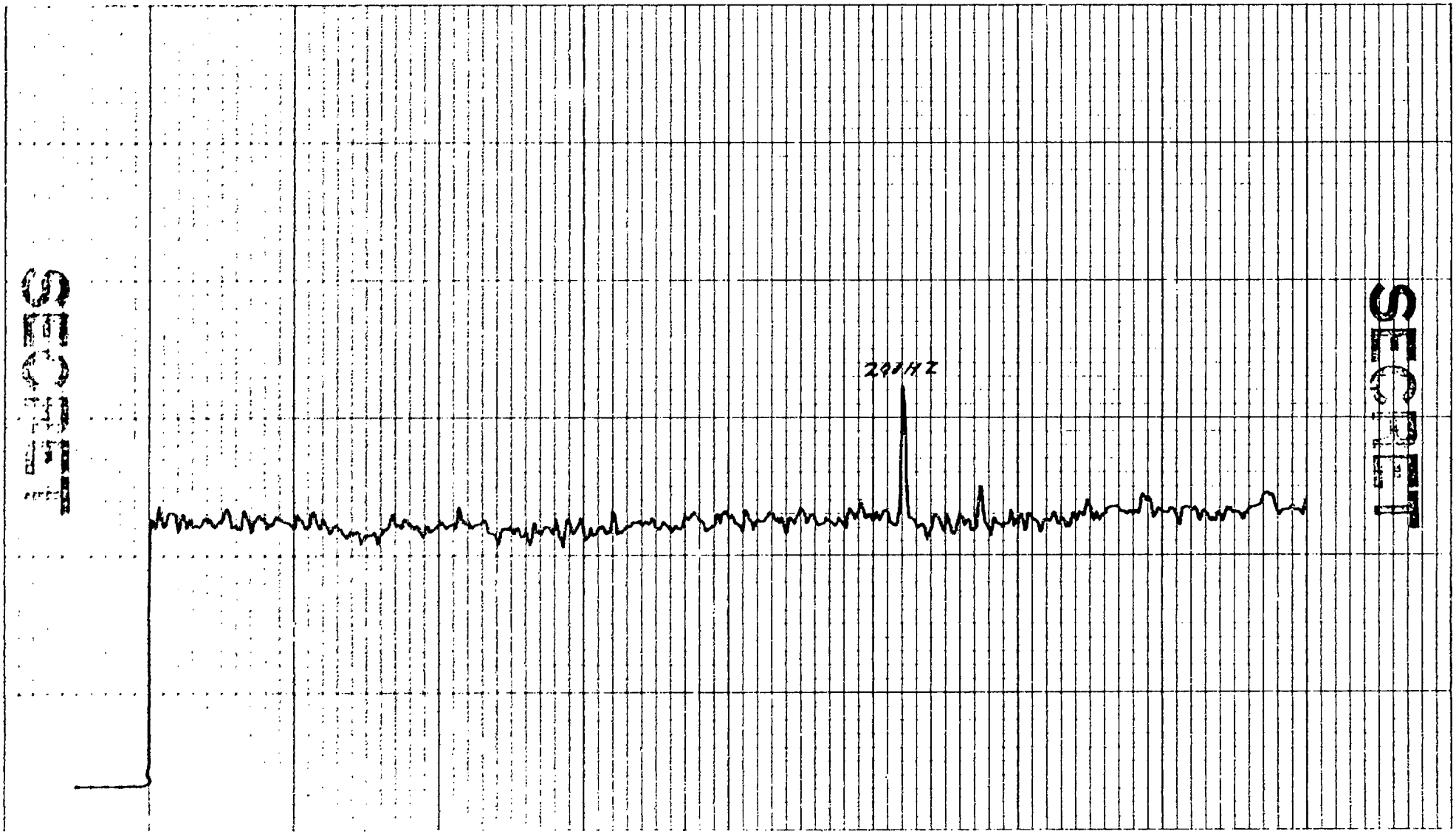
10 X 10 TO THE INCH
KEUFFEL & ESSER CO

46 0703

CONTROL: 3-16 -0633 (24)
OMNI SPECTRUM (ELEMENT 43)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 -0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
____ DEG AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: ~ DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH 46 0703

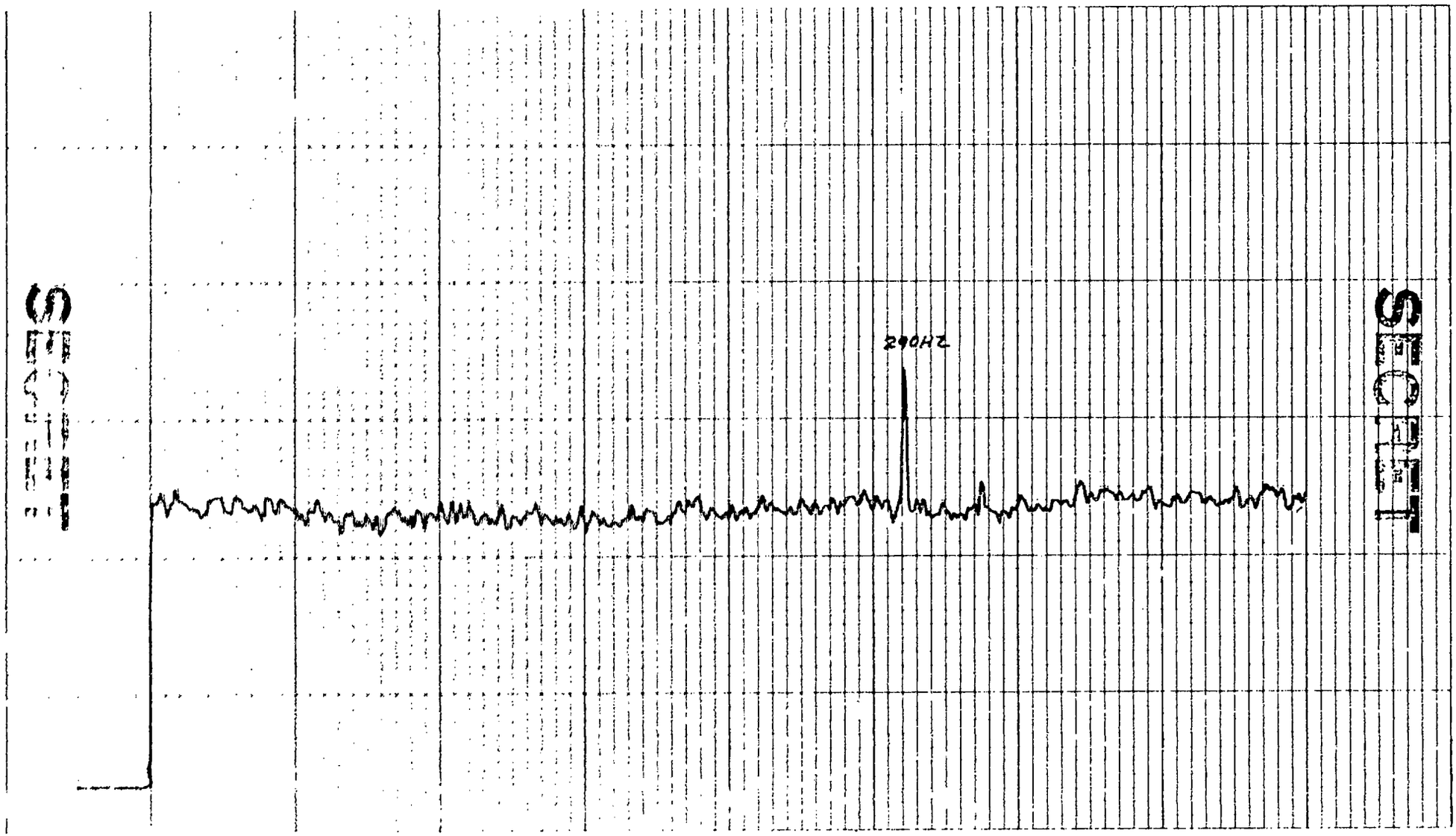
CONTROL: 0633 - 49 (bp10)
OMNI SPECTRUM (ELEMENT 45)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-6-77 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M19 INDEX/637

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

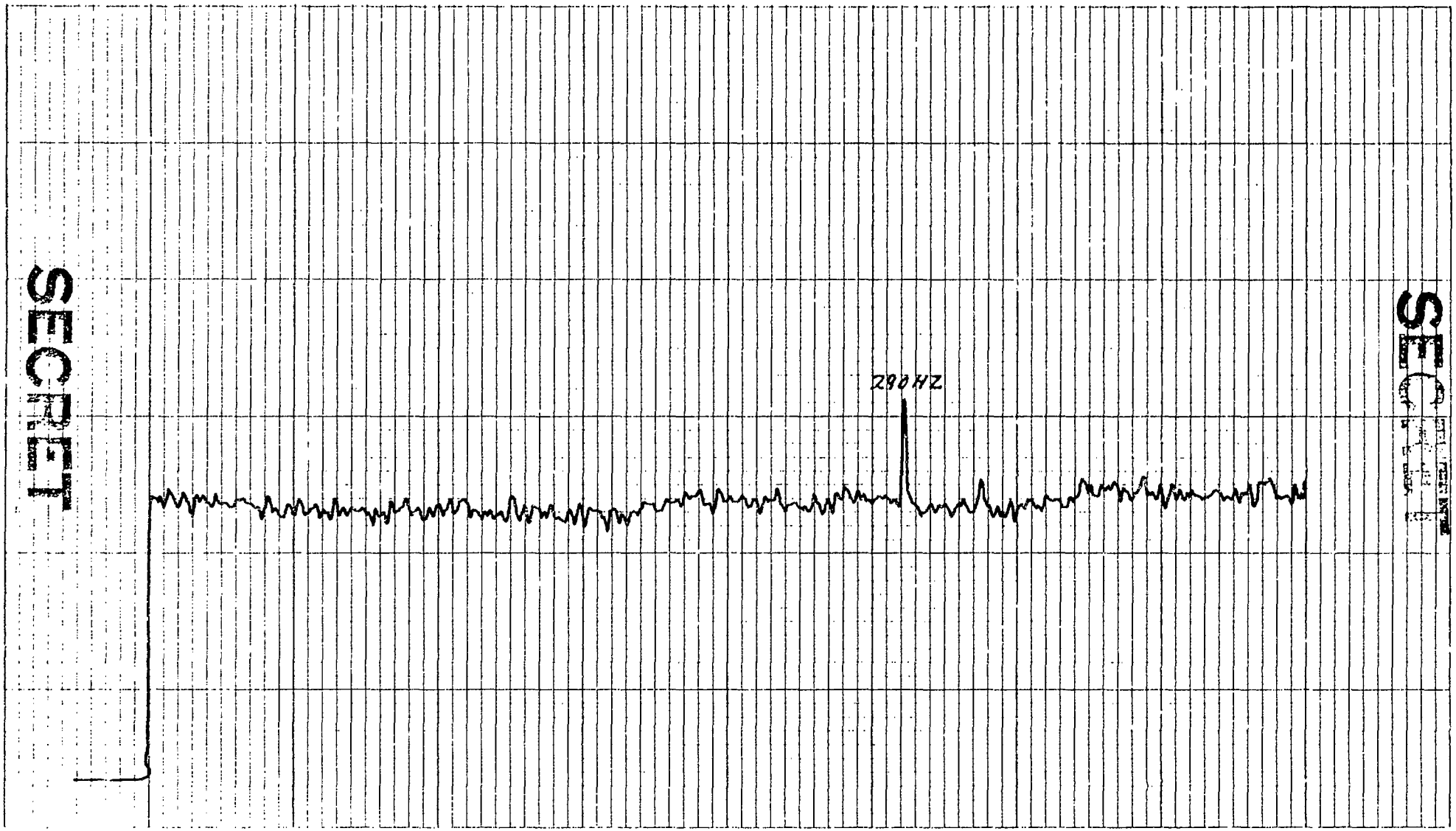
CONTROL: 3-16 -0633 (23)
OMNI SPECTRUM(ELEMENT 47)
EXERCISE:BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-16-77 -0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
____ DEG AZ STEERING

REEL: M19 INDEX 1637

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

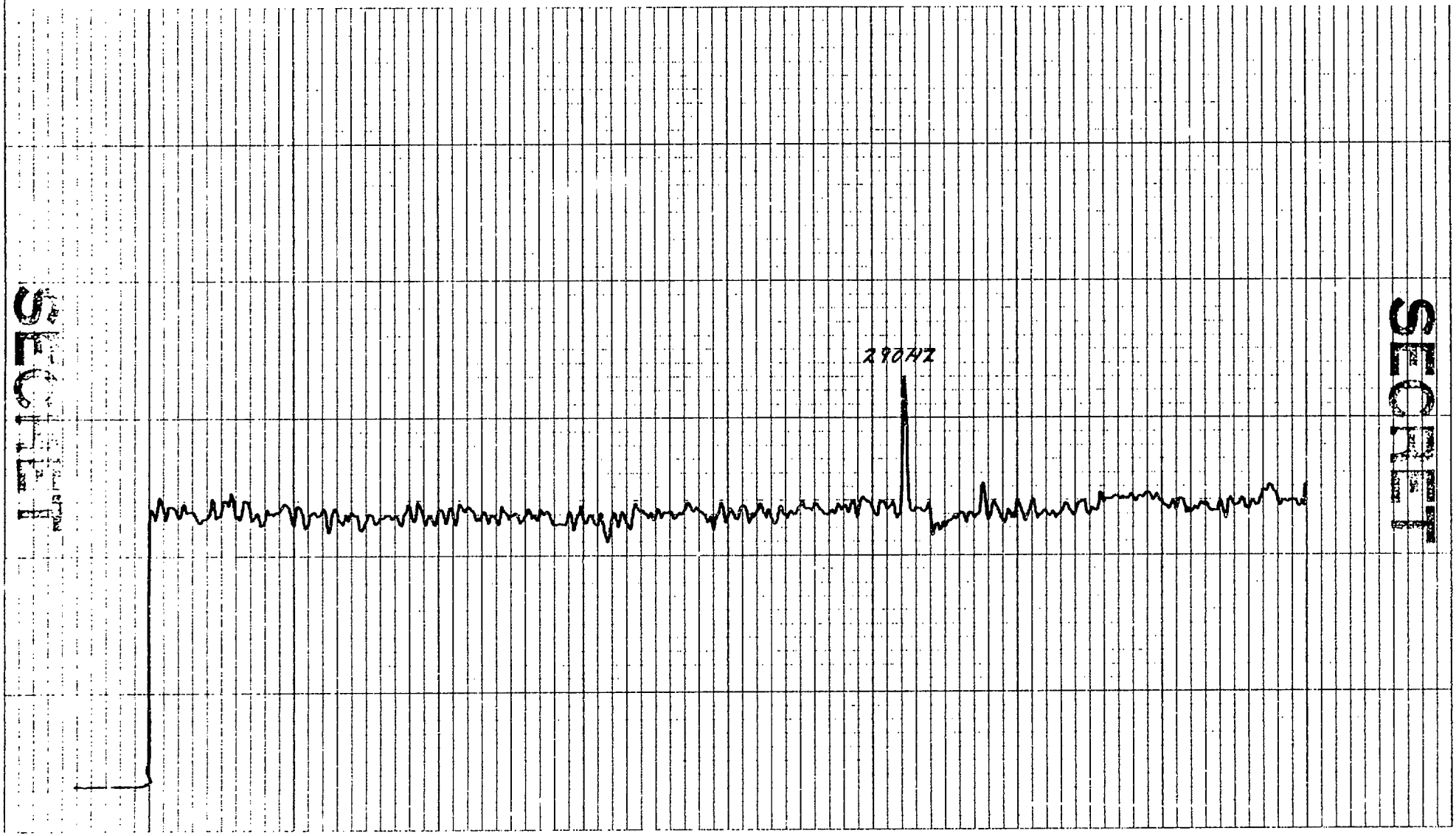
CONTROL: 316 -0633 (24)
OMNI SPECTRUM (ELEMENT 49)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-16-77 -0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
_____ DEG AZ STEERING

REEL: A.9 INDEX 1637

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING

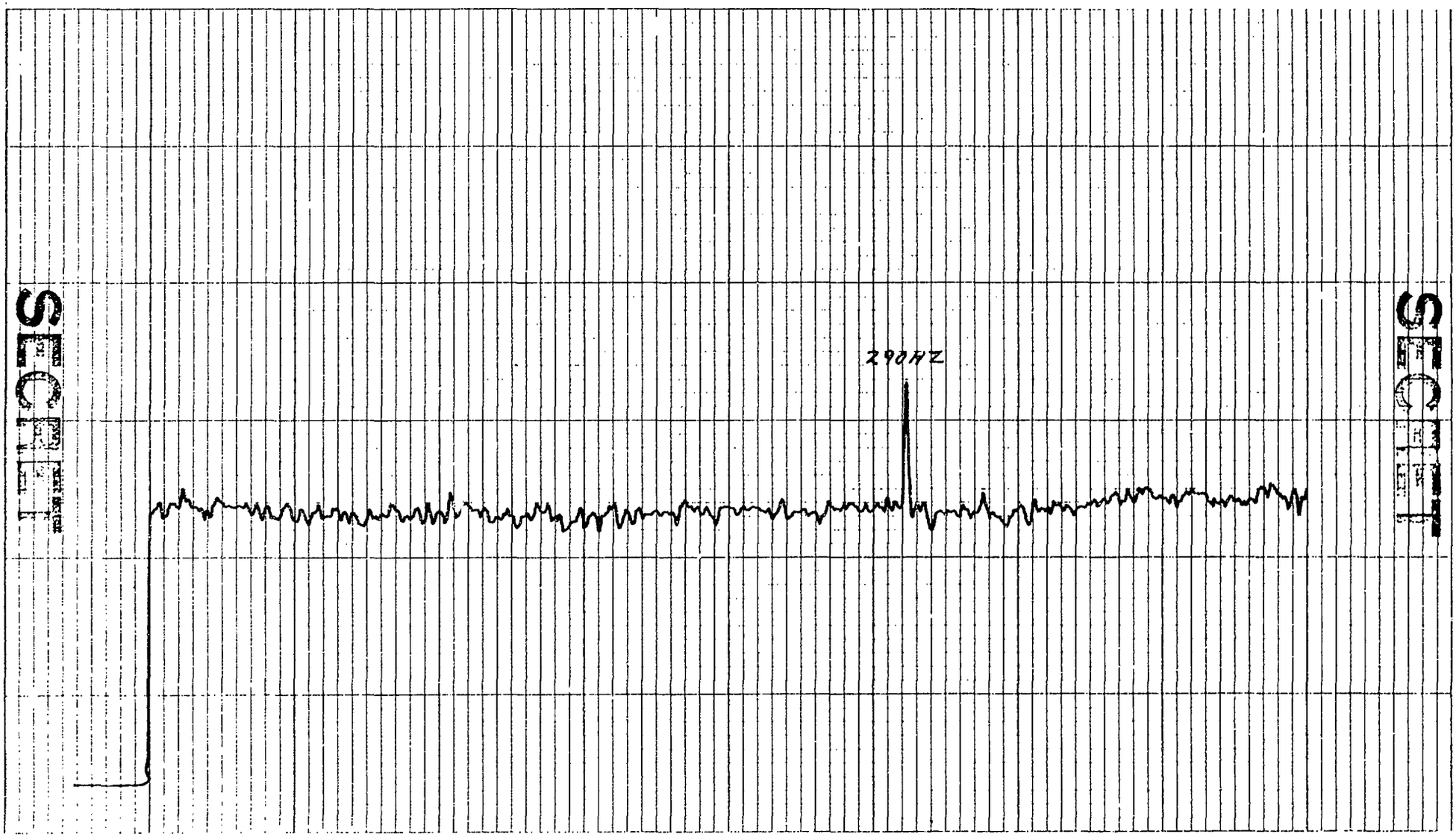


K+E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 3-16-0633 (25)
OMNI SPECTRUM (ELEMENT 51)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 -0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
____ DEG AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

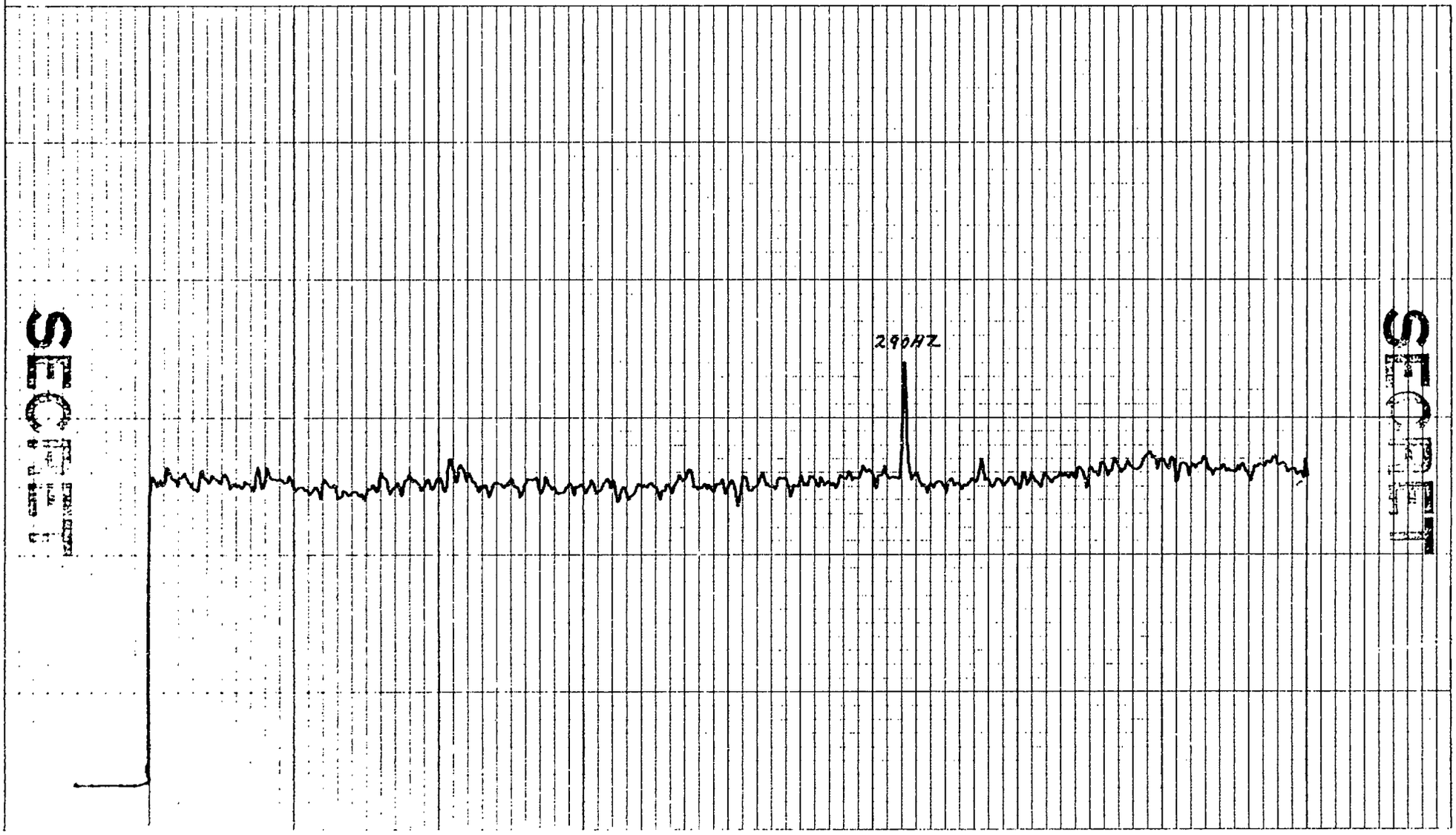
CONTROL: 346 -0633 (26)
OMNI SPECTRUM(ELEMENT 53)
EXERCISE:BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

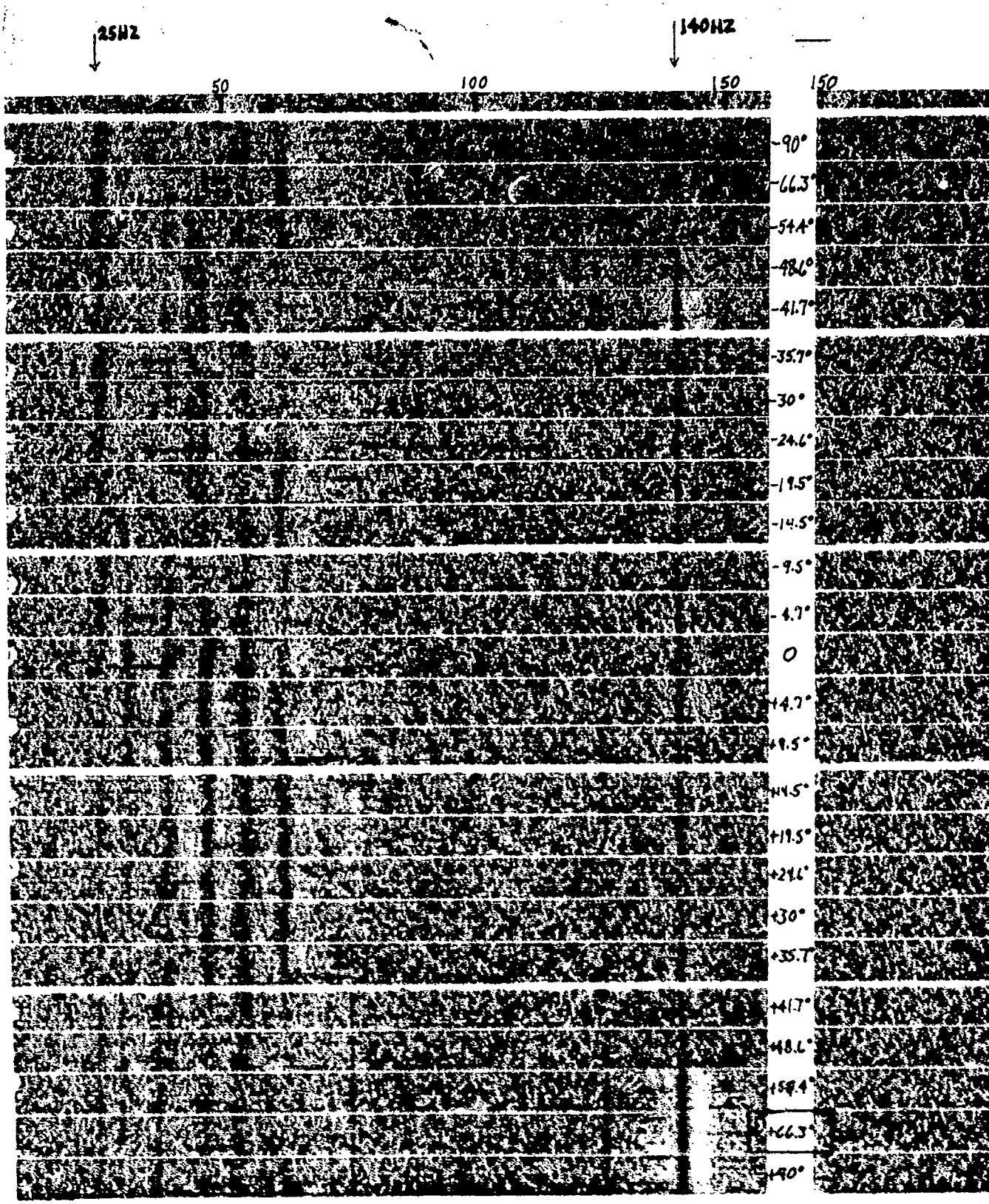
DATE OF ANALYSIS:

DATE/TIME: 3-16-77 -0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M19 INDEX 1637

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING

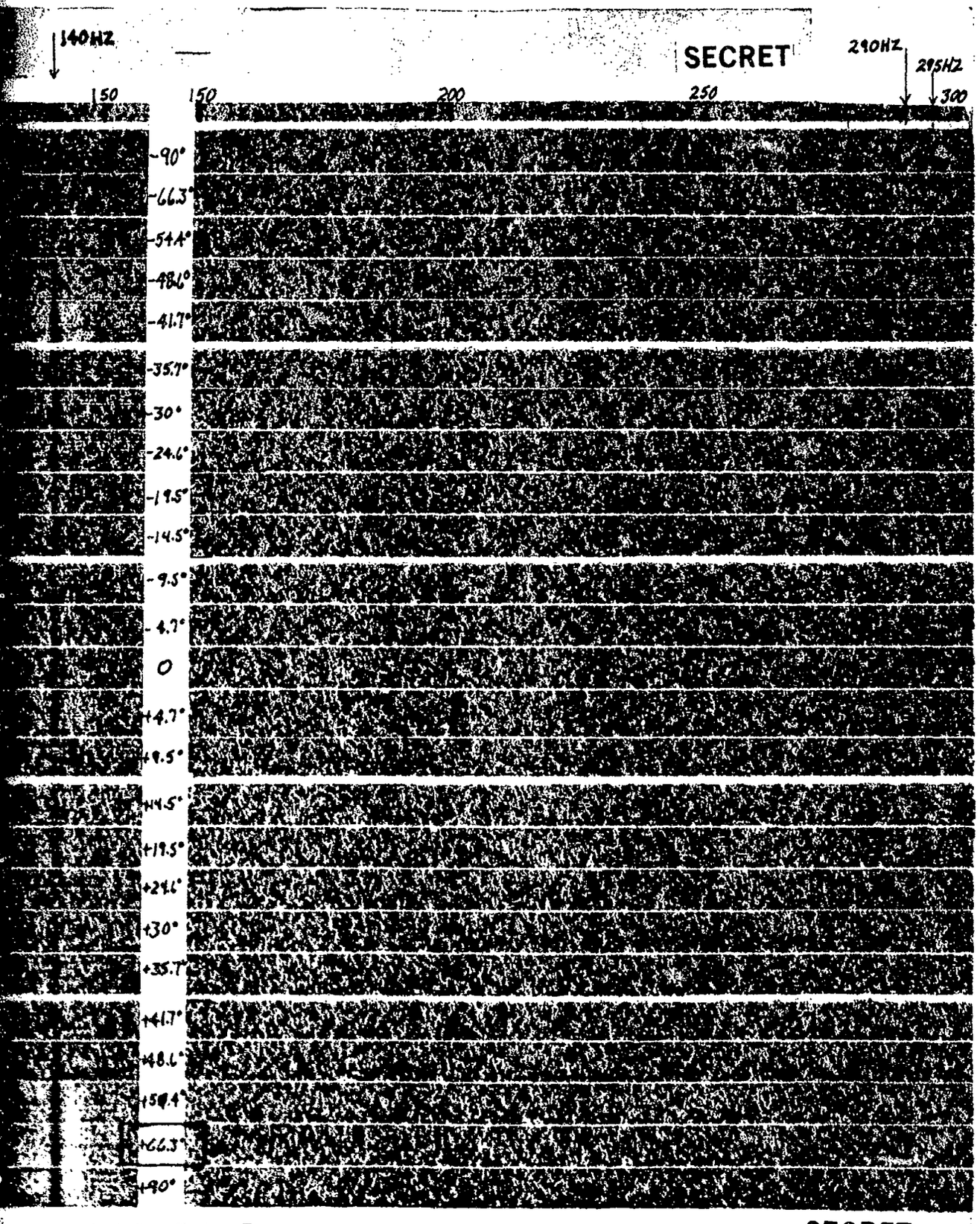




CONTROL NUMBER CC337-51-DPIC
NUMBER OF ELEMENTS 25
FREQUENCY BAND 10 TO 300 HZ
RANGE 128 N.M.

HISTOGRAM
TAPE REEL NUMBER M19

ANALYSIS BAND WIDTH .2 HZ
WATER DEPTH 2500 FMS



HISTOFRAZ
TAPE REEL NUMBER Mi9

ANALYSIS BAND WIDTH .2 HZ
WATER DEPTH 2500 FMS

TAPE COUNT 1637
ELEMENT NUMBERS 1 TO 25 SAN-XXX-78-0140
DATE 3-16-77
EXERCISE: BEARING STAKE

CONFIDENTIAL

SIGNAL LEVEL AND SNR
CALCULATIONS

DATA POINT 10 FREQUENCY 140 HZ NUMBER OF ELEMENTS 16

SIGNAL LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-16.8	
MCPS-32 CAL. CORRECTION	+10	-6.8	
BEAMFORMER GAIN	+12	+5.2	SIG. LEVEL FOR SNR CALCULATIO
MRA CORRECTION	+ .2	+5.4	SIG. LEVEL FOR SIGNAL GAIN

NOISE LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-45.6	
MCPS-32 CAL. CORRECTION	+10	-35.6	
BEAMFORMER GAIN	+12	-23.6	NOISE LEVEL FOR SNR CALCULATION

SIGNAL-NOISE-RATIO

SIGNAL LEVEL FOR SNR		+5.2	
SIGNAL LEVEL FOR SNR	-23.6	28.8	
PROCESSOR CORRECTION	- 4.0	24.8	
MRA CORRECTION	+ .2	25	SNR 1/10 HZ BAND
BANDWIDTH CONVERSION	- 8.2	16.8	SNR 1 HZ BAND

CONFIDENTIAL

SIGNAL LEVEL AND SNR CALCULATIONS

DATA POINT 10 FREQUENCY 290 HZ NUMBER OF ELEMENTS 16

SIGNAL LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-35.8	
MCPS-32 CAL. CORRECTION	+10	-25.8	
BEAMFORMER GAIN	+12	-13.8	SIG. LEVEL FOR SNR CALCULATIO
MRA CORRECTION	+ .8	-13.0	SIG. LEVEL FOR SIGNAL GAIN

NOISE LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-59.4	
MCPS-32 CAL. CORRECTION	+10	-49.4	
BEAMFORMER GAIN	+12	-37.4	NOISE LEVEL FOR SNR CALCULATION

SIGNAL-NOISE-RATIO

SIGNAL LEVEL FOR SNR		-13.8	
SIGNAL LEVEL FOR SNR	-37.4	23.6	
PROCESSOR CORRECTION	- 4.0	19.6	
MRA CORRECTION	+ .8	20.4	SNR 1/10 HZ BAND
BANDWIDTH CONVERSION	-8.2	12.2	SNR 1 HZ BAND

CONFIDENTIAL

DATA POINT 10

SIGNAL GAIN

	140 HZ	290HZ	295HZ
MEAN OMNI SIGNAL LEVEL	23.3	38.0	
MRA SIGNAL LEVEL	+ 5.4	-13.0	
ARRAY SIGNAL GAIN	28.7	25.0	
20 LOG 16 (# of elements)	24	24	
DIFFERENCE	+ 4.7	+1.0	

ARRAY GAIN

MRA SNR	25.0	20.4	
MEAN OMNI SNR	18.7	9.4	
ARRAY GAIN	6.3	11.0	
THEORETICAL AZMUTH GAIN (at MRA)	7.7	10.1	
DIFFERENCE	- 1.4	+ .9	

CONFIDENTIAL

K•Σ 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

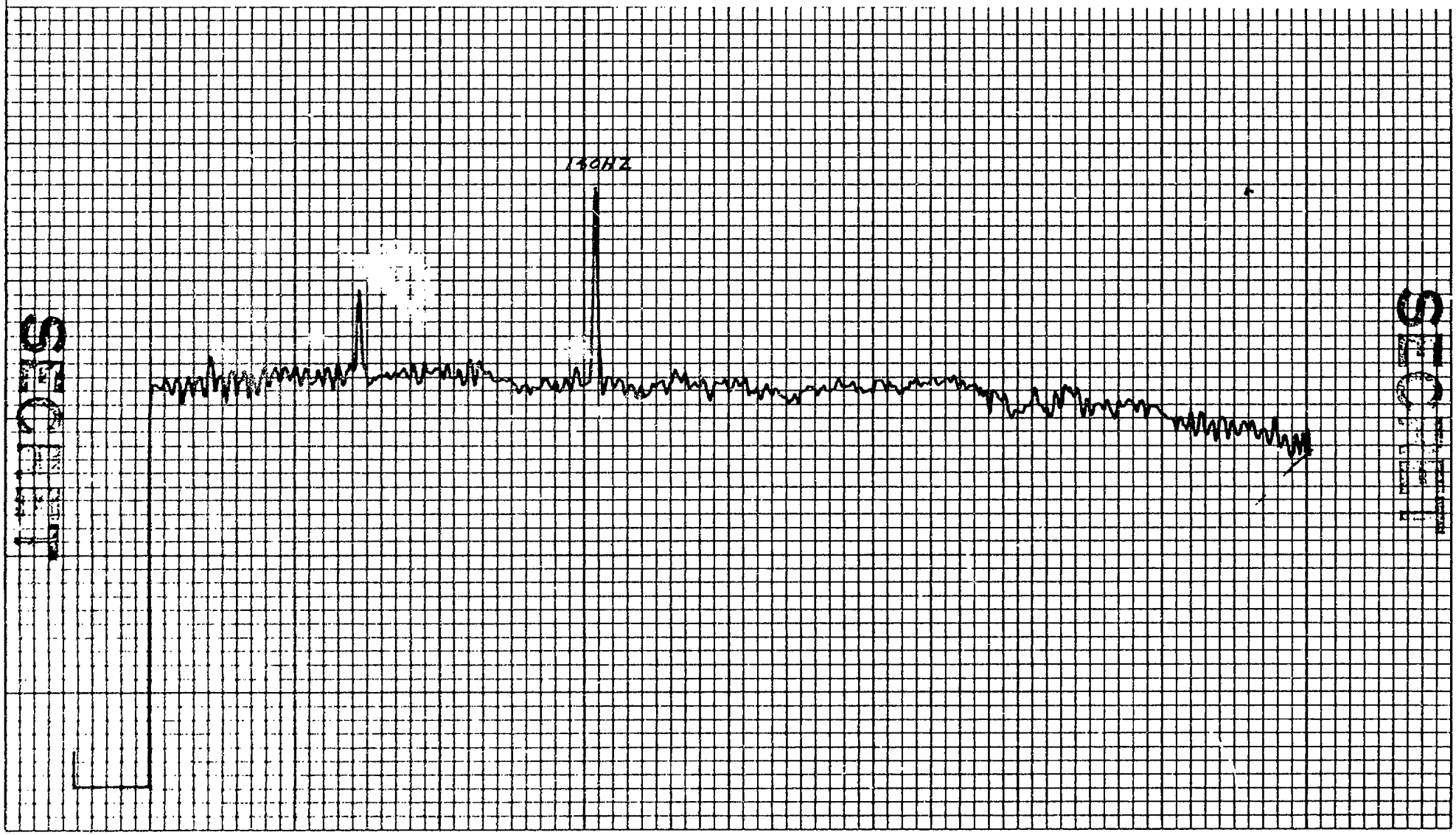
46 0703

CONTROL: 0633 - 16 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 8-17)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: _ _ _
DATE/TIME: 3-16-77 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+50 DEG. AZ STEERING

REEL: 819 INDEX 1637

INTEGRATION TIME 320 SECS ATTEN: -12 DB
FILTER WTG: HANNING



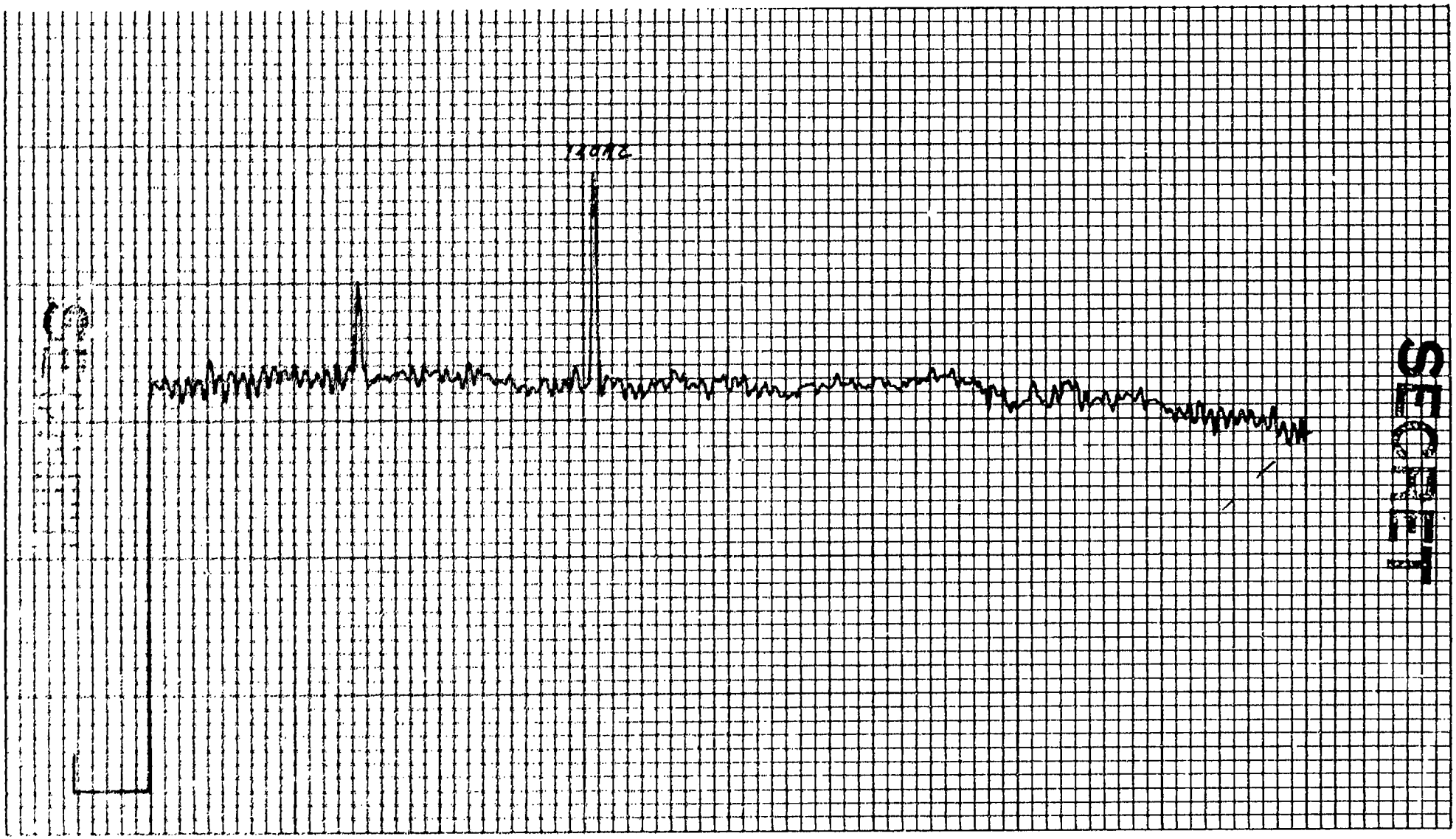
K•E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 0633 - 16 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
(1-6 & 9-17)
DATE/TIME: 3-16-77 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+52 DEG. AZ STEERING

REEL: M19 INDEX 1637

INTEGRATION TIME 320 SECS ATTEN: -12 DB
FILTER WTG: HANNING



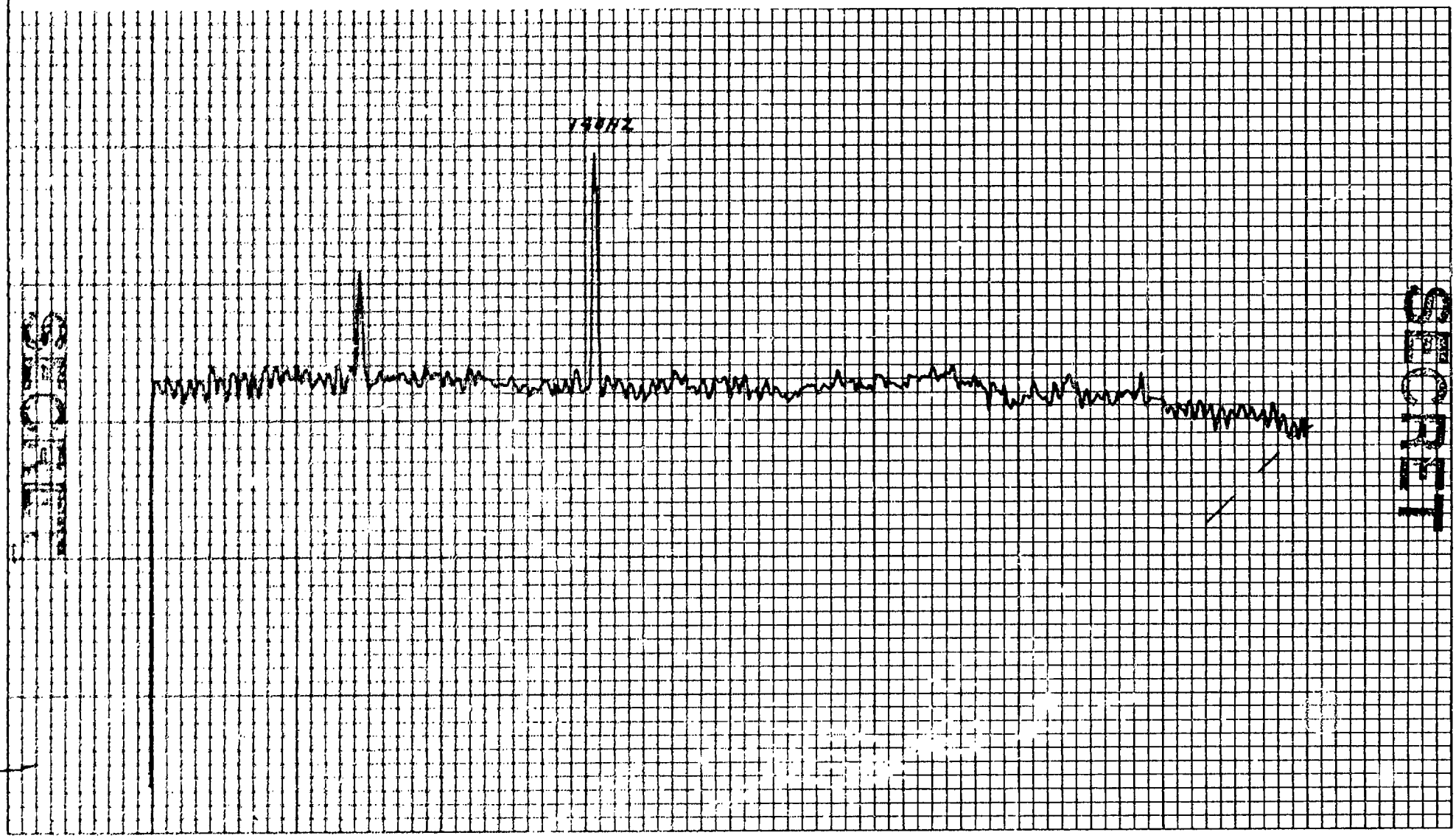
K•E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 0633 - 16 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 9-17)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 -0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
454 DEG. AZ STEERING

REEL: 419 INDEX 0633

INTEGRATION TIME 320 SECS ATTEN: -12 DB
FILTER WTG: HANNING



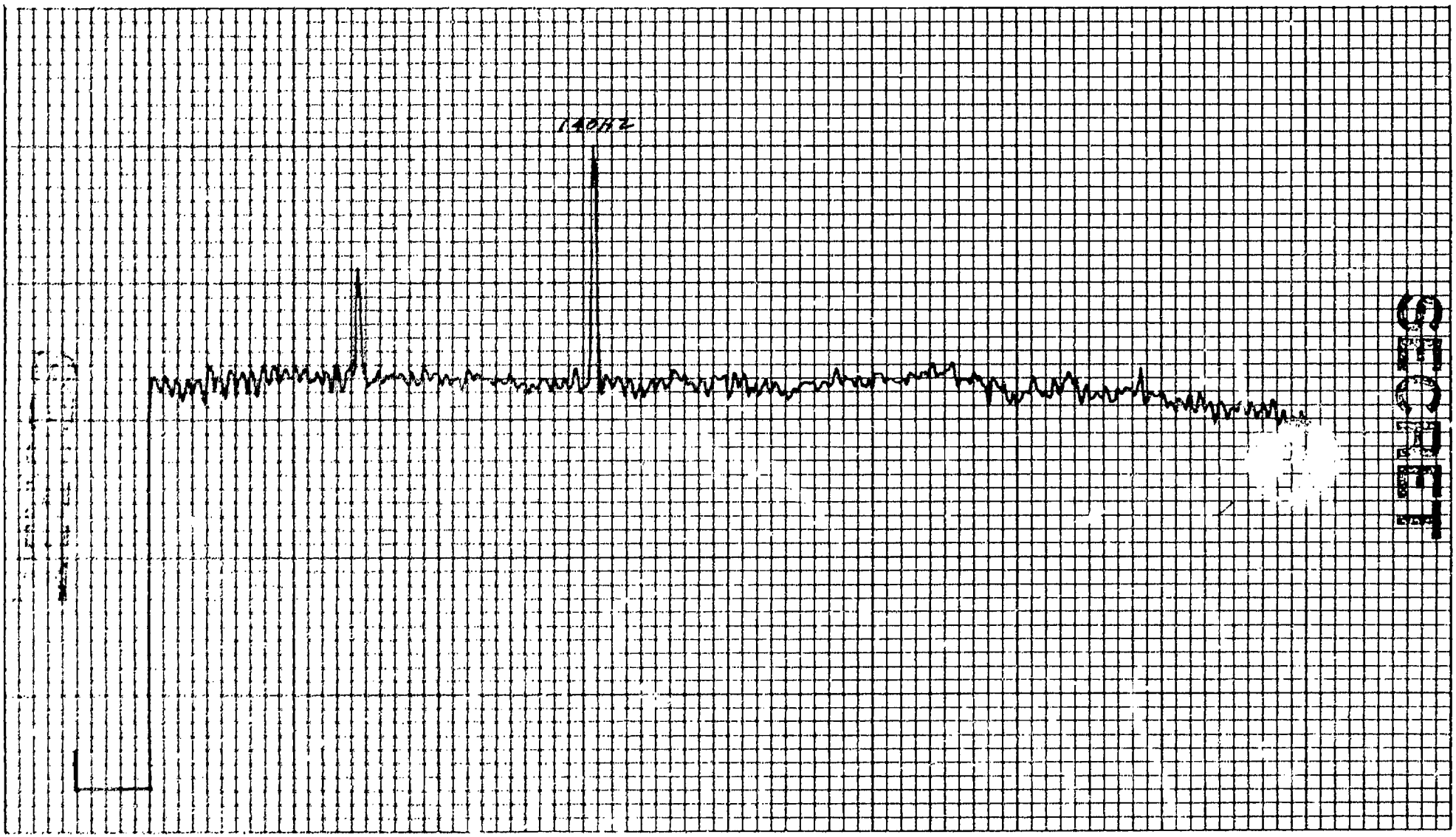
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 0633 - 16 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
1-6 & 8-17
DATE/TIME: 3-16-77 - 0633Z
ANALYSIS BANDWIDTH: 1/10HZ
+56 DEG. AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: -12 DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

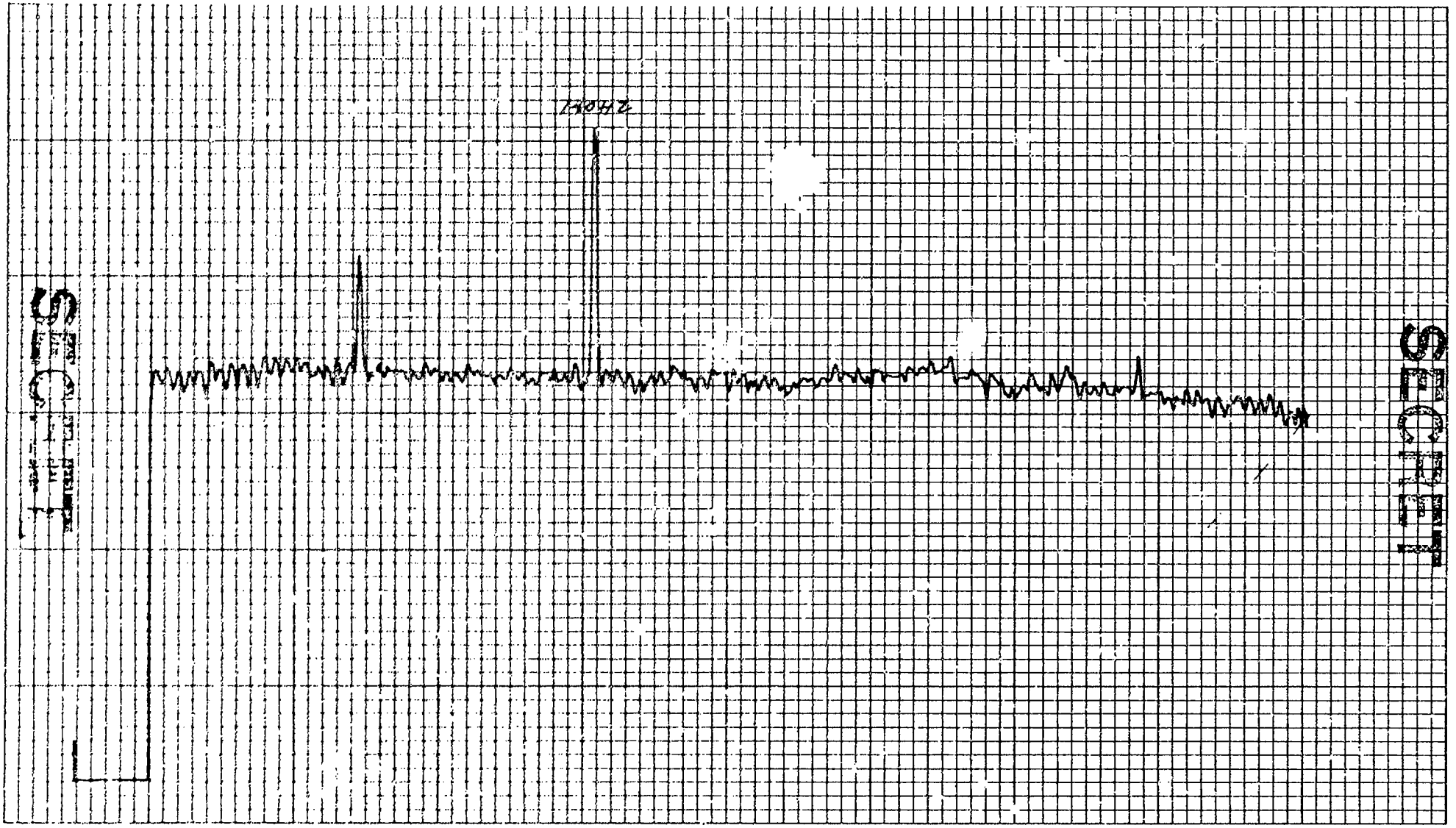
46 0703

CONTROL: 0633 - 16 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
1-6 4 8-17)
DATE/TIME: 3-16-77 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+58 DEG. AZ STEERING

REEL: 419 INDEX 1637

INTEGRATION TIME 320 SECS ATTEN: -12 DB
FILTER WIG: HANNING



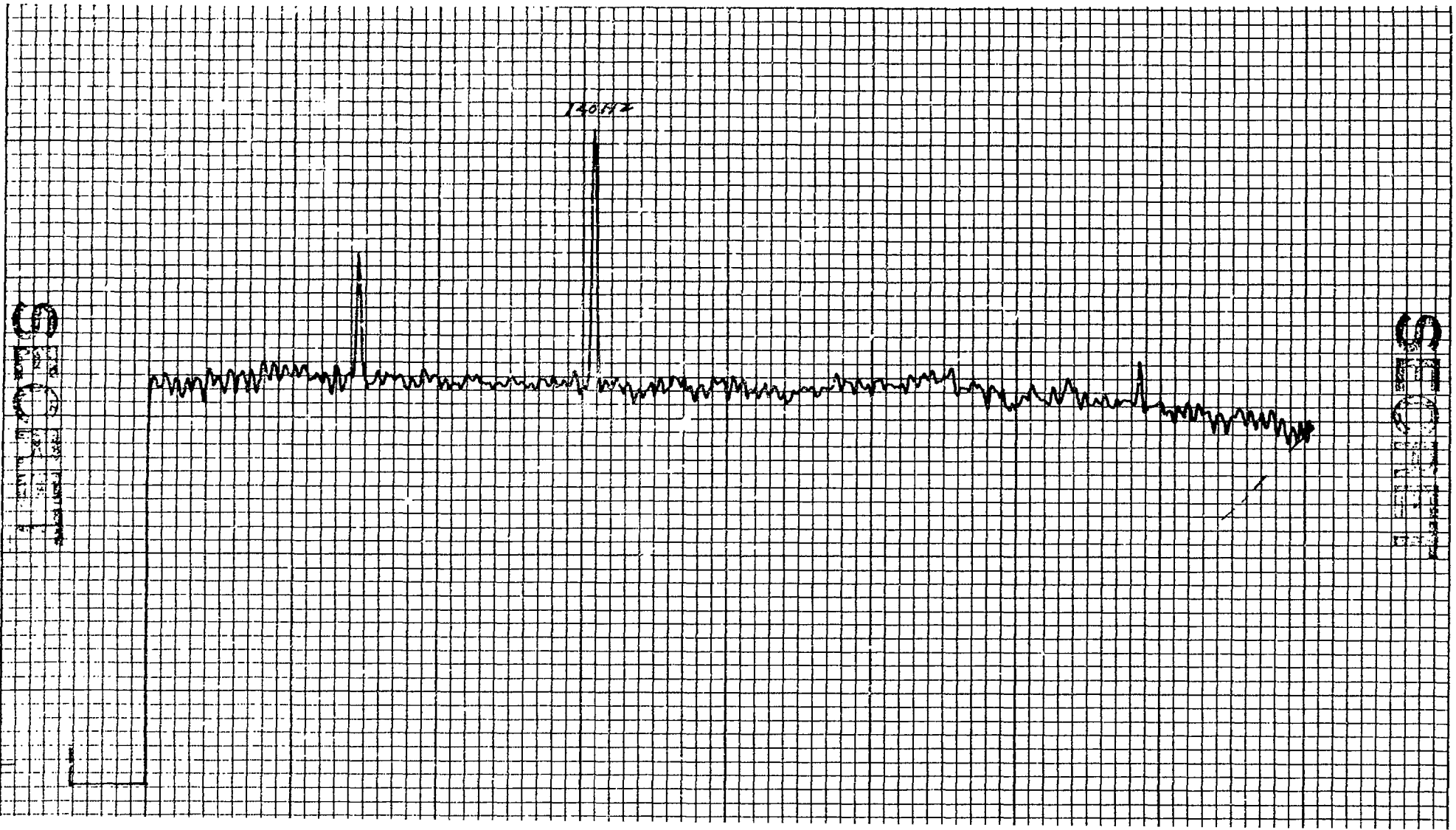
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

CONTROL: 0633 - 16 (EXP10)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 8-17)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+60 DEG. AZ STEERING

REEL: N19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: -12 DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 0633 - 16 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 9-17)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 7.16-77 - 0633Z
ANALYSIS BANDWIDTH: 1/10HZ
+62 DEG. AZ STEERING

REEL: M19 INDEX 1637

INTEGRATION TIME 320 SECS ATTEN: -12 DB
FILTER WTG: HANNING

K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

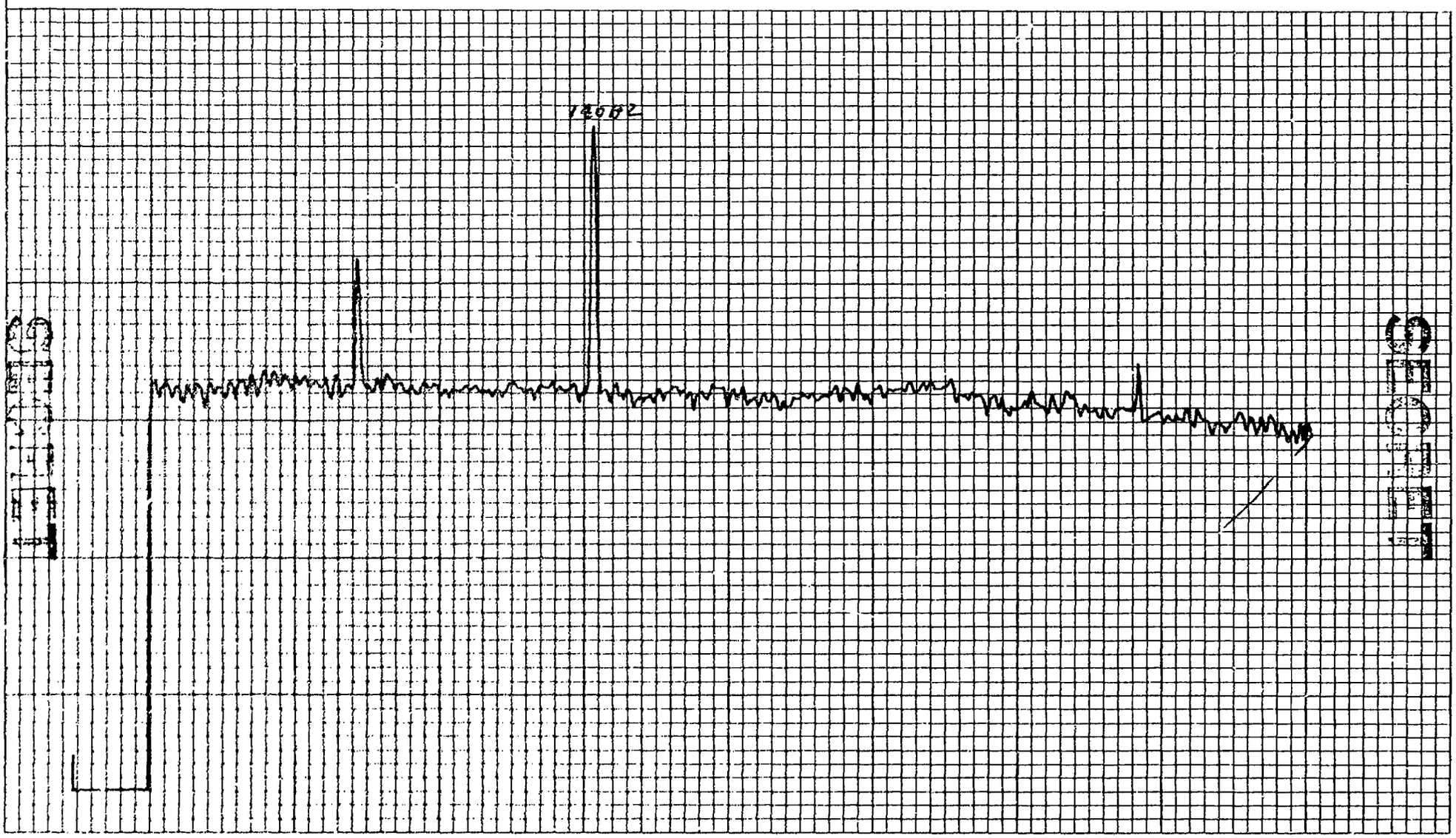
46 0703

CONTROL: 0633 - 16 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
1-6 & 8-17
DATE/TIME: 3-16-77 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+63 DEG. AZ STEERING

REEL: M19 INDEX 1637

INTEGRATION TIME 320 SECS ATTEN: 12 DB
FILTER WTG: HANNING



K•E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

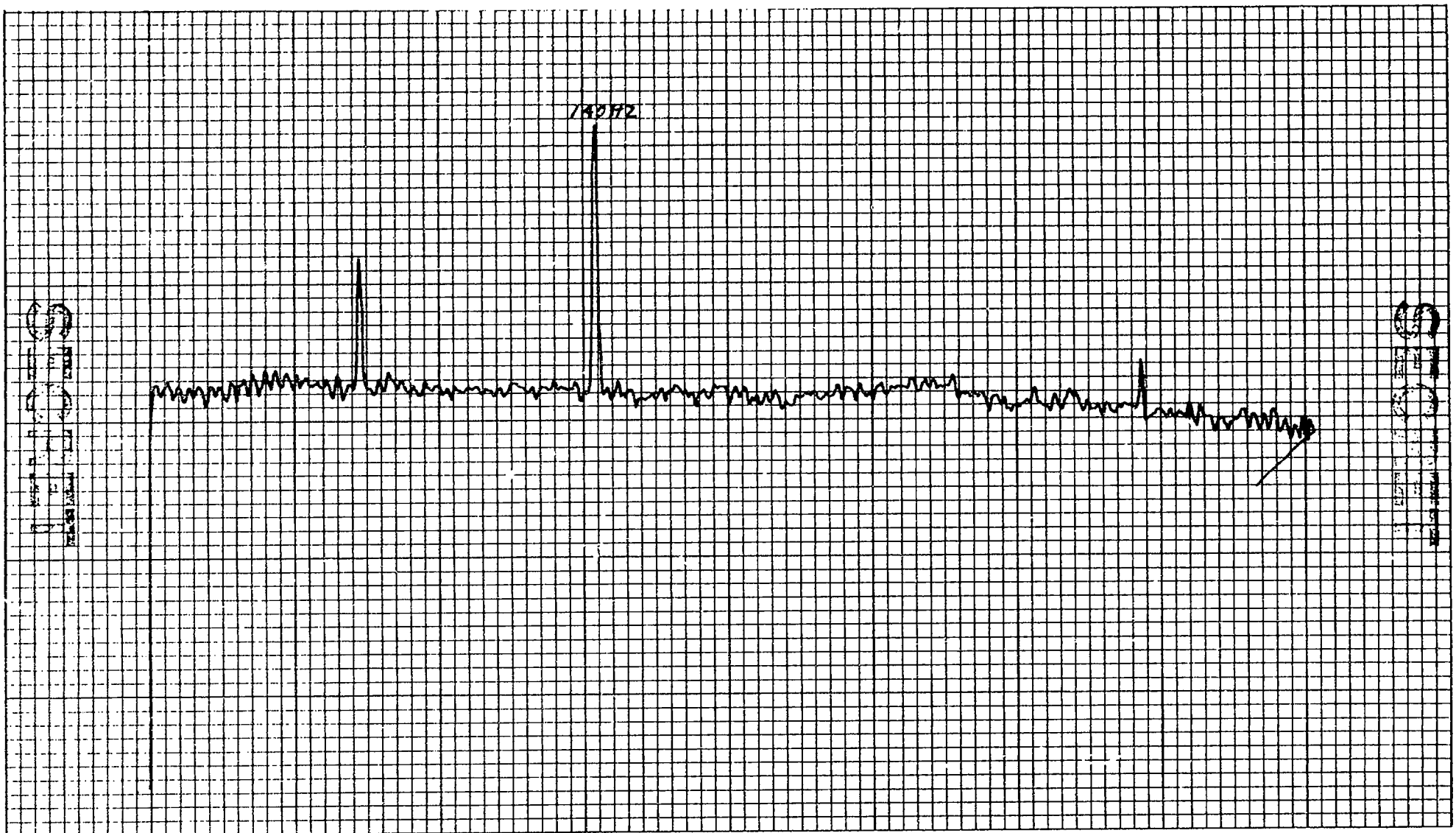
46 0703

CONTROL: Ω33 - 16 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 9-17)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - Ω33 Z
ANALYSIS BANDWIDTH: 1/10HZ
+63.5 DEG. AZ STEERING

REEL: M19
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 1637
ATTEN: +2 DB



K•E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

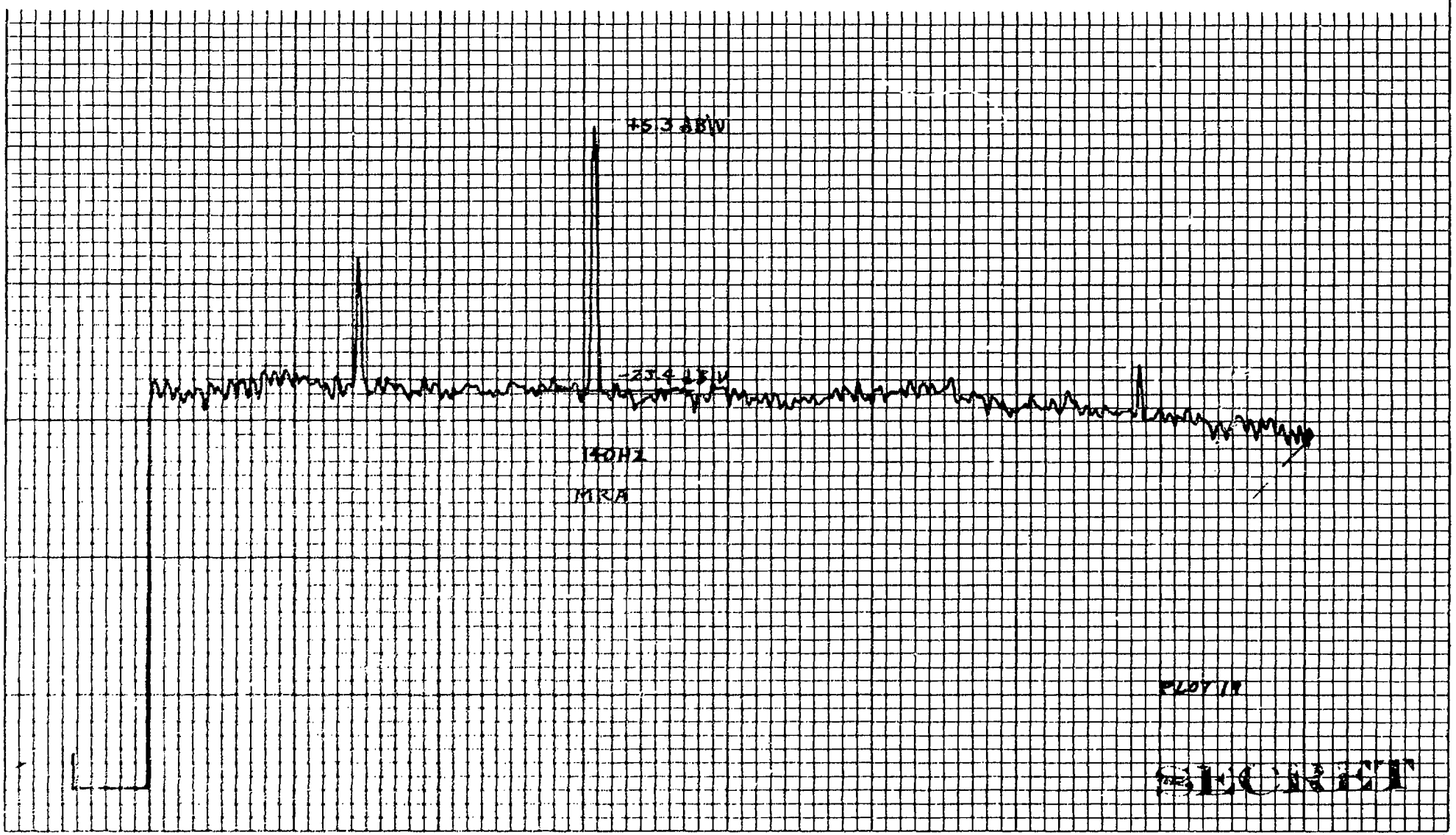
46 0703

SECRET

CONTROL: 0633 - 49 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS 1 TO 6 & 9 TO 17)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: __ ___ __
DATE/TIME: 3-16-77 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+64.0 DEG. AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: - DB
FILTER WTG: HANNING



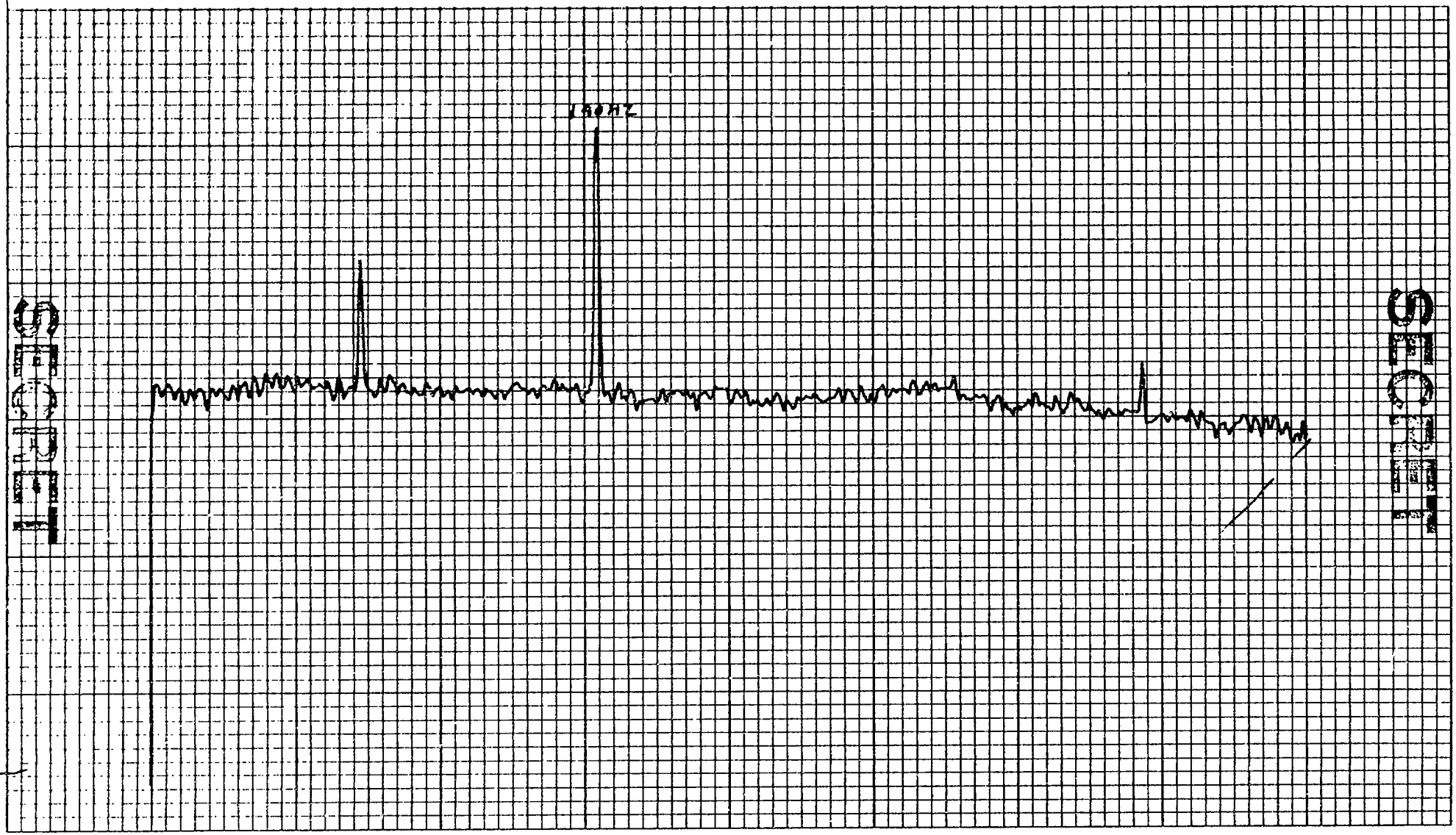
K•E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 0633 - 16 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 9-17)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+14.5 DEG. AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: -12 DB
FILTER WTG: HANNING



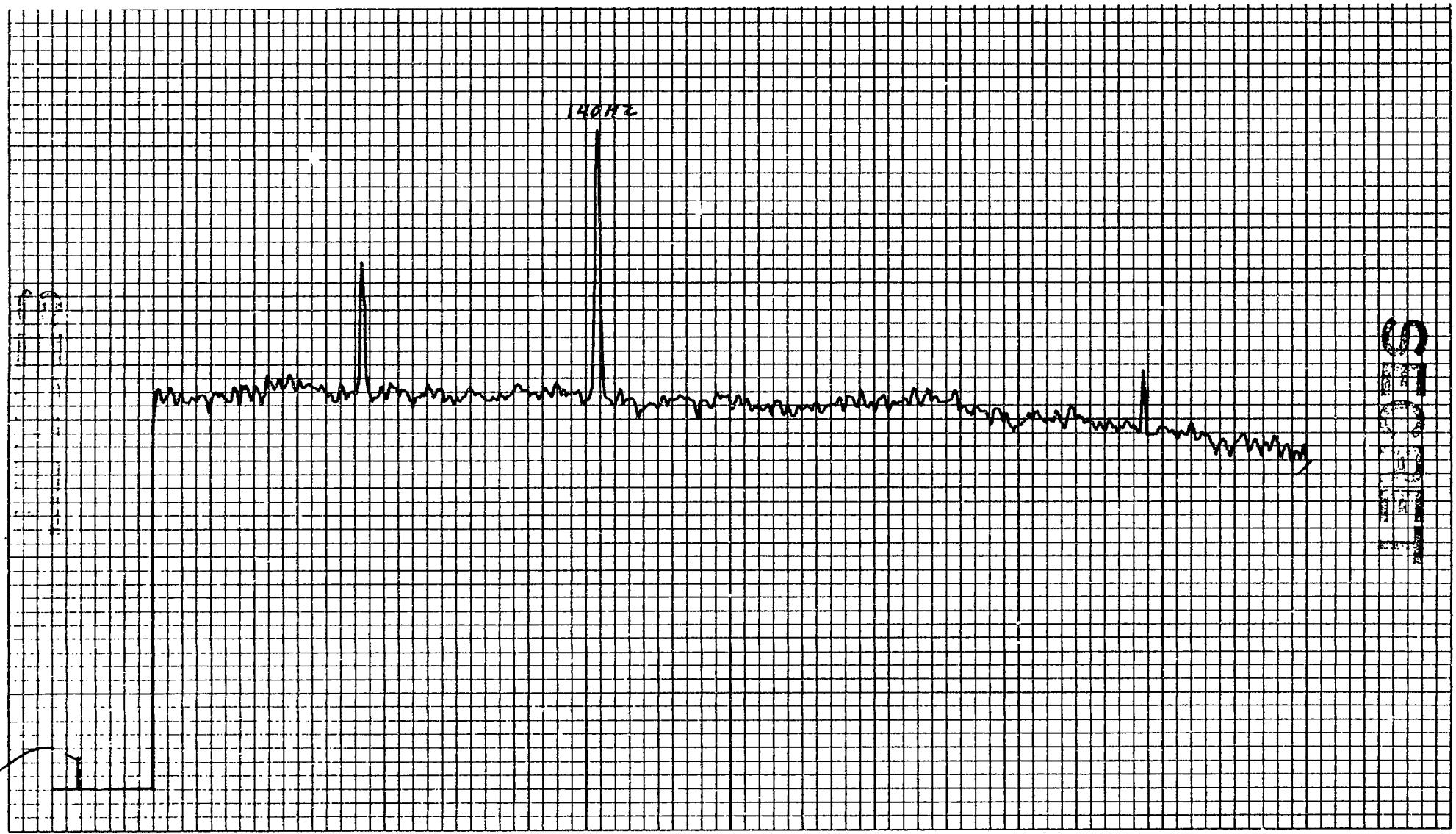
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 0633 - 16 (BP10)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
1-6 & 8-17)
DATE/TIME: 3-16-77 -0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+66 DEG. AZ STEERING

REEL: 419 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: -12 DB
FILTER WTG: HANNING



K•E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 0633 - 16 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
1-6 & 9-17
DATE/TIME: 3-16-77 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+60 DEG. AZ STEERING

REEL: 419 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: -12 DB
FILTER WTG: HANNING

K+E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

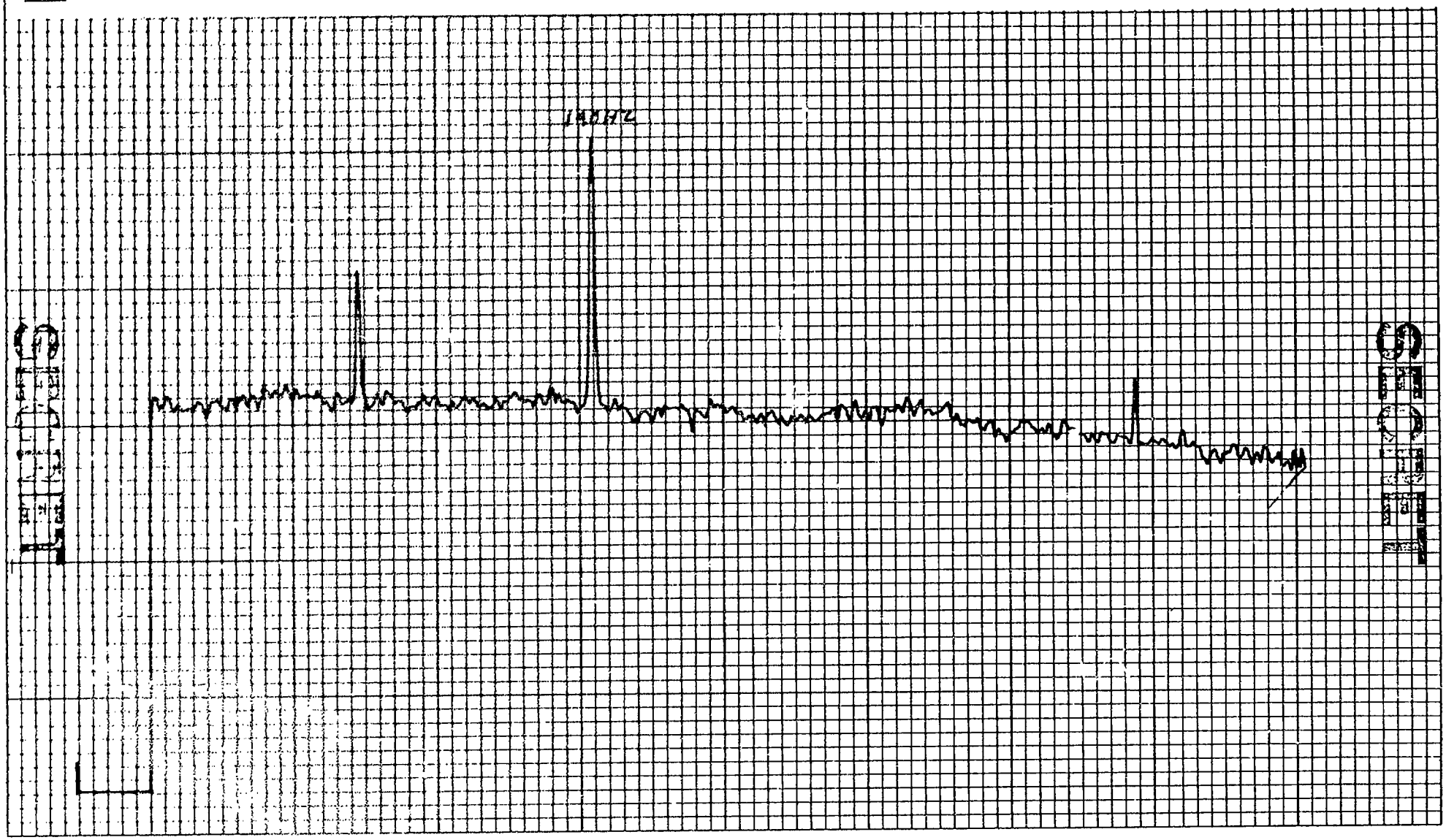
46 0703

CONTROL: 0673 - 16 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
1-6 & 9-17
DATE/TIME: 3-16-77-0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+70 DEG. AZ STEERING

REEL: M19 INDEX 1637

INTEGRATION TIME 320 SECS ATTEN: 12 DB
FILTER WTG: HANNING



K•E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

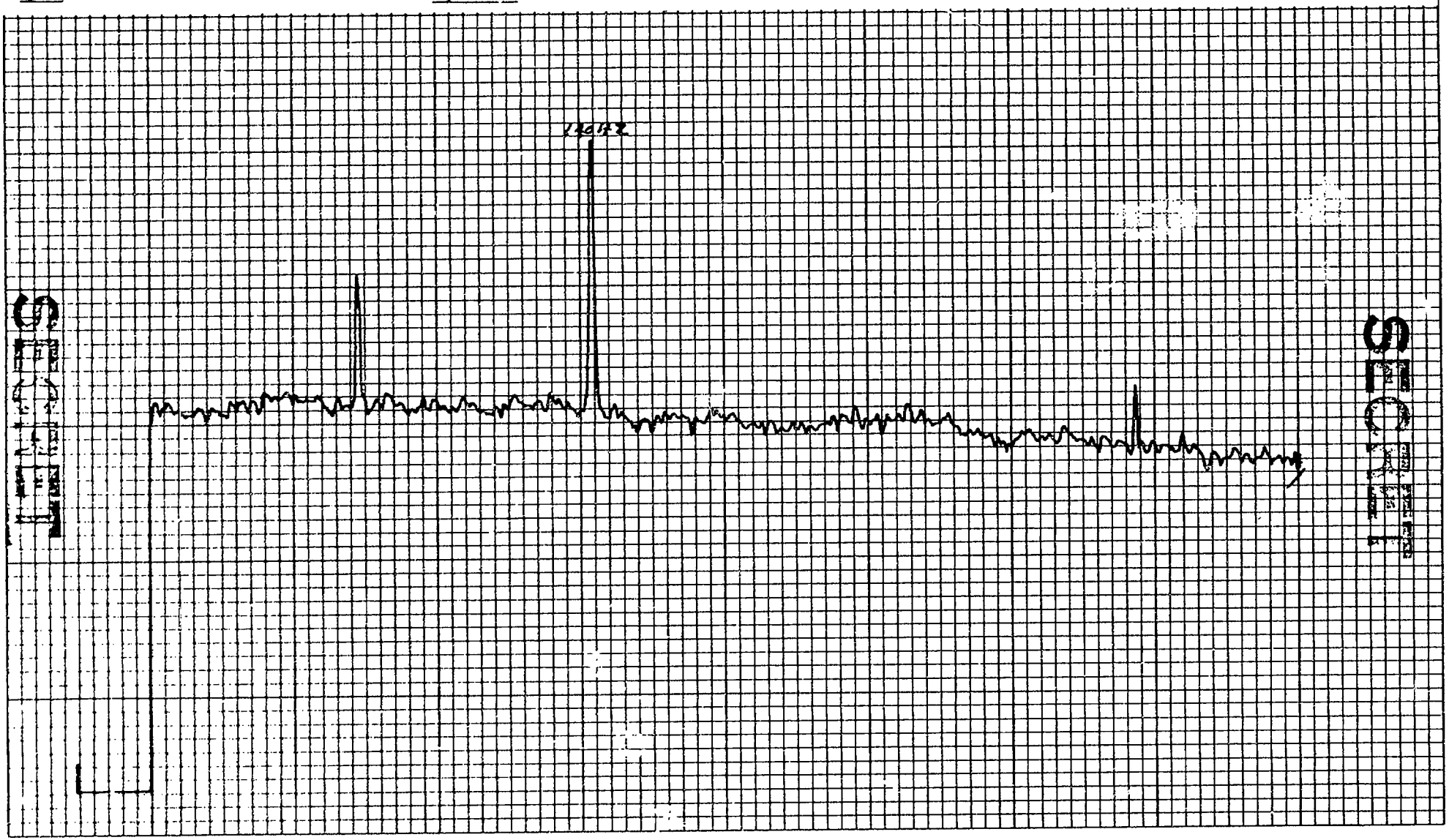
46 0703

CONTROL: 0633 - 16 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 9-17)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 -0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+72 DEG. AZ STEERING

REEL: M19 INDEX 1637

INTEGRATION TIME 320 SECS ATTEN: -12 DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 0633 - 16 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 9-17)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+74 DEG. AZ STEERING

REEL: K19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: -12 DB
FILTER WTG: HANNING

K+E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

CONTROL: 8633 - 16 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: _ _ _
1-6 9-17)
DATE/TIME: 3-16-77 -0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+76 DEG. AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: -12 DB
FILTER WTG: HANNING

K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 0633 - 16 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 9-17)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 7-6-77 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+78 DEG. AZ STEERING

REEL: M19
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 1637
ATTEN: -12 DB

K•E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

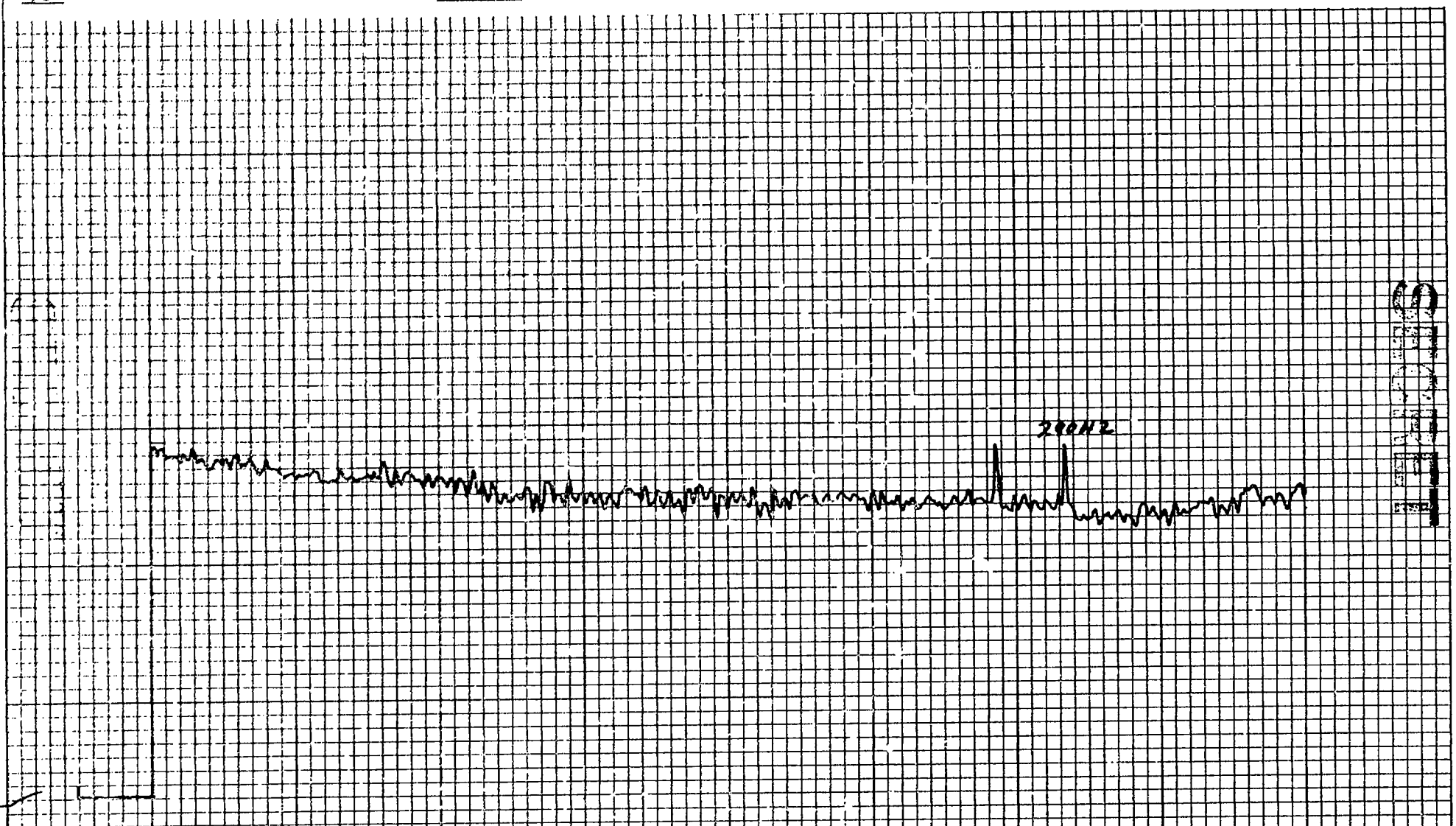
46 0703

CONTROL: 0633 - 16 (0810)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: 1-6 9-17
DATE/TIME: 3-16-77 - 0533Z
ANALYSIS BANDWIDTH: 1/10HZ
+50 DEG. AZ STEERING

REEL: M19 INDEX 1637

INTEGRATION TIME 320 SECS ATTEN: -12 DB
FILTER WTG: HANNING



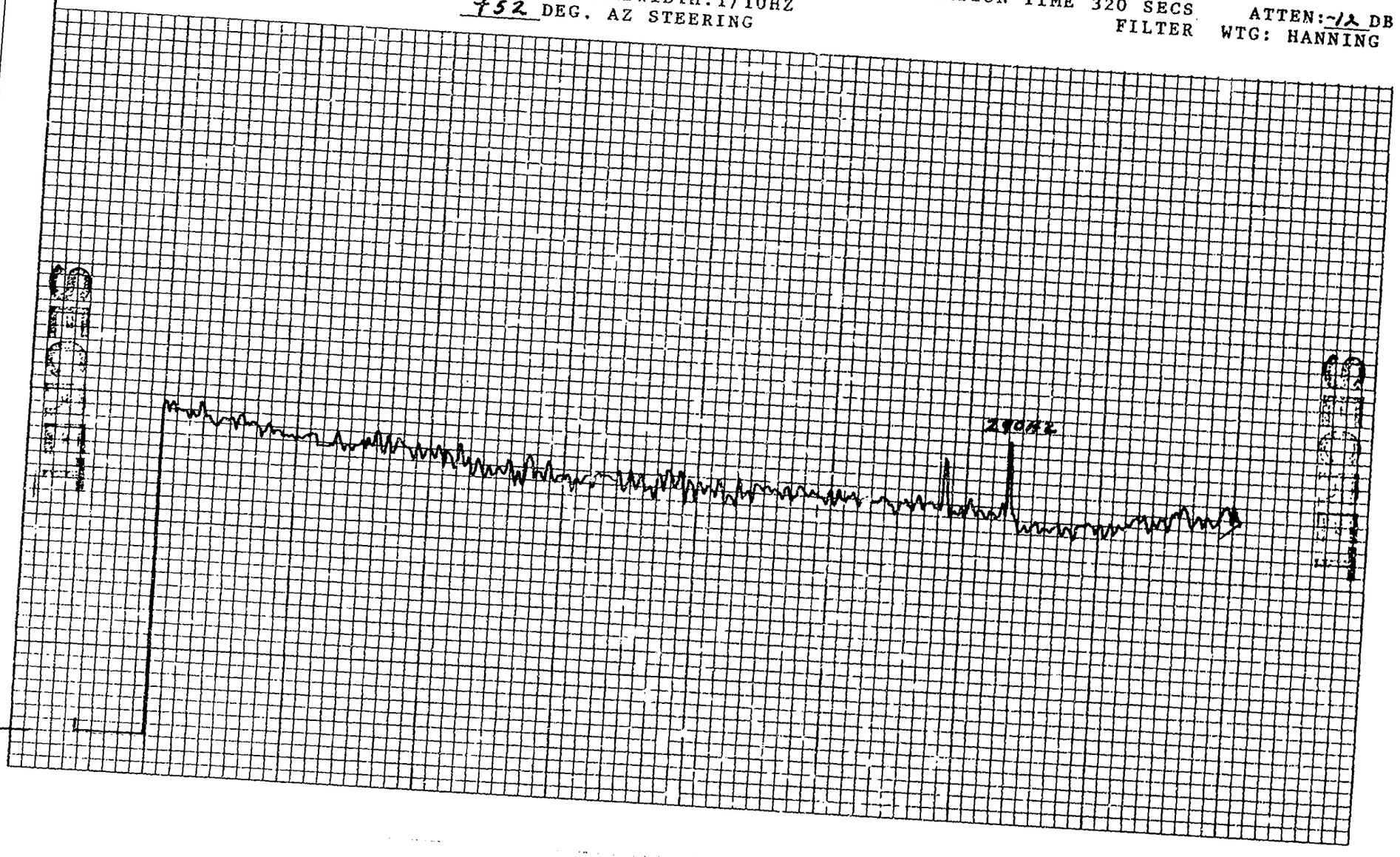
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 0633 - 16 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: 1-6 & 9-17
DATE/TIME: 3-16-77 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
152 DEG. AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: -12 DB
FILTER WTG: HANNING



K•E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

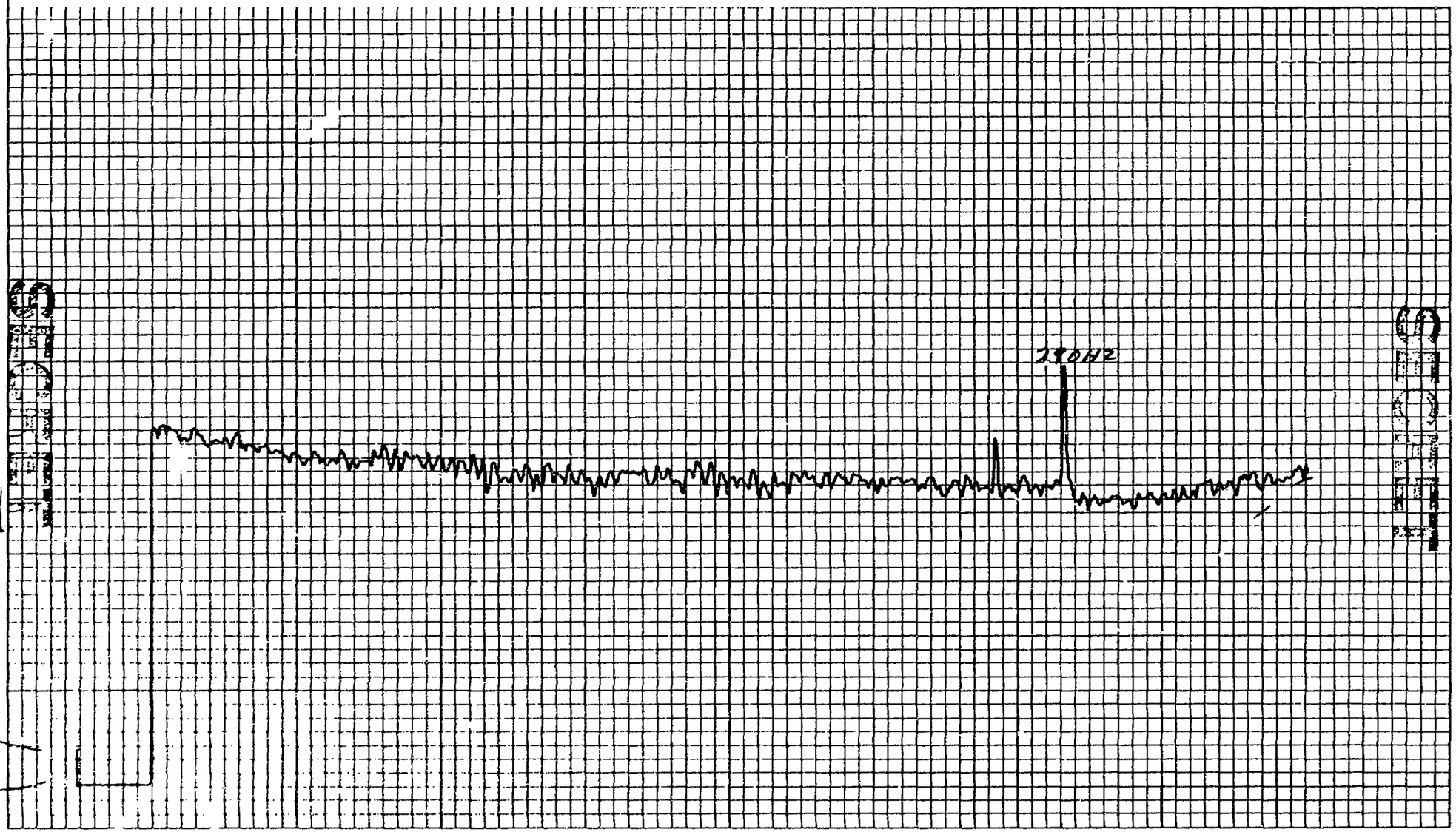
46 0703

CONTROL: 0633 - 16 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
1-6 & 9-17)
DATE/TIME: 3-16-77 -0833 Z
ANALYSIS BANDWIDTH: 1/10HZ
+54 DEG. AZ STEERING

REEL: M19 INDEX 1637

INTEGRATION TIME 320 SECS ATTEN: -12 DB
FILTER WTG: HANNING



K·E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

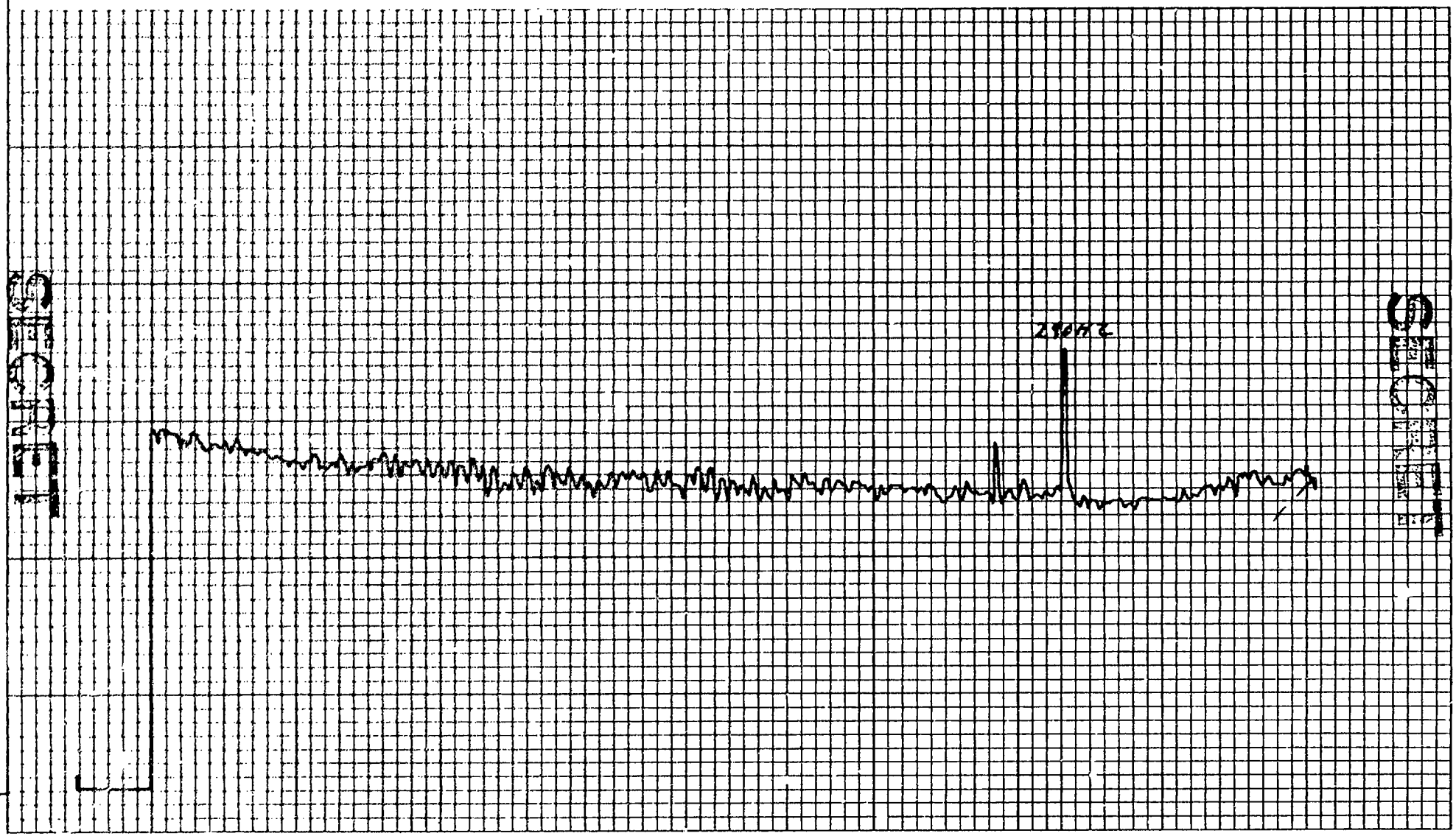
CONTROL: 0633 - 16 (DP10) DATE OF ANALYSIS: - - - REEL: M19 INDEX 1637

BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 8-17)

EXERCISE: BEARING STAKE DATE/TIME: 3-15-77 -0633 Z INTEGRATION TIME 320 SECS ATTEN: -12 DB

CENTER FREQ: 270 HZ ANALYSIS BANDWIDTH: 1/10HZ FILTER WTG: HANNING

16 ELEMENTS +56 DEG. AZ STEERING



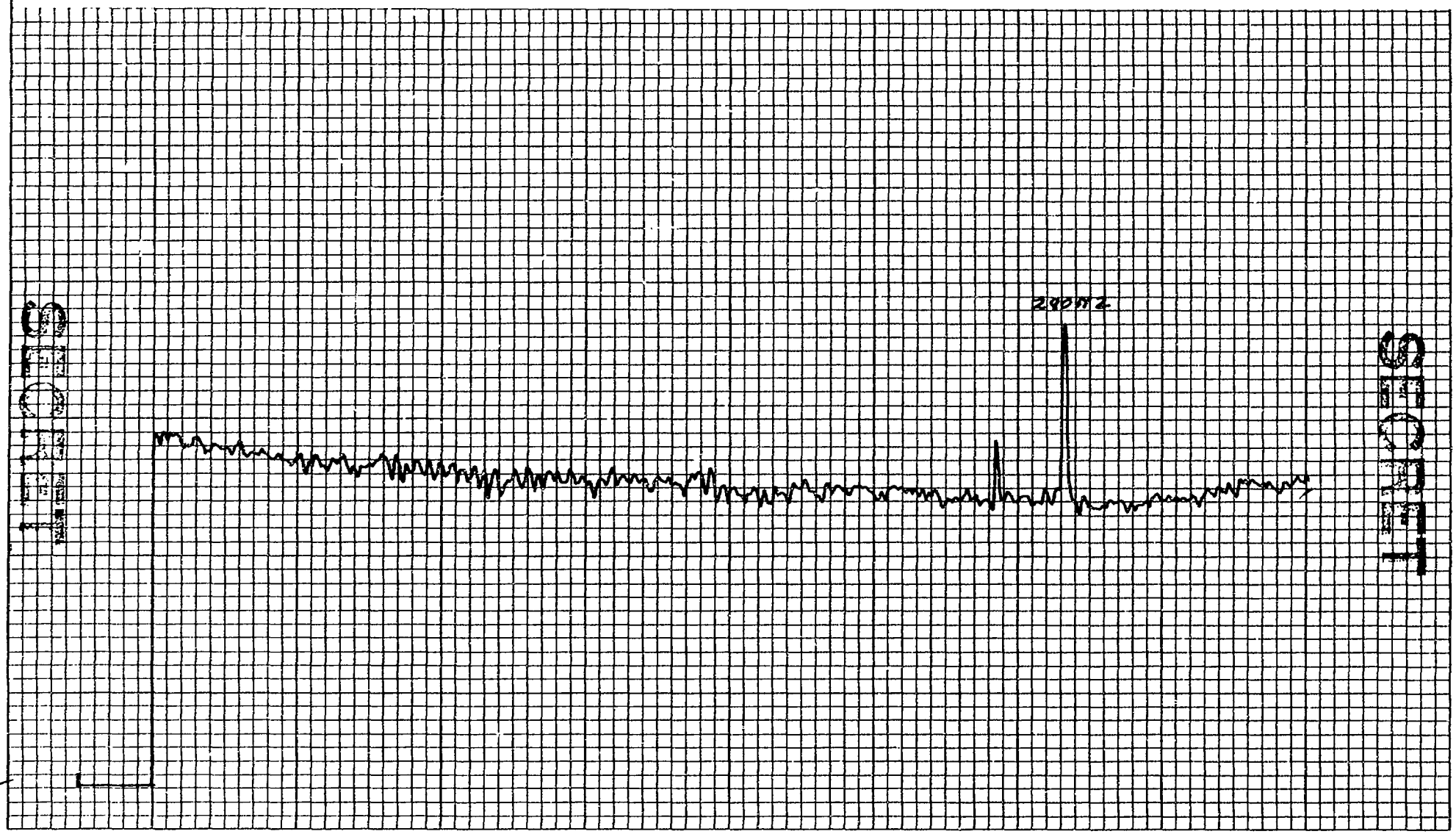
K•E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 0633 - 16 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: 1-6 & 9-17
DATE/TIME: 3-16-77 -0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
±50 DEG. AZ STEERING

REEL: M19 INDEX 1637

INTEGRATION TIME 320 SECS ATTEN: -12 DB
FILTER WTG: HANNING



K+E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 0633 - 16 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: 1-6 & 9-17
DATE/TIME: 3-16-77 -0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+60 DEG. AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: -12 DB
FILTER WTG: HANNING

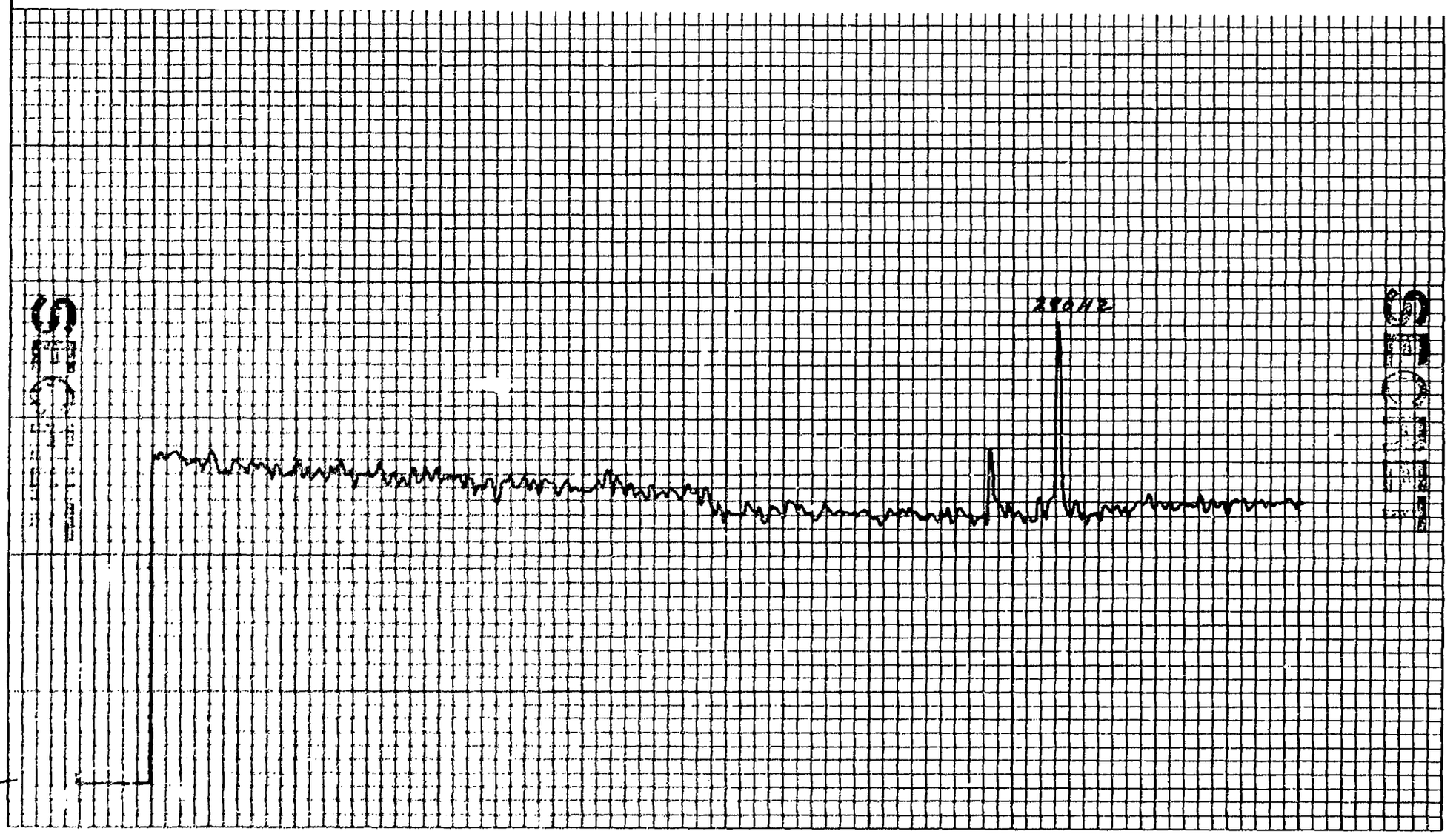
K·E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 0633 - 16 (P10)
BEAMFORMED SPECTRUM (ELEMENTS 1-16 9-17)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+62 DEG. AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: -72 DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE CM • 7 X 10 INCHES

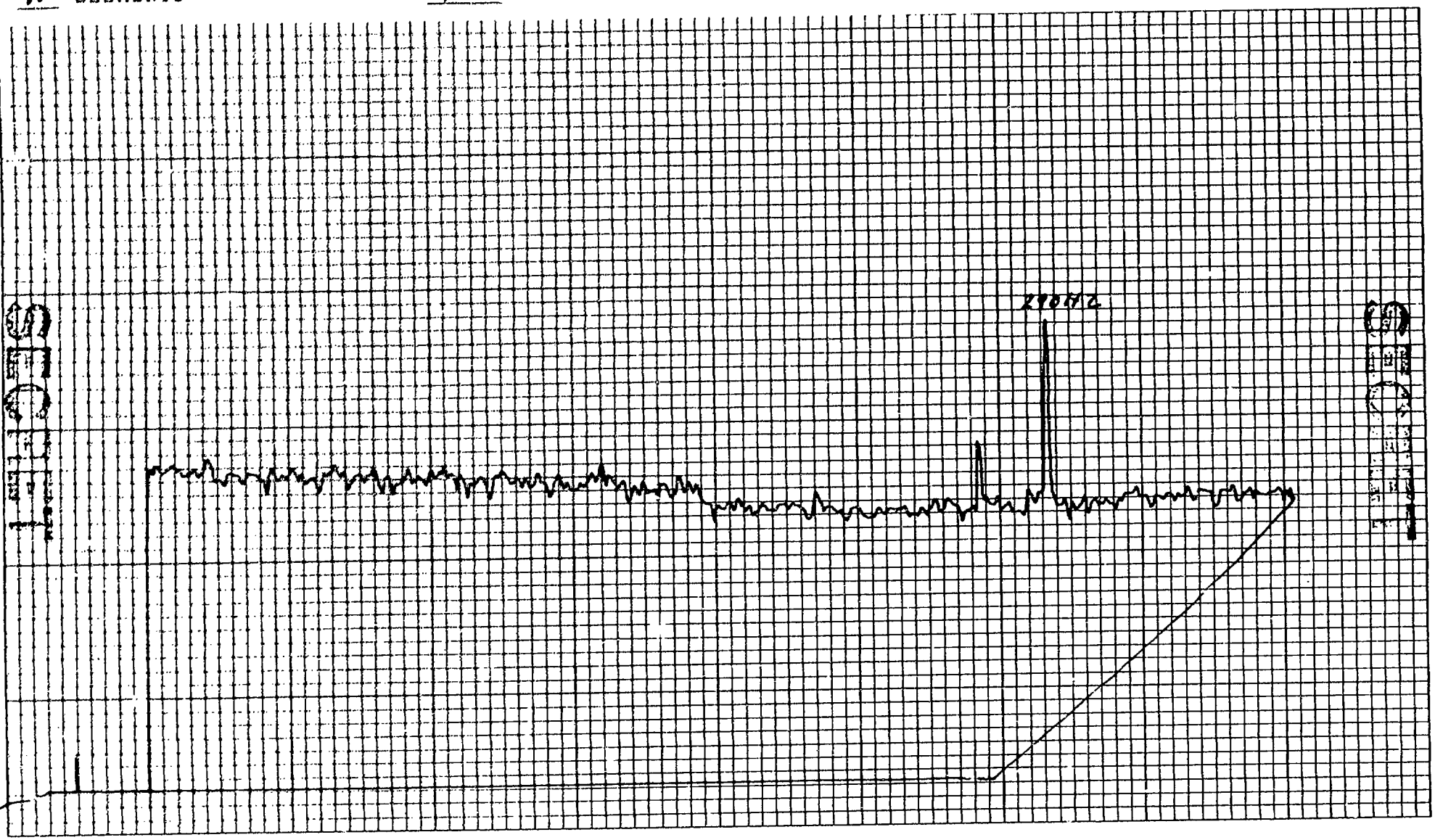
46 0703

CONTROL: 0633 - 16 (DP10)
BEAMFORMED SPECTRUM (ELEMENTS 16)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: 1-6 9-17
DATE/TIME: 3-16-77 -0633Z
ANALYSIS BANDWIDTH: 1/10HZ
+63 DEG. AZ STEERING

REEL: M19 INDEX 1637

INTEGRATION TIME 320 SECS ATTEN: -12 DB
FILTER WTG: HANNING



K•E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 0633 - 16 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
1-6 & 9-17)
DATE/TIME: 3-16-77 -0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+63.5 DEG. AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: -12 DB
FILTER WTG: HANNING

K•E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

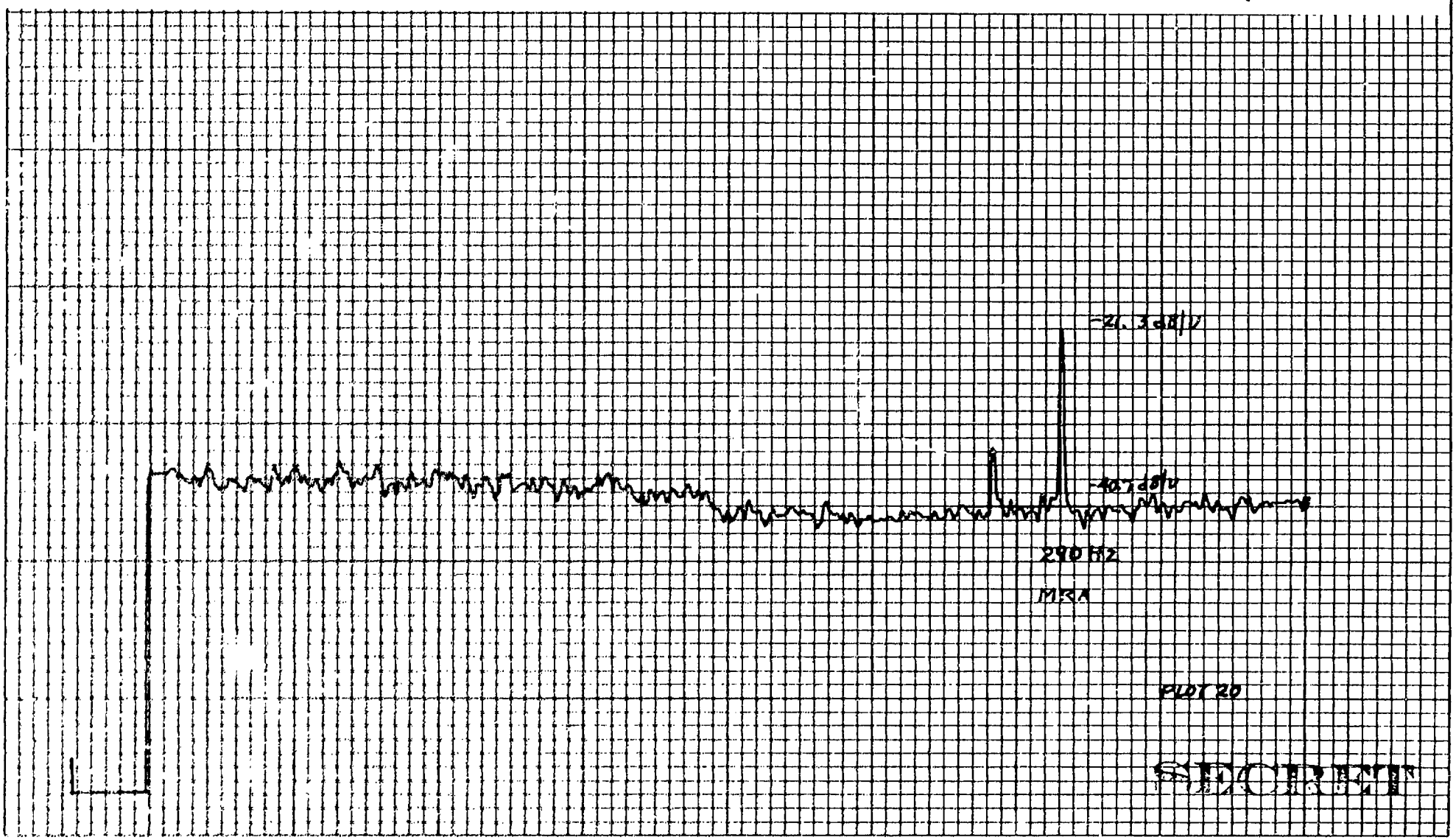
46 0703

SECRET

CONTROL: 0633 - 49 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS 1706 + 9-017)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: __ ___ __
DATE/TIME: 3-16-77 -0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+64.0 DEG. AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: - DB
FILTER WTG: HANNING



K·E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO

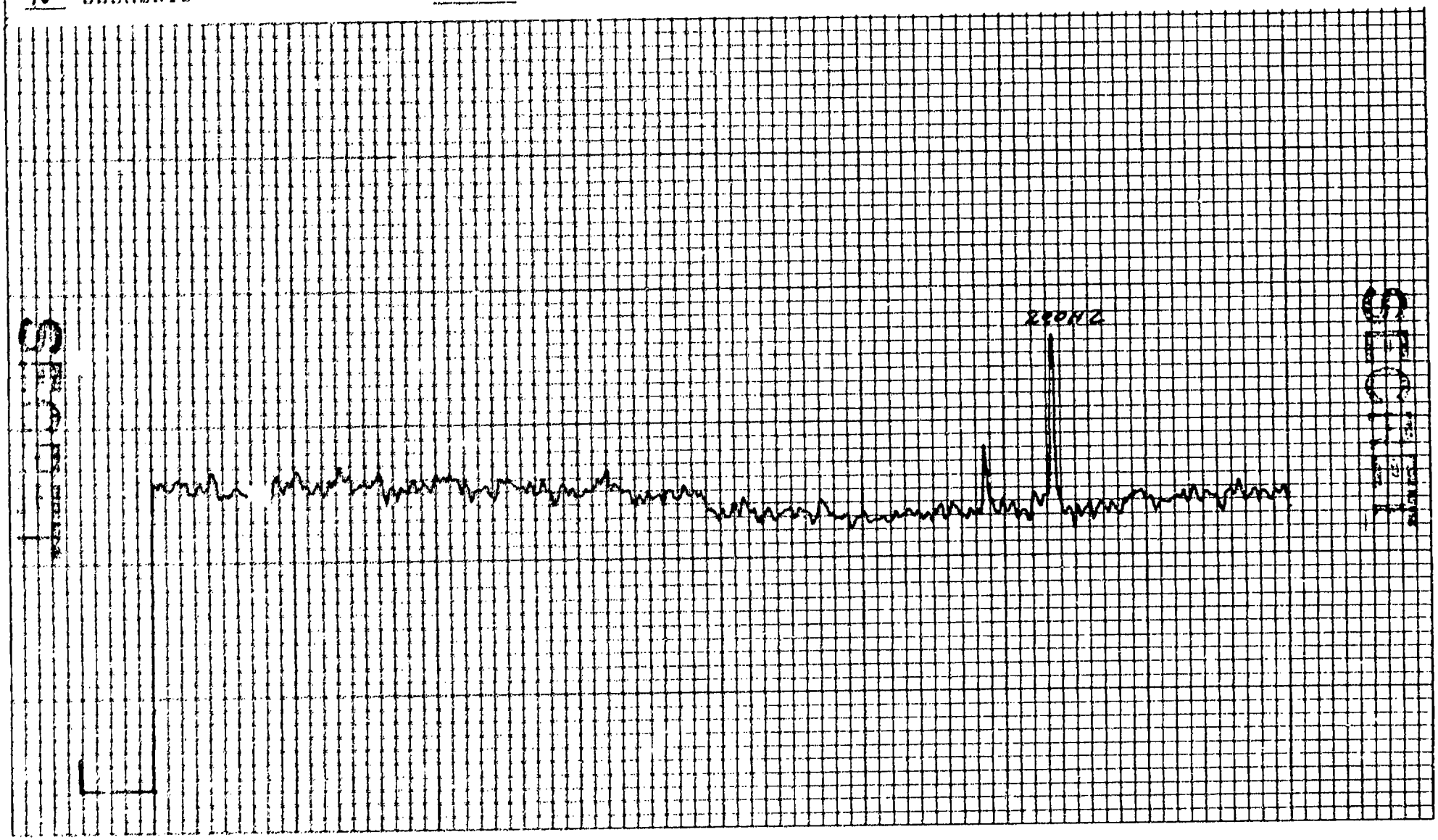
46 0703

CONTROL: 0633 - 16 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: — — —
1-6 & 9-17
DATE/TIME: 3-16-77 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+64.5 DEG. AZ STEERING

REEL: M19 INDEX 1637

INTEGRATION TIME 320 SECS ATTEN: -10 DB
FILTER WTG: HANNING



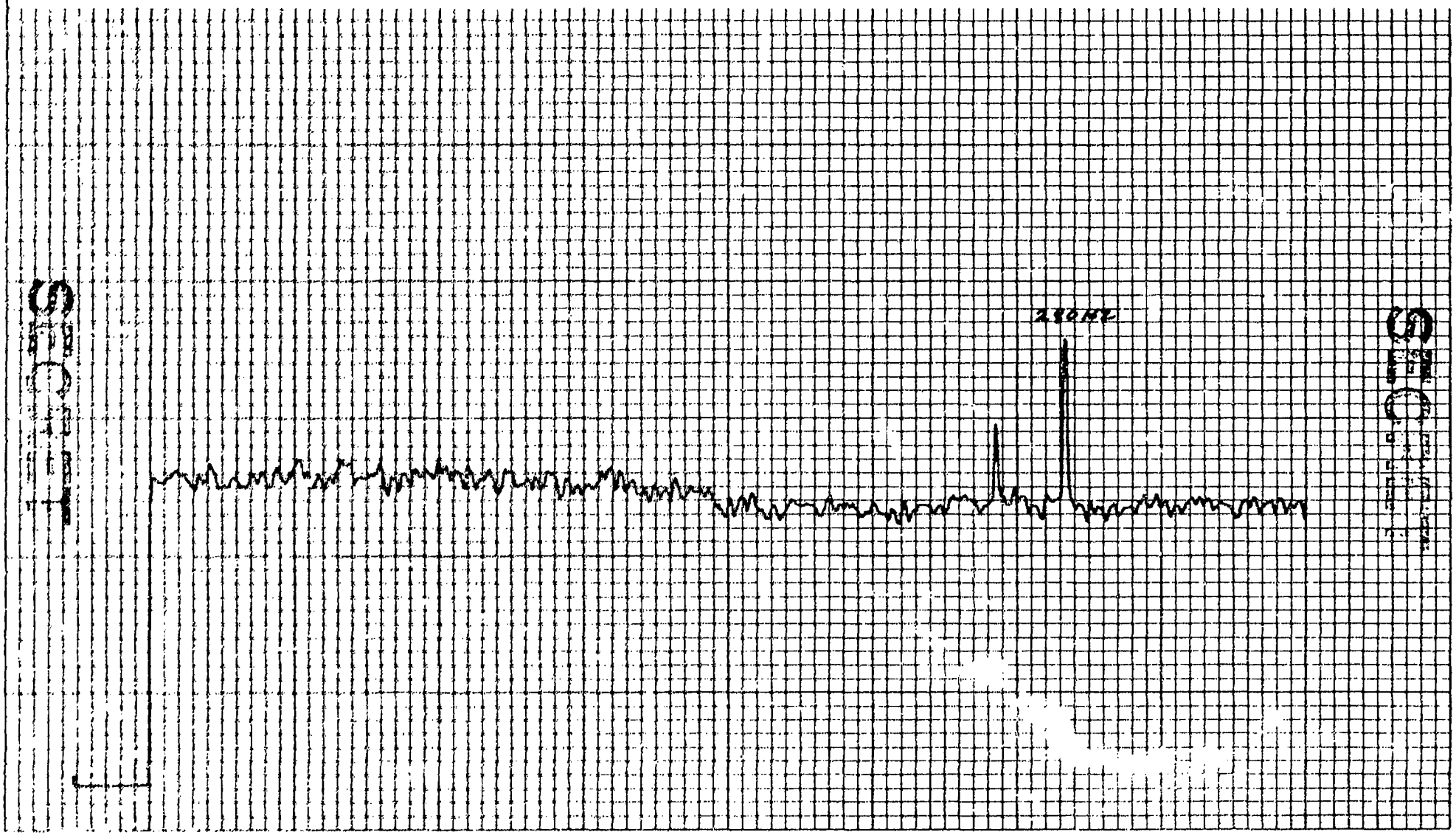
K+E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO.

CONTROL: 0633 - 16 (DD10)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
1-6 & 9-17)
DATE/TIME: 3-16-77 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+66 DEG. AZ STEERING

REEL: M19 INDEX 1637

INTEGRATION TIME 320 SECS ATTEN: -12 DB
FILTER WTG: HANNING



K•E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

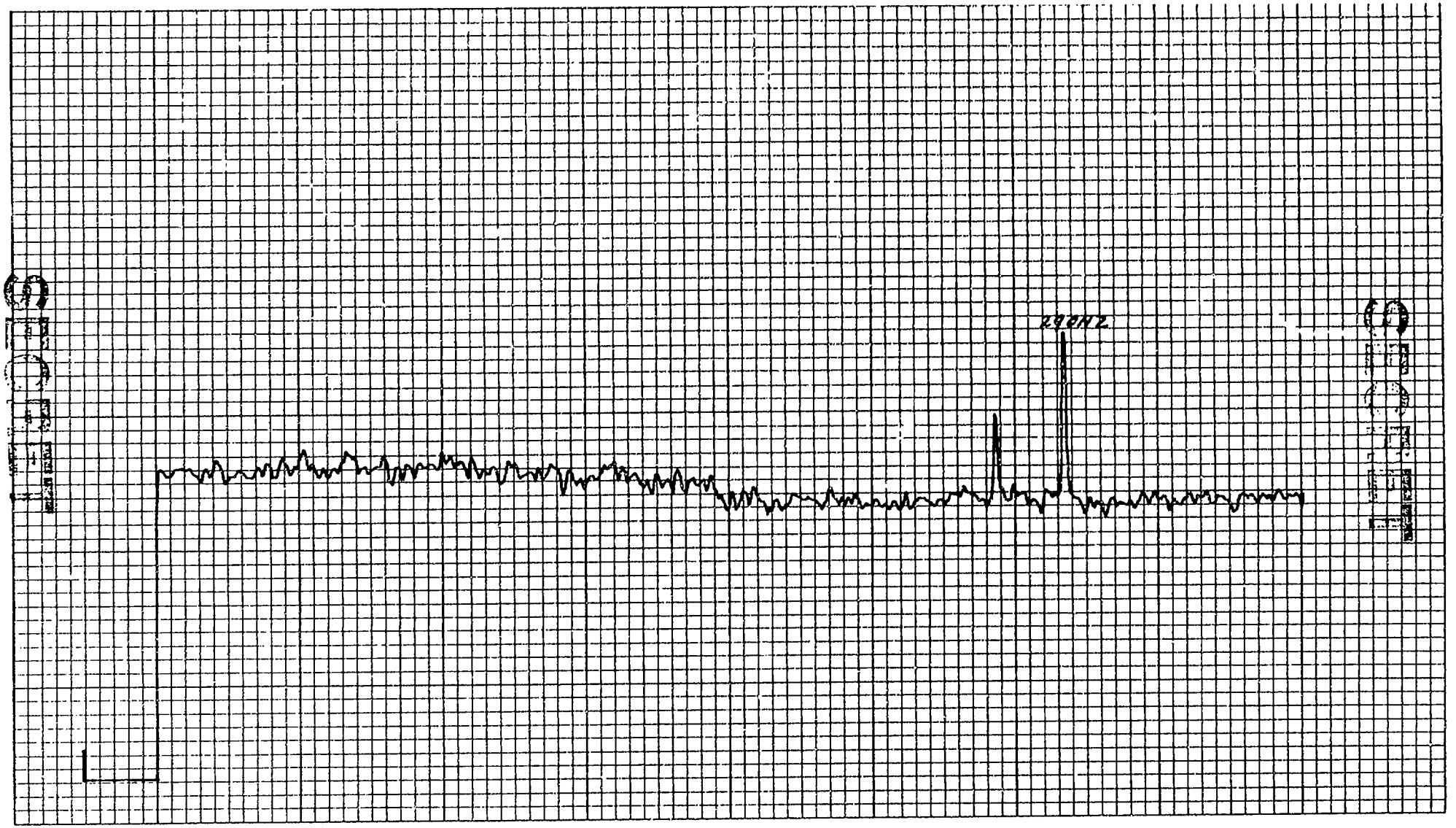
46 0703

CONTROL: 0633 - 16 (DP10)
BEAMFORMED SPECTRUM (ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
1-6 & 9-17
DATE/TIME: 3-16-77 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+68 DEG. AZ STEERING

REEL: M19 INDEX 1637

INTEGRATION TIME 320 SECS ATTEN: -12 DB
FILTER WTG: HANNING



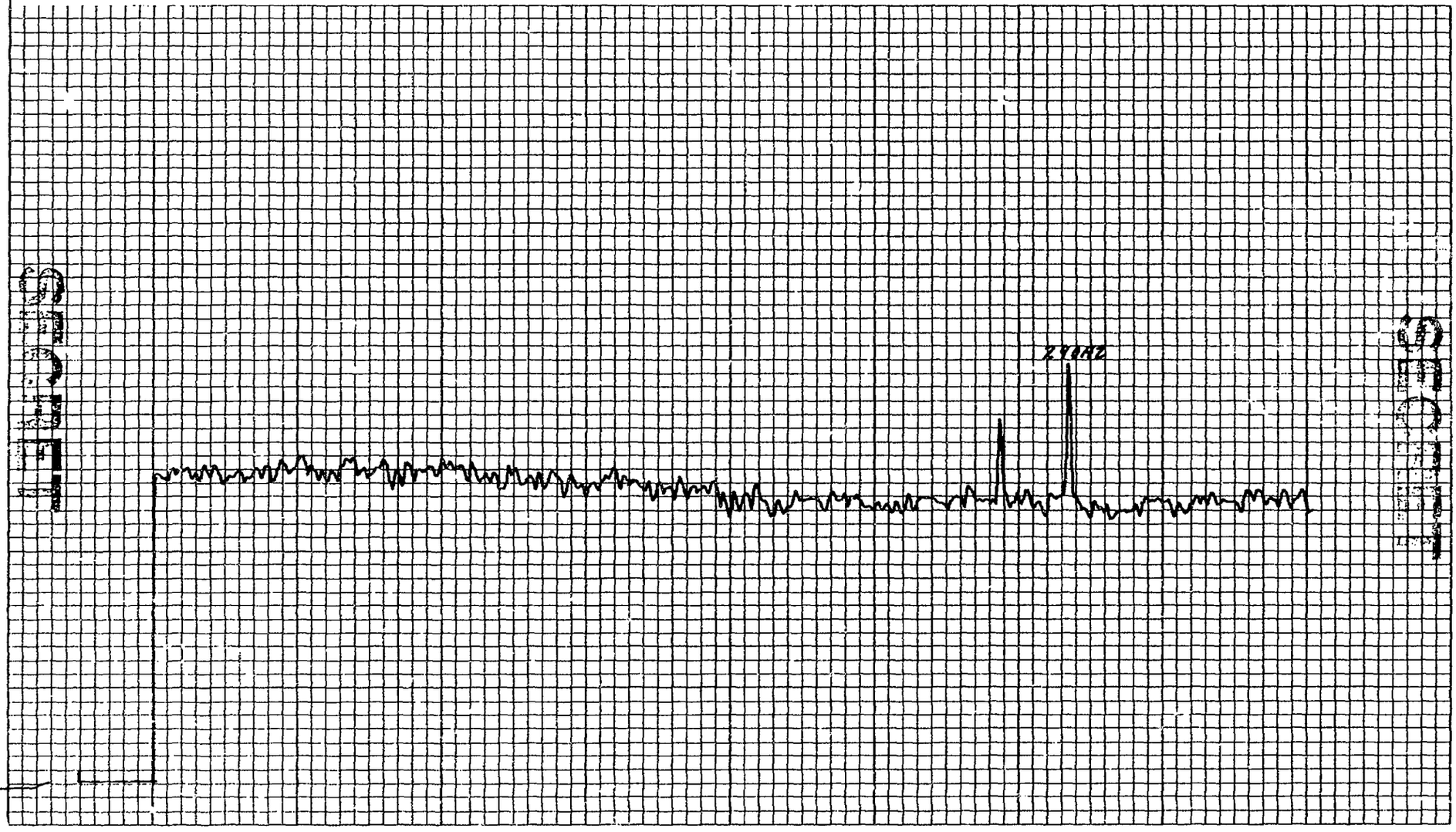
K•E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 0633 - 16 (DP18)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 9-17)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: _ _ _
DATE/TIME: 3-16-77 -0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+70 DEG. AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: -12 DB
FILTER WTG: HANNING



K-E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

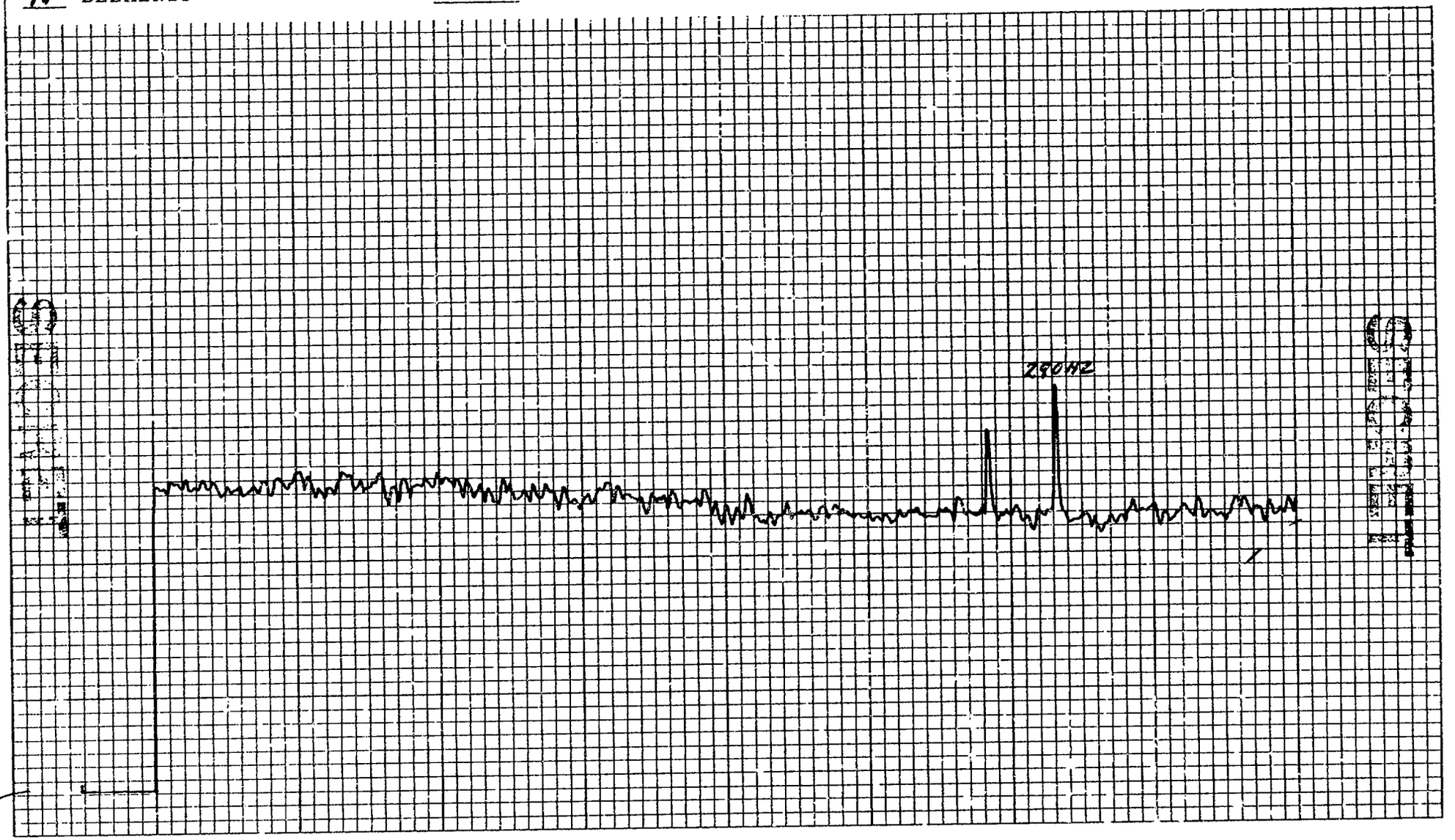
46 0703

CONTROL: 0633 - 16 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
1-6 & 9-17
DATE/TIME: 3-16-77 - 0633Z
ANALYSIS BANDWIDTH: 1/10HZ
+72 DEG. AZ STEERING

REEL: M19 INDEX 1637

INTEGRATION TIME 320 SECS ATTEN: -12 DB
FILTER WTG: HANNING



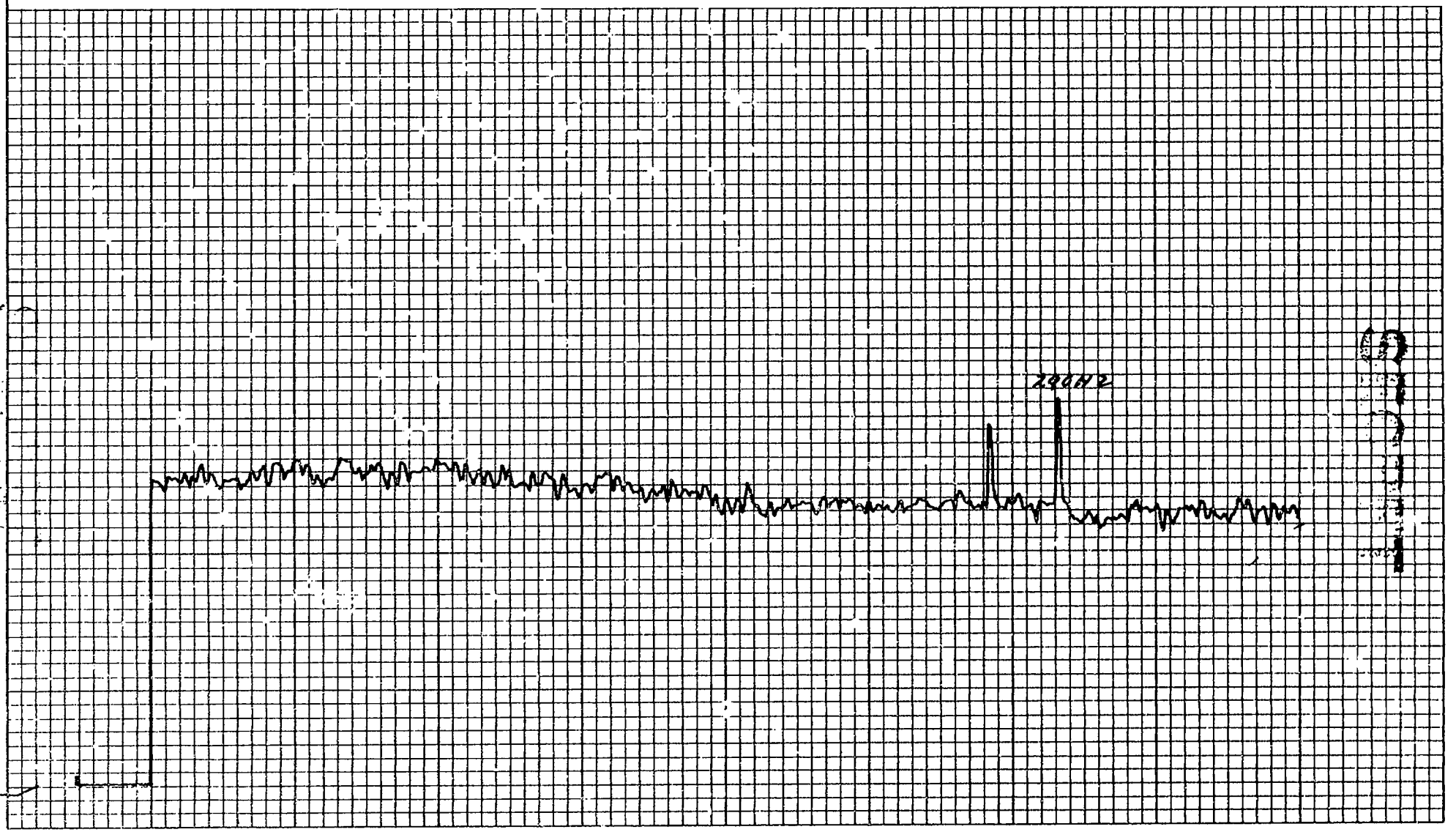
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 0633 - 16 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 275 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
1-6 4 9-17)
DATE/TIME: 3-16-77 -0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+74 DEG. AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: -12 DB
FILTER WTG: HANNING



K•E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 0833 - 16 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: 1-6 & 8-17
DATE/TIME: 3-16-77 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+70 DEG. AZ STEERING

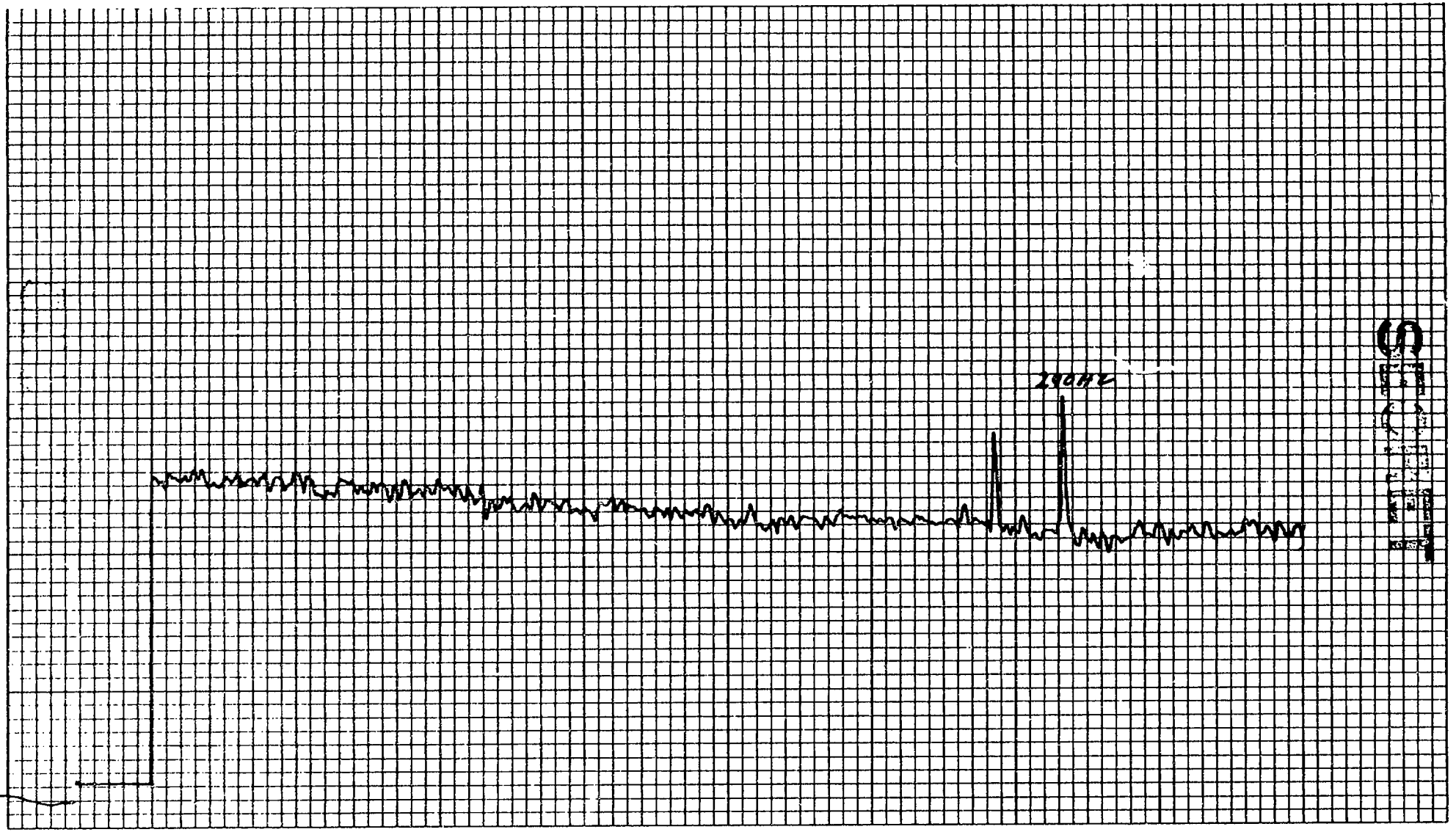
REEL: M19 INDEX 1677
INTEGRATION TIME 320 SECS ATTEN: -12 DB
FILTER WTG: HANNING

K•E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 0633 - 16 (0910)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
1-6 & 9-17)
DATE/TIME: 3-16-77 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+78 DEG. AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: -12 DB
FILTER WTG: HANNING



SIGNAL LEVEL AND SNR CALCULATIONS

DATA POINT 10 FREQUENCY 140 HZ NUMBER OF ELEMENTS 32

SIGNAL LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-18.4	
MCPS-32 CAL. CORRECTION	+10	-8.4	
BEAMFORMER GAIN	+18	+10.4	SIG. LEVEL FOR SNR CALCULATIO
MRA CORRECTION	+ .2	+10.2	SIG. LEVEL FOR SIGNAL GAIN

NOISE LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-50.0	
MCPS-32 CAL. CORRECTION	+10	-40.0	
BEAMFORMER GAIN	+18	-22.0	NOISE LEVEL FOR SNR CALCULATION

SIGNAL-NOISE-RATIO

SIGNAL LEVEL FOR SNR		+10.4	
SIGNAL LEVEL FOR SNR	-22.0	32.4	
PROCESSOR CORRECTION	-4.0	28.4	
MRA CORRECTION	+ .2	28.6	SNR 1/10 HZ BAND
BANDWIDTH CONVERSION	-8.2	20.4	SNR 1 HZ BAND

SIGNAL LEVEL AND SNR CALCULATIONS

DATA POINT 10 FREQUENCY 290 HZ NUMBER OF ELEMENTS 32

SIGNAL LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-35.8	
MCPS-32 CAL. CORRECTION	+10	-25.8	
BEAMFORMER GAIN	+18	-7.8	SIG. LEVEL FOR SNR CALCULATIO
MRA CORRECTION	+ .9	-6.9	SIG. LEVEL FOR SIGNAL GAIN

NOISE LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-59.8	
MCPS-32 CAL. CORRECTION	+10	-49.8	
BEAMFORMER GAIN	+18	-31.8	NOISE LEVEL FOR SNR CALCULATION

SIGNAL-NOISE-RATIO

SIGNAL LEVEL FOR SNR		-7.8	
SIGNAL LEVEL FOR SNR	-31.8	24.0	
PROCESSOR CORRECTION	-4.0	20.0	
MRA CORRECTION	+ .9	20.9	SNR 1/10 HZ BAND
BANDWIDTH CONVERSION	-8.2	12.7	SNR 1 HZ BAND

CONFIDENTIAL

DATA POINT 10

SIGNAL GAIN

	140 HZ	290HZ	295HZ
MEAN OMNI SIGNAL LEVEL	-23.3	-38.0	
MRA SIGNAL LEVEL	+10.6	- 6.9	
ARRAY SIGNAL GAIN	33.9	31.1	
20 LOG 32 (# of elements)	30.1	30.1	
DIFFERENCE	+3.8	+1.0	

ARRAY GAIN

MRA SNR	28.6	20.9	
MEAN OMNI SNR	18.7	8.4	
ARRAY GAIN	9.9	11.5	
THEORETICAL AZMUTH GAIN (at MRA)	10.8	13.4	
DIFFERENCE	- .9	- 1.9	

K·E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

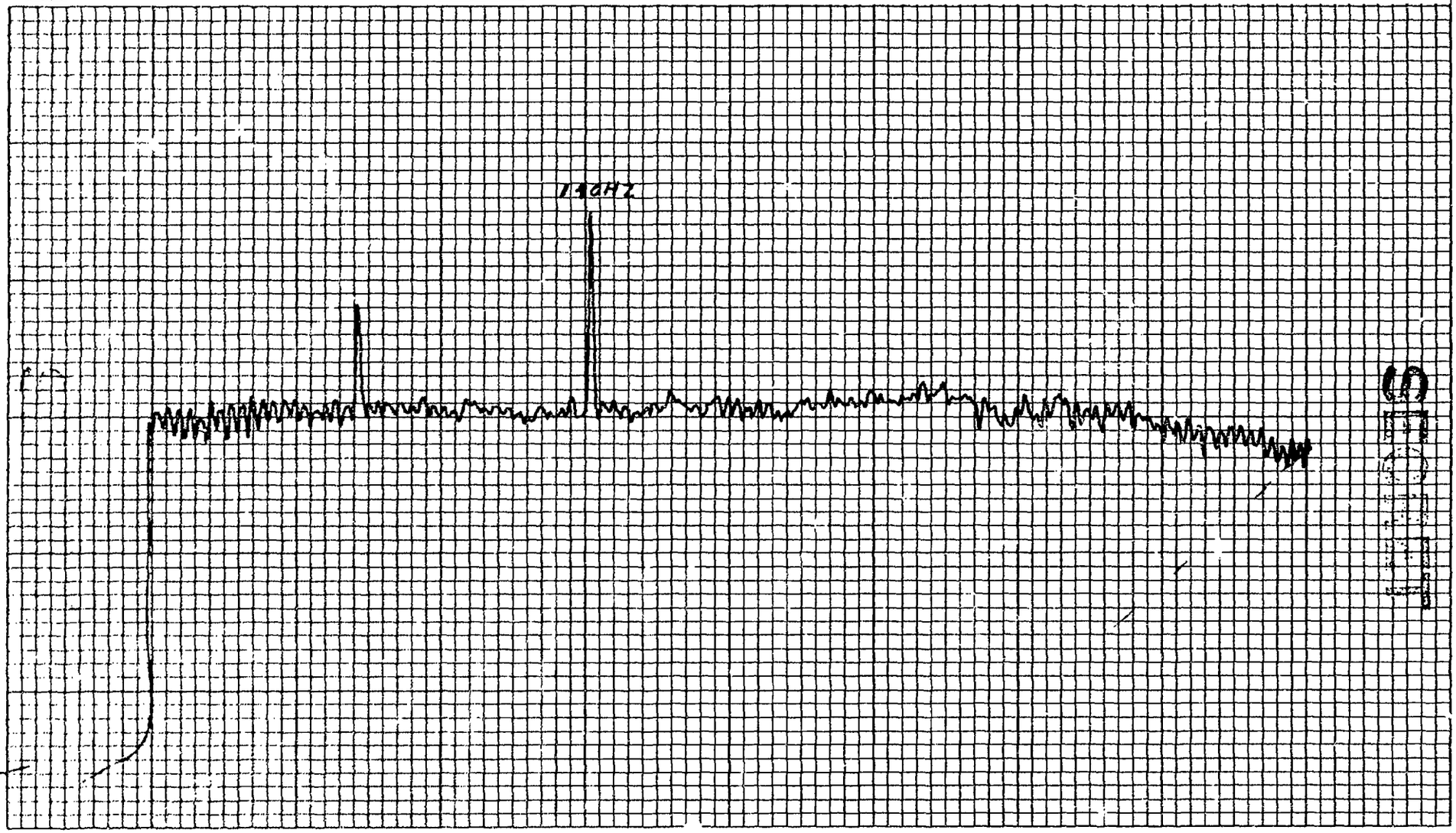
46 0703

17-B31

CONTROL: 0633 - 32 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 9-26 & 29-35)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16.77 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+54 DEG. AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING



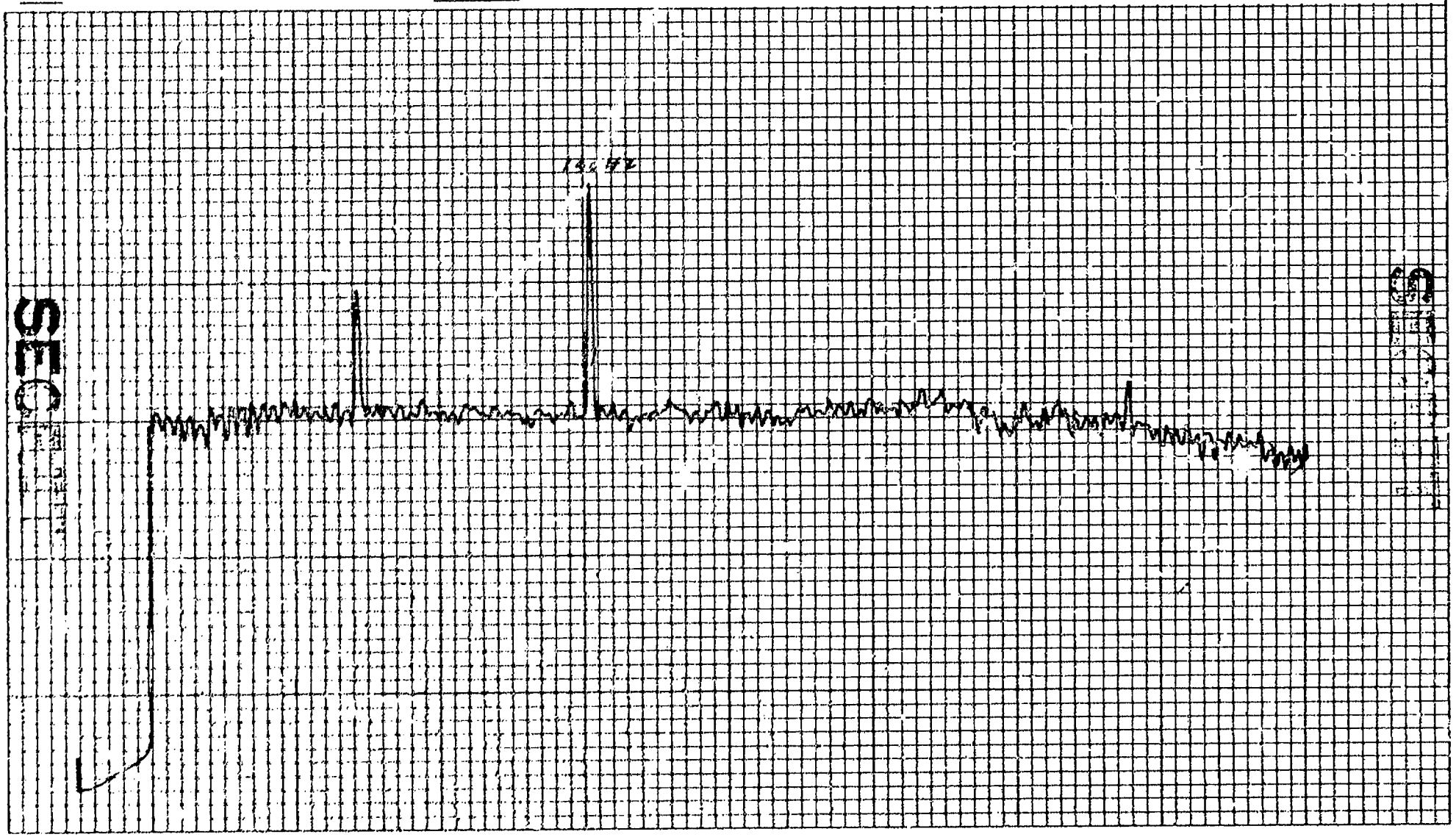
K·E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTRGL: 0633 - 32 (DPIC)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
1-649-264 28-35)
DATE/TIME: 376.77 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+56 DEG. AZ STEERING

REEL: M19 INDEX 1607
INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING



K·E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO

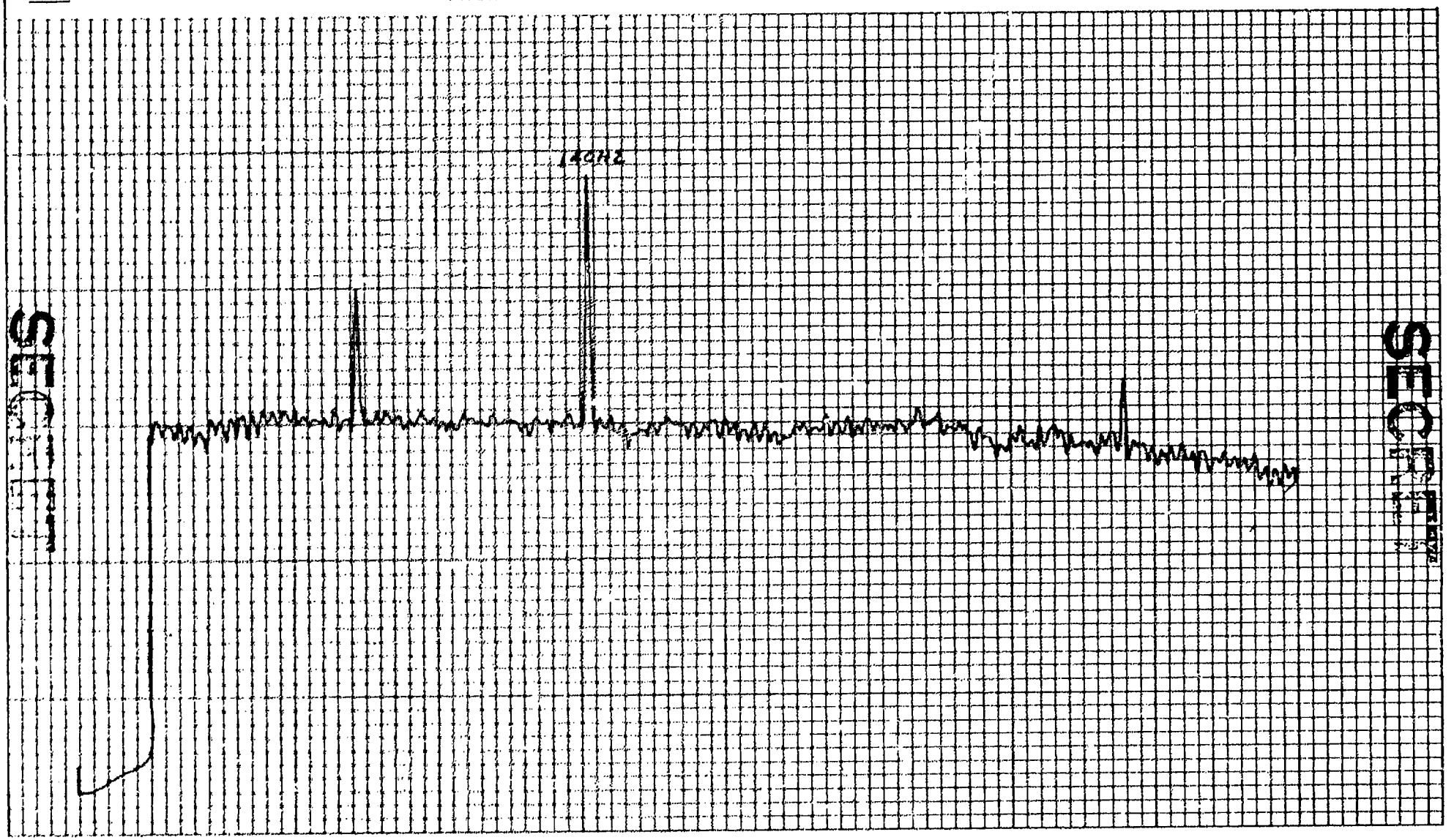
46 0703

CONTROL: 0677 - 72 (DPIC)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 9-26 & 29-35)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
72 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 7-16-77 -0333 Z
ANALYSIS BANDWIDTH: 1/10HZ
+58 DEG. AZ STEERING

REEL: H19 INDEX 1637

INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

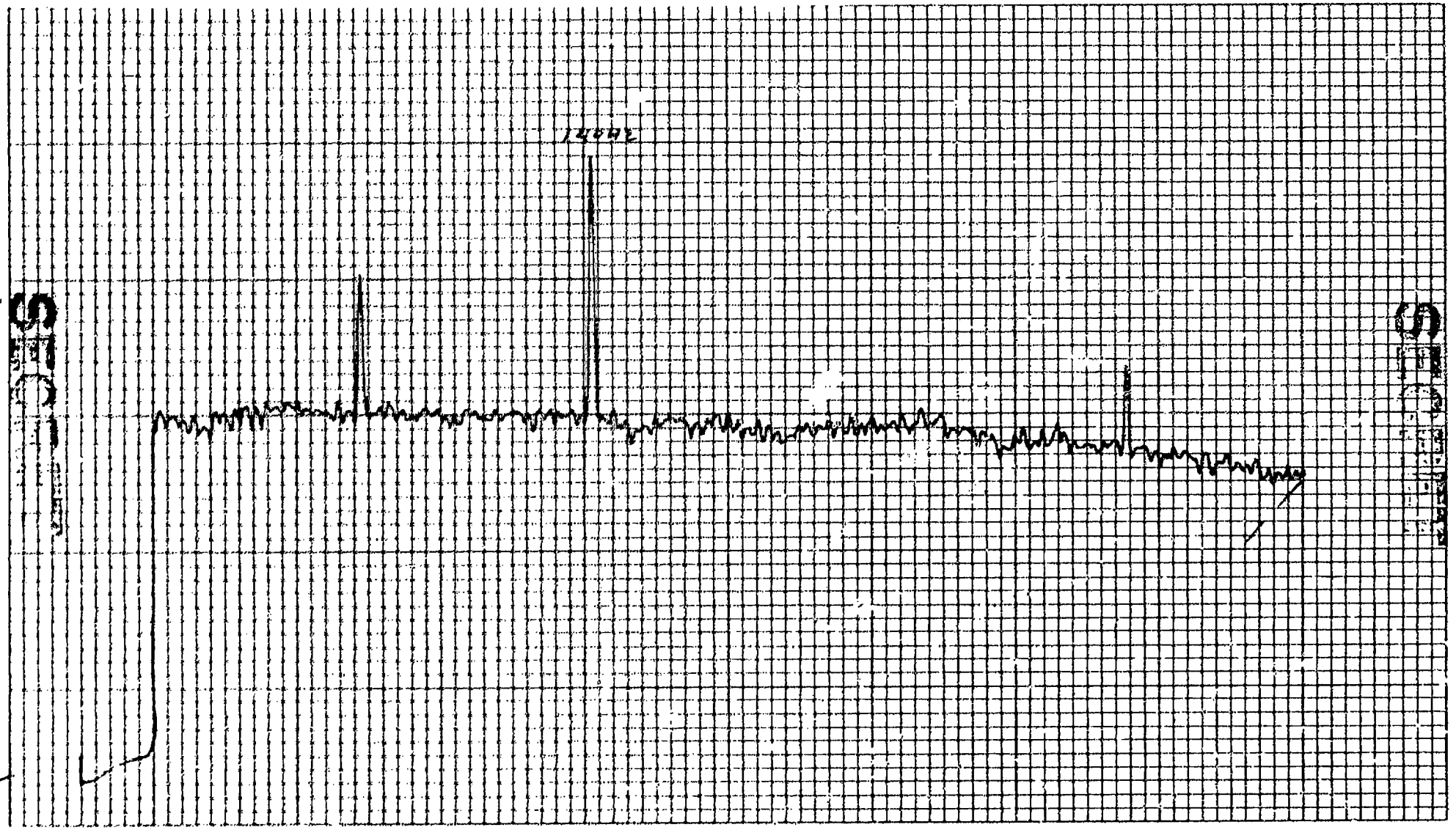
4

CONTROL: 0633 - 32 (0010)
BEAMFORMED SPECTRUM (ELEMENTS 1-6 & 9-26 & 29-35)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-6-72 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
460 DEG. AZ STEERING

REEL: M19 INDEX 1637

INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING



K·E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 0633 - 32 (0810)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 9-26 & 29-35)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 346-77 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+11 DEG. AZ STEERING

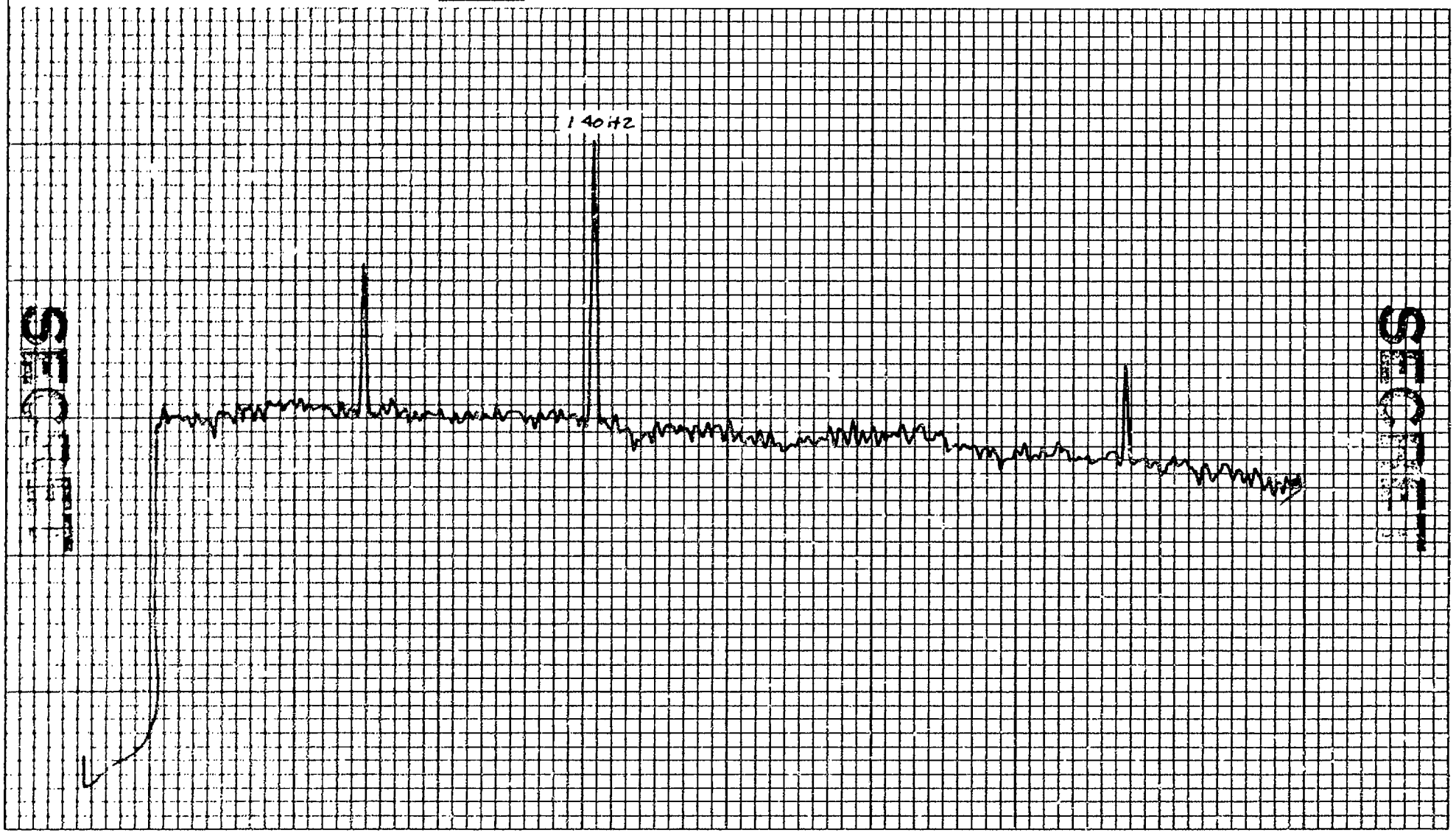
REEL: 1119 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: 10 DB
FILTER WTG: HANNING

K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 0633 - 32 (D810)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 9-26 & 28-35)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

DATE OF ANALYSIS: _ _ _
DATE/TIME: 3-16-77 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+61.25 DEG. AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: 18 DB
FILTER WTG: HANNING



K•E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 063 - 32 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 9-26 & 29-35)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 346-37 -0033Z
ANALYSIS BANDWIDTH: 1/10HZ
+61.5 DEG. AZ STEERING

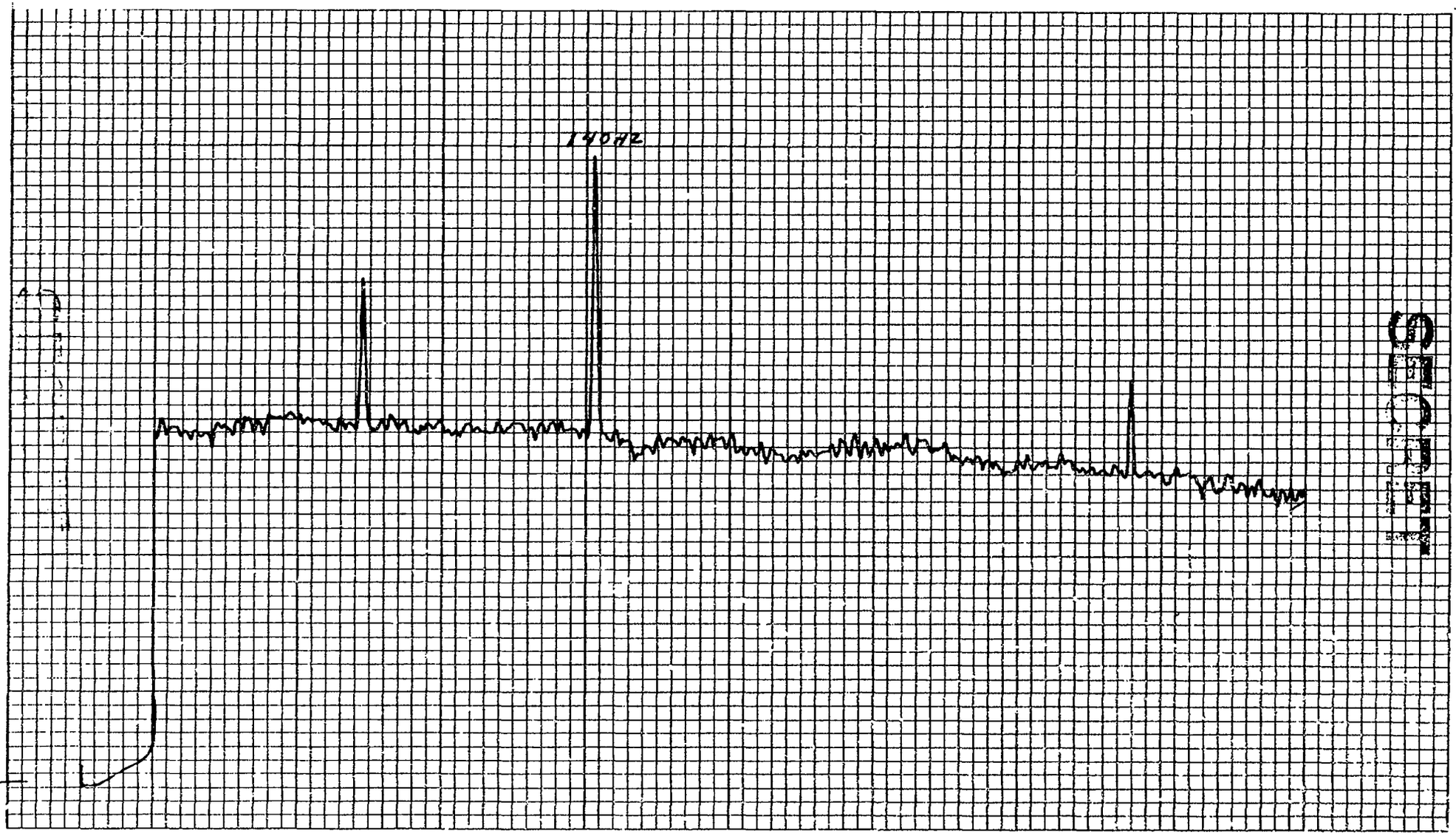
REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: -10 DB
FILTER WTG: HANNING

K+E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 0633 - 32 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 9-26 & 29-35)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+62 DEG. AZ STEERING

REEL: 719 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING

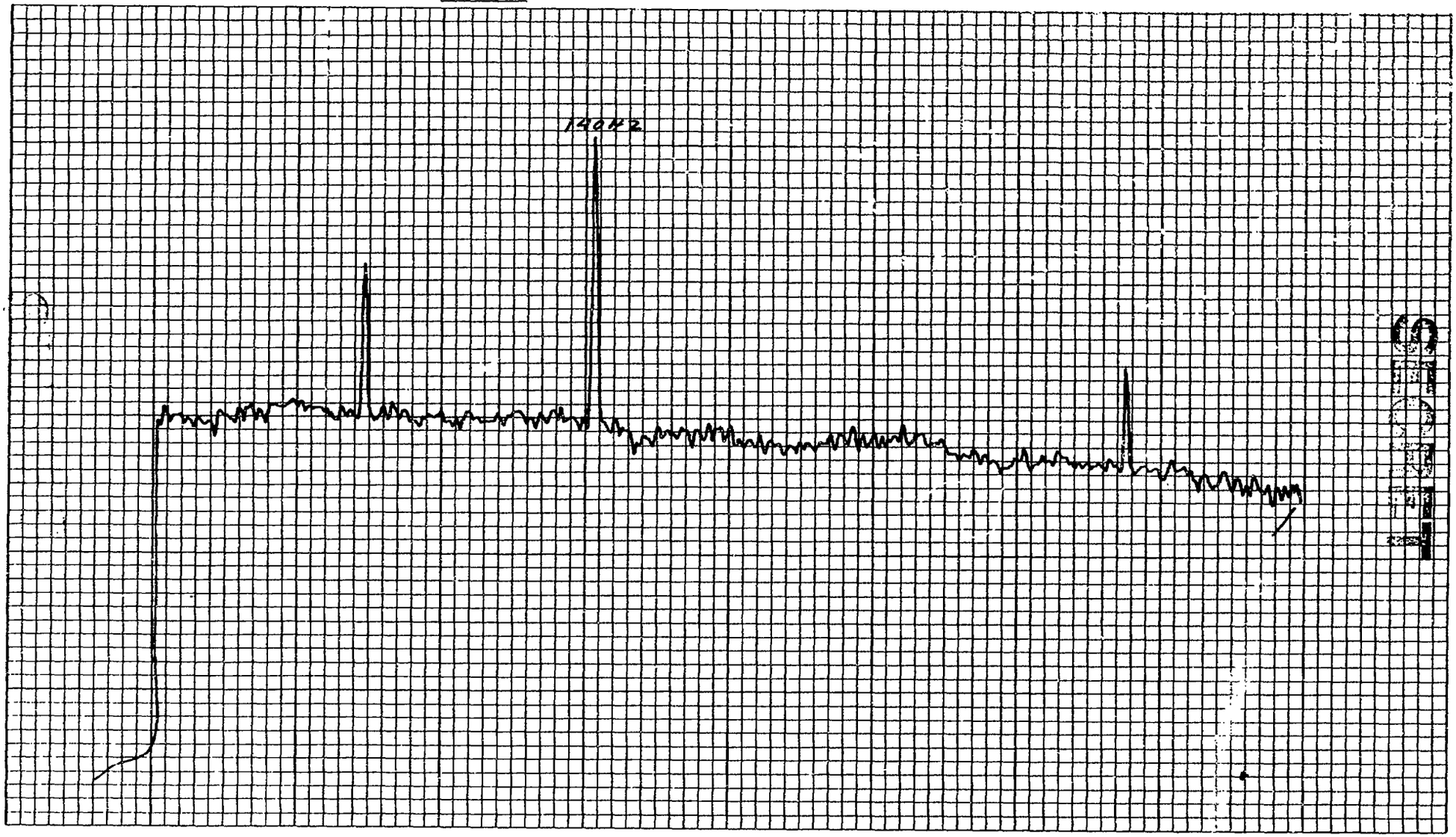


K•E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 0633 - 32 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS 1-64 9-26 & 29-35)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
±62.5 DEG. AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: 10 DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

