BOOK91R

Notes:
"I" on front
"7-49/8-54" on front
"NB-WI-1" on front

"I" on spine
--Please note that this is a very old book, (8.5x14) and had to be reduced and darkened in order to pick up all data. Sorry for the darkness on some pages.
--Please note that pages 1-4 and 99-102 have been torn out from this logbook.

Blank pages: page opposite page 5, 6, 12-14, 18, 21, 28, 31, 32, 36-39, 48, 114-123, 128-139, 141-149, 151

-page 22 has long graph taped to it
-page 25 has big graph taped to it
-pages 52, 80, 83, and 95 each have drawing attached to it
-pages 66/67 have long sheet of paper between pages
-page 69 has (8.5x11) graph taped to it
-page 71 has (8.5x11) graph taped to it
-page 79 has graph taped
-pages 86/87 has (8.5x11) sheet between pages
-page 88 has big graph taped
-page 105 has 2 drawings taped
-page 109 has graph taped
-pages 114/115 has drawing between pages
-page 124 has paper glued to it
-2 (8.5x11) sheets (1 graph) taped to inside back cover sheet
-7 (8.5x11) sheets of paper taped to inside back of book

Scanned by:
Sheila Finch
RSICC /Oak Ridge National Lab.
September 14, 1999

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General Maint.

95

Standard Blank Book

No. 67⅛

Journals	Double	$ and Cts.	no	Units
Cash Books	"	"	"	"
Day Books	"	"	"	"
S. E. Ledgers	"	"	"	"
D. E. Ledgers Full Page Form				"
Long Day Books				"
Records with Margin Line				

In 150, 200, 300 and 500 Pages

Made in U. S. A.

TO REORDER THIS BOOK, SPECIFY NUMBER, RULING AND THICKNESS AS INDICATED ON BACKBONE OF BOOK

A BOORUM & PEASE PRODUCT

ELECTRONIC MAINTENANCE

7-19-49 COUNTER #1 - ERRATIC SENSITIVITY to DEAD
Rx - Replaced 6SN7 and 6AQ7 - Rx 35K 10W &
RK 10K-2W & 7.5K 2W Feedback Resistor --HAK

7-26-49 D.C. Amp #4 - EXCESSIVE sensitivity to TRANSIENT
7-27-49 Rx - Burned down B+ to ground
16MHz 1MFD cathode 12SJ7 regulator tube to ground
16MHz 1MFD across B+ to B- 0.1MFD B+ to ground at rectifier section
HAK-HMJ

7-28-49 D.C. Amp #4 - Alarm circuit difficult to reset
Rx - 0.1MFD - 600WV across G1 to K of 2050 regulator
8mh R.F. oscillation of B+ supply - Rx changed
12SH7 regulator tube to 12SJ7

9-30-49 Vibrating Reed Electrometer - Dead
C-11 Shorted - Replaced
4mh This shorted capacitor had destroyed the 6-V6 and 5Y3 in regulated power supply. Replaced Tubes
Replaced 5 other tubes in amp. unit

9/30/49 Photo Multipliers placed in service after
3mh minor circuit changes (pots instead of fixed)
in battery circuit)
1 - fixed resistor on 931-A voltage divider
opened - replaced

10/4/49 Vibrating Reed bypass capacitor C-11 leaky coupling
4mh capacitor shorted & replaced HAK

10/7/49 Counter Timing Interval control switch shorted
2mh all screws tightened and contacts aligned HAK

10/11/49 Vibrating Reed tubes checked and 6SL7 replaced
2mh
3mh #3 BF3 Counter, Channel 4 Circuit [illegible]

10-13-49 Counter # 2 - Dead
4 mh (a) Replaced a leaky 8-450 mfd electrolytic capacitor in the pre amp.
(b.) Replaced a 500 ω ½ w carbon resistor, (grid limiting resistor) in 6SN7 stage of main amp.

11/8/49 Photomultiplier radiation alarm
3 hr Symptoms - gradual drop off of sensitivity reported. DFC check batteries ran ~220V 1.5 meg resistors 1.8 - 3 mega — Replaced batts & all 1.5 meg resistors (1.6-1.8 mega range of available resistors from stores which were used) values checked after soldering in all but one 1.8 mega, that one 1.6 mega. #1 + #2 dynodes had 1.0 meg resistors whose values were checked as OK. With max. sensitivity trip point (10 mg) was ~8 inches Reset by AC box controls to 3½ KC

11/10/49 #4 D.C. AMPLIFIER - Replaced 6-45 volt batteries
3 hrs 1-12SH7; 2-12J5; 1-5Z3; cleaned ion chamber of dust - remedied poor sensitivity and poor control. OK by JS

11-11-49 #5 DC Amp. Replaced 1-45V battery 1-1½ V, and 1-6V
1 hr battery (all low).
Replaced 1½ V in Brown and 1-7F7 tube.

11/15/49 2 hrs Replaced 5Z3 rectifier, checked batteries OK.
11-16-49 1 hr Replaced 300V battery in Photo-Multiplier
11-17-49 ½ hr Photomultiplier returned to shop.
11-21-49 ½ hr Firing circuit for scalers - replaced. 5V4, 2, 6SJ7's and 3, 2050's behind rectifiers to have shorted out.

12-13-49 Vibrating Reed - 6SJ7; Warm circuit 6SN7; repeated oscillator - running, needle, Fuse to Battery

12/21 Reed Electrometer – Lucite insulators replaced and batteries in head suspended in air by bus bar – appears to improve stability.

JAN 10-1950 Reed Electrometer – Checked tubes, replaced input 6AK5's – Replaced 2 ea 6J5 in main amplifier. Removed reed head from BF3 ion chamber #4 and reinstalled on Freon 8 chamber. End of test started late Nov. 1949 – 6 hrs. #4 D.C. Amp. – placed in panel rack. Replaced 5 low 45 volt batteries. M.J.B.

JAN 20, 1951 12 hrs #4 D.C. Amplifier – checked tubes and batteries, loose cable connector could have caused trouble.
#1 – Brown Recorder Counter – Checked all tubes – replaced 6-V6 6SG7 & VR105 – soldered loose 110V AC wire to switch
#2 – Brown Recorder Counter – Checked all tubes – replaced 2-6V6 2-6SG7 – 4 ea 6SN7 – 1 ea VR105 – Reduced slightly the high voltage, Geiger dc. H.R.K & M.J.B
#5 – Electrometer – drift does not seem excessive.

MARCH 1, 1950 12 hrs #1 – Counter – Checked all tubes, replaced 1-6AC7 and 1-6SH7
#2 – Counter – Checked all tubes, replaced 2-6AC7, 2-6SN7 & 1-6SL7
#3 – D.C. Amplifier – Checked all tubes and batteries – Replaced 2-807, 2-12J5, 1-6J5; 5-45V batteries. Replaced Brown recorder pen with a clean one and replaced 1½V battery in Brown. Tightened ground connection to water pipe reduced transient response (1 DIV)
#4 – D.C. Amplifier – Checked all tubes and batteries – Replaced 1-807, 1-6J5 and 1-954 (VT1) preamp tube; 3-45V Batteries. Changed A.C. connector. Replaced (7 DIV) 2-1½V batteries in Speedomax recorder
#5 – Electrometer – Remained on all day – instability noted in AM but left in 3 hours. Not checked
H.R.K. & M.J.B.

3-9/8-50 #6 Reed Electrometer - checked tubes replaced 6SJ7's and 6J5's reading low. Attempted adjustments on instrument. ERR 3/8 Osc. adj. and gain setting set instruments in operating condition. Packed with full capacitance in. Changed R23 & R25 - from 82k each to 100 k each, giving better peaking point, on capacitor range.
2 hrs. HAIC (ERR)

3-15-50 #1 scaler - tripped register on 40 & 32 at turns instead of 64. Behaviour erratic. Replaced 6SL7's on scale units marked 16 & 32.
2 man hrs. MJB - ERR.

3-17-50 #4 DC. Amplifier - failure to zero adjust.
6 man hrs. Checked tubes - all ok.
Checked batteries - replaced 3 45-volt units.
Checked pre-amplifier - tubes checked ok. Cleaned tubes & input resistor. Packed for monitron.
Made adjustments for balance —
MJB. ERR

3-20-50 - Geiger & survey meters - reading low.
checked batteries replaced several 22½ v. batteries and filament batteries. Instruments still seem poor in response.
- #4 DC. Amplifier - safety trip circuit bad. Trip point checked 6J5 & 2050.
can not be set. Replaced 2050. Still not able to set trip point. Noted that could not coarse adj in such a position that trip light go on when chamber was struck a flow hit.
- linear amplifier #2. Noted vibration, mechanical, thought possibly to have been "frying" capacitor. Checked instrument & noted noise could when one capacitor can was touched. Tightened capacitor on chassis. -
E.R.R.

3-27-50 (PM) #5 - Electrometer - sensitivity low -
Checked batteries. Replaced 1.5 v filament battery (reading 1.4 v) by new 1.5 v. battery. Now helped. ✓

#4 DC Amplifier - Meter affected by output scale changes. Meter deflection peculiar. As scales lowered from 1000 deflection normal (increasing) down to 100 or 50 settings, then deflection off scale negative!! Setting different with zero setting adjustment.
Checked batteries, replacing 1 45 v #738.
Checked tubes - o.k.
Checked components in general circuit check. Noted few questionable sensitive components.

3-24-50 - Rechecked #4 - still no good -
Put another unit in place and tested, after putting in good batteries & tubes. Found it to good.
Checked 3rd unit with little success. Finish with Speedomax.
Put in good #4 unit. -

4-5-52 Instrument check:

#1 2 min cts: 12+8; 12+32; 12+35 ✓ 12+32

#2 2 min cts: 16+12; 16+9; 16+20 ✓ 11-744

Both instruments seem to be OK.

#4 D.C. Amplifier - subject to transients -

Set trip point: Meter x50 scale. Output x100.

Needle to trip at 60 in ascending (62 on meter)

@ 57 (58) not this.

57 (60)

Tripped at 59(62) must this trip

Trip @ 63(66)

@ 60 may trip when operator pulse trip relay -

Seems safe at 57 - Trip is above 57.

#3 OK

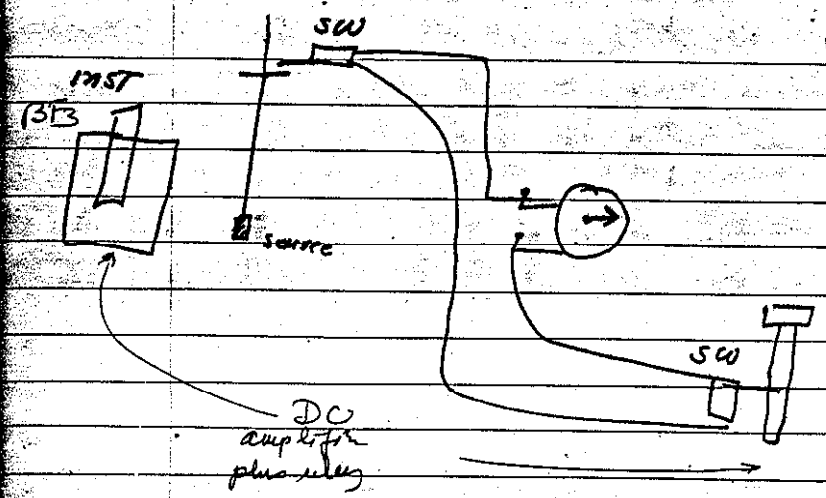
#5 OK.

#6 OK.

#7 OK.

4-12-52 #3 RM alarm - inoperative - replaced 6 volt 300 v battery -

12/8/50



Time sec's (between arrival of source at counter & release of shim rod).

1.60
1.57
1.18 } 80 on trip scale. output meter
1.18 } Background = 10
1.21
1.45 } avg = 1.25

Background = 80 by adding Y ~~and~~ source

1.20
1.09 } trips at 80 on output meter
1.05
1.22 } 1.14 avg

Background = 63 from Y's

0.98
1.02
0.96 } 0.99 sec avg
1.01

Background = 62 from γ's

Time without magnet - clock across K-10 relay points

0.70 sec. (time between arrival of source at chamber and opening of relay in DC amplifier, i.e. deenergizing magnet).
0.69
0.49
0.78
0.79
0.79
0.70 avg.

Background = 40 from γ's

1.05 sec.
1.03
1.02
0.98
0.82
0.98
0.98 sec avg

Background = 1.10 (γ source removed)

1.18 sec
1.21
1.08
1.15
1.00
1.29
1.13 sec avg

Total time - including 12" free fall of loaded Shain rod in air

1.87
1.88
1.64
1.63
1.80 sec

} Rod jumped causing approx .2 sec delay
possible error = 1.60 sec.

1.60
1.25
.35

Total time inc. 12" free fall = 1.80 sec
time no fall (1/32") = 1.25 sec
free fall .55 sec

Instrument alone mag 1:13

Release time of mag .12 sec 10 background
" " " .16 sec 40 background
.29 sec 62 background

3) .57
.19 sec avg

With instrument time < 0.1 sec
total time = 0.70 sec estimated

12-20-80

Shim Rod Drop Time Tests:

Dry Run: 1020

.04 sec — 24 in drop — rejected

.71 " — reasonable

.81 "

Wet Run — 17.5" drops — should repeat

0.62 sec

1.50 sec

Dry — 17.5" drops

1.11 sec

1.13 sec

1.06 sec

15.5"=

0.52 (note limit switch up 2"

0.44

WW

20 General Sampling -

Poppy Check - 4-28-57

Time	Source	Meter	Time	Source	Meter
	Mtg		in 0909 35		
0909		13	0910	98%	1
5		0	5		11
10		0	10		4
15		0	15		0
20		0	20		5
25		5	25		14
30		2	30		13
35		3	35		5
40		3	40		8
45		2	45		10
50		8	50		19
55		3	55		9
0908		5	0911		12
05		0	5		7
10		4	10		8
15		5	15		13
20		0	20		9
25		0	25		6
30		5	30		3
35		0	35		7
40		8	40		11
45		5	45		11
50		11	50		6
55		5	55		5
0909		2	0912		12
05		0	5		8
10		5	10		0
15		3	15		1
20		5	20		8
25		0	25		8
30		0	30		6
	Total	99			240
	31 samples			31's	
	Avg:	3.19		Avg:	7.74

(1) (2) (3)

12-20-50 Scaler Counting Rates) - source in "dog

(1) West tube 1 A°	(2) South side 2 AF_2	(3) East tube 3 A^{40}
~~reject~~ 21^{64} + 3	3^{64} + 38	10^{64} +5
5^{64} +43	3^{64} +40	12^{64} + 29

Source down - between slugs - no water -

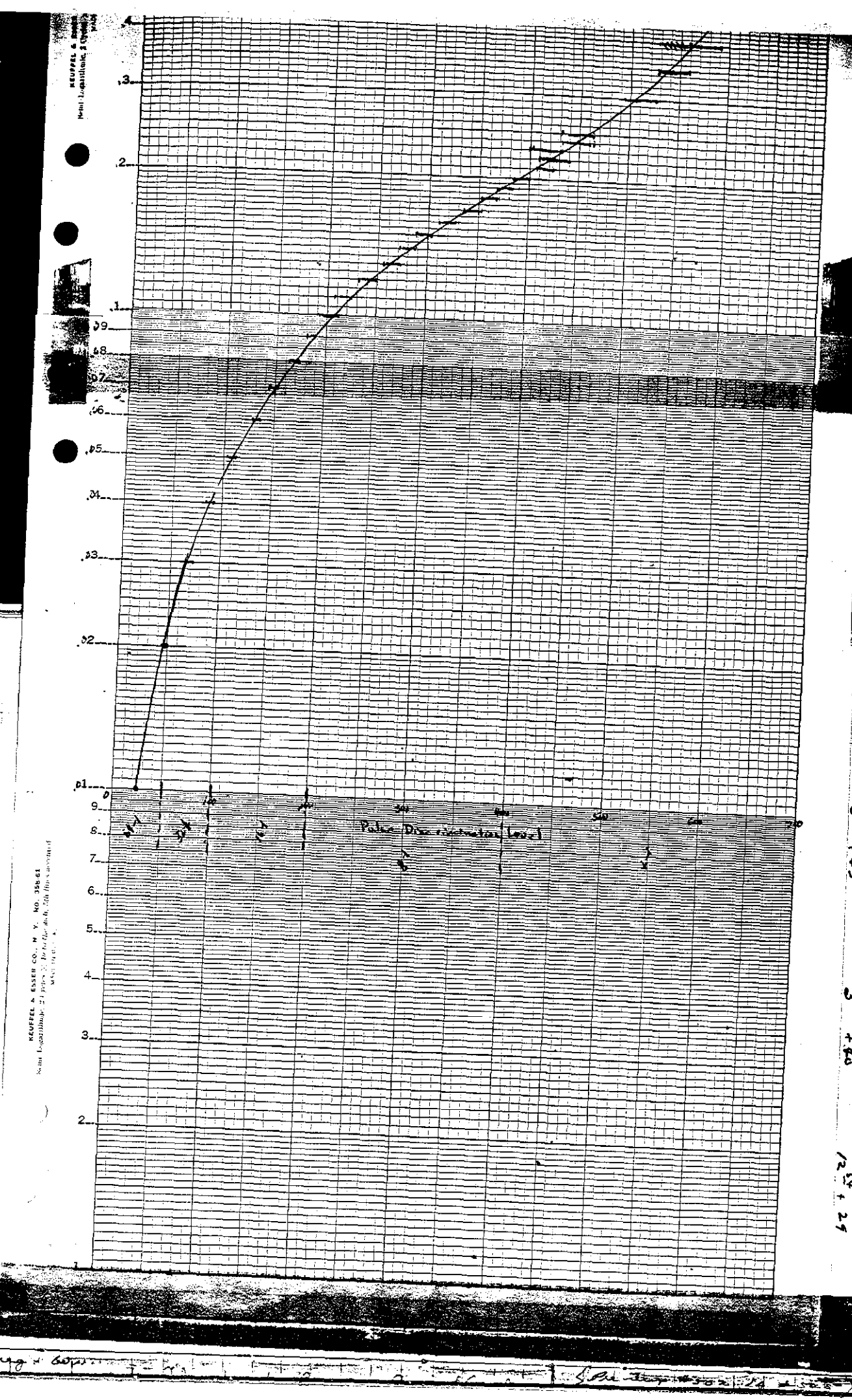
15^{64} + 4	784^{64} +8	29^{64} + 12
12^{64} +2	765^{64} +40	27^{64} 429
	reject - loose coupling	

