

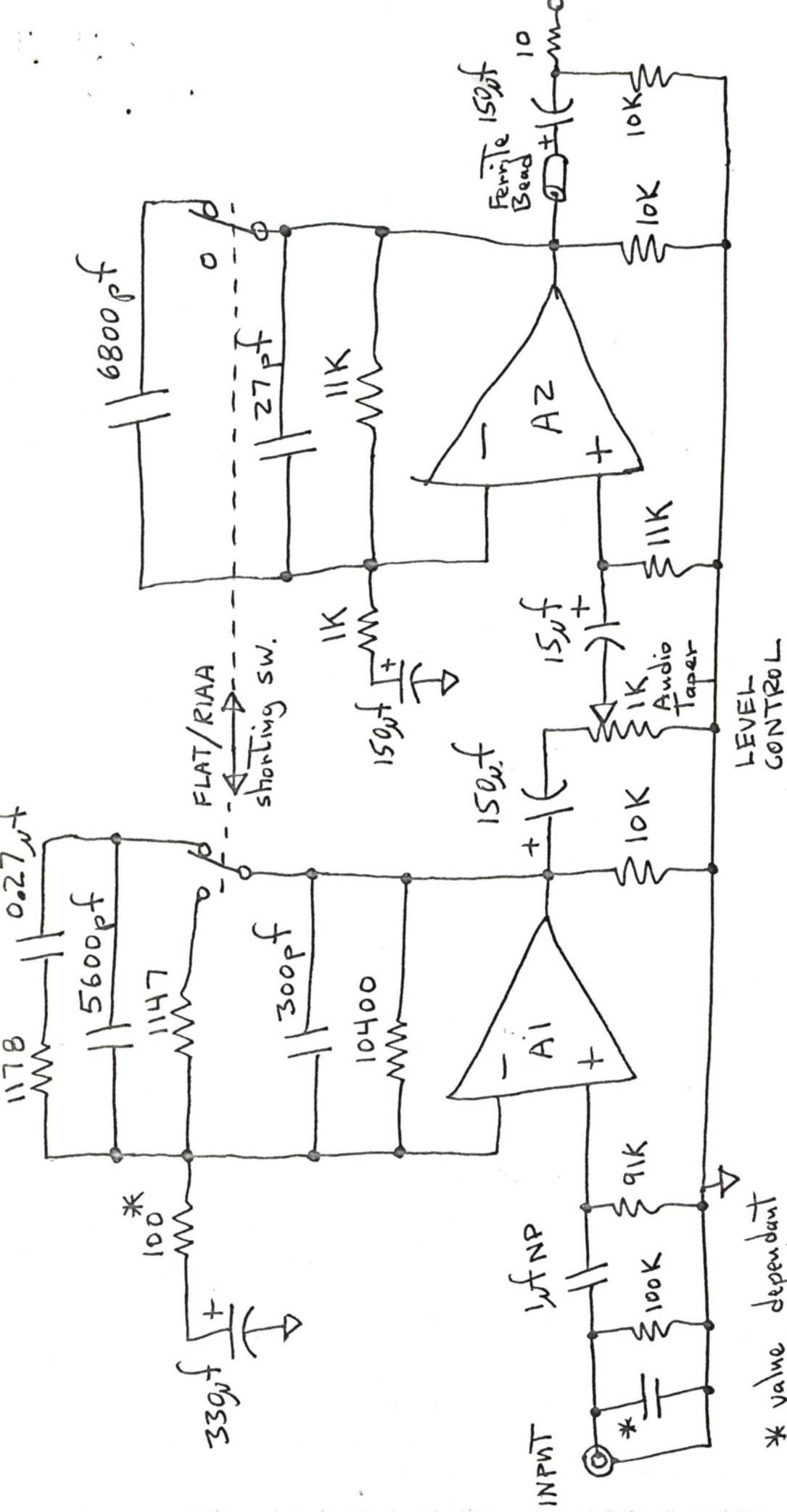


This is an accurate RIAA reproduce amplifier with two gain stages for high maximum input level capability and low distortion, ( $< 0.006\%$  at 20 kHz w/+20 dB v re. 0.775V output) (w/ $R_L = 600 \text{ ohm}$ )

The RIAA/FLAT switch does not change 1 kHz gain. The 3 pole active rumble filter is optional and bypassable. So also the equalization stage for cartridge compensation. The eq section data gives values for typical curves and frequencies, interpolation will yield frequencies for individual cartridge requirements. Note that both the high freq shelf and mid-freq peaking curves are paired for view-thru horizontal slide rule evaluation to aid in ckt value selection.

Please feel free to call me for further info.

Regards  
Deane Jensen.



\* Trim the 100 ohm R to adj. max. gain.

A1 & A2 are 918 Type discrete amps  
Ferrite Bead is Type FB-2

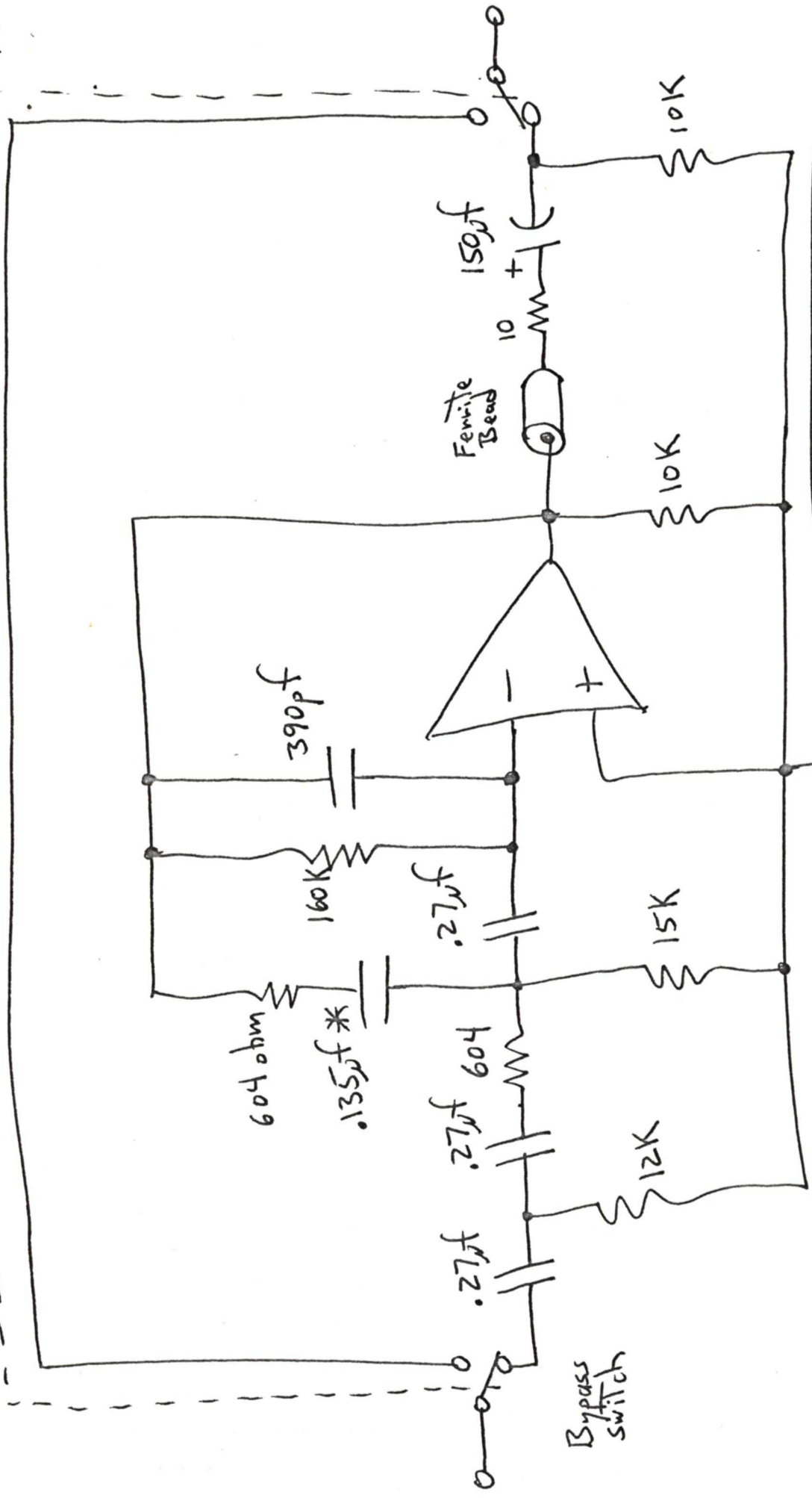
10 ohm resistor at output should be omitted if output transformer is used.

