

Doppler Scorer
Pers T/M

Del Mar Engineering Laboratories

LOS ANGELES, CALIFORNIA

PROJECT COMPUTATION RECORD



7/15/57 W.T. Volt. Meas. on D-100 A MK II

Supply potted $\bar{c}$ silastic + using
Nat. Elec. H.V. Supply. Meas $\bar{c}$

Triplet 630 $\pm$ 592

Input 115 V 400 Ω (meas $\bar{c}$ Variac meter) Triplet on 300VAC Range

No load

Fil 6.5 AC 12VAC R

Cath - 1850 on 6KV Sc.

Grid - 1850 to -2400

Foc - 1320 to -1700

Anode + 2450

$\bar{c}$ K1194 Conn. low Int + Foc.

Ripple V.P.P. on Tek.

Fil 6.3 VAC on 12V.R.

Cath - 1830 ≈ 0.5 on 6KV Sc.

Grid - ~~2~~ 2000V ≈ 10

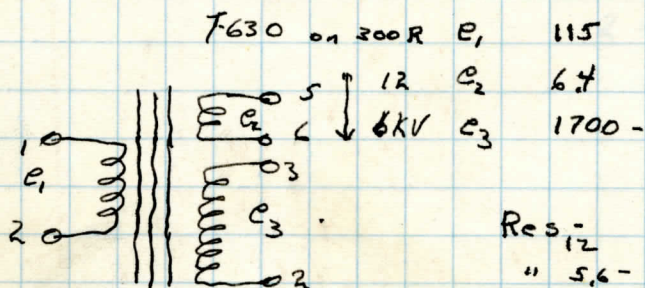
Foc - 1670 $\pm 5\%$

Anode + 2430V 15-

These meas were ckd. $\bar{c}$
another 630 Ω & were
in exp. limits -

There > noise at foc than grid -

Nat Elec Trans -

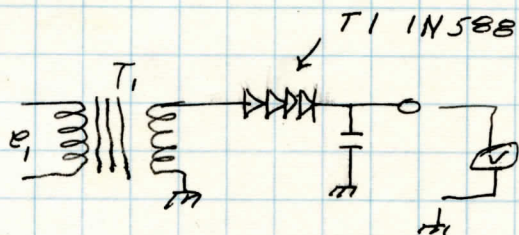


Res₁₂ 13.7 Ω
" 5.6 - 0.25 Ω
" 23 - 3880 Ω

on GR Bridge

H.V. Wdg. Res on Mod Ind. = 3120 Ω

Cont. from Prec. Page -



Trip. 630 on 6 kV R

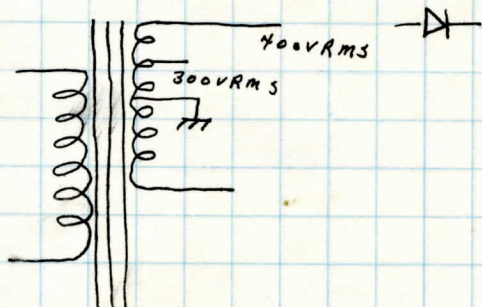
$E_1 = 115V$ 400N (meas $\bar{e}$ 630)

$T_1 - V$

- | | |
|-------------|---------|
| Ⓐ Net Elec- | 2.3 kV |
| Ⓑ - Mod Ind | 2.2 kV |
| Ⓒ Net E. | 2.35 kV |
| Ⓓ " | 2.35 " |

Comp. For possibility of subs. T1 - Silicons (1N648-1N649)

Triad HS 415



For 400 V.R.M.S.

$$\text{No Load PIV} = 2 \times \sqrt{2} \times 4 \times 10^2$$

$$= \cancel{1133} \quad 1133$$

$$2 - 1N649 \text{ in series} = 1200V$$

For 300 V.R.M.S.

$$\text{N.L. PIV} = 2 \times \sqrt{2} \times 3 \times 10^2$$

$$= 849V$$

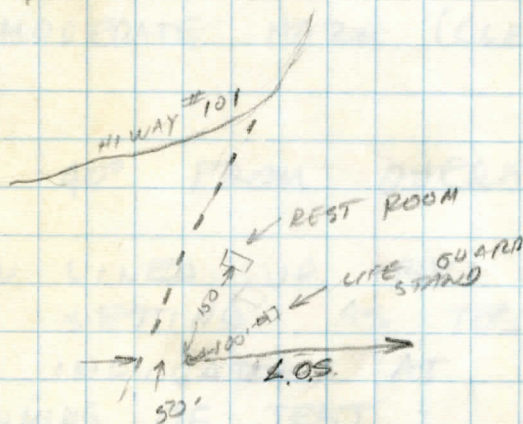
$$2 - 1N648 \text{ in series} = 1000V$$

R. MURRAY, B. THORNTON, D. SCOTT
9-12-57

JOB NO. 513

USING MODEL 71 EYEMO WITH WOLLENSANK 10", f/4.5
LENS.
TEST NO. 1

FLARE SET UP ON PT. DUNE
CAMERA SET AT ZUMA BEACH STATE PARK
APPROX 100' FROM 1ST LIFE GUARD STAND
& 150' FROM REST ROOMS



SKY CONDITIONS: PATCHY CLOUDS TOWARD OCEAN
CLEAR BUT PATCHY INLAND
ATMOSPHERE: MODERATE HAZE

CAMERA: LINE UP BY "EYE BALLING" TO
TARGET, NO BORESIGHT TOOL
USED. APPERTURE AT f/16
RANGE AT ∞ .
24 FRAMES / SEC.

SUN: APPROX 30° FROM OVERHEAD

FILM INDICATOR AT APPROX 5' AT START
OF TEST.

TEST COMMENCED AT 3:04:5 p.m (PDT)

FILM INDICATOR AT APPROX 46' AT END OF TEST

FLARES IGNITED: D.E.L. 245
; BURMITE MK II MD.I LITE AFTER 5 sec.
BURMITE PLACED APPROX 5' & 15'

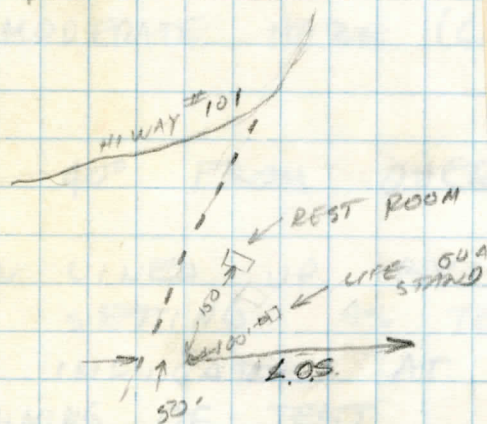
FILMED ON ROLL NO. 1

R. MURRAY, B. THORNTON, D. SCOTT
9-12-57

JOB NO. 513

USING MODEL 71 EYEMO WITH WOLLENSAK 10", f/4.5
LENS.
TEST NO. 1

FLARE SET UP ON PT. D.
CAMERA SET AT ZUMA BEACH
APPROX 100' FROM 1ST LIFE
& 150' FROM REST ROOMS



10" (251.0mm) T5.1 (f/4.5)
TYPE II

808518 U.S. ARMY
SPEC. 75-150

WOLLENSAK OPTICAL
CO.

FOR
BELL & HOWELL CO.

SKY CONDITIONS: PATCHY CLOUDS TOWARD
CLEAR BUT PATCHY
ATMOSPHERE: MODERATE HAZE

CAMERA: LINE UP BY "EYEBALLING" TO
TARGET, NO BORESIGHT TOOL
USED. APPERTURE AT f/16
RANGE AT ∞ .
24 FRAMES / SEC.

SUN: APPROX 30° FROM OVERHEAD

FILM INDICATOR AT APPROX 5' AT START
OF TEST.

TEST COMMENCED AT 3:04:5 p.m (PDT)

FILM INDICATOR AT APPROX 46' AT END OF TEST

FLARES IGNITED: D.E.L. 245

: BURNITE MK II MD.I LITE AFTER 5 sec.

BURNITE PLACED APPROX 5' & 15'

FILMED ON ROLL NO. 1

TEST NO. 2

FLARE SET UP ON PT. DUNE
CAMERA AT SAME LOCATION
AS TEST NO. 1

SKY CONDITIONS: CLEAR BUT PATCHY

ATMOSPHERE: MODERATE HAZE (CLEARER THAN TEST NO. 1)

SUN: APPROX 40° FROM OVERHEAD

CAMERA: AGAIN LINED UP BY "EYEBALLING",
SAME SETTING AS TEST #1
FILM INDICATOR AT 46' AT
BEGINNING OF TEST

TEST COMMENCED AT 3:39:5

FILM INDICATOR AT 96' AT END OF TEST

FLARES IGNITED: DIEL. #245
BURMITE MK II MD I, FLARE FELL DOWN

FILMED ON ROLL NO. 1

TEST NO. 3 (ROLL NO. 2)

FLARE SET UP ON PT. DUNE
CAMERA AT SAME LOCATION AS TEST NO. 1

SKY CONDITIONS: CLEAR BUT PATCHY

ATMOSPHERE: MODERATE HAZE (HEAVIER THAN #1 & 2)

SUN: 45° FROM OVERHEAD, PATCHY CLOUDS

CAMERA: LINED UP WITH A BORESIGHT. SAME
SETTING AS #1 & #2. FILM INDICATOR AT 26'

B. MORRISON, R. MURRAY, D. SCOTT
9-12-57

TEST COMMENCED AT 4:30 PM (P.D.T)

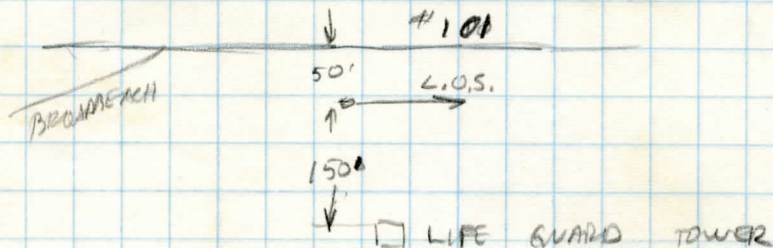
FILM INDICATOR AT 53' AT END OF TEST

FLARES IGNITED: D.E.L. # 245
BURMITE MK II MD. I. (70 APPROX 30')

TEST NO. 4 (ROLL # 3)

FLARE SET UP ON PT DUNE

CAMERA AT FAR END OF ZUMA APPROX
3 MILES FROM FLARE, LOCATION APPROX.
1/4 MILE SOUTH OF BROADBEACH ROAD.



CAMERA: LINE UP BY BORESIGHTING. SET AT $f/16$
RANGE AT ∞ . FILM INDICATOR AT 5'

SKY: CLEAR

ATMOSPHERE: LIGHT HAZE

SUN: APPROX 30° FROM HORIZON

TEST COMMENCED AT APPROX 5:45 PM (P.D.T)

FILM INDICATOR AT $\approx 25'$ AT END OF
TEST

FLARE IGNITED: SAME AS BEFORE

B. THORNTON, R. MURRAY, R. SCOTT
9-12-57

TEST NO. 4 (ROLL #3)

FLARE SET UP ON PT. DUVE

CAMERA MISFIRED

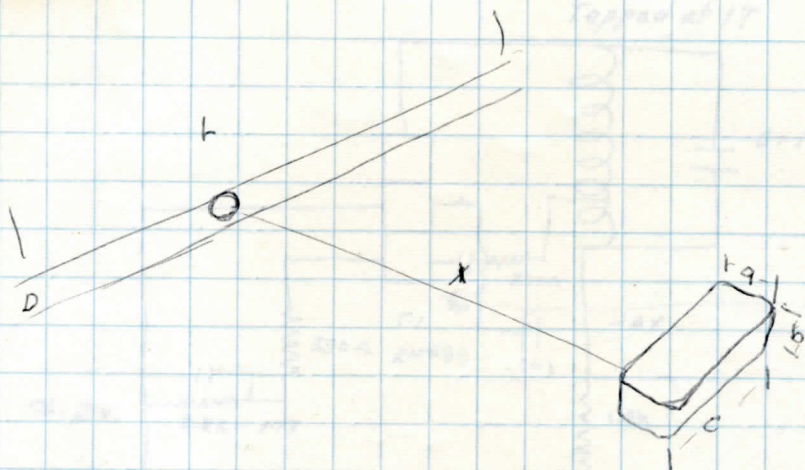
TEST NO. 5 (ROLL #3)

FLARE SET UP ON PT. DUVE

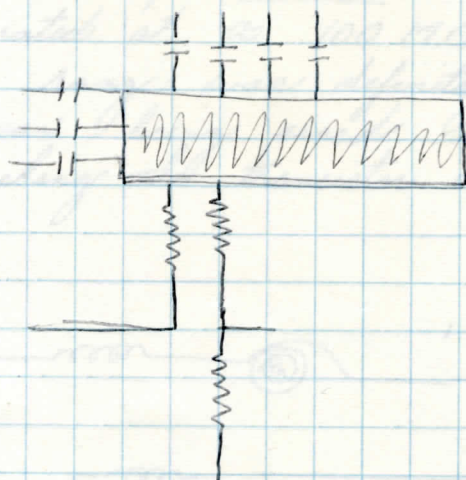
CAMERA SAME AS # 3, 4, & 5

CAMERA OPERATION INTERMITTENT,

RESULTS ARE MEANINGLESS

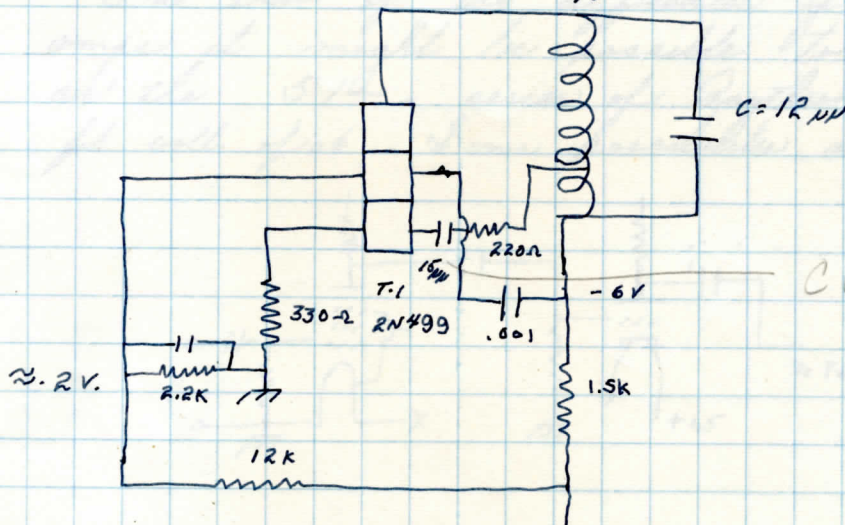


Capacitance could be calculated for this situation but it will probably be as accurate to assume that $C \propto \text{area}$.