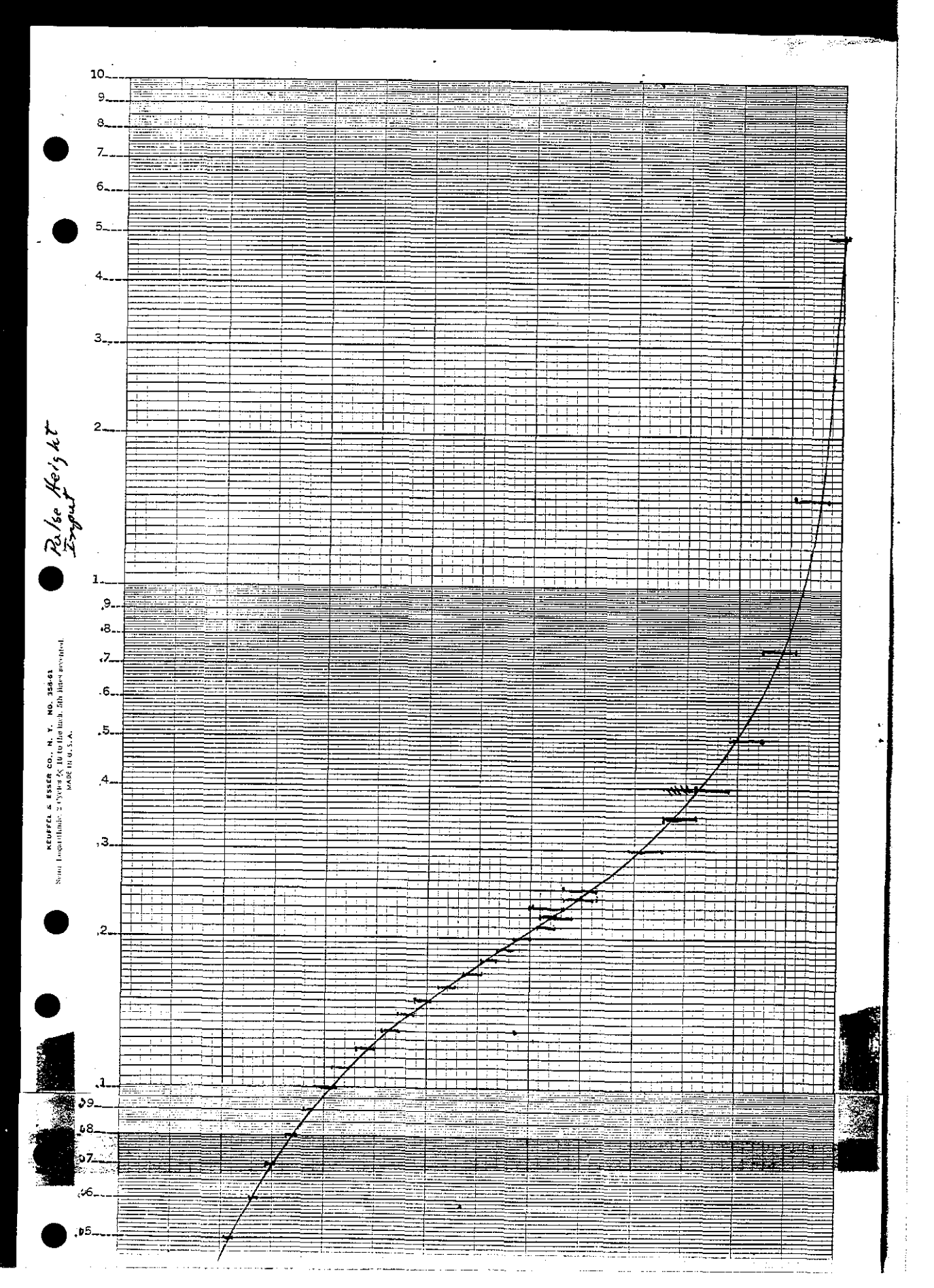
Source down 4" from bottom (center) 93.7 cm above tal

$3.\frac{3}{4}$		2.0
4.5	$3^{1}/_{4}$	$2^{1}/_{4}$

Source in "doghouse" water in tank

0.5	2.5	0.5
0.5	3.5	0.5


KEUFFEL & ESSER
Semi-Logarithmic
.4
.3
.2
.1
.09
.08
.07
.06
.05
.04
.03
.02
.01
9
8
7
6
5
4
3
2
1
0
100
200
300
400
500
600
700
Pulse Discrimination Level
KEUFFEL & ESSER CO., N. Y. NO. 358 61


10
9
8
7
6
5
4
3
2
1
.9
.8
.7
.6
.5
.4
.3
.2
.1
.09
.08
.07
.06
.05
Pulse Height Input
KEUFFEL & ESSER CO., N. Y. NO. 358-61
MADE IN U.S.A.

0.5	.007	64-1	20/23	27	07	.21	8-1	51/53		
0.5	.008	64-1	25	—	11	.22	8-1	53/55		
0.5	.01	64-1	25	25	61	.23	8-1	100		
"	"	"	26	—	—	.25	4-1	25/27		
0.5	.02	64-1	48	17	25	.27	4-1	27/29		
"	"	"	49	—	—	.25	4-1	27/29		
"	.03	64-1	100	07		.26	4-1	28/30		
0.5	.02	32-1	23	07		.28	4-1	31/33		
	.03		23	N.C.		.30	4-1	33/35		
0.5	.03	32-1	34	0		.35	4-1	35/37		
			36	N.C.		.40	4-1	37/39		
0.5	.04	32-1	44			.50	4-1	39/41		
			46			.75	4-1	41/43		
0.5	.05	32-1	100			1.00	4-1	43/44		
		16-1	26/28			5.10	4-1	44/45		
0.5	.06	16-1	32/34			15.0	4-1	45/46		
0.5	.07	16-1	36/38			20.0	4-1	46/47		
0.5	.08	16-1	41/43			.04	16-1	21/23		
0.5	.09	16-1	45/47			.10	8-1	24/26		
0.5	.10	16-1	51/53			.22	4-1	25/27		
0.5	.11	16-1	100							
0.5	.11	8-1	26/28							
	12	8-1	29/31							
	13	8-1	32/34							
	14	8-1	34/36							
	15	8-1	36/38							
	16	8-1	39/41							
	17	8-1	42/44							
	18	8-1	44/46							
	19	8-1	46/48							
	20	8-1	48/ND							

-15-87 Alamo Lake.

7-15-57 Mine Neutron meter Calibration - 55" 150

S: Pb 221 $N_0 = 3.54 \times 10^7$ @ 7/13/57 Eff = 84.7% 14

$N = N_0 e^{-\lambda t} = (3.54 \times 10^7) e^{-\frac{.693}{140} 6}$ $\left[\frac{.693 \times 6}{140} \times 10\right]$

$= 3.54 \times 10^7 e^{-.0297} = 3.54 \times 10^7 \times .970 = 3.48 \times 1$

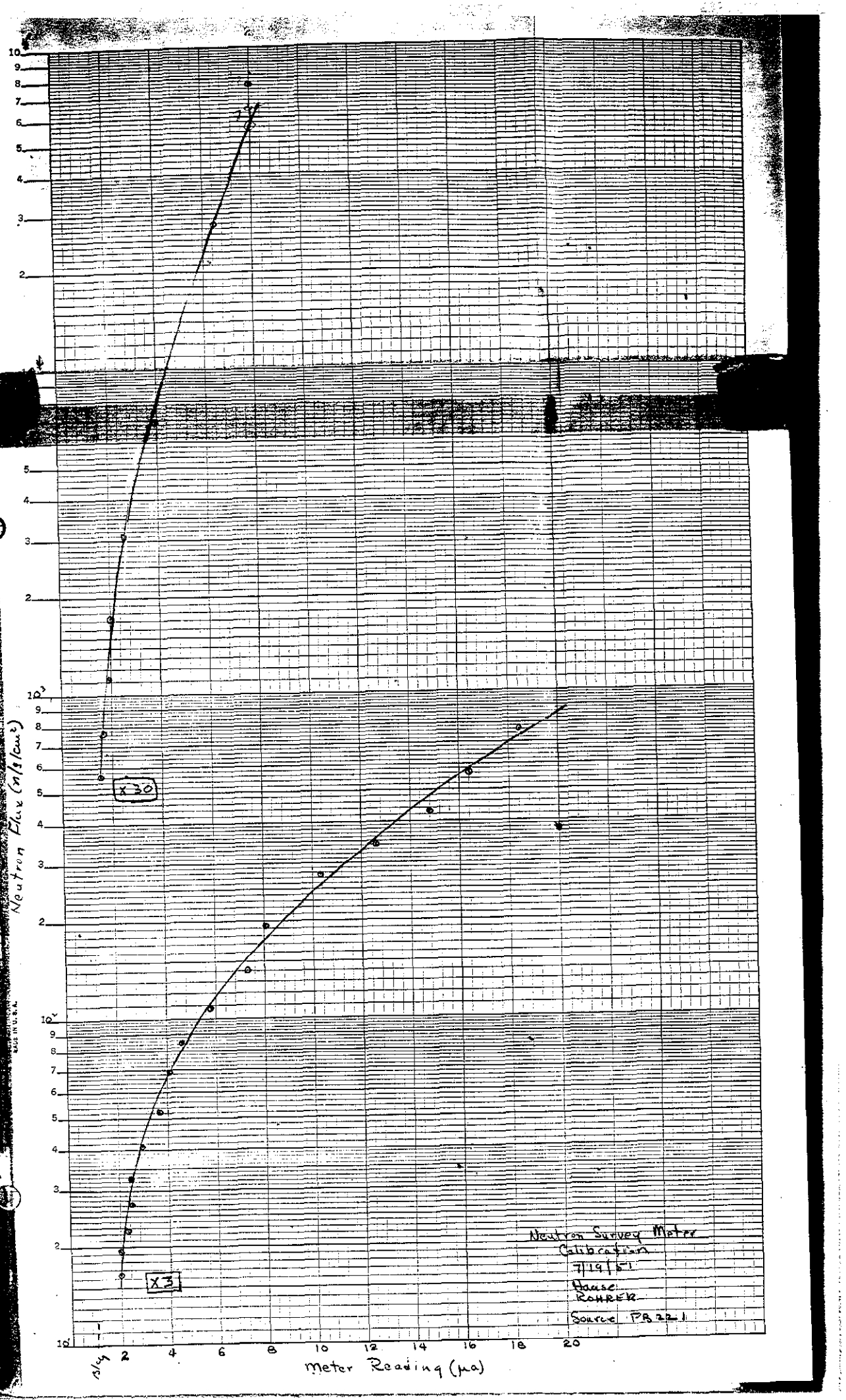
$A = \pi R^2 = 12.57 r^2$

$Flux = \frac{N}{A} = \eta_{Source} = \frac{3.48 \times 10^7}{1.257 \times 10^1 \times r^2} = \frac{2.77}{r^2} \times 10^6$

Counting x3 x30	r(cm)	r^2	Flux (eq)	Flux (value)		
8	6 (1)	36×10^1	$\frac{2.48 \times 10^6}{3.6 \times 10^1}$	$.967 \times 10^5$	9.67×10^4	(316 7.64
6.5	10	1.00×10^2	$\frac{3.48 \times 10^6}{10^2}$	3.48×10^4	3.48×10^4	2.77
3.9	20	4.00×10^2	$\frac{2.48 \times 10^6}{4 \times 10^2}$	$.87 \times 10^4$	8.7×10^3	6.9
2.6	30	9.00×10^2	$\frac{3.48 \times 10^6}{9 \times 10^2}$	$.387 \times 10^4$	3.87×10^3	3.0
2.0	40	1.6×10^3	$\frac{3.48 \times 10^6}{1.6 \times 10^3}$	2.17×10^3	2.17×10^3	1.7
1.9	50	2.5×10^3	$\frac{3.48 \times 10^6}{2.5 \times 10^3}$	1.39×10^3	1.39×10^3	1.1
18.5	1.7	60 3.6×10^3	$\frac{3.48 \times 10^6}{3.6 \times 10^3}$	$.966 \times 10^3$	9.66×10^2	7.
16.4	1.6	70 4.9×10^3	$\frac{3.48 \times 10^6}{4.9 \times 10^3}$	$.710 \times 10^3$	7.10×10^2	5
14.8		80 6.4×10^3	$\frac{3.48 \times 10^6}{6.4 \times 10^3}$	$.544 \times 10^3$	5.44×10^2	4
12.6		90 8.1×10^3	$\frac{3.48 \times 10^6}{8.1 \times 10^3}$	$.430 \times 10^3$	4.30×10^2	3.
10.3		100 1.00×10^4	$\frac{3.48 \times 10^6}{10^4}$		3.48×10^2	2.
8.1		120 1.44×10^4	$\frac{3.48 \times 10^6}{1.44 \times 10^4}$		2.42×10^2	1.
7.3		140 1.96×10^4	$\frac{3.48 \times 10^6}{1.96 \times 10^4}$		1.77×10^2	
5.8		160 2.56×10^4	$\frac{3.48 \times 10^6}{2.56 \times 10^4}$		1.36×10^2	
4.6		180 3.24×10^4	$\frac{3.48 \times 10^6}{3.24 \times 10^4}$		1.07×10^2	
4.1		200 4.00×10^4	$\frac{3.48 \times 10^6}{4 \times 10^4}$	$.870 \times 10^2$	8.7×10^1	
3.7		230 5.29×10^4	$\frac{3.48 \times 10^6}{5.29 \times 10^4}$	$.658 \times 10^2$	6.58×10^1	
3.0		260 6.76×10^4	$\frac{3.48 \times 10^6}{6.76 \times 10^4}$		5.15×10^1	
2.5		290 8.41×10^4	$\frac{3.48 \times 10^6}{8.41 \times 10^4}$		4.14×10^1	
2.5		320 1.024×10^5			3.40×10^1	
2.3		350 1.225×10^5			2.84×10^1	
2.0		380 1.444×10^5			2.42×10^1	
2.0		410 1.681×10^5			2.07×10^1	

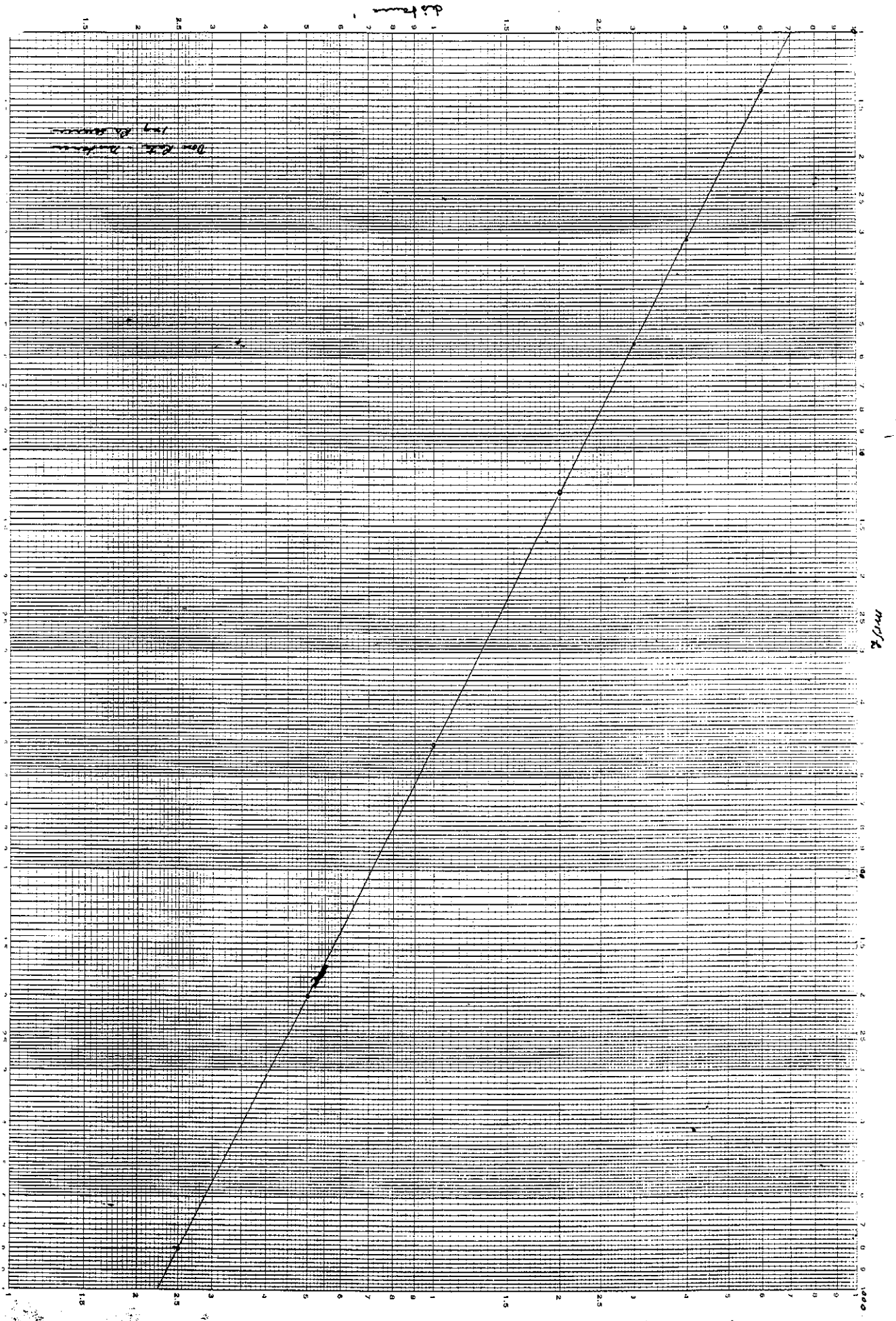
Plug 1/1

calibration outside vessel.


Neutron Flux (n/s/cm²)
Meter Reading (μa)
x30
x3
Neutron Survey Meter
Calibration
7/19/61
Hause
Rohrer
Source PB22-1

NO. 3400-L23 DIETZGEN GRAPH PAPER
LOGARITHMIC
2 CYCLE X 3 CYCLE

EUGENE DIETZGEN CO.
MADE IN U. S. A.



7-16-57 Neutron Meter Calibration — $\frac{N}{N_0} = e^{-\lambda t}$

Sources: Sb^{124} $10.12 \pm .56$ 8.87×10^6
7.88×10^6
16.75×10^6 n/s

$t_{\frac{1}{2}} = 140$ d $\quad 2 = e^{\lambda 140}$

$.693 = \lambda 140 \quad \lambda = \frac{.693}{t_{\frac{1}{2}}}$

10/12/50 – 7/18/57 = 2561d $\quad \frac{279}{2561}$

$N = (16.75 \times 10^6)(e^{-\frac{.693}{140} \times \frac{279}{2561}}) = 4.19 \times 10^6$ n/s

$A = 4\pi r^2 = 12.57 r^2$

Flux n/cm²/sec $= \frac{N}{A}$

$N = 4.19 \times 10^6$

$\text{Flux} = \frac{4.19 \times 10^6}{12.57 \times r^2} = \frac{3.34 \times 10^5}{r^2}$

	r (cm)	r^2	N/s/cm²
A:	10	100	3.67×10^3
	15	225	1.63×10^3
	20	400	9.17×10^2
	25	625	5.87×10^2
	30	900	4.08×10^2
	40	1600	2.29×10^2
	50	2500	1.46×10^2
	60	3600	1.02×10^2
	70	4900	7.49×10
	80	6400	5.74×10
	90	8100	4.63×10
	100	10000	3.67×10

Bkg 1,1

7/19	r	r^2	Flux	Meter x3	x30
	10	100	3.34×10^3	—	2.9
	15	225	1.48×10^3	—	2.1
	20	400	8.34×10^2	19.7	2.0
	25	625	5.34×10^2	17.0	
	30	900	3.71×10^2	16.0	
	40	1600	2.08×10^2	12.5	
	50	2520	1.33×10^2	10.5	
	60	3600	92.8	8.5	
	70	4900	68.2	6.9	
	80	6400	52.2	6.4	
	90	8100	41.2	5.7	
	100	10000	33.4	4.8	

calibration in 210

10 w. ½ emitted.

9-19-57 G. Short calc - 3×10^{11} ϕ/s = 3×10^{11} n/s

$$\text{Flux} = \frac{3 \times 10^{11}}{4\pi r^2} = \frac{3 \times 10^{11}}{1.26 \times 10 \times (8.55)^2 \times 10^6}$$

ϕ = 85'

85 x 30 cm

Σ = 50

$$= \frac{3 \times 10^{11}}{1.26 \times 6.15 \times 10^7} = .387 \times 10^4 = 3.87 \times 10^3 \text{ n/s/cm}^2$$

Gamma Sens check xo sight to 5 mm Ra @ 6 cm.

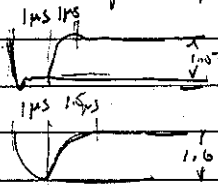
Cadmium shield - xo change in readings.