1KHz gain is +42.8dB in both switch positions

\* value dependent upon cartridge spec.

## 2 STAGE RIAA REPRODUCTION AMPLIFIER

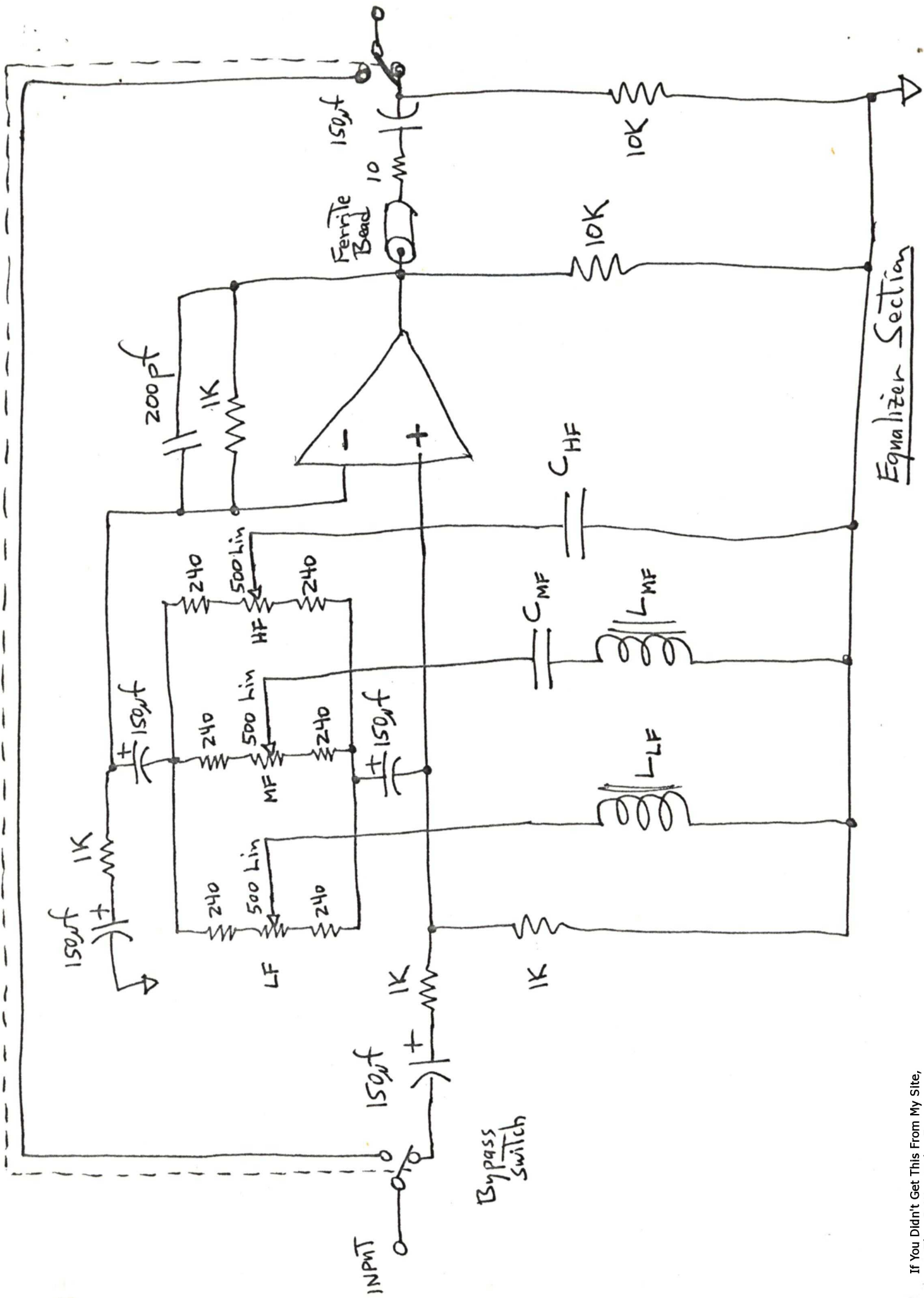
Revised - 10-19-77



Rumble Filter - 10-19-77  
 Stabilized 3 pole HP Butterworth  
 -0.5 dB @ 30 Hz  
 -17 dB @ 10 Hz

- The Two 604 ohm resistors must be closely matched for flat high frequency response, the absolute value is not critical.

\* - Trim the 0.135µF cap. value to adjust passband gain.



Phono pre - EQ section

Mid-range peaking eq  
ckt R's = 1000 ohm

Freq	L	C	
100	563 mH	4.5 $\mu$ f	MF Section # 1
300	188 mH	1.5 $\mu$ f	
500	101 mH	1 $\mu$ f	
700	76.0 mH	0.68 $\mu$ f	

3 KHz	18.763 mH	0.15 $\mu$ f	MF Section # 2
5 K	10.13 mH	0.1 $\mu$ f	
7 K	7.60 mH	0.068 $\mu$ f	
9 K	6.25 mH	0.05 $\mu$ f	

Low frequency section -  $f = \frac{R}{2\pi L}$  label  
 800 mH (99.5 Hz) 100 Hz

HF section -  $f = \frac{1}{2\pi RC}$   
 0.1  $\mu$ f 3180 Hz 3 KHz  
 0.068 4680 Hz 5 K  
 0.047 6770 Hz 7 K  
 0.033 9650 Hz 10 K  
 0.022  $\mu$ f 14.5 kHz 15 KHz