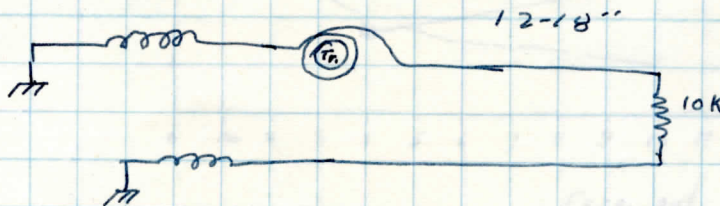
2-14-60

6T 1/4" dia.
Tapped at 1T



CV-13 C - Vitamin
150 J A R
9.28

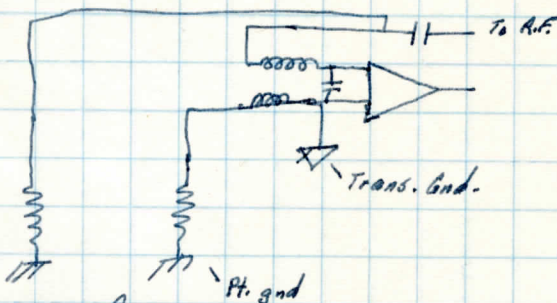
The power output seemed to be increased in the fixed cap. which operated at ≈ 100 M.C. By connecting a lead as shown ~~Now~~ the range was definitely improved. Although an F.M. receiver was being used there was surprisingly little freq. dev. ~~from~~ ^{when} touching the transistor case and the lead.



$$Z = 2\pi fL$$

$$= 6.3 \times 10^8 L$$

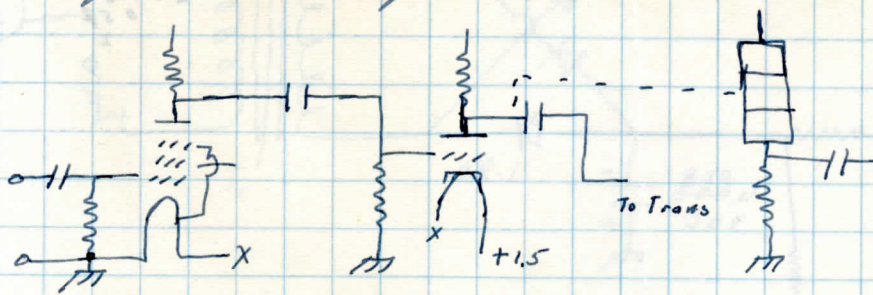
$$\text{or } 1 \mu H = 6.3 \times 10^2 \Omega$$



This arrangement may be used to convert the electrode leads to antennae.

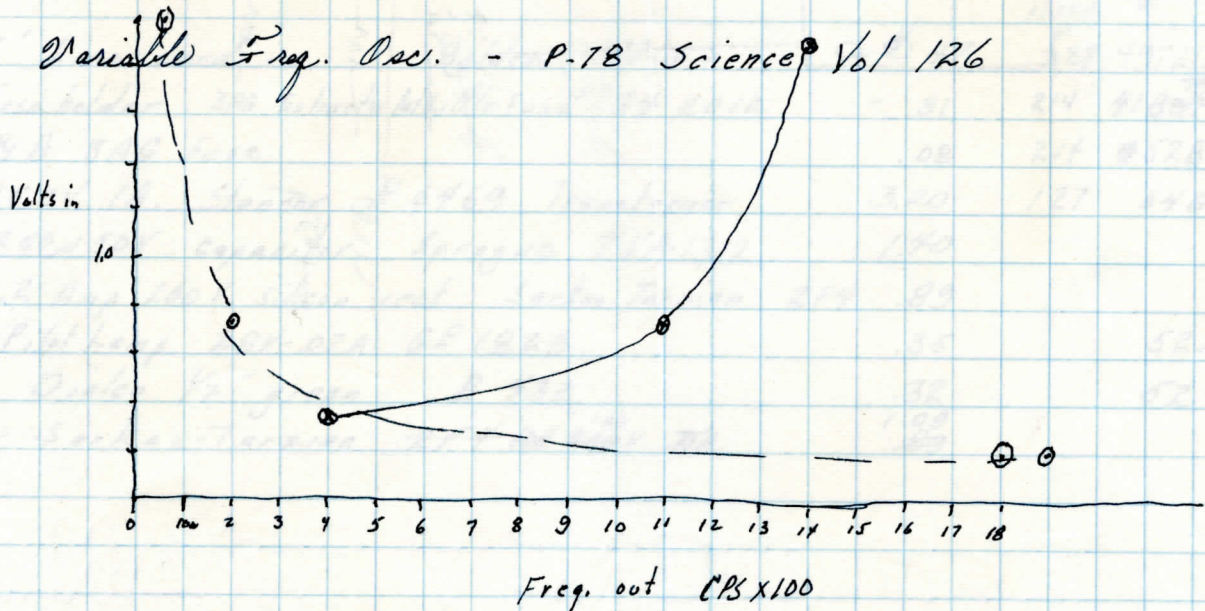
2-14-60

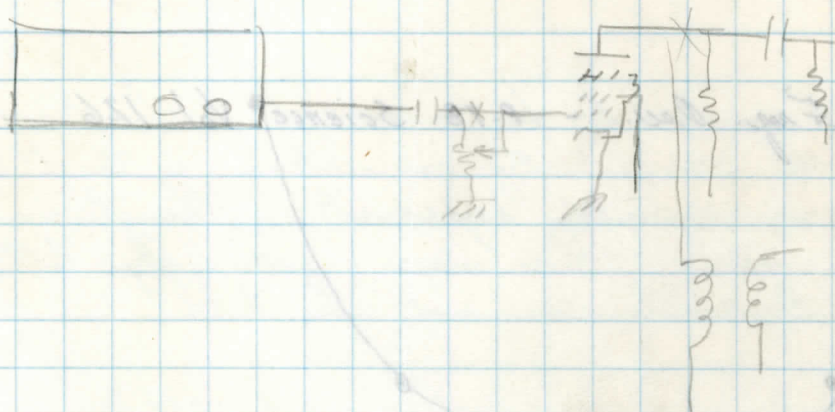
In view of the difficulties of high Z high gain
amps it might be possible to use sub min tubes such
as the 512 series of Raytheon a fil. current of 20 ma +
fil volt. of 0.6 - Some possibilities are -



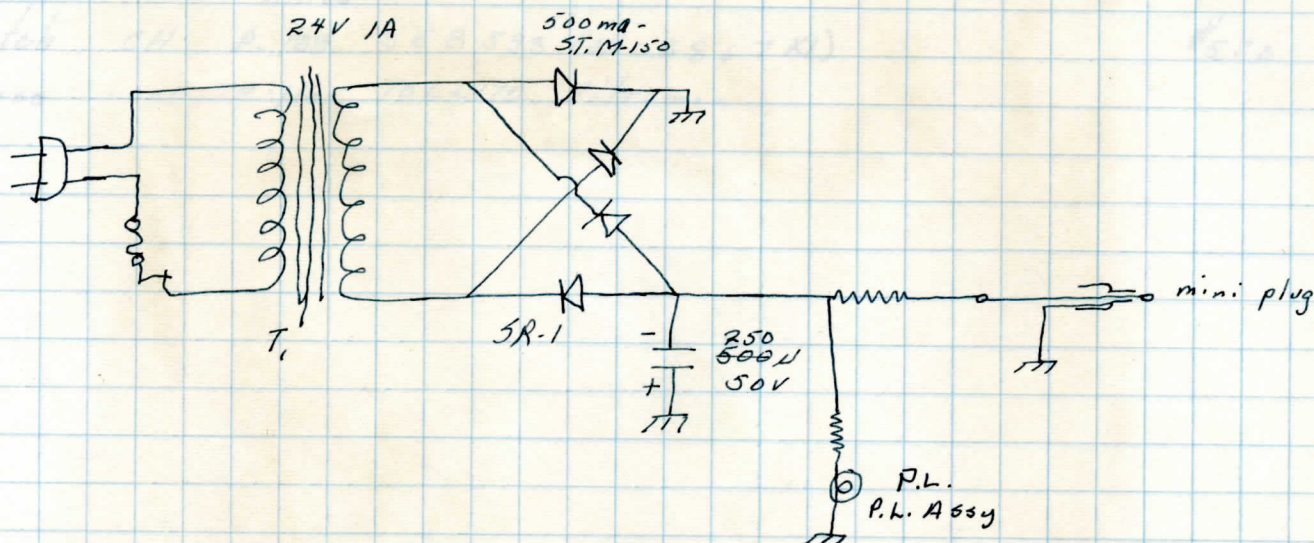
10-8-60

Variable Freq. Osc. - P-18 Science Vol 126



$$\begin{array}{r} 254.6 \\ 0.57 \\ 2 \end{array}$$


Battery charger -



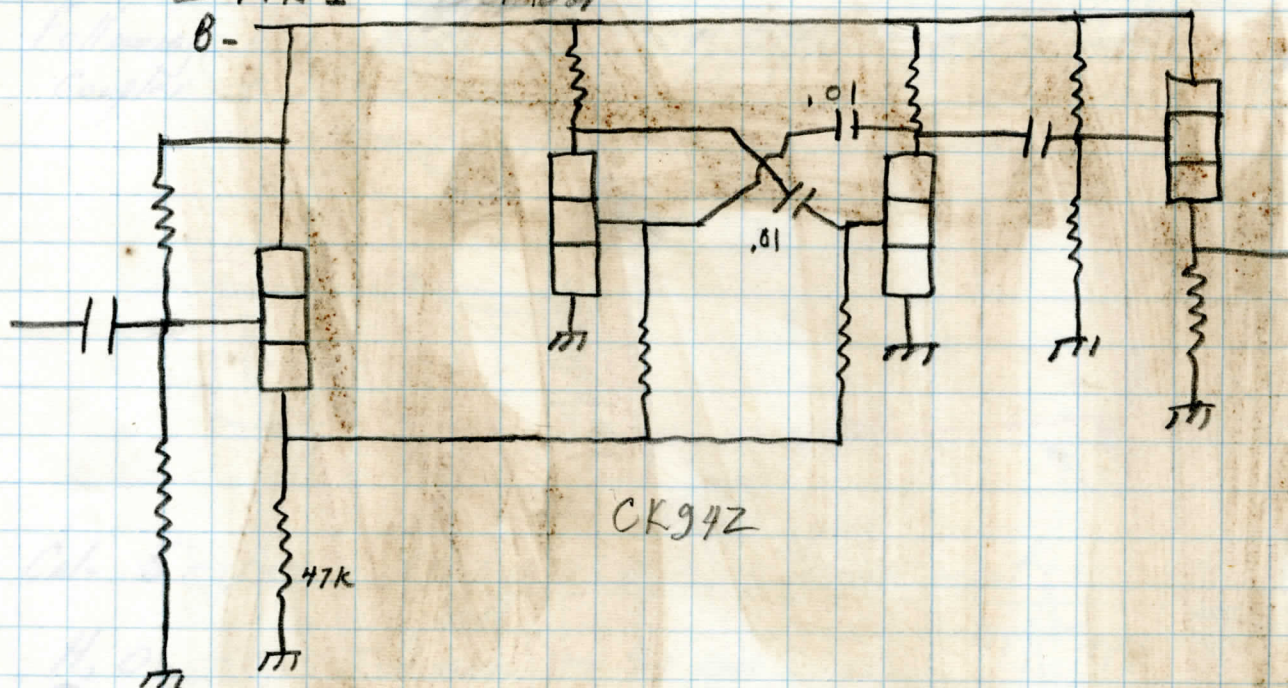
1- 6' Line cord -	Belden 172065	- \$.47	Alled #
1- Fuse holder 3AG Extractor M Little Fuse	34 2012	- .31	227 497212
1- 1/4 A 3AG Fuse		.08	214 418975
T ₁ - 1- 25.2V 1A. Stancor P 6469 Transformer		3.20	214 528231
C ₁ - 1 - 250µ 50V capacitor Sprague TVA-1312		1.40	127 646143
5R-1 - 4 - .2A Amp 200V silicon rect Sarkes Tarzian	2F4	.89	
P.L. 1 - Pilot Lamp 28V-.07A GF 1820		.35	52E343
P.L. Assy 1 - Dialco 1/2" green	B 432	.32	52454
5R 4 - Sarkes-Tarzian	2F4 10H 260V .2A	1.00	