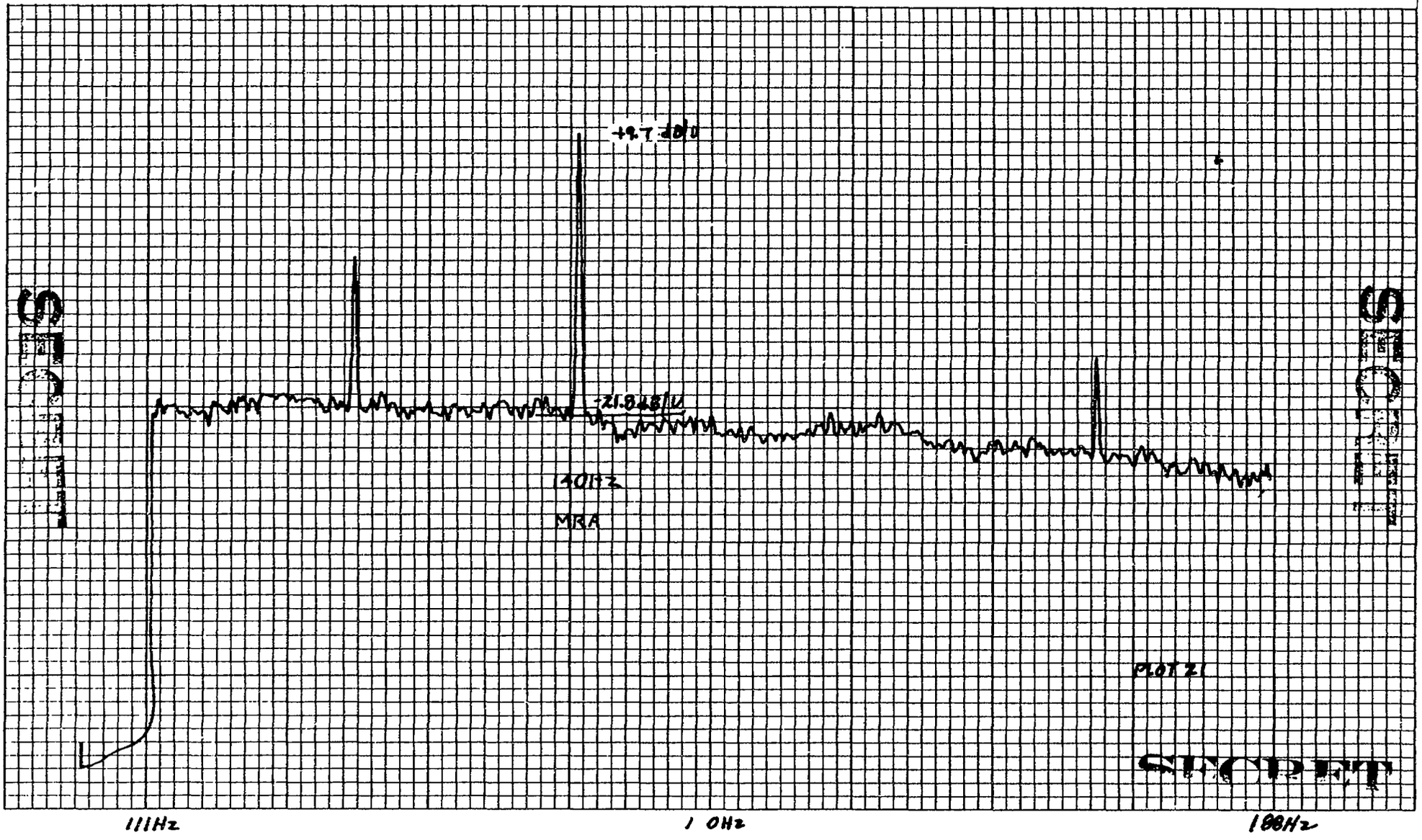
46 0703

SECRET

CONTROL: 0633 - 49 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS 1 TO 6 9 TO 26 29 TO 35)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

DATE OF ANALYSIS: __ ___ __
DATE/TIME: 3-1677 -0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+63.0 DEG. AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: - DB
FILTER WTG: HANNING



K•E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

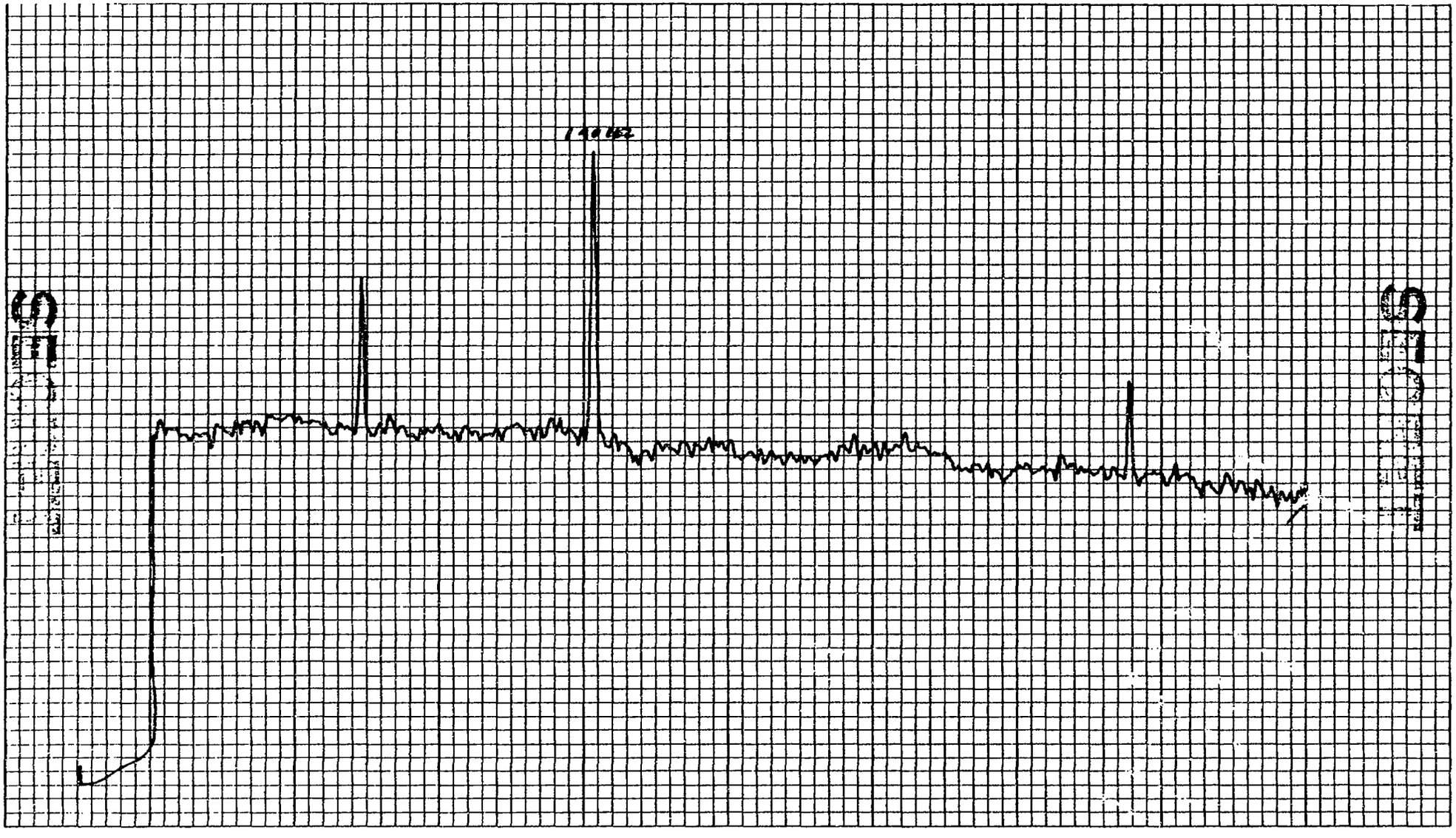
46 0703

CONTROL: 0633 - 32 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 8-26 29-35)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+64 DEG. AZ STEERING

REEL: M19
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 1637
ATTEN: -18 DB



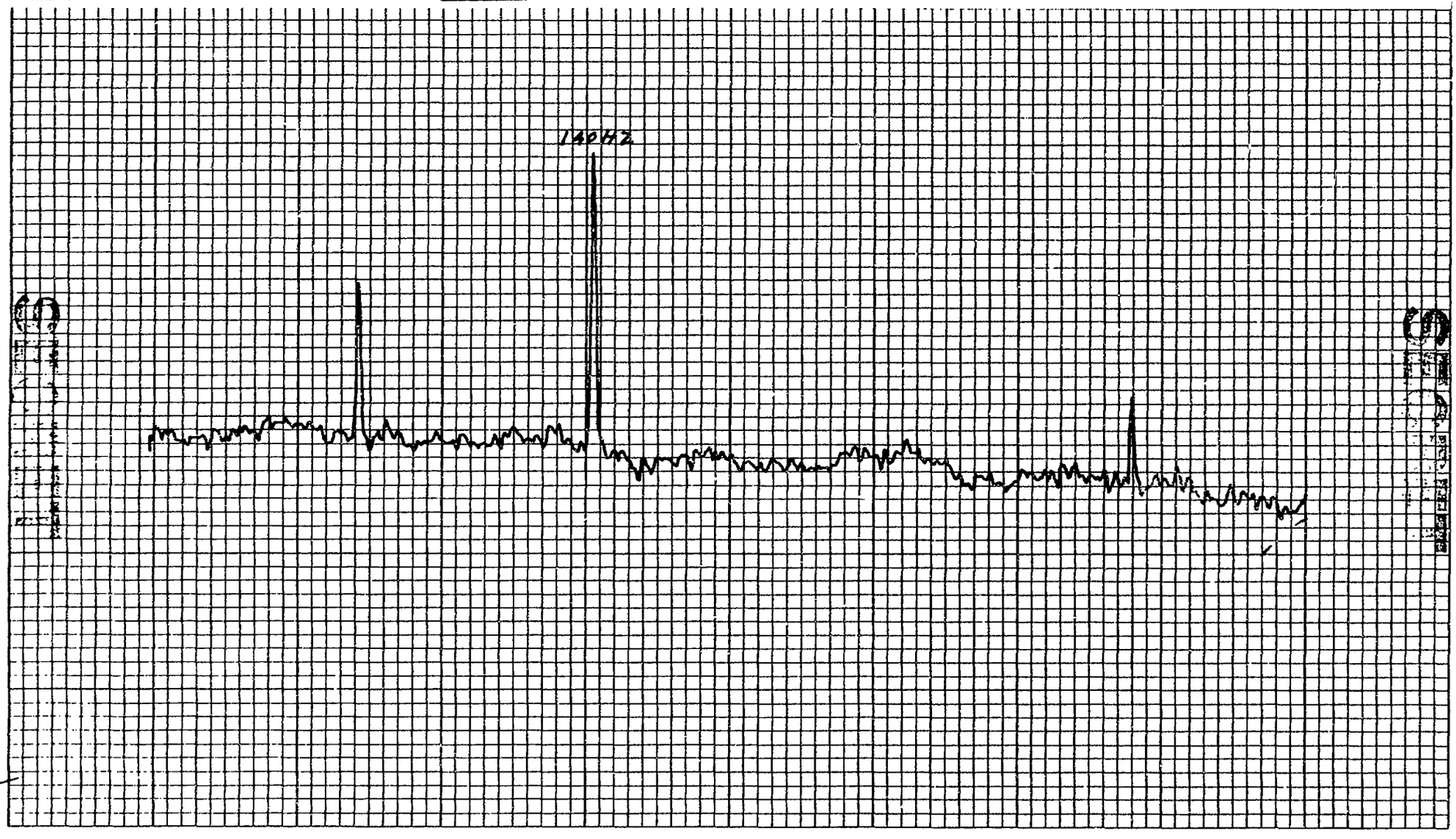
K•E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 0633 -32 (DP16)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 9-26 & 29-35)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3 16 77 -0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+66 DEG. AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: 18 DB
FILTER WTG: HANNING



K•E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

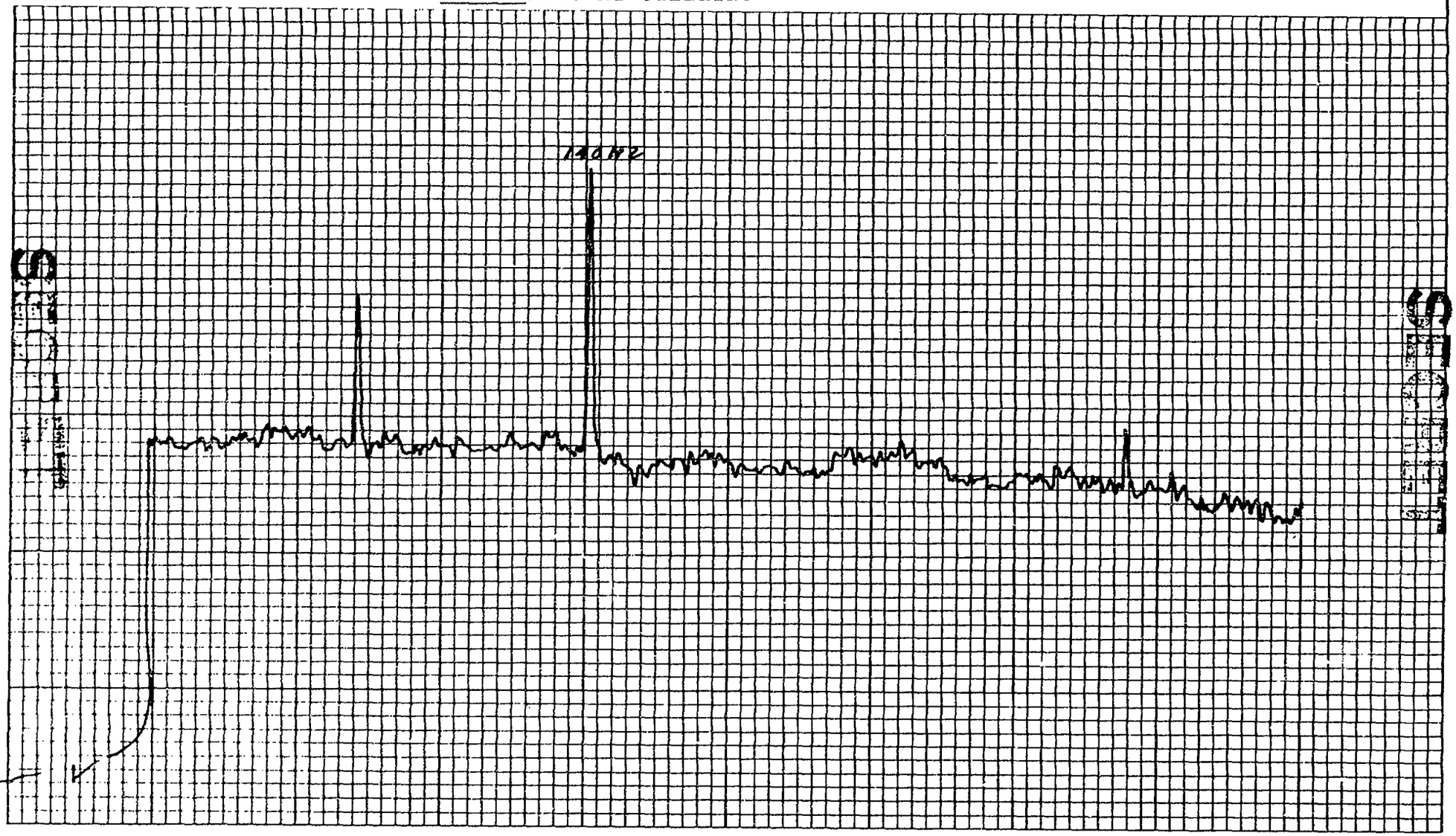
46 0703

CONTROL: 0633 - 32 (DP10)
BEAMFORMED SPECTRUM (ELEMENTS 1-6 & 9-26 & 29-35)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+60 DEG. AZ STEERING

REEL: M19 INDEX 1637

INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING



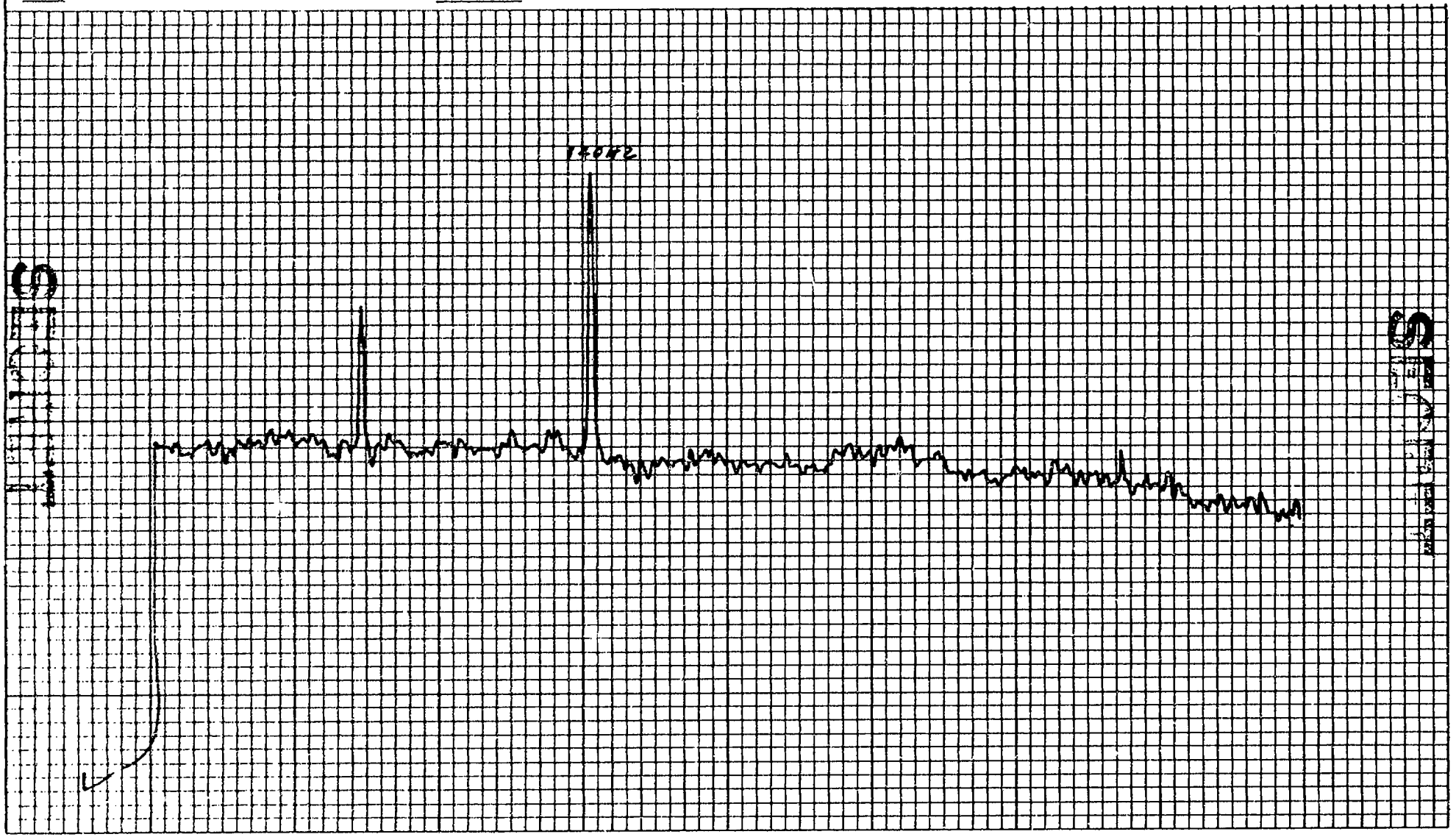
K•E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 0633 - 32 (BP10)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 9-26 & 29-35)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

DATE OF ANALYSIS: _ _ _
DATE/TIME: 3-16-77 -0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+72 DEG. AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING



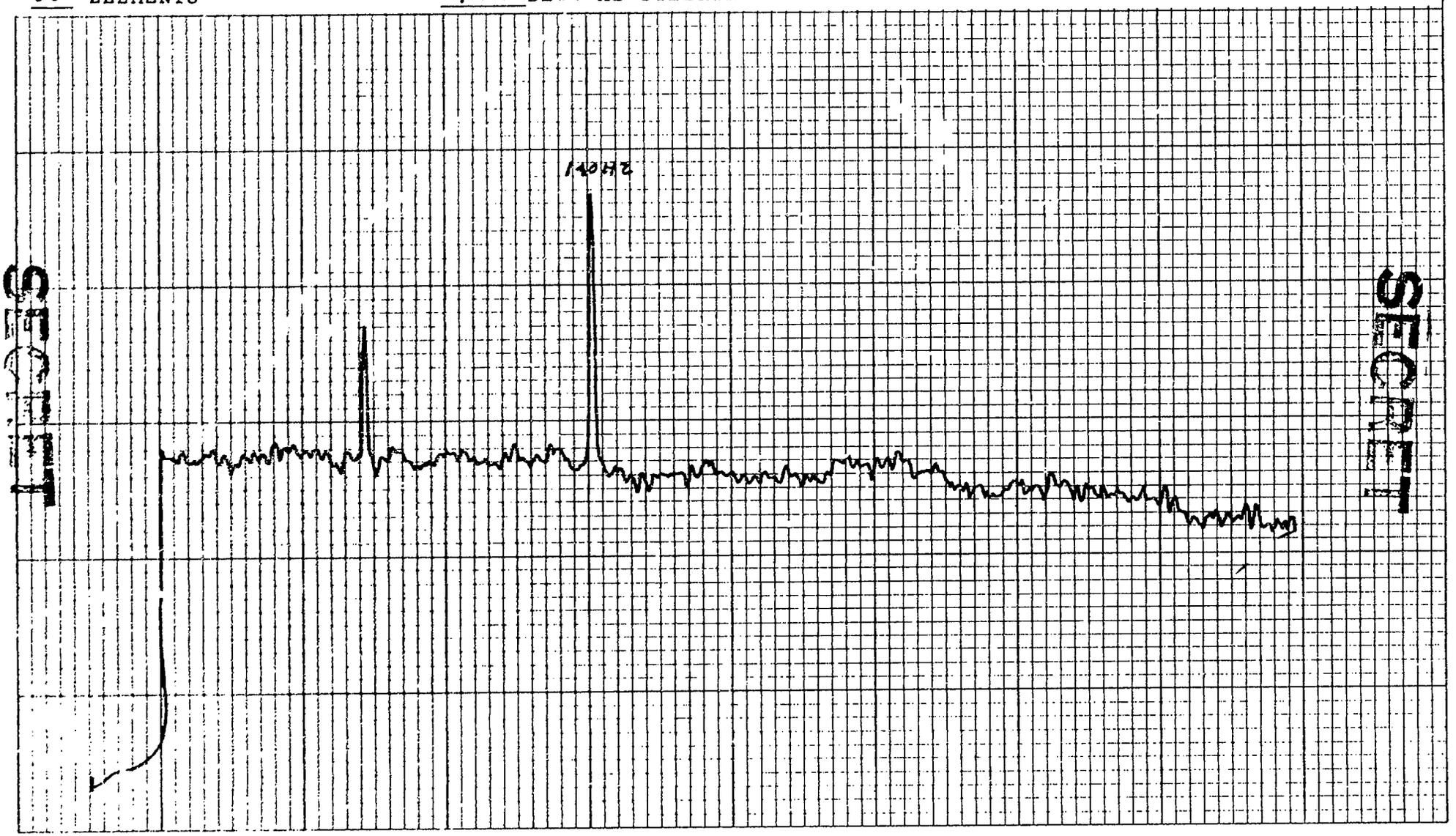
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 0633 - 32 (QP40)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 9-26 & 29-35)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

DATE OF ANALYSIS: -- - -
DATE/TIME: 3-16-77 -0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+74 DEG. AZ STEERING

REEL: M19 INDEX 1677

INTEGRATION TIME 320 SECS ATTEN: 70 DB
FILTER WTG: HANNING



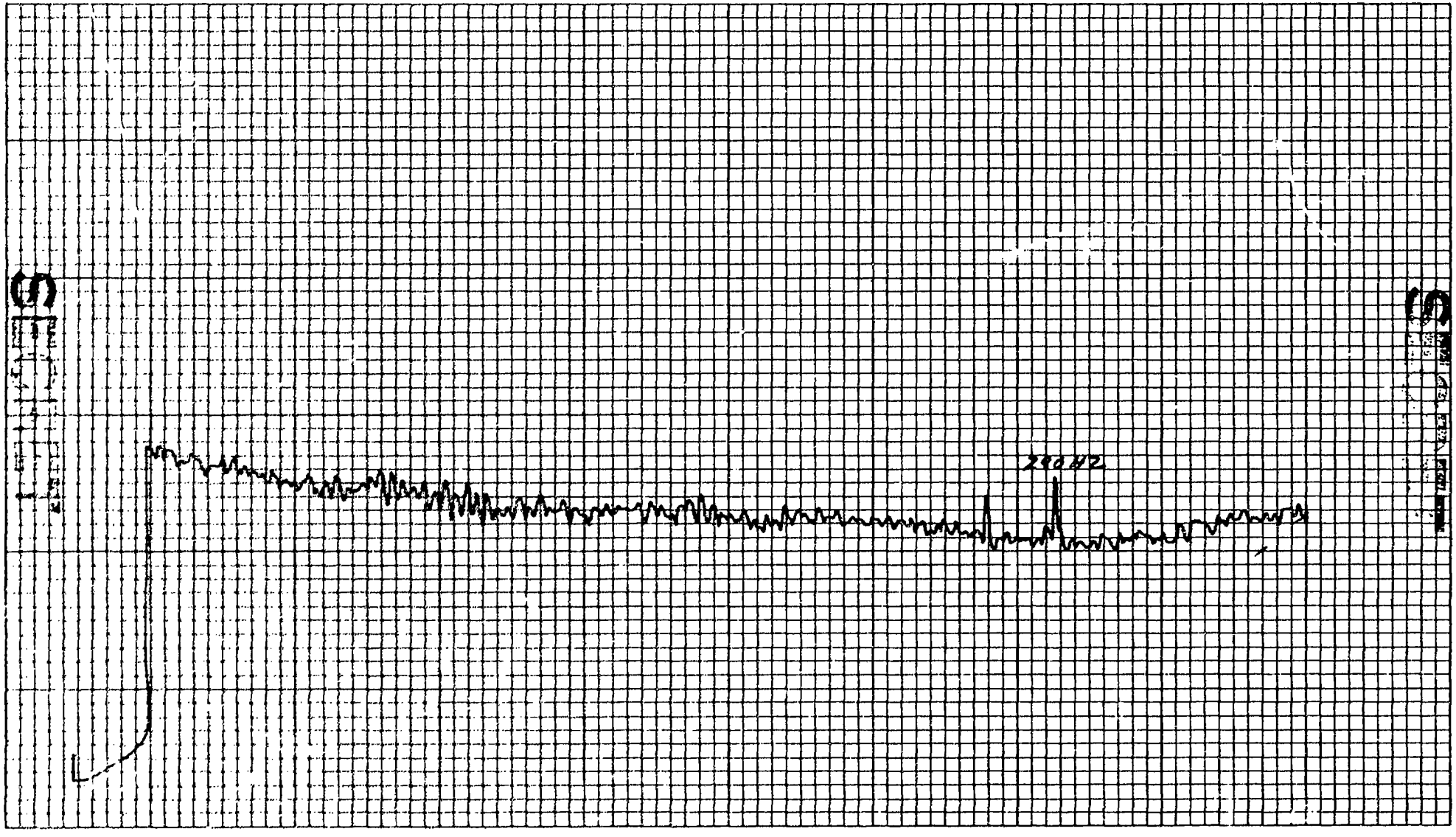
K·E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 0633 - 32 (DBH)
BEAMFORMED SPECTRUM (ELEMENTS 1-6 & 9-26 & 29-35)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 3-16-77 - 0633Z
ANALYSIS BANDWIDTH: 1/10HZ
+54 DEG. AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: -10 DB
FILTER WTG: HANNING



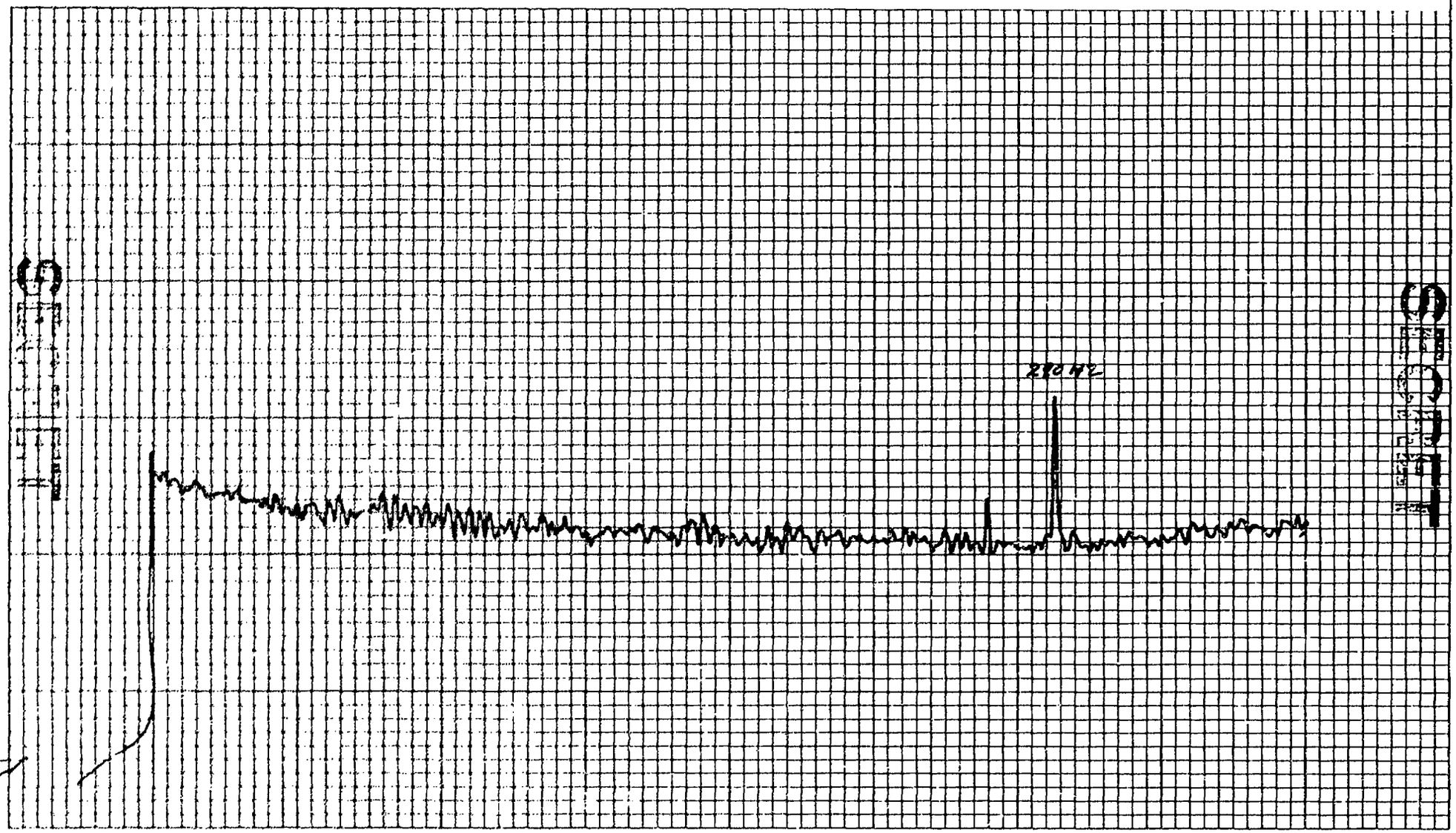
K•E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 0633 - 32 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 9-26 & 28-35)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 376/77 - 0633Z
ANALYSIS BANDWIDTH: 1/10HZ
+56 DEG. AZ STEERING

REEL: M19
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 1637
ATTEN: -10 DB

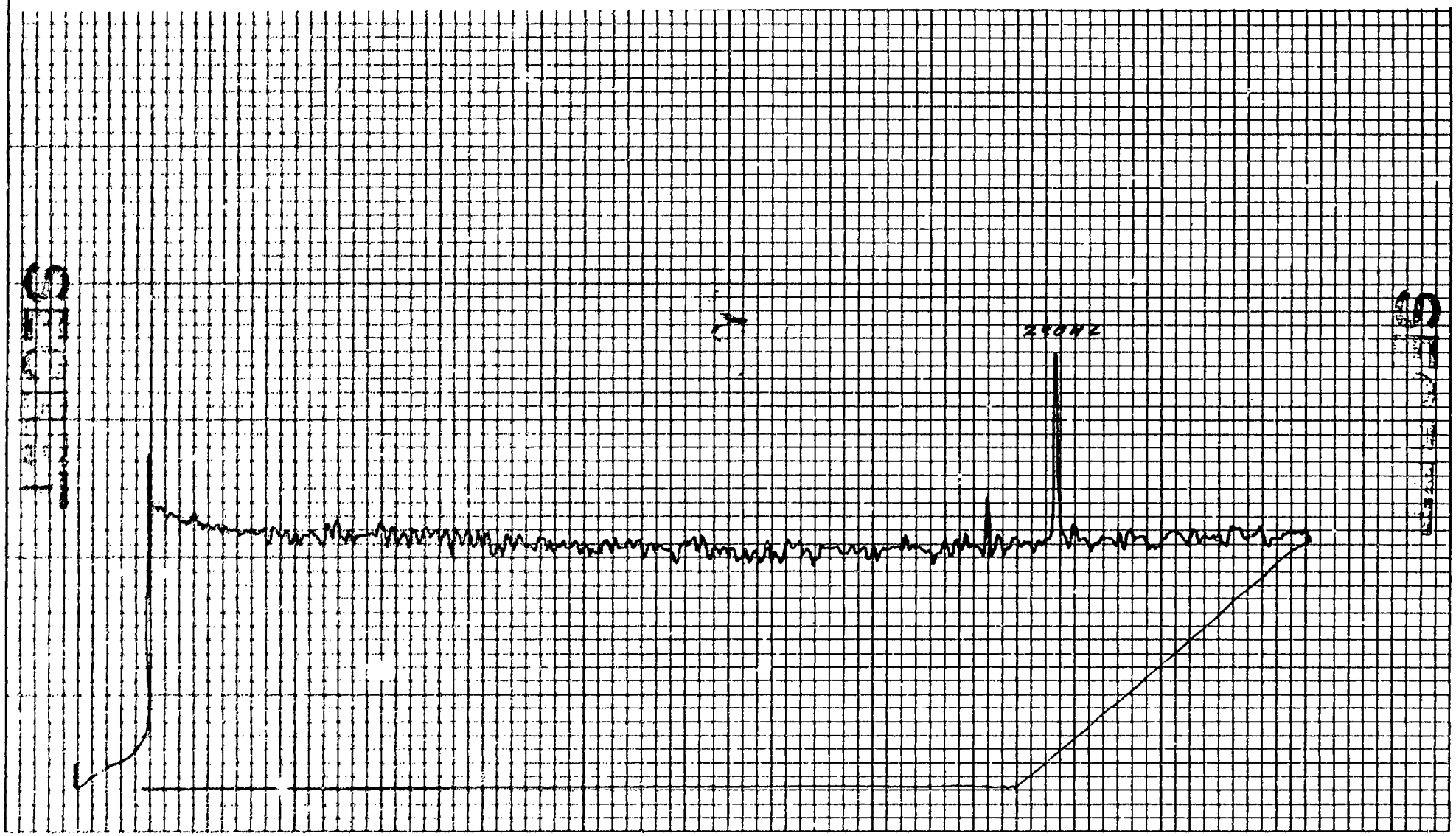


K+E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 0633 - 72 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 9-26 & 29-35)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+58 DEG. AZ STEERING

REEL: K19
INDEX 1637
INTEGRATION TIME 320 SECS
ATTEN: -10 DB
FILTER WTG: HANNING

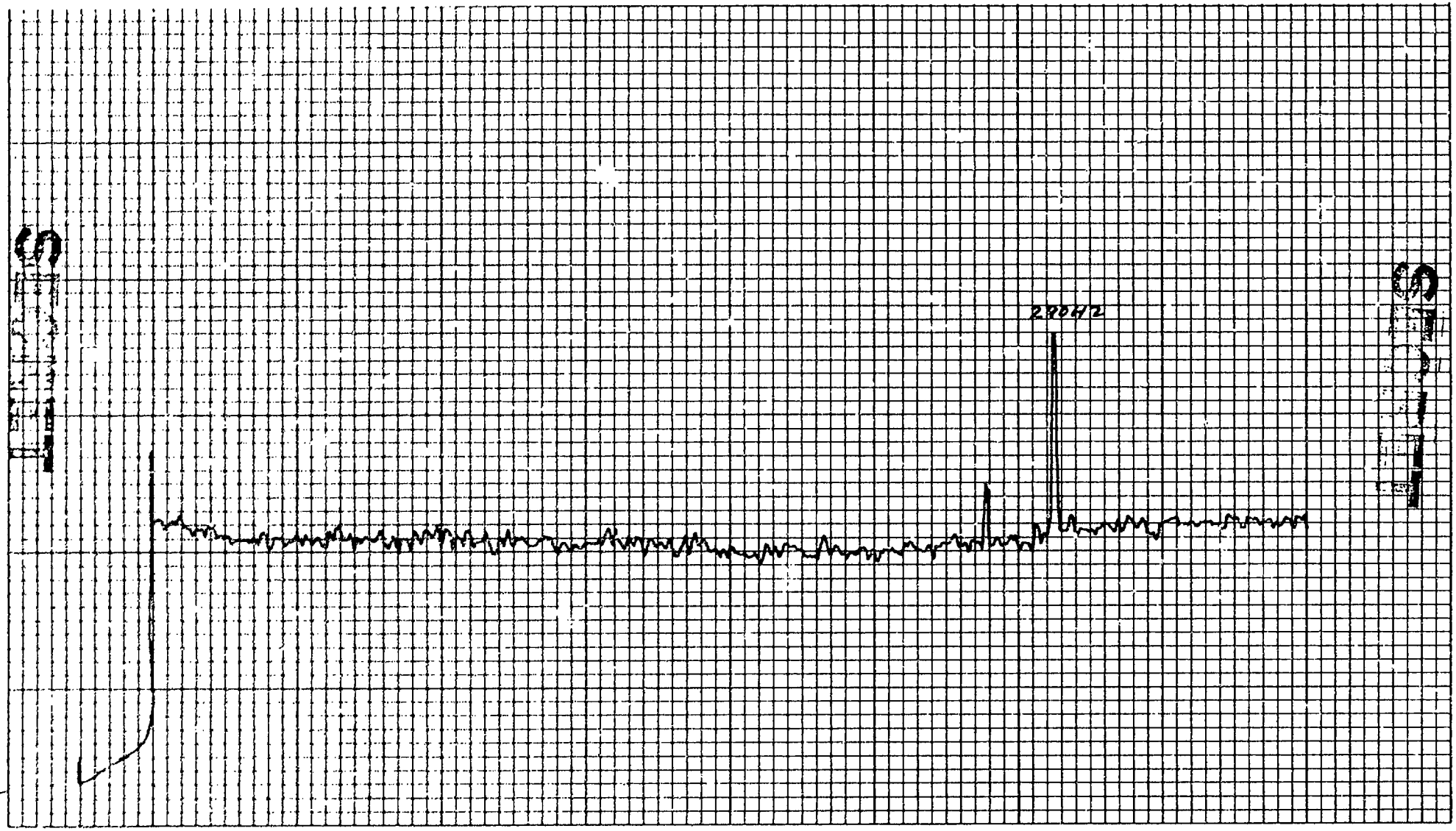


K&E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 0633 - 32 (0910)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 9-26 & 29-35)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: _ _ _
DATE/TIME: 3-16-77 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+60 DEG. AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: 18 DB
FILTER WTG: HANNING

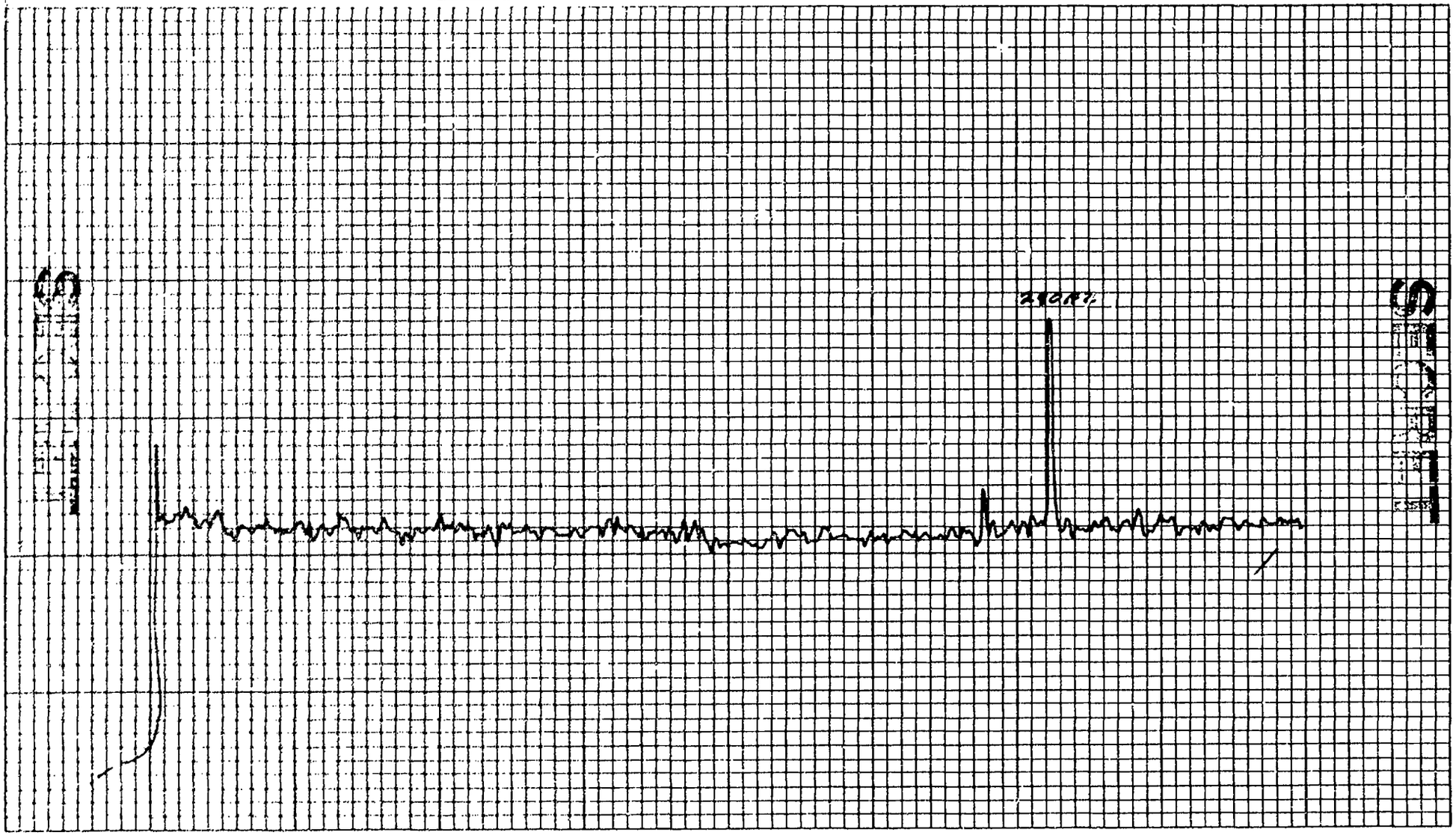


K•E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 0633 - 32 (DP16)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 7-26 & 28-35)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 0633Z
ANALYSIS BANDWIDTH: 1/10HZ
+61 DEG. AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: 18 DB
FILTER WIG: HANNING



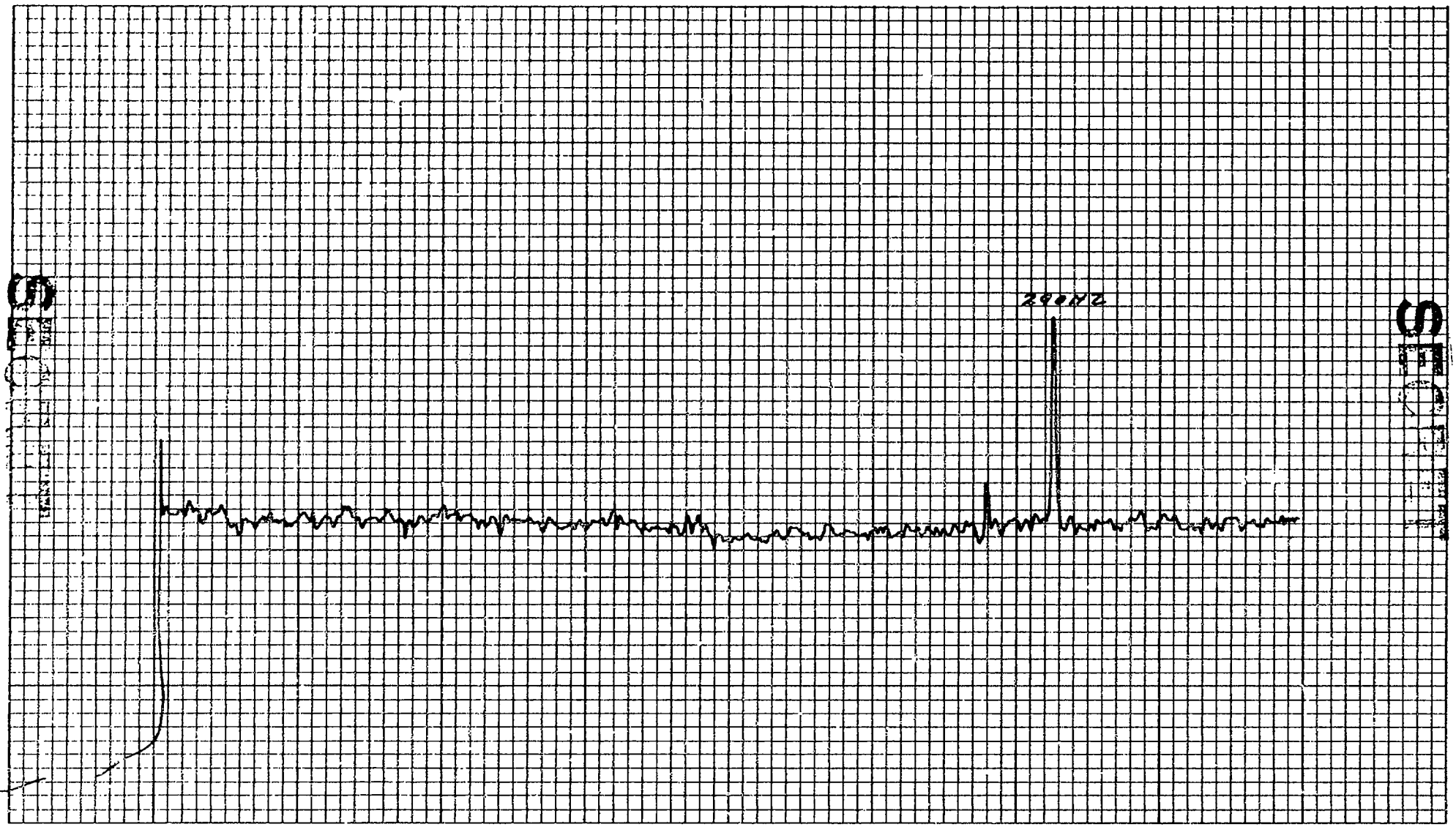
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 0677 - 32 (2810)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 9-26 & 29-35)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 -0033 Z
ANALYSIS BANDWIDTH: 1/10HZ
+61.25 DEG. AZ STEERING

REEL: M19 INDEX 1677
INTEGRATION TIME 320 SECS ATTEN: -10 DB
FILTER WTG: HANNING



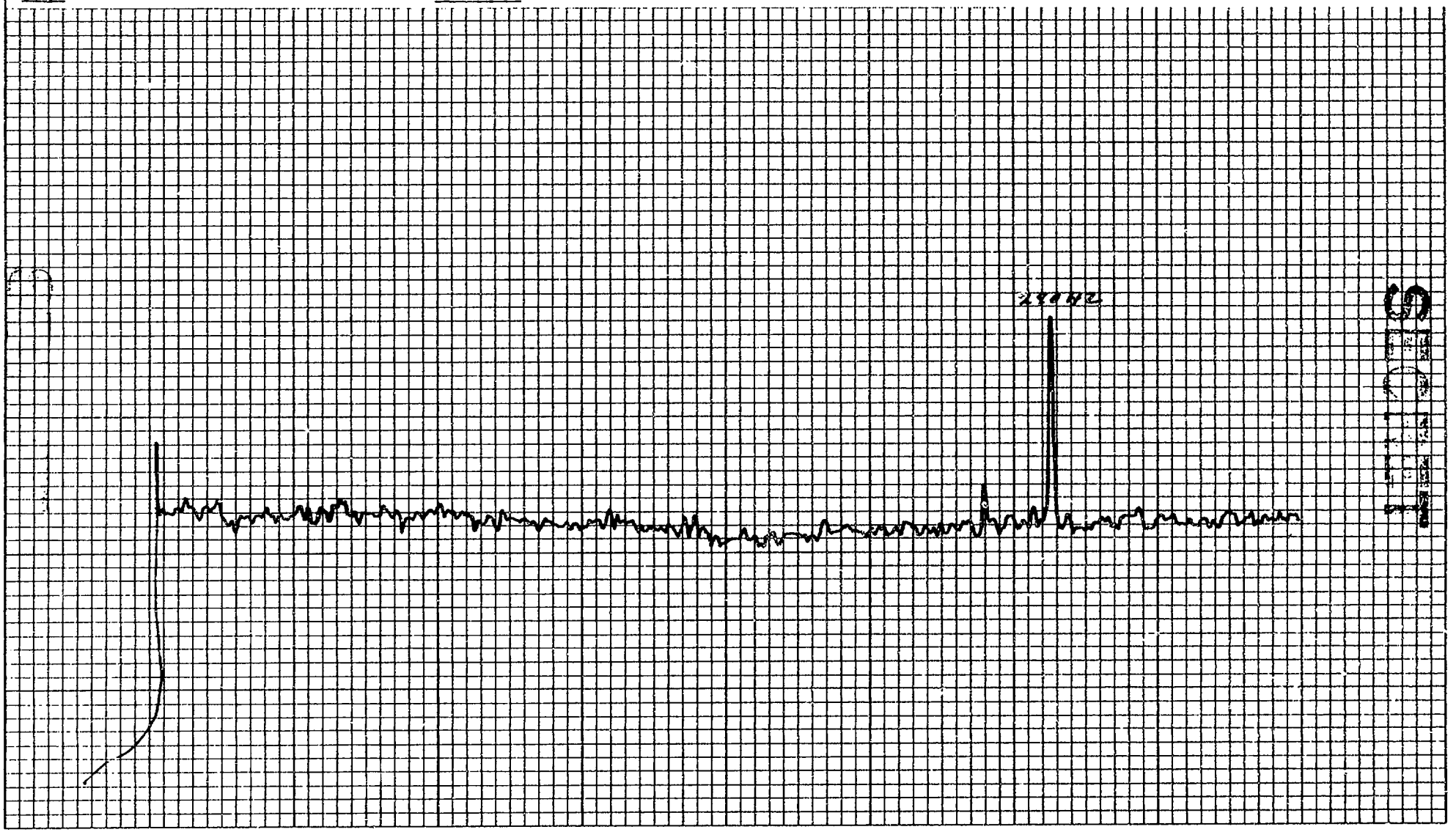
K•E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 0633 - 32 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 9-26 & 29-35)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-97 -0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+61.5 DEG. AZ STEERING

REEL: M19
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 1637
ATTEN: 18 DB



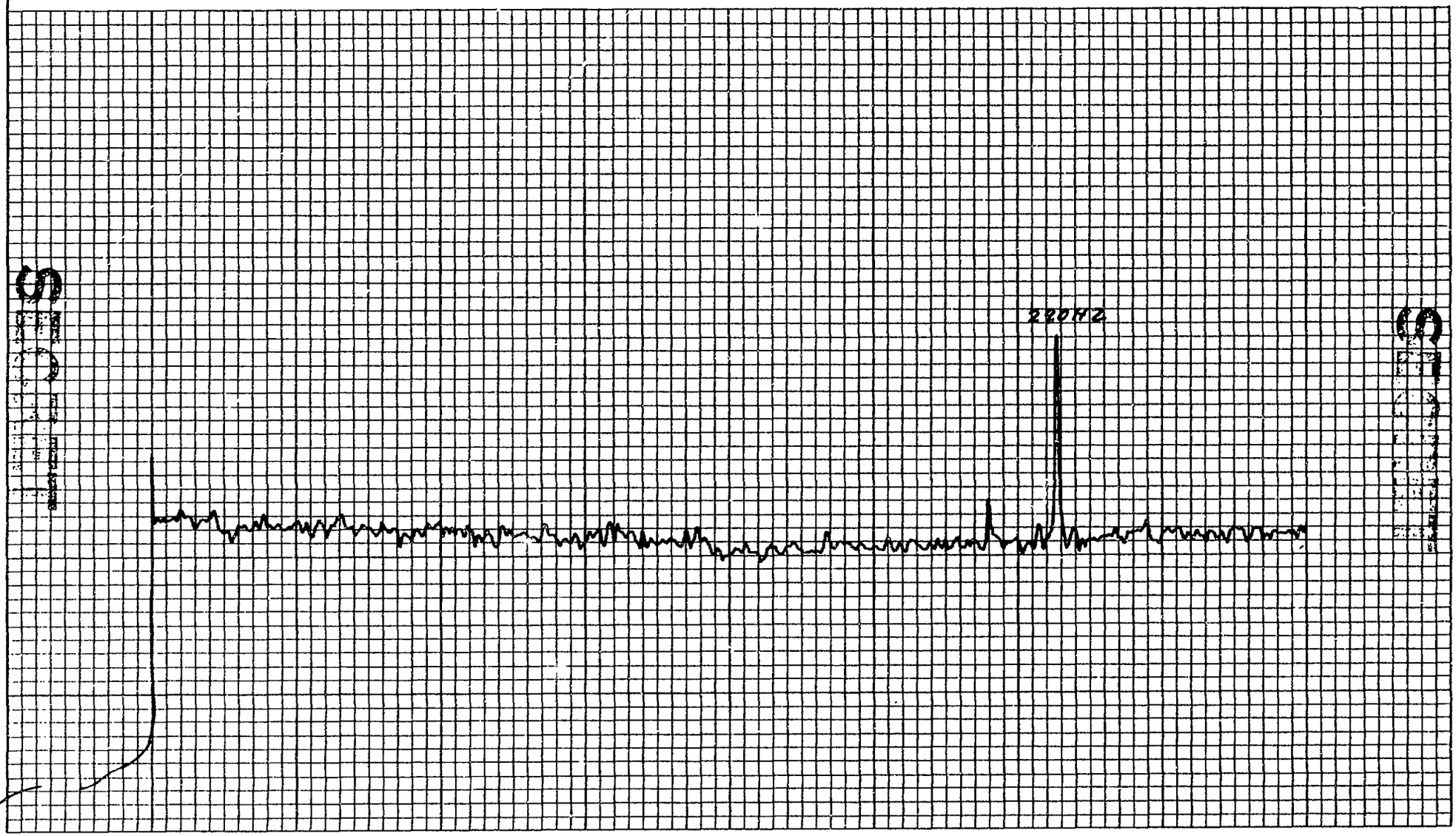
K•E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 0633 - 32 (DP16)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 9-26 & 29-35)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 376-77 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+62 DEG. AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: 18 DB
FILTER WTG: HANNING



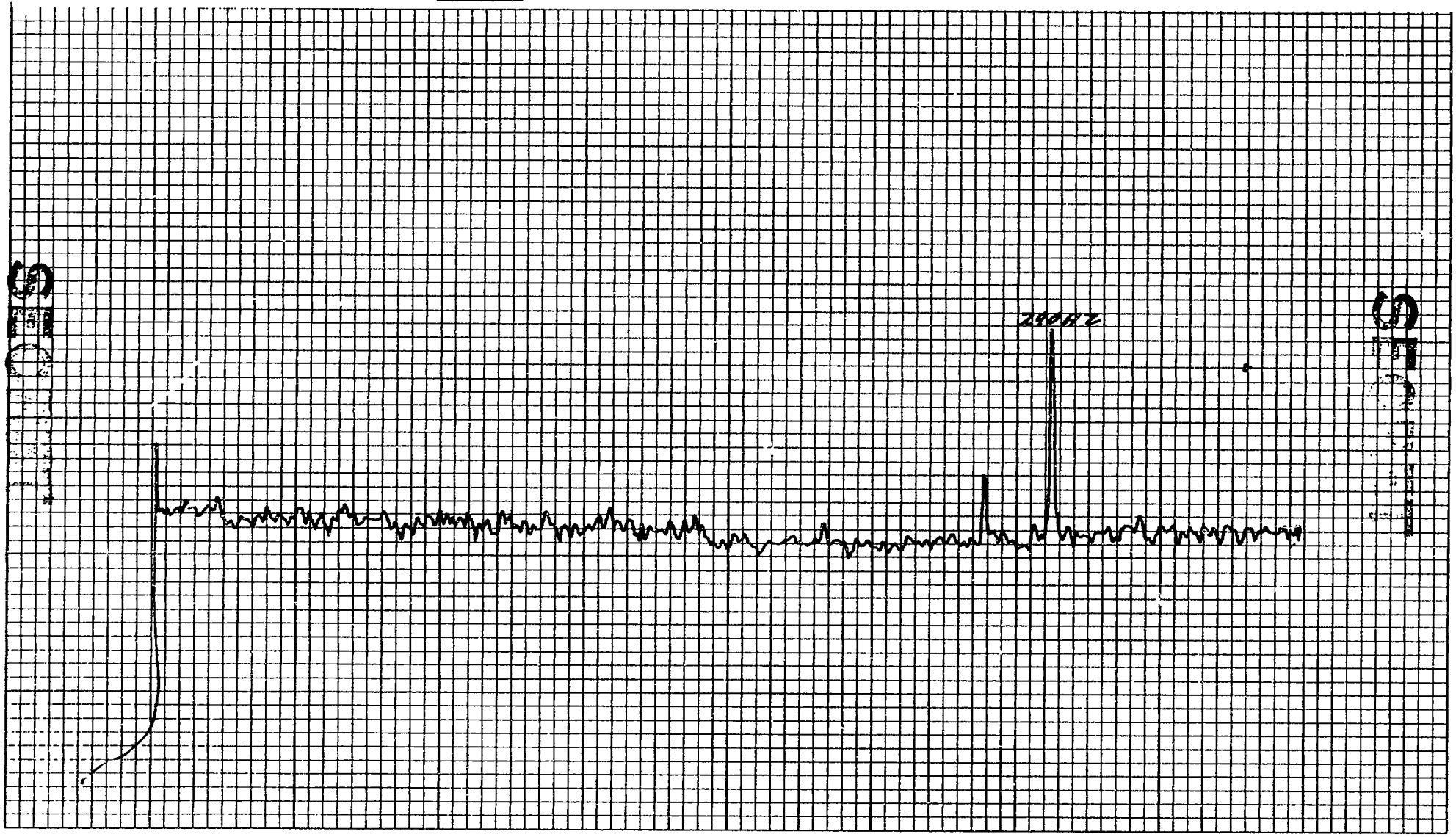
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

3B-3B

CONTROL: 0633 - 32 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 + 9-26 + 29-35)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+62.5 DEG. AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: 18 DB
FILTER WTG: HANNING



K•E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

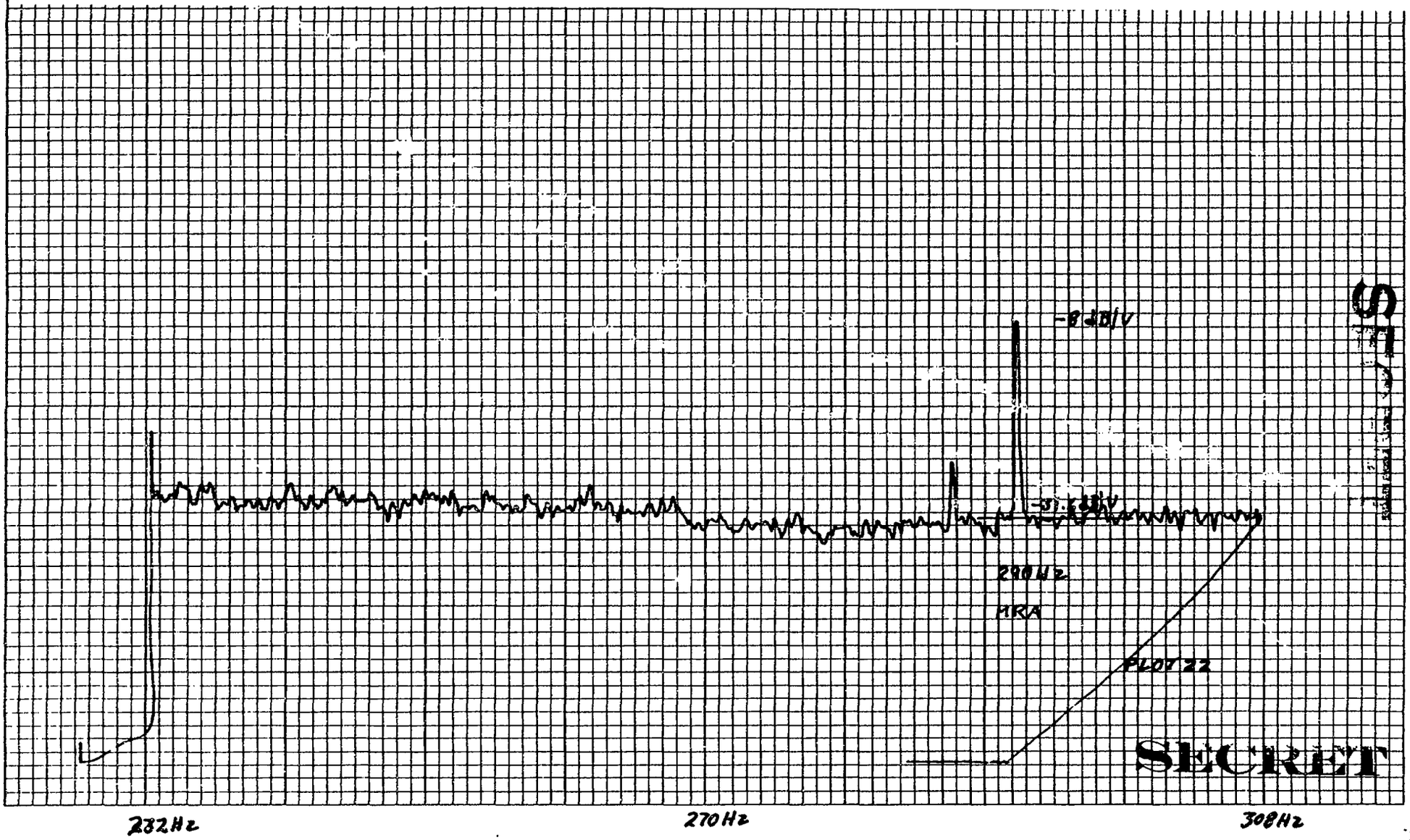
SECRET

CONTROL: 0633 - 49 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS 1 TO 6 9 TO 26 29 TO 35)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: __ ___ __
DATE/TIME: 3-16-77 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+63.0 DEG. AZ STEERING

REEL: M19 INDEX 1637

INTEGRATION TIME 320 SECS ATTEN: - DB
FILTER WTG: HANNING



K•E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

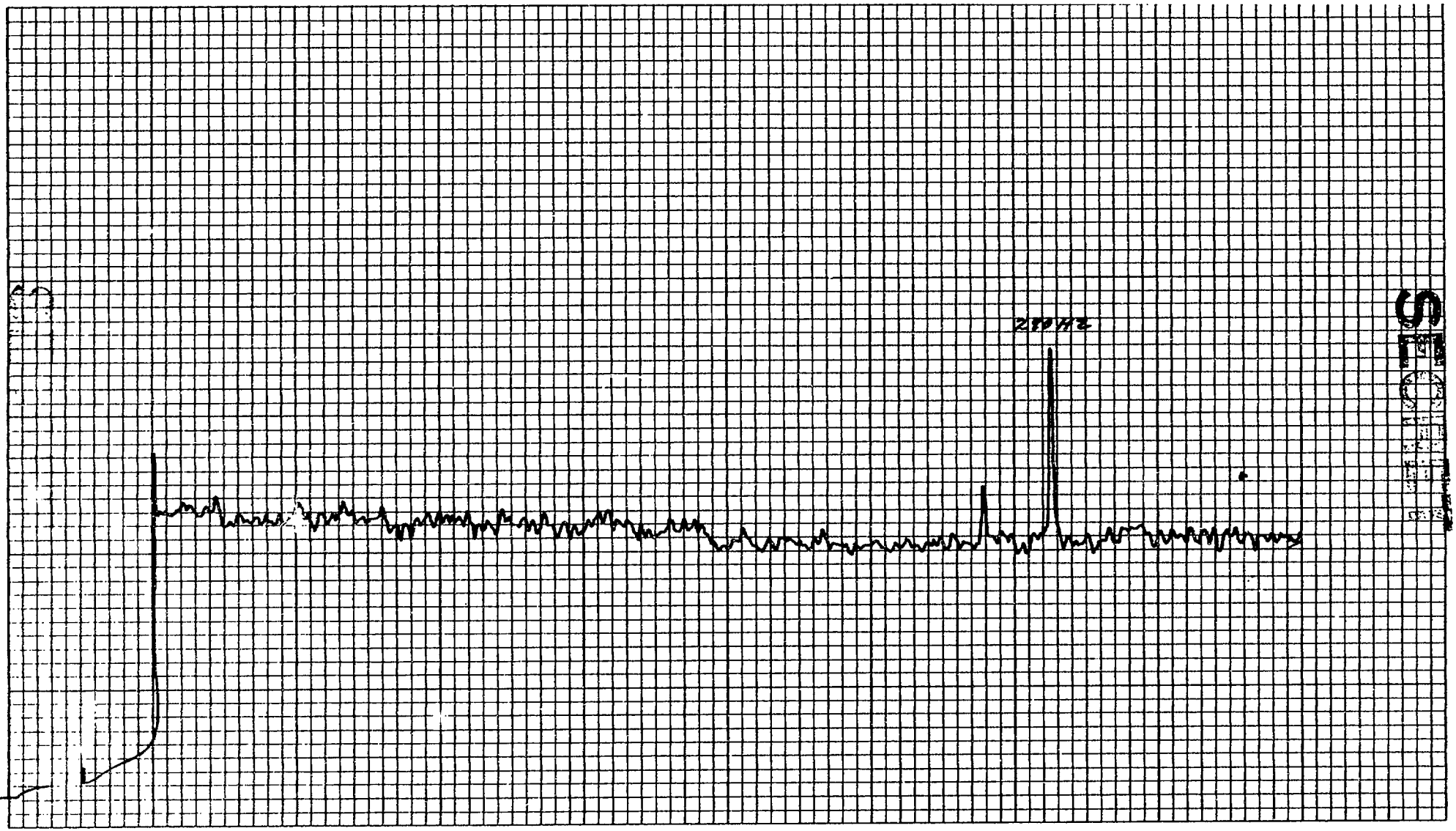
46 0703

CONTROL: 0633 - 32 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
1-6 & 9-26 & 29-35)
DATE/TIME: 3-16-77 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+64 DEG. AZ STEERING

REEL: M19 INDEX 1637

INTEGRATION TIME 320 SECS ATTEN: -10 DB
FILTER WTG: HANNING



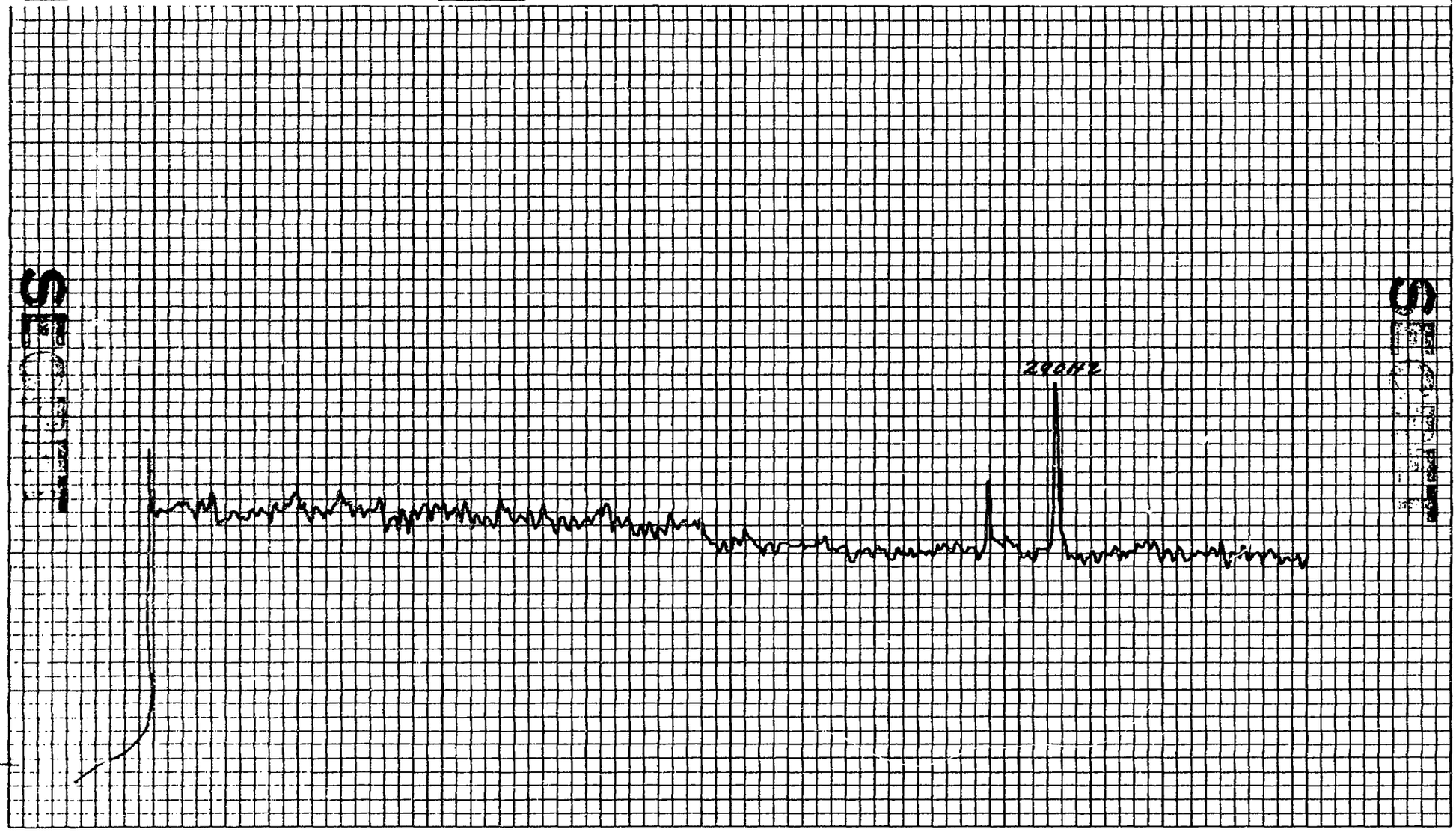
K•E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 0683 - 32 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 8-26 & 28-35)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 346-77 -0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+66 DEG. AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: -10 DB
FILTER WTG: HANNING



K•E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

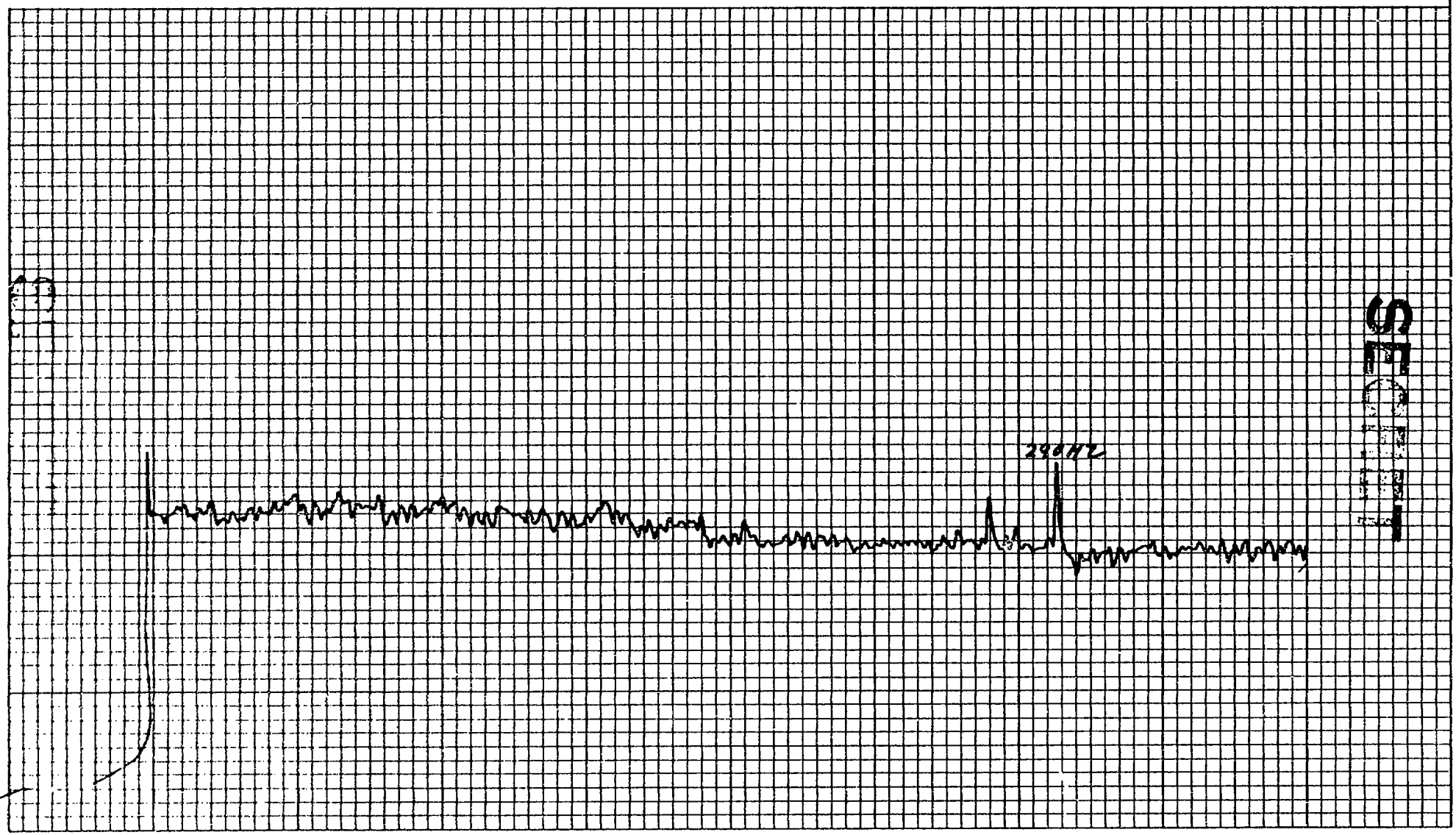
46 0703

CONTROL: 0633-32 (0910)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 9-26 & 29-35)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 3-16-77 - 0033 Z
ANALYSIS BANDWIDTH: 1/10HZ
+68 DEG. AZ STEERING

REEL: M19
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 1637
ATTEN: -18 DB

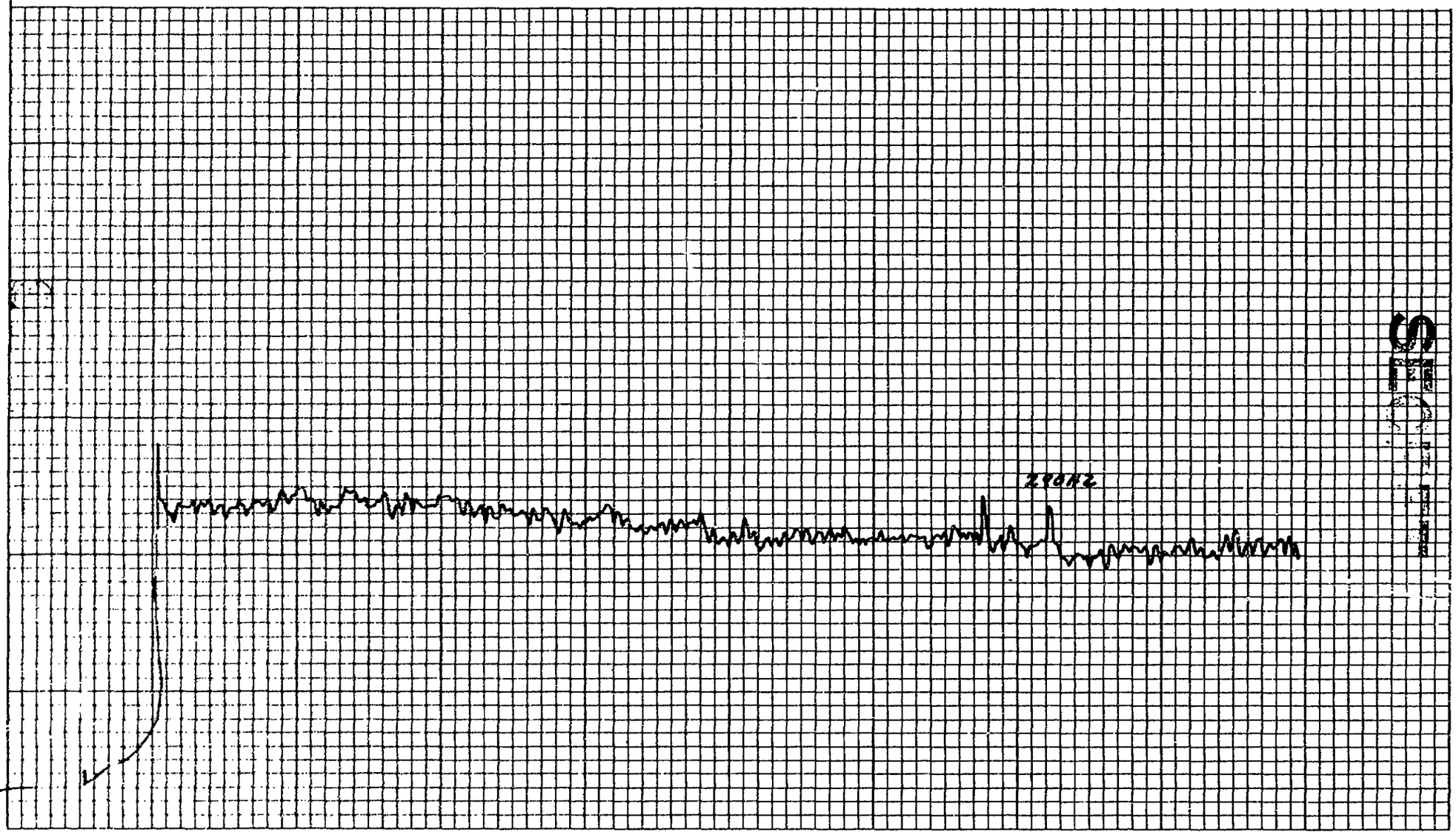


K•E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 0633 - 32 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 8-26 & 28-35)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+72 DEG. AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: 18 DB
FILTER WTG: HANNING



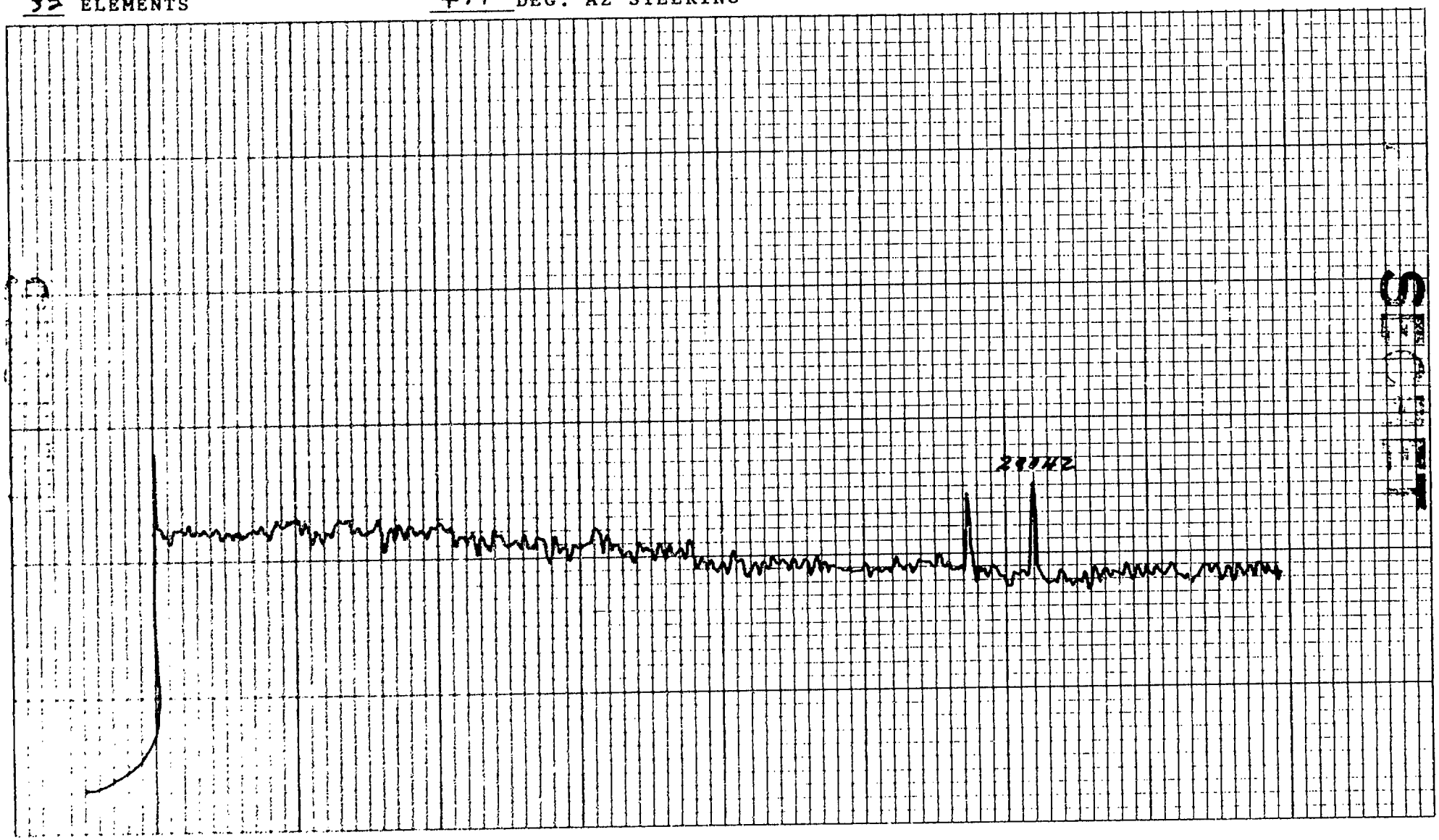
K·E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 0633 - 32 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
1-6 & 9-26 & 29-35)
DATE/TIME: 3-16-77 - 0633Z
ANALYSIS BANDWIDTH: 1/10HZ
+74 DEG. AZ STEERING

REEL: M19 INDEX 1637

INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTC: HANNING



SIGNAL LEVEL AND SNR

CALCULATIONS

DATA POINT 10 FREQUENCY 140 HZ NUMBER OF ELEMENTS 49

SIGNAL LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-21.6	
MCPS-32 CAL. CORRECTION	+10	-11.6	
BEAMFORMER GAIN	+24	+12.4	SIG. LEVEL FOR SNR CALCULATION
MRA CORRECTION	+ .2	+12.6	SIG. LEVEL FOR SIGNAL GAIN

NOISE LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-54.4	
MCPS-32 CAL. CORRECTION	+10	-44.4	
BEAMFORMER GAIN	+24	-20.4	NOISE LEVEL FOR SNR CALCULATION

SIGNAL-NOISE-RATIO

SIGNAL LEVEL FOR SNR		+12.6	
SIGNAL LEVEL FOR SNR	-20.4	33.0	
PROCESSOR CORRECTION	- 4.0	29.0	
MRA CORRECTION	+ .2	29.2	SNR 1/10 HZ BAND
BANDWIDTH CONVERSION	- 8.2	21.0	SNR 1 HZ BAND

SIGNAL LEVEL AND SNR CALCULATIONS

DATA POINT 10 FREQUENCY 290 HZ NUMBER OF ELEMENTS 49

SIGNAL LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-39.0	
MCPS-32 CAL. CORRECTION	+10	-29.0	
BEAMFORMER GAIN	+24	-5.0	SIG. LEVEL FOR SNR CALCULATIO
MRA CORRECTION	+ .9	-4.1	SIG. LEVEL FOR SIGNAL GAIN

NOISE LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-64.1	
MCPS-32 CAL. CORRECTION	+10	-54.1	
BEAMFORMER GAIN	+24	-30.1	NOISE LEVEL FOR SNR CALCULATION

SIGNAL-NOISE-RATIO

SIGNAL LEVEL FOR SNR		-5.0	
SIGNAL LEVEL FOR SNR	-30.1	25.1	
PROCESSOR CORRECTION	- 4.0	21.1	
MRA CORRECTION	+ .9	22.0	SNR 1/10 HZ BAND
BANDWIDTH CONVERSION	- 8.2	13.8	SNR 1 HZ BAND

DATA POINT 10

SIGNAL GAIN

	140 HZ	290HZ	295HZ
MEAN OMNI SIGNAL LEVEL	-23.3	-30.0	
MRA SIGNAL LEVEL	+12.6	-4.1	
ARRAY SIGNAL GAIN	35.9	33.9	
20 LOG 49 (# of elements)	33.8	33.8	
DIFFERENCE	+2.1	+.1	

ARRAY GAIN

MRA SNR	29.2	22.0	
MEAN OMNI SNR	18.7	9.4	
ARRAY GAIN	10.5	12.6	
THEORETICAL AZMUTH GAIN (at MRA)	12.4	15.0	
DIFFERENCE	-1.9	-2.4	

K•E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

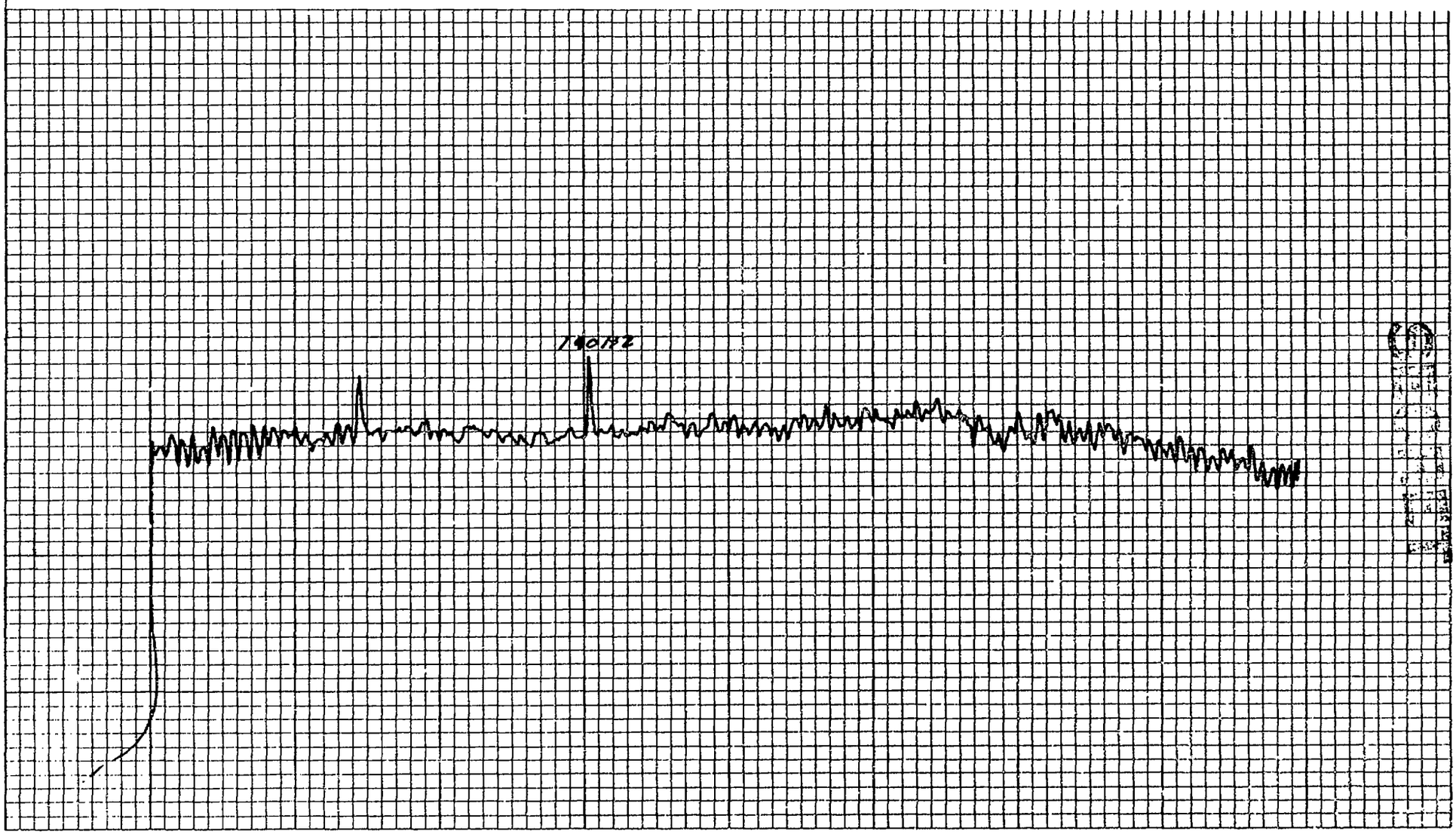
46 0703

CONTROL: 0633 - 49 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
49 ELEMENTS

DATE OF ANALYSIS: - - -
1-6 & 9-26 & 28-53)
DATE/TIME: 3-16-77 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+54 DEG. AZ STEERING

REEL: M19 INDEX 1637

INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

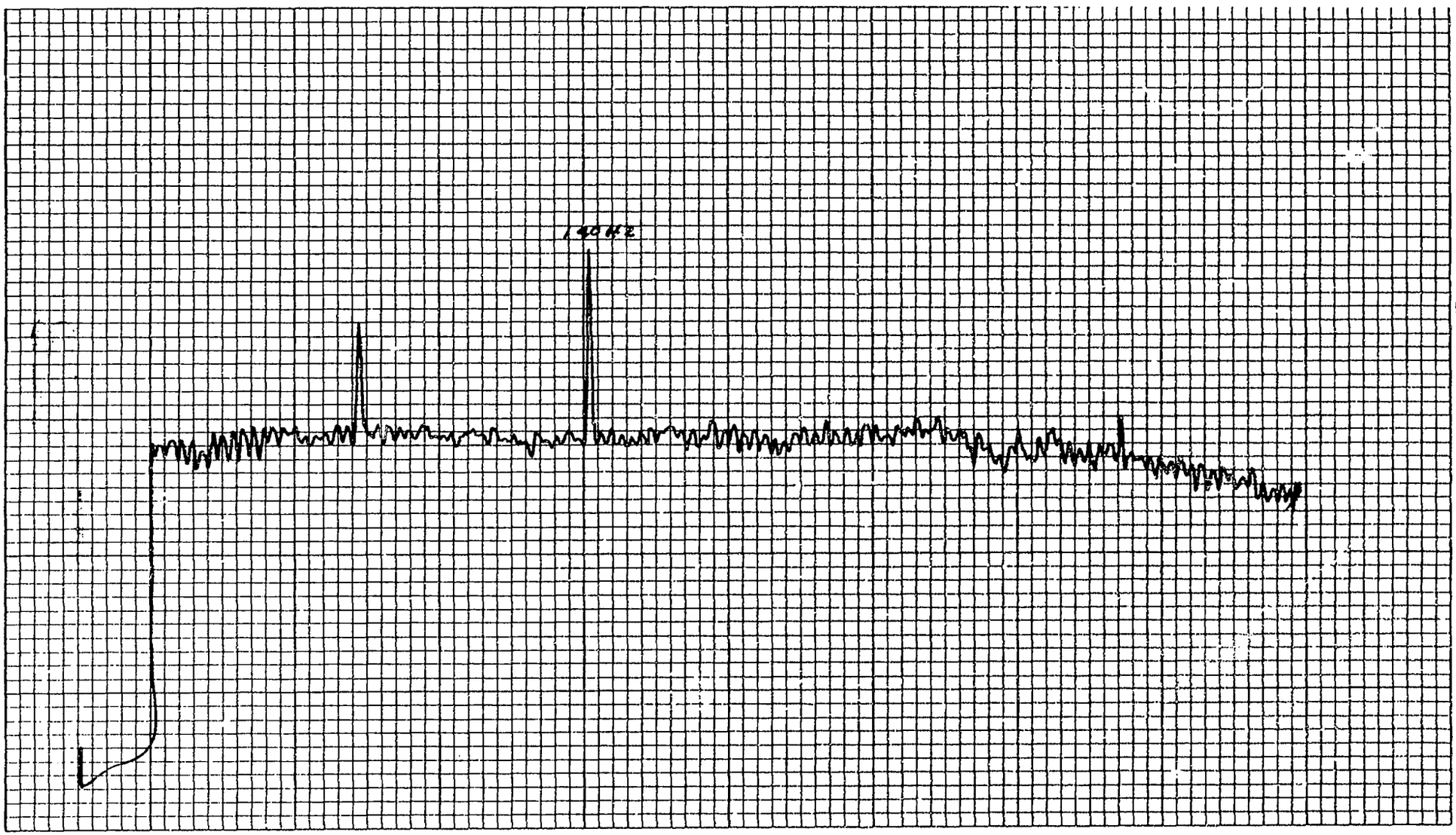
45 0703

14-4-4

CONTROL: 0633 - 49 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 9-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
49 ELEMENTS

DATE OF ANALYSIS: -- -- --
DATE/TIME: 3-16-77 - 0633Z
ANALYSIS BANDWIDTH: 1/10HZ
+56 DEG. AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



K•E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 0633 - 49 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 9-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
49 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 -0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+50 DEG. AZ STEERING

REEL: M19 INDEX 1637

INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING

K•E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 0633 - 49 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 9-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
49 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 -0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+60 DEG. AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING

K•E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

41-47

CONTROL: 0633 - 19 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 9-26 & 29-35)
EXERCISE: BEARING STAKE
CENTER FREQ: 152 HZ
49 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 -0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+61.5 DEG. AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: -04 DB
FILTER WTG: HANNING

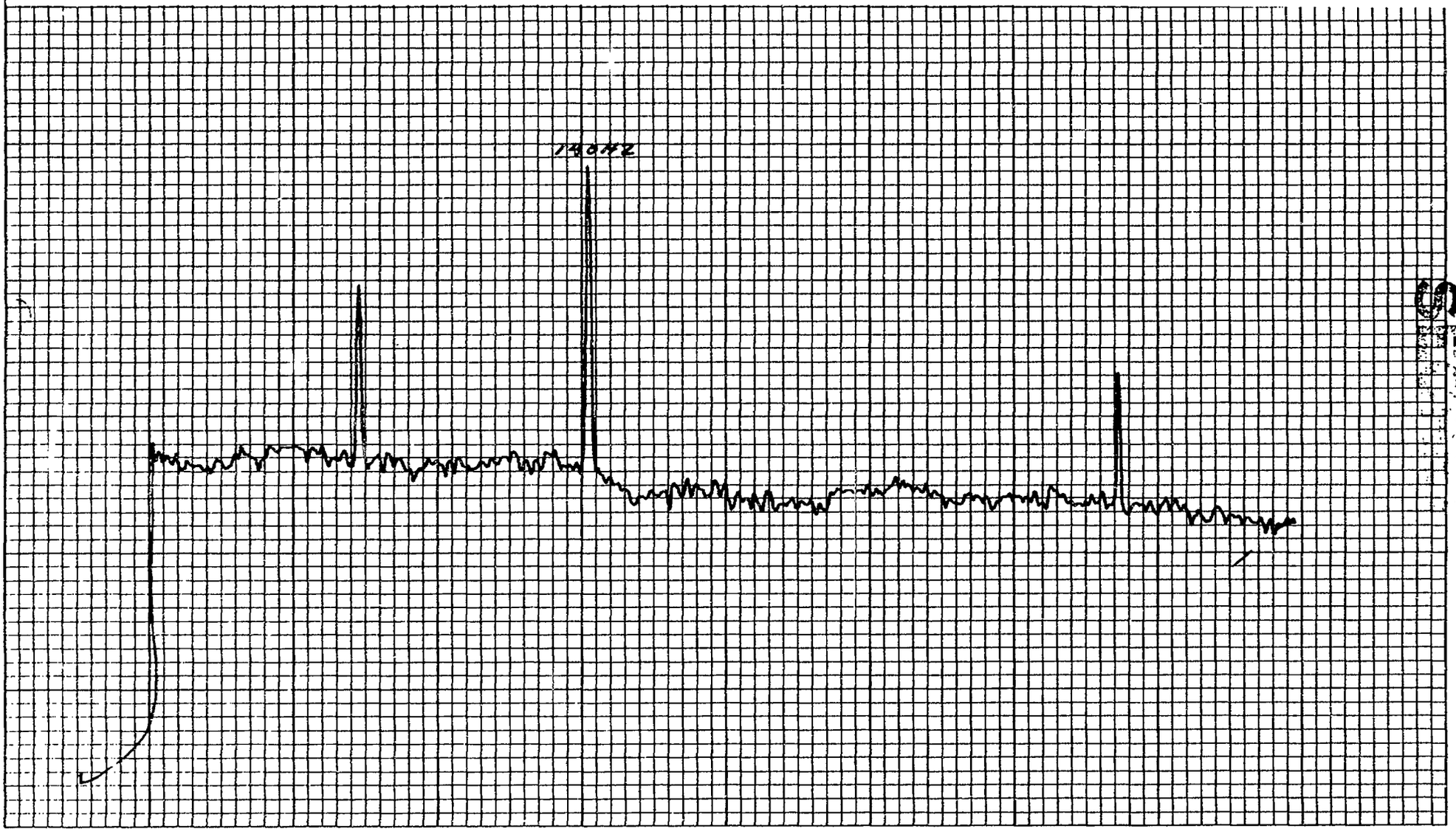
K•E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 0633 - 49 (DP16)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 9-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
49 ELEMENTS

DATE OF ANALYSIS: _ _ _
DATE/TIME: 3-16-77 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+62 DEG. AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



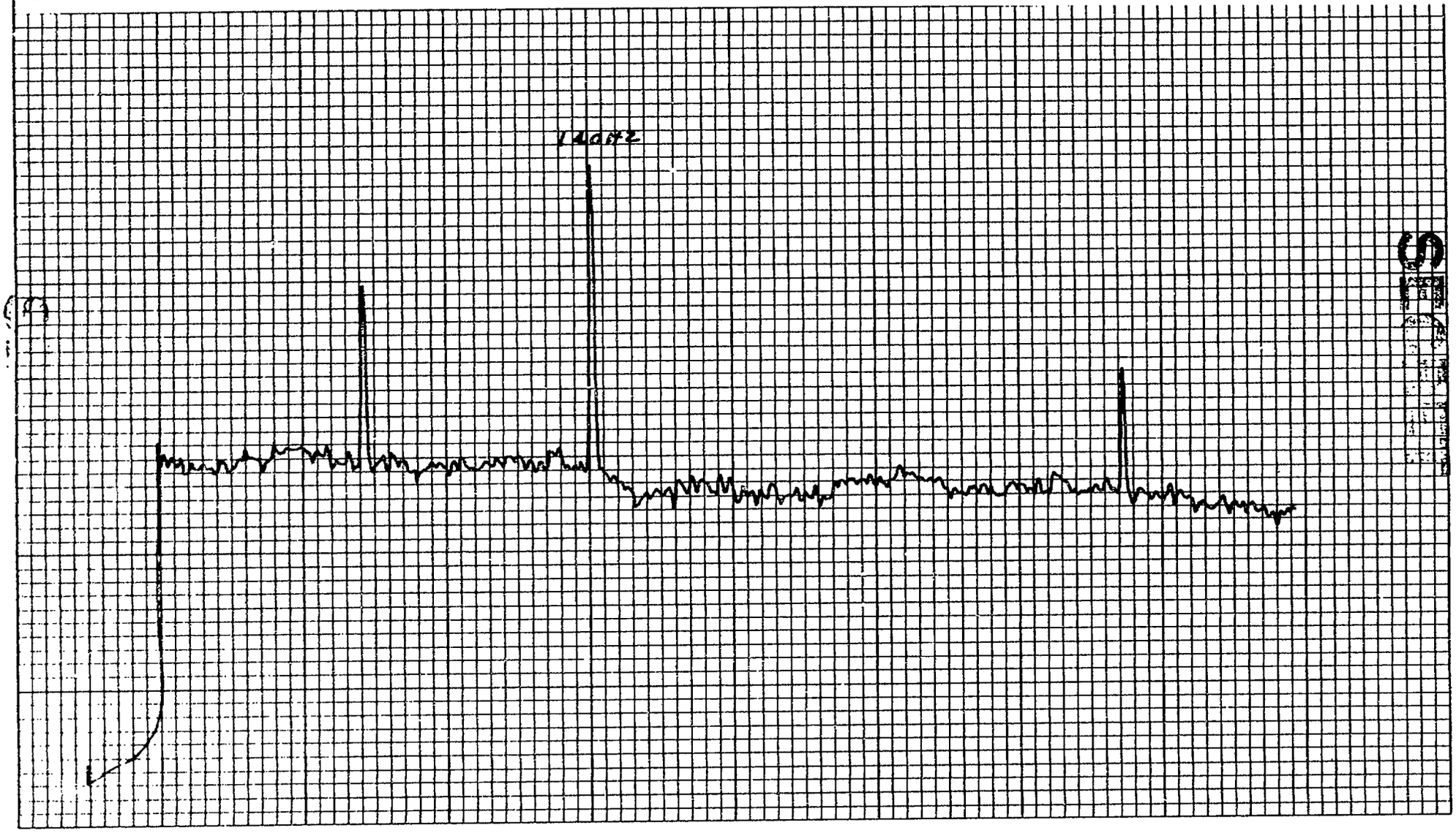
K•E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 0633 - 49 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 9-26 & 29-35)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
49 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 0633Z
ANALYSIS BANDWIDTH: 1/10HZ
+62.25 DEG. AZ STEERING

REEL: M19 INDEX 1637

INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



K•E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

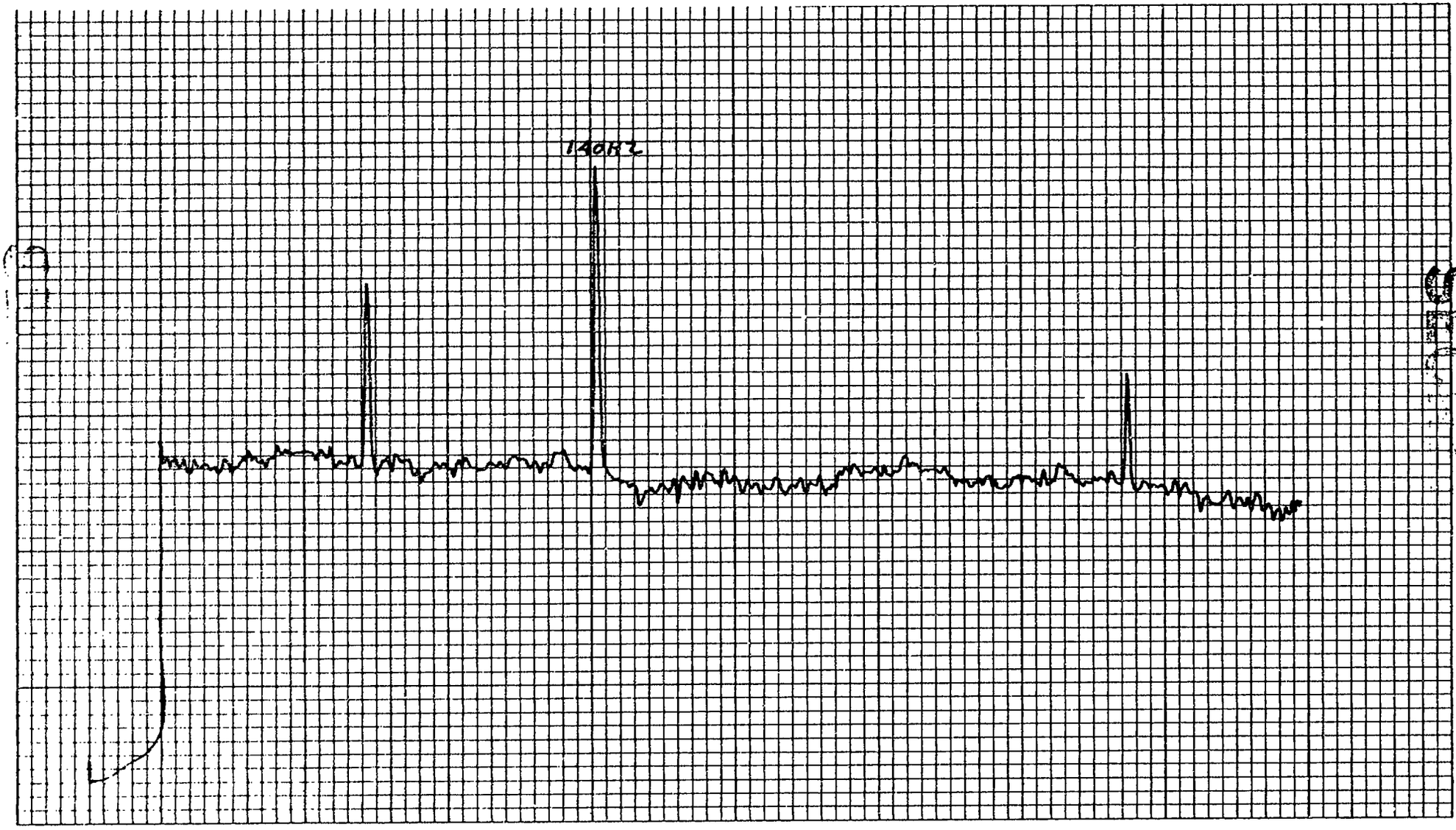
46 0703

CONTROL: 0633 - 49 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 9-26 & 29-35)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
49 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+63 DEG AZ STEERING

REEL: M19 INDEX 1637

INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



K•E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

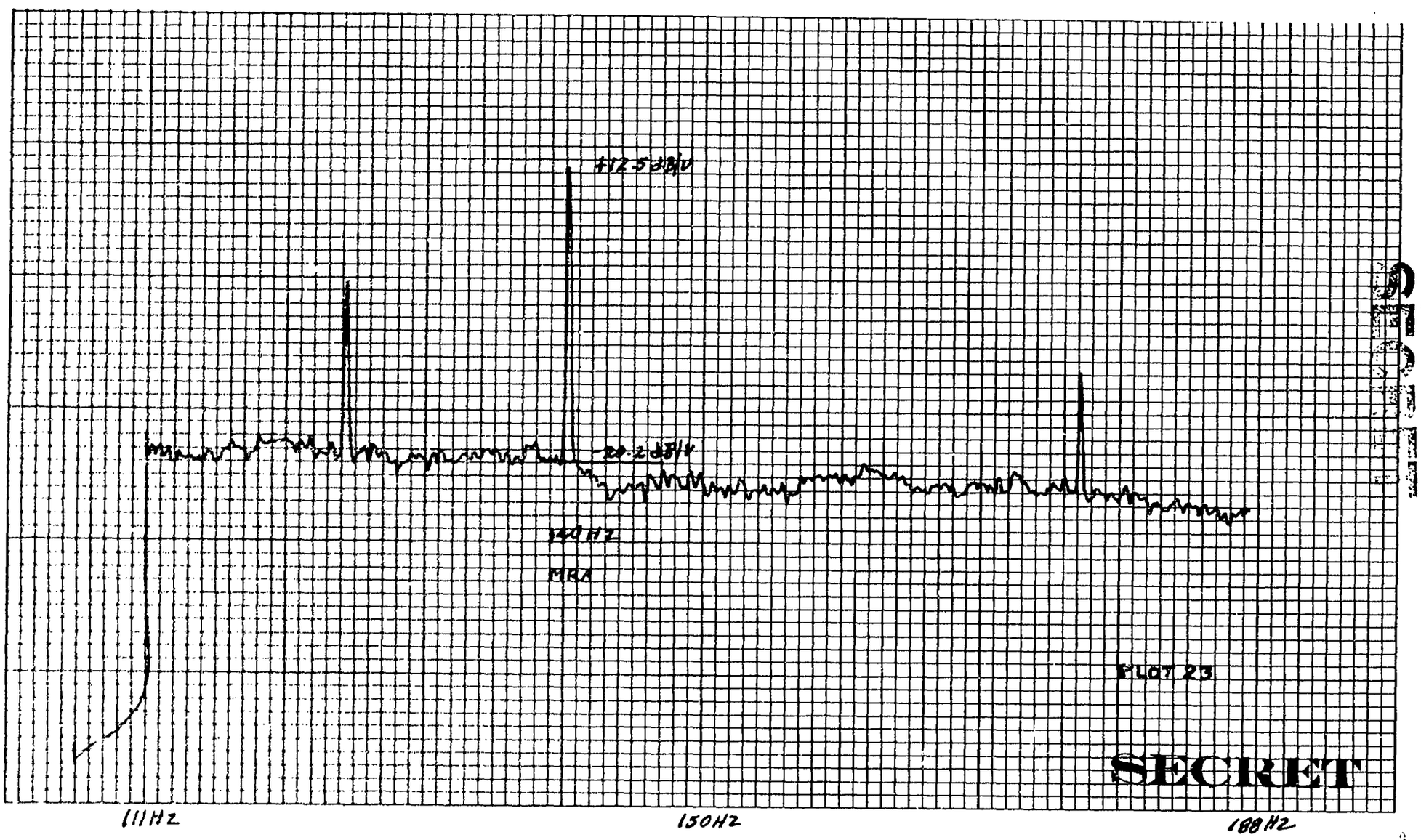
SECRET

CONTROL: 0633 - 49 (DP16)
BEAMFORMED SPECTRUM(ELEMENTS 1 TO 6 9 TO 26 29 TO 53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
49 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 3-16-77 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+62.5 DEG. AZ STEERING

REEL: M19 INDEX 1637

INTEGRATION TIME 320 SECS ATTEN: - DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 0633 - 49 (0010)
BEAMFORMED SPECTRUM(ELEMENTS 1-64 9-64 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
49 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 -0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+64 DEG. AZ STEERING

REEL: M19 INDEX 1637

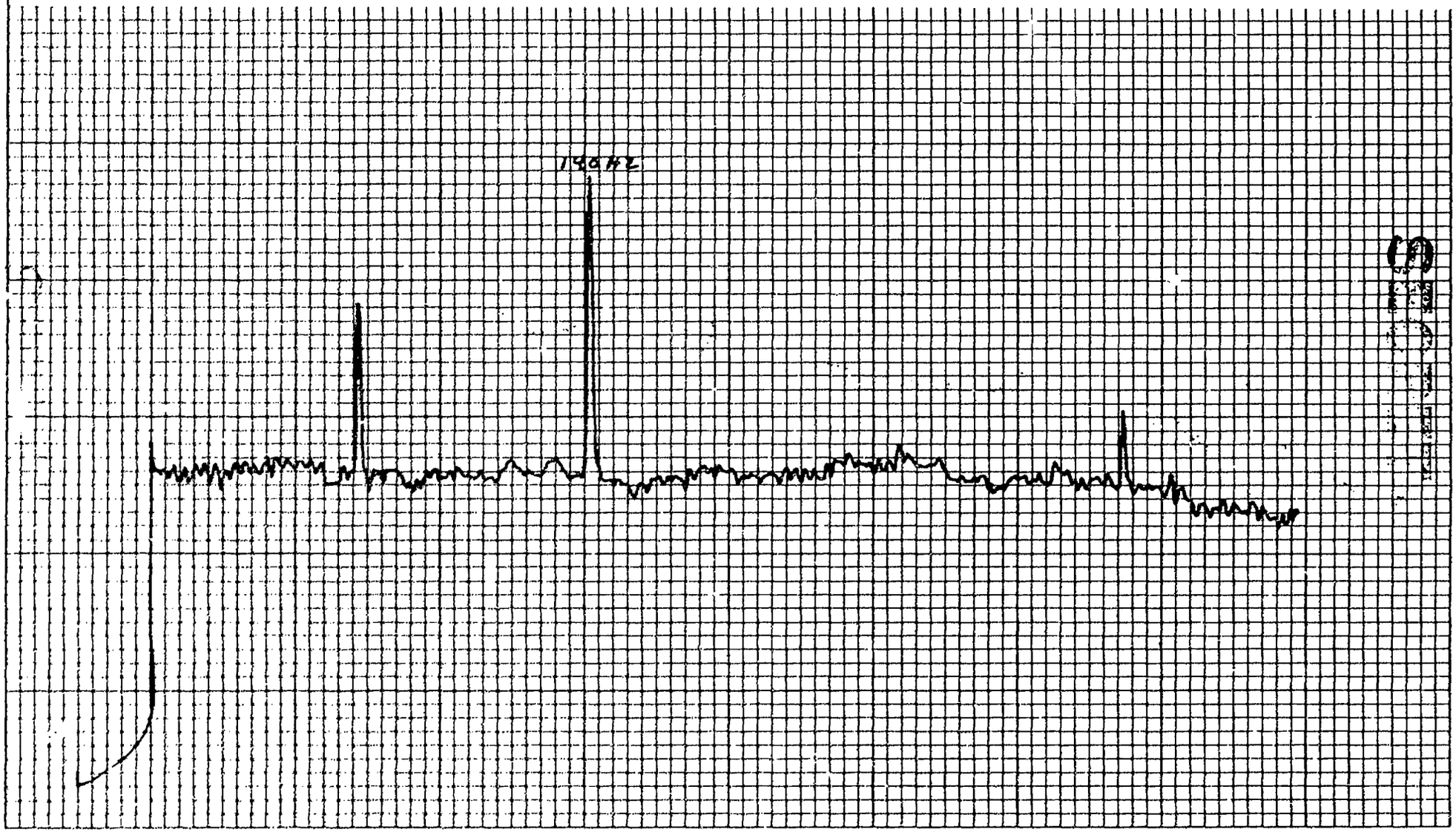
INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING

K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 0673 - 49 (D>10)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 &9-26 &28-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
49 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 0637 Z
ANALYSIS BANDWIDTH: 1/10HZ
+66 DEG. AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



K•E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 0633 - 49 (DD10)
BEAMFORMED SPECTRUM (ELEMENTS 1-6 & 9-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
49 ELEMENTS

DATE OF ANALYSIS: - - .
DATE/TIME: 3-16-77 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+60 DEG. AZ STEERING

REEL: M19
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 1637
ATTEN: -24 DB

K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

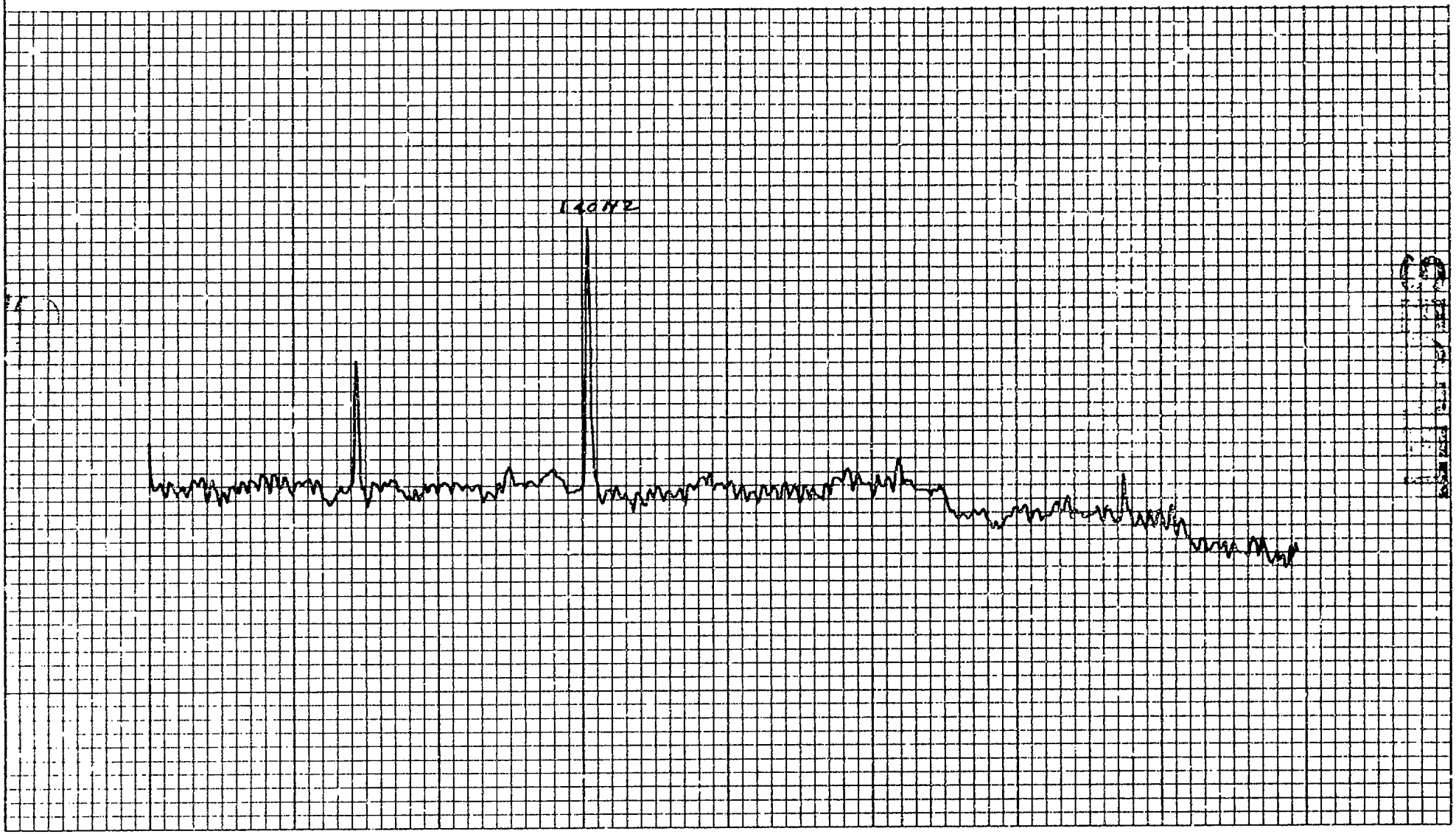
46 0703

25-496

CONTROL: 0633 - 49 (DP10)
BEAMFORMED SPECTRUM (ELEMENTS 1-6 & 9-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
49 ELEMENTS

DATE OF ANALYSIS: ~ ~ ~
DATE/TIME: 3-16-77 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+70 DEG. AZ STEERING

REEL: M19 INDEX 1677
INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING

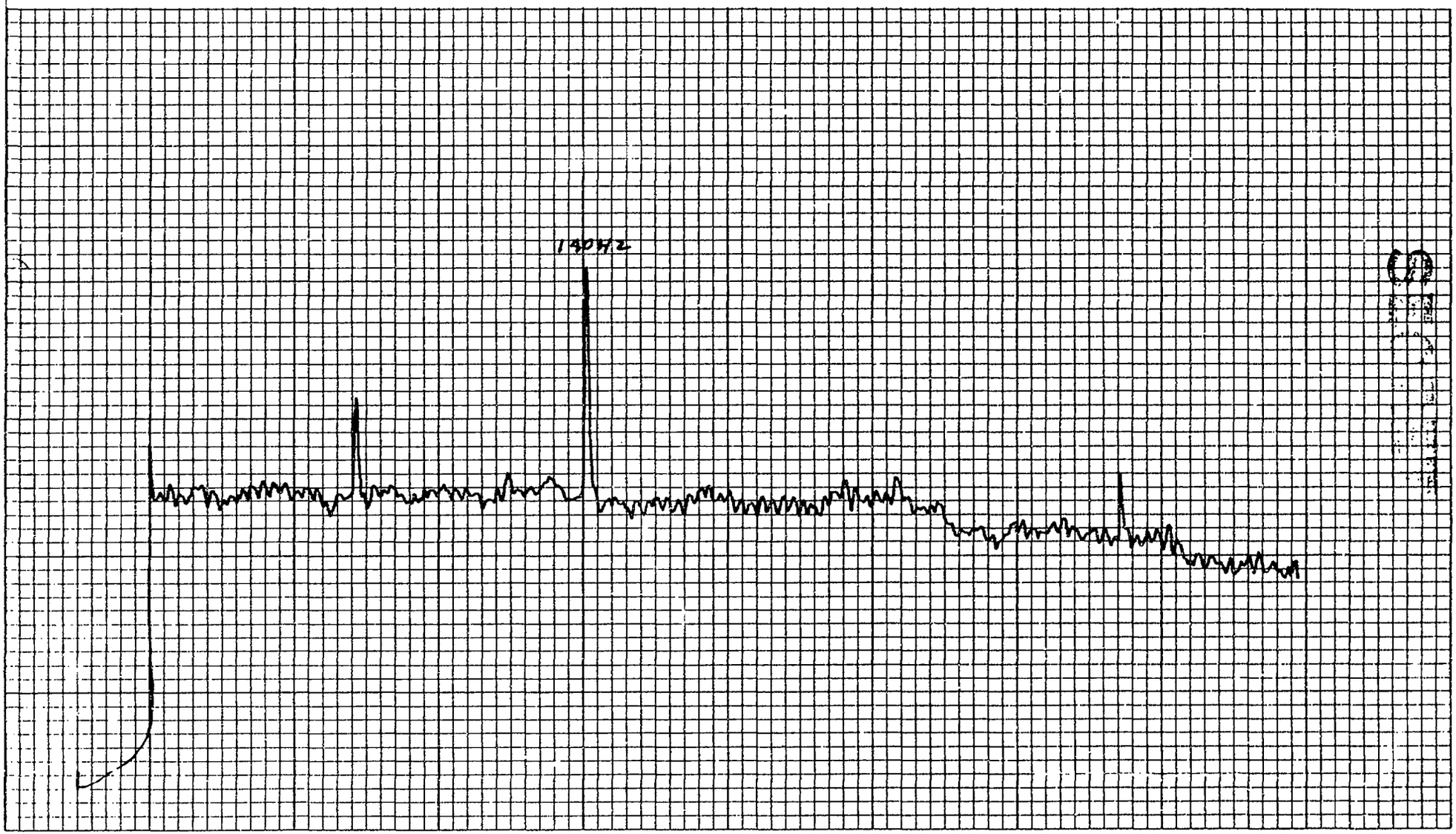


K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 0633 - 49 (DP16)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 9-26 & 28-35)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
49 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3 16-77 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+72 DEG. AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: -7# DB
FILTER WTG: HANNING



K•E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

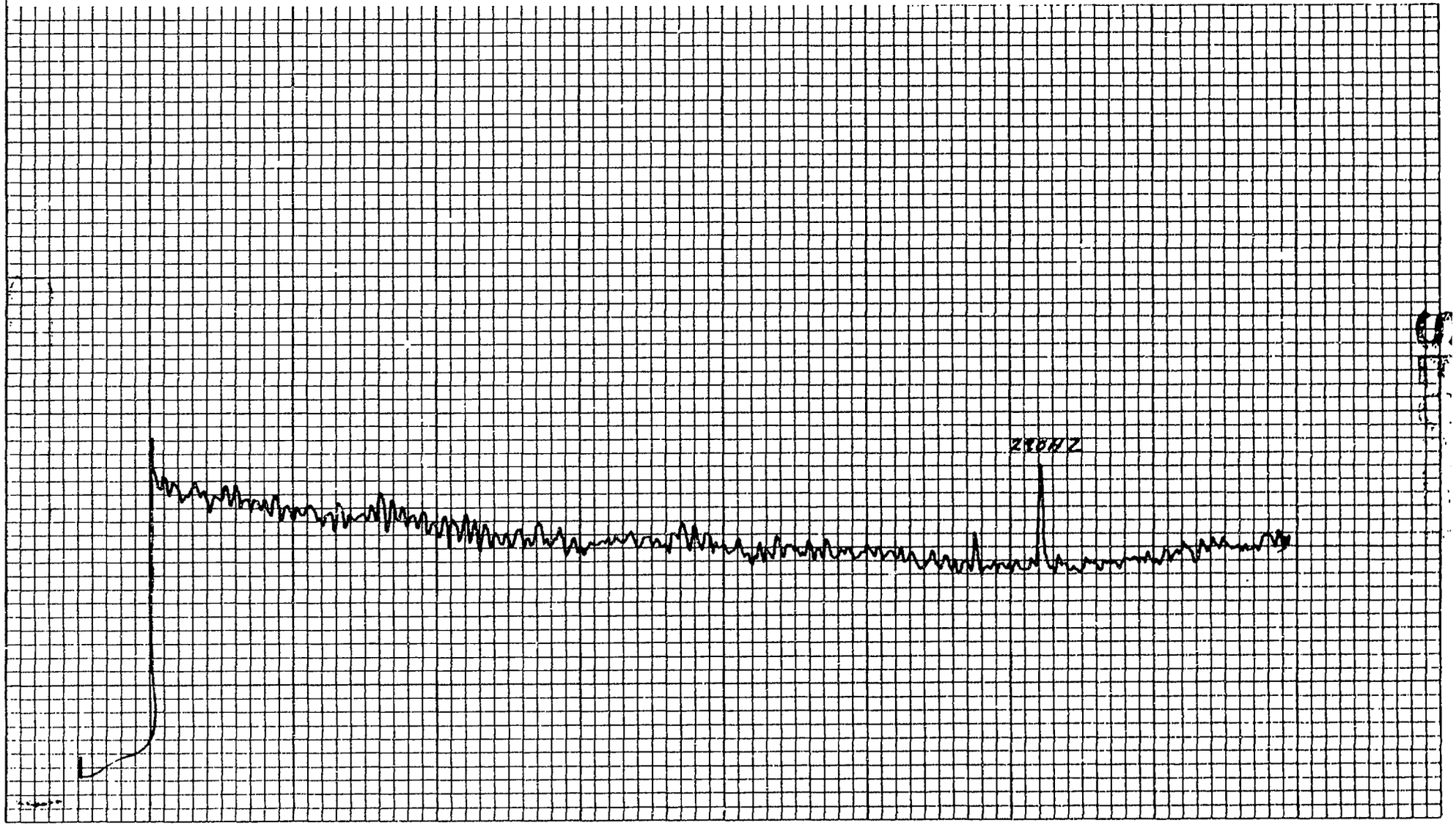
46 0703

CONTROL: 0633 -49 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 9-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
19 ELEMENTS

DATE OF ANALYSIS: ~ ~ ~
DATE/TIME: 3-16-77 -0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+54 DEG. AZ STEERING

REEL: M19 INDEX 1637

INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



K•E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

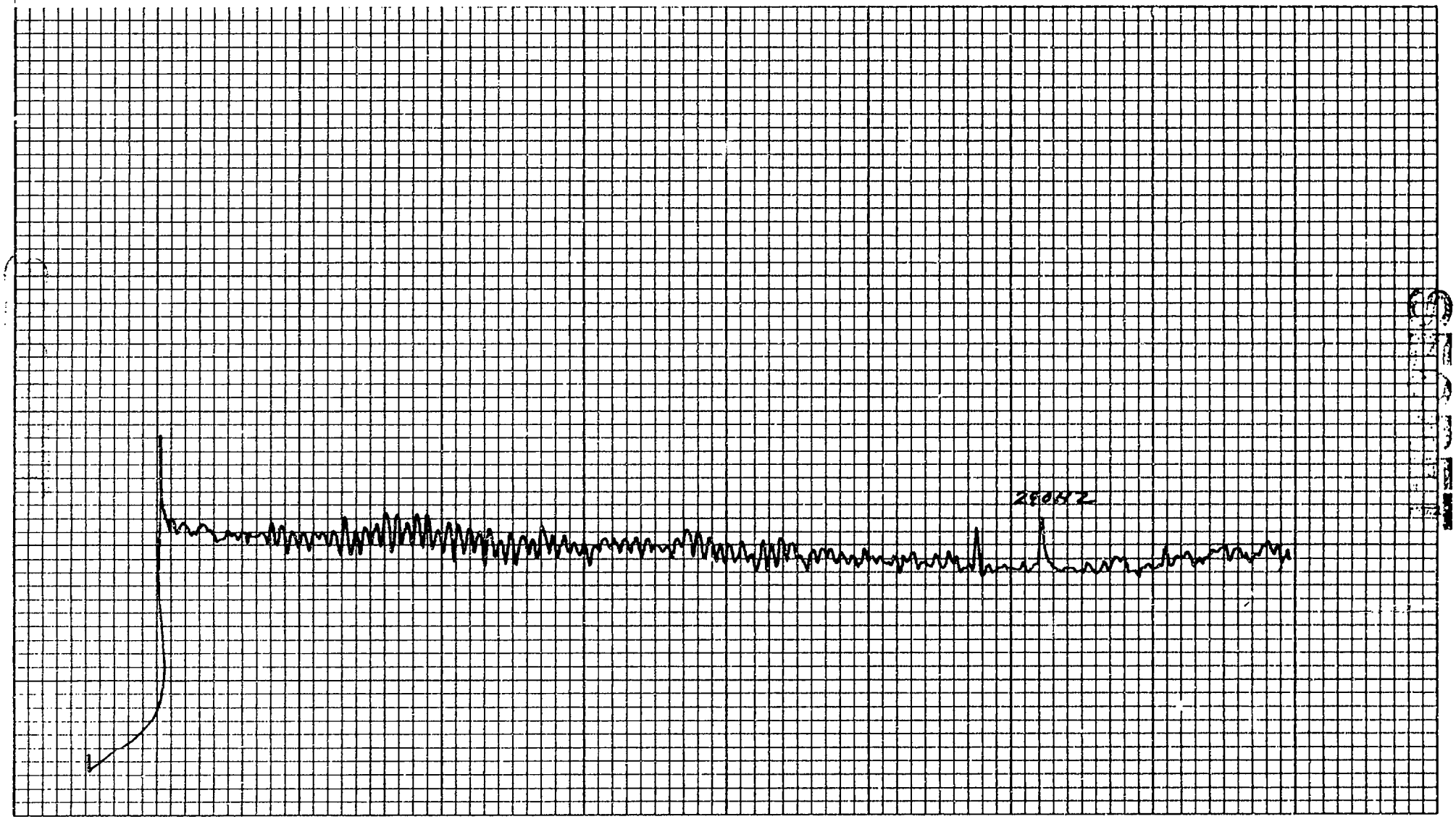
46 0703

CONTROL: 0633 - 49 (DP10)
BEAMFORMED SPECTRUM (ELEMENTS 1-6 & 9-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
49 ELEMENTS

DATE OF ANALYSIS: ~ ~ ~
DATE/TIME: 3-16-77 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+56 DEG. AZ STEERING

REEL: M19
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 1637
ATTEN: -24 DB



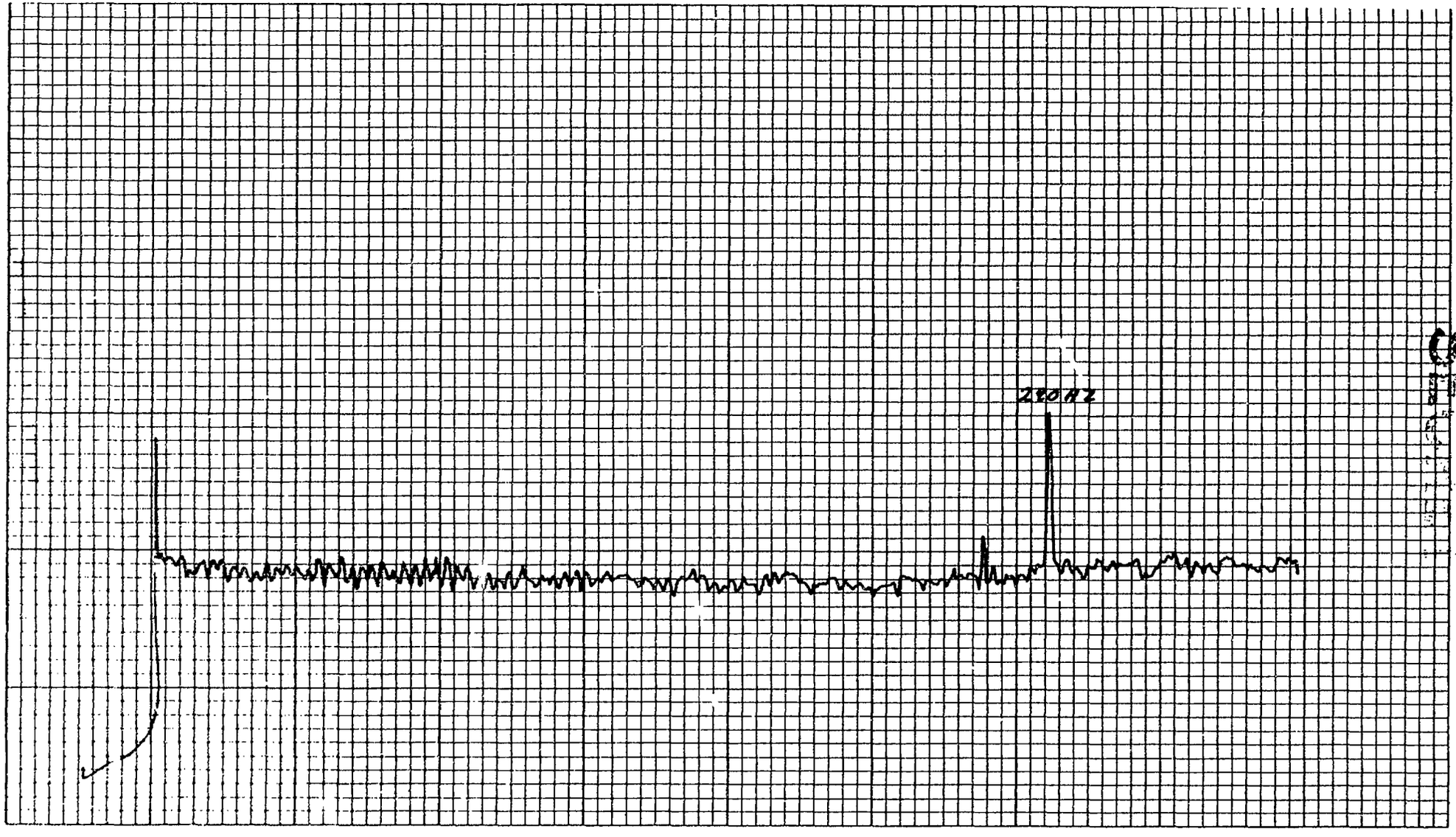
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 0633 - 49 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 9-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
49 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+58 DEG. AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



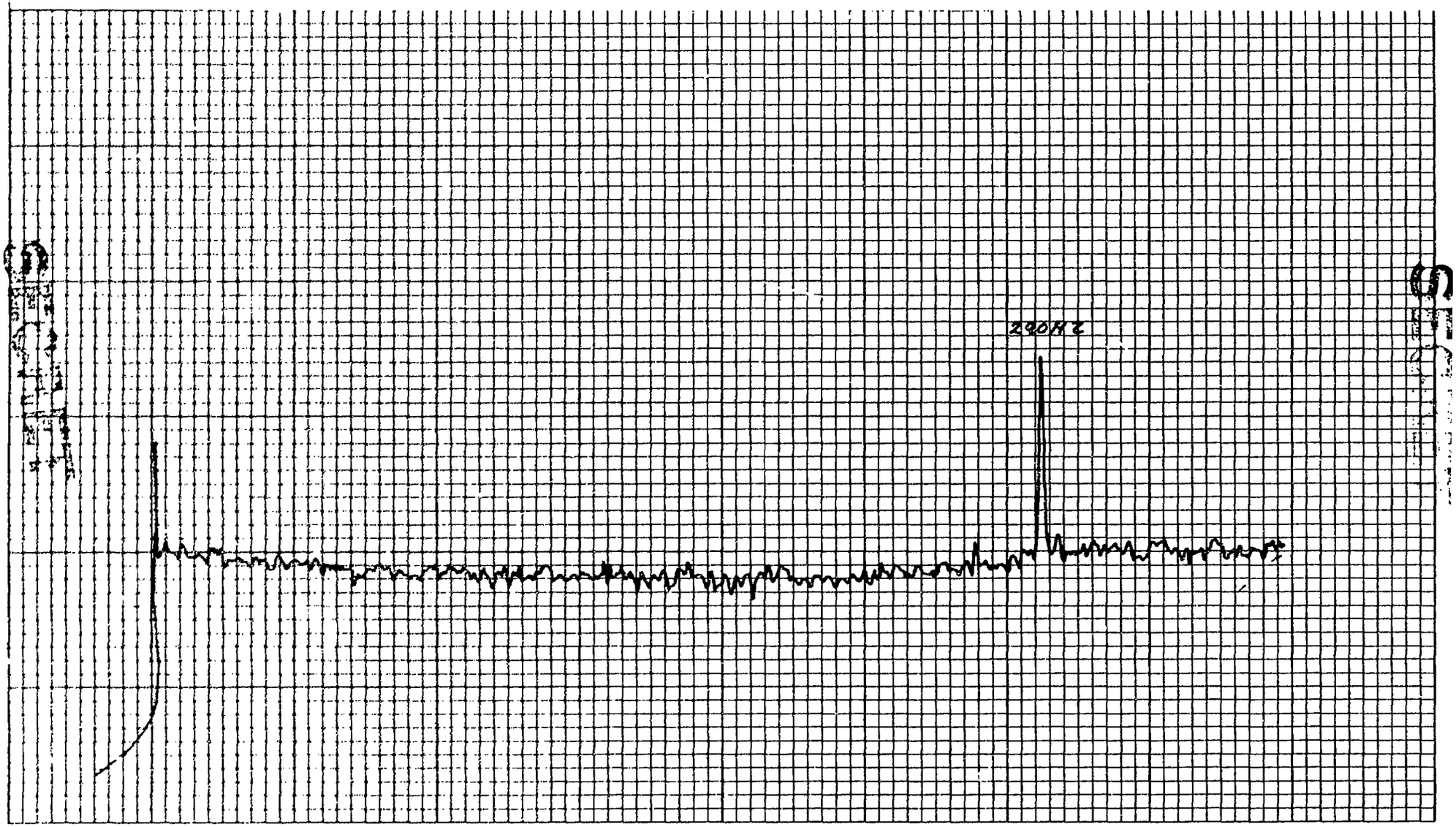
K•E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 0633 - 49 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 8 9-26 28-35)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
49 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 0633Z
ANALYSIS BANDWIDTH: 1/10HZ
+60 DEG. AZ STEERING

REEL: M19 INDEX 1637

INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



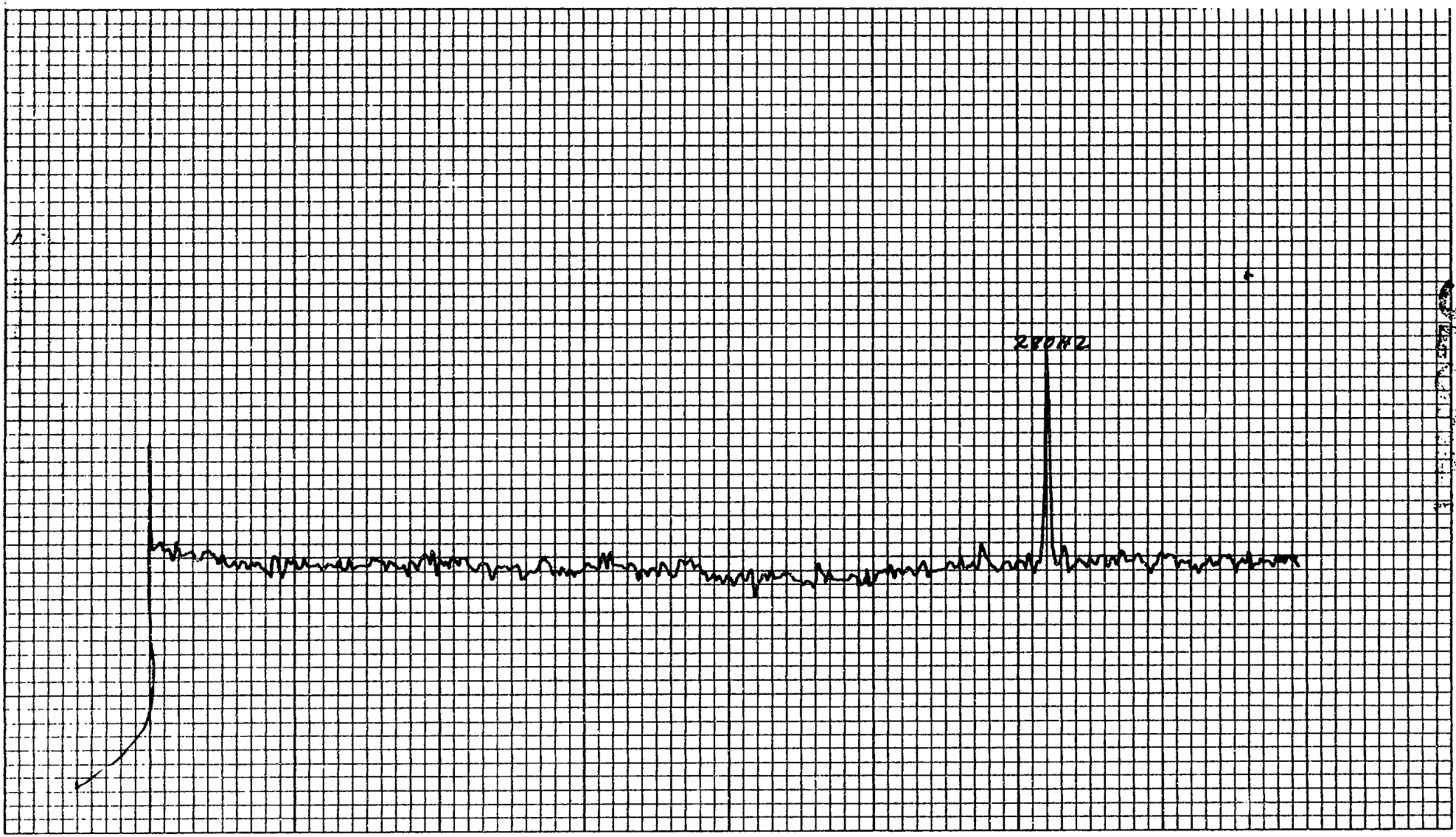
K•E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 0637 - 49 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 49-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
49 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+61.5 DEG. AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



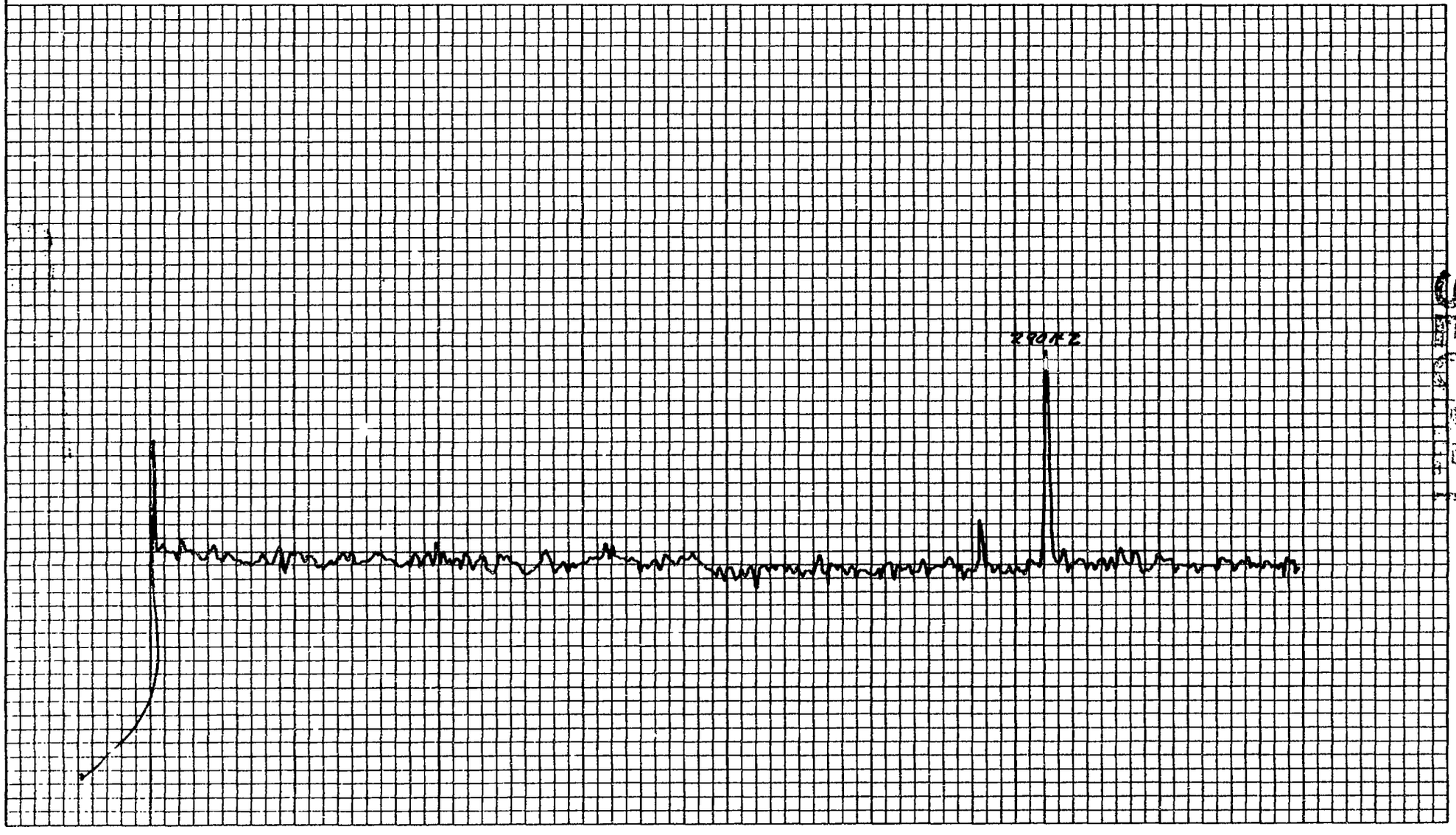
K•E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 0633-49 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 8-26 & 29-35)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
49 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+62 DEG. AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



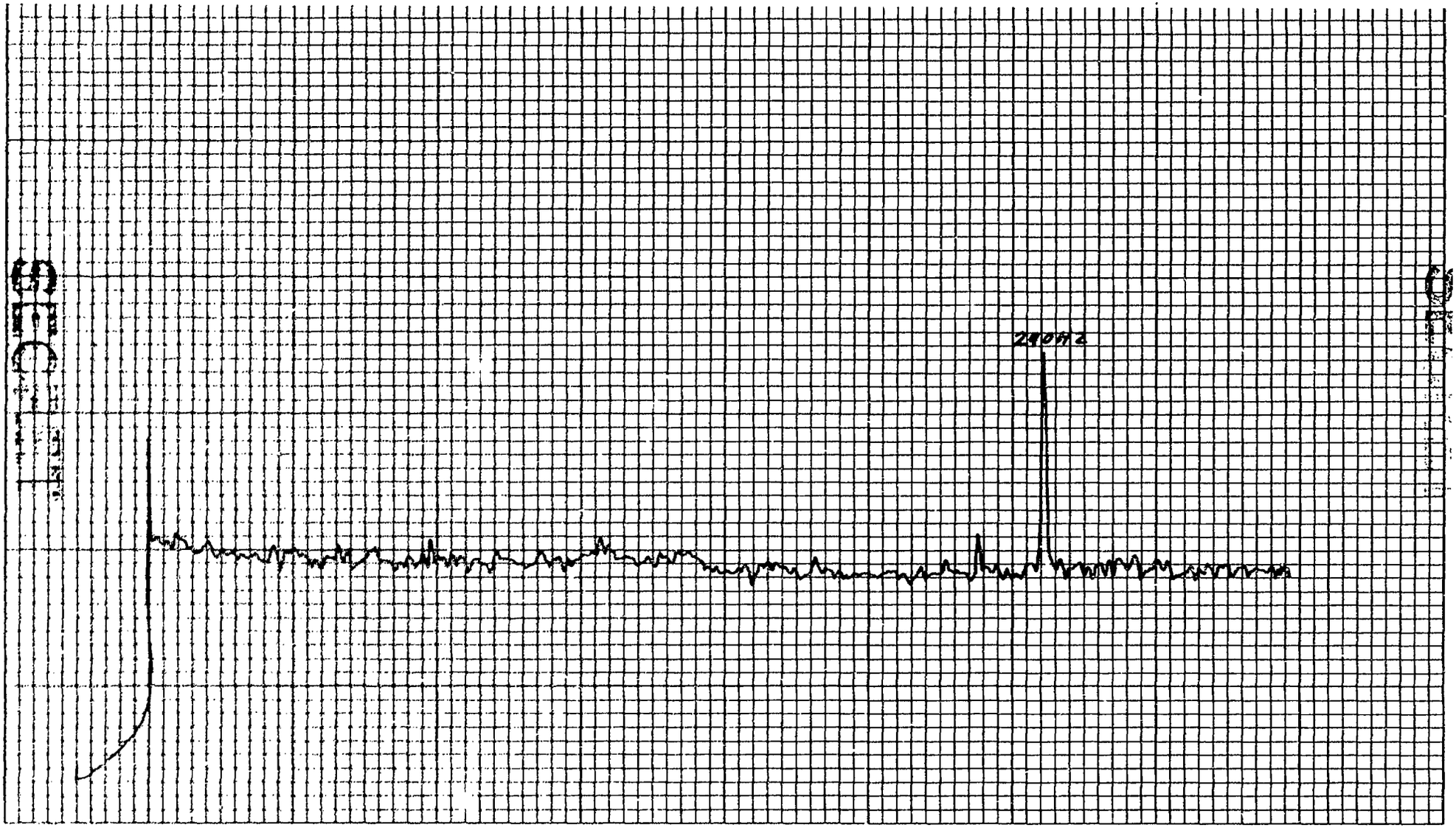
SECRET

K•E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 0633 - 49 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS 1-64 9-26 4 28-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
49 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 0633Z
ANALYSIS BANDWIDTH: 1/10HZ
+62.25 DEG. AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



K·E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

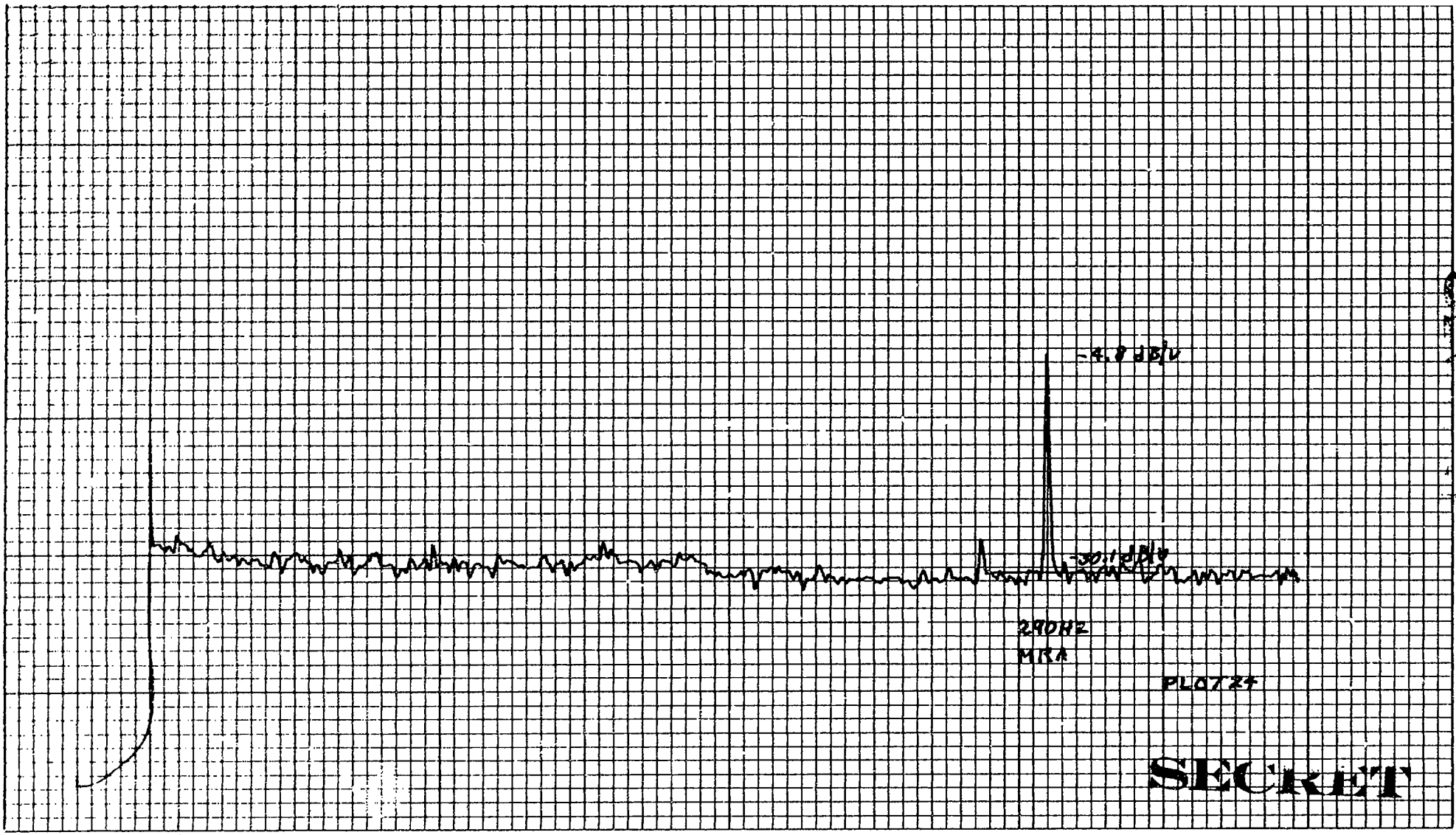
46 0703

SECRET

CONTROL: 0632 - 49 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS 1 TO 9 TO 26 29 TO 53)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
49 ELEMENTS

DATE OF ANALYSIS: __ ___ __
DATE/TIME: _____-0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
462.5 DEG. AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING

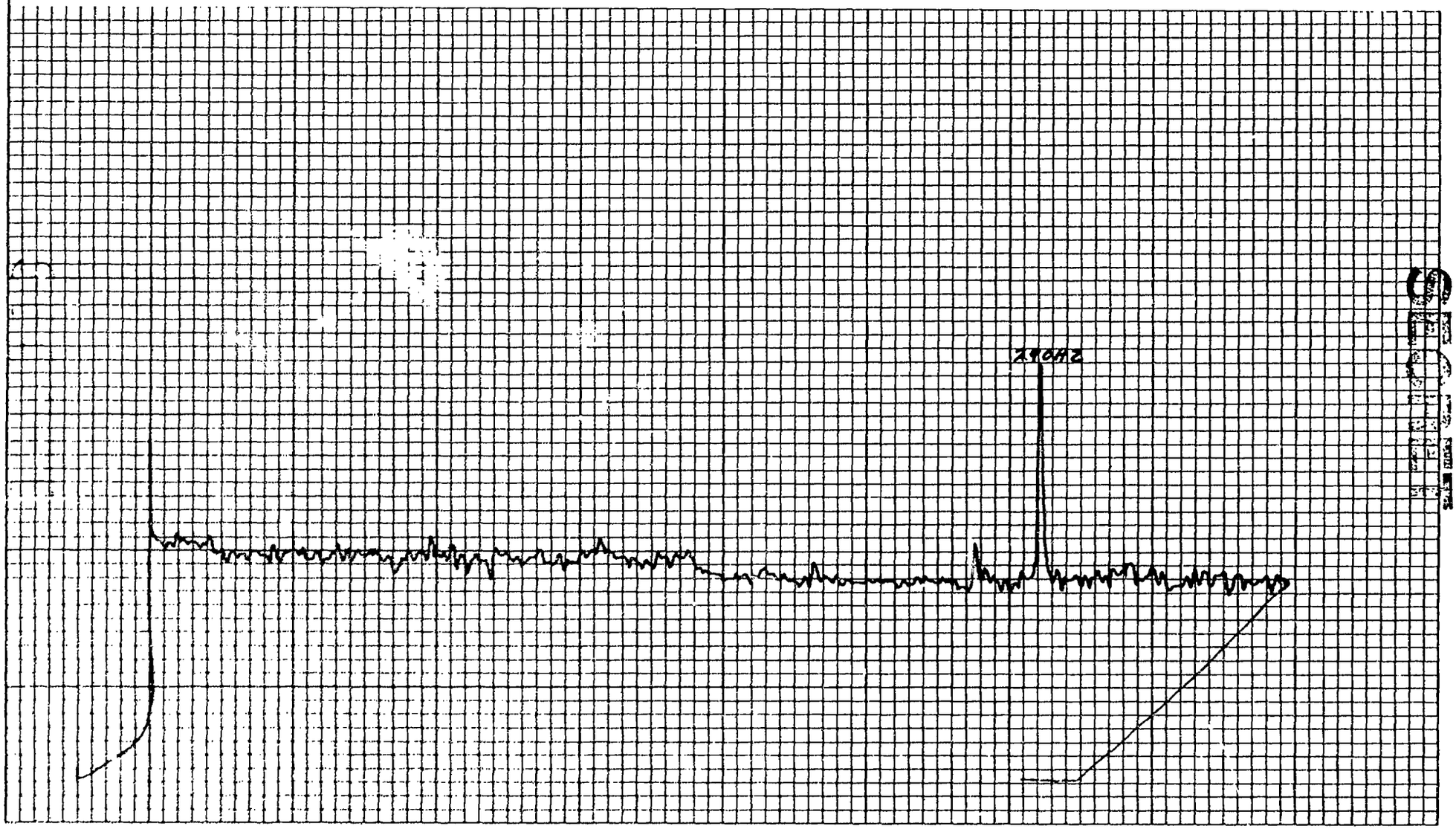


K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 0673 - 19 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 9-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
49 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+63 DEG. AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



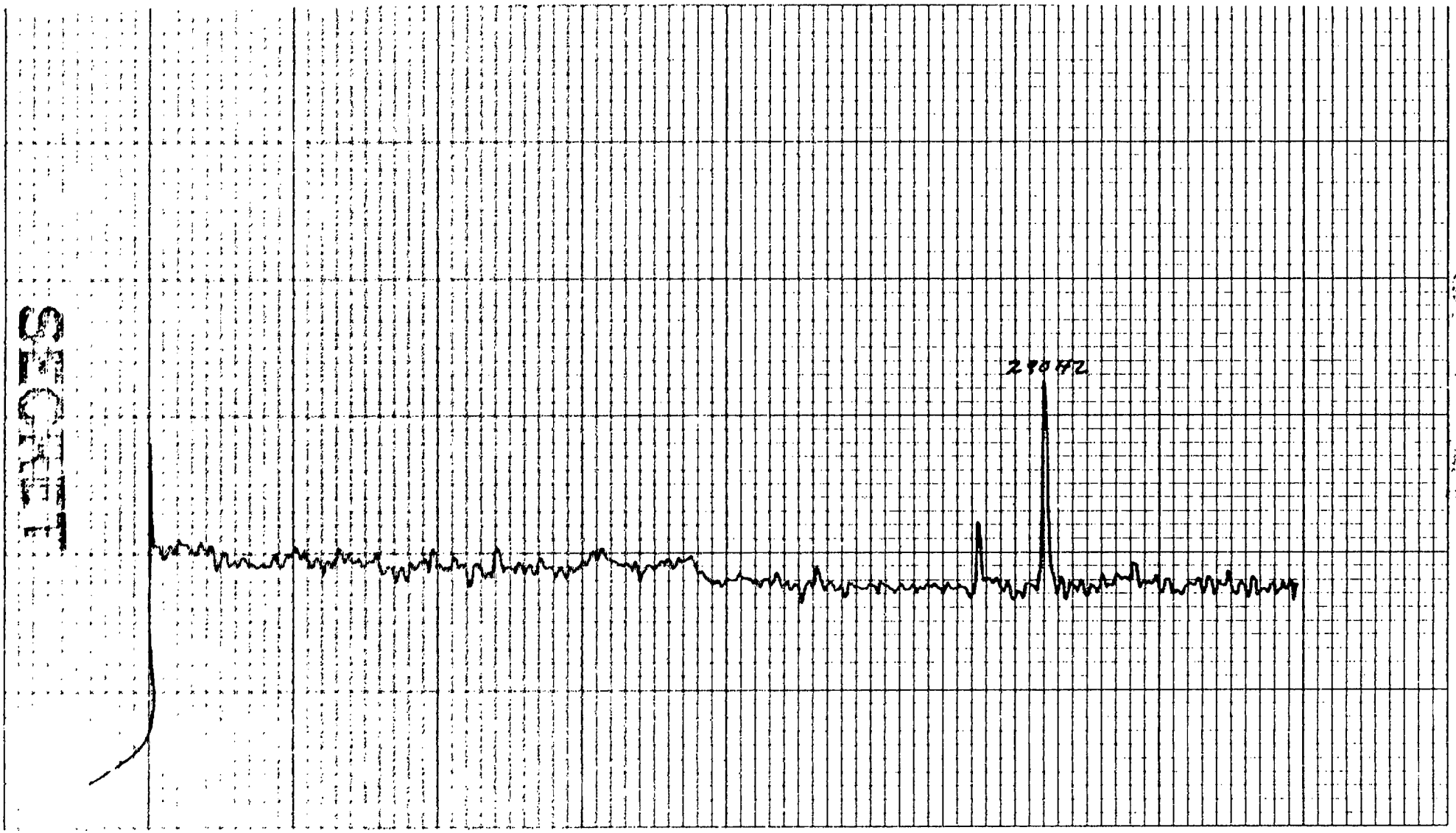
K&E 10 X 10 TO THE INCH • 5 X 10 DIVISIONS KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 0633 - 49 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 9-26 & 28-35)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
49 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 0633Z
ANALYSIS BANDWIDTH: 1/10HZ
+64 DEG. AZ STEERING

REEL: M19 INDEX 1637

INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



SECRET

K+E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

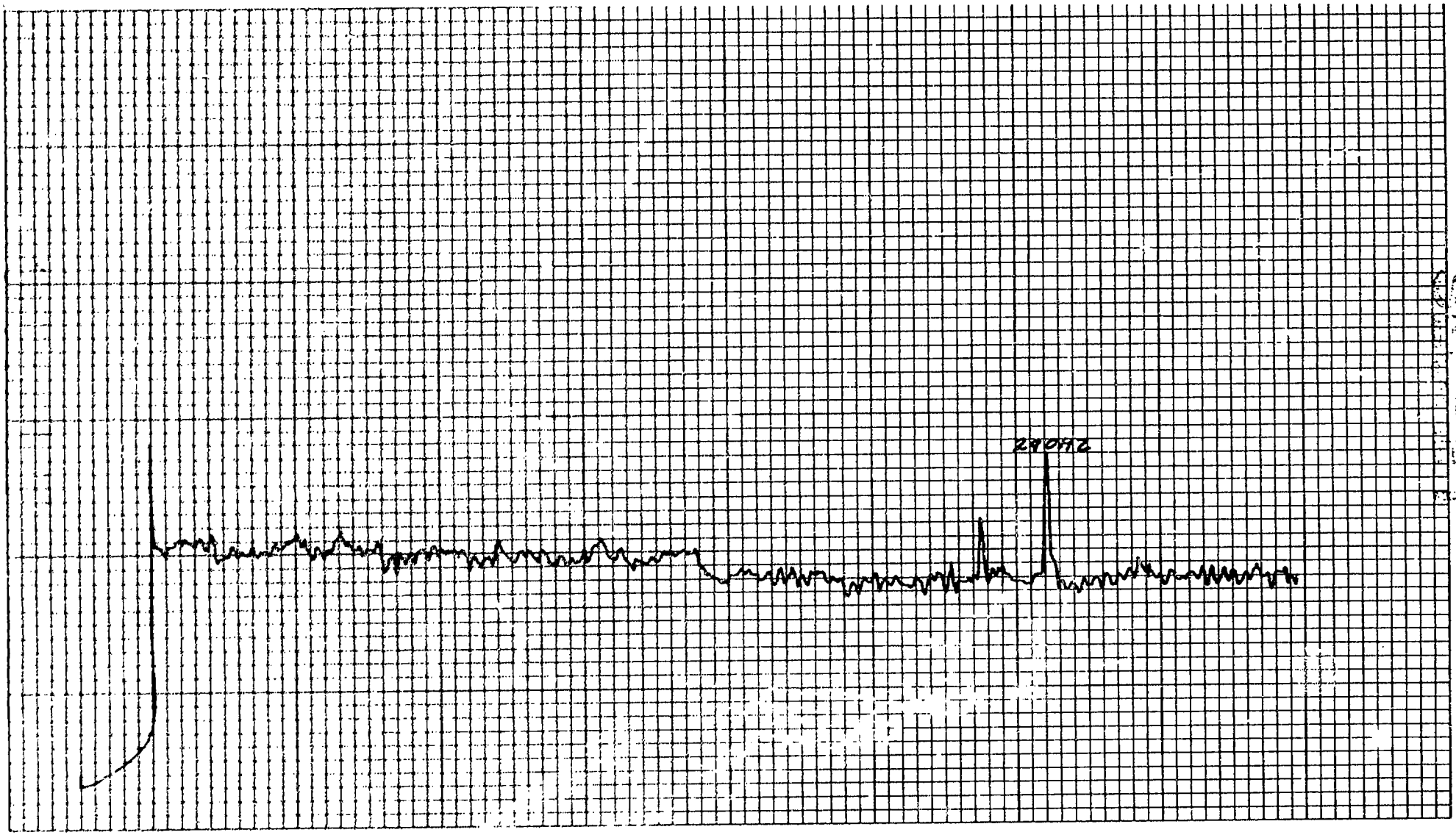
46 0703

CONTROL: 0633 - 49 (QPD)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
49 ELEMENTS

DATE OF ANALYSIS: - - -
1-6 & 9-26 & 29-53)
DATE/TIME: 3-16-77 - 0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+66 DEG. AZ STEERING

REEL: M19 INDEX 1637

INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



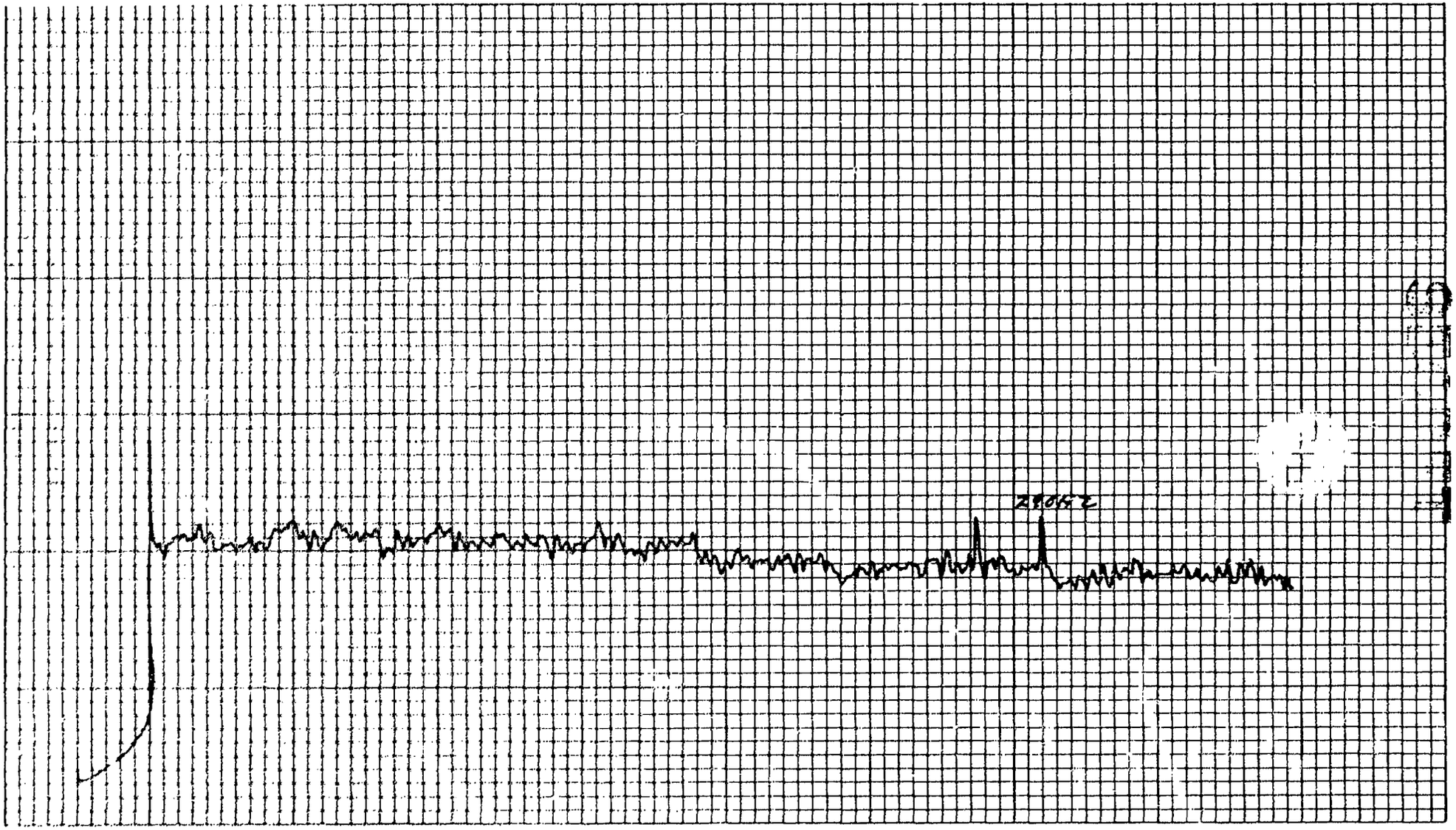
K•E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 0633 - 49 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 9-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
49 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 -0633Z
ANALYSIS BANDWIDTH: 1/10HZ
+60 DEG. AZ STEERING

REEL: M19 INDEX 1637

INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



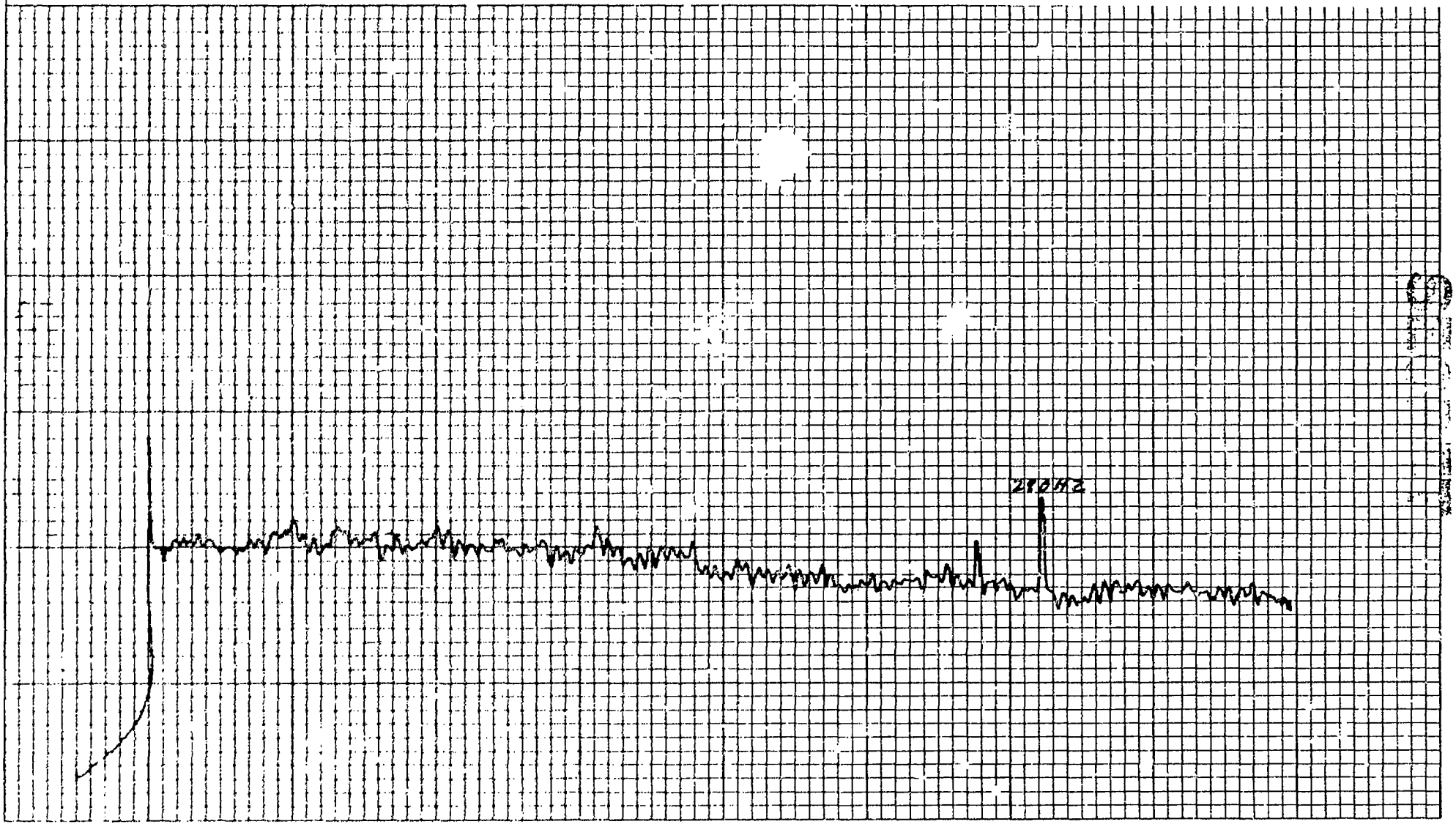
K•E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 0633 - 49 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
49 ELEMENTS

DATE OF ANALYSIS: - - -
1-6 8-26 & 28-53)
DATE/TIME: 3-1677 -0633 Z
ANALYSIS BANDWIDTH: 1/10HZ
+70 DEG. AZ STEERING

REEL: M19 INDEX 1677

INTEGRATION TIME 320 SECS ATTEN: -2# DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 0633 - 49 (DP10)
BEAMFORMED SPECTRUM(ELEMENTS 1-18-26&28-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
49 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 0633Z
ANALYSIS BANDWIDTH: 1/10HZ
+72 DEG. AZ STEERING

REEL: M19 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING

NOISE SPECTRAL DENSITY CALCULATIONS FOR SPRAY/BEARING STAKE (U)

DATA POINT 11 DATE 3-16-77 TIME 09352

FREQUENCY 140 HZ

INDICATED NOISE LEVEL dBV $\frac{1/10}{ABW}$			-50.0
SYSTEM SENSITIVITY dB/μB	-(-12)	=	-38.0
BANDWIDTH CONVERSION TO 1 HZ BAND	+8.2	=	-29.8
CONVERSION TO dBreμPa/1HZ	+100	=	+70.2

UNCLASSIFIED
UNCLASSIFIED

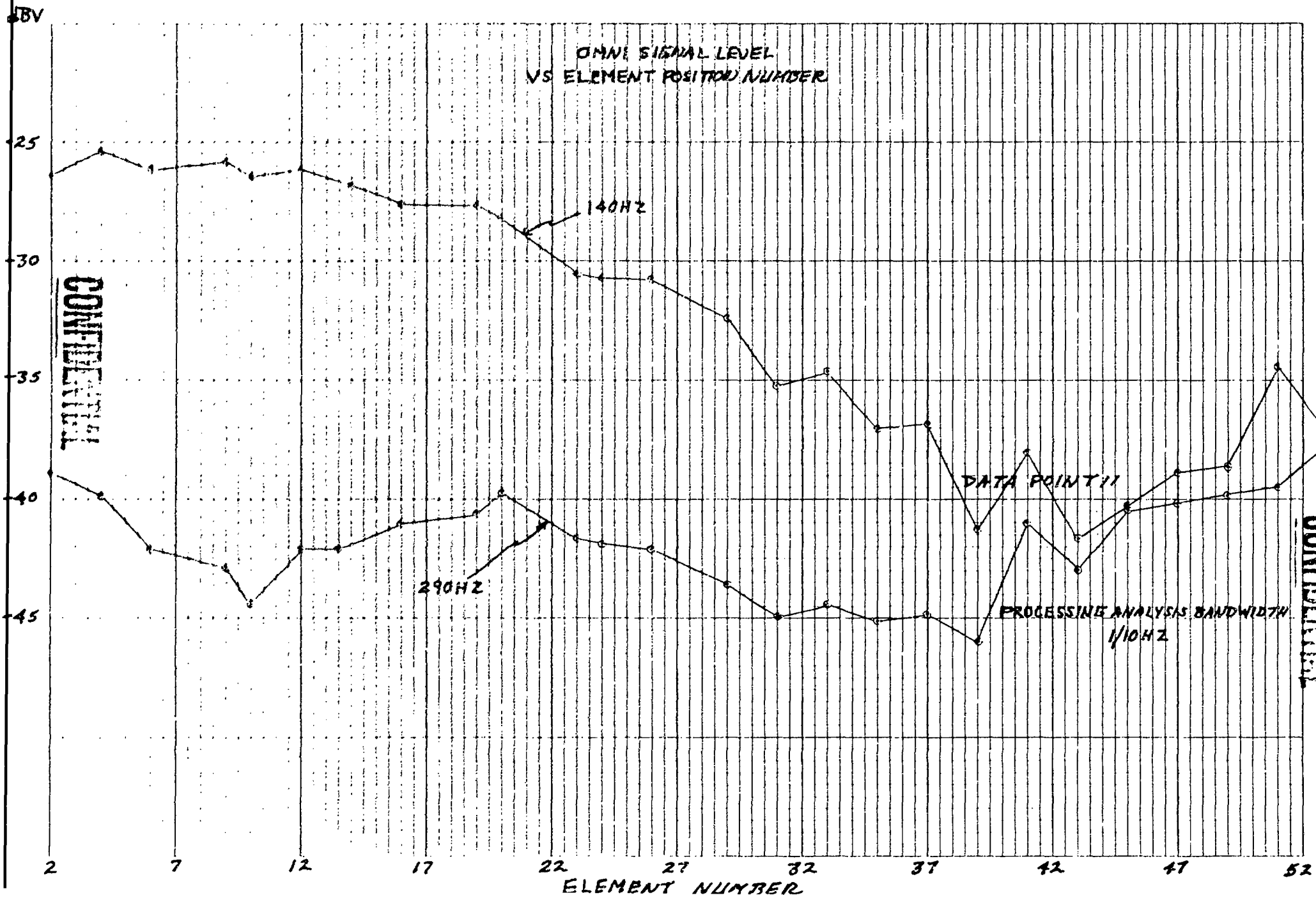
NOISE SPECTRAL DENSITY CALCULATIONS FOR SPRAY/BEARING STAKE (U)