Level Control



RIAA  
 3180us pole  
 318us zero  
 w/flat sw  
 ~ 20 dB gain @ 1kHz



RIAA  
 75us pole  
 w/flat sw.  
 ~ 20 dB gain @ 1kHz

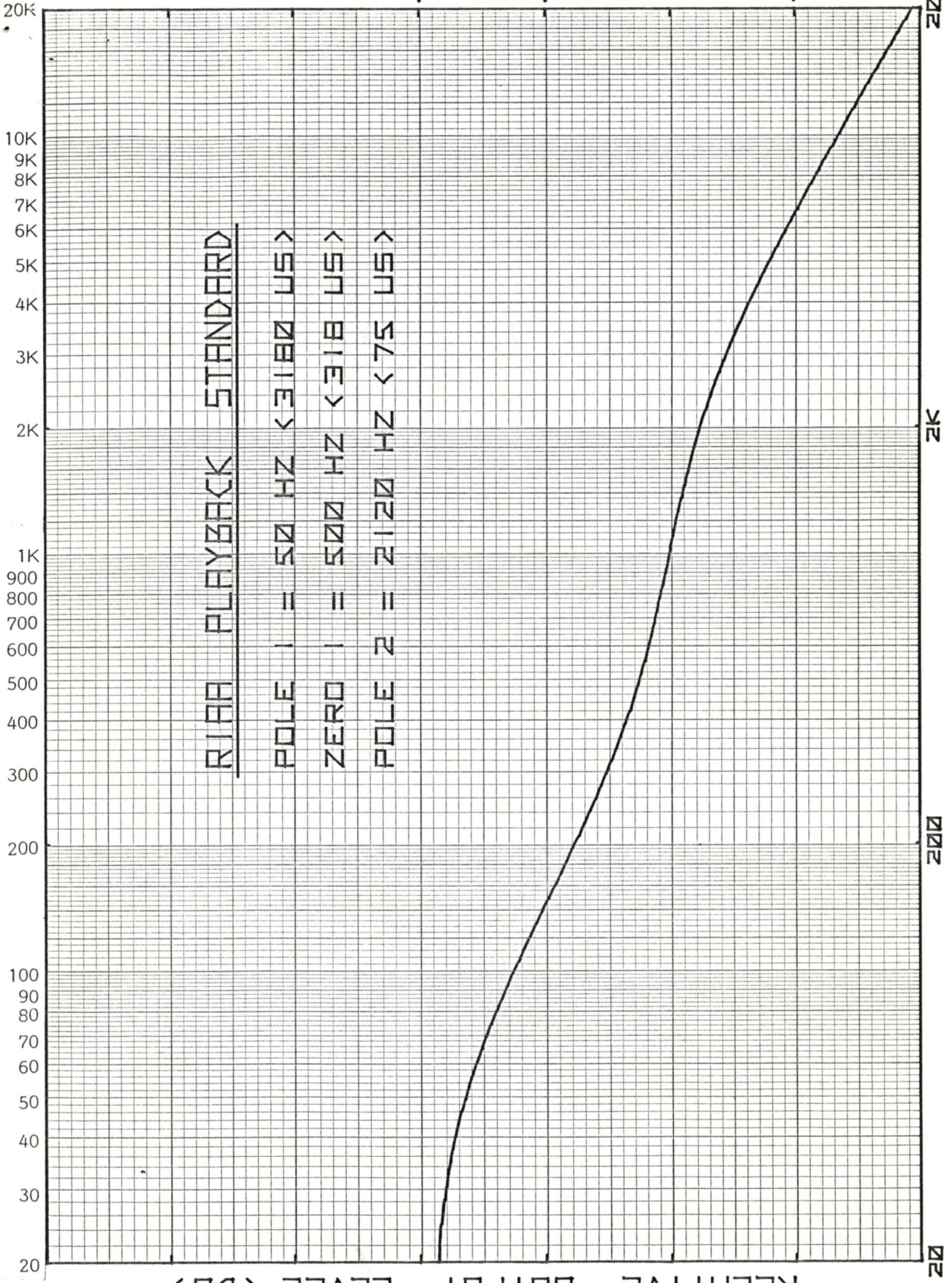


RUMBLE FILTER  
 3 pole HP  
 $F_c = 21 \text{ Hz}$   
 -0.5dB @ 30Hz  
 w/bypass sw.  
 unity gain @ 1kHz



EQUALIZER  
 w/bypass sw.  
 unity gain @ 1kHz

Block diagram of phono pre.