MK I Transmitter
Allied

Switch CH. P-109 35B533 (CH-8867K1)
Bypass .001 P-116 70LL170 Vitremon

\$5.70

- MKI D Mod -



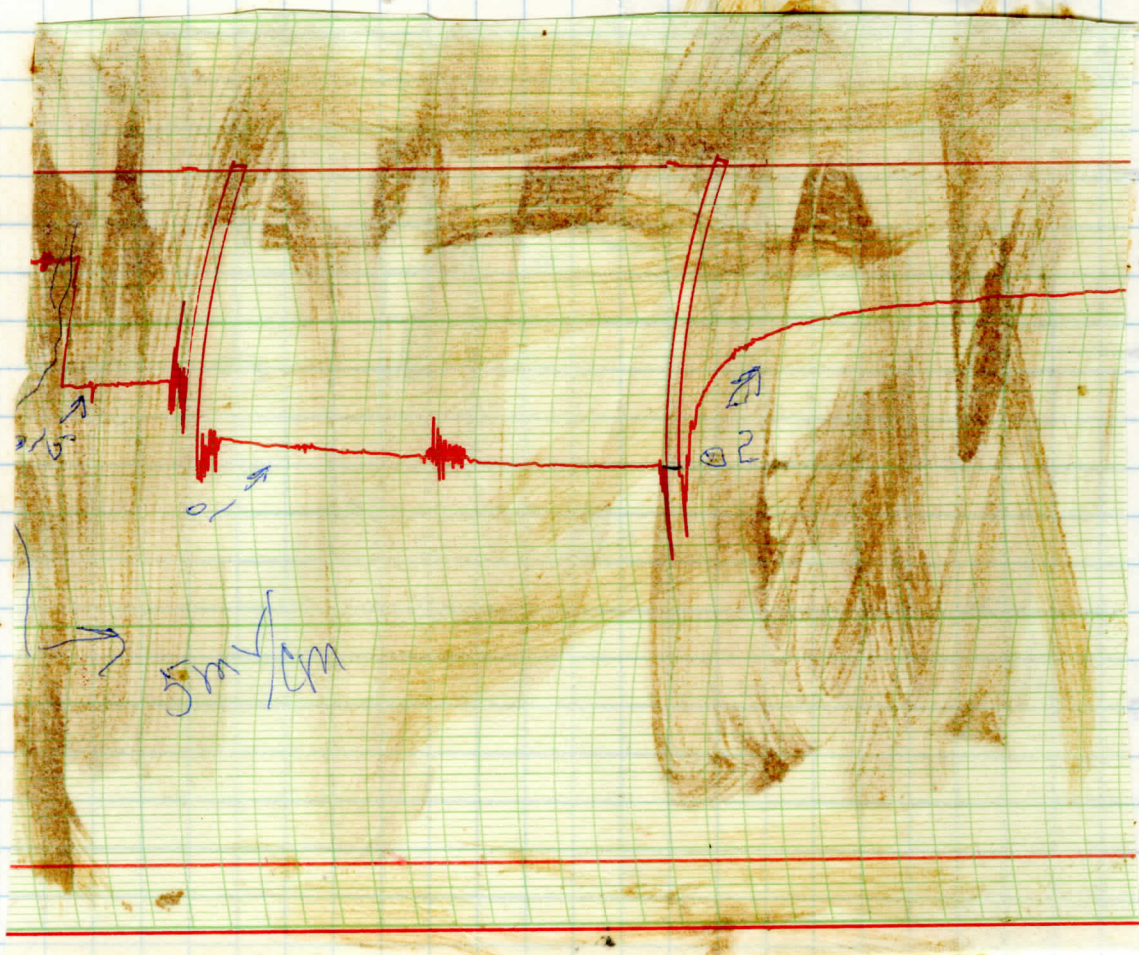
CK942

100 0
150 12
200 24

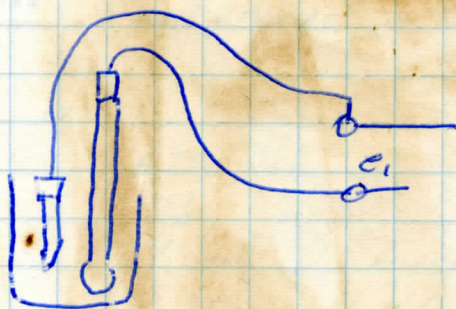
6.25
12.5

slope at 2.5
at 12.5

2.5 gain of 2.5 at 12.5 level at 2.5 at 12.5
was present.



Following Meas. made $\bar{e}$ 400 Ω Offner - Electrometer
Copley + Beckman Na Electrode $\bar{e}$ Indifferent pH electrode



Cal. 5 mv/cm - 0 taken $\bar{e}$ 22 M. res across input
Defl

H_2O -	-9 mm.	- 45 mv.
200 Meg	+13 mm	+ 65
100 "	+11.5 mm	+ 57.5

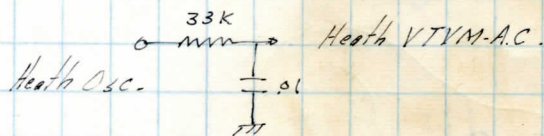
Cal. 0.5 mv/cm

Meg N.	defl. mm.	Volts
100	0	
150	12.	6. mv
200	24.5	12.25 mv

slope of $\approx \frac{6}{50} \text{ mv/meq}$
 $\approx .12 \text{ mv meq.}$

$\bar{e}$ a gain of 0.5 mv/cm a noise level of $\approx 250 \text{ nV.P.P.}$
was present.

Experimental det. of attenuation of R.C. filters.



Freq. C.P.S.	ATT: Db			
	1 sect.	2 sect.	3 sect.	4 sect.
20	0	0	-1.	-2.
40	-5	-1.0	-2.	-4.
80	0	-1.0	-3.0	-6.0
200	-1.5	-5.0	-9.0	-13.0
400	-3.0	-10.0	-16.0	-23.0
800	-6.0	-15.0	-24.0	-32.0
2×10^3	-13.5	-28.0	-40.0	-48.0
4×10^3	-20.0	-38.0	-46.0	-51.0

Calib -

Defl.

units

65

46

$\frac{13}{12}$
 $\frac{12}{13}$
 $\frac{26}{156}$

Counts

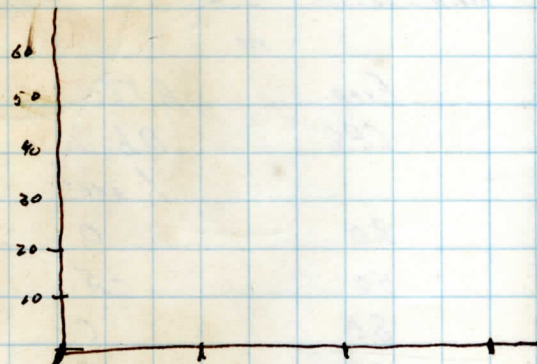
p/min

~~162~~ 312

156

144

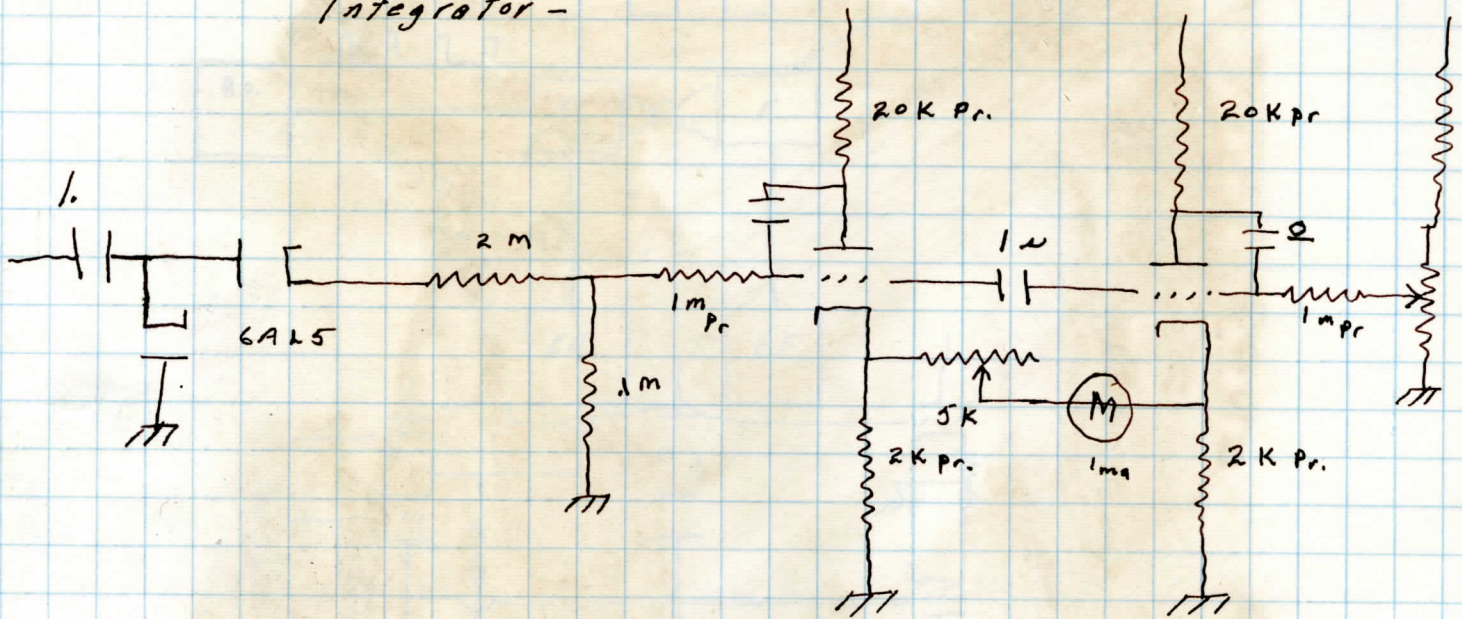
Counts/unit



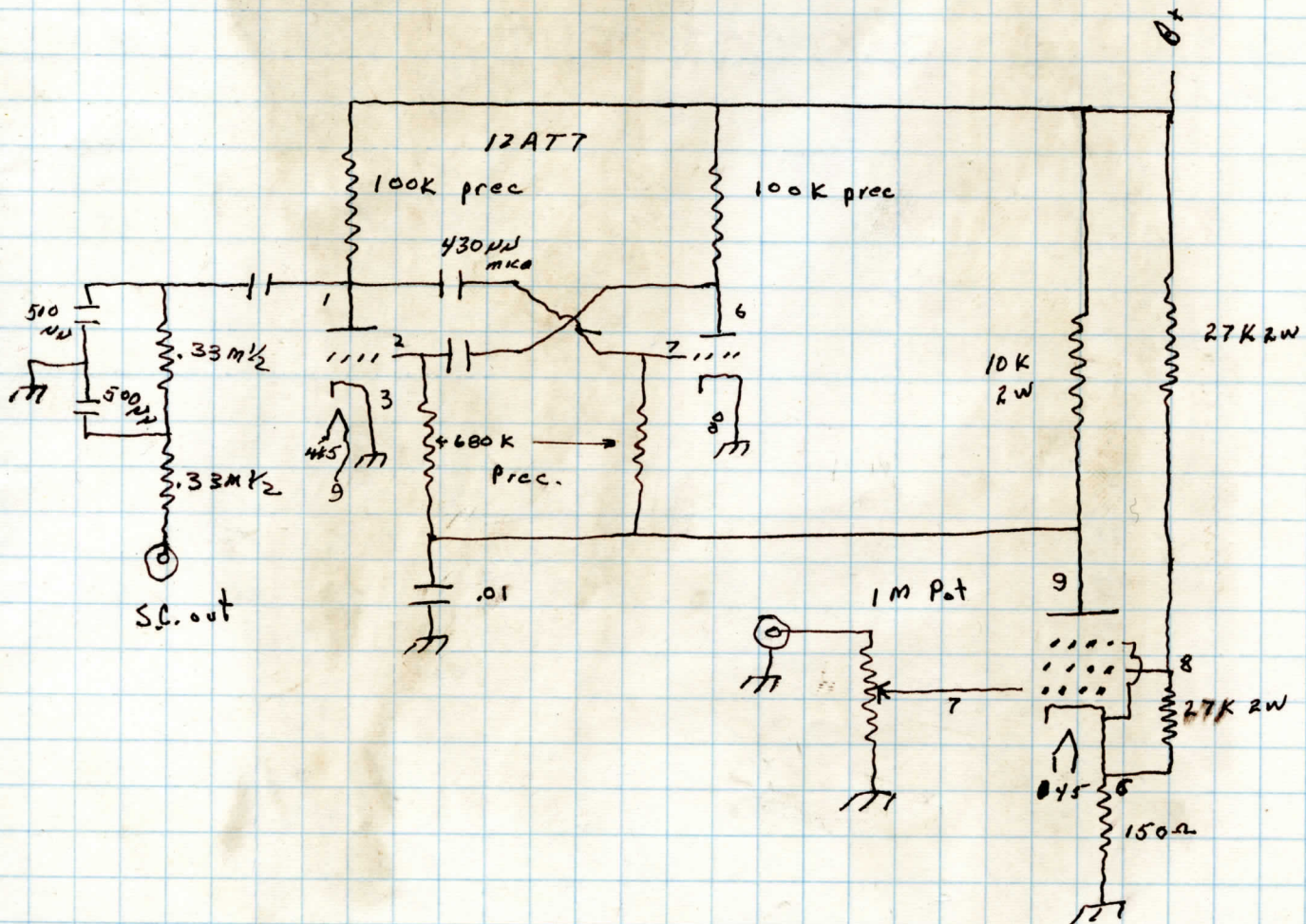
3-30-61

Switch For Phase -

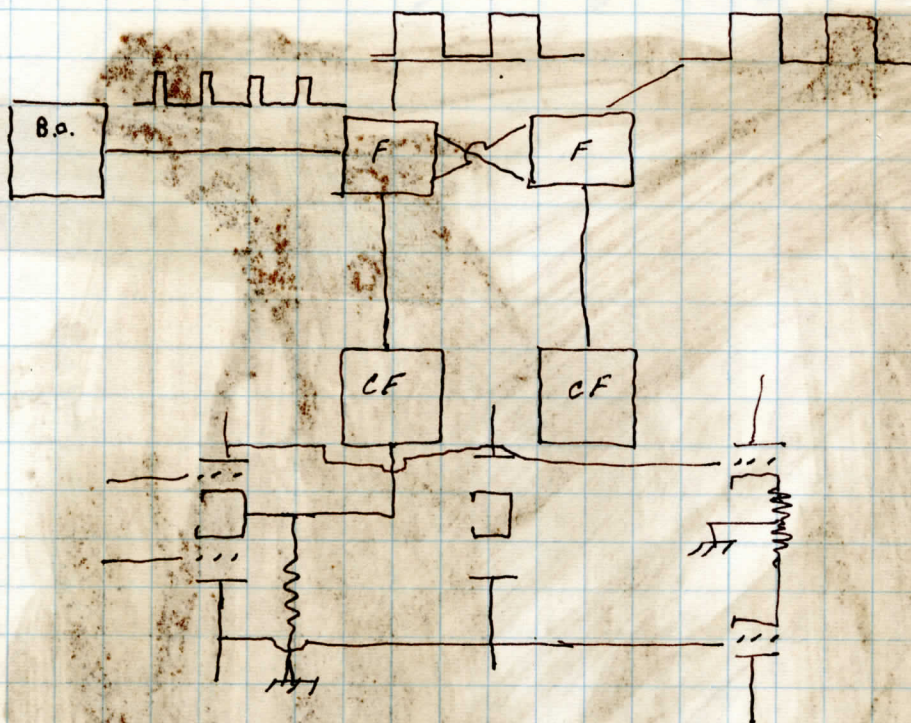
Integrator -



S.C.O.