DATA POINT 11 DATE 3-16-77 TIME 09352

FREQUENCY 290 HZ

INDICATED NOISE LEVEL dBV $\frac{1/10}{ABW}$			-54.0
SYSTEM SENSITIVITY dB/μB	-(-8)	=	-46.0
BANDWIDTH CONVERSION TO 1 HZ BAND	+8.2	=	-37.8
CONVERSION TO dBreμPa/1HZ	+100	=	+62.2

UNCLASSIFIED
UNCLASSIFIED


dBV
OMNI SIGNAL LEVEL
VS ELEMENT POSITION NUMBER
25
30
35
40
45
140HZ
290HZ
DATA POINT 11
PROCESSING ANALYSIS BANDWIDTH
1/10 HZ
2
7
12
17
22
27
32
37
42
47
52
ELEMENT NUMBER
CONFIDENTIAL
CONFIDENTIAL

K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

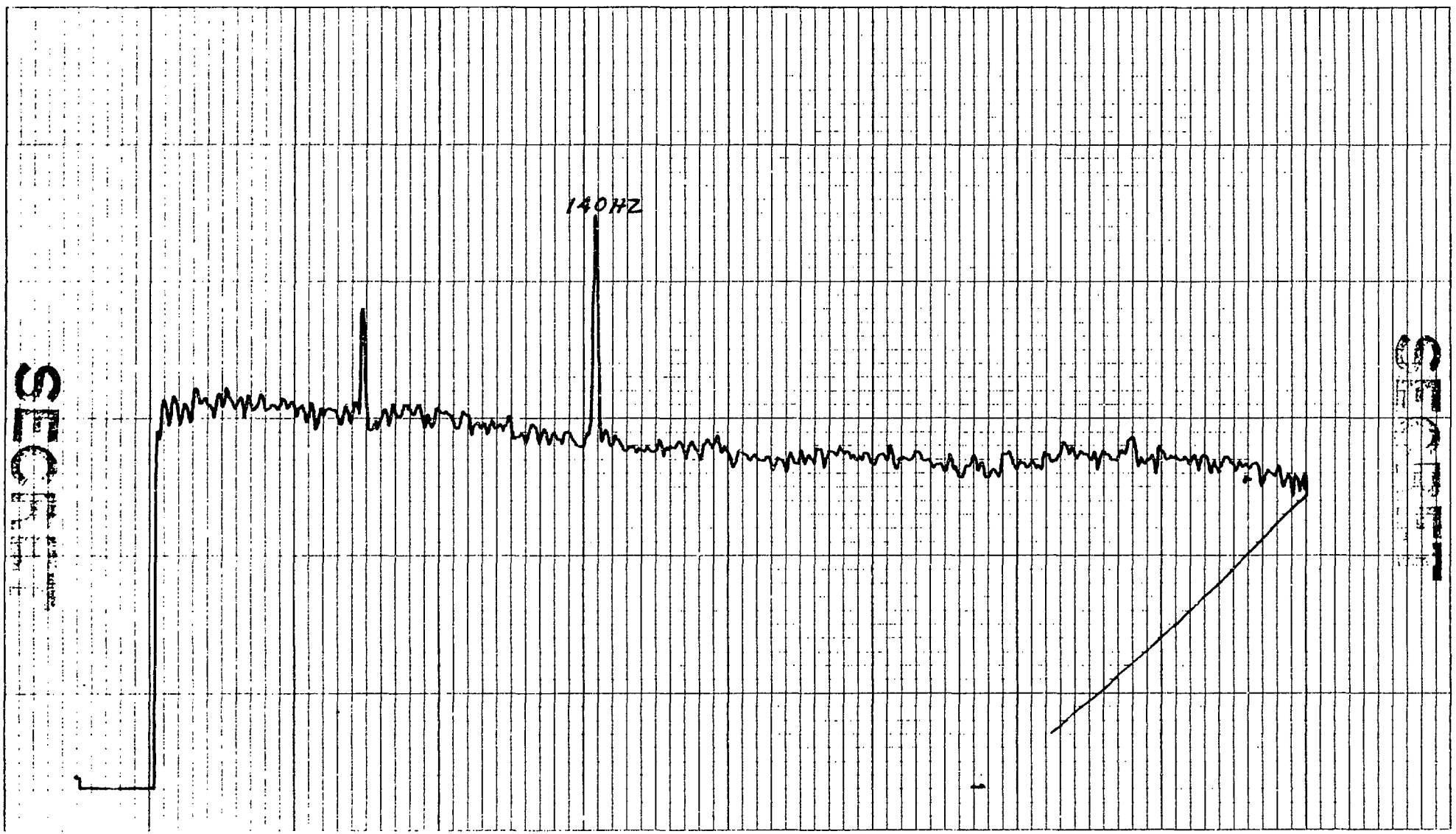
CONTROL: 346-0935 (27)
OMNI SPECTRUM (ELEMENT 2)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 346-77-0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M22 INDEX 566

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



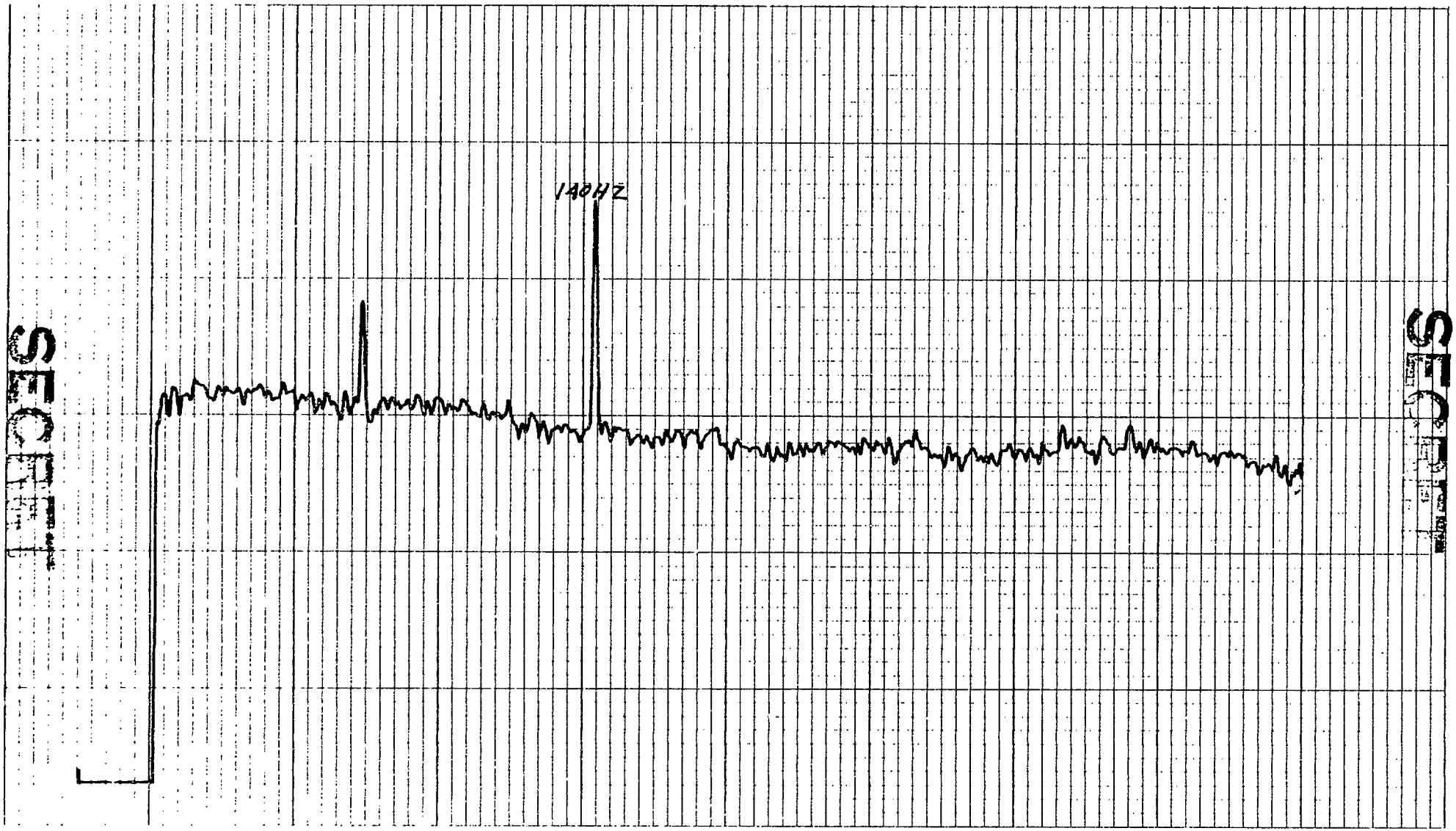
K&E 10 X 10 TO THE INCH 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

CONTROL: 3-16-0935 (28)
OMNI SPECTRUM (ELEMENT 4)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 - 0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
____ DEG AZ STEERING

REEL: M22 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



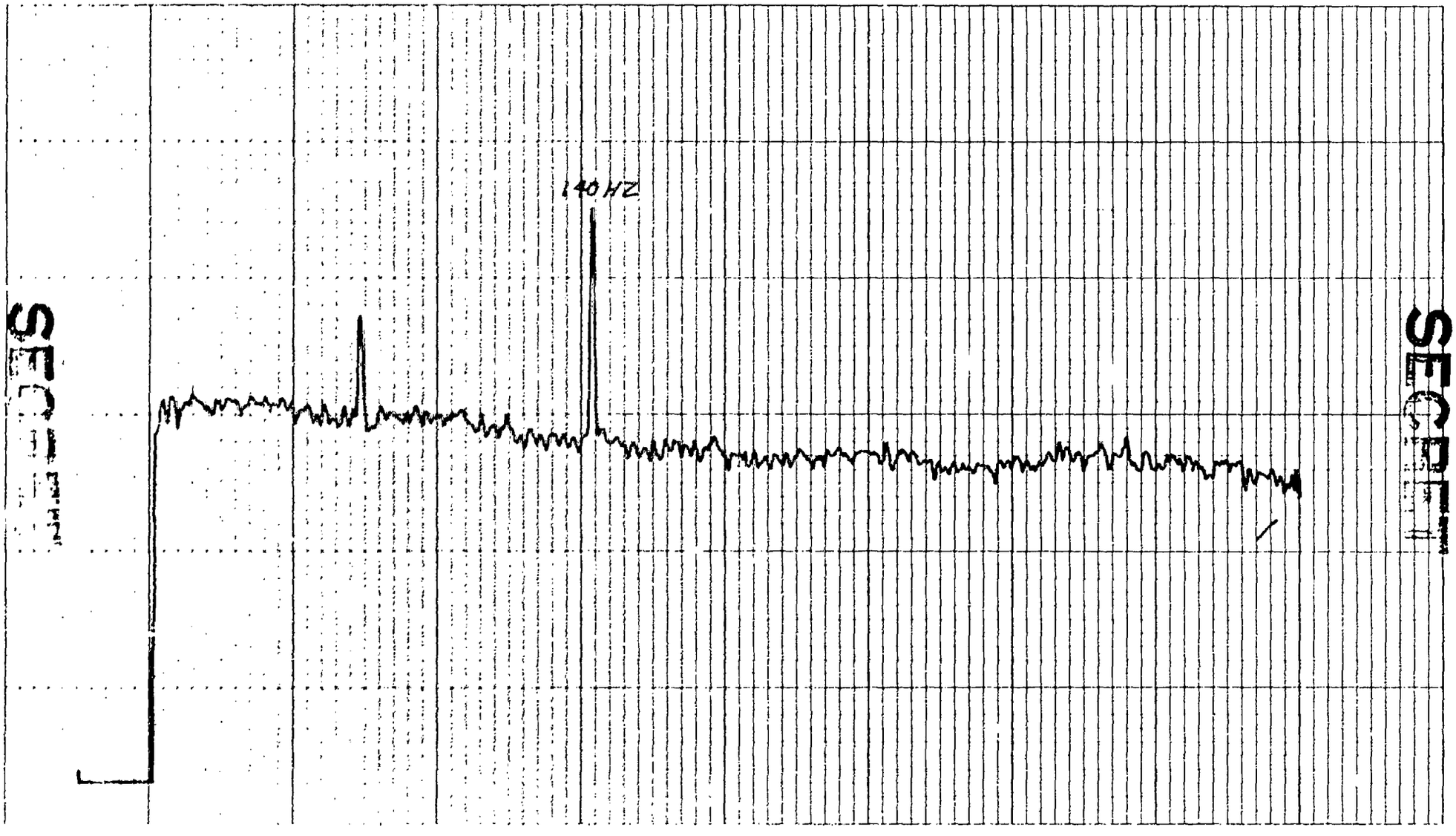
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

CONTROL: 3-16 -0935 (29)
OMNI SPECTRUM (ELEMENT 6)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 -0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M22 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH KEUFFEL & ESSER CO

46 0703

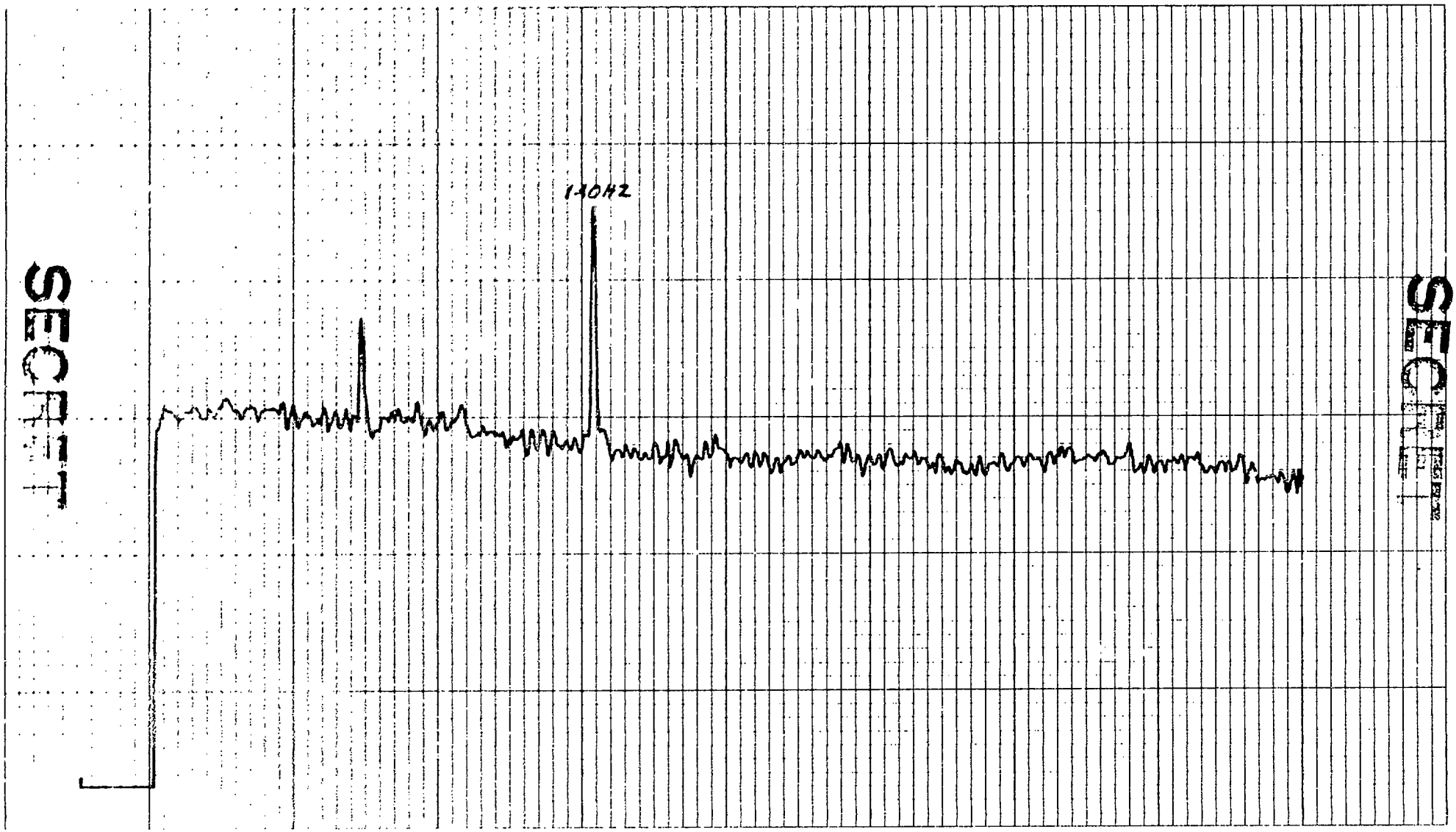
CONTROL: 3-16 -0935 (30)
OMNI SPECTRUM(ELEMENT 9)
EXERCISE:BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-16-77 -0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M22 INDEX 566

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

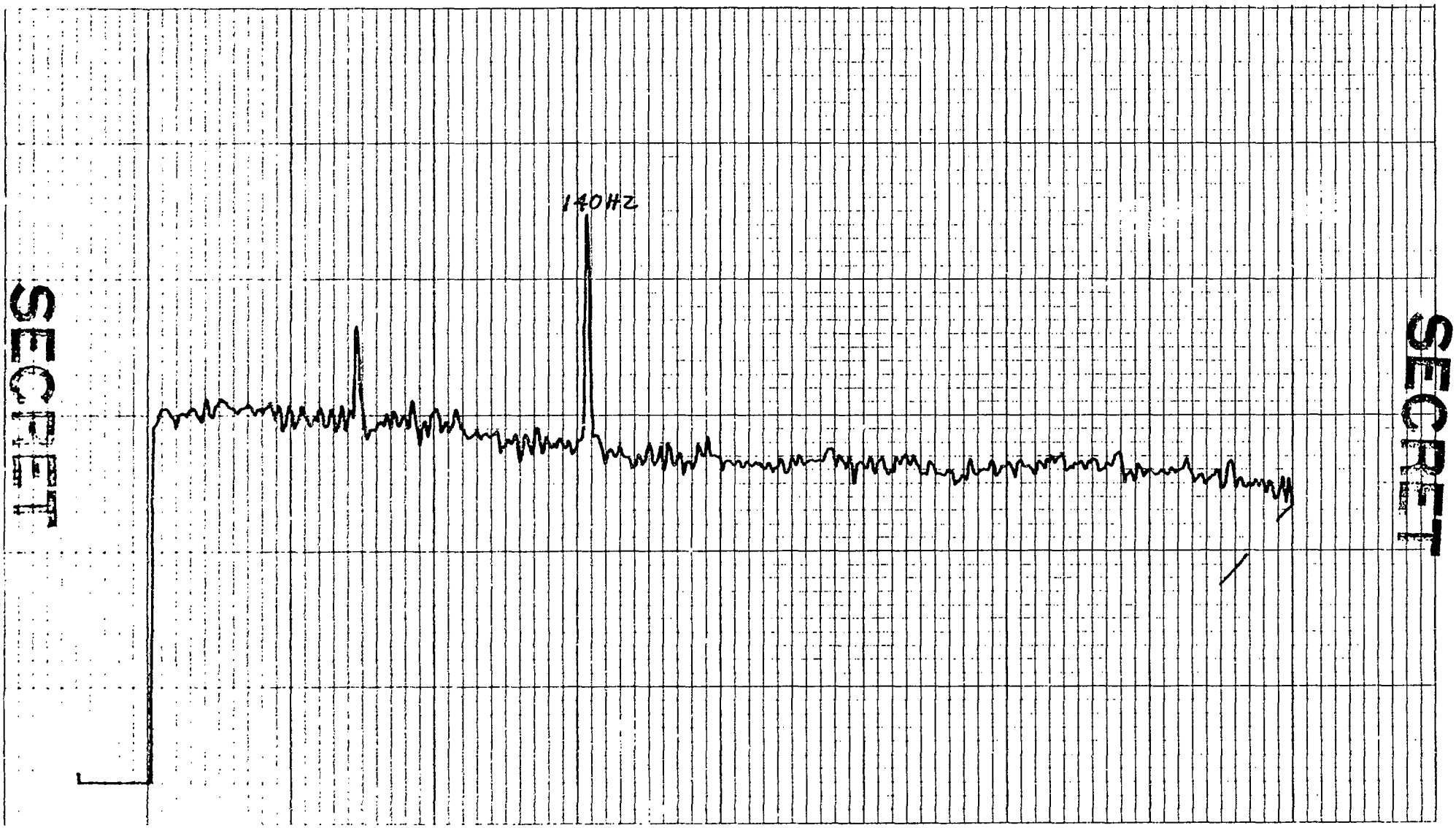
CONTROL: 3-16 -0835 (31)
OMNI SPECTRUM(ELEMENT 10)
EXERCISE:BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-16-77 -0835 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M22 INDEX 566

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



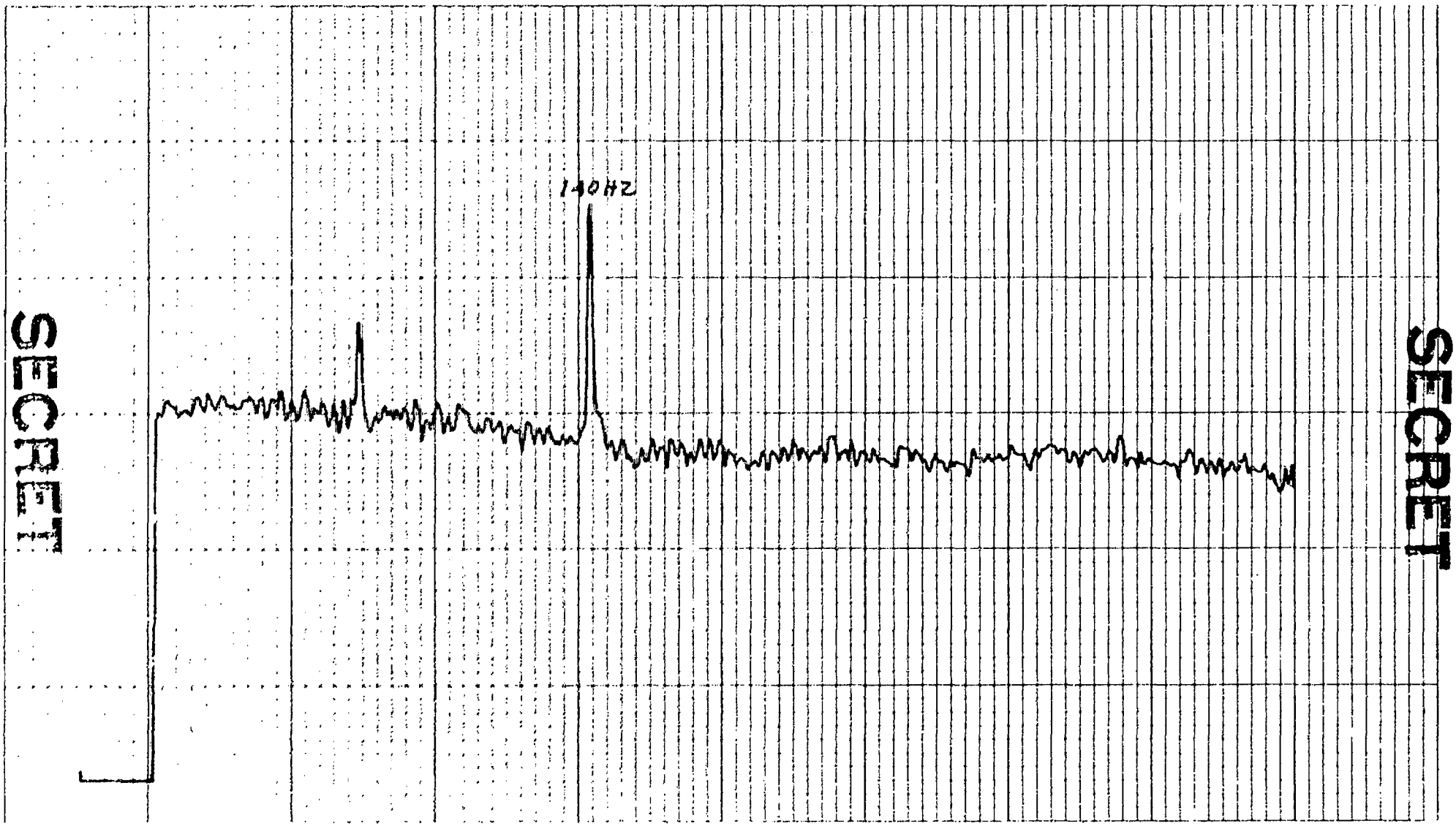
K&E 10 X 10 TO THE INCH 7 X 10 INCHES KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

CONTROL: 3-16-0935 (32)
OMNI SPECTRUM (ELEMENT 12)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 -0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
____ DEG AZ STEERING

REEL: M22 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



K&E

46 0703

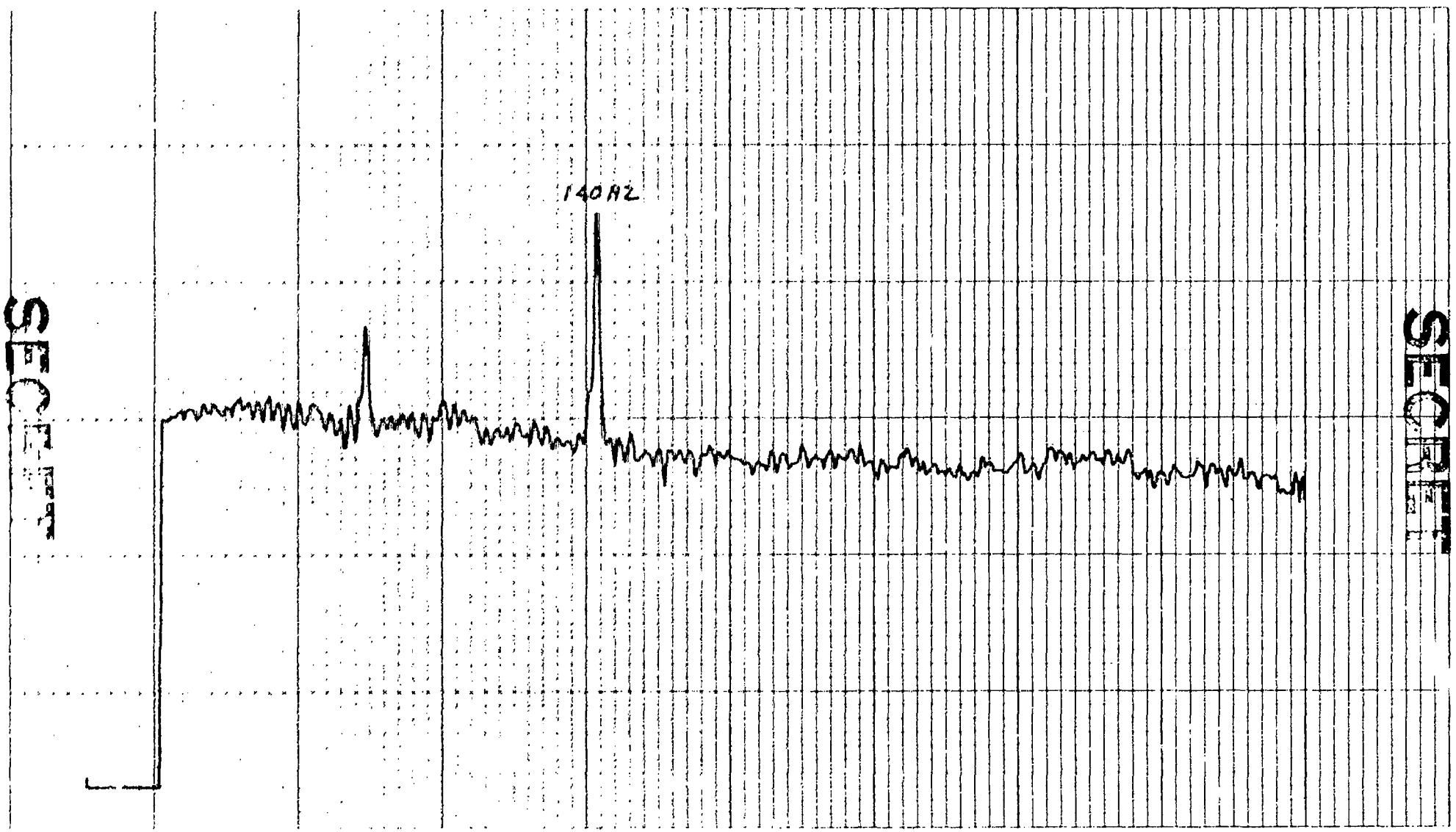
CONTROL: 3-16-0935 (33)
OMNI SPECTRUM (ELEMENT 14)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-16-77 - 0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M22 INDEX 566

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTC: HANNING



K&E 10 X 10 TO THE INCH

46 0703

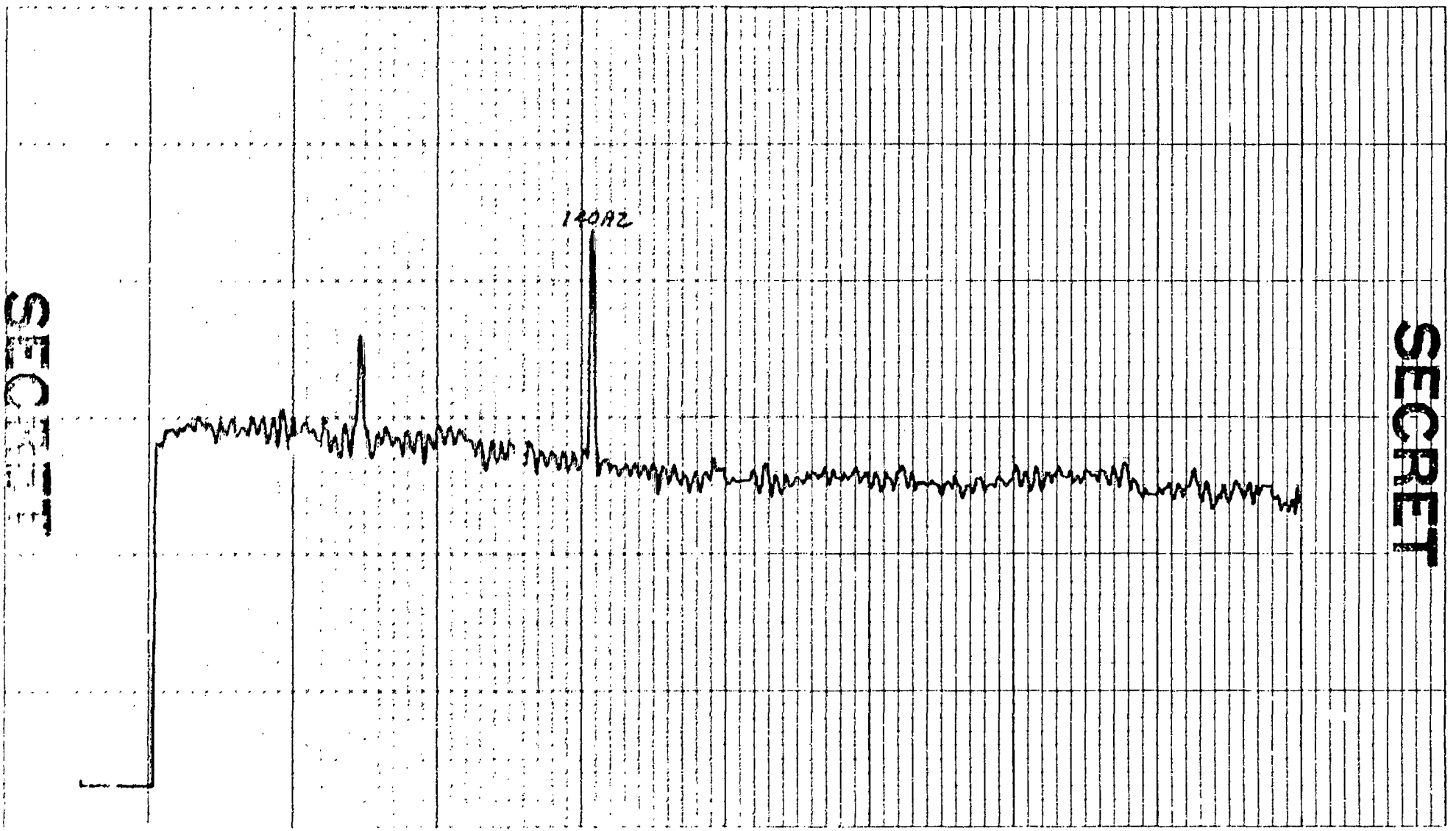
CONTROL: 3-16 -0935 (34)
OMNI SPECTRUM (ELEMENT 16)
EXERCISE: BEARING SIAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-16-77 -0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M22 INDEX 566

INTEGRATION TIME 320 SECS ATTEN: - DB
FILTER WTG: HANNING

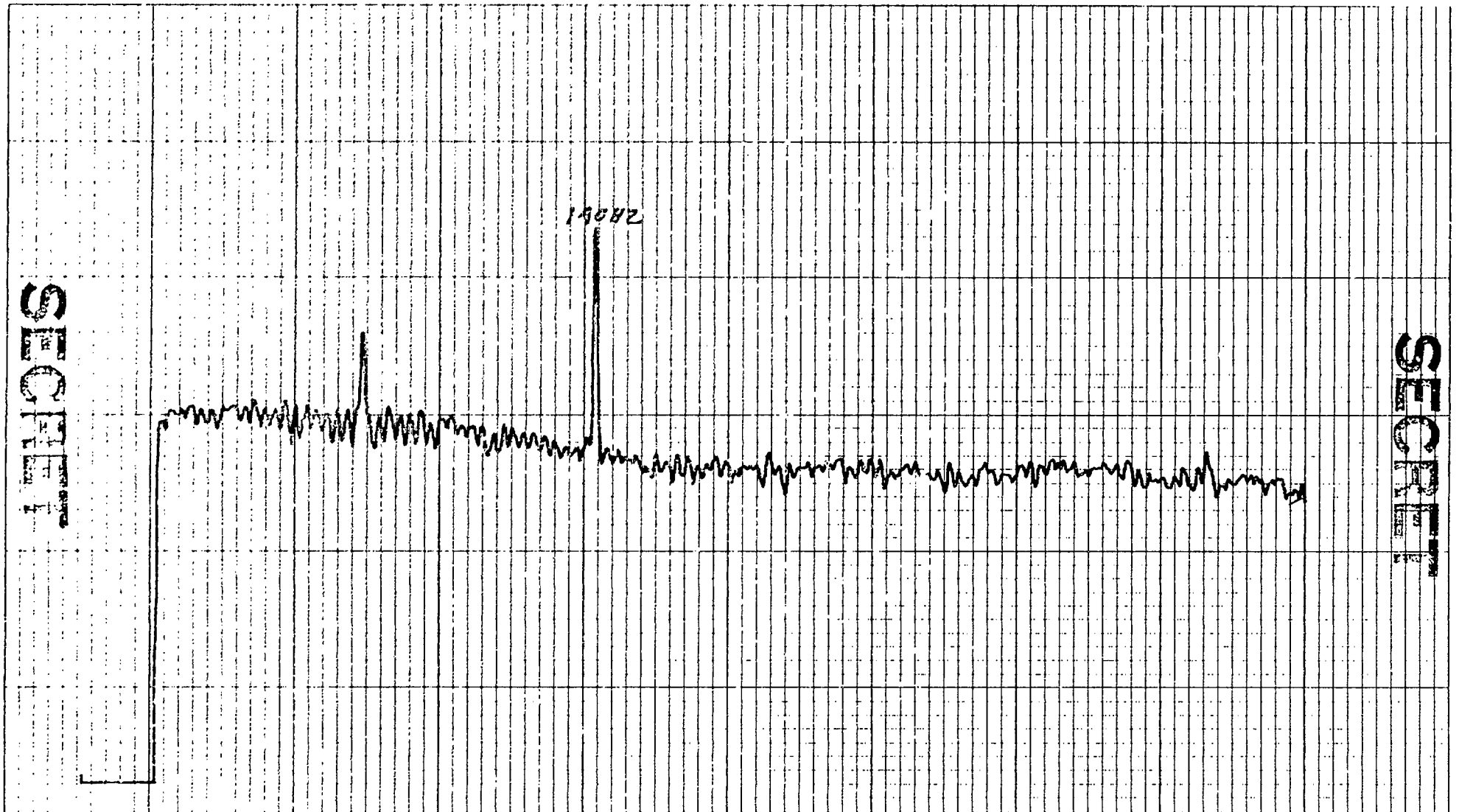


K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 3-16-0935 (35)
OMNI SPECTRUM (ELEMENT 19)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77-0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
___ DEG AZ STEERING

REEL: M22 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



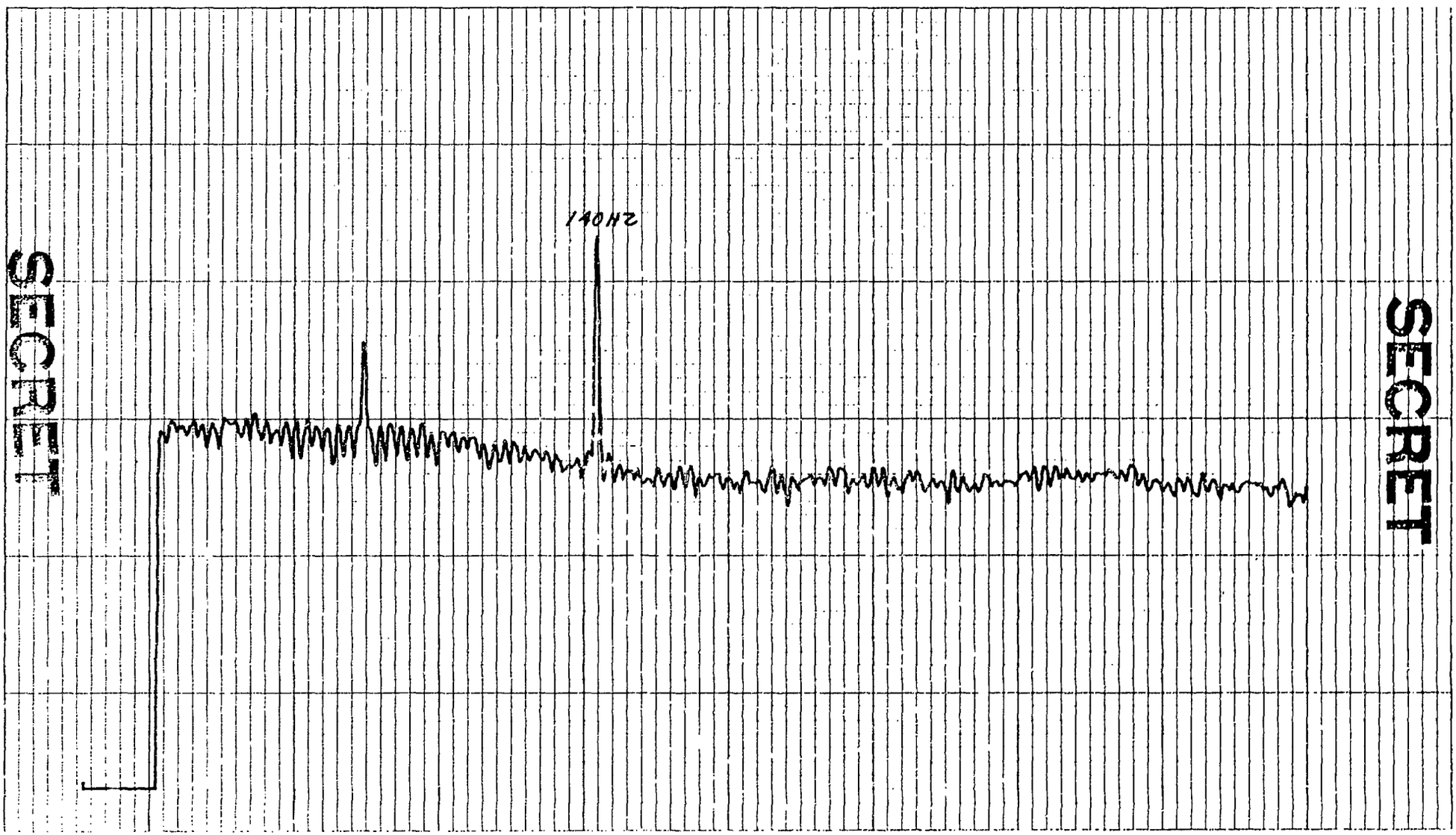
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 3-16-0935 (36)
OMNI SPECTRUM (ELEMENT 20)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 -0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
____ DEG AZ STEERING

REEL: M22 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



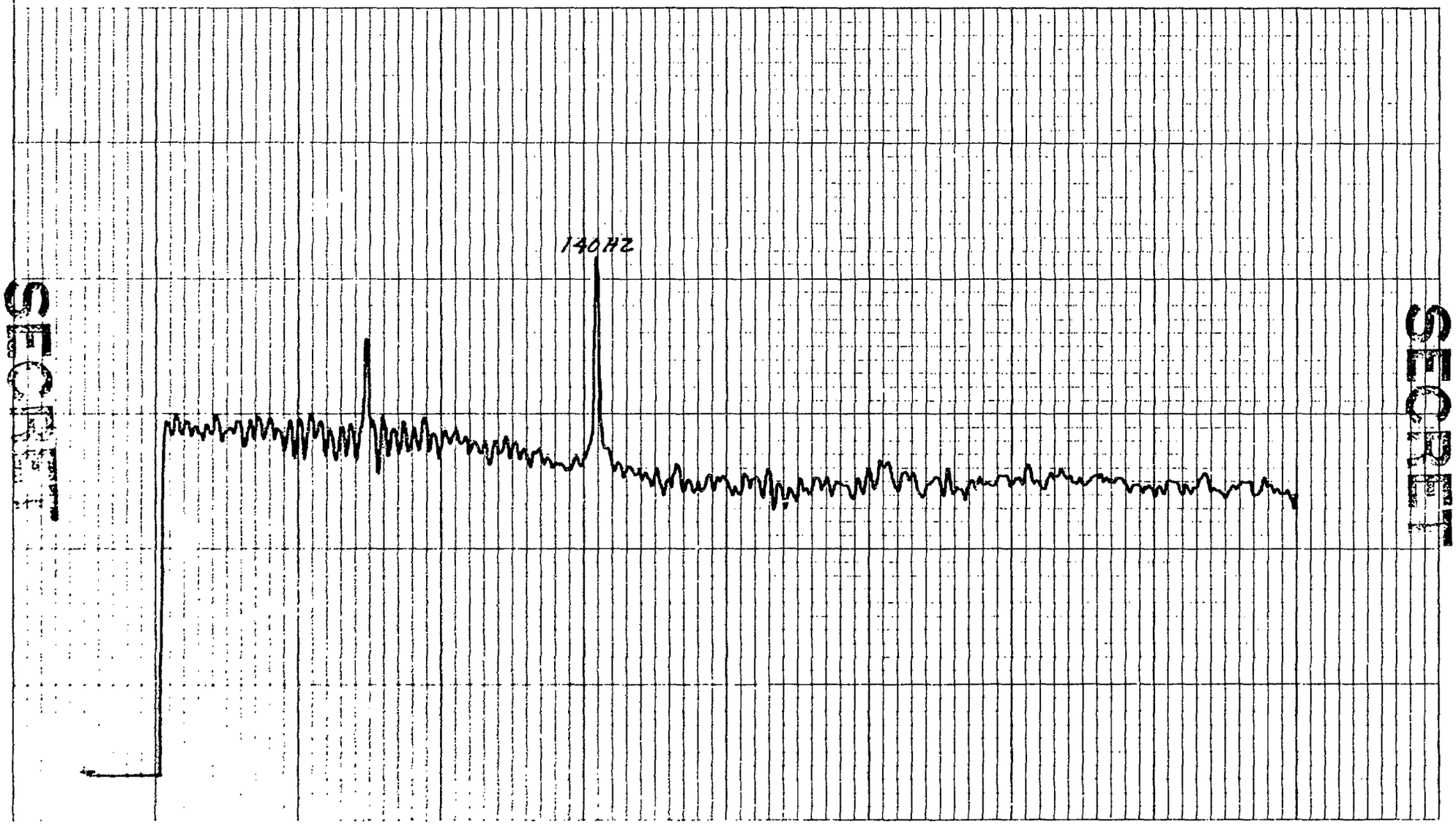
K+E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 346 -0935 (37)
OMNI SPECTRUM (ELEMENT 23)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 346-77 -0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
____ DEG AZ STEERING

REEL: M22 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: - DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH KEUFFEL & ESSER CO.

46 0703

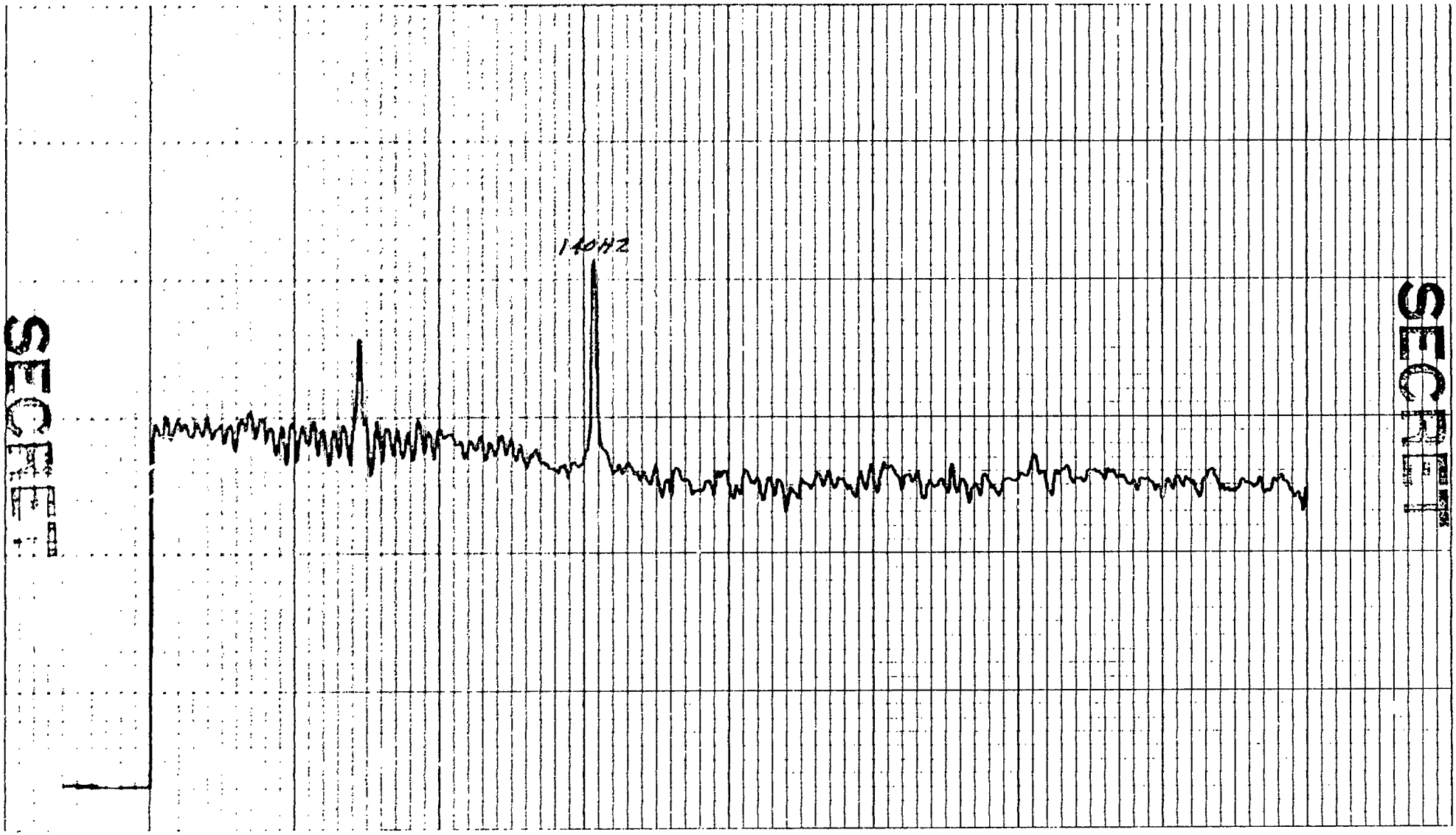
CONTROL: 3-16 -0935 (38)
OMNI SPECTRUM (ELEMENT 24)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-16-77 -0935Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M22 INDEX 566

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



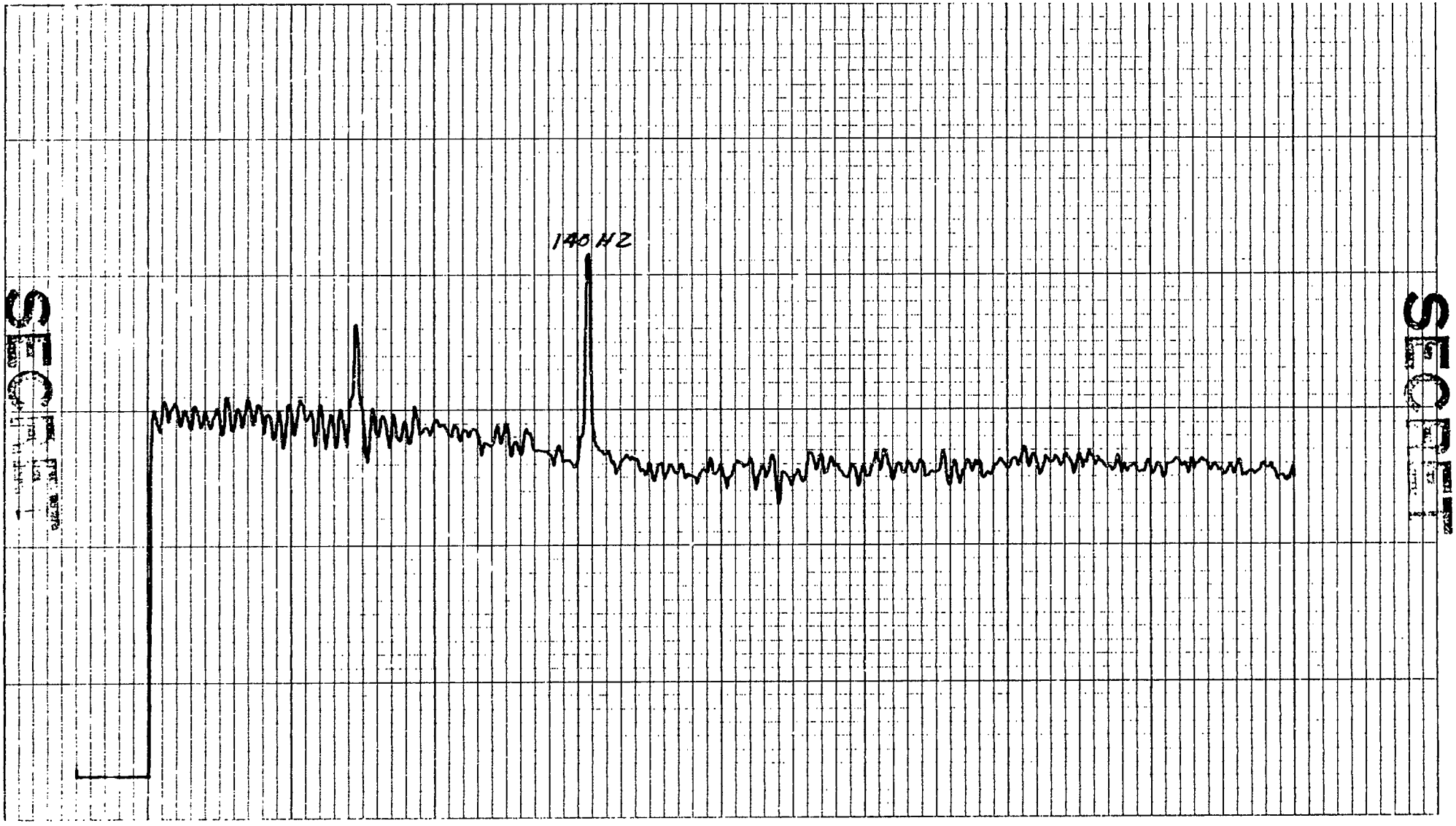
K·E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 3-16-0935 (39)
OMNI SPECTRUM (ELEMENT 26)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77-0935Z
ANALYSIS BANDWIDTH: 1/10HZ
_____ DEG AZ STEERING

REEL: M22 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



K+E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

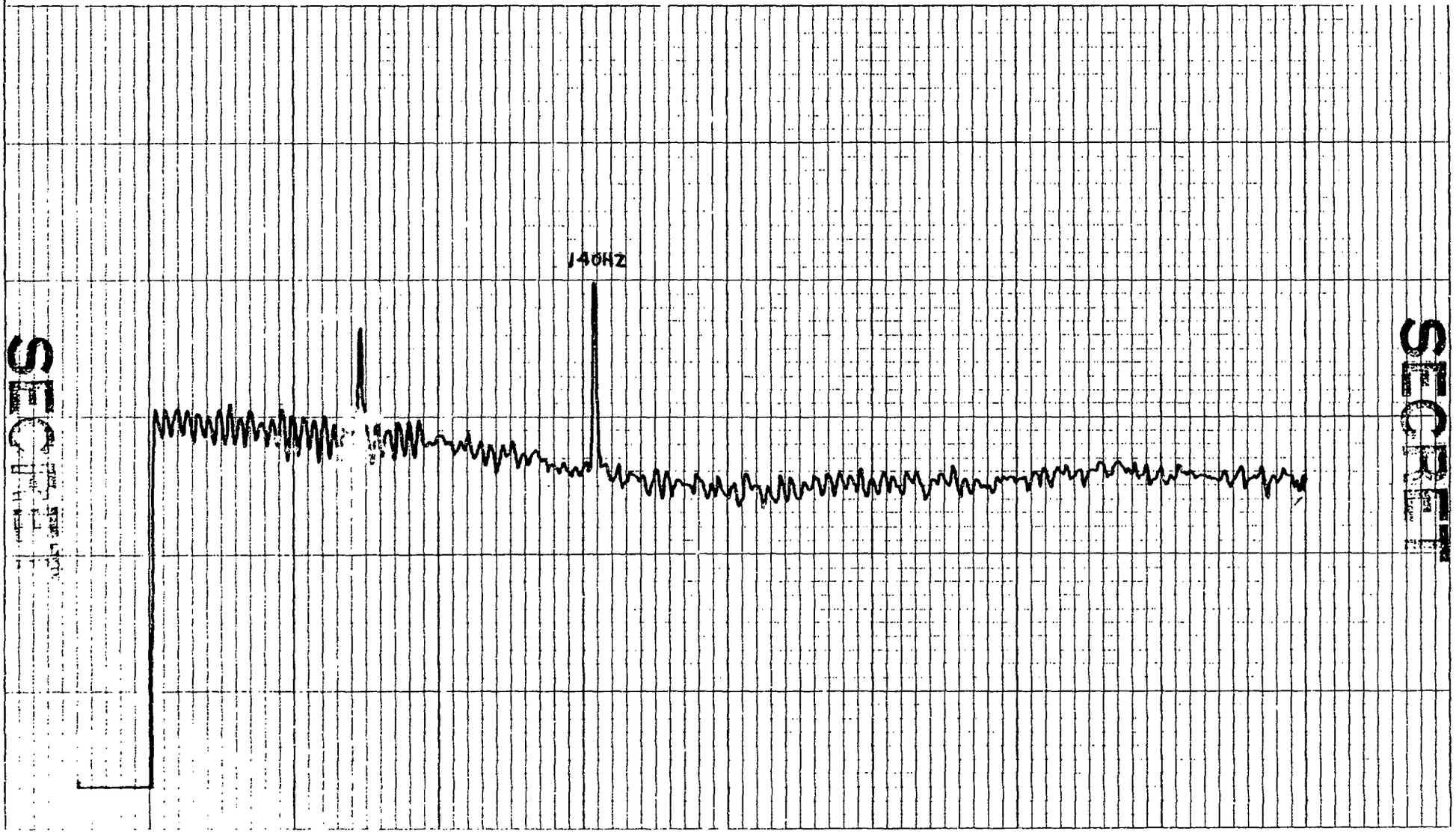
CONTROL: 0935 - 51 (DPII)
OMNI SPECTRUM(ELEMENT 29)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-16-77 - 0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M22 INDEX 566

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

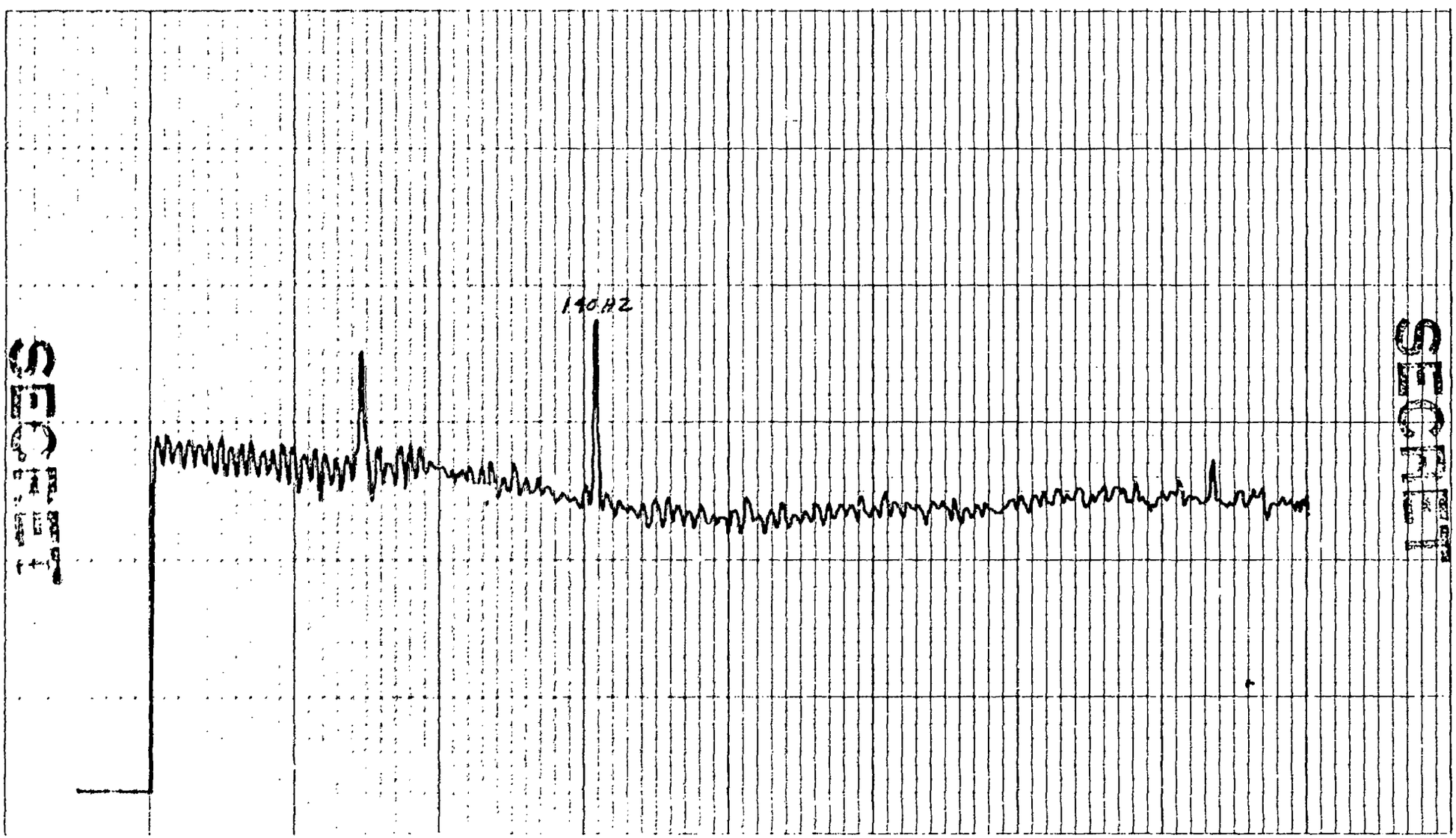
CONTROL: 3-16-0935 (41)
OMNI SPECTRUM (ELEMENT 31)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-16-77 -0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M22 INDEX 566

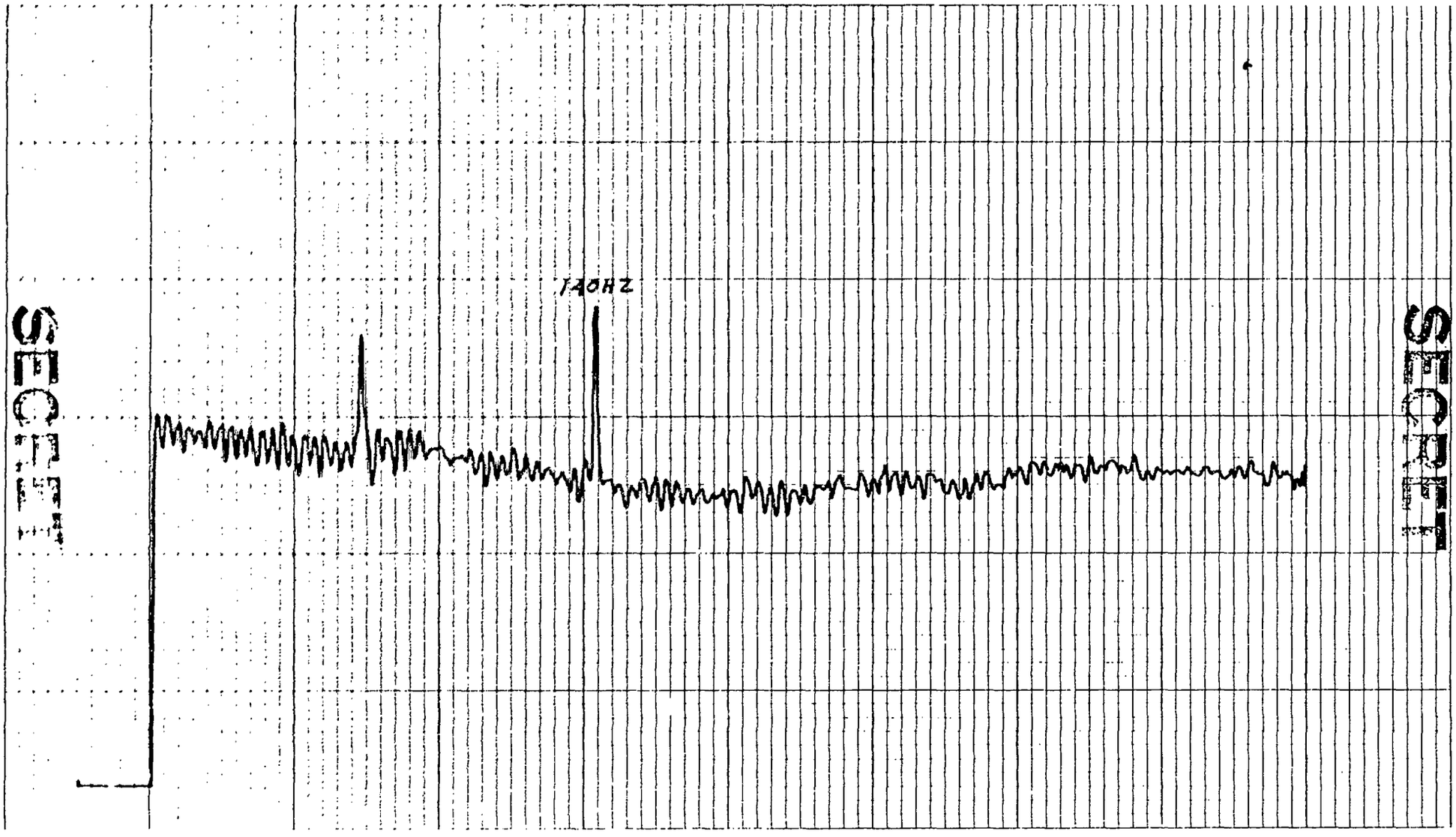
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



CONTROL: 3-16 -0935 (42)
OMNI SPECTRUM (ELEMENT 33)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 -0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
____ DEG AZ STEERING

REEL: M22 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING

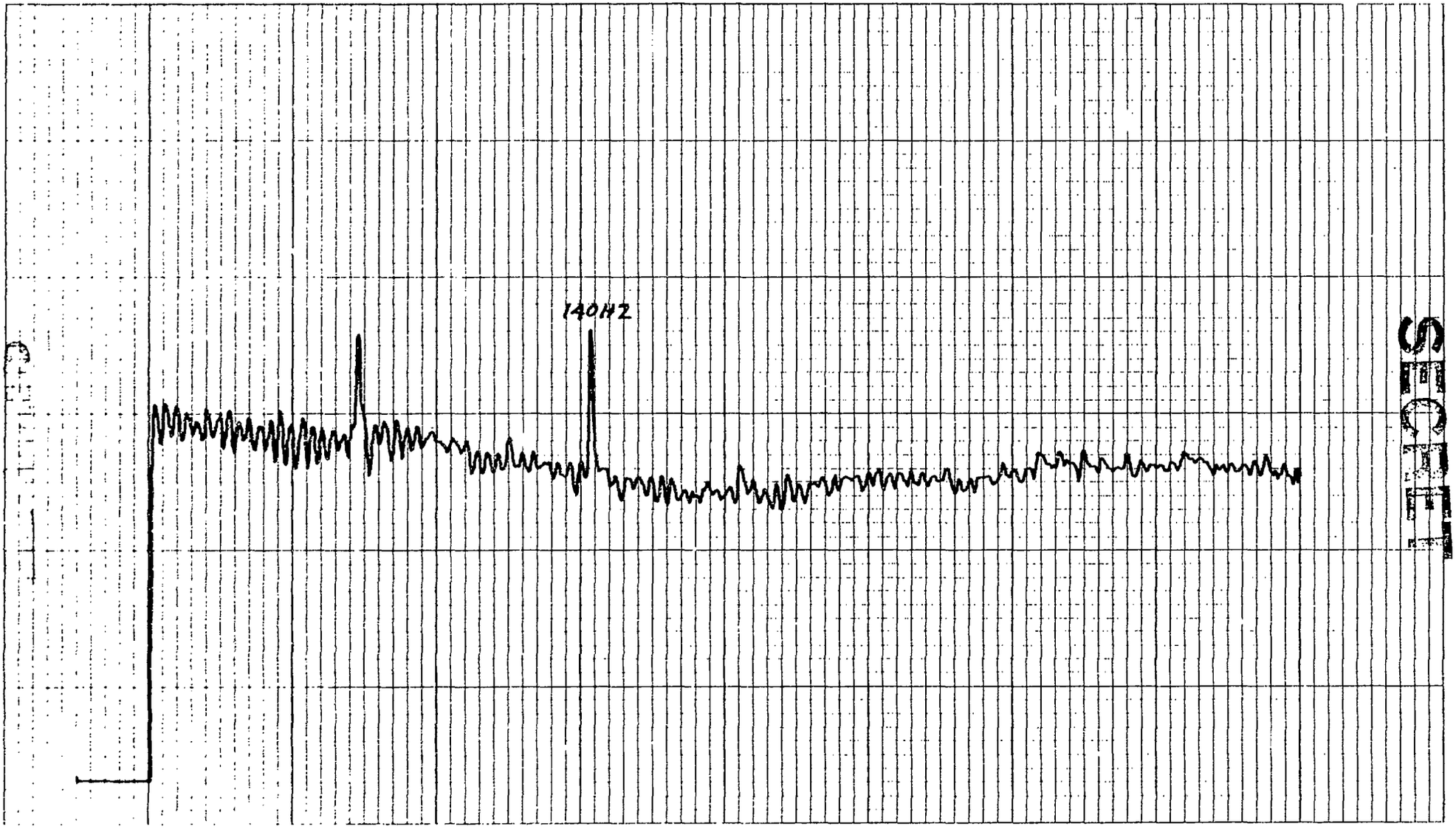


K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 376 -0935 (43)
OMNI SPECTRUM(ELEMENT 35)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 -0935Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M22 INDEX 561
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING

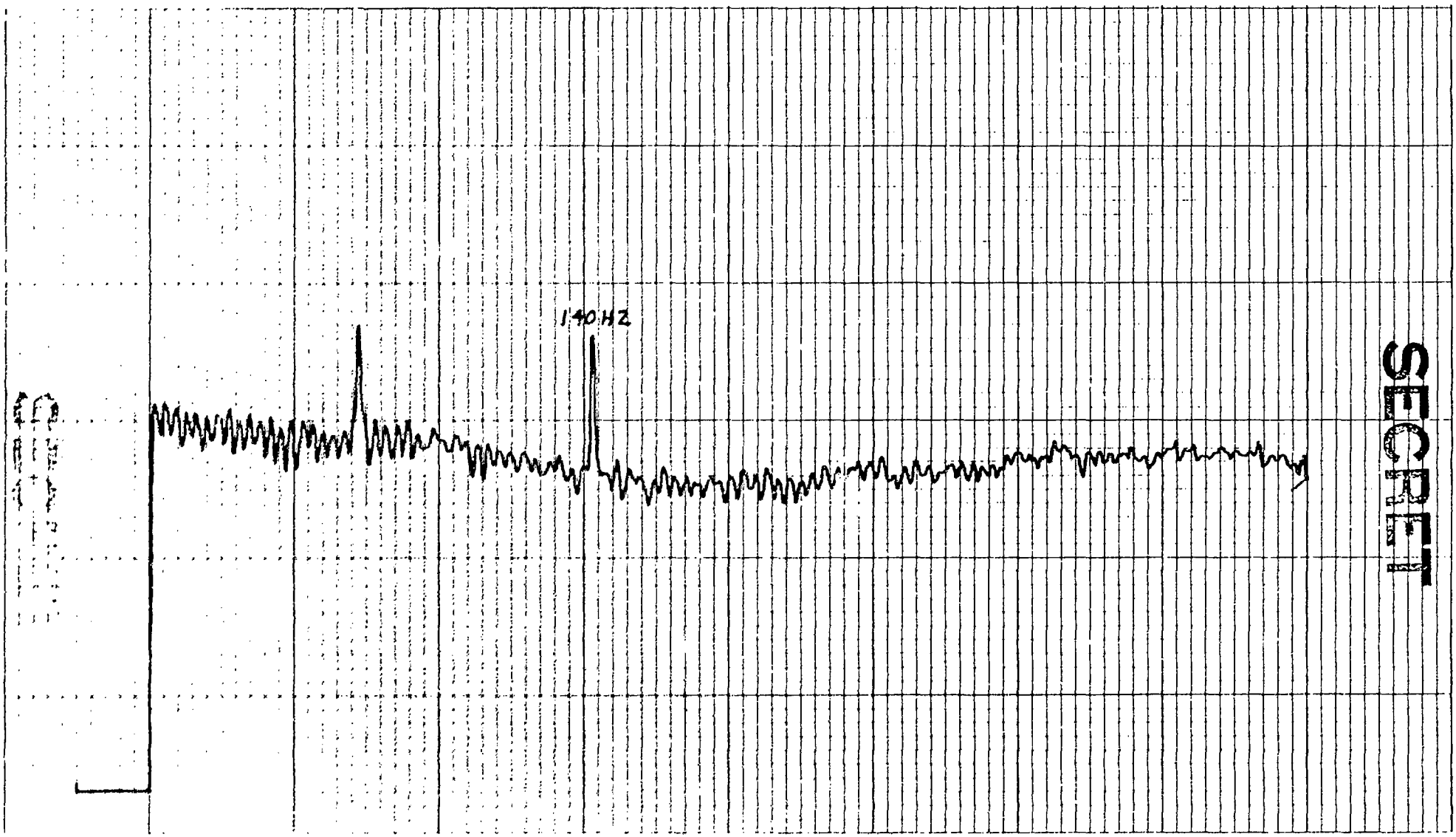


K+E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 316 -0935 (44)
OMNI SPECTRUM(ELEMENT 37)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 -0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
___ DEG AZ STEERING

REEL: M22 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: - DB
FILTER WTG: HANNING



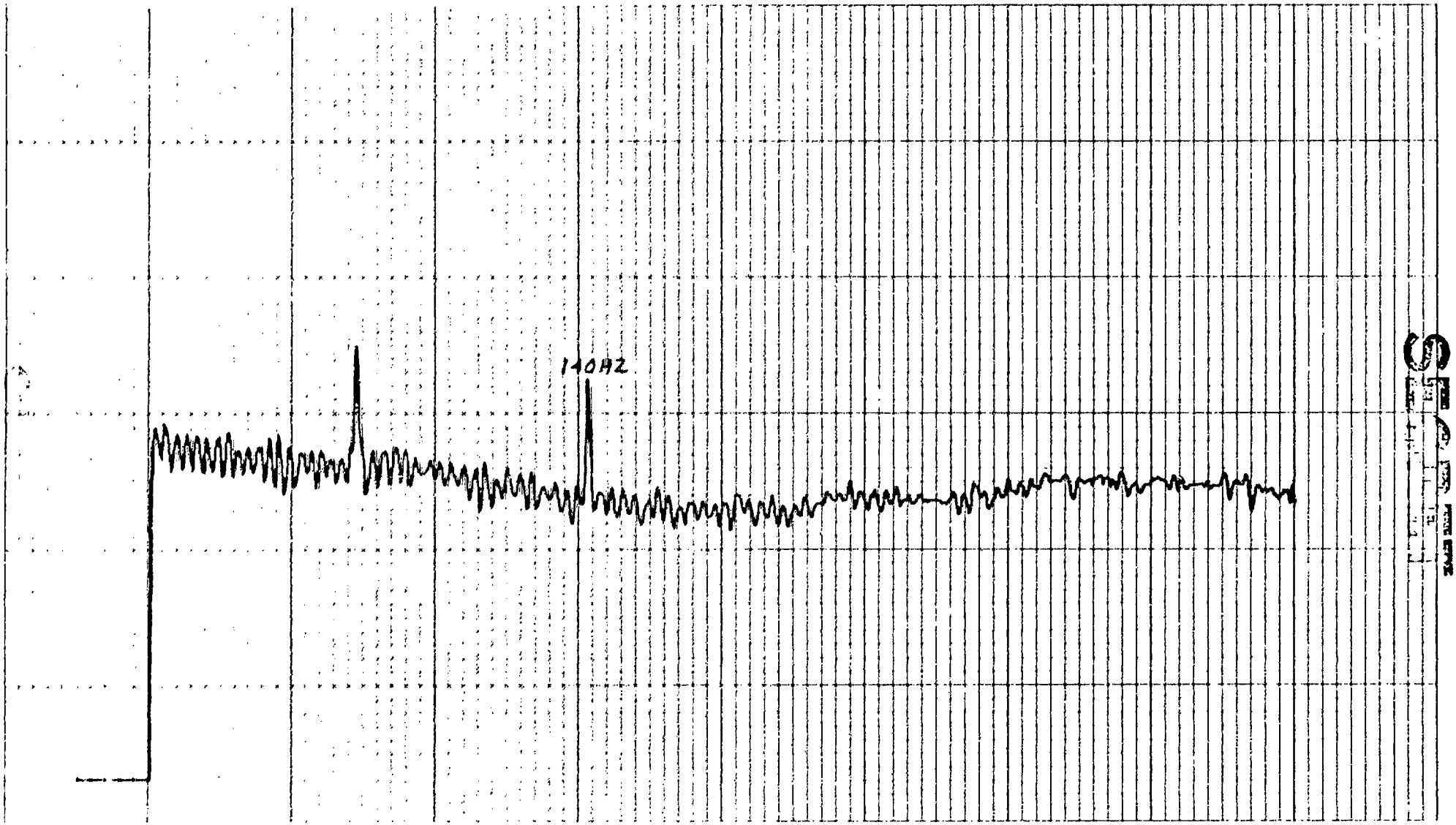
CONTROL: 316-0935 (45)
OMNI SPECTRUM (ELEMENT 39)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 316-77-0935Z
ANALYSIS BANDWIDTH: 1/10HZ
____ DEG AZ STEERING

REEL: M19 INDEX 566

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



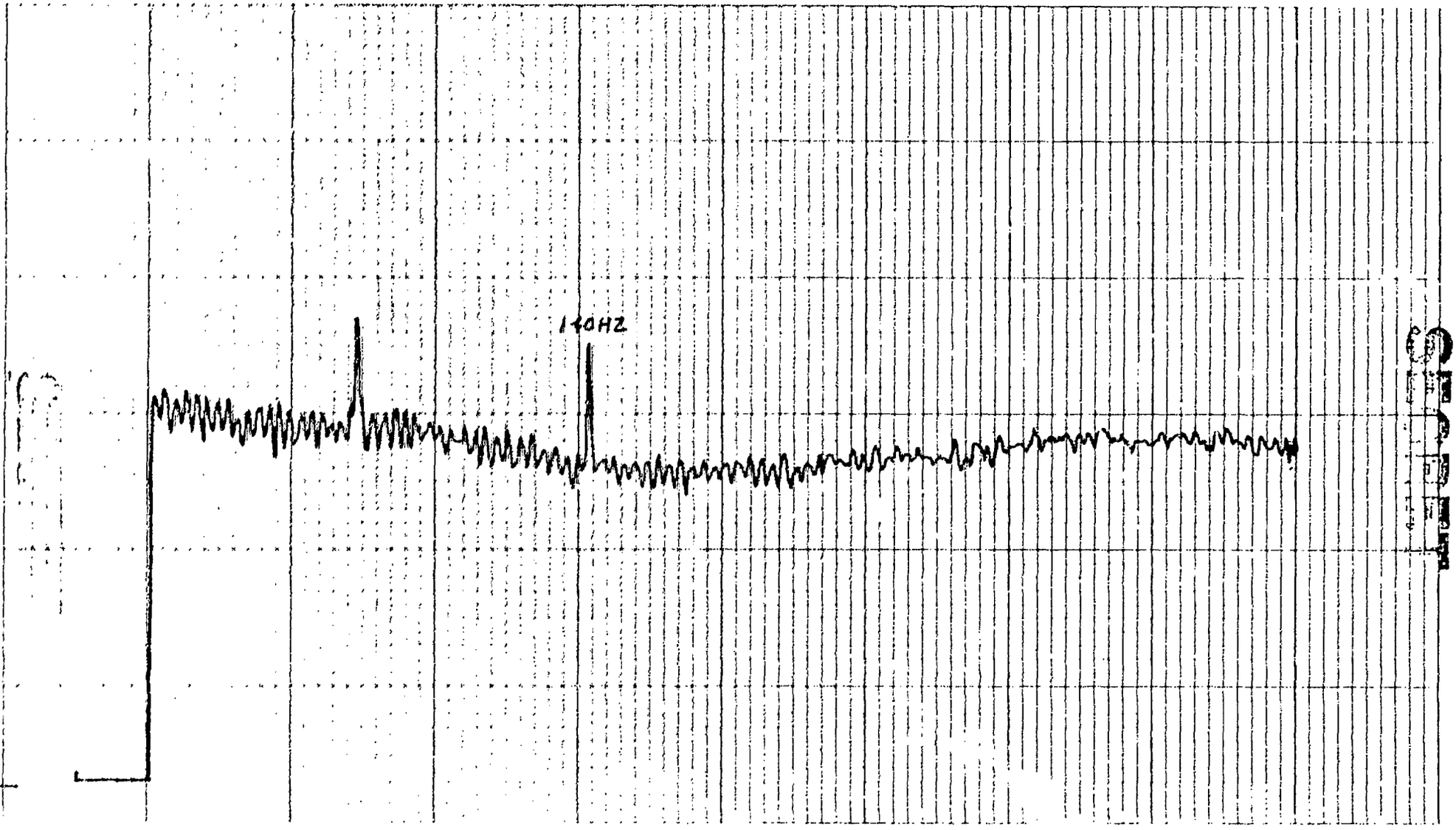
K·E

46 0703

CONTROL: 3-16-0935 (46)
OMNI SPECTRUM (ELEMENT 41)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 -0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
_____ DEG AZ STEERING

REEL: M22 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: - DB
FILTER WTG: HANNING

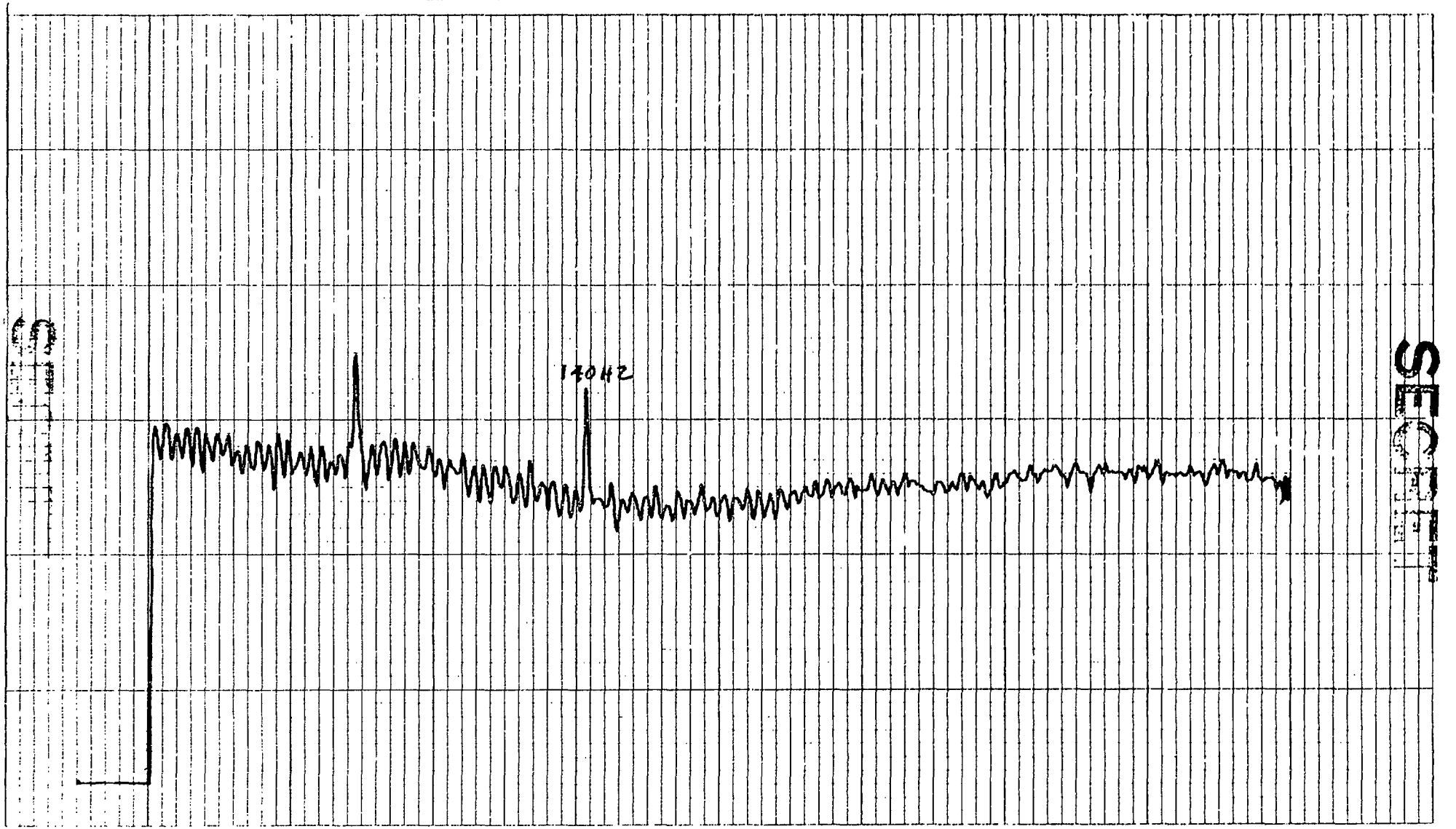


K+E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 3-16 -0935 (47)
OMNI SPECTRUM (ELEMENT 43)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 -0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
___ DEG AZ STEERING

REEL: M22 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: - DB
FILTER WTG: HANNING



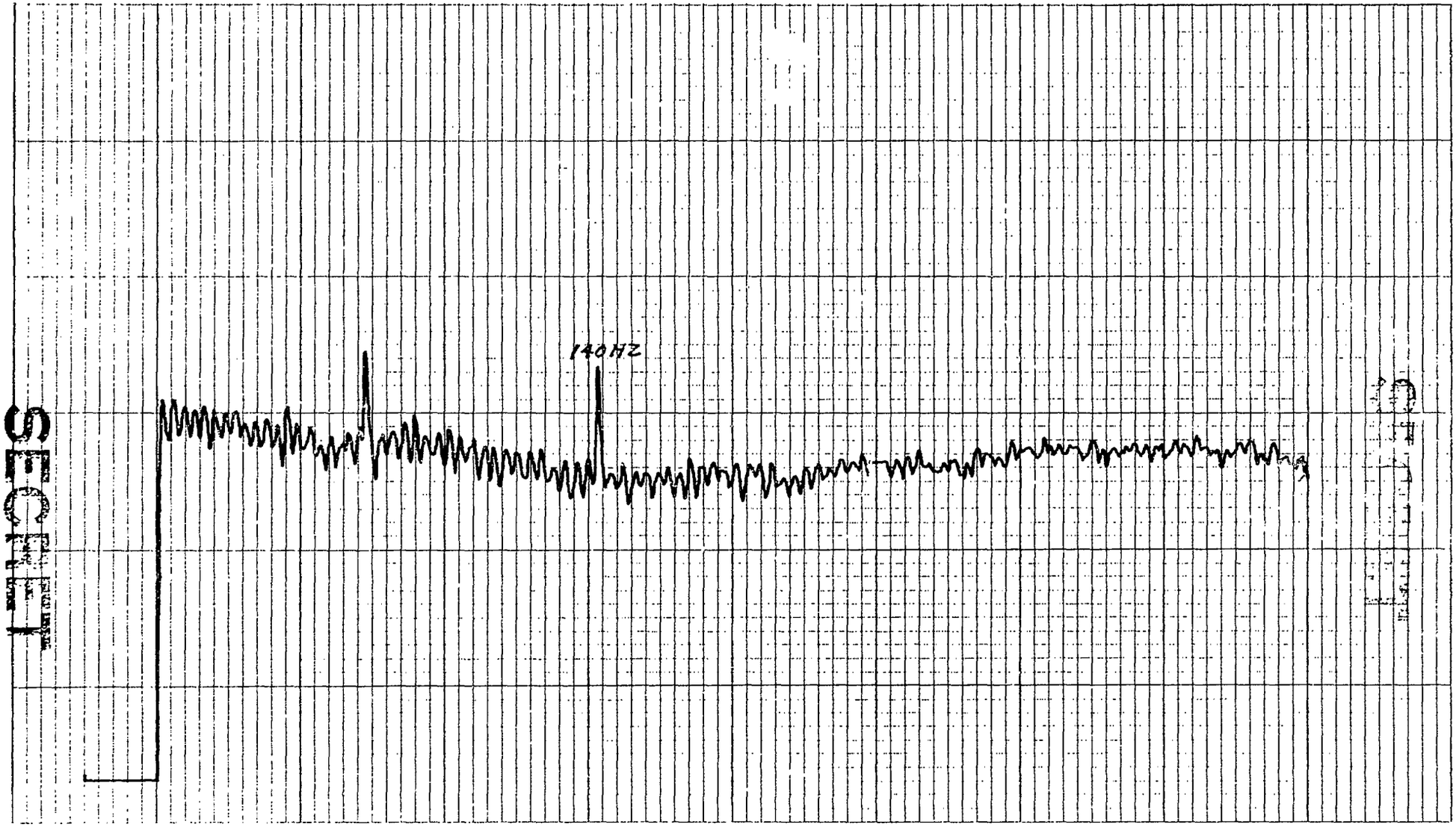
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 3-16-0935 (48)
OMNI SPECTRUM(ELEMENT 45)
EXERCISE:BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 - 0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M22 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



K+E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

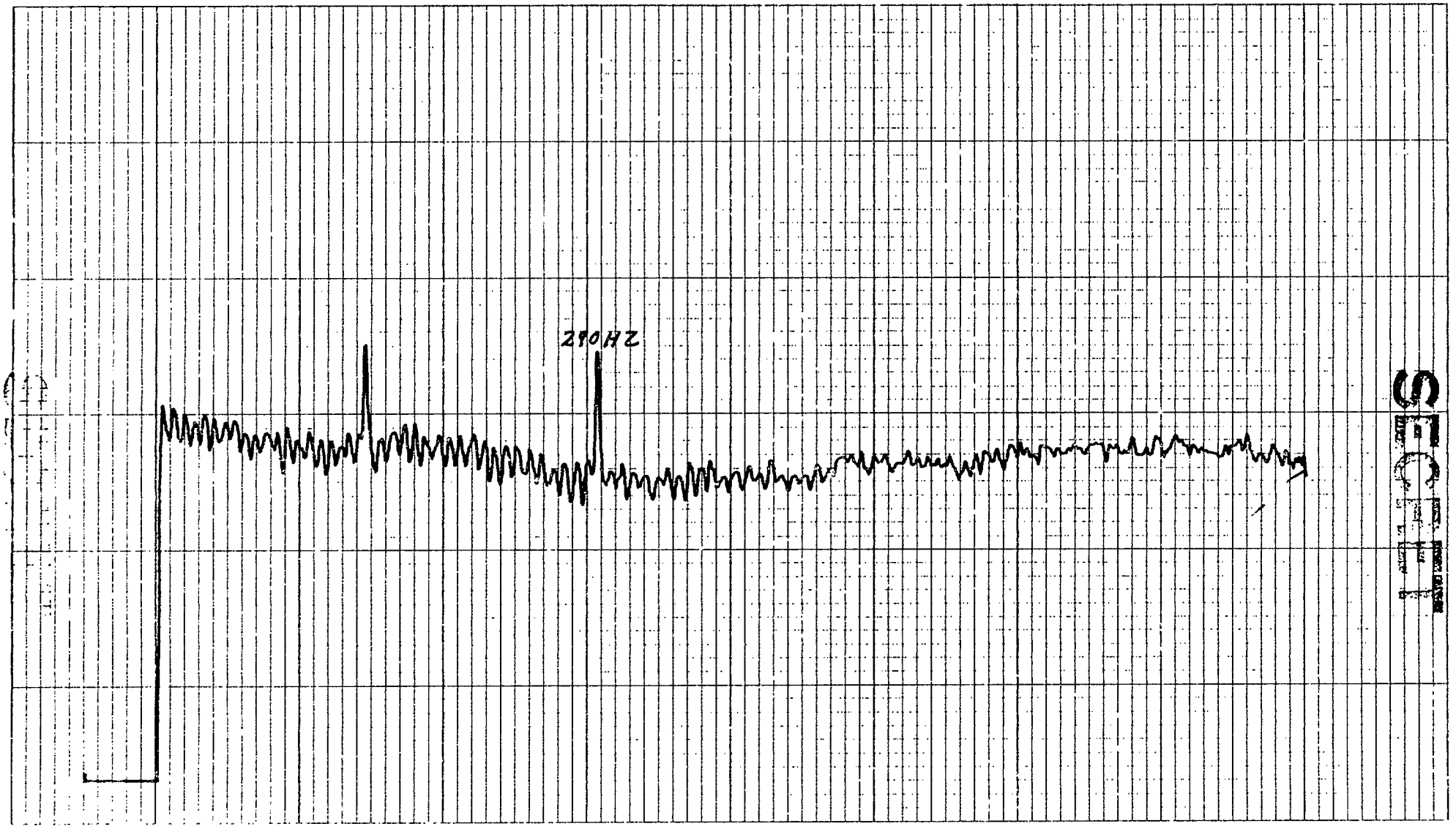
CONTROL: 3-16-0935 (49)
OMNI SPECTRUM (ELEMENT 47)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-16-77 -0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: 122 INDEX 566

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING

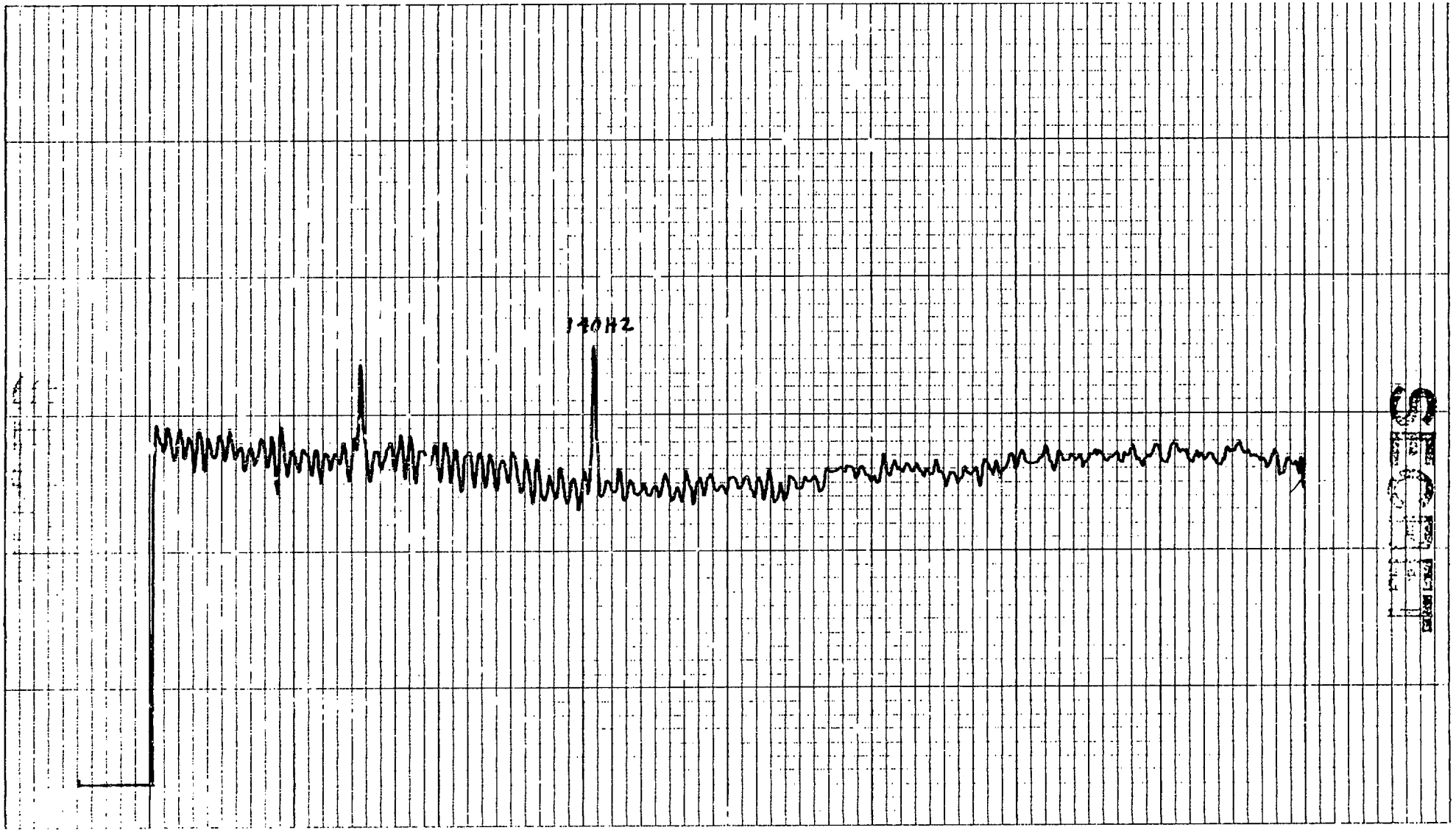


K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 346-0935 (50)
OMNI SPECTRUM (ELEMENT 49)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 346-77-0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: MX2 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: - DB
FILTER WTG: HANNING

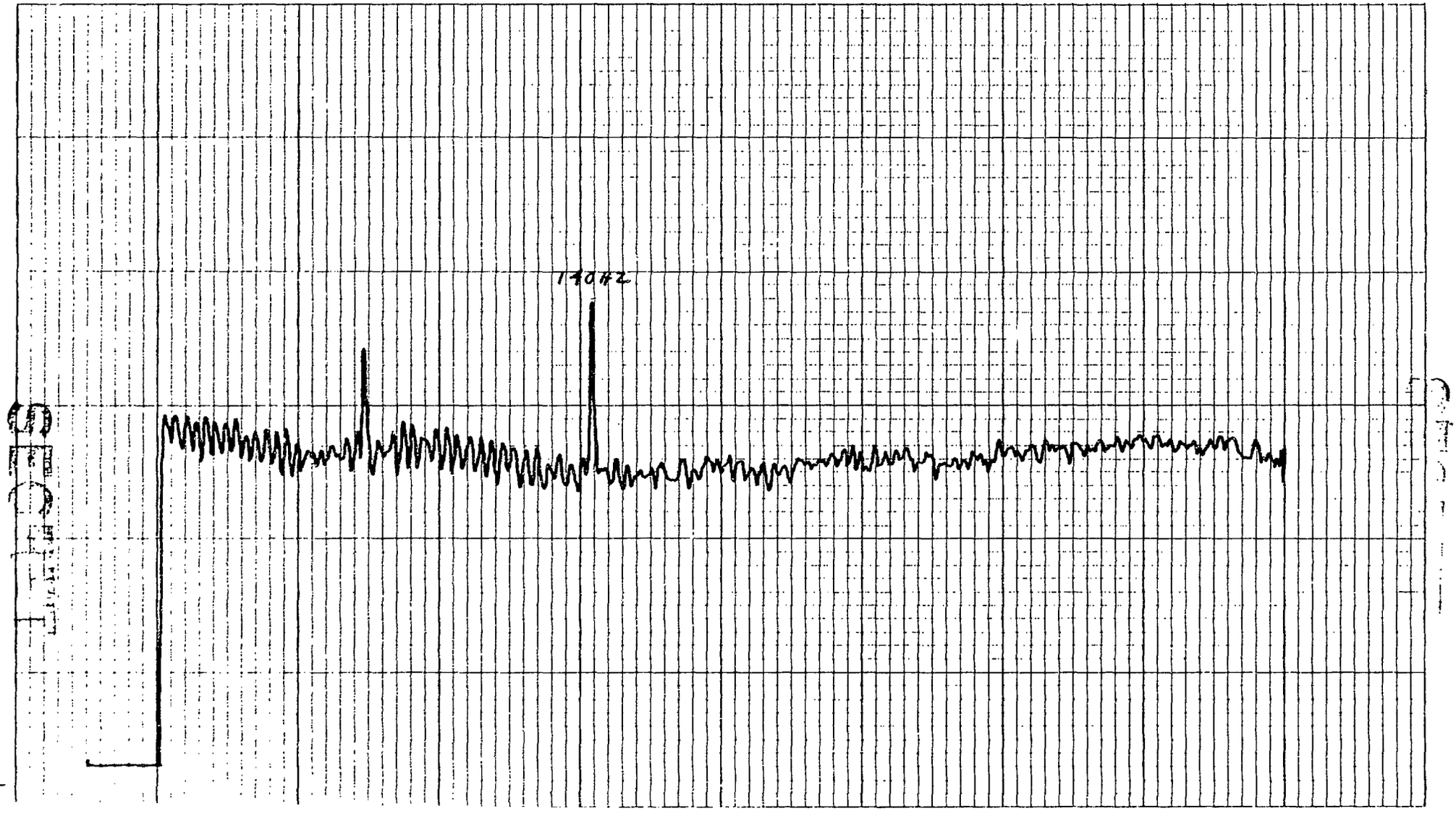


K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 3-76-0935 (51)
OMNI SPECTRUM (ELEMENT 51)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-1677-0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
___ DEG AZ STEERING

REEL: M22 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: - DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

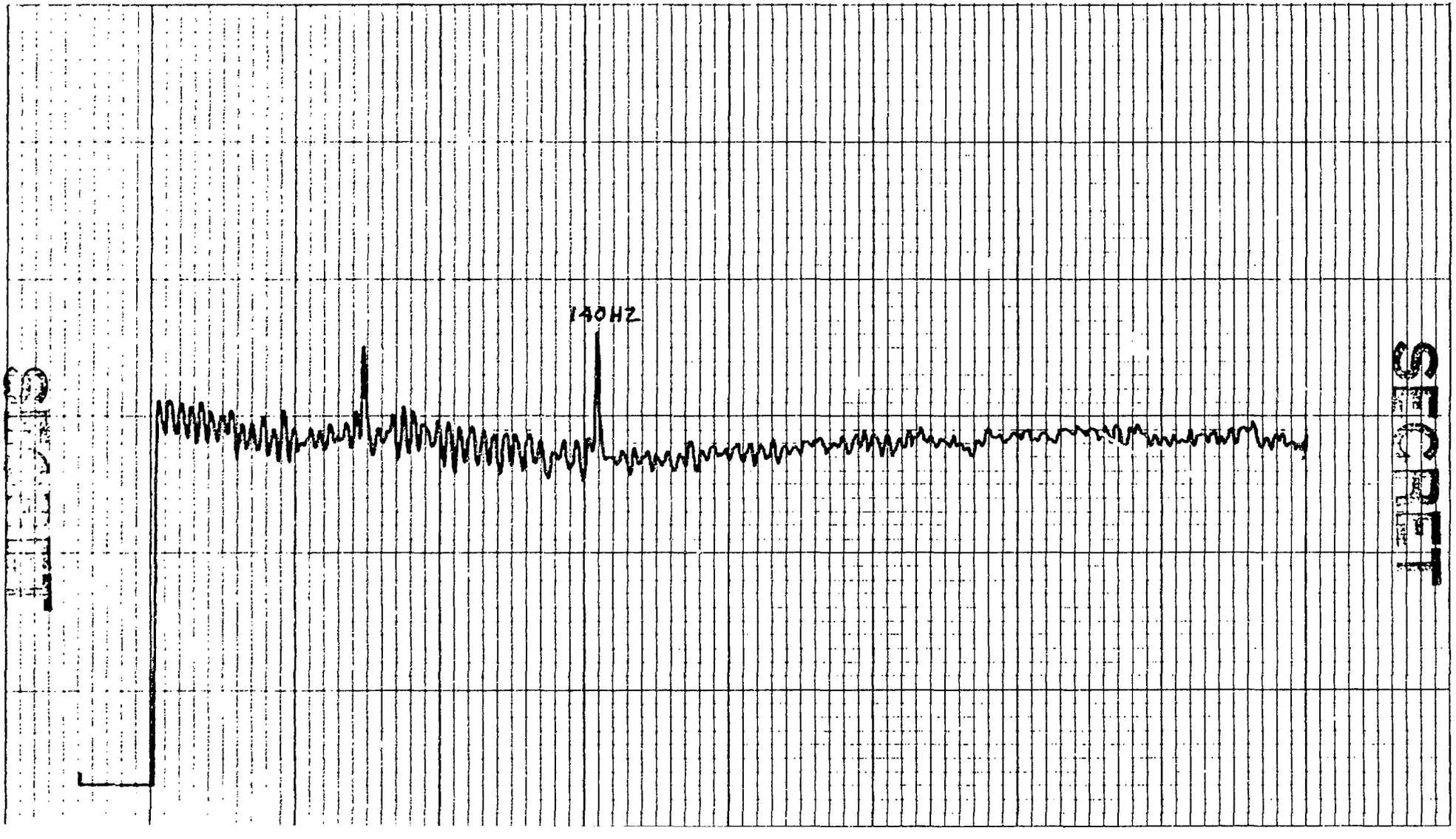
CONTROL: 3-16-0935 (52)
OMNI SPECTRUM (ELEMENT 53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-16-77 - 0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M22 INDEX 566

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 3-16 -0825 (53)
OMNI SPECTRUM(ELEMENT 2)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 -0835Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

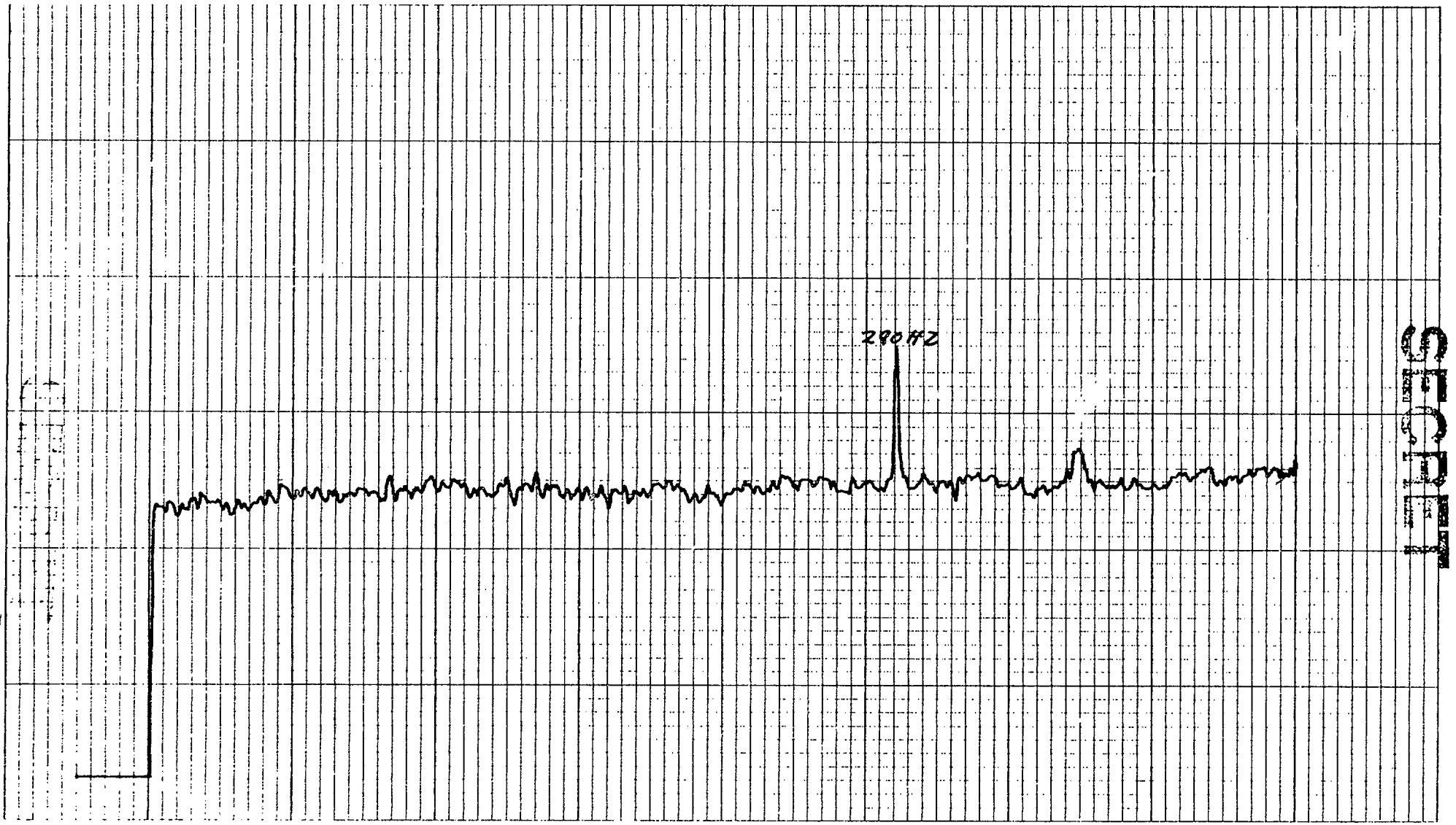
REEL: M22 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING

K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 346 - 0935 (54)
OMNI SPECTRUM (ELEMENT 4)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 346-77 - 0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: 422 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: - DB
FILTER WTG: HANNING

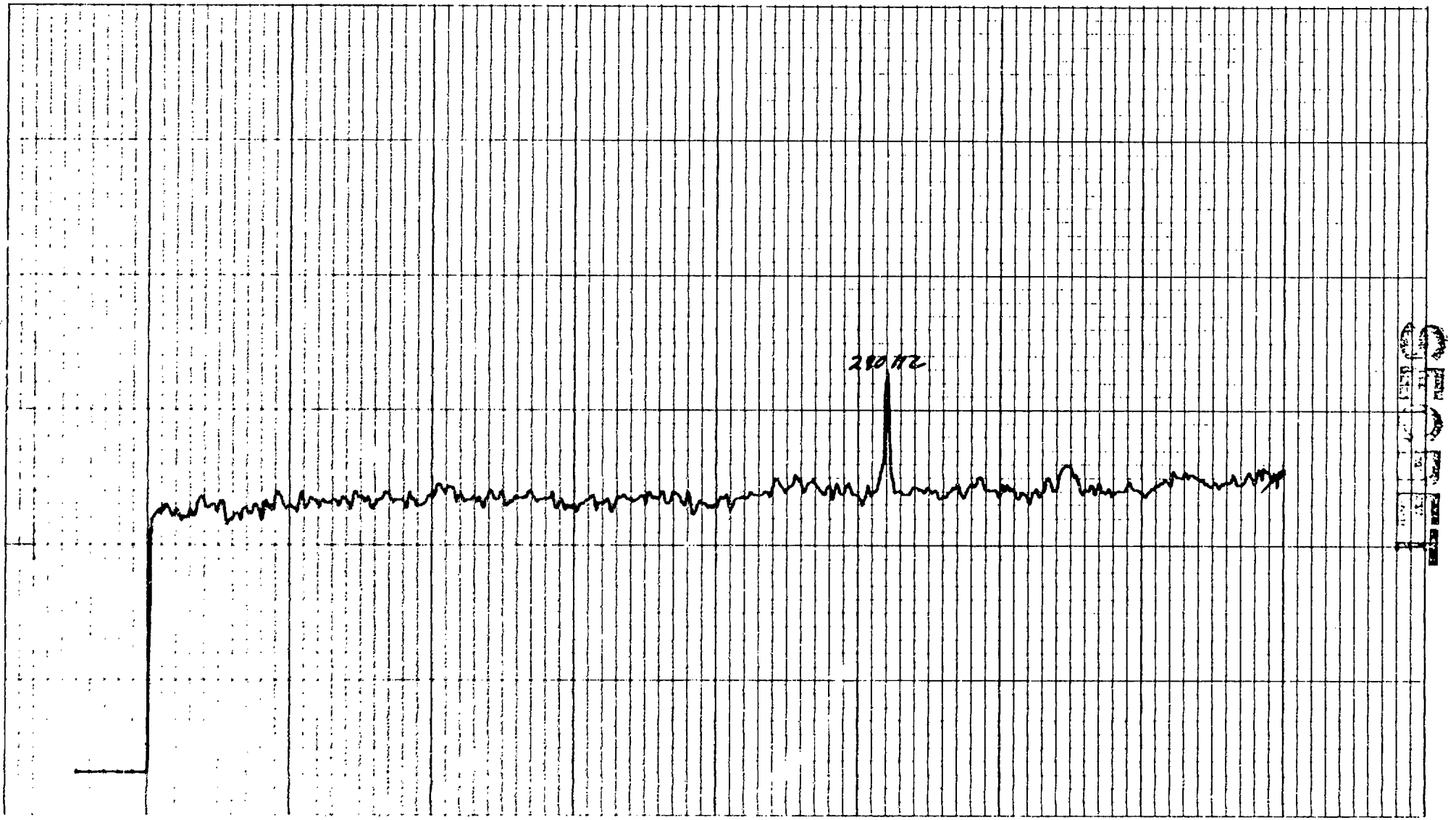


K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 316-0935 (55)
OMNI SPECTRUM (ELEMENT 6)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 316-77 -0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M22 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING

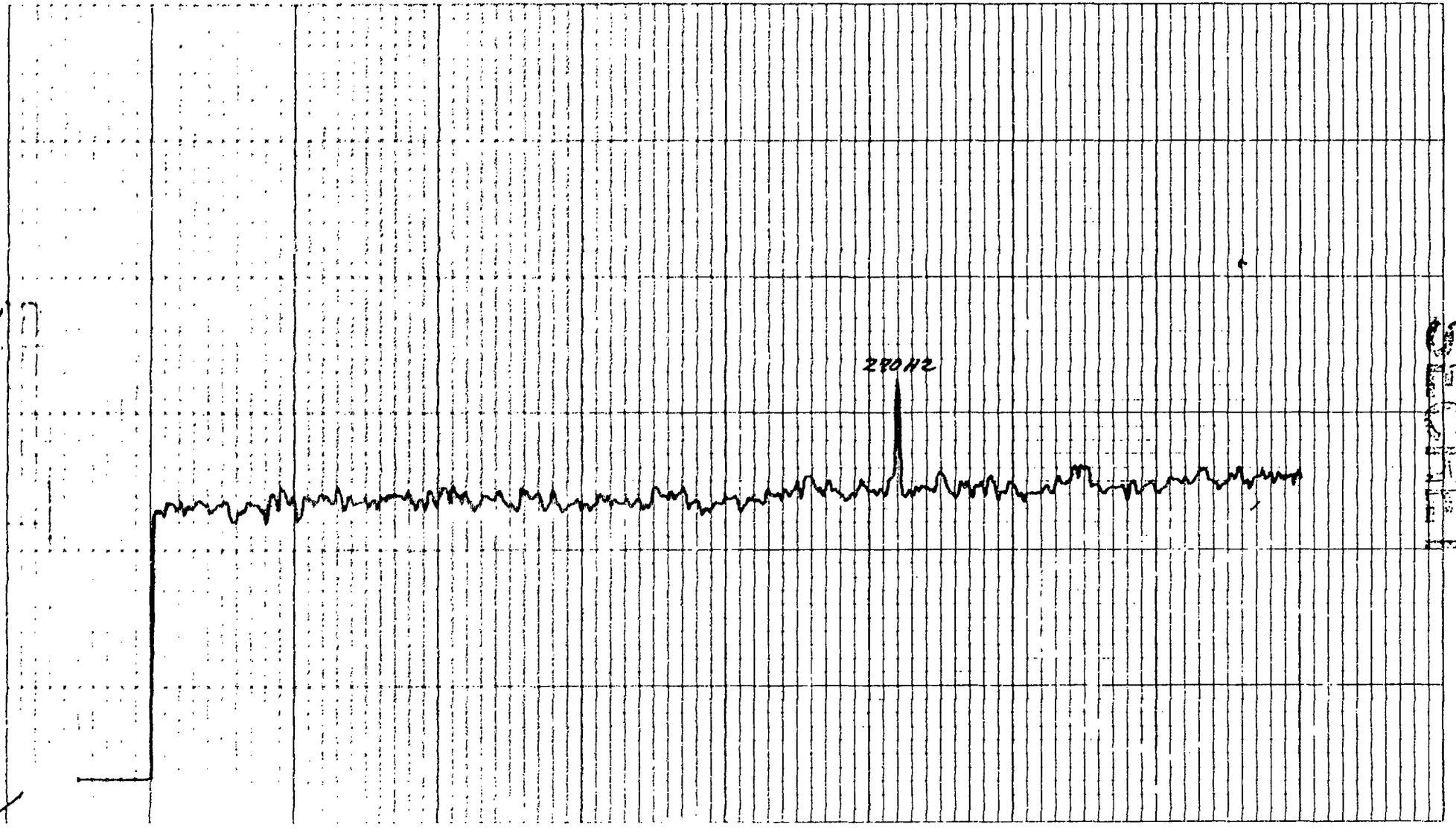


K&E 10 X 10 TO THE INCH • 5 X 10 TO THE INCH KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 3-16-0935 (56)
OMNI SPECTRUM (ELEMENT 9)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 -0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M22 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING

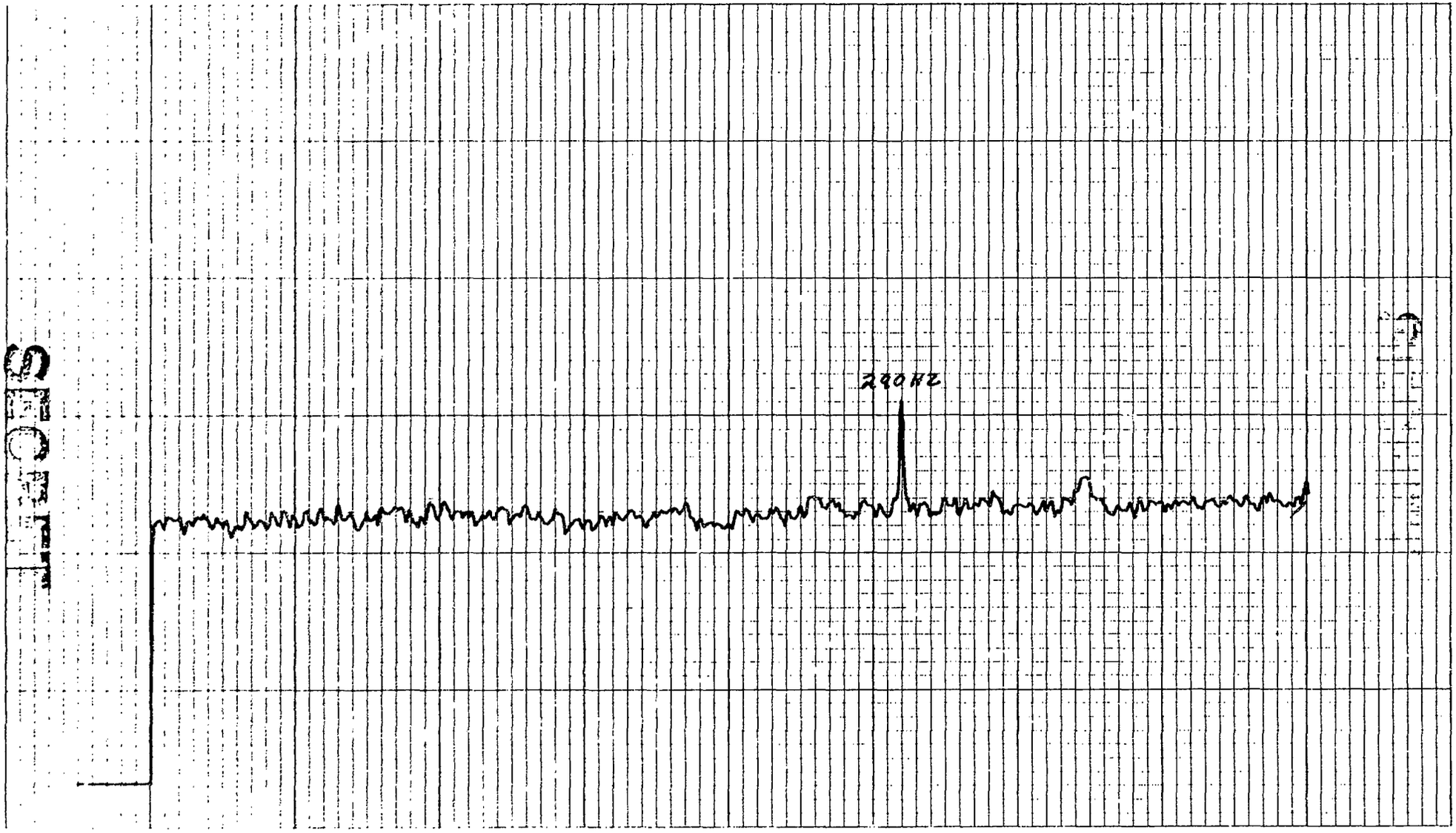


K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 346 - 0935 (57)
OMNI SPECTRUM (ELEMENT 10)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-6-77 - 0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M22 INDEX 666
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



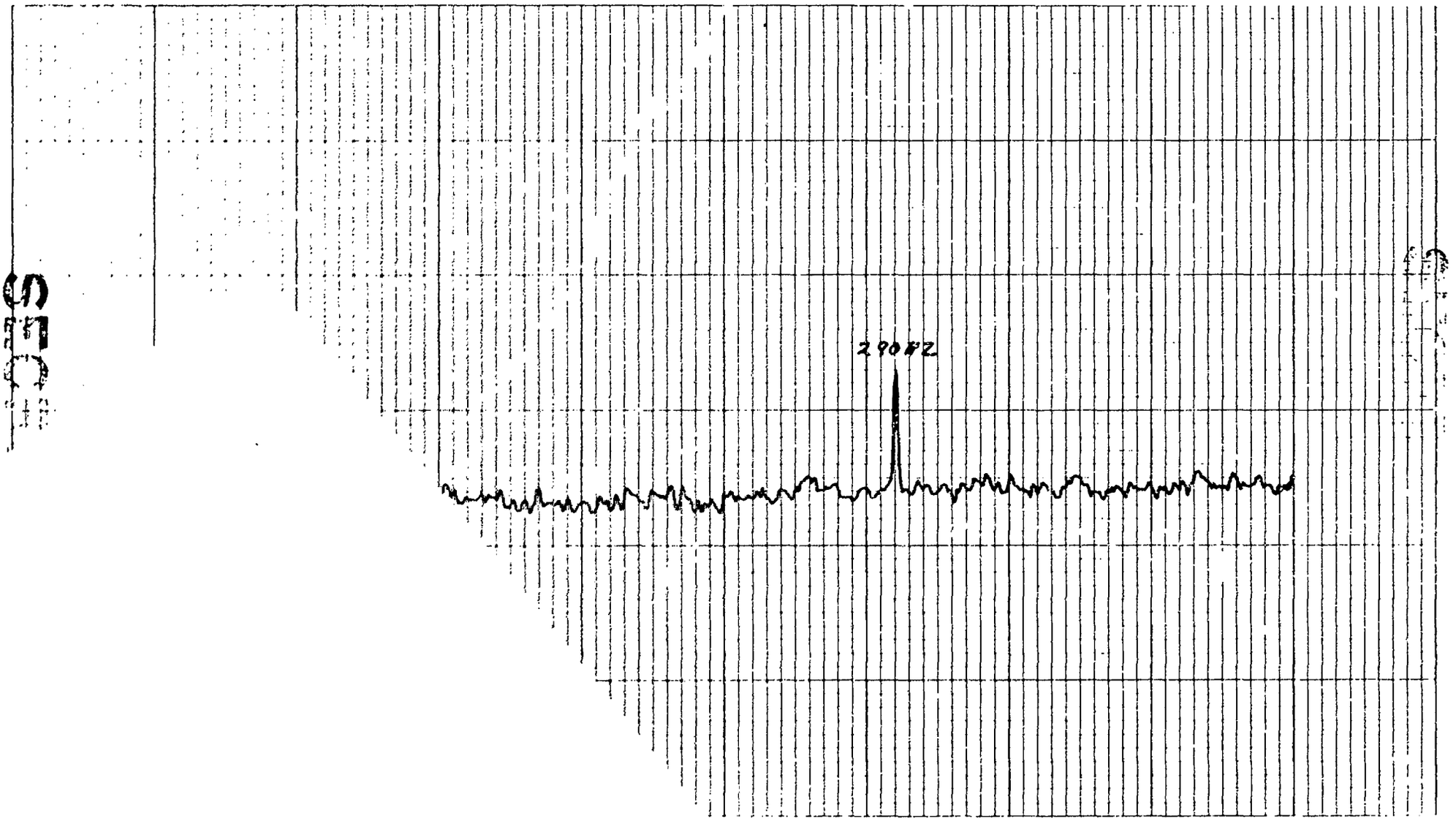
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 3-16 -0935 (68)
OMNI SPECTRUM(ELEMENT 12)
EXERCISE:BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 -0935 Z
ANALYSIS BANDWIDTH: 1/1CHZ
___ DEG AZ STEERING

REEL: M22 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH

46 0703

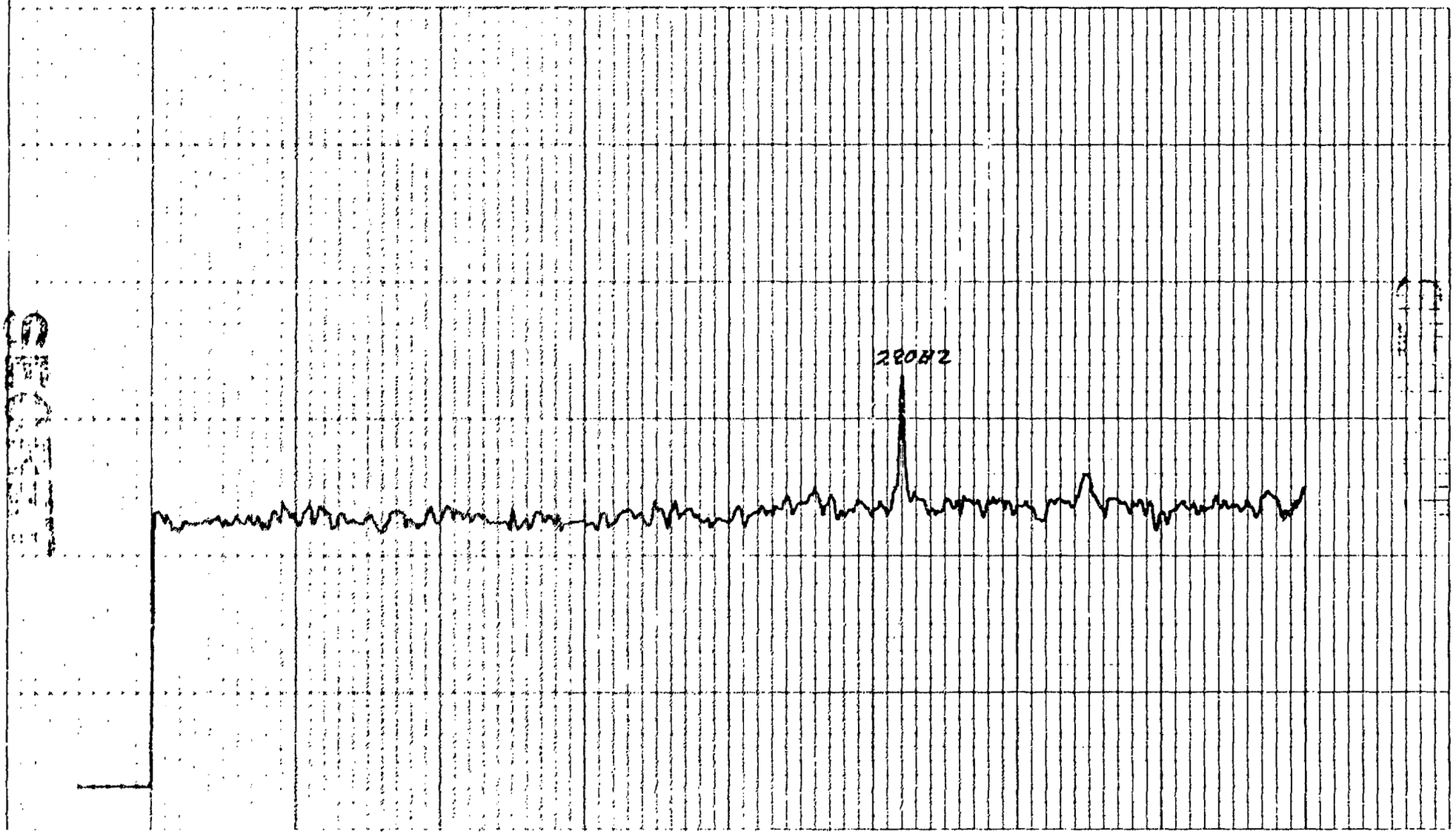
CONTROL: 3-16 -0935 (59)
OMNI SPECTRUM(ELEMENT 14)
EXERCISE: BEARING STAKE
CENTER FREQ: 200 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-16-77 -0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M22 INDEX 566

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



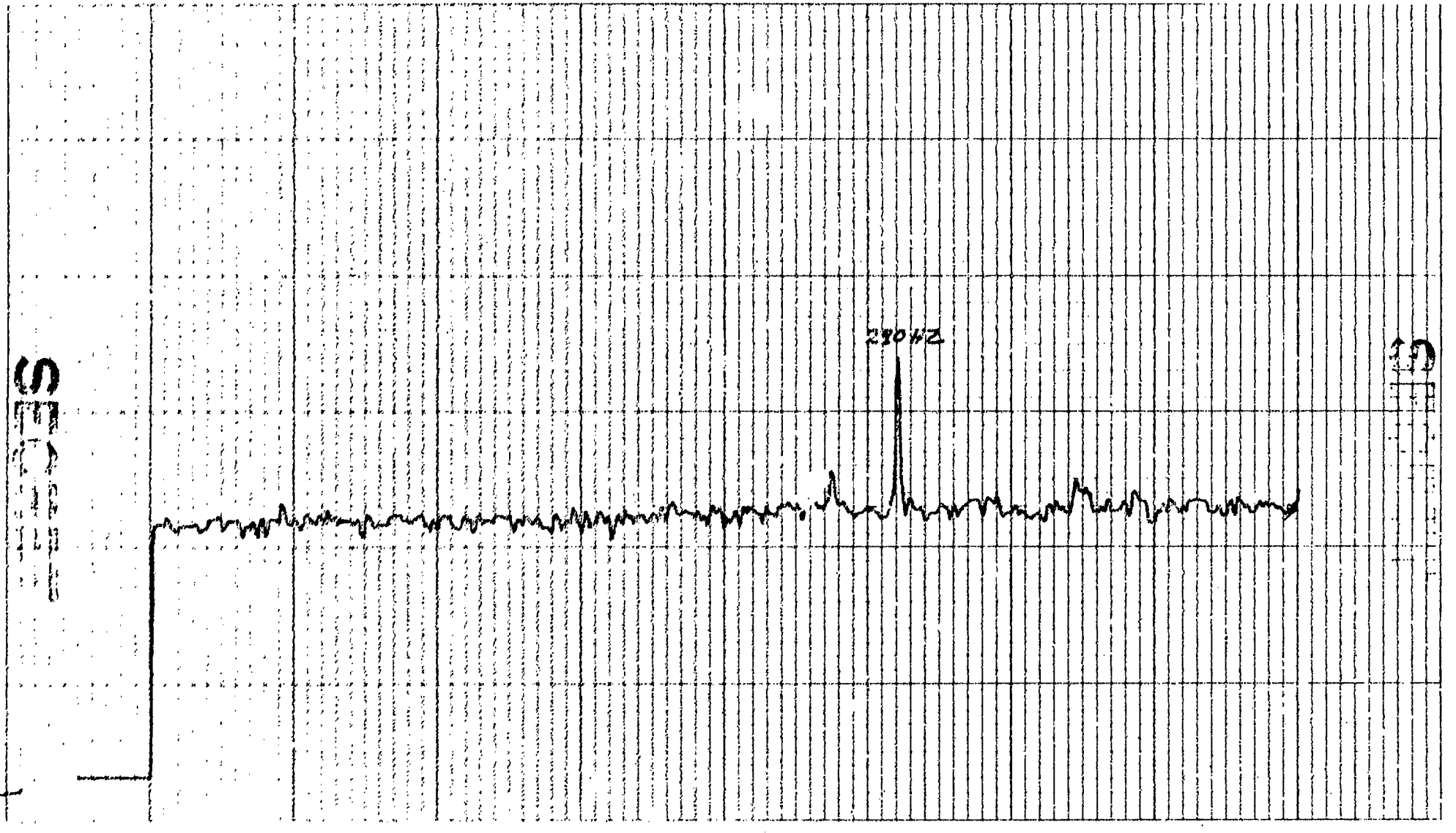
K+E

46 0703

CONTROL: 376-0935 (60)
OMNI SPECTRUM (ELEMENT 16)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 - 0935Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M22 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 5 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

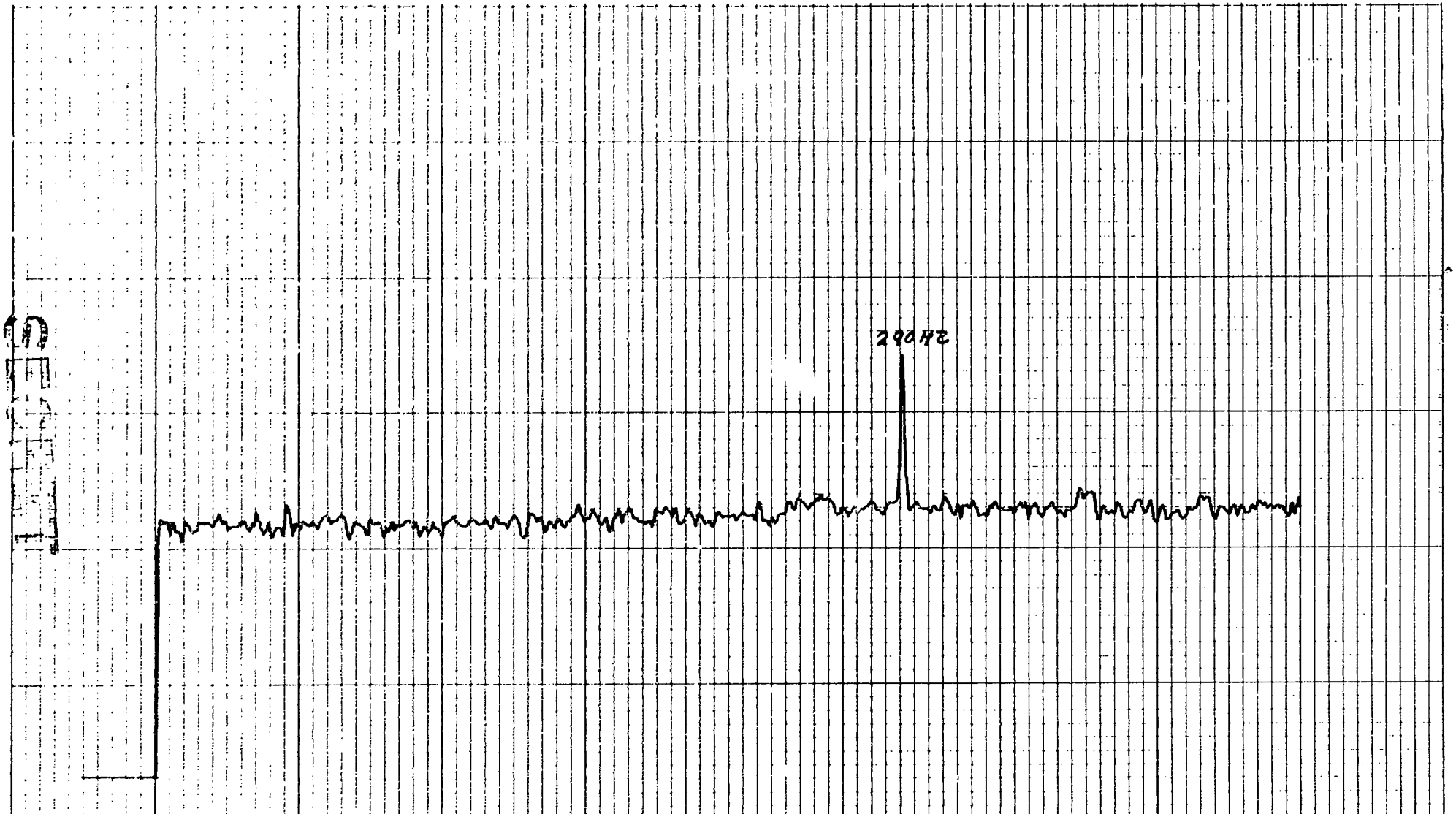
CONTROL: 3-16-0935 (6/)
OMNI SPECTRUM(ELEMENT 19)
EXERCISE:BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-16-77 -0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M22 INDEX 561

INTEGRATION TIME 320 SECS ATTEN: - DB
FILTER WTG: HANNING



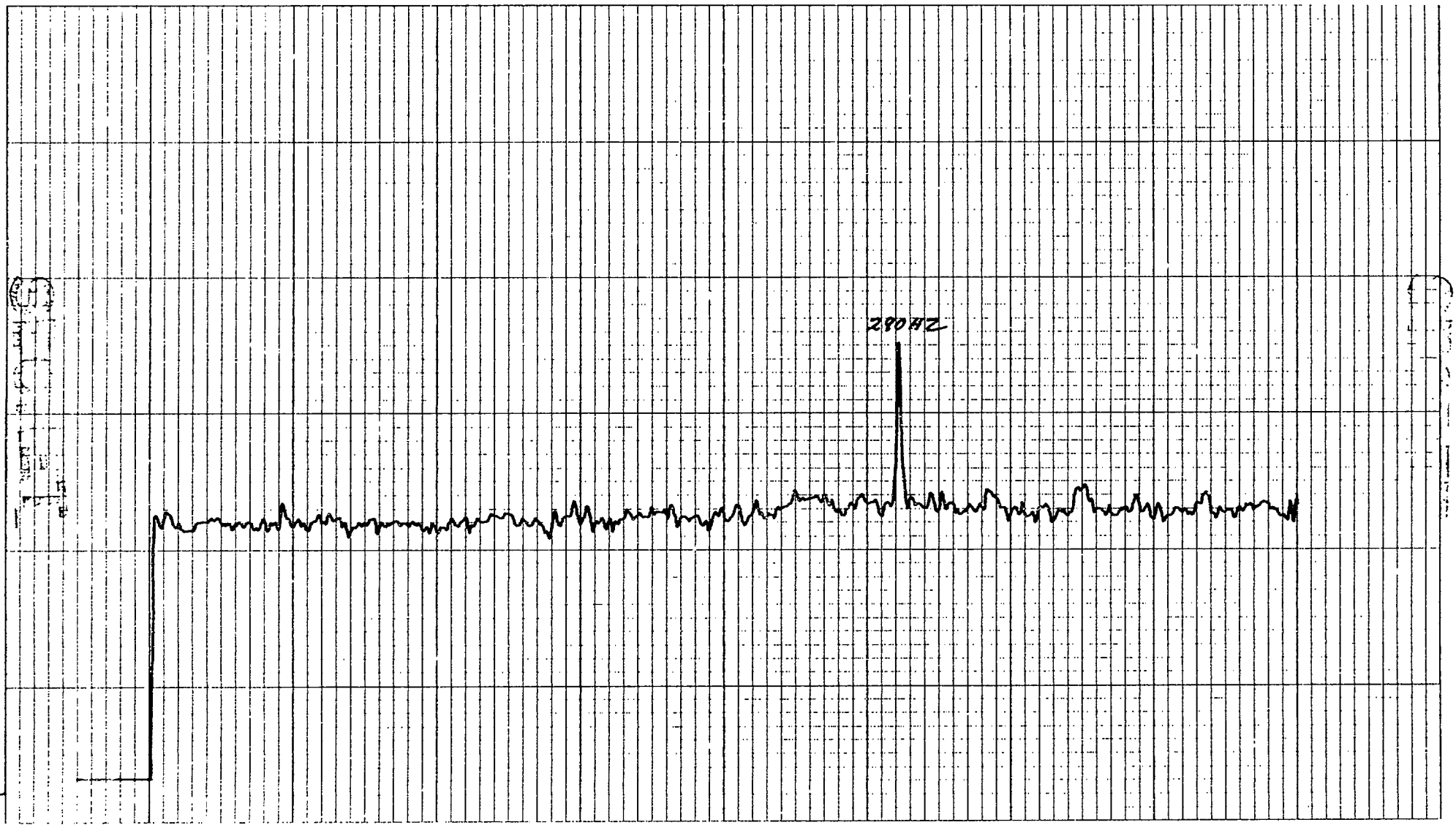
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

CONTROL: 316 -0935 (62)
OMNI SPECTRUM(ELEMENT 20)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 -0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M29 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



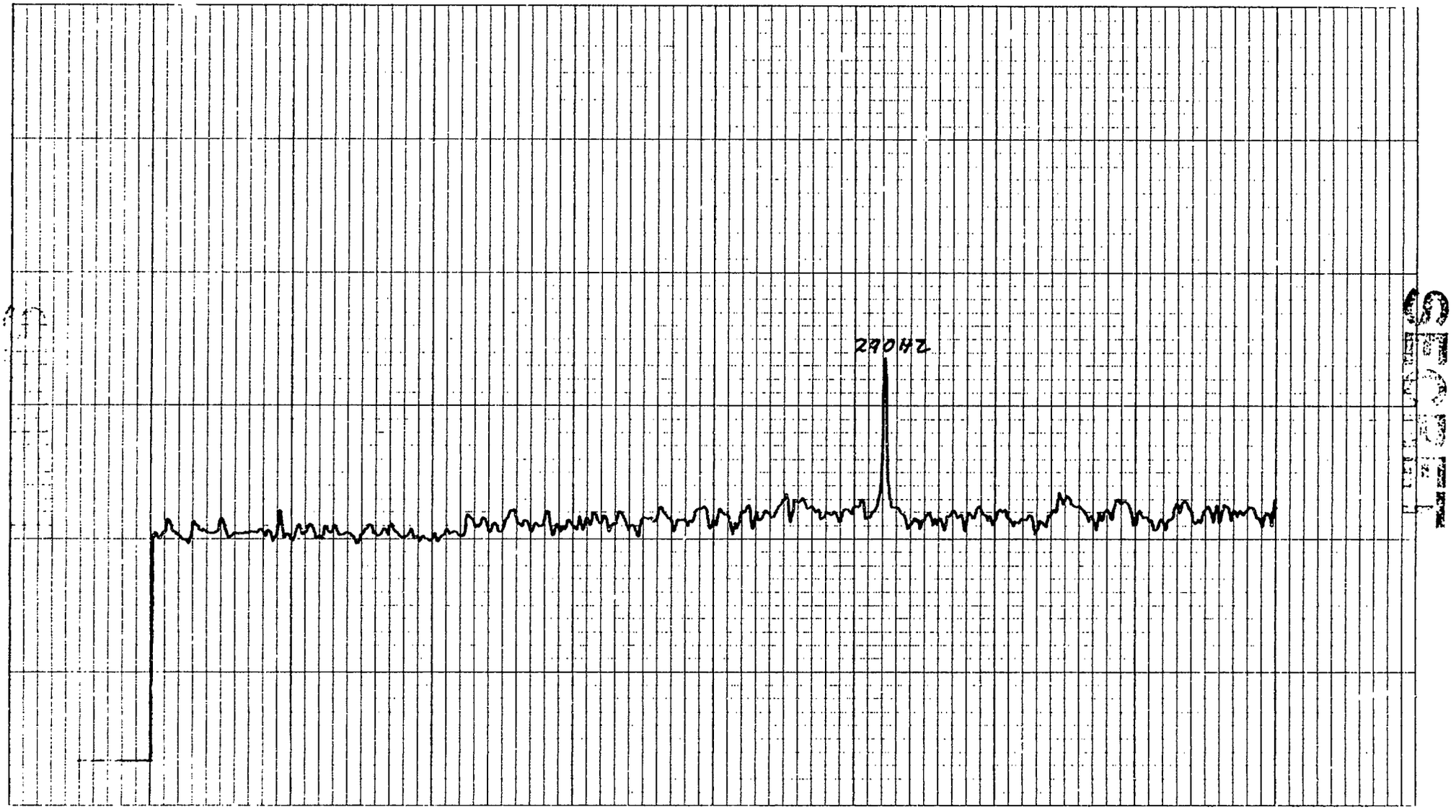
K+E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 3-16 -0935 (63)
OMNI SPECTRUM(ELEMENT 23)
EXERCISE:BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 -0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M22 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



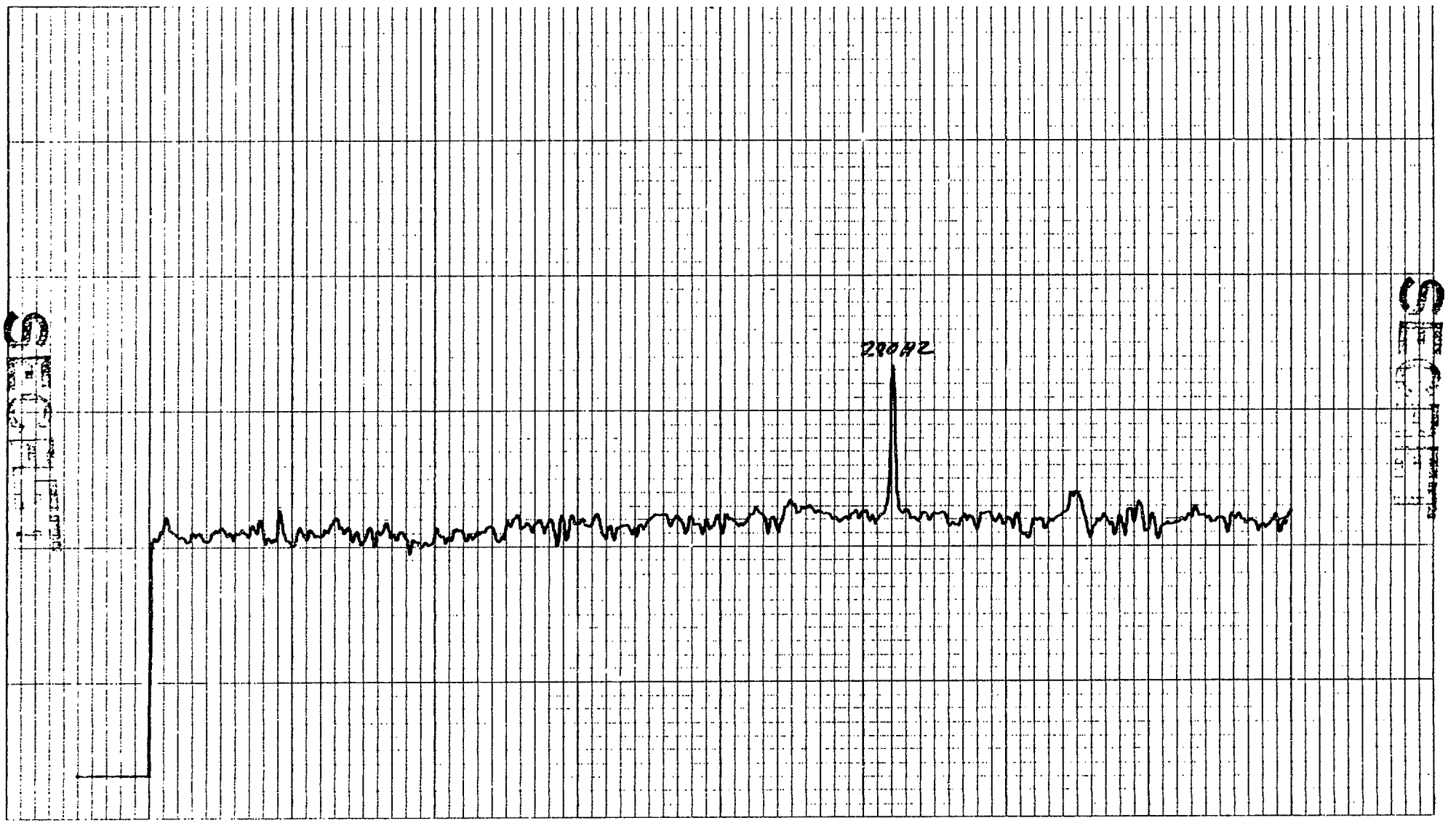
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

4

CONTROL: 3-16-0935 (64)
OMNI SPECTRUM (ELEMENT 24)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 - 0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M22 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



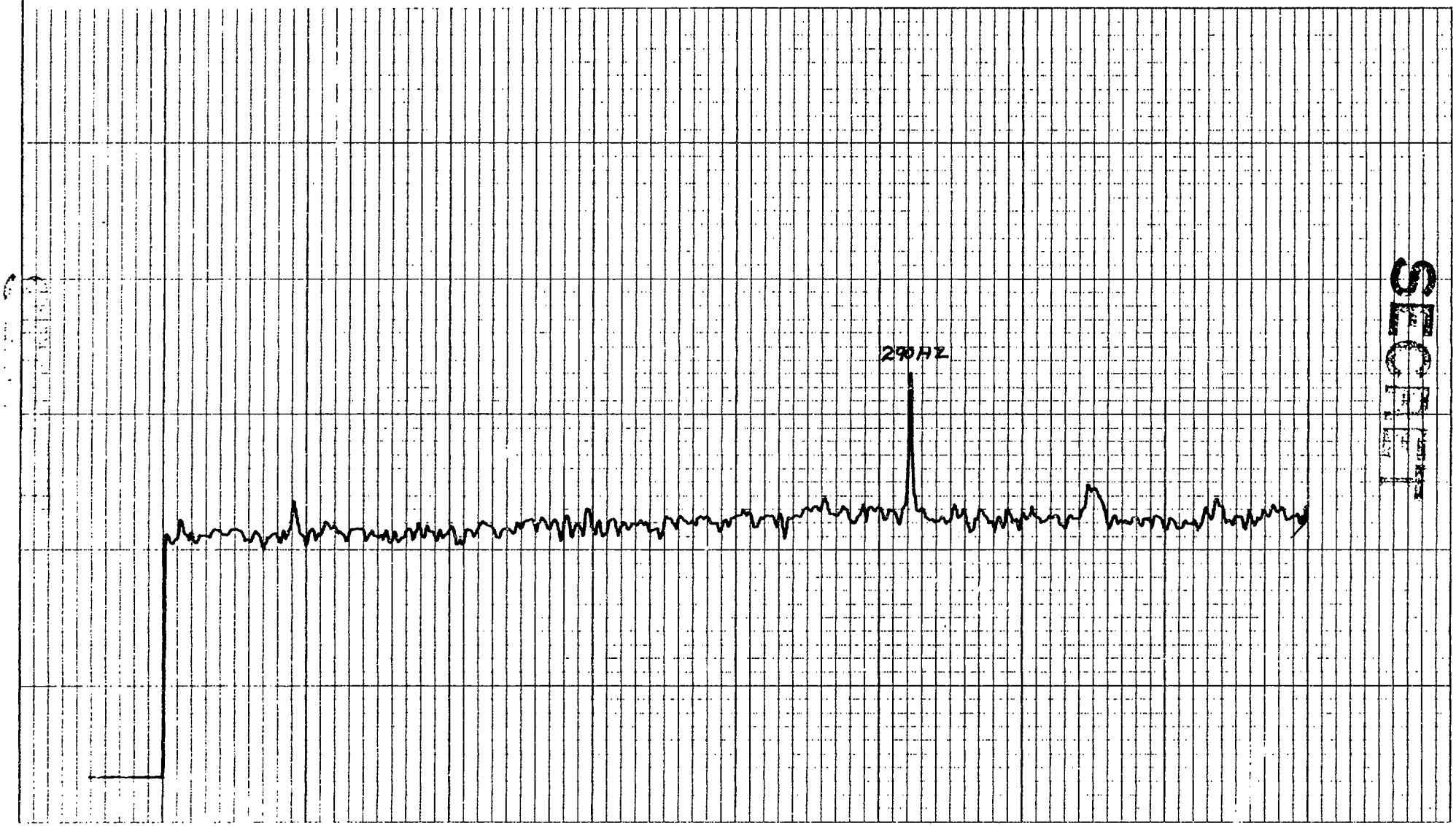
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 0935 - 51 (DPII)
OMNI SPECTRUM (ELEMENT 26)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 - 0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
- DEG AZ STEERING

REEL: M22 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: - DB
FILTER WTG: HANNING



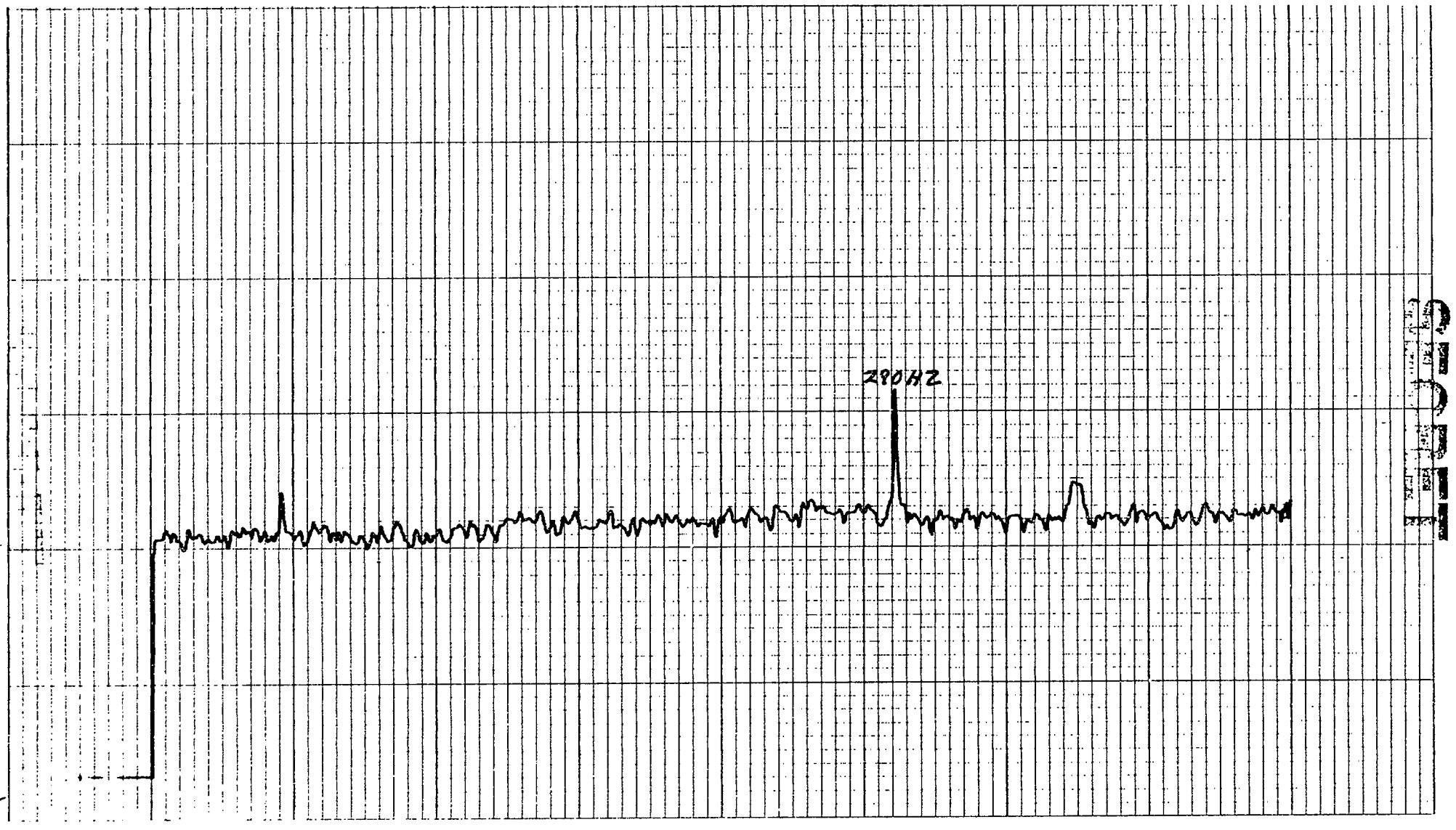
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 3-16-0935 (66)
OMNI SPECTRUM(ELEMENT 29)
EXERCISE:BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 - 0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M22 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



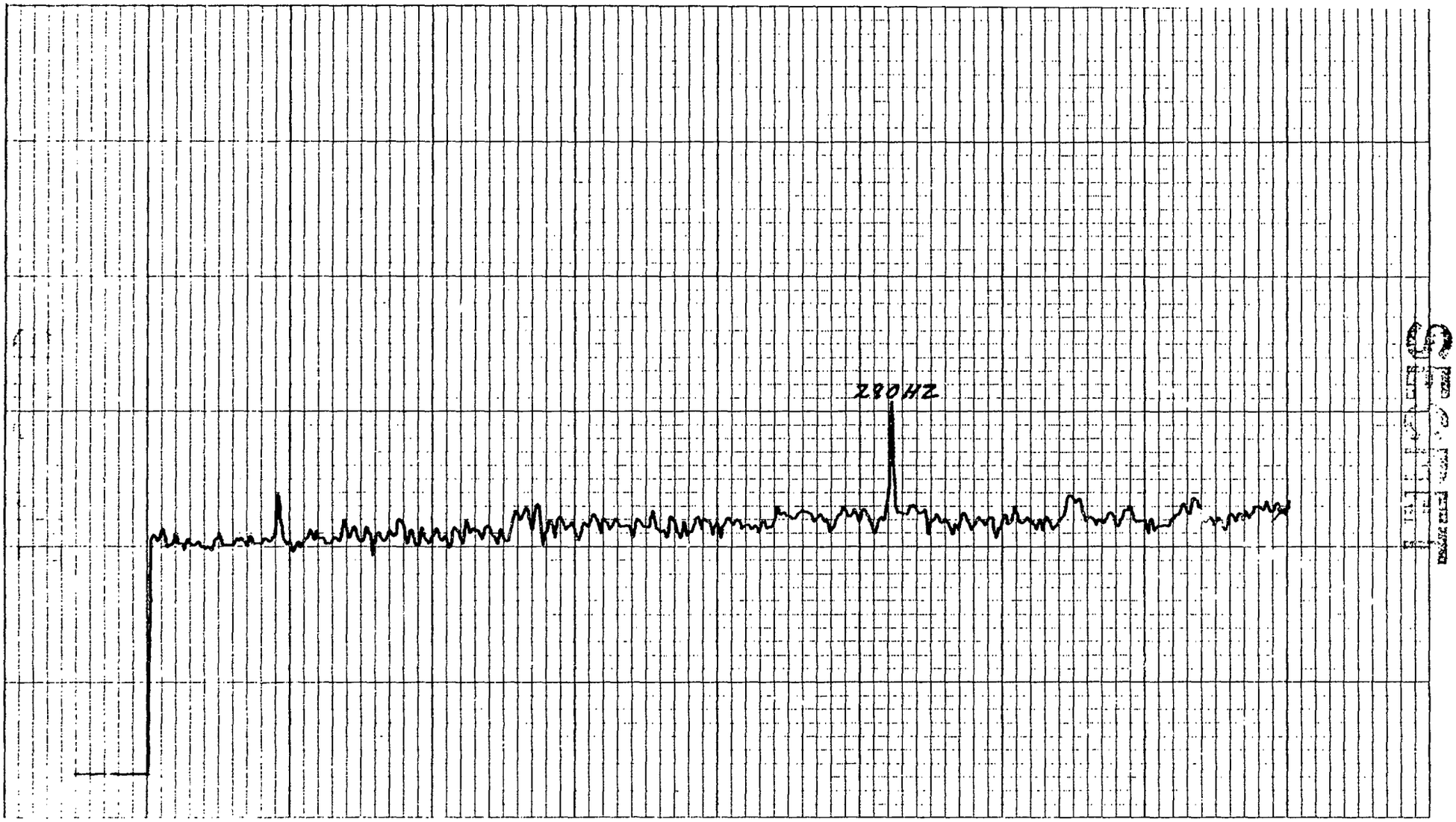
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 3-16 -0935 (67)
OMNI SPECTRUM (ELEMENT 31)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 -0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: 1122 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



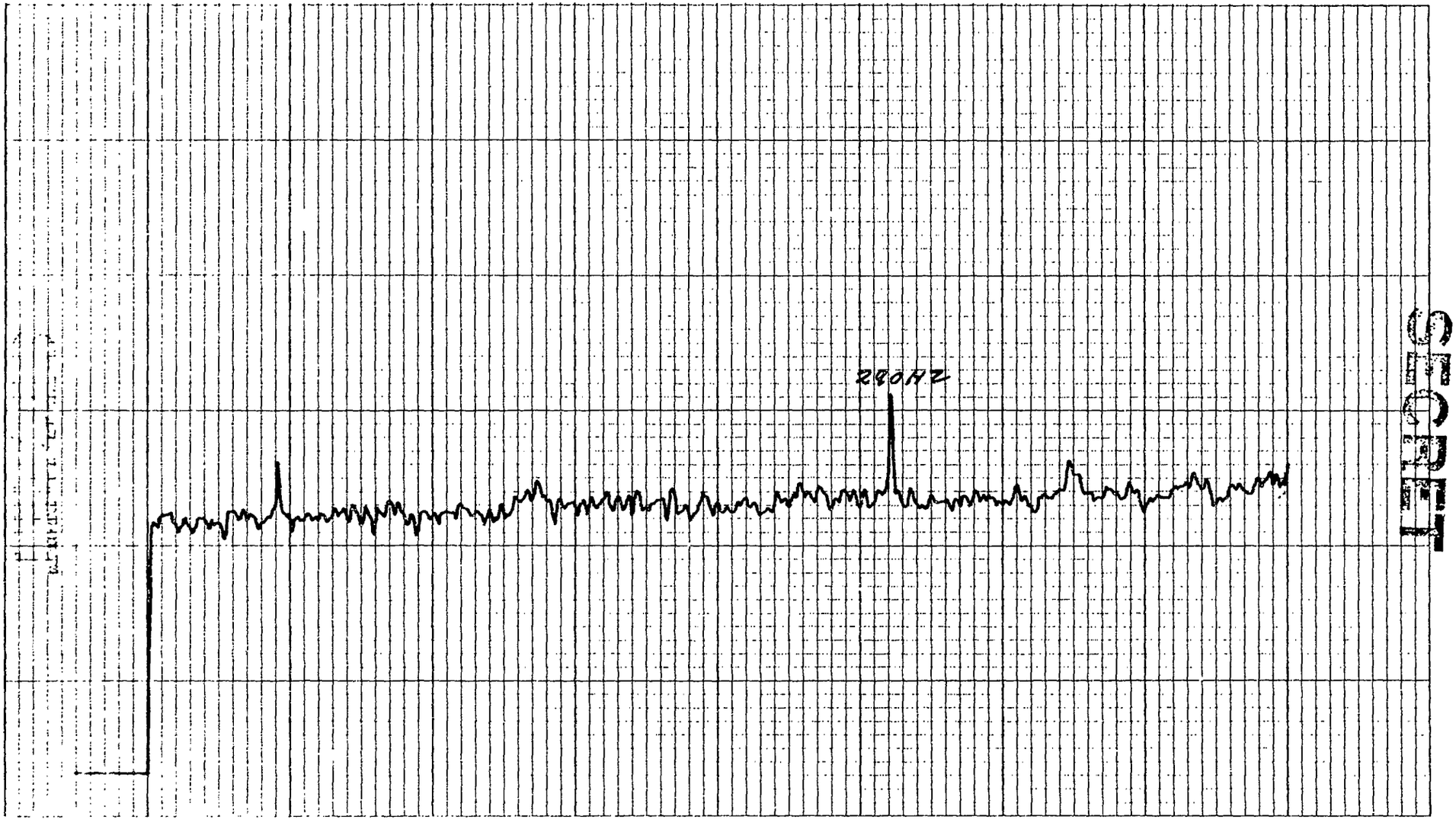
K-E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 3-16-0935 (68)
OMNI SPECTRUM(ELEMENT 33)
EXERCISE:BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME:3-16-77 -0835Z
ANALYSIS BANDWIDTH:1/10HZ
— DEG AZ STEERING

REEL: 122 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



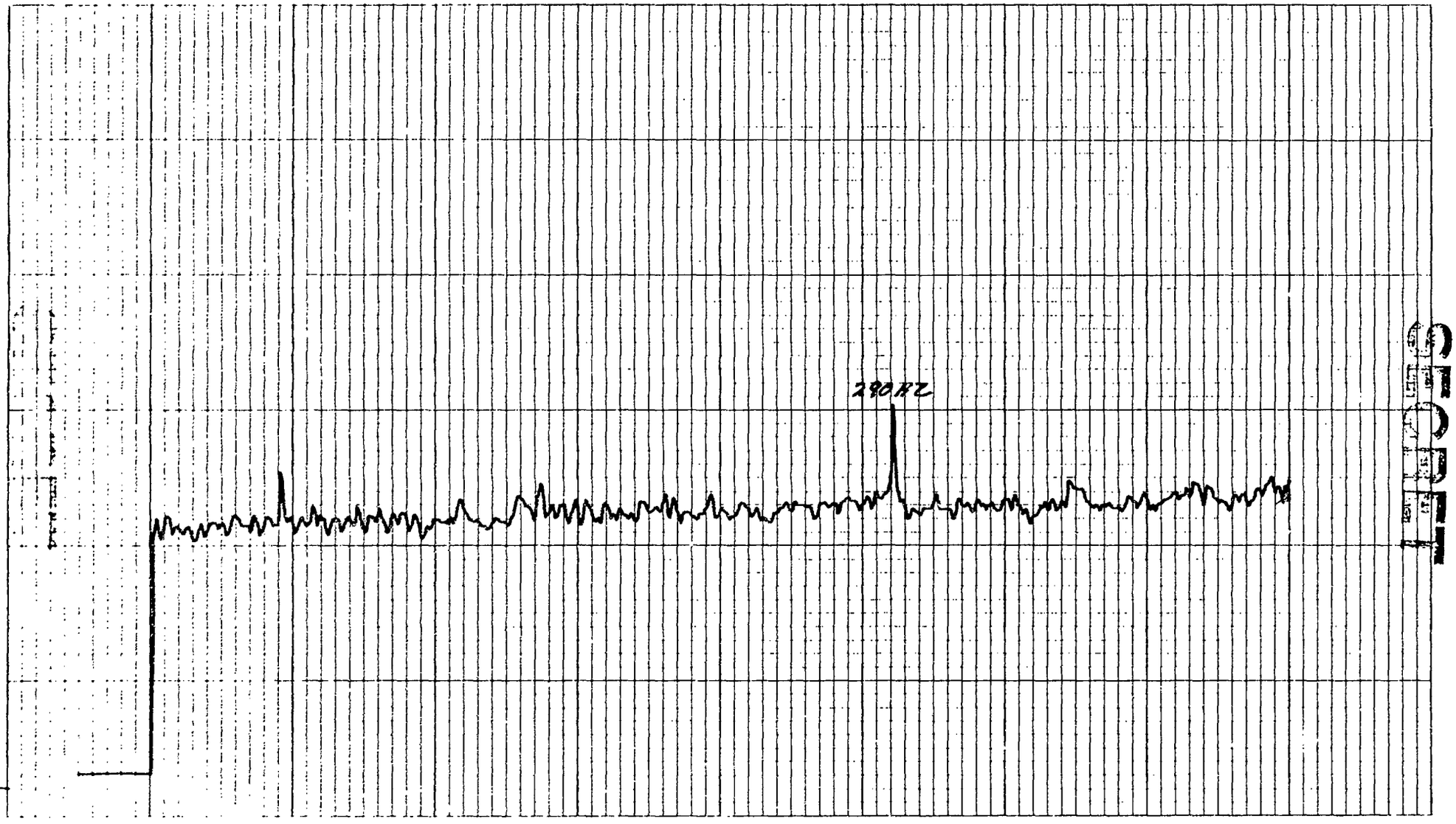
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 3-16-0935 (69)
OMNI SPECTRUM (ELEMENT 35)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 -0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
___ DEG AZ STEERING

REEL: 1422 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING

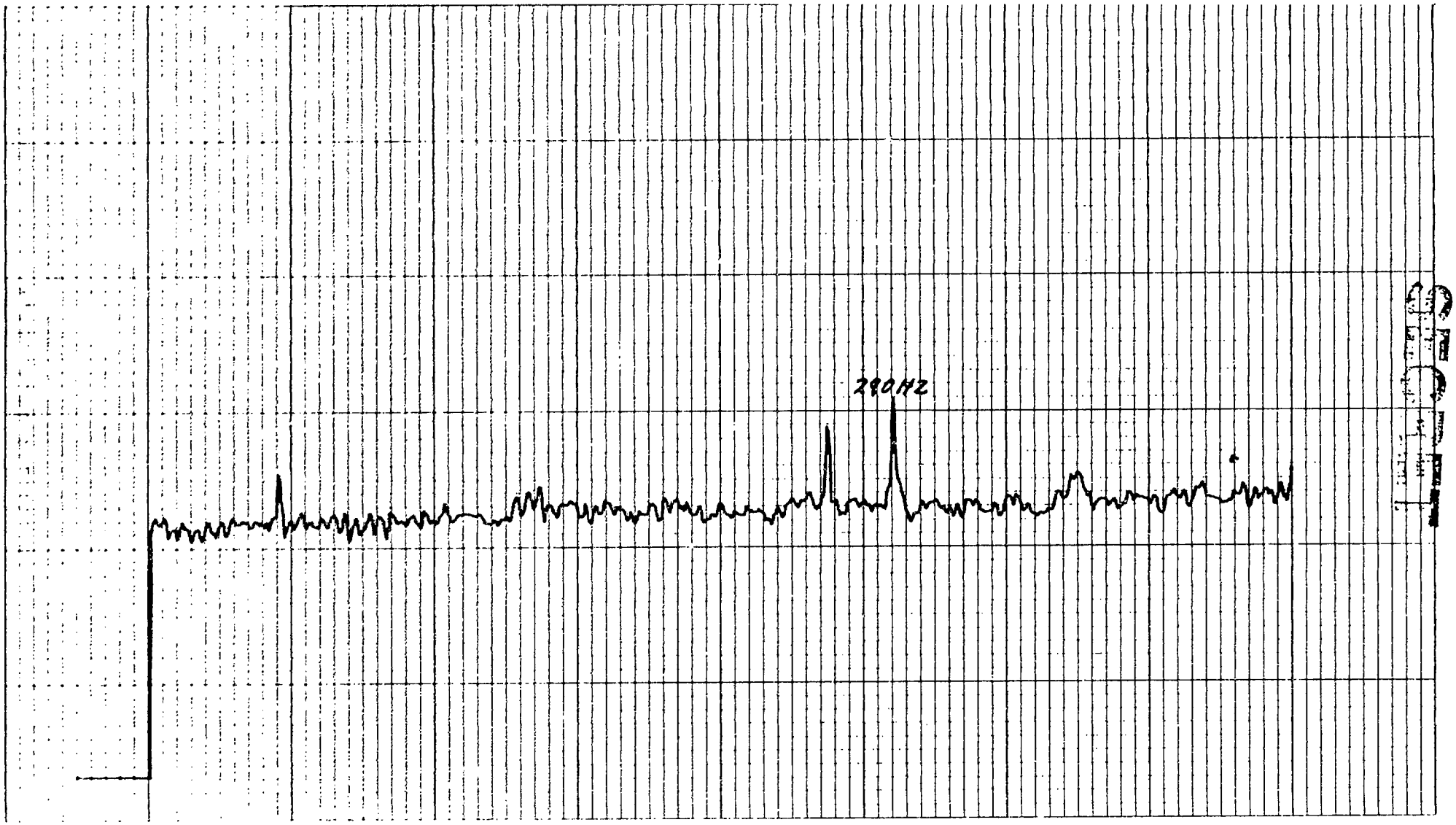


K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 346-0935 (70)
OMNI SPECTRUM(ELEMENT 37)
EXERCISE:BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 346-77 -0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
___ DEG AZ STEERING

REEL: M22 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: ~ DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MAIN IN U.S.A.