RELATIVE OUTPUT LEVEL < DB >

20K

2000

200

20K

RIAA PLAYBACK STANDARD

POLE 1 = 50 HZ < 3180 US >

ZERO 1 = 500 HZ < 318 US >

POLE 2 = 2120 HZ < 75 US >

+20

+10

0

-10

20K

10K

9K

8K

7K

6K

5K

4K

3K

2K

1K

900

800

700

600

500

400

300

200

100

90

80

70

60

50

40

30

20

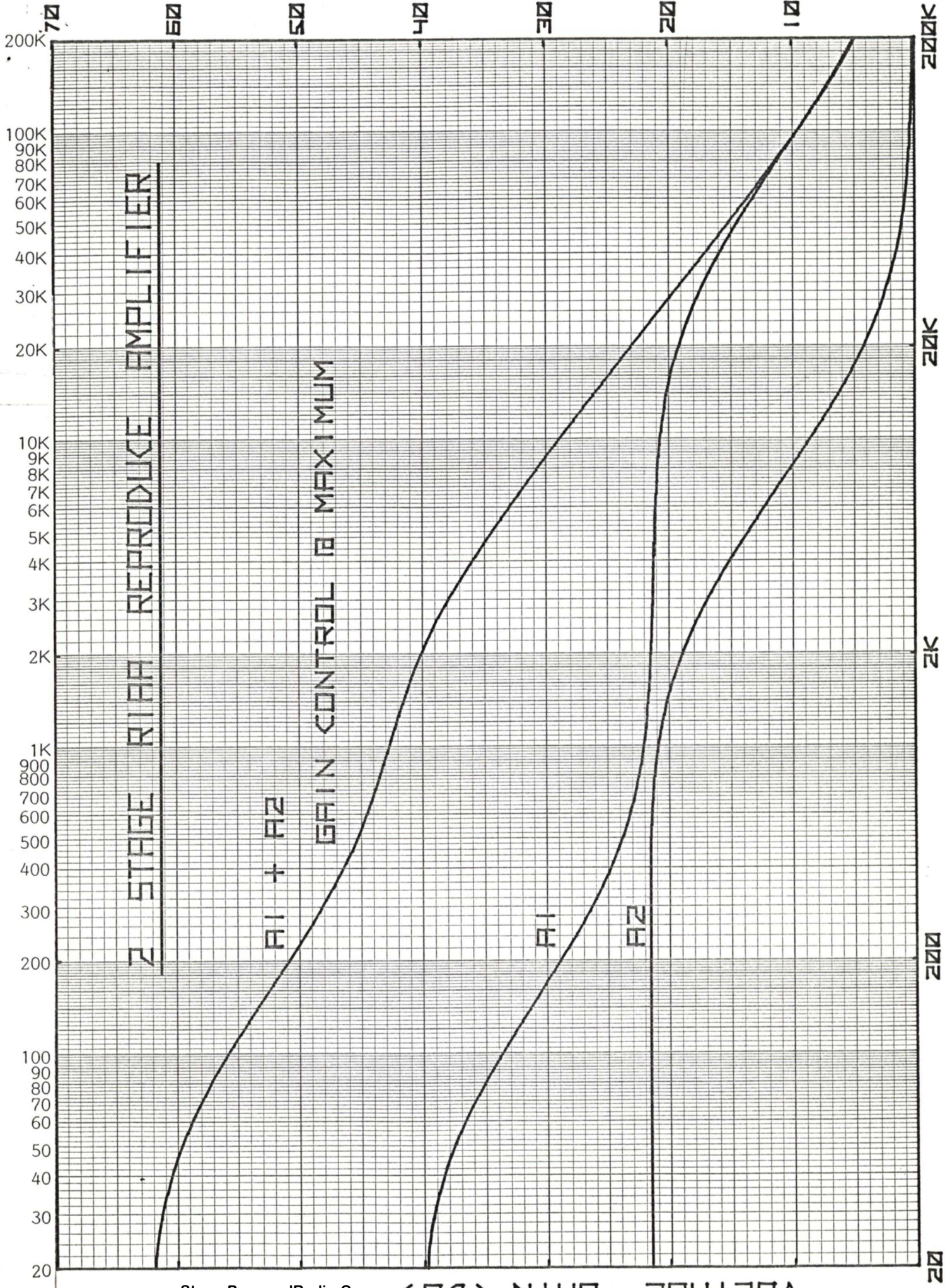
FREQUENCY < HZ >

20

2000

200

20K



2 STAGE RIAA REPRODUCE AMPLIFIER

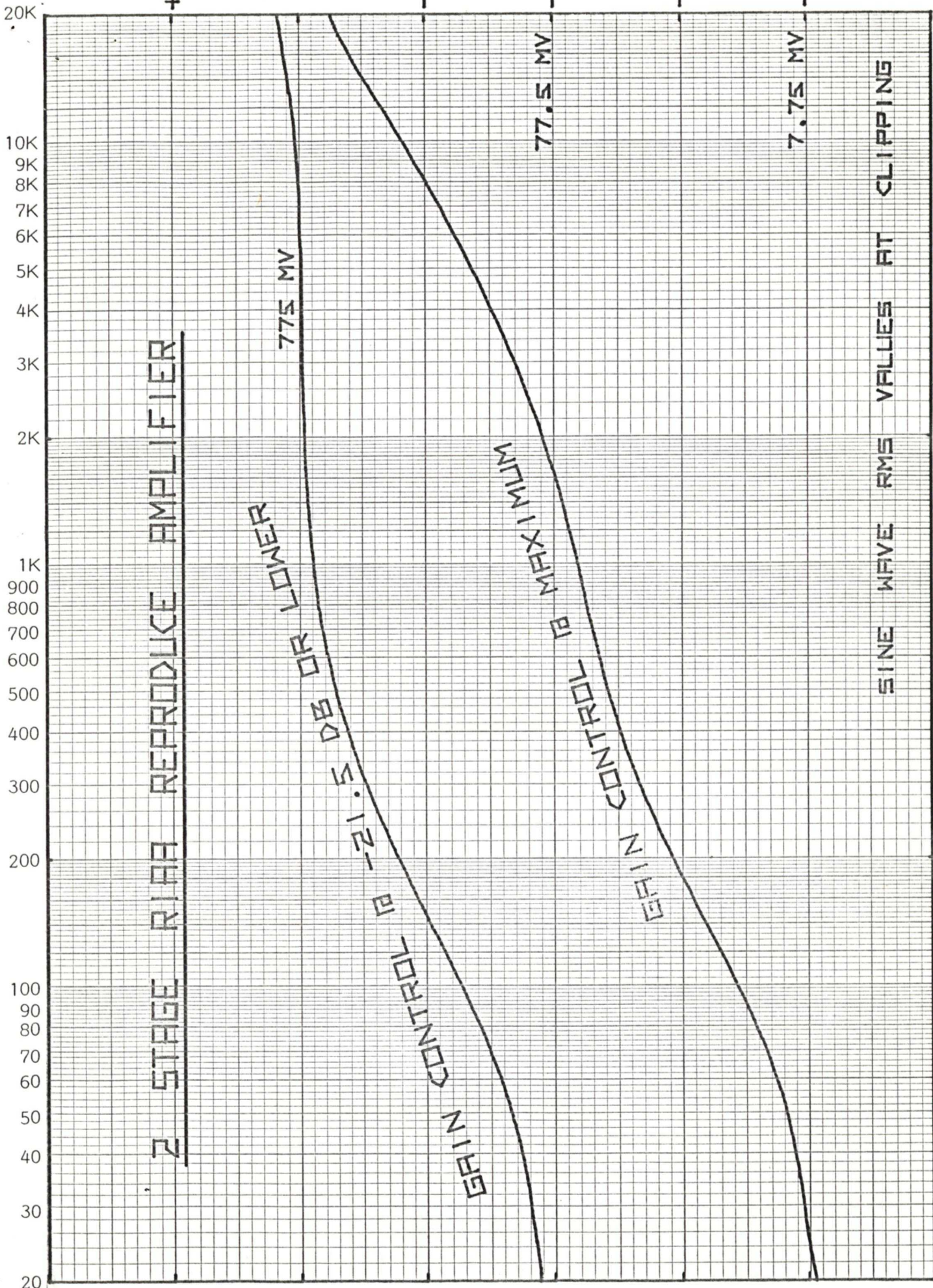