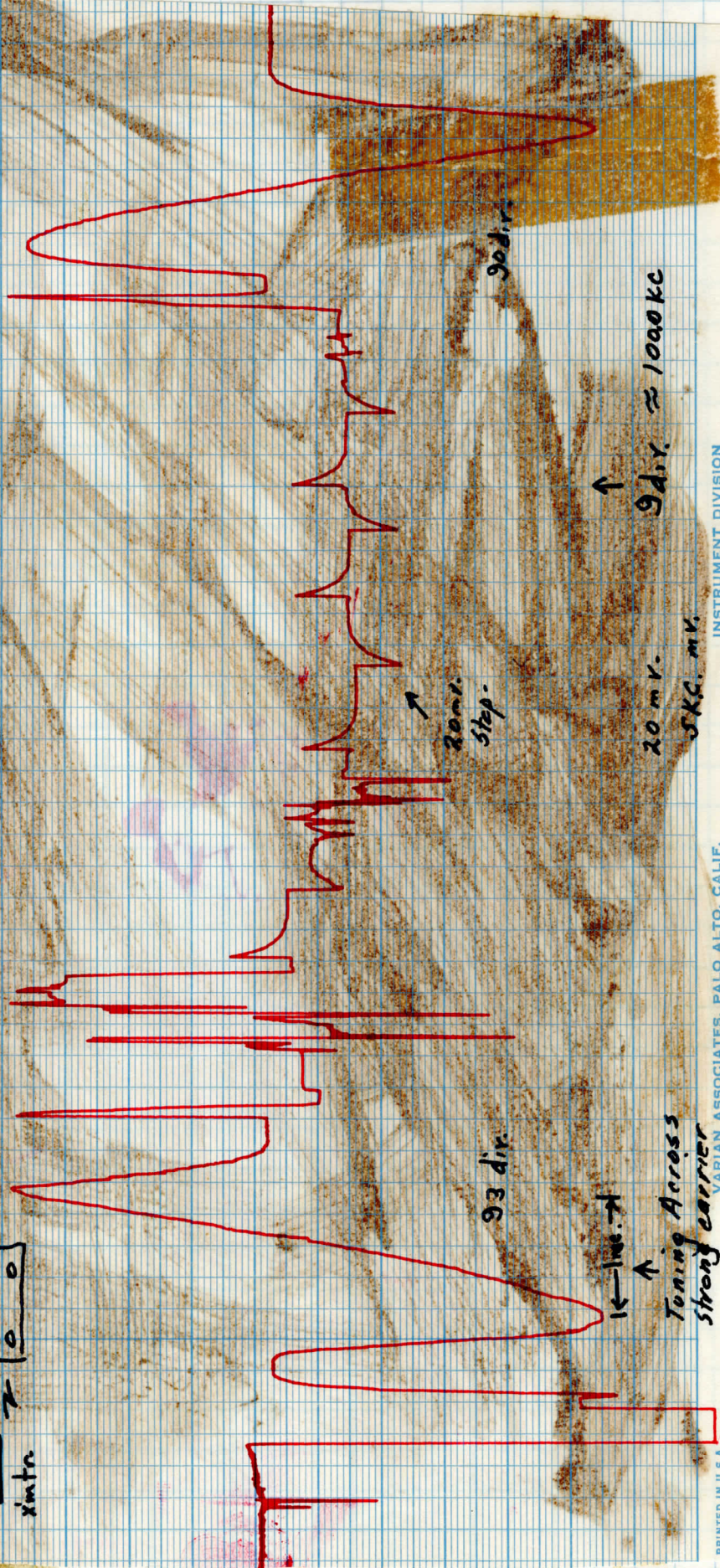


Switch For Phono -



$$\begin{array}{r}
 48 \\
 98 \\
 276 \\
 276 \\
 \hline
 68 \overline{) 3036} \quad .004
 \end{array}$$

Sherwood 3000 III Revr - Unit 6 trans 9.26.63

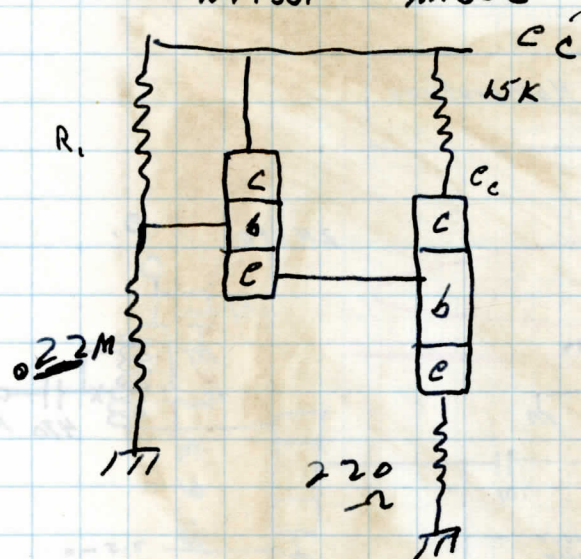


INSTRUMENT DIVISION

VARIAN ASSOCIATES, PALO ALTO, CALIF.

PRINTED IN U.S.A.

CK. of Trans. Ckt. for MKI



There is a large gain & this arrangement apparently through large β of 508 -

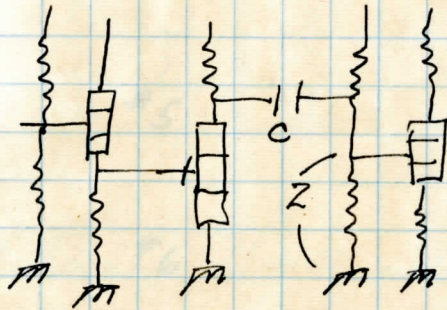
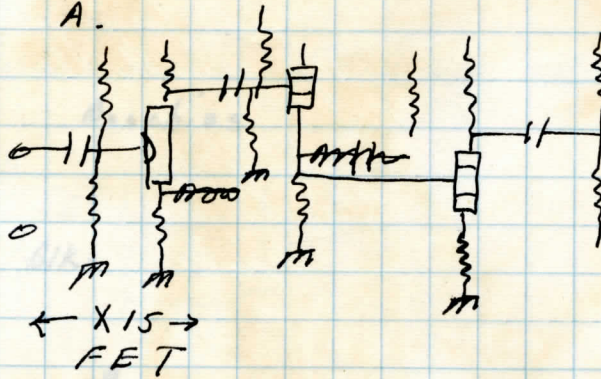
- By making R_1 2.7 M. C_c runs at 2-3 volts at body temp. gain is 18 and stable -

E.E. G

Freq. Resp - 1 to 60 n

T.C. = 25

Config. A.

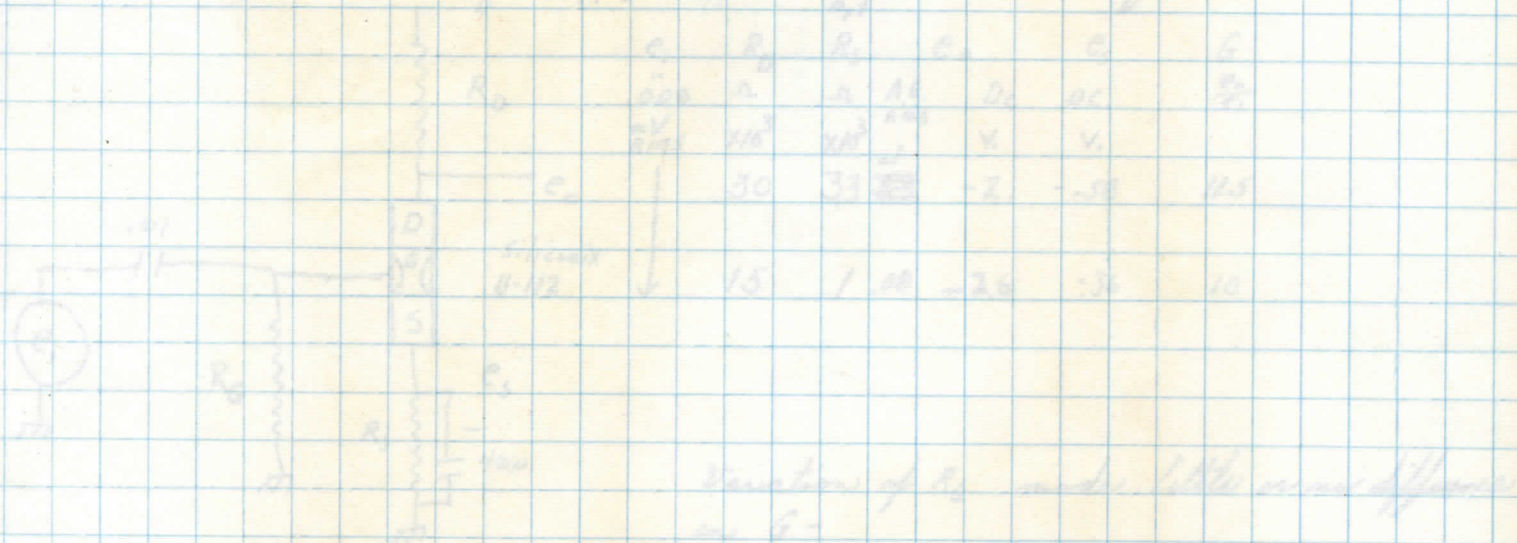


$$R = 2 \times 10^3 \Omega$$

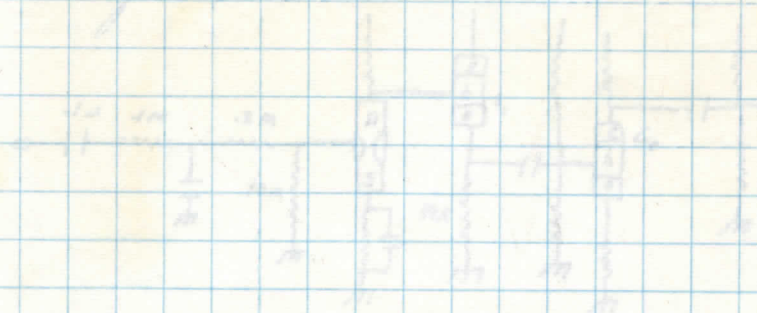
$$TC = 0.1 = C \times 2 \times 10^3$$

$$\frac{1}{2} \times 10^{-1} \times 10^{-3} = 0.5 \times 10^{-4} = 50 \times$$

Room	Unit.	Freq-	Rev	Scope	Chg.
1 -	Pink	98	FM-4	502	1
2 -	Boochies		HK - Fixed	502	2
3 -	Blk-		FM-4 Fixed	502	3
4 -	#4	107	FM-4 Fixed	502	4
5 -	#5				
6 -	#6				

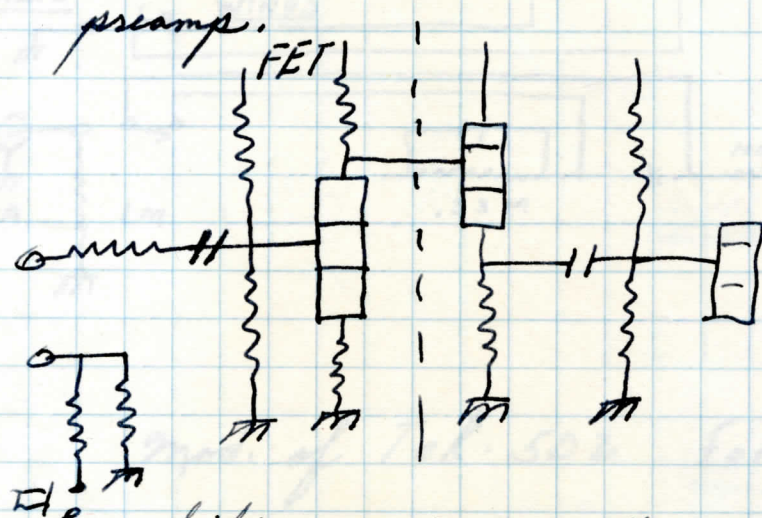


Proposed design

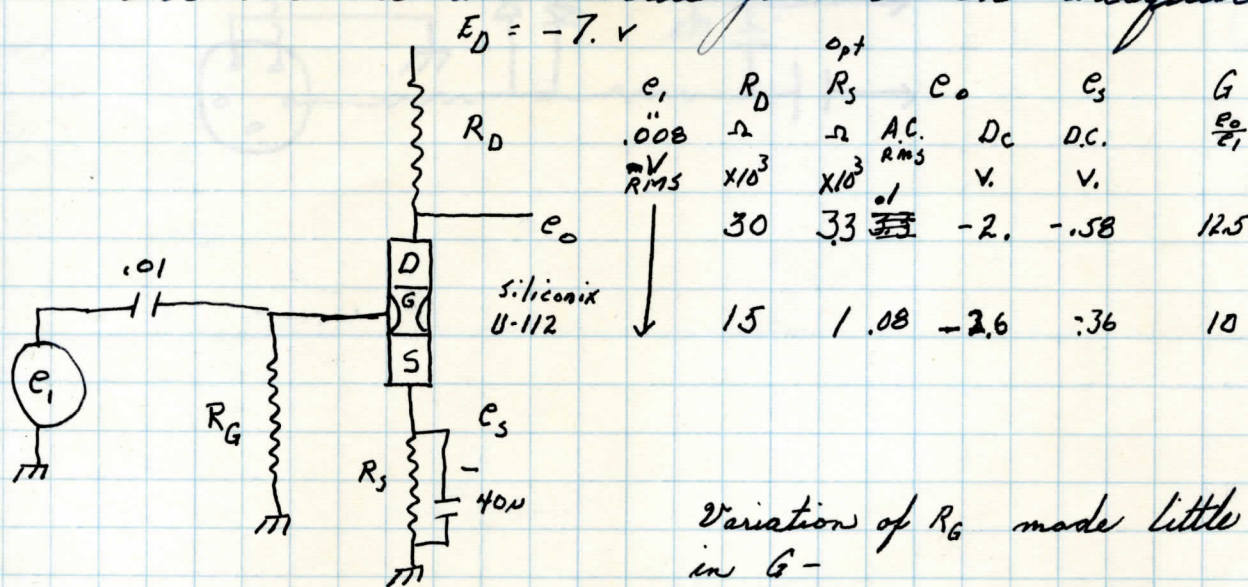


C.B.G. (using FET)

It is theoretically possible to use the present MKI C.B.G. trans. as an C.B.G. by adding a FET as a preamp.