46 0703

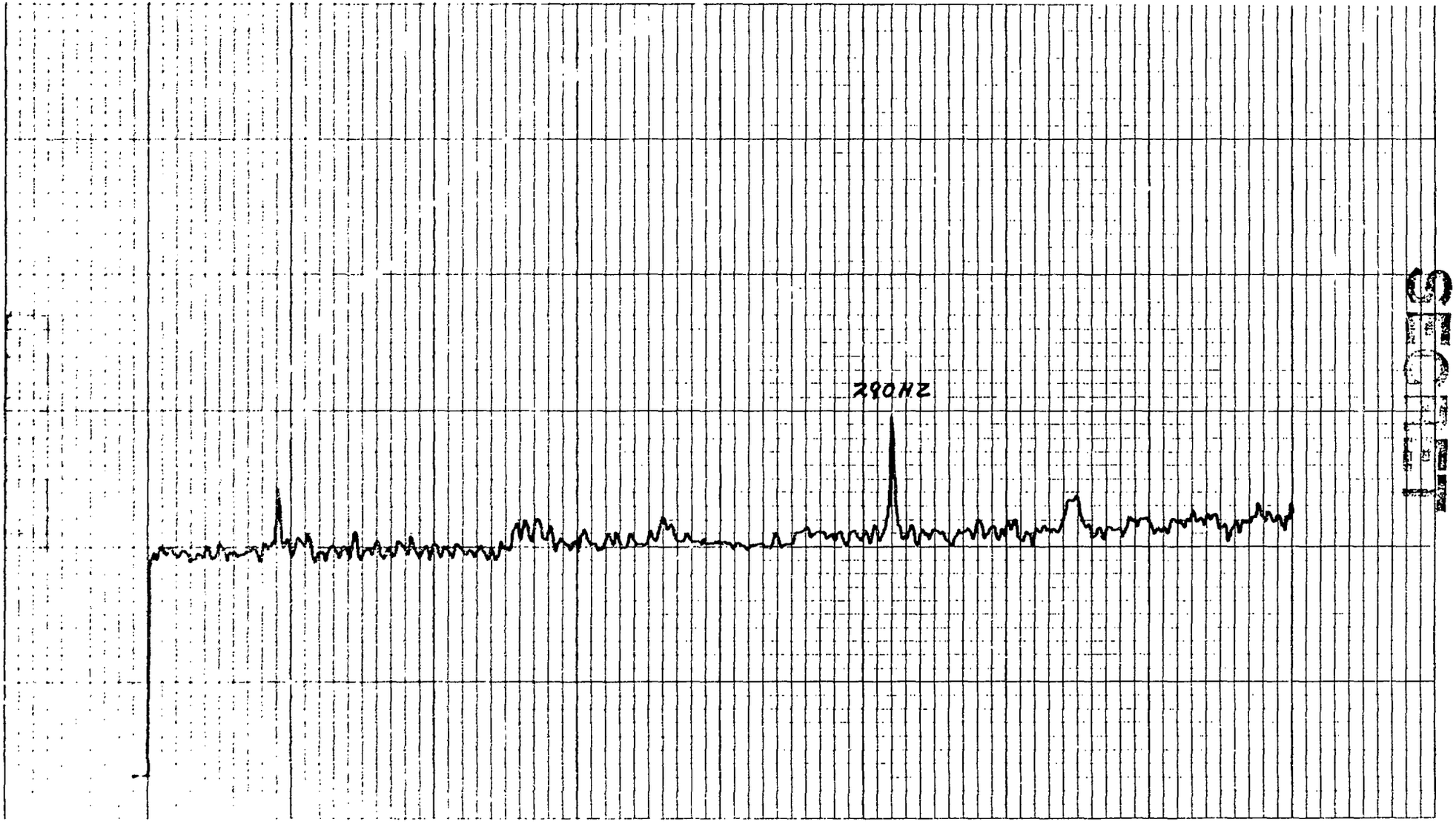
CONTROL: 316-0935 (71)
OMNI SPECTRUM (ELEMENT 39)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-16-77 -0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
____ DEG AZ STEERING

REEL: M22 INDEX 566

INTEGRATION TIME 320 SECS ATTEN: - DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

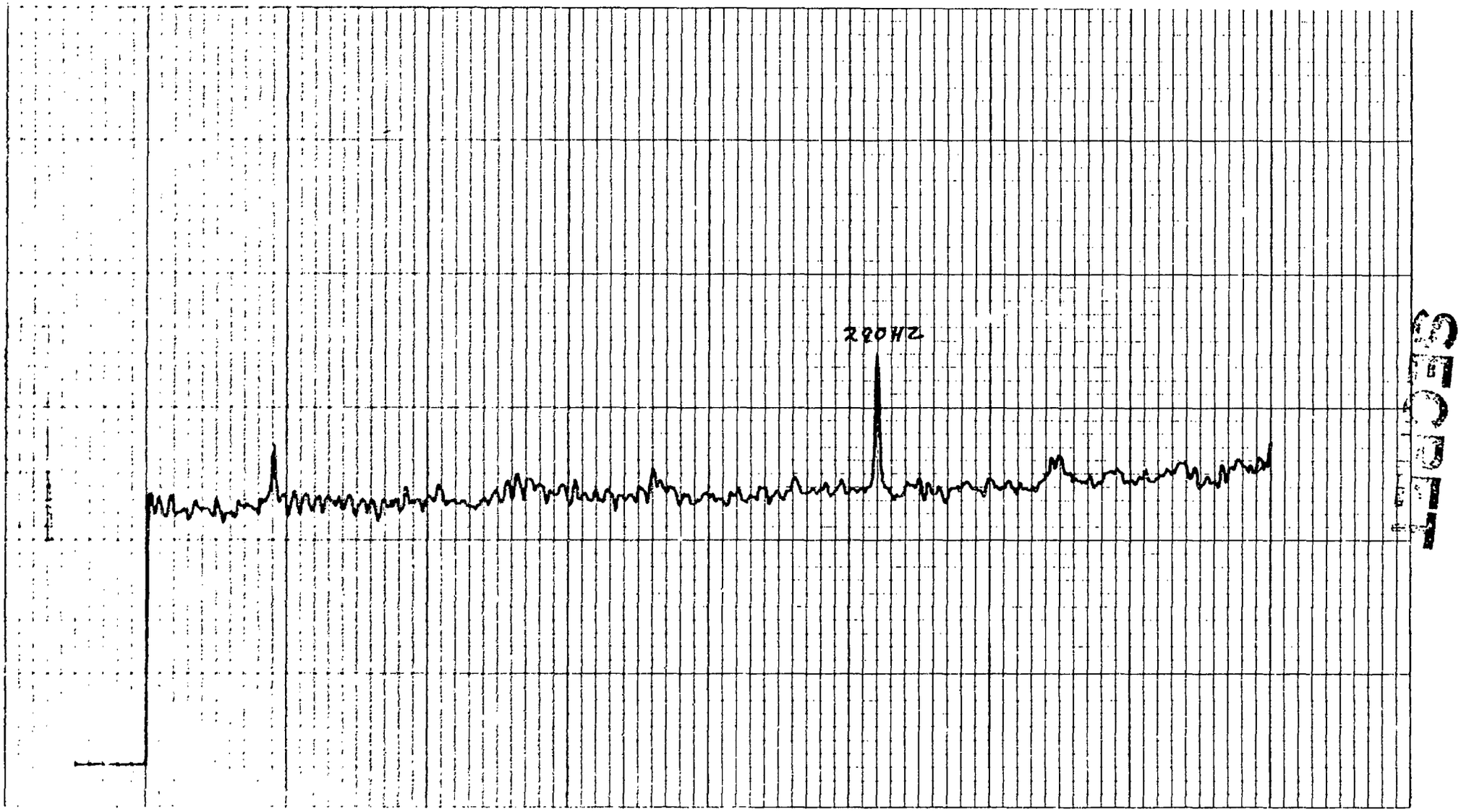
CONTROL: 316-0935 (72)
OMNI SPECTRUM(ELEMENT 41)
EXERCISE:BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-16-77 -0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
_____ DEG AZ STEERING

REEL: M22 INDEX 566

INTEGRATION TIME 320 SECS ATTEN: __ DB
FILTER WTG: HANNING



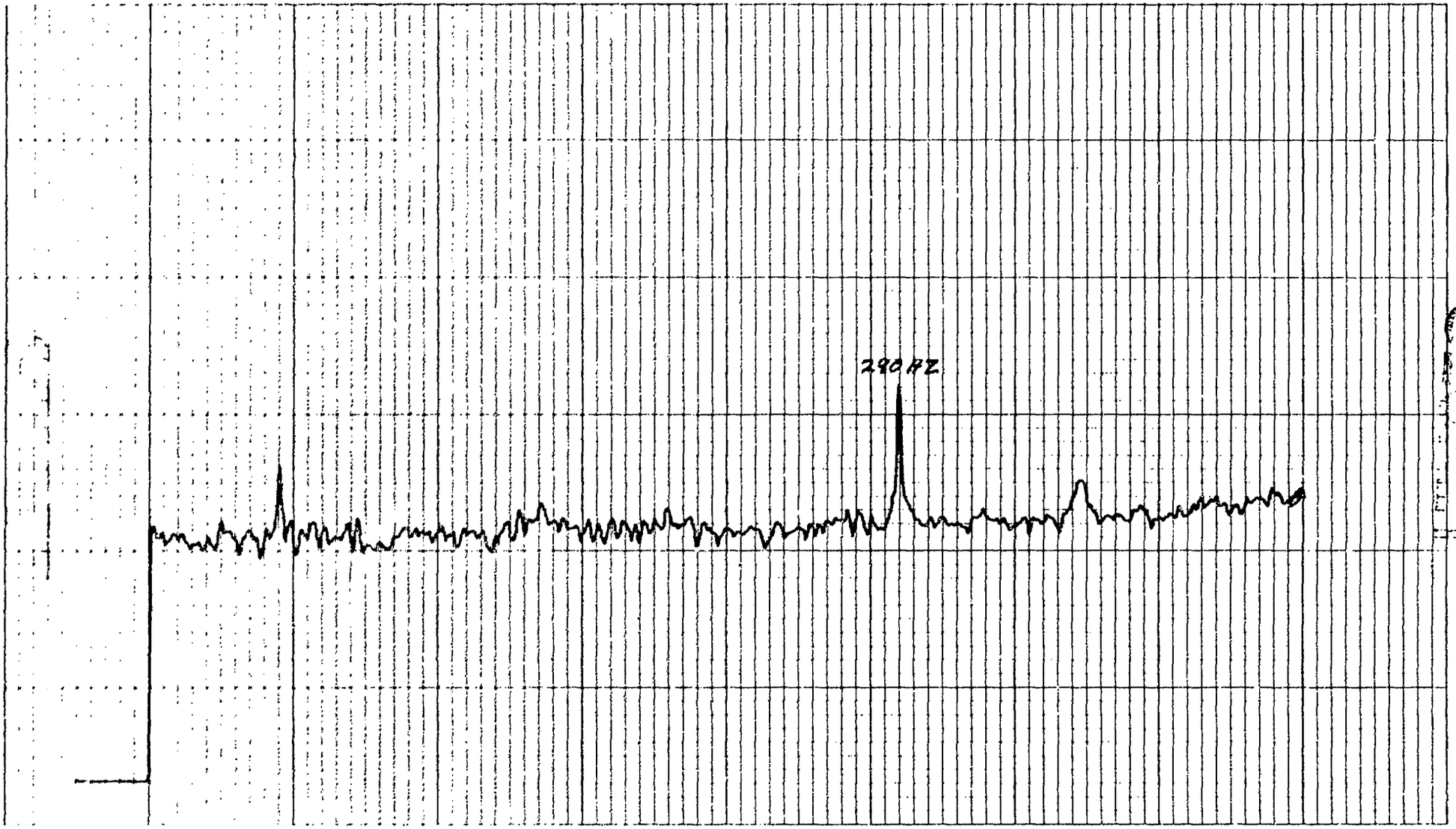
10 X 10 TO THE INCH • 5 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

CONTROL: 3-16 -0935 (73)
OMNI SPECTRUM (ELEMENT 43)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 -0935Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M22 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: ~ DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH KEUFFEL & ESSER CO

46 0703

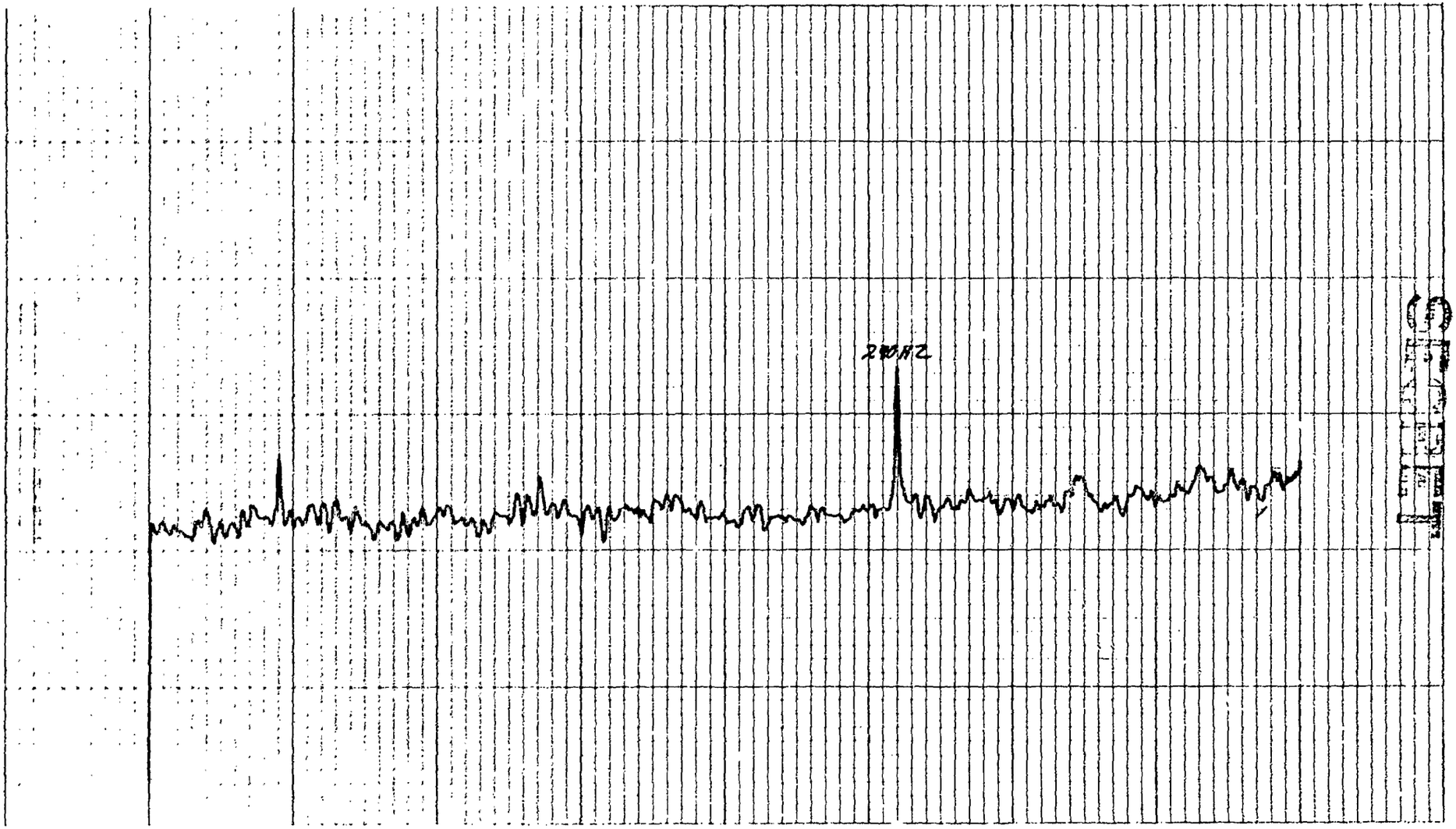
CONTROL: 316 - 0935 (74)
OMNI SPECTRUM(ELEMENT 45)
EXERCISE:BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-16-77 - 0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
_____ DEG AZ STEERING

REEL: M22 INDEX 566

INTEGRATION TIME 320 SECS ATTEN: ~ DB
FILTER WTG: HANNING

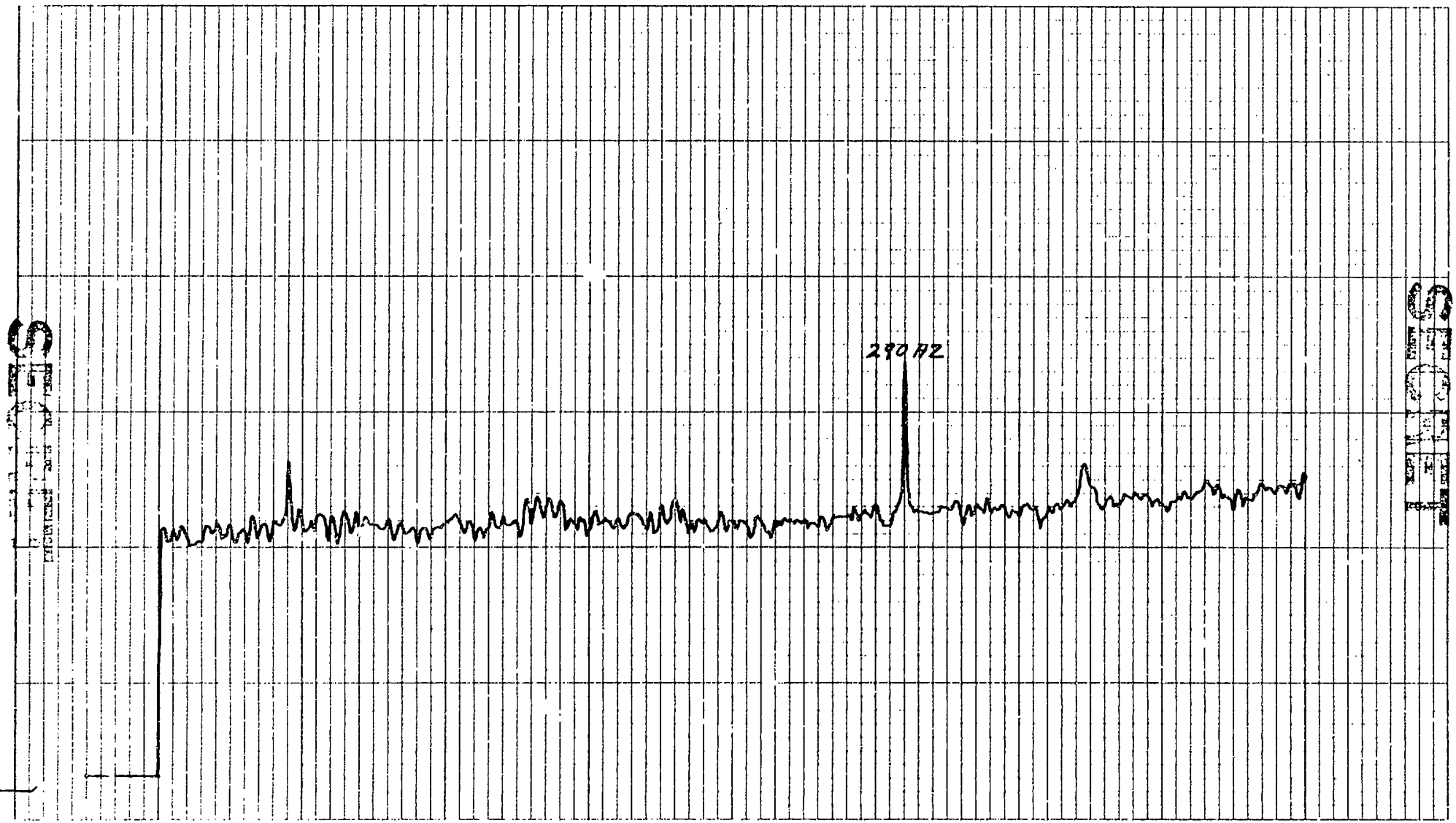


K-E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 3-16 -0935 (75)
OMNI SPECTRUM (ELEMENT 47)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 - 0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M22 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

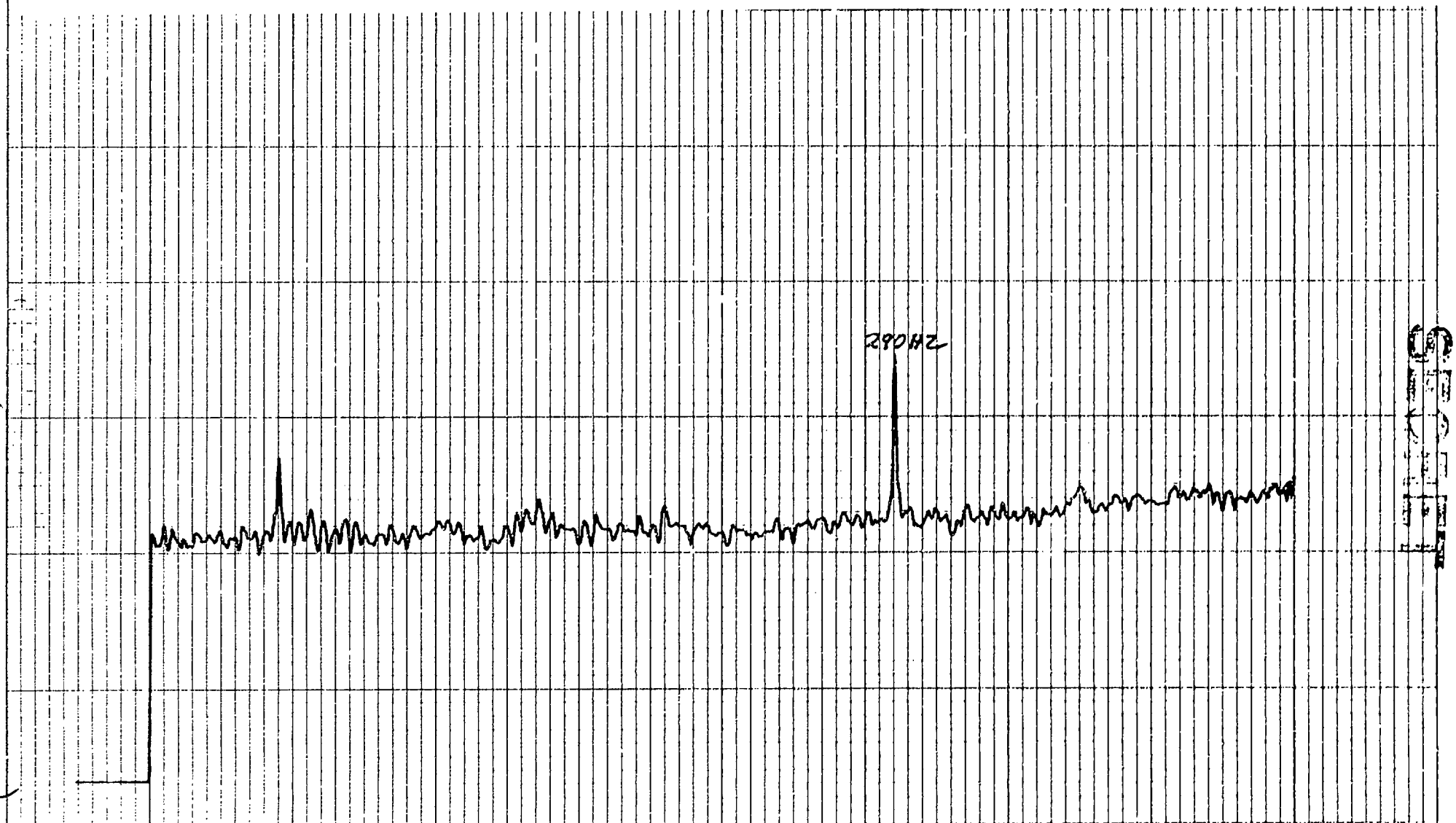
CONTROL: 3-16-0935 (76)
OMNI SPECTRUM (ELEMENT 49)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-16-77 - 0935Z
ANALYSIS BANDWIDTH: 1/10HZ
____ DEG AZ STEERING

REEL: M22 INDEX 566

INTEGRATION TIME 320 SECS ATTEN: ~ DB
FILTER WTG: HANNING



10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

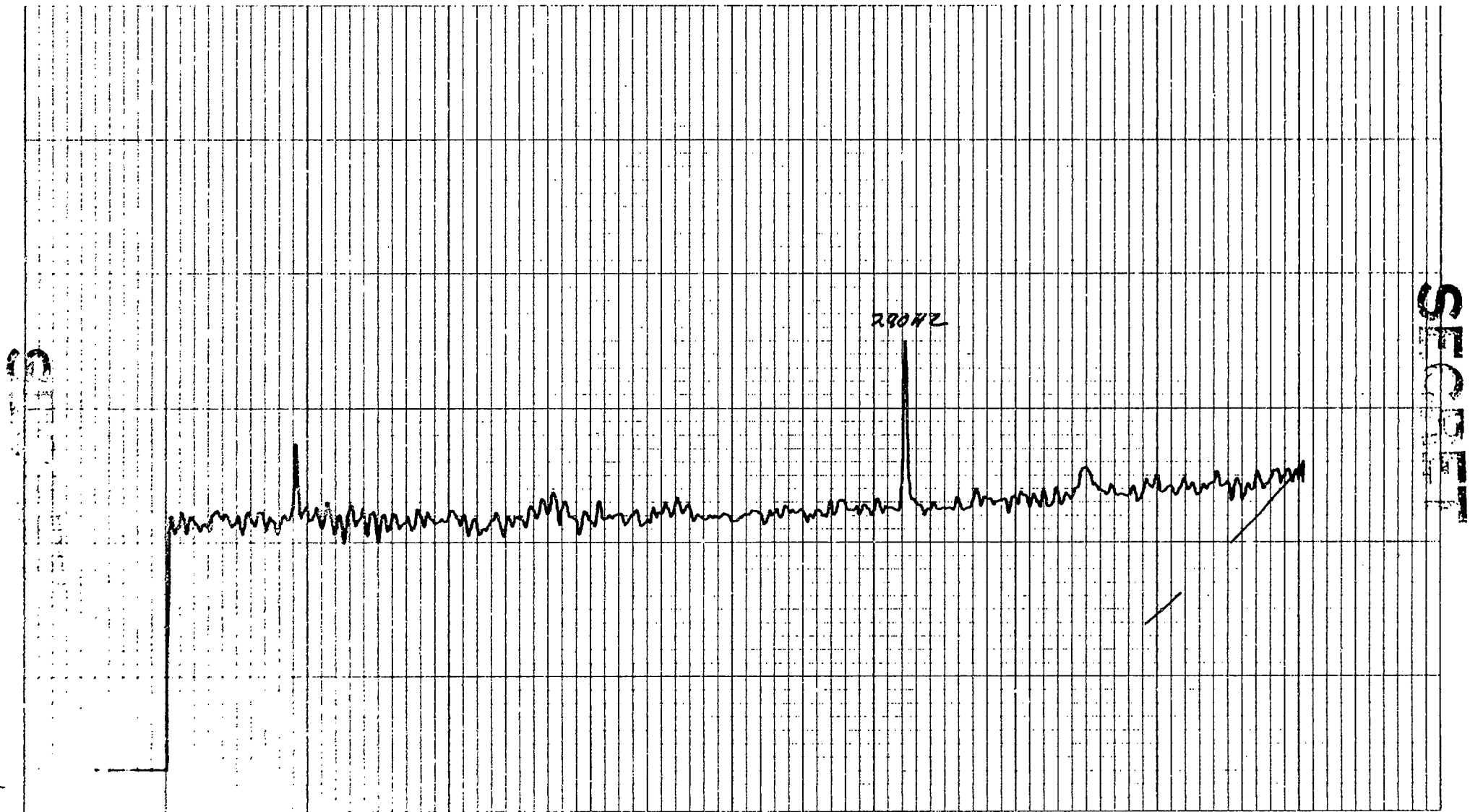
CONTROL: 3-16 - 0935 (77)
OMNI SPECTRUM(ELEMENT 51)
EXERCISE:BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-16-77 -0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: 1122 INDEX 566

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

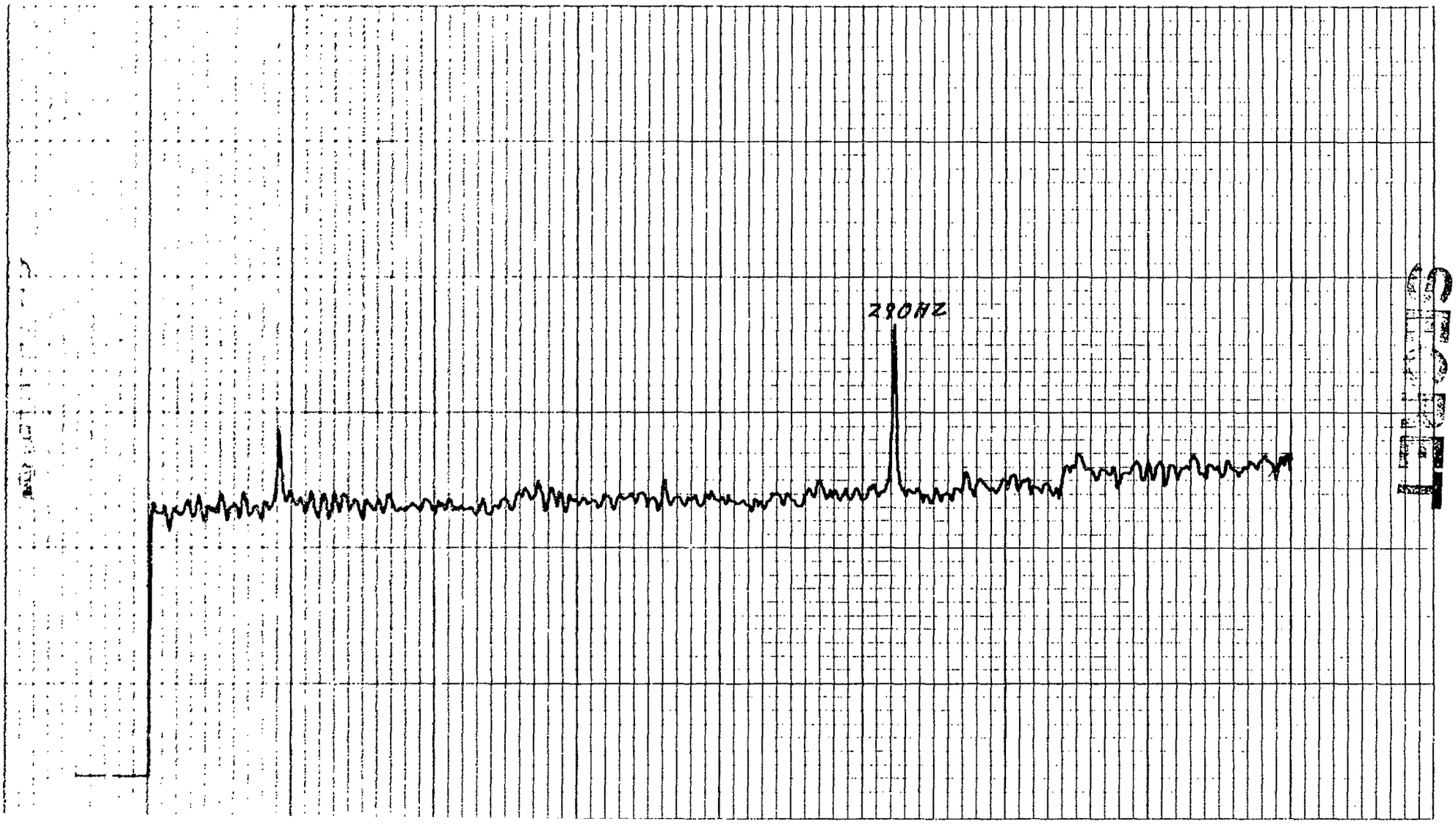
CONTROL: 346 - 0935 (78)
OMNI SPECTRUM (ELEMENT 53)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

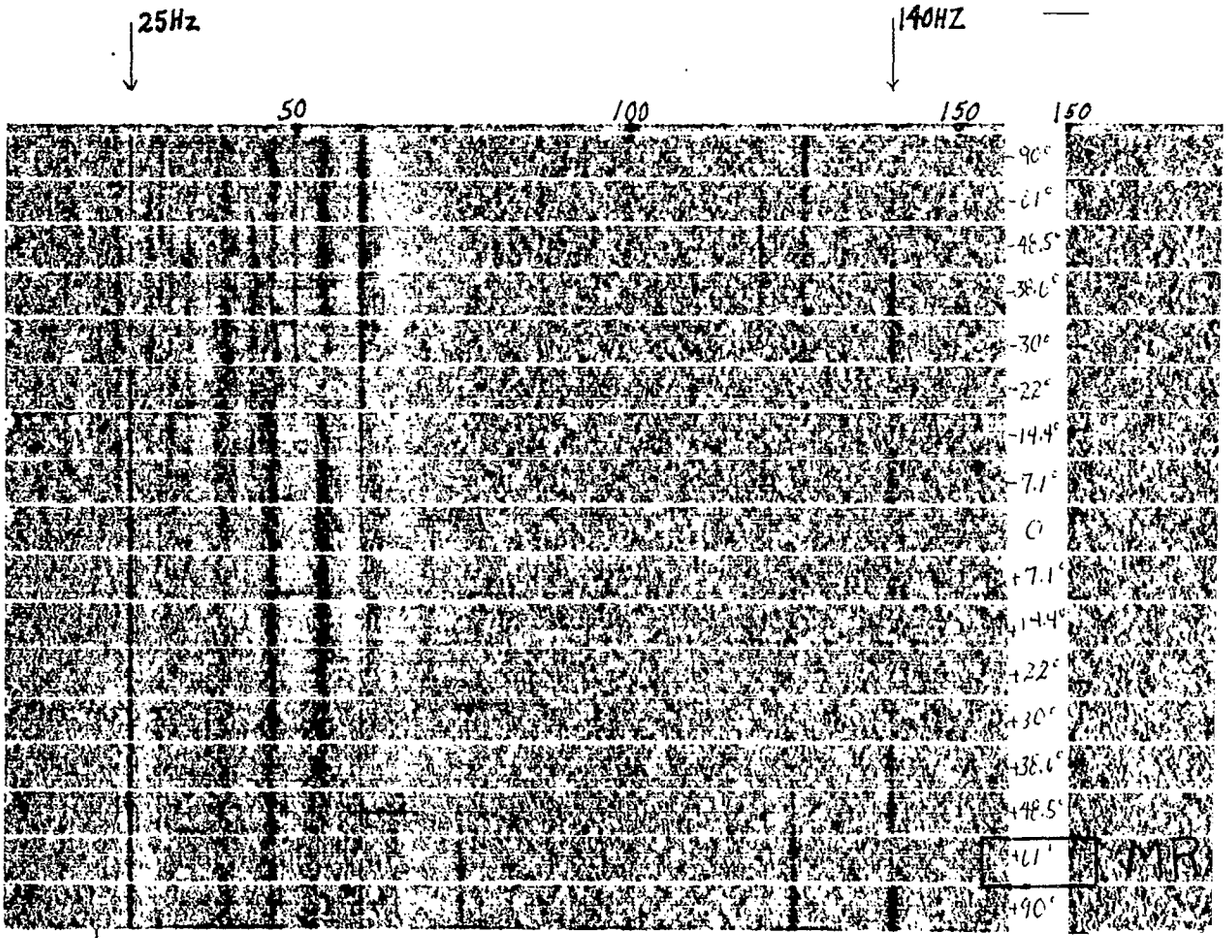
DATE OF ANALYSIS:

DATE/TIME: 346-77 -0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M22 INDEX 566

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



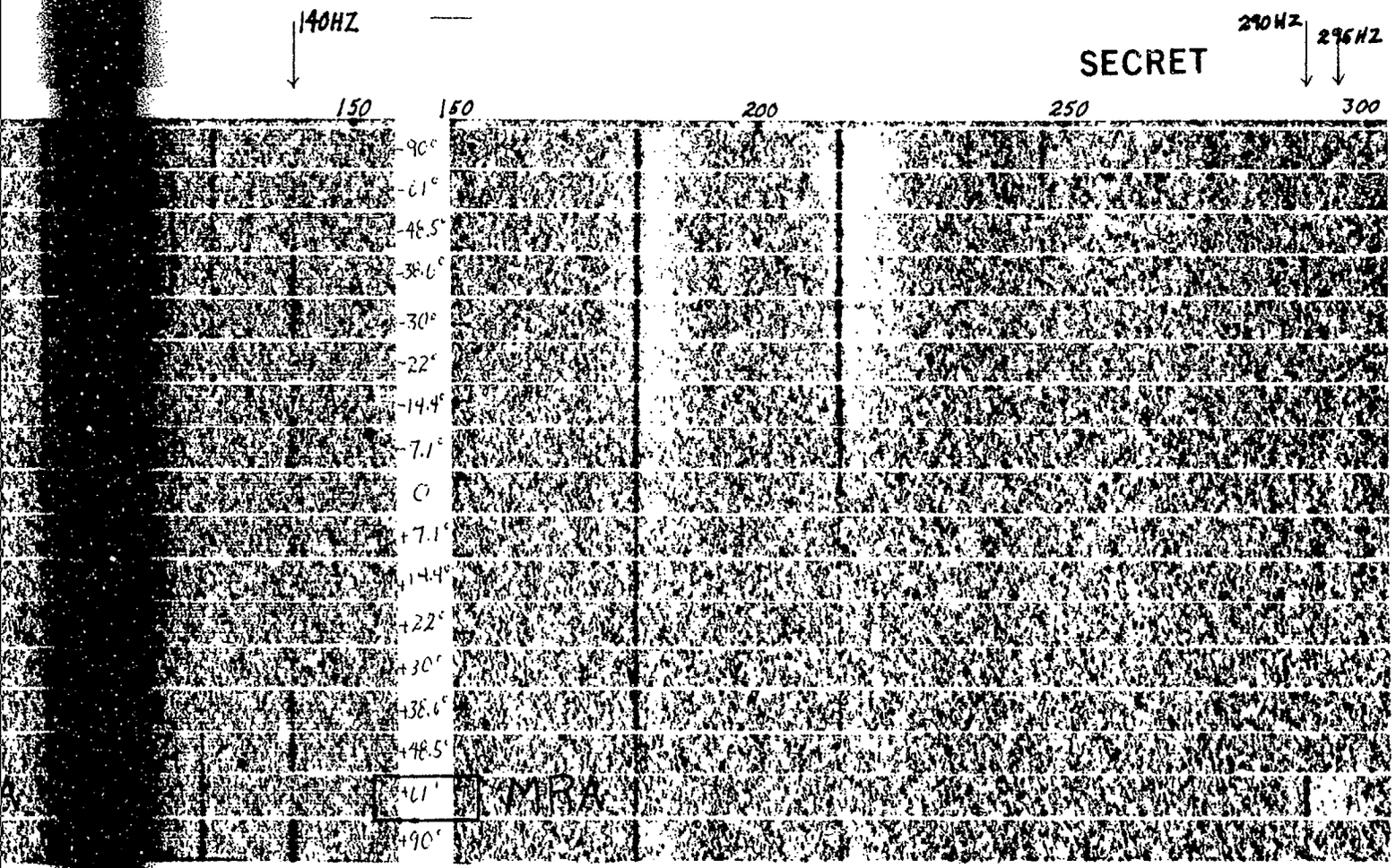


CONTROL NUMBER 09352-49-DP11
NUMBER OF ELEMENTS 16
FREQUENCY BAND 10 TO 300 HZ
RANGE 122 N.M.

HISTOFRAZ
TAPE REEL NUMBER M22

ANALYSIS BAND WIDTH .2
WATER DEPTH 2800' F

SECRET



H I S T O F R A Z

TAPE REEL NUMBER M22

ANALYSIS BAND WIDTH .2 HZ

WATER DEPTH 2800' FMS

TAPE COUNT 566

ELEMENT NUMBERS 1 TO 16

DATE 3-16-77

EXERCISE: BEARING STAKE

SECRET

SAN-XXX-78-0139

CONFIDENTIAL

SIGNAL LEVEL AND SNR CALCULATIONS

DATA POINT 11 FREQUENCY 140 HZ NUMBER OF ELEMENTS 16

SIGNAL LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-28.8	
MCPS-32 CAL. CORRECTION	+10	-18.8	
BEAMFORMER GAIN	+18	- .8	SIG. LEVEL FOR SNR CALCULATION
MRA CORRECTION	+ .2	- .6	SIG. LEVEL FOR SIGNAL GAIN

NOISE LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-56.2	
MCPS-32 CAL. CORRECTION	+10	-46.2	
BEAMFORMER GAIN	+18	-28.2	NOISE LEVEL FOR SNR CALCULATION

SIGNAL-NOISE-RATIO

SIGNAL LEVEL FOR SNR		- .8	
SIGNAL LEVEL FOR SNR	-28.2	27.4	
PROCESSOR CORRECTION	- 4.0	23.4	
MRA CORRECTION	+ .2	23.6	SNR 1/10 HZ BAND
BANDWIDTH CONVERSION	-8.2	15.4	SNR 1 HZ BAND

CONFIDENTIAL

SIGNAL LEVEL AND SNR CALCULATIONS

DATA POINT 11 FREQUENCY 290 HZ NUMBER OF ELEMENTS 16

SIGNAL LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-45.4	
MCPS-32 CAL. CORRECTION	+10	-35.4	
BEAMFORMER GAIN	+18	-17.4	SIG. LEVEL FOR SNR CALCULATION
MRA CORRECTION	+ .8	-16.6	SIG. LEVEL FOR SIGNAL GAIN

NOISE LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-64.7	
MCPS-32 CAL. CORRECTION	+10	-54.7	
BEAMFORMER GAIN	+18	-36.7	NOISE LEVEL FOR SNR CALCULATION

SIGNAL-NOISE-RATIO

SIGNAL LEVEL FOR SNR		-17.4	
SIGNAL LEVEL FOR SNR	-36.7	19.3	
PROCESSOR CORRECTION	- 4.0	15.3	
MRA CORRECTION	+ .8	16.1	SNR 1/10 HZ BAND
BANDWIDTH CONVERSION	-8.2	7.9	SNR 1 HZ BAND

DATA POINT 11

SIGNAL GAIN

	140 HZ	290HZ	295HZ
MEAN OMNI SIGNAL LEVEL	-29.8	-41.4	
MRA SIGNAL LEVEL	- .6	-16.6	
ARRAY SIGNAL GAIN	29.2	24.8	
20 LOG 16 (# of elements)	34.1	34.1	
DIFFERENCE	- 4.9	9.3	

ARRAY GAIN

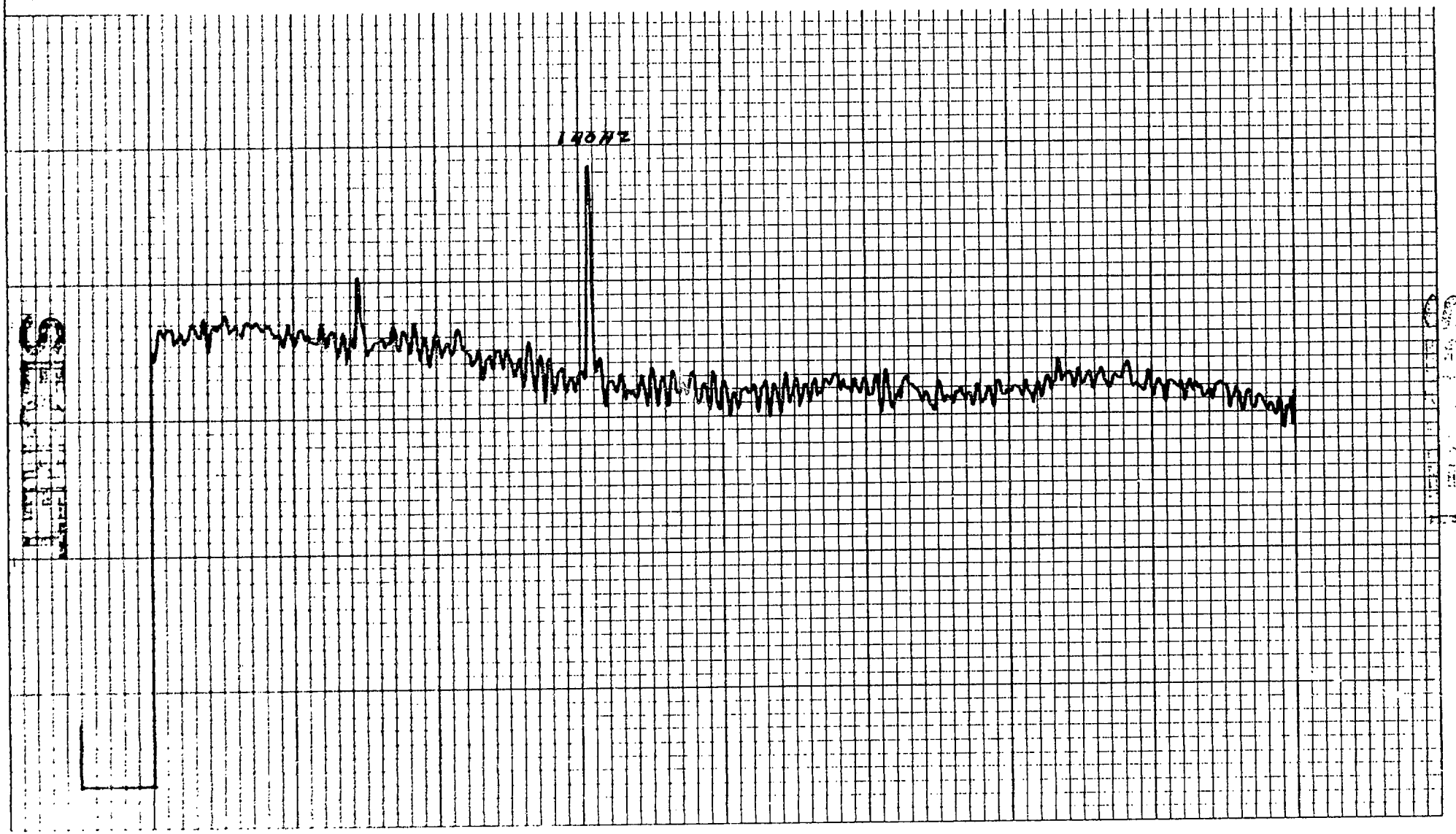
MRA SNR	23.6	16.1	
MEAN OMNI SNR	16.2	8.4	
ARRAY GAIN	7.4	7.7	
THEORETICAL AZMUTH GAIN (at MRA)	7.6	9.4	
DIFFERENCE	- .2	-1.7	

K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 0935 - 16 (DP11)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
(1-16)
DATE/TIME: 3-16-77 - 0935Z
ANALYSIS BANDWIDTH: 1/10HZ
+44 DEG. AZ STEERING

REEL: N22 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: -10 DB
FILTER WTG: HANNING

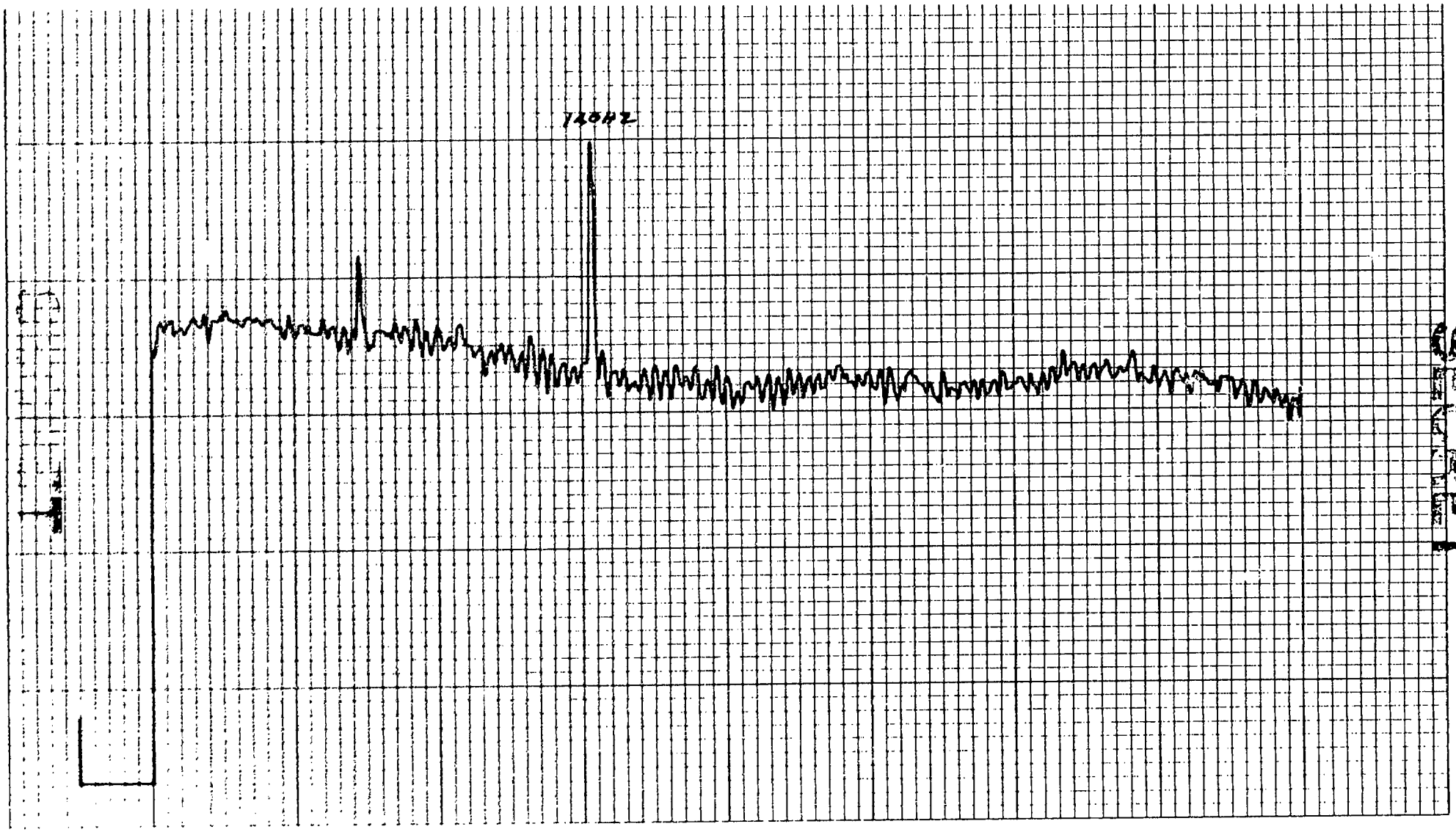


K•E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 0935 - 16 (DP11)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+46 DEG. AZ STEERING

REEL: M22 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING



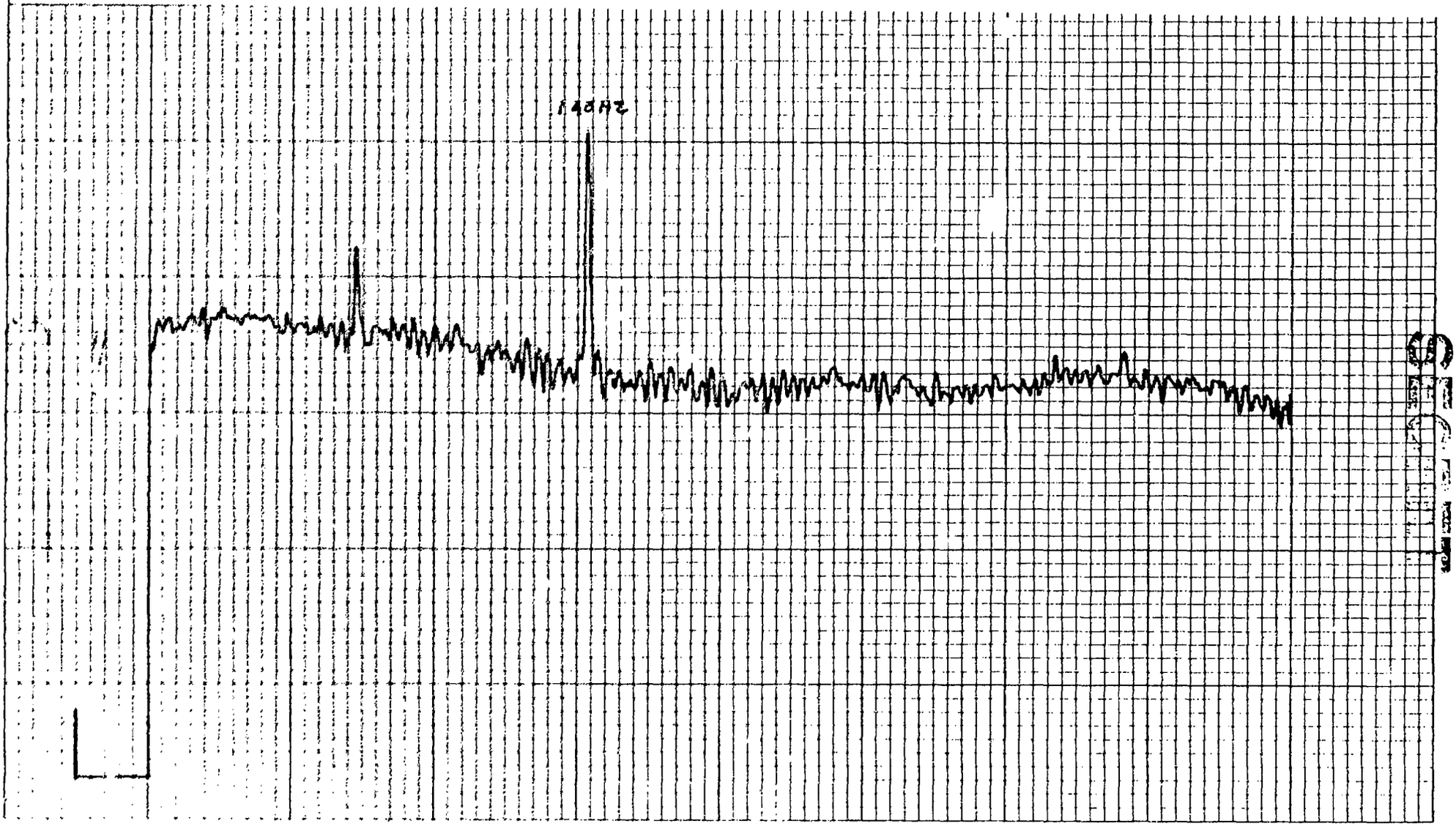
K+E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 0935 - 16 (DP11)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: — — —
1-16
DATE/TIME: 3-16-77 -0835 Z
ANALYSIS BANDWIDTH: 1/10HZ
+48 DEG. AZ STEERING

REEL: M22 INDEX 586

INTEGRATION TIME 320 SECS ATTEN: -10 DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH KEUFFEL & ESSER CO

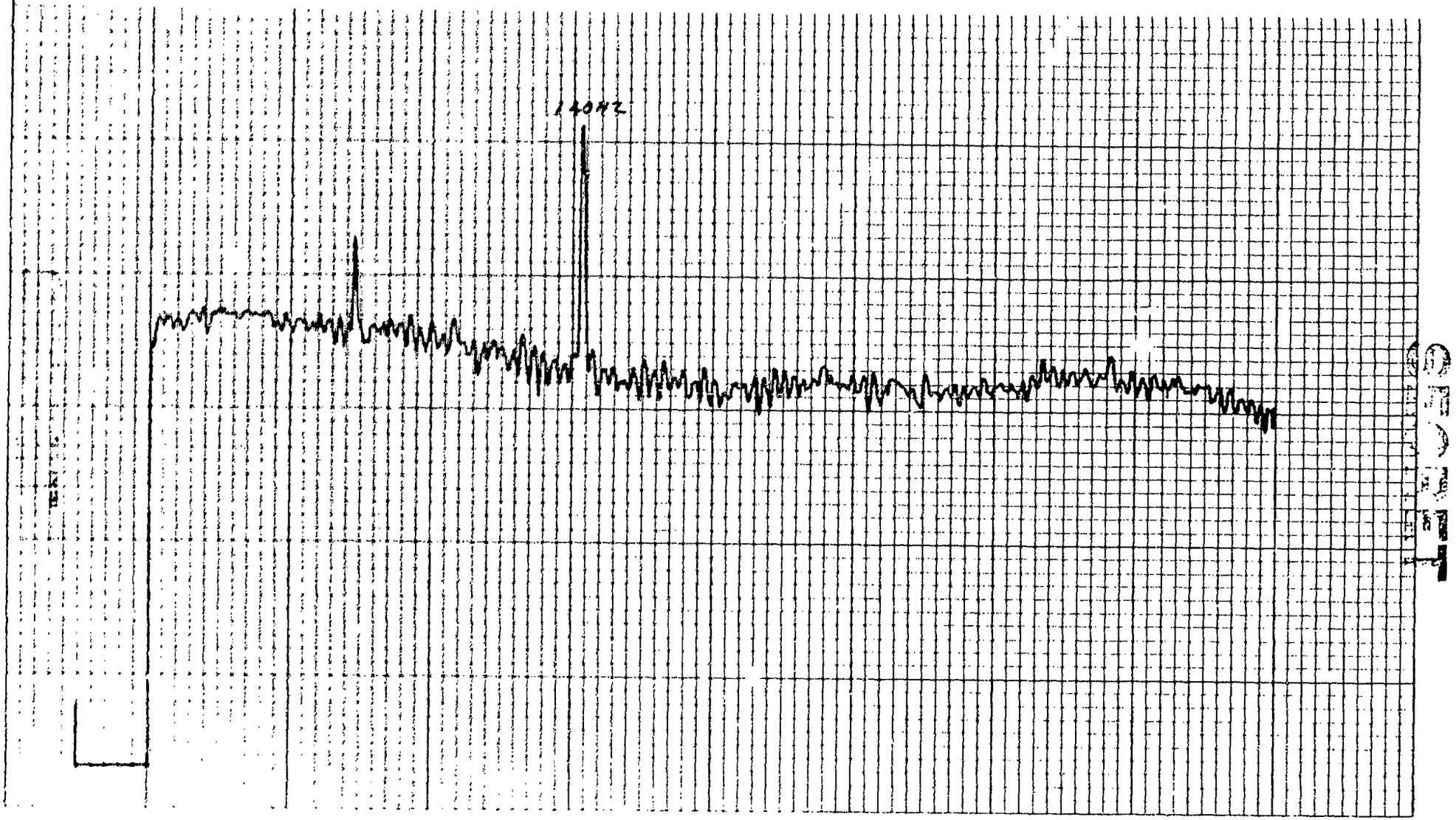
46 0703

CONTROL: 0935 - 16 (DP11)
BEAMFORMED SPECTRUM (ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
(1-16)
DATE/TIME: 3-16-77 -0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
±60 DEG. AZ STEERING

REEL: H22 INDEX 566

INTEGRATION TIME 320 SECS ATTEN: 18 DB
FILTER WTG: HANNING

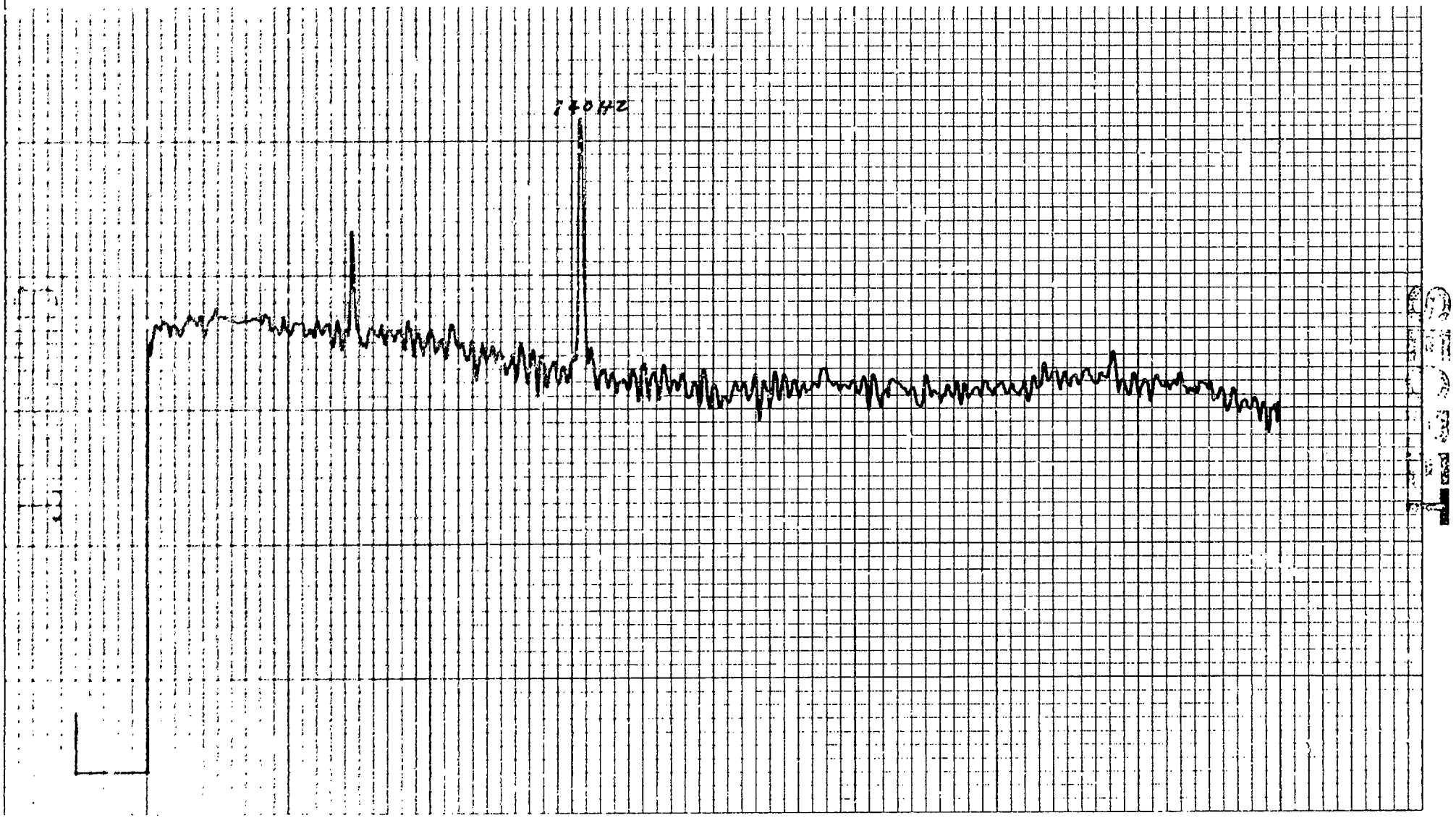


K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTRCL: 0935 - 16 (DP11)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
1-16
DATE/TIME: 3-16-77 -0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+52 DEG. AZ STEERING

REEL: M22 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: 10 DB
FILTER WTG: HANNING



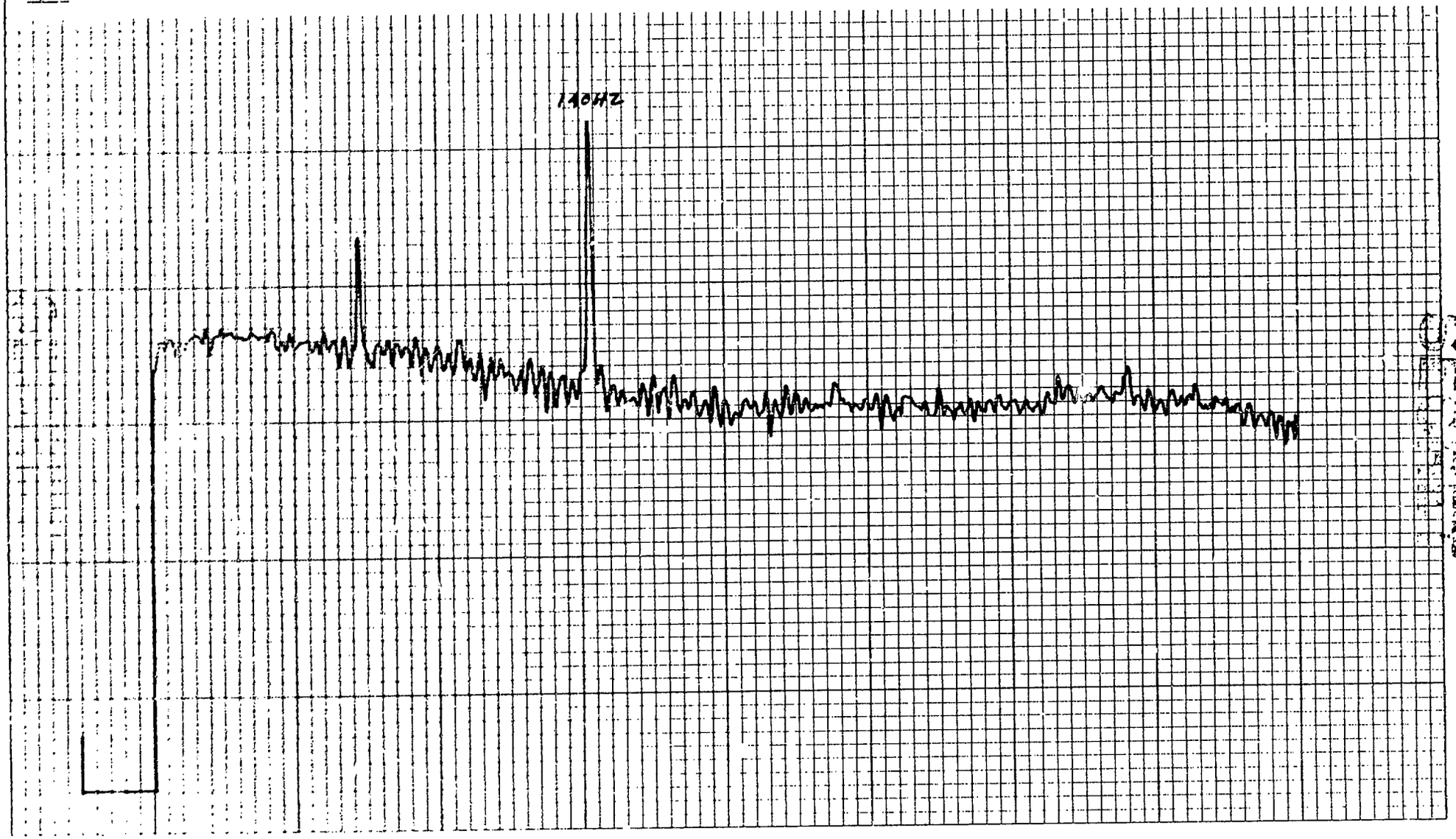
K·E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

CONTROL: 0935 - 16 (DP11)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: _ _ _
DATE/TIME: 3-16-77 - 0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+54 DEG. AZ STEERING

REEL: M22 INDEX 1637
INTEGRATION TIME 320 SECS ATTEN: -10 DB
FILTER WTG: HANNING



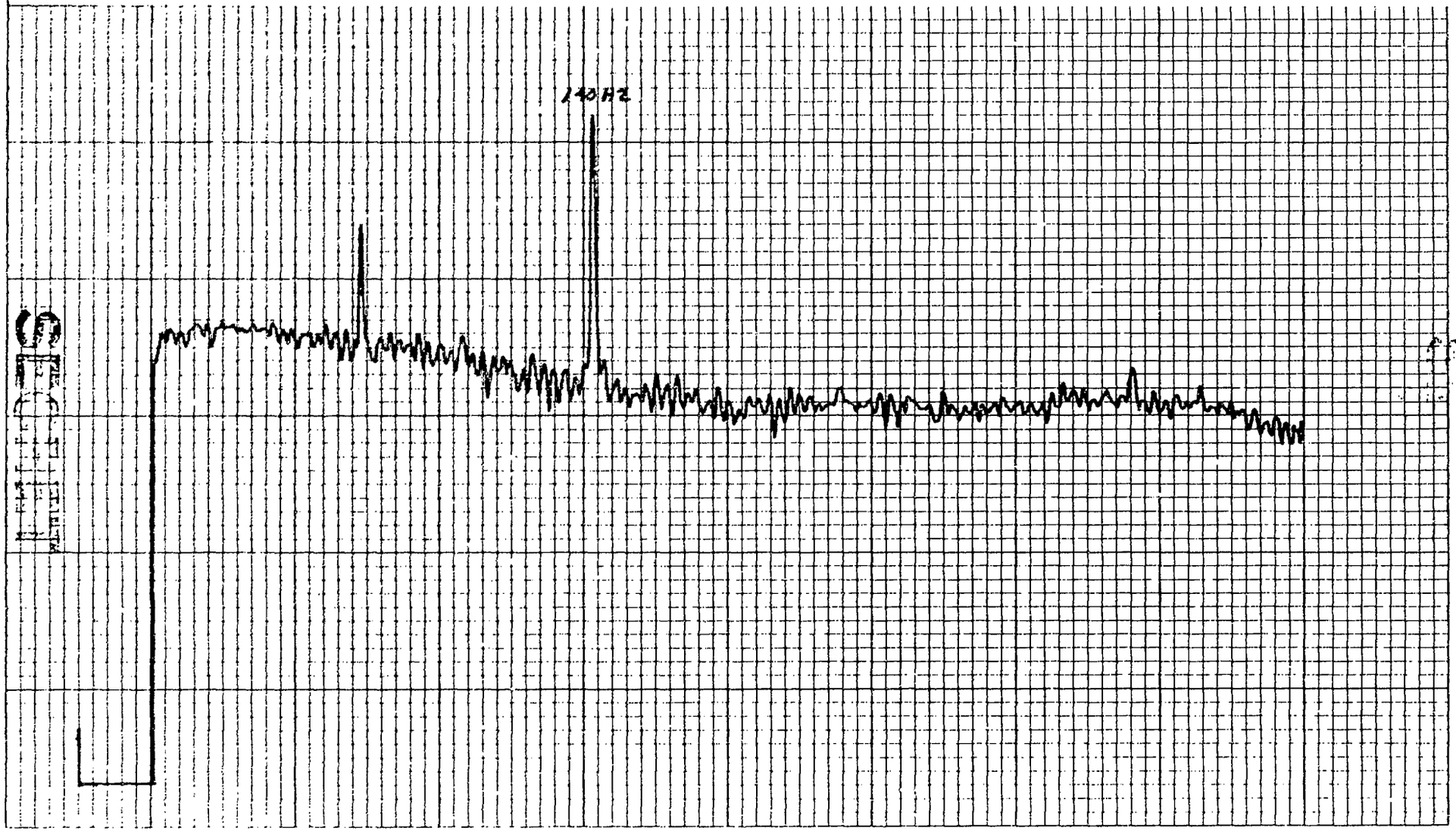
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 0935 - 16 (DP11)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+56 DEG. AZ STEERING

REEL: M22 INDEX 566

INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING



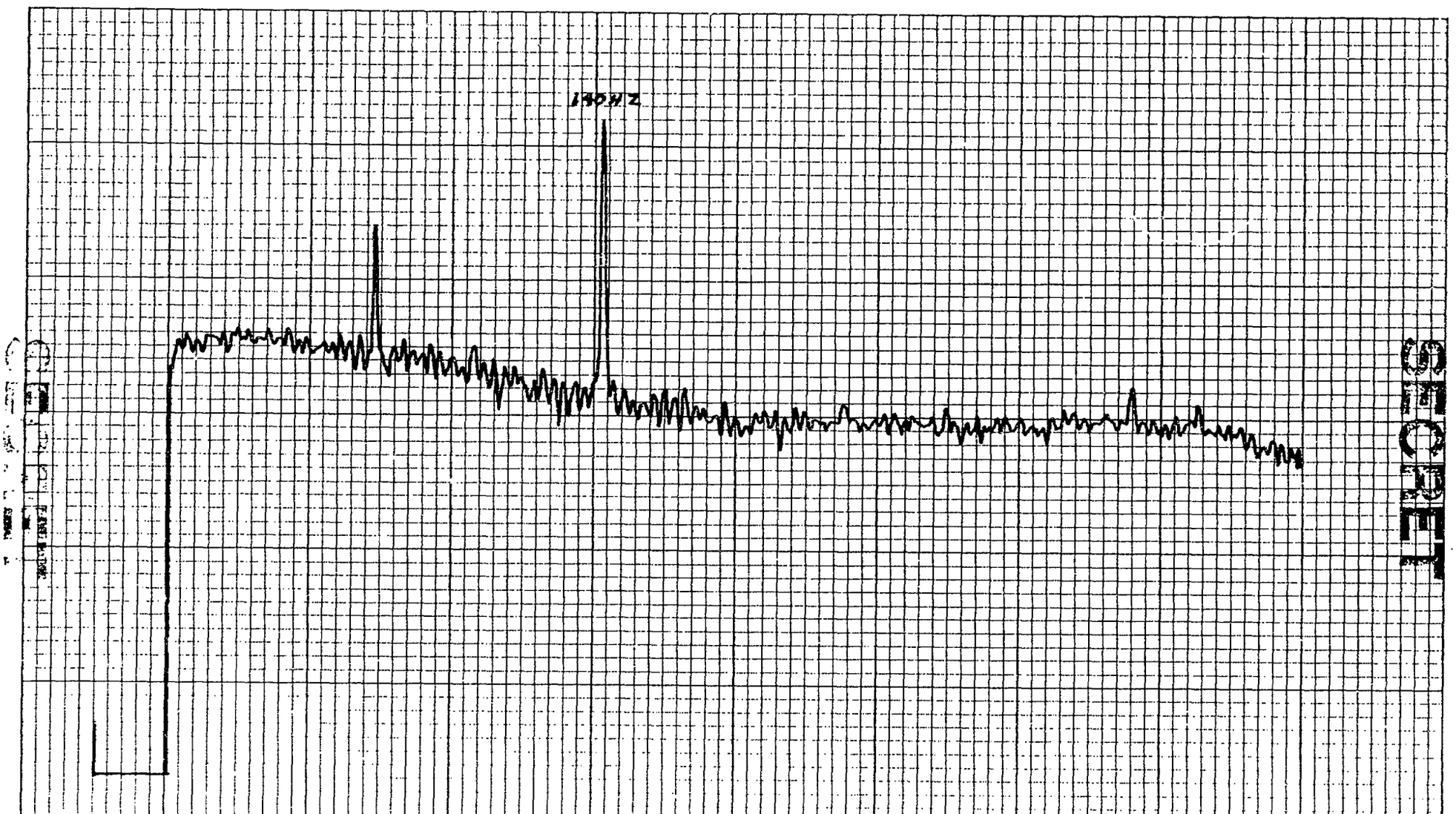
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

CONTROL: 0935 - 51 (DP11)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: __ ___ __
DATE/TIME: 3-16-77 - 0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+58 DEG. AZ STEERING

REEL: M22 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: 18 DB
FILTER WTG: HANNING



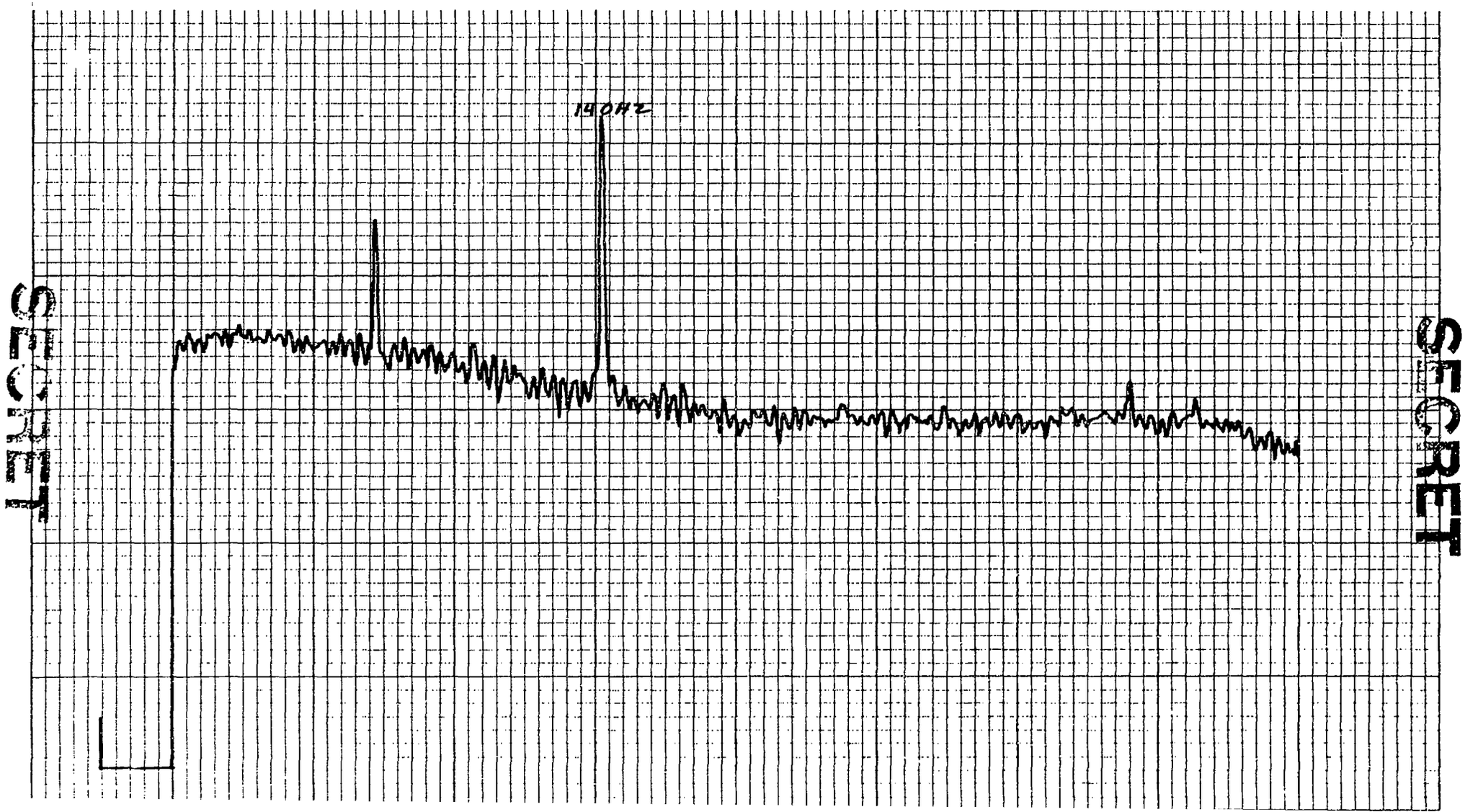
K•E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 0935 - 16 (D811)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 -0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+60 DEG. AZ STEERING

REEL: M22 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: -10 DB
FILTER WTG: HANNING

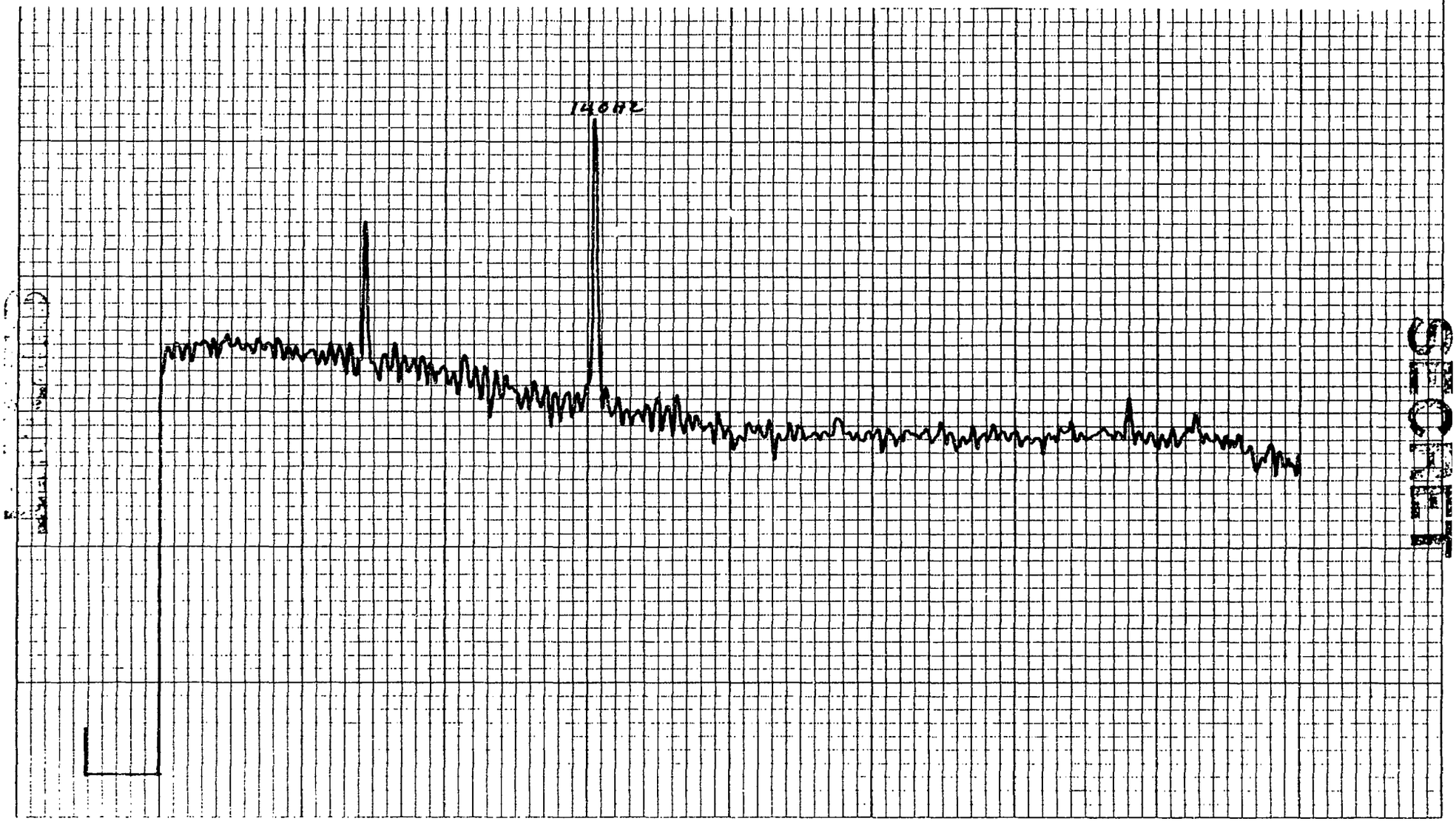


K·E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 0935 - 16 (DP11)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 -0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+62 DEG. AZ STEERING

REEL: 1902 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING



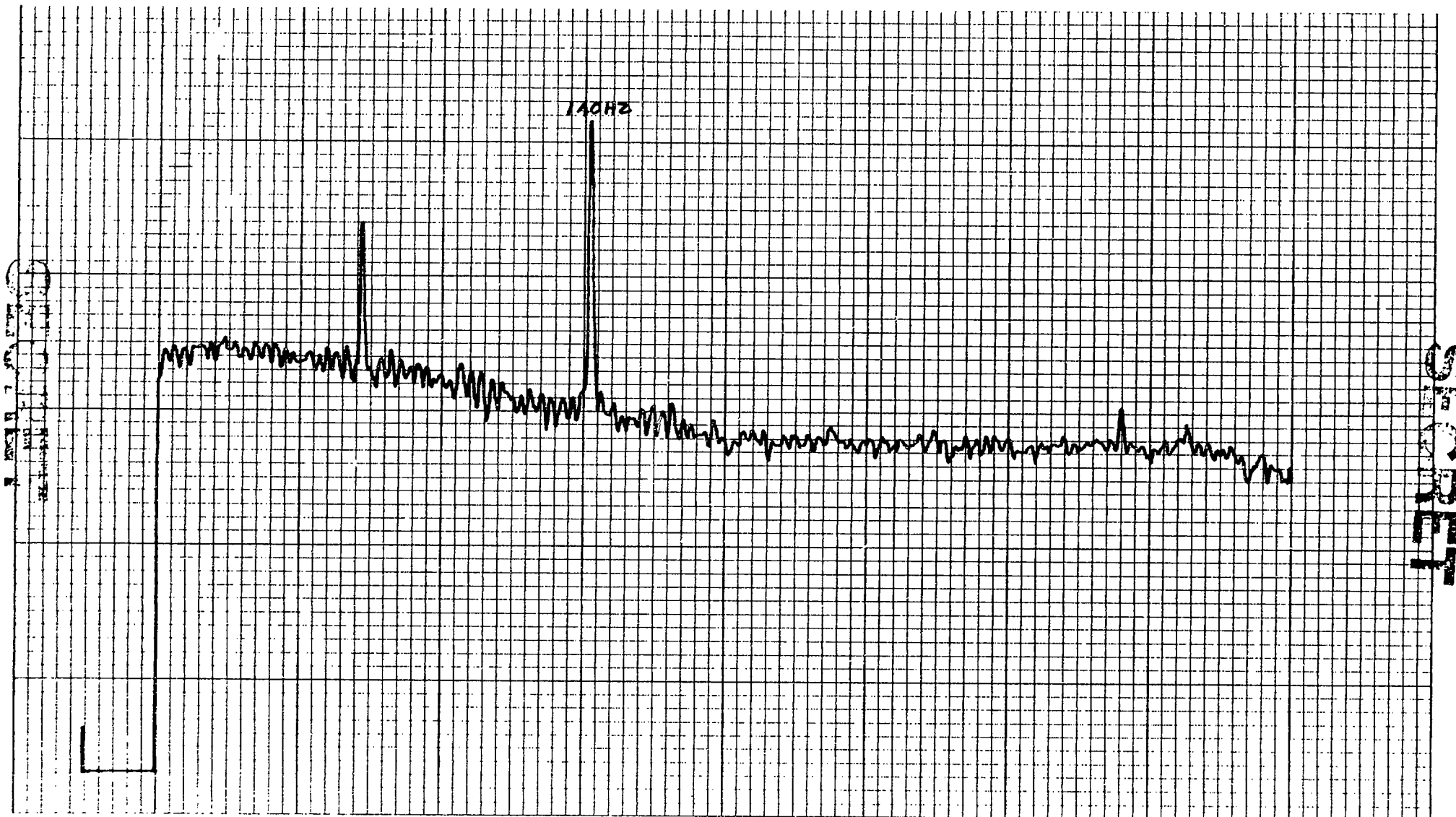
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 0935 - 16 (DP4)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+64 DEG. AZ STEERING

REEL: M72 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

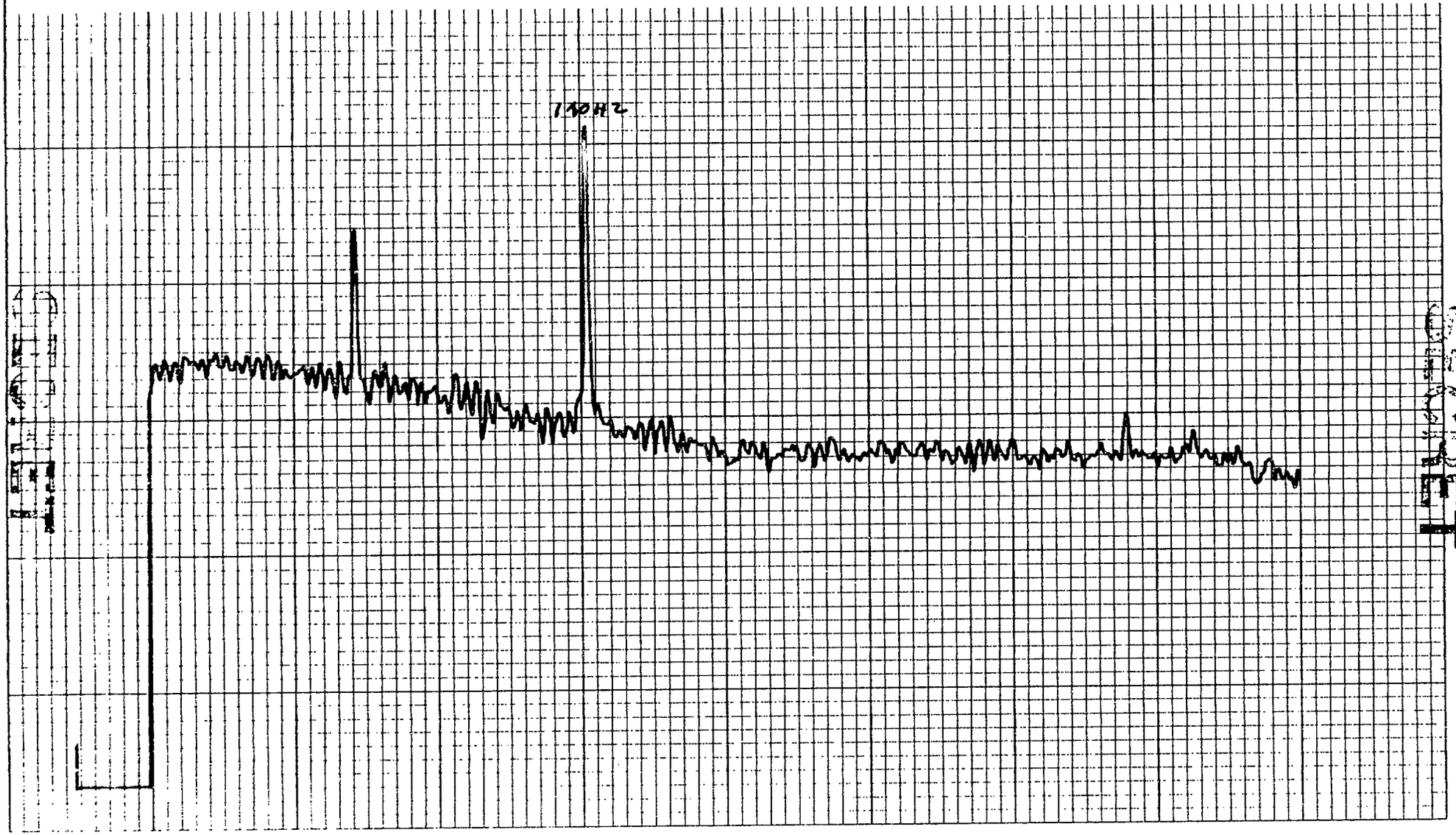
46 0703

CONTROL: 0935 - 16 (DP11)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
1-16)
DATE/TIME: 3-16-77 -0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+66 DEG. AZ STEERING

REEL: M22 INDEX 566

INTEGRATION TIME 320 SECS ATTEN: -10 DB
FILTER WTG: HANNING



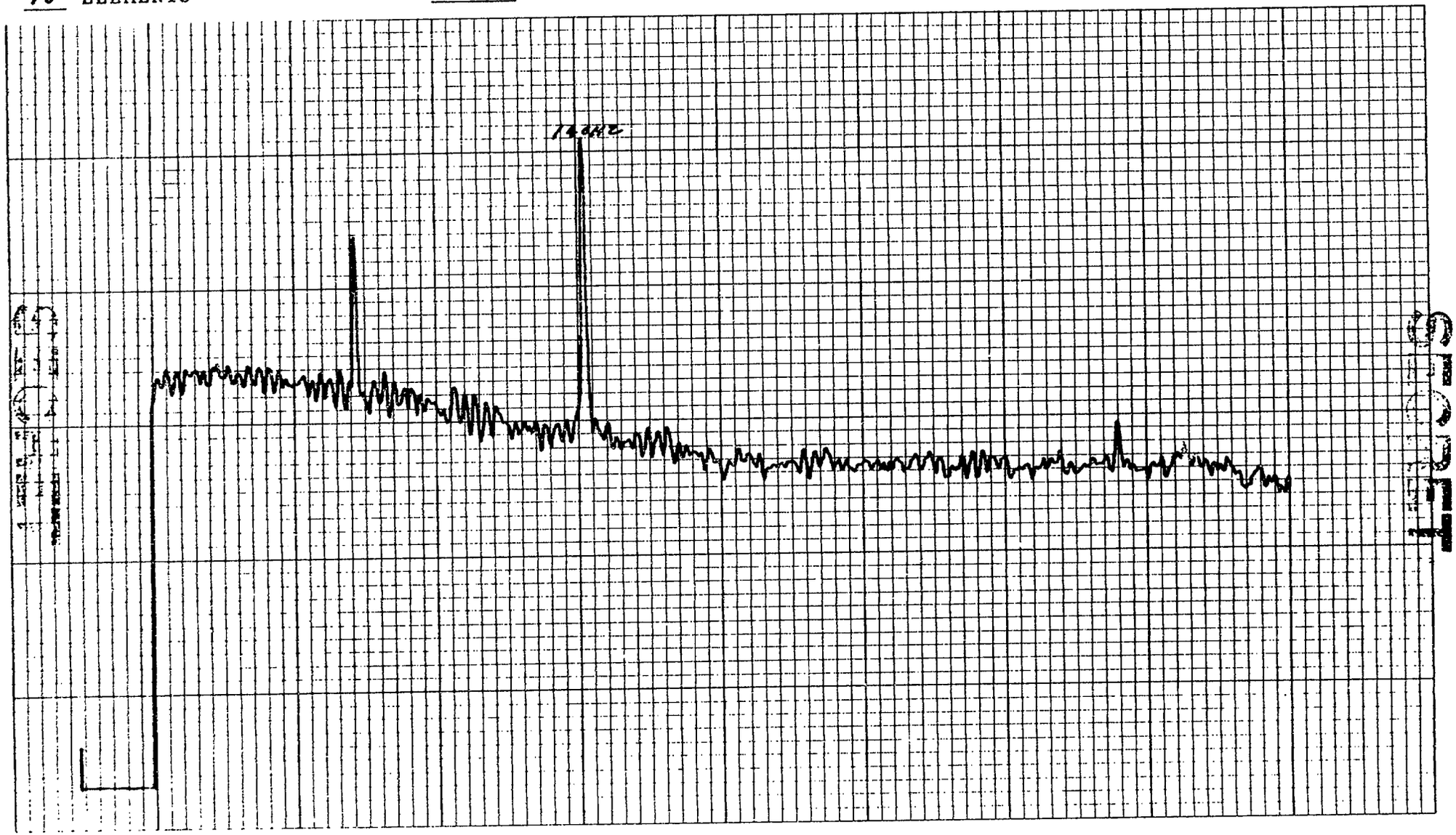
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 0935 - 16 (DP11)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
(1-16)
DATE/TIME: 3-16-77 - 0935Z
ANALYSIS BANDWIDTH: 1/10HZ
+10 DEG. AZ STEERING

REEL: M22 INDEX 566

INTEGRATION TIME 320 SECS ATTEN: -10 DB
FILTER WTG: HANNING

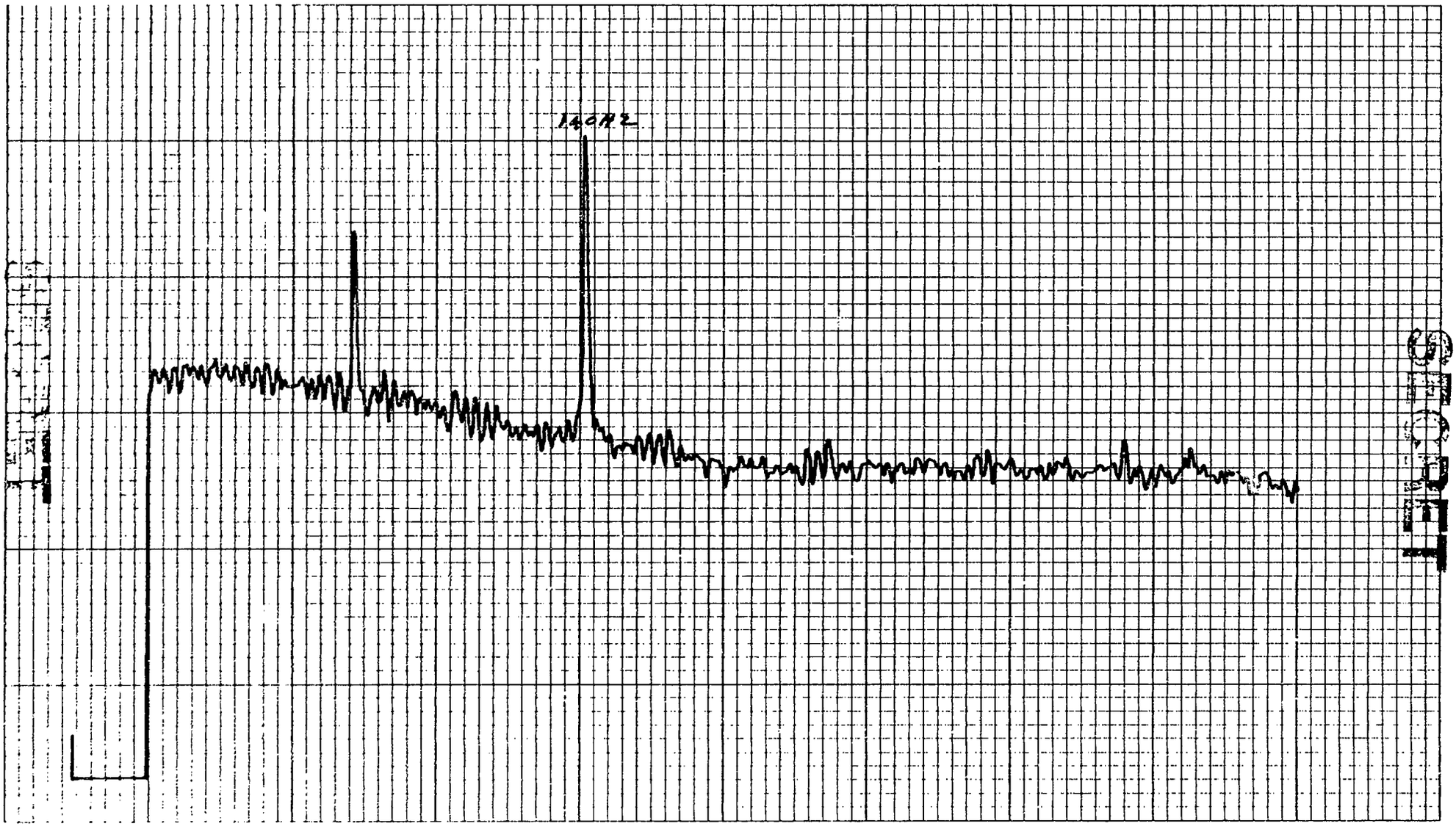


K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 0935 - 16 (DP11)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+70 DEG. AZ STEERING

REEL: 1422 INDEX 586
INTEGRATION TIME 320 SECS ATTEN: 78 DB
FILTER WTG: HANNING



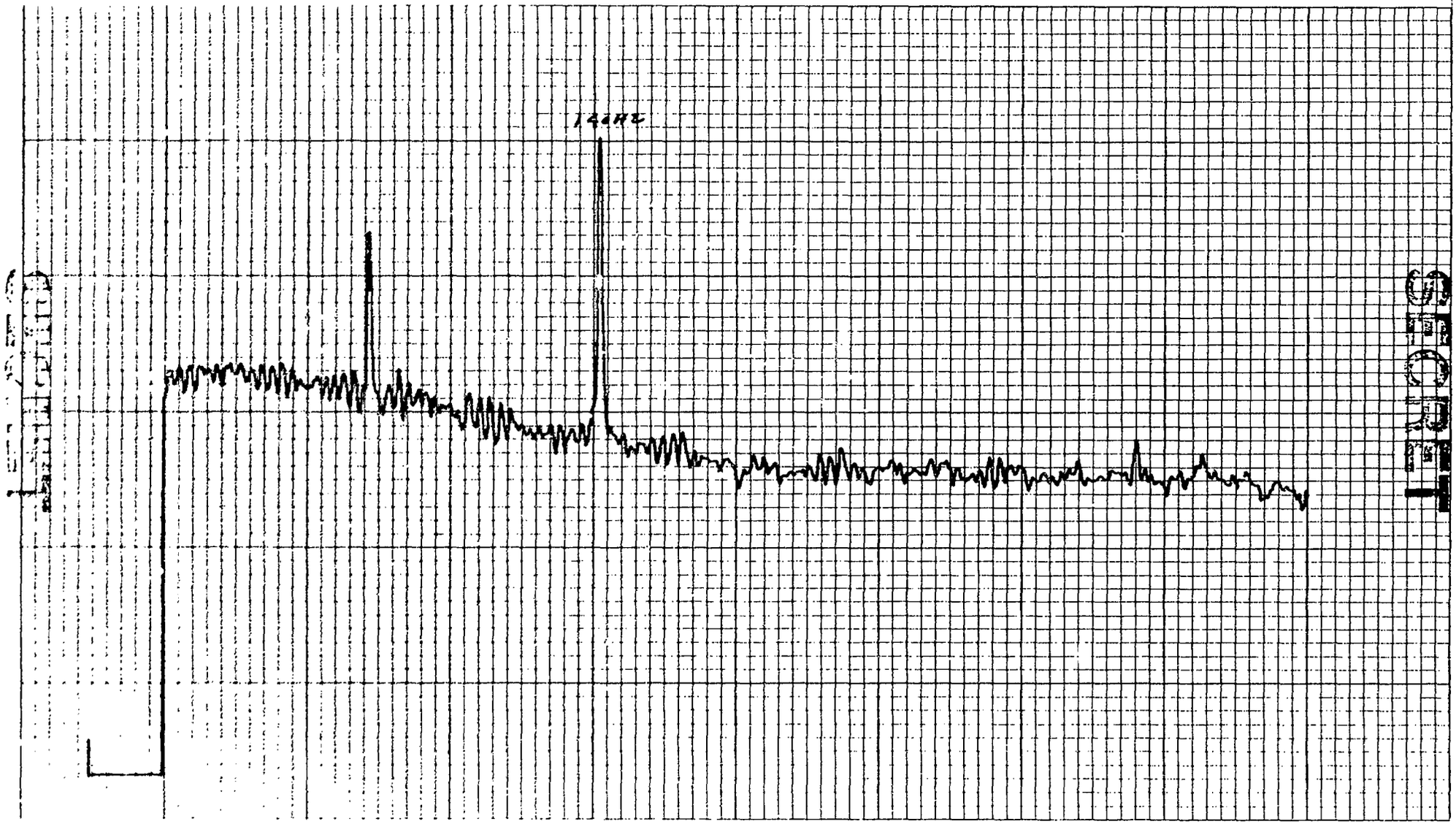
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

CONTROL: 0935 - 16 (DPI)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+72 DEG. AZ STEERING

REEL: M22 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: -10 DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

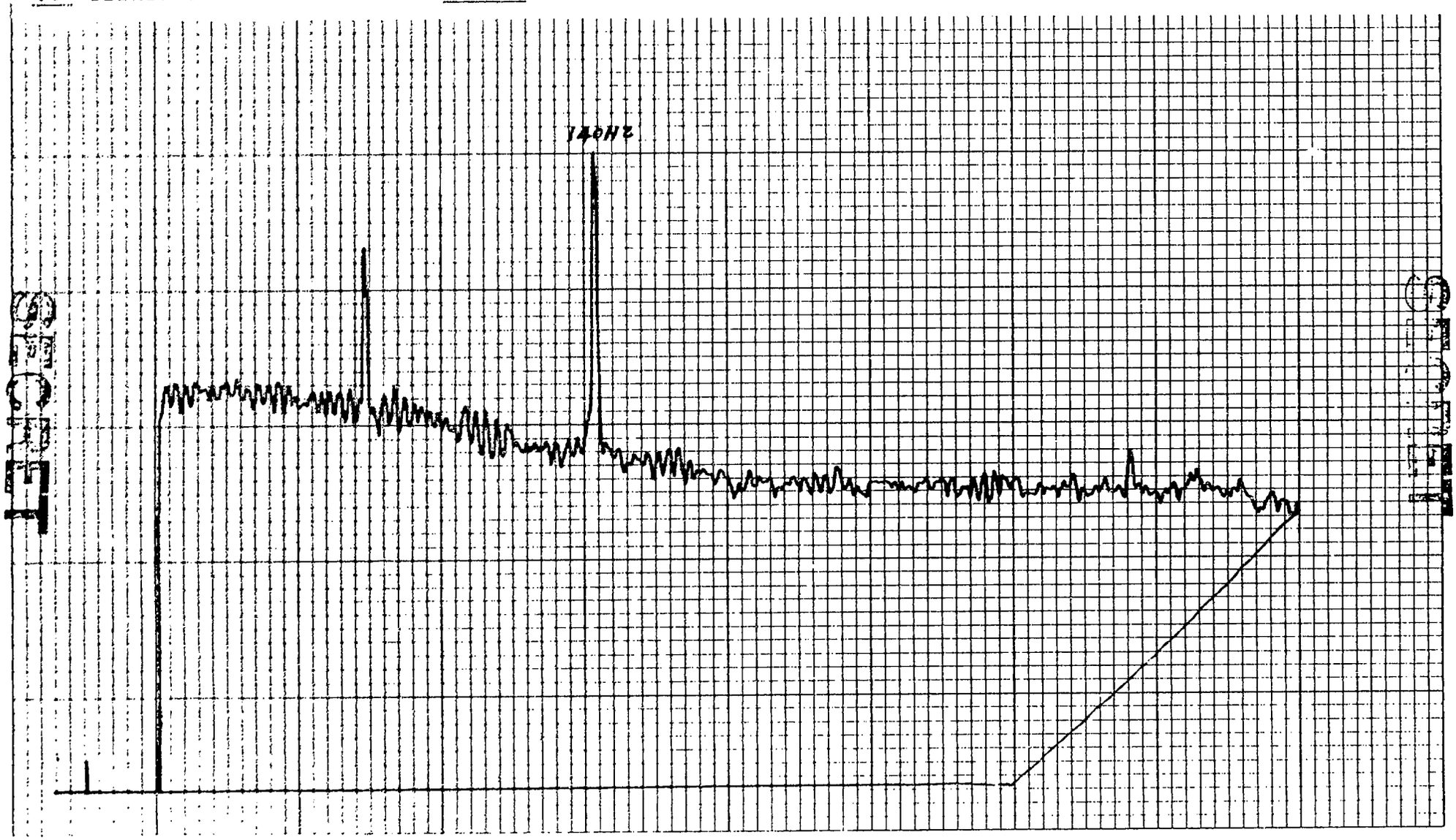
46 0703

CONTROL: 0835 - 16 (DP11)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: 1-16
DATE/TIME: 1-16-77 - 0835 Z
ANALYSIS BANDWIDTH: 1/10HZ
+74 DEG. AZ STEERING

REEL: M22 INDEX 566

INTEGRATION TIME 320 SECS ATTEN: -10 DB
FILTER WTG: HANNING



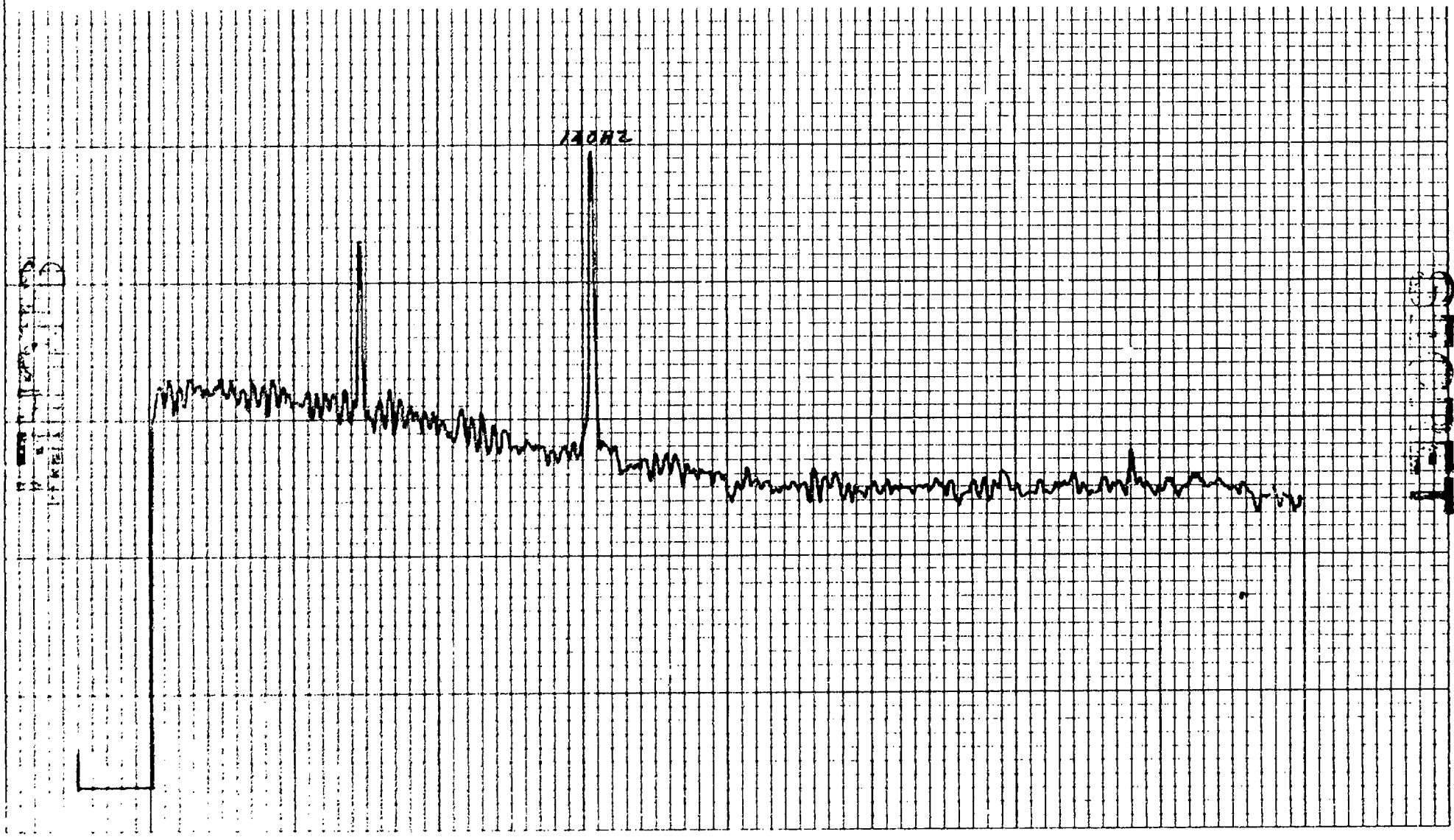
K•E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 0935 - 16 (DP11)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
1-16
DATE/TIME: 3-16-77 - 0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+76 DEG. AZ STEERING

REEL: A02 INDEX 566

INTEGRATION TIME 320 SECS ATTEN: -10 DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH
KEUFFEL & ESSER CO

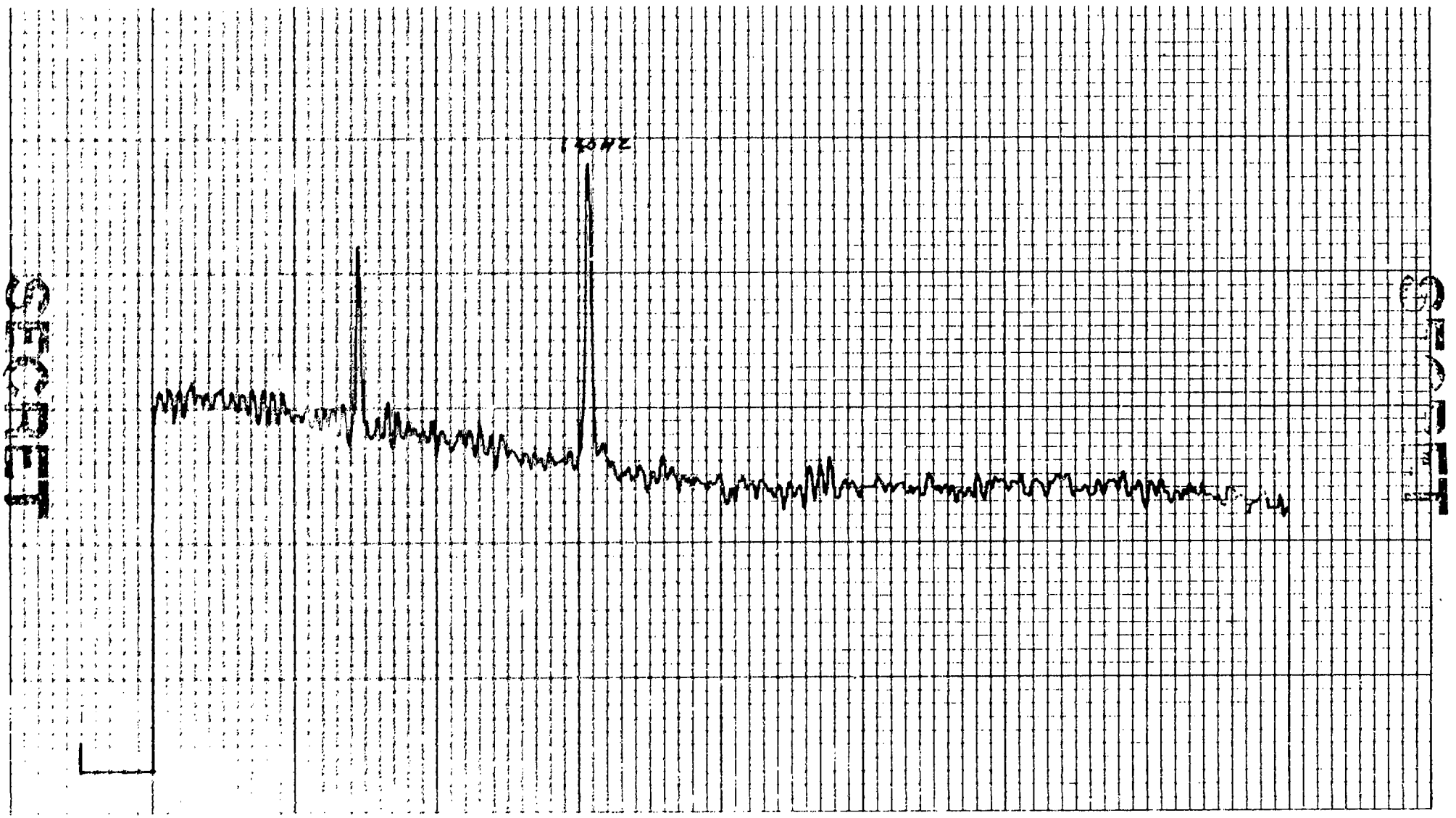
46 0703

CONTROL: 0935 - 16 (DPII)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 0935Z
ANALYSIS BANDWIDTH: 1/10HZ
+78 DEG. AZ STEERING

REEL: M02
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 566
ATTEN: -18 DB



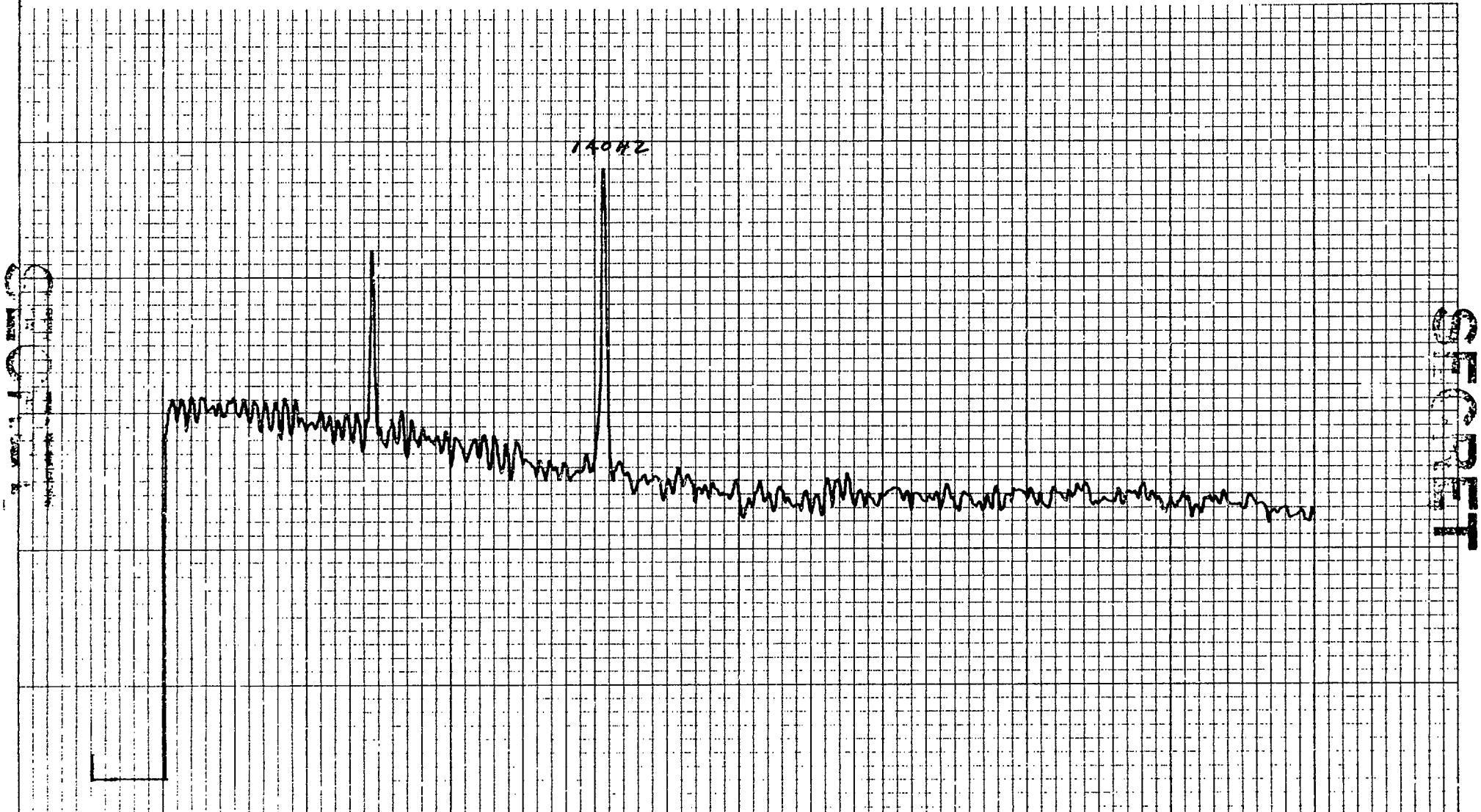
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 0935 - 16 (bPH)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 0935Z
ANALYSIS BANDWIDTH: 1/10HZ
+90 DEG. AZ STEERING

REEL: M22
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 566
ATTEN: -10 DB



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 0935 - 16 (DAU)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-6-77 - 0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+50 DEG. AZ STEERING

REEL: M27 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: -10 DB
FILTER WTG: HANNING

K+E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

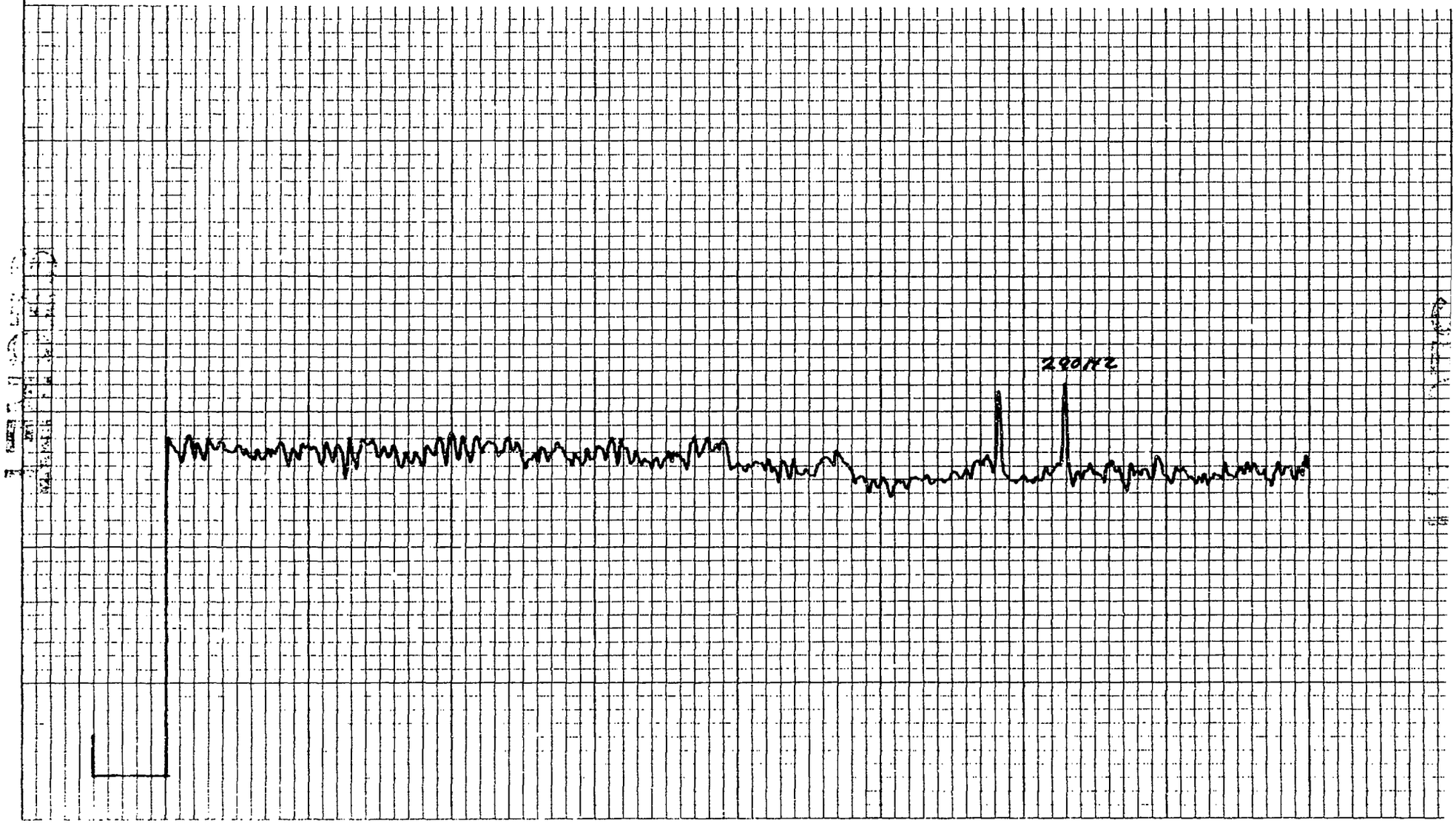
46 0703

CONTROL: 0935 - 16 (DP11)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-72 - 0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+52 DEG. AZ STEERING

REEL: 1422 INDEX 564

INTEGRATION TIME 320 SECS ATTEN: 10 DB
FILTER WTG: HANNING



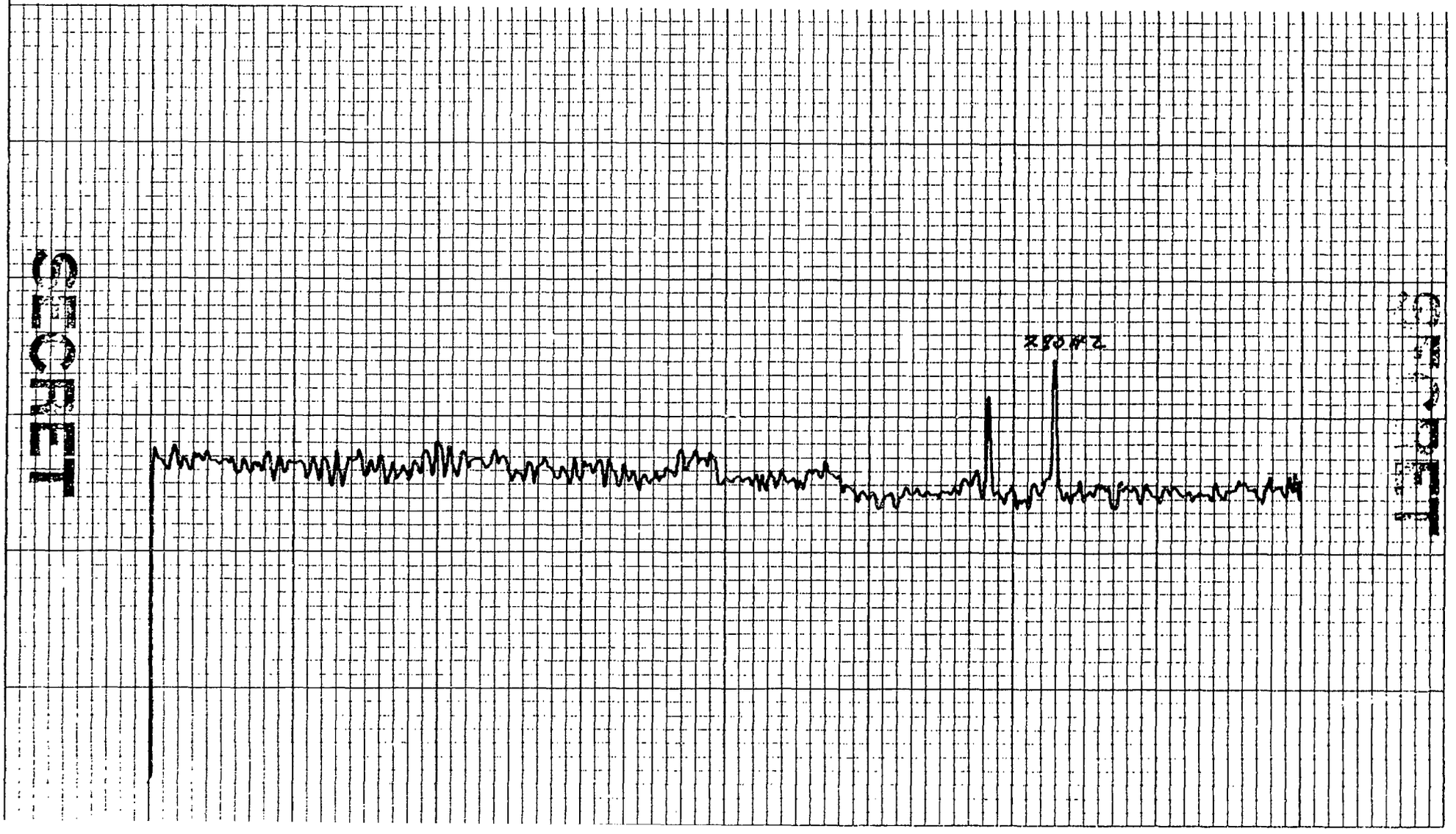
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 0935 - 16 (DP11)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+54 DEG. AZ STEERING

REEL: N22 INDEX 566

INTEGRATION TIME 320 SECS ATTEN: 78 DB
FILTER WTG: HANNING



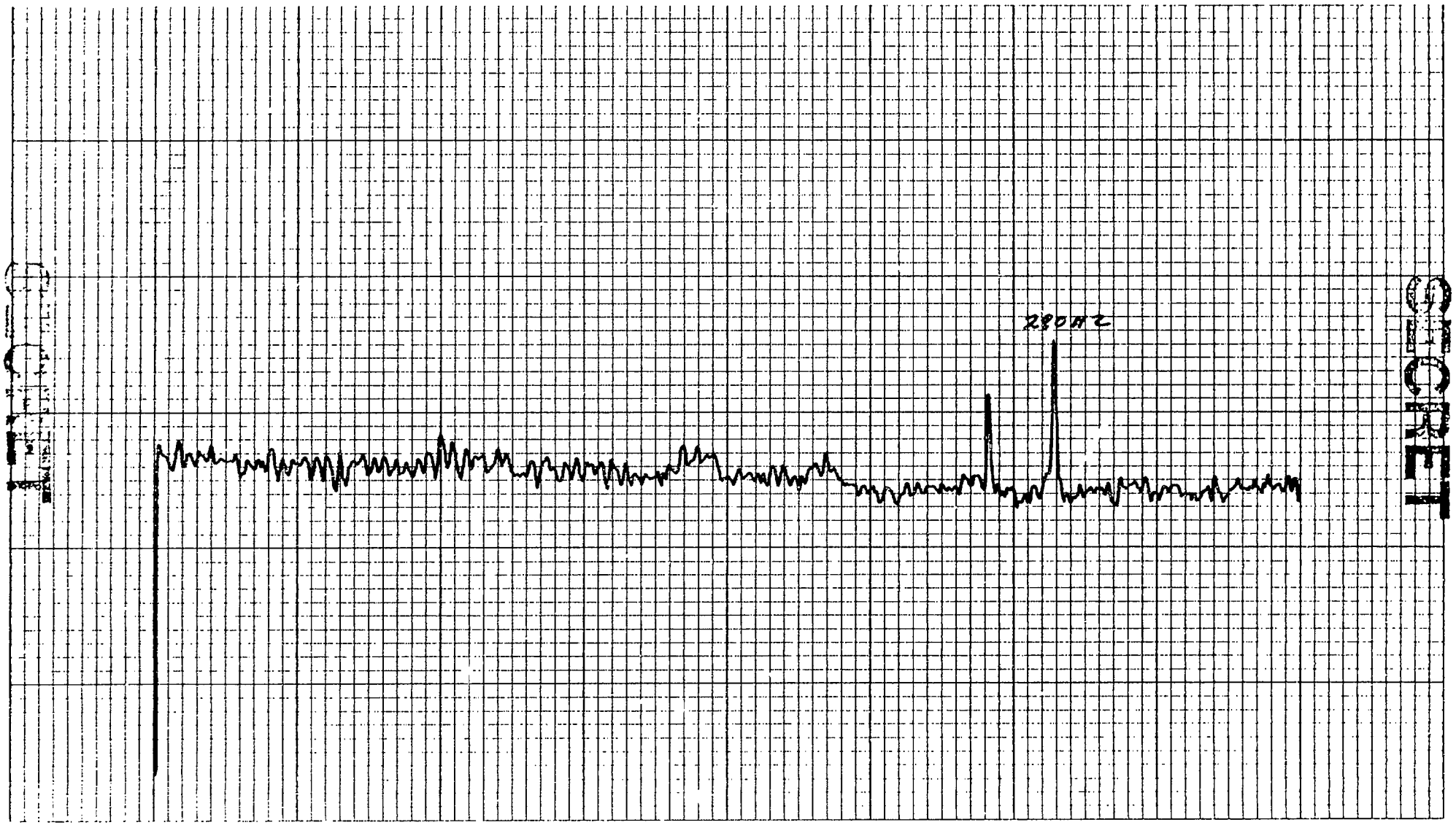
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

CONTROL: 0935-16 (DP11)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 0935Z
ANALYSIS BANDWIDTH: 1/10HZ
+56 DEG. AZ STEERING

REEL: M22 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: -16 DB
FILTER WTG: HANNING

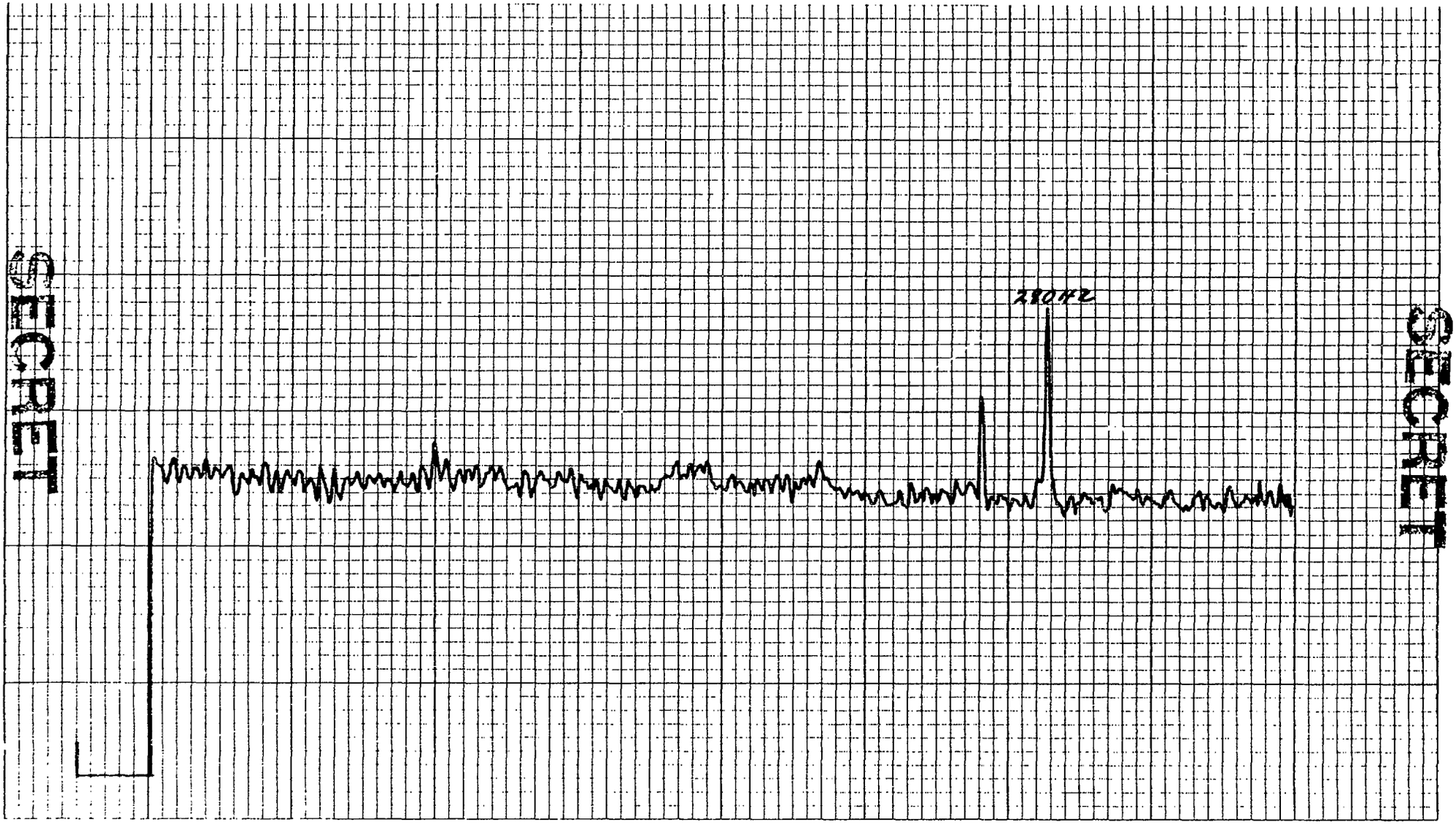


K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 0935 - 16 (DP11)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+58 DEG. AZ STEERING

REEL: A22 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: -10 DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

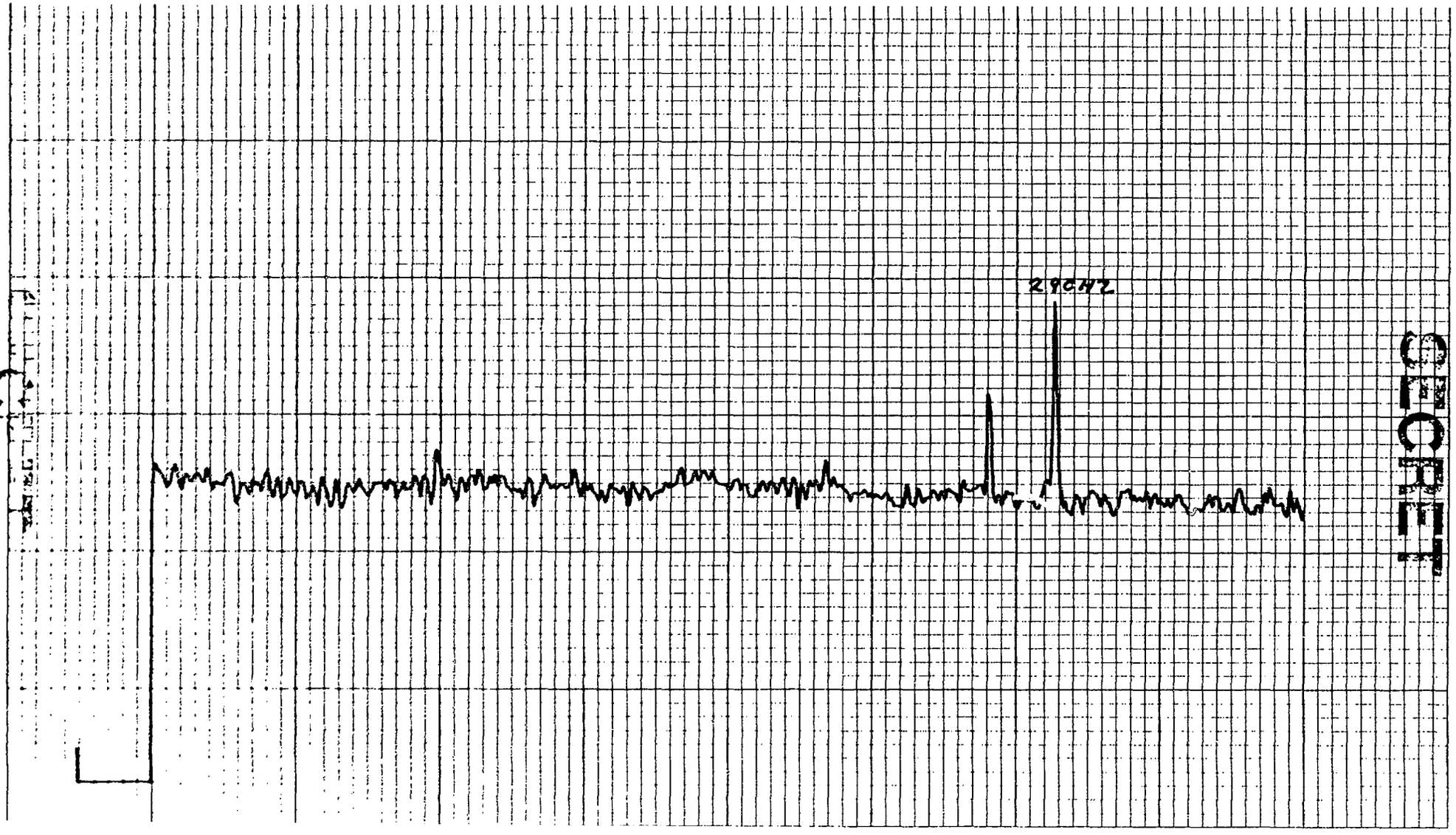
46 0703

CONTROL: 0935 - 16 (DP11)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
1-16
DATE/TIME: 3-16-77 -0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+60 DEG. AZ STEERING

REEL: M22
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 564
ATTEN: -18 DB



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO MADE IN U.S.A.

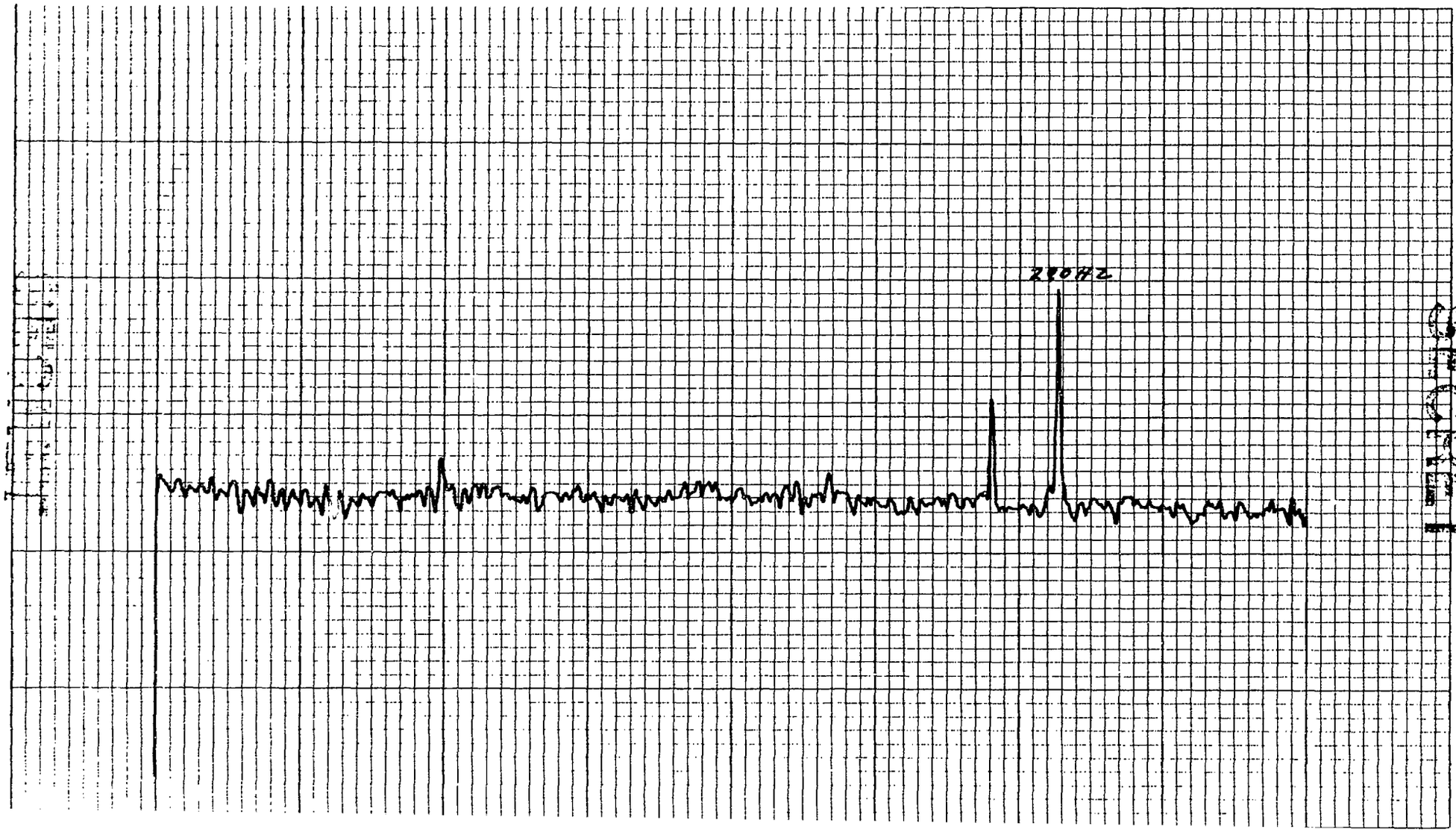
46 0703

CONTROL: 0935 - 16 (DAIJ)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: ~ ~ ~
DATE/TIME: 3-16-77 - 0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+62 DEG. AZ STEERING

REEL: M22 INDEX 561

INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

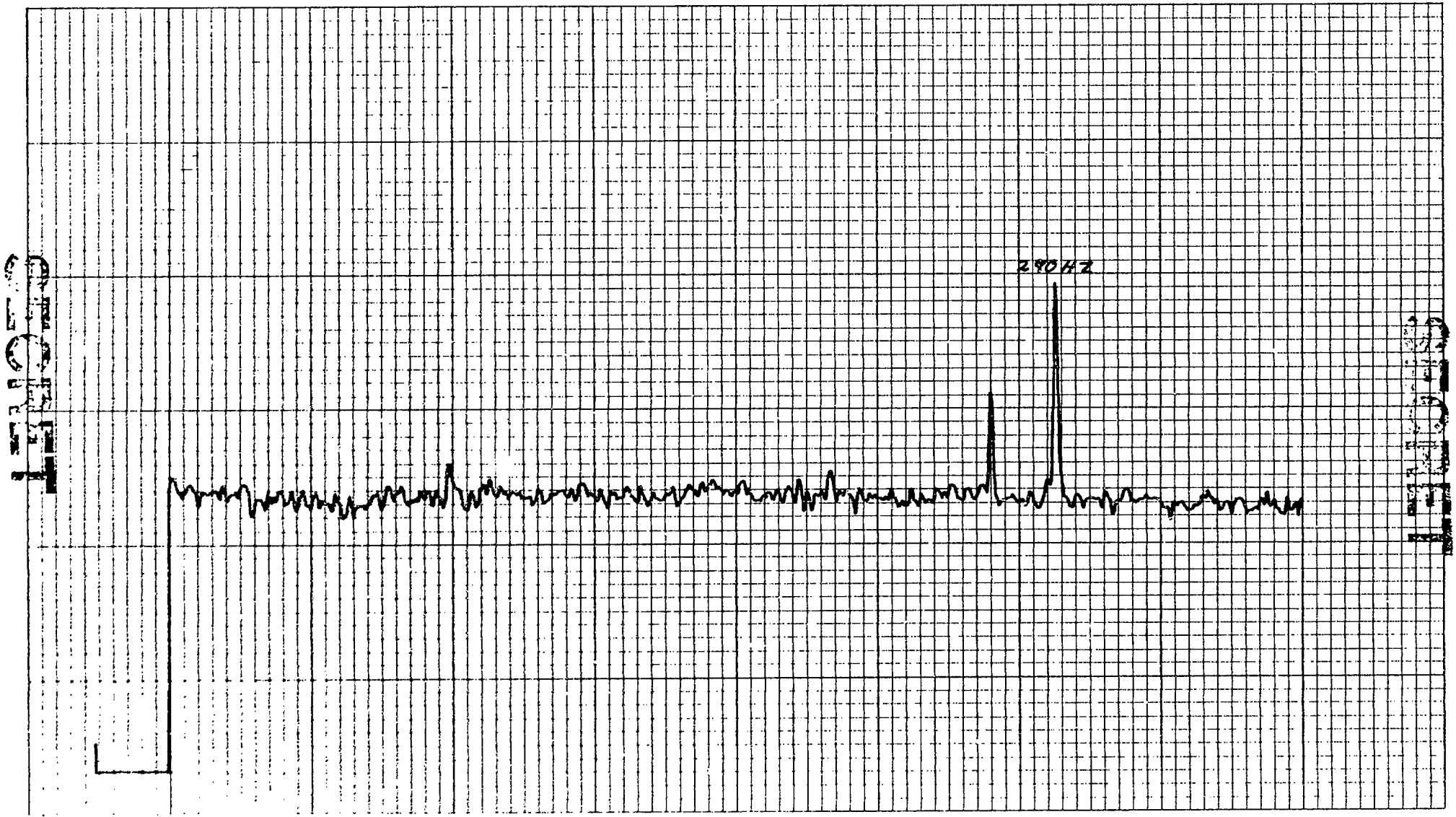
46 0703

CONTROL: 0935 - 51 (DP11)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: __ ___ __
DATE/TIME: 3-16-77 - 0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+64 DEG. AZ STEERING

REEL: M22 INDEX 566

INTEGRATION TIME 320 SECS ATTEN: 18 DB
FILTER WTG: HANNING



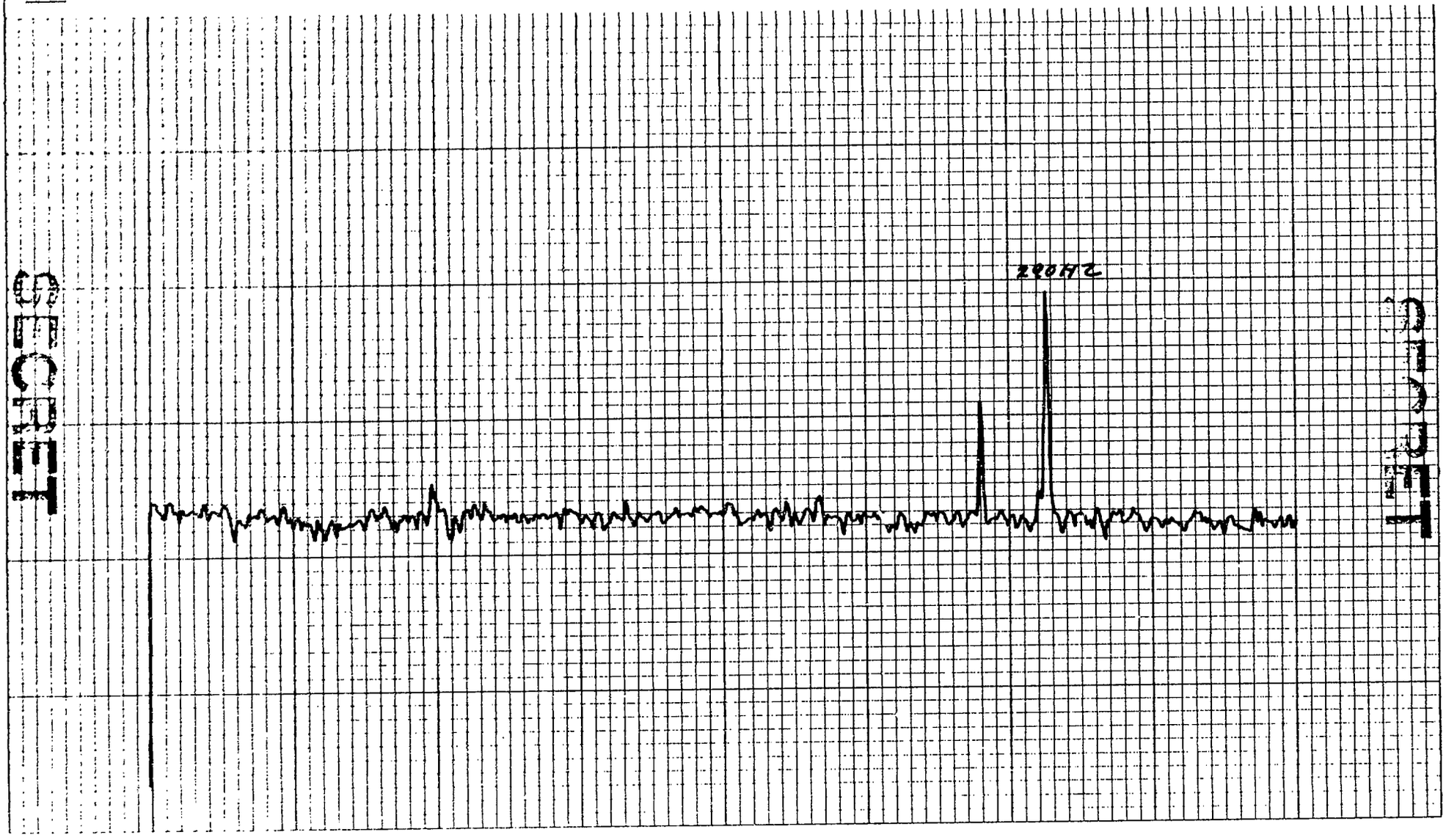
K·E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

CONTROL: 0935 - 16 (DP11)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+66 DEG. AZ STEERING

REEL: M22 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING



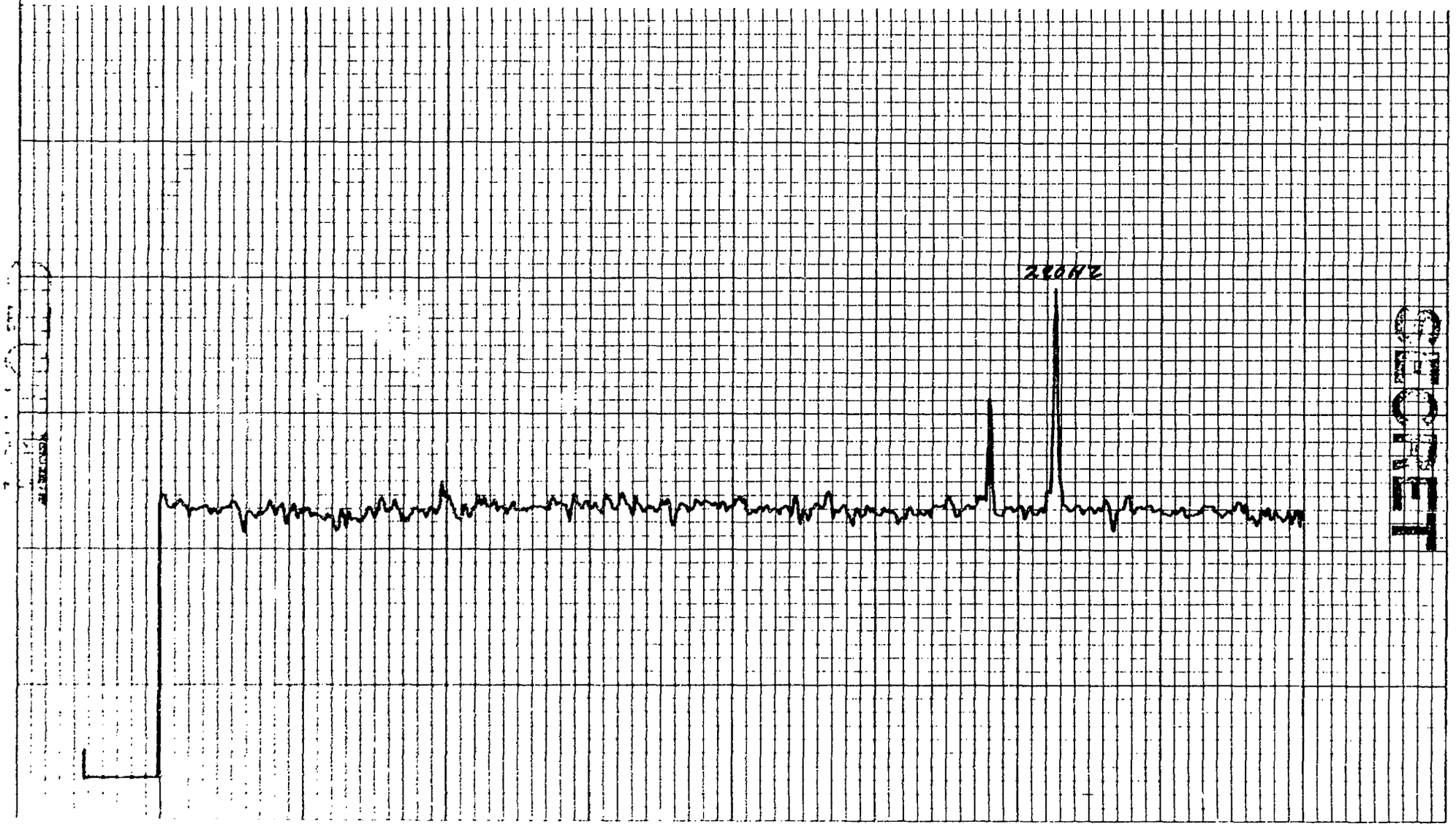
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 0935 - 16 (DP11)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 -0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+60 DEG. AZ STEERING

REEL: N22
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 566
ATTEN: -18 DB



K+E 10 X 10 TO THE INCH
KEUFFEL & ESSER CO

46 0703

CONTROL: 0935 - 16 (DD11)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+70 DEG. AZ STEERING

REEL: M22 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING

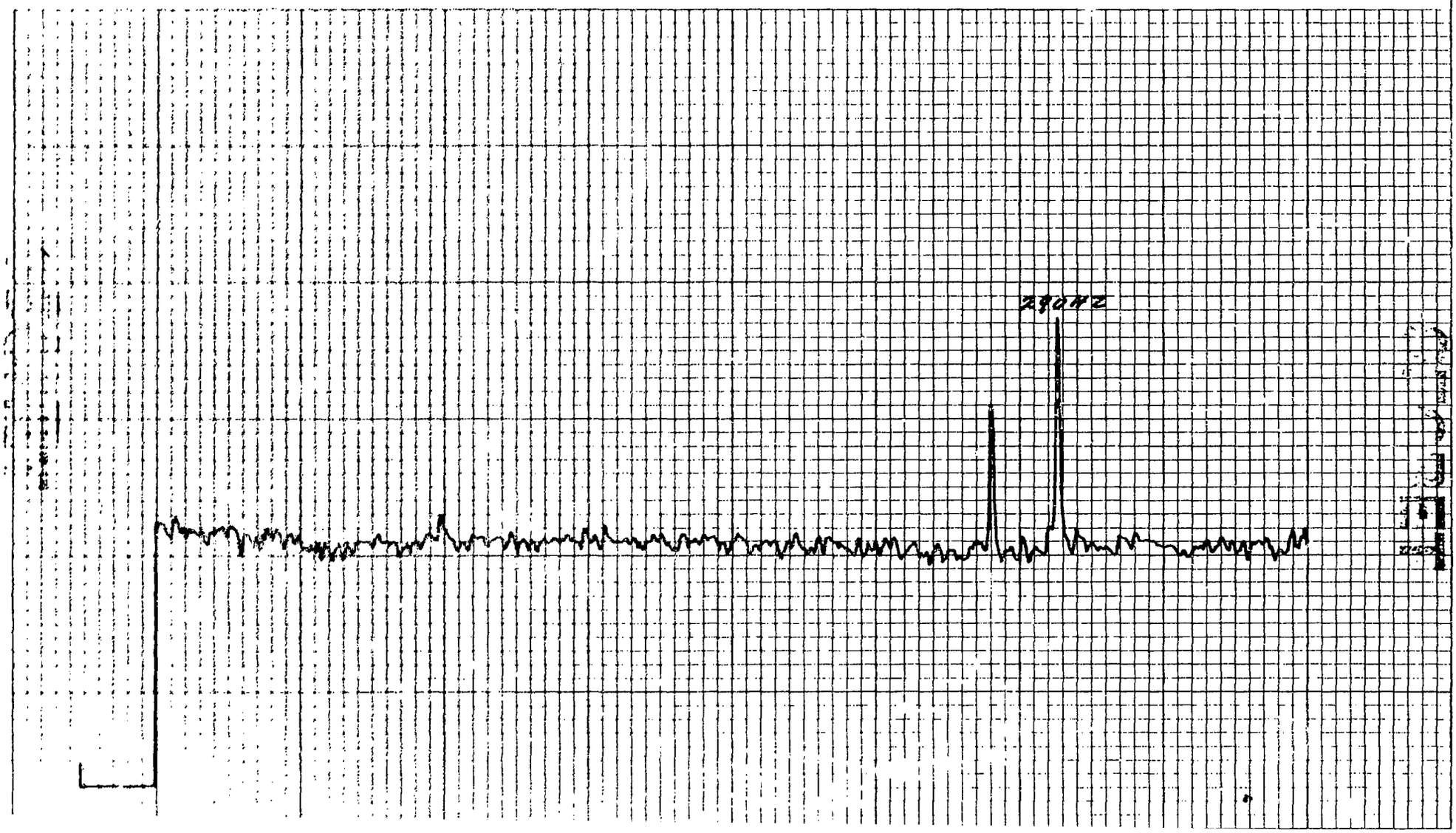
K+E 10 X 10 TO THE INCH

46 0703

CONTROL: 0935 - 16 (DW11)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+72 DEG. AZ STEERING

REEL: H22 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING



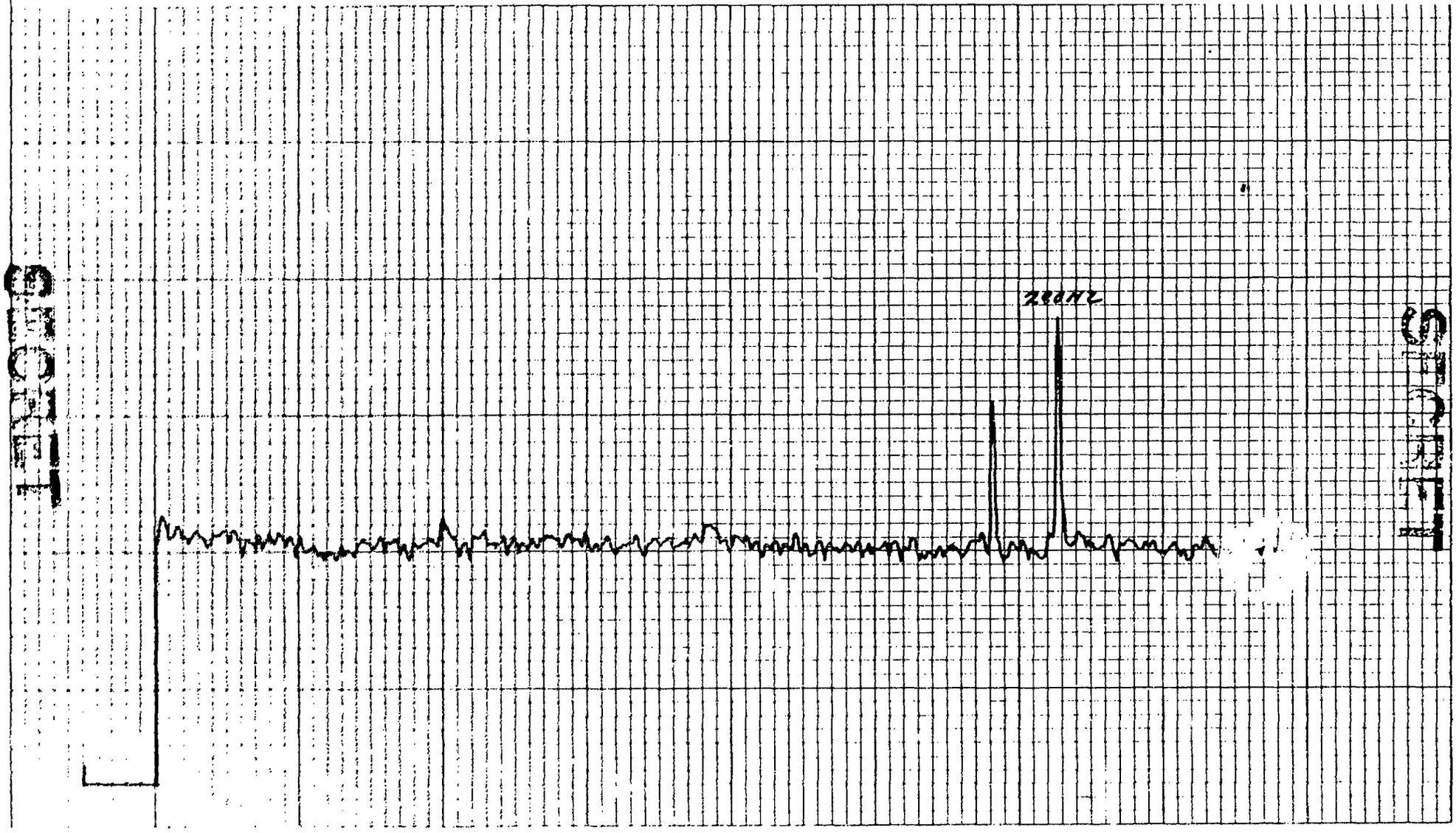
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

CONTROL: 0935 - 16 (DP11)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+74 DEG. AZ STEERING

REEL: N22 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING



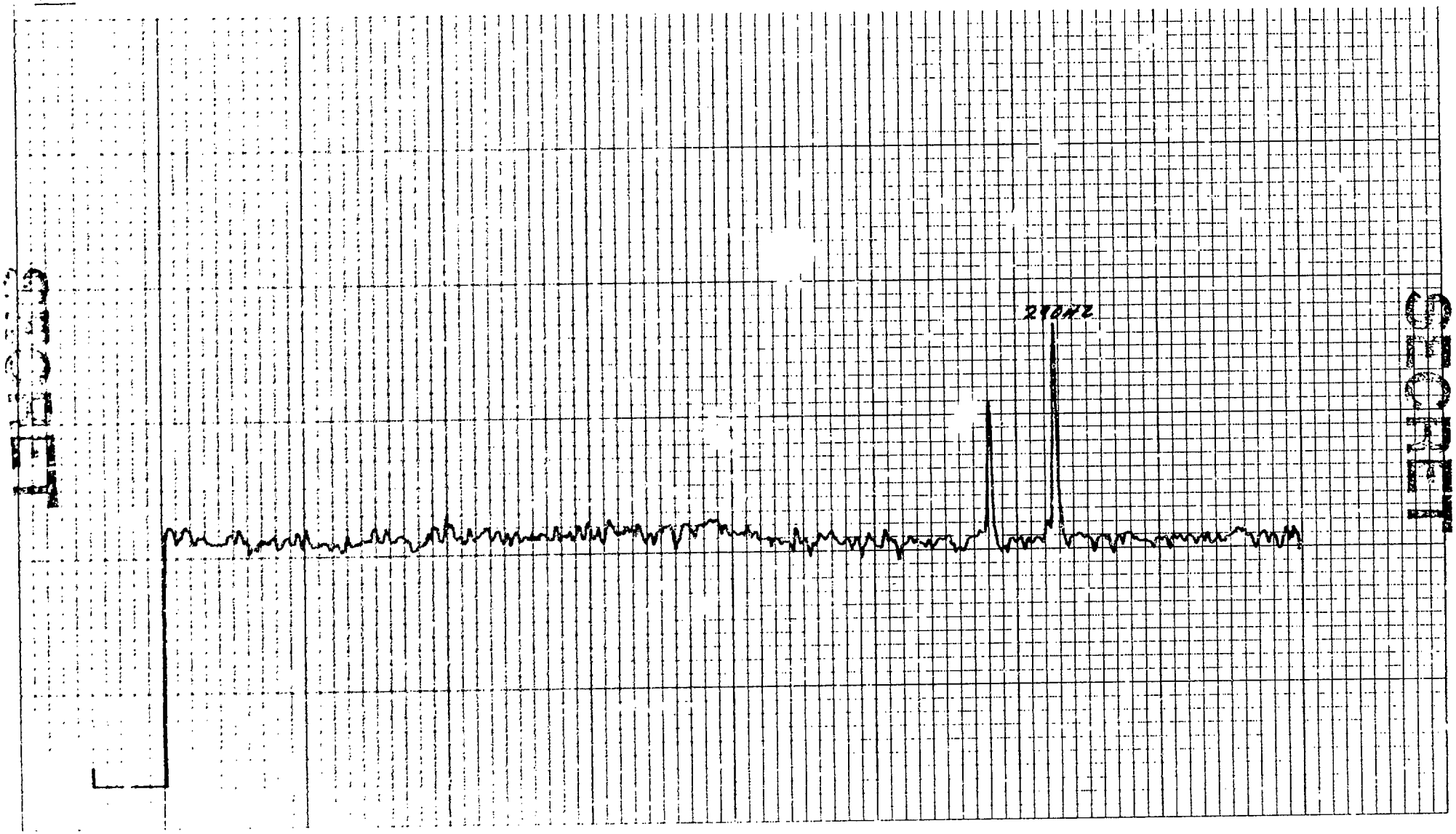
K&E 10 X 10 TO THE INCH

CONTROL: 0935 - 16 (DP11)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: -- - --
(1-16)
DATE/TIME: 3-16-77 - 0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+75 DEG. AZ STEERING

REEL: M22 INDEX 566

INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

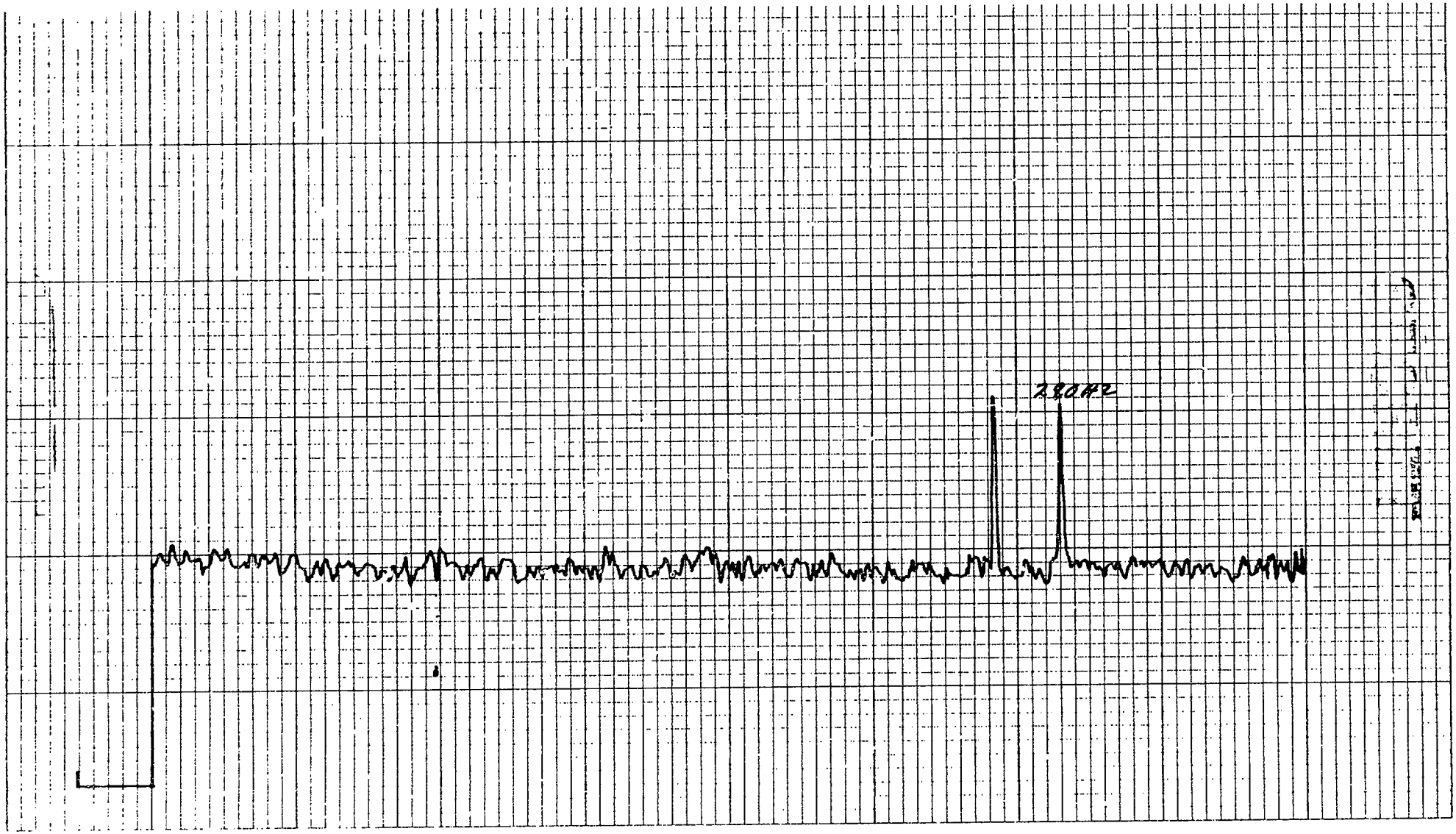
46 0703

CONTROL: 0975-16 (D911)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: -- - -
1-16
DATE/TIME: 3-16-77 - 0933 Z
ANALYSIS BANDWIDTH: 1/10HZ
+78 DEG. AZ STEERING

REEL: M22 INDEX 566

INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING



K+E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 0935 - 16 (D811)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 0935Z
ANALYSIS BANDWIDTH: 1/10HZ
+90 DEG. AZ STEERING

REEL: M20 INDEX 566

INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING

CONFIDENTIAL

SIGNAL LEVEL AND SNR

CALCULATIONS

DATA POINT 11 FREQUENCY 140 HZ NUMBER OF ELEMENTS 32

SIGNAL LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-30.6	
MCPS-32 CAL. CORRECTION	+10	-20.6	
BEAMFORMER GAIN	+24	+ 3.4	SIG. LEVEL FOR SNR CALCULATION
MRA CORRECTION	+ .2	+3.6	SIG. LEVEL FOR SIGNAL GAIN

NOISE LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-59.4	
MCPS-32 CAL. CORRECTION	+10	-49.4	
BEAMFORMER GAIN	+24	-25.0	NOISE LEVEL FOR SNR CALCULATION

SIGNAL-NOISE-RATIO

SIGNAL LEVEL FOR SNR		+3.4	
SIGNAL LEVEL FOR SNR	-25.0	28.4	
PROCESSOR CORRECTION	-4.0	24.4	
MRA CORRECTION	+ .2	24.6	SNR 1/10 HZ BAND
BANDWIDTH CONVERSION	-8.2	16.4	SNR 1 HZ BAND

SIGNAL LEVEL AND SNR

CALCULATIONS

DATA POINT 11 FREQUENCY 290 HZ NUMBER OF ELEMENTS 32

SIGNAL LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-45.6	
MCPS-32 CAL. CORRECTION	+10	-35.6	
BEAMFORMER GAIN	+24	-11.6	SIG. LEVEL FOR SNR CALCULATION
MRA CORRECTION	+ .8	-12.4	SIG. LEVEL FOR SIGNAL GAIN

NOISE LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-68.9	
MCPS-32 CAL. CORRECTION	+10	-58.9	
BEAMFORMER GAIN	+24	-34.9	NOISE LEVEL FOR SNR CALCULATION

SIGNAL-NOISE-RATIO

SIGNAL LEVEL FOR SNR		-11.6	
SIGNAL LEVEL FOR SNR	-34.9	23.3	
PROCESSOR CORRECTION	-4.0	19.3	
MRA CORRECTION	+ .8	20.1	SNR 1/10 HZ BAND
BANDWIDTH CONVERSION	-8.2	11.9	SNR 1 HZ BAND

CONFIDENTIAL

DATA POINT 11

SIGNAL GAIN

	140 HZ	290HZ	295HZ
MEAN OMNI SIGNAL LEVEL	-29.8	-41.4	
MRA SIGNAL LEVEL	+3.6	-12.4	
ARRAY SIGNAL GAIN	33.4	29.0	
20 LOG 32 (# of elements)	34.1	34.1	
DIFFERENCE	-.7	-5.1	

ARRAY GAIN

MRA SNR	24.6	20.1	
MEAN OMNI SNR	16.2	8.4	
ARRAY GAIN	8.4	11.7	
THEORETICAL AZMUTH GAIN (at MRA)	10.9	13.0	
DIFFERENCE	-2.5	-1.3	

K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

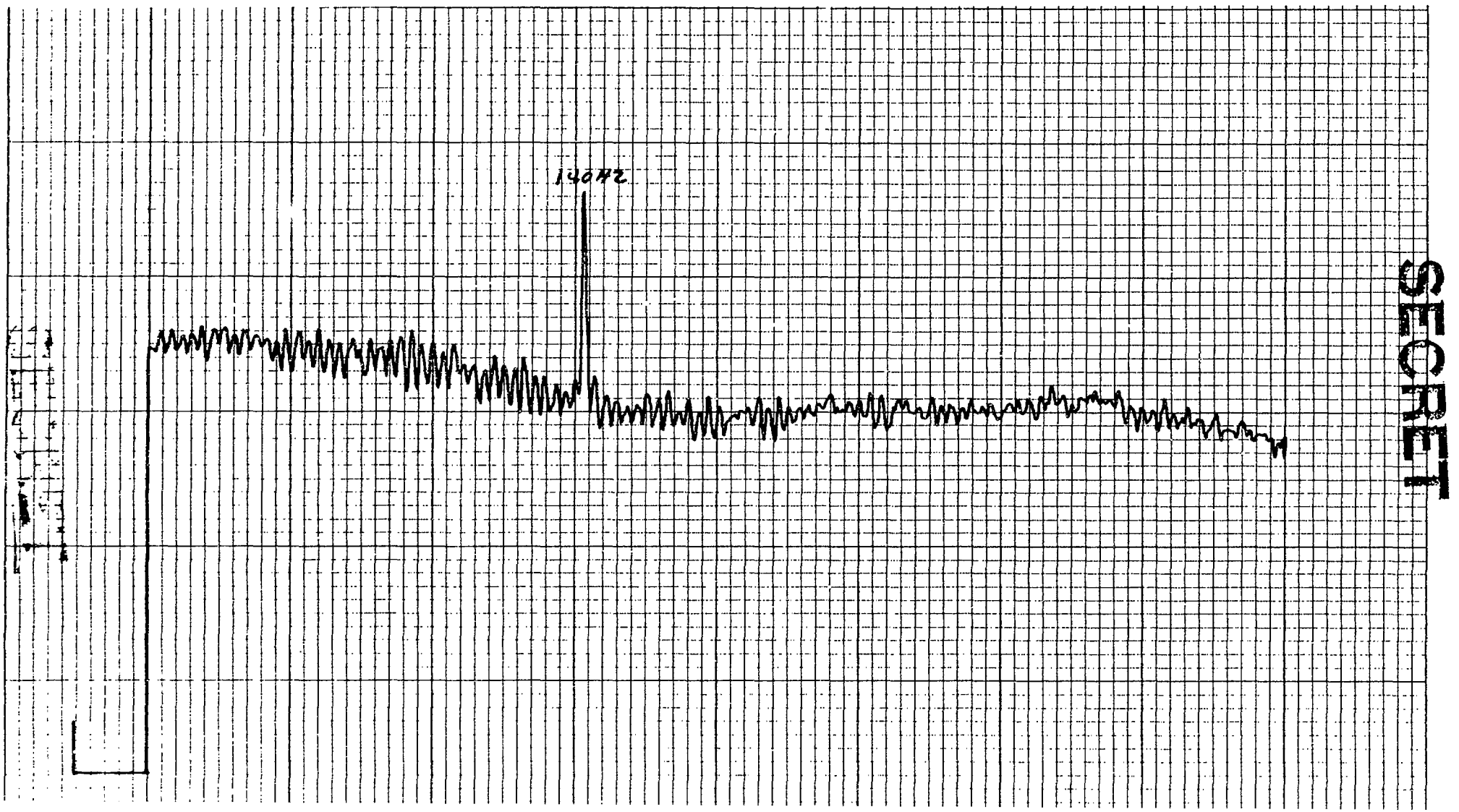
46 0703

CONTROL: 0936 - 32 (DP11)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 3-16-79 - 0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+50 DEG. AZ STEERING

REEL: M22 INDEX 566

INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



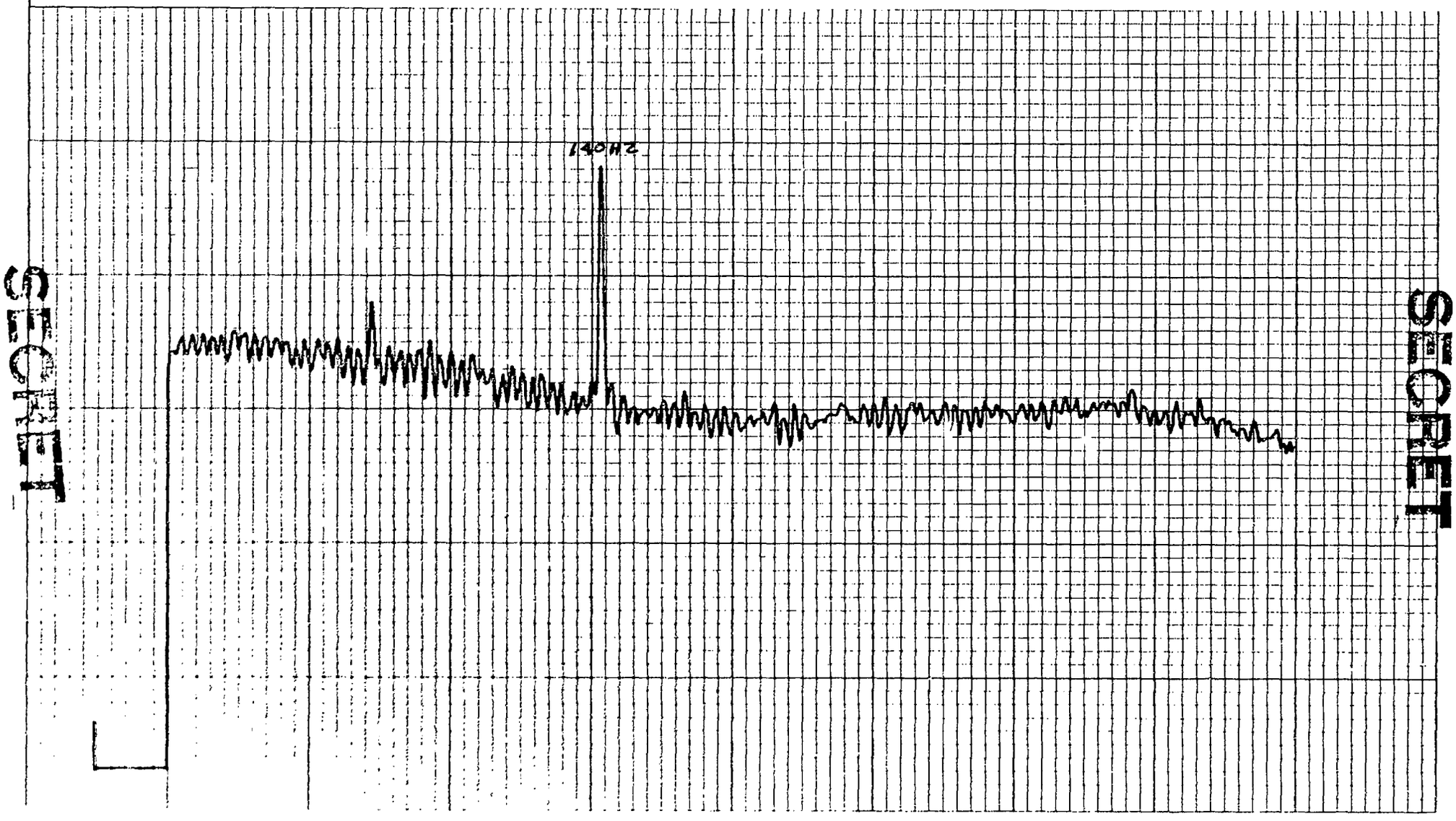
K•E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

CONTROL: 0935 - 32 (DP11)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 28-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

DATE OF ANALYSIS: ~ ~ ~
DATE/TIME: 3-16-77 - 0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+52 DEG. AZ STEERING

REEL: M22 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: -84 DB
FILTER WTG: HANNING

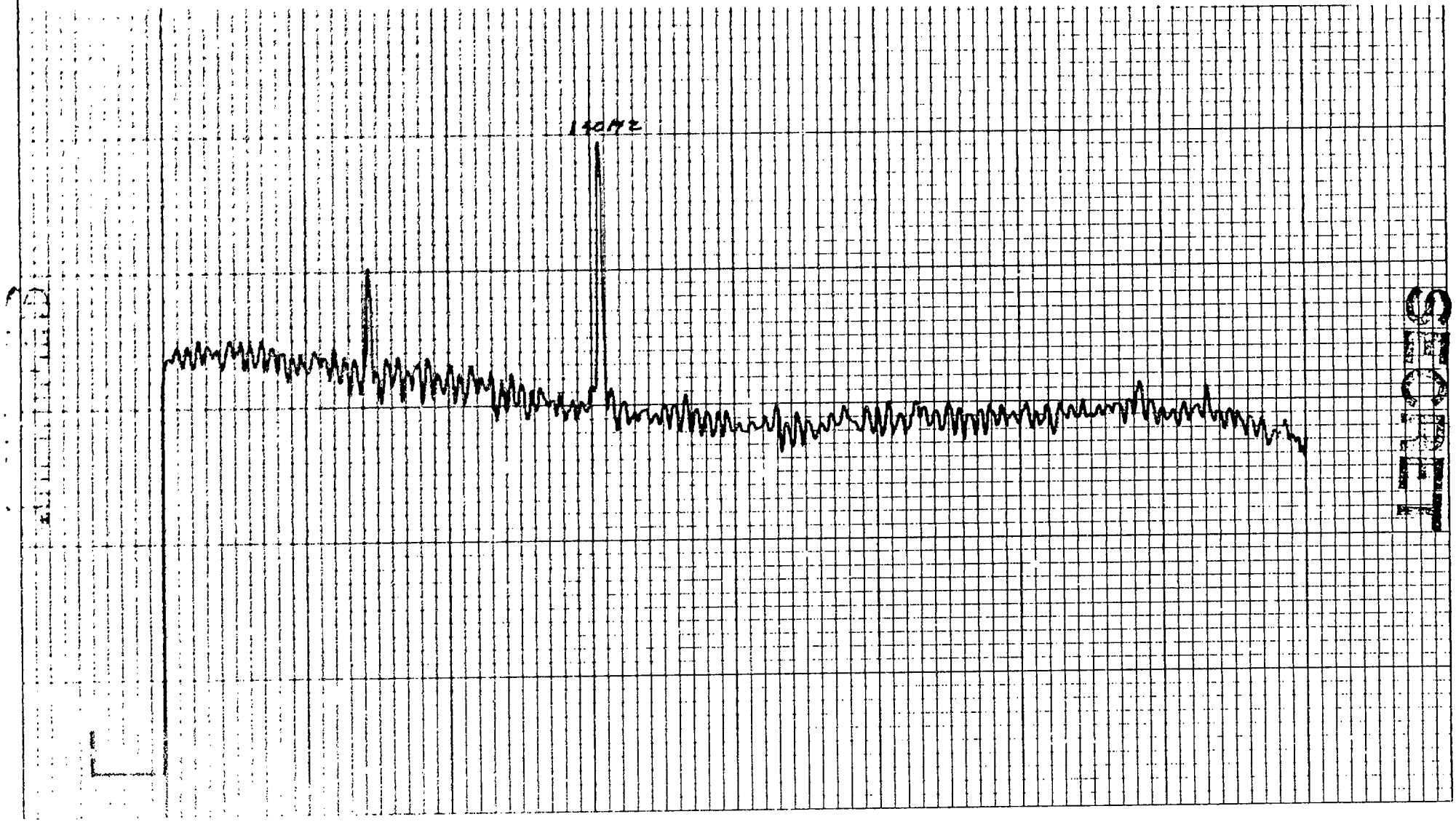


K+E 10 X 10 TO THE INCH

CONTROL: 0935 - 32 (DP4)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

DATE OF ANALYSIS: — — —
1-26 & 28-34
DATE/TIME: 3-16-77 0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+54 DEG. AZ STEERING