7-31-57 2 fold Lund counter - 1 HV Xfmr Burndown
2x2 A checks OK. -
3C53 checks bad -
Noted large collection of bugs in unit, many at HV. points.
Removed xfmr, Halldorson P19328
8-9-57 Replaced xfmr - coated HV. receptacles with plexiglas dope to insulate against future bug shorts.
In checking found HV. did not adjust. Checked divider current. Noted 10 Meg Ω resistance from filament of 2x2A to ground. 2x2A replaced. (There was 10 MΩ ~~leak~~ between 1B4 and 3 [illegible] which was used as terminal for 3C53 filters in unit) OK.

C_1 - C_2 Linear Amplifier Voltages & Waveforms

Linear Amplifier - characteristics

Waveforms Input: 1μsec, neg., .05V, repeate 2kc -



Input

Grid 3rd stage

Plate 5th Stag

- Output Source - (cath.)

Voltages: Simpson: B+ to amp strip 300 v

Reduced B+ 225 v

6SJ7	E_{s1}	77	E_{p1}	96	E_{k1}	1.7 v.
6SH7	E_{s2}	112	E_{p2}	40	E_{k2}	10.10 V
6SA7	E_{s3}	179	E_{p3}		E_{k3}	42
6SG7	E_{s4}	103	E_{p4}	185	E_{k4}	1 v.
6AG7		116		36		
6AC7		300 v.		42 v		
6SN7	g_1	4_2	P_1	210	k_1	46
	g_2	130	p_2	300	k_2	140

Ripple a 300 v point 2 1/2 cm amp gain x100 att 1

30 $C_1 - C_2 - C_3$ Reproducibility of Count Check: 11-1-57

A.M.: C_1: Met-Lab head here.

C_2: GE head in paraffin. Two minute counts

C_3: Met-Lab head in paraffin.

C_1 scaler	C_1 count	C_1 c/m	C_2 scaler	C_2 count	C_2 c/m	C_3 scaler	C_3 count	C_3 c/m
17^{61}	1149	574.5						
19^{34}	1250	625						
18^{26}	1178	589						
18^{19}	1171	585.5						
18^{52}	1204	602						
19^{40}	1256	628	72^{17}	2812.5		33^{37}		1074.5
19^{42}	1258	629	68^{51}	2201.5		32^{5}		1026.5
19^{05}	1221	610.5	67^{09}	2153.5		32^{11}		1029.5
19^{34}	1250	625	70^{10}	2245.0		32^{19}		1031.0
18^{13}	1165	582.5	68^{10}	2181.0		32^{32}		1040.0
Avg:		605.1		2218.7				1040.3
max dev:		-30.6		+93.8				+34.2
% dev:		5.1%		4.3%				3.6%

P.M.: C_1: GE head in paraffin

C_2: Met-Lab head here

C_3: Met-Lab head in paraffin (unchanged)

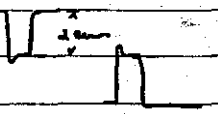
C_1 scaler	C_1 c/m	C_2 scaler	C_2 c/m	C_3 scaler	C_3 c/m
43^{7}	1377.5	28^{43}	917.5	33^{34}	1073
44^{37}	1426.5	28^{44}	918	33^{12}	1062
44^{43}	1439.5	28^{43}	917.5	33^{38}	1073
44^{49}	1400.5	26^{09}	836.5	33^{17}	1064.5
42^{57}	1370.5	27^{51}	889.5	31^{61}	1022.5
Avg	1402.9		895.8		1057.4
max dev.	+36.6		-59.3		-36.9
% dev	2.61%		6.62%		3.48%

12-13-57 Check 204-B LA. Characteristics

input: pulses from NICC pulse gen

input pulses negative - 1 μs @ 10^5 c/s

		main	diff
input Iv.:	scope gain X10 – 1	att x 1	2 mm
output:	scope gain X.1 - 1	att x 1	2cm



LA. .5, 2 μsec –

.8 μs

4 μs

Ra Source

50.0 mg/l 1.0 ft

12.5 mg/l. @ 2.0 ft.

6.25 mg/l. 3.0 ft.

3.125 mg/l. 4.0 ft.

.50 10.0 ft

1.3875 6.0 ft

200 .5 ft

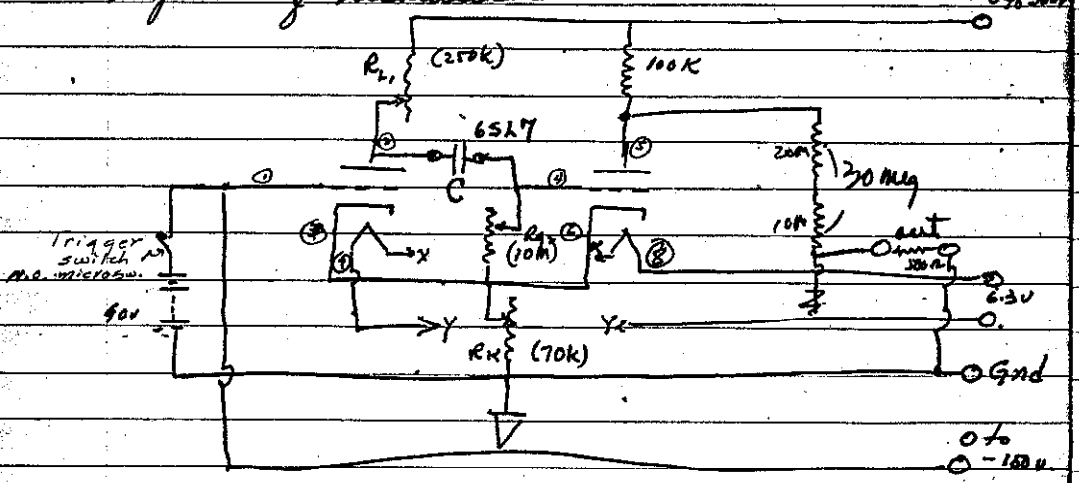
800 .25

12-20-57 RCL Rate Meter

operation checks with GM Tube

source dist		Ek	RM	Sc	Sweep	HV
2.5'	8 mr/h	.5	100 (x30)		5'	840
3.0	5.5	.4	80 (x30)		5'	840
2.0'	12.5	.65	135 (x30)		5'	840
1.5'	22.2	.93	180 (x30)		5'	(840)

2/52 Signal Generator, pulse type, for checking response of recorders -



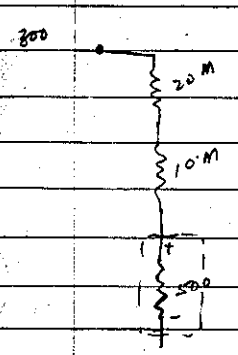
2/52 Checked HH Speedomax - using following set values for R-

R_{g_1} = 220k

R_{g_2} = 7.5 M

R_K = 10 K.

C C-D decade capacitor -



3-3-82 Poppy (K-25) - bkg check - no H.V. on cable.

counts/min (1m) =	Channel 1		Channel 2	
	5		4	
	3		5	
	2		7	
	3		3	
	5		1	
	0		2	
	0		5	
	4		8	
	2		2	
	2		7	
	120	Avg 3.0	144	4.4

Seems to be a difference between channels

Run voltage check - using Triumph DTM.

No pre-amp - cables still in.

Input receptacles: pin A out at common post selector switch 396v.

B at 1 & 2 270v

C 5.25 v ac.

D at sel. switch common 0.0 v.

VT 1	pin 3.5(K)	.56v	VT 2:	3.5	1.9v	
6SJ7	4 (G1)	probe connection 0.2v	6SJ7	4	0	
	6 (Sc)	26v		6	16.8v	
	8 (P)	38v		8	286	
	E_B	270v		E_B	295v	
VT 3:	3.5	0v.	VT 4	5(G)	-35 *	adjust for zero
6SJ7	4	0v	7050			
	6	18.4v				
	8	27.8v				
	E_B	295				

E_B values high: check to see if C_{15} & C_{34} are in ckt. Missing

put on pre amp checked pre amp voltages. at input recpt.

pin A 295

B 2.65 voltages too high for pre-amp

D 19.5

E 10.4

Calculations - current values:

Pre-amp: $I_{R_4} = \frac{19.5}{1.01} \times 10^{-5}$ 19.3×10^{-5} a. = .193 ma

$I_5 = \frac{5}{27} \times 10^{-3}$ .185 ma

VT 1: $I_{R_6} = \frac{5.6 \times 10^{-1}}{5.1 \times 10^2} = 1.1$ ma

$I_6 = \frac{270 - 26}{10^6} = 2.44 \times 10^{-4}$ a. .24 ma

$I_p = \frac{270 - 38}{2.7 \times 10^5} = \frac{232}{2.7} \times 10^{-3}$ .86 ma ✓ check

2-3-53 Pepping (Ge-25) - Mylar foil - 78 RPM - 1 cm/sec

Channel	Counts/min (5 min)	Channel	Counts/min (5 min)
1		1	
2		2	
3		3	
4		4	
5		5	
6		6	
7		7	
8		8	
9		9	
10		10	
11		11	
12		12	
13		13	
14		14	
15		15	
16		16	
17		17	
18		18	
19		19	
20		20	
21		21	
22		22	
23		23	
24		24	
25		25	
26		26	
27		27	
28		28	
29		29	
30		30	
31		31	
32		32	
33		33	
34		34	
35		35	
36		36	
37		37	
38		38	
39		39	
40		40	
41		41	
42		42	
43		43	
44		44	
45		45	
46		46	
47		47	
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65		65	
66		66	
67		67	
68		68	
69		69	
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75		75	
76		76	
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109		109	
110		110	
111		111	
112		112	
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115		115	
116		116	
117		117	
118		118	
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126		126	
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128		128	
129		129	
130		130	
131		131	
132		132	
133		133	
134		134	
135		135	
136		136	
137		137	
138		138	
139		139	
140		140	
141		141	
142		142	
143		143	
144		144	

Seems to be a difference between channels

Run voltage checks using Zomax strip.

no pre-amp - added still.

Input receptacles: from A and at selector switch 296v.

B 2.2 | 2 270v

C 2.2v a.c.

D Bank at switch common 10 v.

VT 1 pin 3 (K) 5.8v VT 2 pin 3 (K) 18.8v

6557 4 (G_1) probe cancellation 6557 4 0

6 (G_2) 26v 6 18.8v

8 (P) 38v 8 28v

E_b 270v E_b 295v

VT 3 pin 3 (K) VT 4 pin 3 (K) 35

6557 4 0v 6557

6 18.4v

8 27.5v

E_b 296

E_b values high; check to see if C_{35} & R_{34} are in ckt. Forgot to put in pre amp checked pre amp voltages at input receptacles

pin A 295

B 2.5 voltages too high for pre amp

D 19.5

E 10.4

Calculations - circuit values

Pre-amp. $I_K = \frac{19.5}{10^5} \times 10^{-3} = \frac{19.3 \times 10^{-3}}{10^2} = .193$ ma

$I_G = \frac{E}{R} \times 10^{-3} = .185$ ma

UT 1: $I_K = \frac{5.6 \times 10^{-3}}{5.1 \times 10^2} = 1.1$ ma

$I_G = \frac{270 - 26}{10^6} = 2.44 \times 10^{-4}$ amp $= .24$ ma

$I_P = \frac{270 - 38}{2.7 \times 10^5} = \frac{232 \times 10^{-3}}{2.7} = .86$ ma ✓ check

Current calculations —

Current thru R_1 : $\frac{25}{24} \times 10^{-3} = 1.04$ ma check

VT 2: I_{R11} : $\frac{1.9}{1.5} \times 10^{-3} = 1.3$ ma

I_{R8} : $\frac{2.93 \times 10^{2}}{10^{5}} = 2.9$ ma re check ?

$I_{T(R_9)}$: $\frac{9}{2.7} \times 10^{-5} = 33$ μa

$I_{R,10}$: $\frac{16.8}{68} \times 10^{-3} = .25$ ma

I_{R+1} : $\frac{295 - 17}{10^{6}}$: $\frac{2.78 \times 10^{2}}{10^{6}} = .27$ ma } check ✓

VT 3: $I_{\_}$: $\frac{295 - 18}{10^{6}}$ $\frac{2.77 \times 10^{-4}}{} = .277$ ma

I_p : $\frac{295 - 27}{2.7 \times 10^{5}}$ $\frac{2.68 \times 10^{-3}}{2.7}$ Ω / ma

1.1 + .2 + 3.0 + .3 + .3 + 1 5.9 ma

295 − 200 95V

Inverted R_{3K} & C_{1K} :

Voltage readings:

Input receptacle A (ctw) (252 v)

B 226 V

C 5.3 AC

D ctw 21.0 V

E 13.0 V

VT 1	3,5	.47	VT 2	3.5	1.54	VT 3	3,5	0
	4	-.2		4	0		4	0
	6	23.5		6	13.4		6	16.4
	8	32		8	23.3		8	23.4
	B	226		B	244		B	244

VT 4	5	-35
	3	295
	B	297

$.2 \times 10^{-3} \times 500 \times 10^{3} = 100$

Ep preamp (1700v) Putnis dropping discriminator for pre-amp (2.7 v/c . 1 μf).
Bkg still rather high

3-4-82 Shunted R40 .68 Meg with .39 Meg to reduce sensitivity. Seems better operating @ 2800 v (meter lower vert). Plunged scaler in for check of bkg & sample counts.

Time	Sample	Scaler	Count	Rate	
3m	Bkg	0 12	12	4 c/m	
"	99	3 10	58	19.3 c/m	4.35
"	Bkg	0 14	14	4.7 c/m	4.87/1
"	99	4 4	68	22.7 c/m	21.0
1m.	516	5 1	81	81 c/m	
"	"	5 12	92	92 c/m	87.3 c
"	"	5 9	89	89 c/m	20.07/1

Some of 20s counts:

Bkg	99	516
4	7	30
1	8	30
1	13	25
1	7	32
0	4	25
1	5	22
3	3	33
2	8	24
2	7	25
3	8	21
18	71	282
Avg 1.8	7.1	28.2
	3.44/1	15.67/1

Bkg · 10 m : 3444 43 4.3 c/m > 5.49/1
99 " : 1812 236 23.6 c/m

next page

3/4 Check on rate switch - scale connection removed.
cycle. 99% sample for 15 sec. (max. reading needed) 15 sec wait - note blkg for 15 sec (note max) 15 sec lag.

s 15	s 34	s 11	s 18	
b 5	b 8	b 8	b 5	
s 9	s 20	s 10	s 20	
b 2	b 5	b 5	b 8	
Σ_{20} s = 363 s_a = 18.15 s 22	s 24	s 24	s 30	
Σ_{20} b = 117 b_a = 5.85 b 5	b 5	b 8	b 5	
3.10/1 s 24	s 17	s 14	s 17	
b 2	b 8	b 2	b 7	
s 13	s 12	s 24	s 35	
b 7	b 5	b 10	b 7	

Cycle sample 20, blank 20, blkg 20 (sec).

s 34	s 27	s 21	s 23	s 26
b 8	b 7	b 12	b 7	b 10
s 24	s 29	s 16	s 23	s 17
b 10	b 5	b 10	b 5	b 8

Σ_{10} s = 240 s_a = 24.0
Σ_{10} b = 82 b_a = 8.2
} 2.92/1

Above readings taken with chassis on work bench. — Placed in dolly, panel up chassis vert.
Excess blkg - again noted — change of one above. hard to detect 100 c/m. — Still needs work - if to be used in cart. Ok on horizontal surface chassis mounted OK.—

3/11/52 Old model Boggy - same as on previous pages - Mounted in support with panel up (as cast.

(a) low v. am. - hot probe connection - scales tied to output - cover plate removed
Check on btg. under above conditions. Sm. 2+16+1 = 33
1+16+14 = 30

(b) same as (a) with HV cable attached : 1+16+12 = 29

(c) same as b with lv. cable attached. 4+16+13 = 77

(d) removed probe and lv. cable. 4+16+4 = 84

(e) repeat of b : 2+16+3 = 55

(f) repeat of c : 4+16+4 = 68

(g) same. HV on. 4+16+15 = 79

lb 99%m 3+16+15 = 159

cs 52% 29+16+0

Voltage readings - Kenyon panel with HV: 2650 ±

Input receptacle A 132 v
B 12.5 v
C 6.12 v AC.
D 28.5 v.
E 25.2 v.

	VT1	VT2	VT3	VT4
	3.5 .47 v.	3.5 1.58 v	3.5 ?	5 -12.2 v
4	-.15 v	4 0 v.	4 -.24	3
6	23.5 v	6 14.7 v	6 14 v	8
8	24.6 v.	8 25.3	8 27 v.	
A	22.6 v.	A 25.5	A 25.3	

3-12-52 Poppy Servicing -

Early morning checks showed 1P poppy in Jan shape good for 500 # more for same.

Poppy (K-25) responding to oppenheim pulses - shielded whole under side of chassis.

4-4-52 Log N amplifier check

Cal. at ORNL setting —

c-c 16½" sm d.h. (16½) pp, reading .0022

small d.h. .0027

Lead house reduces radiation by factor of 2, with lead brick as P shield. Found change in power from .001 to .002

Chamber 2½' from d.h. opening.

(2½')

d.h. (center) ⊙

Source @ p.p.	
in d.h	.00042
27"	.0012
18"	.002
13½	.003
7½	.007
6½	.009
5½	.011
0pp	.018

Chamber 600 V on

Source "in"	having to run	
4"	from	.02
6"		.012
8"		.010
10"		.007
12"		.0055
14"		.004
16"		.003
20"		.0023
25"		.0018
30"		.0012
35"		.00085
40"		.00070
45"		.00062
d.h.		.00049
		.00032

3000 V — .017 max.

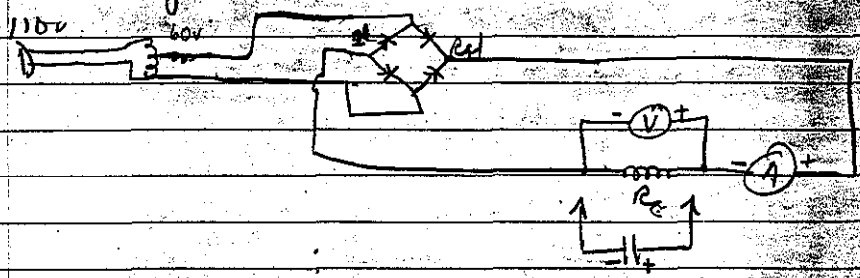
4-17-52 Rectifier for relays.