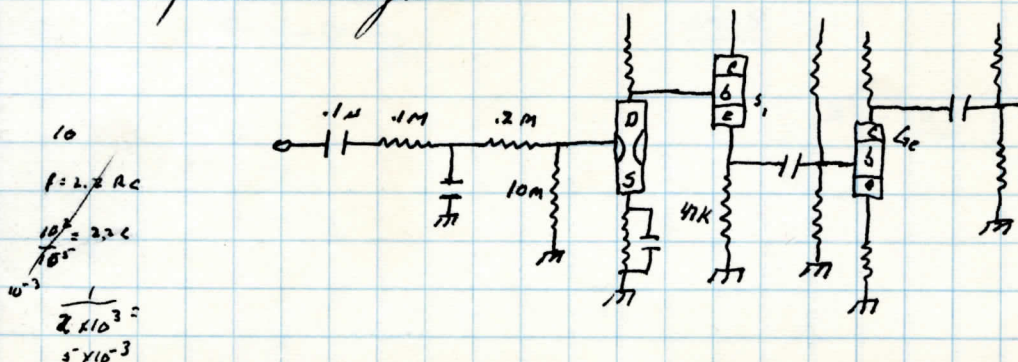


A Siliconix U-112 will give a gain of 15 which will increase the overall gain to an adequate level -



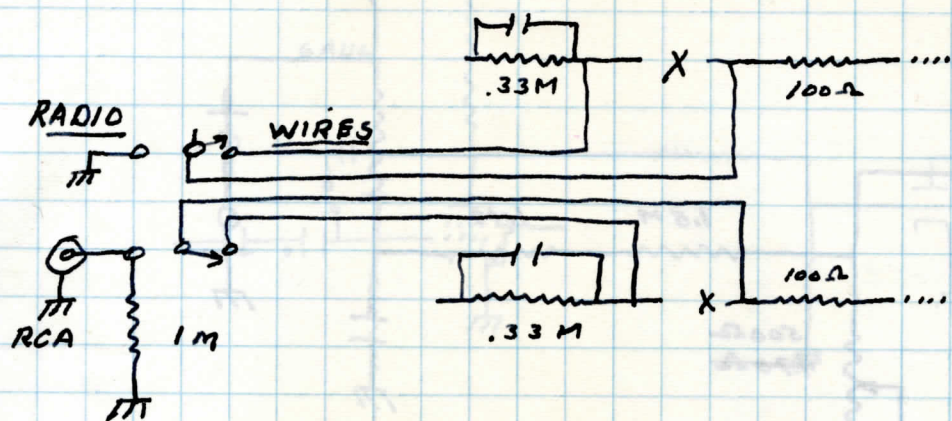
Variation of R_G made little or no difference in G -

Proposed design -

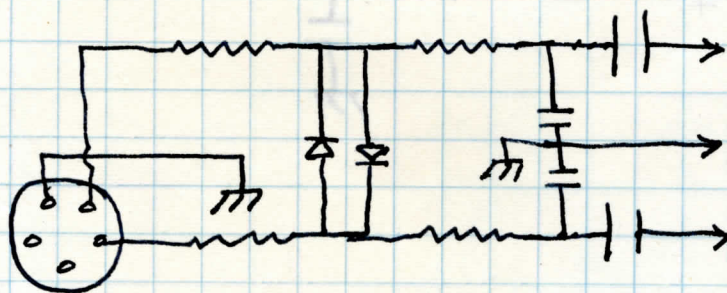


Mod. of Tek. Mod 50 (for 560)

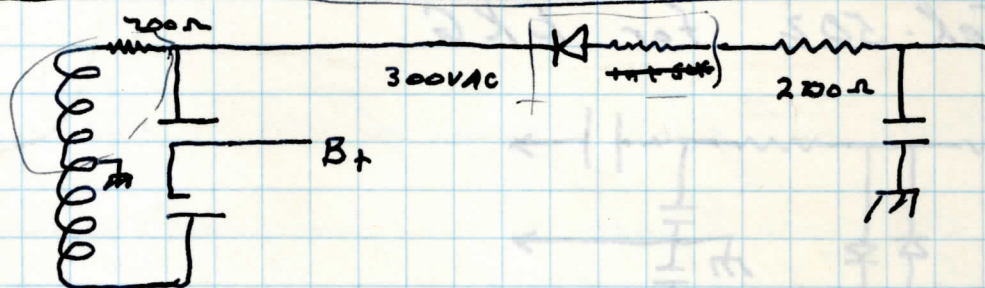
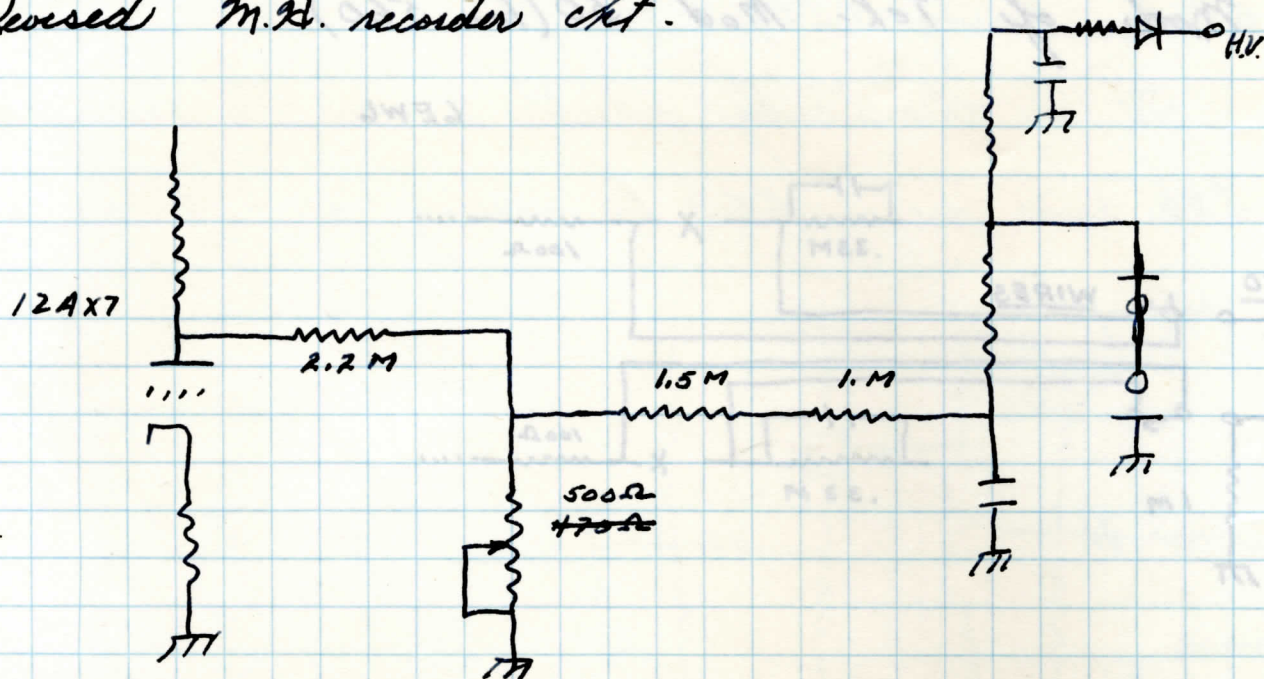
6EW6



Mod. of Tek. 502 for EKG



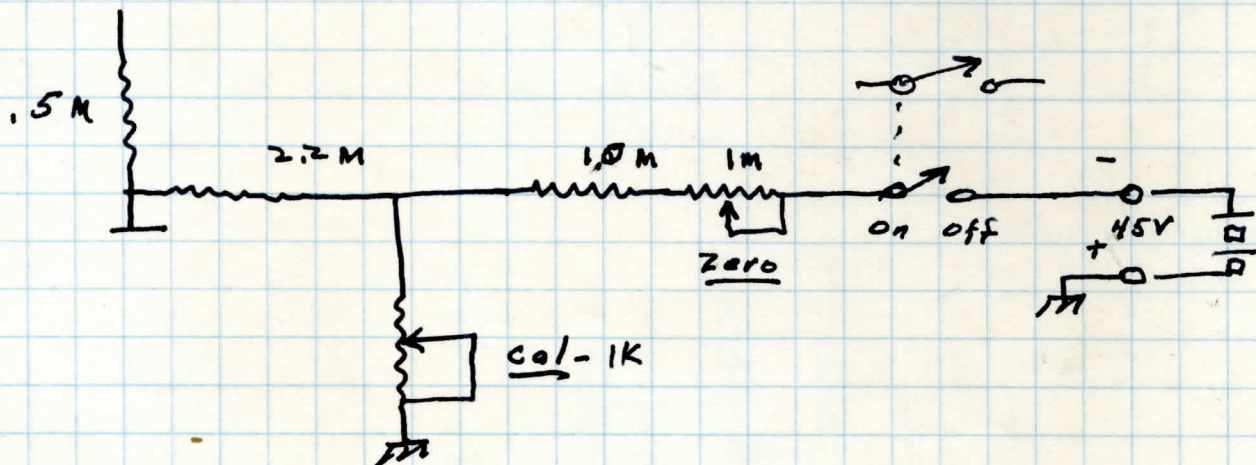
Revised m.x. recorder ckt.

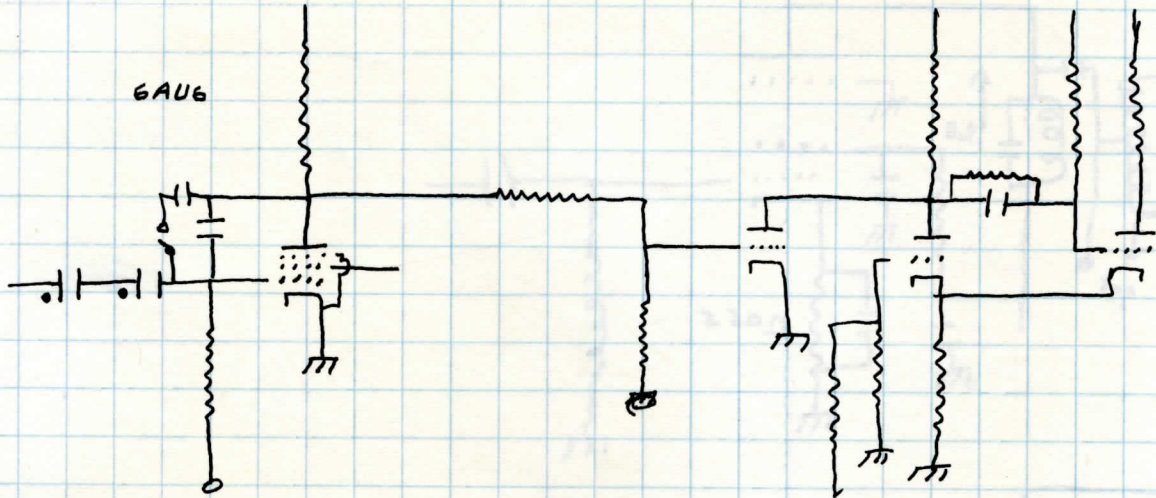


$$\frac{10^2}{.66} = 1.5 \text{ k} \times$$

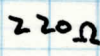
$$\frac{300 \text{ V}}{3 \times 10^{-3}} = 10^5$$

3





0.2 37 1/2



6446

10.7×2

$$\begin{array}{r} 250 \\ 20 \\ \hline 230 \\ 125 \\ \hline 105 \\ 3 \end{array} = 35 \times 10^3$$
$$1.05 \times 10^2 \times 3 \times 10^3$$
$$= 3 \times 10^5$$

Osc. 3T $\frac{1}{2}$ " Long $\approx \frac{3}{8}$ " Dia.

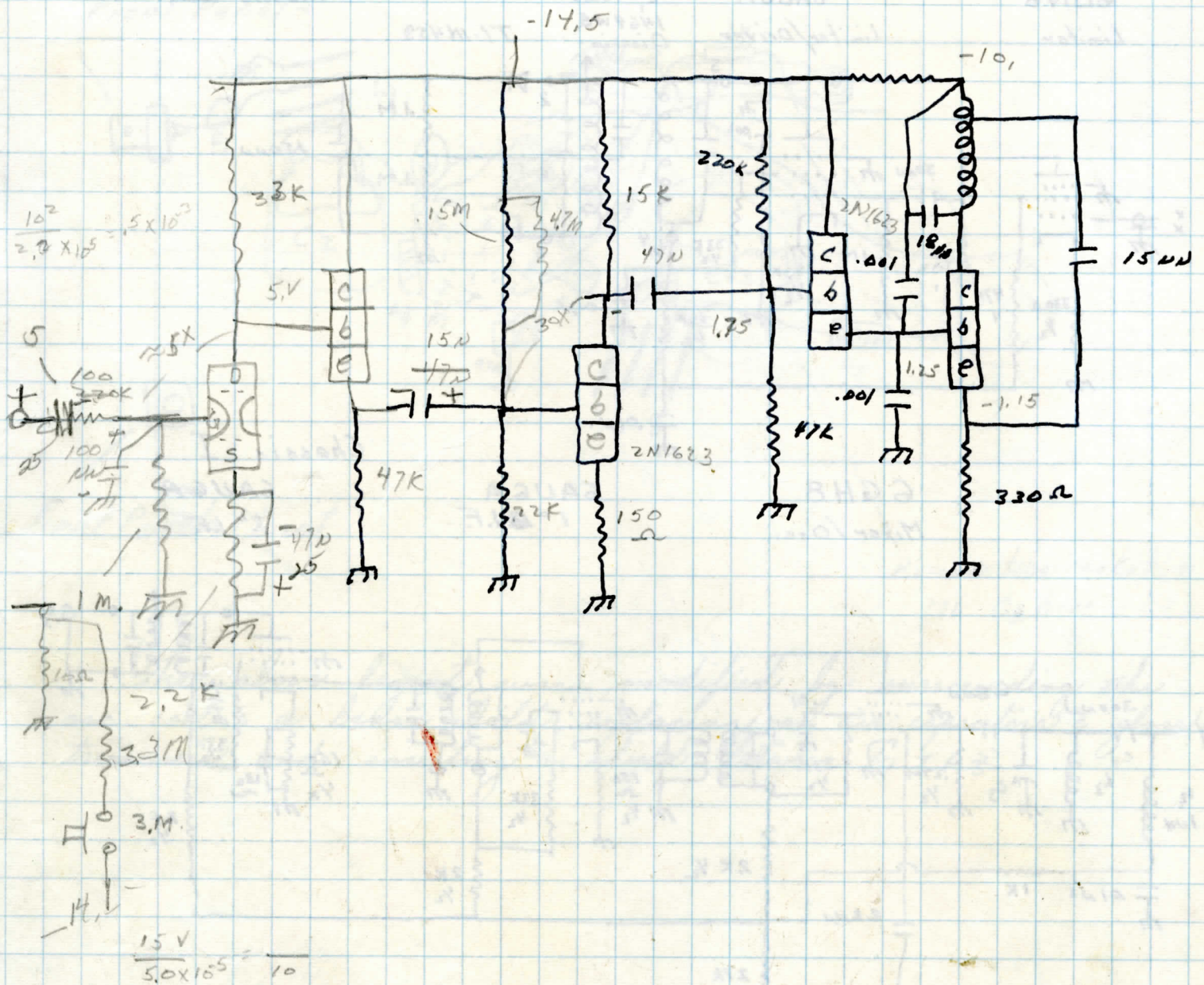
R.F. 4T $\frac{1}{2} \times \approx \frac{1}{2}$