REEL: 422 INDEX 526
INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

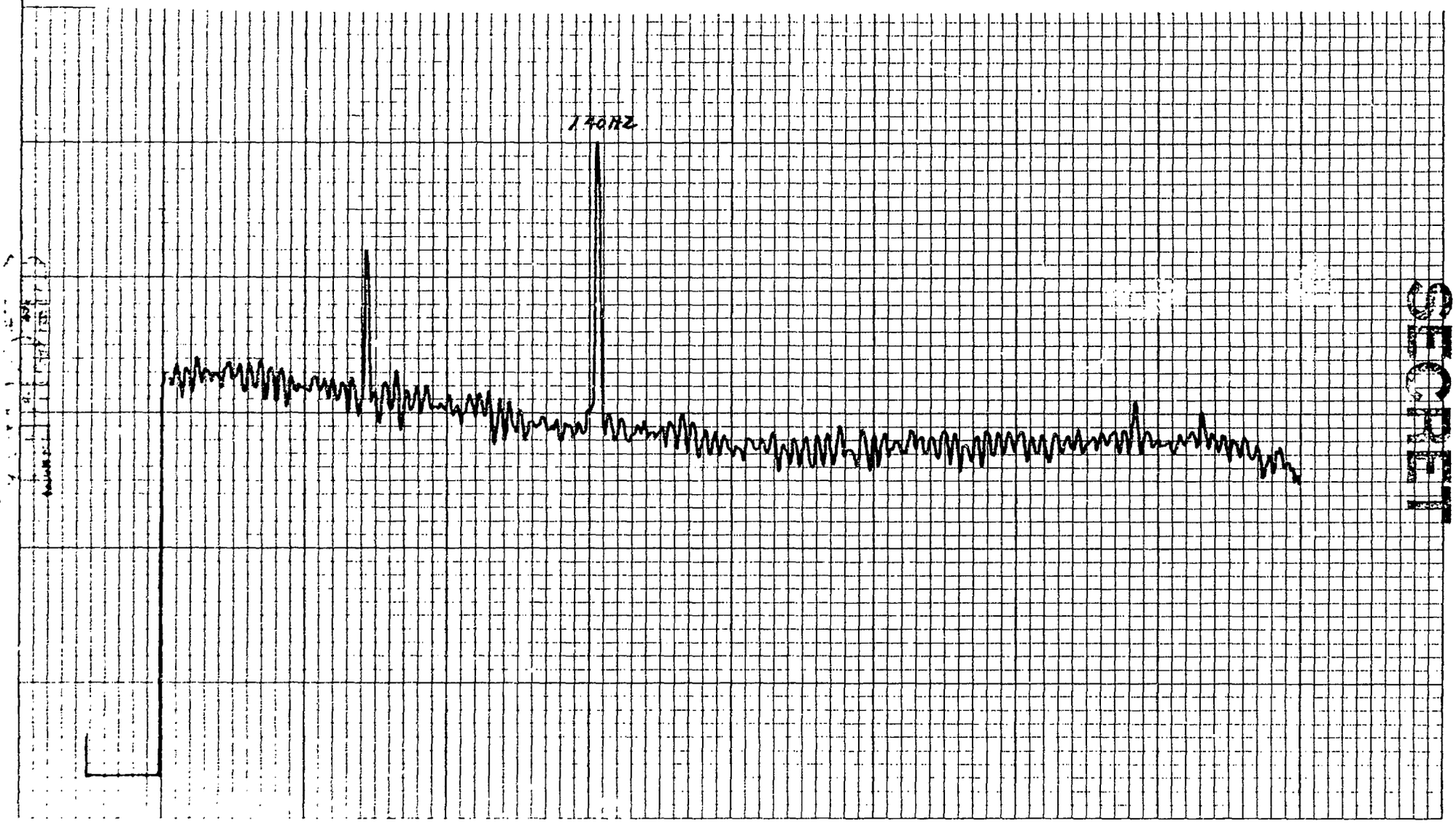
46 0703

CONTROL: 0935 - 32 (DP11)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

DATE OF ANALYSIS: ~ ~ ~
(1-26 & 28-34)
DATE/TIME: 3-16-77 - 0935Z
ANALYSIS BANDWIDTH: 1/10HZ
+56 DEG. AZ STEERING

REEL: M22 INDEX 566

INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING

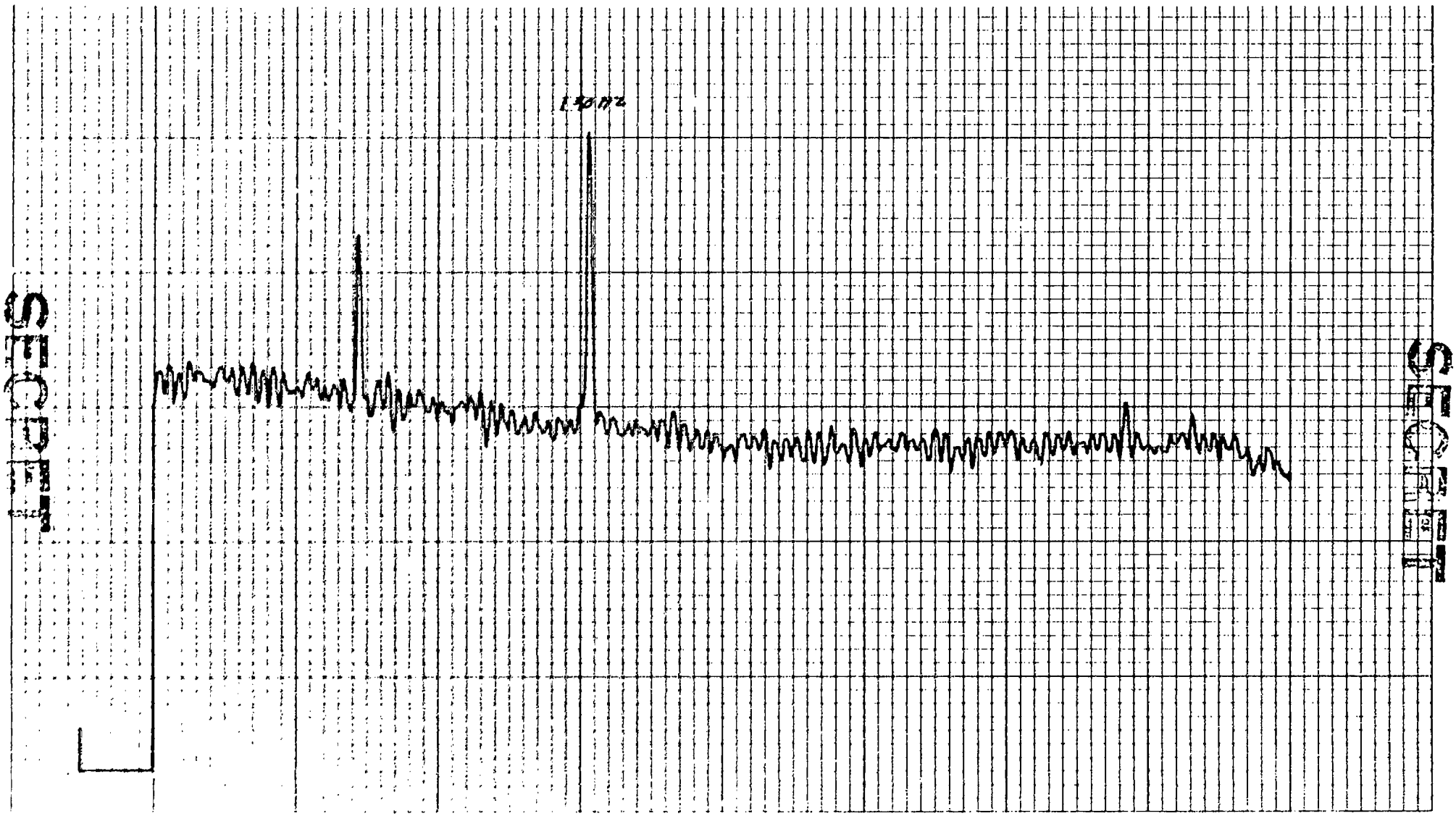


K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 0935 - 32 (DP11)
BEAMFORMED SPECTRUM(ELEMENTS 1-32 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 250 HZ
32 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 3-16-77 -0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+58 DEG. AZ STEERING

REEL: M22 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



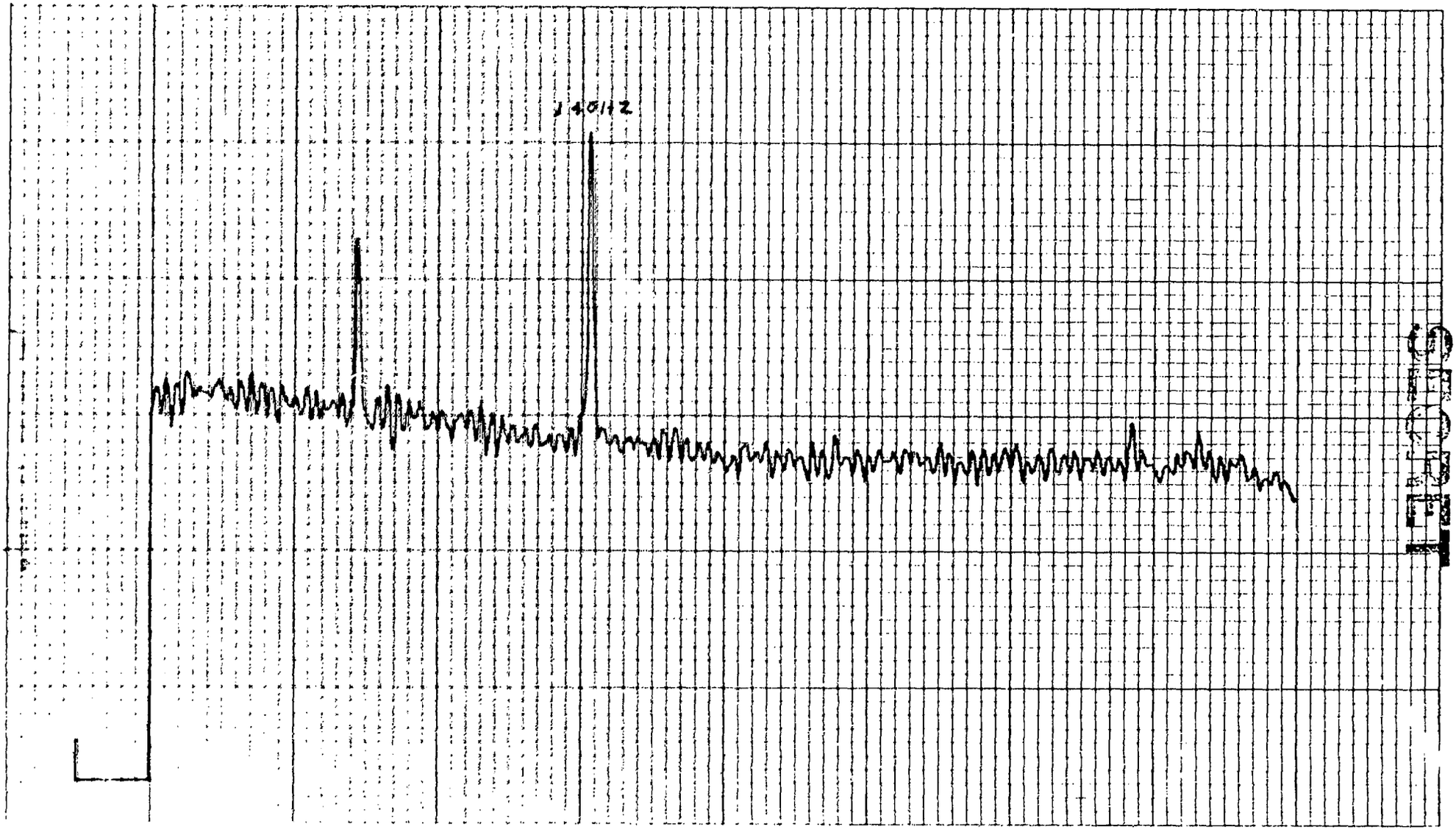
K&E 10 X 10 TO THE INCH • 5 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 0935 - 51 (DP11)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 160 HZ
72 ELEMENTS

DATE OF ANALYSIS: __ ___ __
DATE/TIME: 3-16-77 -0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+59 DEG. AZ STEERING

REEL: MZZ INDEX 566
INTEGRATION TIME 320 SECS ATTEN: 24 DB
FILTER WTG: HANNING



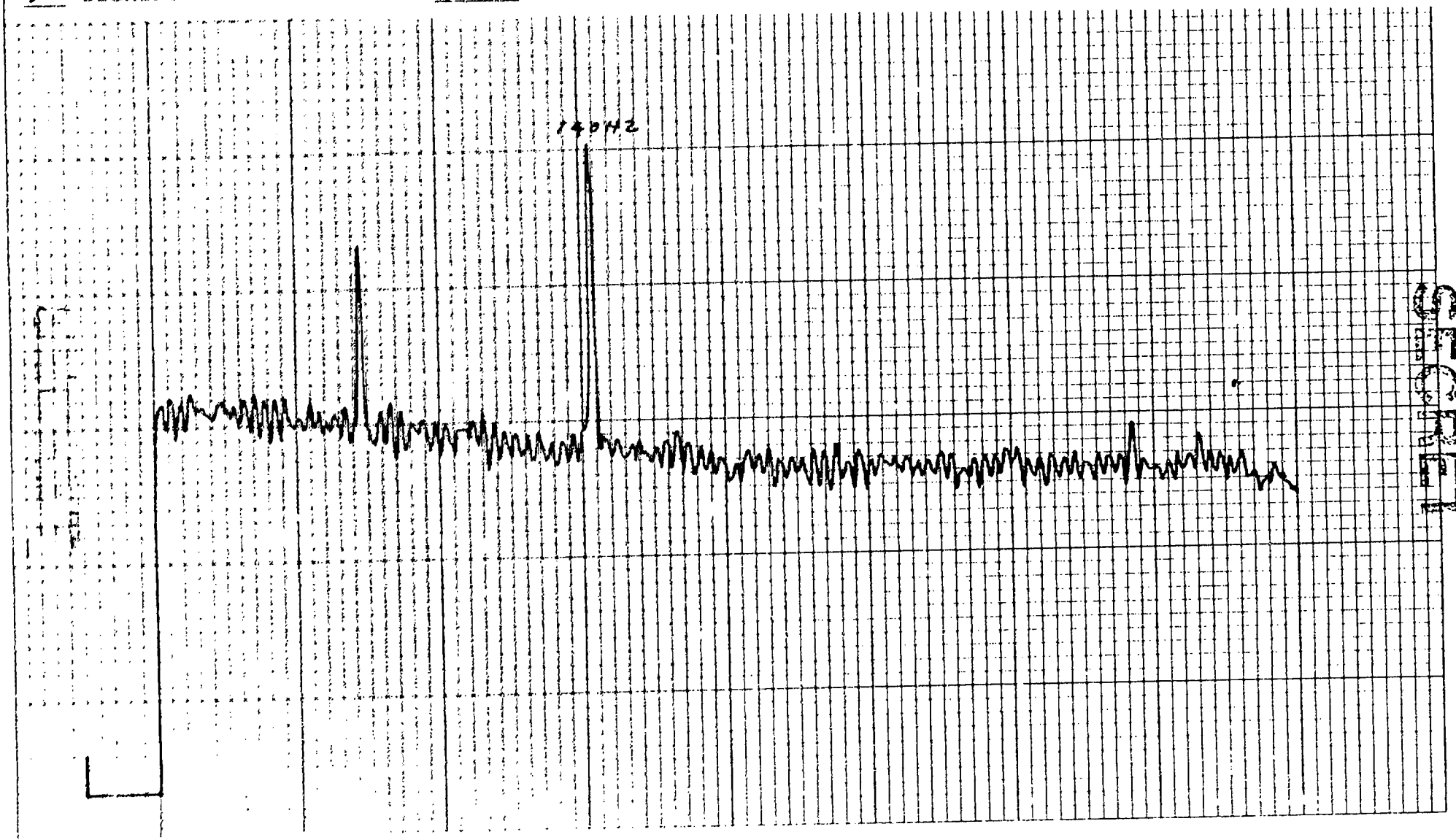
46 0703

CONTROL: 0935 - 72 (0911)
BEAMFORMED SPECTRUM (ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
72 ELEMENTS

DATE OF ANALYSIS: _ _ _
1-26 & 28-34
DATE/TIME: 3-16-77 - 0935Z
ANALYSIS BANDWIDTH: 1/10HZ
+60 DEG. AZ STEERING

REEL: M02 INDEX 566

INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING

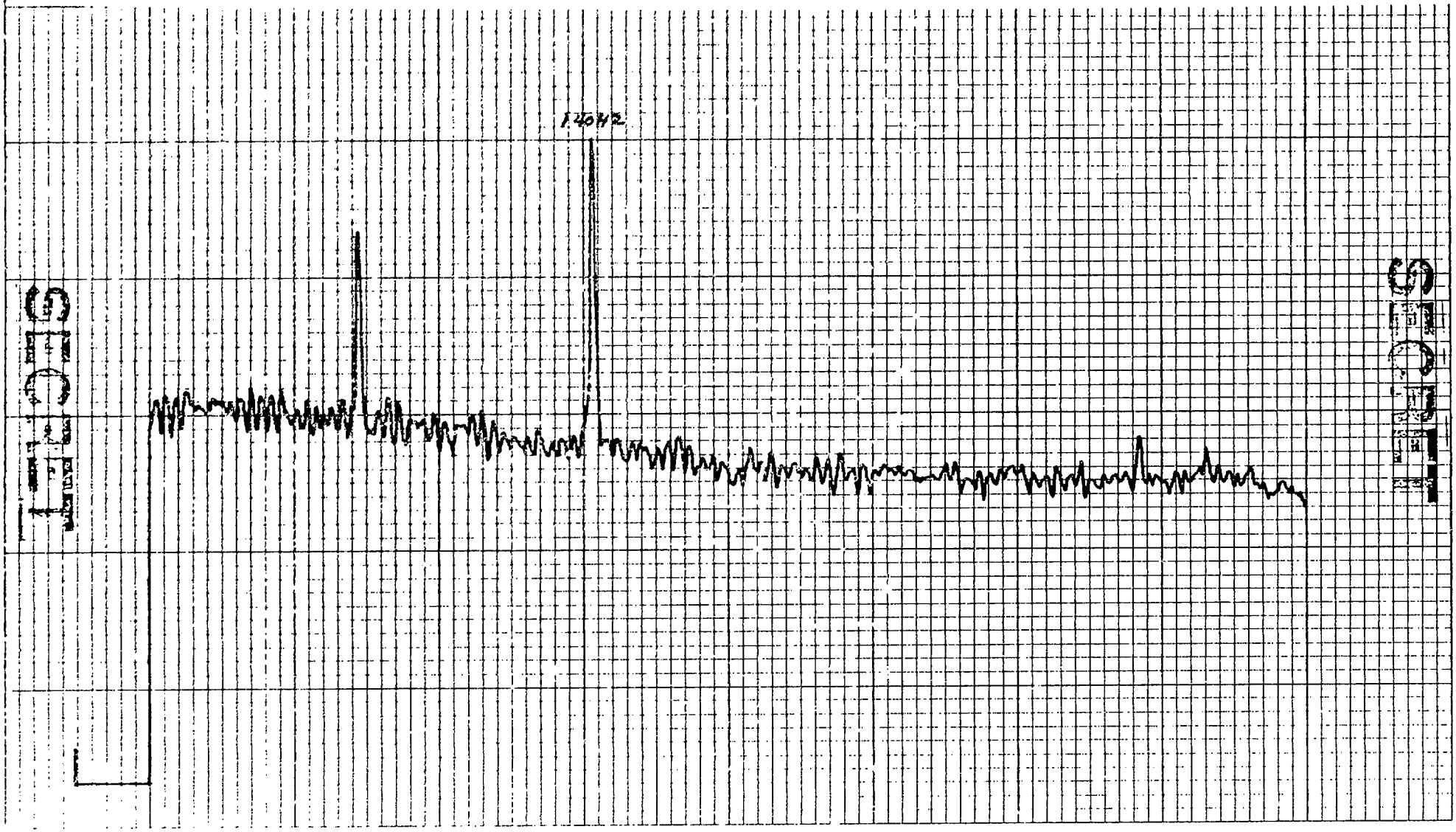


K&E 10 X 10 TO THE INCH
KEUFFEL & ESSER CO

CONTROL: 0935 - 32 (DF11)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
1-26 & 28-34)
DATE/TIME: 3-6-77 - 0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+62 DEG. AZ STEERING

REEL: N22 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



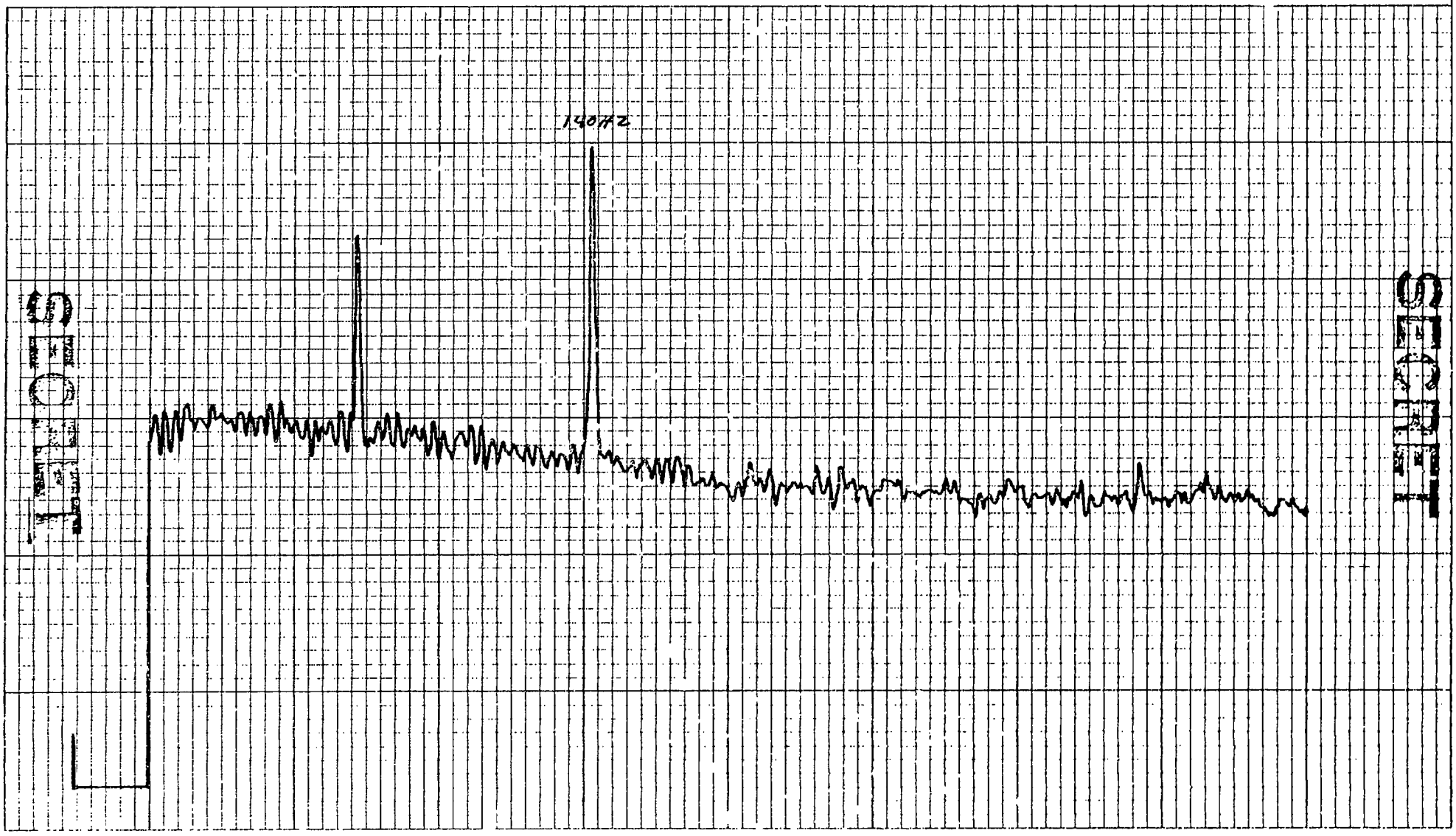
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 0935 - 32 (DP11)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 -0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+63 DEG. AZ STEERING

REEL: M22 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 0935 - 32 (0911)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 250 HZ
32 ELEMENTS

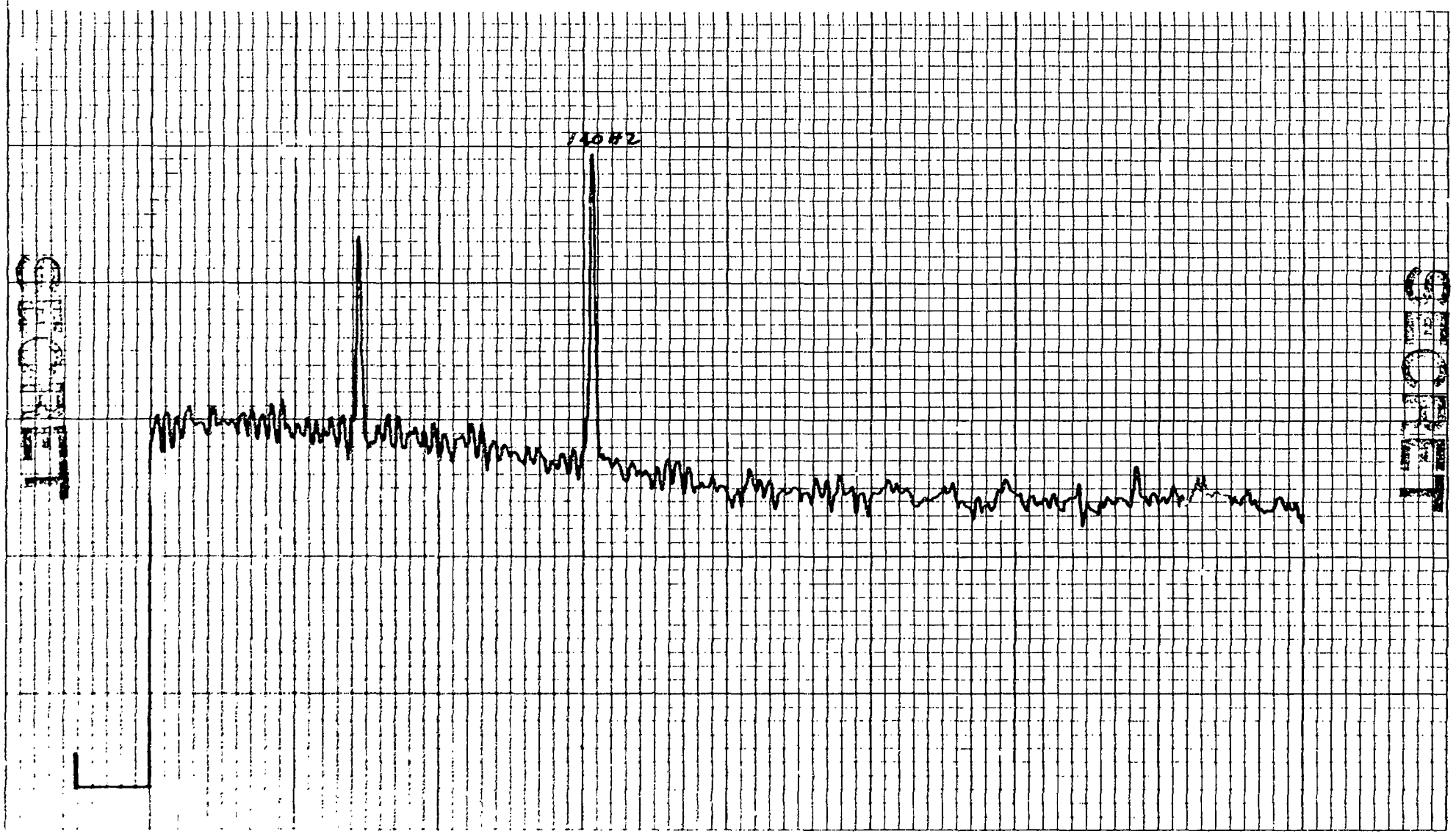
DATE OF ANALYSIS: — — —
1-26 & 99-3#)
DATE/TIME: 3-16-77 -0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+64 DEG. AZ STEERING

REEL: H22

INTEGRATION TIME 320 SECS

INDEX 564

ATTEN: -24 DB
FILTER WTG: HANNING



K•E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

CONTROL: 0935 - 32 (DP1)
BEAMFORMED SPECTRUM (ELEMENTS 1-26 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 3-16-77 -0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+66 DEG. AZ STEERING

REEL: M02 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING

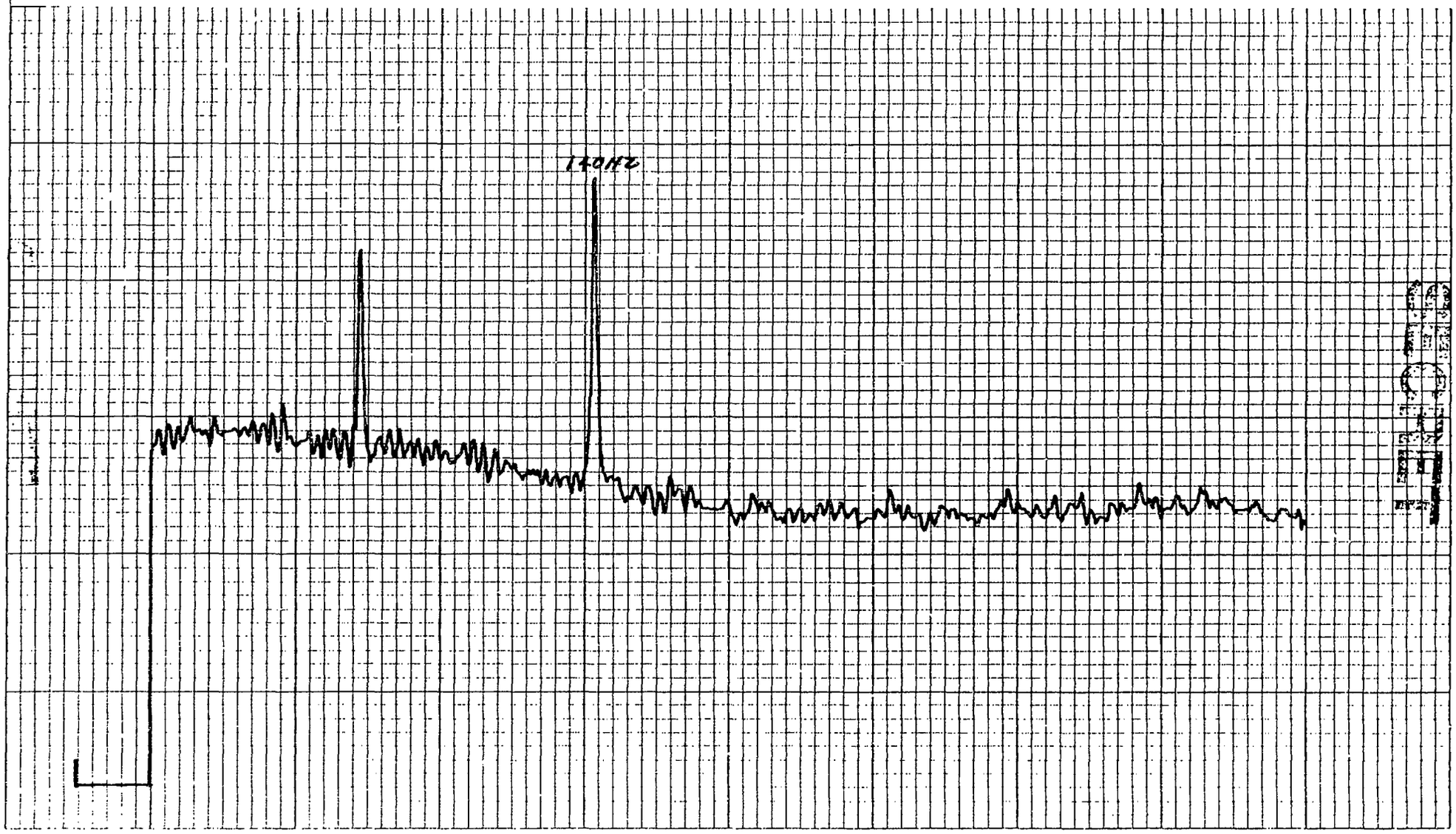
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 0935 - 32 (DBH)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 -0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+68 DEG. AZ STEERING

REEL: H22 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



K+E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

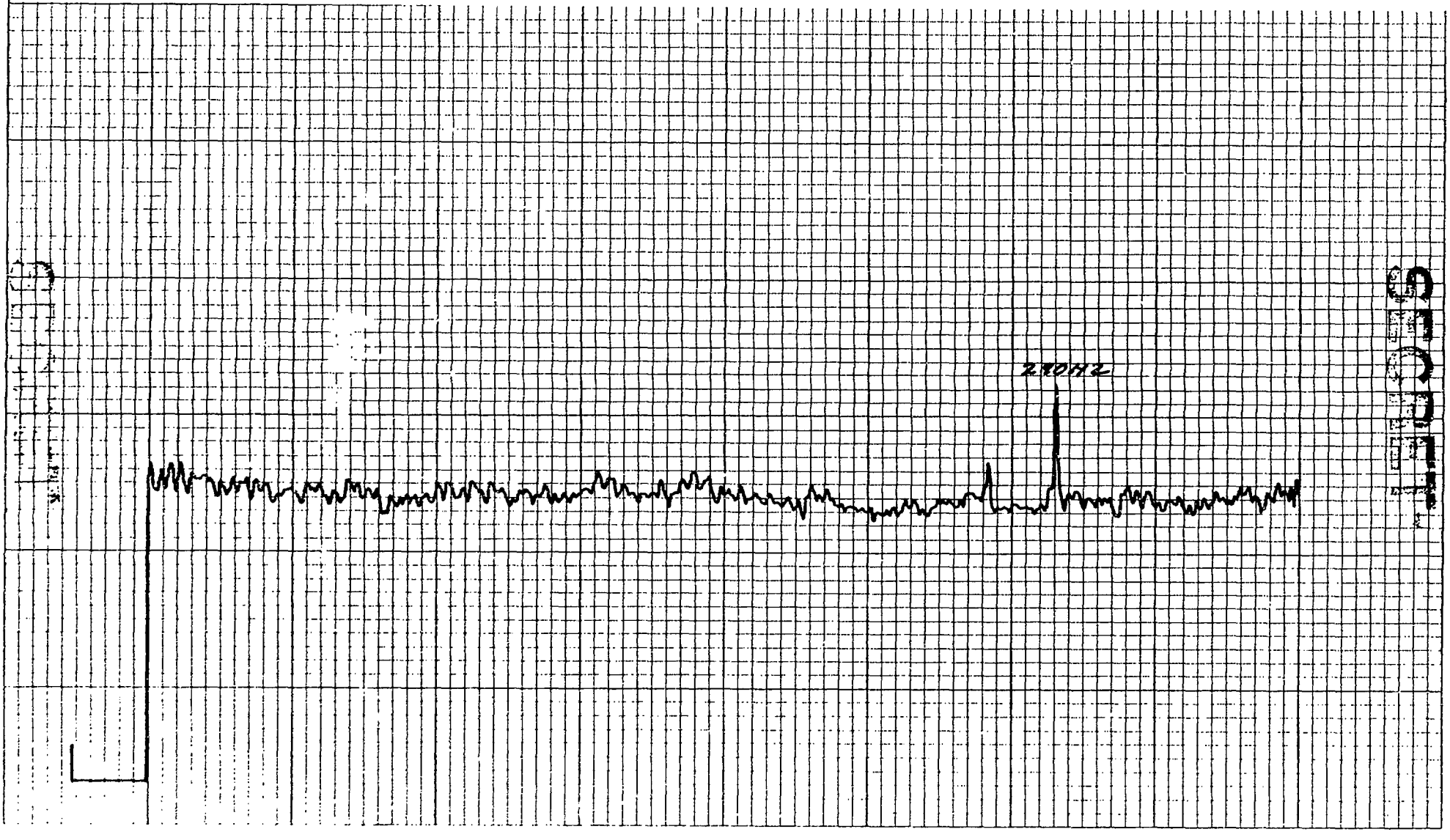
46 0703

CONTROL: 0935 - 32 (DF11)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 28-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77-0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+50 DEG. AZ STEERING

REEL: 422 INDEX 566

INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



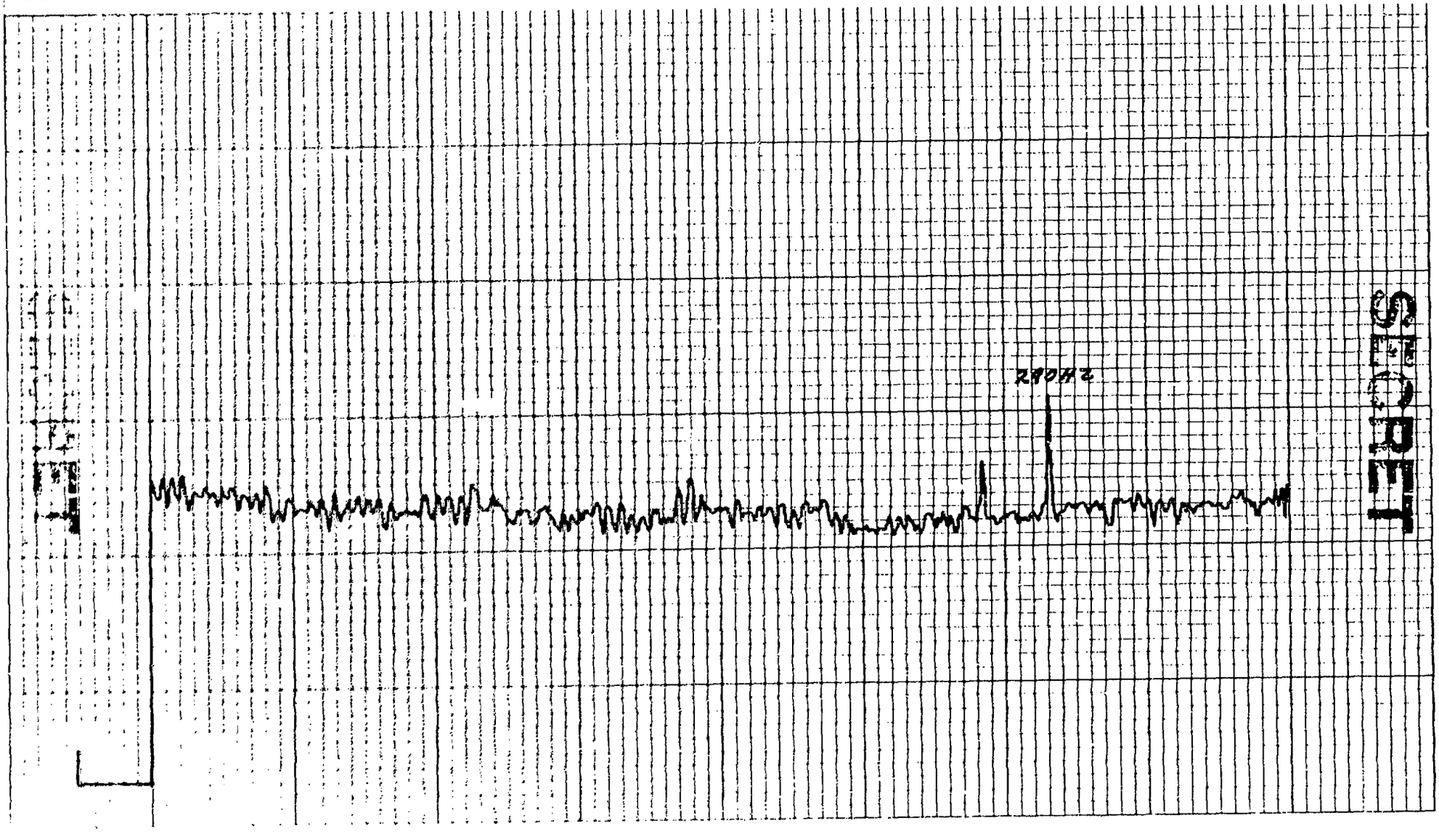
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 0935 - 32 (DP11)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+52 DEG. AZ STEERING

REEL: M22 INDEX 566

INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



K•E 10 X 10 TO THE INCH 5 X 10 INCHES

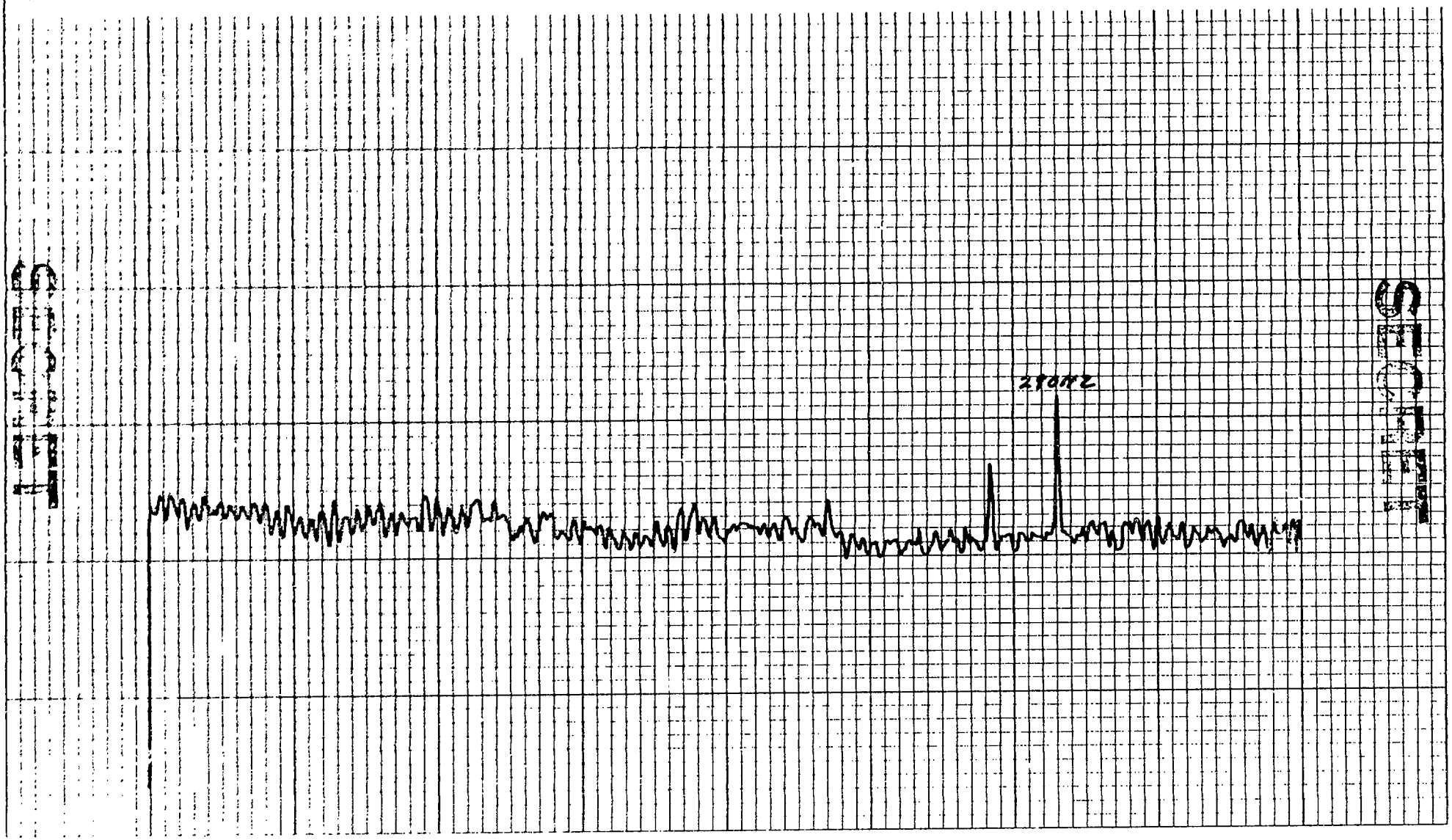
46 0703

CONTROL: 0935 - 32 (DOII)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: — — —
1-26 & 09-34)
DATE/TIME: 3-16-77 -0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+54 DEG. AZ STEERING

REEL: 1122 INDEX 566

INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



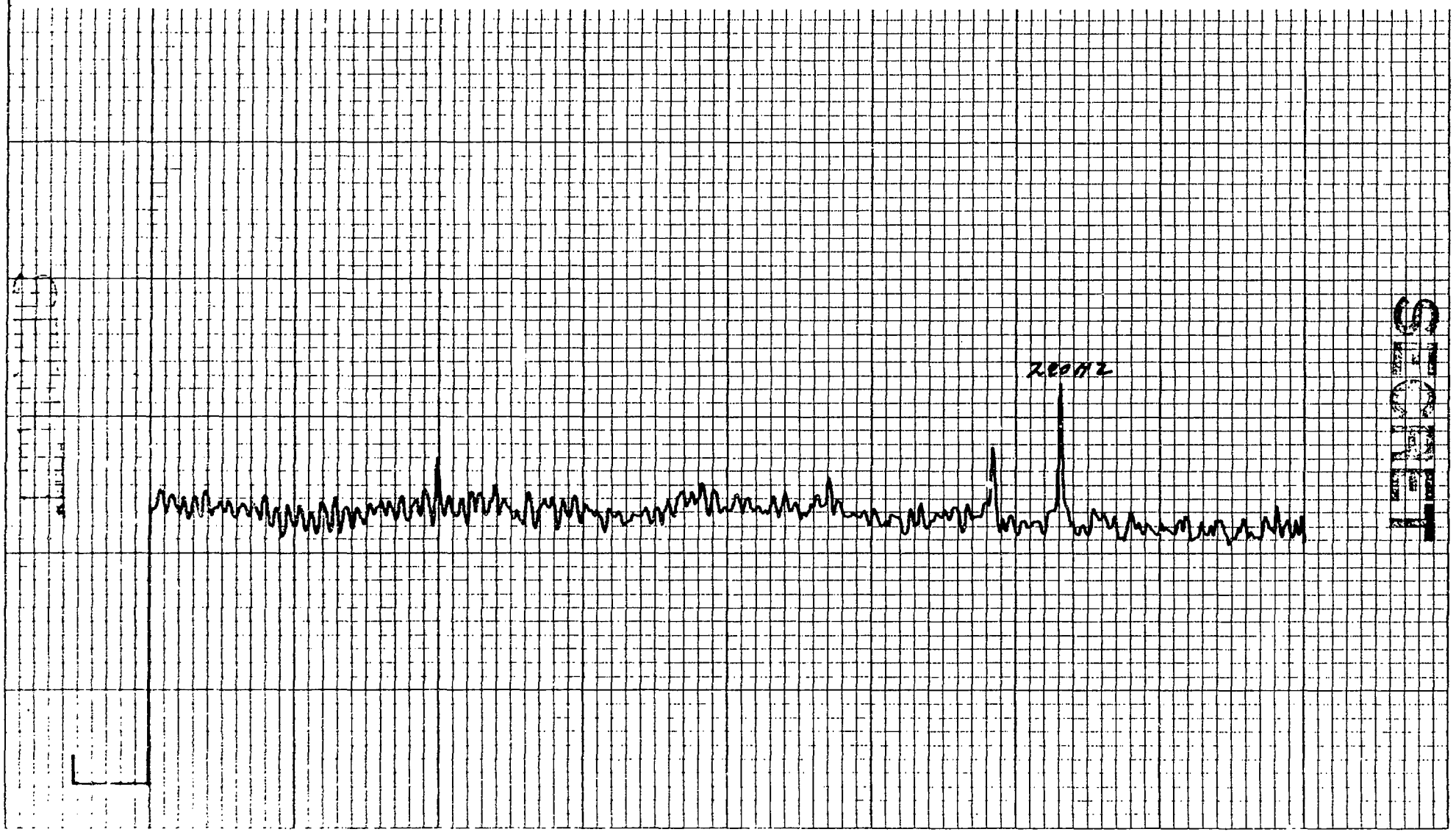
K·E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 0935 - 32 (D011)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
(1-26 & 02-34)
DATE/TIME: 3-16-77 - 0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+56 DEG. AZ STEERING

REEL: N22 INDEX 566

INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



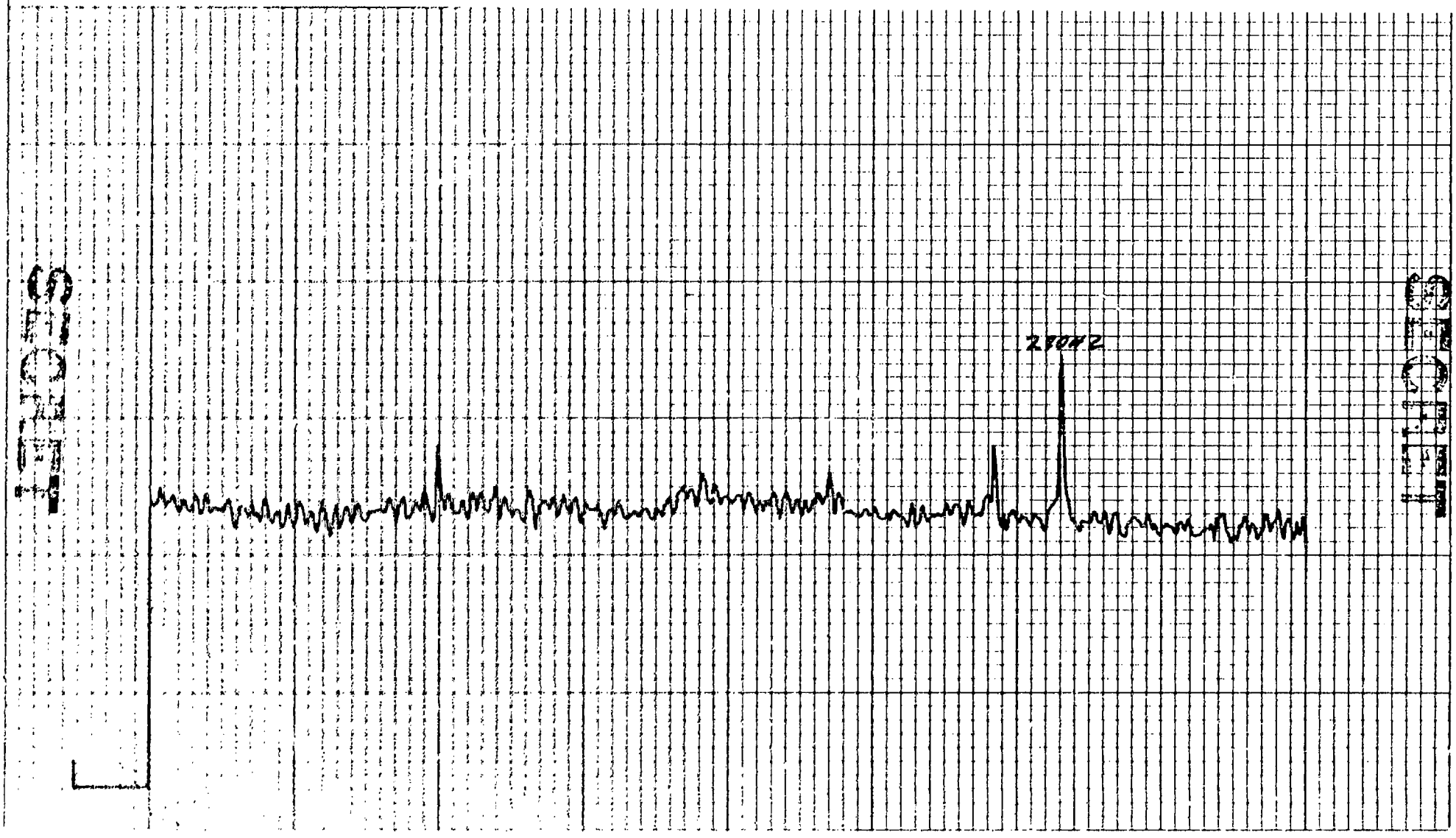
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 0935 - 32 (DP11)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 -0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+50 DEG. AZ STEERING

REEL: M22 INDEX 566

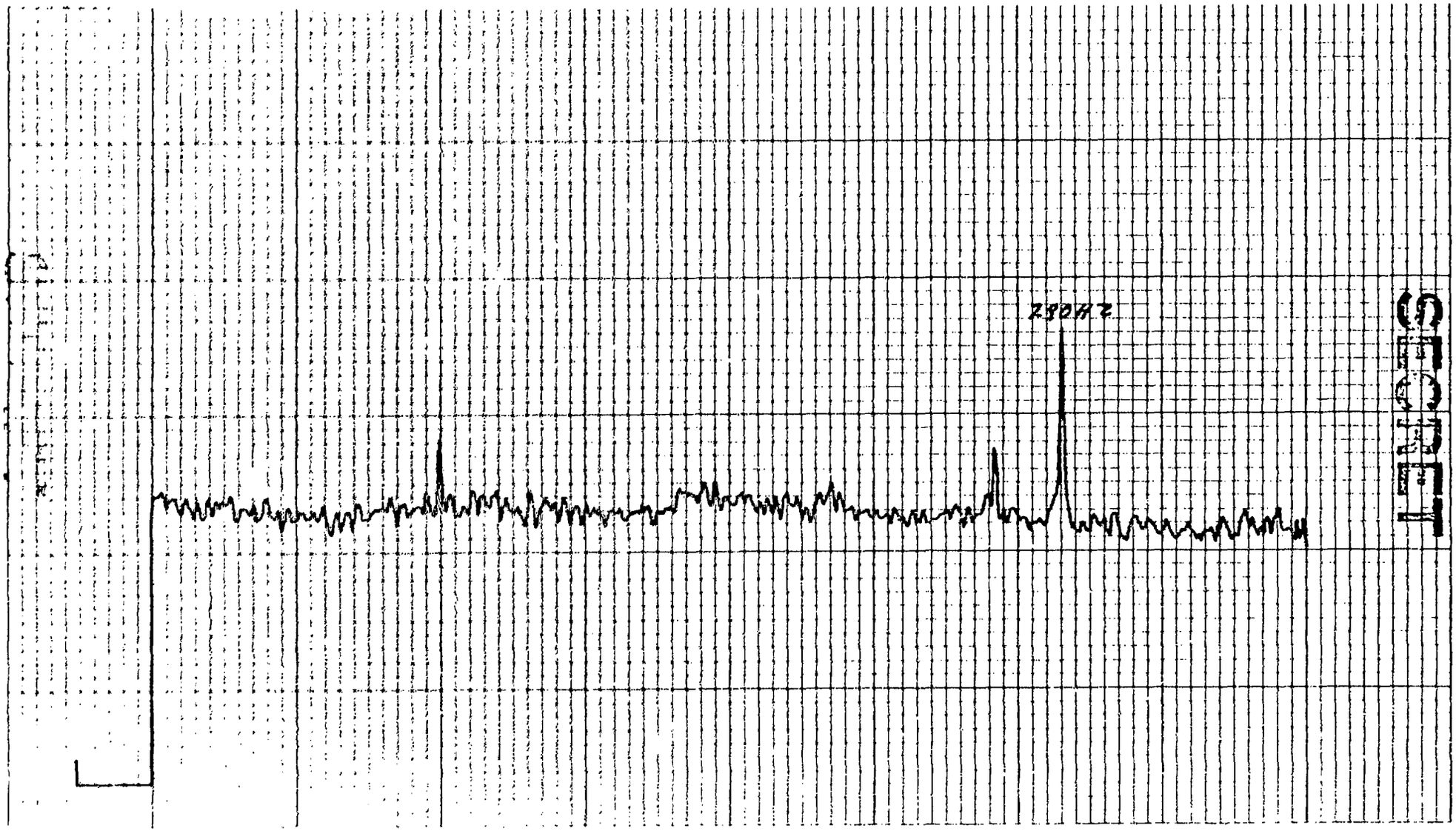
INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



CONTROL: 0934 - 32 (DP11)
BEAMFORMED SPECTRUM (ELEMENTS 1-26 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 3-16-77 -0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+59 DEG. AZ STEERING

REEL: M22 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: -21 DB
FILTER WTG: HANNING



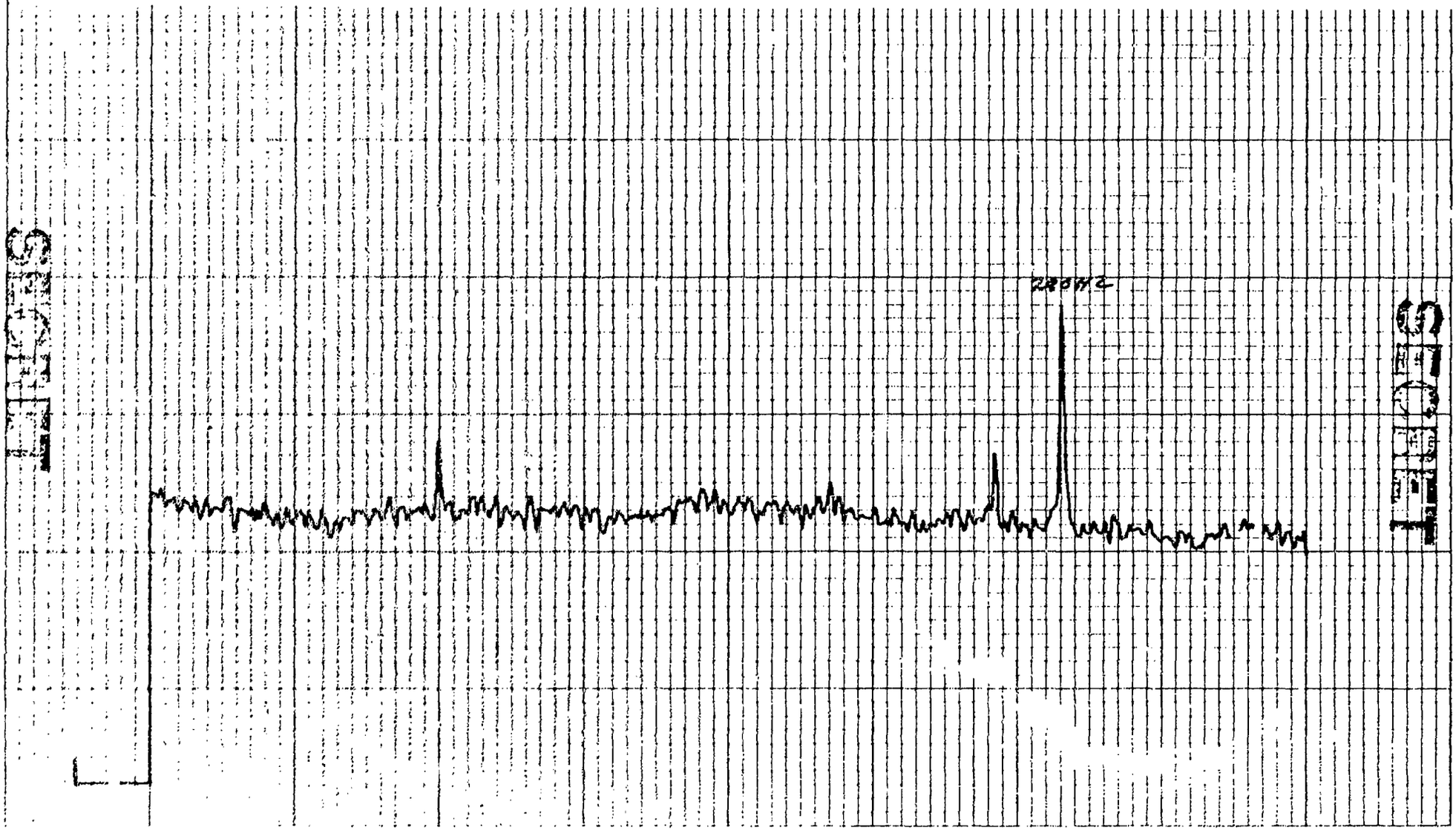
K+E 10 X 10 TO THE INCH

46 0703

CONTROL: 0935 - 32 (3011)
BEAMFORMED SPECTRUM (ELEMENTS 1-26 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 3-16-77 -0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+60 DEG. AZ STEERING

REEL: M22 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING

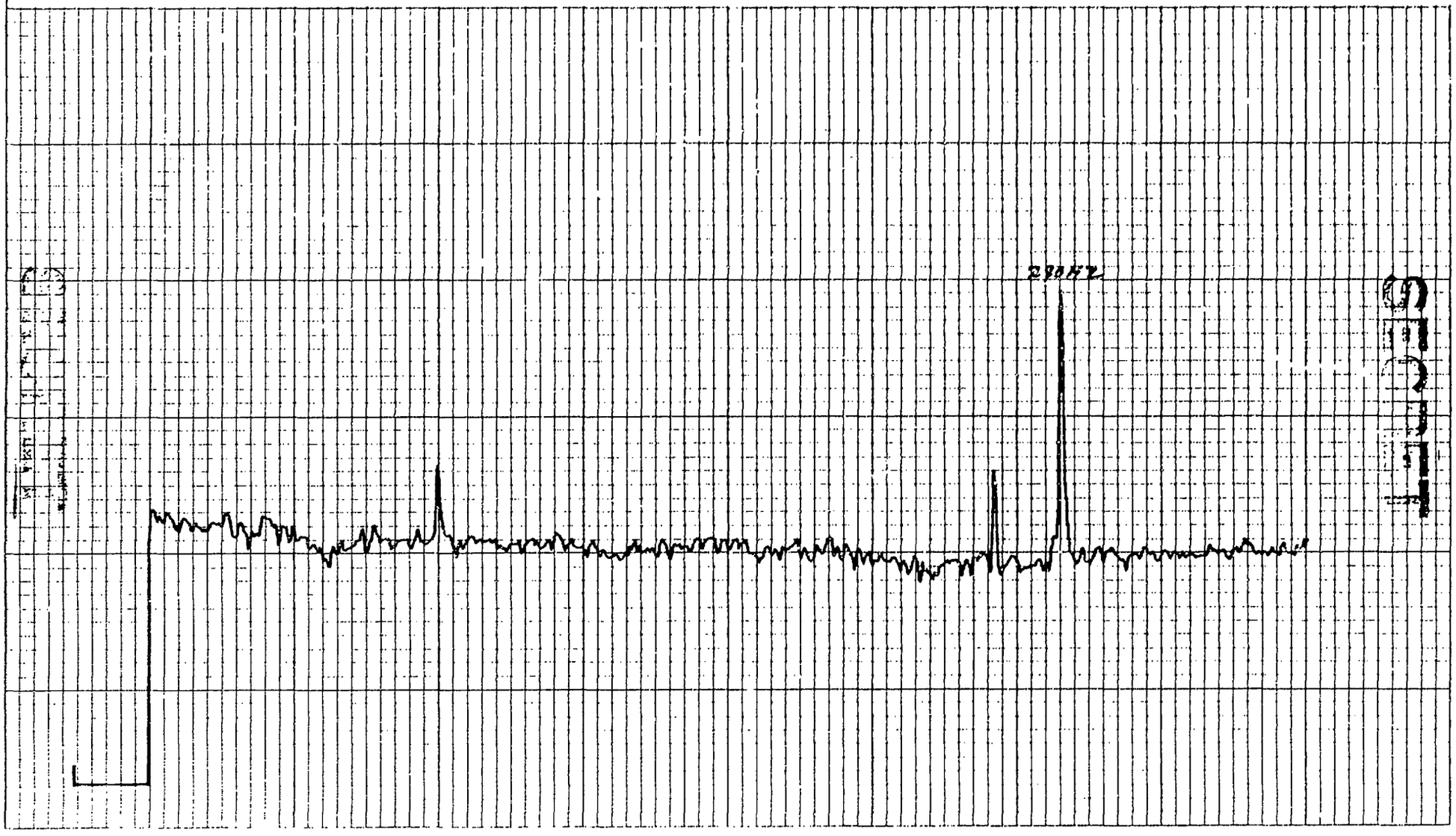


K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 0935 - 51 (DP11)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: __ ___ __
DATE/TIME: 3-16-77 -0933 Z
ANALYSIS BANDWIDTH: 1/10HZ
+63 DEG. AZ STEERING

REEL: M22 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: 24 DB
FILTER WTG: HANNING



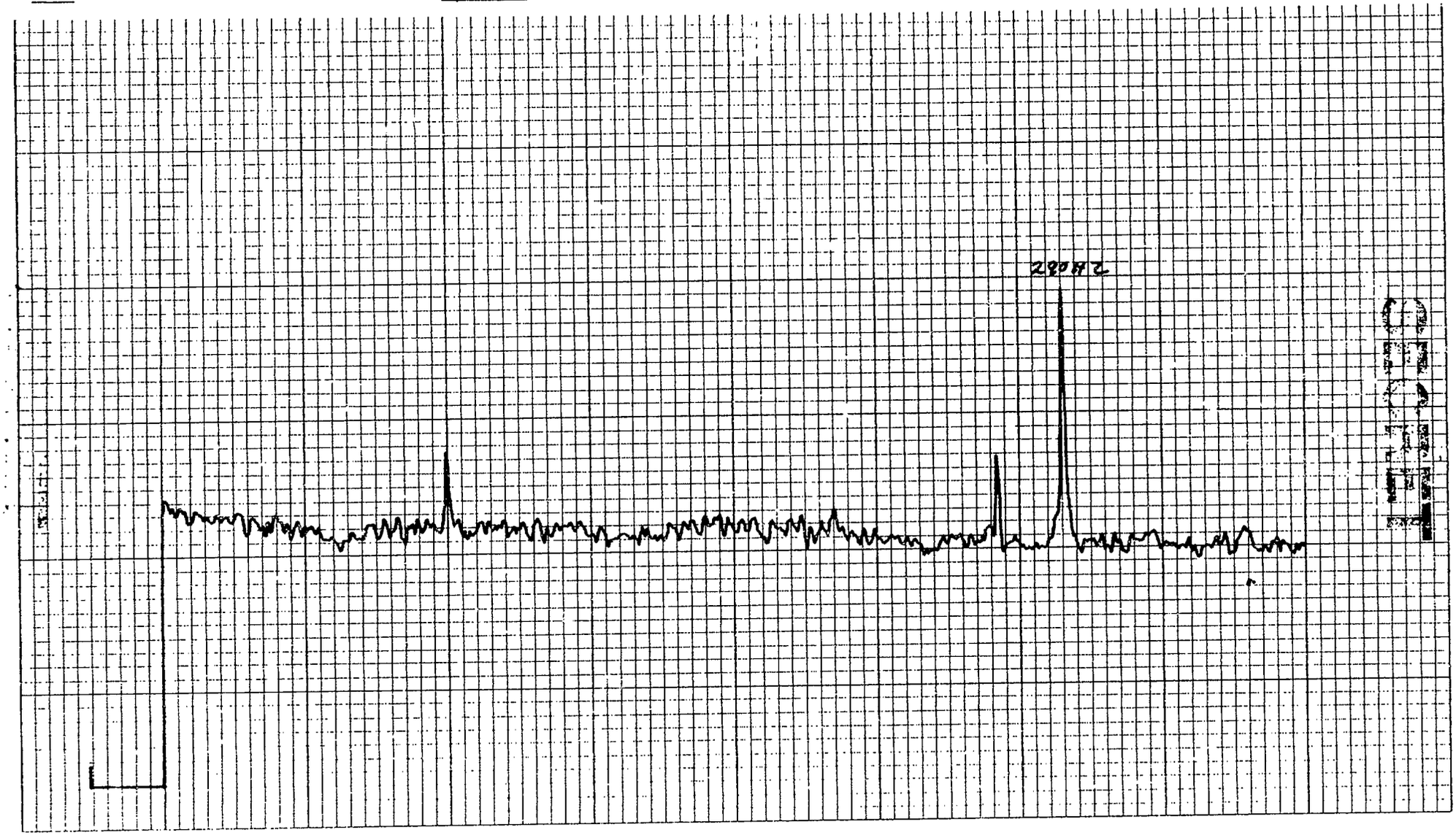
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 0935 - 32 (DP11)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: — — —
(1-26 & 28-34)
DATE/TIME: 3-16-77 -0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+62 DEG. AZ STEERIN

REEL: M22 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

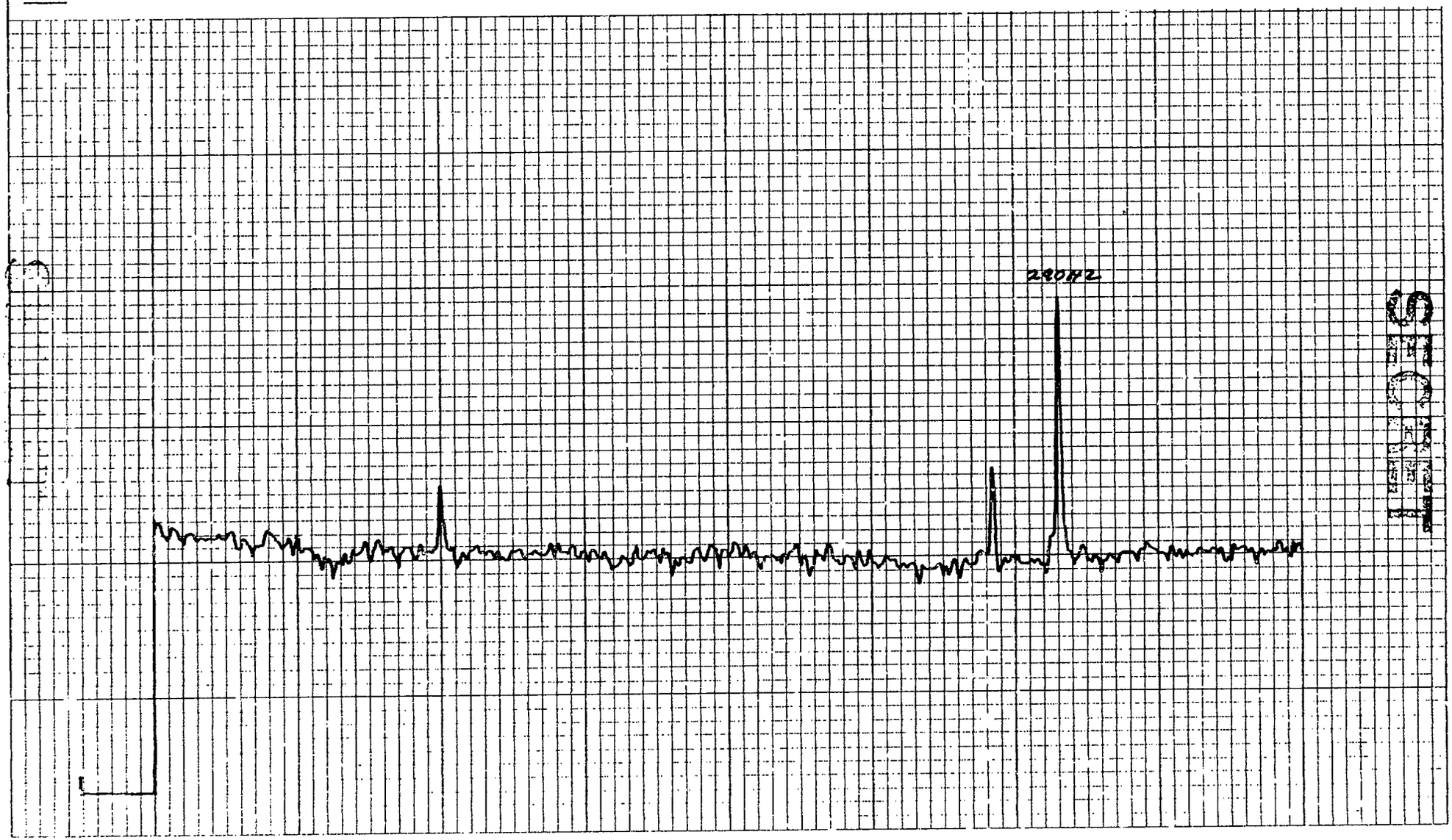
46 0703

CONTROL: 0835 - 32 (DP4)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: — — —
(1-26 & 28-34)
DATE/TIME: 3-16-77 - 0835 Z
ANALYSIS BANDWIDTH: 1/10HZ
+64 DEG. AZ STEERING

REEL: M22 INDEX 566

INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



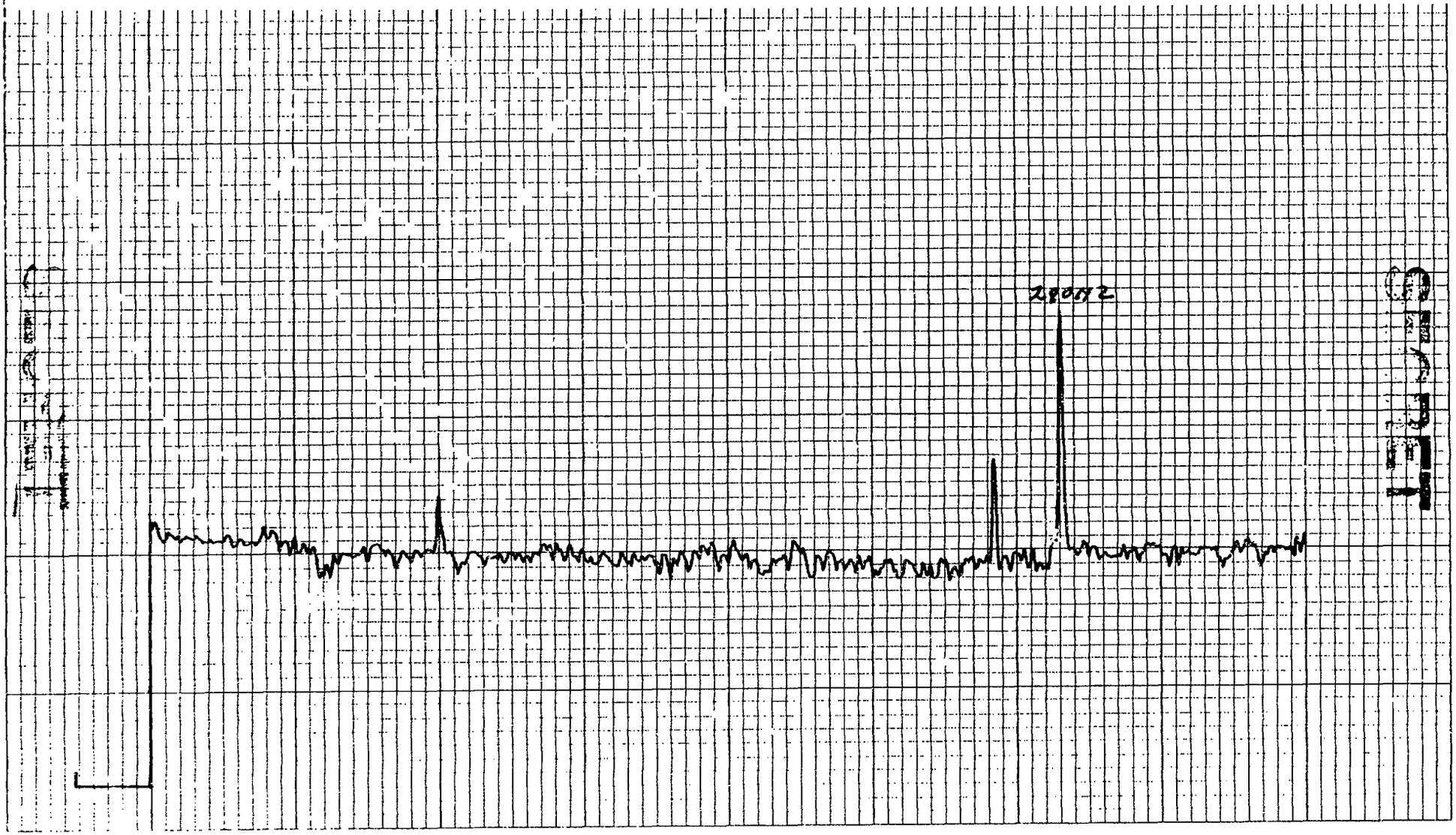
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 0935 - 32 (DD11)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
1-26 & 38-35)
DATE/TIME: 3-16-79 -0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+16 DEG. AZ STEERING

REEL: 422 INDEX 565

INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



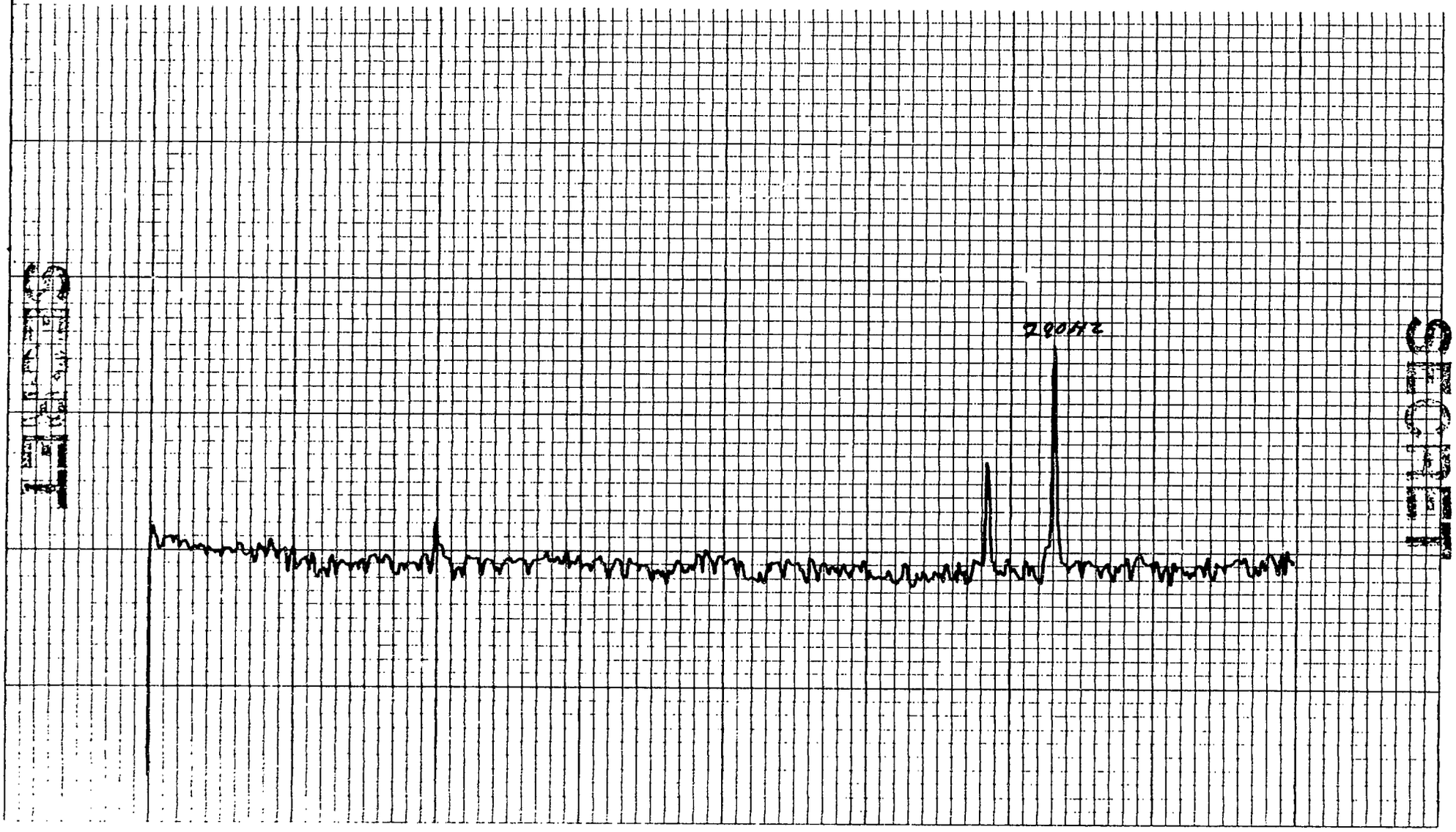
K·E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 0935 - 32 (DP11)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: — — —
(1-26 & 29)
DATE/TIME: 3-16 79 -0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+60 DEG. AZ STEERING

REEL: 122 INDEX 566

INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



CONFIDENTIAL

SIGNAL LEVEL AND SNR

CALCULATIONS

DATA POINT 11 FREQUENCY 140 HZ NUMBER OF ELEMENTS 51

SIGNAL LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-30.4	
MCPS-32 CAL. CORRECTION	+10	-20.4	
BEAMFORMER GAIN	+24	+3.6	SIG. LEVEL FOR SNR CALCULATION
MRA CORRECTION	+ .2	+3.8	SIG. LEVEL FOR SIGNAL GAIN

NOISE LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-57.6	
MCPS-32 CAL. CORRECTION	+10	-47.6	
BEAMFORMER GAIN	+24	-23.6	NOISE LEVEL FOR SNR CALCULATION

SIGNAL-NOISE-RATIO

SIGNAL LEVEL FOR SNR		+3.6	
SIGNAL LEVEL FOR SNR	-23.6	27.2	
PROCESSOR CORRECTION	-4.0	23.2	
MRA CORRECTION	+ .2	23.4	SNR 1/10 HZ BAND
BANDWIDTH CONVERSION	-8.2	15.2	SNR 1 HZ BAND

CONFIDENTIAL

SIGNAL LEVEL AND SNR

CALCULATIONS

DATA POINT 11 FREQUENCY 290 HZ NUMBER OF ELEMENTS 51

SIGNAL LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-42.4	
MCPS-32 CAL. CORRECTION	+10	-32.4	
BEAMFORMER GAIN	+24	-8.4	SIG. LEVEL FOR SNR CALCULATION
MRA CORRECTION	+ .8	-7.6	SIG. LEVEL FOR SIGNAL GAIN

NOISE LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-66.1	
MCPS-32 CAL. CORRECTION	+10	-56.1	
BEAMFORMER GAIN	+24	-32.1	NOISE LEVEL FOR SNR CALCULATION

SIGNAL-NOISE-RATIO

SIGNAL LEVEL FOR SNR		-8.4	
SIGNAL LEVEL FOR SNR	-32.1	23.7	
PROCESSOR CORRECTION	-4.0	19.7	
MRA CORRECTION	+ .8	20.5	SNR 1/10 HZ BAND
BANDWIDTH CONVERSION	-8.2	12.3	SNR 1 HZ BAND

CONFIDENTIAL

DATA POINT 11

SIGNAL GAIN

	140 HZ	290HZ	295HZ
MEAN OMNI SIGNAL LEVEL	-29.8	-41.4	
MRA SIGNAL LEVEL	+ 3.8	- 7.6	
ARRAY SIGNAL GAIN	33.6	33.8	
20 LOG 51 (# of elements)	34.1	34.1	
DIFFERENCE	- .5	- .3	

ARRAY GAIN

MRA SNR	23.4	20.5	
MEAN OMNI SNR	16.2	8.4	
ARRAY GAIN	7.2	12.1	
THEORETICAL AZMUTH GAIN (at MRA)	12.4	14.8	
DIFFERENCE	-5.2	-2.7	

10 X 10 TO THE INCH • 10 INCHES
KEUFFEL & ESSER CO

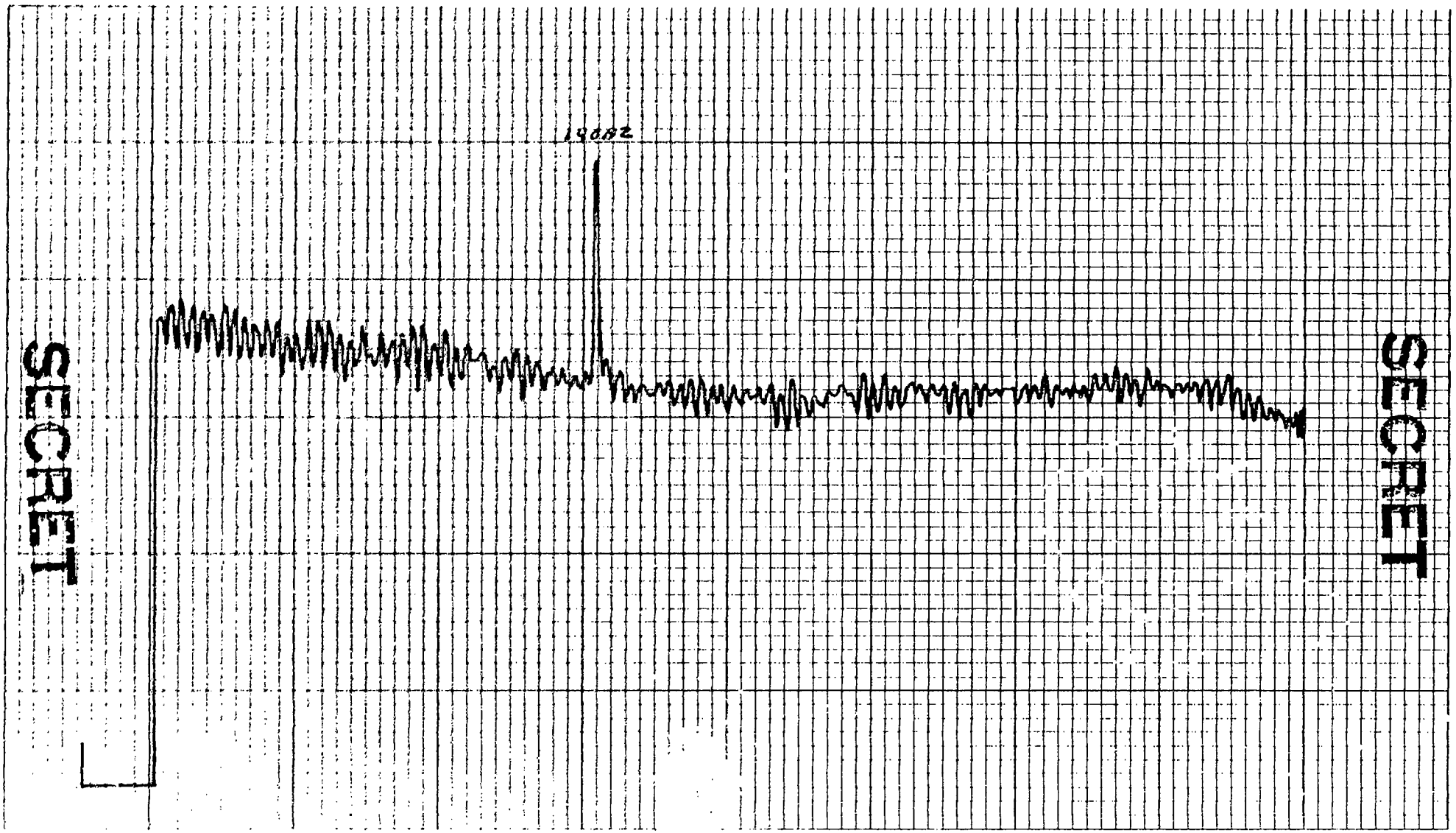
46 0703

CONTROL: 0935 - 51 (DP11)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
51 ELEMENTS

DATE OF ANALYSIS: - - -
1-26 & 29-53)
DATE/TIME: 3-16-77 -0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+52 DEG. AZ STEERING

REEL: N22 INDEX 566

INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING

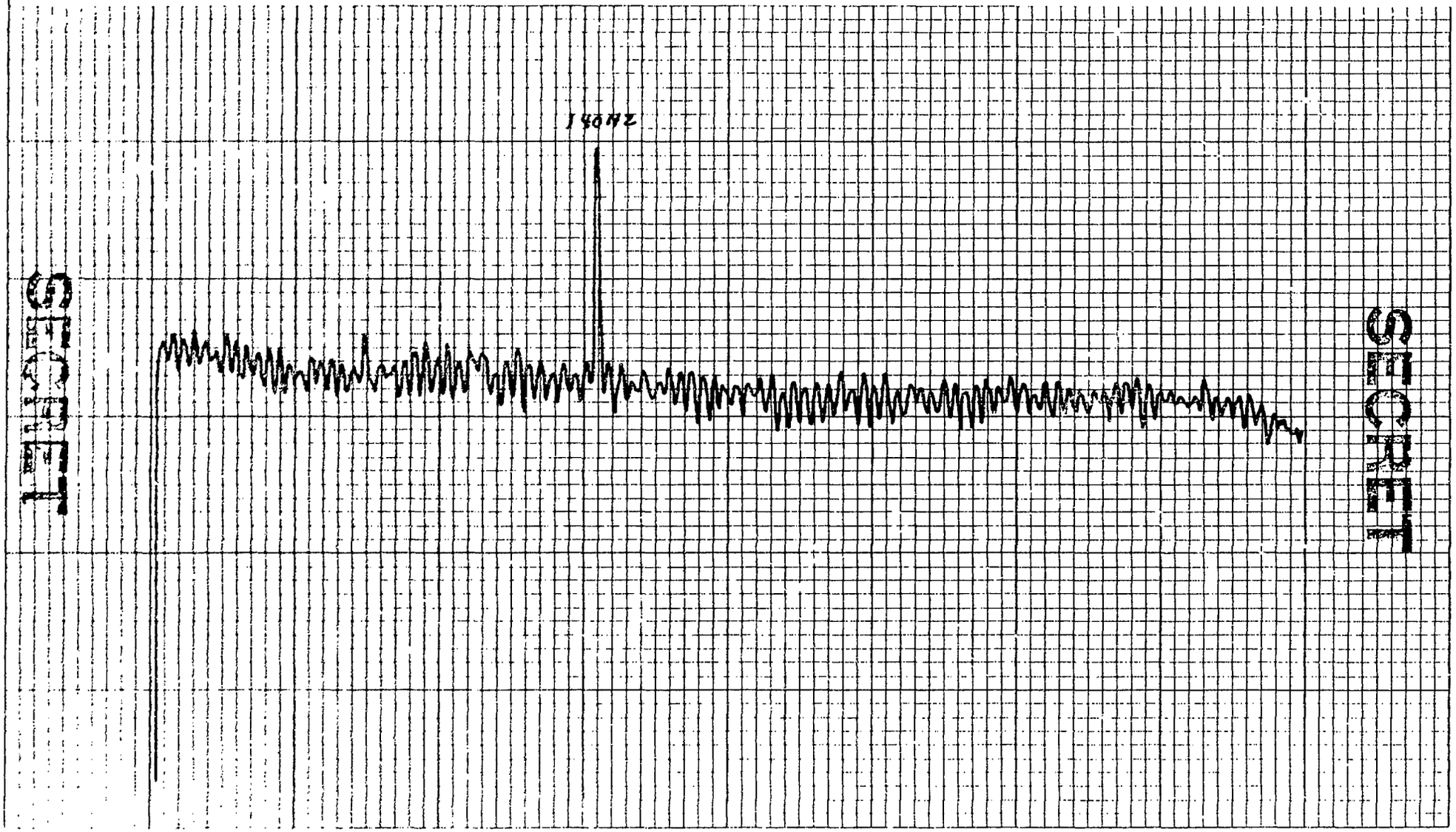


K·E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 0935 - 51 (DP11)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 89-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
51 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 3-16-77 -0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+54 DEG. AZ STEERING

REEL: H22 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

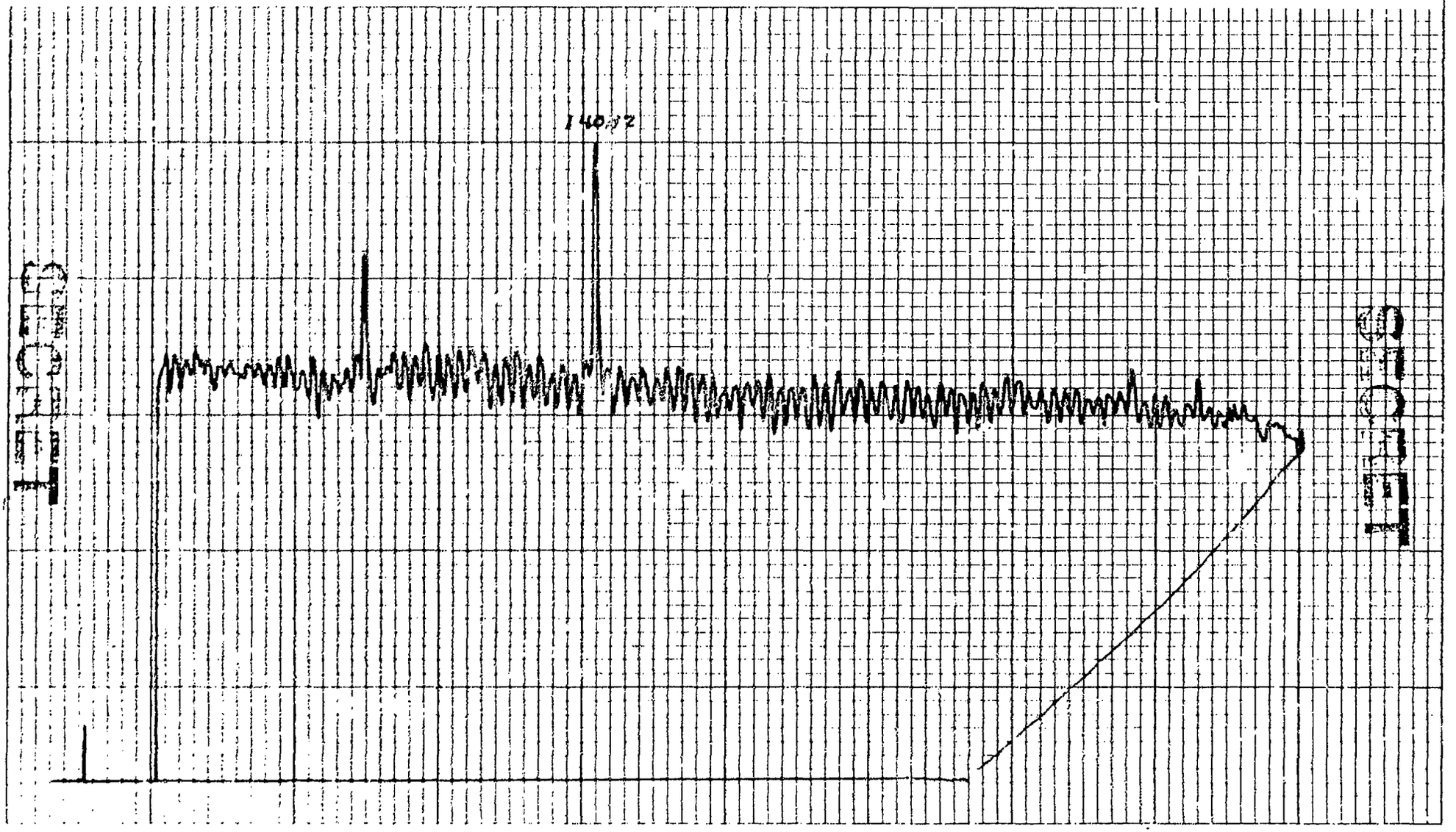
46 0703

CONTROL: 0935 - 51 (DP11)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
51 ELEMENTS

DATE OF ANALYSIS: - - -
1-26 & 09-53)
DATE/TIME: 3-16-77 - 0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+56 DEG. AZ STEERING

REEL: M22 INDEX 566

INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



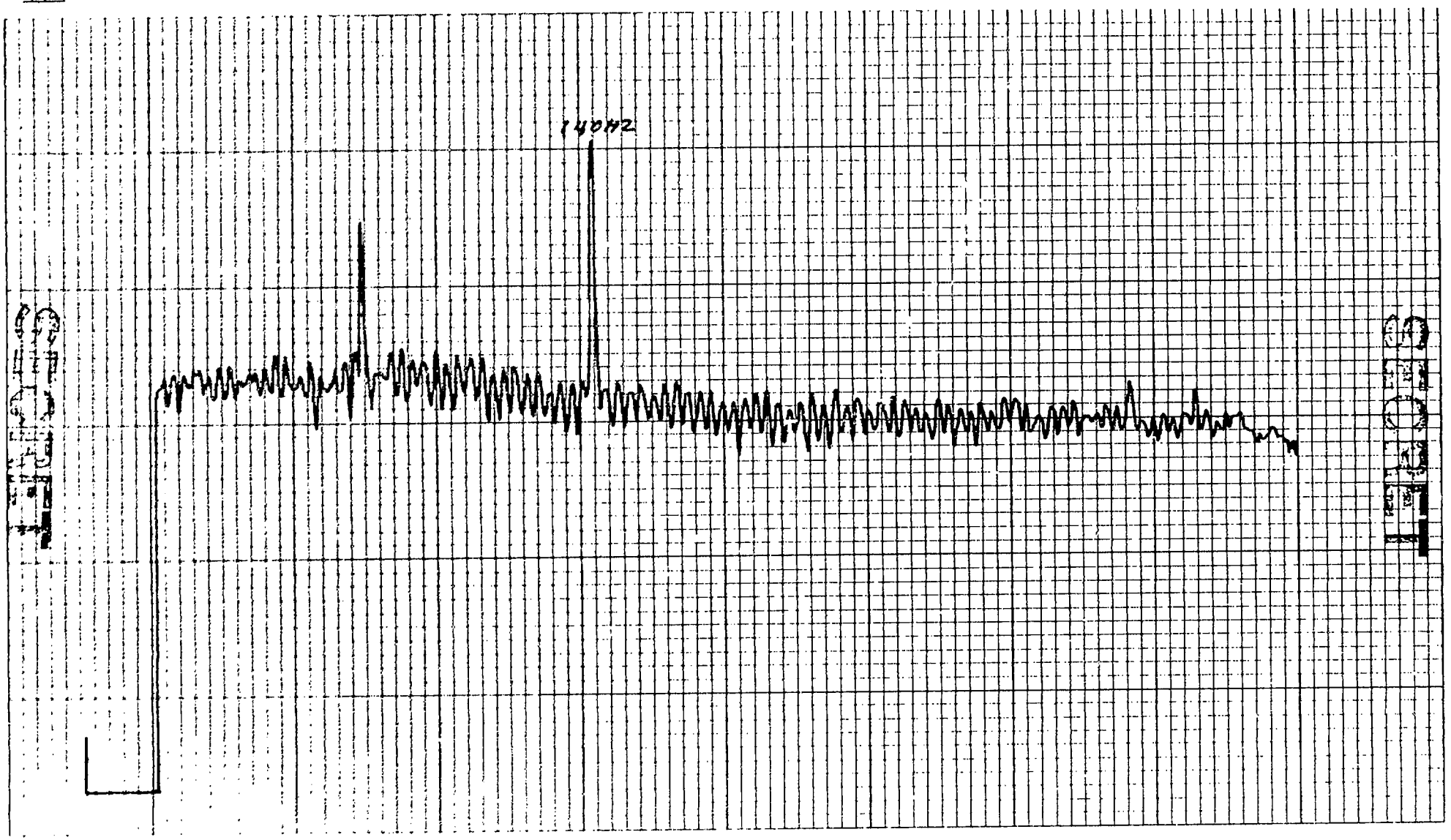
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 0935 - 51 (BA11)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
51 ELEMENTS

DATE OF ANALYSIS: — — —
1-26 & 29-53
DATE/TIME: 346-77 -0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+50 DEG. AZ STEERING

REEL: M 2 INDEX 561

INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



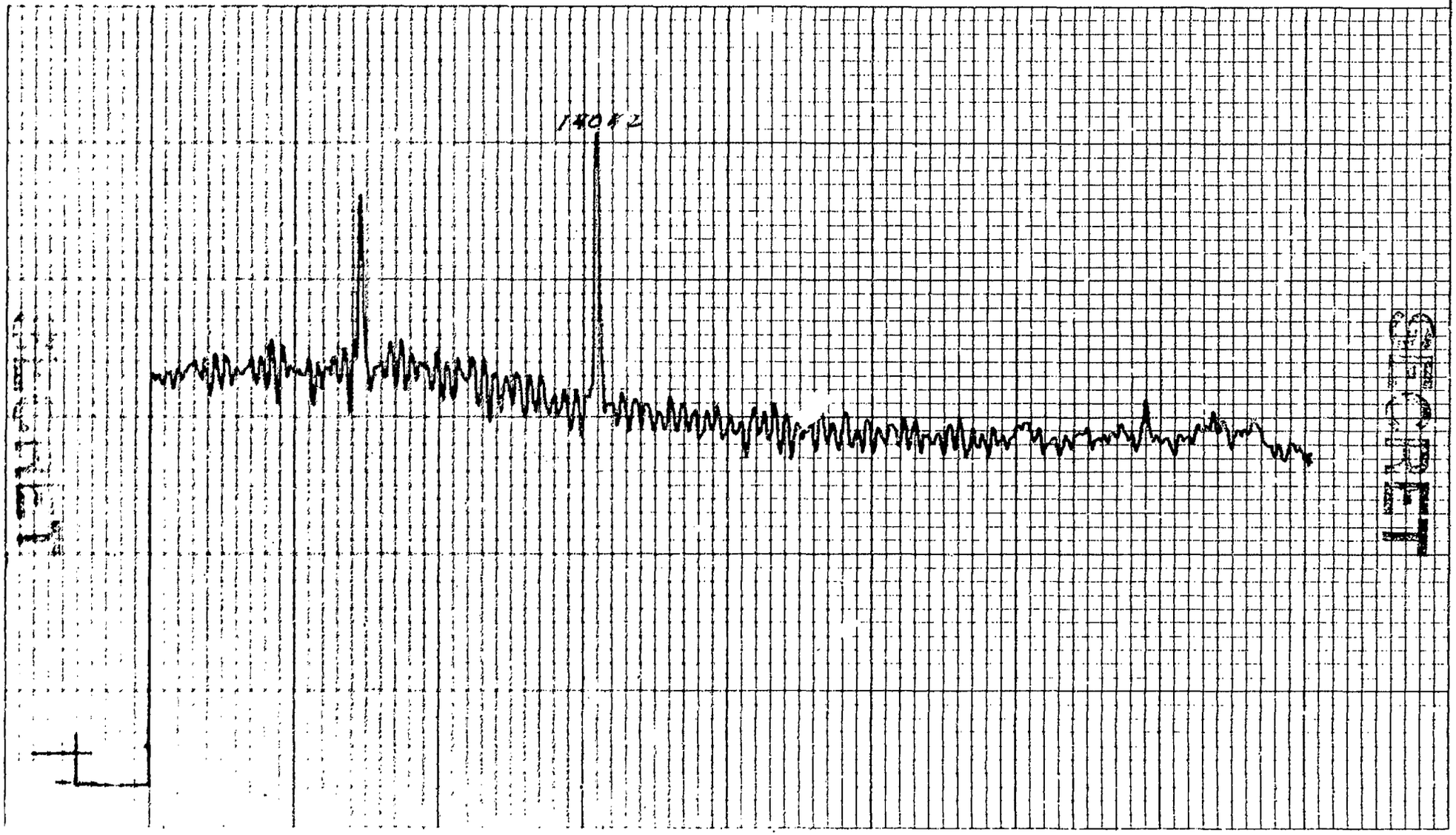
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

CONTROL: 0935 - 51 (DP11)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 28-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
51 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 3-16-77 -0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+60 DEG. AZ STEERING

REEL: H22 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING

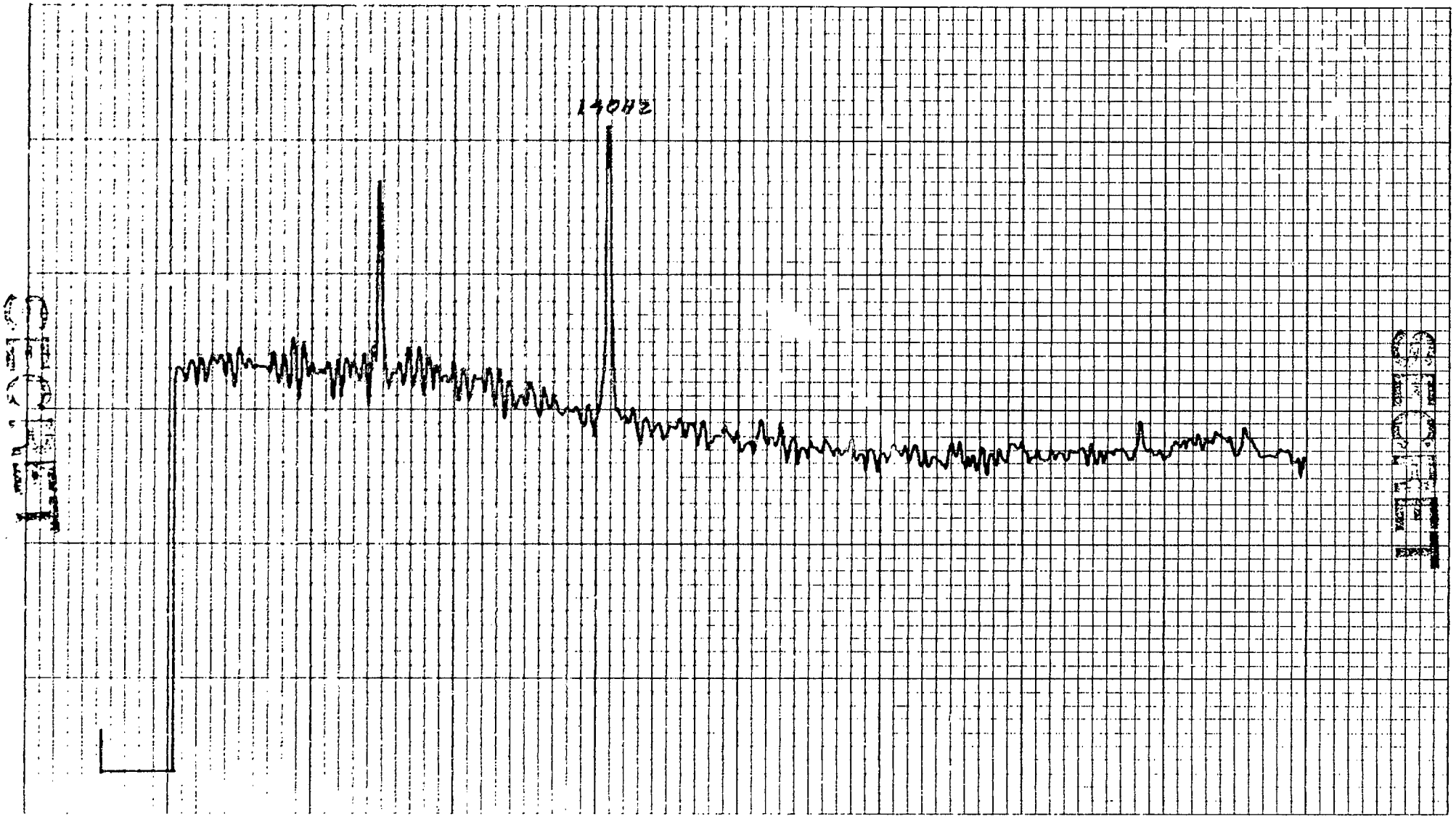


K&E 10 X 10 TO THE INCH

CONTROL: 0935 - 51 (DFII)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
51 ELEMENTS

DATE OF ANALYSIS: __ ___ __
DATE/TIME: 3-16-77 -0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+62 DEG. AZ STEERING

REEL: M22 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: 24 DB
FILTER WTG: HANNING



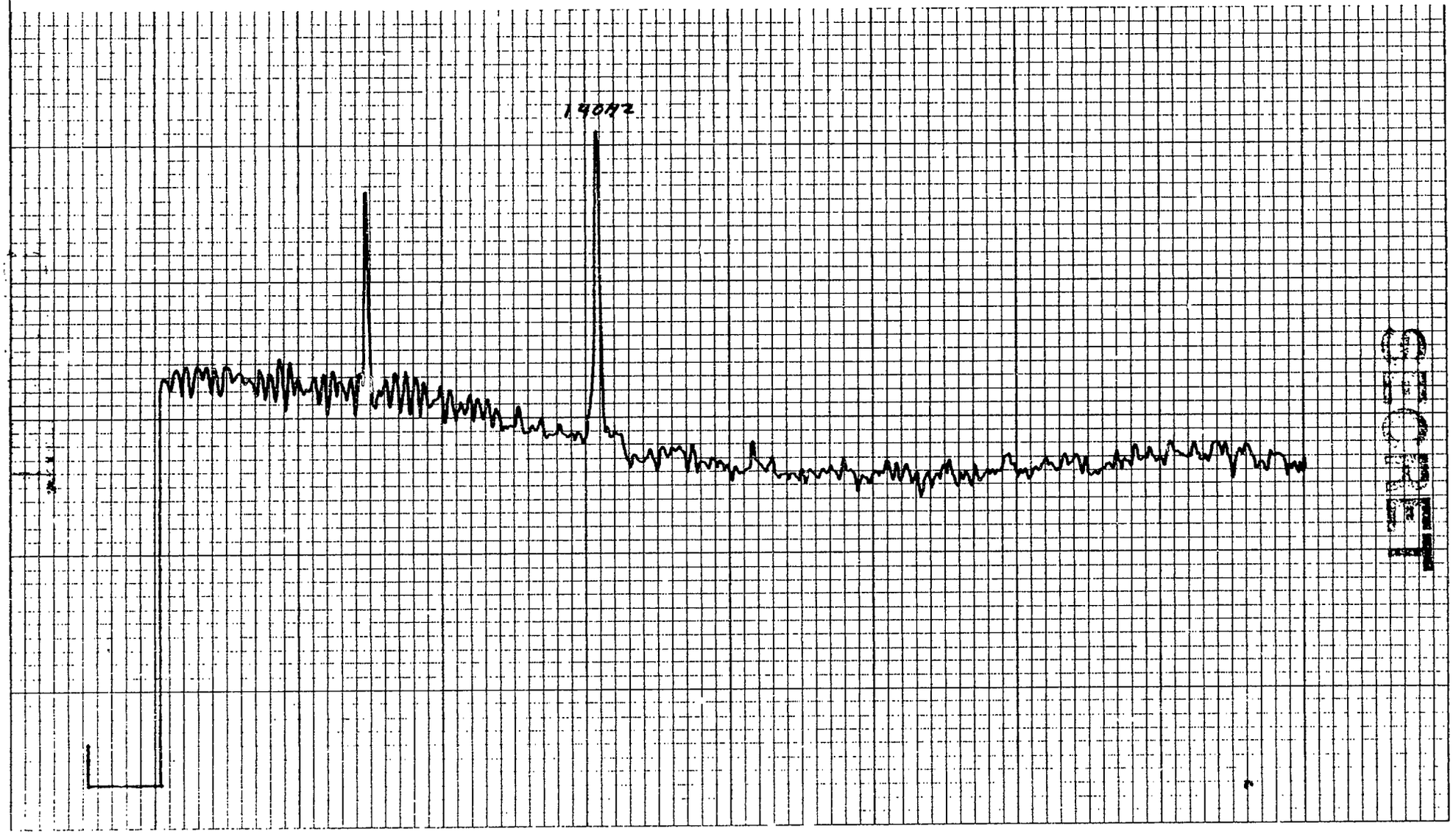
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 0935 - 51 (DP1/)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
51 ELEMENTS

DATE OF ANALYSIS: ~ - - -
1-26 & 29-53)
DATE/TIME: 3-16-77 -0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+64 DEG. AZ STEERING

REEL: M22 INDEX 566

INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING

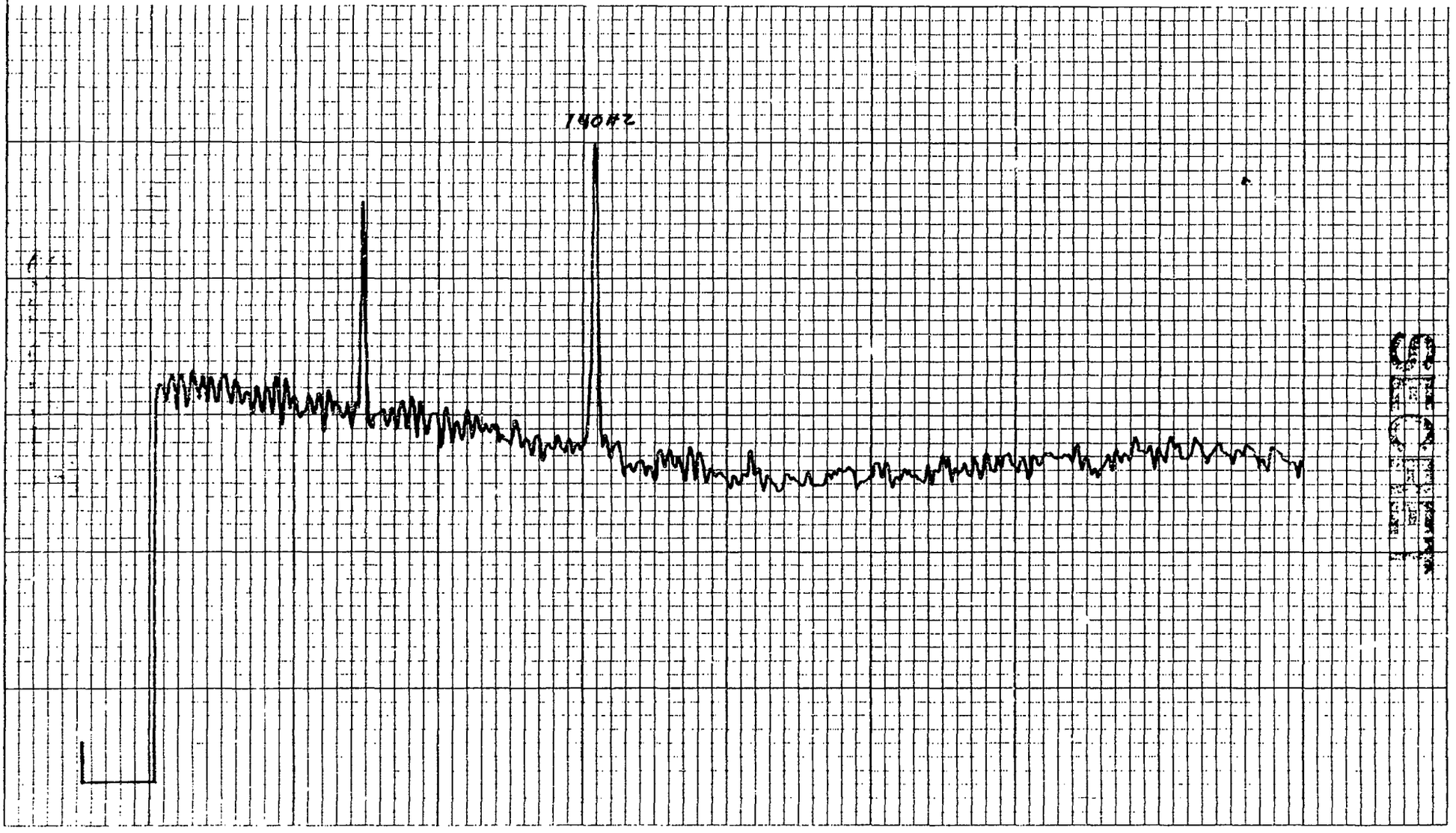


K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 0935 - 51 (DP11)
BEAMFORMER SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
51 ELEMENTS

DATE OF ANALYSIS: — — —
1-26 & 09-53)
DATE/TIME: 3-16-77 -0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+66 DEG. AZ STEERING

REEL: H22 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING

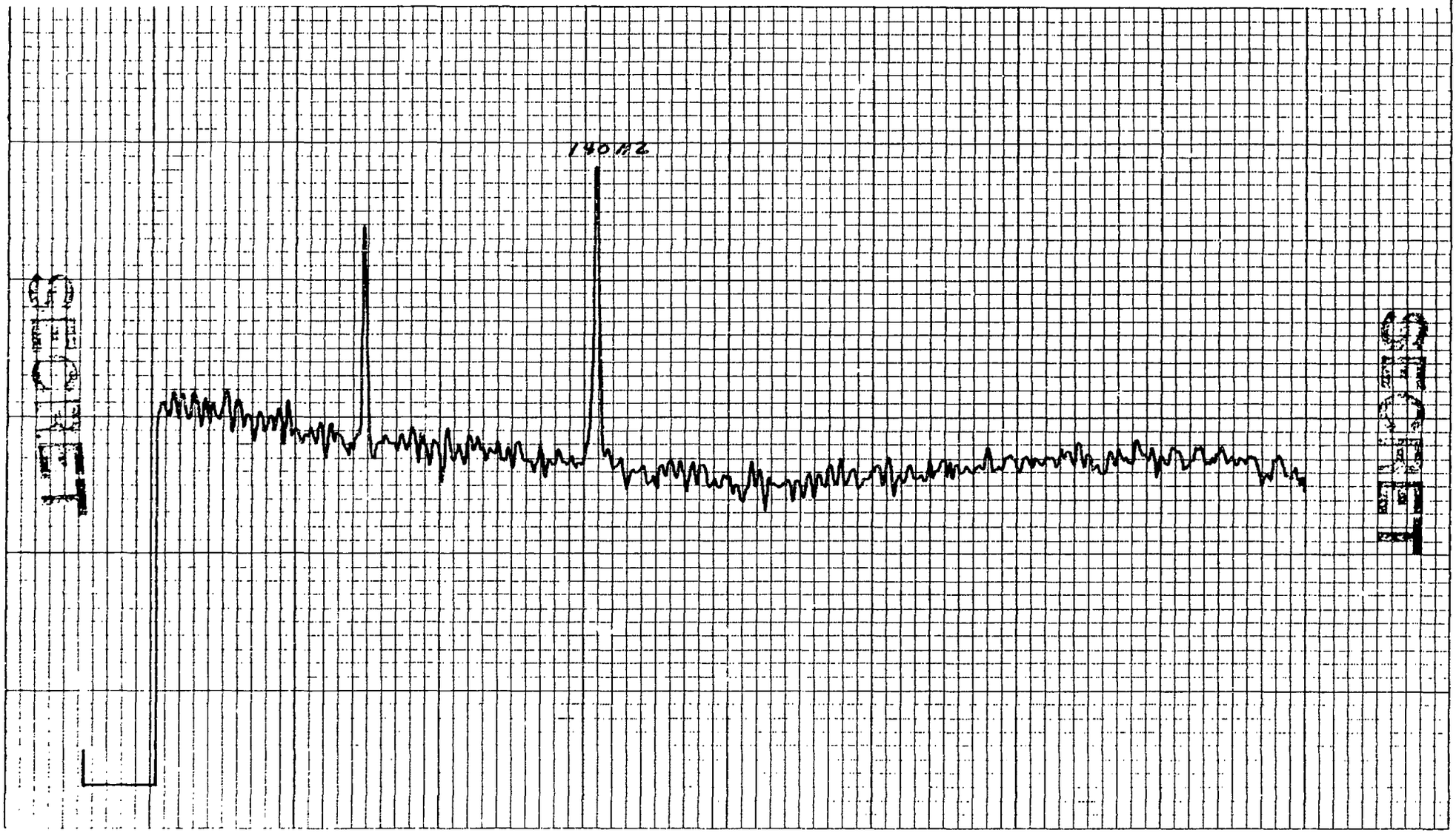


K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 0935 - 51 (DP11)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
53 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 0935Z
ANALYSIS BANDWIDTH: 1/10HZ
+68 DEG. AZ STEERING

REEL: 422 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



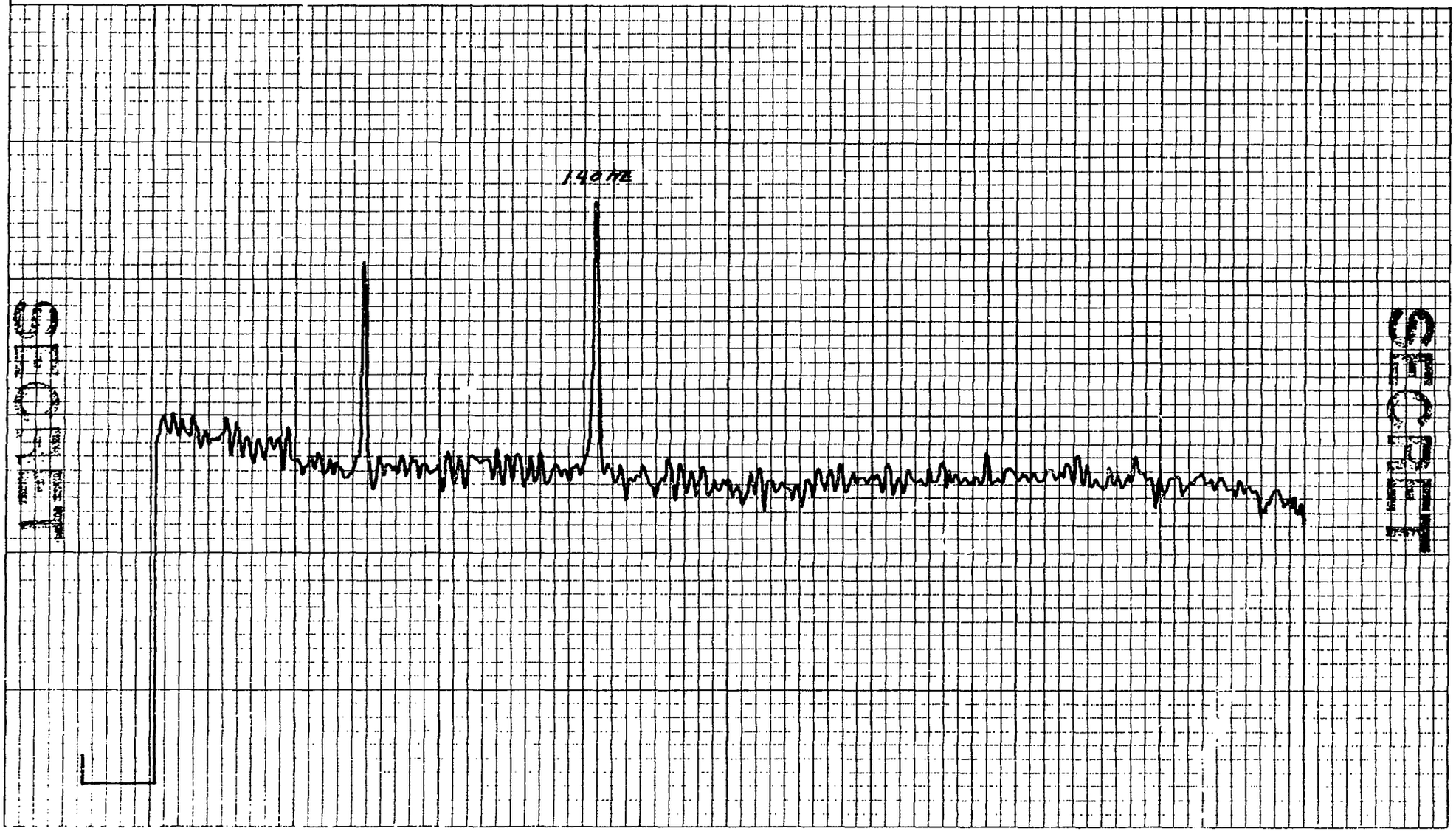
K+E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 0935 - 51 (DD11)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 28-53)
EXERCISE: BEARING STAKE
CENTER FREQ 150 HZ
51 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 3-16-77 -0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+70 DEG. AZ STEERING

REEL: M22 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



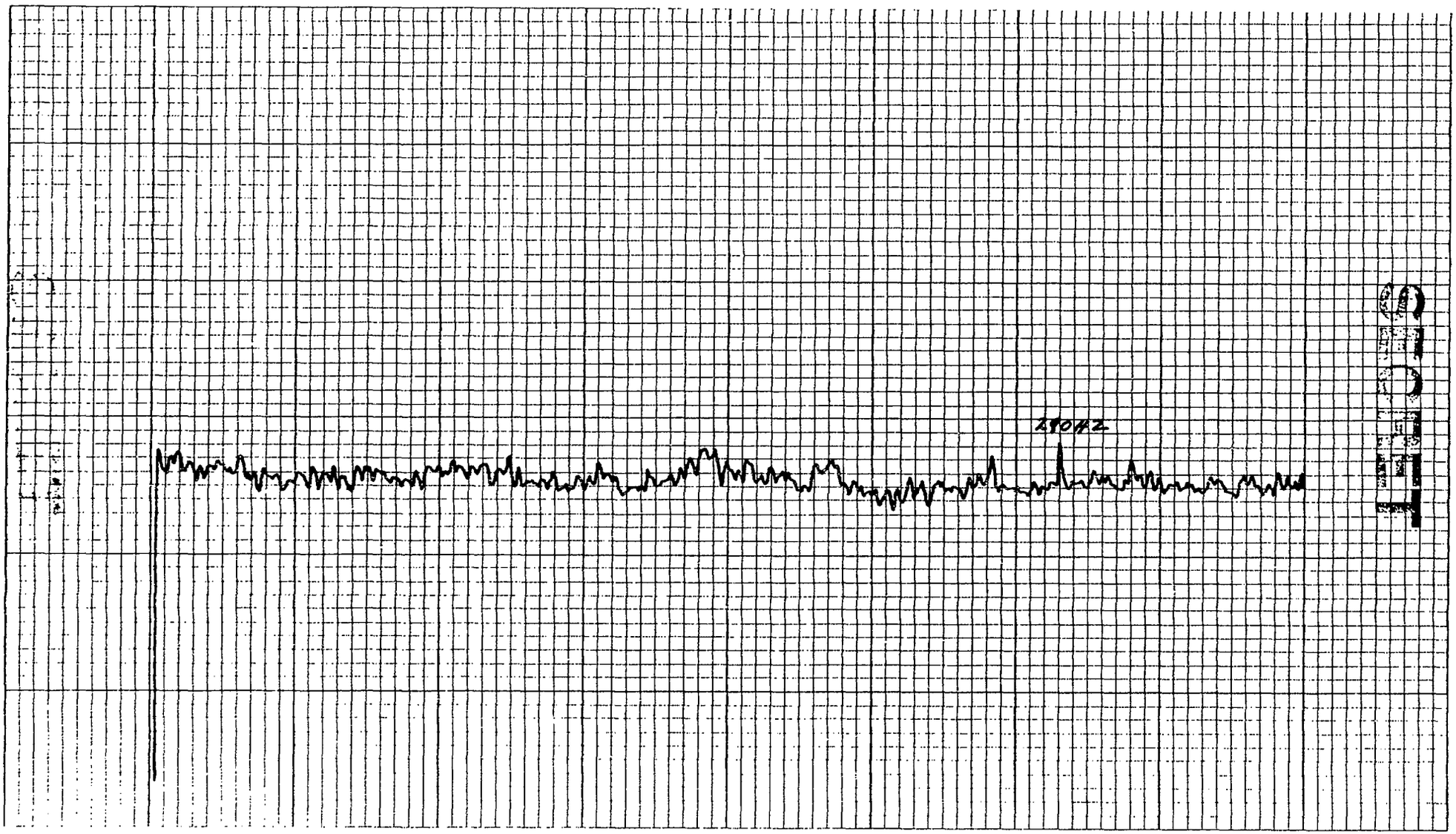
K•E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 0935 - 51 (DPII)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
51 ELEMENTS

DATE OF ANALYSIS: — - -
1-26 & 29-53)
DATE/TIME: 3-16-77-0935Z
ANALYSIS BANDWIDTH: 1/10HZ
+52 DEG. AZ STEERING

REEL: A22 INDEX 516
INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



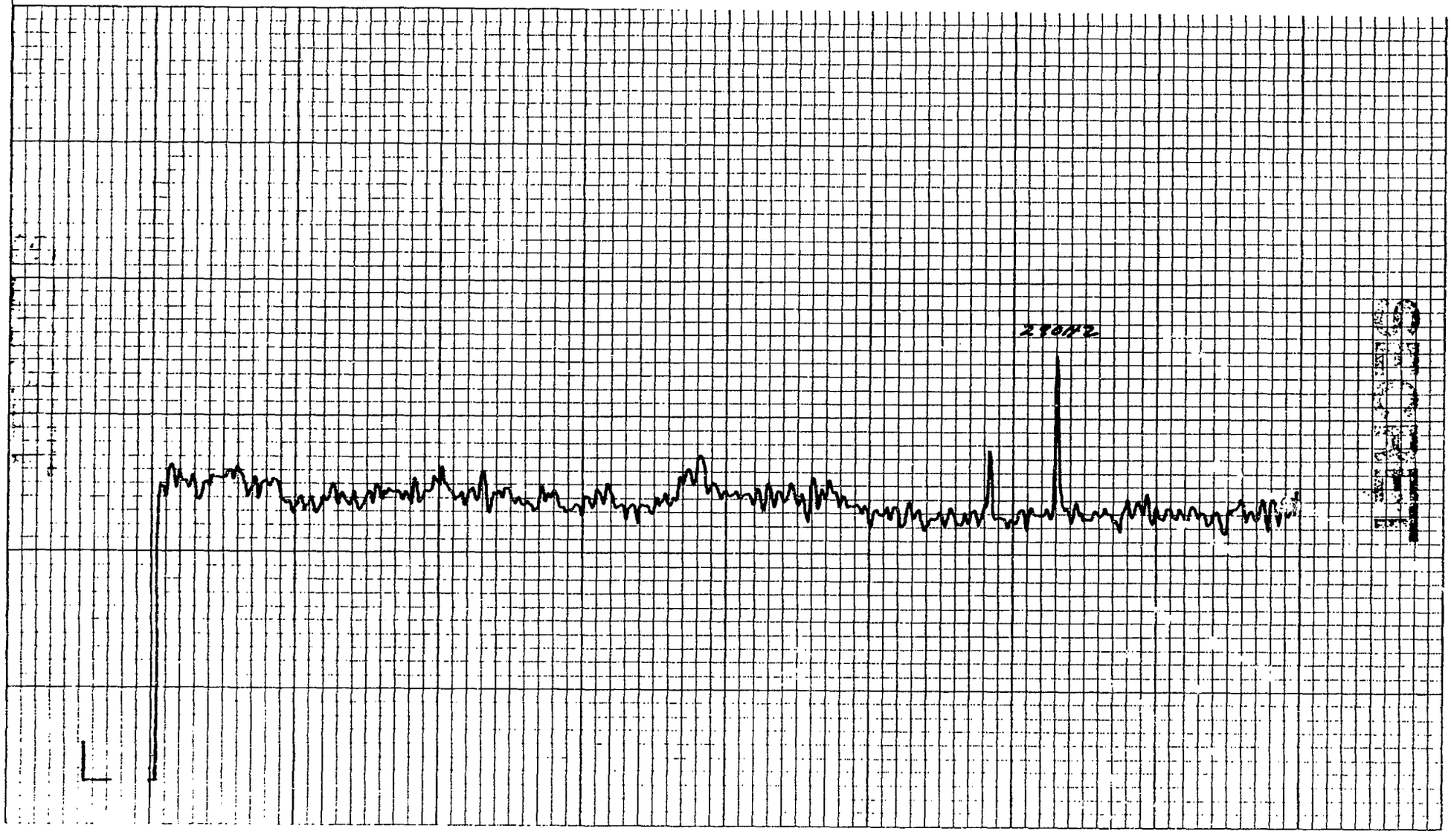
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 0935 - 51 (3011)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
51 ELEMENTS

DATE OF ANALYSIS: - - -
1-26 & 28-53)
DATE/TIME: 7-16-77 - 0935Z
ANALYSIS BANDWIDTH: 1/10HZ
+54 DEG. AZ STEERING

REEL: 1122 INDEX 566

INTEGRATION TIME 320 SECS ATTEN: -34 DB
FILTER WTG: HANNING



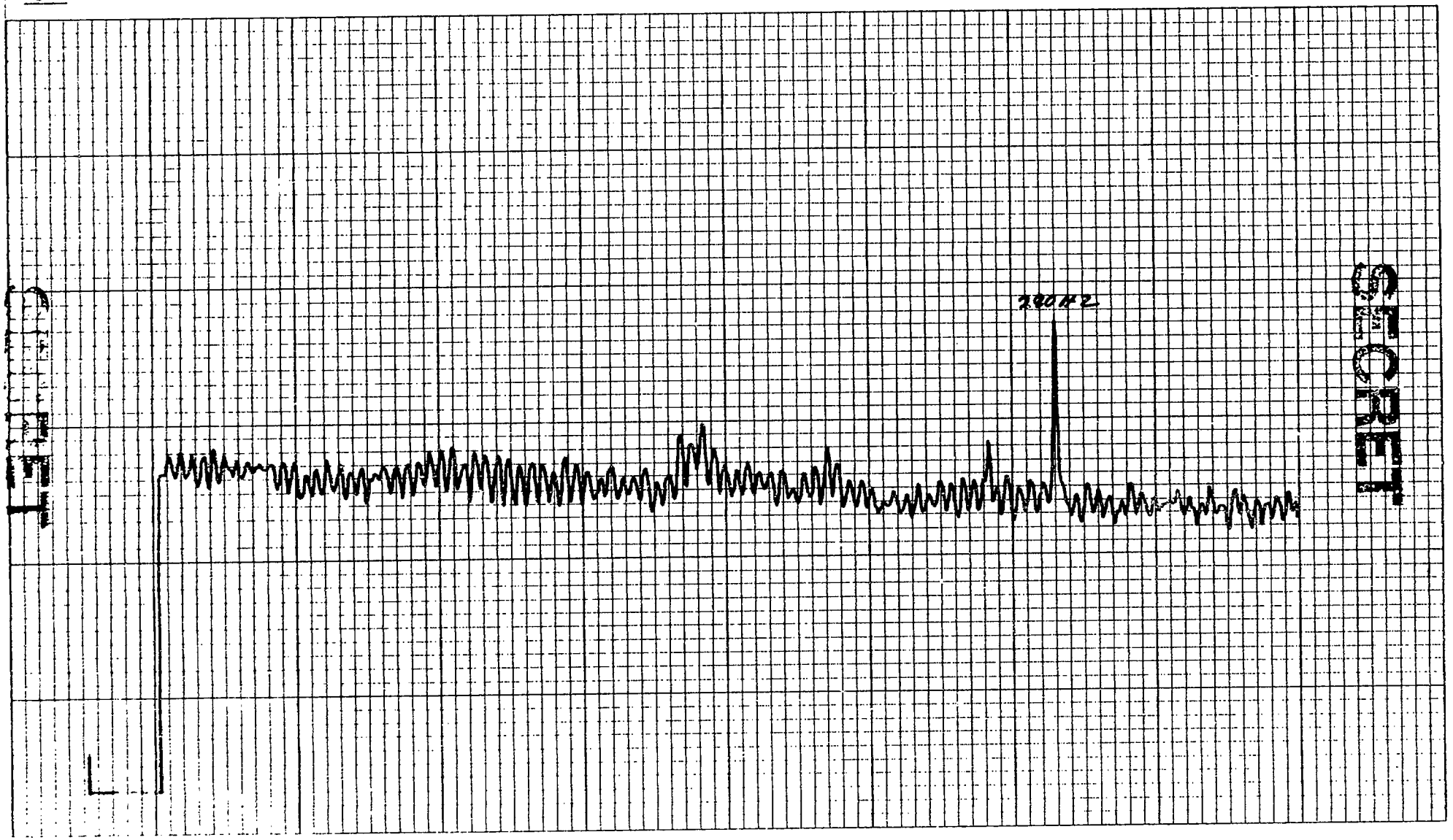
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 0935 - 51 (DP11)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
51 ELEMENTS

DATE OF ANALYSIS: - - -
1-26 & 28-53)
DATE/TIME: 3-16-77 - 0935Z
ANALYSIS BANDWIDTH: 1/10HZ
+56 DEG. AZ STEERING

REEL: M22 INDEX 566

INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



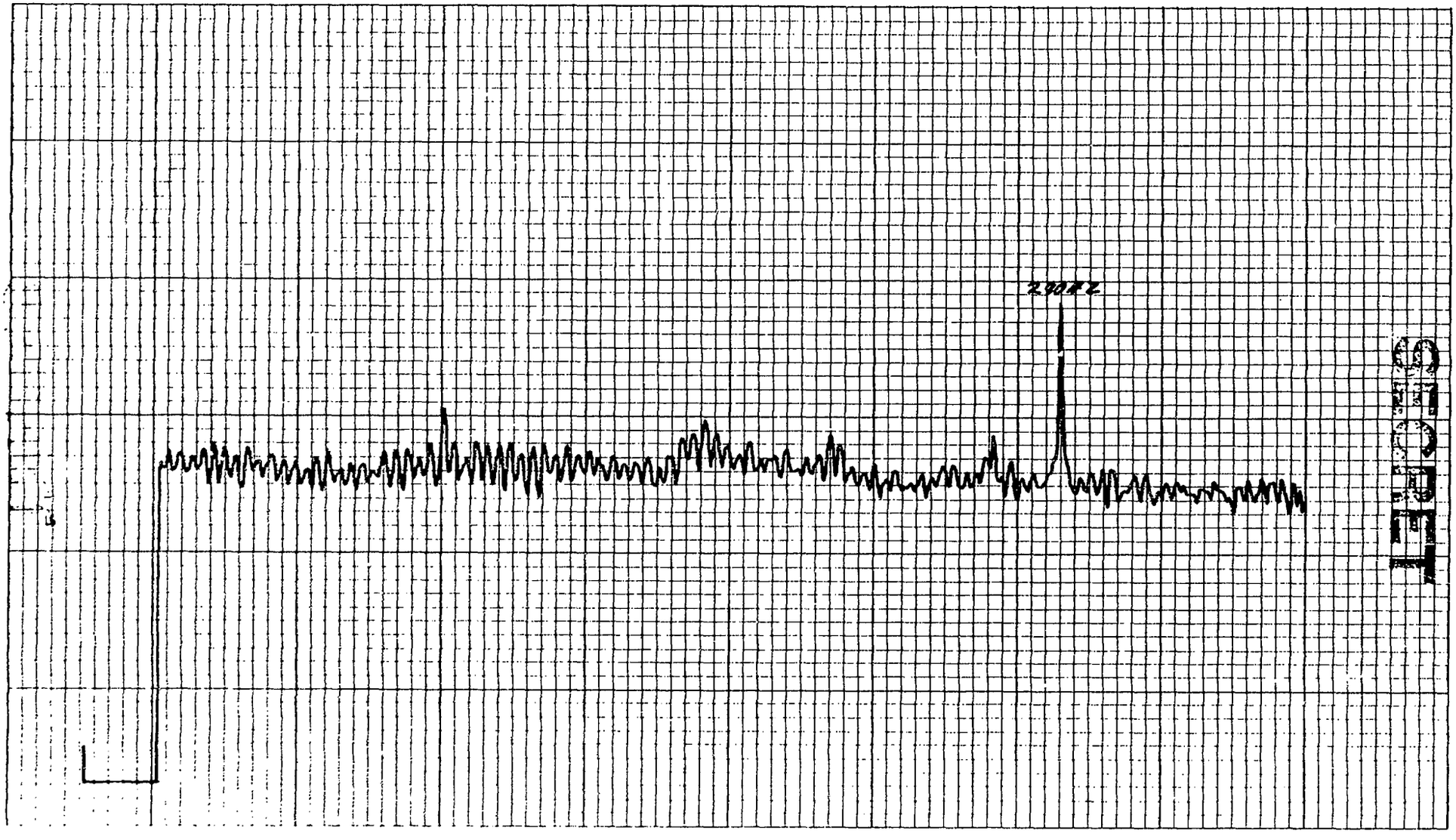
K·E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 0935 - 51 (DP4)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
51 ELEMENTS

DATE OF ANALYSIS: - - -
1-24 20-53)
DATE/TIME: 3-1677 - 0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+58 DEG. AZ STEERING

REEL: 422 INDEX 566

INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



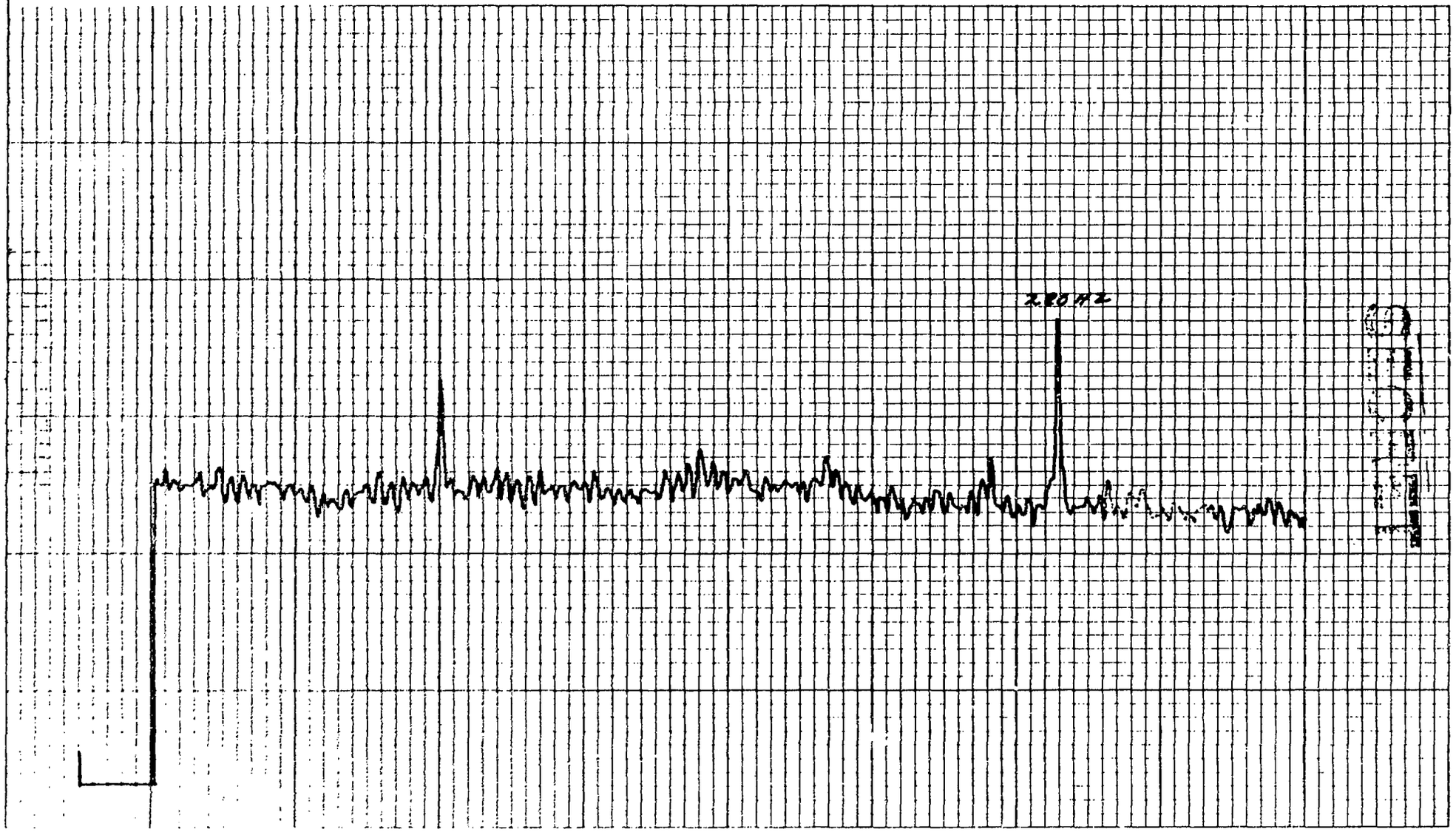
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

CONTROL: 0935 - 51 (DP11)
BEAMFORMED SPECTRUM(ELEMENTS 51)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
51 ELEMENTS

DATE OF ANALYSIS: 1-26 & 09-53
DATE/TIME: 3-16-77 - 0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+60 DEG. AZ STEERING

REEL: 422 INDEX 506
INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

511

CONTROL: 0935 - 51 (DP11)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
51 ELEMENTS

DATE OF ANALYSIS: _ _ _ _ _
1-26&29-53
DATE/TIME: 3-6-7 - 0735Z
ANALYSIS BANDWIDTH: 1/10HZ
+62 DEG. AZ STEERING

REEL: H 22 INDEX 566

INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING

K&E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 0935 - 51 (DP11)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 28-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
51 ELEMENTS

DATE OF ANALYSIS: __ ___ __
DATE/TIME: 3-16-77 - 0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+64 DEG. AZ STEERING

REEL: M22 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: 24 DB
FILTER WTG: HANNING

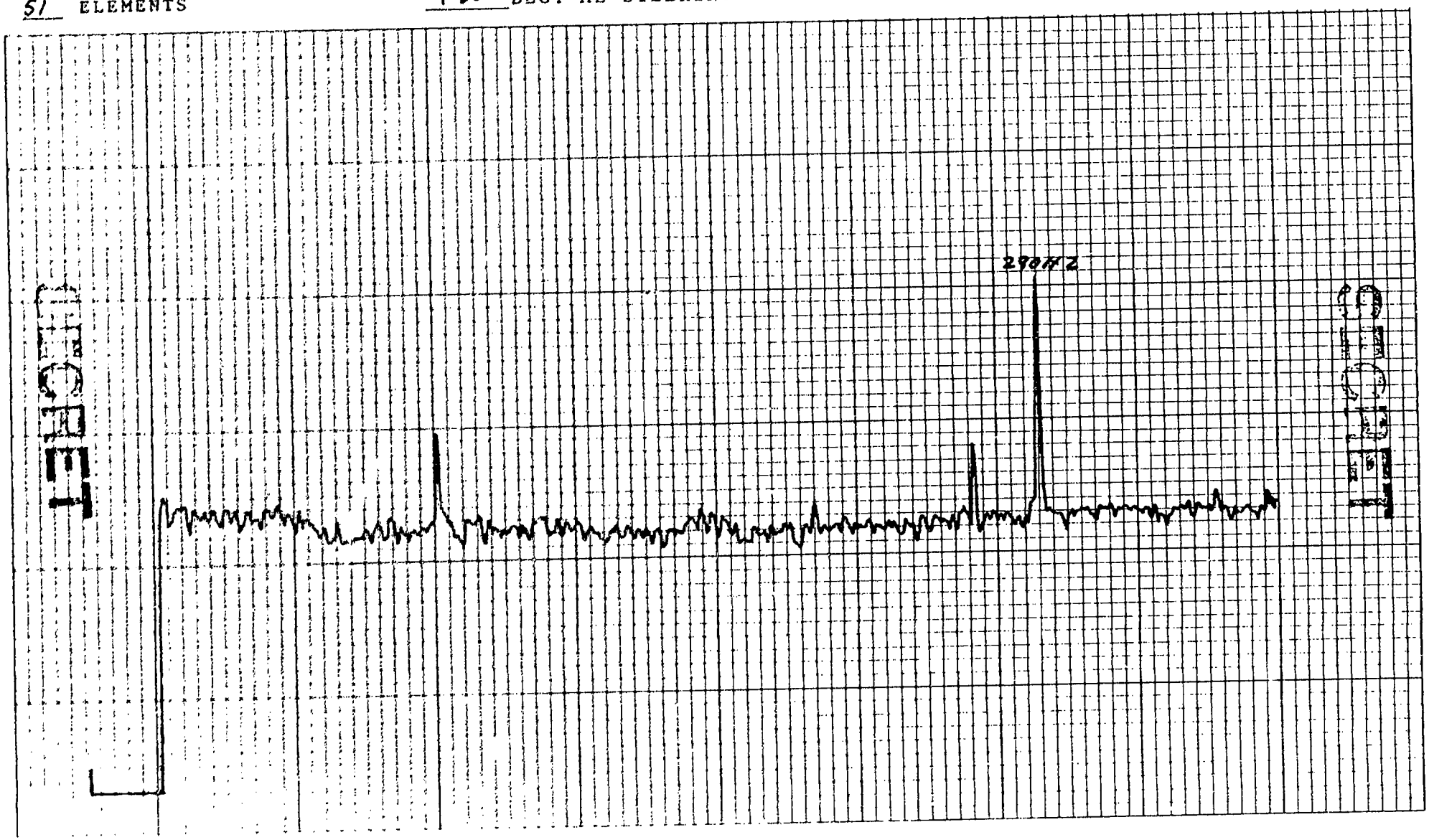
K&E 10 X 10 TO THE INCH • X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

CONTROL: 0935 - 51 (DP11)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
51 ELEMENTS

DATE OF ANALYSIS: - - -
1-26 & 29-53)
DATE/TIME: 7-16-77 - 0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+66 DEG. AZ STEERING

REEL: M22 INDEX 566
INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



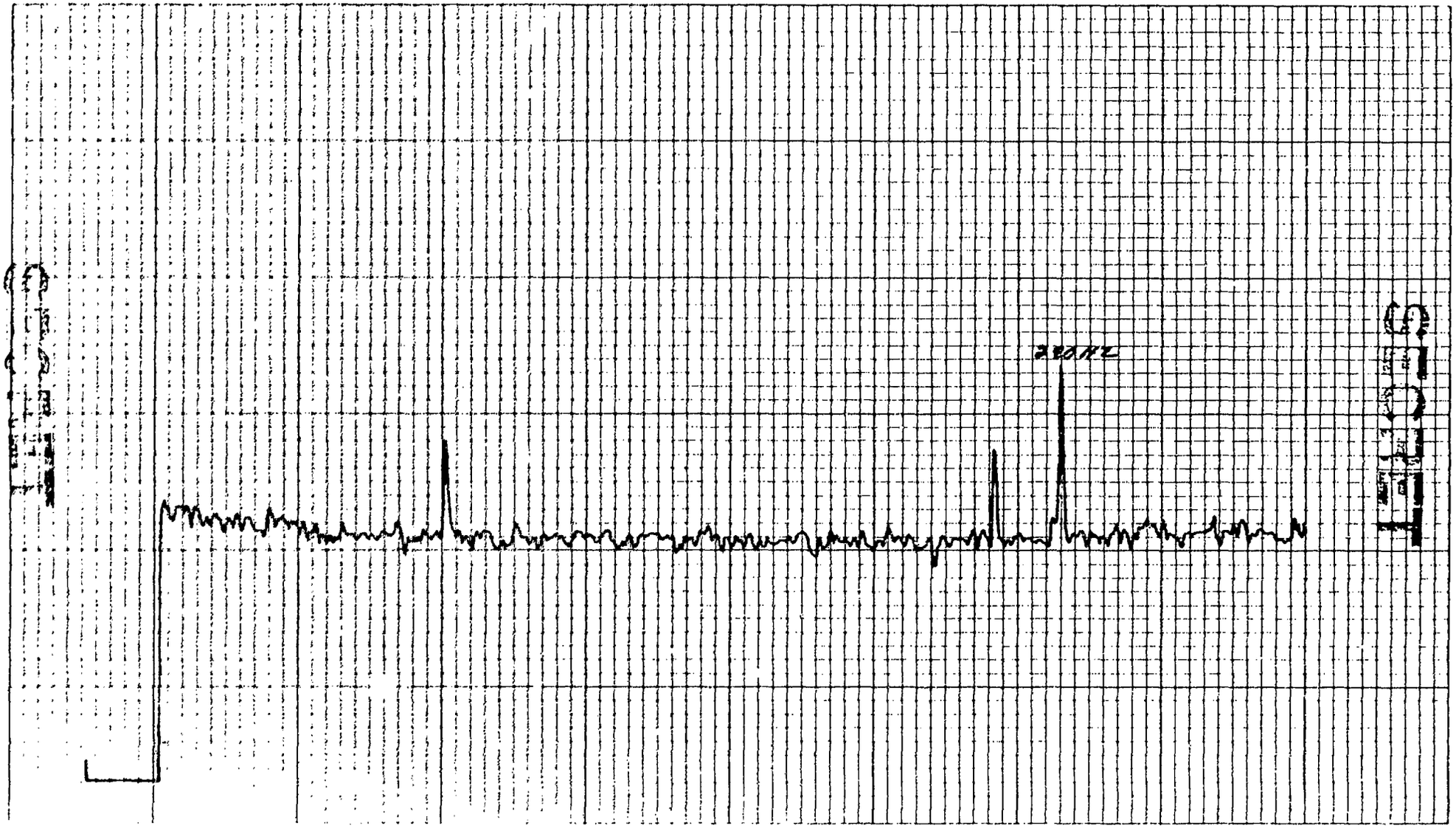
K&E 10 X 10 TO THE INCH

CONTROL: 0935 - 51 (DPH)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
51 ELEMENTS

DATE OF ANALYSIS: - - -
1-26 & 29-53)
DATE/TIME: 3-16-77 - 0935 Z
ANALYSIS BANDWIDTH: 1/10HZ
+68 DEG. AZ STEERING

REEL: M22
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 566
ATTEN: -4 DB



NOISE SPECTRAL DENSITY CALCULATIONS FOR SPRAY/BEARING STAKE (U)

DATA POINT 12 DATE 3-16-77 TIME 1148Z

FREQUENCY 140 HZ

INDICATED NOISE LEVEL dBV .1HZ / ABW		-48.2 dBV
SYSTEM SENSITIVITY dB/μB	-(-12)	= -36.2
BANDWIDTH CONVERSION TO 1 HZ BAND	+82	= -28.0
CONVERSION TO dBreμPa/1HZ	+100	= +72

UNCLASSIFIED

UNCLASSIFIED

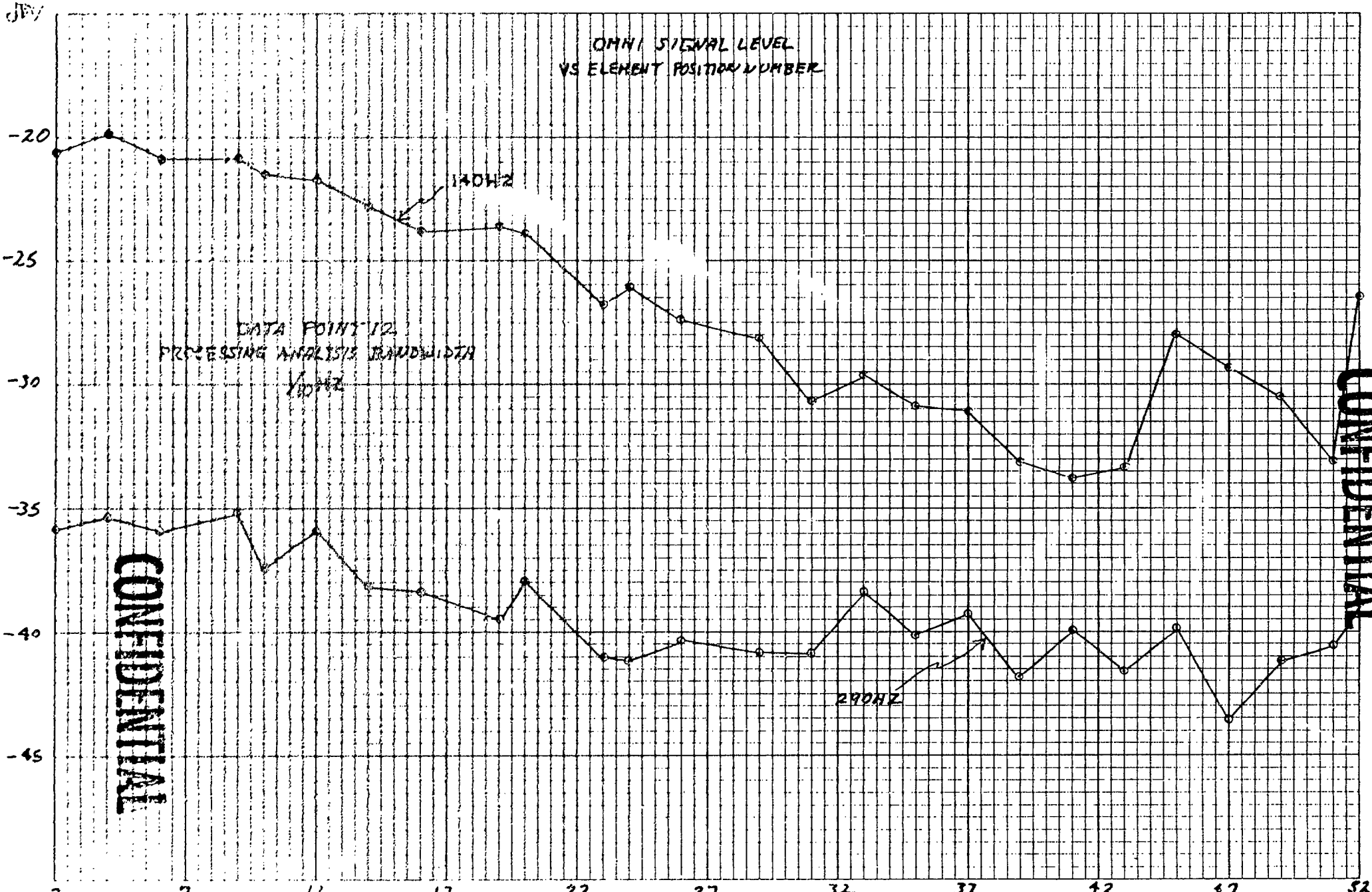
NOISE SPECTRAL DENSITY CALCULATIONS FOR SPRAY/BEARING STAKE (U)

DATA POINT 12 DATE 3-16-77 TIME 1148Z

FREQUENCY 290 HZ

INDICATED NOISE LEVEL dBV .1 HZ ABW			-50.7dBV
SYSTEM SENSITIVITY dB/μB	-(-8)	=	-42.7
BANDWIDTH CONVERSION TO 1 HZ BAND	+8.2	=	-34.5
CONVERSION TO dBreμPa/1HZ	+100	=	+65.5

UNCLASSIFIED
UNCLASSIFIED

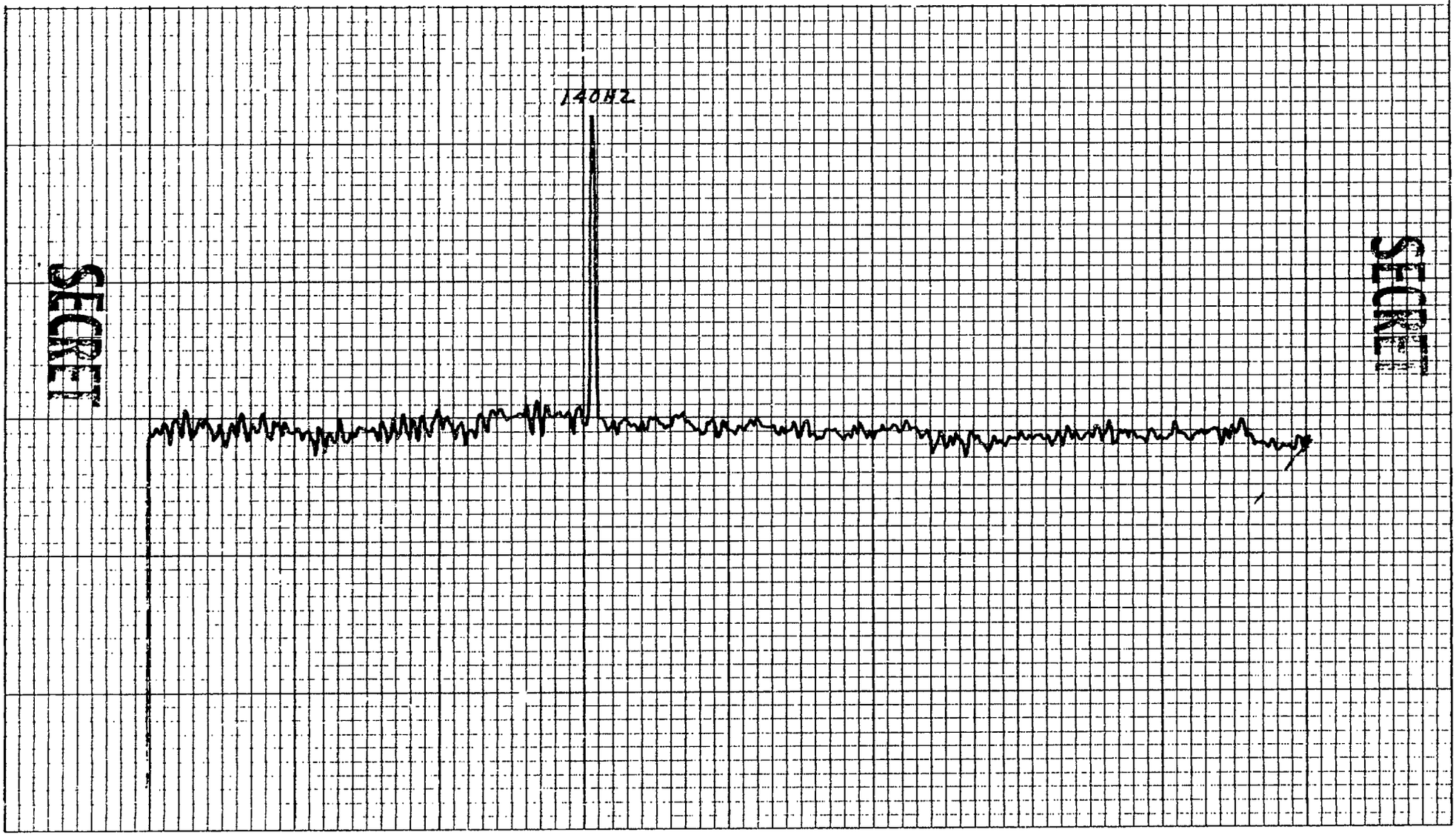

dBV
OMNI SIGNAL LEVEL
VS ELEMENT POSITION NUMBER
-20
-25
-30
-35
-40
-45
140HZ
DATA POINT 12
PROCESSING ANALYSIS BANDWIDTH
1/10 HZ
240HZ
2
7
12
17
22
27
32
37
42
47
52
CONFIDENTIAL
CONFIDENTIAL

K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 316-1148 (27)
OMNI SPECTRUM (ELEMENT 2)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: A24 INDEX 1980
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



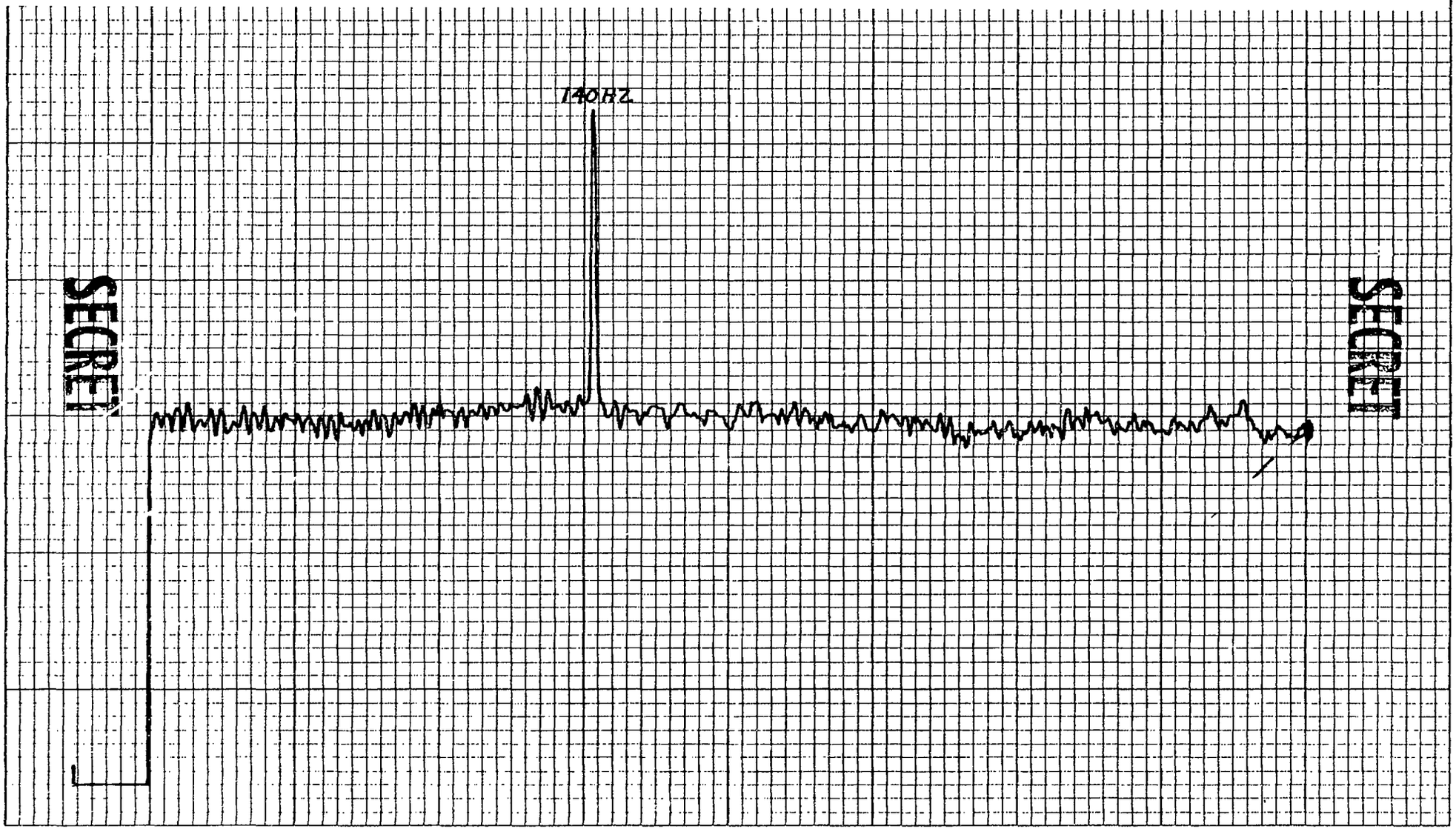
K·E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 3-16 -1148 (28)
OMNI SPECTRUM(ELEMENT 4)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 -1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M24 INDEX 1980
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

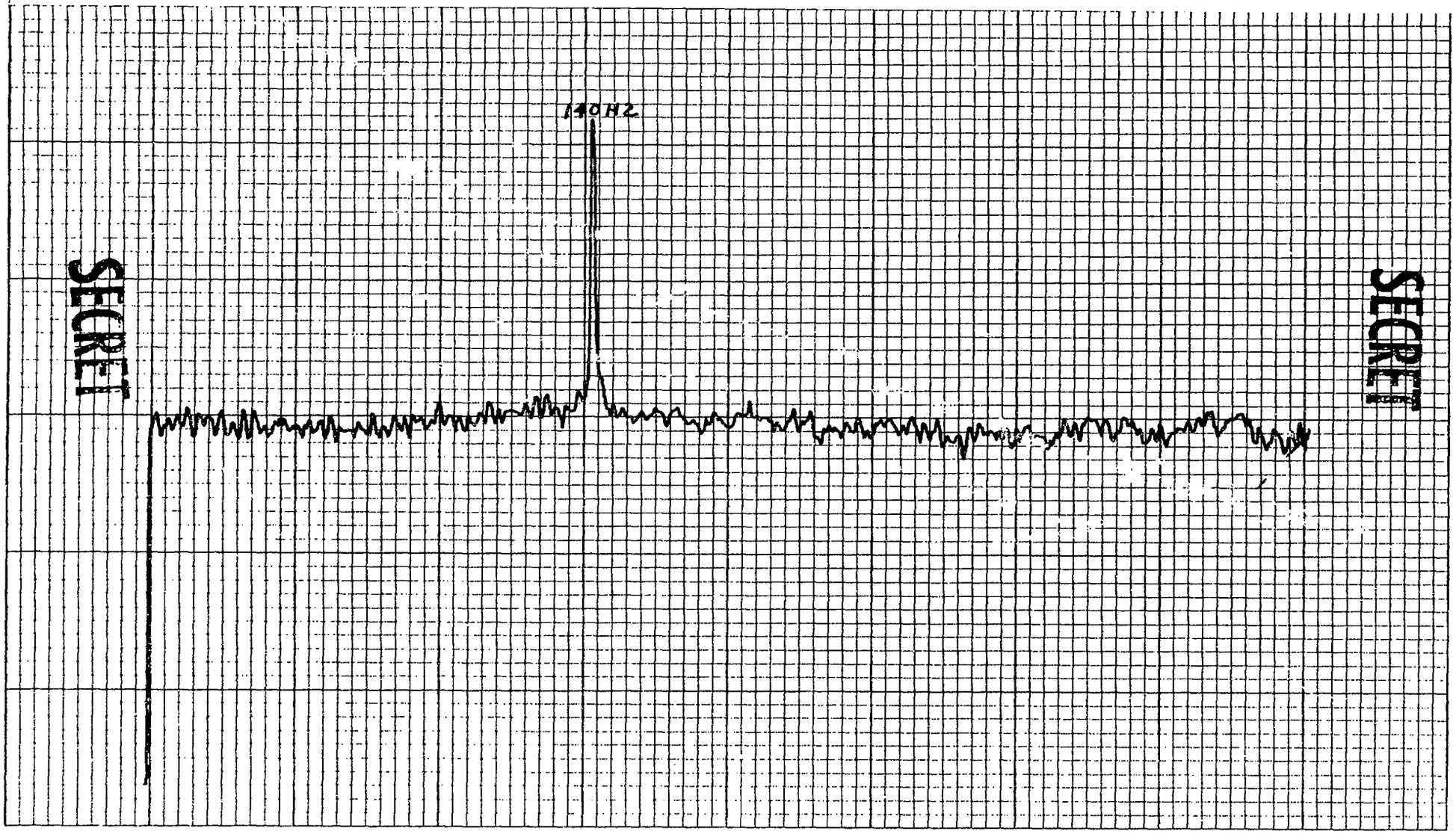
46 0703

#14

CONTROL: 3-16 -1148 (89)
OMNI SPECTRUM (ELEMENT 6)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 -1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M24 INDEX 1980
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING

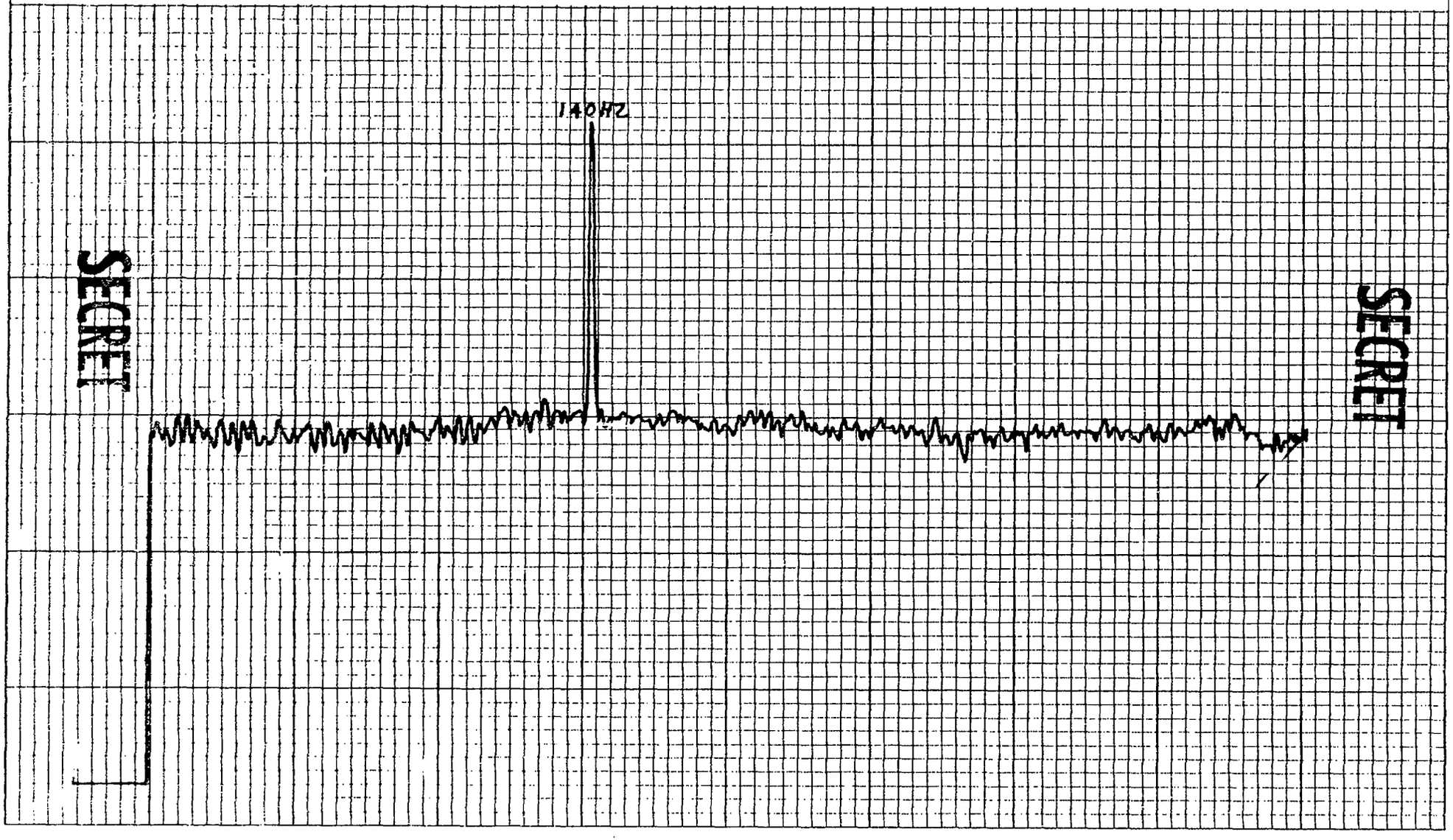


K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 3-16 -1148 (30)
OMNI SPECTRUM (ELEMENT 9)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 -1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M24 INDEX 1980
INTEGRATION TIME 320 SECS ATTEN: ~ DB
FILTER WTG: HANNING

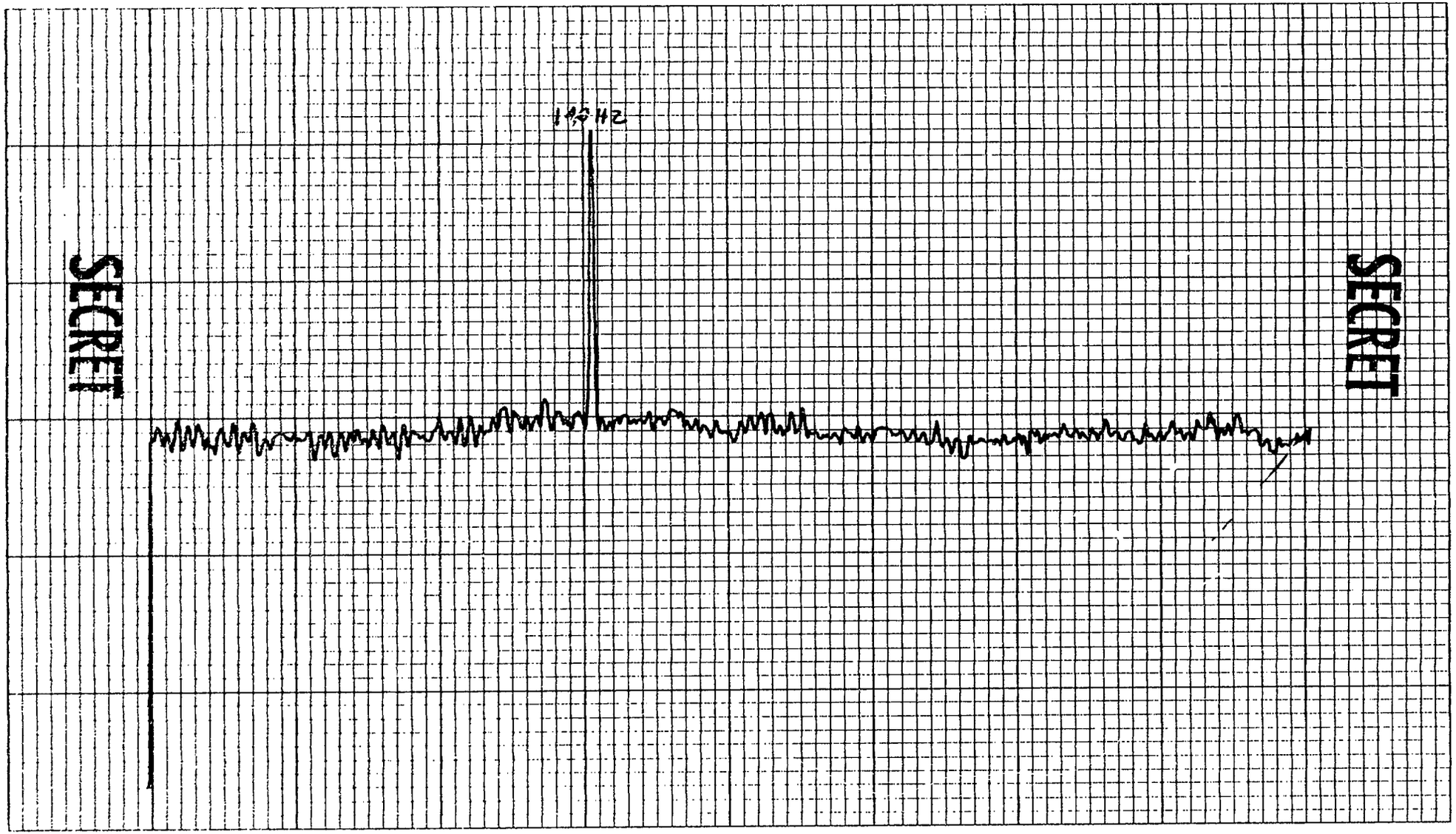


K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 3-16-1148 (31)
OMNI SPECTRUM (ELEMENT 10)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M24 INDEX 1980
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



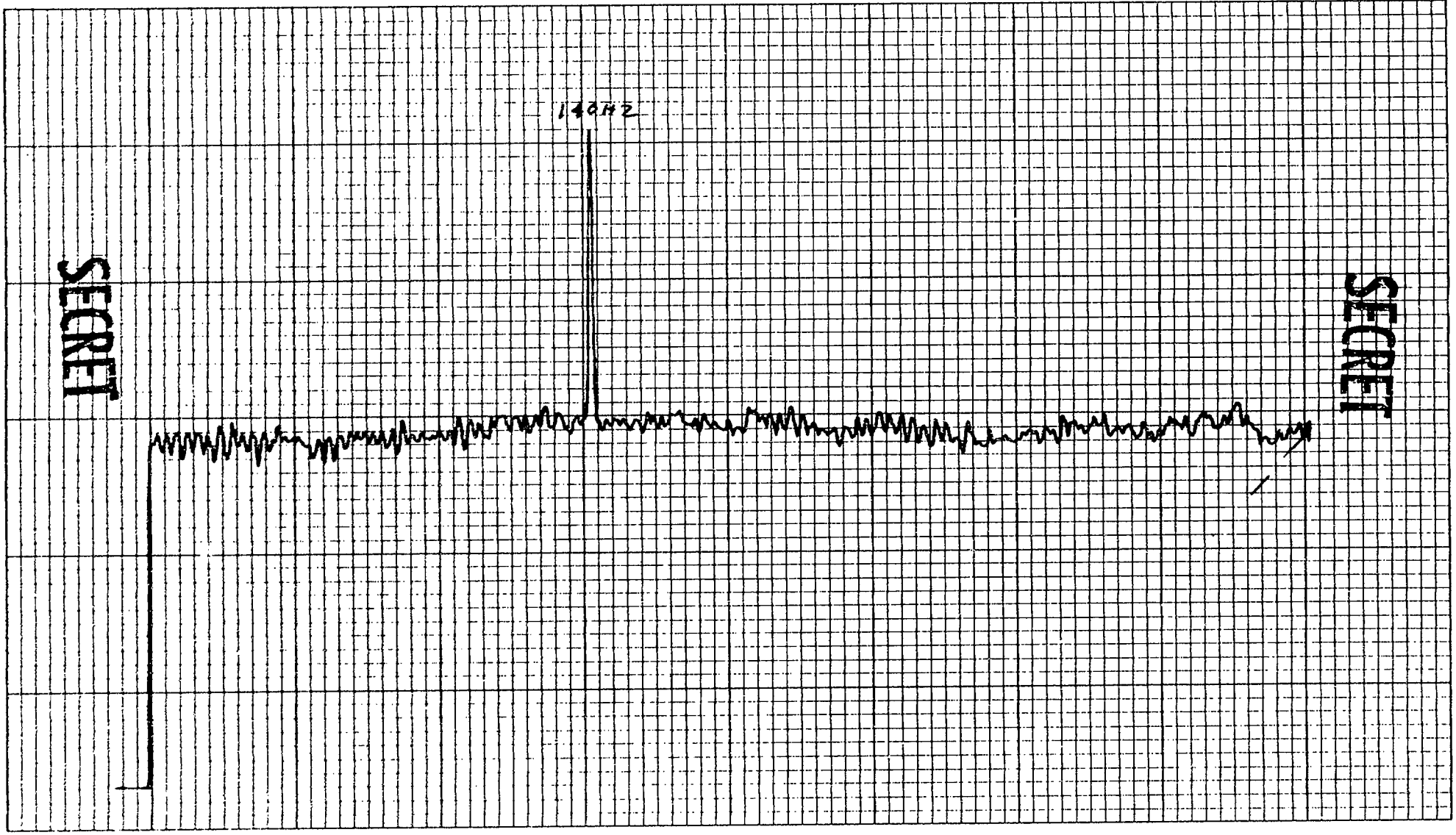
K•E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 3-16-1148 (32)
OMNI SPECTRUM (ELEMENT 12)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77-1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M24 INDEX 1980
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING

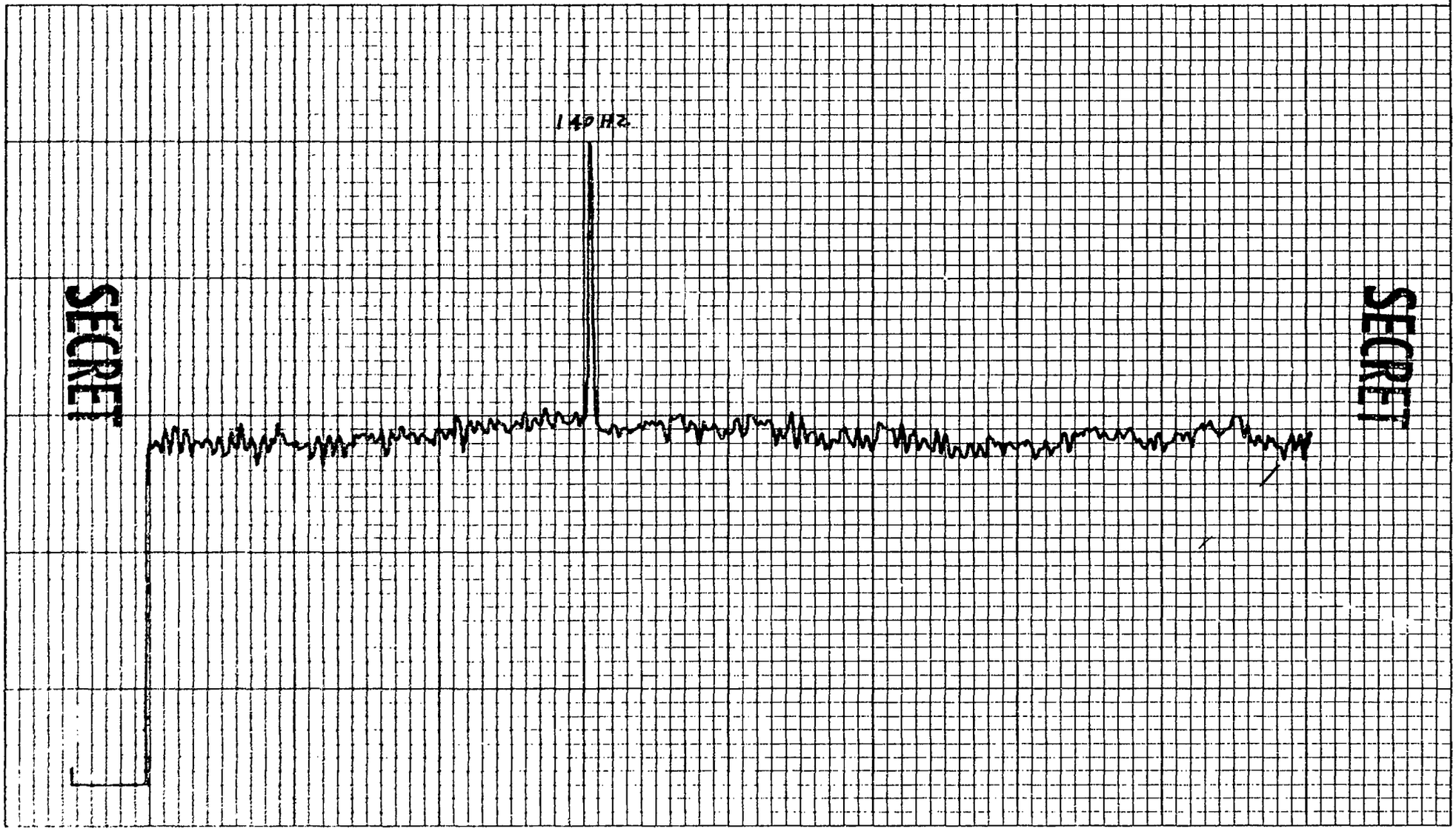


K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 3-16 - 1148 (33)
OMNI SPECTRUM (ELEMENT 14)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
____ DEG AZ STEERING