Act: Fansteel BE304m -80v 4a -

1 Leach relay 2128 R_c = 540 Ω

R_c of other type is same -

bridge ckt. 1 - 2:1 step down 280w Hem



V = 46 v
A = 82 ma
} no filter capacitor

18 relays in panel -

$18 \times .82 \times 10^{-1} = 14.77 \times 10^{-1} = 1.477$ amps

30 Ω. 48 v. 1.53 amps -

$2.25 \times 30 = 76$ K

Toma/n @ 310 ℉

4-18-52 1210 - Setup as above diagram with R_c equiv of 30 ohms. Fan cooling transformers

V = 40.4 v

A = 1.25 A

1210 off - { V 40.8 / A = 125 }

5-9-52 Neutron Detector Racked – For RCR-RLM

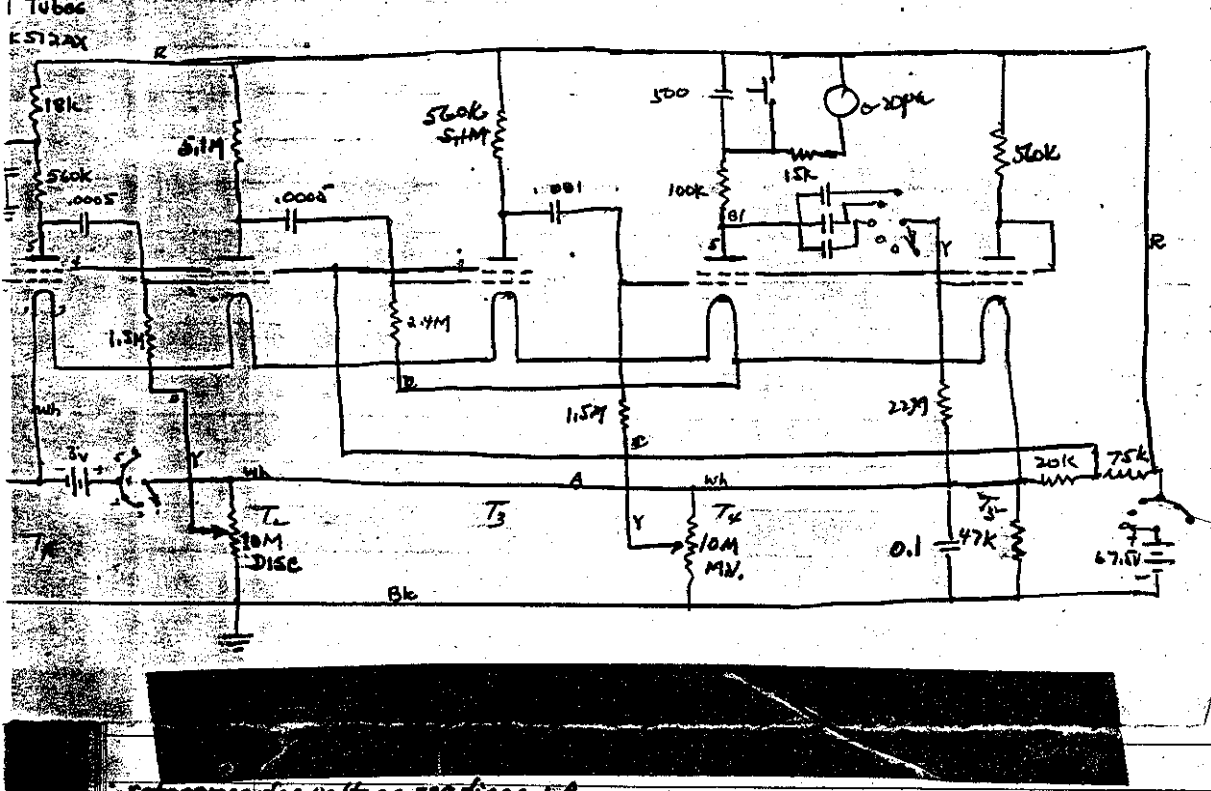
1. MV adj. counter clockwise full bias
   Det. counter clockwise full bias
   MV bias: 22.40.
   bias reduced to free running point 2.39 volts
   then turned back & set at 2.50.
   meter rises on bias setting no change in room.
   400.
   3.7 begin to get a pulse or pile up pulses
   3.4 point up 1-count
   Mercury – To be taken up later.

1-9-52 Vibrating Reed Check:

1. Output noise - OK
2. ~~Output Noise~~ - 100 sec. ΔV .46 - .40 mv .06 mv
   Drift. Rate { drift rate .0006 mv/sec
   100 sec .40 - .42 " .0002 mv/sec
3. Contact Potential - -
4. Unbalance - -.2 mv. OK.
5. Over-all Gain Check -
   Test - .21 mv Ans. .11 mv

5-9-52 Ion Chamber Sensitivity - .45 with R_{in} = 495 meg.
O.S. - 4900 Meg.
4900 Meg has high α value.
495 / 440

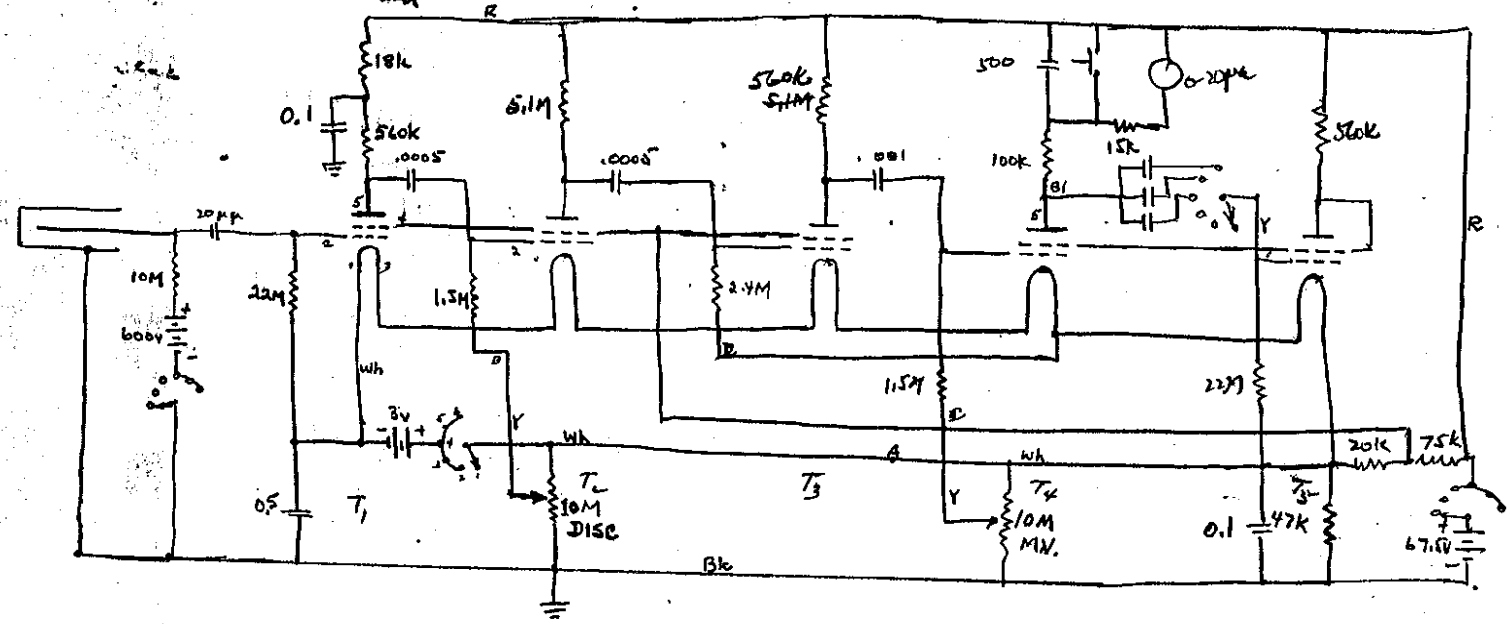
5-28-52 Circuit Check on n-survey meter -
sketched circuit from photostat of write-up. Noted
[illegible]



Reference for voltage readings : A.
Switches - 2 T_{1-1} -3.92 T_{1-3} -1.33 T_{2-3} -1.24 T_{4-3} -.61 T_{5-3} 0
T_{1-5} -2.37
not A-thread across half.
200 - 61 fil 2.94 Ia 68 H.V. 600
back to FA.

Sw #2.	T_{14} & 2	T_{21}	-2.25			T_{3-1}	1.8
	T_{15} 25.5	T_{22}	-28.0	D max	-3.25	T_{3-2}	-1.88
	T_{12} -3.4		-28.4		-3.30		
	T_{11} -2.9	T_3	40.7	1:1		T_{3-5}	-1.0

All Tubes
CK512AX



5-28-57

	MV Mon i'	MV Cond ii'		i'	ii'
$T_{4,1}$	-1.23	—	$T_{5,1}$	-.58	—
#2 C	-22.8 -23.J	-1.26 -7.8	$T_{5,2}$	-1.08	-1.86
#4	11	13	$T_{5,4}$	11	13
#5	11	27.8	$T_{5,5}$	11	13

T_1 amp incr. input V 1.2 1.05 A
T_2 disc 2.2 A 2.5 V
T_3 inv 2.2 V 2.5 A
$T_{4,5}$ MV.

* Just in case.
recheck of gain in ambient light

$T_{1,2}$ -3.7 $T_{4,2}$ 24.9 $T_{3,2}$ -1.96 $T_{4,2}$ -22.7 $T_{5,2}$ -1.2
$T_{1,1}$ -2.98 A 24.5 B -.58 D -23.4

T_3: 1-3 .6v. T_1 ref 2 -.82v
2 -.78v 3 -.63v
5 (v.)

HV - discrim.

-4.

Suj - 6.2 1μs 60v

8

Observed oscillation on T_3 -3 when discr set to give counting 1v pulses. T_3 removed (gain 2.5 V.) Replaced T_2 - new tube behaved similarly.

Tube not supplying grid neg plate neg by observing scope trace. Changed plate resistance to 560k input in new cct capacitor - fell this cut out internal oscillation. Operation seems to be improved.

Put patch leads on top side of Cat. Discr control & read discrimination volts. Meter in Konyo to place - Adjusted -

4 MV adj. (Discr at max bias)
turn clockwise until meter indicates free-running mv. ii back off so as to stop meter deflection (may get ≤0.5 μa deflection with proper adjustment.)

B. Discriminator -

5-28-52 Routine survey check-up. — adjustments —

B-discriminator:

i - turn clockwise til "background" causes meter reading.

ii back off to level repeating "bkg." (reading ≤ 1 μa)

Disc bias meter x3

max ~23 volts

@ 3.75 volts 1.0

with source in position ~ 15 μa

named Disc.

to o.s. more sensitive

MV adj. 2.6 v bias

disc 42.5 v reproduc. reads 15 μa at ~3' (R3)

4.5 v.

2 x 300

3 x 30

6-3-52 Continued check. Source not in room (in paraffin rm 201 wing)

Re-check of MV point. Found ~2.52 v bias set @ 2.6 v.

With disc. field in (max. bias) meter reads ~.2-3 μa.

Attached voltmeter to discriminator post.

max 24.2 v.

drift up @ 4.05 v. drift increases as down lower —

5 22 : runs 4.05 - 4.15 as min point in checking in presence of source

disc. set at 4.5 v:	source bkg.	meter	scale	source	meter	scale	disc.
19.35	100 cm	.25 μa / -3.5	-3	2640 15	3.2	30	4.5
36.4	150 cm	2 μa 2-5.5	3	5950 10	5.1 /	30 300	4.5
38.1	125 cm	4 μa 2-7	3	~912' source in paraffin	.8 3-7	3 -	
59.5	100 cm	3 μa 4-9	3	180	4.5	3	4.25
93	80 cm	5.5 5-10	3	130	5.5 3-10	3	
140.7	65	7.5 7-12	3	125	8.5 6-12	3 30 300	
238	50	10 10-14	3	100	10 8-12	3	
372	40	12 12-18	30 3	80	13.5 10-16	3 30-100	
484	35	14-11 16	30 3	65	15 12-20	3 30 1.5	
661	30	1.5 30 1.15	30	50	0.5 c.	3 30 1.45	
952	25	2.1	3 30	40	2.0	30	
1478	20	2.1	30	35	2.6	30	

source	meter	scale	desc.
30	2.5	30	4.2#
25	2.8	30	4.2#
20	4.2	30	
	1.3	300	
15	8.9	30	
	9.0	20	
10	1.9	300	
	2.0	200	
6	1.6	30	4.2.
*180	1.25	3	4.25
*150	1.50		
*125	2.0		
100	2.5		
* 80	3.5		
* 65	4.0		
50	5.0		
40	6.0		
	10.0		
30	~~5.0~~		
20	16.0	3	
	1.5	30	
10	2.2	30	
	0.5.	3	4.8
10/20 impossible			4.05
180	4-6 5.0	3	
150	3-9 6.0		
125	12-15 8		
100	6-12 10 13-17	3	
80	1.0	30	
	1.2	30	
65	1.5	3	
50	9.5	3	
	2.1	30	
40	2.4		
30	2.4		
	2.5	300	
20	6.0	30	
	2.0	200	
10	12.2	30	
	16.3	30	
6	5.0	300	
40	1.5	3	4.5 ✓✓

Wkg - 0.3 μa. 4.5

drift pt. 3.9.

desc 5.0

s
20. 10.0

30 5.0

desc 5.5

30 0.3

20 0.3 — cut off

cut off point.

s@10. desc. very close to 5.5

responds @ 5.4

to source.

source Pb 221 @ 2s

7/13/51 $N_0 = 3.59 \times 10^7$ 14.83 c.

$N = N_0 e^{-\lambda t} = N_0 e^{-\frac{.693}{140} \times t(32\text{d})}$

$N = 3.59 \times 10^7 \, e^{-.693 \times \frac{32\text{d}}{140}}$

$= 3.59 \times 10^7 \, e^{-1.59}$

$= 3.59 \times 10^7 \times .208$

$= 7.47 \times 10^6$

Flux $= \frac{N}{A}$ $A = 4\pi r^2$

$= \frac{7.47 \times 10^6}{12.57 \, r^2} = \frac{5.95 \times 10^5}{r^2}$

r	$4\pi r^2$	F
*180	3.24×10^4	1.835×10^1
150	2.25×10^4 (140: 1.96×10^4)	2.64×10^1 (5.02)
125	1.56×10^4	3.81×10^1
100	10^4	5.95×10^1
80	6.4×10^3	$.93 \times 10^2$
65	5.23×10^3	1.137×10^2
50	2.5×10^3	2.38×10^2
40	1.6×10^3	3.72×10^2
35	1.23×10^3	4.84×10^2
30	9.0×10^2	$.661 \times 10^3$
25	6.25×10^2	$.952 \times 10^3$
20	4.0×10^2	1.487×10^3
15	2.25×10^2	2.64×10^3
10	10^2	5.95×10^3
6	3.6×10^1	1.65×10^4

	D	41 m	42 D	42 m	43 D	43 m	4.4 Dm	4.5 M
4K 1833	160	3.5"	4		2.5"		2	2.5"
30.3	140	7	8		5		4	5
585	120	8	12.5"		8		6.5"	8
53	80	12	17.5"		11		9.5"	7.5
238	50	15.	0.5.		19		16	13
372	40				25		0.5	15.5"
661	20							0.5.

Drawn across hill Rm 2/12

In checking Marck C.F. → (Head noted in B; on range, signal drop off at v≤1100 v.)

6-19-52 Photomultiplier Testing:

(A) 5819 in closed cavern. (5.0 meg units in divider)

(B) 5819 in sample changer (10.65 KV)

High Voltage Supply - ship built

(A) Cascade - 10^6 Ω PB 221 resume near PM.

V	Sweep	Pattern
600	max sens.	½-⅔ cm
700	"	2-2½ cm
750	"	3
800	¼ att x2	2-3
850	"	3-3½
900	x4	3
1000		3½
>1100		signal over loads - no drop off.

Pattern appears to be satisfactory

(B) R_L 10^6 Ω

600	max sens	3½
700	x8	1½ - ¼
750	"	1⅔
800	"	1¾
850		2 Tending to overload.

(A) 10^7 Ω R_L pattern saturates 10^3 v > 1000 drops off 4-5 lower bound pulses.

(A) 10^5 Ω R_L operates off up to v/1000 v. pulses much subsiter

6-20 - Alarm Circuit Check - applied bias to input (5 meg) res. Battery connected across resistor. read panel meter, & voltages on grid of 6SJ7 & on grid of 2050.

Bias:	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1.0	Trip 1.04
6SJ7 Plate	45	53	61	69	77	85	93	103	111	122	130	132.5
2050 Grid:	-98	-83	-75	-67	-58	-50	-42	-32	-25	-13	-4.5	-2.5
meter	.82	.80	.794	.76	.735	715	.694	.665	64	.625	.60	.58

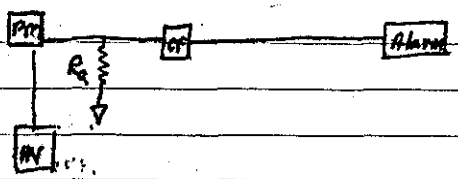
~~reading taken~~ bias varied by changing sens. control

6-20-52. Second Run. Bias externally varied. Sensitivity at maximum.

											trip.			
Bias	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1.0			
Plate I	46	58	61	70	80	89	99/102	112	117	125				
Grid 2 - 91	-93	-75	-66	-56	-48		37/33	-23	-17	-10				
Meter	.82	.80	.78	.758	.728	.705	.67/.68	.64	.625	.606				

* scale change 62

Circuit.



Photomultiplier: 5819 + anthracene. Bleeder 5 meg a watt in divider.

Voltage range for $R_a = 10^6\Omega$ 900-950 v.
5819 with bleeder of 10 megs
Range for $R_a = 10^6\Omega$ 700 - 900 volts.

When one of two tubes is to be changed without changing socket connections:

6-23-52 Tested on HV L.T., cf. L.T., Vary of PM-1 Electron alarm.
Meter reading on alarm not rise above 20 % 1800.
When all power in on system, alarm on without changing setting.
Operating range 750 - 1000 volts.
Meter light back from socket.
Light shielded partially from arm range 750 - 1200.

Changed divider on (A) (Now 4 meg & 8.2 meg.)
very sensitive to B.
Range 750 - 950 v.

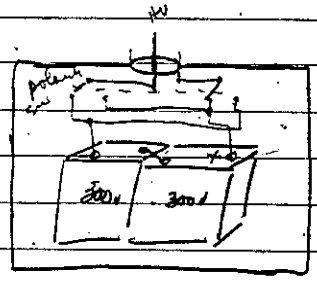
6-24-52 Mounted cathode follower on PM head.
Tested operating range with 100' HV line,
in original (use 62 H) & use is voltage supply.
Range from 800-1200 volts. Could operate
up to 1300 & above but safe range is 800-1200
Left HV at 1200 to see if false beam runs.

6-25-52 Response time check.
source in block in test dig.

Drop time (sec)	High Voltage	Total Time
.41		
.468	900 v.	.485
.412		.478
change L.S. .405		.478
.404		.468
.404	1050	.445
.413		.444
.413		.440
at source distances 9"&W from threshold	1150	.444
source carrier		.428
3" from PM base		.424
last N 2½"		.428

7-2-52 Power failure - Replaced 45V batteries (4) in DC-3
others batteries check O.K.

7-22-52 Log N chamber - battery box



Log N works on + polarity

7-23 Made up battery box for rect - neg. 600v.

7-28-52 RCL rate meter not reading on meter - to shop for servicing & relocation of recorder & scaler jacks.

RCL rate meter

Back to shop - worked after removing & checking tubes - all good. Left on for while stopped.

7-29-52 Instrument on L.V. & calibrated - checked with 600 neg pulses 1/sec & 4 v. peak. OK. - Traced signal for reference.

OK. 0917 - OK 1205 130 P. on Channel #1

9-30-52 Relocated recorder & scaler outputs - on log 6 chassis behind meter -

Scaler - coax receptacle

recorder - phone plug

1220 power on.

1223 60v 1μs, 4v neg. pulses in, switched 30-10: meter off scale & negative

back to +30 negative meter -

power off, then on, all N 15 sec. OK.

Took voltage readings when normal - Recorded in booklet RCL

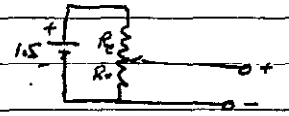
Voltage Changes noted when reading tubes:

		Good	Bad
V_6	1	21.4	36.5
	2	10.4	84
	3	23.8	36.5
	4	21.0	36.5
	5	10.8	83.5
	6	23.8	36.5
V_7	1	.01	22.8
	2	5.8	86.0
	3	21.9	22.8
V_5		OK.	OK.

With no signal - scale changes don't affect meter.
Changing from 100 → 300 O/C.
300 → 100 O/C
100 → 30 Bad
300 → 1000 bad
Selector switch opens - drives grid 9 V7B up.
8-11-52 Off-scale response noted when Hammond on.