Ant 4T $\frac{1}{2} \times 1$ Tapped at $1\frac{1}{2}$ (ant) +
 $2\frac{1}{2}$ T (Grid)

$$\frac{30}{6 \times 10^3} = 5 \times 10^{-3}$$

$$\begin{array}{r} 220 \\ 80 \\ 5 \overline{) 130} \\ 10 \end{array} \quad 26 \times 10^3$$

EEG Transmitter



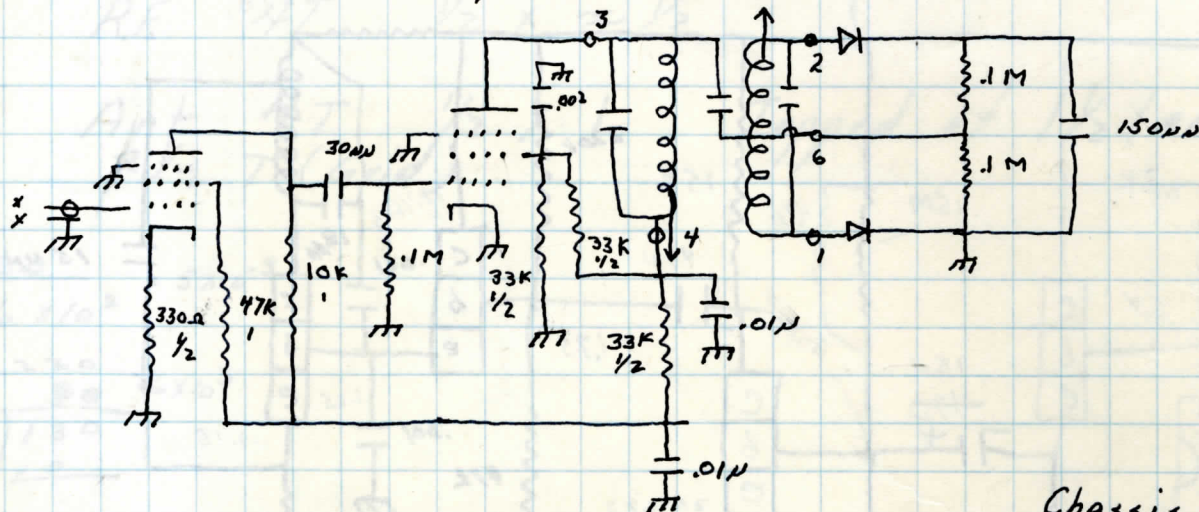
6BN6
Limiter

6AUGA
Limiter/Driver

L₁ - Miller
1464WB
Discrim.

T1-IN459

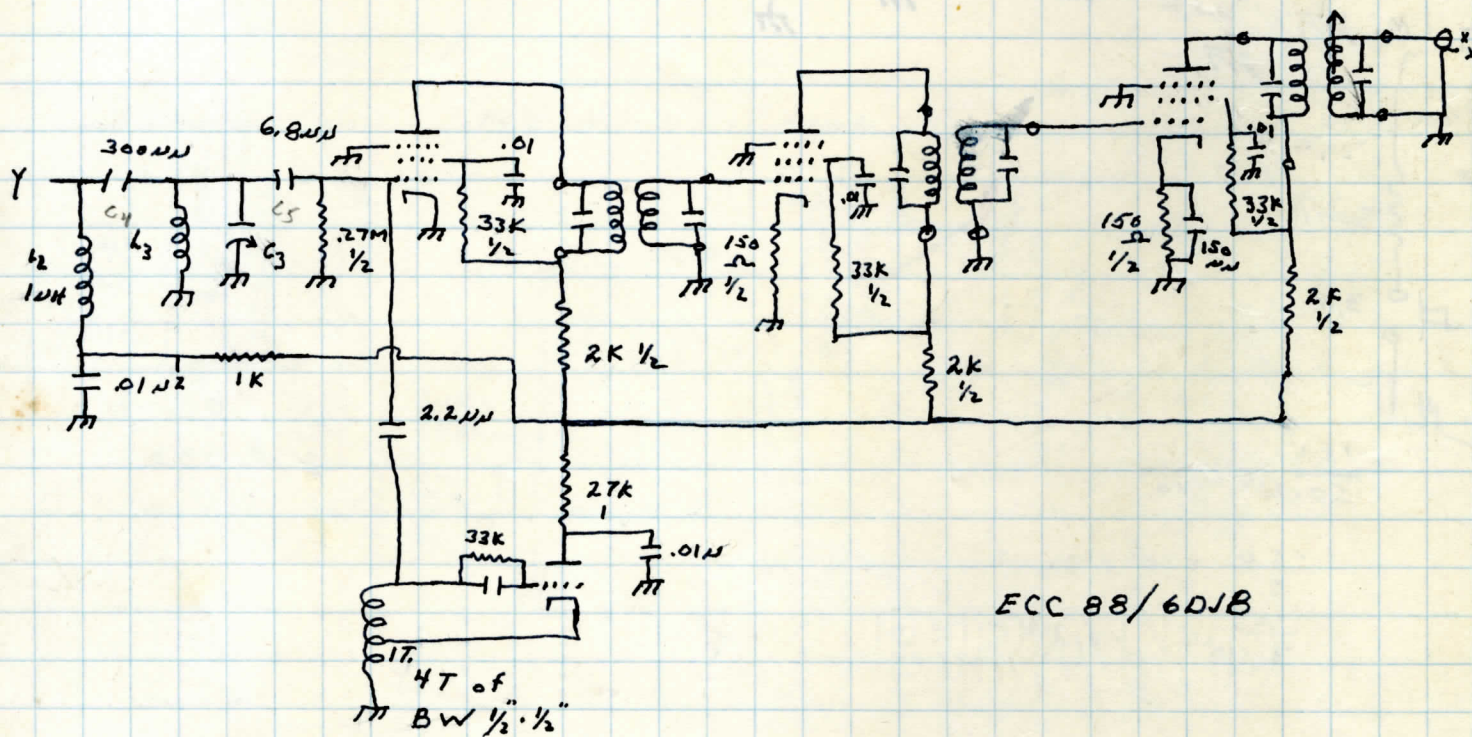
Chassis II.



6GH8
Mixer/Osc.

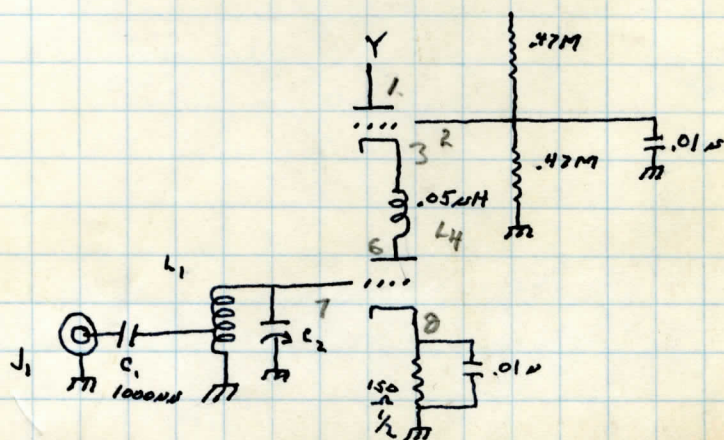
6AUGA
1° I.F.

Chassis I
GAUGA
2° LF

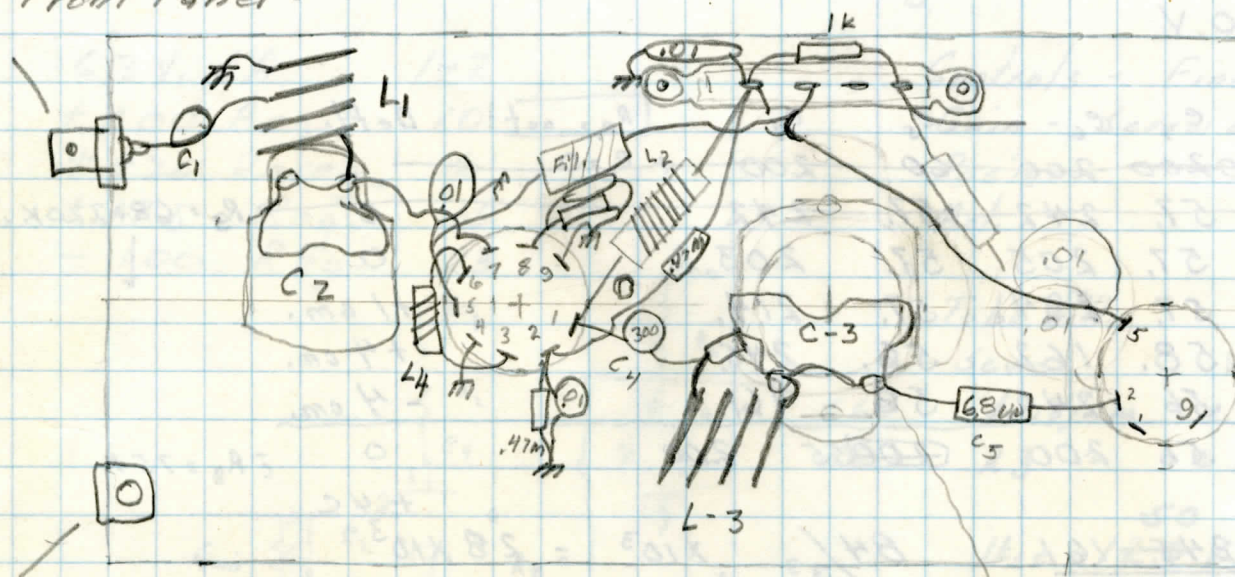


FCC 88/60JB

$L_{1,3} = 4 \text{ T B.W } \frac{1}{2}''$



J₁ - BNC Conn. on
Front Panel -



Front Panel Mount

Remove tube socket &
Mth C₃ here

The above layout was modified by surrounding the
osc. coil & a brass shield, replacing ~~air~~ capacitors & glass
trimmers, and inserting a shield between L₁ & L₃.

$B_- = 100V$
 $B_+ = 137.5V$
 $B_2^+ = 300V$

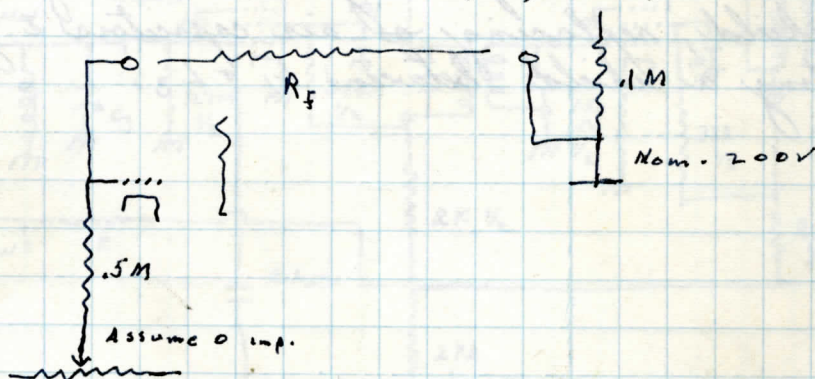
$R_{10,11} = 0.1M - \frac{100V}{10^5} = 1 \times 10^{-3}$
 $R_9 = 68K$

e_3	e_4	e_6	e_5	e_7	$ R_{0,2 out} $	Defl.
60 200	200	200	60	200	$+ e_2 = 0$	
-0.61	57.	242	+57.	242		0 $R_9 = 68 + 220K in $
-0.59	57.	205	57.	203.		0
-0.51	57.	294.	57.	214.		+1 cm.
-0.021	58.	162.	56.	245.		+4 cm.
-0.092	56	245.	58.	161.		-4 cm.
-0.062	56	200	200 55	200		0 $\bar{A}_9 = 75K$
-0.030						+4C

$\underline{G} = \frac{245 - 161}{.092 - .059} = \frac{84}{.033} \times 10^3 = 28 \times 10^3$

Feedback.

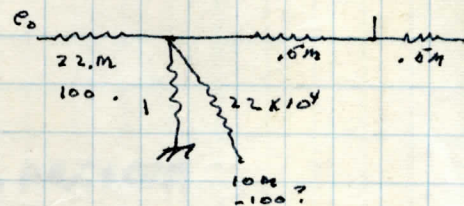
$A' = \frac{A}{1 - \beta A} = \frac{25 \times 10^3}{1 - (-2 \times 10^3) 25 \times 10^3} = \frac{25 \times 10^3}{1 + 50} \approx 5 \times 10^2$



D.C. offset

$\frac{2 \times 10^2}{5 \times 10^2} = .4V$

$R_f \approx .5 \times 10^6 \times 5 \times 10^2 = 2.5 \times 10^8$
 250 M!



E_{in}	E_i	Defl	$\bar{e}$ FB	
$-.036 + .67 \approx .64$		+4		run A again
$1.38 + 1.70 \approx .32$		+4		
				Bad 12AX7
$-.45 \Delta E_i$		+4.0 cm.		$\Delta E_o = 0$ 87 $\nearrow$ $\frac{87}{.53} \approx 160$
$-.98$	.83	0 0, 0		

Deflection Amplifier - MK I RCVR -

Rcvr. to fit Tek-560-1 Plug-In -

6.3 V, 6A, 142
 +300 Reg- 10
 +420 Unreg- 6
 +125 Reg- 15
 -100 Reg- 23

Controls - Fine Tune
 Gain - screw driver
 Pos'n. - " "
 Ant.