REEL: M24 INDEX 1980
INTEGRATION TIME 320 SECS ATTEN: __ DB
FILTER WTG: HANNING

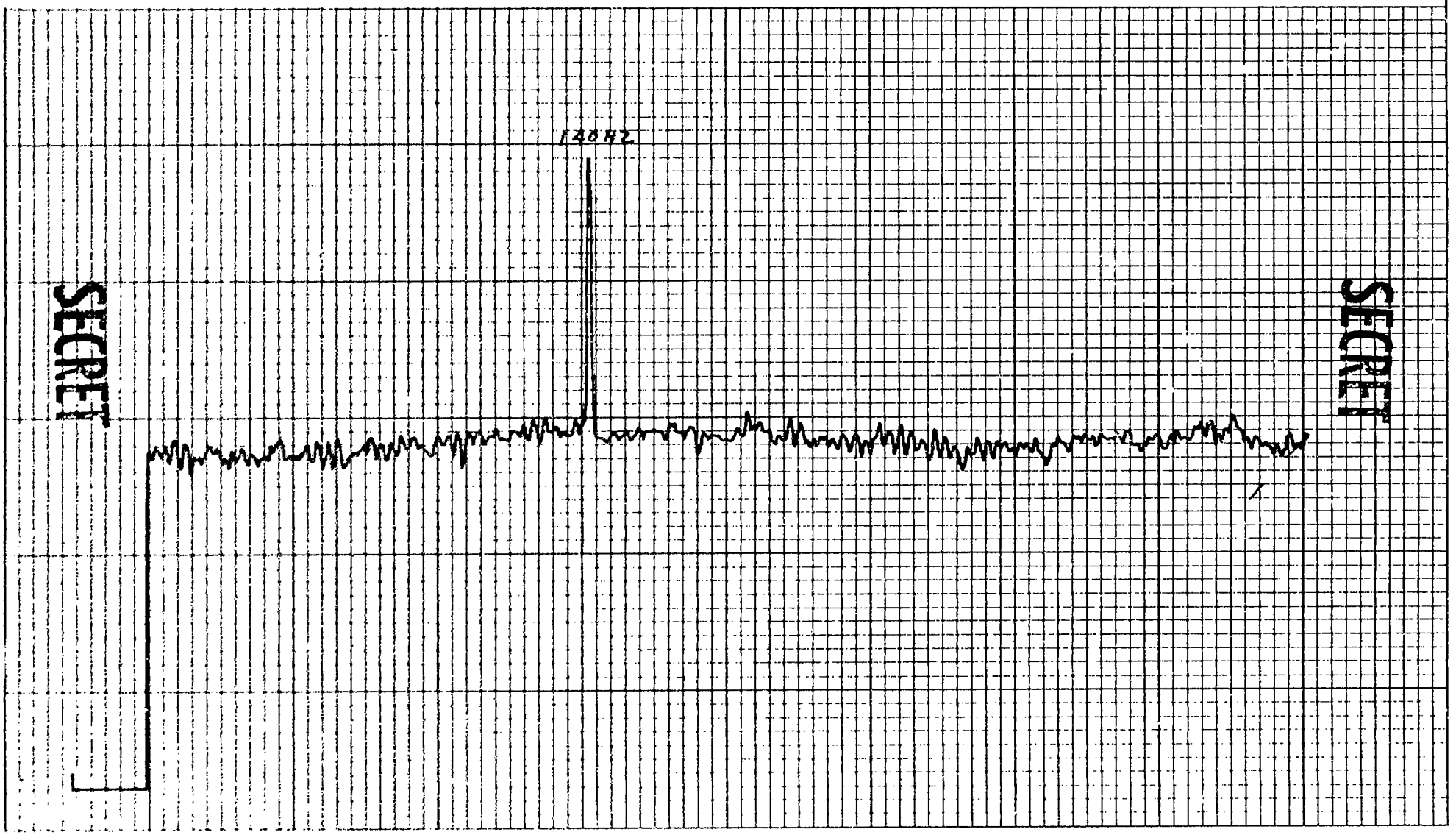


K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 3-16 -1148 (34)
OMNI SPECTRUM(ELEMENT 16)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M24 INDEX 1980
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH KEUFFEL & ESSER CO

46 0703

CONTROL: 3-16 -1148 (35)
OMNI SPECTRUM (ELEMENT 19)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
I ELEMENT

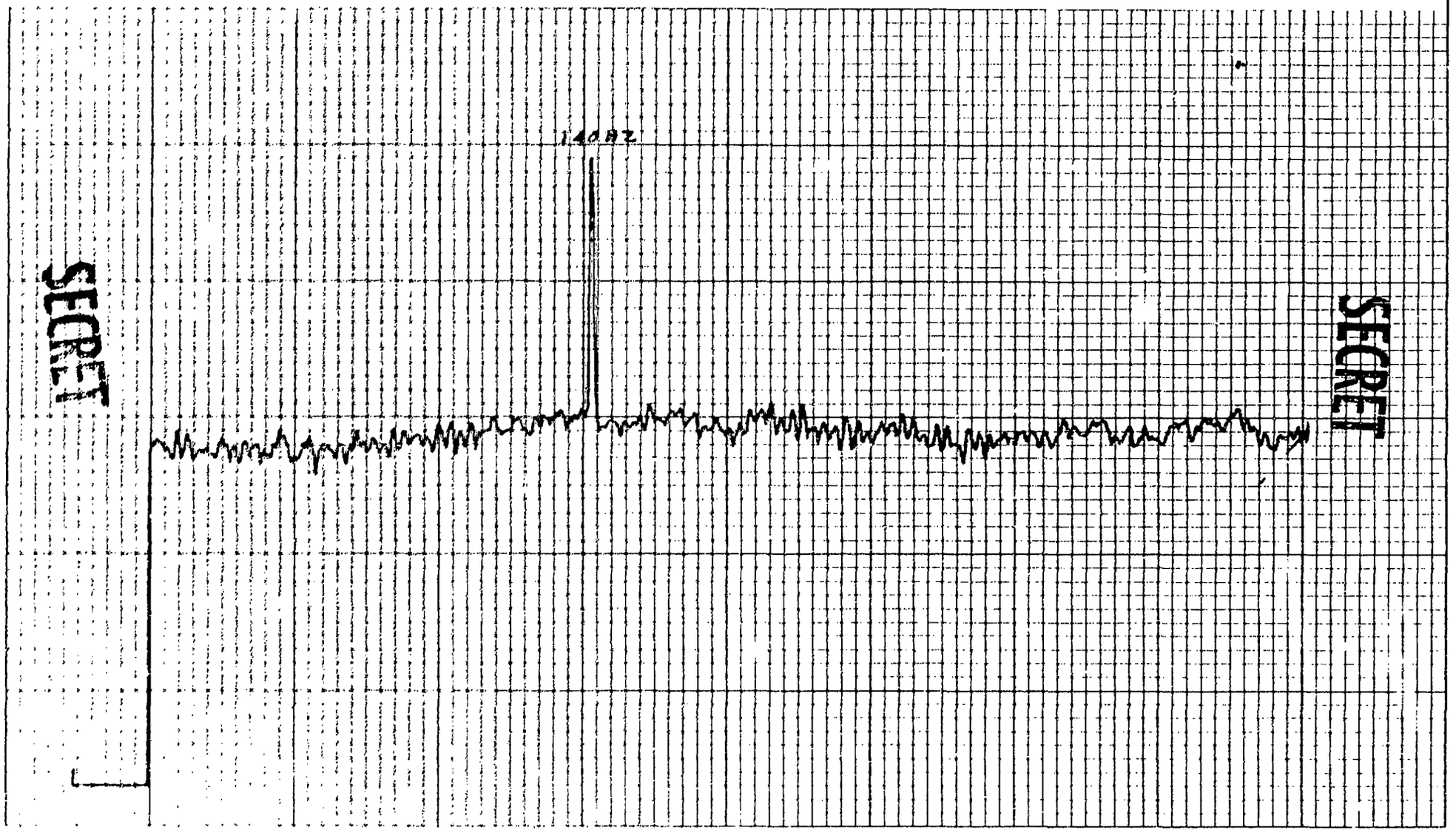
DATE OF ANALYSIS:
DATE/TIME: 3-16-77 -1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M24 INDEX 1980
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING

CONTROL: 3-16 - 1148 (36)
OMNI SPECTRUM (ELEMENT 20)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M24 INDEX 180°
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING

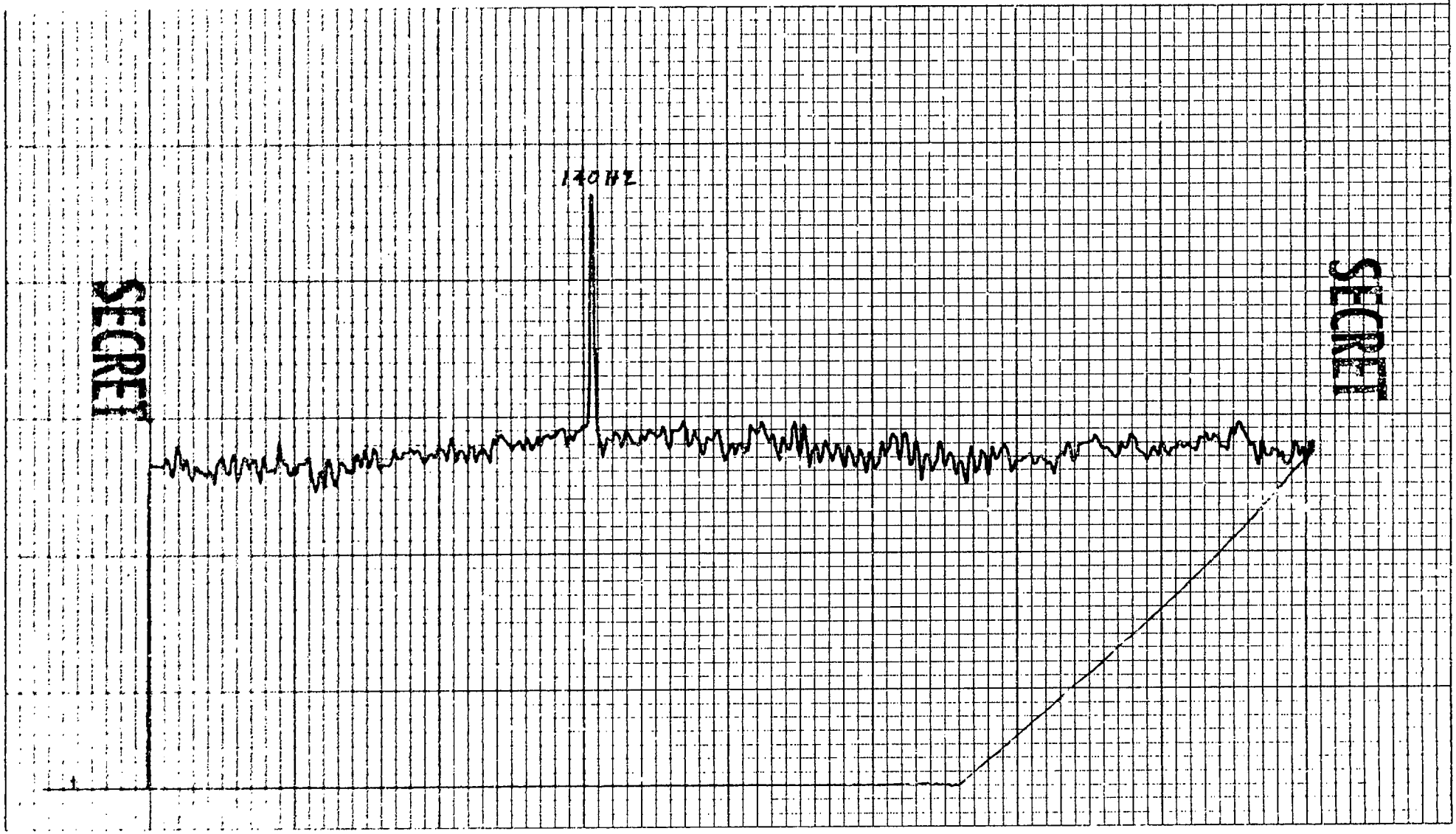


K&E 10 X 10 TO THE INCH • 7 X 11 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 3-16-1140 (37)
OMNI SPECTRUM (ELEMENT 23)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 - 1148Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M24 INDEX 1980
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



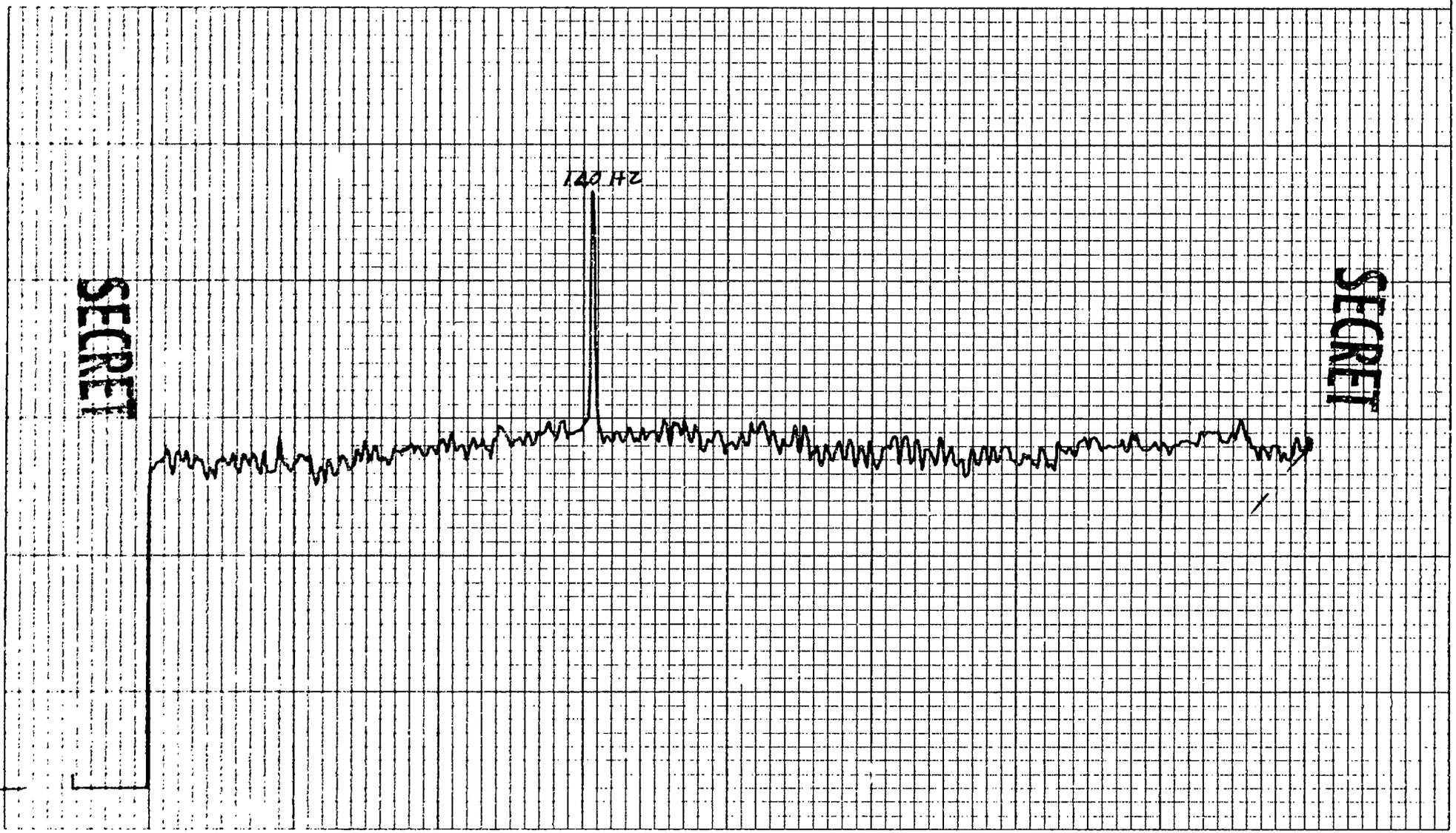
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 3-16-1148 (38)
OMNI SPECTRUM (ELEMENT 24)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77-1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M24 INDEX 180
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



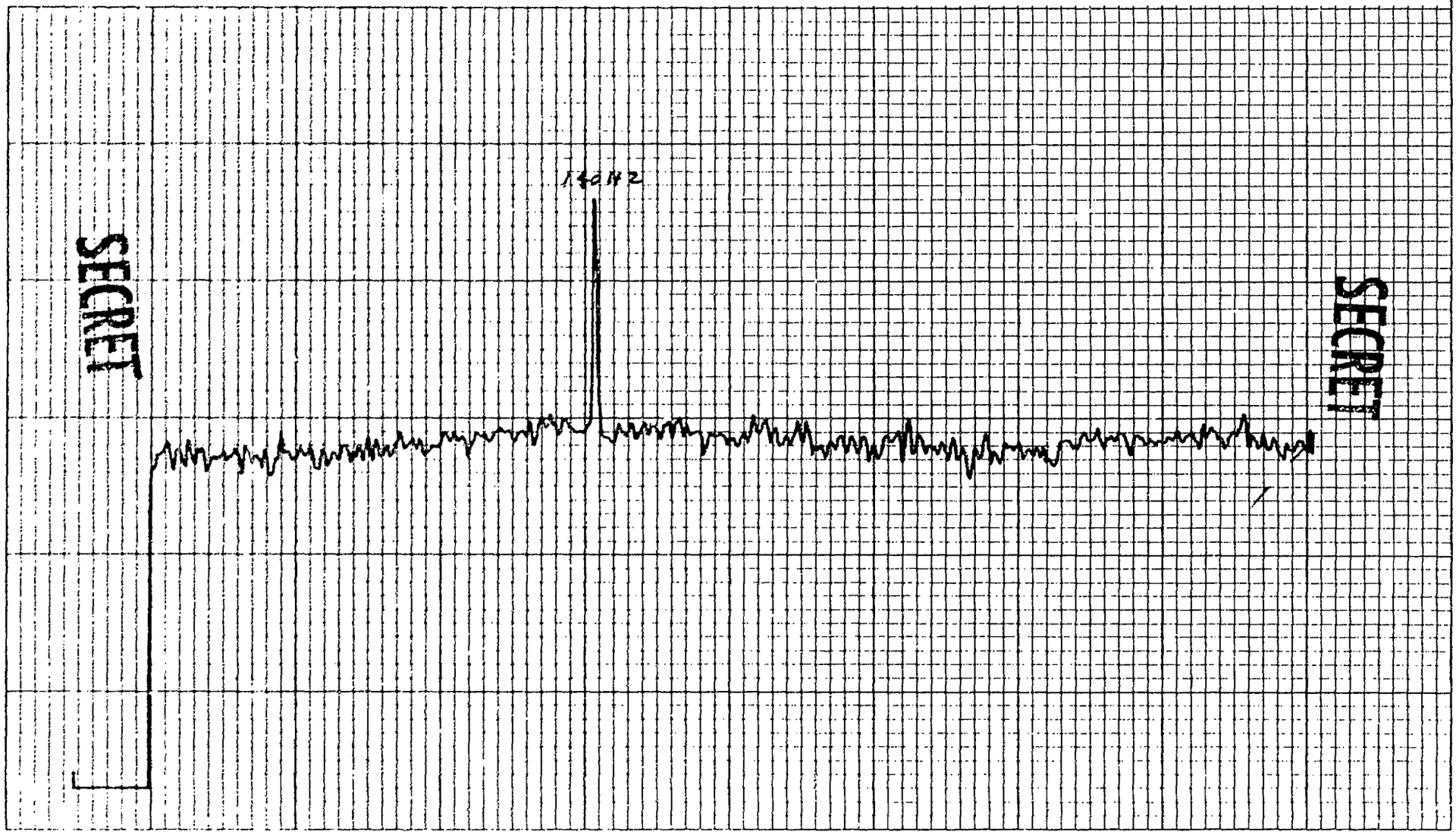
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

CONTROL: 3-16-1148 (39)
OMNI SPECTRUM (ELEMENT 26)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 -1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M24 INDEX 1980
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



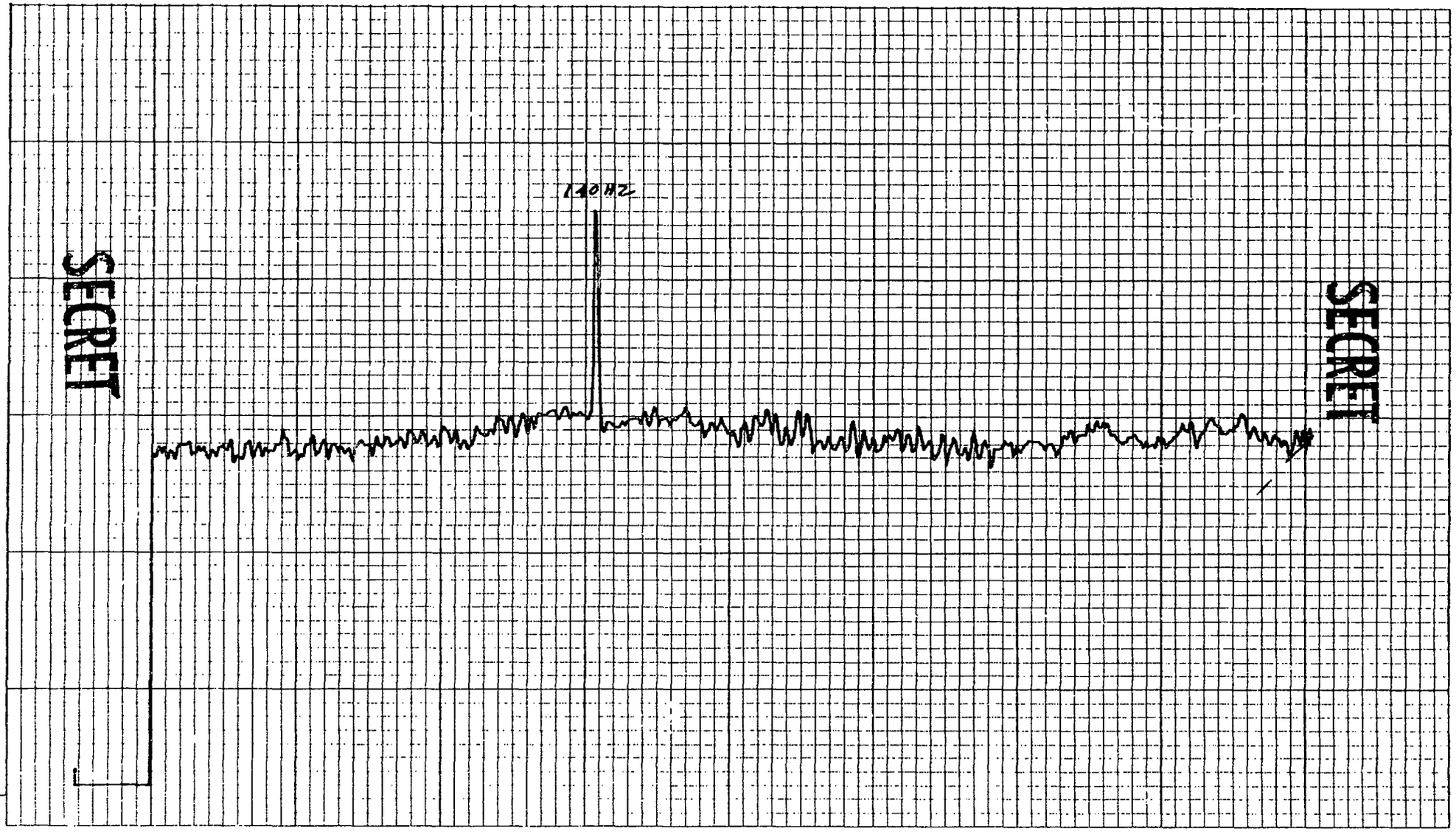
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

CONTROL: 3-16-1148 (40)
OMNI SPECTRUM (ELEMENT 29)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: 424 INDEX 1960
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

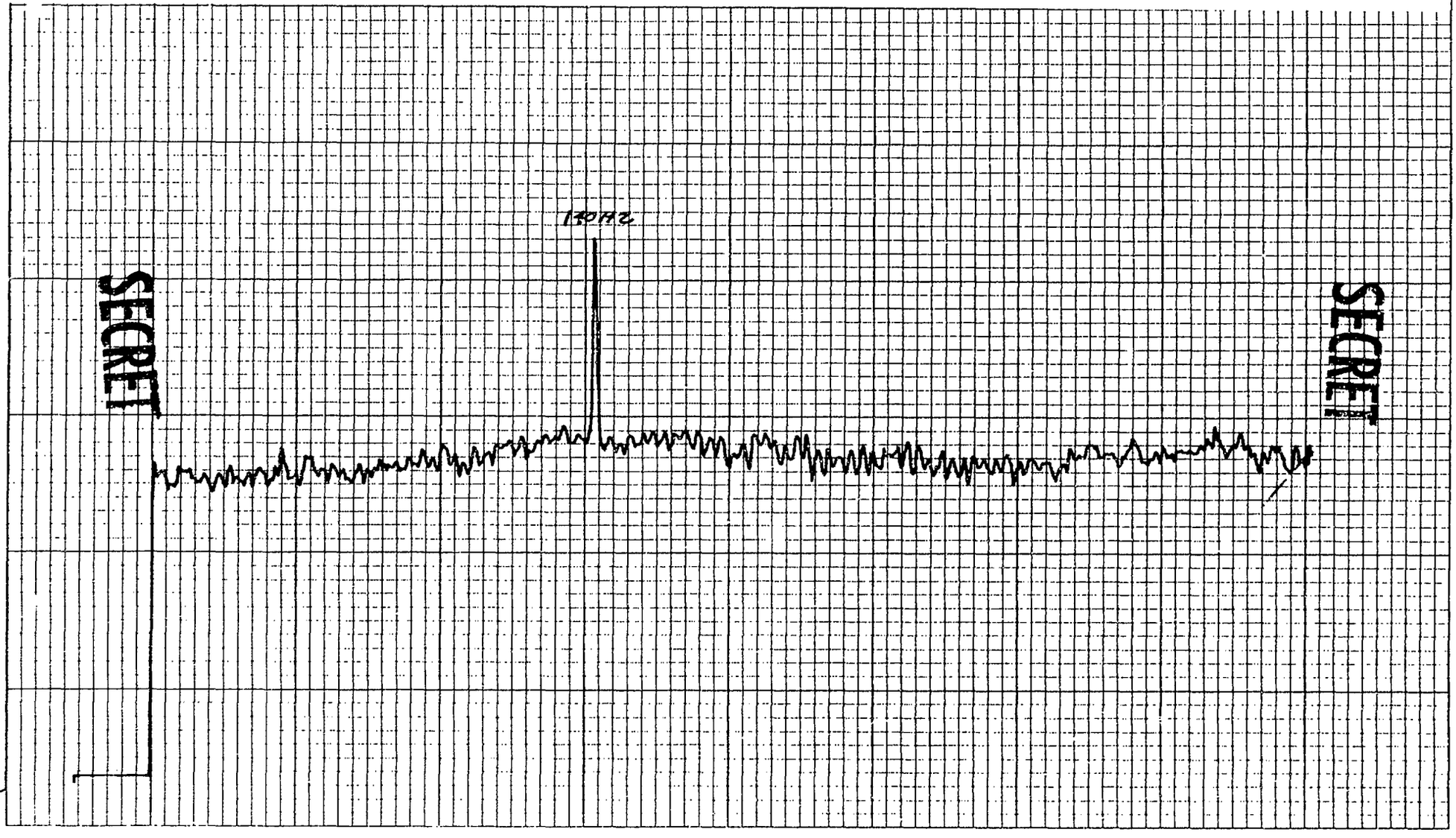
CONTROL: 3-16 -1148 (41)
OMNI SPECTRUM (ELEMENT 31)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-16-77 -1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M24 INDEX 1980

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING

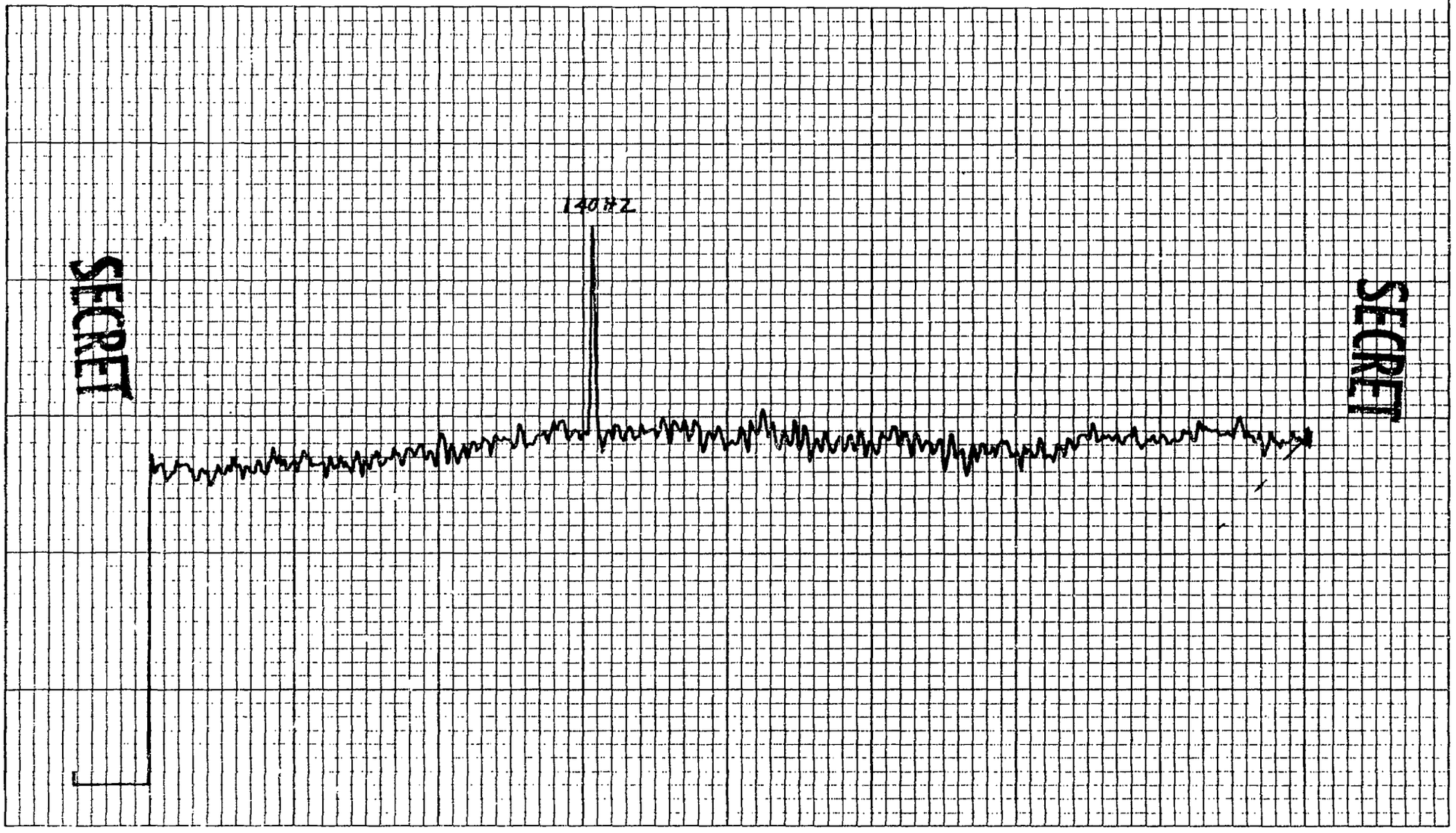


K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 3-16 -1140 (42)
OMNI SPECTRUM(ELEMENT 33)
EXERCISE:BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: N24 INDEX 1980
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



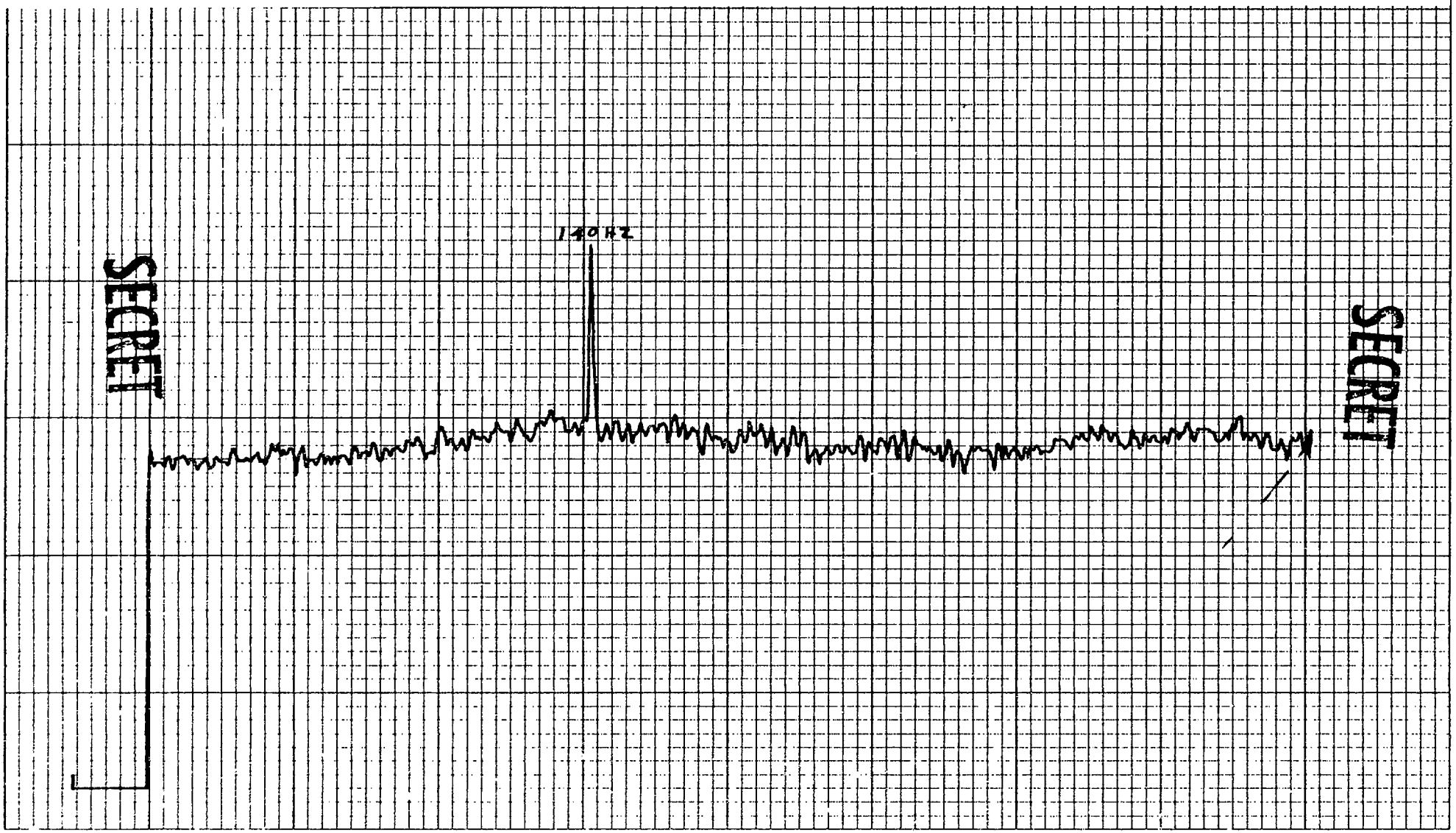
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

CONTROL: 3-16 -1148 (43)
OMNI SPECTRUM(ELEMENT 35)
EXERCISE: BEARING STAKE
CENTER FREQ: 50 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 -1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: N24 INDEX 1980
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING

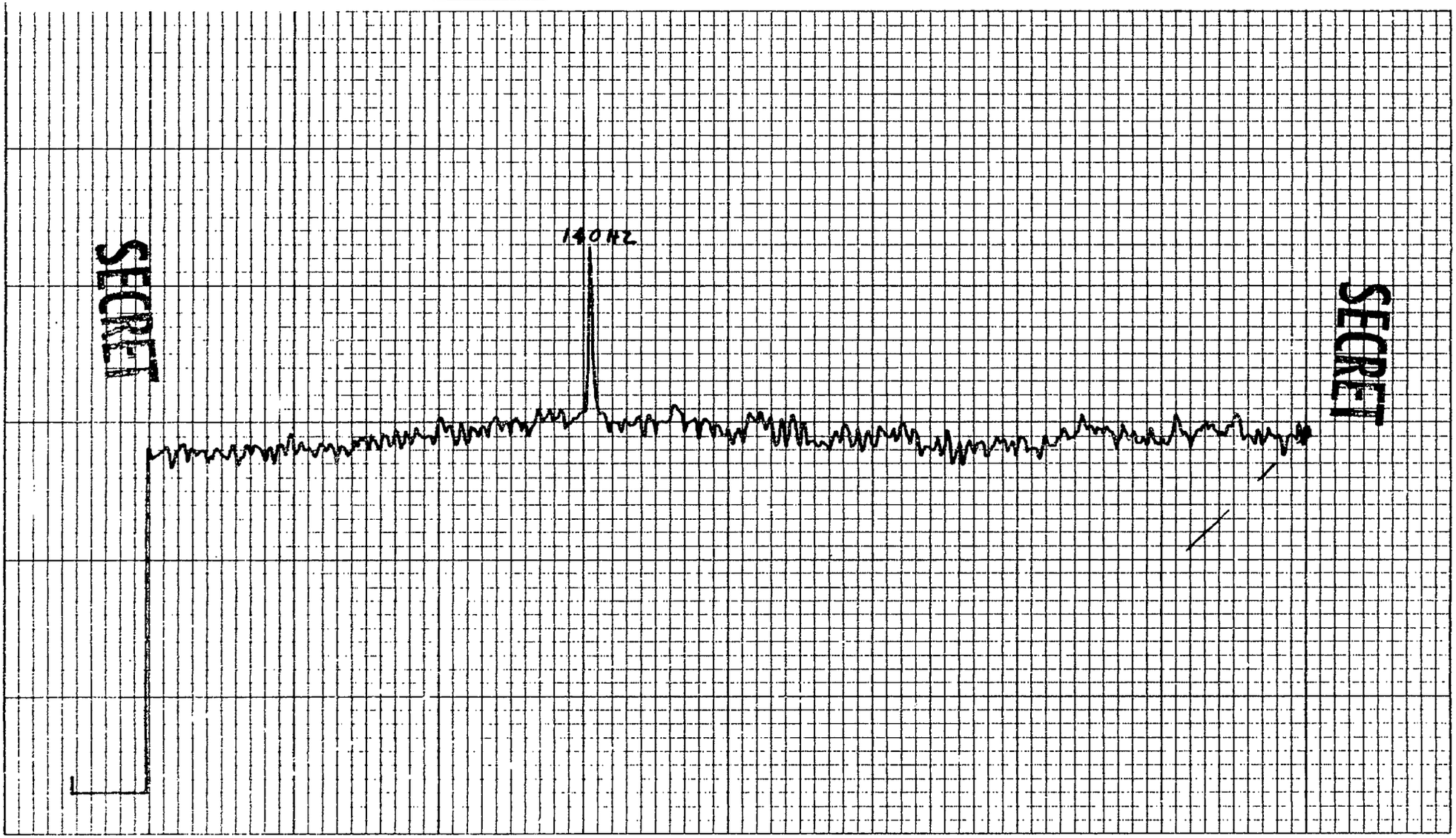


K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 3-16 -1148 (44)
OMNI SPECTRUM(ELEMENT 37)
EXERCISE:BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 -1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M24 INDEX 1980
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



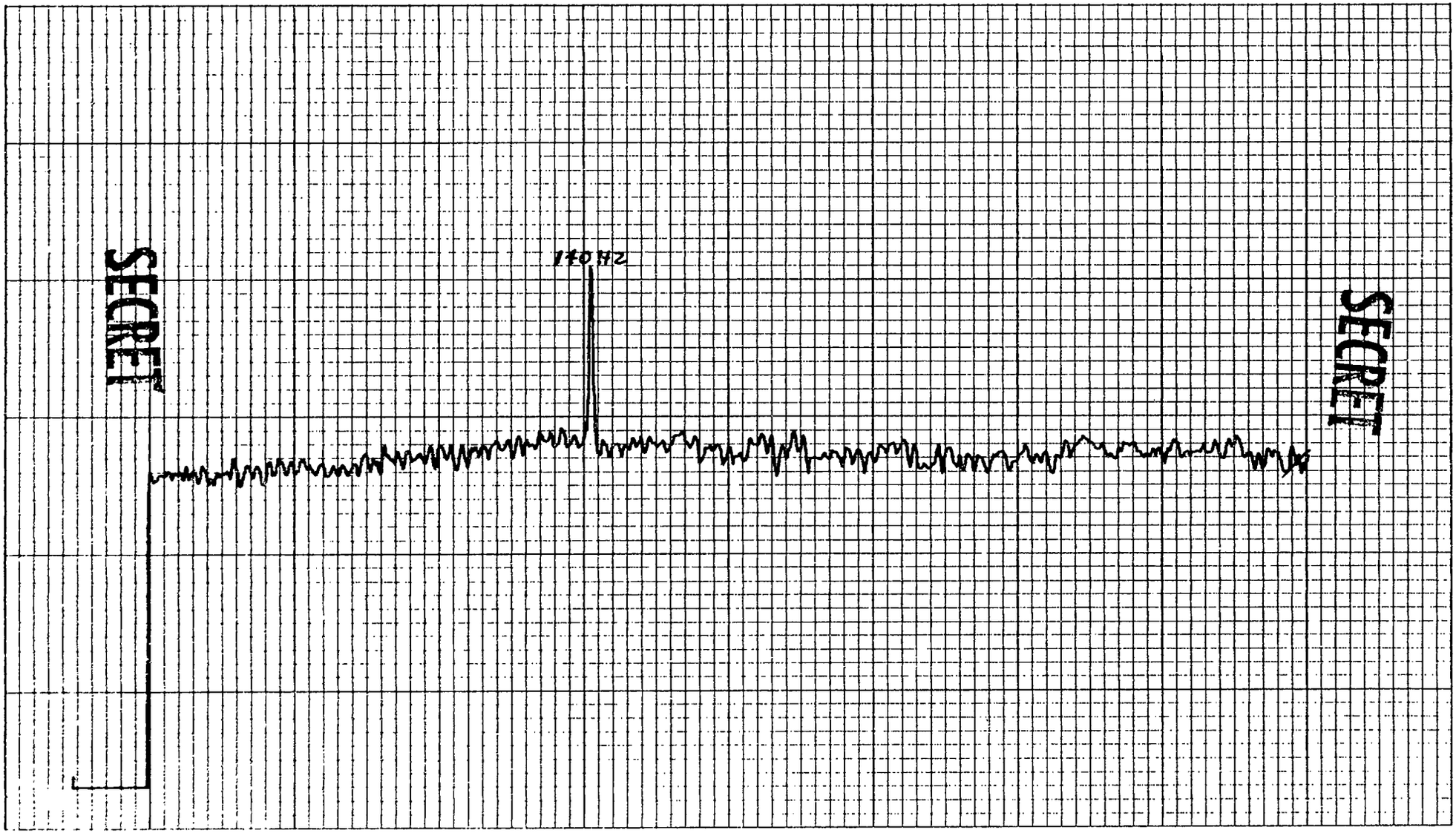
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 3-16 -1148 (45)
OMNI SPECTRUM(ELEMENT 39)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 -1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M24 INDEX 1980
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

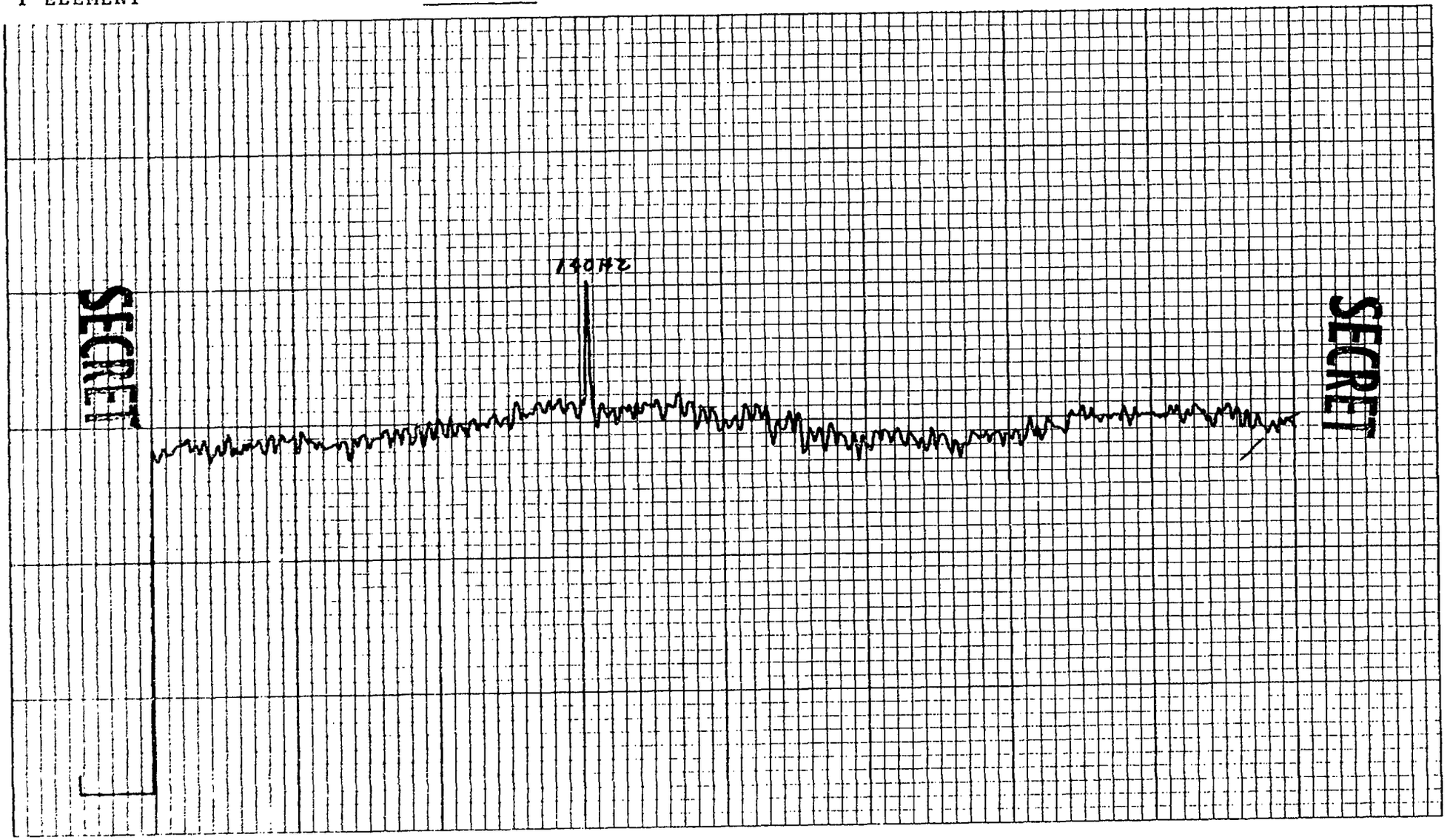
CONTROL: 3-16 - 1140 (46)
OMNI SPECTRUM(ELEMENT 41)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M24 INDEX 1980

INTEGRATION TIME 320 SECS ATTEN: ~ DB
FILTER WTG: HANNING

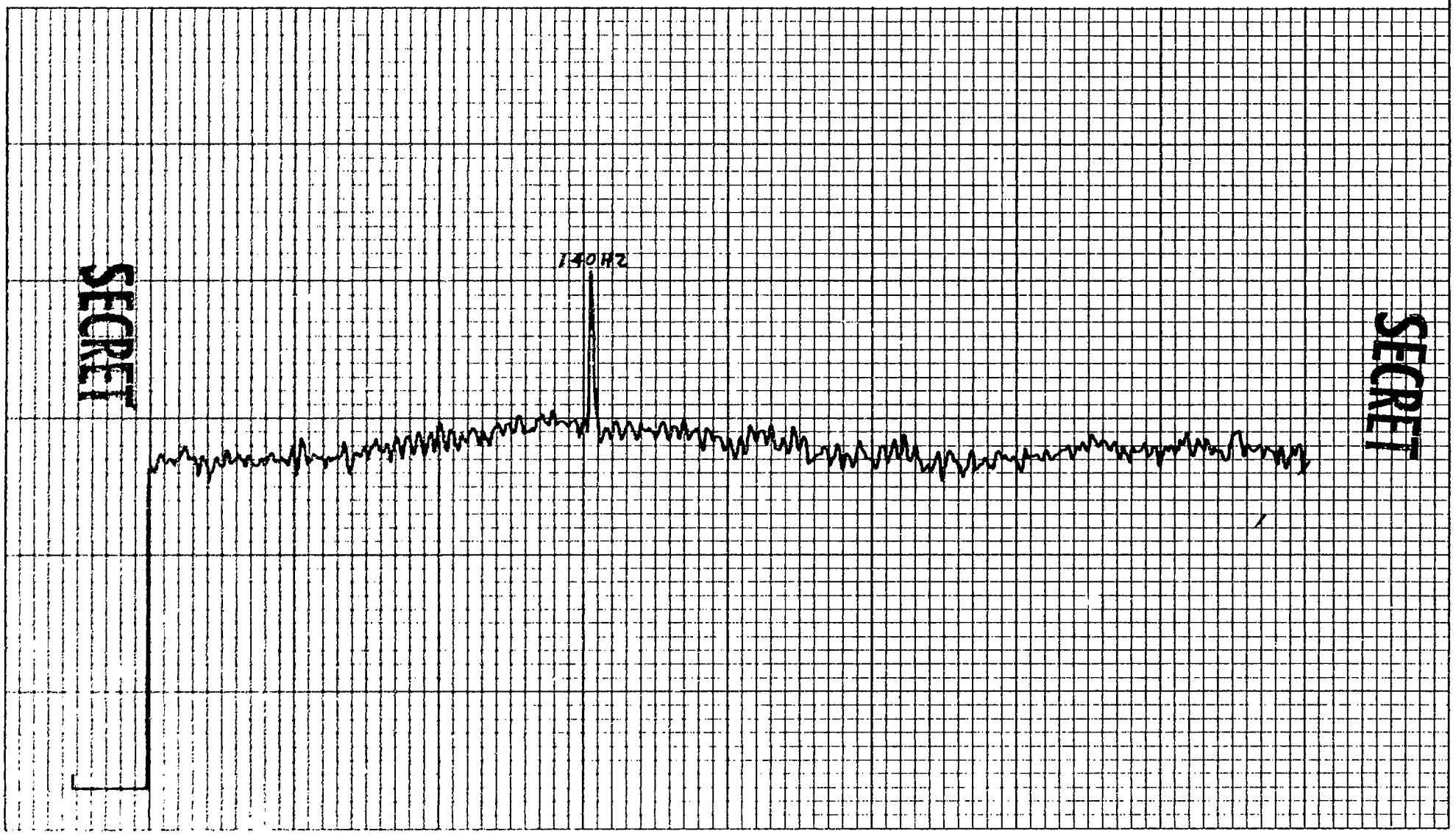


K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 3-16 - 1148 (47)
OMNI SPECTRUM (ELEMENT 43)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M24 INDEX 1980
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

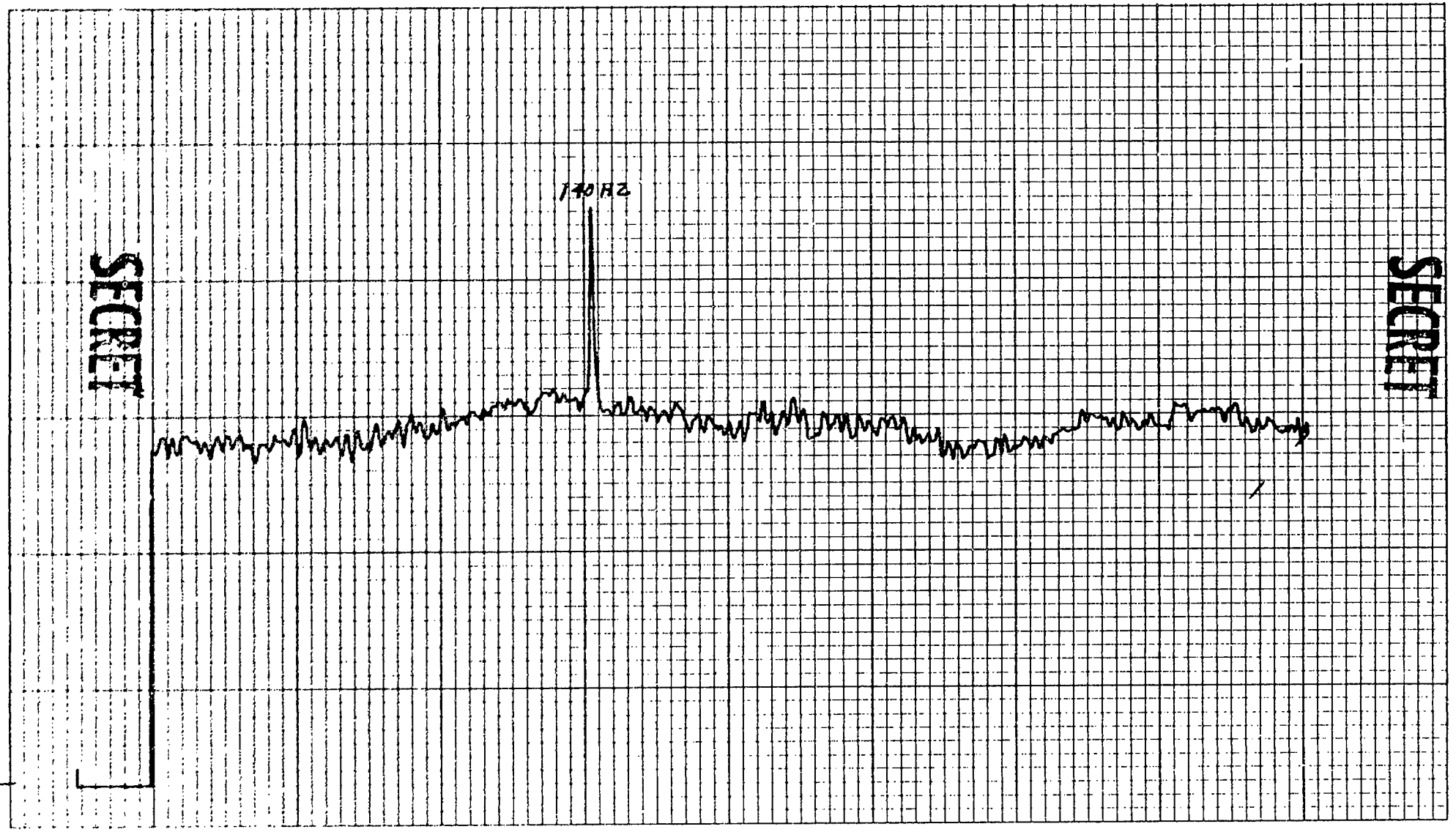
CONTROL: 346-1148 (48)
OMNI SPECTRUM (ELEMENT 45)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 346-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M24 INDEX 1148

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING

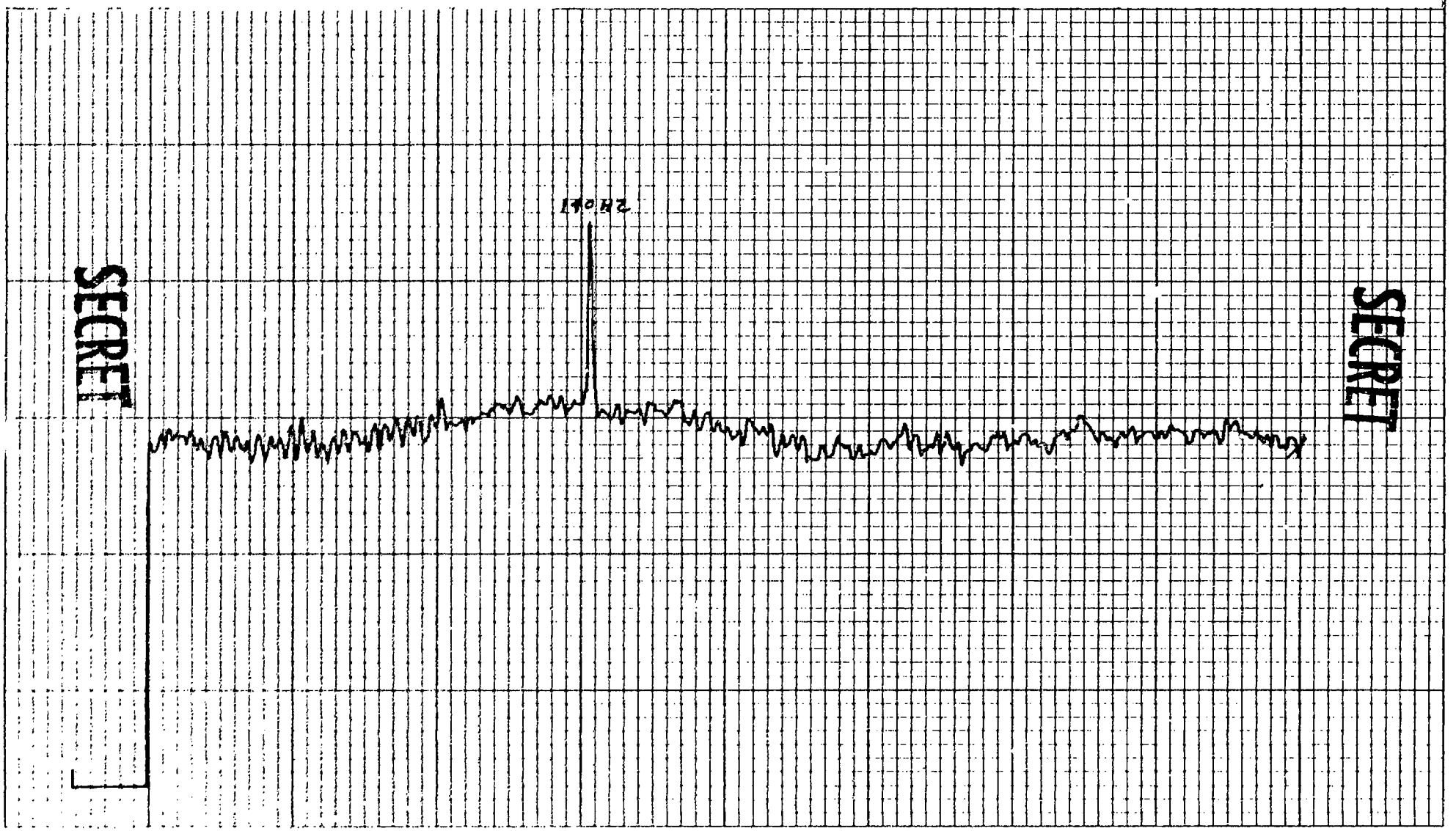


K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 3-16 - 1148 (49)
OMNI SPECTRUM(ELEMENT 47)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M24 INDEX 1980
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



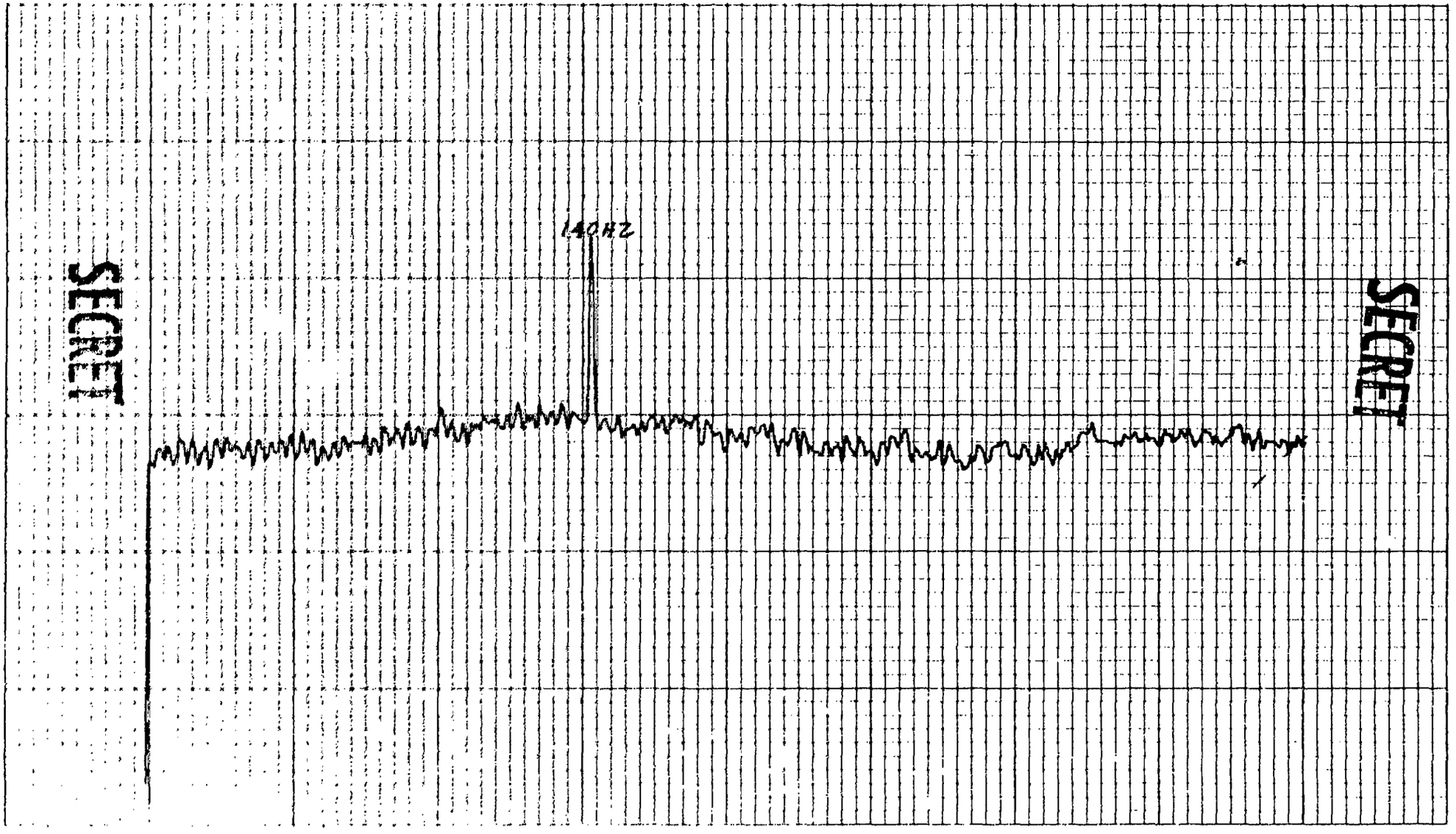
K&E 10 X 10 TO THE INCH • 5 TO INCH
KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

CONTROL: 3-16 - 1148 (50)
OMNI SPECTRUM (ELEMENT 49)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M24 INDEX 1980
INTEGRATION TIME 320 SECS ATTEN: - DB
FILTER WTG: HANNING



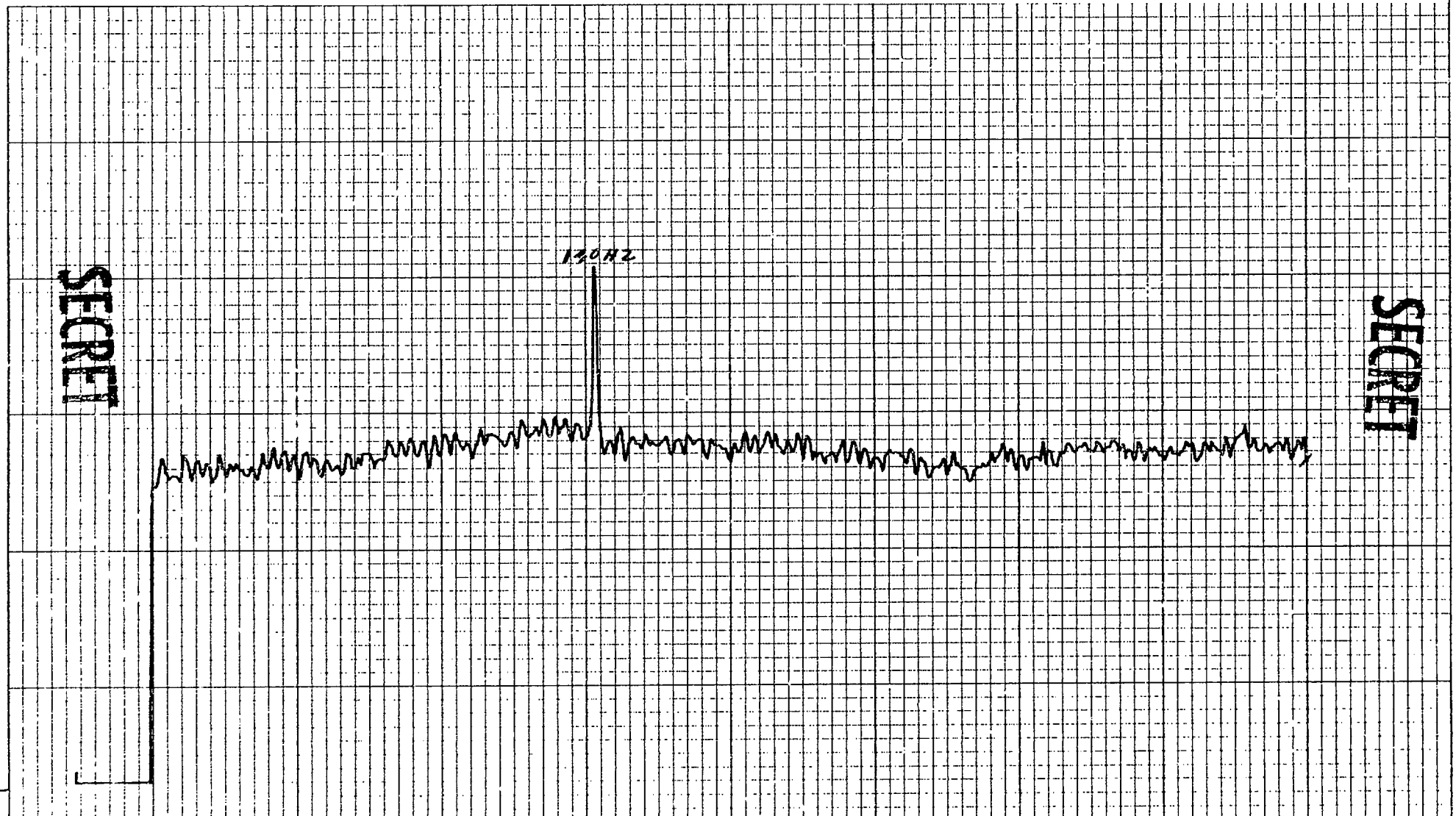
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 3-16 -1148 (51)
OMNI SPECTRUM(ELEMENT 51)
EXERCISE:BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 -1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M24 INDEX 1980
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING

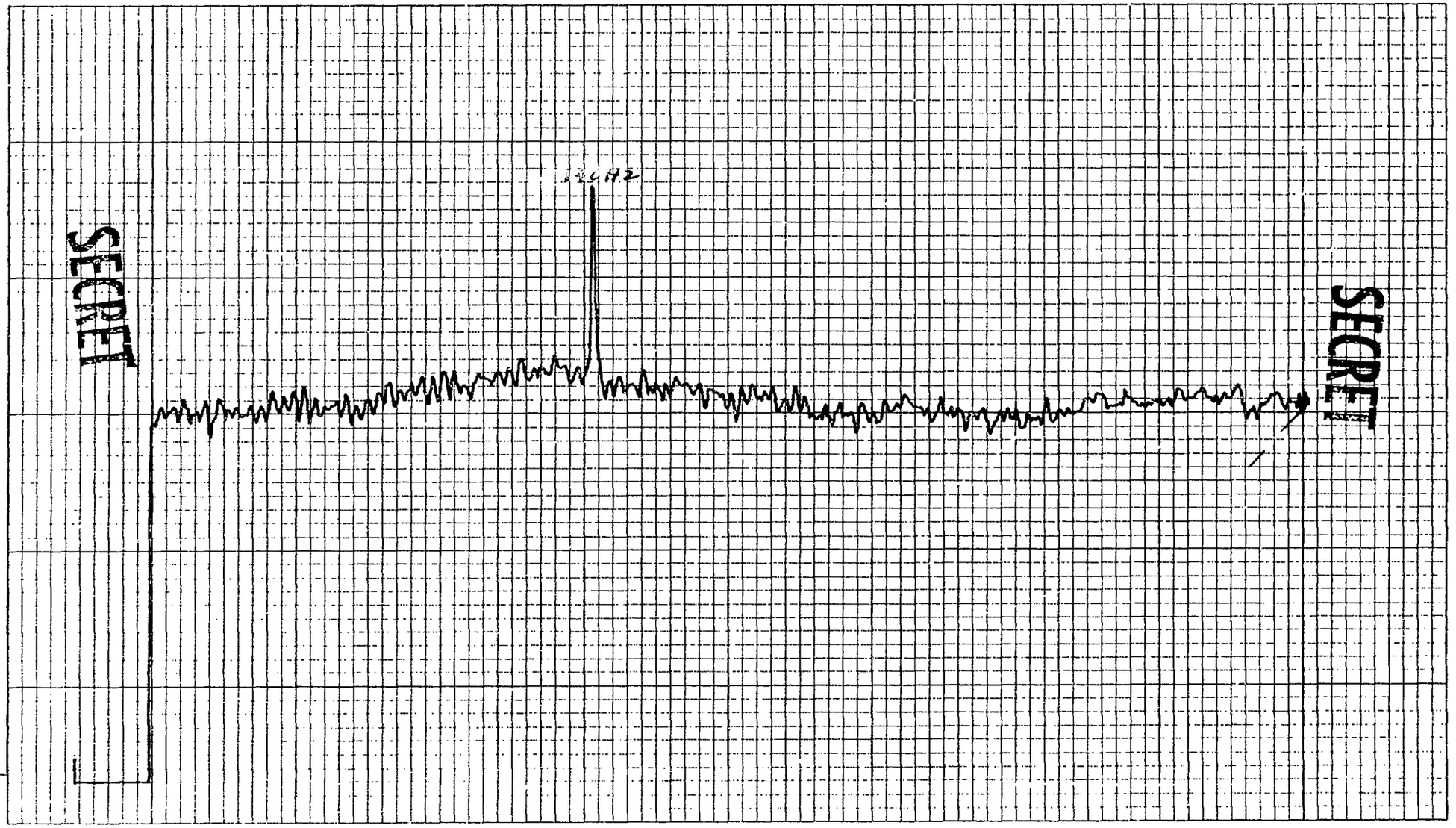


K+E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 3-16 - 1148 (52)
OMNI SPECTRUM (ELEMENT 52)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M24 INDEX 1980
INTEGRATION TIME 320 SECS ATTEN: - DB
FILTER WTG: HANNING



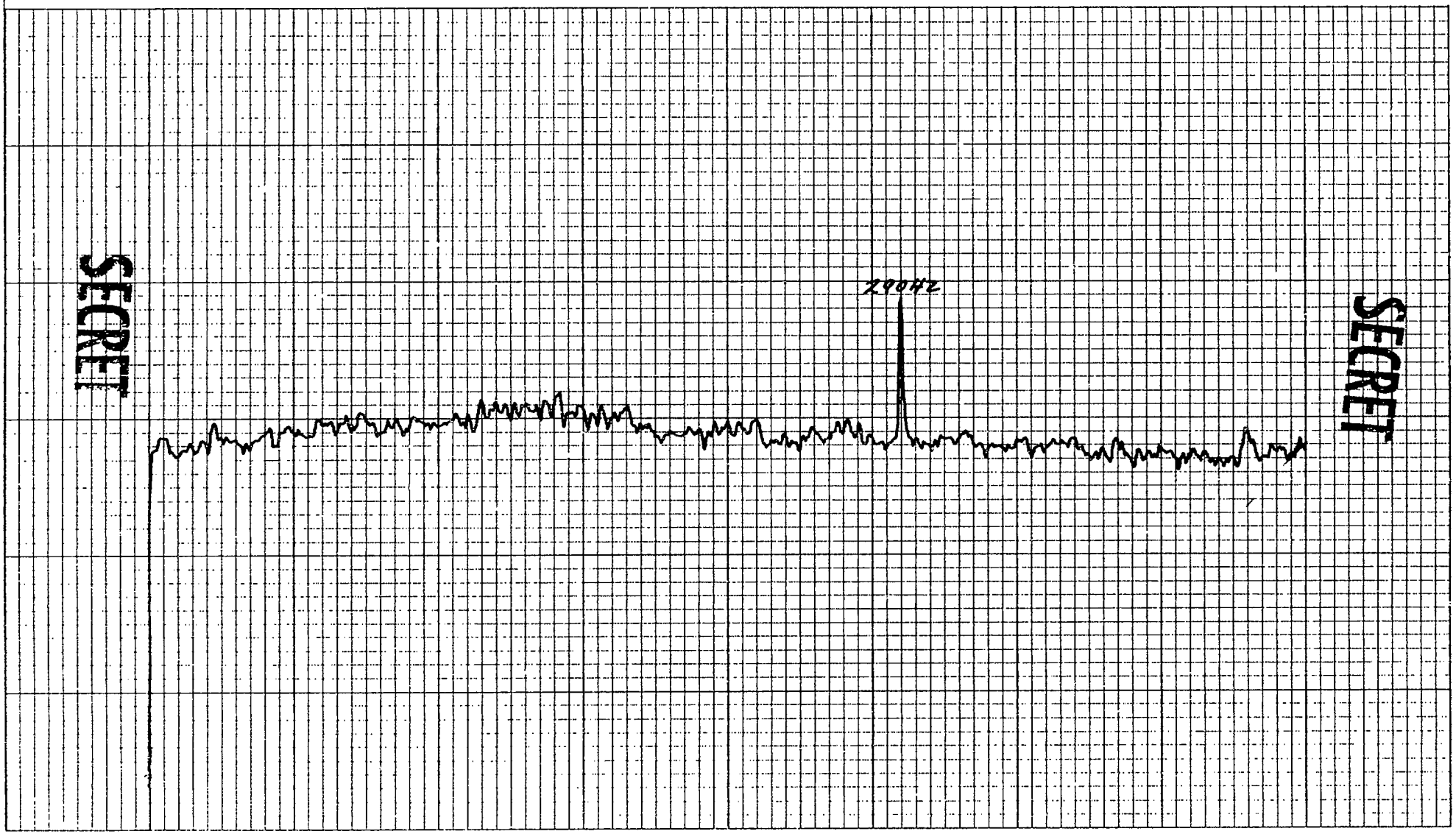
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 3-16 - 1148 (1)
OMNI SPECTRUM(ELEMENT 2)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M24 INDEX 1980
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

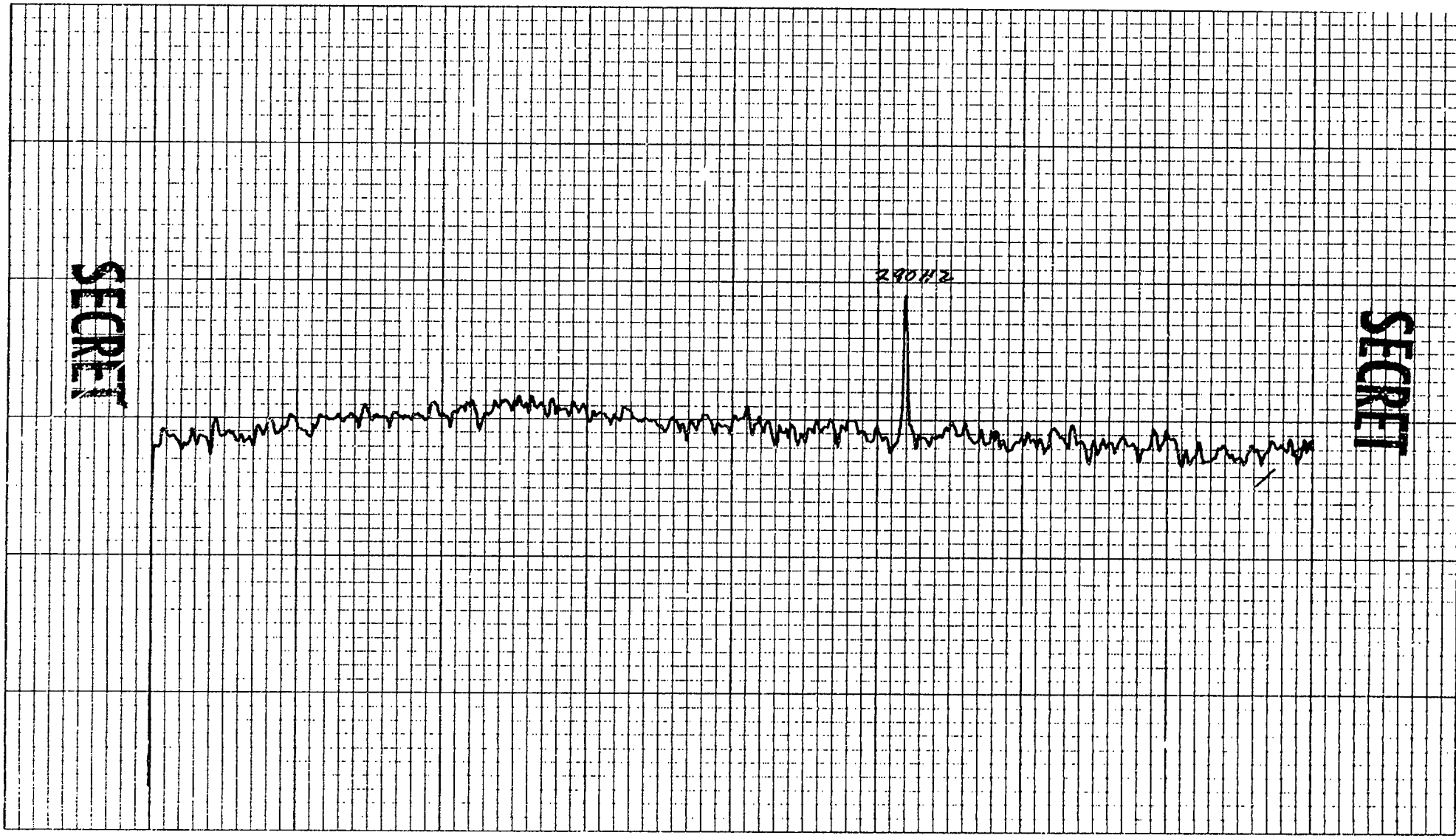
CONTROL: 3-16-1148 (2)
OMNI SPECTRUM (ELEMENT 4)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: 1124 INDEX 1980

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



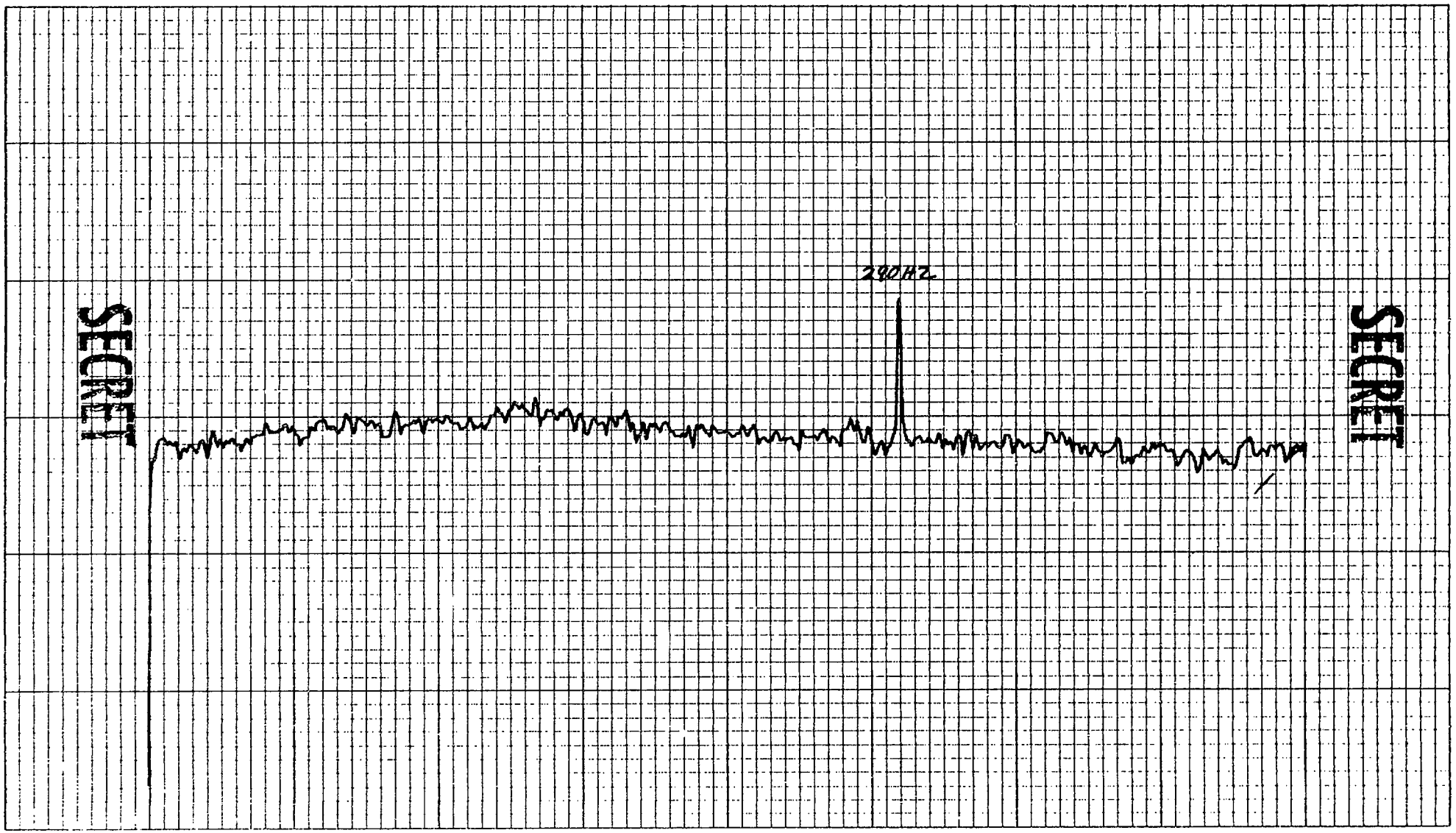
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 3-16-1148 (3)
OMNI SPECTRUM (ELEMENT 6)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 -1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M24 INDEX/980
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



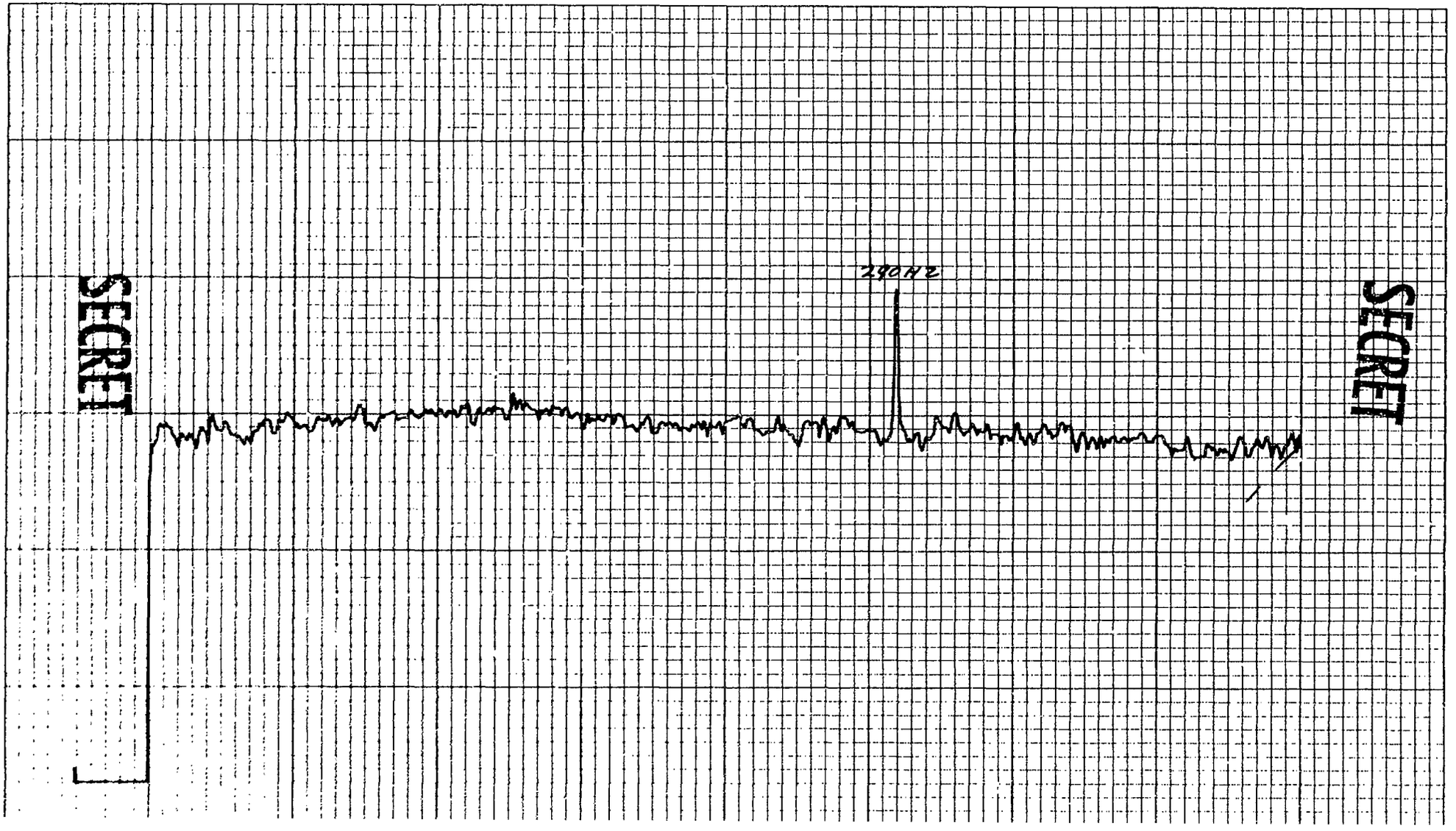
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 3-16-1148 (4)
OMNI SPECTRUM(ELEMENT 9)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M24 INDEX 1980
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



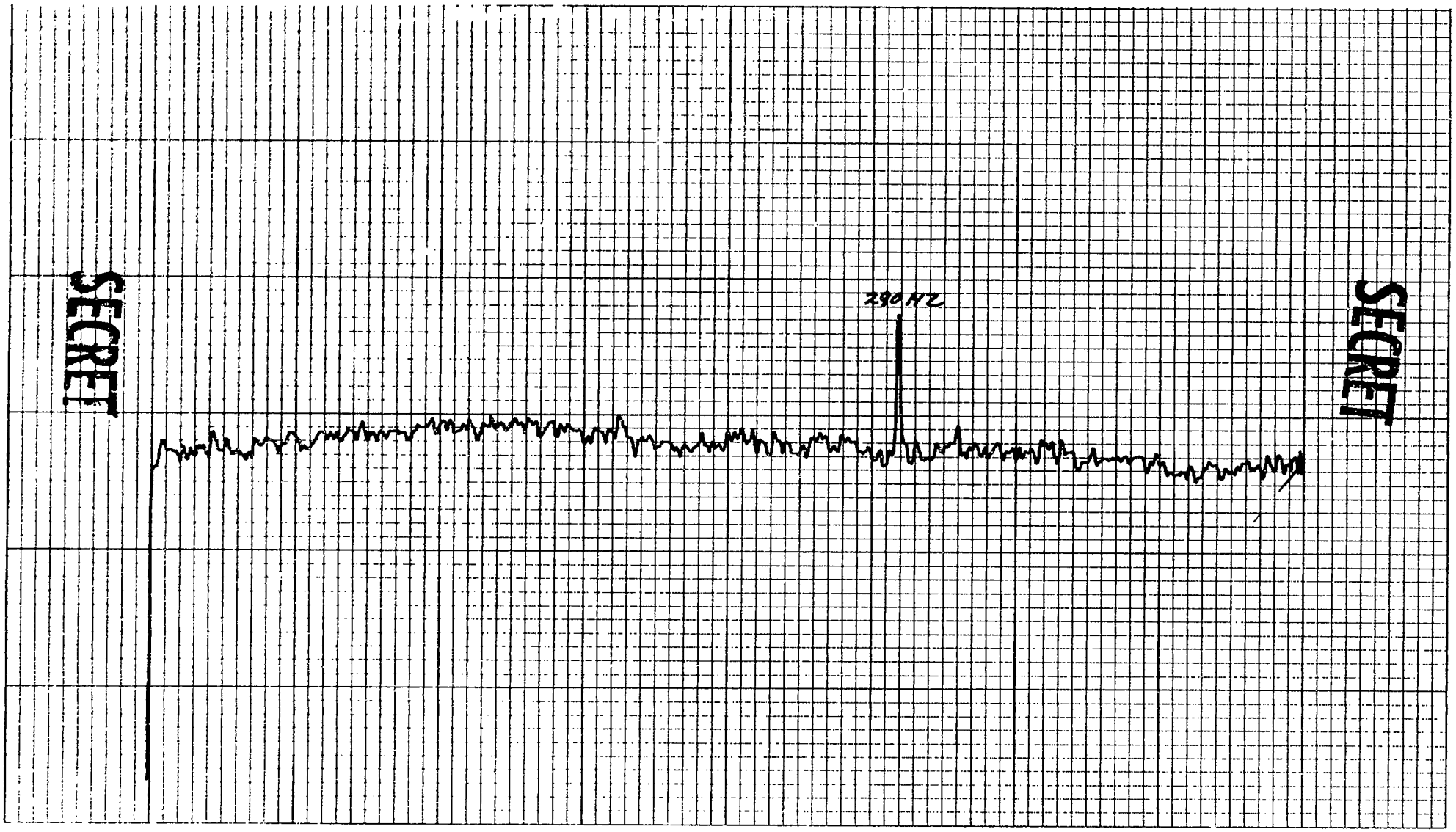
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

CONTROL: 376-1148 (5)
OMNI SPECTRUM (ELEMENT 10)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M24 INDEX 1980
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

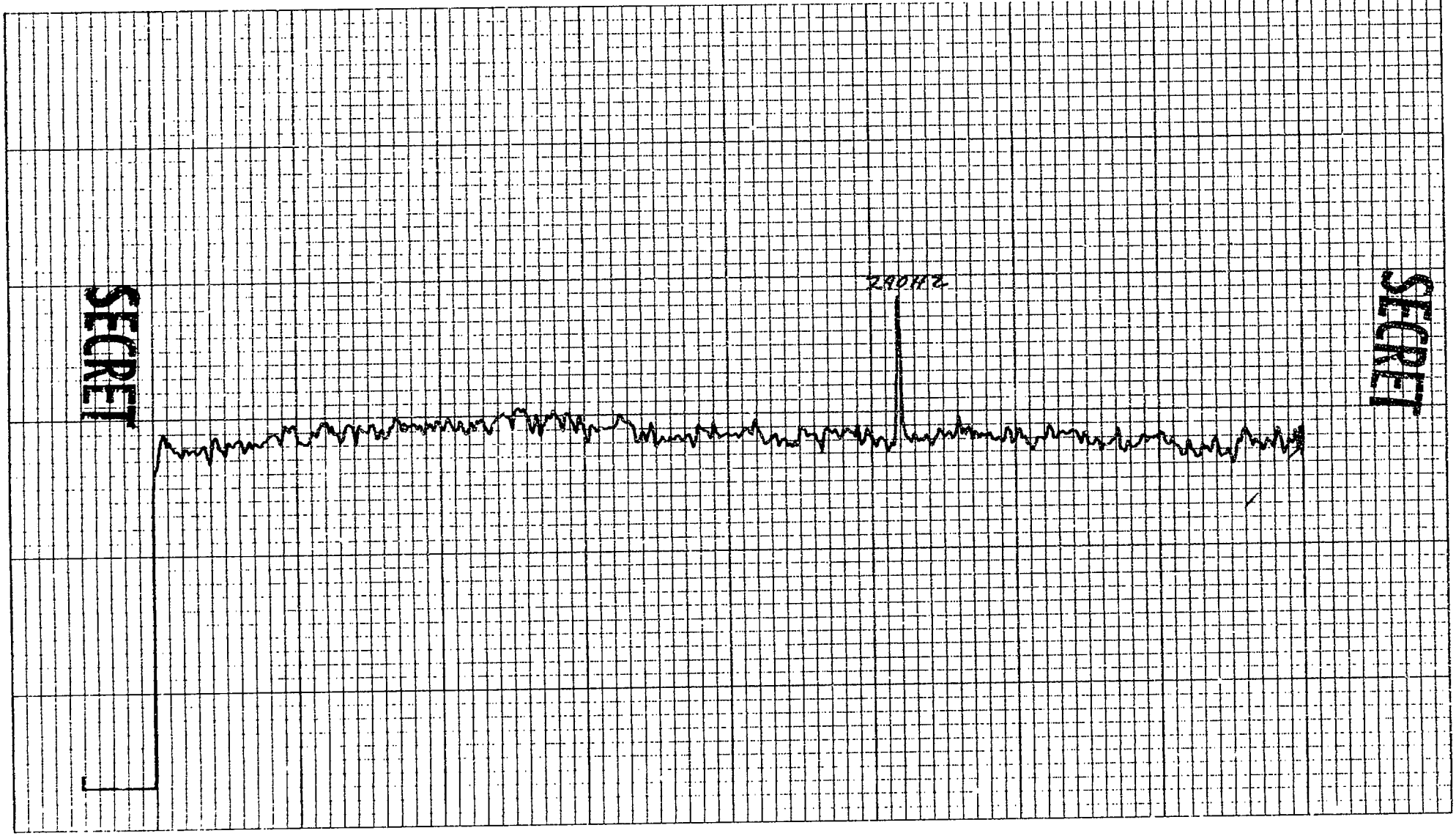
CONTROL: 3-16-1148 (6)
OMNI SPECTRUM(ELEMENT 12)
EXERCISE:BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-16-77-1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: 424 INDEX 185°

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING

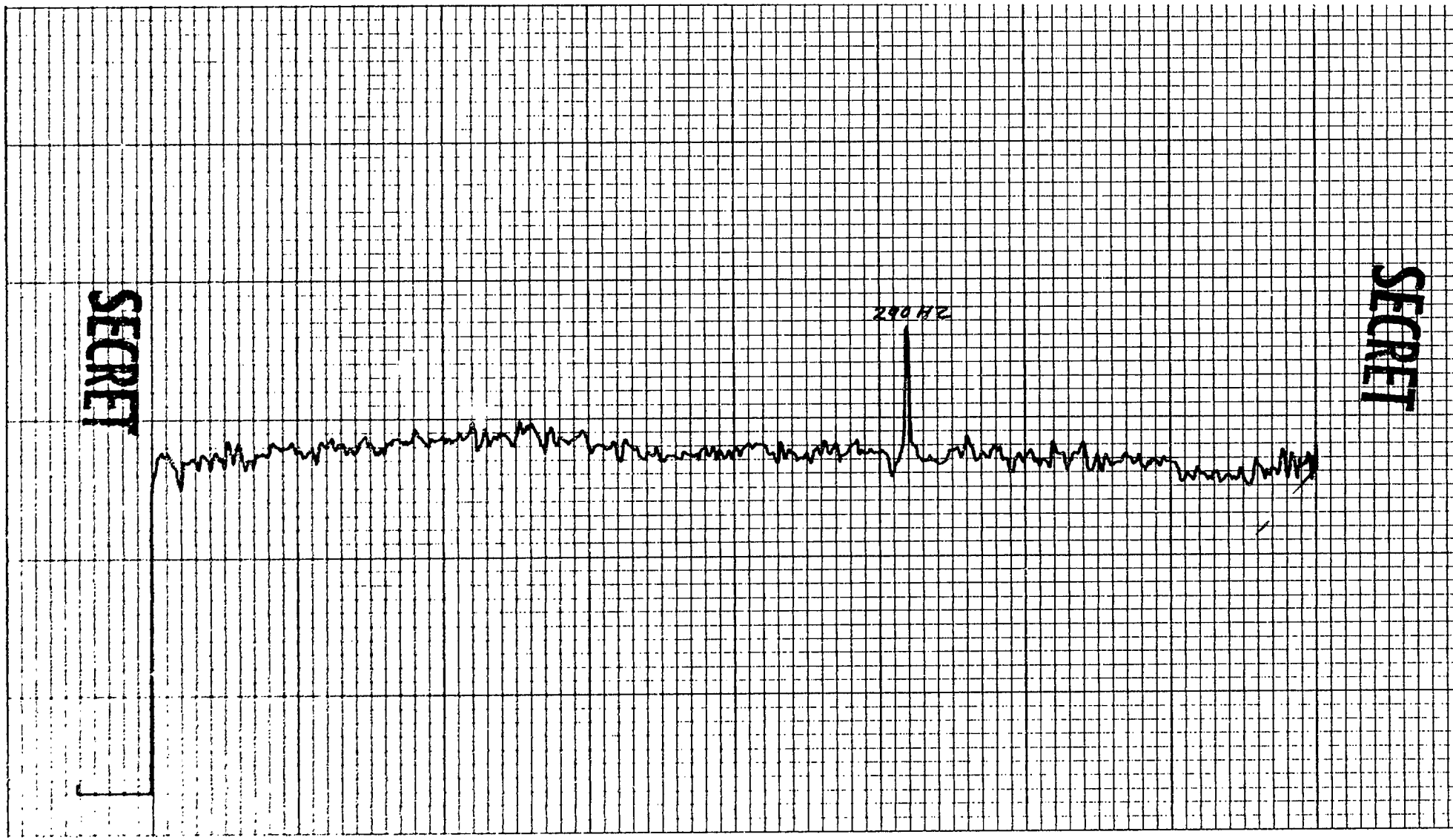


K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 3-16 - 1148 (7)
OMNI SPECTRUM(ELEMENT 14)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M24 INDEX 1980
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

CONTROL: 3-16-1148 (6)
OMNI SPECTRUM(ELEMENT 16)
EXERCISE:BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M24 INDEX 19FC

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING

K&E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 3-16-1148 (9)
OMNI SPECTRUM(ELEMENT 19)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 -1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

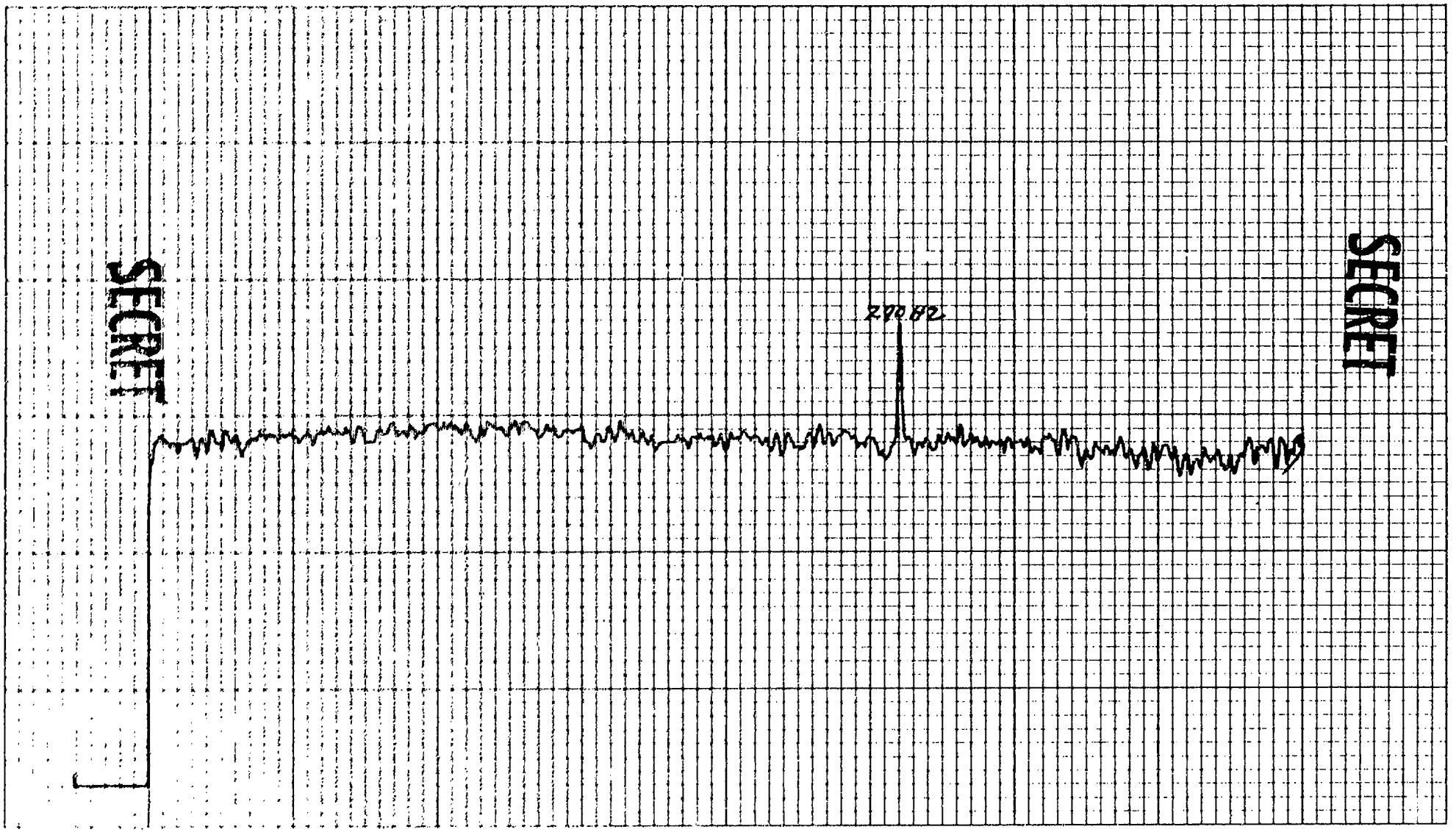
REEL: M22 INDEX 1980
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING

K&E 10 X 10 TO THE INCH • 5 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 3-16-1148 (10)
OMNI SPECTRUM (ELEMENT 20)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M24 INDEX 1980
INTEGRATION TIME 320 SECS ATTEN: ~ DB
FILTER WTG: HANNING

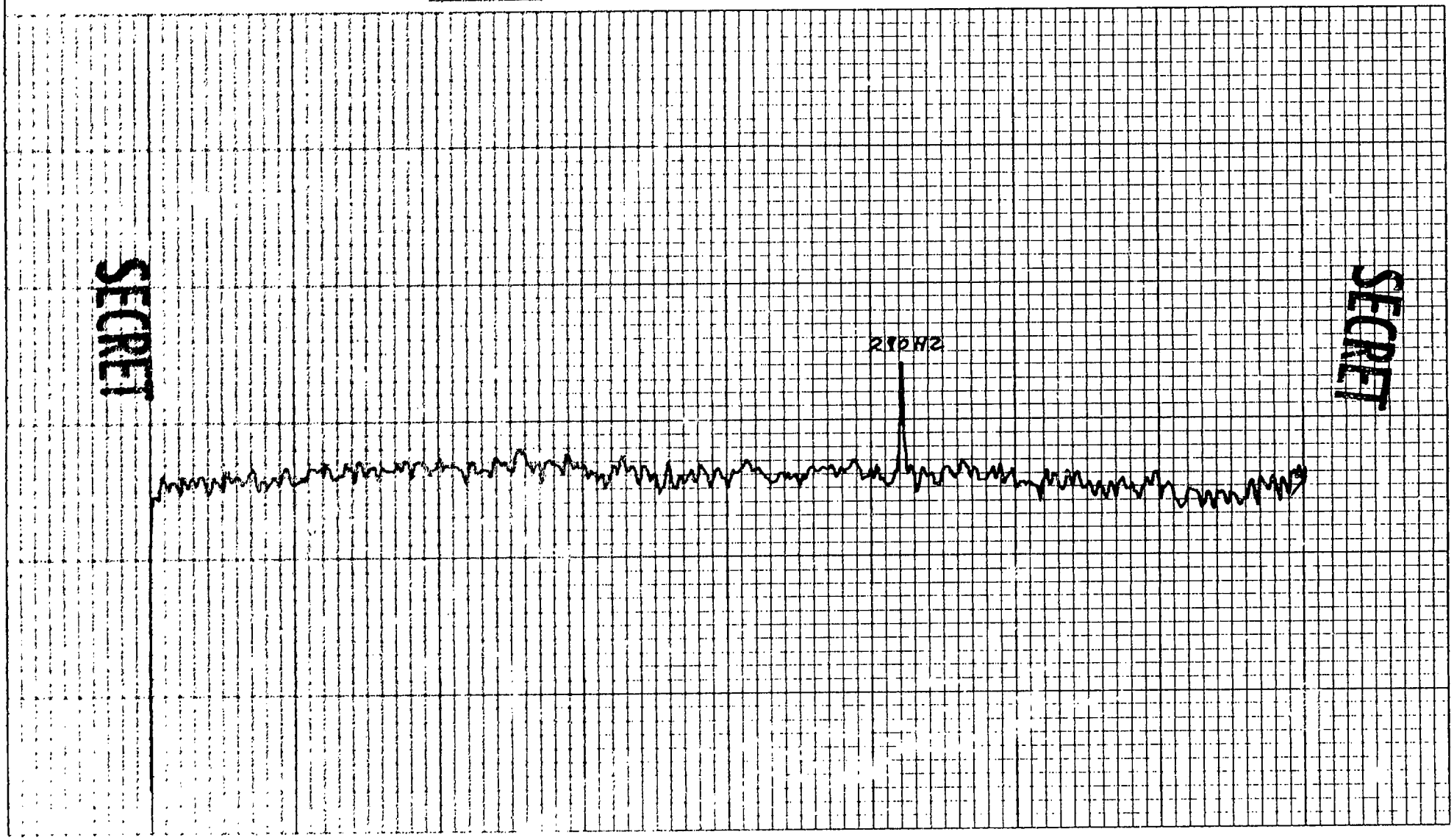


K&E 10 X 10 TO THE INCH • 5 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 3-16-1148 (11)
OMNI SPECTRUM (ELEMENT 23)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M24 INDEX 1980
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



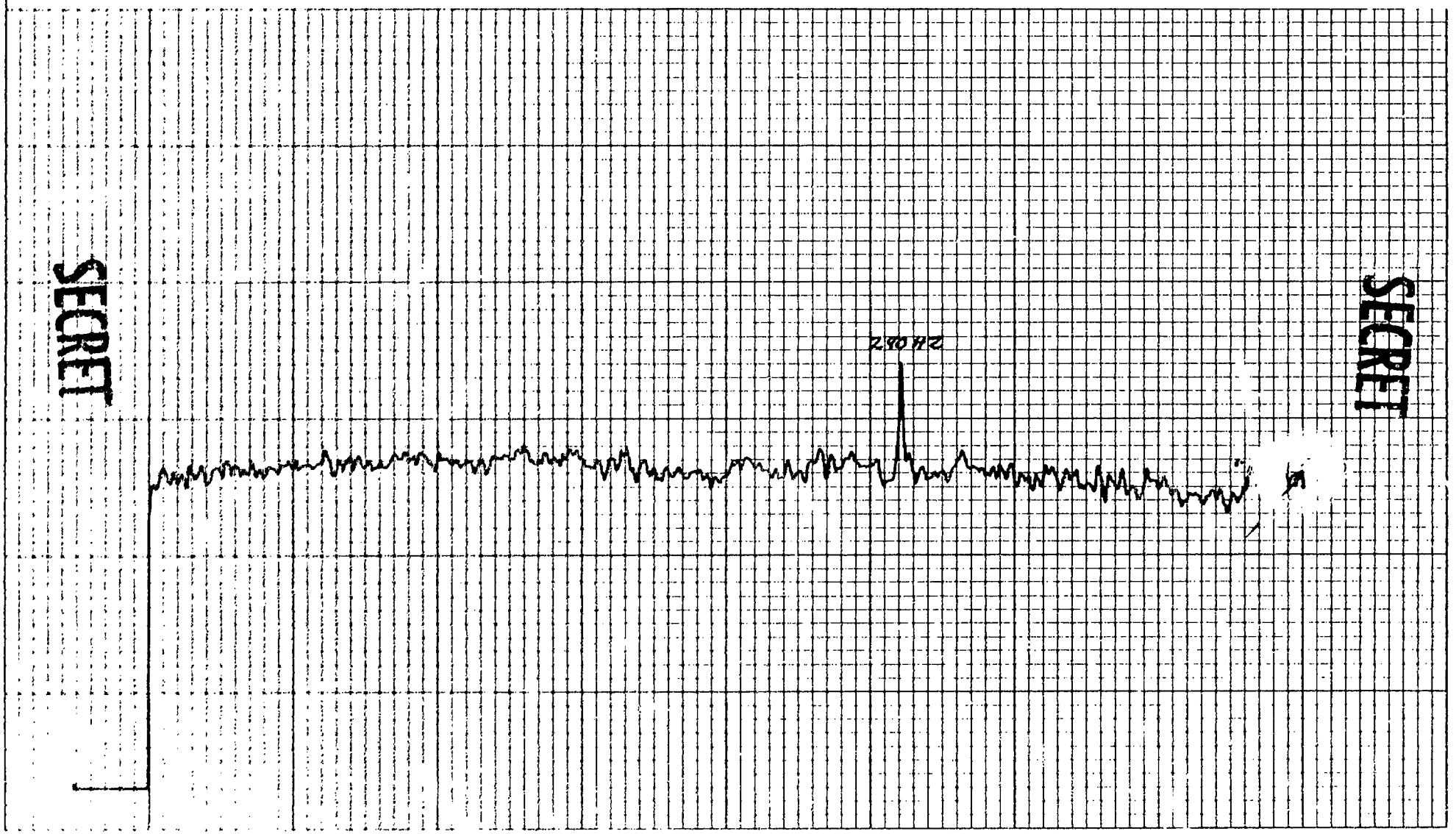
K&E 10 X 10 TO THE INCH • 5 X 10 INCHES KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

CONTROL: 346 - 1148 (12)
OMNI SPECTRUM (ELEMENT 24)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
I ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 346-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

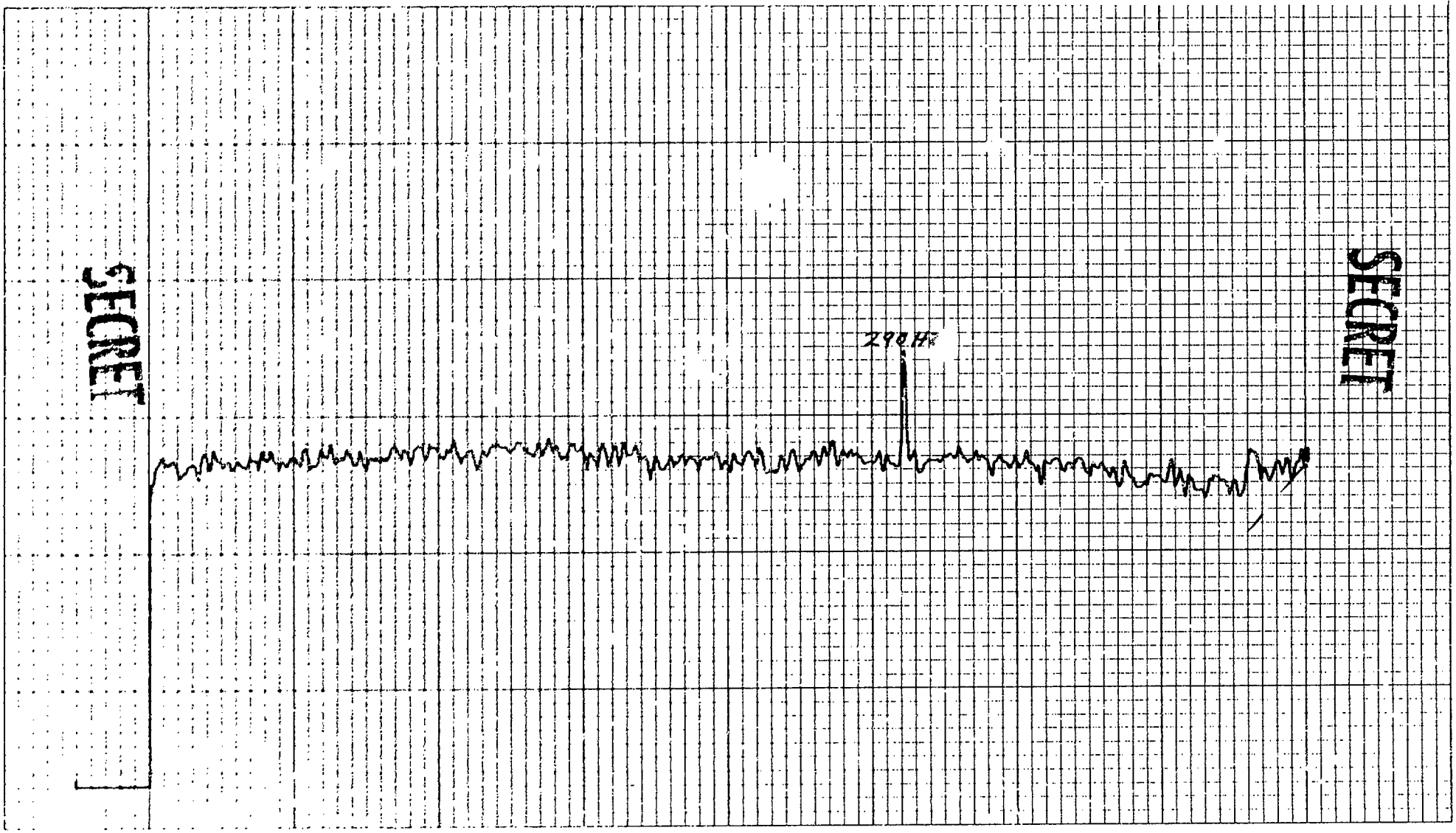
REEL: M24 INDEX 1980
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



CONTROL: 3-16 -1148 (13)
OMNI SPECTRUM (ELEMENT 26)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 -1149 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M24 INDEX 1980
INTEGRATION TIME 300 SECS ATTEN: — DB
FILTER WTG: HANNING



10 X 10 TO THE INCH
KEUFFEL & ESSER CO

46 0703

CONTROL: 3-16 - 1148 (14)
OMNI SPECTRUM(ELEMENT 29)
EXERCISE:BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M24 INDEX 1980
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING

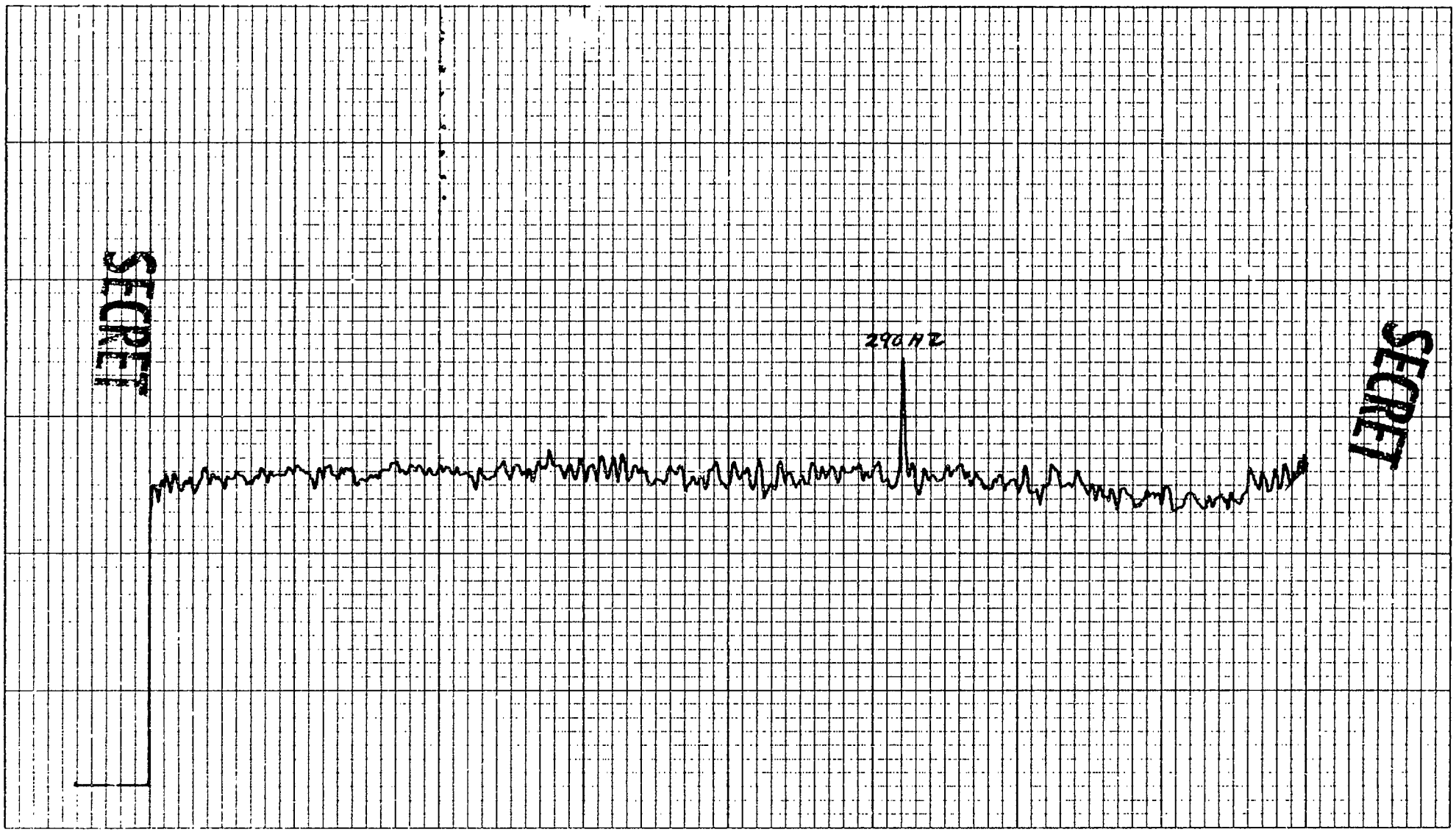
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 3-16-1148 (15)
OMNI SPECTRUM(ELEMENT 31)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M24 INDEX 1980
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING

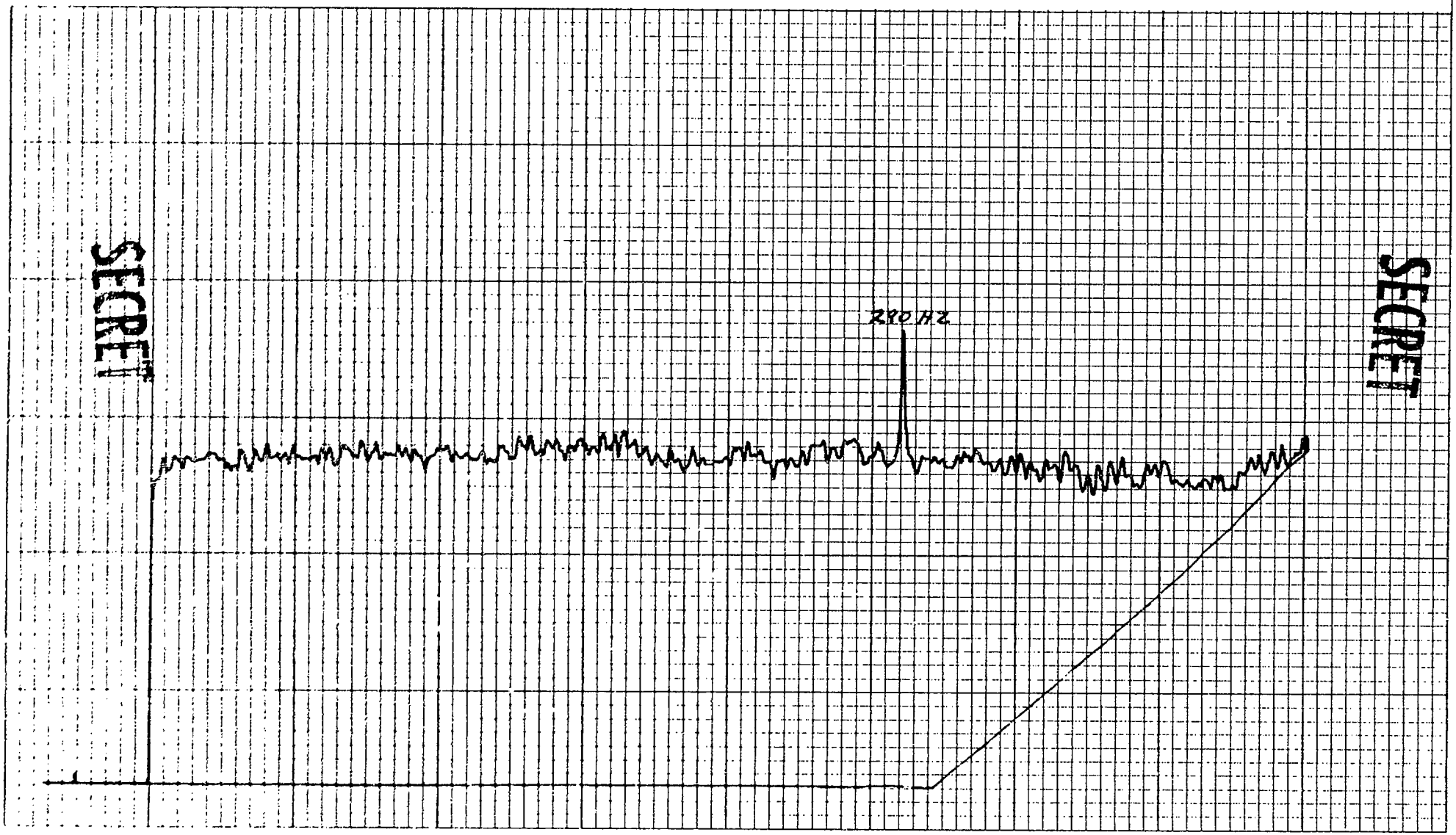


K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 3-16 -1148 (16)
OMNI SPECTRUM(ELEMENT 33)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 -1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M24 INDEX 1980
INTEGRATION TIME 320 SECS ATTEN: - DB
FILTER WTG: HANNING



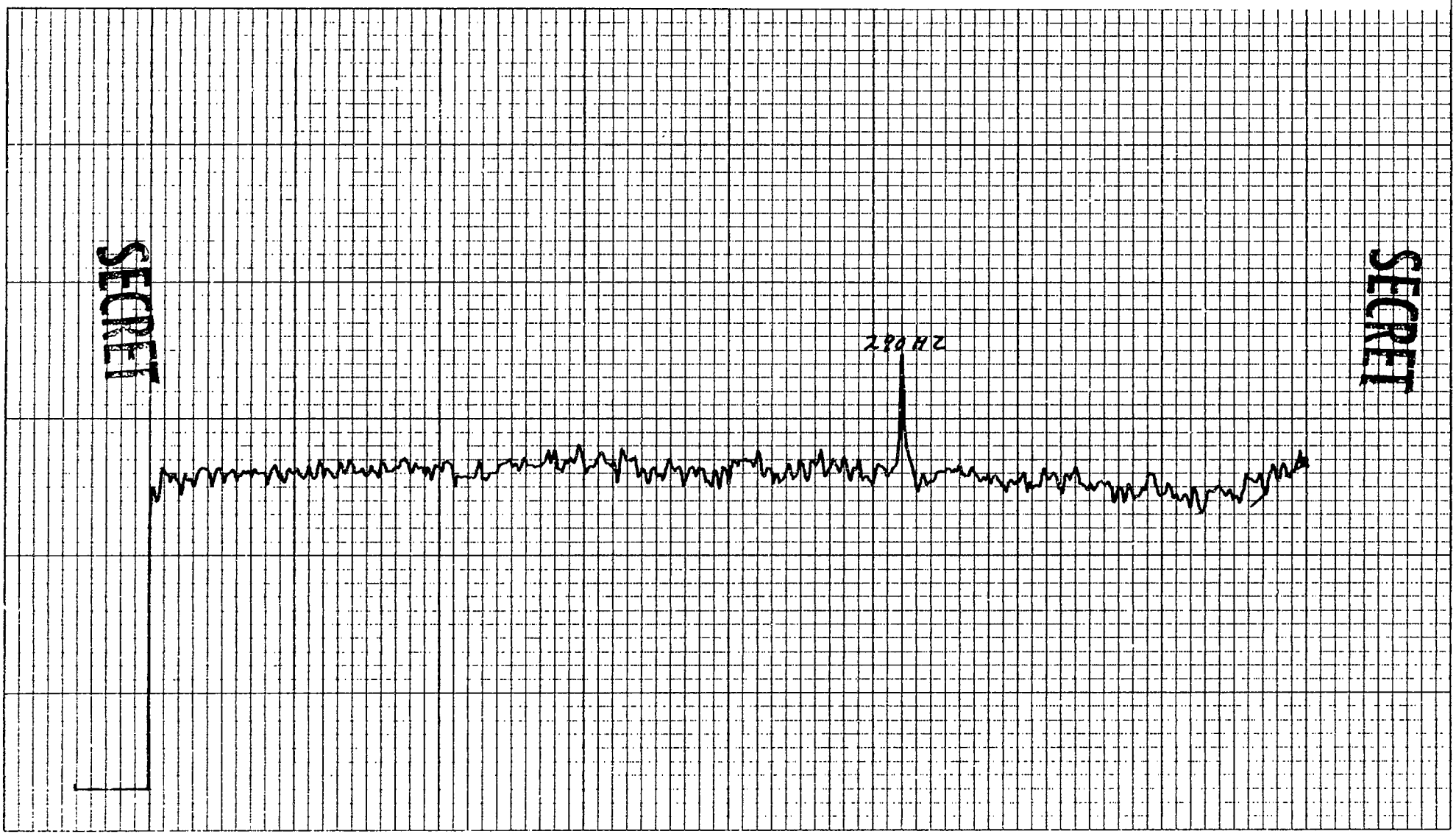
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

CONTROL: 3-16-1148 (17)
OMNI SPECTRUM (ELEMENT 35)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M24 INDEX 198c
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



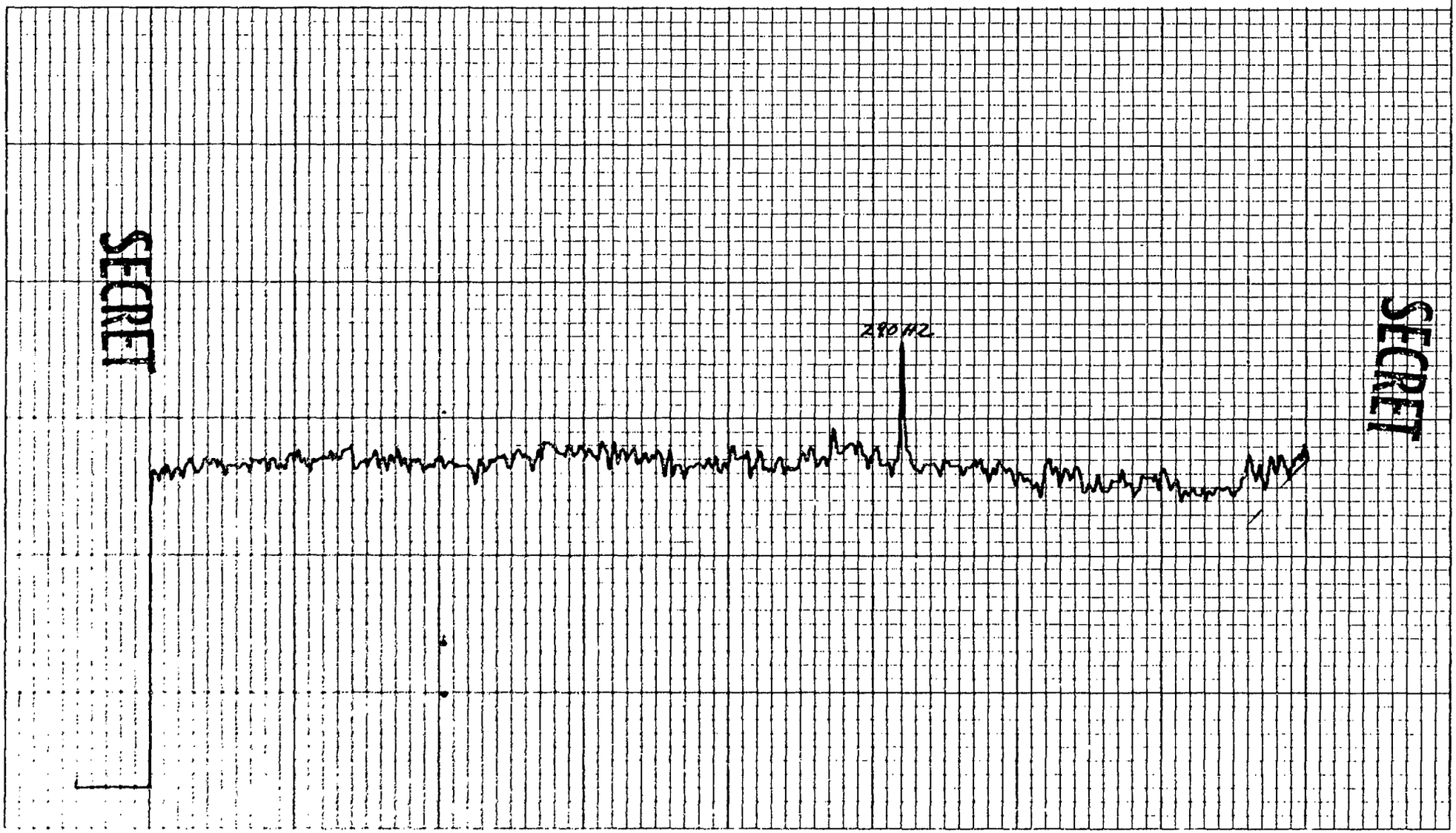
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 346 - 1148 (18)
OMNI SPECTRUM(ELEMENT 37)
EXERCISE:BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 346-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M24 INDEX 1850
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH KEUFFEL & ESSER CO.

46 0703

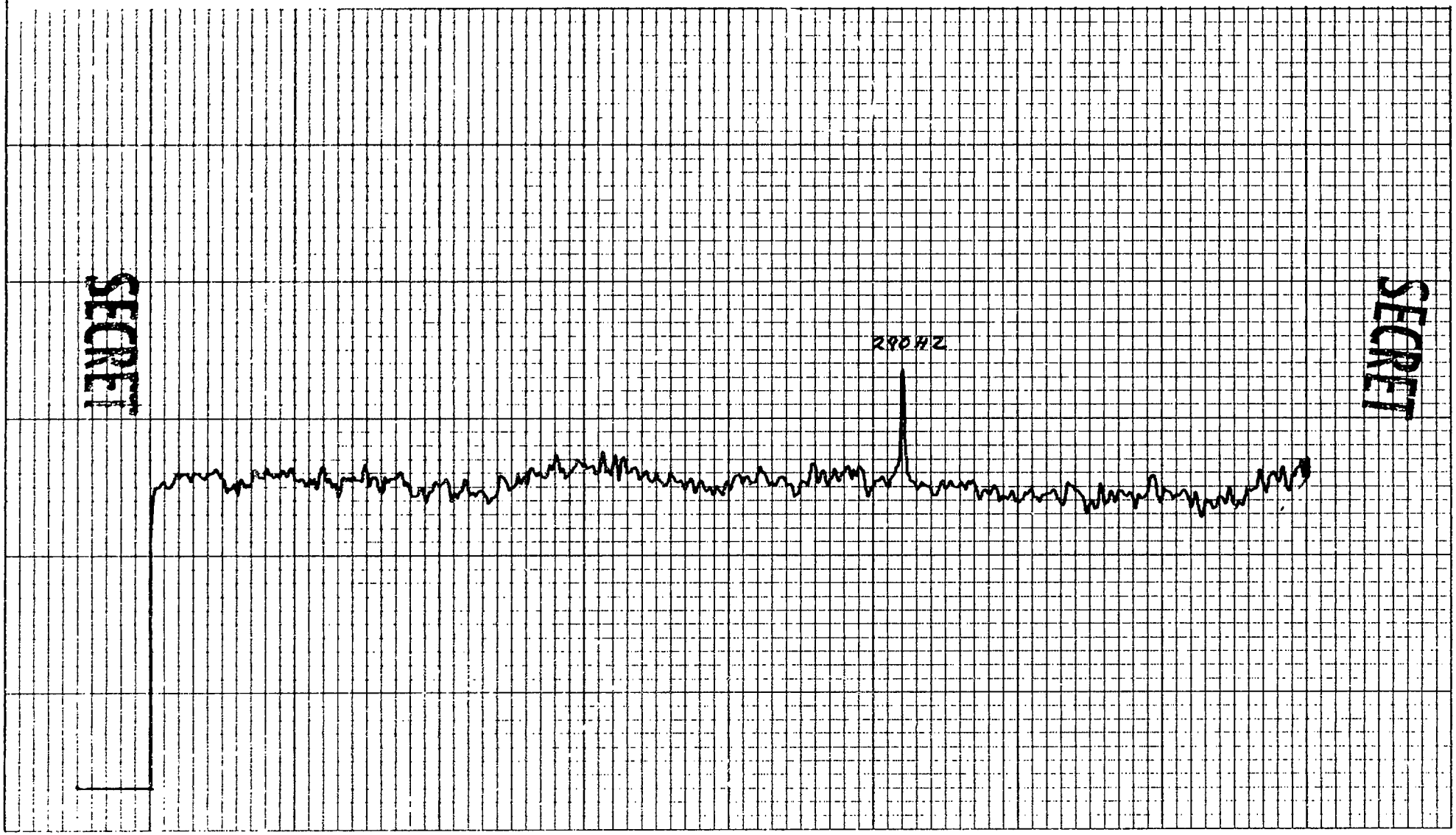
CONTROL: 3-16 -1148 (19)
OMNI SPECTRUM (ELEMENT 39)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-16-77 -1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M24 INDEX 1980

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



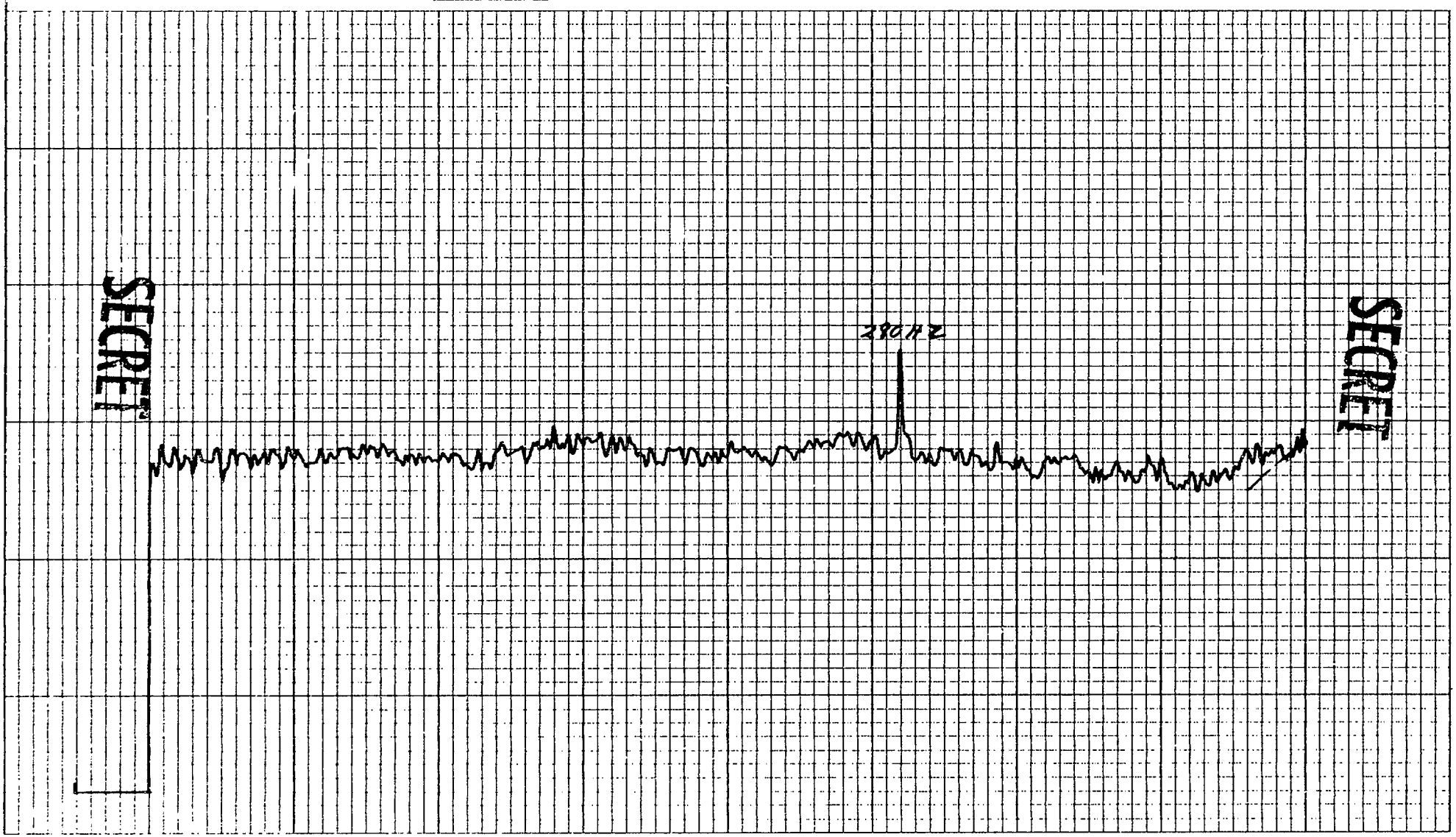
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

CONTROL: 3-16 - 1148 (20)
OMNI SPECTRUM(ELEMENT 41)
EXERCISE:BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M24 INDEX/960
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



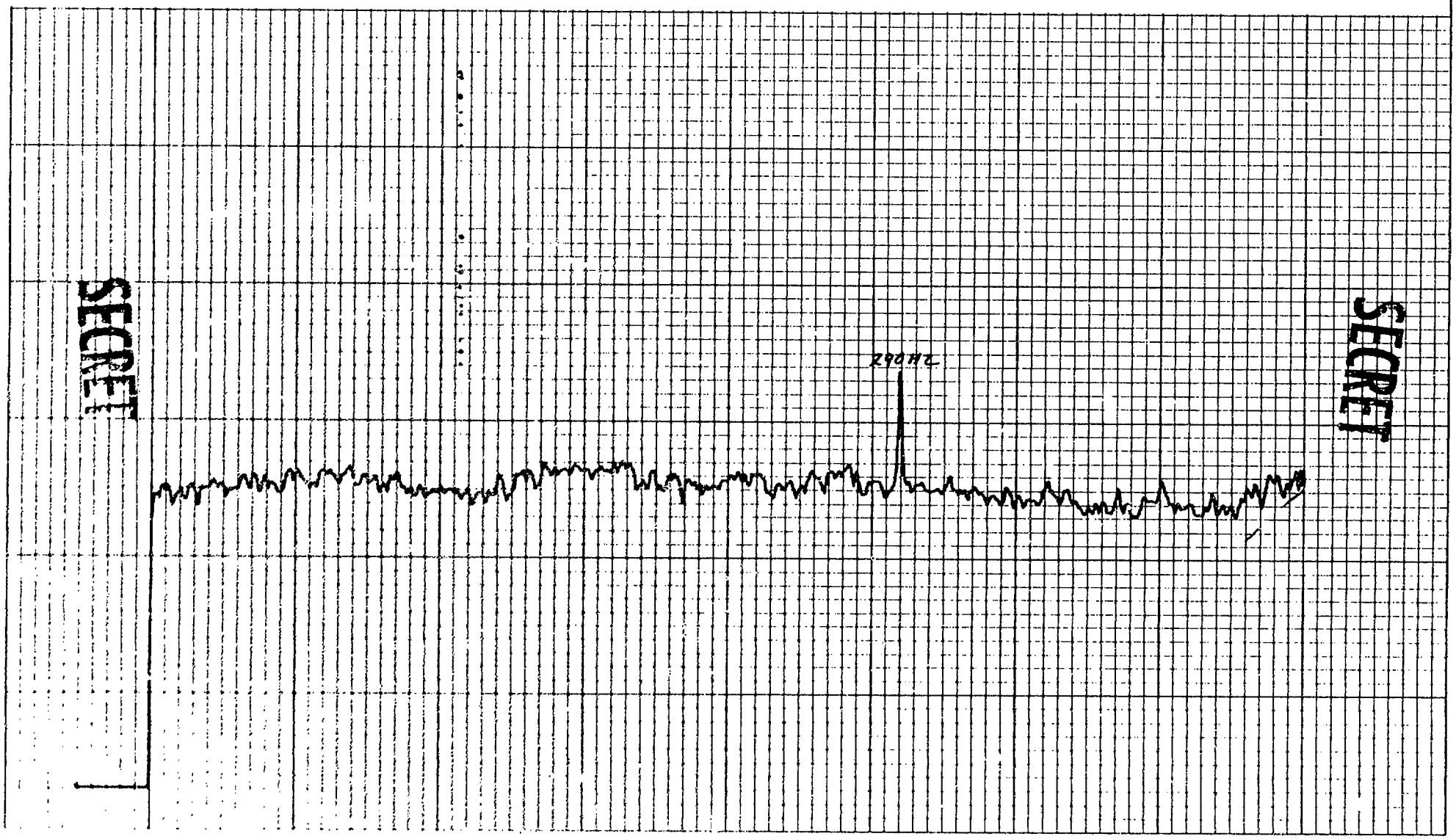
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 3-16 - 1148 (2/)
OMNI SPECTRUM (ELEMENT 43)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M24 INDEX 1980
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



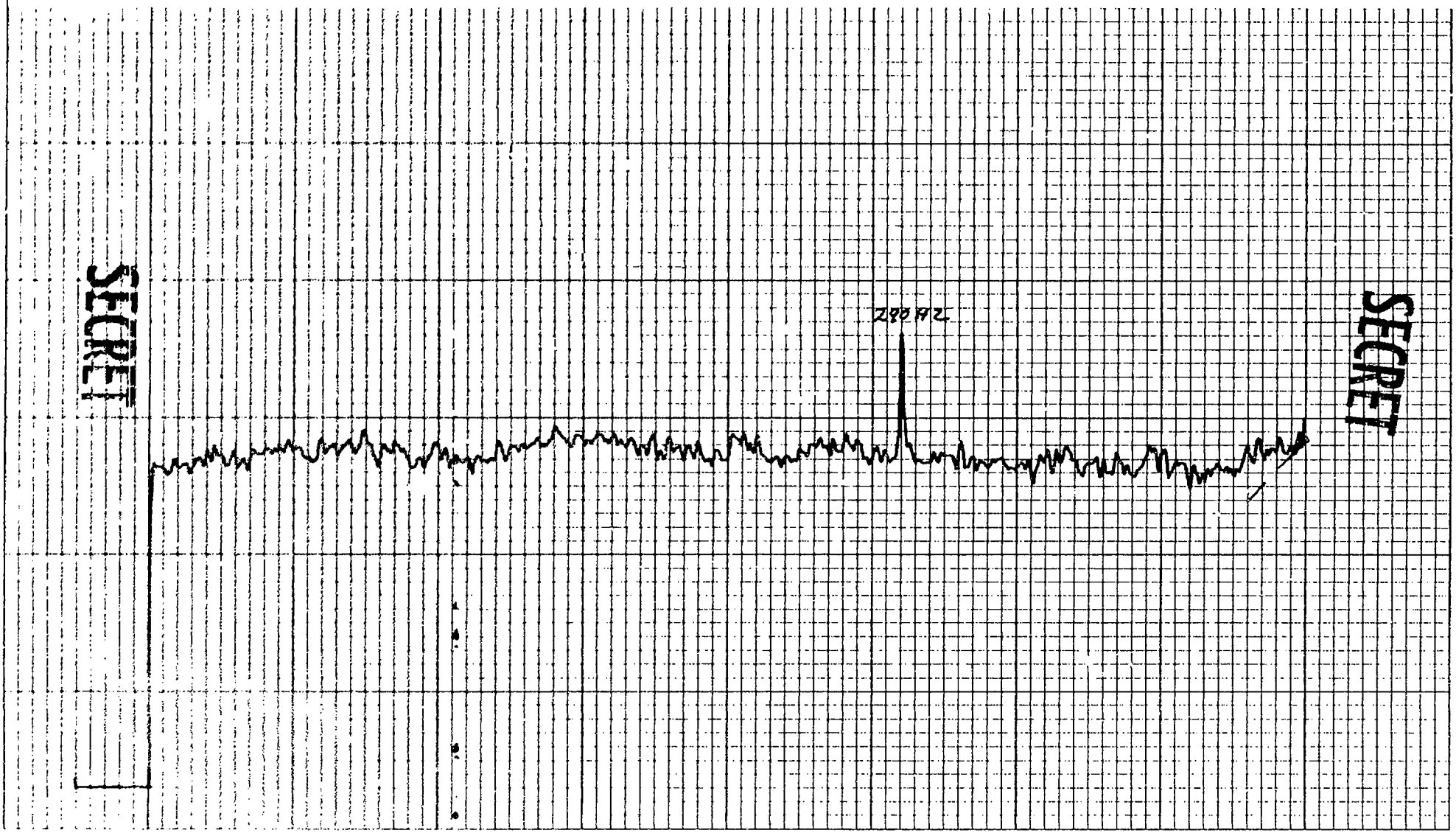
K&E 10 X 10 TO THE INCH • 5 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 3-16 -1148 (22)
OMNI SPECTRUM (ELEMENT 45)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 -1140 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M24 INDEX 1980
INTEGRATION TIME 320 SECS ATTEN: - DB
FILTER WTG: HANNING

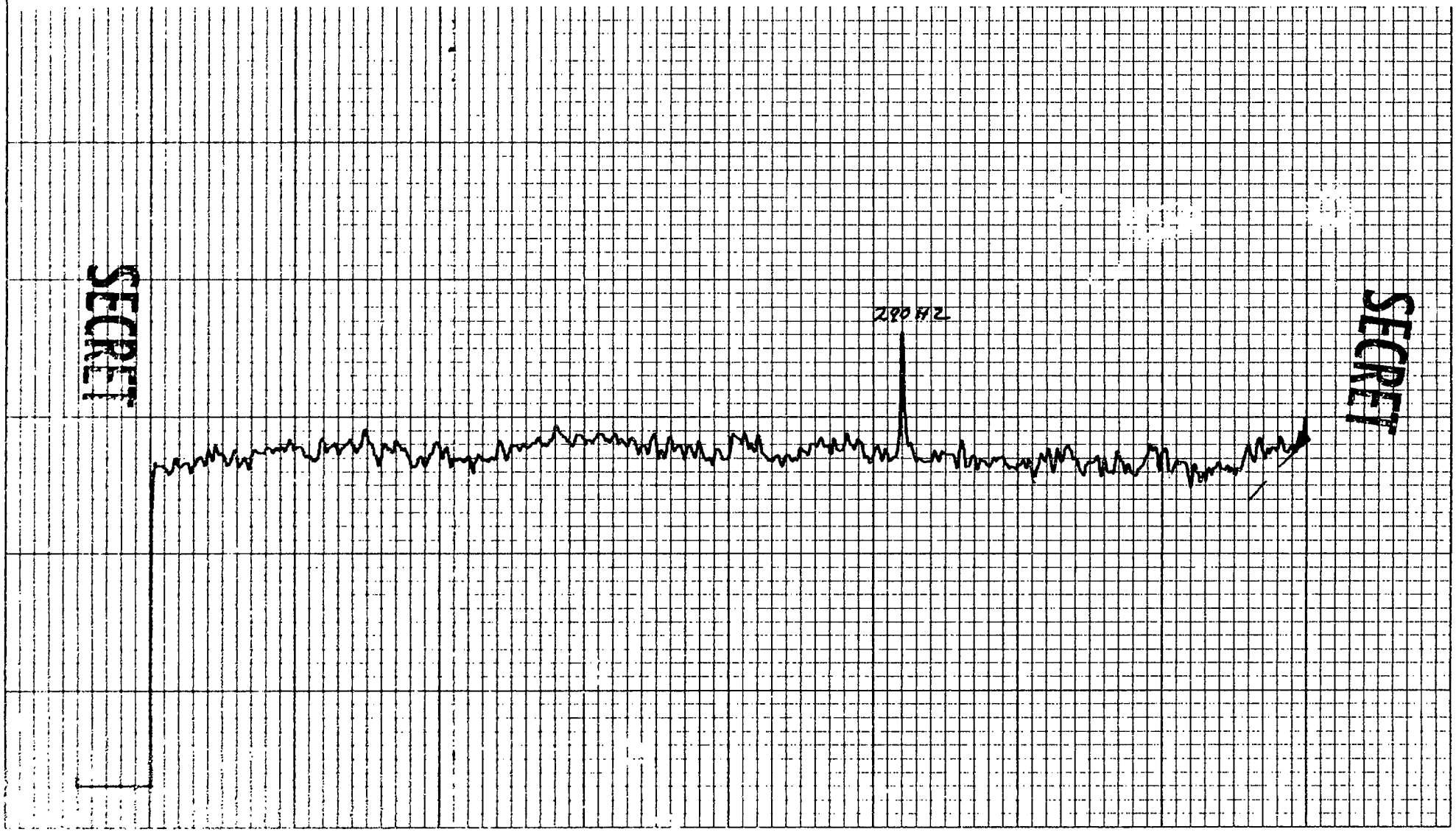


K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 3-16 -1148 (22)
OMNI SPECTRUM(ELEMENT 45)
EXERCISE:BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 -1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M24 INDEX 1980
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



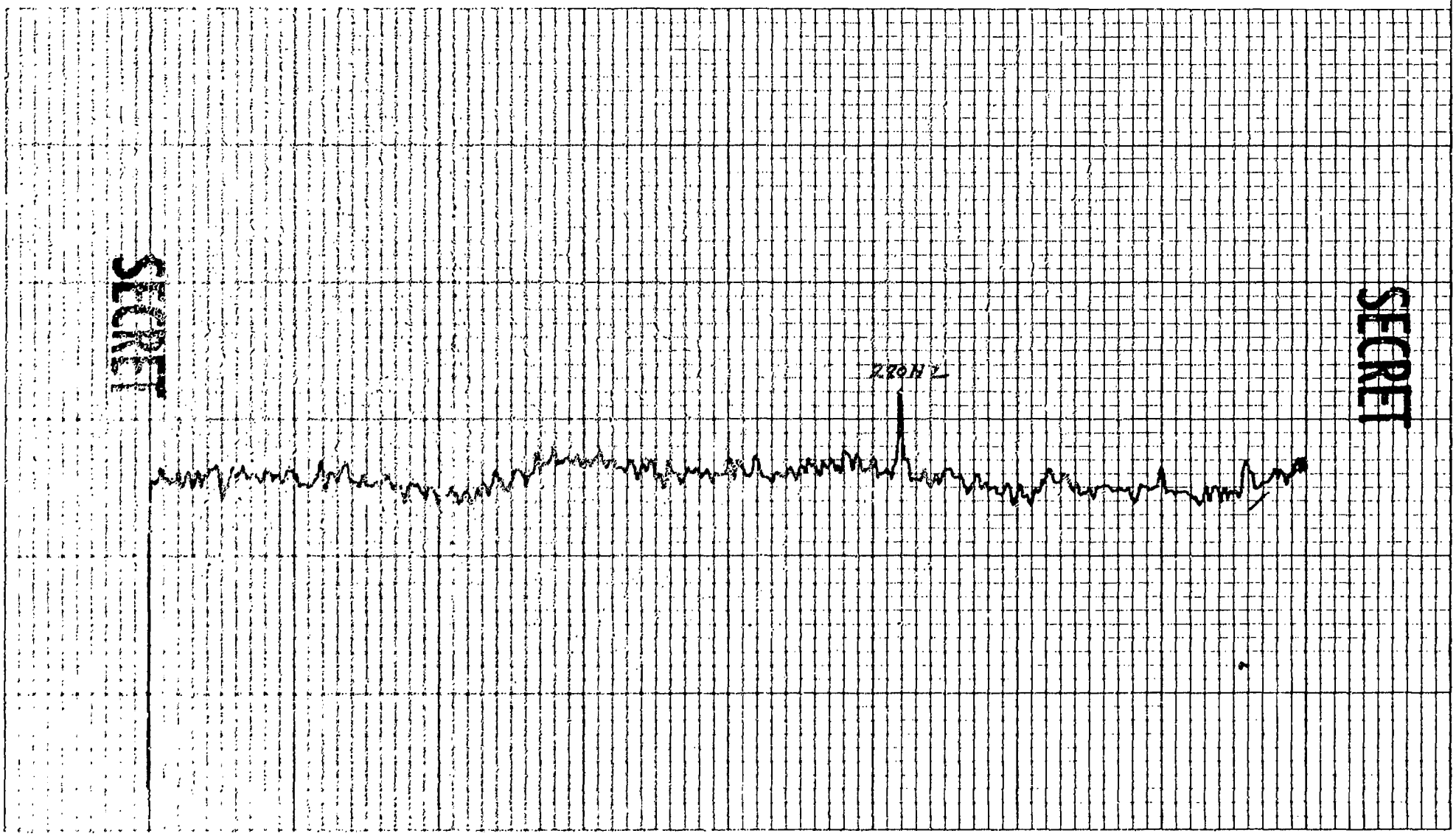
K&E 10 X 10 TO THE INCH • 5 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 34-1148 (23)
OMNI SPECTRUM (ELEMENT 47)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3 Apr 77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

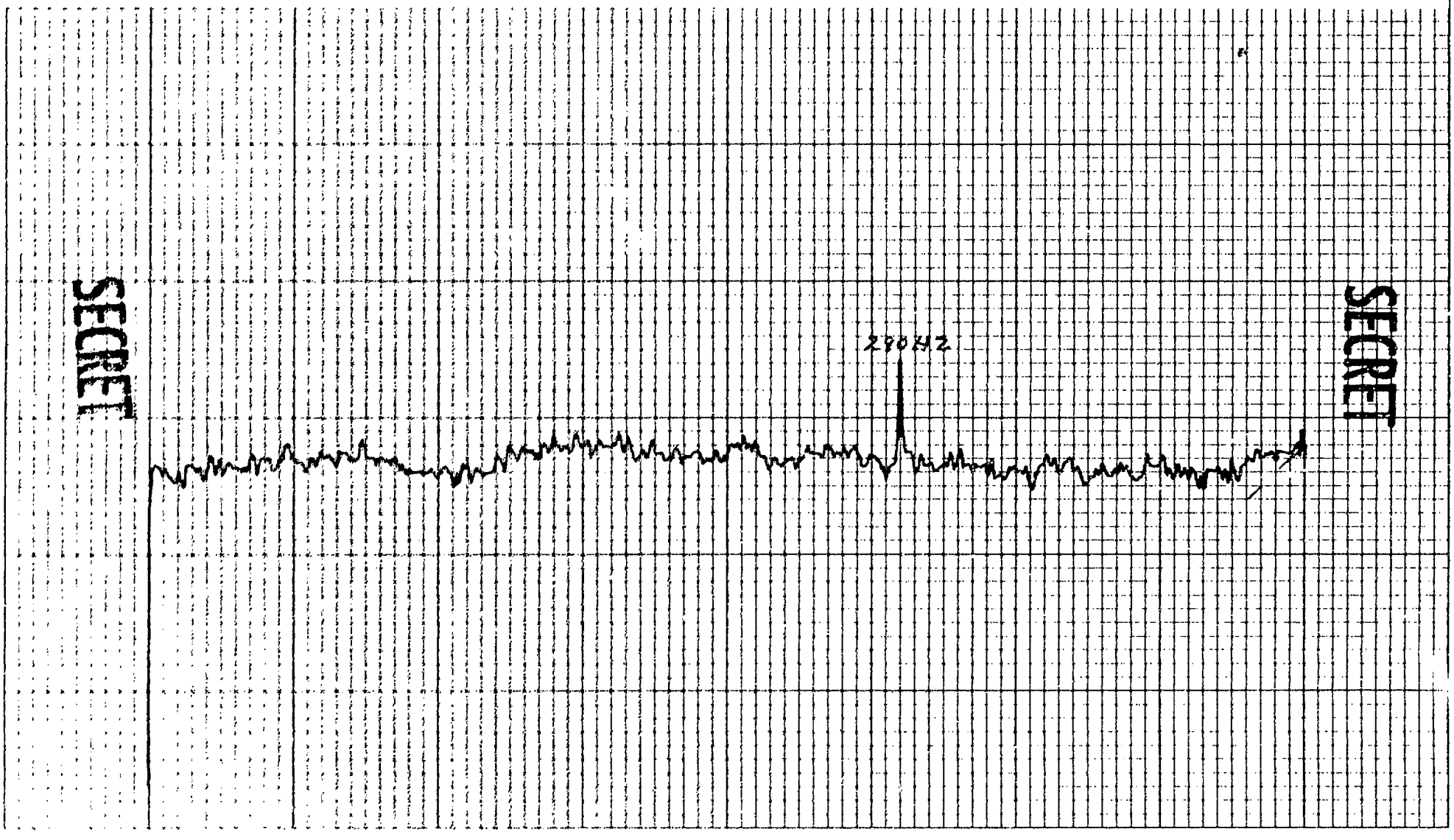
REEL: M24 INDEX 180
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



CONTROL: 346 - 1148 (24)
OMNI SPECTRUM (ELEMENT 49)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 346-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M24 INDEX 1980
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



CONTROL: 316 - 1148 (25)
OMNI SPECTRUM (ELEMENT 51)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

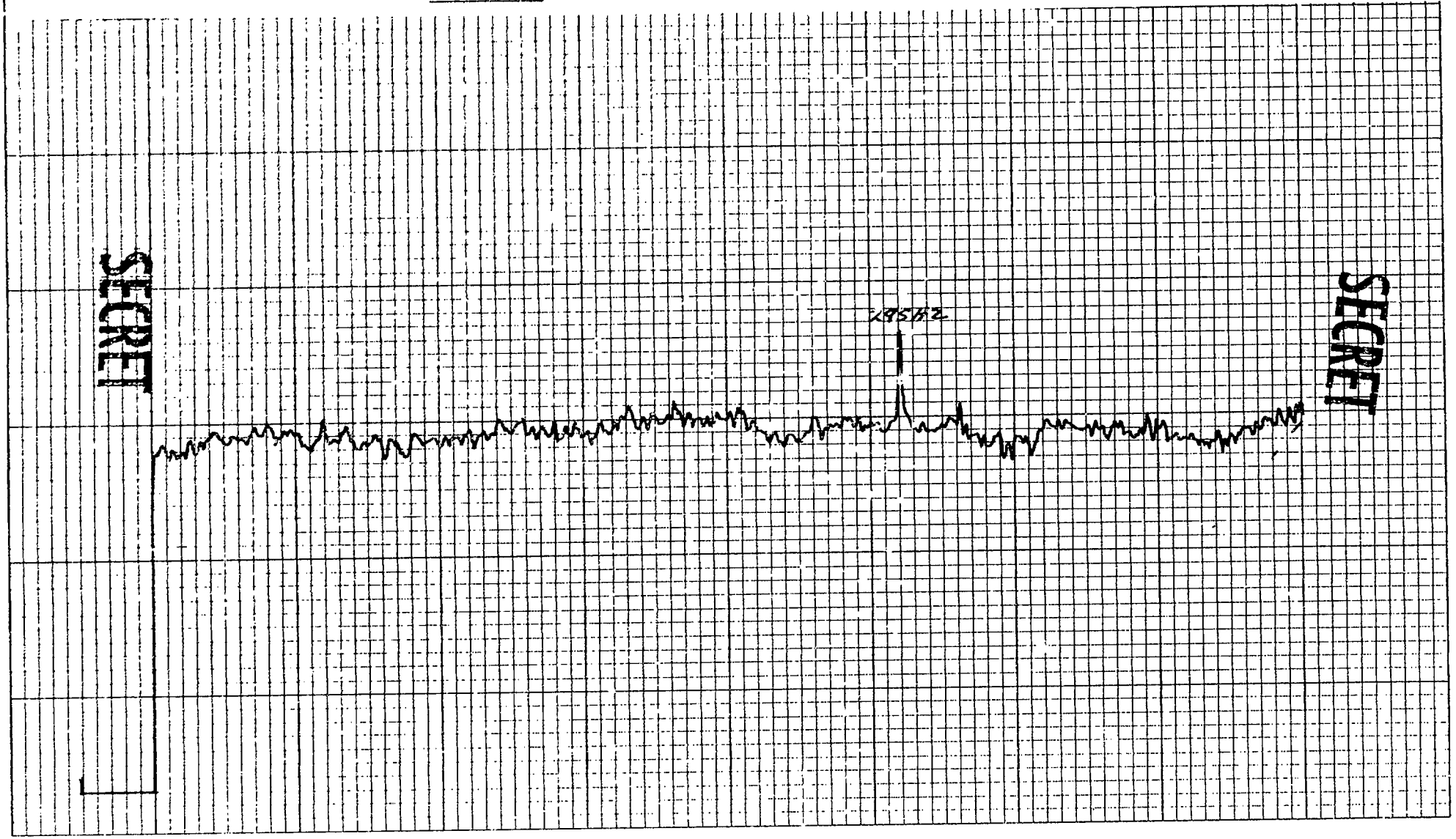
REEL: N24 INDEX 1980
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING

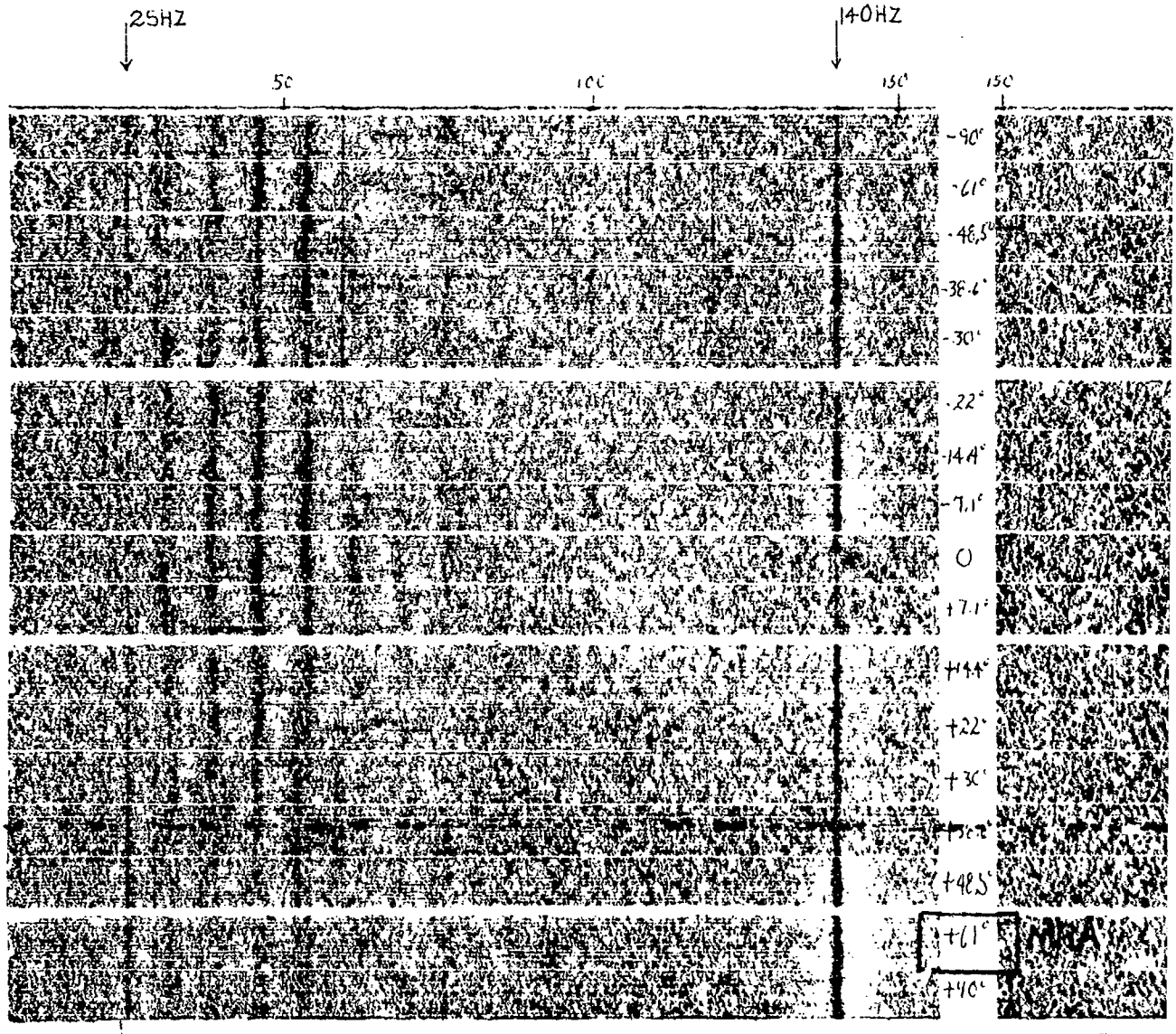
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 3-16-1148 (26)
OMNI SPECTRUM(ELEMENT 53)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-16-77-1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
___ DEG AZ STEERING

REEL: H24 INDEX 1980
INTEGRATION TIME 320 SECS ATTEN: ~ DB
FILTER WTG: HANNING





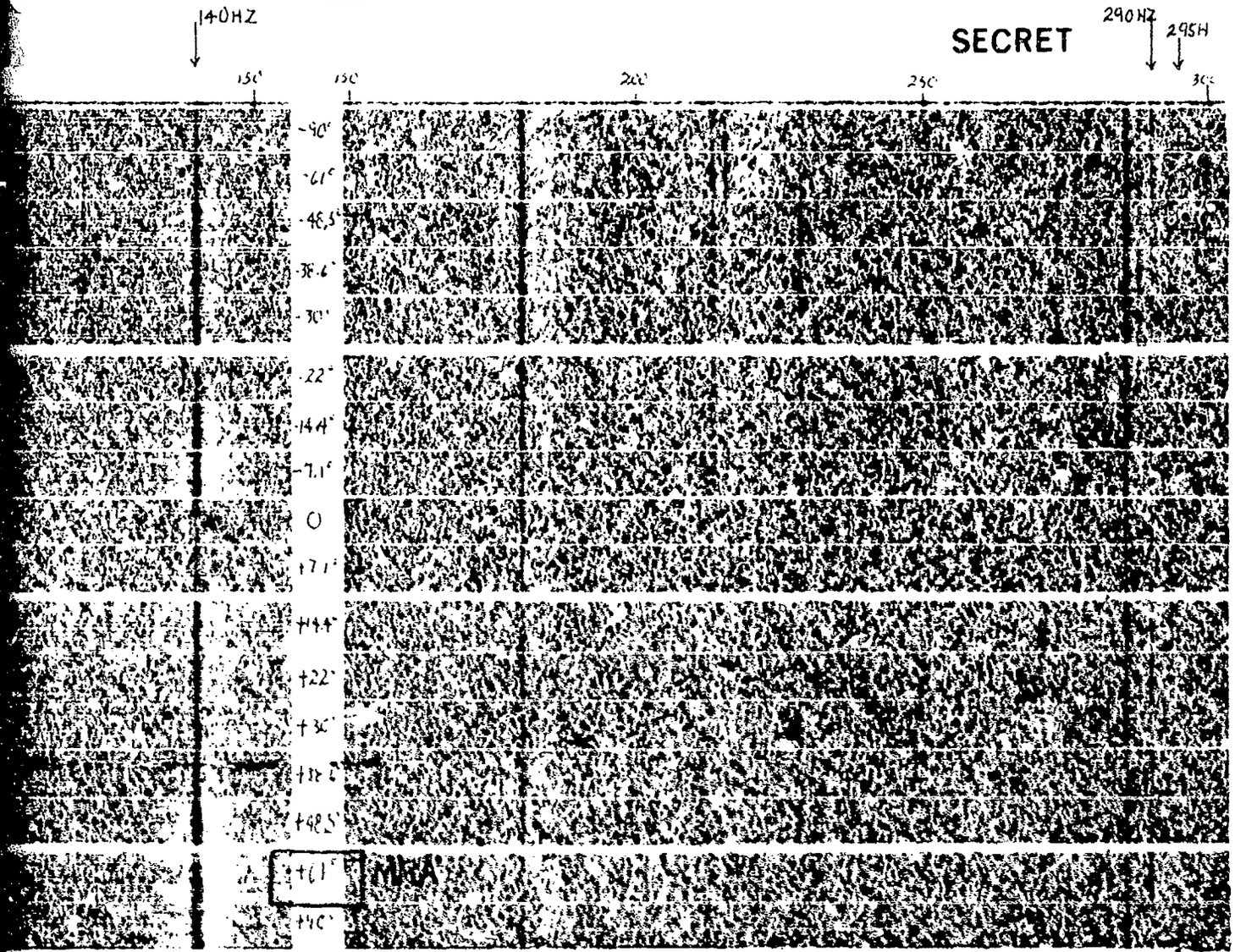
HISTOFRAZ

CONTROL NUMBER 1148Z-51-DP12
NUMBER OF ELEMENTS 16
FREQUENCY BAND 10 TO 30C HZ
RANGE 122 N.M.