A1 + A2  
GAIN CONTROL @ MAXIMUM

A1

A2



MAXIMUM INPUT LEVEL < DBV RE. 775V >



NOISE OUTPUT < DBV RE. 775V >

# 2 STAGE RIAA REPRODUCE AMPLIFIER

GAIN CONTROL @ MAXIMUM

BW = 1/3 OCTAVE

20 KHZ BW > -74.95 DBV < RE. 775V >

CARTRIDGE SPEC

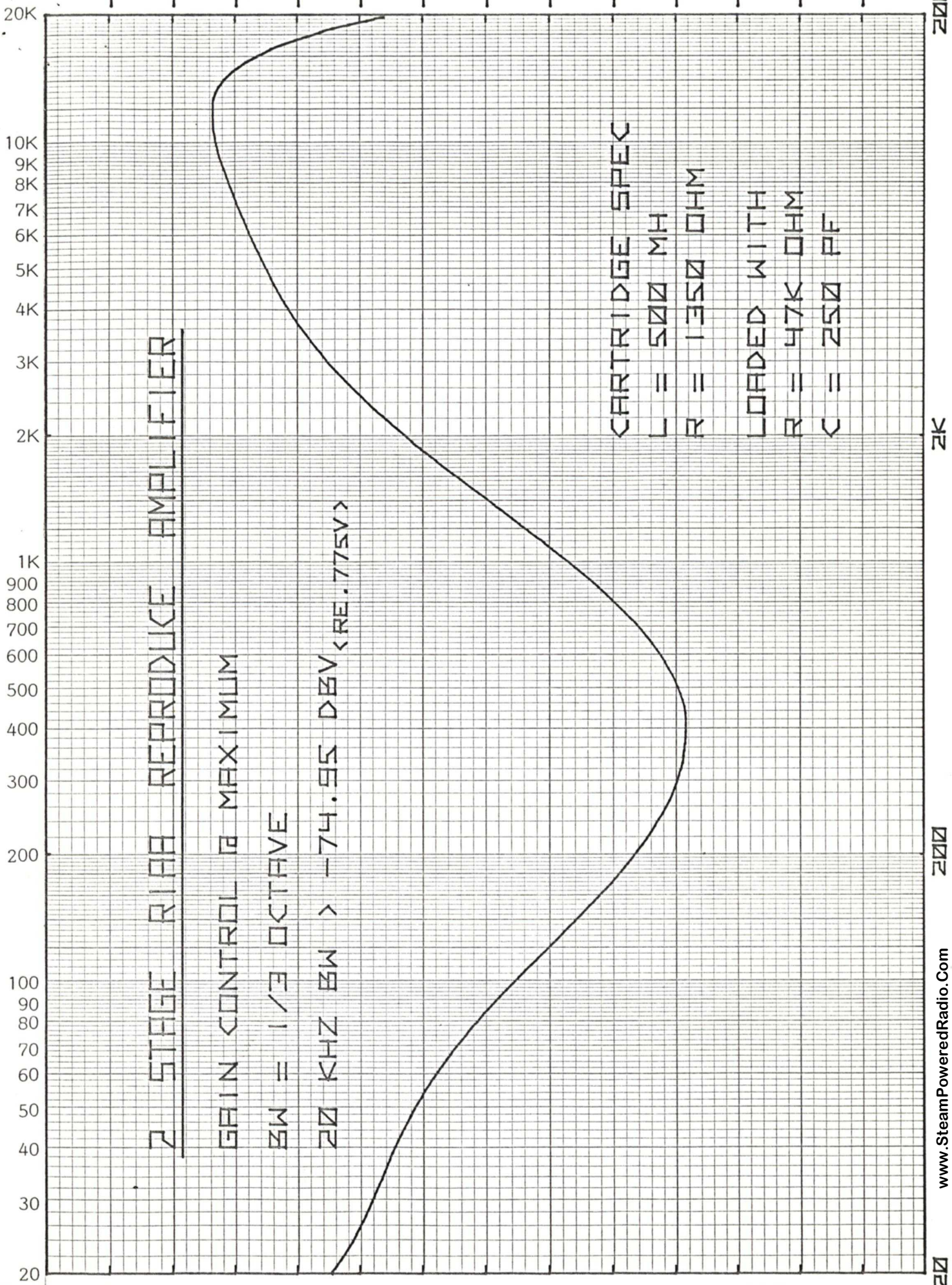
L = 500 MH

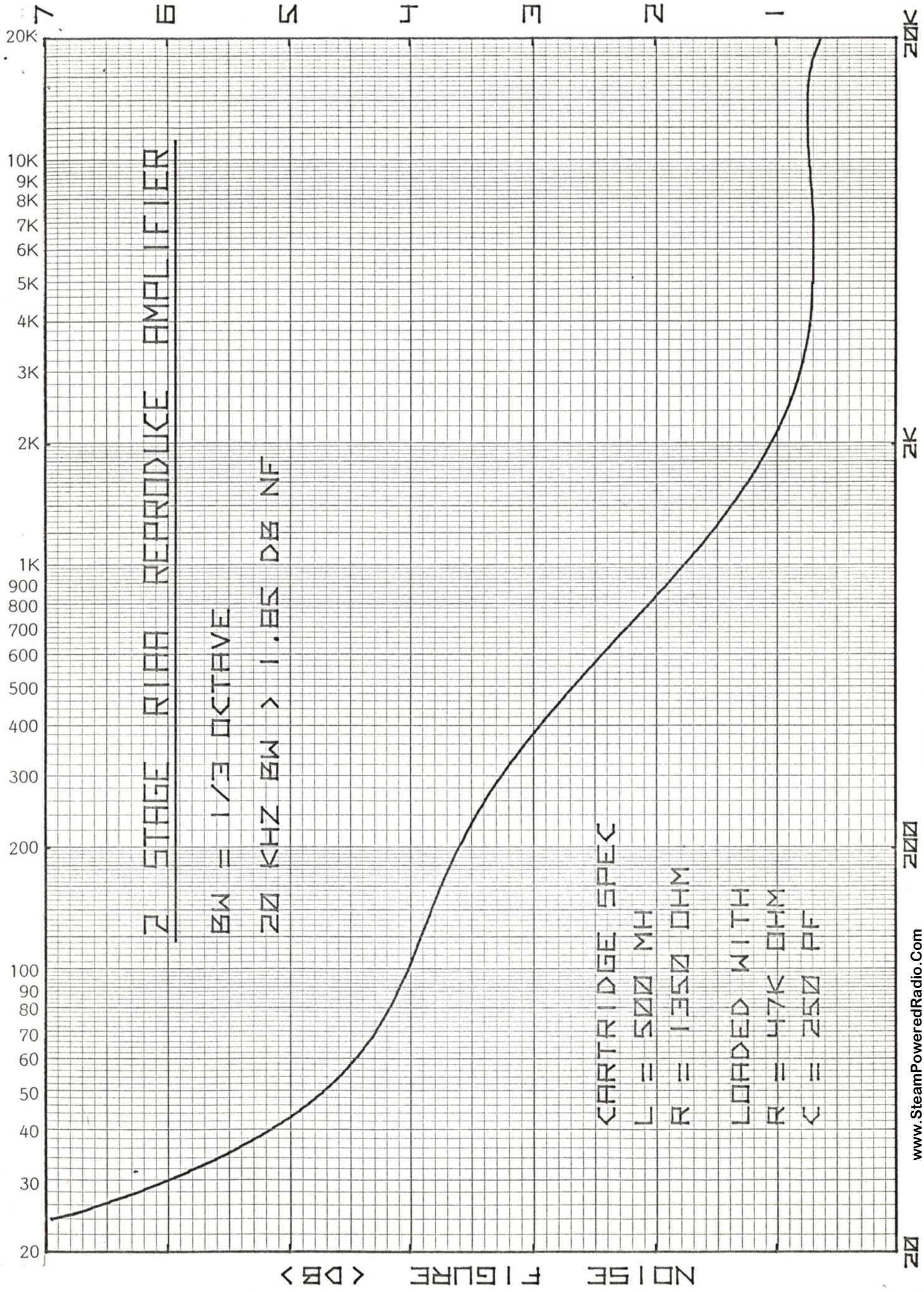
R = 1350 OHM

LOADED WITH

R = 47K OHM

C = 250 PF