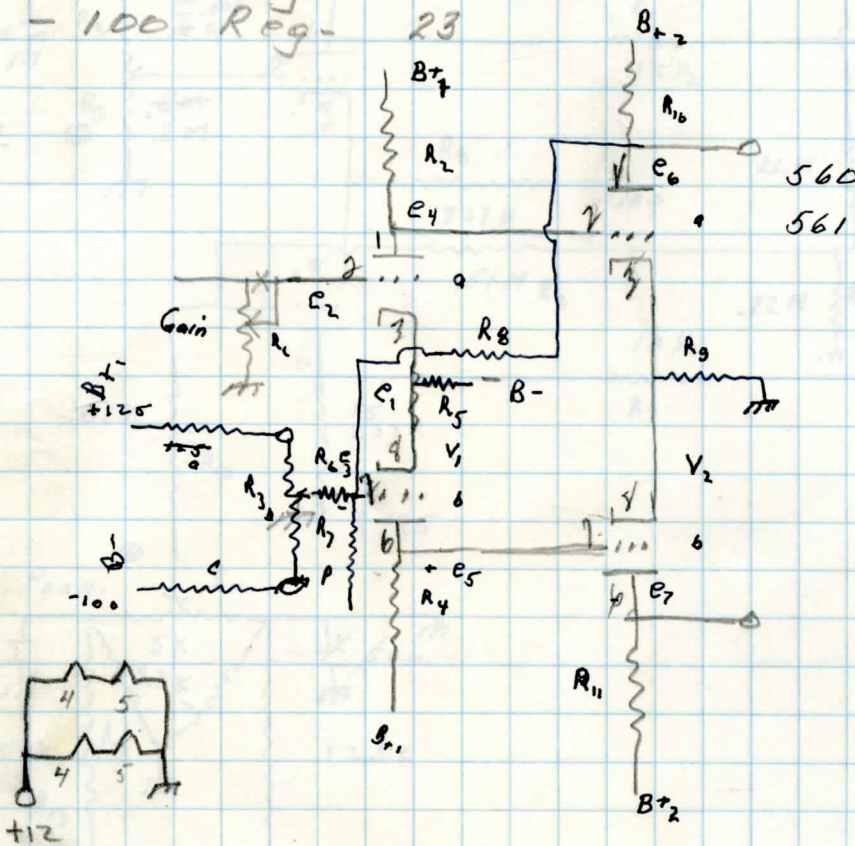
Tube defl. Sens. Nominal Voltage
 19 V/cm +125
 23 " +200

50
 Use 125 V +
 20 V/cm.

Input will be ≈ 0.1 V/cm
 for gain of 200X -

Total Defl. Voltage
 $10 \text{ cm} \times 20 \text{ V/cm} = 200 \text{ V}$
 or 100 V. swing/tube
 ie $200 \pm 150 \pm 100 \text{ V}$.

12AT7 Gain is 30X or $\approx 3 \text{ Vin}$



V₁ - 12AX7

V₂ - 12AT7

R₁ - .5 M Front Panel GAIN

R_{2,4} - .22 M 1% (2373-MERCO)

R₅ - " " "

R₆ - .15 M

R₃ a - 125 K b - 10K - Front Panel ZERO c - 100 K

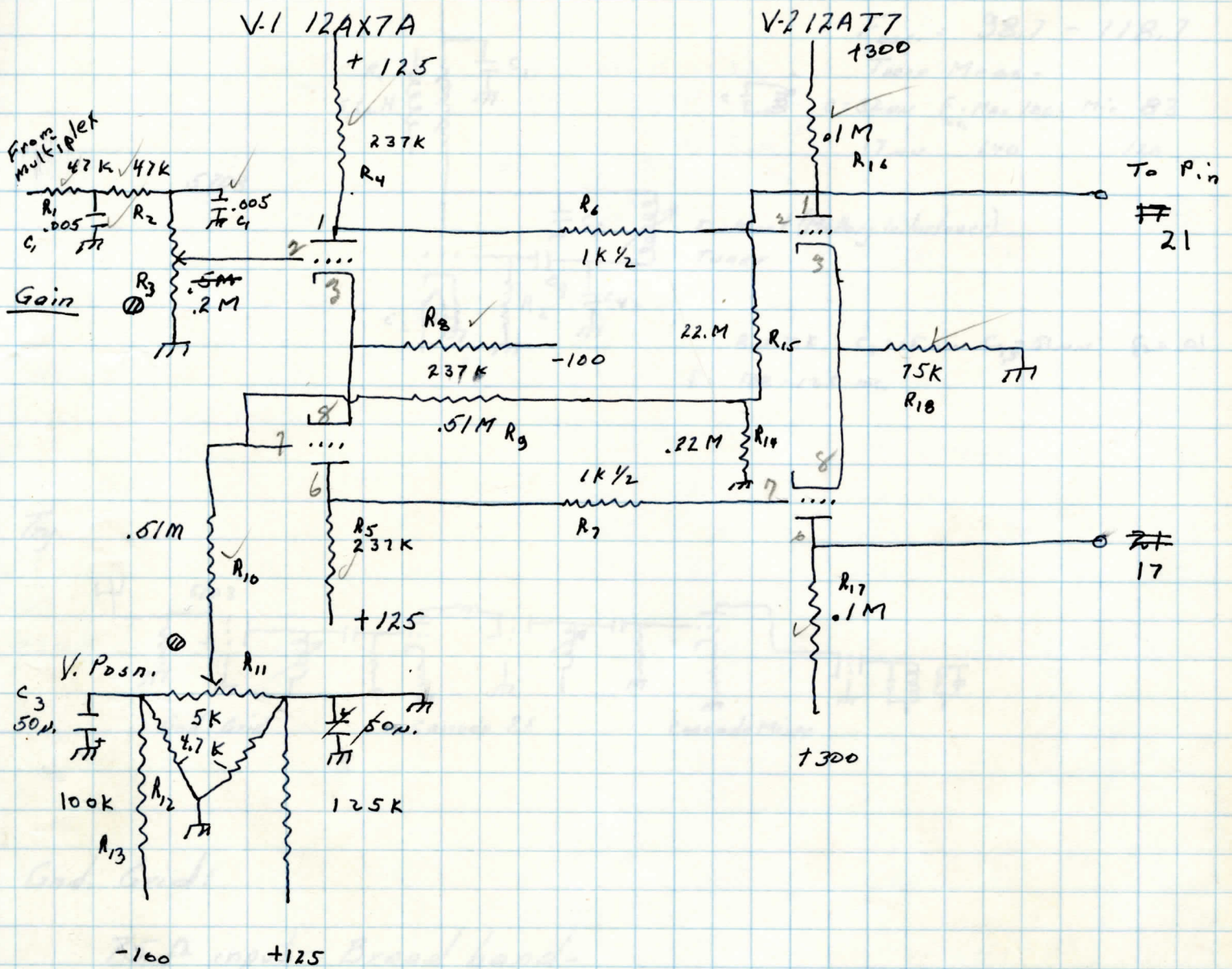
R₇ -

R₈ -

R₉ -

R_{10,11} -

Final Ckt. - Vert. Amp. for 561 Recvr.



$$Q = \frac{R}{Z_{0L}} = \frac{R}{2\pi f L}$$

$$R = Q Z_{0L} = 105 \cdot 925 \times 10^{-6} \approx 10.0 \Omega \times 6 \text{ !}$$

$$G \text{ for } g_m = 5 \times 10^{-3} \quad 5 \times 10^{-3} \cdot 10^3 = 5 \text{ ! ?}$$

$$Z_{0L} = 0.1 \times 10^{-6} \times 6.28 \times 10^8 = 62.8 \Omega$$

$$R = 105_{est} \cdot 62.8 \approx 6.3 \times 10^3 \Omega$$

$$\text{At } 50 \text{ mc} \quad Q = 105 \\ L \approx 0.05 \mu\text{H} \quad C = 120 \text{ pF}$$

$$f = \frac{1}{2\pi \sqrt{LC}}$$

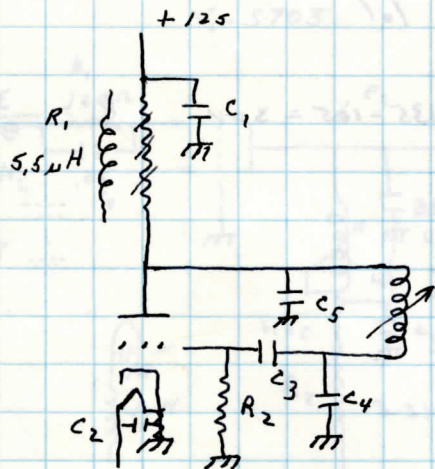
$$f^2 = \frac{1}{(2\pi)^2 LC}$$

$$L = \frac{1}{4\pi^2 C f^2} = \frac{1}{39.2 \times 1.2 \times 10^{-10} \times 2.5 \times 10^4}$$

$$= \frac{1}{1.18 \times 10^6} = .925 \times 10^{-6}$$

Tuner - Osc.

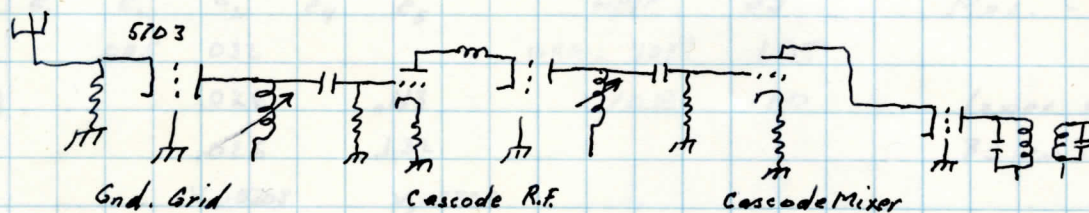
5703



$F_{osc} = 98.7 - 118.7$
 Tuner Meas -
 $C = 32\mu F$ F. Max 100 - Min 83
 17μF 140 120

$R_2 = 33K$ $C_3 = 15\mu F$ $C_{4,5} = 51\mu F$ $C_2 = .01$
 $F = 108 - 125 mc$

Try.



Gnd. Grid:

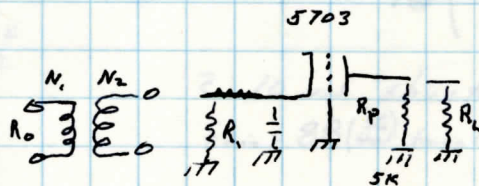
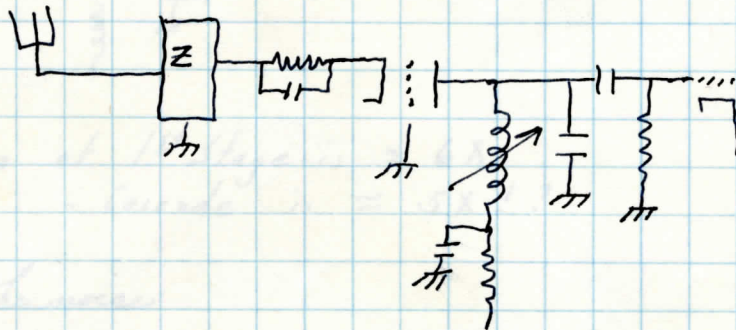
75Ω input - Broad band -
 G.F.H.B.

$$\mu = G_m R_p \mid 9ma \quad 120\Omega R_k \quad 120V$$

$$G_m = 5 \times 10^{-3} mho$$

$$\mu = 25$$

$$R_p = \frac{25}{5 \times 10^{-3}} = 5 \times 10^3 \Omega$$



$$R_i = \frac{r_p + R_o}{\mu + 1}$$

$$= \frac{25 \times 10^3 + 6.3 \times 10^3}{26}$$

$$= \frac{11.3 \times 10^3}{26} = 230 \Omega$$

$$N_1 : N_2 = \sqrt{230/75} = 1.7$$

$$I_p = 9 \text{ mA}$$

$$AE = 135 - 105 = 30 \text{ V}$$

$$R_1 = \frac{30}{9 \times 10^{-3}} = 3.3 \times 10^3$$

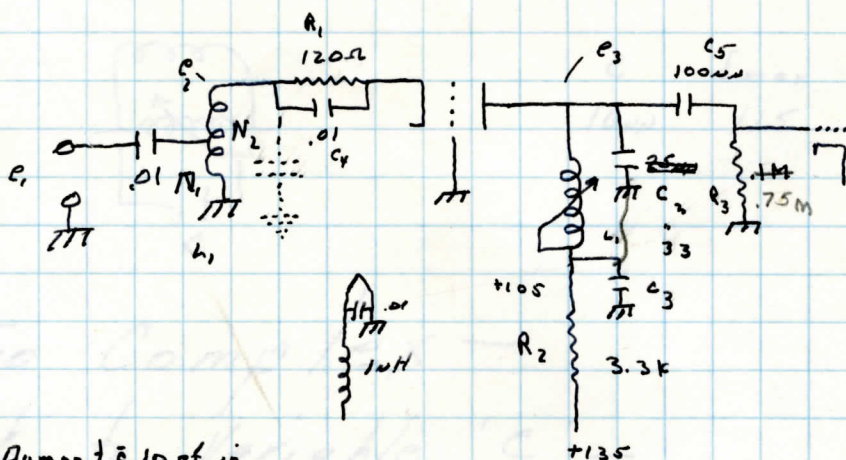
$$\frac{100}{.01} = \frac{10^2}{10^{-2}} = 10^4$$

5703 -

$C_{pk} \approx 2 \mu\mu$

C_k to all other elements - $6 \mu\mu + R_k$

$V_1 - 5703$

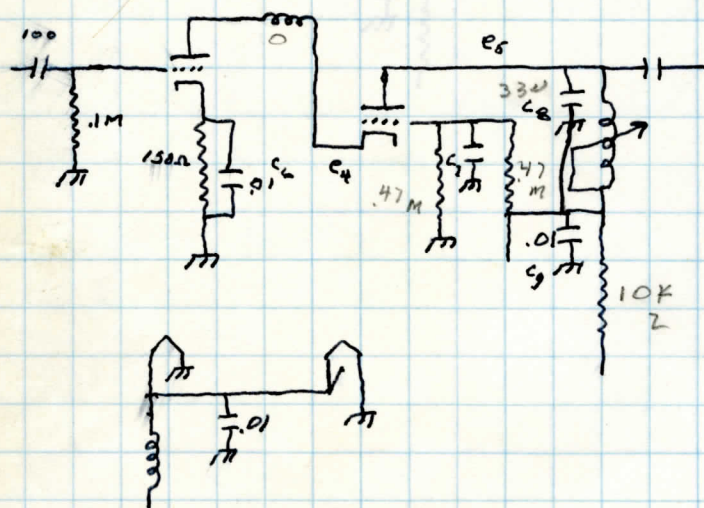


Meas. δ Dumont $\delta 10 \mu\text{ft}$ in
series $\approx$ VHF Probe

f	e_1	e_2	e_3	e_4	e_5
f_{me}					
≈ 95		.005	.032		
88 (SG)			.026	.113	
			.026	.132	

$V_2 - 5703$

$V_3 - 5703$



Free.	$f_{gen.}$
88	90
WPTF	99
WRA 102?	105
108	110

$\bar{C}$ 33 μ across L

Tuning -

Min. - 95.