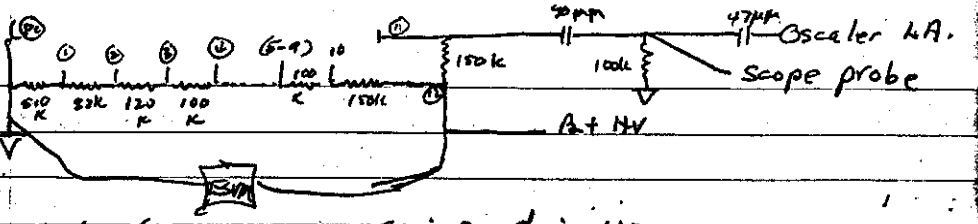
RCL
Rotometer

Brown Check — Signal input for test



~~$IR_c + IR_v = 1.5$~~ ~~$I(R_c + R_v) = 1.5$~~
~~$IR_v = .010$~~ $\frac{R_v}{R_c} = \frac{1}{1500}$ $R_c = 150R_v$
$R_v = 1000\ \Omega$, $R_c = 150{,}000\ \Omega$
Applied signal (D.C.) to Brown on DC-2. Recorder checked OK. Fed output of DC-3 into recorder. OK. Trouble seems to be in DC-2.

8-7/8 Hand Counter — Run 201 in test. Stop 9781 for servicing. Hi. voltage transformer had ~~burned~~ burned out.
Hand Counter — D.F.C. installed heater - Turned unit 8-8/8a
8-12-52 Cured off-scale response by replacing V_9.
RCL - RM. Could not zero. Proper choice of V_6 fixed this.
8-14-52 Installed RM in rack in 201 & tested. OK
9-2-52 Reactivation of B-γ scintillation counter project
Bγ Switch: (reference II pp. 228–249)
Voltage divider consideration:
Bell uses: ~~5:1~~, .82, .62, 1 ----- ~~$\times 10^5$~~ in note with
1.5 ~~$\times 10^5$~~ from test dynode to gnd.
negative H.V. supply
Wired tube socket as above:
Anode $R_{50} = 150$ k 50 μμf coupling & 100 k
output to scaler thru 47 μμf - oscilloscope on output. ESVM reading HV
Positive HV NICC 1090.



Scaler for 100 sec. gain 2 disc .25

HV = 700 60 × 256 + 135

61 × 256 + 179

59 × 256 + 113

0 × 256 + 116

0 × 256 + 144

9-4-52 Readings from instruments in 215.

End window counter: 1 Std: 2571 c/m 90.2/1

bkg: 28.5 c/m

2 Std: 3112 c/m 139/1

bkg: 22.4 c/m

For Reference 3 Std: 2698 c/m 107/1

bkg: 25.1 c/m

4 Std: 2570 c/m 95.7/1

bkg: 27.1 c/m

Proportional counter Std: 17780 c/m 250/1

bkg: 71.1 c/m

Tests on Pm. etc —

HV.	Source	Time	Scaler	Gain (dB) 1st 2nd	counts	Calc c/m	Sig/bkg	net-d
600	bkg	30 m.	40 [64] + 13	2 254	653	21.8	5.71	
	std	4	5 [16] + 2	"	498	124.5		702.7
640	std	2	179 [64] + 52	"	11508	5754	102.35	5700.4
	bkg	4	16 [16] + 12	"	268	53.6		
680	bkg	3	12 [16] + 13	"	205	68.3	135.67	9197.1
	std	1	144 [64] + 50	"	9266	9266		
720	std	1	183 [64] 8	"	11720	11720	162.3	11647.9
	bkg	5	22 [16] 9	"	361	72.2		
760	bkg	3	17 [16] 14	"	286	95.3	152.9	14477.7
	std	1	227 [64] 45			14573		
800	std	1	245 [64] 50			15730	145.6	15622
	bkg	2	13 [16] 8		216	108		
850	bkg	2	18 [16] 11		294	145.5	112.9	16283.5
	std	1	256 [64] 45			16429		
900	std	1	245 [64] 31			16491		16289.5
	bkg	2	22 [16] 3			204.5	80.62	

9-4-52

9-4-52 Running 1060 under other adjusting pressure - to accept smaller pulses applying detail from anode pm when 50μμ do inputs.

(WICC) (WSVA)

Hi-V & Mfr	Source	Time of Count	Scaler Reading	Gain Attn.	Gain Mic.	Total Count	c/m Rate	s/n bkg	Hi-V	Source	Time of Ct.	Scaler Reading	Gain Attn.	Gain Mic.	Total Count	c/m Rate	s/n bkg	net ct
900	std	1 m	263 64/16	56	2	+25 16484	16484	96.7	700	std	5 m	13			333	66.6	3.5	48.0
"	"	"	249	45	4	+25 15853	15853	127.8		bkg	"	1 29			98	18.6		
"	"	"	222	34	8	+25 14242	14242	176.3	740	bkg	"	2 48			191	38.2	41.3	1540.8
"	"	"	150	24	16	+25 9624	9624	212.9		std	1 m.	24 43			1509	1579		
"	"	"	37 16	61	32	" 2429	2429	134.9	780	std	"	101 6			6470	6470	197.7	6423
"	bkg	5m	5	10	32	" 90	18			bkg	5m	3 48			235	47.0		
"	"	"	14	3	16	" 336	45.2		820	bkg	5m	5 60			330	66.0	187.5	14171
"	"	"	25	4	8	" 404	80.8			std	1m	222 89			14247	14247		
"	"	"	38	12	4	" 620	124		860	std	1m	356 06			22789	22789	207.2	22679
"	"	"	54 16	9	2	" 573	174.6			bkg	2m.	3 28			220	110		
720	bkg	5m	35	10	1	" 670	134.0		900	bkg	2m.	4 60			306	153	182.9	26589
"	"	"	17	15	2	" 289	57.8			std	1m	112 70			28742	28742		
"	"	"	11	1	4	" 177	35.4		940	std	1m	126 15			32271	32271	154.6	32069
"	"	"	4	13	8	" 77	15.4			bkg	1m.	2 10			202	202		
"	"	"	2	1	16	" 33	6.6		980	bkg	1m.	3 10			202	202	168.1	33746
"	"	"	—	—	32	" —	—			std	1m.	132 152			33948	33948		
"	std	5m	0 16	2	32	" 2	0.4		1024	std	2m	263 119			33723	33723	152.6	33502
"	"	4m	2	12	16	" 44	7.33	1.1		bkg	1m	3 89			221	221		
"	"	1m	5 64	46	8	" 366	366	24.8										
"	"	"	97	48	4	" 6256	6256	176.7										
"	"	"	191	57	2	" 12281	12281	213.9										
"	"	"	238	64	1	" 15286	15286	134.1										
	"	"																

Above readings on hvd 1060 with lin. amp.

9-5-52 Made cover for PM  Receptacle
PM B Tube Brass sleeve to fit over 82-805 for HV.
lower cylinder 88-10 for output

P-C. grounded anode R = 150k 50μμf coupling & out.

HV AC	HV DC	Source	Time Count	Scaler Reading	Count	Rate	Net ct	Sig/bkg
650	670	std	1m.	5	18	338	338	
				4	25	281	281	
				4	13	269	269	
"	"	bkg		2	11	43	43	
		(Source in tray then out)		1	8	24	24	
				2	8	40	40	
700	720	bkg		3	3	51	57	
				5	2	82	82	
		std.		79	17			
750	770	std		172	6			
		bkg		1	42			
800	820	std		314	23			
		bkg		2	4			
850	870	std		103	39			
		bkg		7	9			
900	940	bkg		6	24			
		std		113	234			
950	990	std		108	184			
		bkg		5	20			
900		bkg		4	1			
900				4	28			
850				4	19			
800				2	12			
750				1	39			
700		std		1	7			ESVM disconnect
700	69	8	bkg 0	12	4424/52	85.1		
750	777	38	0	1	36	11366/104	1138	
801	311	29	0	2		19933/130	1513	Scale i
850	104	15	2	6		26639/134	1988	Scaler not
900	112	103	2	40		25775/148	171.3	responding
950	108	71	3	35		27719/227	122.1	as should
1000	98	247	1	48		25295/352	73.6	by low counts
								thereon ai.

Scaler on 400 scale to check stepping

9-5-52 adj. yes to stop stray counts.

850 bkg	1X64	+58	2½ m.	~~118~~ 122	118	
	1X64	+50		114	47.2 c/m	
880 std	165	34		105 9d		
	163	45		104 77	224/1	
	165	1		105 61		

9-8-52 Checked operation & Pen counter as left 9:30 a.m.

H.V.	Source	Counting Time	Scaler reading	Count	Rate	Sig/bkg	
9:00 A/m. 850	bkg	5m.	16/13 13	221	44.2	221.1	
	std	1m	64/158 44	9772	9772		
900	std	1m.	199 48	18784	12284	211.6	
	bkg	5m.	4 52	304	60.8		
950	bkg	5m.	6 52	436	87.2	170.8	
	std	1m	232 49	14897	14897		
800	bkg	5m.	16/8 4	132	26.4		
		5m.	8 7	135	27.0		
		5m	7 15	127	45.4		
			Average		26.2		
	std	1m	64/73 38	4710	4710		
			75 80	4830	4830	185.2	
			77 44	4972	4972		Avg 4852.6
		5m	382 49	24497	4899.4		
850	std	1m	155 38	9453	945		
			154 26	9882			
			151 40	9704	9819.2		
			152 19	9747			
			153 18	9810		222.9	
	bkg	5m	16/15 4	244	48.8		same
			12 15	207	41.4		
			13 3	211	42.2		
					(44.1)		

Discriminator knob (yes' set) so low test not counting — too fast

2:20 P 850	b	5m	16/13 0	205	41.6	

9-8-52 Adjusted gen set for proper 60v operation ~~of~~ of scaler - Higher voltage than required for PM operation

H.V.	1075	1100	1125	1150	
	5[16] 113	2[16] 8	3[16] 9	4[16] -5	
bkg	45c/m	40c/m	57c/m	69	One minute
	1026[64] -35	1366[64] 61	1165[64] 31	1806[64] -13	counts - all
Std	6563c/m	8765	10591	11533	
S/b	< 200	219	< 200	< 200	

One minute check at 1100.

bkg 10^{16} - 10 170c 34 c/m 2.5c/1

std 680^{64} - 23 8708.16 c/m

9-9-52 0819 5 min bkg. 13^{16} - 1 209c 41.8 c/m .212/1

0827 1 min std 138^{64} 57 8889 8889 c/m

0847 10 min bkg 26^{16} - 1 417c 41.7 c/m

9-9-52 Constructed pre-amp & got with PM - 3:00 PM

Test.

900 v	s	140^{64} - 47	b 3^{16} 8	56
750		201^{64} 44	4 12	76
800		190^{64} 4	0^{64} 63	63
950		212 39	1 34	
900		241 42	1 38	
750		75 42	0 34	
800		170 19	0 58	

Repeat test to pre-amp unshielded - picking up - okay. PM thoroughly shielded

9-9-52 Final counts @ 800v with pre-amp (unshielded)

400 P s 211 [64] +33

b 1 +8

1 +20

9-10-52 0810 s 321 50

1 16

Timing	Voltage Range			Plate Amp.	Output Ampl.	P_1			R_2 (pins)			G_1 (pins)		G_2 (pins)		Cathode (pins)		*Reset	Output			Unmap	Simpson						
	1μs	10μs	100μs			pulse	off	on	pulse	off	on	on	off	on	off	on	off		Out	off	on	R_4	R_5	R_6	R_1	R_2	R_3	R_4
	5.1 —	5.2 —	5.1 —	19.5	26	207	278	136	209	137	277	63.5	38	31.5	24	64	62	69	273	257	270	13M	600K	40K	100K	33K	75K	1.5M	500K
	8.2 —	8.6 —	8.6 —	23.0	32	205	283	136	209	146	282	84	59	41.5	29	83	73	94	282	258	269	300K	200K	10K	200K	5K	15K	200K	100K
	6.9 —	6.8 —	7.0 —	22.0	30	209	276	141	216	142	276	74	47	45	28	90	73	90	275	261	291	210K	110K	10K	22K	4.3K	15K	220K	110K
	not pulsing properly - light on most of time —																					158K	120K	8K	22K	5.7K	15K	170	120K
	6146 ½ load		5 kV	2.6	mA 6.5	mA NS	—	—																				
	Keeps failing			Need not need																								

Unmap Simpson

110

Sealing Pair	Voltage Range 1µs	10µs	100µs	Plate 6JG Ampl.	output Ampl.	P_1 pulse	off	on	R_1 pulse	off	on	G_1 (1st) on	off	G_2 (1st) on	off	G_3 Cathode on	off	*Reset	Output pulse	off	on	① R_1	① R_2	② R_3	① R_4	② R_5	① R_6	① R_7	② R_8
1201 6 BH	5.1 —	5.2 —	5.1 —	19.5	130	207	278	136	209	137	277	63.5	38	31.5	20	64	62	69	273	217	290	430	500K	40K	100K	23K	75K	1.5M	560K
1202 N	8.5 —	8.6 —	8.6 —	23.0	132	205	283	136	209	146	282	84	59	47.5	90	83	83	94	282	258	289	160K	137K	10K	21K	5K	14K	130K	110K
1204	6.9 —	6.8 —	7.0 —	22.0	130 ripple	209	276	141	211	142	276	74	49	45	90	93	88	90	275	261	291	210K	110K	10K	22K	4.1K	15K	220K	110K
1208	not pulsing properly - light on most of time -								measured same as 1206													158K	120K	8K	22K	5.7K	15K	178K	130K
	6H6 ½		5 tiff no	rec 65 off NG																								
1206	keeps pulsing		but not reset																									

9-11-52 Removed grounds for further run direct —
HV set at 1100 v.
Standard run for 5 min — bkg 10 min This cycle

	611x64 + 36	39140	7828.0
	24x16 + 1	385	38.5
	595x64 + 38	38118	7623.6
	19x16 + 8	312	31.2
	581x64 + 33	37217	7443.4
	23x16 + 14	382	38.2
	572x64 + 7	36615	7323.0
	22x16 + 14	366	36.6
	560x64 + 24	36082	7200.4
	21x16 + 8	344	34.4
1m. old	560x64 + 27	35867	7173.4
	112x64 + 25	7193	
	111 + 14	7118	
	113 + 54	7286	
	111 + 36	7160	
	114 + 19	7315	
	112 + 39	7207	
	112 + 9	7171	
	113 + 3	7235	
	113 + 19	7257	
	111 41	7145	
5m	553x64 + 15	35407	7081.4
1m	113 43	7275	
	557 27	35675	7135.0

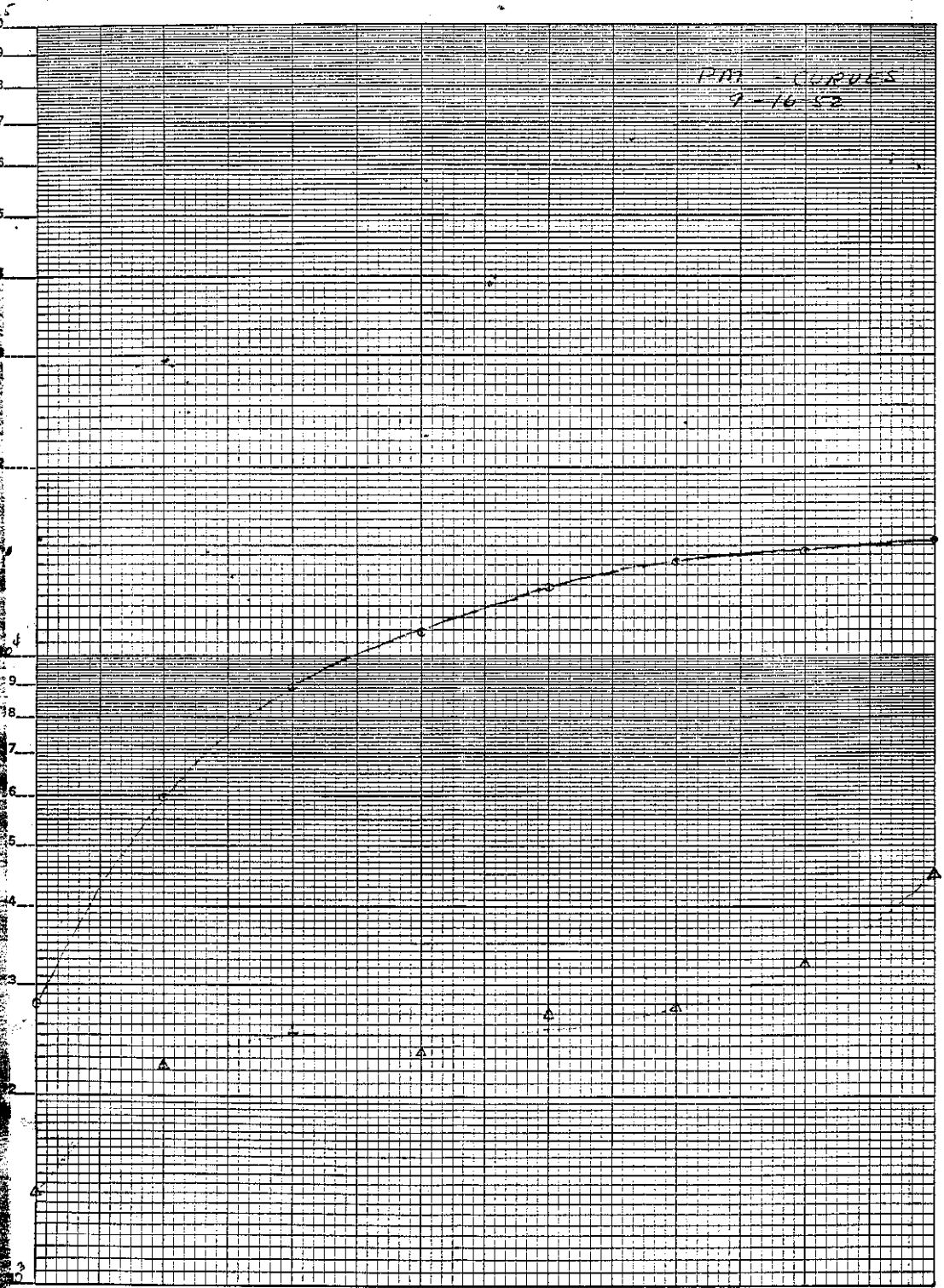
Left HV & LV on —

9-12-52 0804 bkg — 20 x 16 + 13 10m. 333 33.3
60m old 642 64 + 17 41105 6850.8
HV off check against other sts - room

9-12- 3:18 P- 22x16 + 4 (10m) 352 35.6
528x64 + 24 36376 7275.0
523x64 + 10 36042 7208.4
526x64 + 24 36248 7249.6
561x64 41 35945 7189.0

9-12-82	std (5m)	562 x 64 + 37	36022	7204.4		3.55 P
		558 x 64 + 13	35735	7145.0		
		577 x 64 + 28	35740	7148.0		
		561 x 64 + 25	35929	7185.6	Avg 7200.6	320/1
	bkg	18 x 16 + 10	298	29.8	Avg 32.7	
	HV off 4:26 P	L.V. on over weekend				
9-13-82	0817 bkg	30m. 61 x 16 + 5	981	32.7		
	std	5m 565 x 64 + 47	36207	7241.2	HV 0825	
	Lead shields 4 bricks →					321/1
	3.59 P bkg	15m. 23 x 16 + 6	374	24.93		
	std	5m 536 x 64 + 37	34344	6868.1		275/1
	HV off 4:22 P					
9-14-82	0825 std	581 x 64 + 55	5m 37481	7486.0	Avg 7271.0	
	bkg	14 x 16 + 12	10m 236	23.6		308/1
	std	557 x 64 + 17	5m 35681	7056.0	HV off	
	0915 stacked more Pb brick around core					
						
	0918 bkg	15min. 13 x 16 + 0	1610			
	0935 std	577 x 64 + 9	33088	6617.6	5/m	413/1
	Shielded pre-amp and inserted it in output of pm.					Lowered HV
12:19	(700V) bkg	2m. 1 x 16 + 12	28	14 c/m		
	s	1m 43 x 64 + 48	2800	2800		200:1
725	s	1m 93 x 64 + 31		5983		
	b	1m. 2 x 16 + 13	45	22.5		266:1
730	b	1m 3 x 16 + 13	61	35.5		
	s	1m 139 x 64 + 21		8923		349:1
735	s	1m 171 x 64 + 21		10965		
	b	2m. 2 x 16 + 15	47	23.5		465:1
800	b	2m. 3 x 16 + 6	54	27.0		476:1
	s	1m 200 x 64 + 21		12802		
	b	10m. 15 x 16 + 7	295	29.5		

PM1 - CURVES
9-16-52



338P	6-10	22 x 16 + 3	35.5	
353P	5-5	1026X64+49	13220.6	HV off

9/16/52 1:20? 800 S-1 199x64+21 check on pressure

825 S-1 221x64+53 14197 5/5:1

b-2 3x16+7 55 27.5

850 b-2 4x16+1 65 32.5 4.5-4:1

S-1 230x64+16 14736

875 S-1 234x64+0 15296 3V0:1

b-2 5x16+10 90 45.0

Single bed Reproducibility check @ 800v.