# 2 STAGE RIAA REPRODUCE AMPLIFIER

SOURCE IMPEDANCE FOR NOISE MODEL

46 7403

CARTRIDGE SPEC

$L = 500 \text{ MH}$

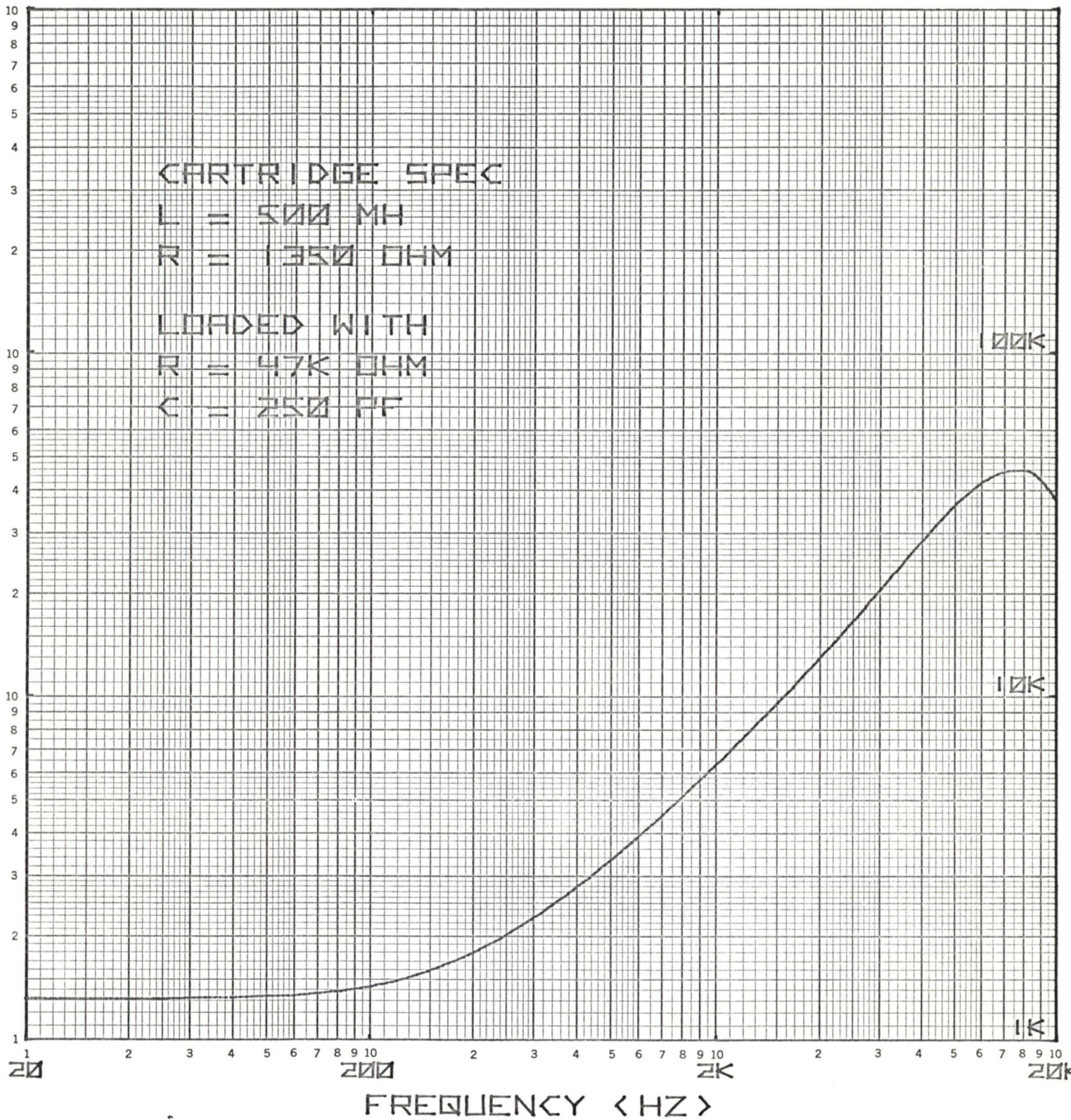
$R = 1350 \text{ OHM}$

LOADED WITH

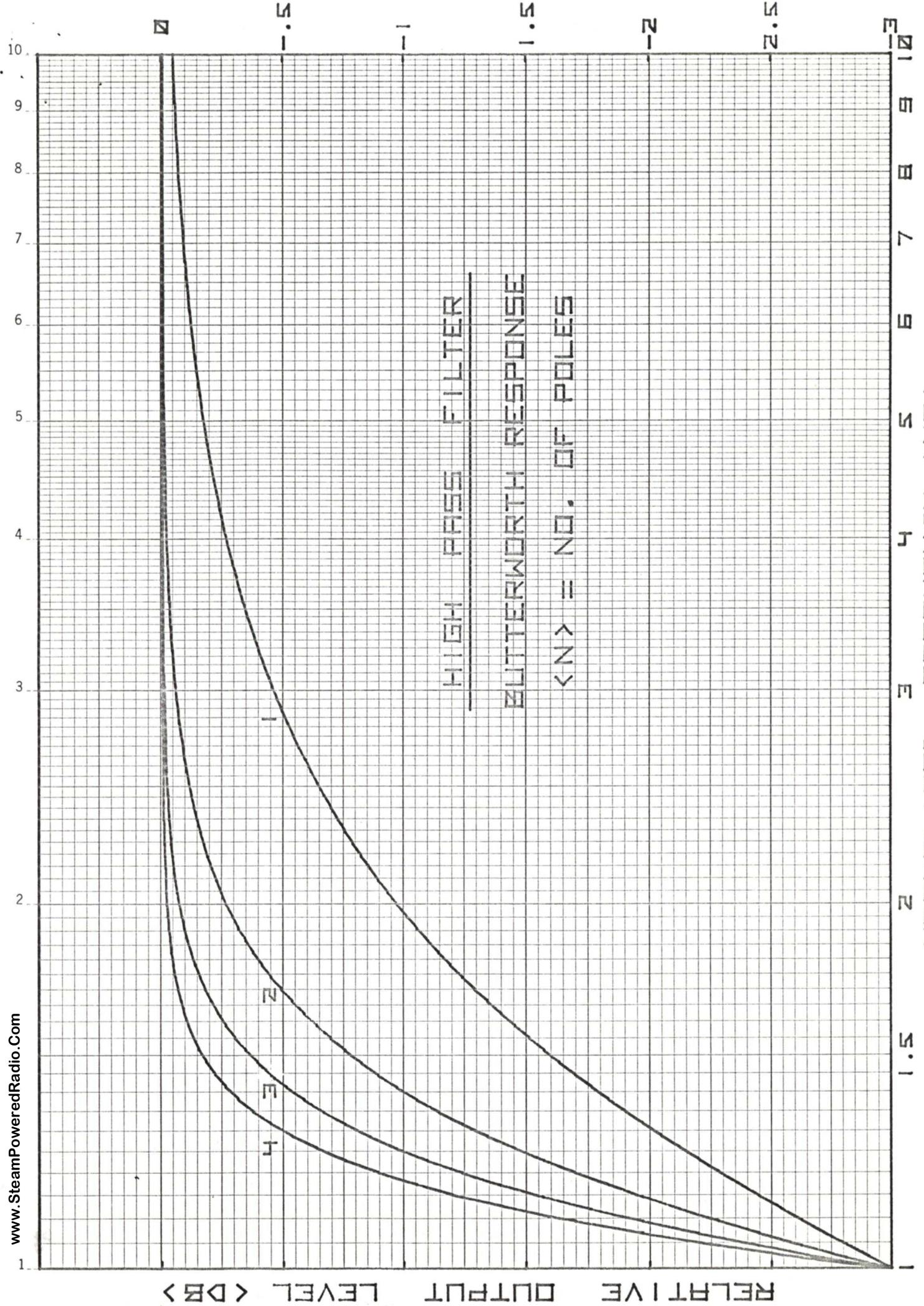
$R = 47\text{K OHM}$

$C = 250 \text{ PF}$

LOGARIT-IMIC 3 X 3 CYCLES  
KEUFFEL & ESSER CO. MADE IN U.S.A.



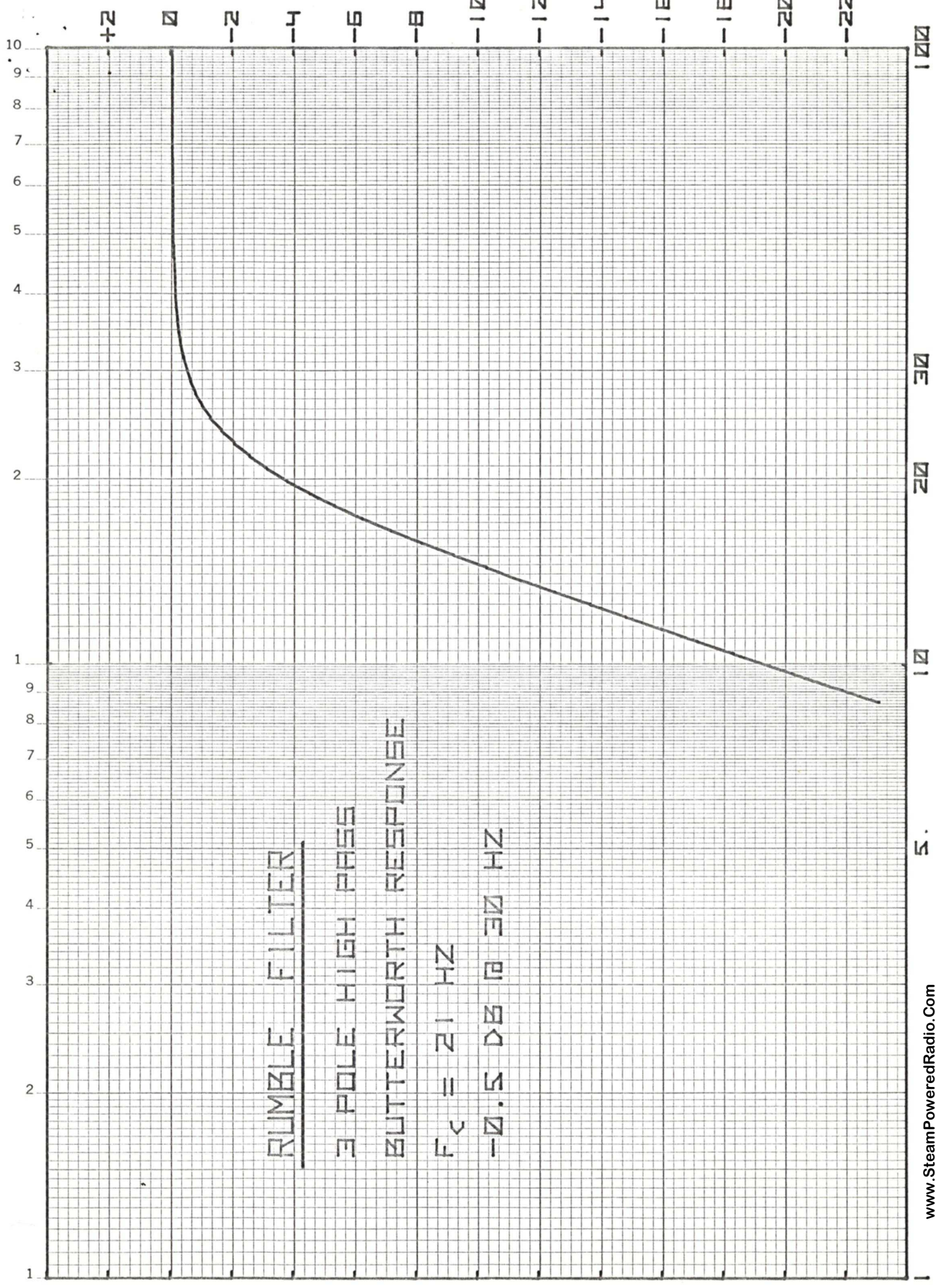
If You Didn't Get This From My Site,  
Then It Was Stolen From...