TAPE REEL NUMBER M24

ANALYSIS BAND WIDTH .2
WATER DEPTH 28CC F

SECRET



HISTOFRAZ

TAPE REEL NUMBER M24

ANALYSIS BAND WIDTH .2 HZ

WATER DEPTH 2800 FMS

TAPE COUNT 1960

ELEMENT NUMBERS 1 5 16 — — SAN-XXX-78-0131

DATE 3-16-77

EXERCISE: BEARING STAKE

SECRET

SIGNAL LEVEL AND SNR

CALCULATIONS

DATA POINT 12 FREQUENCY 140 HZ NUMBER OF ELEMENTS 16

SIGNAL LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-22.7dBV	
MCPS-32 CAL. CORRECTION	+10	-12.7	
BEAMFORMER GAIN	+18	+5.3	SIG. LEVEL FOR SNR CALCULATIO
MRA CORRECTION	+ .18	+5.5	SIG. LEVEL FOR SIGNAL GAIN

NOISE LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-54.6dBV	
MCPS-32 CAL. CORRECTION	+10	-44.6	
BEAMFORMER GAIN	+18	-26.6	NOISE LEVEL FOR SNR CALCULATION

SIGNAL-NOISE-RATIO

SIGNAL LEVEL FOR SNR		+5.3	
NOISE LEVEL FOR SNR	-26.6	31.9	
PROCESSOR CORRECTION	- 4.0	27.9	
MRA CORRECTION	+ .2	28.1	SNR 1 HZ BAND
BANDWIDTH CONVERSION	____		SNR 1 HZ BAND

SIGNAL LEVEL AND SNR CALCULATIONS

DATA POINT 12 FREQUENCY 290 HZ NUMBER OF ELEMENTS 16

SIGNAL LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-39.9 dBV	
MCPS-32 CAL. CORRECTION	+10	-29.9	
BEAMFORMER GAIN	+18	-11.9	SIG. LEVEL FOR SNR CALCULATIO
MRA CORRECTION	+ .8	-11.1	SIG. LEVEL FOR SIGNAL GAIN

NOISE LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-57.8dBV	
MCPS-32 CAL. CORRECTION	+10	-47.8	
BEAMFORMER GAIN	+18	-29.8	NOISE LEVEL FOR SNR CALCULATION

SIGNAL-NOISE-RATIO

SIGNAL LEVEL FOR SNR		-11.9	
NOISE LEVEL FOR SNR	-29.9	18.0	
PROCESSOR CORRECTION	-4.2	13.8	
MRA CORRECTION	+ .8	14.6	SNR .013 HZ BAND
BANDWIDTH CONVERSION			SNR 1 HZ BAND

CONFIDENTIAL

DATA POINT 12

SIGNAL GAIN

	140 HZ	290HZ	295HZ
MEAN OMNI SIGNAL LEVEL	-24.8	-30.6	
MRA SIGNAL LEVEL	+5.5	-11.1	
ARRAY SIGNAL GAIN	30.3	27.5	
20 LOG 16 (# of elements)	24	24	
DIFFERENCE	+6.3	+3.5	

ARRAY GAIN

	140 HZ	290HZ	295HZ
MRA SNR	28.1	14.6	
MEAN OMNI SNR	19.4	7.9	
ARRAY GAIN	8.7	6.7	
THEORETICAL AZMUTH GAIN (at MRA)	7.4	9.8	
DIFFERENCE	+ .7	-3.1	

CONFIDENTIAL

K&E 10 X 10 TO THE INCH KEUFFEL & ESSER CO

CONTROL: 1148 - 16 (D#12)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 140 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DAT /TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
±48 DEG. AZ STEERING

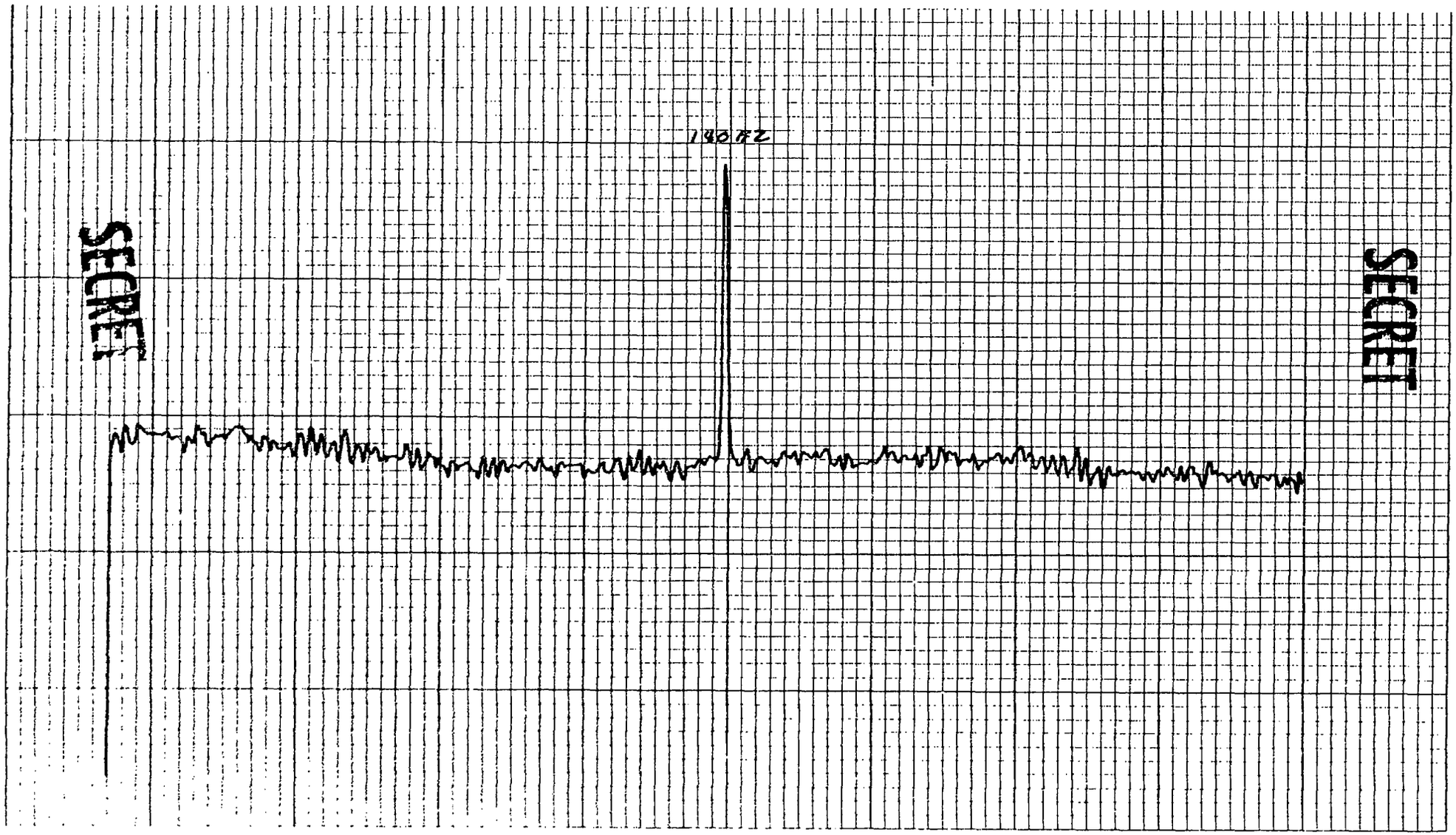
REEL: N34 INDEX 1995
INTEGRATION TIME 320 SECS ATTEN: -10 DB
FILTER WTG: HANNING

K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 1148 - 16 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 140 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+50 DEG. AZ STEERING

REEL: 424 INDEX 1995
INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING



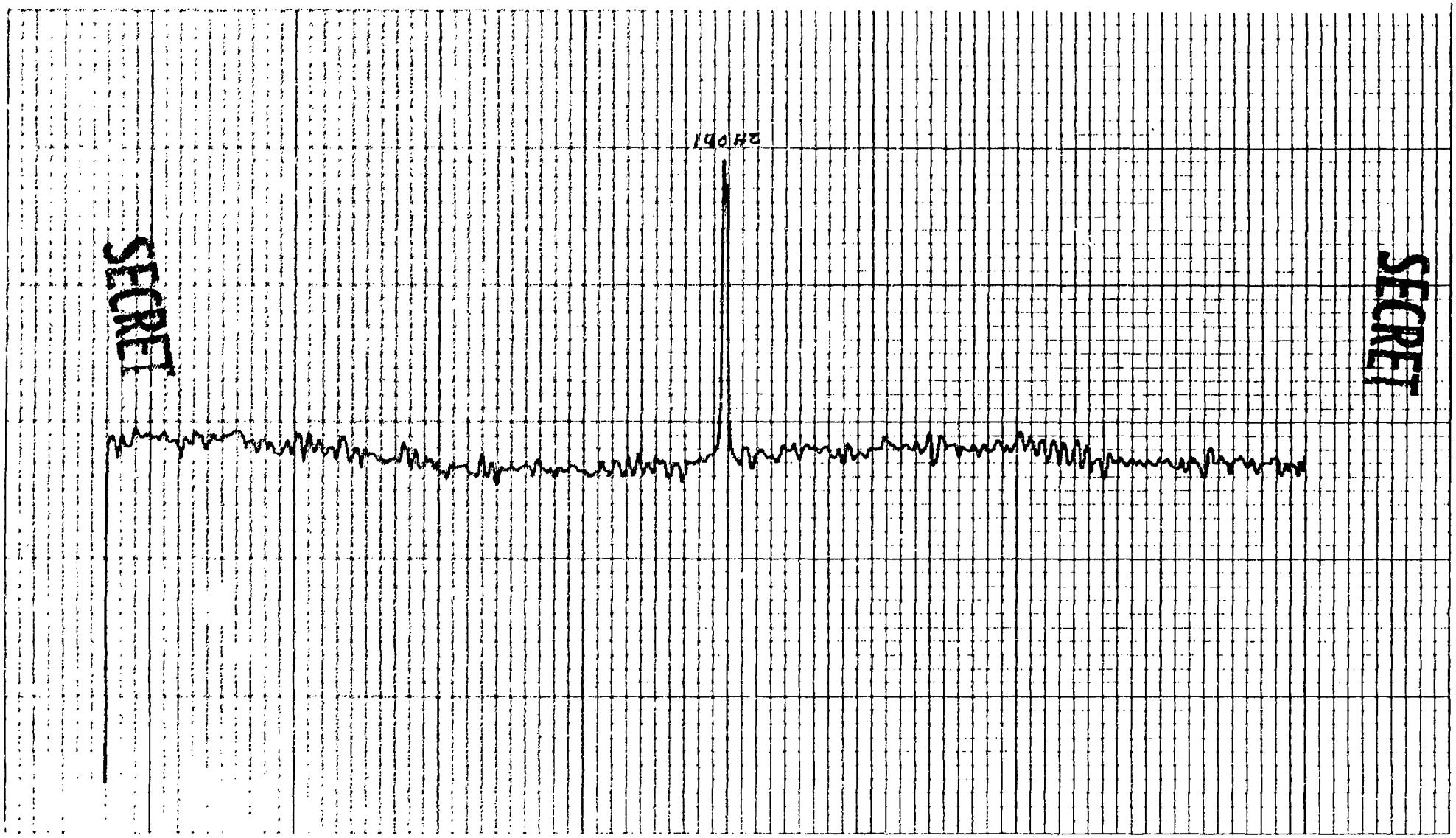
K&E 10 X 10 TO THE INCH 46 0703

CONTROL: 1148 - 16 (DPIA)
BEAMFORMED SPECTRUM (ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 140 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
1-16
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+52 DEG. AZ STEERING

REEL: M24 INDEX 1995

INTEGRATION TIME 320 SECS ATTEN: -10 DB
FILTER WTG: HANNING



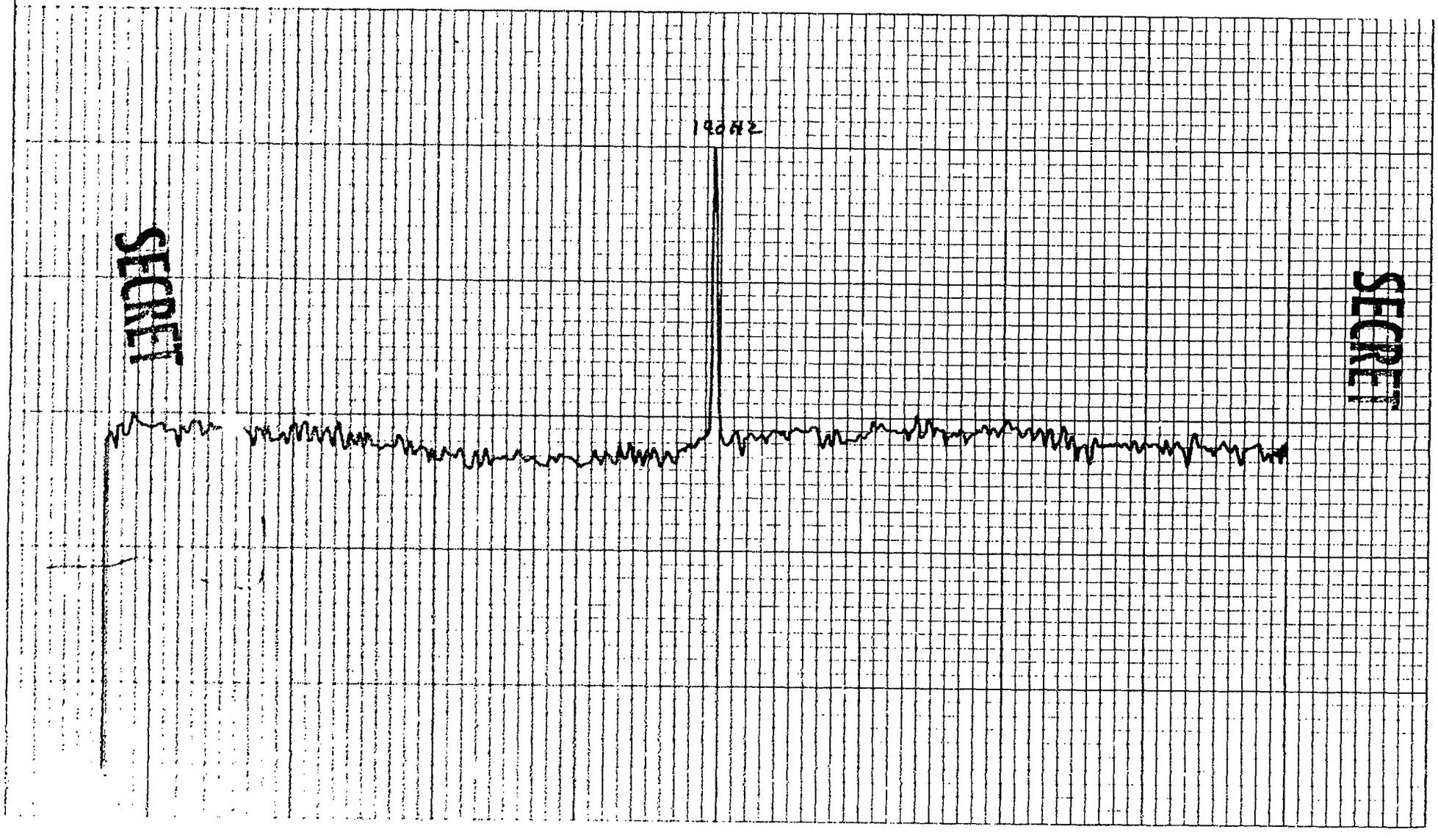
K+E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

CONTROL: 1148 - 16 (DF12)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 140 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+54 DEG. AZ STEERING

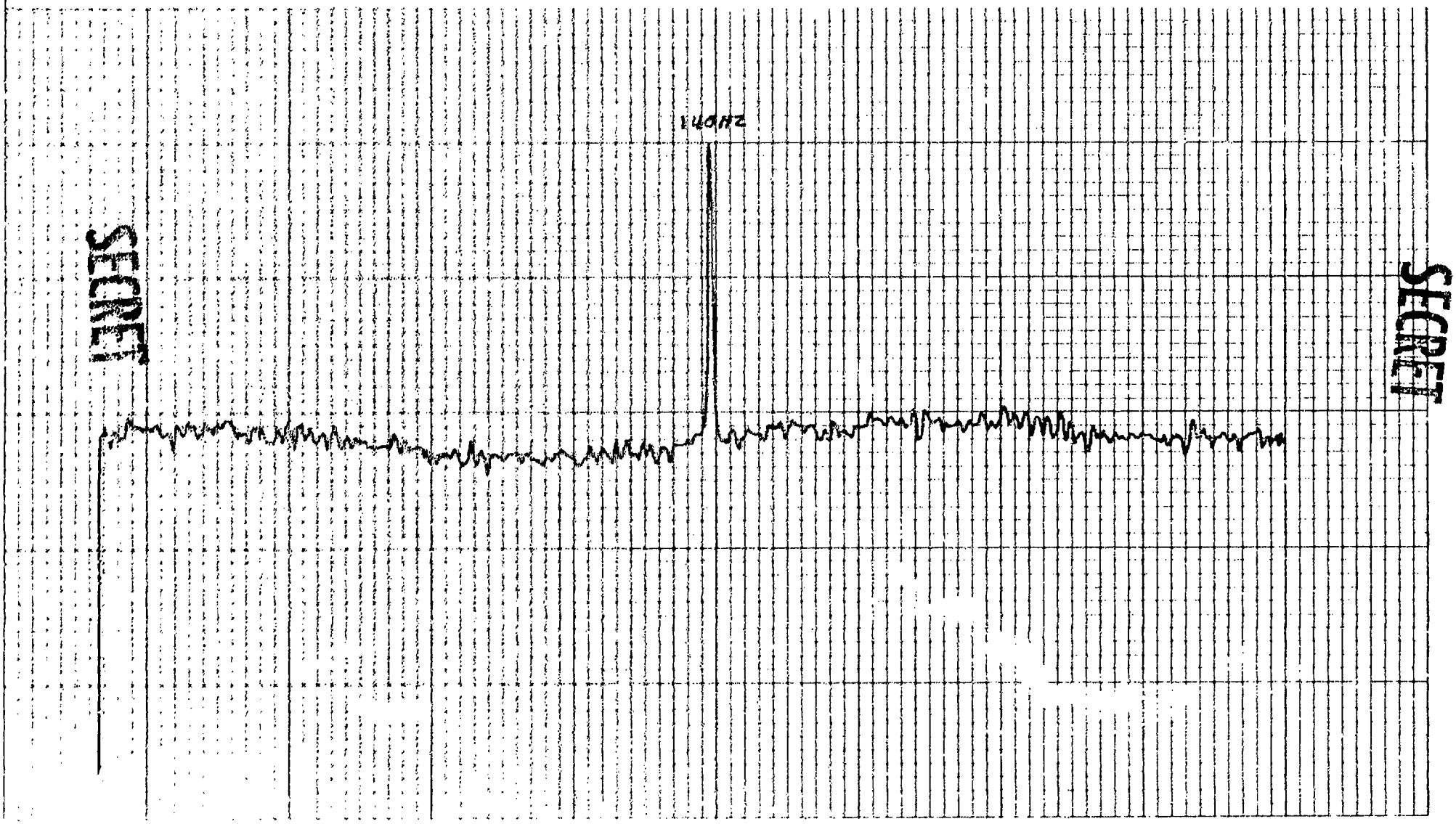
REEL: 124 INDEX 1995
INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING



CONTROL: 1148 - 16 (9/12)
BEAMFORMED SPECTRUM (ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 140 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+56 DEG. AZ STEERING

REEL: M24 INDEX 1985
INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

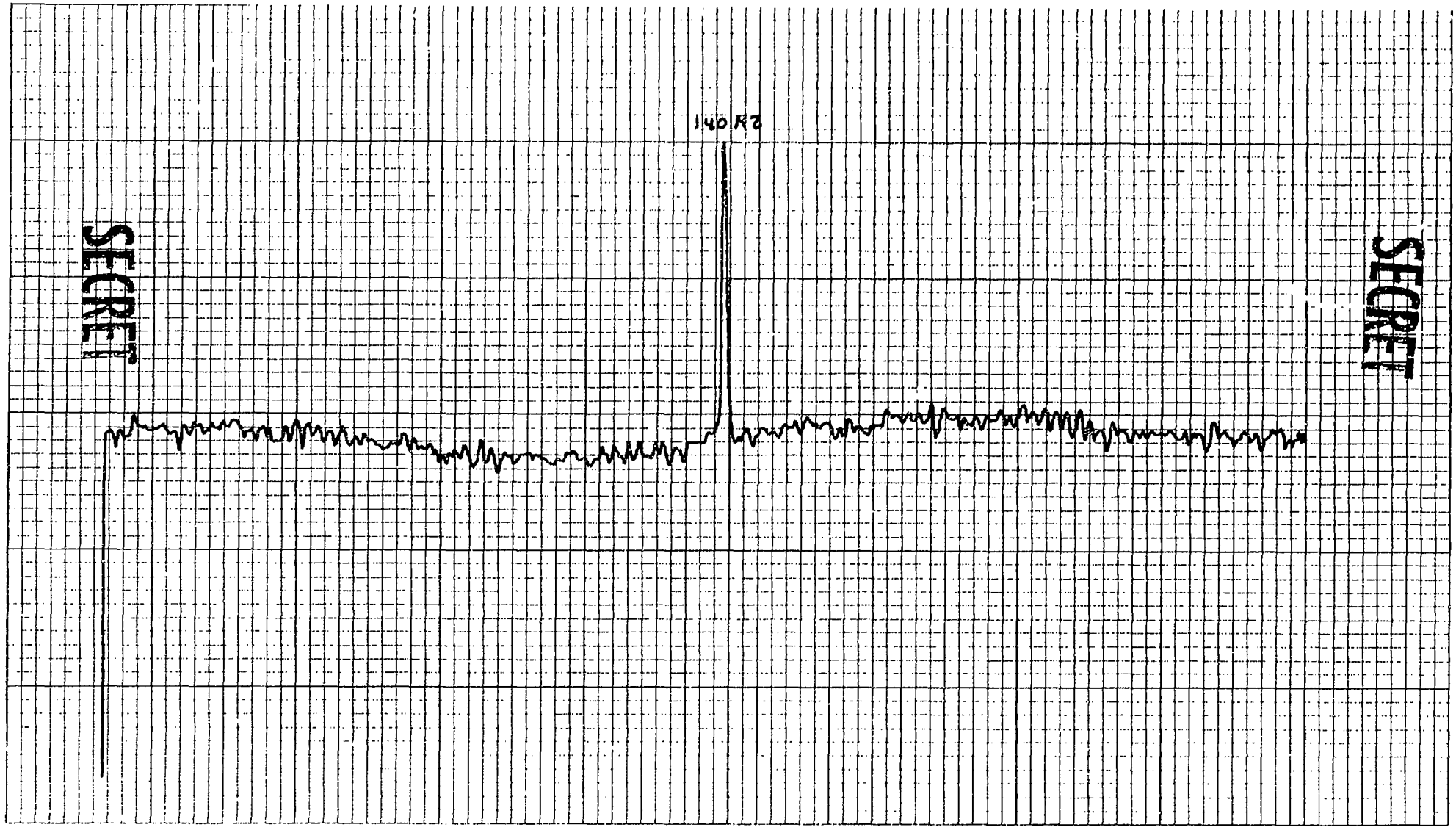
46 0703

CONTROL: 1148 - 16 (DF12)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 140 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+58 DEG. AZ STEERING

REEL: M24
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 1905
ATTEN: -18 DB



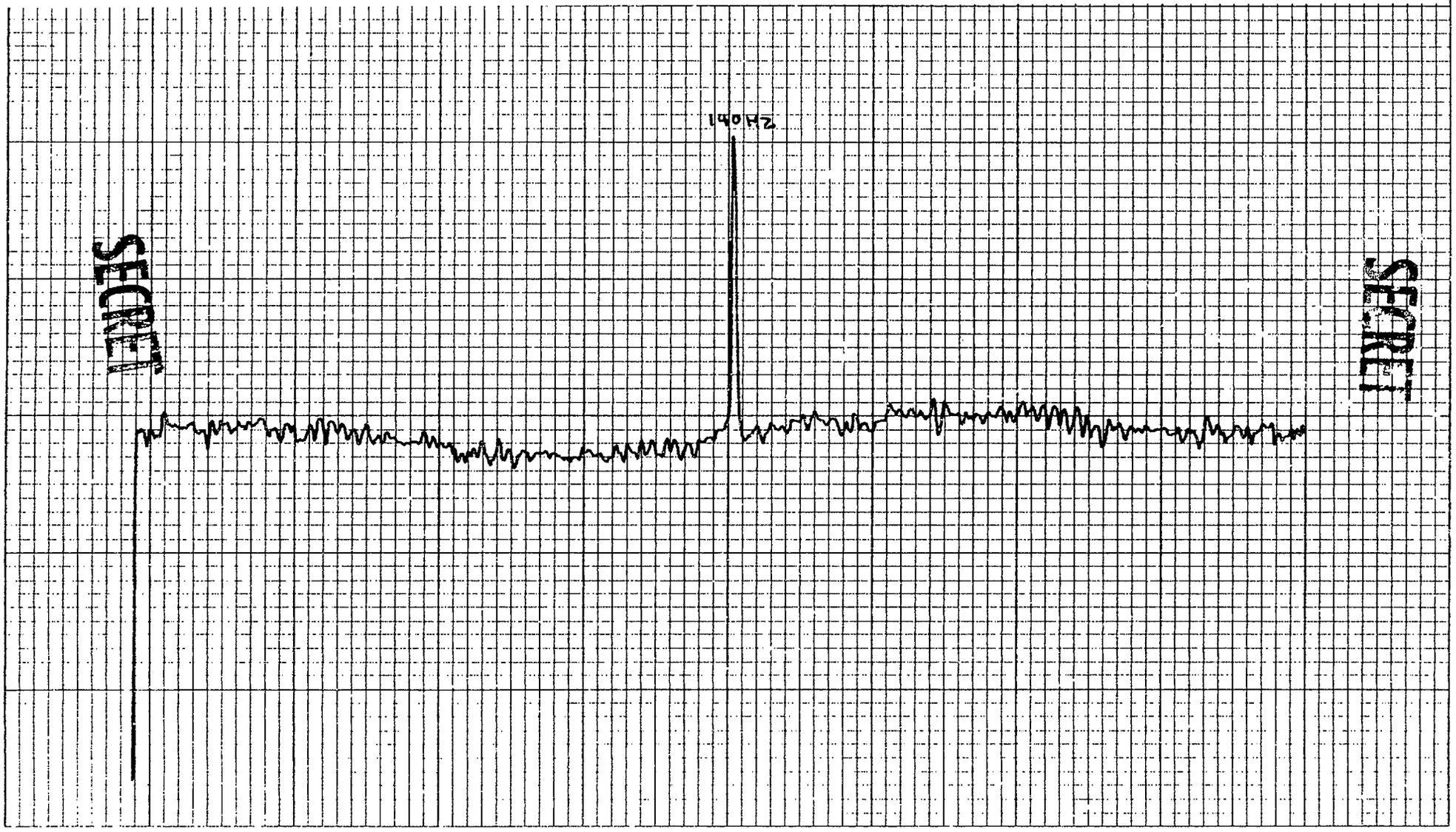
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 1148 - 16 (DP11)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 140 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 1148
ANALYSIS BANDWIDTH: 1/10HZ
+59 DEG. AZ STEERING

REEL: M34 INDEX 1985
INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING



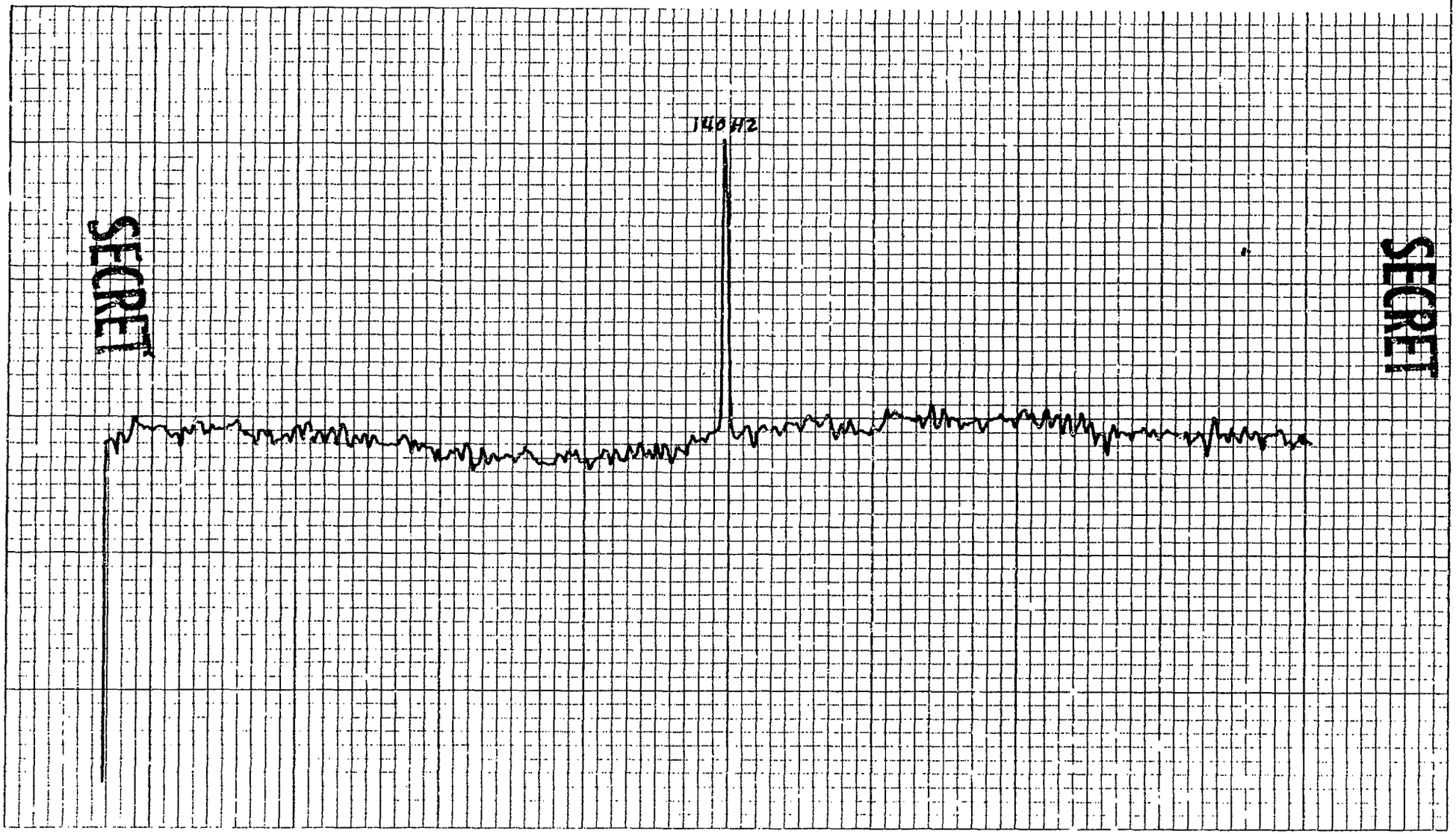
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 1148 - 16 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 140 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+60 DEG. AZ STEERING

REEL: M24 INDEX 1995
INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

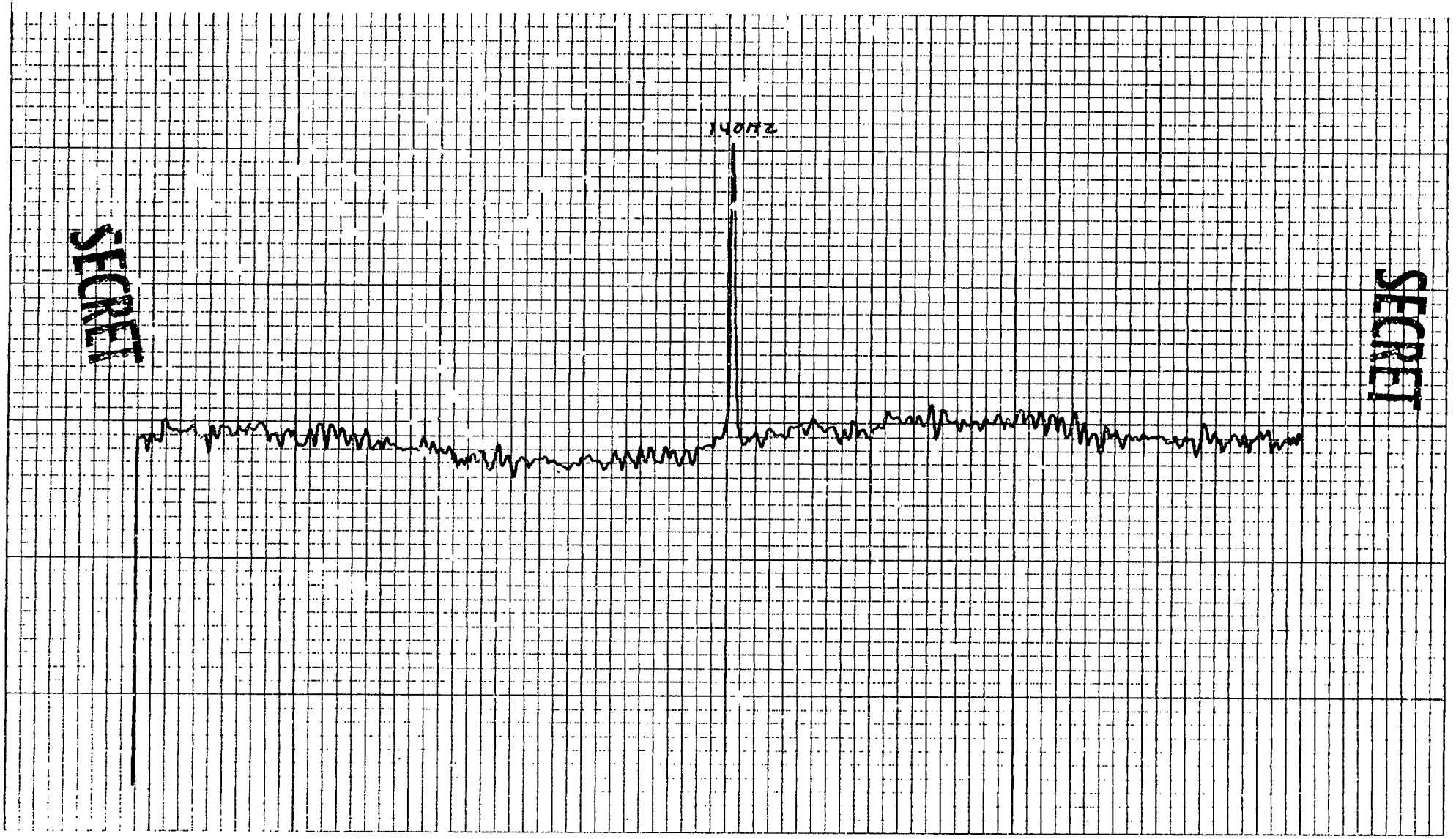
46 0703

B16/75

CONTROL: 1148 - 16 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 140 HZ
16 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+61 DEG. AZ STEERING

REEL: M24 INDEX 1995
INTEGRATION TIME 320 SECS ATTEN: -10 DB
FILTER WTG: HANNING



K+E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

D 1037

CONTROL: 1148 - 16 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 140 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+61.5 DEG. AZ STEERING

REEL: M24 INDEX 1996
INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING

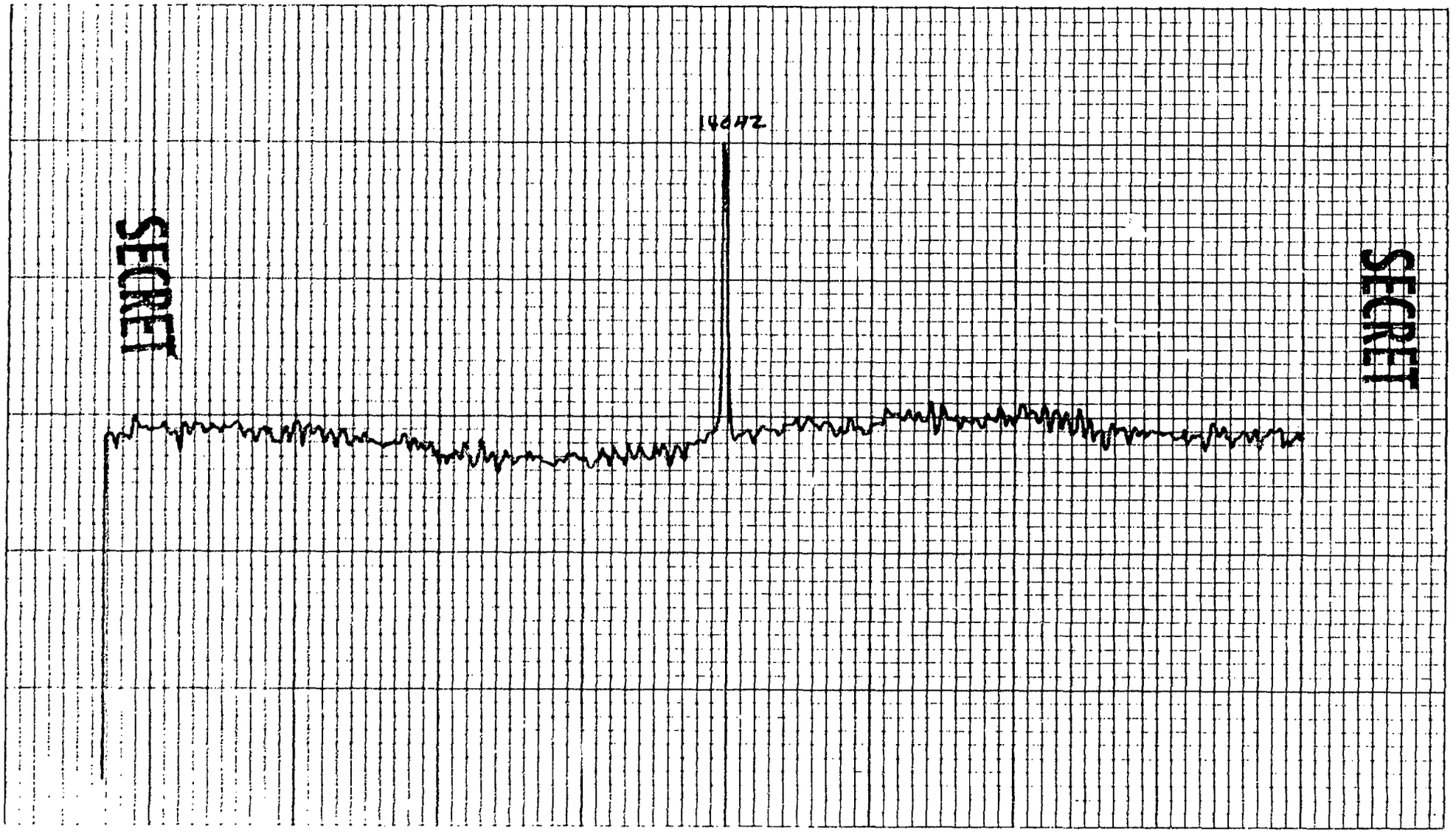
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

Page 13

CONTROL: 1140 - 16 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 160 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+62 DEG. AZ STEERING

REEL: M24 INDEX 1885
INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING



K•E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO MADE IN U.S.A.

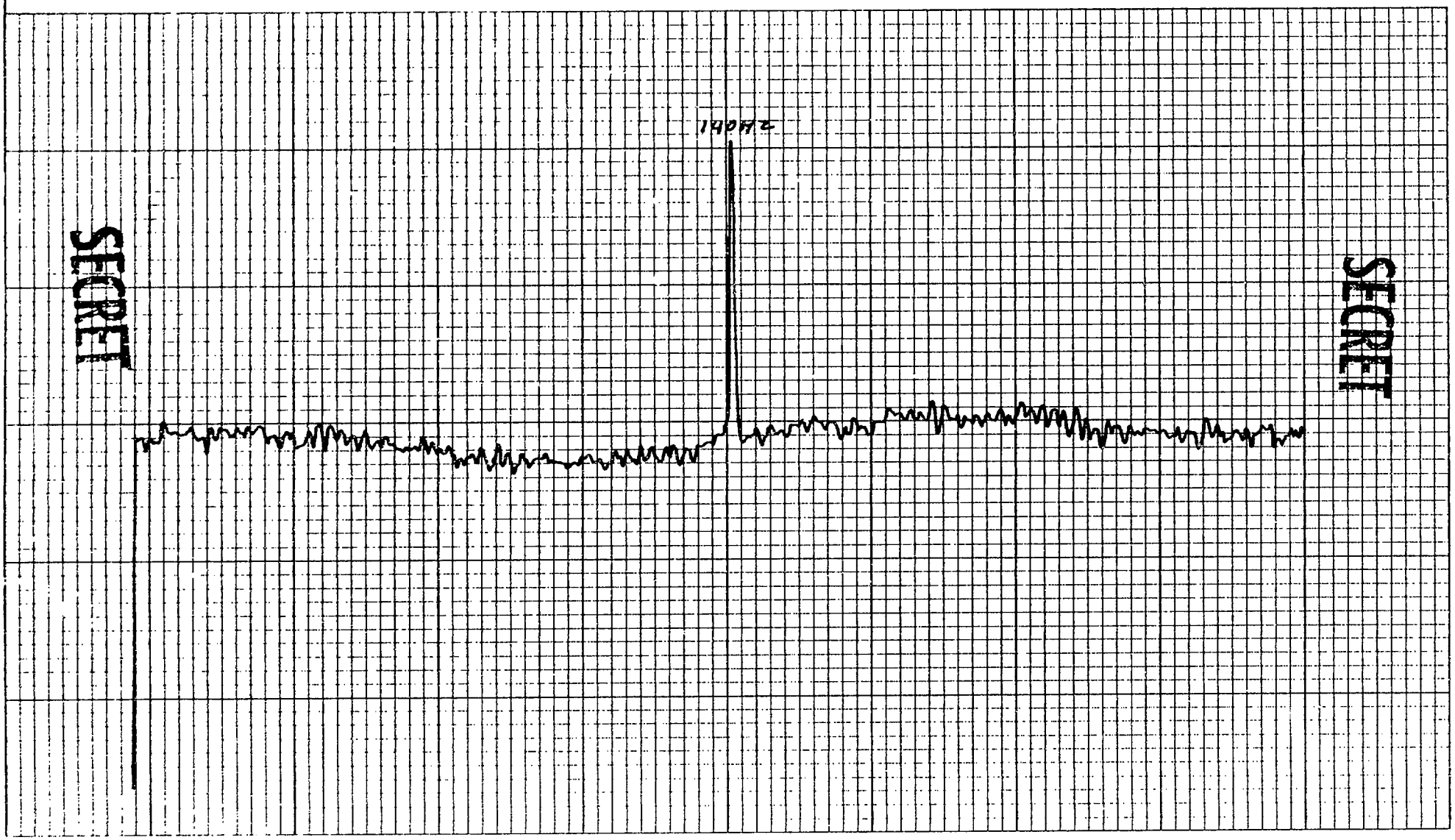
46 0703

CONTROL: 1148 - 16 (DD12)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 140 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+63 DEG. AZ STEERING

REEL: M24 INDEX 1995

INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING



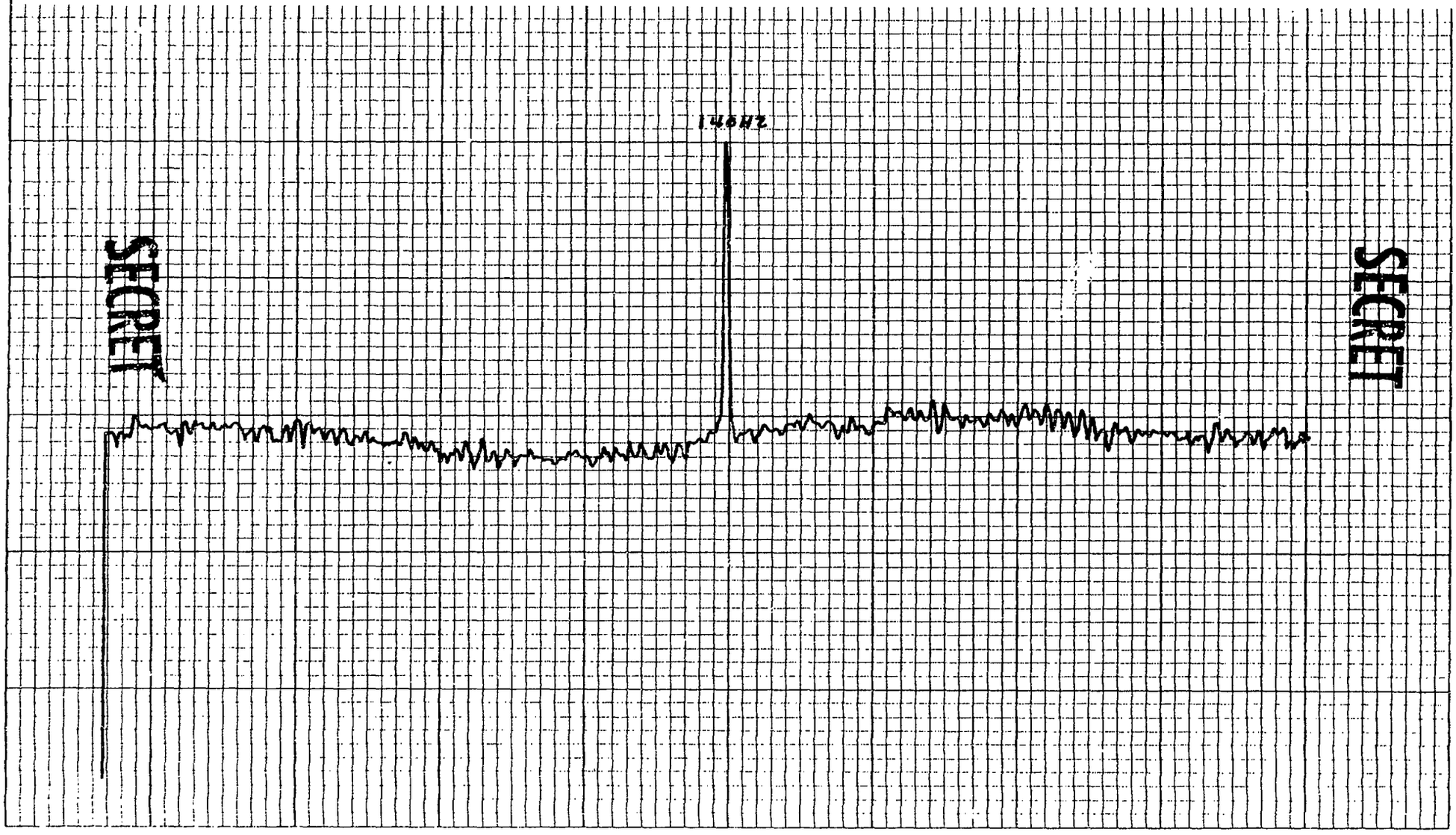
K+E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 1148 - 16 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 140 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+64 DEG. AZ STEERING

REEL: M24 INDEX 1885
INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING



K•E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

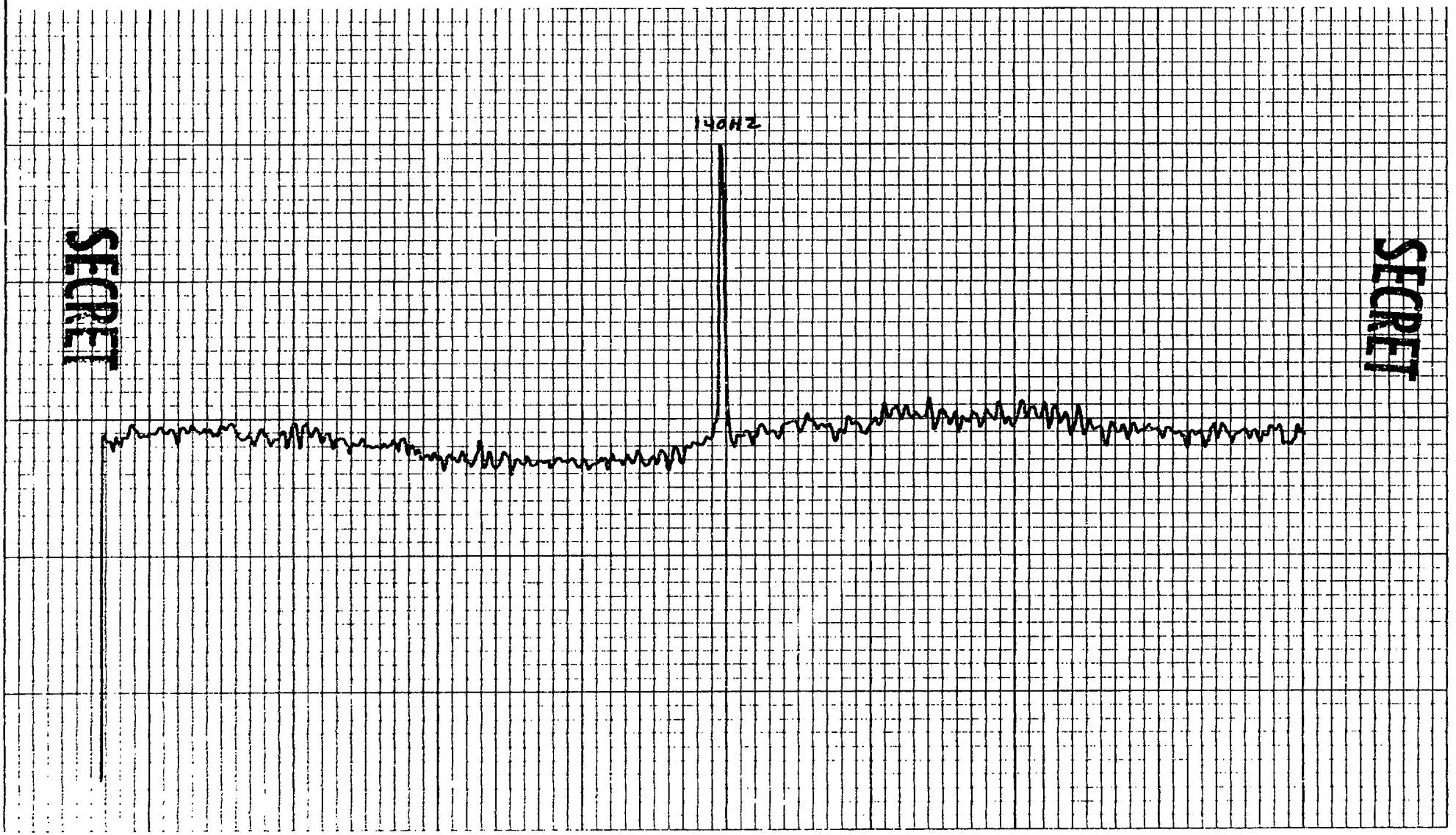
P16/17

46 0703

CONTROL: 1148 - 16 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 140 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-79 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+66 DEG. AZ STEERING

REEL: M24 INDEX 1996
INTEGRATION TIME 320 SECS ATTEN: -10 DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 1148 - 16 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 148 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+60 DEG. AZ STEERING

REEL: H24 INDEX 1995
INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING

K&E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

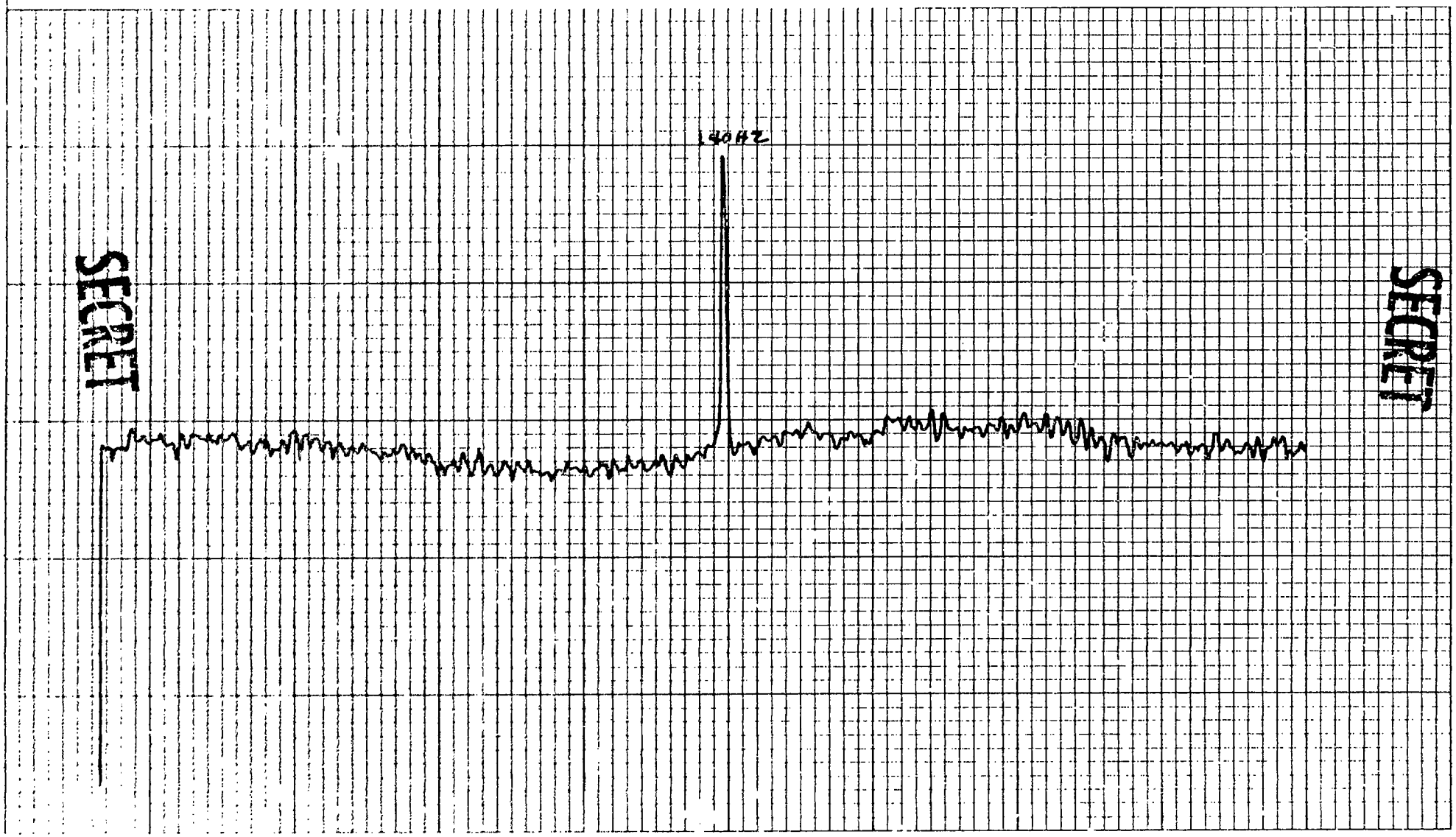
46 0703

CONTROL: 1148 - 16 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 140 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77-1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+70 DEG. AZ STEERING

REEL: M24
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 1995
ATTEN: -10 DB



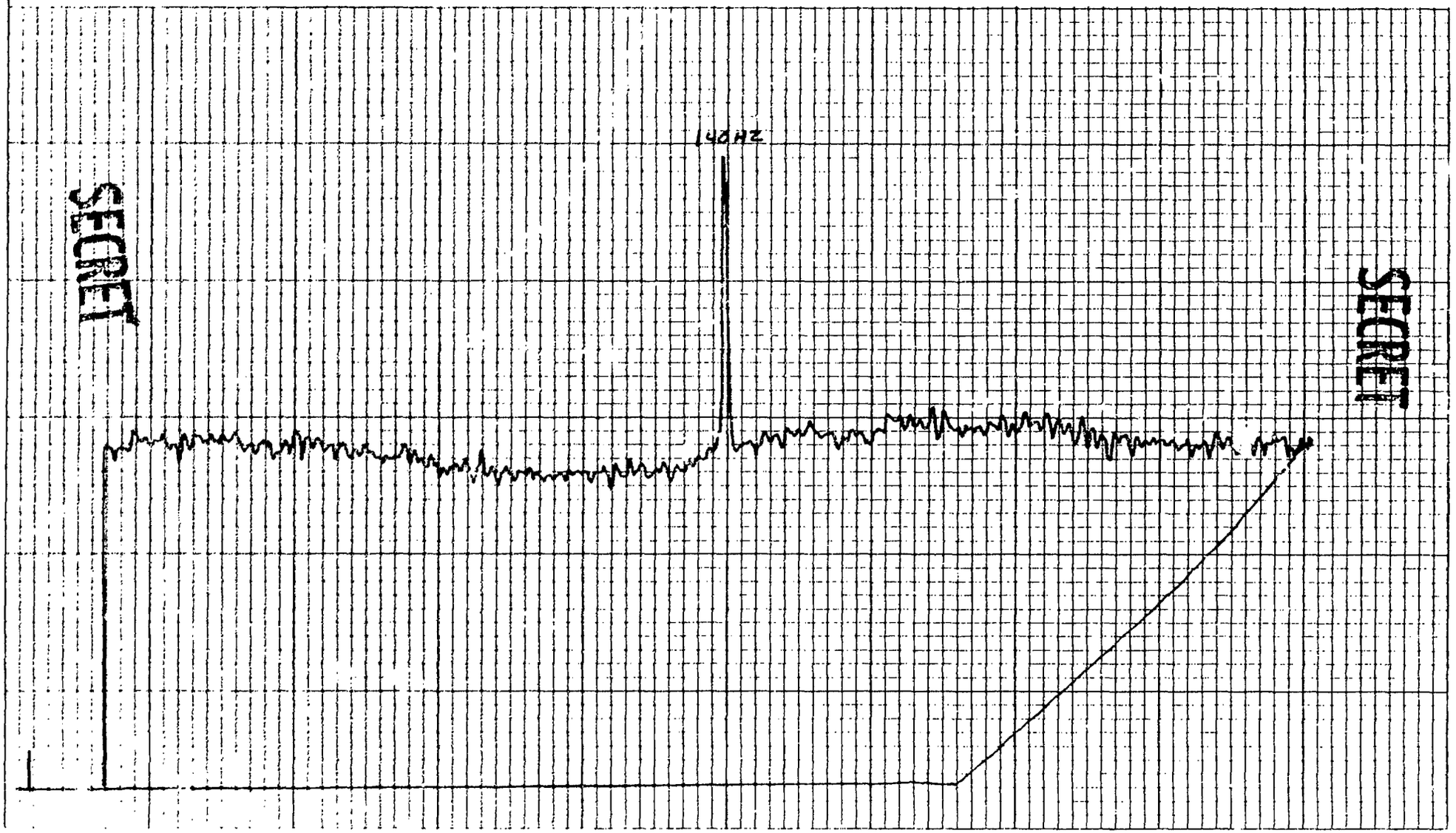
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

CONTROL: 1148 - 16 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 140 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 11-8 Z
ANALYSIS BANDWIDTH: 1/10HZ
+72 DEG. AZ STEERING

REEL: M24 INDEX 1995
INTEGRATION TIME 320 SECS ATTEN: -19 DB
FILTER WTG: HANNING

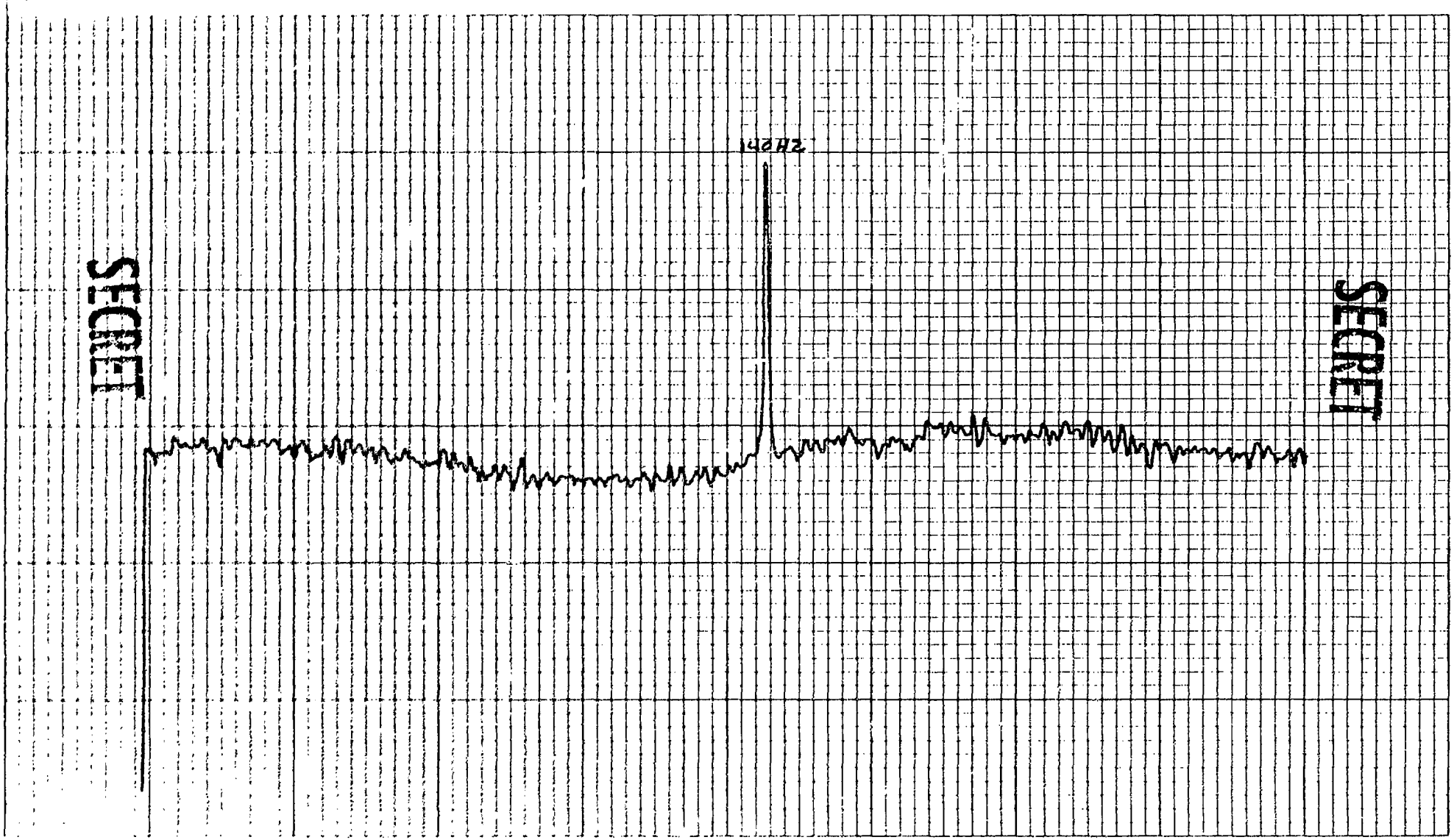


K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 1148 - 16 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 140 HZ
16 ELEMENTS

DATE OF ANALYSIS: — - —
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+74 DEG. AZ STEERING

REEL: M24 INDEX 1995
INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING

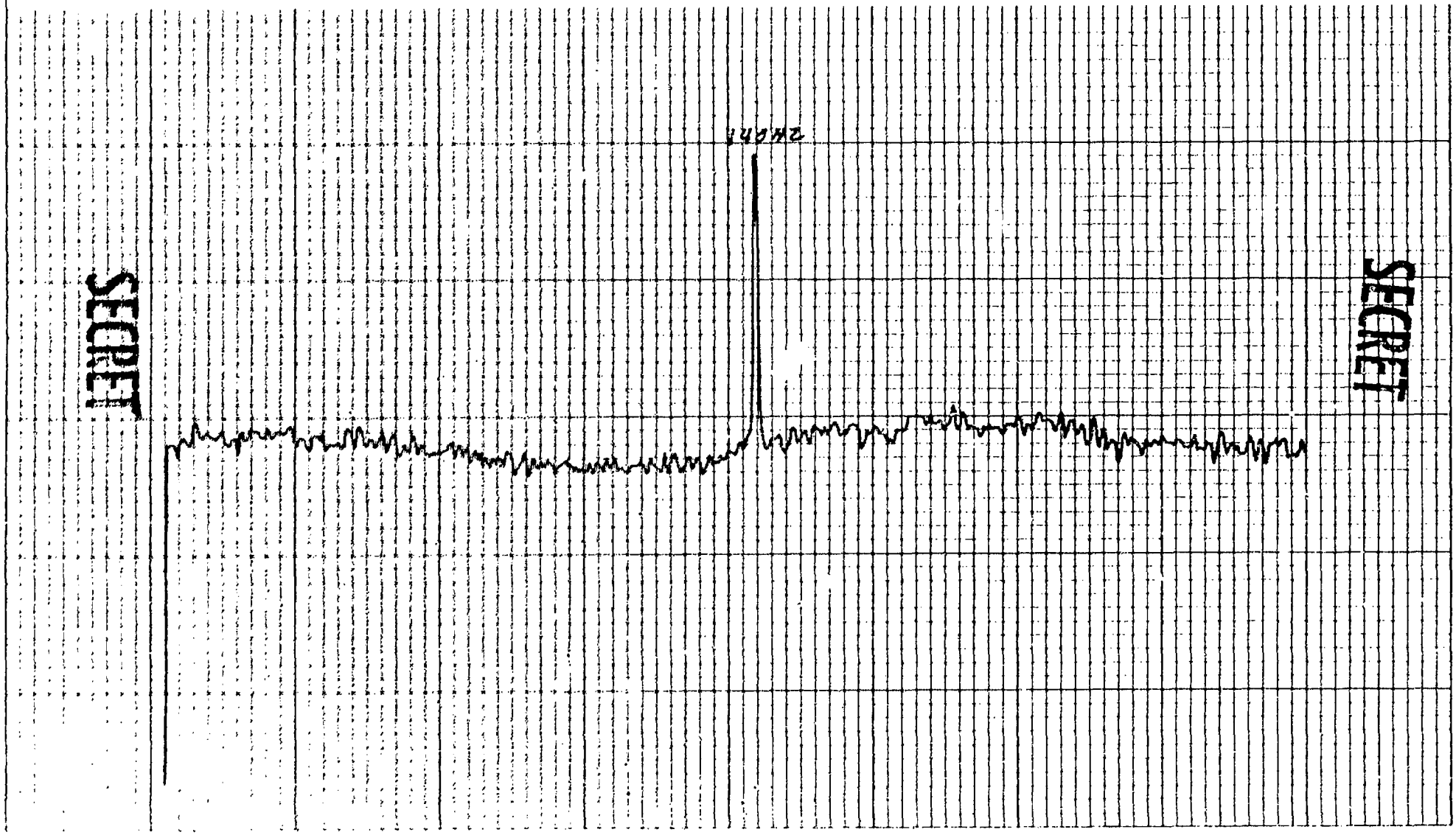


K&E 10 X 10 TO THE INCH

CONTROL: 1148 - 16 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 140 HZ
16 ELEMENTS

DATE OF ANALYSIS: — — —
1-16
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+76 DEG. AZ STEERI G

REEL: M34 INDEX 1995
INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING



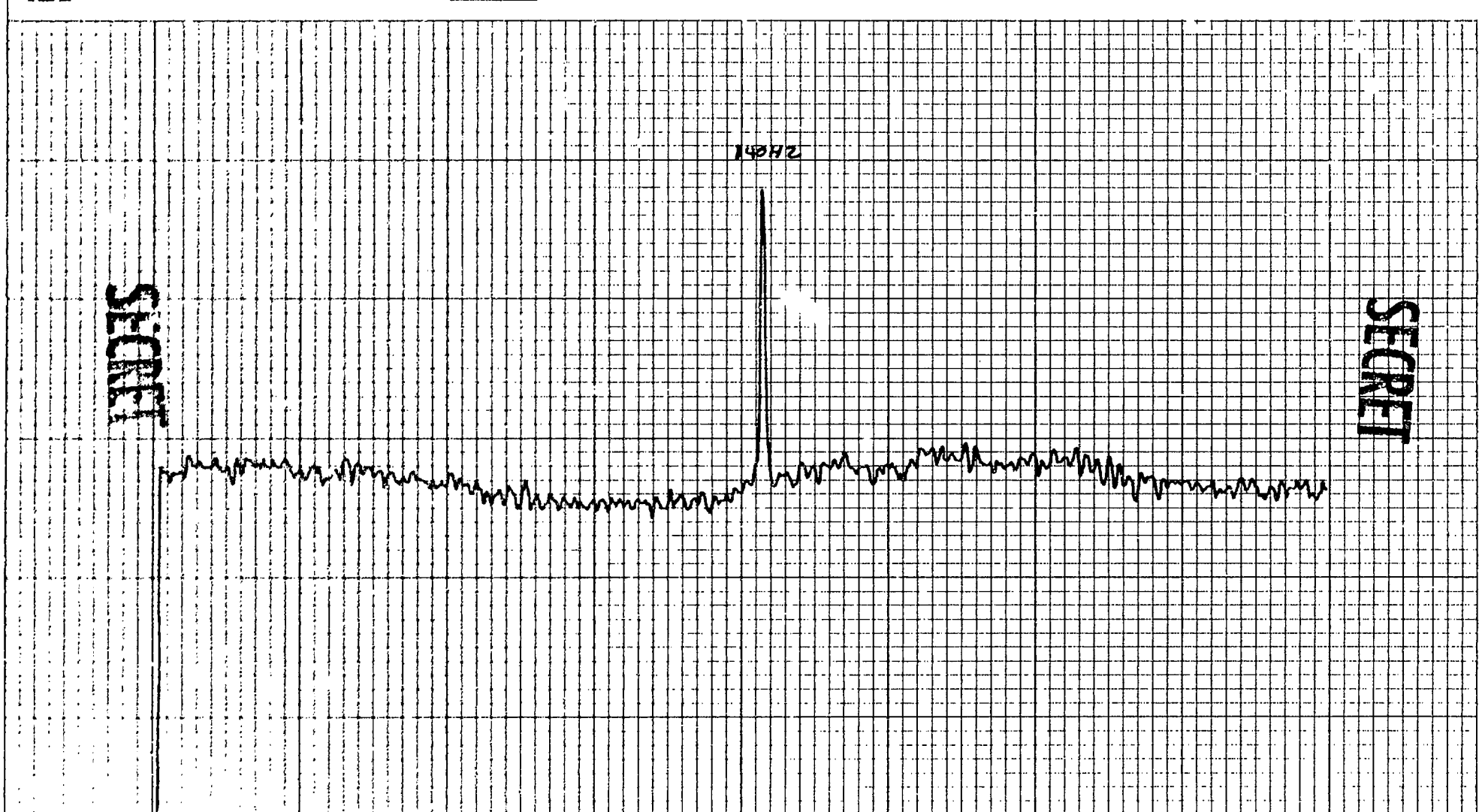
K·E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

CONTROL: 1148 - 16 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 140 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+78 DEG. AZ STEERING

REEL: M24 INDEX 1995
INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING



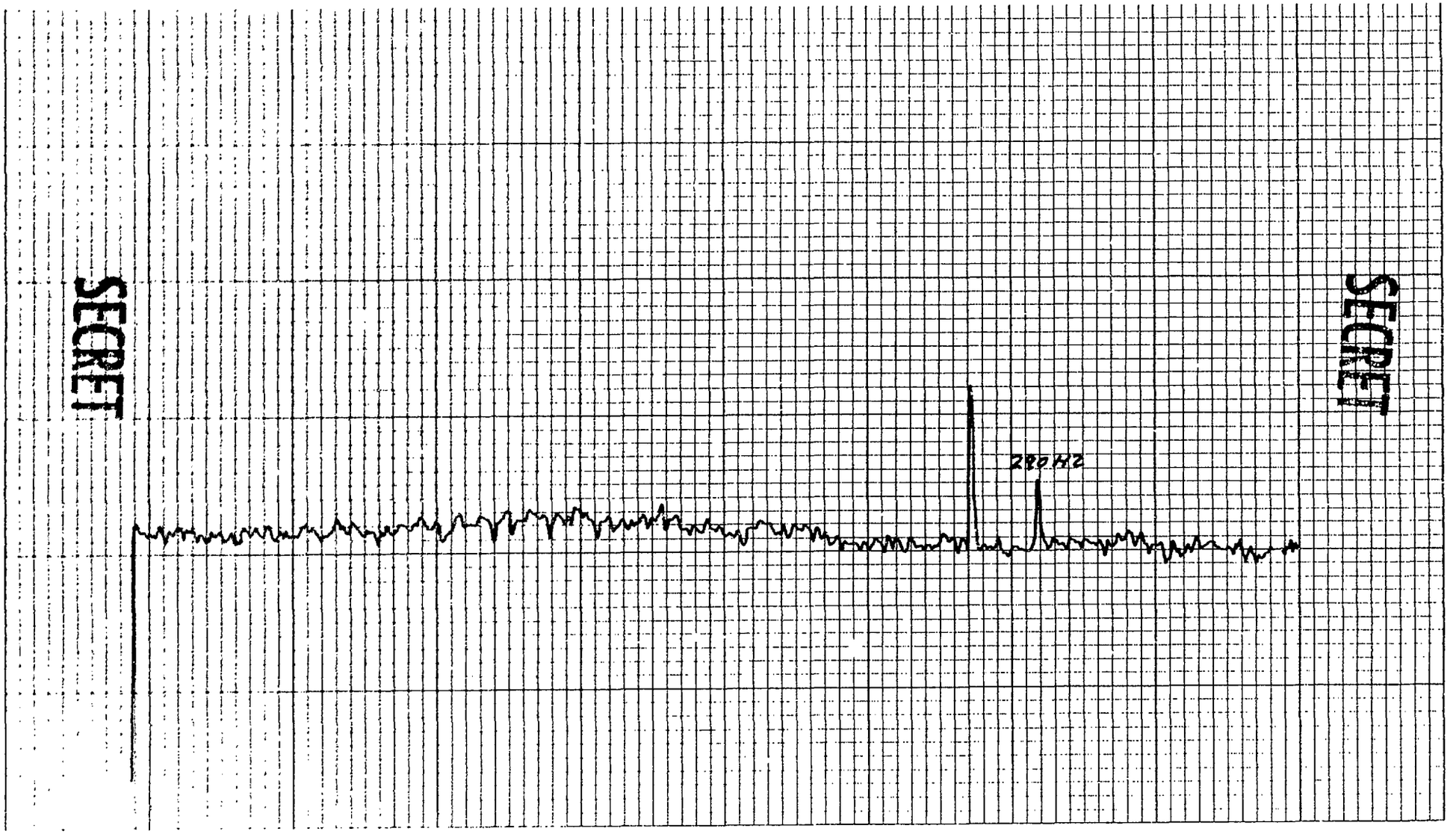
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

CONTROL: 1148 - 16 (OP12)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
1-16)
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+48 DEG. AZ STEERING

REEL: N24 INDEX 1895
INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING



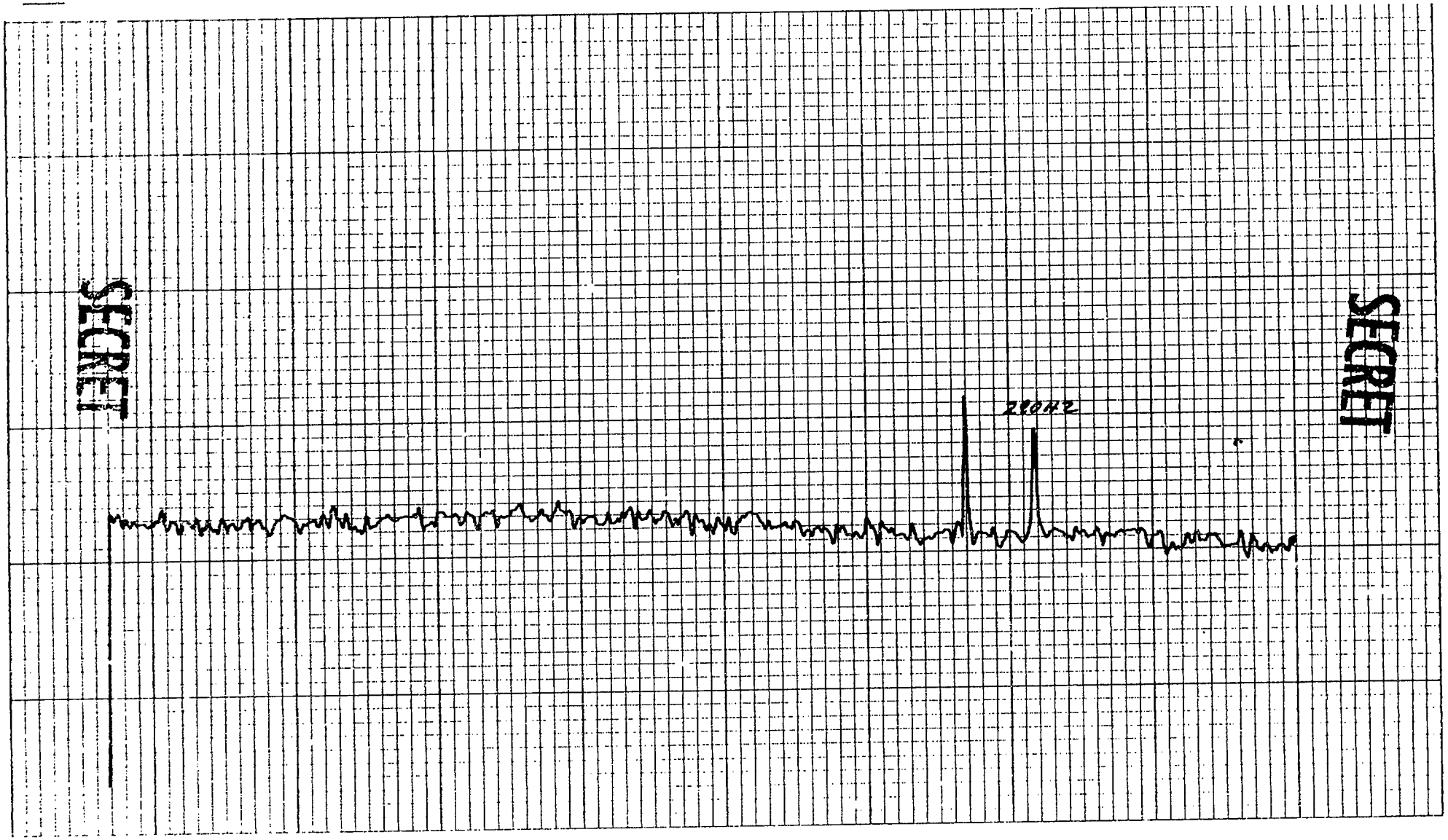
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 1143 - 16 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: — — —
1-16
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+50 DEG. AZ STEERING

REEL: M34 INDEX 1995

INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING

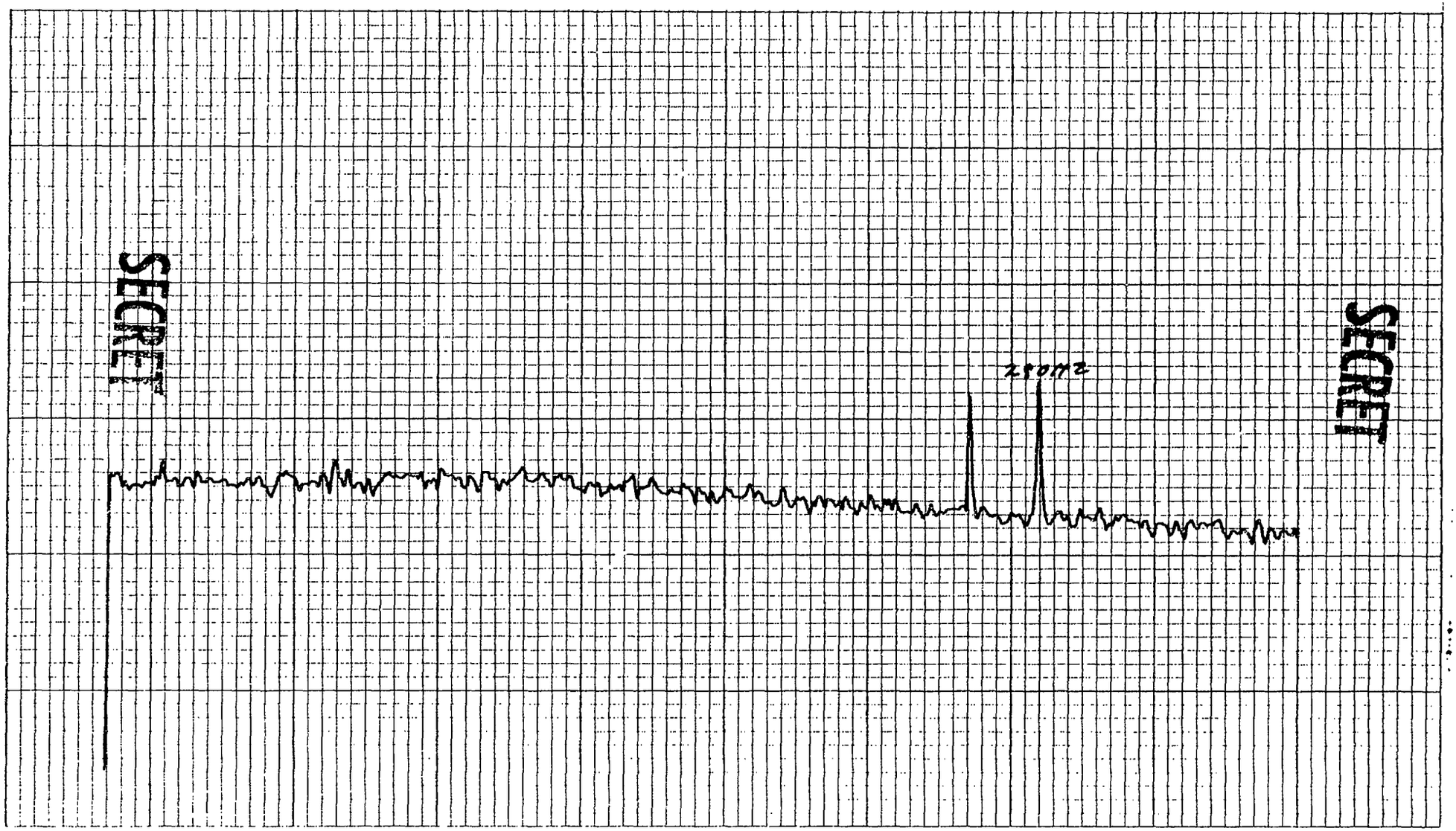


K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 1148 - 16 (DD12)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+52 DEG. AZ STEERING

REEL: M24 INDEX 1995
INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING



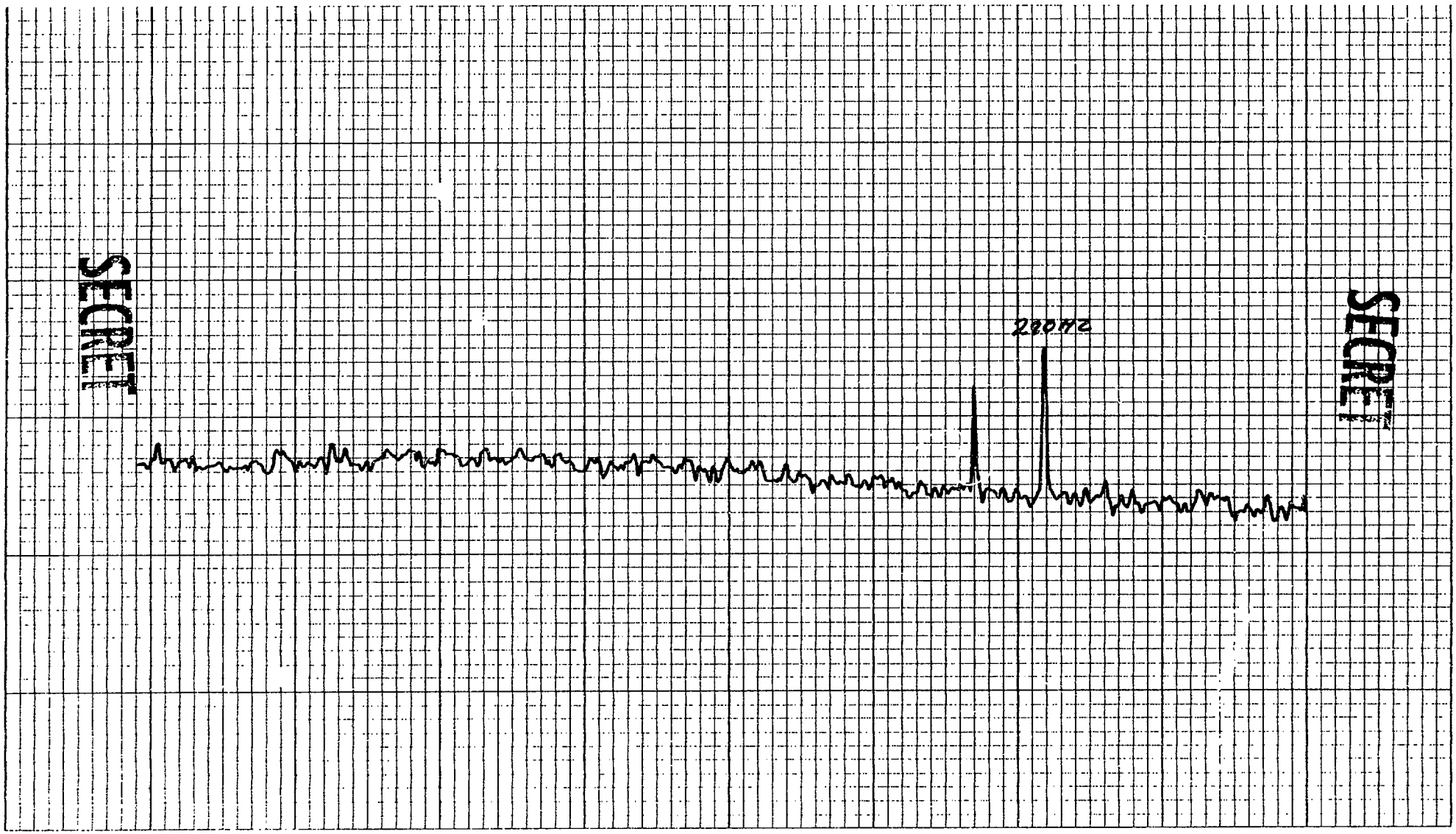
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 1148 16 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+54 DEG. AZ STEERING

REEL: M24 INDEX 1995
INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

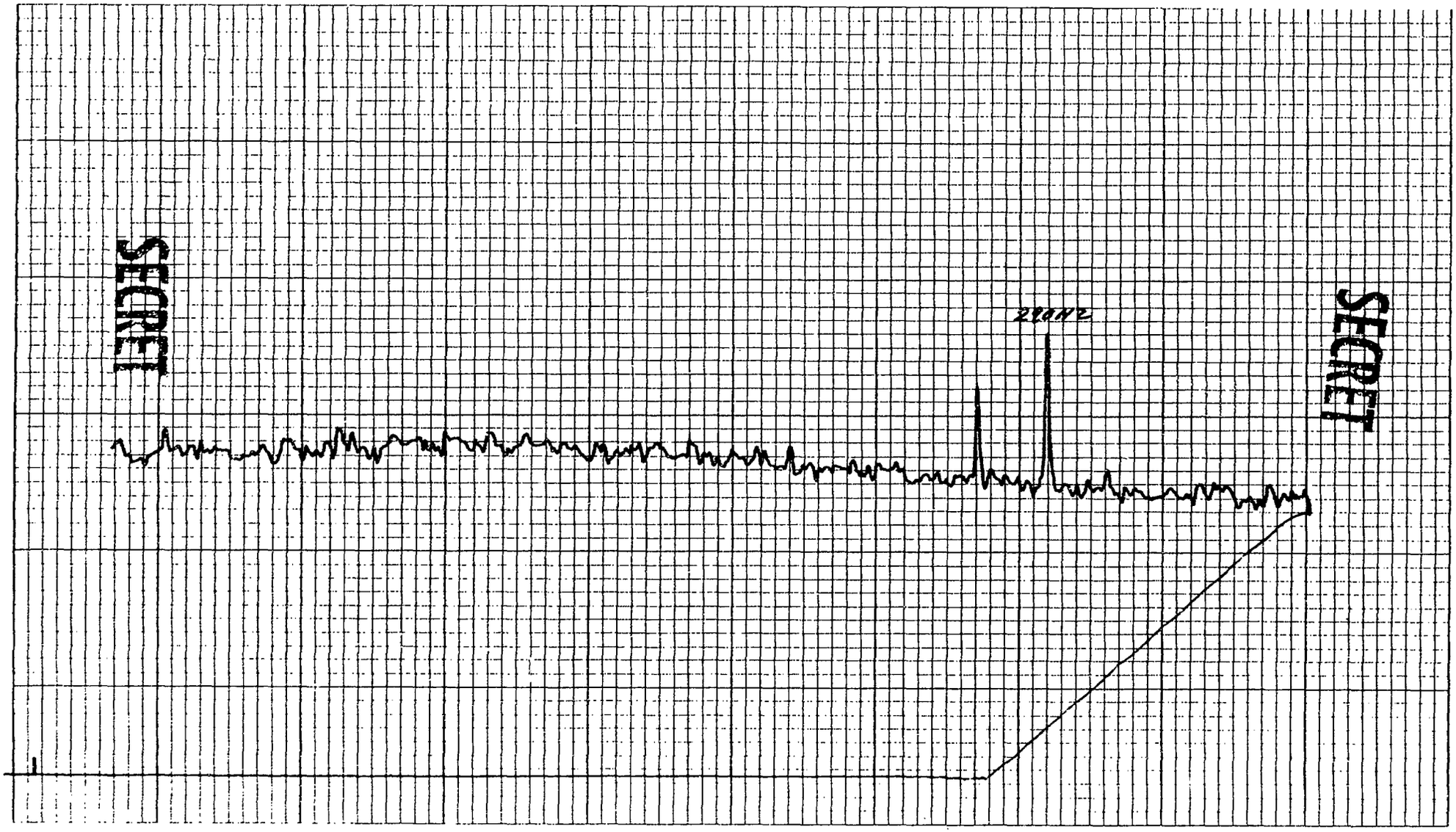
46 0703

CONTROL: 1148 - 16 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+56 DEG. AZ STEERING

REEL: M24
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 1985
ATTEN: -10 DB



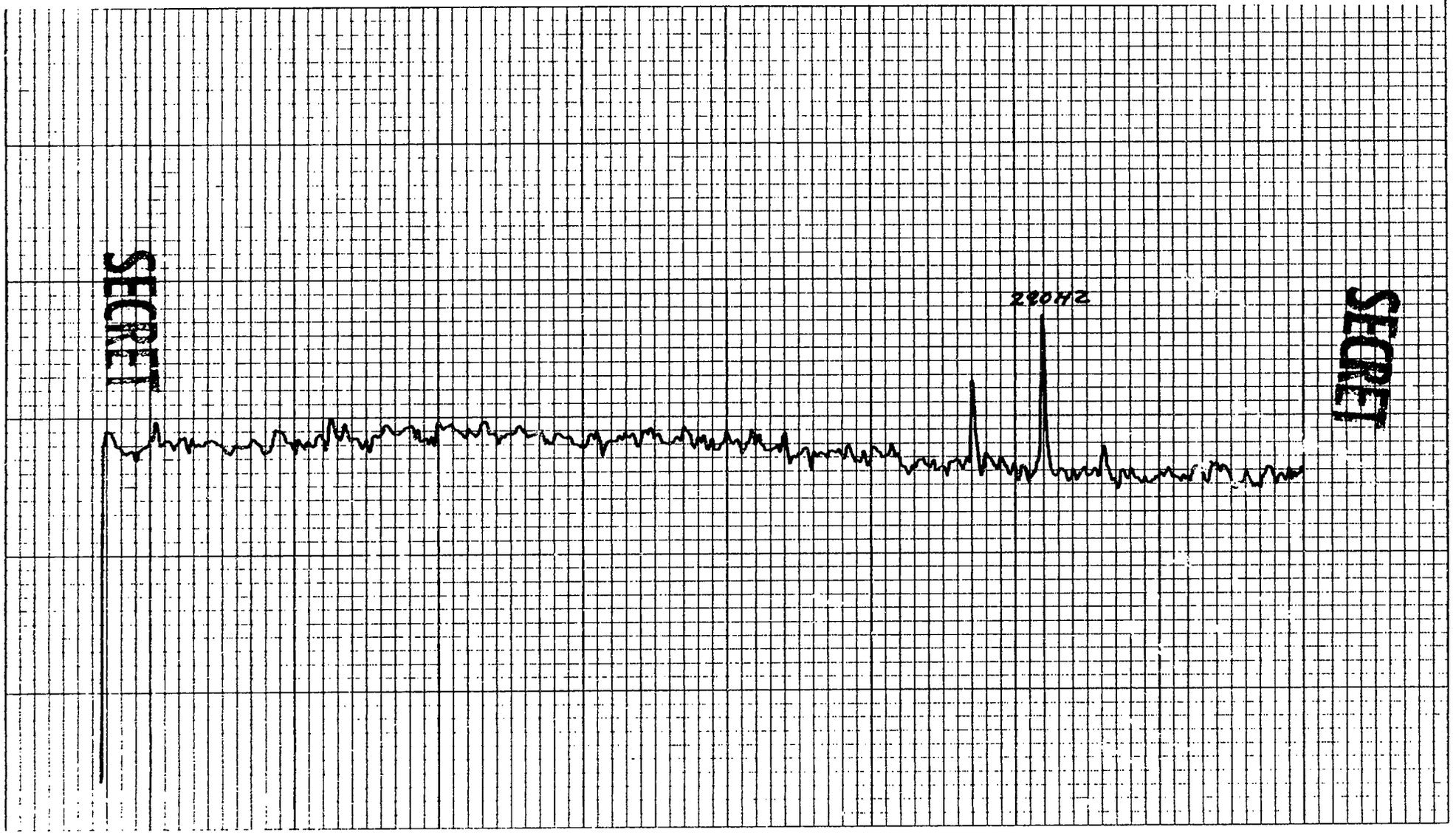
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 1148 - 16 (BP12)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
1-16
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+58 DEG. AZ STEERING

REEL: M24 INDEX 1995
INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING



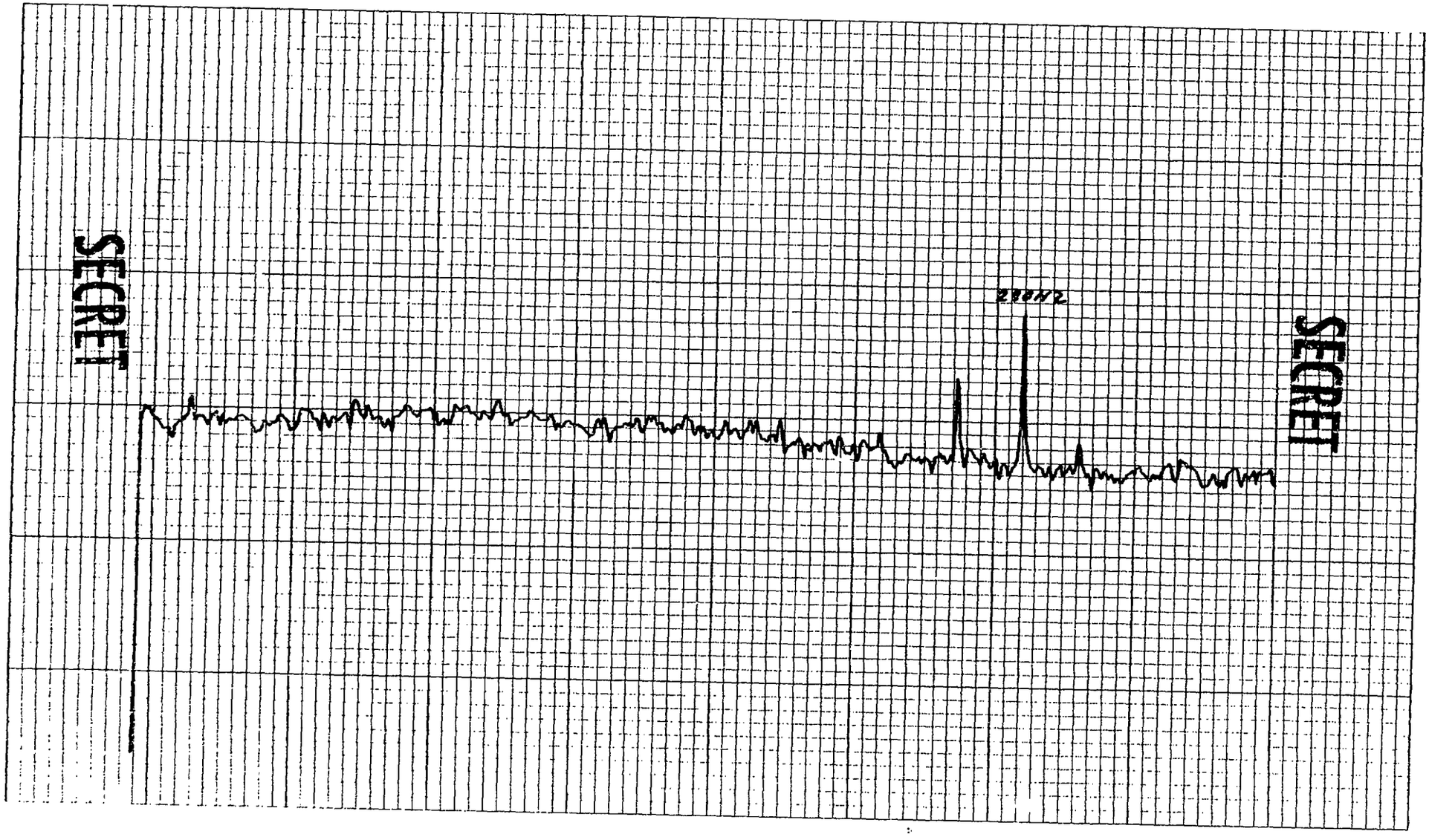
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 1148 - 16 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+59 DEG. AZ STEERING

REEL: M24 INDEX 1995
INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING



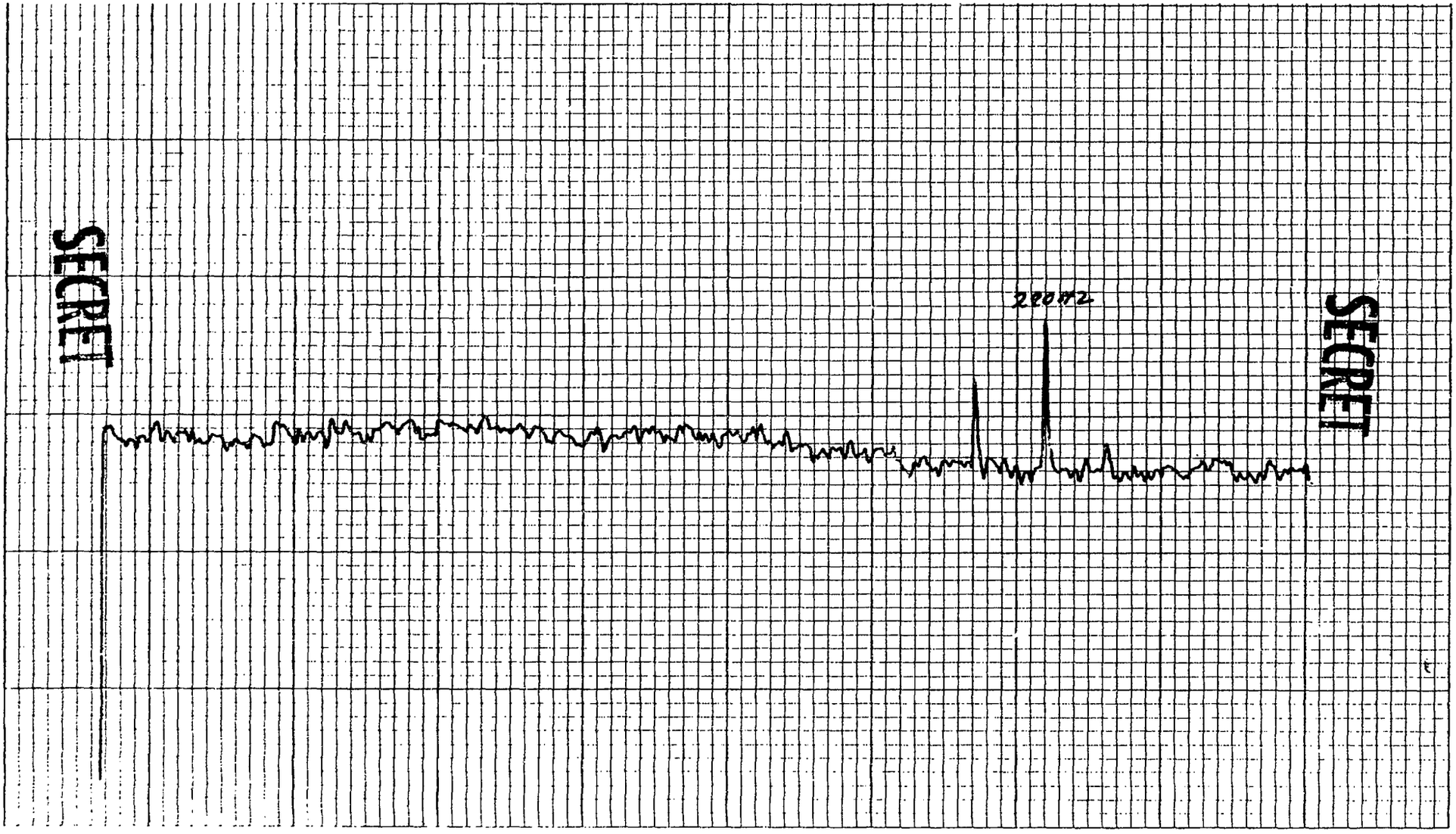
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

CONTROL: 1148 - 16 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+60 DEG. AZ STEERING

REEL: M24 INDEX 1985
INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

CONTROL: 1148 - 16 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: ~ ~ ~
DATE/TIME: 3-16-77 -1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+61 DEG. AZ STEERING

REEL: M24 INDEX 1995
INTEGRATION TIME 320 SECS ATTEN: -10 DB
FILTER WTG: HANNING

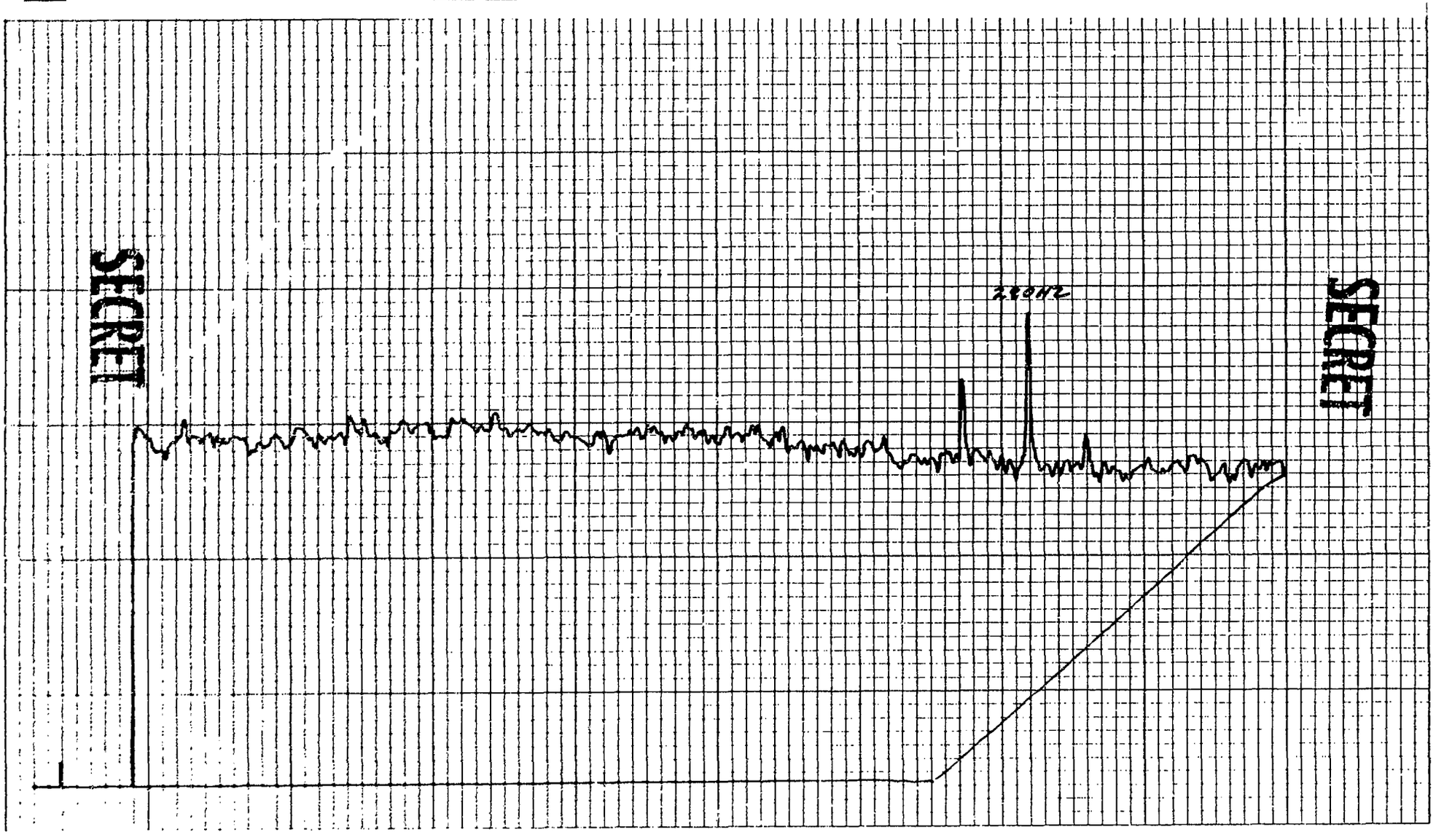
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

CONTROL: 1148 - 16 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+61.5 DEG. AZ STEERING

REEL: N24 INDEX 1995
INTEGRATION TIME 320 SECS ATTEN: DB
FILTER WTG: HANNING



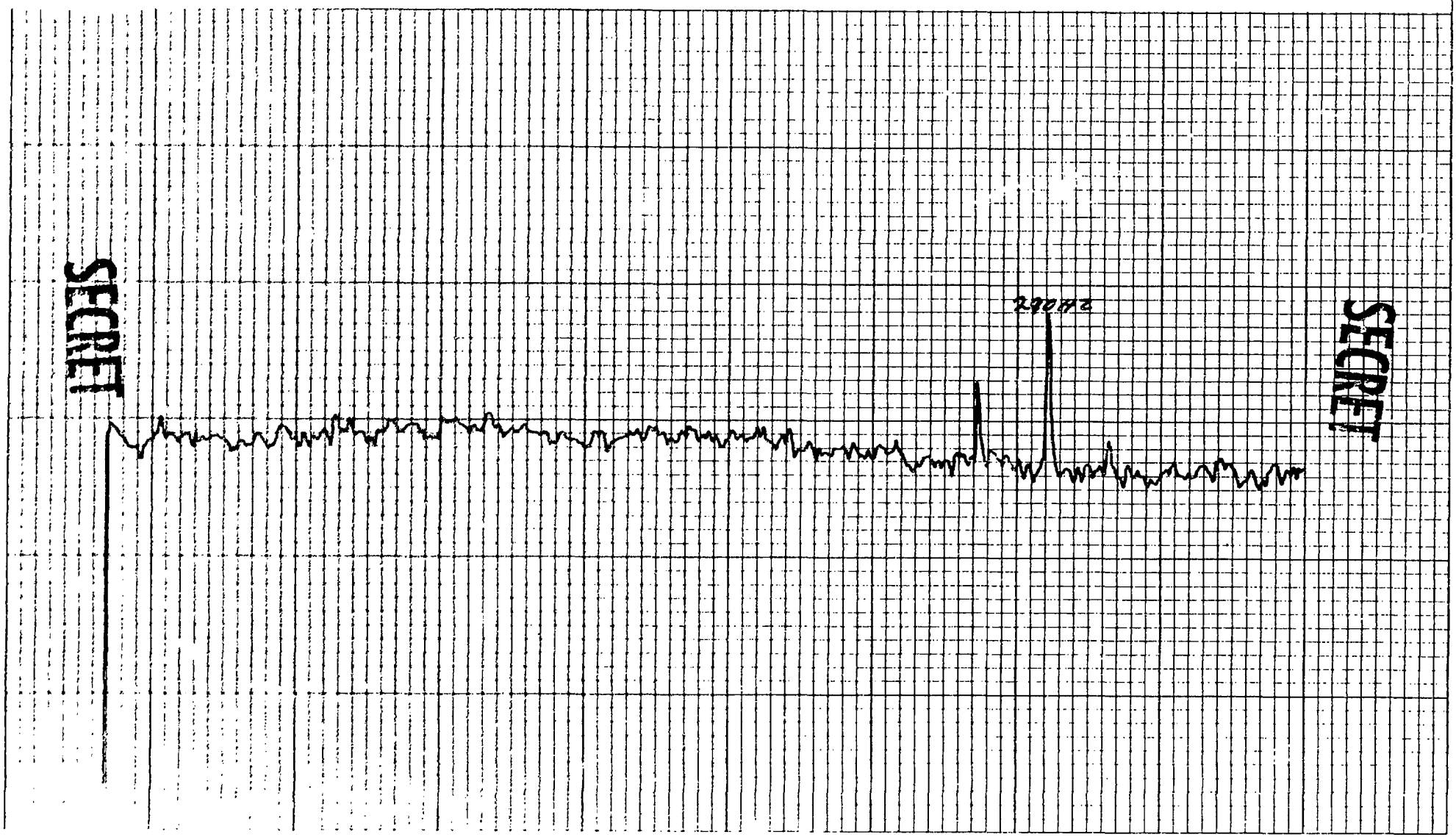
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 1148 - 16 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77-1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+62 DEG. AZ STEERING

REEL: 404
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 1905
ATTEN: -18 DB



K&E 10 X 10 TO THE INCH • 5 X 10 INCHES
KEUFFEL & ESSER CO

CONTROL: 1148 - 16 (D912)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 -1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+63 DEG. AZ STEERING

REEL: M24
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 1995
ATTEN: -10 DB

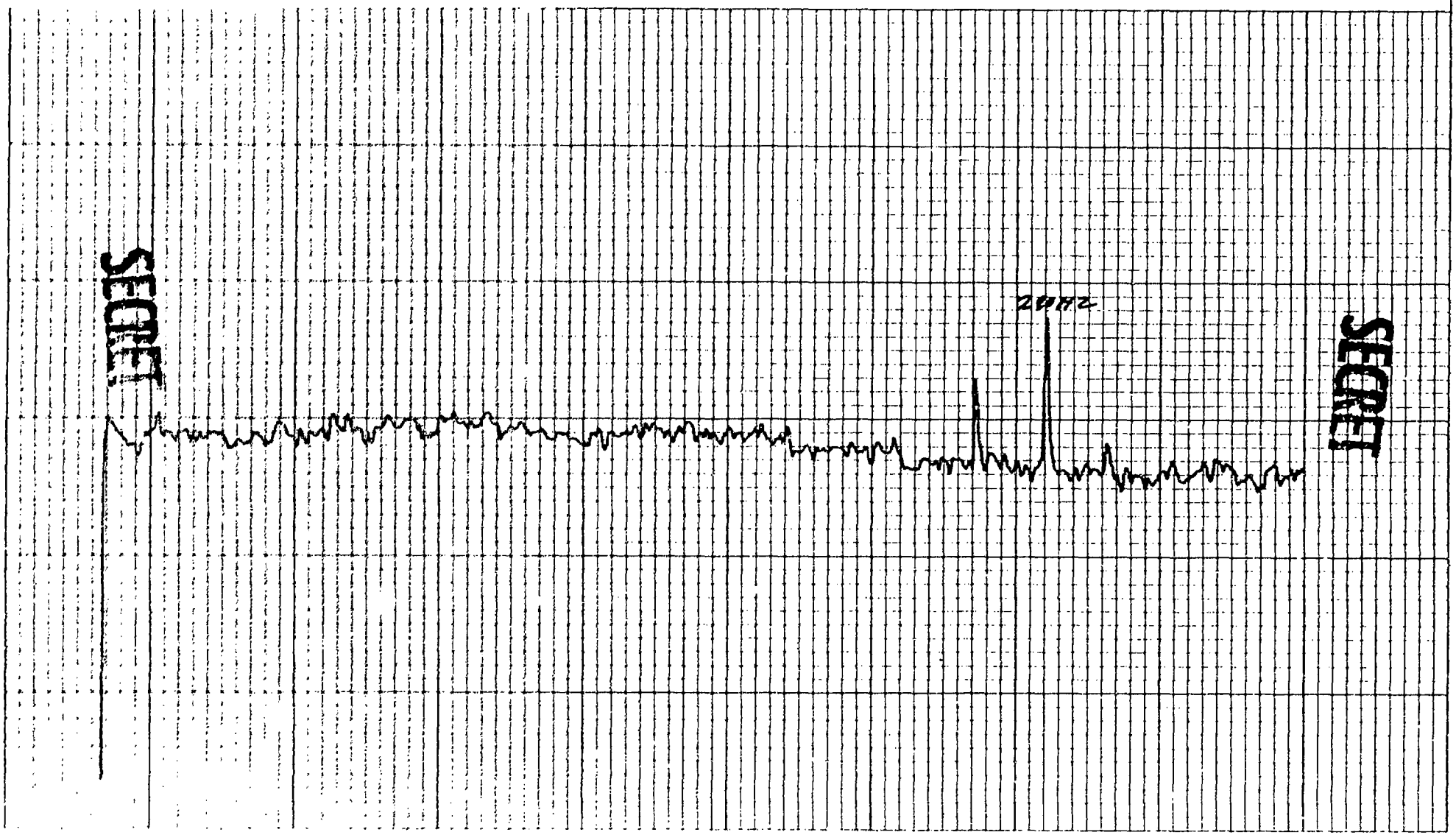
K&E 10 X 10 TO THE INCH • 5 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 1148 - 16 (2812)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 3-16-77 -1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+64 DEG. AZ STEERING

REEL: N34
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 1995
ATTEN: -10 DB



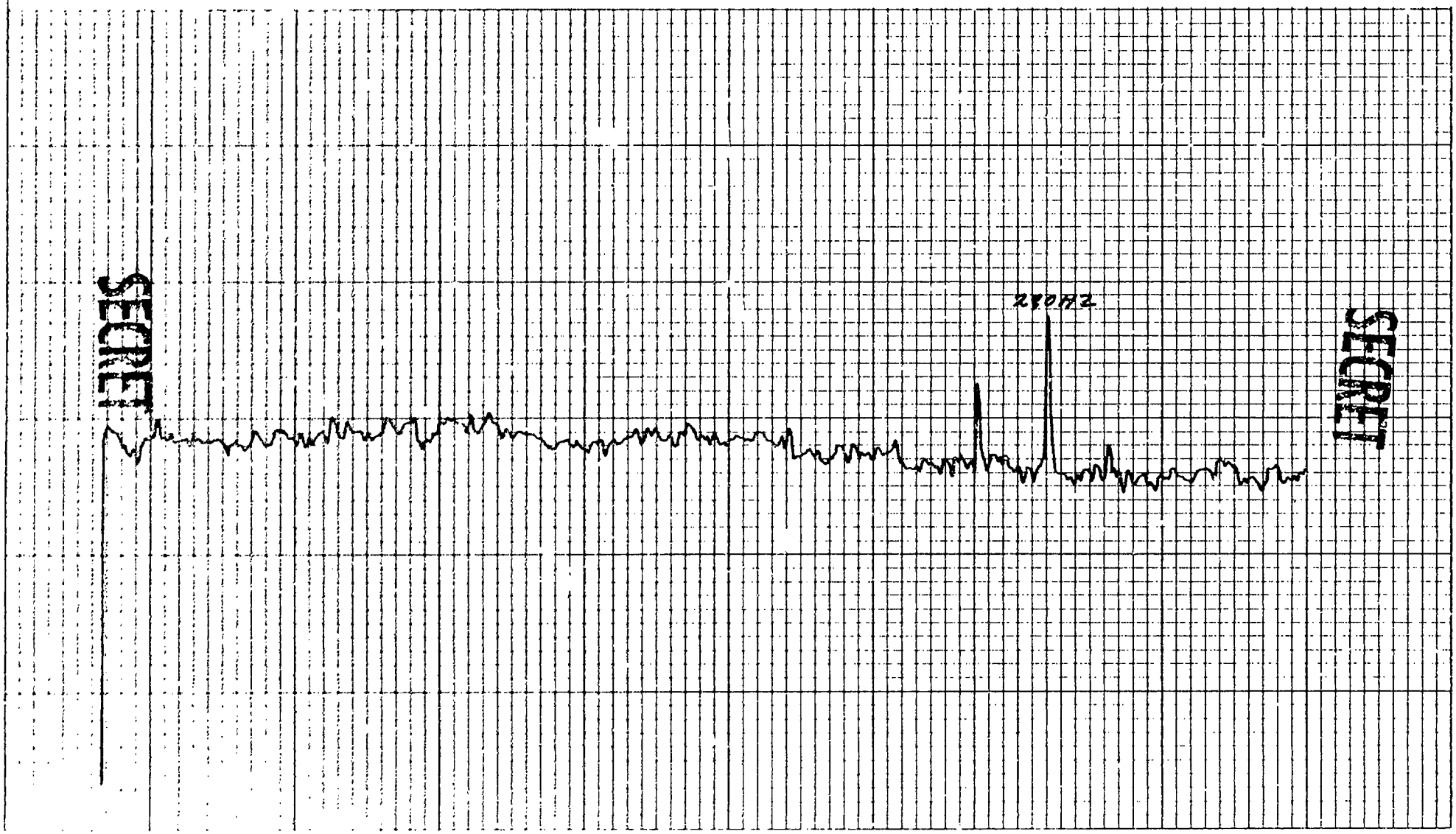
K&E 10 X 10 TO THE INCH • 5 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 1148 - 16 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+66 DEG. AZ STEERING

REEL: H34
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 1995
ATTEN: 78 DB



K&E 10 X 10 TO THE INCH • 5 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 1148 - 16 (SP12)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+68 DEG. AZ STEERING

REEL: M24 INDEX 1995
INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING

K&E 10 X 10 TO THE INCH 5 X 10 INCHES KEUFFEL & ESSER CO MADE IN U.S.A.

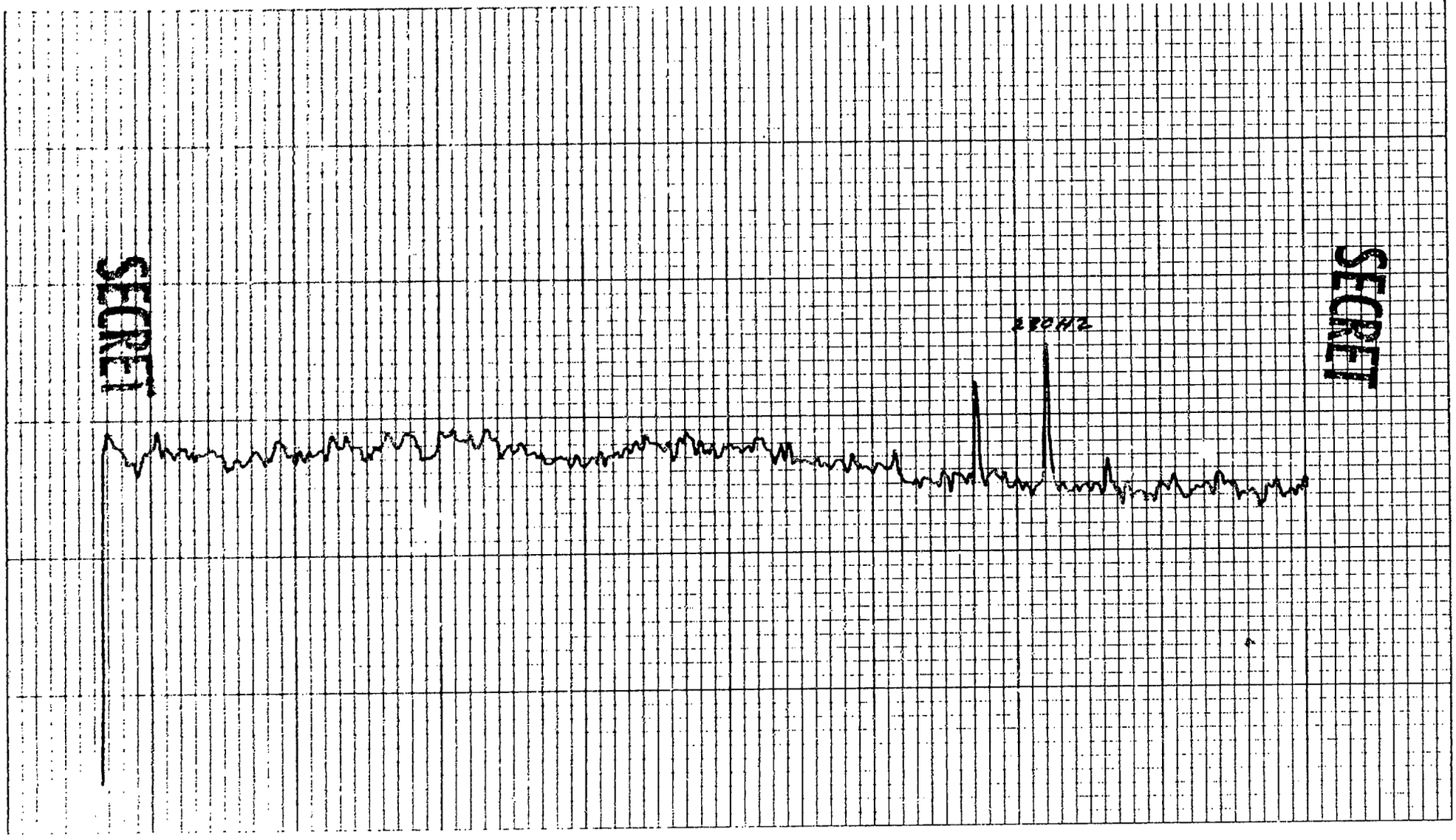
46 0703

CONTROL: 1148 - 16 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: — — —
1-16
DATE/TIME: 3-16-77-1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+70 DEG. AZ STEERING

REEL: N24 INDEX 1985

INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING



K•E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

Right

CONTROL: 1148 - 16 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77-1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+72 DEG. AZ STEERING

REEL: H24 INDEX: 005

INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING

K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

CONTROL: 1148 - 16 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+74 DEG. AZ STEERING

REEL: M24
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 1005
ATTEN: -10 DB

K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

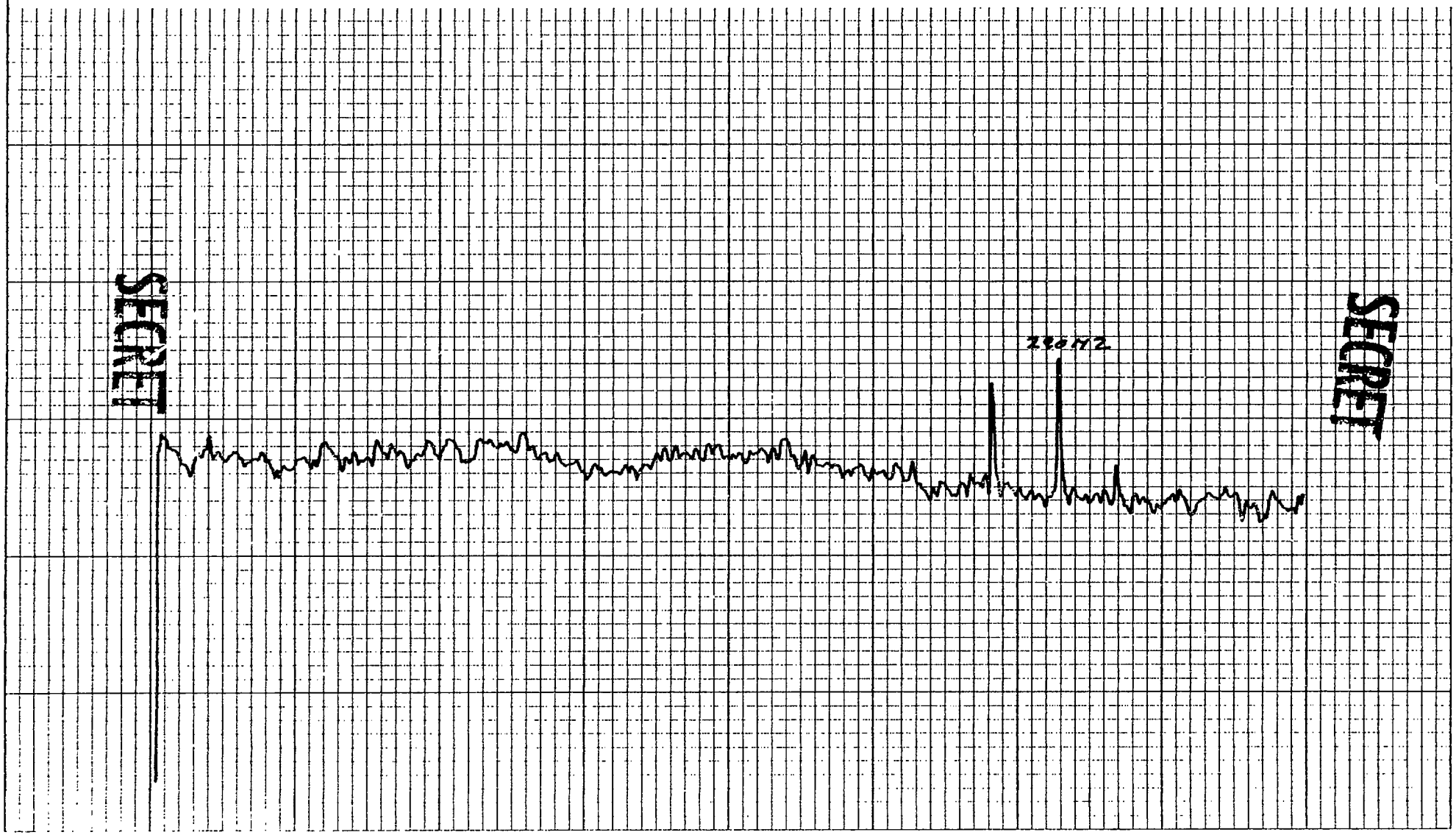
BIG 18

CONTROL: 1148 - 16 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+76 DEG. AZ STEERING

REEL: M04
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 1985
ATTEN: -10 DB



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 1148 - 16 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+70 DEG. AZ STEERING

REEL: M24 INDEX 1995
INTEGRATION TIME 320 SECS ATTEN: 70 DB
FILTER WTG: HANNING

CONFIDENTIAL

SIGNAL LEVEL AND SNR

CALCULATIONS

DATA POINT 12 FREQUENCY 140 HZ NUMBER OF ELEMENTS 32

SIGNAL LEVEL

MCPS-32 SIGNAL LEVEL INDICATED	-18.9 dBV	
MCPS-32 CAL. CORRECTION	+10	-8.9
BEAMFORMER GAIN	+18	+9.1 SIG. LEVEL FOR SNR CALCULATIO
MRA CORRECTION	+.2	+9.3 SIG. LEVEL FOR SIGNAL GAIN

NOISE LEVEL

MCPS-32 SIGNAL LEVEL INDICATED	-50.6 dBV	
MCPS-32 CAL. CORRECTION	+10	-40.6
BEAMFORMER GAIN	+18	-22.6 NOISE LEVEL FOR SNR CALCULATION

SIGNAL-NOISE-RATIO

SIGNAL LEVEL FOR SNR	+9.1	
NOISE LEVEL FOR SNR	-22.6	31.7
PROCESSOR CORRECTION	-4	27.7
MRA CORRECTION	+.2	27.9 SNR .013 HZ BAND
BANDWIDTH CONVERSION		SNR 1 HZ BAND

CONFIDENTIAL

CONFIDENTIAL

SIGNAL LEVEL AND SNR CALCULATIONS

DATA POINT 12 FREQUENCY 290 HZ NUMBER OF ELEMENTS 32

SIGNAL LEVEL

MCPS-32 SIGNAL LEVEL INDICATED	-35.8 dBV	
MCPS-32 CAL. CORRECTION	+10	-25.8
BEAMFORMER GAIN	+18	- 7.8 SIG. LEVEL FOR SNR CALCULATIO
MRA CORRECTION	+ .9	- 6.9 SIG. LEVEL FOR SIGNAL GAIN

NOISE LEVEL

MCPS-32 SIGNAL LEVEL INDICATED	-54.6 dBV	
MCPS-32 CAL. CORRECTION	+10	-44.6
BEAMFORMER GAIN	+18	-26.6 NOISE LEVEL FOR SNR CALCULATION

SIGNAL-NOISE-RATIO

SIGNAL LEVEL FOR SNR		-7.8
NOISE LEVEL FOR SNR	-26.6	18.8
PROCESSOR CORRECTION	- 4.2	14.6
MRA CORRECTION	+ .9	15.5 SNR .013 HZ BAND
BANDWIDTH CONVERSION		SNR 1 HZ BAND

CONFIDENTIAL

CONFIDENTIAL

DATA POINT 12

SIGNAL GAIN

	140 HZ	290HZ	295HZ
MEAN OMNI SIGNAL LEVEL	-24.8	-30.6	
MRA SIGNAL LEVEL	+9.3	-6.9	
ARRAY SIGNAL GAIN	34.1	31.7	
20 LOG 32 (# of elements)	30.1	30.1	
DIFFERENCE	+4.0	+1.6	

ARRAY GAIN

MRA SNR	27.9	15.5	
MEAN OMNI SNR	19.4	7.9	
ARRAY GAIN	8.5	7.6	
THEORETICAL AZMUTH GAIN (at MRA)	10.6	13.4	
DIFFERENCE	-2.1	-5.8	

CONFIDENTIAL

K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 1148 - 32 (DB12)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 140 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
1-26 & 28-34
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+98 DEG. AZ STEERING

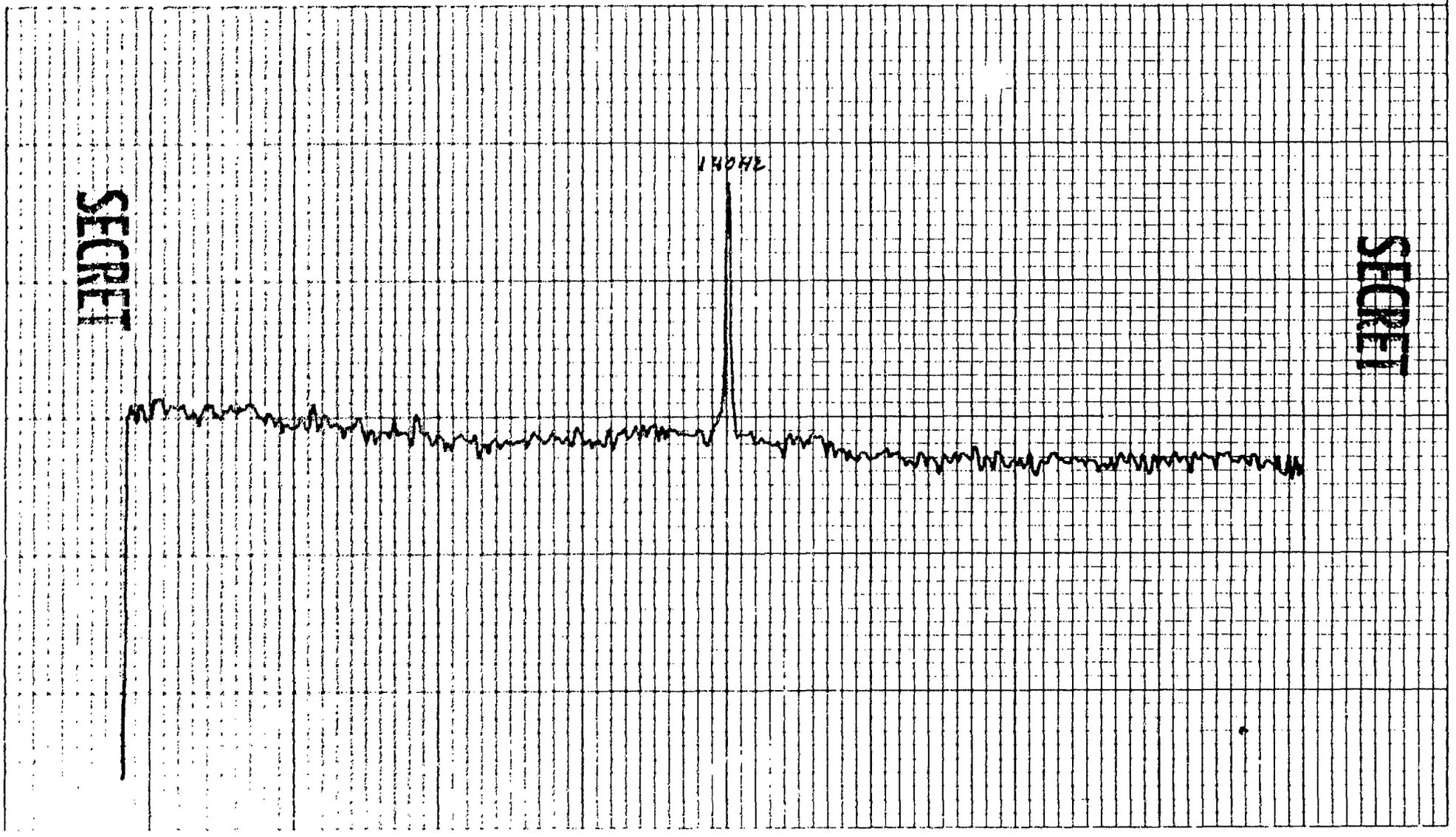
REEL: M24 INDEX 1995
INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING

K&E 10 X 10 TO THE INCH • 5 X 10 INCHES
KEUFFEL & ESSER CO

CONTROL: 1140 - 32 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 140 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 7-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+50 DEG. AZ STEERING

REEL: M24 INDEX 1995
INTEGRATION TIME 320 SECS ATTEN: -11 DB
FILTER WTG: HANNING



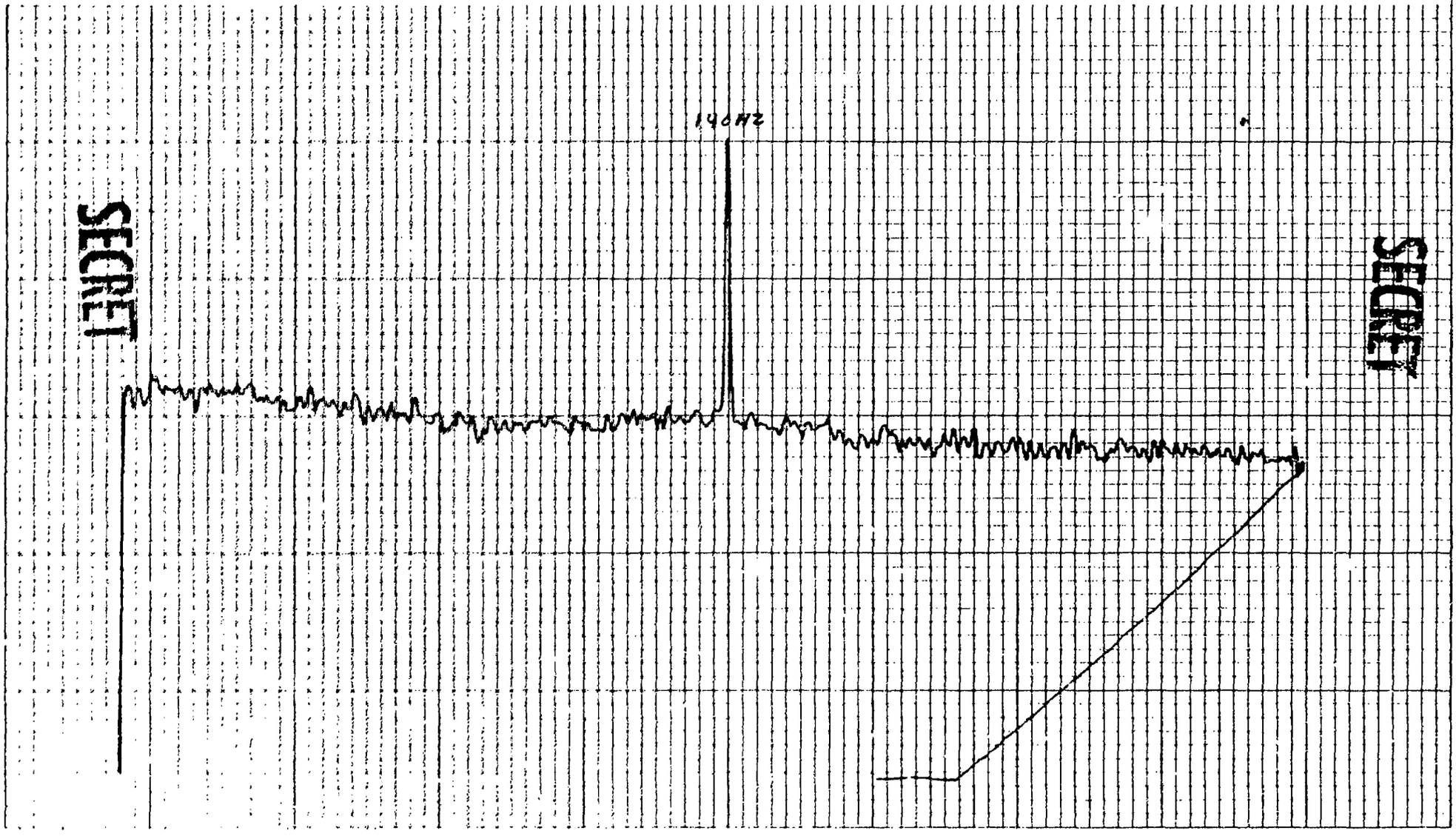
K&E 10 X 10 TO THE INCH • 5 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTRO.: 1140 - 72 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 28-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 140 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+52 DEG. AZ STEERING

REEL: H34
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 1985
ATTEN: -18 DB



K&E 10 X 10 TO THE INCH
KEUFFEL & ESSER CO

CONTROL: 1148 - 32 (D.12)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 28-34)
EXERCISE·BEARING STAKE
CENTER FREQ: 140 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 1149 Z
ANALYSIS BANDWIDTH: 1/10HZ
+54 DEG. AZ STEERING

REEL: M24 INDEX/995
INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING

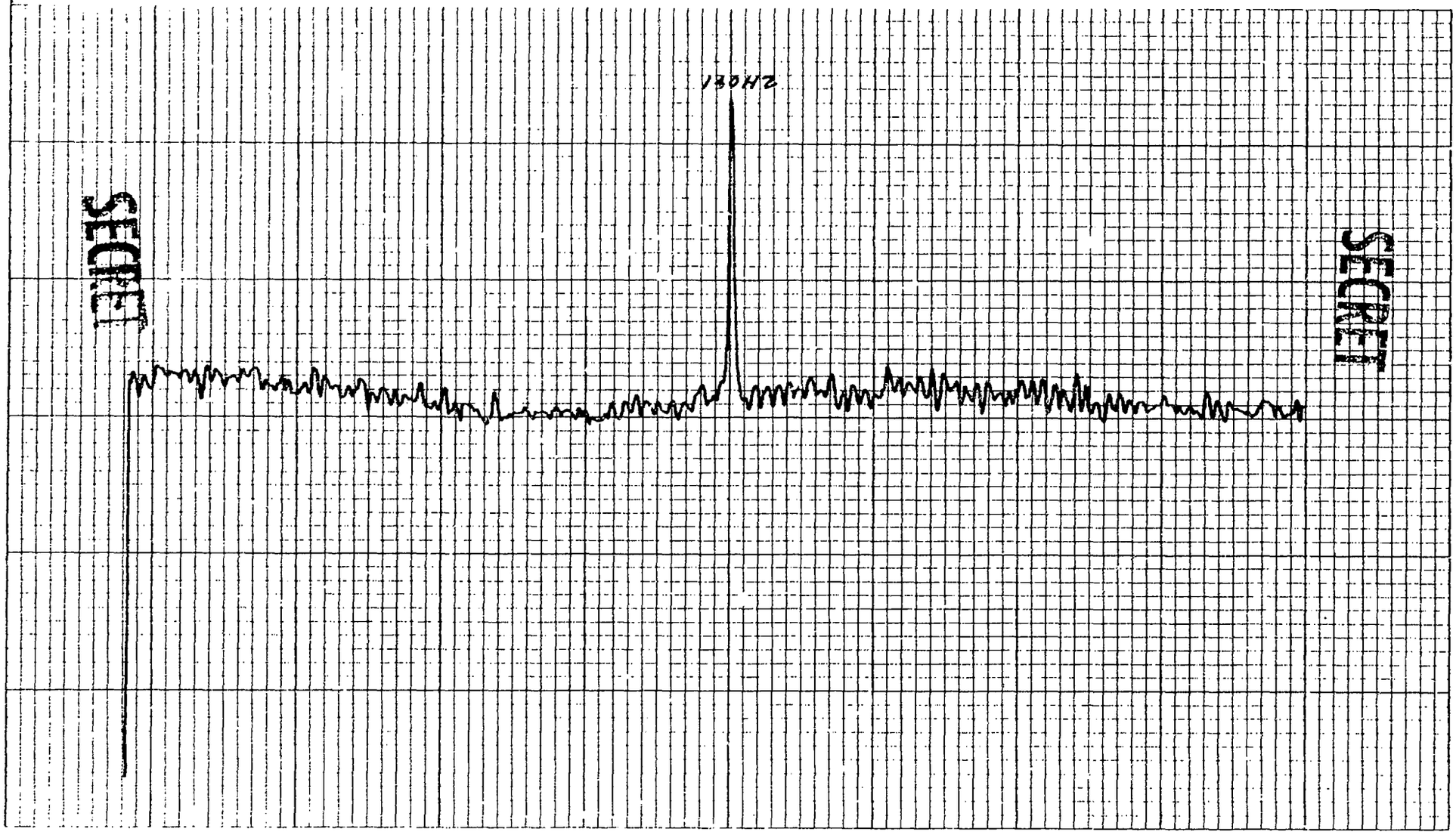
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

CONTROL: 1148 - 32 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 28-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 140 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+56 DEG. AZ STEERING

REEL: M24 INDEX 1985
INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING



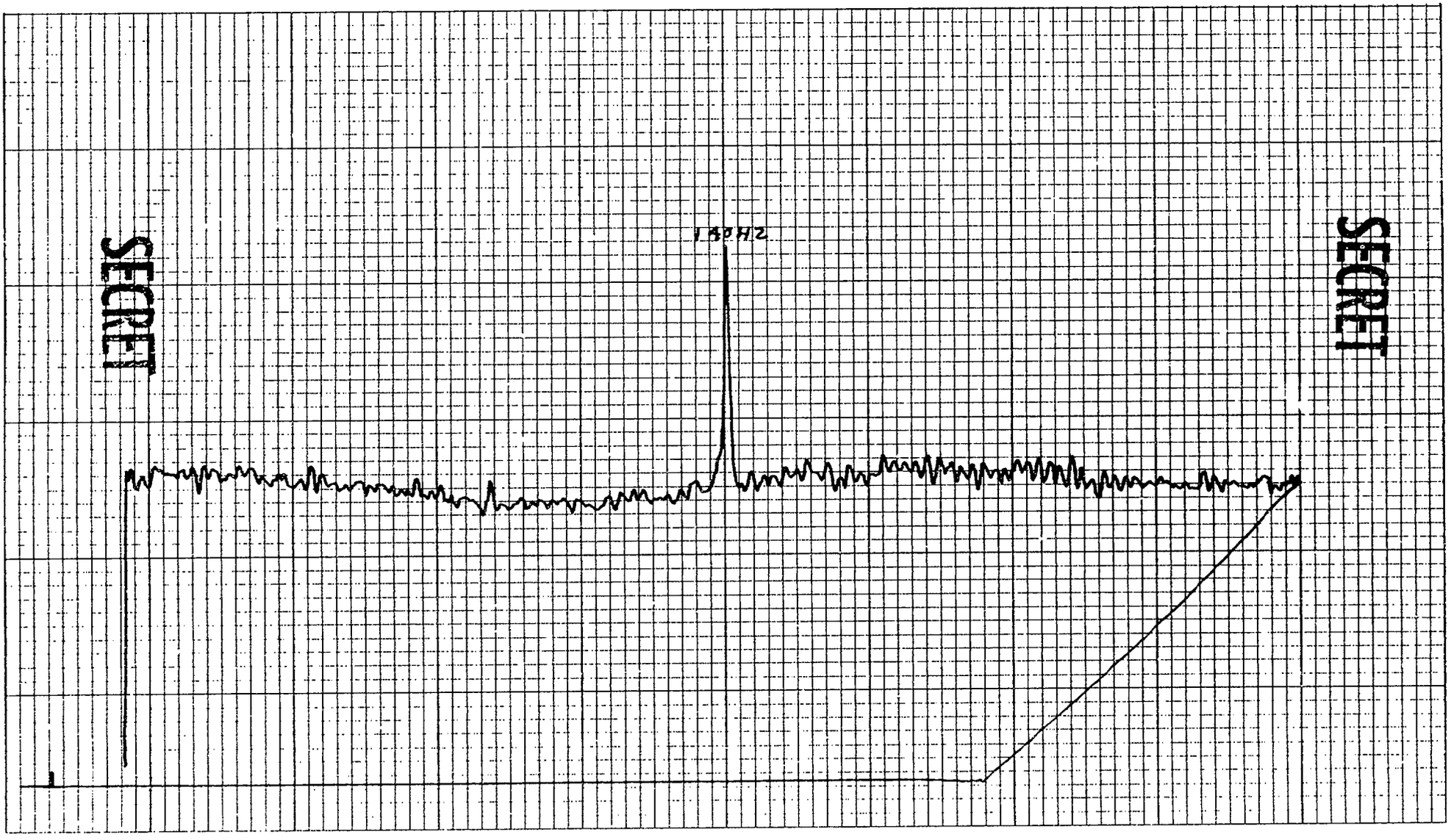
K·E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

CONTROL: 1148 - 32 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 140 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
(1-26 & 29-34)
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+58 DEG. AZ STEERING

REEL: M24 INDEX 1895
INTEGRATION TIME 320 SECS ATTEN: -10 DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 1148 - 32 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 140 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
1-26 & 29-53)
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+59 DEG. AZ STEERING

REEL: M24 INDEX 1985

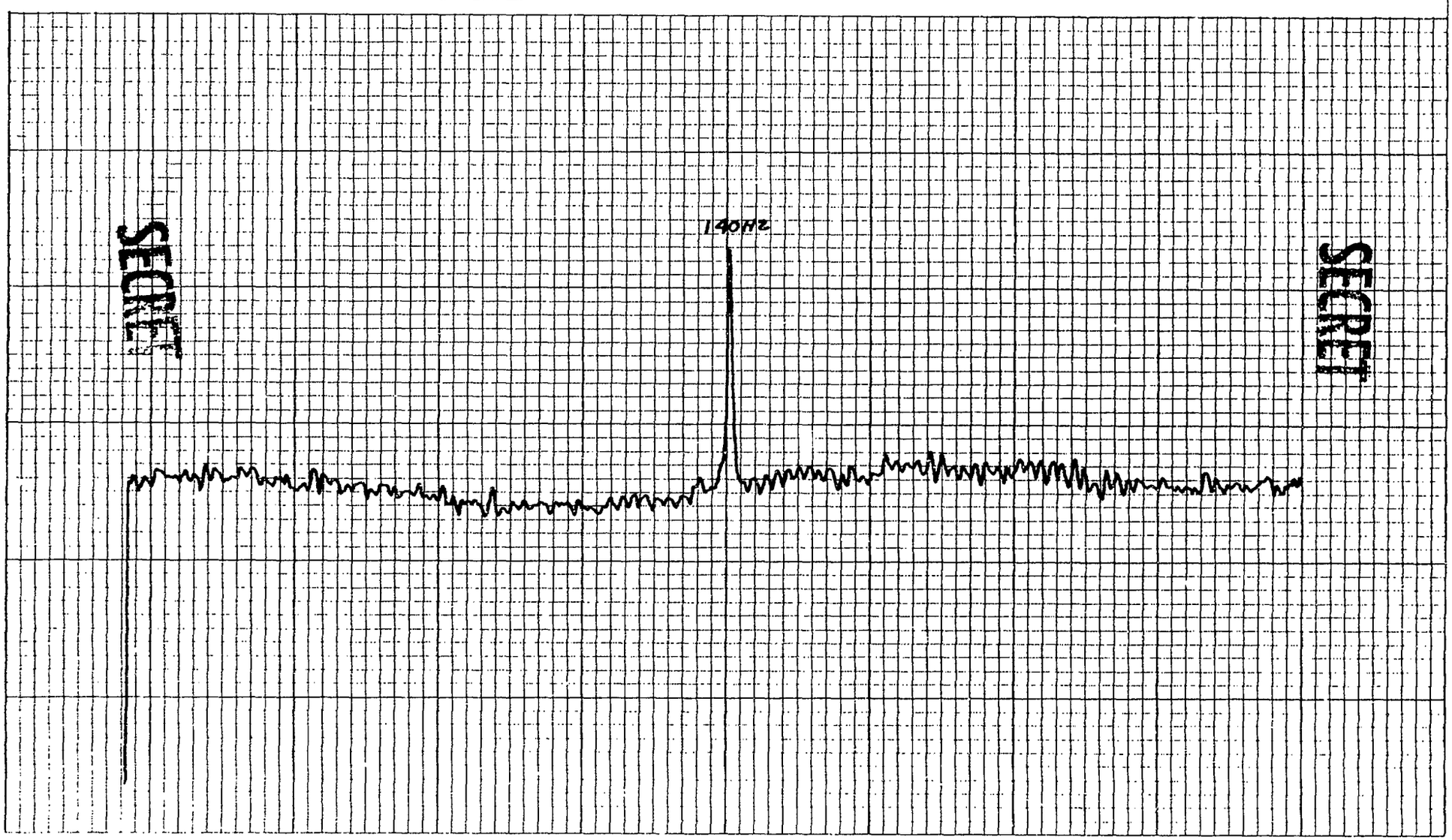
INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING

K+E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER C... MADE IN U.S.A.

CONTROL: 1148 - 32 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS 1-26,28-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 140 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+60 DEG. AZ STEERING

REEL: M24 INDEX 1995
INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

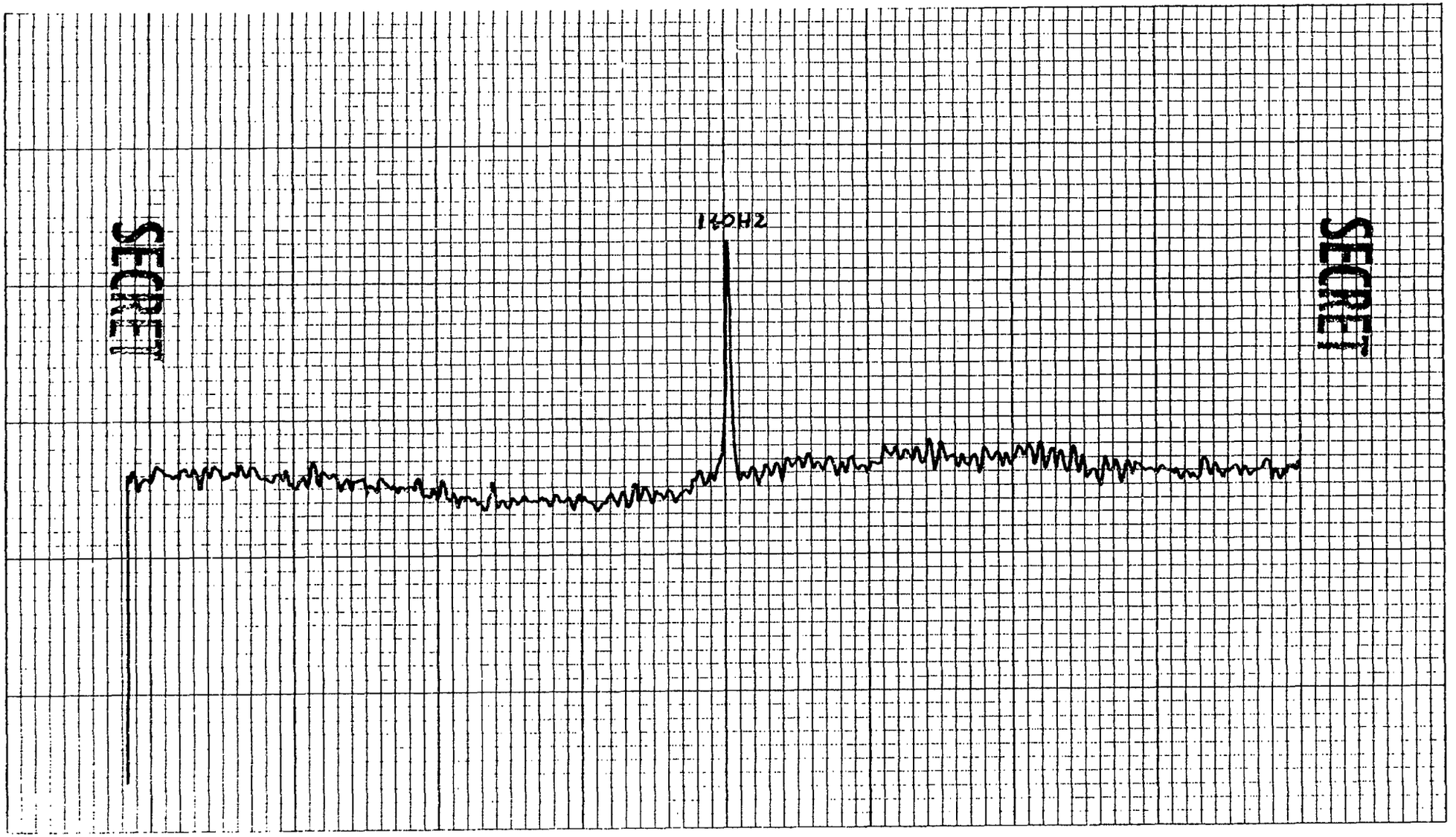
46 0703

CONTROL: 1148 - 32 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 140 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+61 DEG. AZ STEERING

REEL: M24 INDEX 1995

INTEGRATION TIME 320 SECS ATTEN: -10 DB
FILTER WTG: HANNING



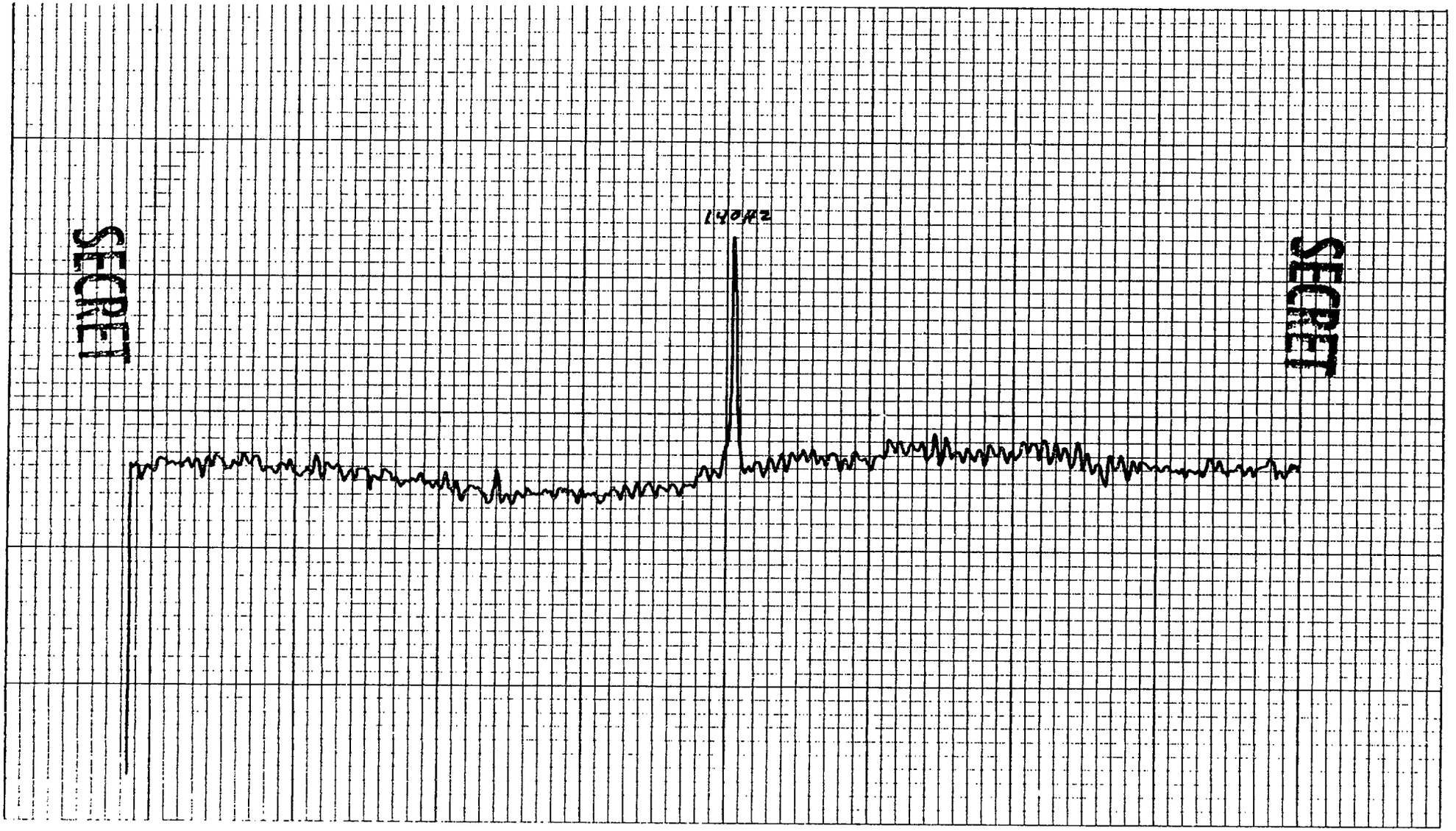
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

B32 46 0703

CONTROL: 1148 - 32 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 140 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
1-26 & 29-34
DATE/TIME: 346-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+61.5 DEG. AZ STEERING

REEL: N24 INDEX 1995
INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING



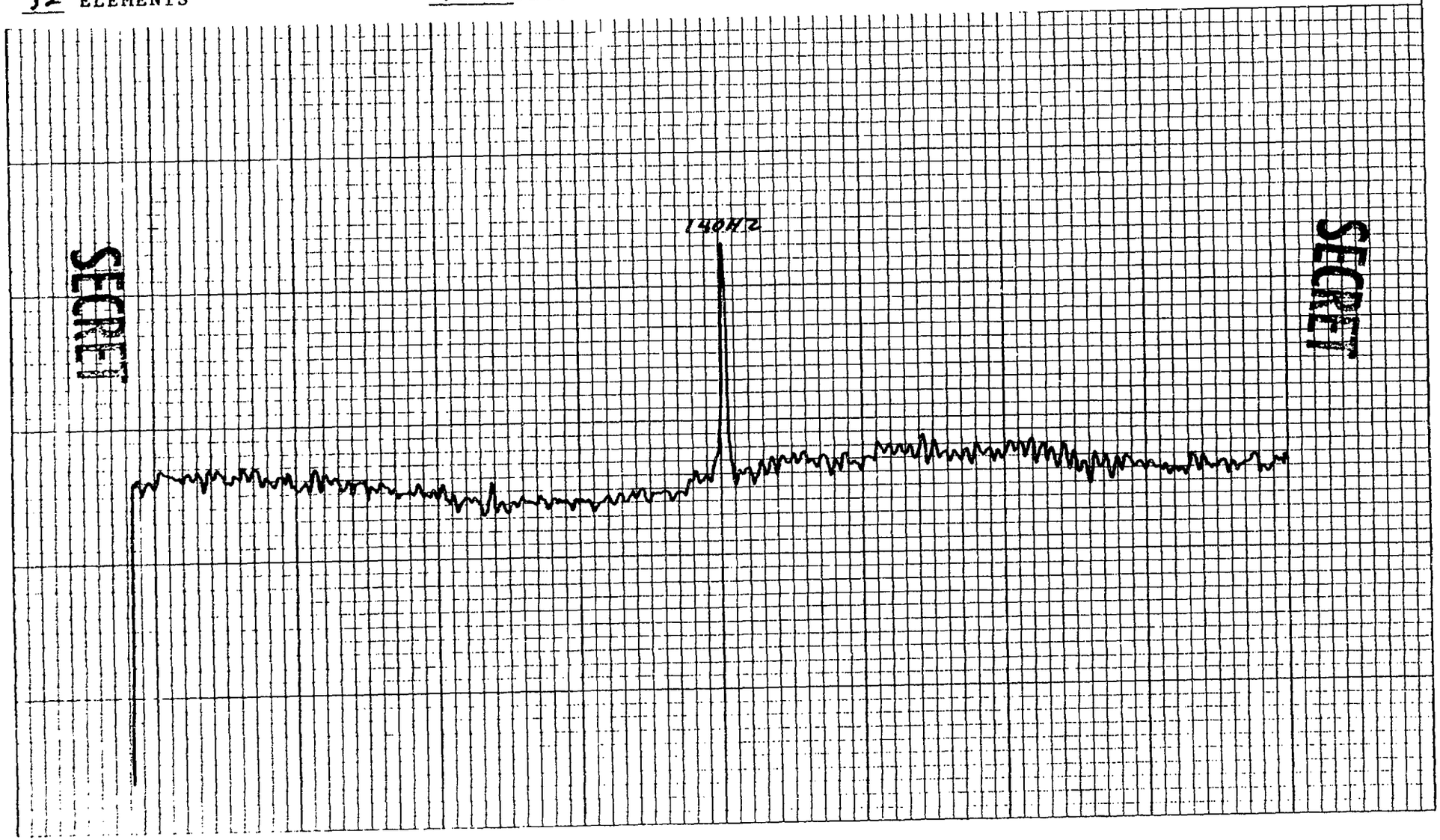
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 1148 - 32 (DPIR)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 140 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
1-26 & 3834)
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+62 DEG. AZ STEERING

REEL: M24 INDEX 1886
INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING



K·E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 1148 - 32 (bP12)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 140 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
1-26 & 29-34)
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+63 DEG. AZ STEERING

REEL: M24 INDEX/995

INTEGRATION TIME 320 SECS ATTEN: 10 DB
FILTER WTG: HANNING

K·E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

CONTROL: 1148 - 32 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 140 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+64 DEG. AZ STEERING

REEL: M 24
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

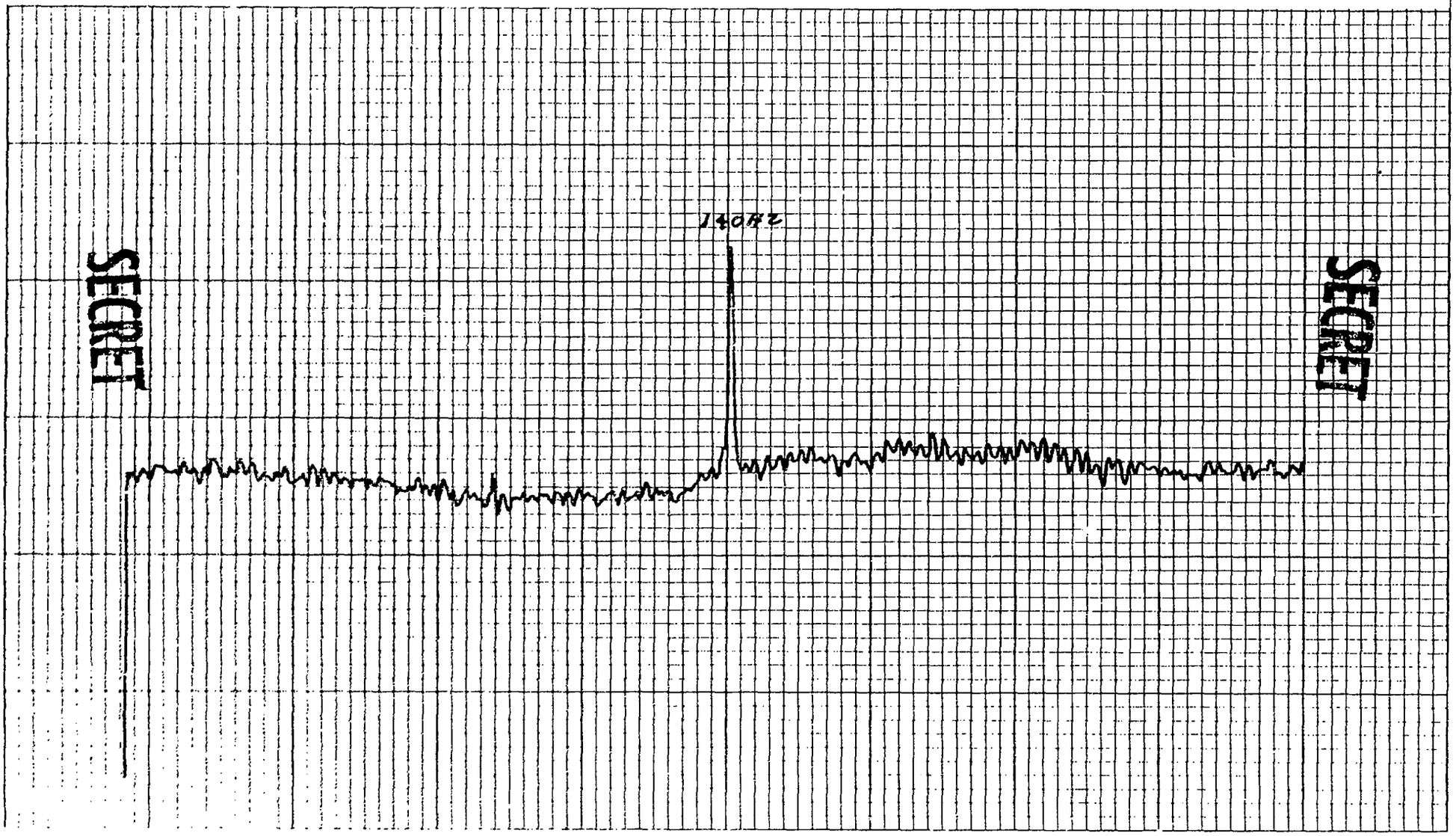
INDEX 1995
ATTEN: 78 DB

K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 1148 - 32 (DP:2)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 28-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 140 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+66 DEG. AZ STEERING

REEL: M24 INDEX 1995
INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

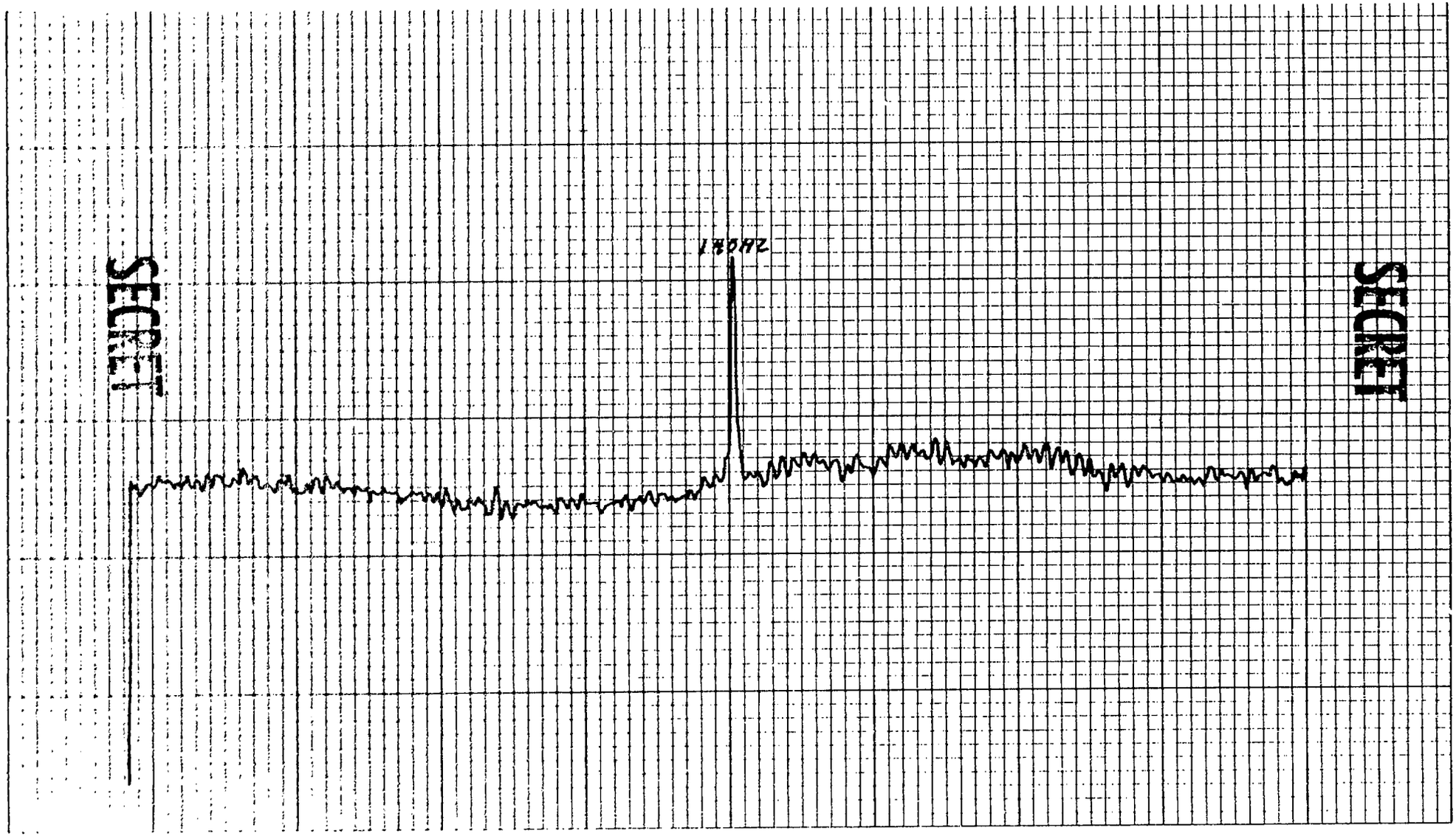
46 0703

CONTROL: 1148 - 32 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 140 HZ
32 ELEMENTS

DATE OF ANALYSIS: — — —
1-26 & 29-34)
DATE/TIME: 3-16-77 -1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+68 DEG. AZ STEERING

REEL: M24 INDEX 1985

INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING



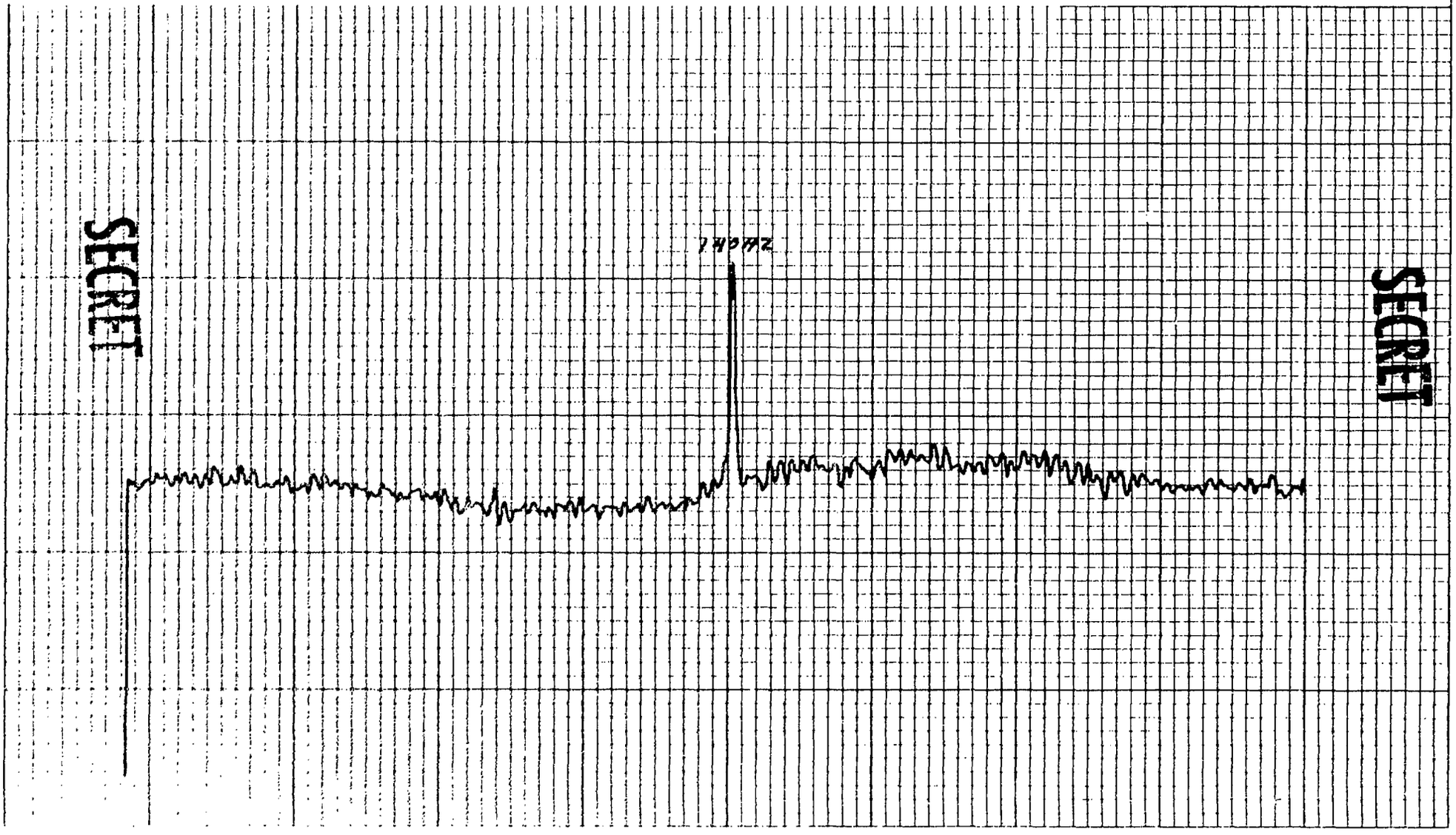
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 1148 - 72 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 140 HZ
72 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+70 DEG. AZ STEERING

REEL: M24 INDEX 1985

INTEGRATION TIME 320 SECS ATTEN: -10 DB
FILTER WTG: HANNING

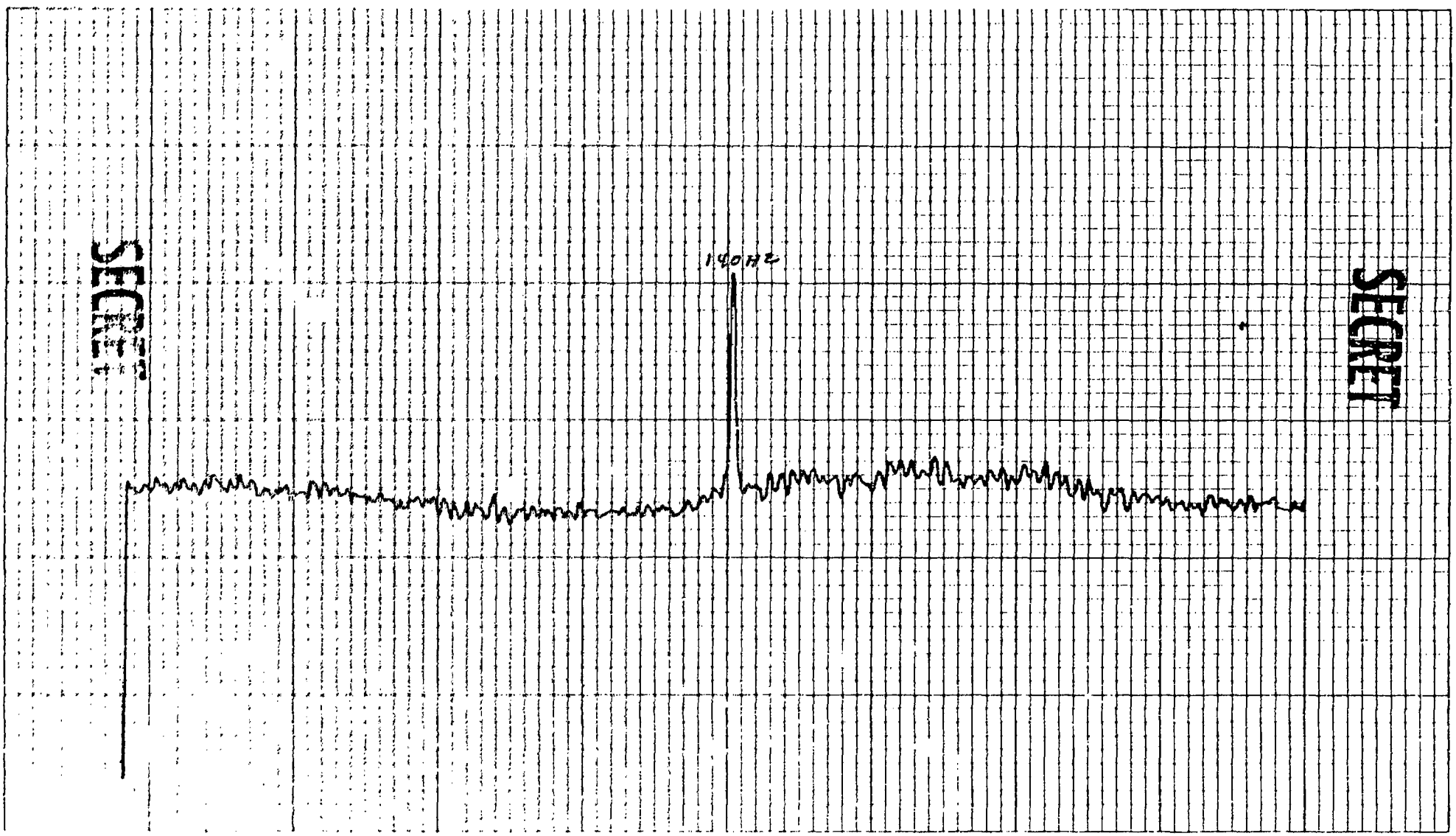


K&E 10 X 10 TO THE INCH • 5 X 10 INCHES
KEUFFEL & ESSER CO

CONTROL: 1148 - 32 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 140 HZ
32 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 3-16-77 -1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+72 DEG. AZ STEERING

REEL: N24 INDEX 1995
INTEGRATION TIME 320 SECS ATTEN: -10 DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

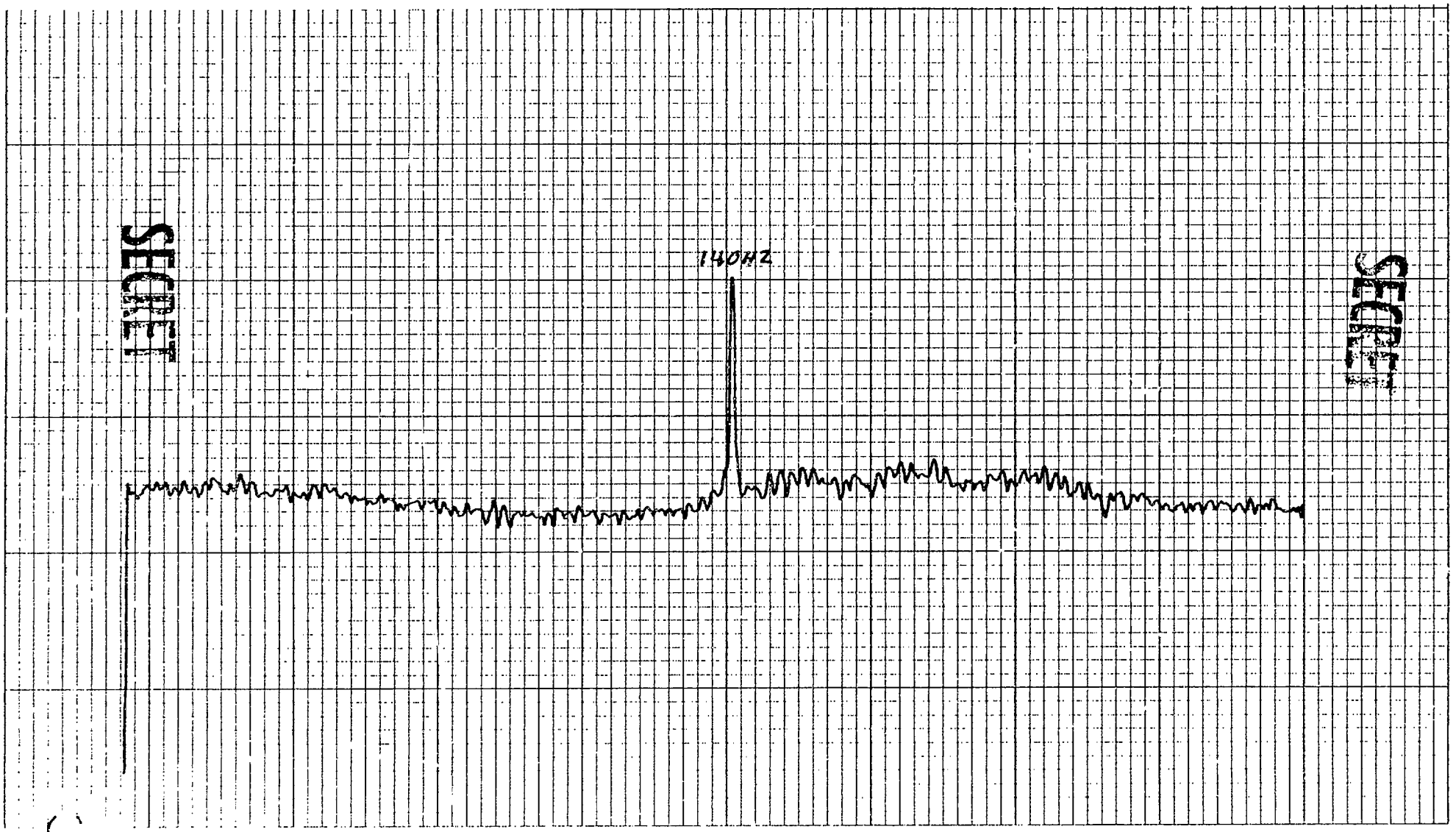
46 0703

CONTROL: 1148 - 32 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 140 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+74 DEG. AZ STEERING

REEL: M24 INDEX 1885

INTEGRATION TIME 320 SECS ATTEN: -10 DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 1148 - 32 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 140 HZ
32 ELEMENTS

DATE OF ANALYSIS: — — —
1-26 & 29-34)
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+76 DEG. AZ STEERING

REEL: M24 INDEX 1895
INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING

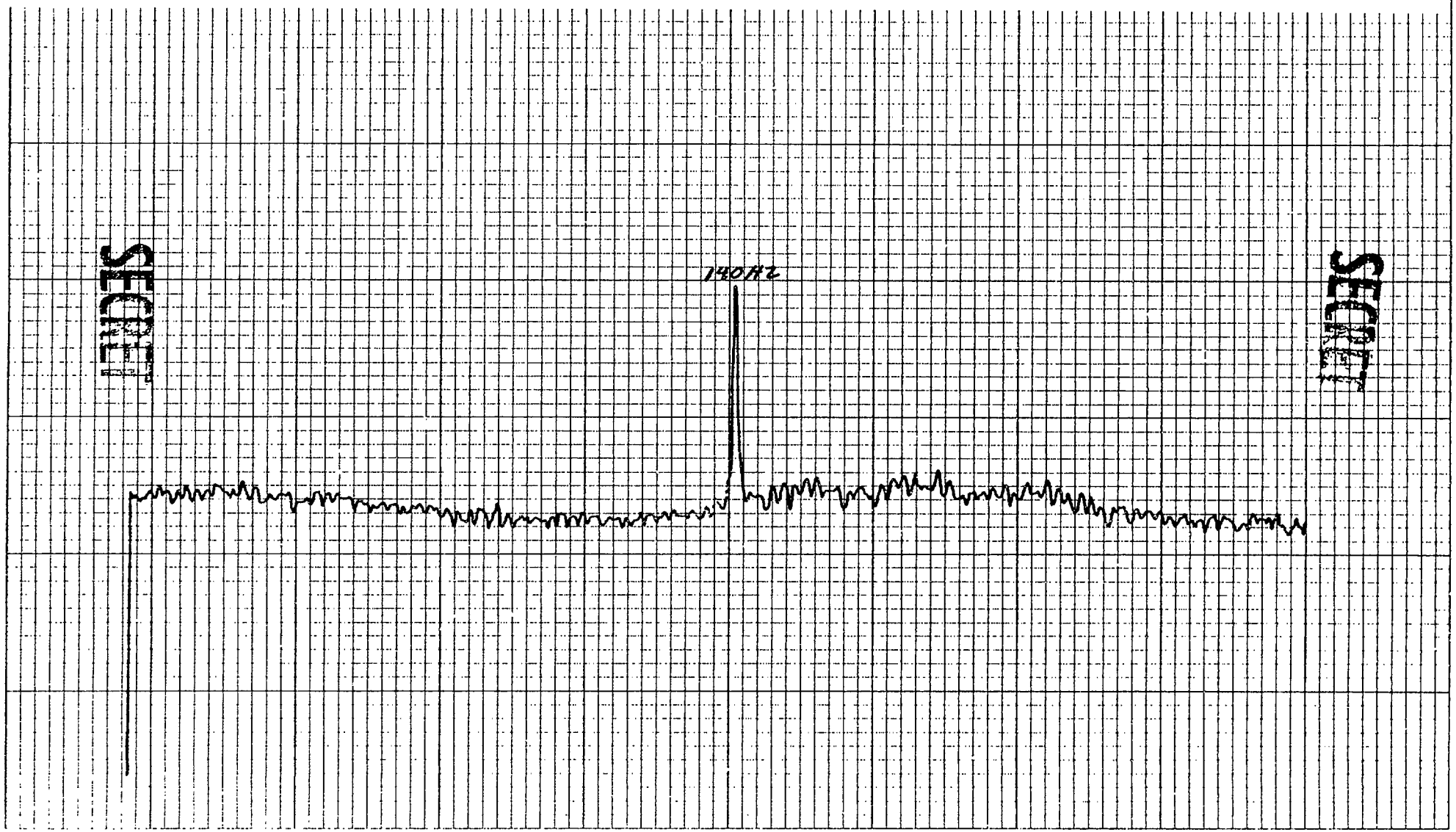
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 1148 - 32 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 140 HZ
72 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 3-16-77 - 1148Z
ANALYSIS BANDWIDTH: 1/10HZ
+78 DEG. AZ STEERING