1:37 b-10 18x16+13 301 30.1 ± 1.7 {28.4, 31.8}

1:48 S-5 1033x64+16 66128 13225.6 ± 51.4 {26.45.1} 13277.0

S-5 1037x64+35 66403 18280.6 ± 51.5 {26.56.1}

Avg 13289.06 S-5 1042x64+17 66705 13341.0 ± 51.7 {26.66.2} 13289.3

13289.3 S-5 1039x64+32 66528 13305.6 ± 51.6 {26.61.1}

S-5 1040x64+28 66588 13317.6 ± 51.6 {26.63.3} > 400:1

13161 13417 b-10 20x16+4 324 32.4 ± 1.8 {30.6, 34.2}

1:40 on 4.8 on 1.5

3:43 b-10 18x16+5 293 29.3 ± 1.7 {27.6, 31.0}

S-5 1041x64+24 66648 13329.6 ± 51.6

HV off overnite

9-17-52 0806 HV on

0807 S-5 1050x64+9 13441.8 ± 51.8 X warm up

b-10 18x16+12 30.0 ± 1.7

0824 S-5 1038x64+3 13287.0 ± 51.5

1022 S-5 1036x64+22 66198 13239.6 ± 51.4 OK

1023 S-1 206x64+2 13186

1 210x64+50 13490

1 208x64+39 13353 13276.2

1 207x64+35 13283

1 204x64+15 13207 X 13297.1

1 208x64+15 13327

1 206x64+9 13193

1 207x64+47 13295 13318.0

1 210x64+23 13463

1 208x64+33 13312

1:50 S-5 1038x64+59 13370.2

2384 b-10 22x16+3 35.5

S-5 1036x64+49 13320.6 HV off

9-18-82

0805	HV on				
0816	5th-5	1036 x64 + 23		132345.8	
0822	b-10	19x16+7		27.9	HV on
1052	5-5	1024x64 + 1		13107.4	
3227	5-5	1019x64 + 35		130502	
	b-10	4x64 + 9		26.5	

9-19-82

0806	HV on				
0807	b-20	36x16 + 13	589	29.4	
0829	5-5	1027x64+7			sample emission change
0835	5-5	1015x64 +29			
0841	5-5	1017x64+32			
1035	5-5	1021 x64 + 7			

HV off to insert ESUM in supply line at Delta -

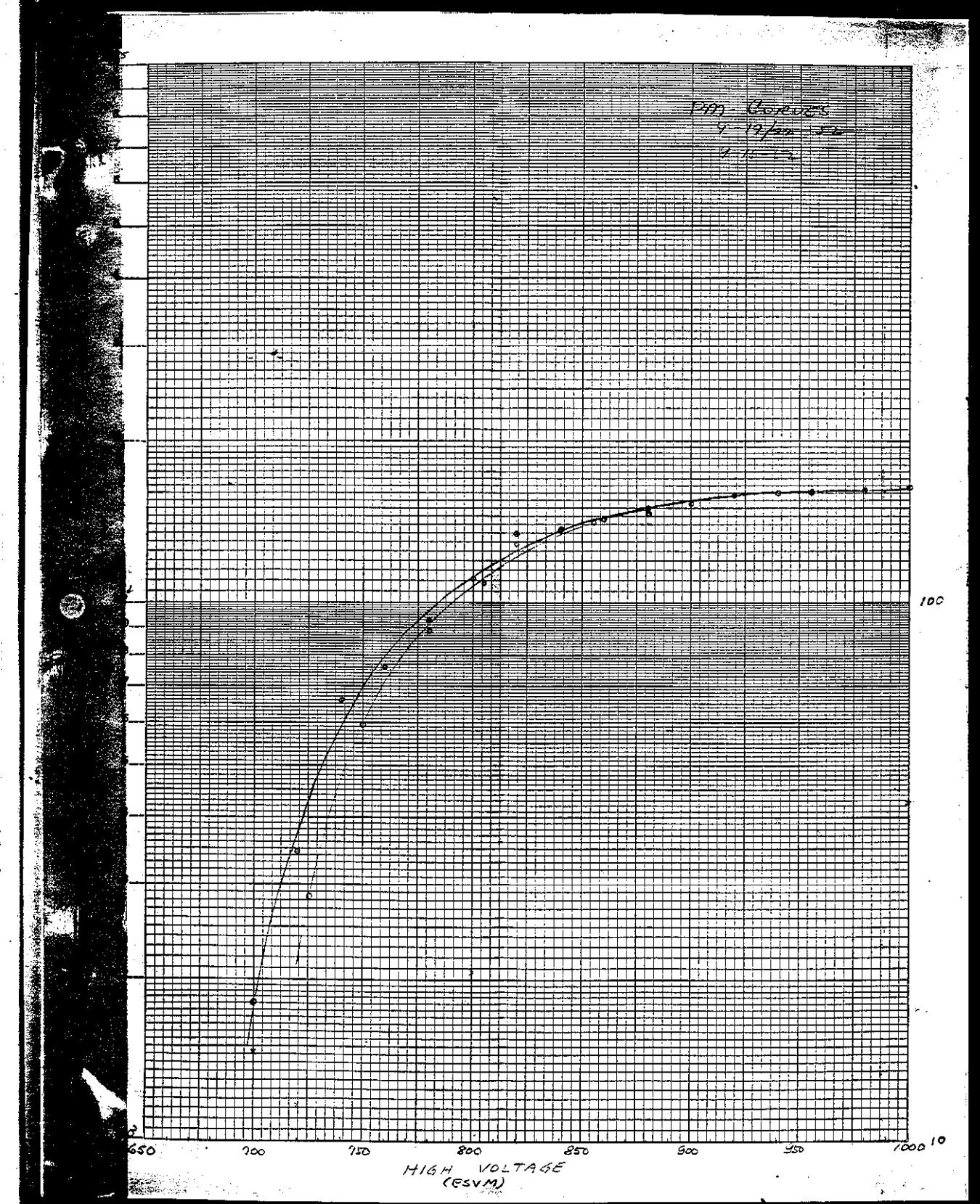
ESUM 822 volts

ESUM 820 volts

1220	5-5	1010 x64 + 50		
ESUM adj. HV - to 822		1052 x64 + 21		

Run over voltage range, using ESUM for HV readings

5x64 2x20 ESUM 700 (675)	5-5	140 - 58	9018	1803.6	123.5	ESUM indicated rise normal Sr
[710]	b-5	4 - 9	73	14.6		
720 (695)	5-5	108 - 17	6929	3464.5	298.7	
	b-5	3 - 10	58	11.6		
740 (710)	5-5	206 - 13	13197	6598.5	439.9	
[742]	b-5	4 - 11	75	15.0		
760 (735)	5-5	237 - 44	15212	7606.0	408.9	
	b-5	5 - 13	93	18.6		
780 (750)	5-5	290 - 34	18594	9297.0	442.7	
	b-5	6 - 9	105	21.0		
800 (770)	5-5	344 - 13	22029	11014.5	529.5	
	b-5	6 - 8	104	20.8		
820 (800)	5-5	420 - 8	26888	13444.0	470.1	
	b-5	15/8 - 2/15	242 / 145	48.4 / 28.6		
840 (810)	5-5	486 - 5	29289	13644.5	530.4	
	b-5	4 - 13	77	25.7		
860 (830)	5-5	449 - 16	28752	14376.0	453.5	
	b-5	5 - 15	95	31.7		


650
700
750
800
850
900
950
1000
100
10
HIGH VOLTAGE
(ESVM)

880 (870)	S-1	[234] 467 - 51	29939	14969.5	424.1
	b-3	6 - 10	106	35.3	
900 (870)	s-1	239 - 0	15296	work on 9/19 stopped here went to arrest Fox in 202	
	b-3	-	-	-	

* Re-run 8000 Bkg 2½m 8-12
Checked ends W & E EE @ 2W.
820 b-5 after E. shutdown.

920	s-1					
	b-2					
9-22-82 0835 900	b-5	9 - 9	121	40.3	374.6	
920 (885)	s-2	496 - 43	31781	15893.5	362.9	
	b-5	13 - 11	219	43.8		
940 (900)	s-2	499 - 63	31999	15999.5	406.1	
	b-5	12 - 5	199	39.4		
960 (915)	s-2	501 - 53	32117	16058.5	434.1	
	b-5	11 - 11	187	37.4		
980 (940)	s-2	504 - 11	32267	16133.5	384.13	
	b-5	13 - 2	210	42.0		
1000 (950)	s-2	510 - 58	32698	16349.0	385.6	
	b-5	13 - 4	212	42.4		

set NVQ 901 0921
1:28 PM - set at 900v.
4:17 PM HV off.

9-23-82 0821 HV on reading 0946 v.
0826 bkg for 2000 sec 78116 ± 10 39.7 c/m

0944	6-1	248 - 51	15923 ± 126.2	series of 1-m c/s
		248 - 21	15893 ± 126.1	
	8 Hg 21m.	252 - 30	16158 ± 127.1	
		248 - 6	15878 ± 126.0	
		249 - 37	15973 ± 126.4	Avg: 15,928.8
		248 - 25	15897 ± 126.1	
		249 - 62	15998 ± 126.5	
		245 - 58	15728 ± 125.5	
		251 - 19	16081 ± 126.8	
		246 - 65	15749 ± 125.5	

9-23-52 Made Microflex Fenix unit for single scaler - Checked ± 4 mt deter on 60 V.

1228	5-1	248-56	
		250-0	
		248-55	
		247-18	
		248-46	
		247-55	
		250-62	
		246-52	
		246-20	
		242-16	
1238	6-10	22-4	
1250	"	28-9	Fast end running during other period -
1307	"	51-5	
1311	"	49-1	
1321	"	21-4	1331 1315

Rate Meter & E.G. Recorder added to circuit.

1352	6-2	4-0	64	32.0	<40	N.18
	"	4-9	73	36.5	<40	N.18
1357 40	"	4-3	67	33.5	<40	N.18
1357 45	"	4-9	73	36.5	<40	N.18
1401 50	"	4-15	79	39.5	45	.20
1410		4-10	74	37.0		

1420 NV 946.

checked Fenix with 600 {56-16 58-45 58-38 58-57} check with water as source

disconnect Rm - 58 + static high

source not under PM. 58-23

1504	5-1	241-60	~~15484~~	15484
		243-25		15581
		248-10		15882
		244-13		15629
		245-57	1592	15737
2211	5	1226-47		15702.2
		1231-48		15766.4
		1234-6		15796.4

b-5 11-14 35.2 c/m : 12V off ammeter

9-24-52 0807 HV on

0833 b-5 10-4 33.2

1233 S-5 1243-29 15916.2

9-25-52 0802 HV on

08/4 b-5 12-14 41.2

0820 S-5 1238-40 15854.4

Check on speed of response & registers on AIC scaler—used audio gen, pulse gen, feeding scaler. 1 minute count

	Freq.	Scale	Register
Dead	200	64	184 23
Reading	300	"	277 11
	400	"	369 5
	500	"	457 00
	600	"	541 57
	700	"	635 59
	750	"	680 57

10 A/S ok.

PM OS -

2nd P S-1 1238-39 15854.2

206 b-5 11-11 37.4

9-26-52 0812 HV on

0823 b-5 12-4 39.8

0829 S-5 1236-8 15822.4

1237 P b-5 11-12 37.6

1.00 P S-5 1238-24 15851.2

358 P S-5 1229-30 15737.2

9-29-52 0805 HV on

0835 b-5 11-6 36.4

0841 S-5 1231-47 15766.2

1021 S-5 1226-9 15694.6

730 P S-5 1231-58 15768.4

336 P b-5 9-15 31.8

9-30 0801 HV on

0813 HV reads 950

0814 b-5 12-9 40.2

0821 S-5 1225-38 15687.6

105 P S-5 1233-4 15793.6

9:30-12	3 P	6-5	1222-0
10:-12	0827	6-5	12-0
	0833	5-5	1233-36
	1222	5-5	1233-02
	3 P	5-5	1235-7
10-2-12	0806	HV on	11-7
	0821	6-5	11-7
	0827	5-5	1232-15
	10:16	5-5	1246-14
	1022	5-5	1243-20
	1030	6-5	11-11
	removed	HV - meter & CRM -	
	1200	6-5	11-11
	1206	5-5	[illegible]
	0808	HV on	
	0833	6-5	12-2
	0840	5-5	1234-34
	0846	5-5	1243-21
	1035	5-5	1253-9
	1041	6-5	12-7
	2 10 P	5-5	1231-31
	847A	HV on	
	12 43 P	5-5	1244-46
	12 58 P	6-5	11-5
	1 30 P	5-5	1238-41
	2 30 P	5-5	1250-53
	0820	HV on	
	1002	6-5	10-11
	1006	5-6	1233-39
	120	6-5	12-12
	1211	5-5	11-HV
	2 29 P	5-5	1247-41

10-7-52 0805 HV on

0930 b-5 12-2

0942 5-5 1242-35

off in 2th. during interval

1150 5-5 1239-2

1157 b-5 11-13

10-13-52 0805 HV on

1033 5-5 1223-18

1107 5-5 1217-57

1120 b-5 12-8

10-15-52 HV on 0805

0830 b-5 10-2

0905 5-5 1219-57

2267 5-5 1220-48

10-17-52 HV on 0807

829A b-5 11-0

836 5-5 1217-24

(happen of hunt - after work hearing)

11-11-52 HV on 0820

823A b-5 10-15

829 " 10-3

846 " 11-15

857 5-5 1237-26

1021 5-5 1218-17

1205 5-5 1231-20

1214 b-5 13-15

427 HV off

11-12-52 819A HV on

940 b-5 12-1

1035 5-5 1238-52

415P HV off

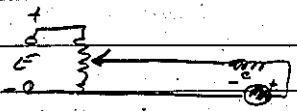
11-13-52 805 HV on

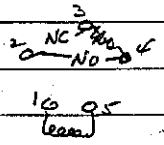
808 b-5 12-8

816 5-5 1231-49

10-29-82 Check GE sens relays CR 2791 C103C25

1.- R_0 = 2400 Ω I_{trip} ≈ 2-4 ma





2500 Ω, I_{trip} 3 ma pin 2-3 opens 3-4 not operate

Sets 2.2 ma 2-3 closes

All three on hand checked out O.K.

Avg 2.9 ma, 2.2 ma out 2-3 NC
2-4 NO

A & D Reverse actuator first trips

R_1 very sound

R_2 needs to have higher point of shunt so drops out first

11-3-82 Run 215 Scalers 60N check C_3 doubling

replaced, 114 strips.

64	281 $\frac{20}{}$	281 $\frac{18}{}$	281 $\frac{19}{}$	281 $\frac{15}{}$
	281 $\frac{41}{}$	281 $\frac{52}{}$	281 $\frac{41}{}$	281 $\frac{42}{}$
155 bkg x16 hr - 5	8 ^{13}	6 ^{7}	8 ^{9}	8 ^{1}
0° 0-5 10	18 ^{3}	13 ^{2}	16 ^{8}	16 ^{3}
tol 5-10 15	28 ^{9}	19 ^{13}	25 ^{11}	25 ^{9}
10-15 20	35 ^{14}	25 ^{15}	33 ^{10}	33 ^{3}
60N				
x16	1126 ^{9}	1129 ^{3}	1126 ^{6}	1126 ^{6}
1560	70 ^{78}	70 ^{77}	70 ^{78}	70 ^{71}

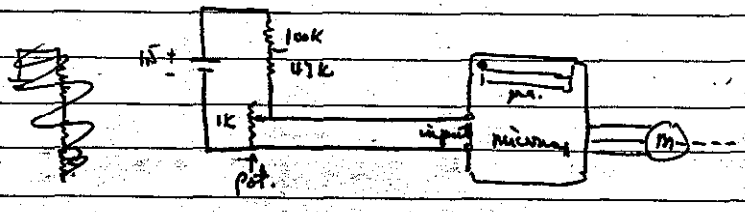
12-29-82 Check IC Amplifier Spares.
Voltage readings - output scale off - meter switch to
Preamp. cable connections -

B -40.3
C -33.2
D -39.3
E +86.8
F +5.2V
H -40.1

12-31-52 Brush Recorder set in with Instr. in 202 for slurry study.
One unit of Brush recording tension level from output of R-1.
Second unit recording stress-speed input across servo-resistors in tachometer-meter circuit.

R-1 sensitivity too poor for good readings -

1-22-53 Speed Controller for Agitator -
microamp. with bridge & meter movement.
Test setup



m desired set	Pot
.2	0.72 - 0.92
.3	1.36 - 1.46
.4	1.75 - 1.90
.5	2.30 - 2.40
.6	2.65 - 2.85
.7	3.13 - 3.33
.8	3.60 - 3.70
.9	4.00 + 4.20
1.0	4.13 - 4.23

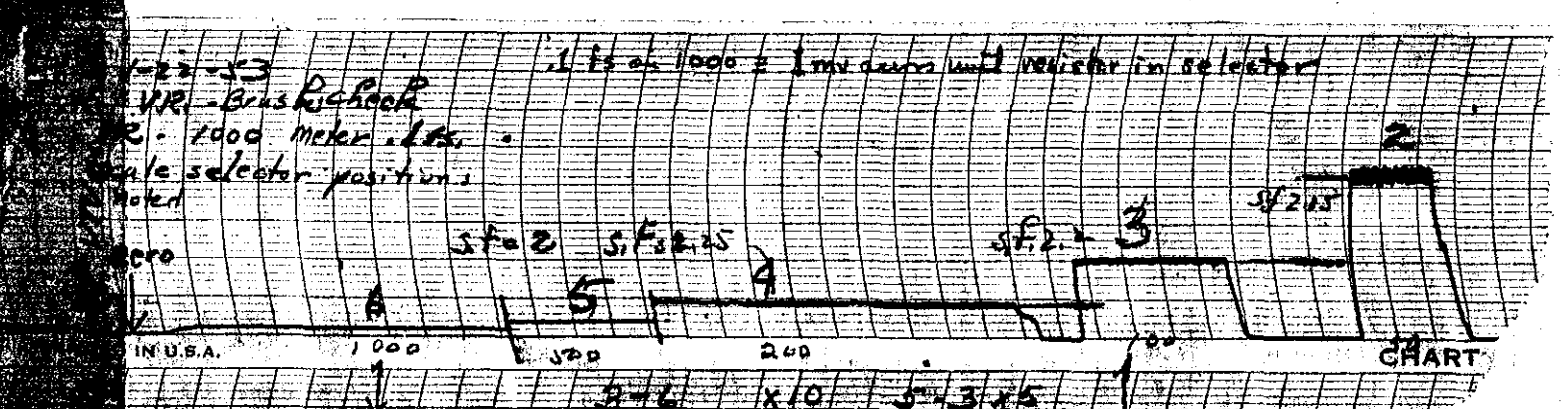
Pot 2.75 m .6 ± .03

~~[illegible]~~

Check Pot settings -

Pot		Pot		
1-23		0.0	0	
.82	1.3 mv.	1	1.3	
2.75	2.8 mv.	2	2.3	
1.80	1.7 mv	3	3.0	
1.80	2.05	4	3.7	
2.80	2.50	5	4.15	
3.23	3.15	6	4.52	
3.65	3.42	7	5.00	
4.18	3.80	8	5.4	
4.63	4.00	9	5.5	
		10	5.8	

Accus 4K 1K .5 r + .0144



6-5
6-4
6-2

x10
x4.5
x2.1

5-3 x5
5-2 x11

1.58V.