Max. - Off scale $\gg 120$

Lower freq by shunting
33 $\mu\mu$'s -

$$f \sim \frac{1}{\sqrt{C}} \quad \frac{f_1}{f_2} = \sqrt{\frac{C_2}{C_1}}$$

$$\left(\frac{f_1}{f_2}\right)^2 = \frac{C_2}{C_1} \quad C_2 = C_1 \left(\frac{f_1}{f_2}\right)^2$$

$$= 40 \left(\frac{93}{85}\right)^2 = 40 \cdot 1.2 = 48$$

$\approx 10 \mu\mu$ shunted across $C_{3,8}$
 $f_{min} = 88 \left(\frac{SG}{\mu\mu}\right) f_{max} = 104 \text{ (SG)}$

Gain of 1st Stage is $\approx 6X$
" " Cascode is $\approx 5X$!?

The noise

Shunt tuner $\bar{c}$ 4T $\frac{1}{2}$ " D. ($\approx 1 \mu H$)

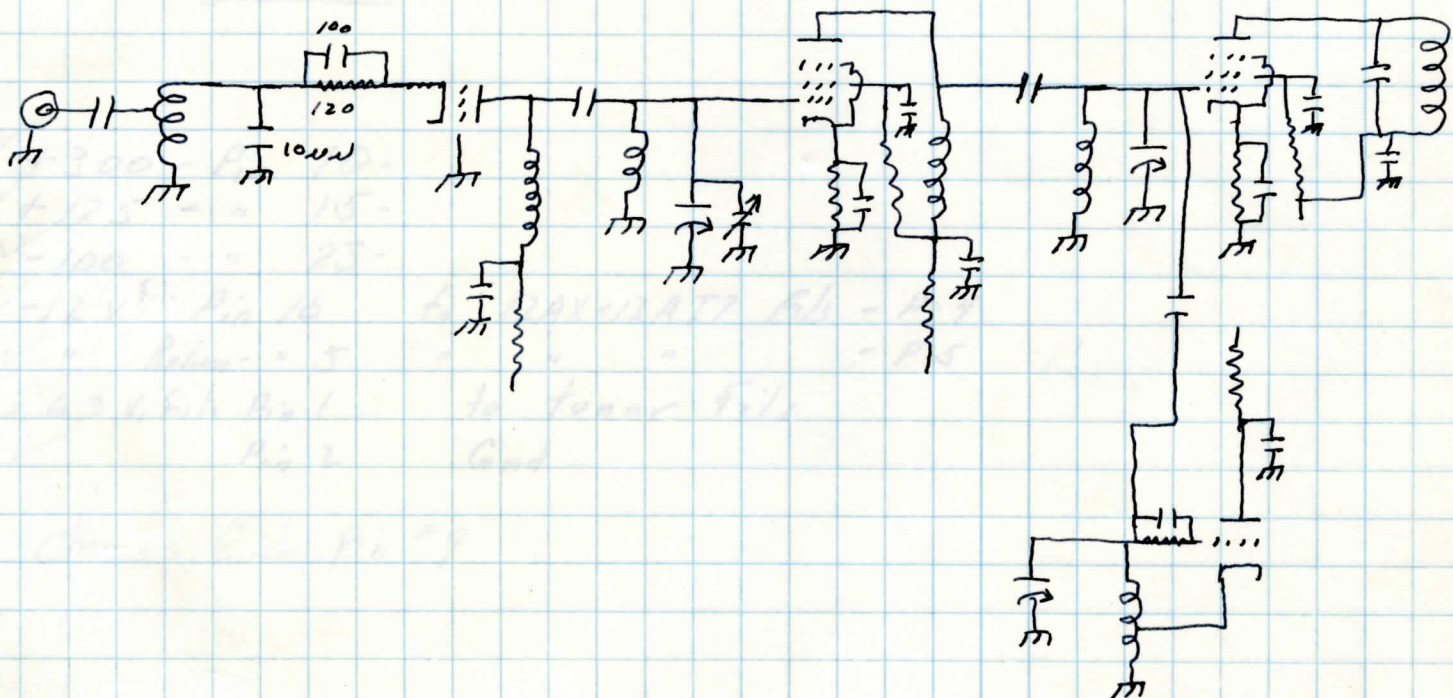


C	f _{max}	f _{min}	GDO
10 μ N	115	>> 140	

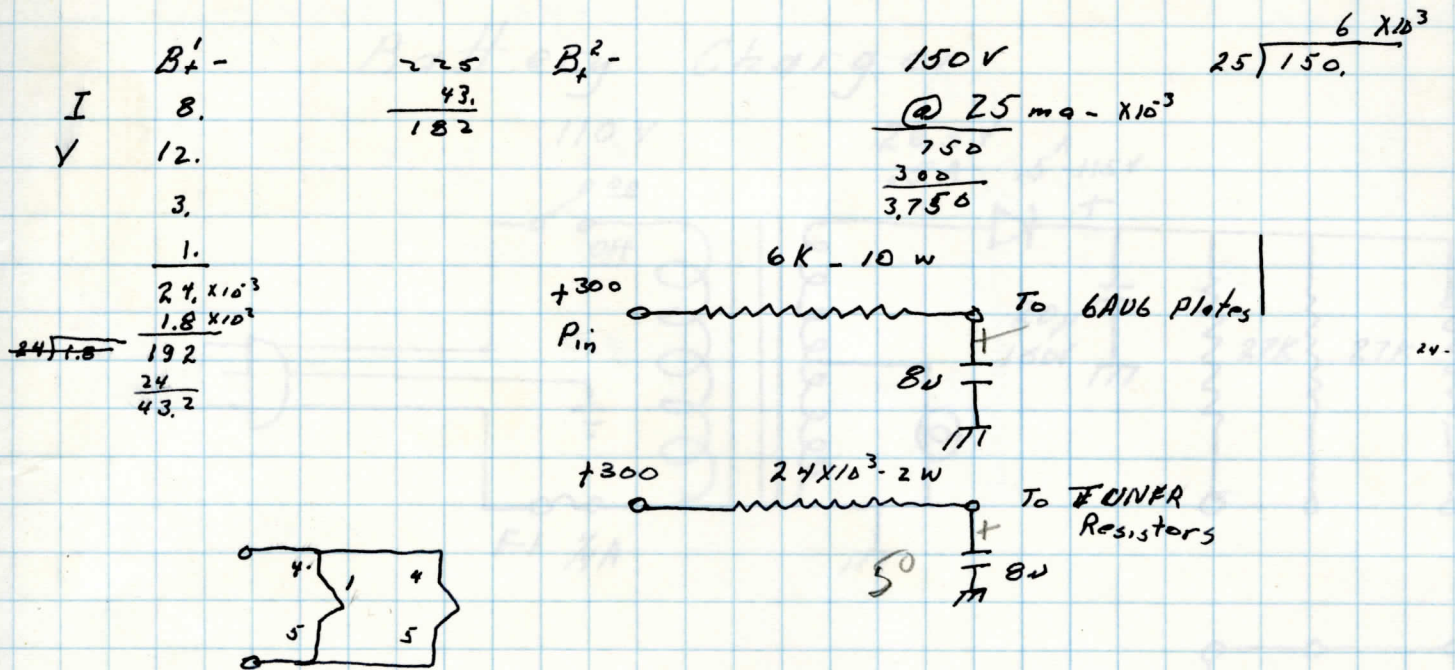
Too Complex -
Back to Variable 'C' -

V₁ - 5703

V₂ - 5702



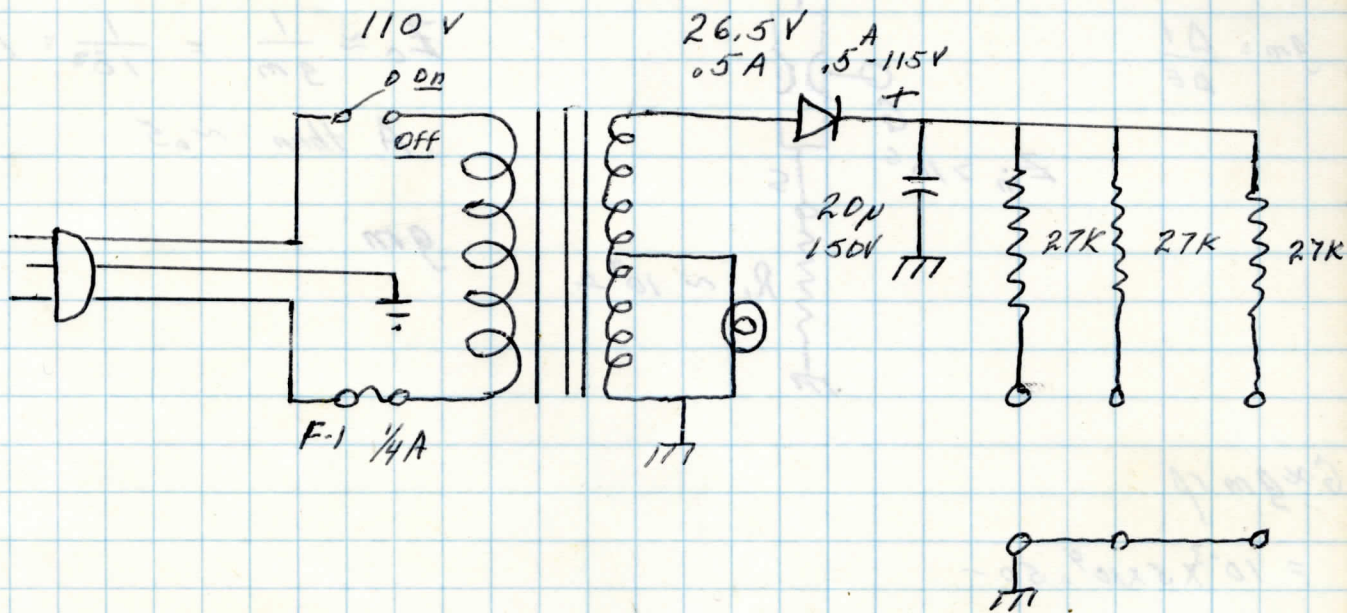
Inst. of Eico in Tek. 561



- ✓ $+300 - Pin \ 10 -$
- ✓ $+125 - " \ 15 -$
- ✓ $-100 - " \ 23 -$
- ✓ $-12V \ Fil - Pin \ 16 \ to \ 12AX + 12AT7 \ Fil - P.4$
- ✓ $" \ Return - " \ 5 \ " \ " \ " \ - P.5$
- ✓ $6.3V \ Fil. \ Pin.1 \ to \ Tuner \ Fil.$
- ✓ $Pin.2 \ Gnd$

Chassis Gnd Pin #9

Monitor Instruments Battery Charger



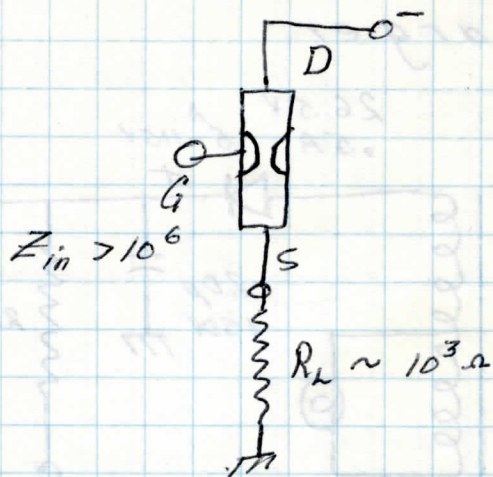
Vert

$$R_D = \frac{10}{2 \times 10^{-3}} = 5 \times 10^3 \Omega$$

$$r = E$$

Use of FET's in EKG
As Voltage Follower -

$$g_m = \frac{\Delta I}{\Delta E}$$



$$Z_o \approx \frac{1}{g_m} = \frac{1}{10^{-3}} = 10^3$$

A then ~ 0.5

[20]

g_m

$$G \propto g_m r_p$$

$$= 10^{-3} \times 5 \times 10^4 = 50 -$$

10.21.63 G.H.

65' - 440yd - 30 - 220 35 - 220

start + Cal - 12:00 Start Run - 12:15 65.6' Rest - 1:00

126 Cal - sit

209 Up + walk 345 Warm Up

430 2nd Run - 682

510 sit - 535

W/HA. start 535 + Cal 540 Instr - 545 Run

635 Cal - 640 sit + Cal 700 Off

JOC 705 On + Cal - 712 Start Run - 830 Cal -

G. Howard - 11.4.63

RR/mm. Rate

Control

22 - 68

Warning

13 113

Start

15 100

1 min

7.5 200

2 "

7.5

3 "

7.5

4 "

7.5

5 "

7.5

6 "

7.5

7 "

7.5

Stop + 20"

8+

187

30"

9

167

60"

11

137

5'

12

125

12
17
14
12
10
8
6
4
2
0

700
600
500
400
300
200
100
0

20/12/64

House built. ~ 1896 - 1900

~~John~~ Janie, John Williams - living c. H. T. who worked
in Wallace -

H. T. went to Bowden ~ 1902 -

J. X. Morton M.D. to Faison in 1917

more in the
in Thornton