REEL: M24 INDEX 1995
INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING

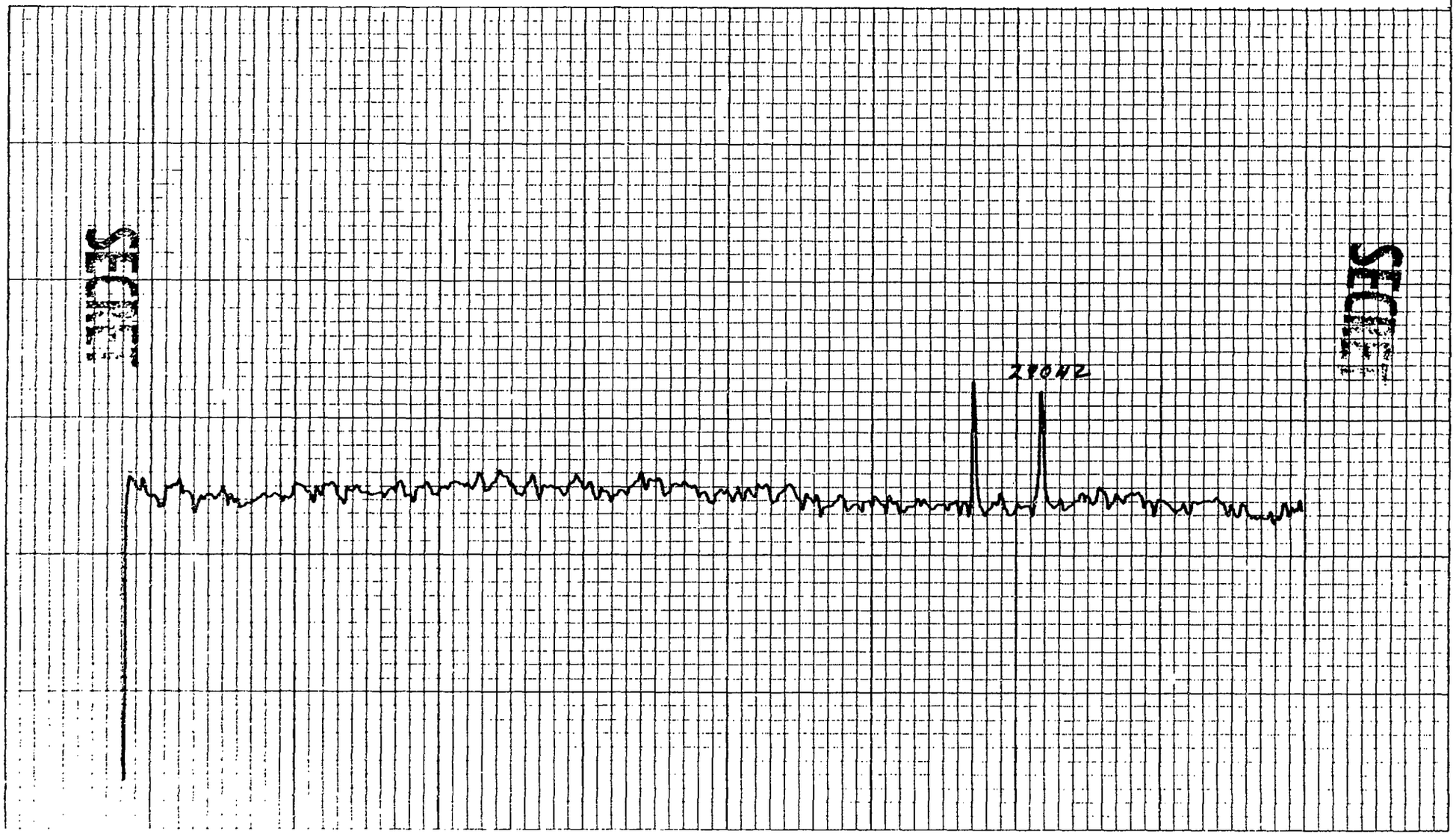


K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 1148 - 32 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 28-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 -1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+48 DEG. AZ STEERING

REEL: M24 INDEX 1995
INTEGRATION TIME 320 SECS ATTEN: -10 DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 1148 - 72 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
92 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+50 DEG. AZ STEERING

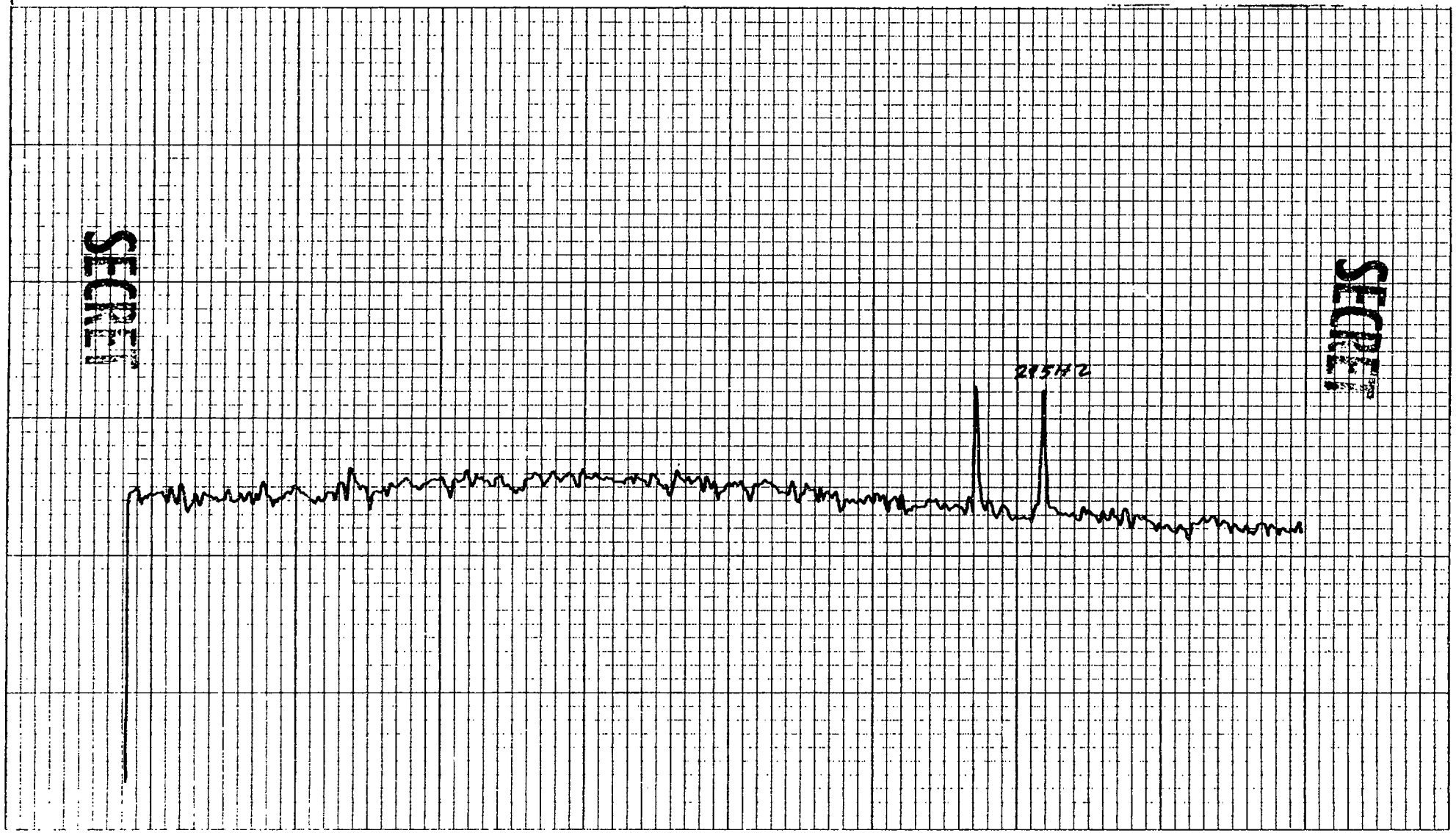
REEL: 1124 INDEX 1985
INTEGRATION TIME 320 SECS ATTEN: -18DB
FILTER WTG: HANNING

K·E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 1148 - 32 (D012)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+52 DEG. AZ STEERING

REEL: M24 INDEX 1895
INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING



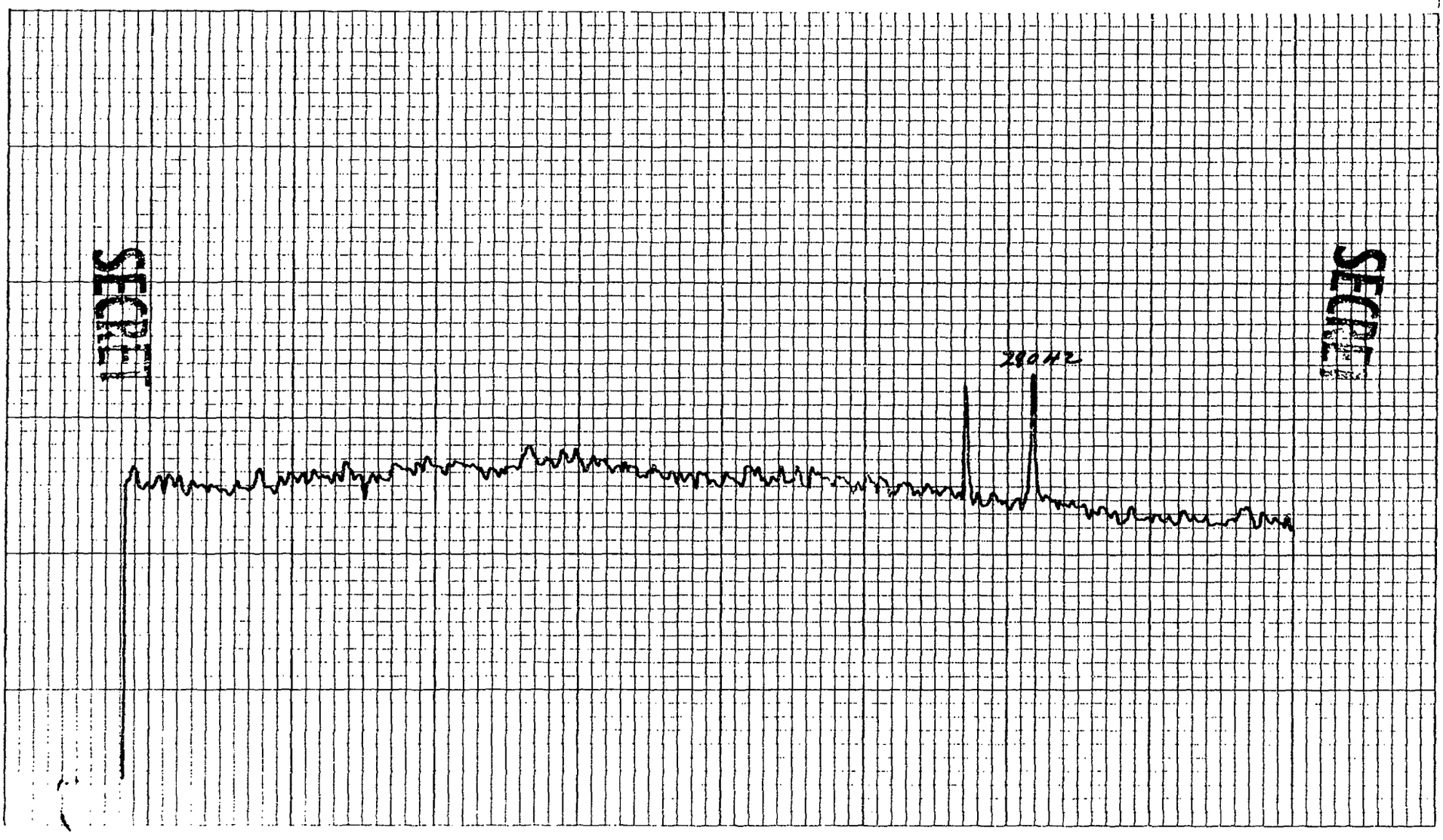
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 1148 - 32 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+54 DEG. AZ STEERING

REEL: A24
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 1985
ATTEN: -18 DB



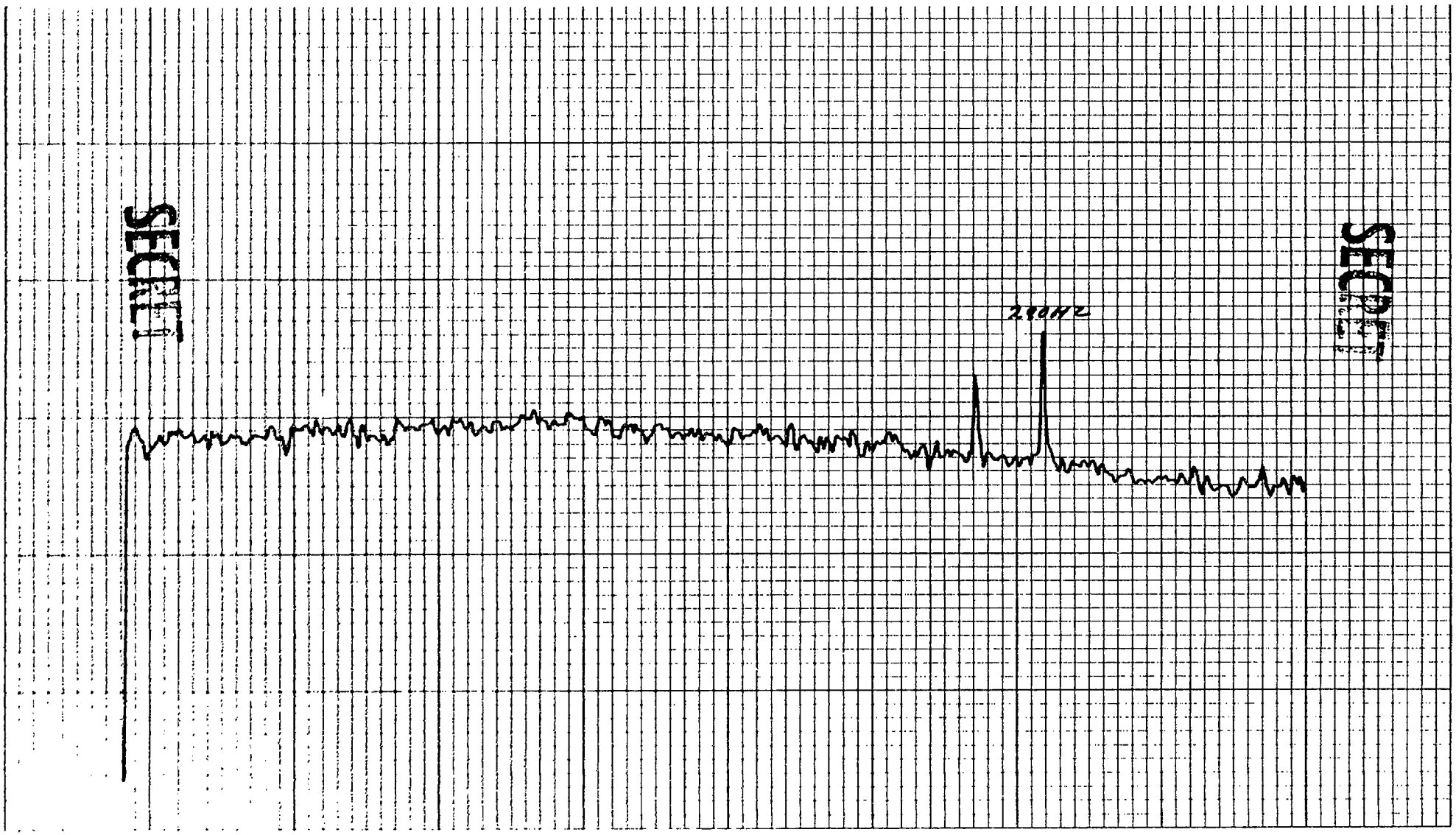
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 1148 - 32 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: — — —
(1-26 & 28-34)
DATE/TIME: 346-77 -1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+56 DEG. AZ STEERING

REEL: M24 INDEX 1995

INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING

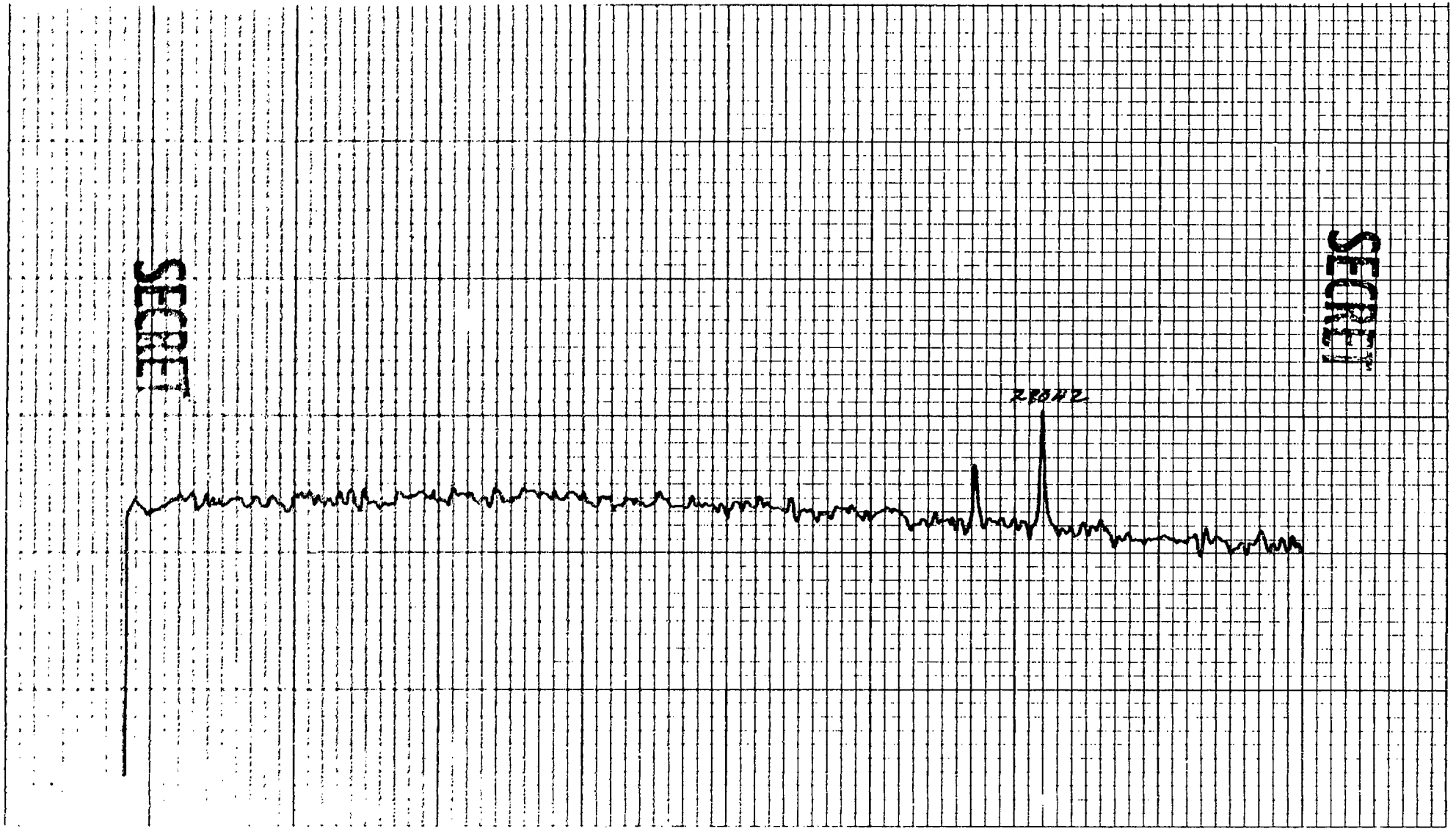


K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 1148 - 32 (2012)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+50 DEG. AZ STEERING

REEL: M24 INDEX 1985
INTEGRATION TIME 320 SECS ATTEN: -10 DB
FILTER WTG: HANNING



K•E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

CONTROL: 1148 - 72 (DP1A)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: — — —
1-26 & 28-34)
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+59 DEG. AZ STEERING

REEL: M24 INDEX 1945
INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING

K·E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 1148 - 32 (DD12)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-72 -1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+60 DEG. AZ STEERING

REEL: M24
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 1995
ATTEN: -10 DB

K&E 10 X 10 TO THE INCH

46 0703

CONTROL: 1148 - 32 (D012)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 290 HZ
32 ELEMENTS

DATE OF ANALYSIS: — — —
1-26 & 29-34)
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+61 DEG. AZ STEERING

REEL: N24 INDEX 1895

INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING

46 0703

CONTROL: 1148 - 32 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+61.5 DEG. AZ STEERING

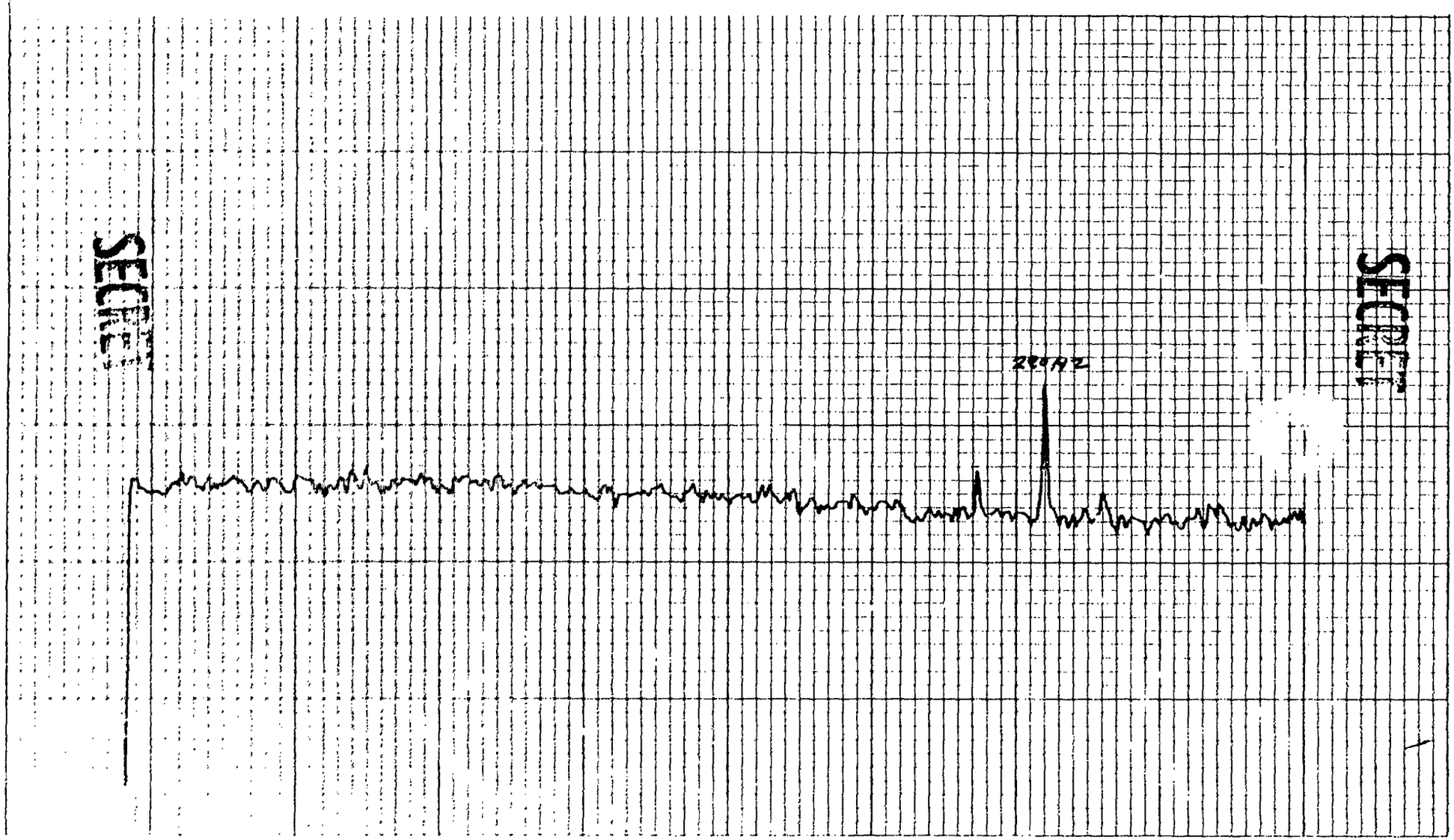
REEL: H24 INDEX 1895
INTEGRATION TIME 320 SECS ATTEN: 10 DB
FILTER WTG: HANNING

10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 1148 - 32 (0012)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 7-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+62 DEG. AZ STEERING

REEL: M20 INDEX/1995
INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING



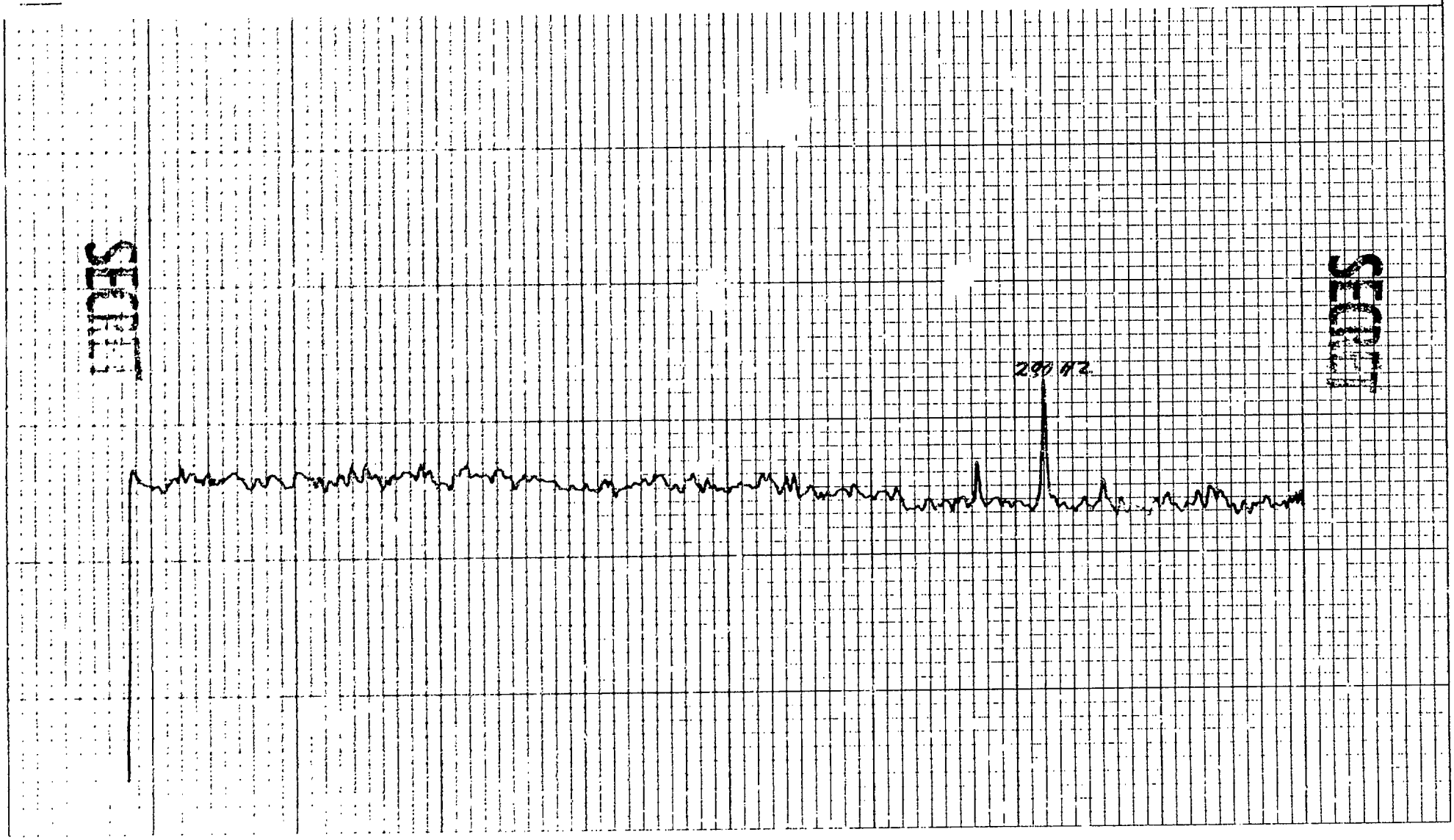
K&E 10 X 10 TO THE INCH • 5 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 1148 - 32 (DDIQ)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: -- -- --
1-26 & 29-34)
DATE/TIME: 3-16-87 -1124 Z
ANALYSIS BANDWIDTH: 1/10HZ
+63 DEG. AZ STEERING

REEL: M24 INDEX 1995

INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING



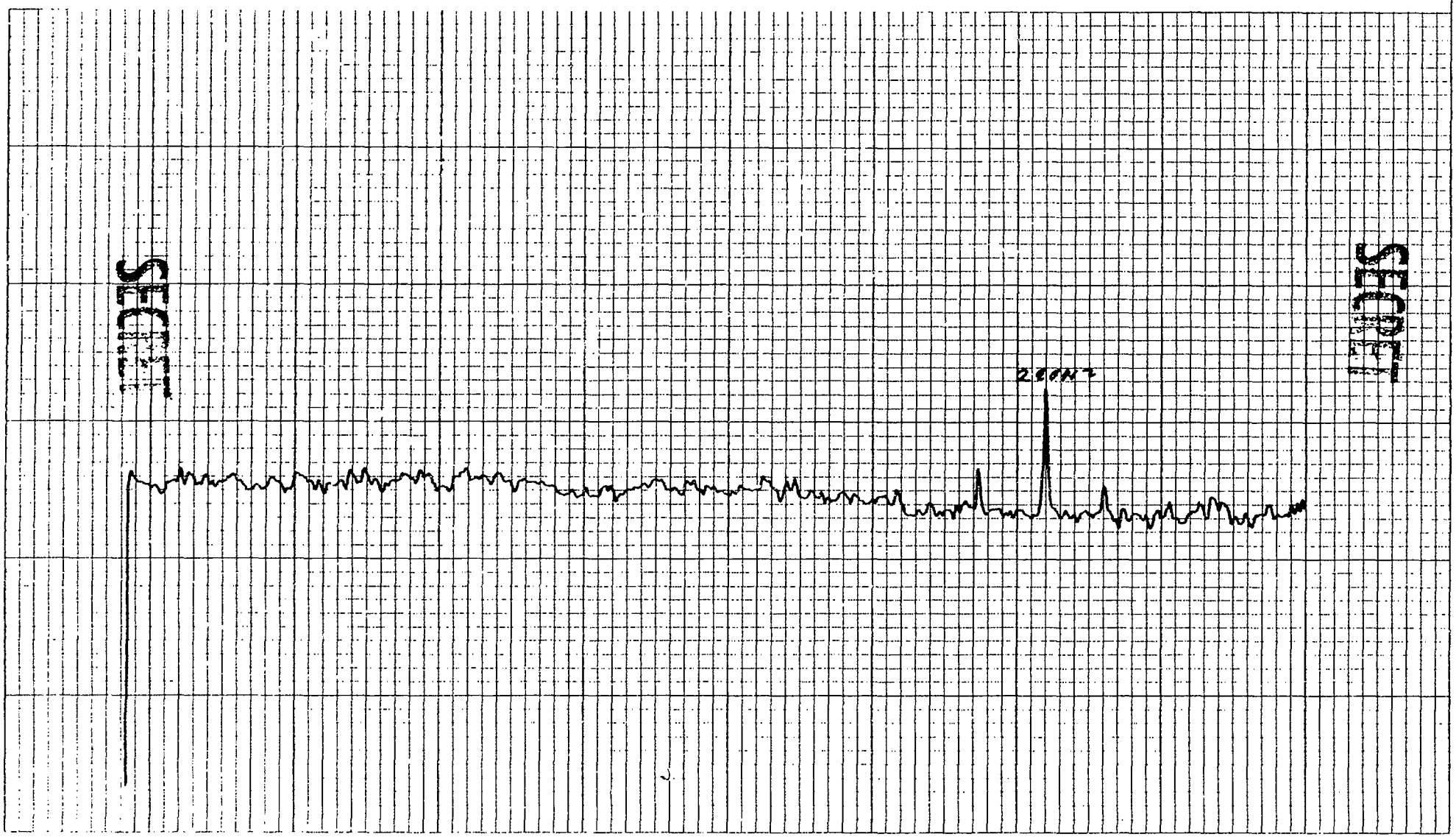
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 1148 - 32 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS 1-25 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+64 DEG. AZ STEERING

REEL: M24 INDEX 1995
INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 1148 - 32 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
1-26 & 29-74)
DATE/TIME: 3 16-77 -1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+66 DEG. AZ STEERING

REEL: 1124 INDEX/995
INTEGRATION TIME 320 SECS ATTEN: -10 DB
FILTER WTG: HANNING

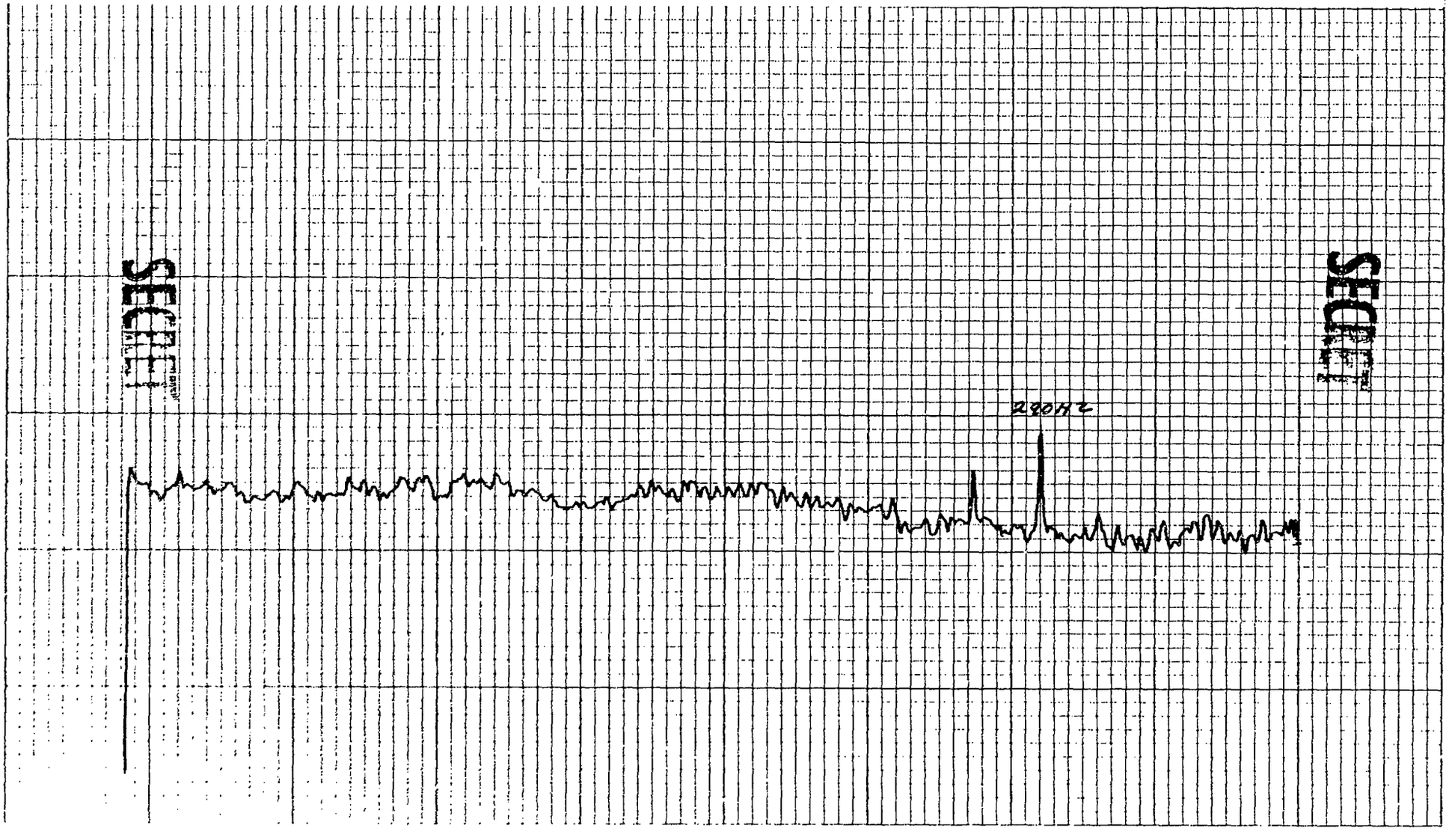
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 1140 - 32 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 99-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 220 HZ
32 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+60 DEG. AZ STEERING

REEL: H24 INDEX 1995
INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 5 X 10 TO THE INCH
KEUFFEL & ESSER CO. MADE IN U.S.A.

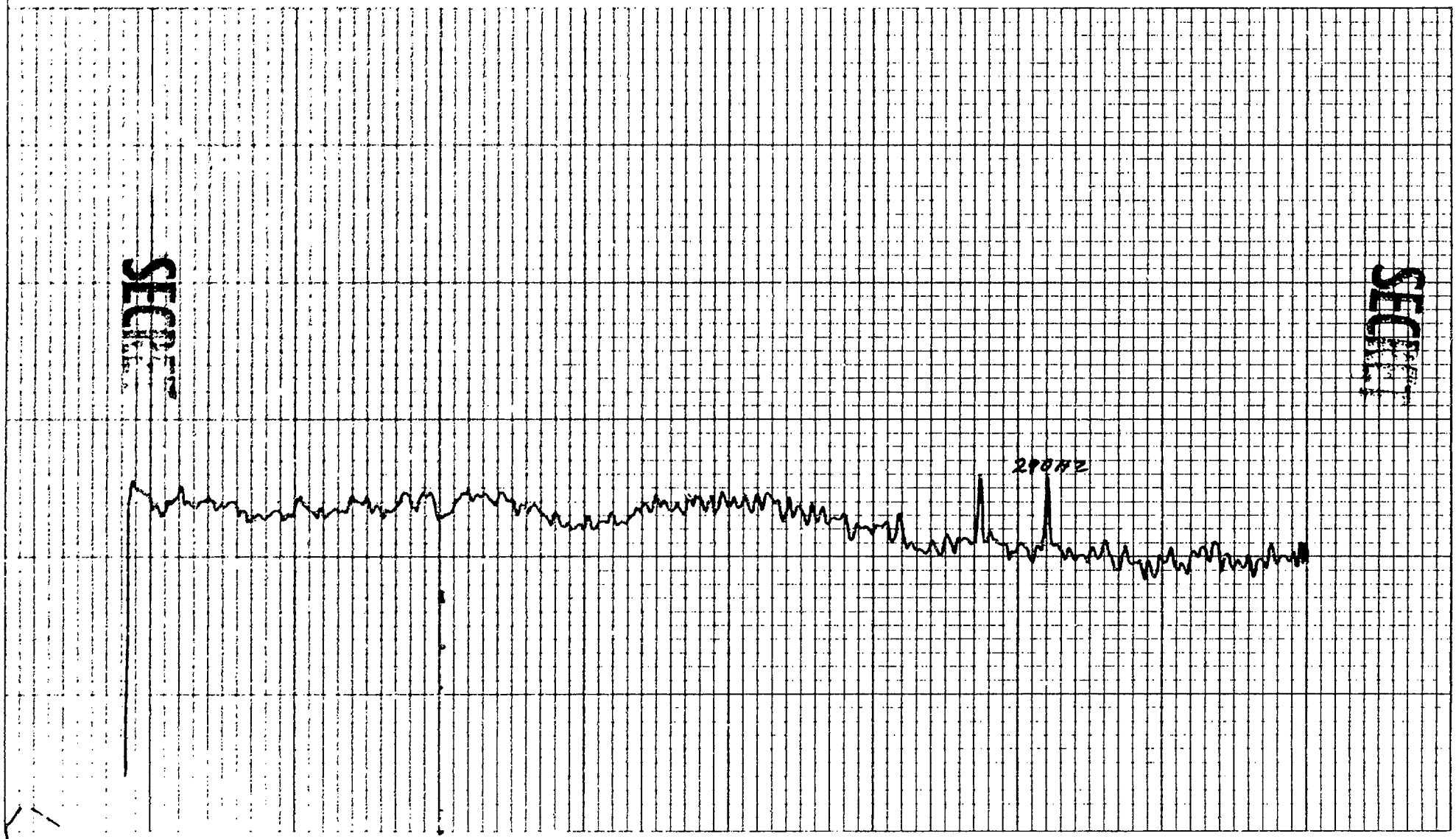
46 0703

CONTROL: 1148 - 32 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: — — —
1-26 & 29-34)
DATE/TIME: 3-16-77-1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+70 DEG. AZ STEERING

REEL: M24 INDEX 1985

INTEGRATION TIME 320 SECS ATTEN: 78 DB
FILTER WTG: HANNING



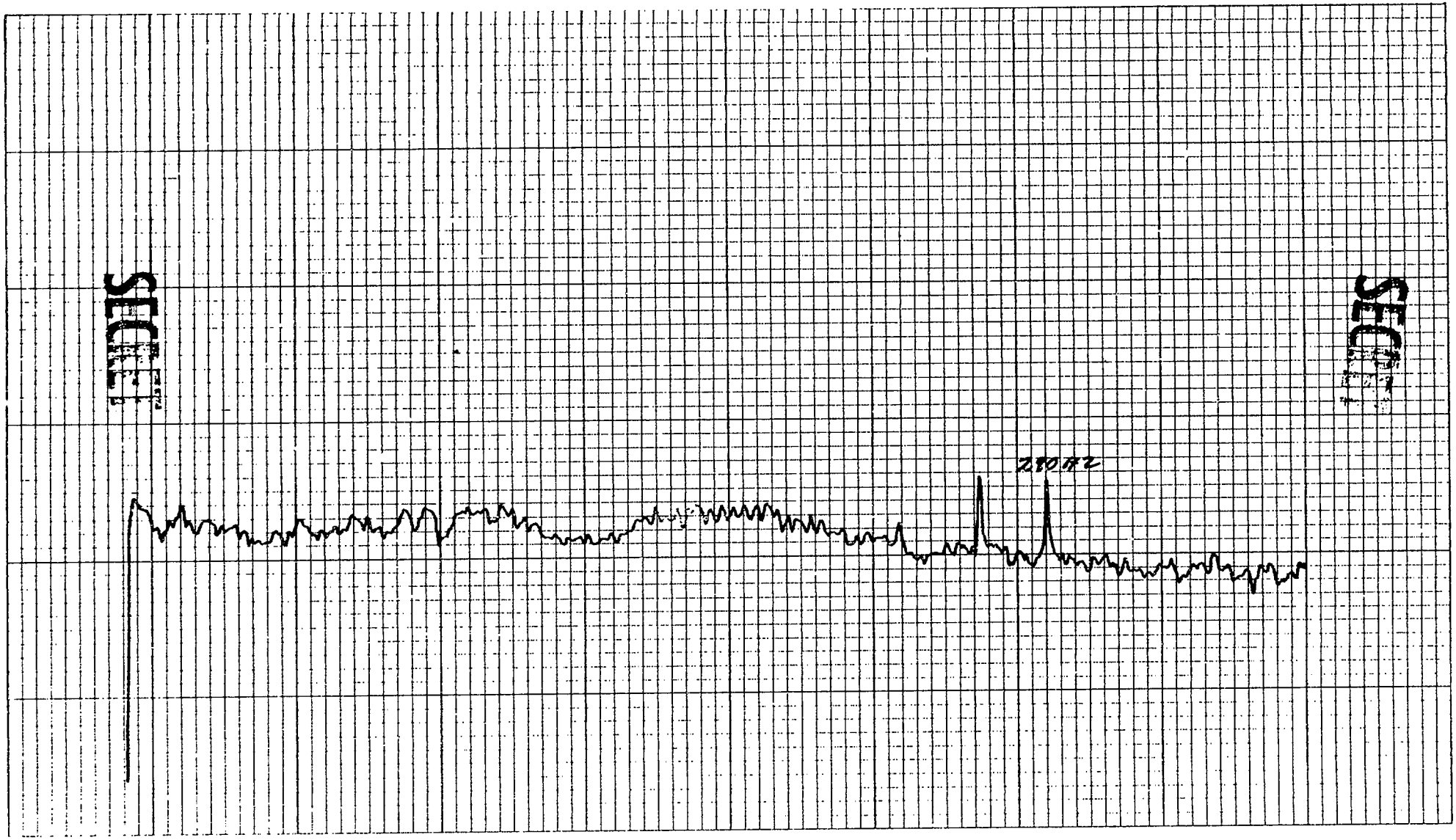
K·E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 1148 - 32 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEAPING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: — — —
(1-26 & 29-34)
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+72 DEG. AZ STEERING

REEL: 424 INDEX/1995

INTEGRATION TIME 320 SECS ATTEN: -18 DB
FILTER WTG: HANNING

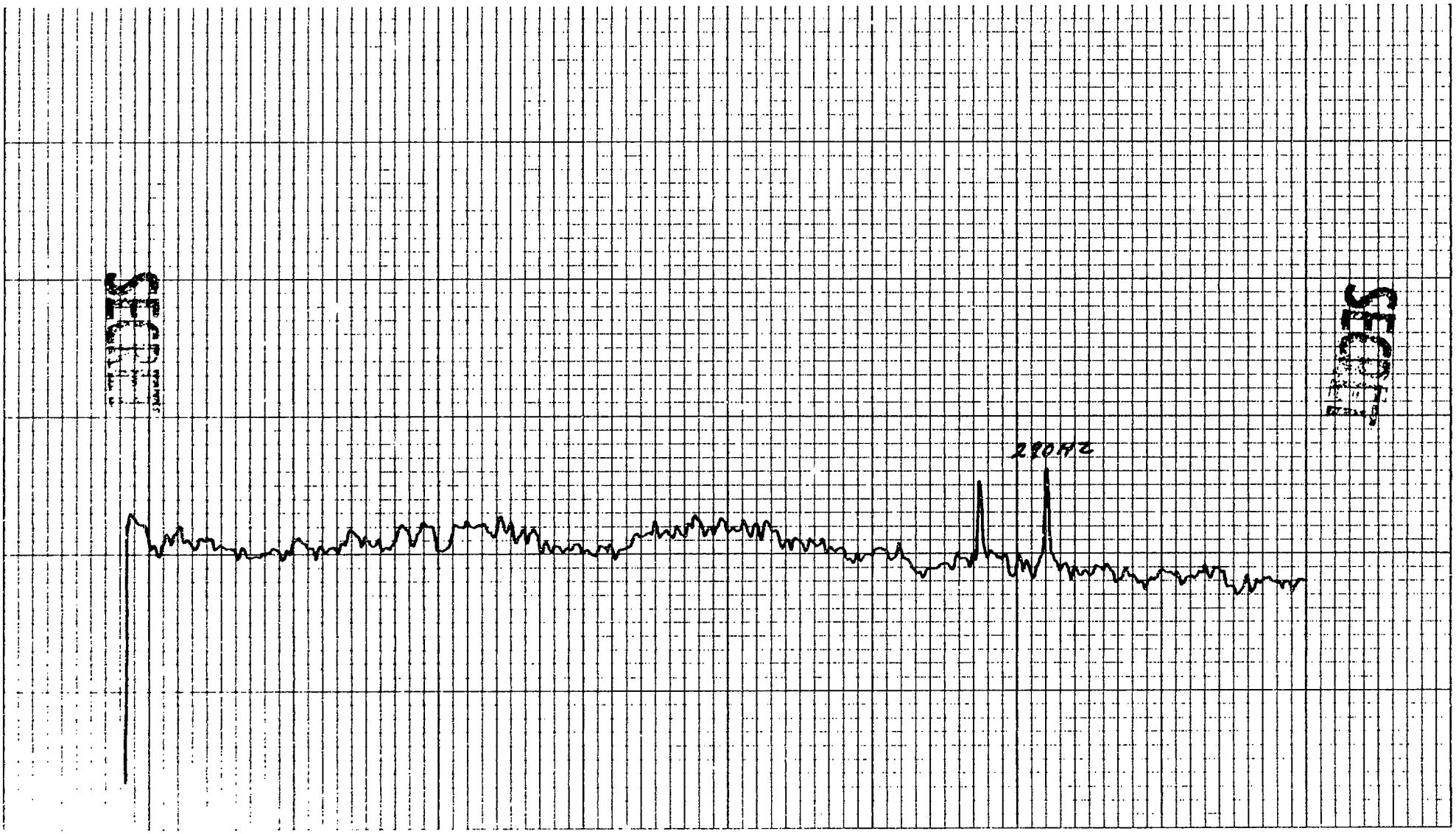


K+E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 1148 - 32 (DP-12)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: — — —
(1-26 & 29-34)
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+74 DEG. AZ STEERING

REEL: M24 INDEX 1995
INTEGRATION TIME 320 SECS ATTEN: 78 DB
FILTER WTG: HANNING



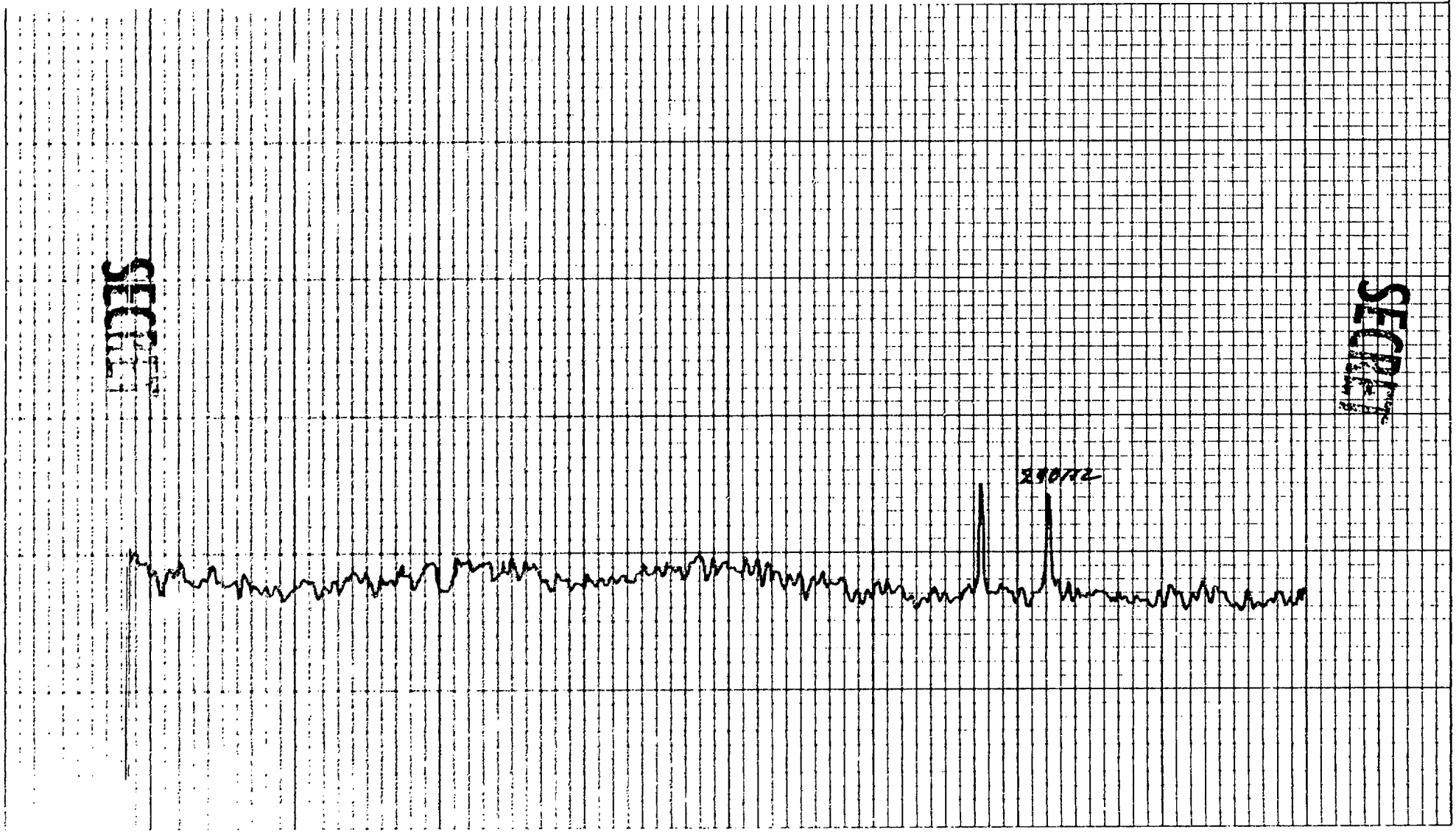
K·E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 1148 - 72 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
72 ELEMENTS

DATE OF ANALYSIS: — — —
1-26 & 29-34)
DATE/TIME: 3-16 77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+76 DEG. AZ STEERING

REEL: M24 INDEX 1995

INTEGRATION TIME 320 SECS ATTEN: 10 DB
FILTER WTG: HANNING

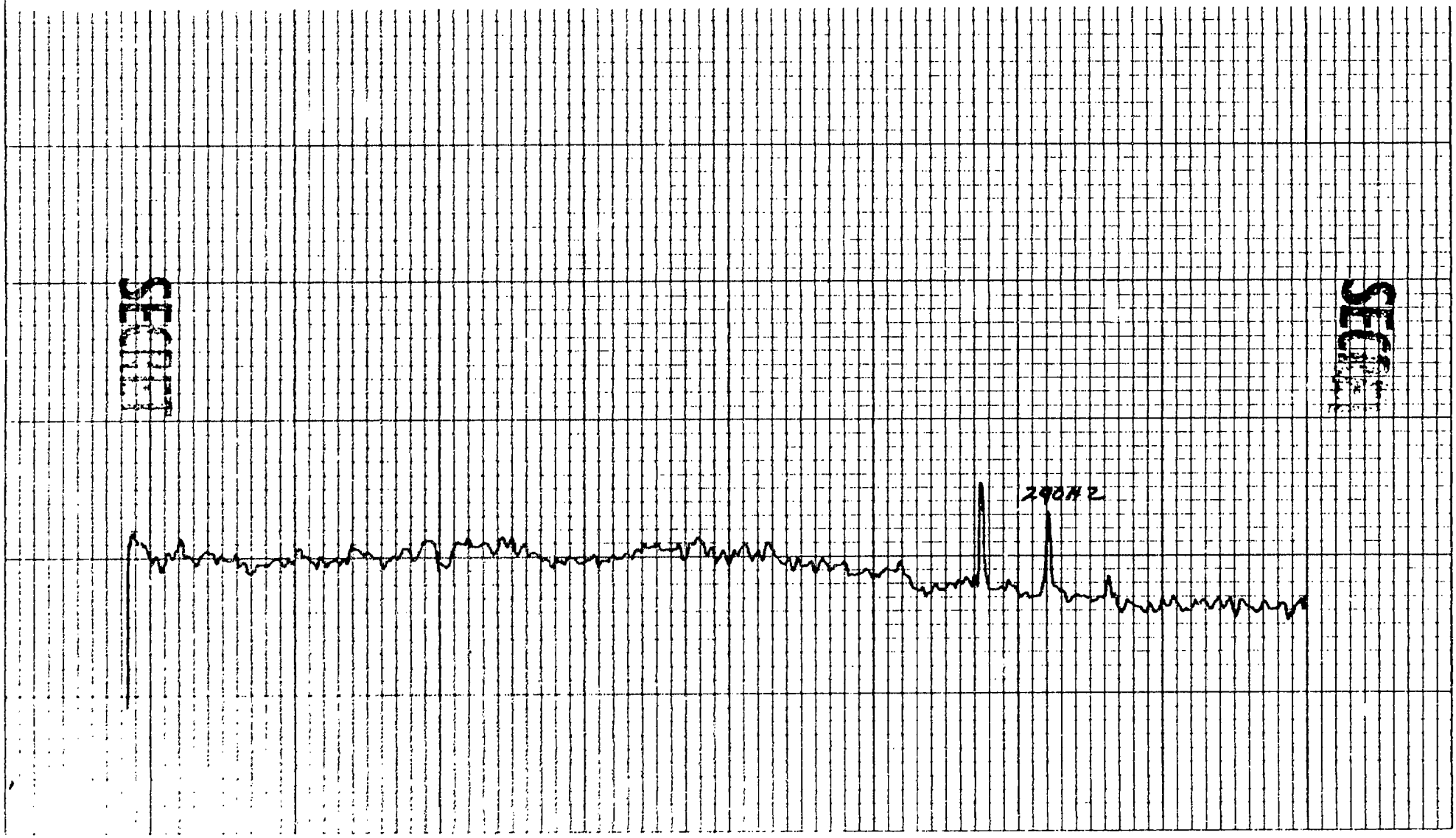


K&E 10 X 10 TO THE INCH • 5 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 1148 - 32 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: — — —
1-26 & 28-74)
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+78 DEG. AZ STEERING

REEL: M24 INDEX 1985
INTEGRATION TIME 320 SECS ATTEN: 10 DB
FILTER WTG: HANNING



CONFIDENTIAL

SIGNAL LEVEL AND SNR

CALCULATIONS

DATA POINT 12 FREQUENCY 140 HZ NUMBER OF ELEMENTS 51

SIGNAL LEVEL

MCPS-32 SIGNAL LEVEL INDICATED	-23.6 dBV	
MCPS-32 CAL. CORRECTION	+10	-13.6
BEAMFORMER GAIN	+24	+10.4 SIG. LEVEL FOR SNR CALCULAT
MRA CORRECTION	+ .2	+10.6 SIG. LEVEL FOR SIGNAL GAIN

NOISE LEVEL

MCPS-32 SIGNAL LEVEL INDICATED	-53.6 dBV	
MCPS-32 CAL. CORRECTION	+10	-43.6
BEAMFORMER GAIN	+24	-19.6 NOISE LEVEL FOR SNR CALCULA TI

SIGNAL-NOISE-RATIO

SIGNAL LEVEL FOR SNR		+10.4
NOISE LEVEL FOR SNR	-19.6	30.0
PROCESSOR CORRECTION	-4	26.0
MRA CORRECTION	+ .2	26.2 SNR .013 HZ BAND
BANDWIDTH CONVERSION		SNR 1 HZ BAND

CONFIDENTIAL

CONFIDENTIAL

SIGNAL LEVEL AND SNR

CALCULATIONS

DATA POINT 12 FREQUENCY 290 HZ NUMBER OF ELEMENTS 51

SIGNAL LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-39.2dBV	
MCPS-32 CAL. CORRECTION	+10	-29.2	
BEAMFORMER GAIN	+24	-5.2	SIG. LEVEL FOR SNR CALCULATIO
MRA CORRECTION	+ .81	-4.4	SIG. LEVEL FOR SIGNAL GAIN

NOISE LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-57.2dBV	
MCPS-32 CAL. CORRECTION	+10	-47.2	
BEAMFORMER GAIN	+24	-23.2	NOISE LEVEL FOR SNR CALCULATION

SIGNAL-NOISE-RATIO

SIGNAL LEVEL FOR SNR		-5.2	
NOISE LEVEL FOR SNR	-23.2	18	0
PROCESSOR CORRECTION	-4.2	13.8	
MRA CORRECTION	+ .8	14.6	SNR .013 HZ BAND
BANDWIDTH CONVERSION			SNR 1 HZ BAND

CONFIDENTIAL

CONFIDENTIAL

DATA POINT 12

SIGNAL GAIN

	140 HZ	290HZ	295HZ
MEAN OMNI SIGNAL LEVEL	-24.8	-38.6	
MRA SIGNAL LEVEL	+10.6	-4.4	
ARRAY SIGNAL GAIN	35 4	34.2	
20 LOG 51 (# of elements)	34.1	34.1	
DIFFERENCE	+1.3	+ .1	

ARRAY GAIN

MRA SNR	20.2	14.6	
MEAN OMNI SNR	19.4	7.9	
ARRAY GAIN	6.8	6.7	
THEORETICAL AZMUTH GAIN (at MRA)	12.6	15.1	
DIFFERENCE	- 5.8	- 8.4	

CONFIDENTIAL

K&E 10 X 10 TO THE INCH

46 0703

CONTROL: 1148 - 51 (Opie)
BEAMFORMED SPECTRUM (ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 140 HZ
51 ELEMENTS

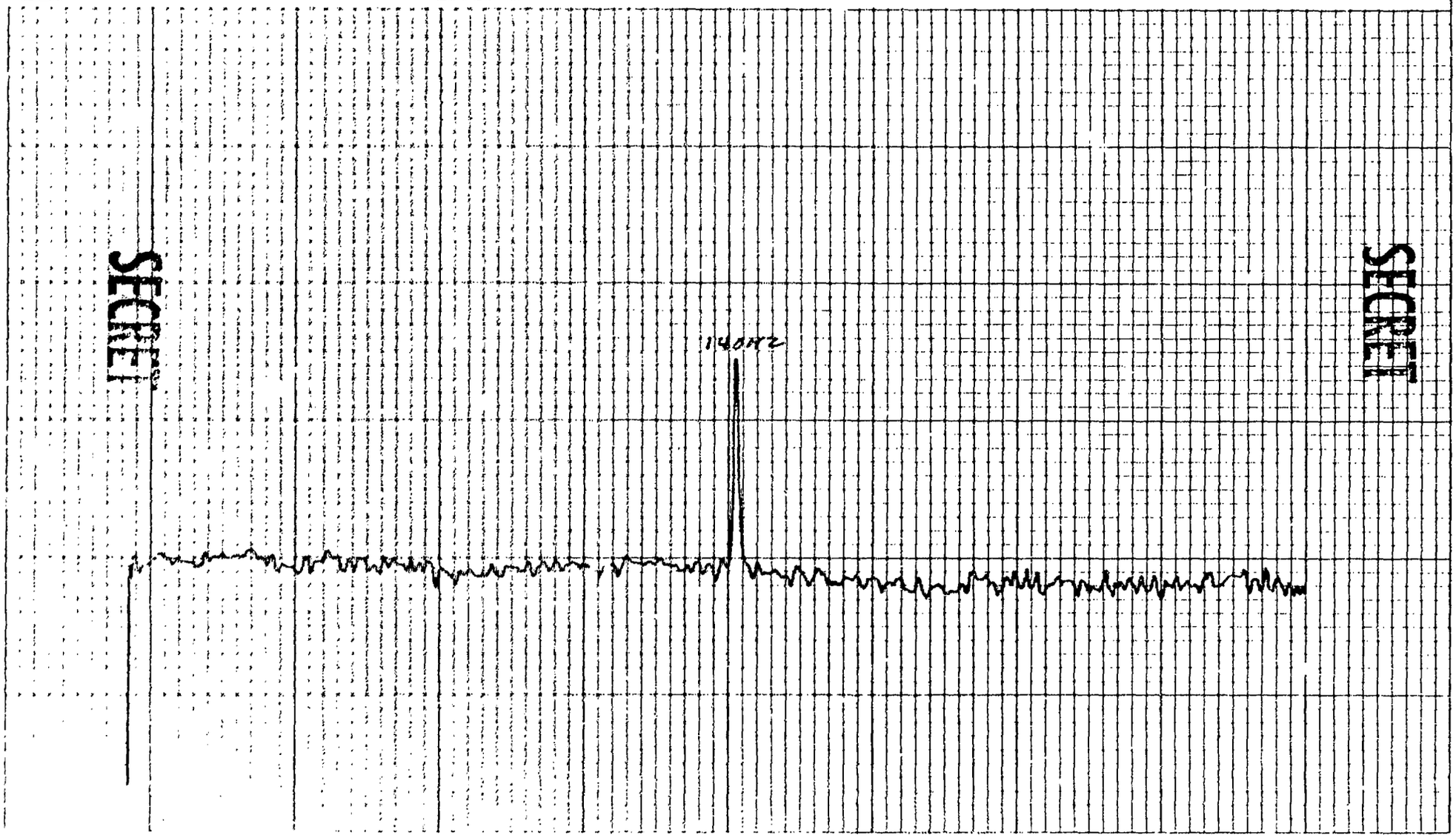
DATE OF ANALYSIS: - - -
1-26 & 29-53)
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+48 DEG. AZ STEERING

REEL: N34

INDEX 1805

INTEGRATION TIME 320 SECS

ATTEN: -24 DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 1148 - 51 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 140 HZ
51 ELEMENTS

DATE OF ANALYSIS: — — —
1-26 & 29-53)
DATE/TIME: 7-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+50 DEG. AZ STEERING

REEL: M24 INDEX 1985

INTEGRATION TIME 320 SECS ATTEN: -8 DB
FILTER WTG: HANNING

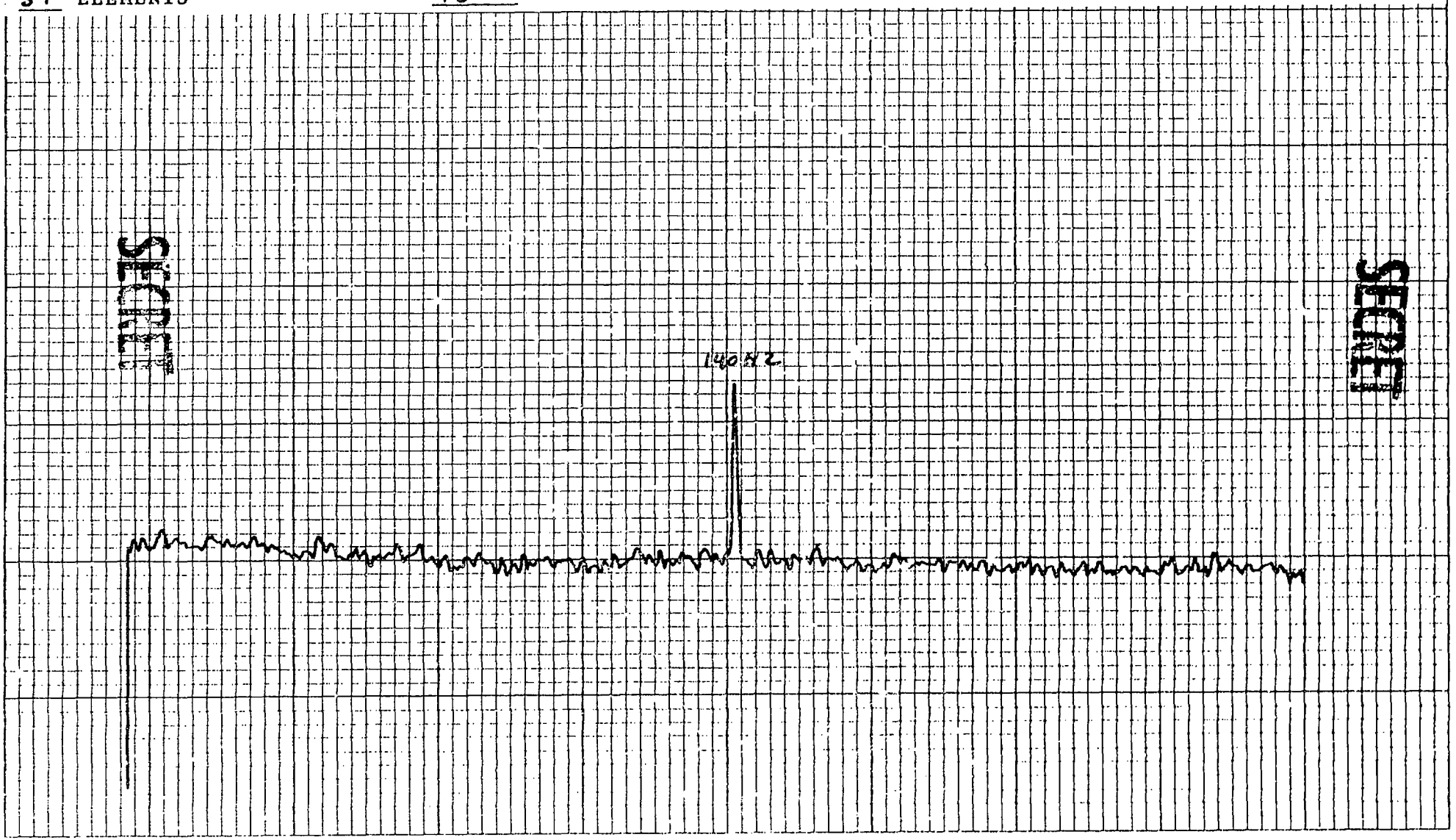
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 1148 - 51 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 140 HZ
51 ELEMENTS

DATE OF ANALYSIS: 1-26 & 2-9-53
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+52 DEG. AZ STEERING

REEL: R24 INDEX 1986

INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

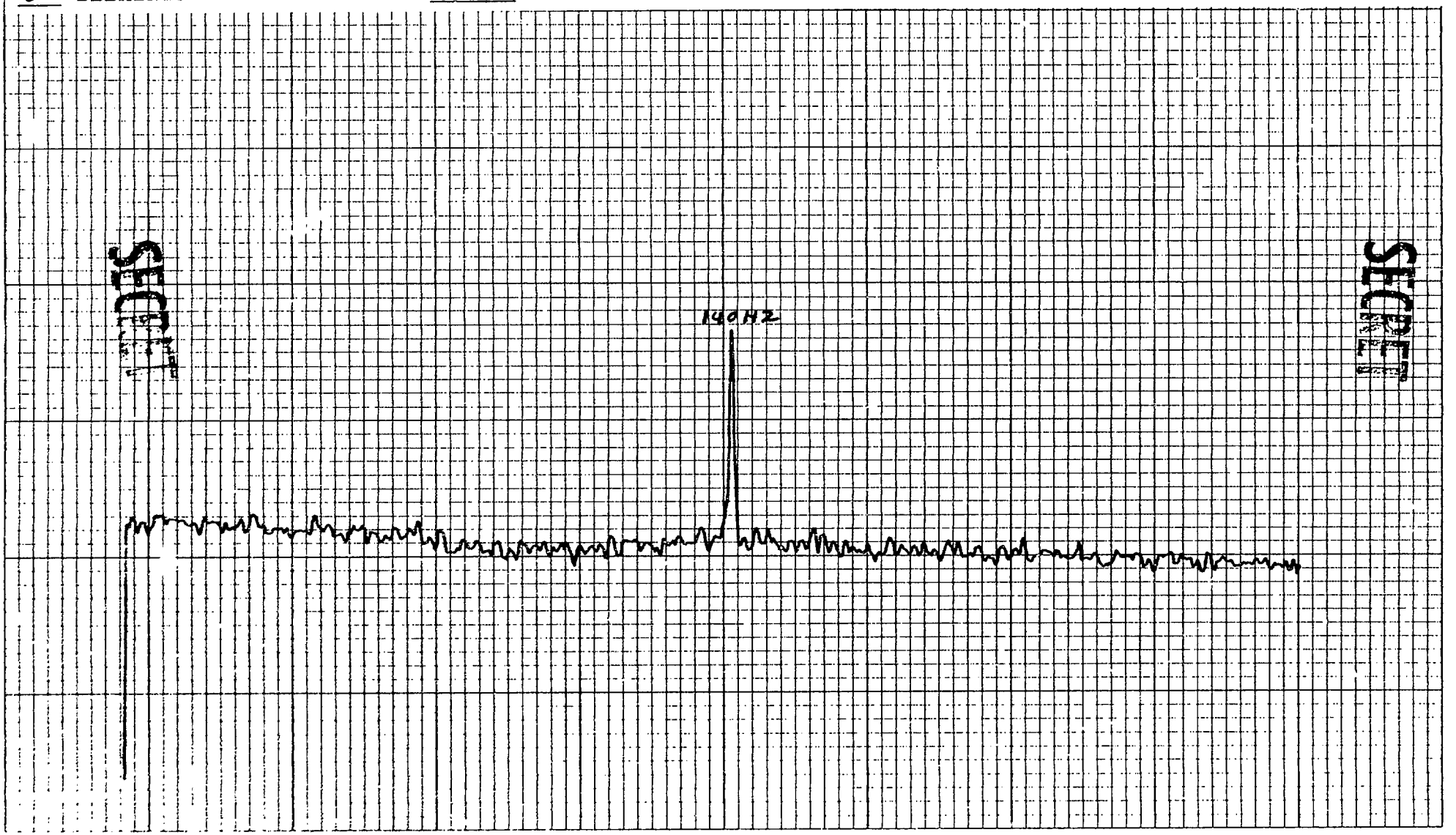
46 0703

CONTROL: 1148 - 51 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 140 HZ
51 ELEMENTS

DATE OF ANALYSIS: — — —
1-26 & 29-53
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+54 DEG. AZ STEERING

REEL: M24 INDEX 1995

INTEGRATION TIME 320 SECS ATTEN: -24DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 1 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 1148 - 51 (D012)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 140 HZ
51 ELEMENTS

DATE OF ANALYSIS: — — —
1-26 & 29-53)
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+56 DEG. AZ STEERING

REEL: M24 INDEX 1996

INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING

K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

CONTROL: 1148 - 51 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 140 HZ
51 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-17 - 1140 Z
ANALYSIS BANDWIDTH: 1/10HZ
+58 DEG. AZ STEERING

REEL: M24 INDEX 1905
INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING

K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

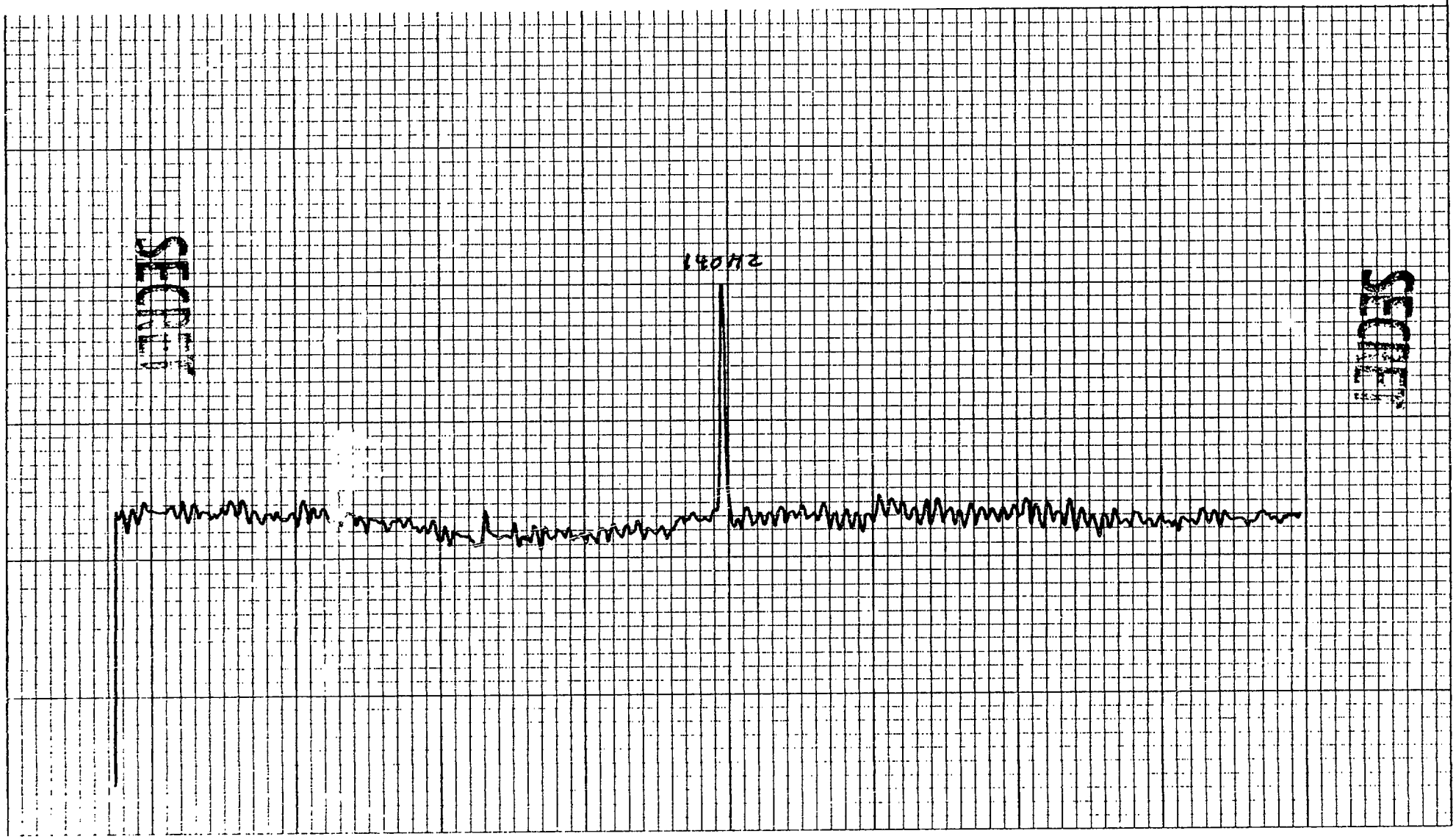
46 0703

CONTROL: 1148 - 51 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 140 HZ
51 ELEMENTS

DATE OF ANALYSIS: — — —
1-26 & 29-53)
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+59.5 DEG. AZ STEERING

REEL: M24 INDEX 1885

INTEGRATION TIME 320 SECS ATTEN: -24DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

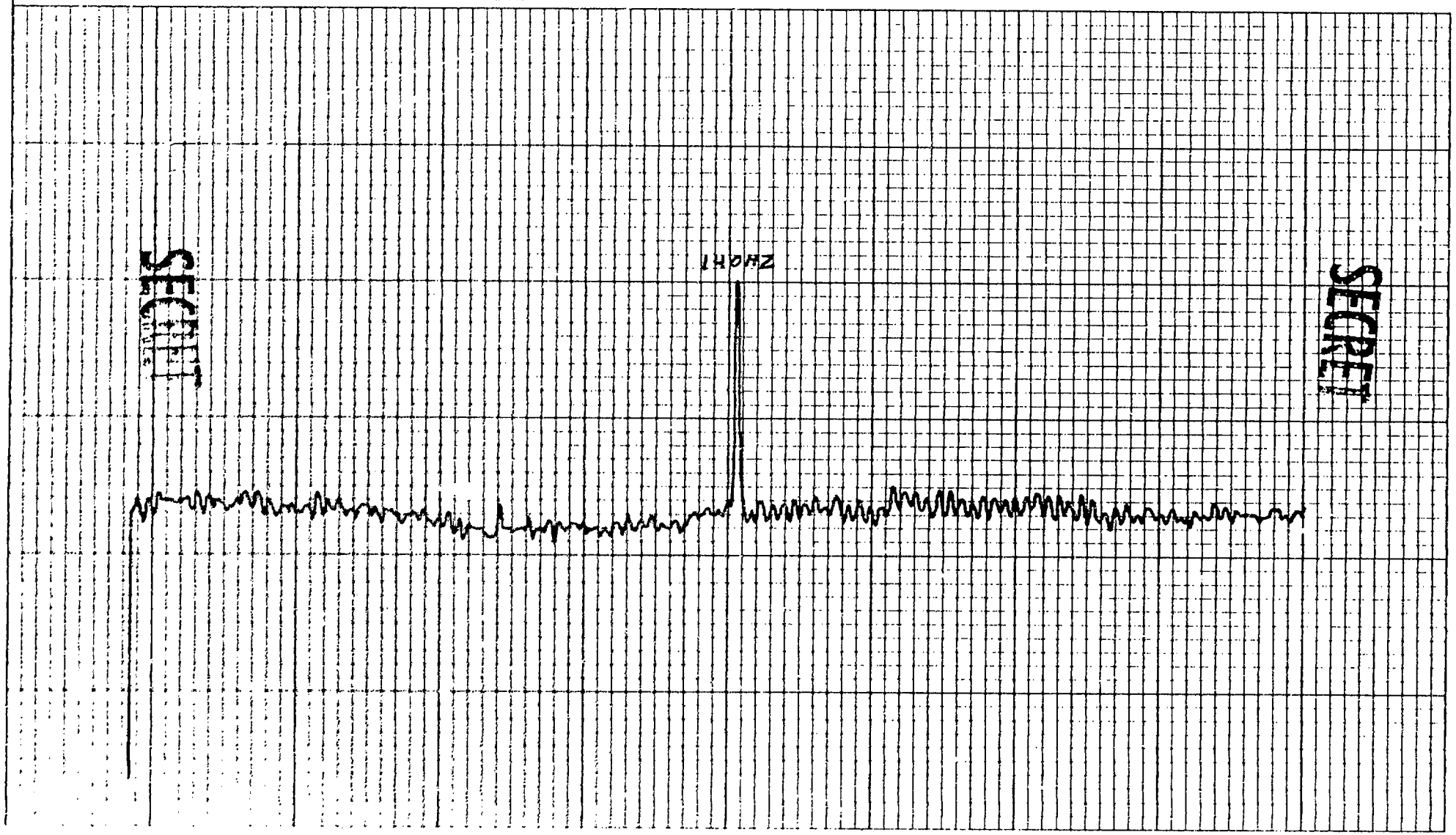
46 0703

P. B. 12

CONTROL: 1148 - 51 (0012)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 28-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 140 HZ
51 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+60 DEG. AZ STEERING

REEL: M24 INDEX 1985
INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



K+E 10 X 10 TO THE INCH

46 0703

CONTROL: 1148 - 51 (D012)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 140 HZ
51 ELEMENTS

DATE OF ANALYSIS: — — —
1-16 & 29-53)
DATE/TIME: 3-16-77-1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+51 DEG. AZ STEERING

REEL: N24 INDEX 1985

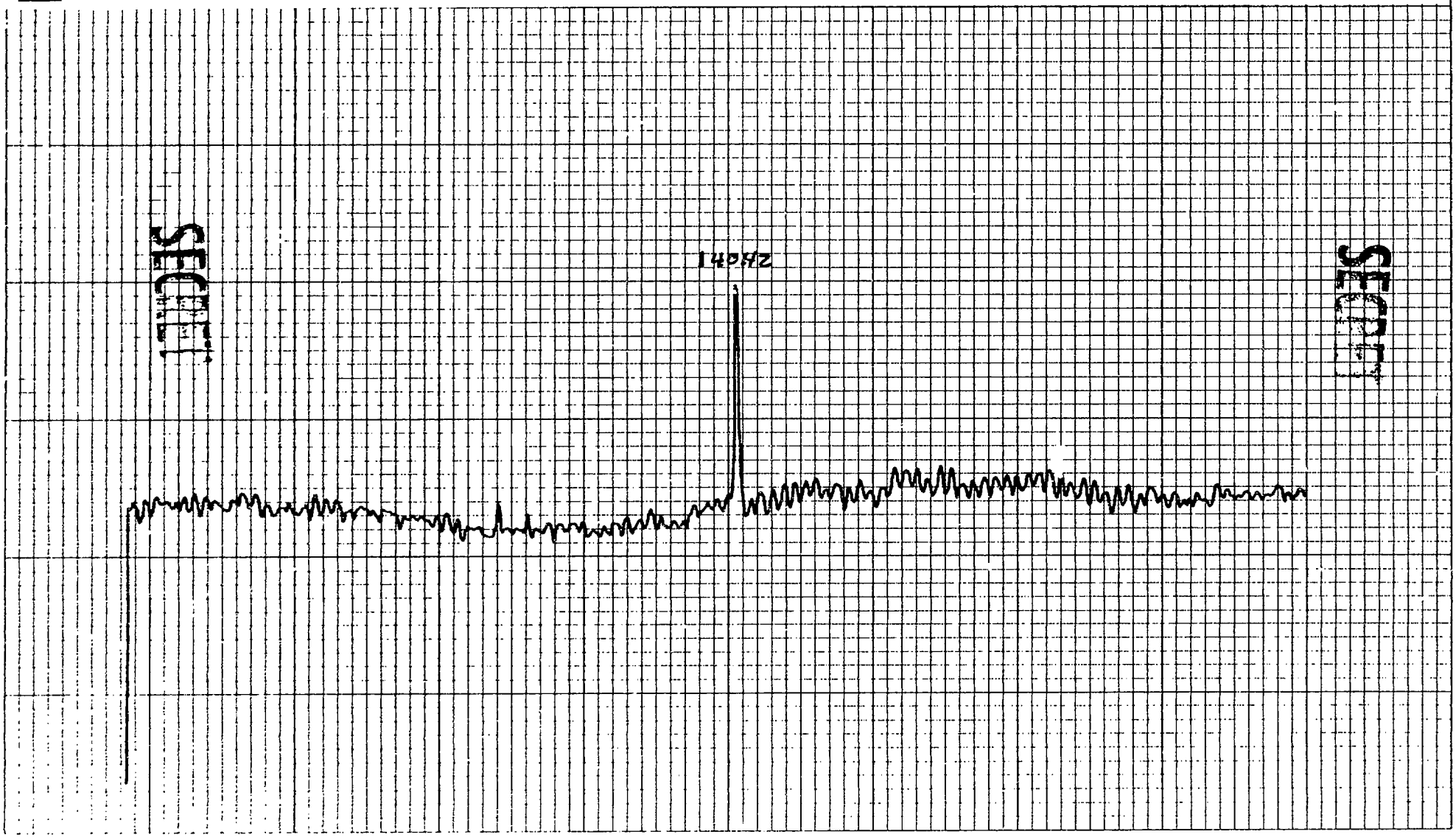
INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING

K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 1148 - 51 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 28-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 140 HZ
51 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+62 DEG. AZ STEERING

REEL: M24 INDEX 1895
INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



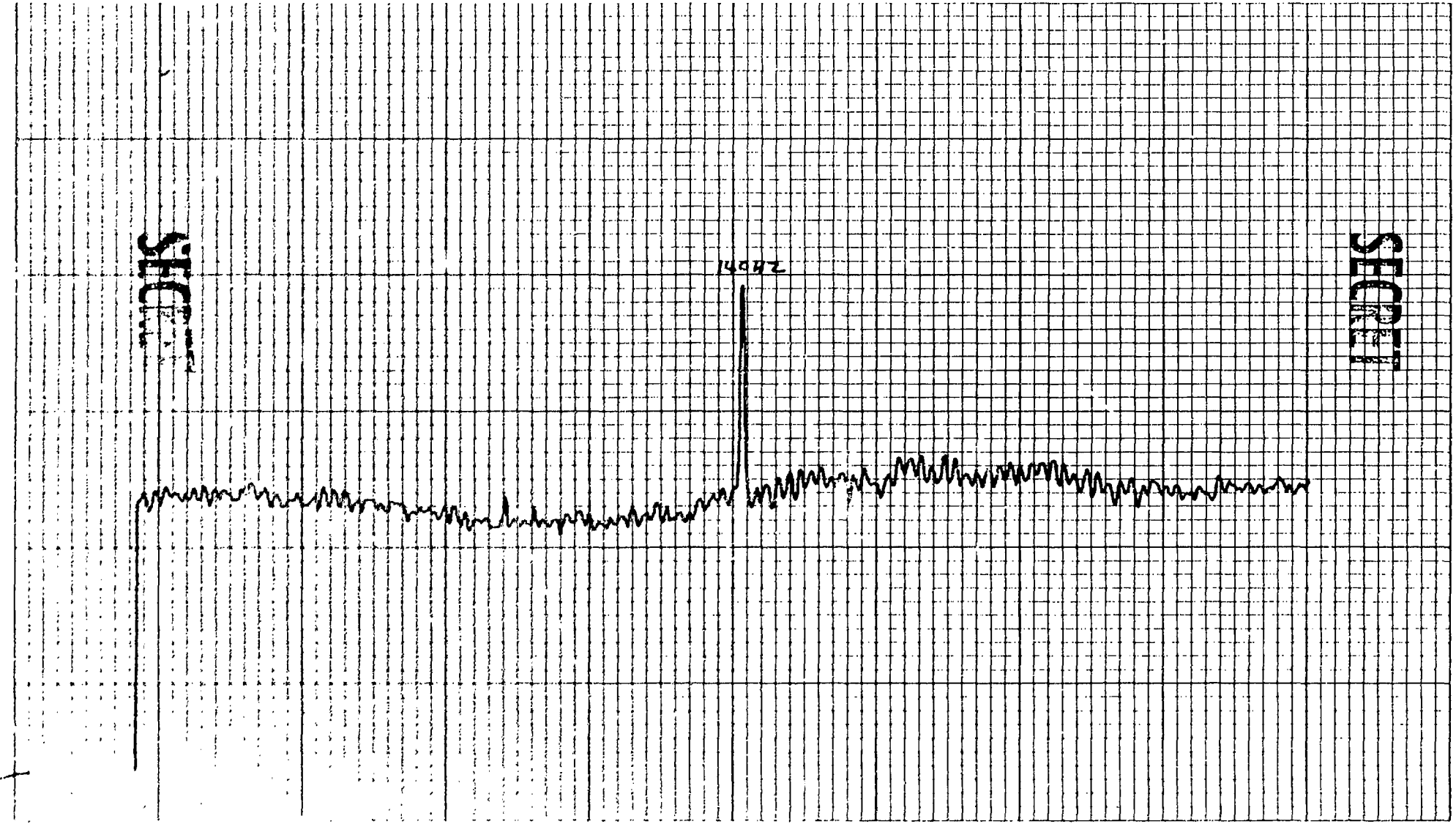
K&E 10 X 10 TO THE INCH 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

CONTROL: 1148 - 51 (DD12)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 140 HZ
61 ELEMENTS

DATE OF ANALYSIS: - - -
1-26 4 28-53)
DATE/TIME: 3-16-77 -1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+63 DEG. AZ STEERING

REEL: M24 INDEX/885
INTEGRATION TIME 320 SECS ATTEN: -84 DB
FILTER WTG: HANNING



CONTROL: 1148 - 51 (DIFAR)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 140 HZ
51 ELEMENTS

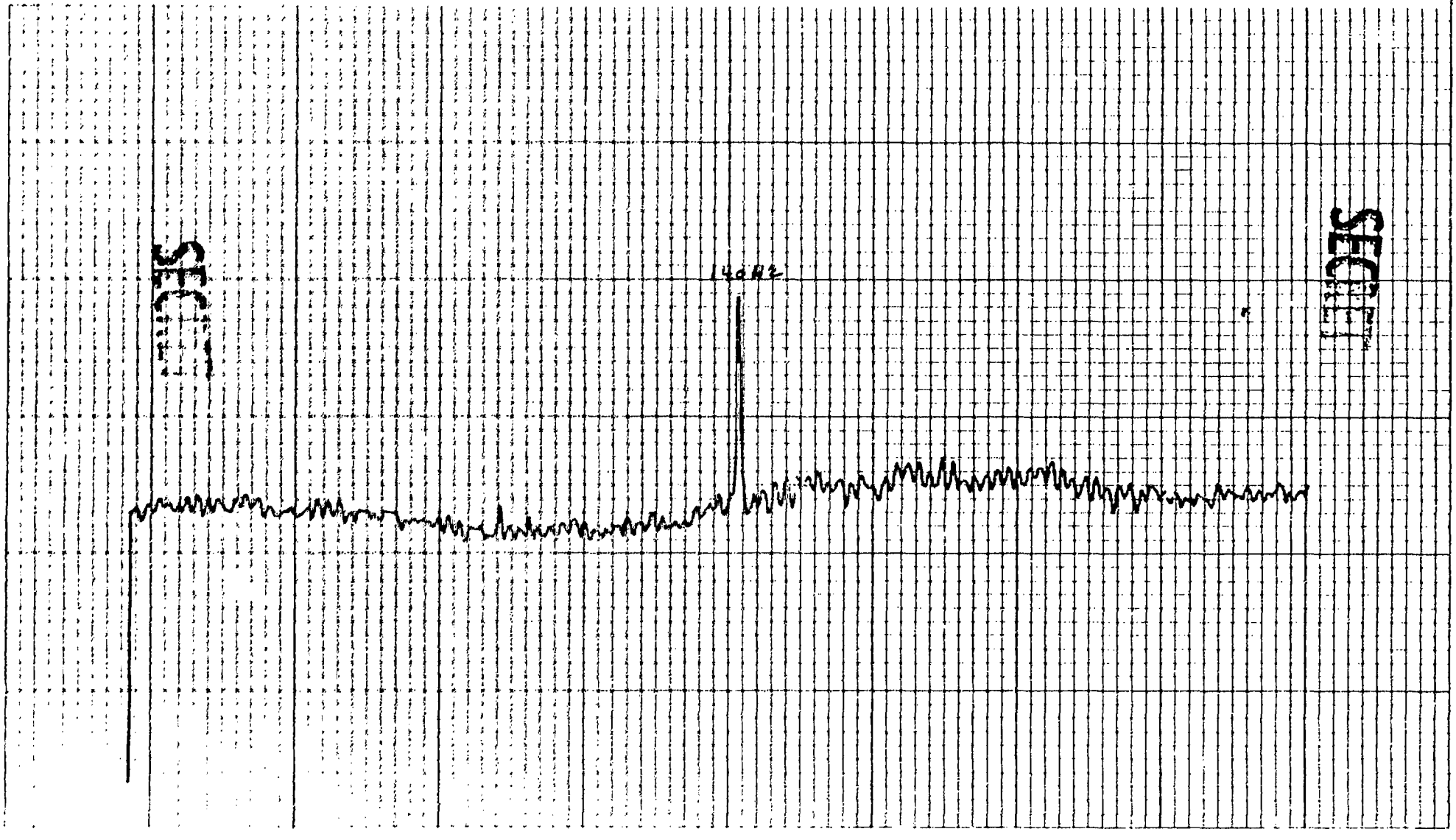
DATE OF ANALYSIS: - - -
1-26 & 29-53)
DATE/TIME: 3-16-77 - 1140 Z
ANALYSIS BANDWIDTH: 1/10HZ
+64 DEG. AZ STEERING

REEL: A24

INTEGRATION TIME 320 SECS

INDEX/885

ATTEN: -24 DB
FILTER WTG: HANNING

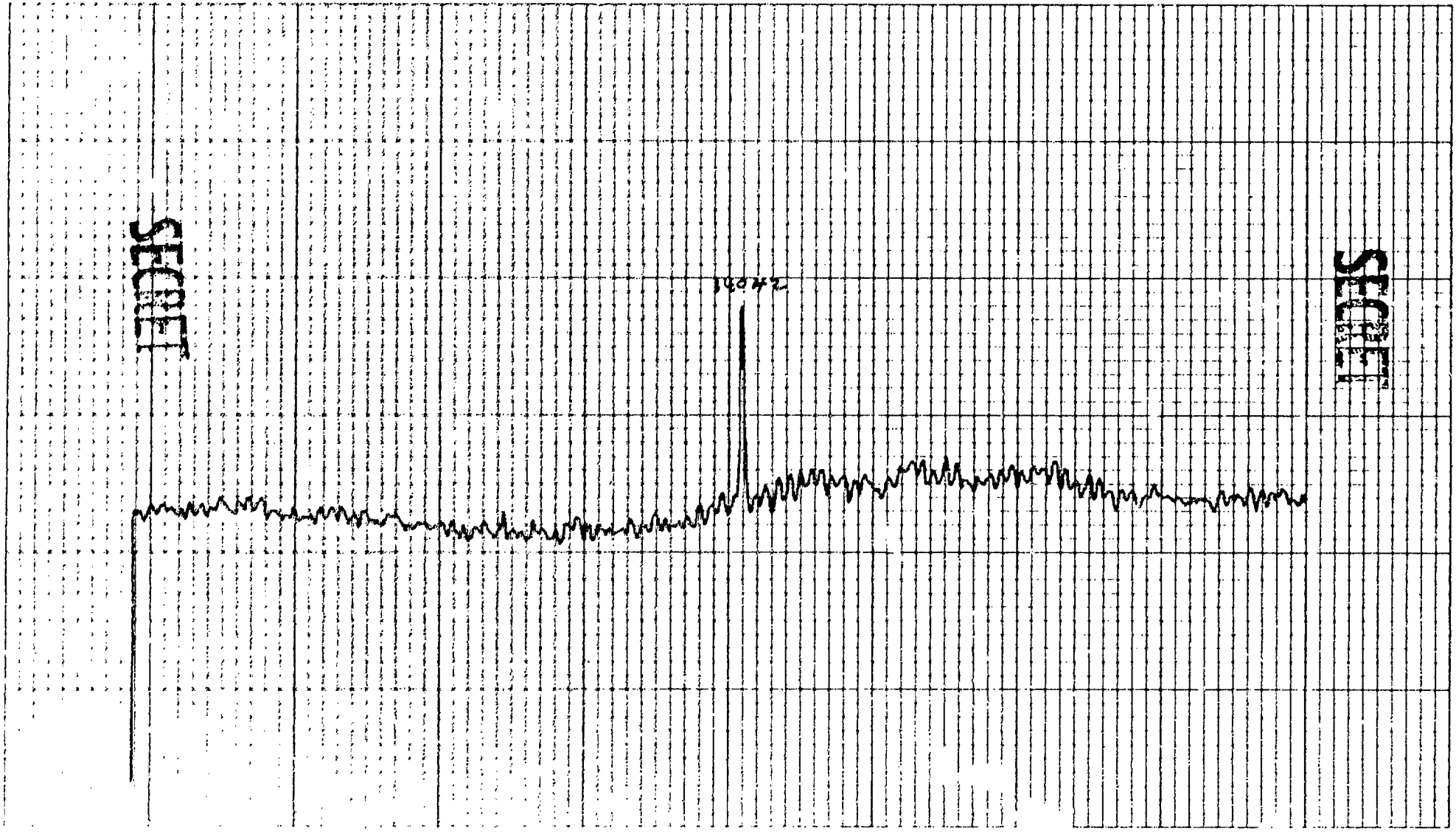


CONTROL: 1148 - 51 (DP/R)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 140 HZ
51 ELEMENTS

DATE OF ANALYSIS: — — —
1-06 & 22-53)
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+66 DEG. AZ STEERING

REEL: N24 INDEX 1995

INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

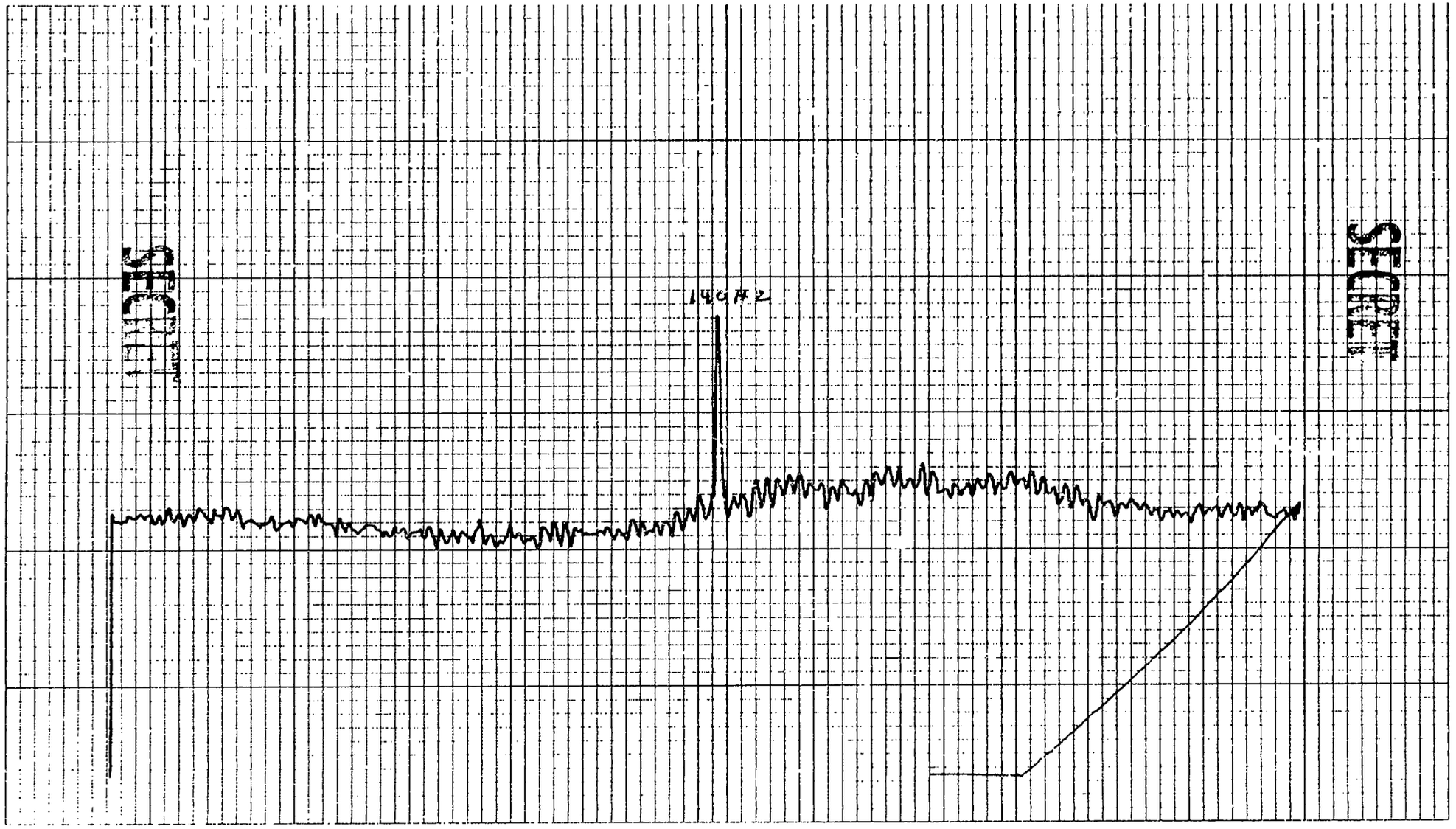
46 0703

CONTROL: 1140 - 51 (8912)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 140 HZ
51 ELEMENTS

DATE OF ANALYSIS: - - -
1-26 & 29-53)
DATE/TIME: 3-6-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+68 DEG. AZ STEERING

REEL: M24 INDEX: 1985

INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

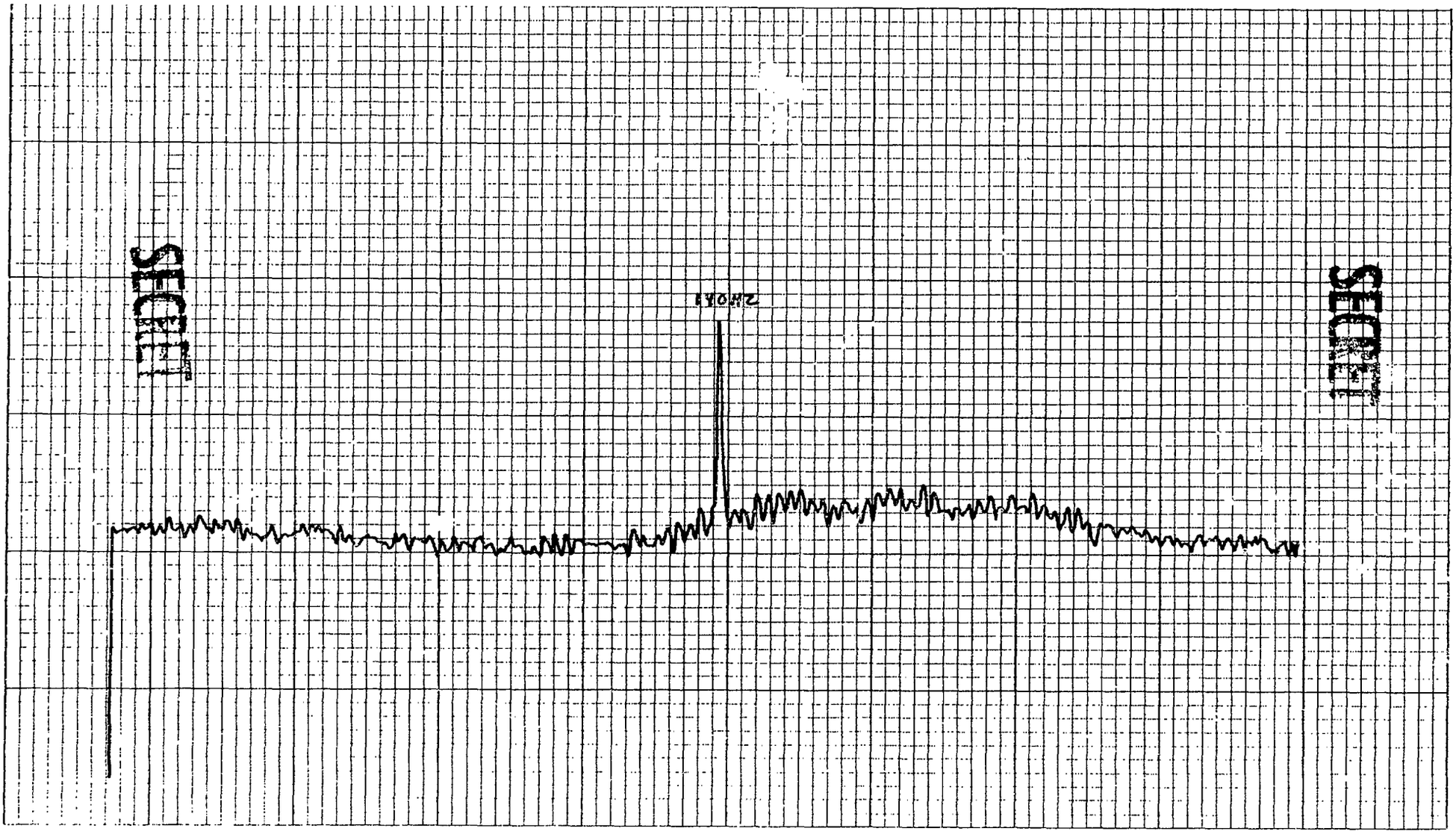
B5/27

CONTROL: 1148 - 51 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 28-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 140 HZ
51 ELEMENTS

DATE OF ANALYSIS: ~ ~ ~
DATE/TIME: 3-16-77 -1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+70 DEG. AZ STEERING

REEL: 424 INDEX 1985

INTEGRATION TIME 320 SECS ATTEN: -2V DB
FILTER WTG: HANNING



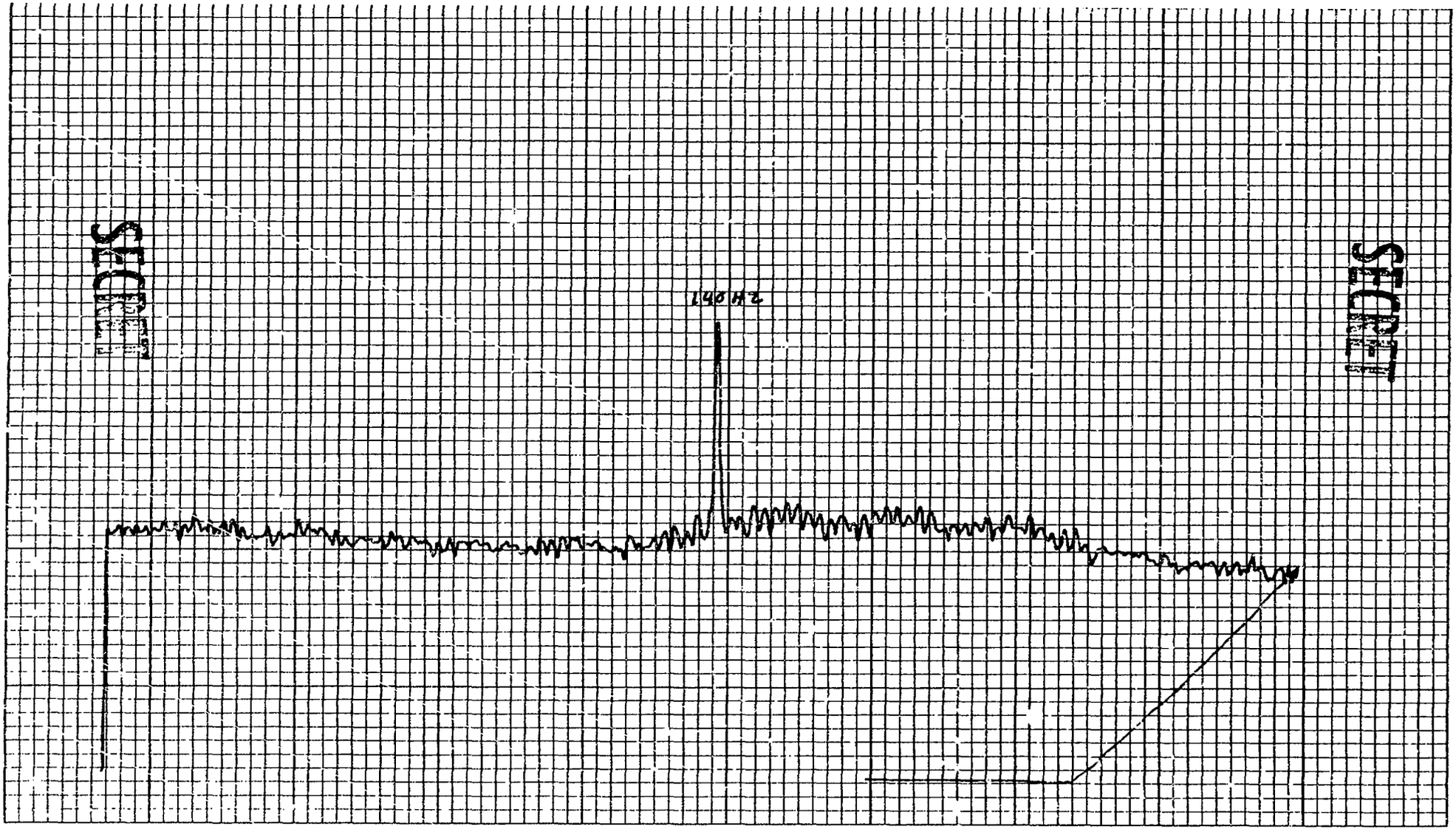
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 1148 - 51 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 28-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 140 HZ
51 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+72 DEG. AZ STEERING

REEL: N24 INDEX 1885

INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

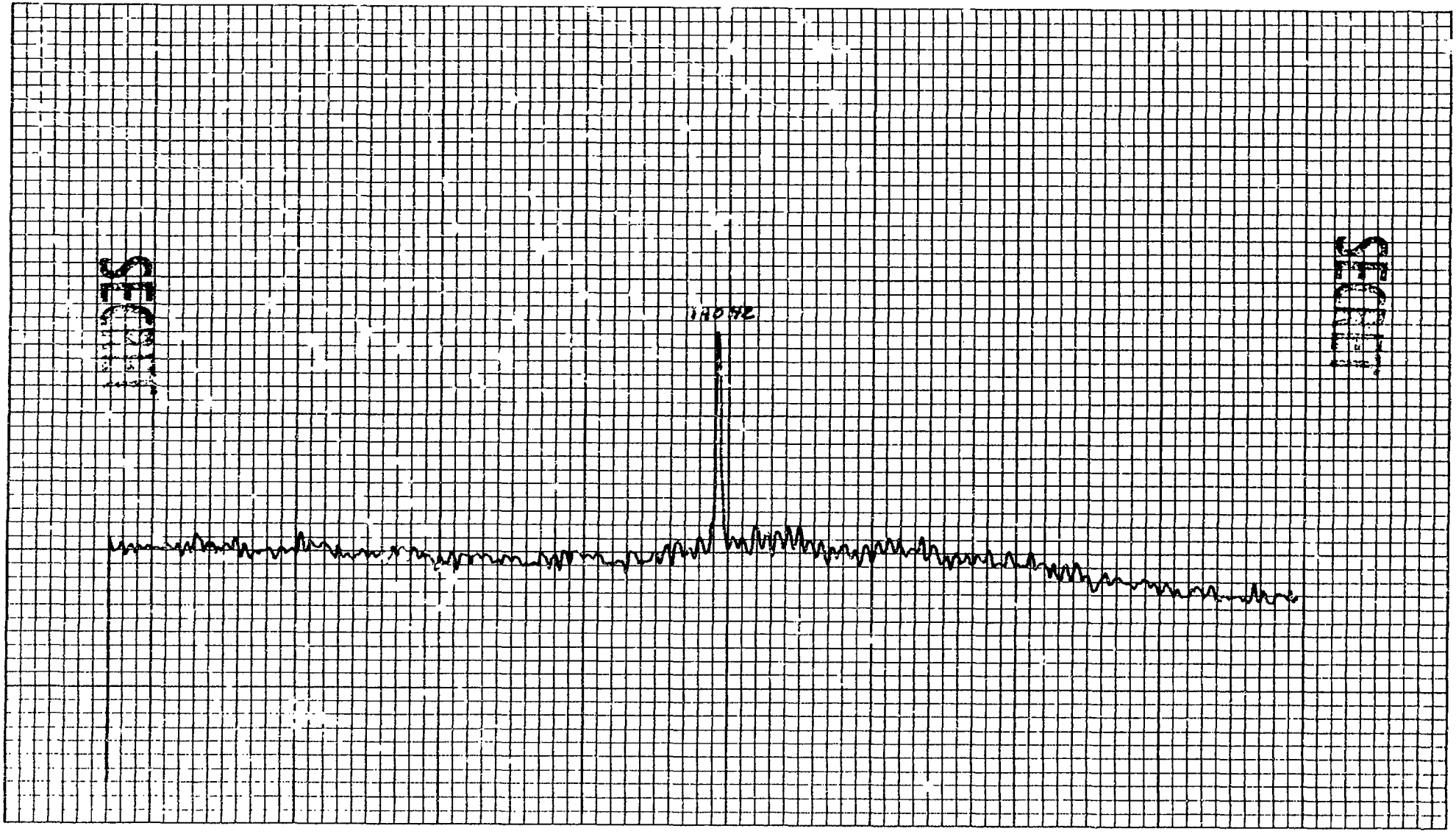
46 0703

CONTROL: 1148 - 51 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 148 HZ
51 ELEMENTS

DATE OF ANALYSIS: - - -
1-26 & 28-53)
DATE/TIME: 3 16-77 - 1146 Z
ANALYSIS BANDWIDTH 1/10HZ
+74 DEG. AZ STEERING

REEL: N84 INDEX 1935

INTEGRATION TIME 320 SECS ATTN: -24 DB
FILTER WTG: HANNING



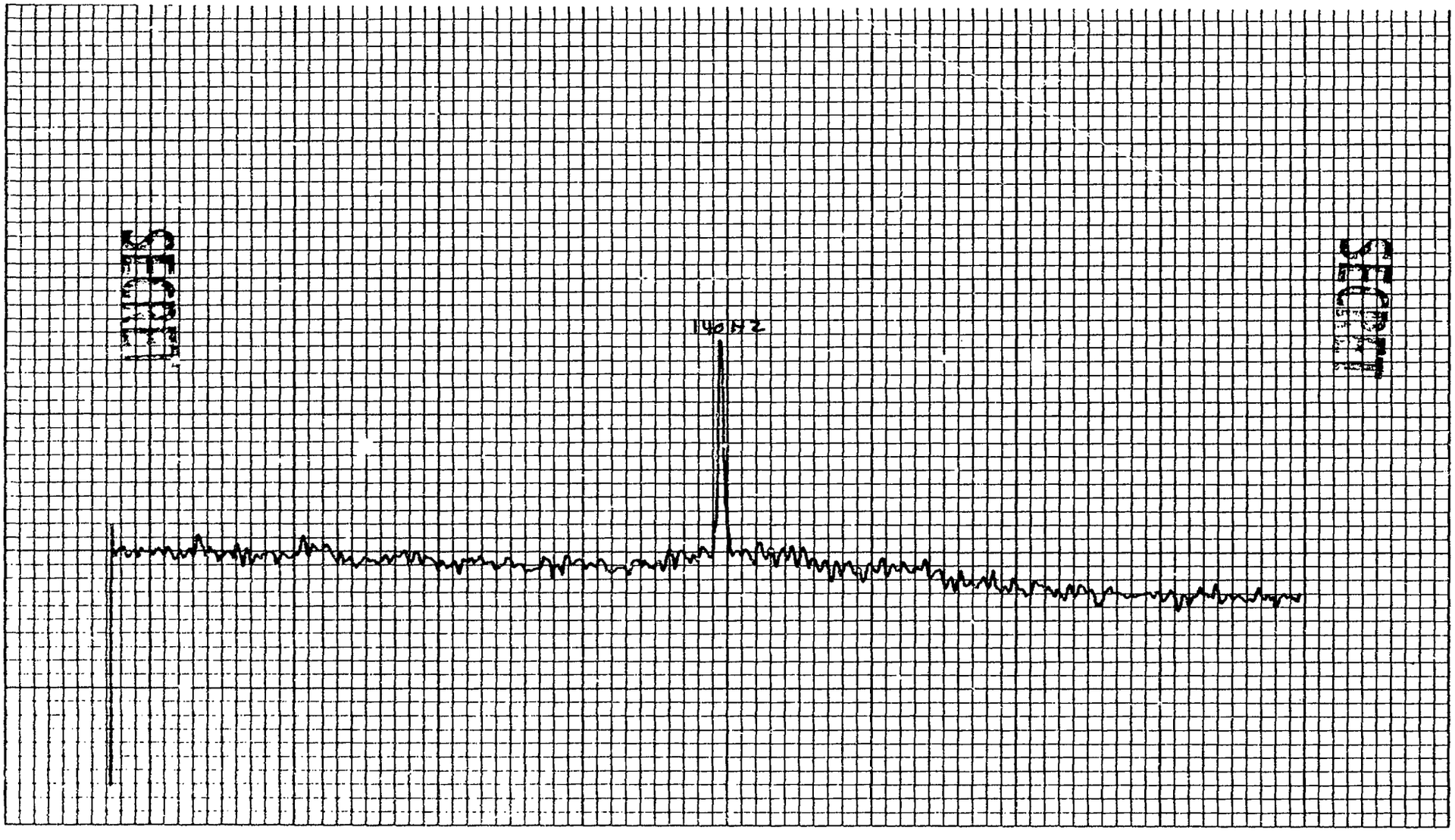
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 1148 - 51 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 140 HZ
51 ELEMENTS

DATE OF ANALYSIS: - - -
1-26 & 29-53)
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+76 DEG. AZ STEERING

REEL: H24 INDEX 1995
INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



K·E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 1148 - 51 (D012)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 140 HZ
51 ELEMENTS

DATE OF ANALYSIS: — — —
1-26 & 29-53)
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+70 DEG. AZ STEERING

REEL: M2V
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

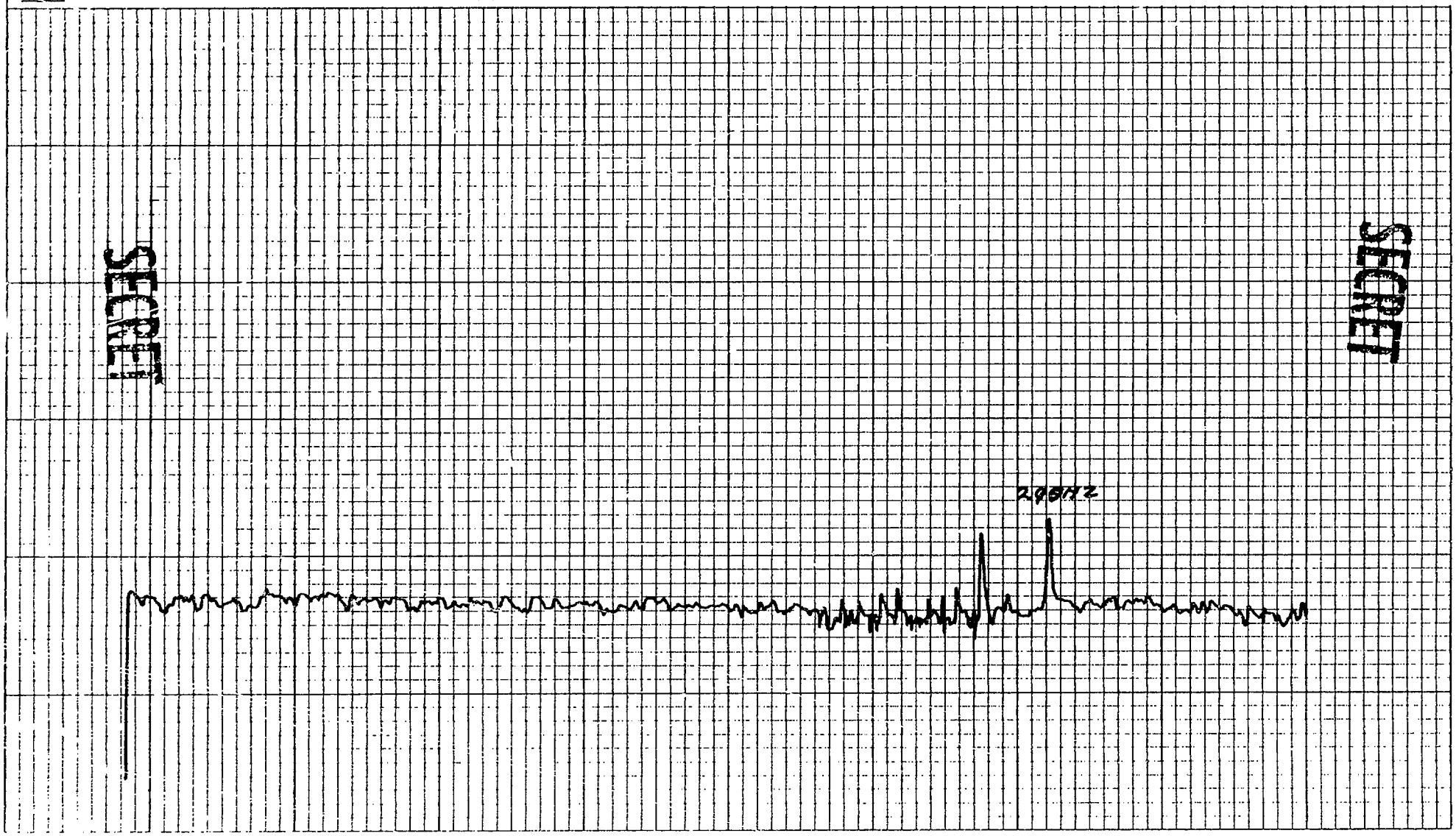
INDEX 1995
ATTEN: -24 DB

K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 1148 - 51 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 28-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
51 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 3 16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+48 DEG. AZ STEERING

REEL: M24 INDEX 1986
INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING

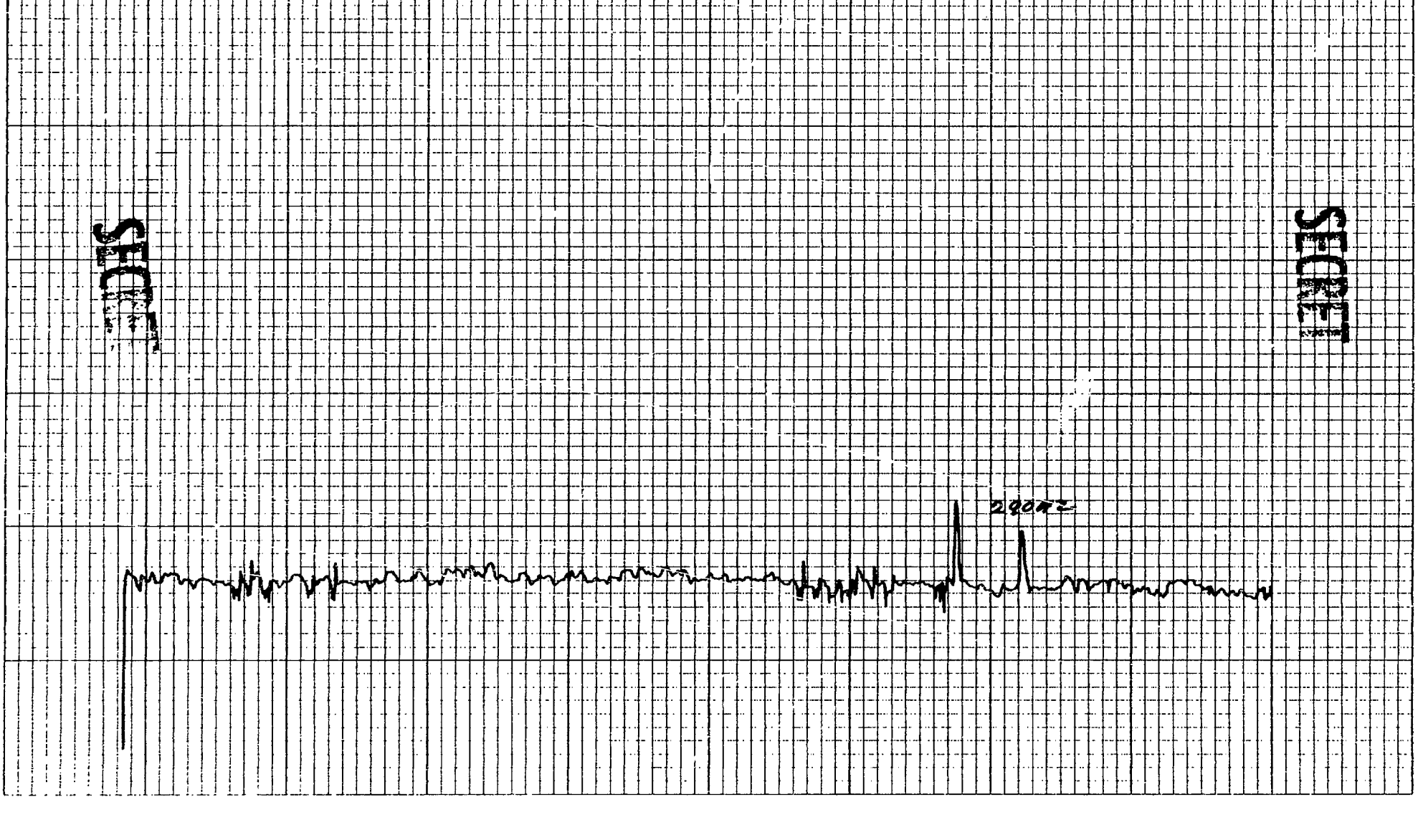


K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 1148 - 51 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
51 ELEMENTS

DATE OF ANALYSIS: — — —
1-26 & 29-53)
DATE/TIME: 3-26-87 -1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+50 DEG. AZ STEERING

REEL: MQ4 INDEX/885
INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 1146 - 51 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 28-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
51 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+52 DEG. AZ STEERING

REEL: M 24
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 1895
ATTEN: -24 DB

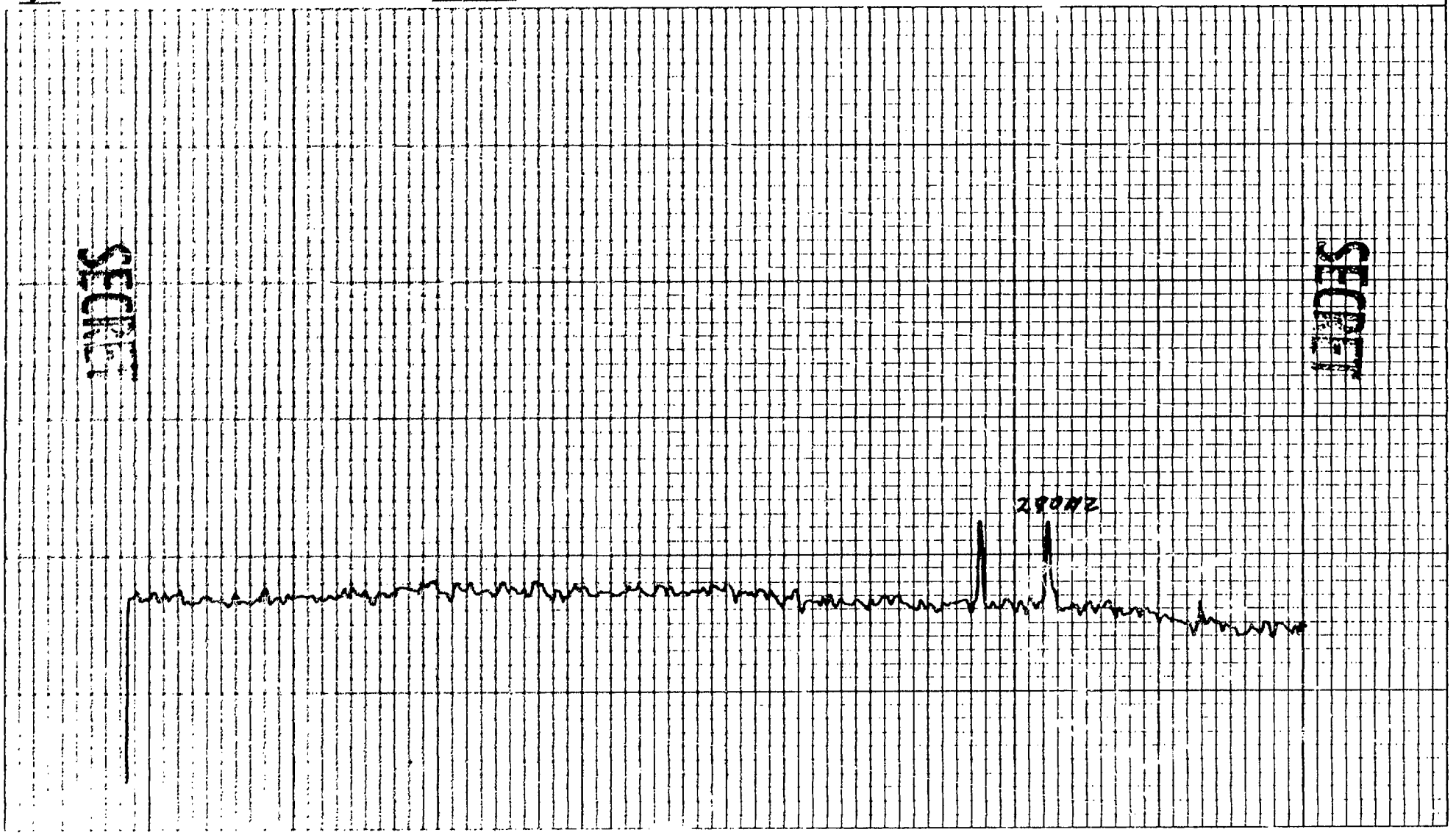
K+E 10 X 10 TO THE INCH 5 X 10 INCHES KEUFFEL & ESSER CO MADE IN U.S.A.

CONTROL: 1148 - 51 (0912)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
51 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+54 DEG. AZ STEERING

REEL: M24 INDEX 1985

INTEGRATION TIME 320 SECS ATTEN: -24DB
FILTER WTG: HANNING



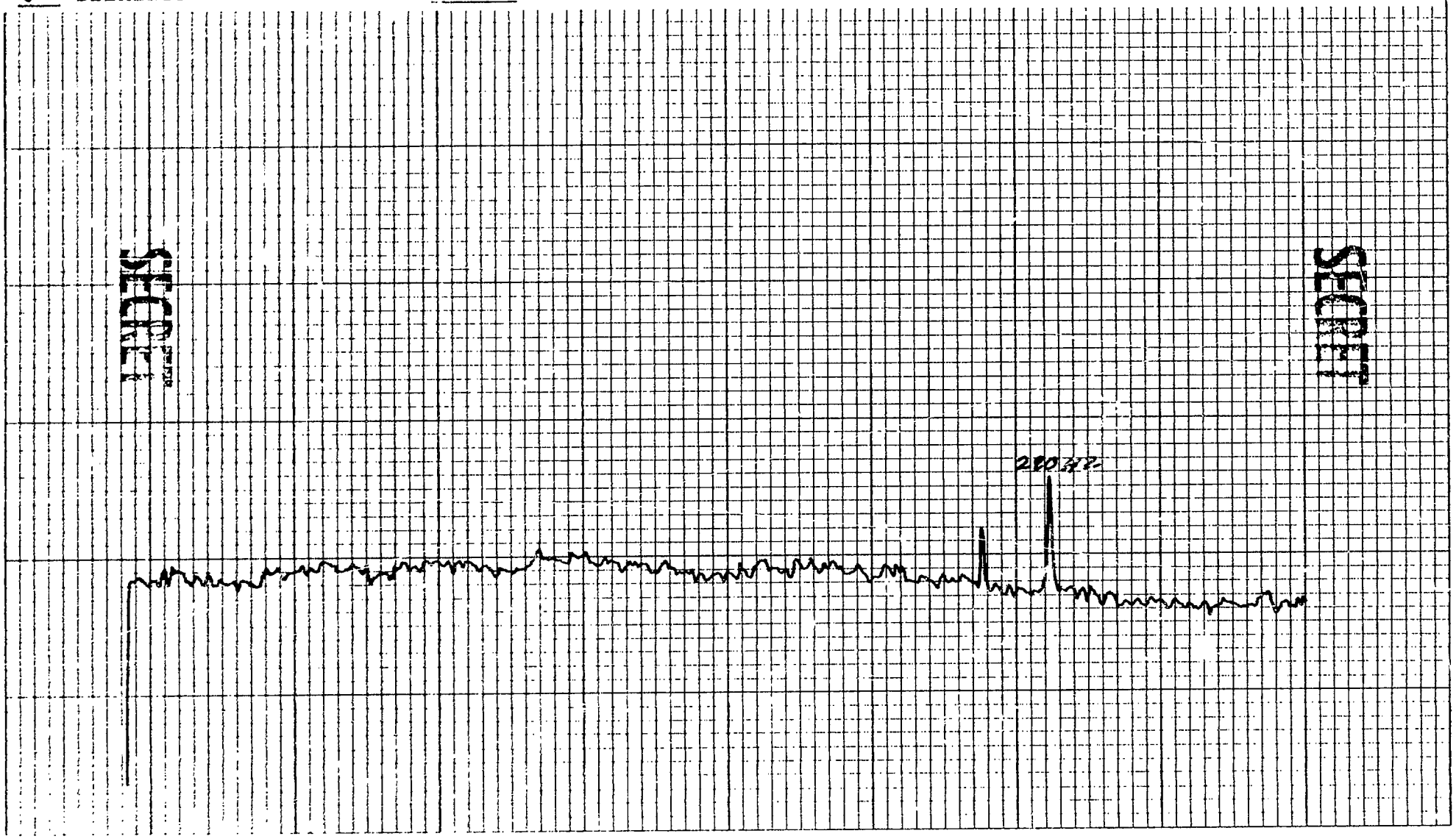
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

CONTROL: 1148 - 51 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
51 ELEMENTS

DATE OF ANALYSIS: - - -
1-26 & 28-53)
DATE/TIME: 3-16-77 -1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+56 DEG. AZ STEERING

REEL: 44 INDEX: 985
INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



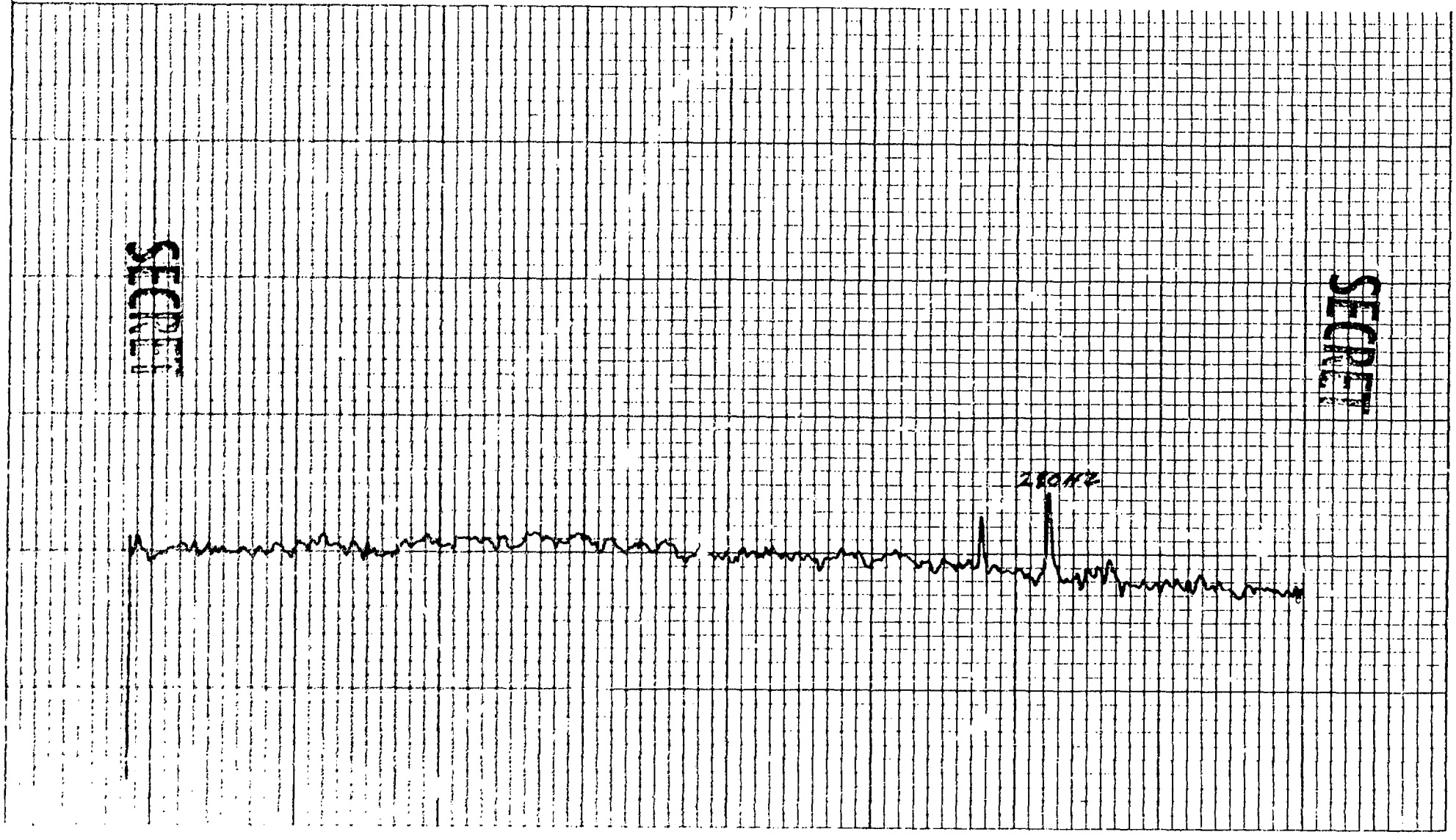
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

CONTROL: 1148 - 51 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
51 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 3-16-77 - 1148Z
ANALYSIS BANDWIDTH: 1/10 HZ
+58 DEG. AZ STEERING

REEL: 424 INDEX 1985
INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



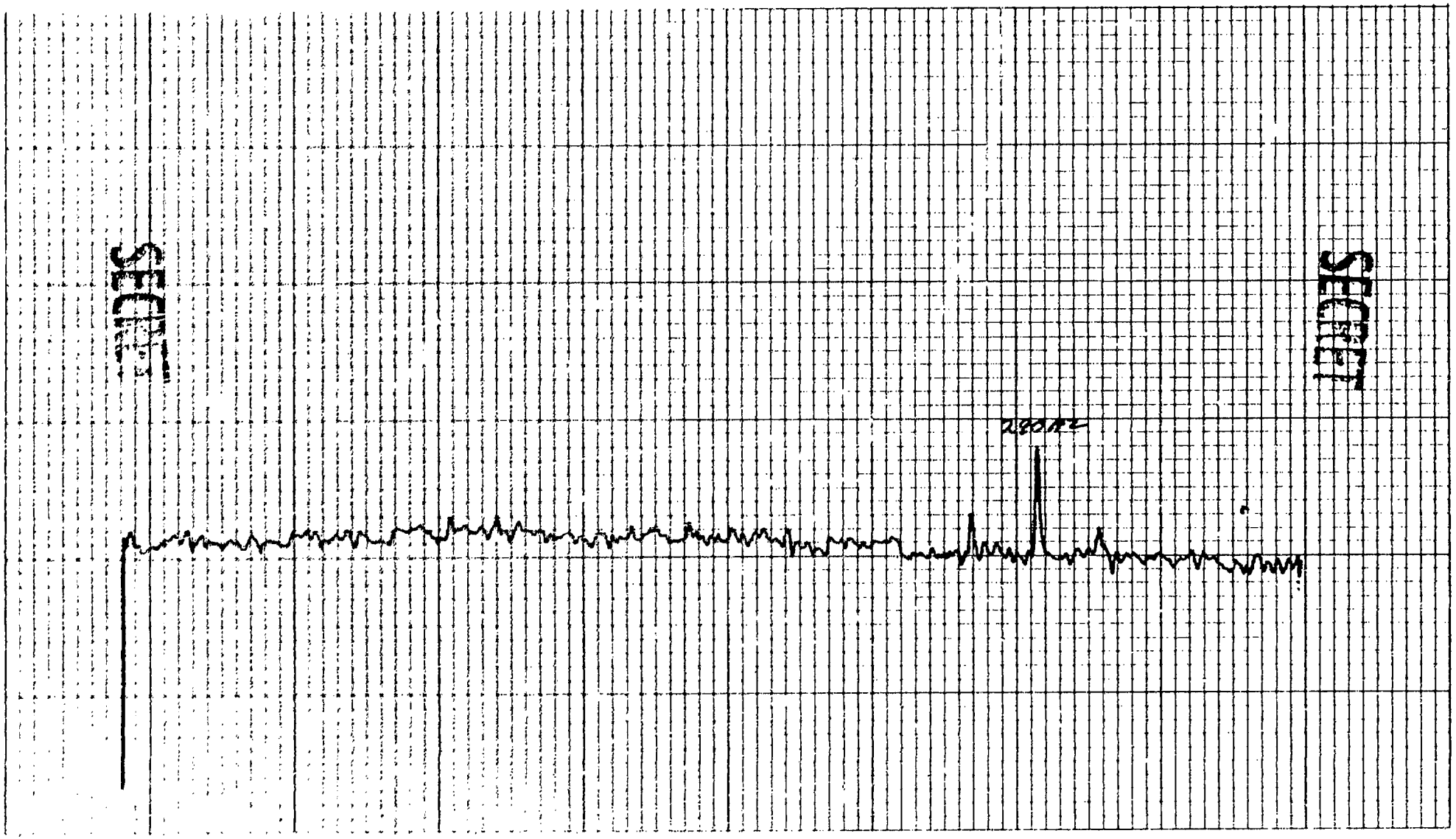
K&E 10 X 10 TO THE INCH • 5 X 10 INCHES
KEUFFEL & ESSER CO

CONTROL: 1148 - 51 (DO12)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
51 ELEMENTS

DATE OF ANALYSIS: - - -
1-26 4 28-53)
DATE/TIME: 3-16-77-1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+59.5 DEG. AZ STEERING

REEL: N24 INDEX 1005

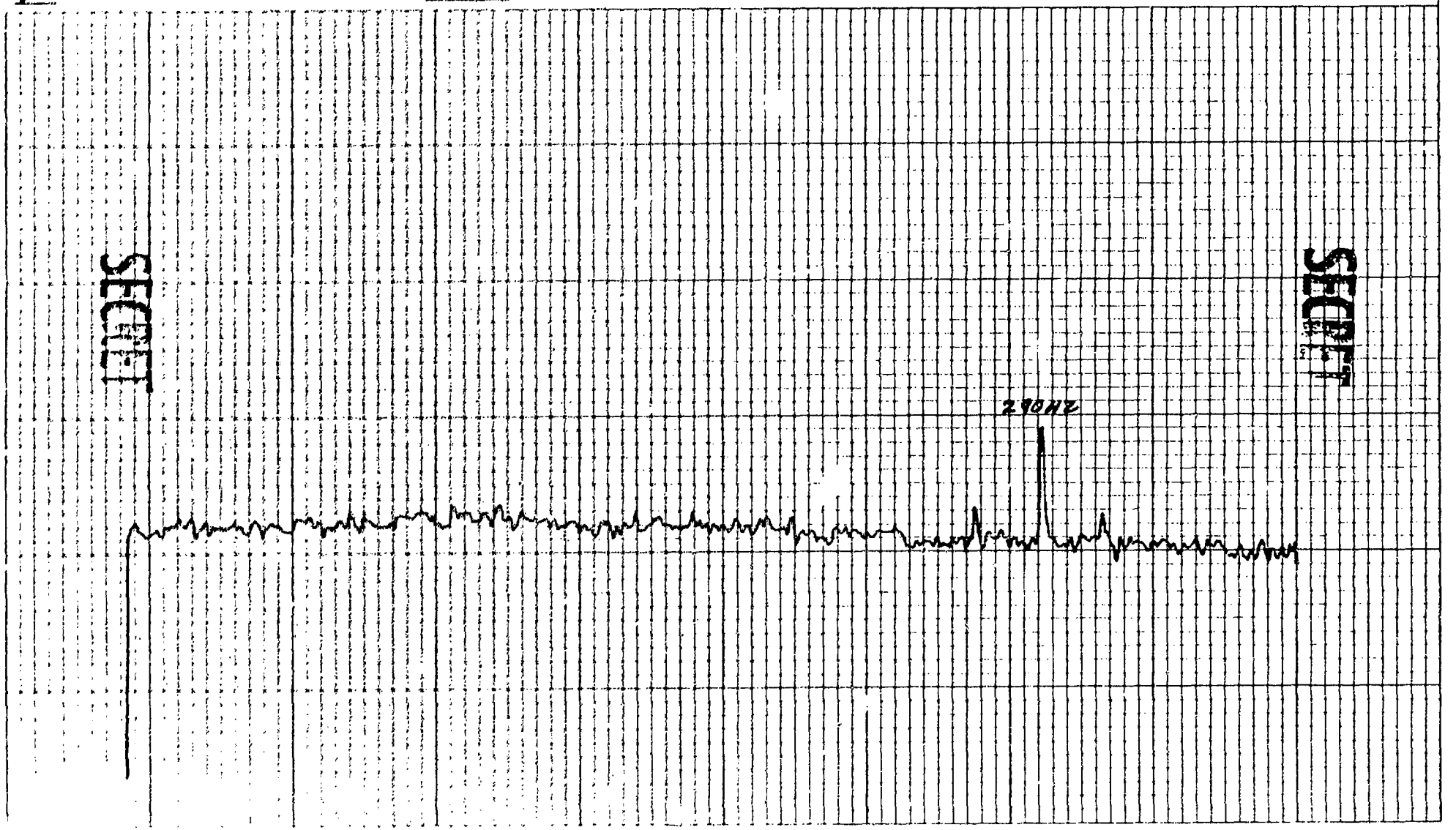
INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



CONTROL: 1148 - 51 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
51 ELEMENTS

DATE OF ANALYSIS: — — —
1-26 & 29-53)
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+60 DEG. AZ STEERING

REEL: 424 INDEX 1285
INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING

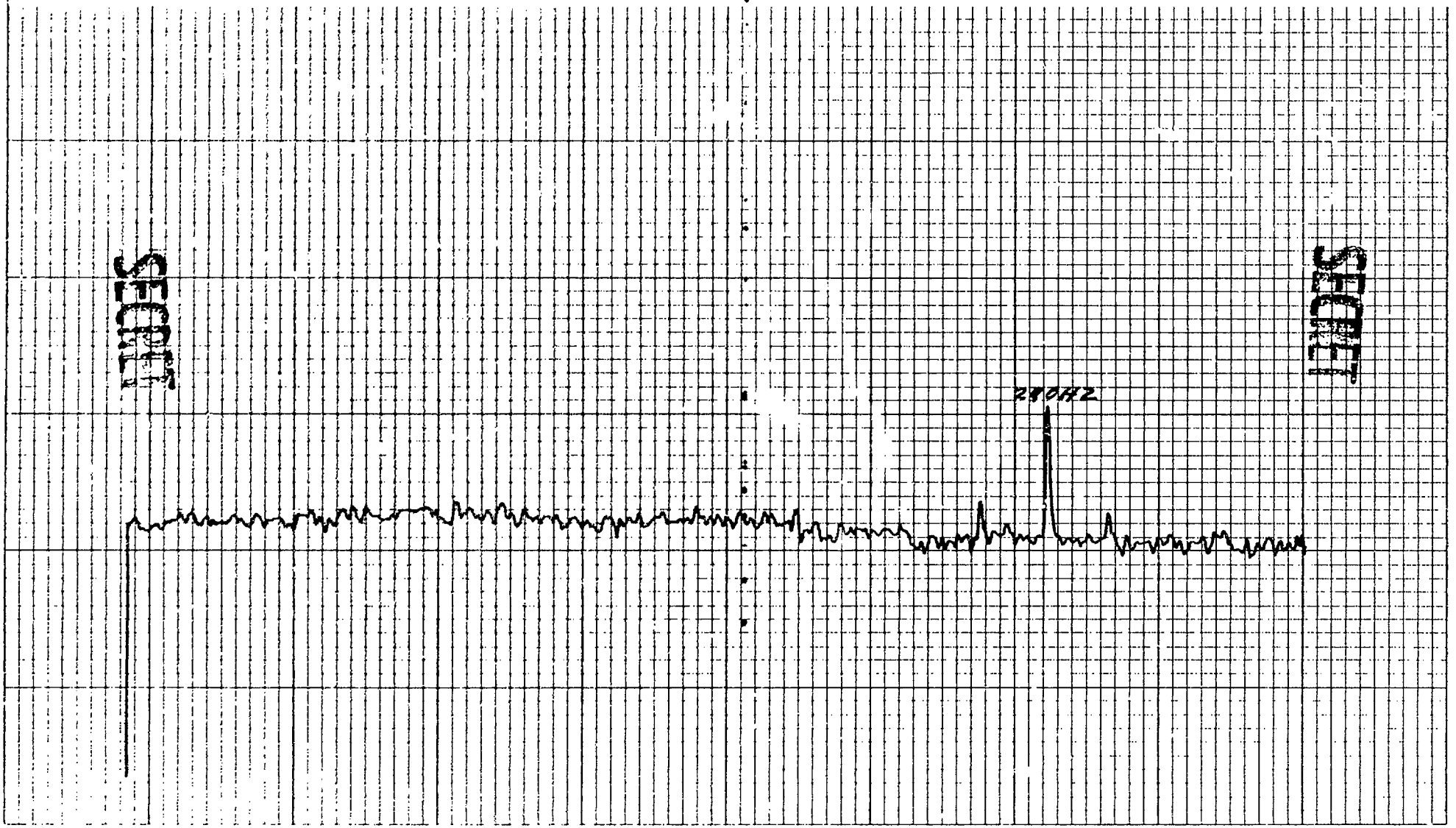


K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 1148 - 51 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
51 ELEMENTS

DATE OF ANALYSIS: — — —
1-26 # 88-53)
DATE/TIME: 3-16-77 -1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+51 DEG. AZ STEERING

REEL: N24 INDEX 1995
INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

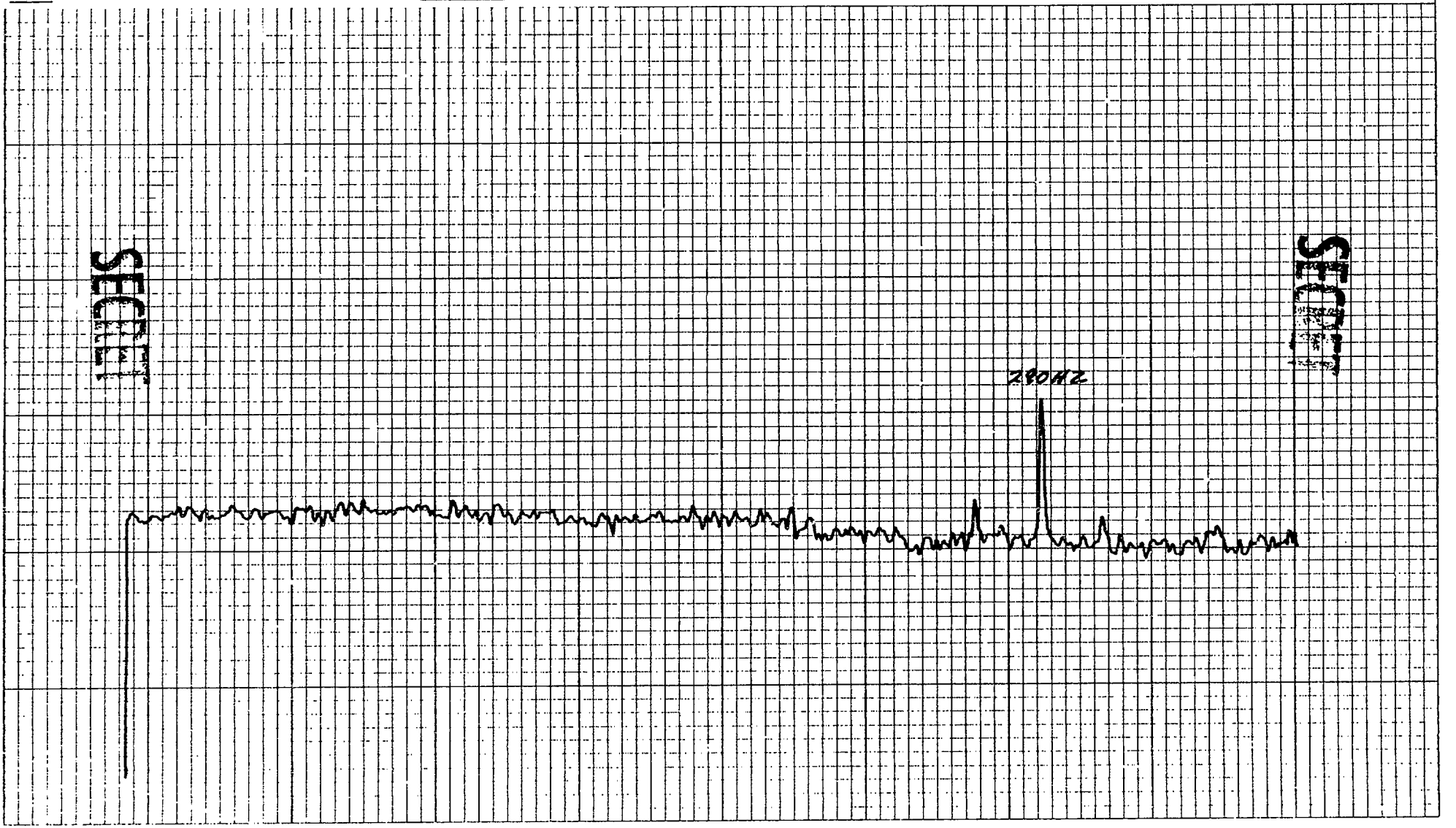
46 0703

CONTROL: 1148 - 51 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
51 ELEMENTS

DATE OF ANALYSIS: - - -
1-26 & 28-53)
DATE/TIME: 3-16-77 -1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+62 DEG. AZ STEERING

REEL: M24 INDEX/995

INTEGRATION TIME 320 SECS ATTEN: -07 DB
FILTER WTG: HANNING



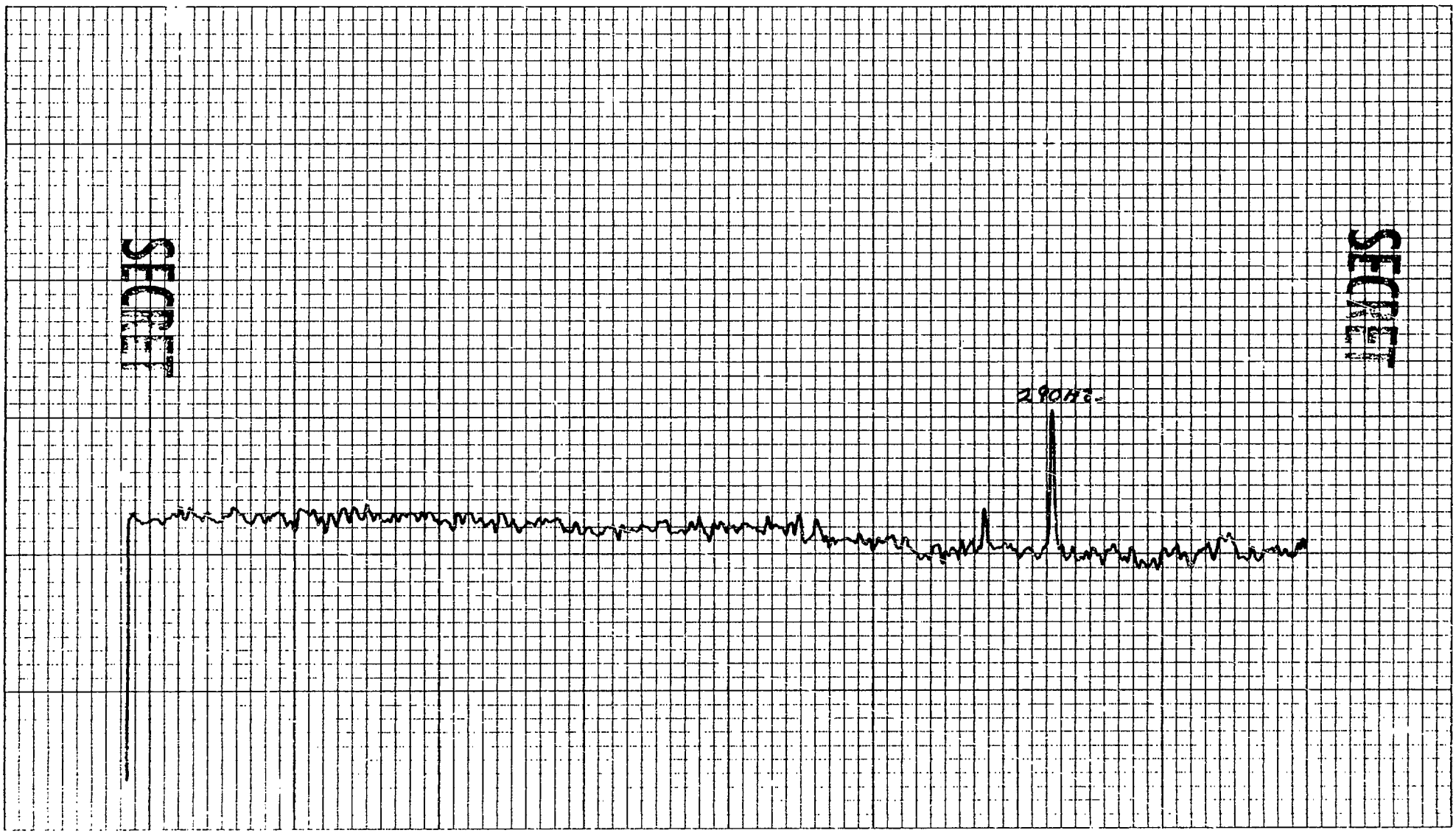
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

P. 51 F.

CONTROL: 1148 - 51 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 28-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
51 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+63 DEG. AZ STEERING

REEL: N24 INDEX 1885
INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

B01122

CONTROL: 1148 - 51 (D812)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 28-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
51 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+64 DEG. AZ STEERING

REEL: H34
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 1895
ATTEN: -24 DB

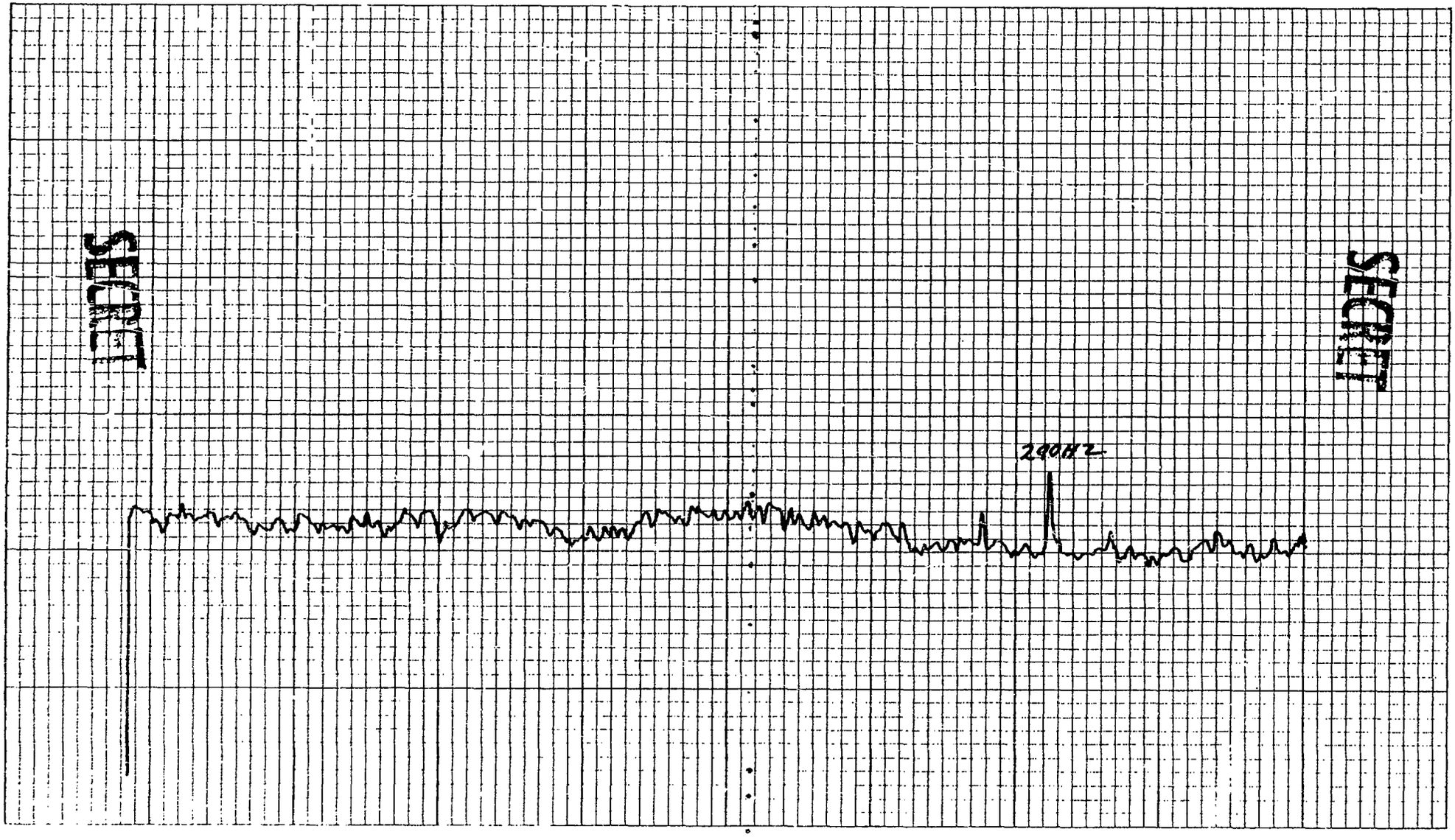
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 1148 - 51 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 28-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
51 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
166 DEG. AZ STEERING

REEL: 124 INDEX 1995
INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



K+E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

CONTROL: 1148 - 51 (DP12)
BEAMFORMED SPECTRUM (ELEMENTS 1 - 26 & 28-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
51 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+68 DEG. AZ STEERING

REEL: K24
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 1995
ATTEN: -24 DB

K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

46 0703

B-51123

CONTROL: 1148 - 51 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 28-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
51 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+70 DEG. AZ STEERING

REEL: M24
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 1985
ATTEN: -24 DB

K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

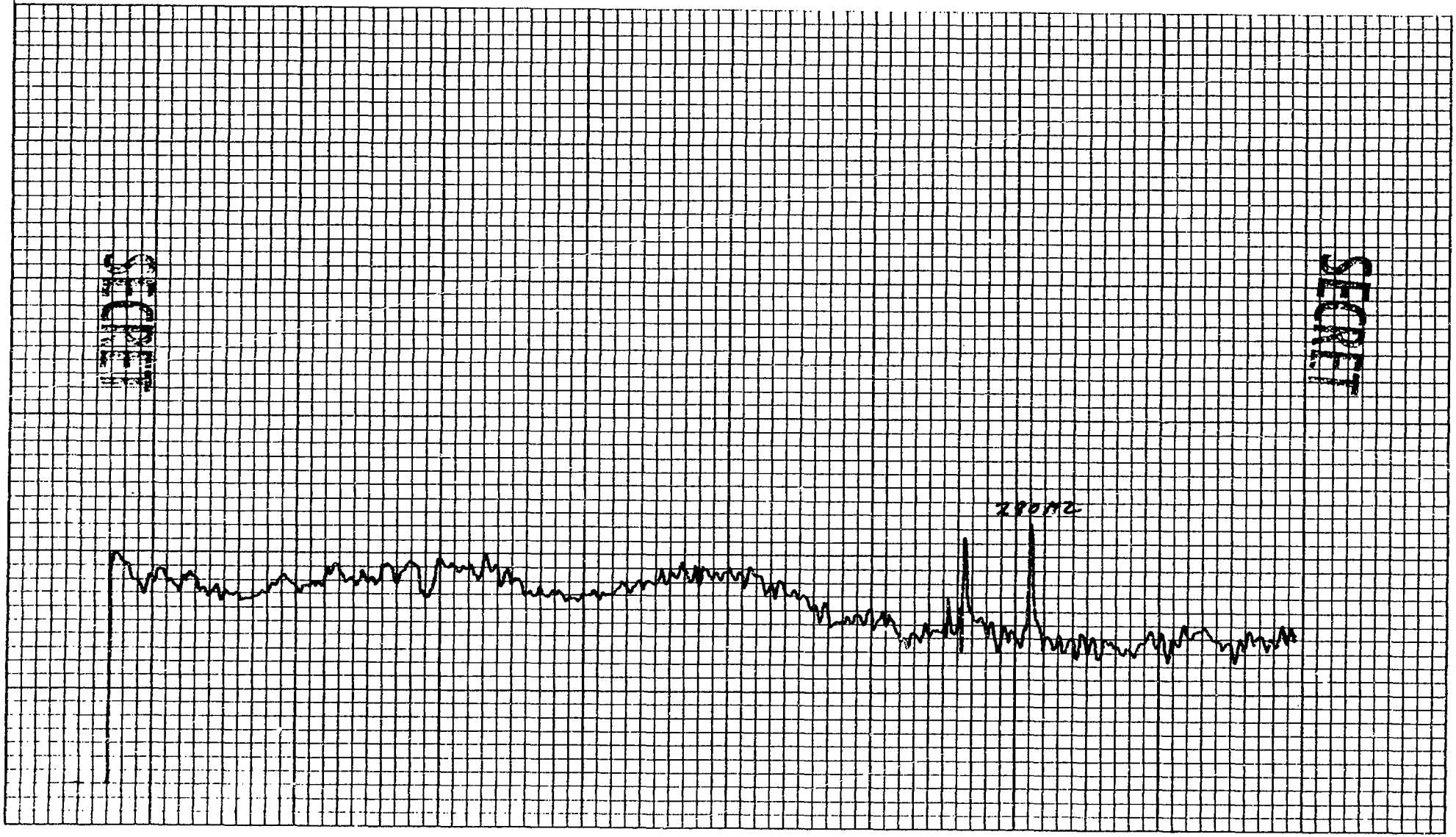
46 0703

CONTROL: 1148 - 51 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
51 ELEMENTS

DATE OF ANALYSIS: — — —
1-26-29-53)
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+72 DEG. AZ STEERING

REEL: A24 INDEX 1985

INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



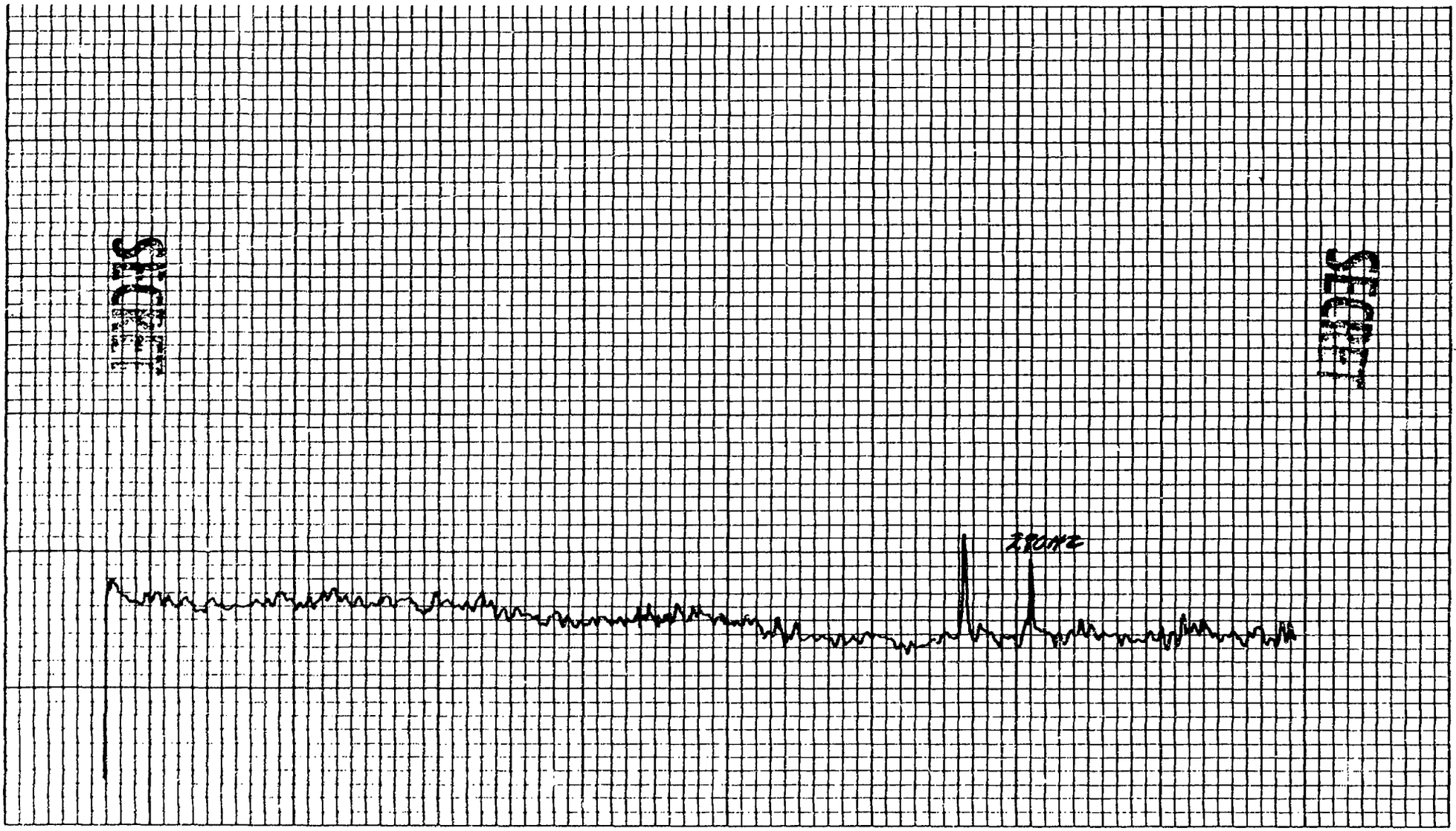
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 1140 - 51 (DP12)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 28-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
51 ELEMENTS

DATE OF ANALYSIS: — - -
DATE/TIME: 3-6-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+74 DEG. AZ STEERING

REEL: M24 INDEX 1995
INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WTG: HANNING



K•E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

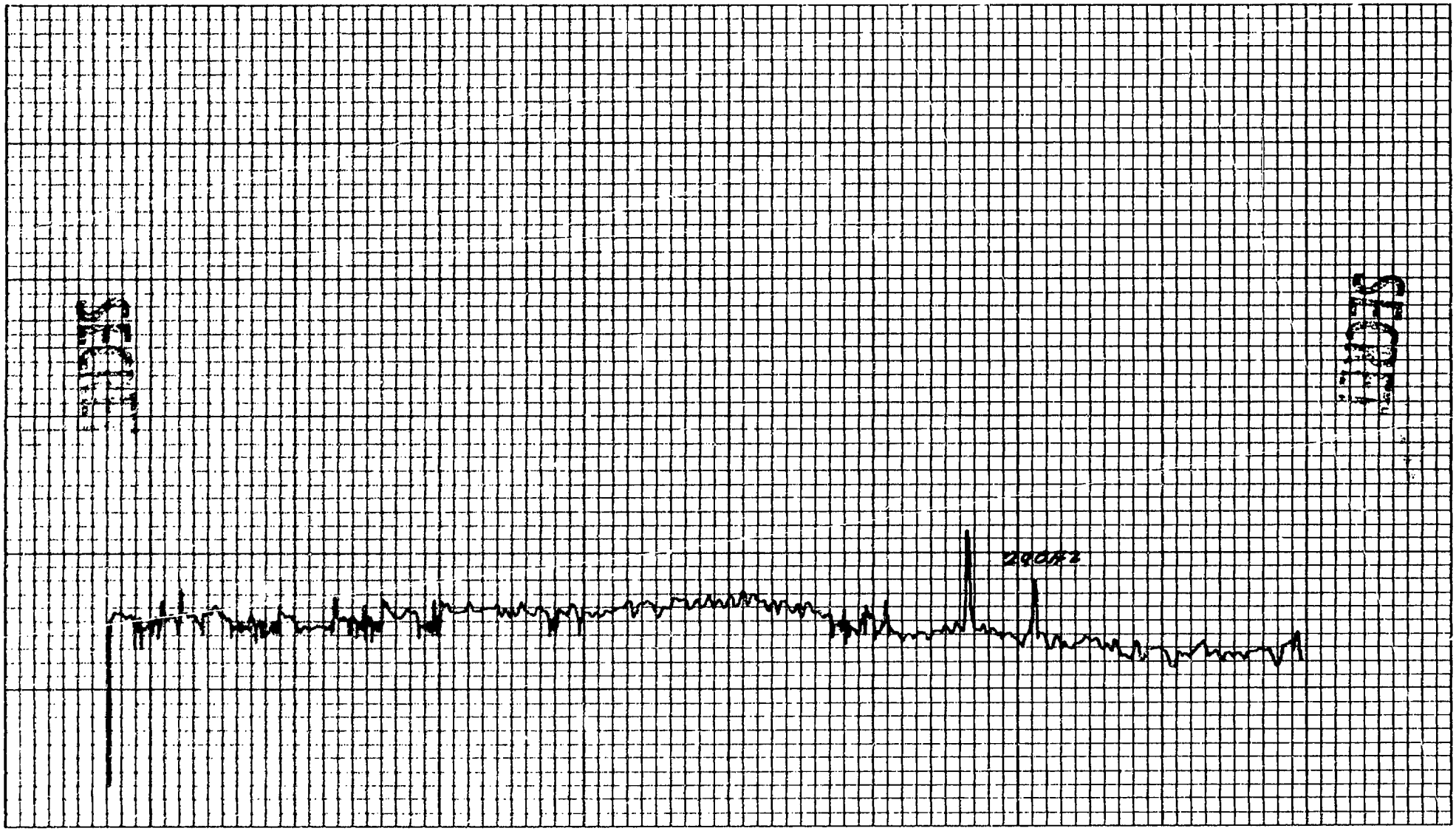
46 0703

CONTROL: 1148 - 51 (0912)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
51 ELEMENTS

DATE OF ANALYSIS: — — —
1-26 & 29-53)
DATE/TIME: 3-16-77 - 1148 Z
ANALYSIS BANDWIDTH: 1/10HZ
+78 DEG. AZ STEERING

REEL: K24
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 1975
ATTEN: -24 DB



DEPARTMENT OF THE NAVY
OFFICE OF NAVAL RESEARCH
875 NORTH RANDOLPH STREET
SUITE 1425
ARLINGTON VA 22203-1995

IN REPLY REFER TO:

5510/1
Ser 321OA/011/06
31 Jan 06

MEMORANDUM FOR DISTRIBUTION LIST

Subj: DECLASSIFICATION OF LONG RANGE ACOUSTIC PROPAGATION PROJECT (LRAPP) DOCUMENTS

Ref: (a) SECNAVINST 5510.36

Encl: (1) List of DECLASSIFIED LRAPP Documents

1. In accordance with reference (a), a declassification review has been conducted on a number of classified LRAPP documents.

2. The LRAPP documents listed in enclosure (1) have been downgraded to UNCLASSIFIED and have been approved for public release. These documents should be remarked as follows:

   Classification changed to UNCLASSIFIED by authority of the Chief of Naval Operations (N772) letter N772A/6U875630, 20 January 2006.

   DISTRIBUTION STATEMENT A: Approved for Public Release; Distribution is unlimited.

3. Questions may be directed to the undersigned on (703) 696-4619, DSN 426-4619.

BRIAN LINK
By direction

Subj: DECLASSIFICATION OF LONG RANGE ACOUSTIC PROPAGATION PROJECT (LRAPP) DOCUMENTS

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Declassified LRAPP Documents

Report Number	Personal Author	Title	Publication Source (Originator)	Pub. Date	Current Availability	Class.
Unavailable	Unavailable	SELF-TENSIONING ACOUSTICAL HORIZONTAL LINE ARRAY (SPRAY) DATA ANALYSIS. FINAL REPORT OF BEARING STAKE TESTS JANUARY THRU MARCH 1977. VOLUME IVB. DATA POINTS 10, 11 AND 12 RAW DATA	Sanders Associates, Inc.	790109	ADC017579	U
ARLTR7924	Mitchell, S. K., et al.	ANALYSIS OF ACOUSTIC BOTTOM INTERACTION IN BEARING STAKE (U)	University of Texas, Applied Research Laboratories	790223	ADE001369; NS; ND	U
TIU1886502F	Eichenberger, D.	REPORT FOR CHURCH STROKE II OCEANOGRAPHIC SERVICES	Texas Instruments, Inc.	790326	ADB036751; ND	U
Unavailable	Unavailable	FINAL REPORT, 1 NOVEMBER 1976-31 DECEMBER 1978	Xonics, Inc.	790430	ADB037987	U
Unavailable	Mitchell, T. M.	PREMOBILIZATION OF R/V INDIAN SEAL	Texas Instruments, Inc.	790531	ADB039703	U
Unavailable	Hays, E. E.	ACODAC AMBIENT NOISE PROGRAM	Woods Hole Oceanographic Institution	790601	ADB040404	U
LRAPPR79029	Unavailable	INTRODUCTION TO THE LRAPP ENVIRONMENTAL-ACOUSTIC DATA BANK (U)	Naval Ocean R&D Activity	790601	ADB041066; NS	U
USRD NO. 4807	Unavailable	MEASUREMENTS ON AQUADYNE MODEL AQ-1 ELEMENTS FOR THE UPGRADED LAMBDA ARRAY	Naval Research Laboratory	790802	ND	U
Unavailable	Ellis, G. E.	SUMMARY OF ENVIRONMENTAL ACOUSTIC DATA ANALYSIS	University of Texas, Applied Research Laboratories	790814	ADA073876	U
BR U0048-9C2	Unavailable	TAP III FINAL REPORT (U)	Bunker-Ramo Corp. Electronic Systems Division	790901	ND	U
ORITR1245	Moses, E. J.	OPTIONS, REQUIREMENTS, AND RECOMMENDATIONS FOR AN LRAPP ACOUSTIC ARRAY PERFORMANCE MODEL (U)	ORI, Inc.	790917	NS; ND	U
Uavailable	Colborn, J. G., et al.	EVALUATION OF STANDARD OCEAN CANDIDATES	Pacific-Sierra Research Corp,	800301	ADA087304	U
Unavailable	Kirby, W. D.	ENVIRONMENTAL ACOUSTIC SUPPORT FOR FLEET OPERATIONS AND NATO	Science Applications, Inc.	801112	ADB052623	U
Unavailable	Unavailable	SUMMARY OF ENVIRONMENTAL ACOUSTIC MEASUREMENTS, MODELING AND ANALYSIS	University of Texas, Applied Research Laboratories	801215	ADB053770	U
Unavailable	Renner, W. W., et al.	SURFACE DUCT, ROUGH SURFACE SCATTERING, AND CUSPED CAUSTIC IMPROVEMENTS FOR FACT	Science Applications, Inc.	810301	ADA126250	U
Unavailable	Wilson, J. H.	WIND-GENERATED NOISE MODELING	Science Applications, Inc.	810401	ADA190143	U
Unavailable	Goit, E. H.	TOWED ARRAY PERFORMANCE PREDICTION SYSTEM - VERSION 1.2	Science Applications, Inc.	810701	ADB059397	U
3	Unavailable	FINAL REPORT	University of Texas, Applied Research Laboratories	810721	ND	U