[47k-1k] — .525 V.

Check of Value of resistors. Using Wheatstone Bridge

100kΩ = 99.4 kΩ

47kΩ = 47.9 kΩ

1kΩ = 0.999 kΩ

ΣR = 148.299 kΩ

Divider current: $I = \frac{V}{R} = \frac{1.58}{1.48 \times 10^5} = 1.068 \times 10^{-5}$

Scaler AIC strip 114

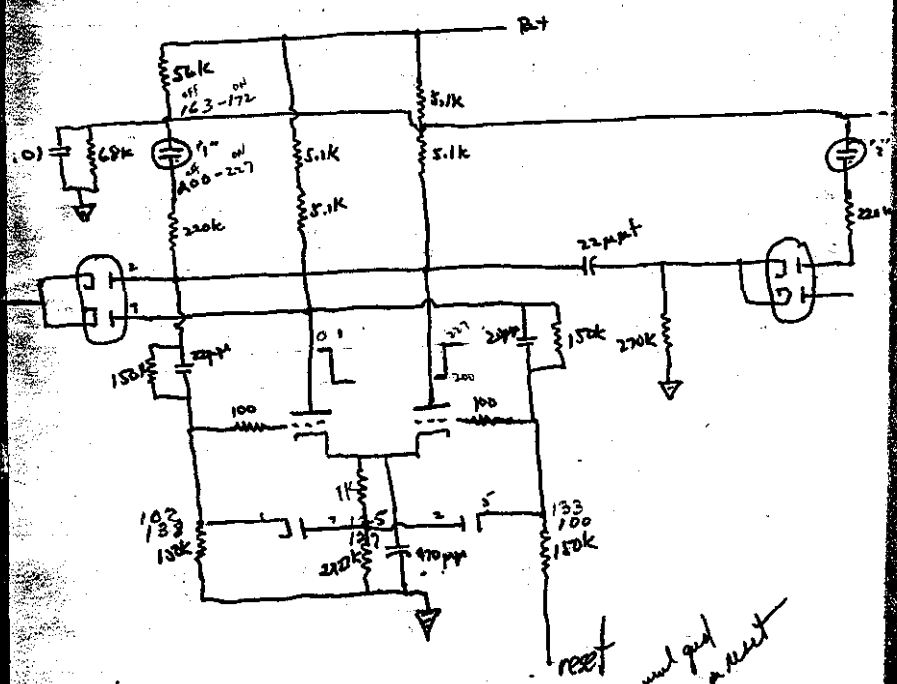
Voltages

V_3	1: 106	V_6 1: 95	Readings from strip which "doubles" when V_3 is inserted.
	2: 120	2: 103	
	5: 129	5: 93	Count-off —
	7: 120	7: 105	

Readings on healthy strip: V_3: 1: 100 · no tube
2: 128
5: 128
7: 128

	0	1	2
V_3 1	102	138	102
2	125	127	124
5	133	100	133
7	125	127	124

Pulled under chassis "sour" 114 strip. Separated and re-installed. Operation OK.



2-19-53 Liquid Level Indicator.

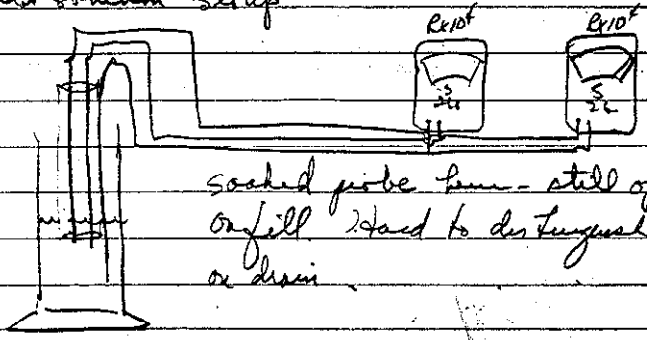
Resistance H_2O - probe - HP VTVM =

Contact Liquid - ∞ $8 \times 10^{-5}\Omega$ when touching H_2O

Contact Air - liquid, no H_2O cond. ∞

When touch - R drops to ∞ $10^{5}\Omega$ & once above $5 \times 10^{5}\Omega$ to $9 \times 10^{5}\Omega$

Salt solution setup:



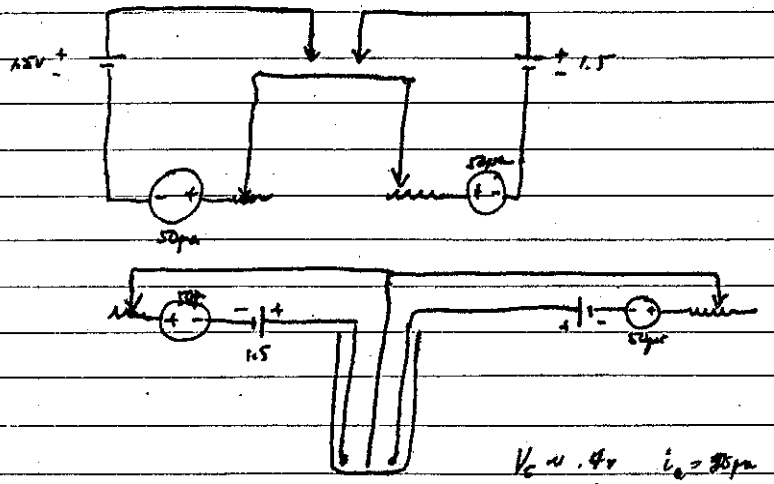
soaked probe 5 min - still operate OK.

On fill Hard to distinguish difference or drain.

R_c = 12000 Ω worked fine for dilutes

R_o = ∞ solutions only - -

for concentrated salt solution 25 i 40-50 μa



V_c ~ .4v i_c = 75μa

V_o ~ .6v i_o ~ 40μa

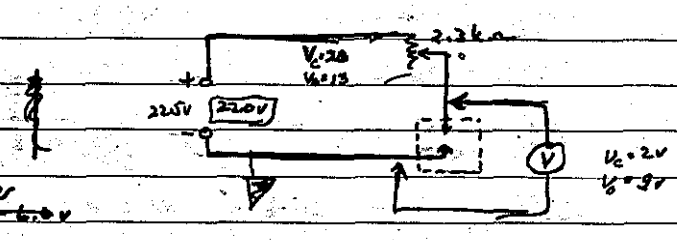
$R_c = \frac{4 \times 10^{-1}}{5 \times 10^{-6}} = .8 \times 10^{5} = 80\ k\Omega$

$R_o = \frac{6 \times 10^{-1}}{4 \times 10^{-4}} = 1.5 \times 10^{+4} = 150\ k\Omega$

Measured R_c 1.6 kΩ 2.4 ~2:1

R_o 4 kΩ 4.8

8.2



V_c = 1.6V

V_o: ~~6.8V~~ 5.5V

$\frac{2.0}{2.3}$ $\frac{2}{x}$ $\frac{R_c}{R_o} = \frac{1}{2}$

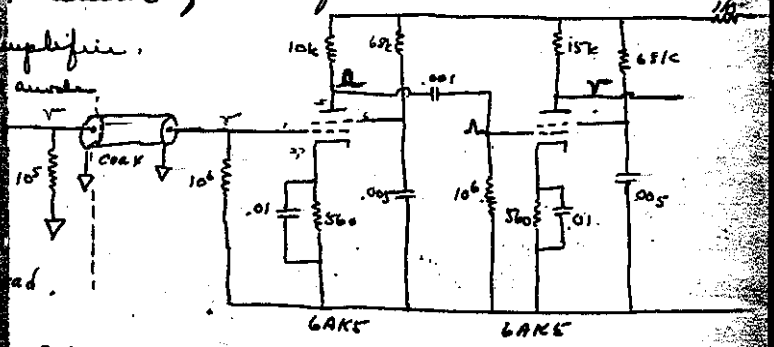
$\frac{20}{2.3}$ N 8.3 mA $\frac{2}{8.3} \times 10^3$ N 250Ω $\frac{2}{2}$ = 1 mm

$\frac{13}{2.3}$ N 5.6 mA $\frac{9}{5.6} \times 10^3$ N 1.7K $\frac{9}{4}$ = 2.2 mm

2-23-53 PM: Linear changed on negative HV - is to be used with this on scintillation detector in sample chamber.

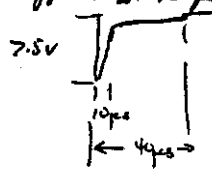
Gain of 100 thru 2 stage amplifier —
Used ESVM to determine and HVon PM. HUPS readings
w 2A Trace.

2/25/53 PM - detector fast response recorder - Brush
Amplifier.



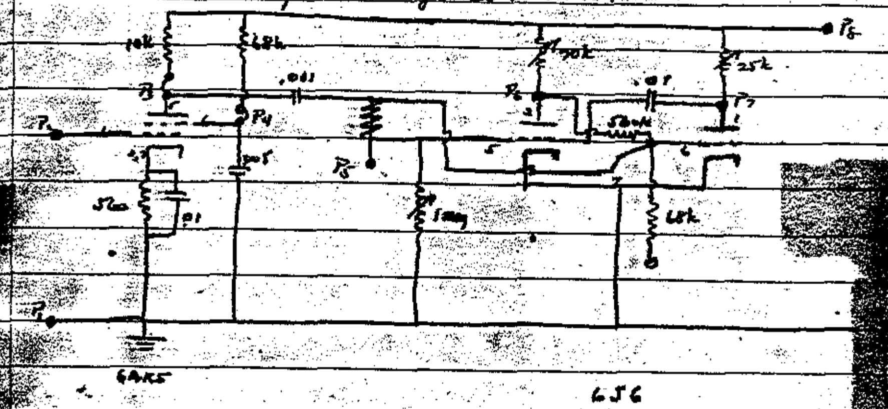
B+ = 150v.

input 0.07 v.s. = 75 mv
output 7.5 volts = gain of 100 —
output P.W. appx 70% 10 μs. Reads 6 cps

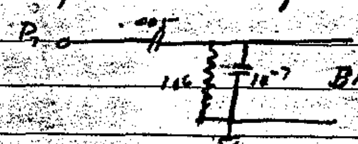


Need to feed thru impedance circuit into Brush
ring out & Brush 0 - 100 cps.

3-2-53 "Bread-boarded" amp & MV stages as follows:

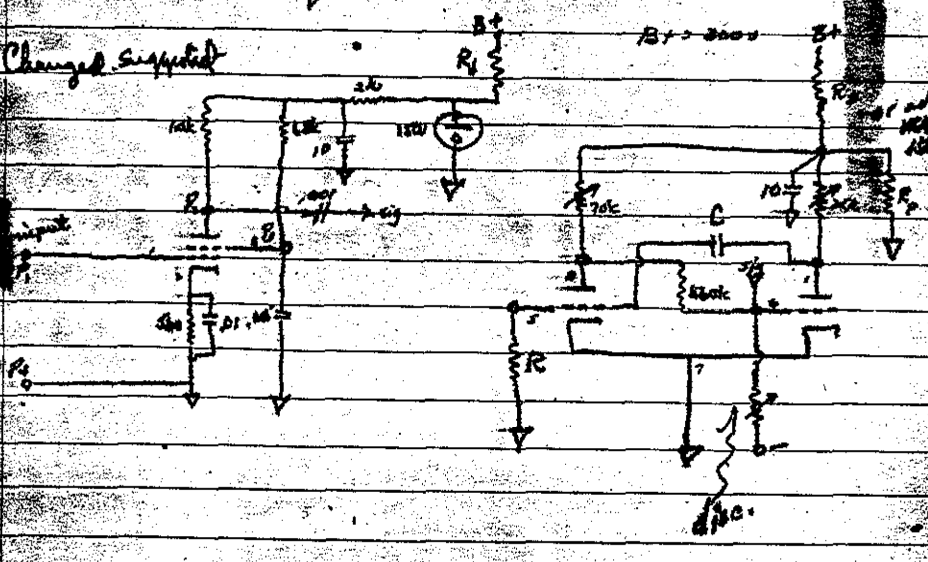


Ran rough check on above — (from WICC pig. HP sig gen w/ input 10µs, -pulses .1v in amplitude + output variable pulses 800 - 10,000 µs long, 20 volts in amplitude —
When fed to Brush off P_7 ( ) only get vibratory trace no deflection —

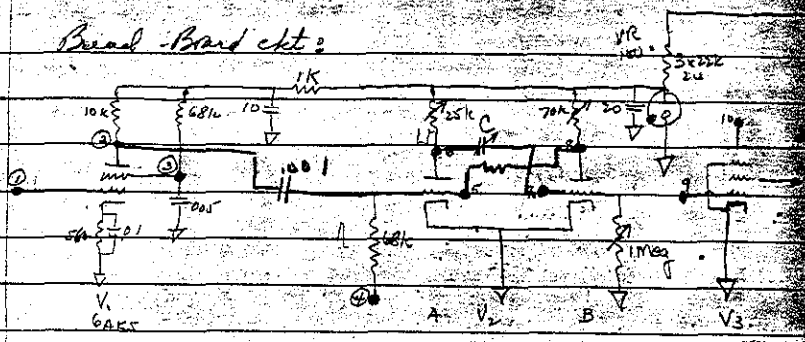


Output leads ...

Changed supply



3-4-13 Bread-Board ckt:



Below classic arrangement:

Voltage readings as is:

1	+0.1	5	-15	9	-1.5
2	112	6	150	10	—
3	70	7	-.84	11	—
4	-18	8	355	12	294

I_f = 19 ma (as read on P.S. panel meter)

PM signal — V .75V p-p

P.I. 10V

100 μs

Coupling 5 .001 μf - at 5 10V signal

Check on hum dist — N 200V - turn off 6kj

Added 560K 5-8:

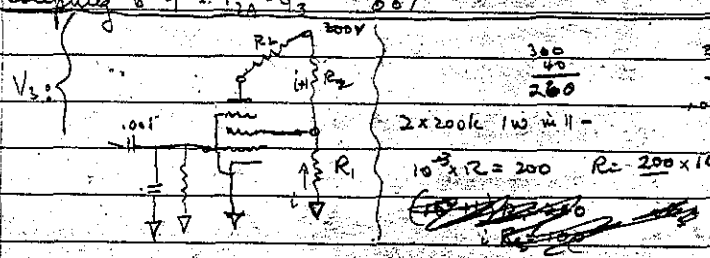
V_1 = -18.3 ; V_5 = -12 ; V 8 34

For V_5 -20 V_1 = -29

3-5-13 PM - 1200V = Meas - 15V = V_7 6 I_{DC} = $\frac{9}{68} \times 10^{-3}$

Cap 6-7 decade box -

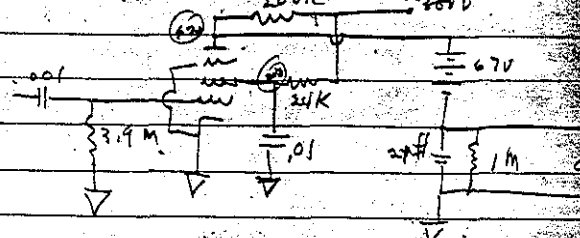
Coupling 6-9 - P_A-G_3 .001



$i = 1$ ma $R_1 = 100K\Omega = 10^5$ $P = 10^5 \times 10^{-6} = 10^{-1}$ W.

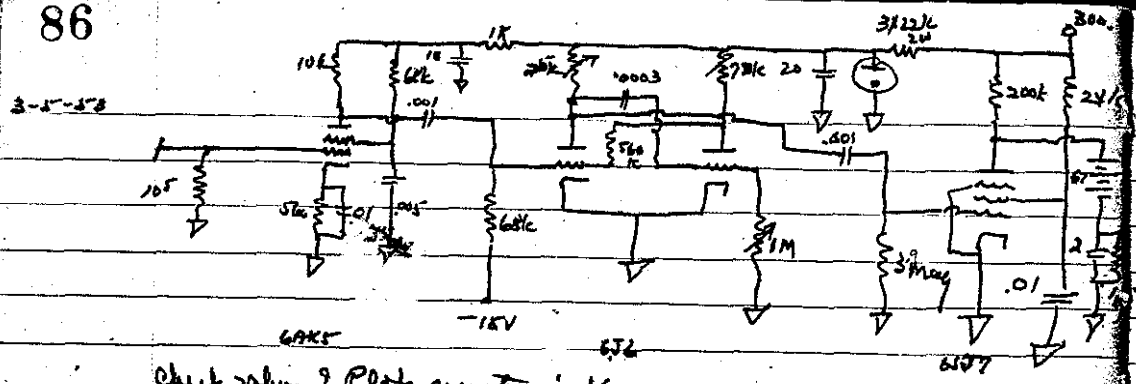
$R = \frac{200}{1} = 10^5$ $P = 10^5 \times 4 \times 10^{-5} = 4$W

V_3 as tested -



over for complete test circuits

3-5-58



Check values of Plate resistors in V_2 -

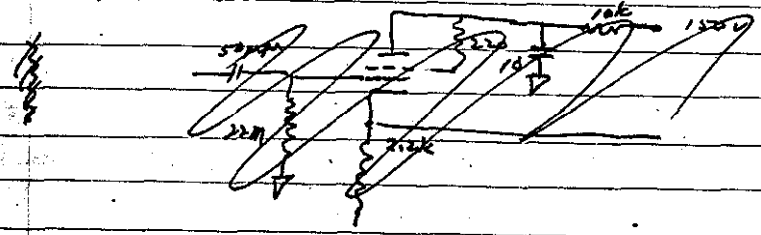
For remote operation mount -

Cathode follower on RM - 78K = 30-35K

25K = 26K -

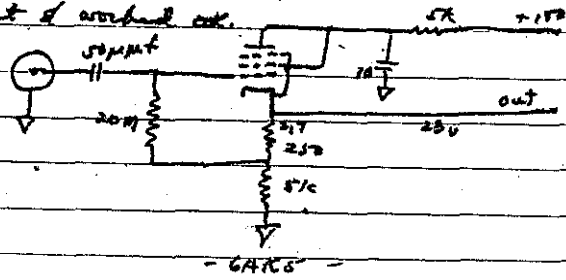
3-6-58 Cathode follower for Plateau Detector -

From NYO 10577

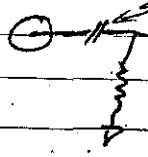


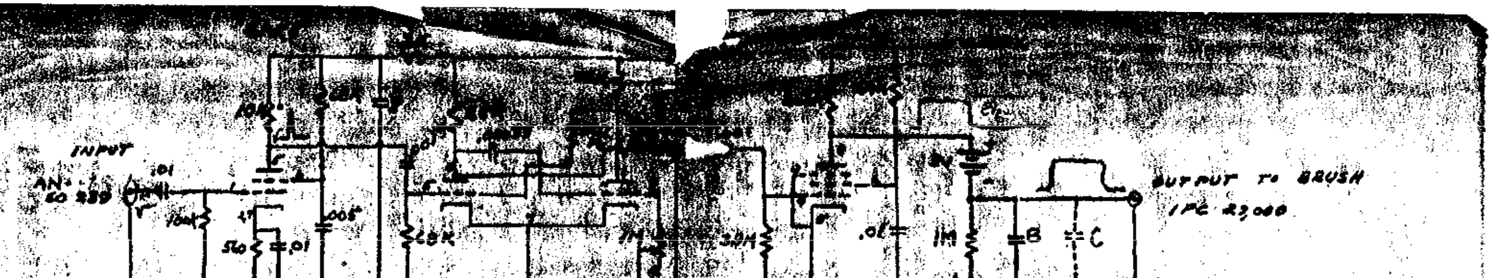
On hand: 1 model 110 pre-amp. (Electron Sands)

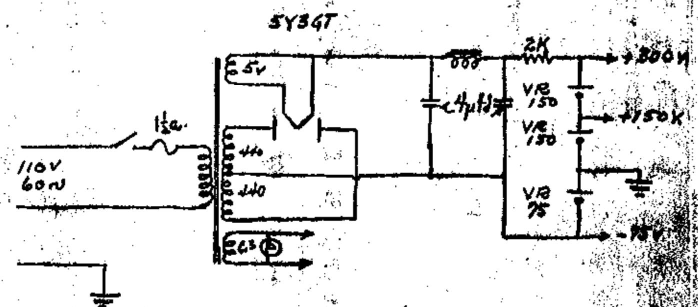
2 mil unit of overhead cost.



input to transient amplifier requires capacitive coupling





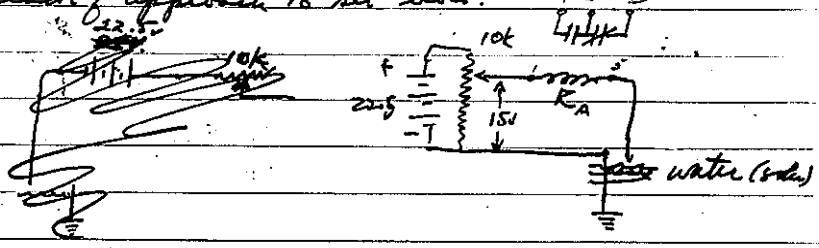


TRANSIENT RESPONSE
AMPLIFIER

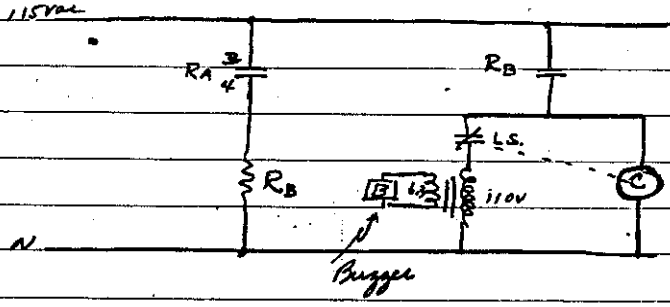
REDRAWN 3-30-53

3-16-53 Liquid Level Warning Probe.