SEMI-LOGARITHMIC 2 CYCLES X 84 DIVISIONS  
KEUFFEL & ESSER CO. MADE IN U.S.A.

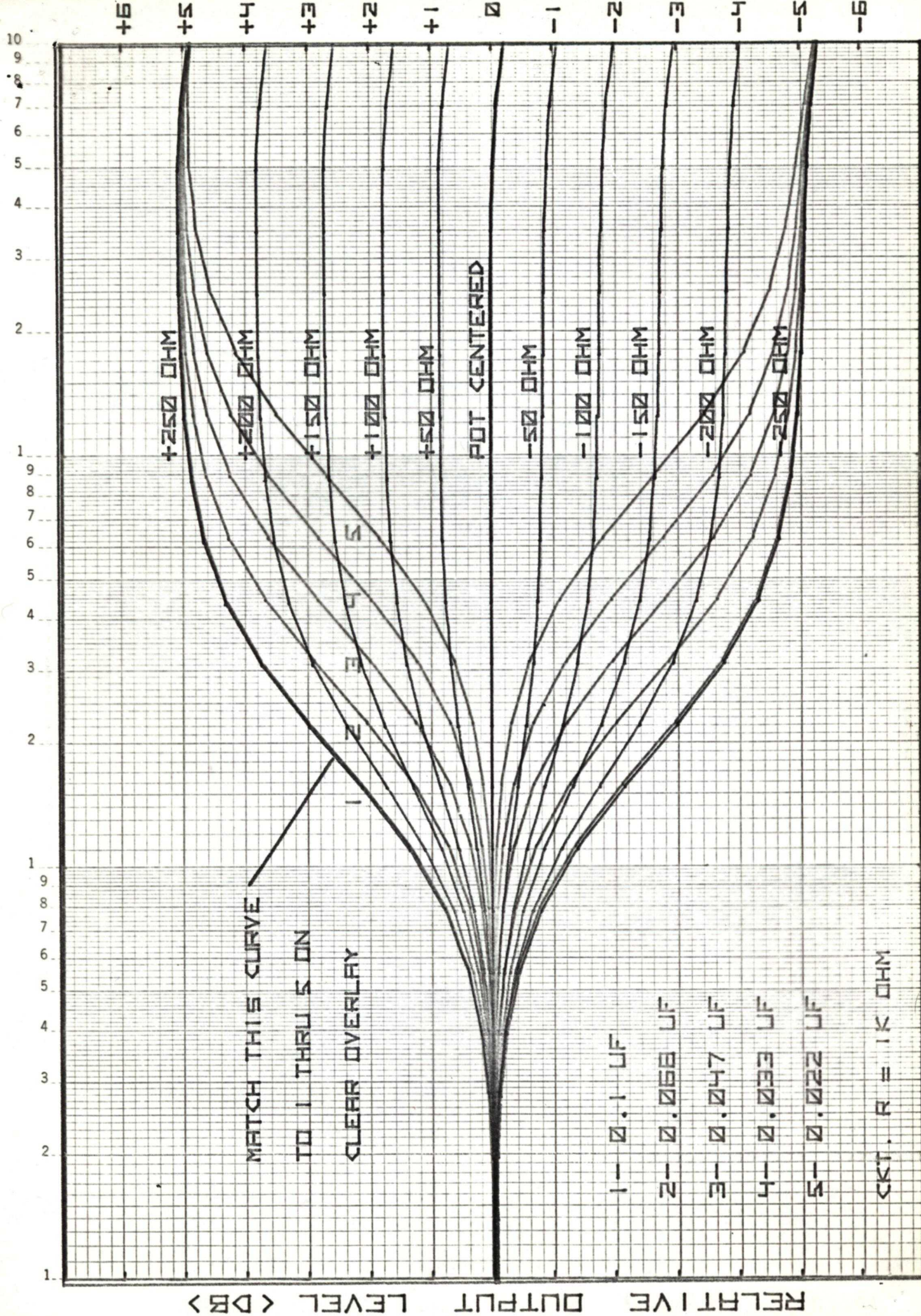
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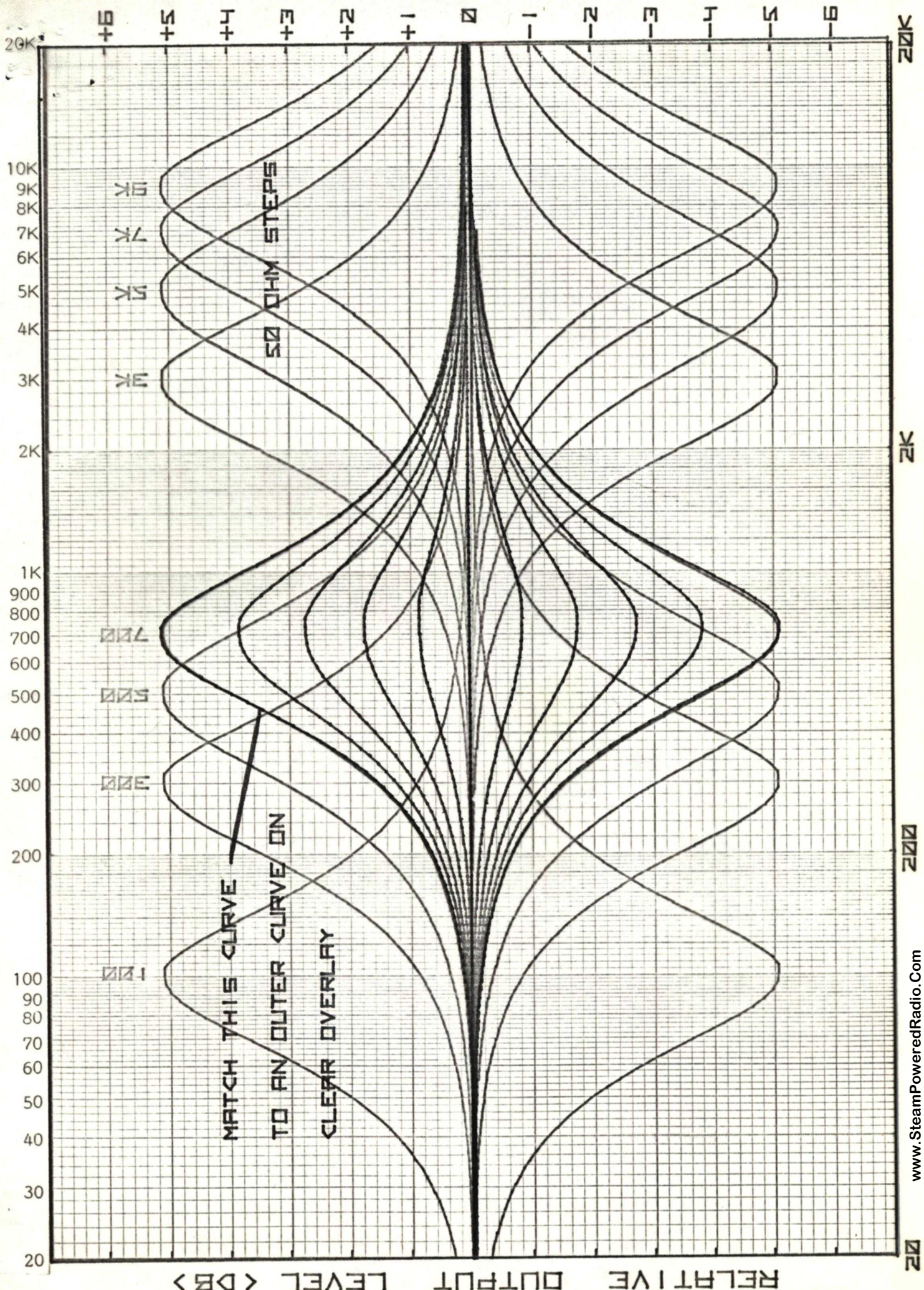


RUMBLE FILTER

3 POLE HIGH PASS  
BUTTERWORTH RESPONSE

$F_c = 21 \text{ HZ}$   
-0.5 DB/OCT HZ





RELATIVE OUTPUT LEVEL <DB>

FREQUENCY <HZ>

+6 +5 +4 +3 +2 +1 0 -1 -2 -3 -4 -5 -6

20K

10K

9K

8K

7K

6K

5K

4K

3K

2K

1K

900

800

700

600

500

400

300

200

100

90

80

70

60

50

40

30

20

10K

9K

8K

7K

6K

5K

4K

3K

2K

1K

900

800

700

600

500

400

300

200

100

90

80

70

60

50

40

30

20

50 OHM STEPS

MATCH THIS CURVE TO AN OUTER CURVE ON CLEAR OVERLAY

100

300

500

700

10K

9K

8K

7K

6K

5K

4K

3K

2K

1K

900

800

700

600

500

400

300

200

100

90

80

70

60

50

40

30

20

10

5

1

0

-1

-2

-3

-4

-5

-6

-7

-8

-9

-10

-11

-12

+6

+5

+4

+3

+2

+1

0

-1

-2

-3

-4

-5

-6

-7

-8

-9

-10

-11

-12

-13

-14

-15

-16

-17

-18

-19

-20

-21

-22

-23

-24

-25

-26

+6

+5

+4

+3

+2

+1

0

-1

-2

-3

-4

-5

-6

-7

-8

-9

-10

-11

-12

-13

-14

-15

-16

-17

-18

-19

-20

-21

-22

-23

-24

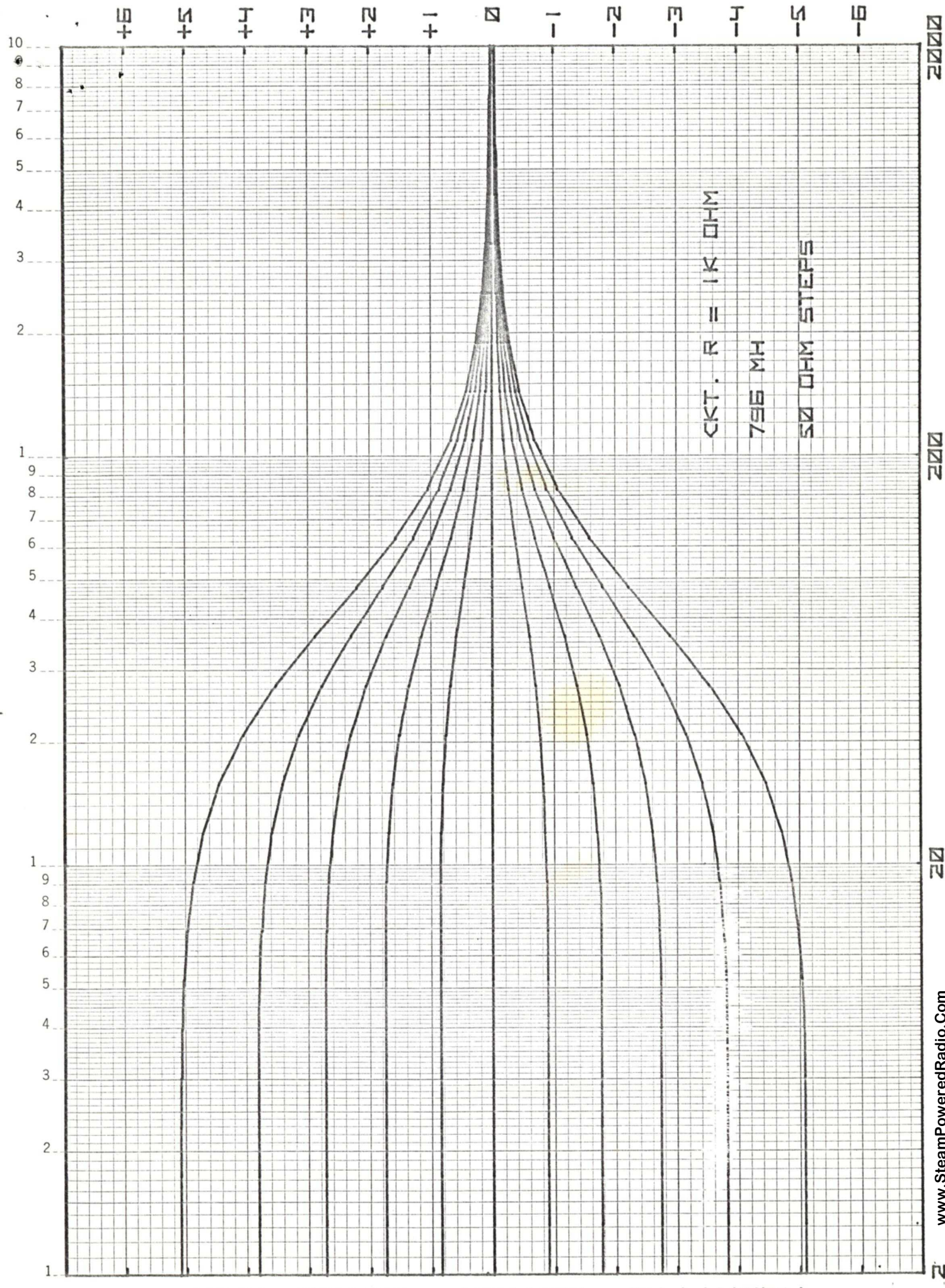
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KE SEMI-LOGARITHMIC • 3 CYCLES X 70 DIVISIONS  
KEUFFEL & ESSER CO. MADE IN U.S.A.



2000  
200  
20  
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