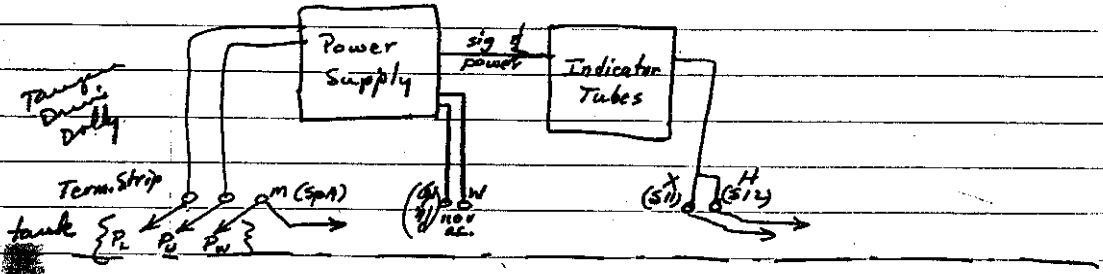
Thes probe to extend 1/2 - 1 in. below level indicators to warn operator of approach to set level.

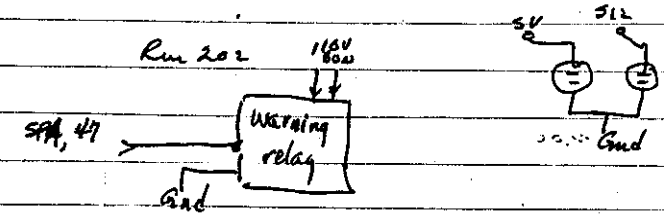


3-17-53 Warning buzzer circuit wired -



3-31-53 Liquid Level Indicator Installation Run 201 - 202

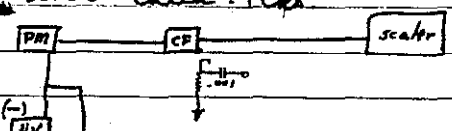




SP13 (I) & SPC (L) were disconnected from terminal strip

Next reference 90

4-13-53 P.M. scaler - check. Cht



using negative HV
two minute counts
standard mi = 5
standard ant = 6

source	reg.		voltage	count	note	S/L	reg. #	volt	count	rate
	64									
S/S	115	81	700		4-14-53	S/2	444 27/64	1000	28443	14221.5
	16									
b/S	5	5	"			b/2	1 50/64		114	57
	16									
b/S	13	9	750			S/2	442 27/64		28316	14158
	64									
S/S	460	14	"			b/2	2 5/64		133	66.5
	64									
S/S	1098	1	800			S/2	446 32/64		28576	14288
	64						Al 209 bare	567 162/256		
b/S	4	45	"				1/2" Pb	124 11/16		
	64						2" 1/2 Pb	96 9/16		
b/S	3	0	850				1/2" Pb	122 3/16		
	256						bare	563 29/256		
S/S	6256	182	"							
	2x2									
S/S	789	108	900							
	64									
b/S	72	61	"							
	64									
b/S	10	10	900			S-2	440 33/64		28193	14096.5
	256									
S/S		83	900			b-2	2 1/64		129	64.5
S/S	524	99	"		4-15-53					
S/S	530	84	"							
S/S	537	17	"			b-2	2 22/64		150	75
S/S	565	240	"		0827	S/2	435 0/64		27968	13984
S/S	598	127	900		0829	b/2	2 9/64		133	66.5
S/S	607	204	"			S/2	437 41/64		28009	14004.5
S/S	614	53	"		0833	b/2	1 57/64		123	61.5
S/S	583	107	"		0835	S/2	437 28/64		27992	13996
S/S	575	144	"		0838	b/2	2 9/64		137	68.5
					0840	S/2	440 12/64		28178	14086
					0842	b/2	1 61/64		125	62.5
					0844	S/2	433 20/64		27737	13868.5
						NV left on - setting unchanged				
					1210	b-2	1 20/64	1000 [990]		
					*	S-2	421 6/64	[990]		
						reset		1000		
						S-2	438 22/64		28052	14026
						b-2	1 57/64		121	60.5
						S-2	439 15/64		28111	14055.5
						Al 209	405 214/256			

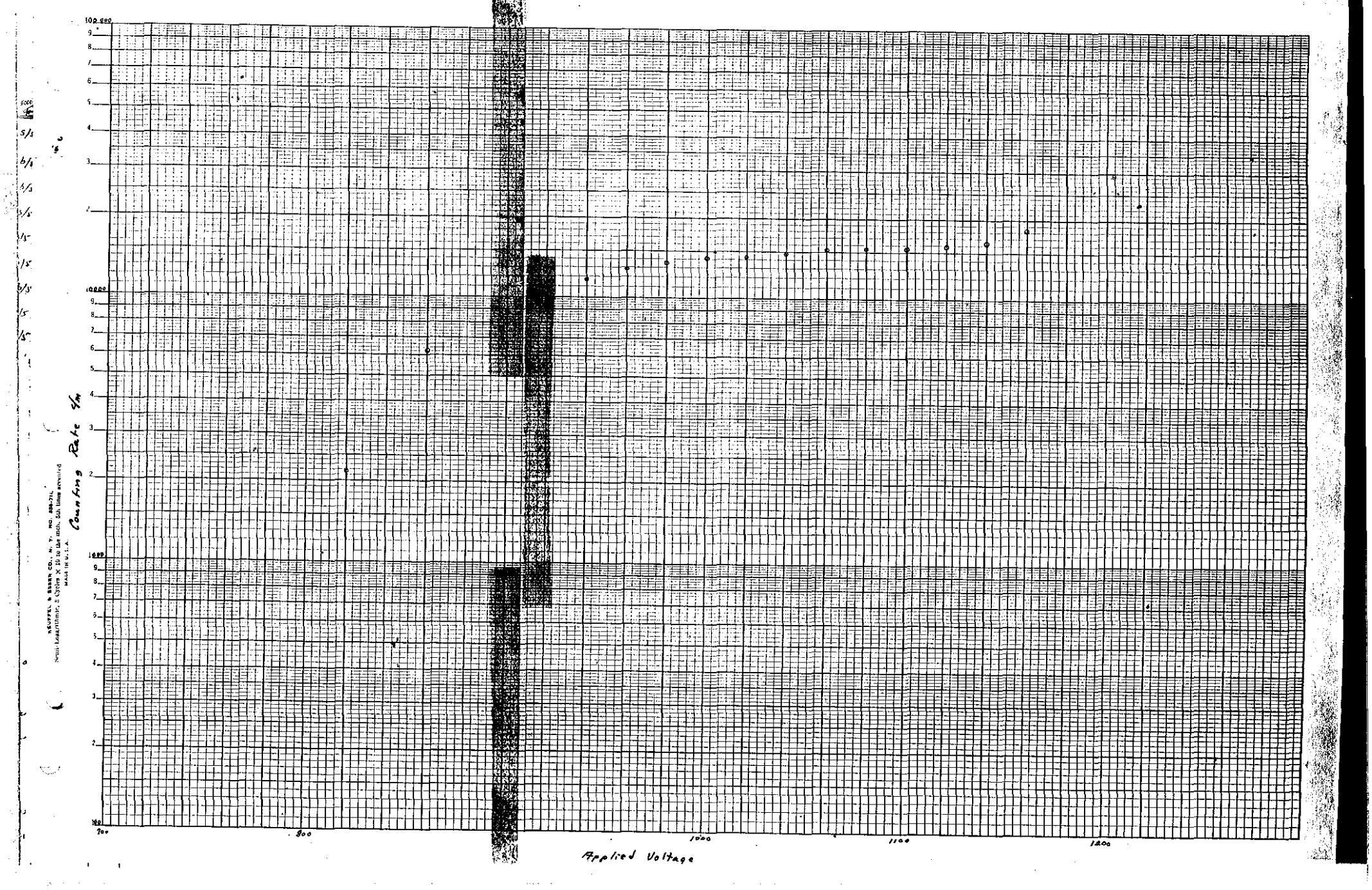
Scaler may need to be readjusted

Count rate

2

During the above counts it was noted that scaler did not seem to operate normally. Some jumping of neon indicators observed.

4-14-53 PM tied directly to scaler 1010. Made adj. in zero sets. - Run a few counts -


Counting Rate
Applied Voltage
800
1000
1100
1200

Left scales on count overnight. No counts registered.

11-16-53 0809 Reads 1015 ×

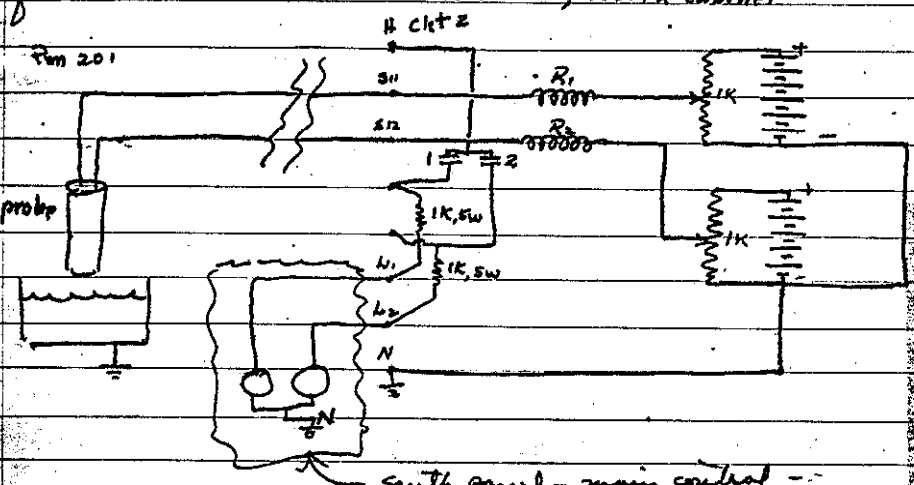
hr	source	register	voltage			hr	source	register	voltage		
	b-2	1 1/64	1015	105	52.5		s-2	570 24/64	1160	36444	18247
	s-2	452 11/64	"	28979	14489.5		b-2	22 32/64		1440	720
08/9	s-2	439 34/64	1000	28120	14060		b-2	1 20/64	1000 1160	84	42
	b-2	1 37/64	"	101	50.5		s-2	433 49/64		27761	13880.5
	s-2	437 30/64	"	28003	14001.5		s-2	434 4/64	1000	27782	13891
	b-2	1 21/64	980	85	42.5		b-2				
	s-2	422 58/64	"	27066	13533						
	s-2	402 23/64	960	25751	12875.5	4-17		NVon 0806 adj HV to 1000 volts			
	b-2	1 31/64	"	95	47.5	0815	s-2	439 42/64	1000		
	b-2	1 1/64	940	65	32.5		b-2	1 37/64	"		
	s-2	364 57/64	"	23385	11692.5						
	s-2	274 (595)	940	17585	8792.5						
	b-2	61/64	"	61	30.5						
	b-2	51/64	960	51	25.5						
	s-2	195 20/64	"	12444	6247						
	s-2	67 38/64	820	4326	2163						
	b-2	29/64	"	29	14.5						
	b-2	19/64	780	19	9.5						
	s-2	1 1/64	"	80 40	40						
	s-2	441 48/64	1000	28272	14136						
	b-2	1 13/64	"	77	38.5						
	b-2	1 32/64	1020	96	47.5						
	s-2	445 29/64	"	28508	14254						
	s-2	467 25/64	1040	29941	14970.5						
	b-2	1 55/64	"	118	55.0						
	b-2	1 49/64	1060	113	56.5						
	s-2	475 41/64	"	30441	15220.5						
	s-2	483 32/64	1080	30964	15482						
	b-2	1 61/64	"	125	62.5						
	b-2	2 6/64	1100	134	67						
	s-2	483 32/64	"	30934	15467						
	s-2	498 47/64	1120	31919	15959.5						
	b-2	1 53/64	"	117	58.5						
	b-2	4 25/64	1140	284	142						
	s-2	510 25/64	"	32645	16322.5						

20 minutes during this run

4-27-53 Level Indicator - last ref. p 87.

Installed Simplified level indicator, after need had arisen for frequent adjustment & previous setup (for each cylinder change).

Complete level system, except for warning probe, is as follows:



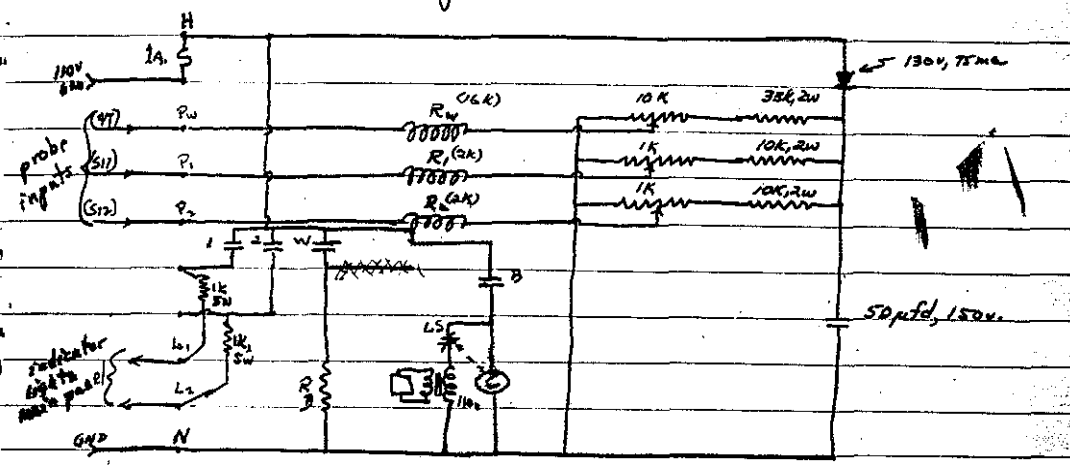
Procedure in modification -

201
- i - removed input & output (2 wire - probe, 2 wire - lights) cables to indicator unit on shelf above S.id.
- ii ran jumpers from probe terminal (red & black) to K & H - S11 & S12.

202
- iii disconnect S_{11}, S_{12} leads running to lights from terminal block.
- iv ran 4-wires from to N-panel; two tied to S11-S12 at block, remaining two to S_{11}, S_{12} leads removed in (iii) tied in K & N to block in N. panel.

Tested unit with dead short in 202 ok.
Tested unit with probe in acid in 201 - ok.

5-4-53 Level Indicator - Battery drain was too great on indicating probe circuits. Took probe circuits - warning & indicating - to 210 for reworking. Mounted on angle base & installed selenium rectifier & filter as voltage supply for the three probes. Circuit:



5-5-53 Note on above - 10k, 2w resistors to be replaced by 3k, 5w when available. -

5-11-53 Bruce -

5-15 Still unstable balance - Non-linear - gain low

5-18-53 Checked tubes $V_1 - V_4$

Replaced all 4 tubes -

Ran thru calibration procedure - seemed ok.

Scotty ran D.C. calibration with multivolt polarimeter.

5-14-53 D.C amplifier check out - (Begun 5-11-53)

Having difficulty balancing.

Output o.k. 1255 voltages out of order.

grid = -250 ; cathode + 7 volts.

cathode should be approx = grid -

[E changed from 22.5 to 45 to drive grid negative)

removing capacitor & test output no help.

Removed output meter & sent selector leads to

grid -24, cathode +9, plate +92

Removed 1255 this repeats all wrong -

New 1255 - no change

floating cathode ; feedback -65 Eplate +92

+ output batt -43 0.K.

· V_4 cathode - +52

grid +47

plate floating {feedback - -64

{output batt + -42

cathode -42

grid -42

plate -42

grid floating- f-b = +9

batt +- +33

cath - +33

grid - +.5

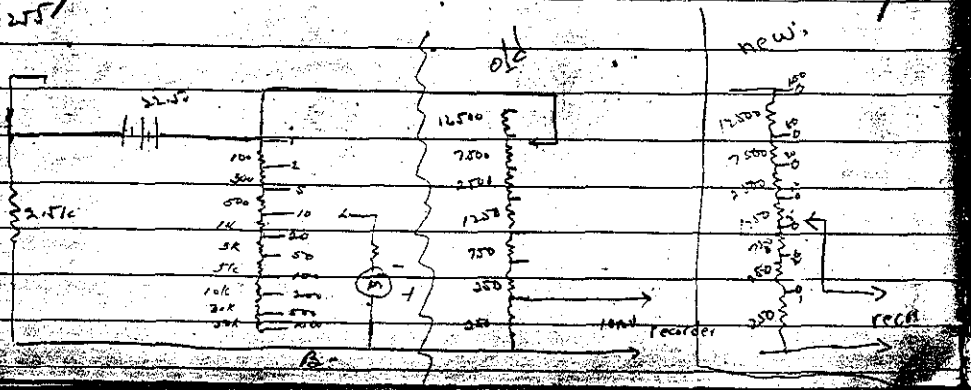
plate - +92

Replaced zeners with 2½ - output resistor -

5-18-53 Mounted 40-40 mfd cap. in place) 1648. - VGH

Change in scale selector sw. affects meter reading -

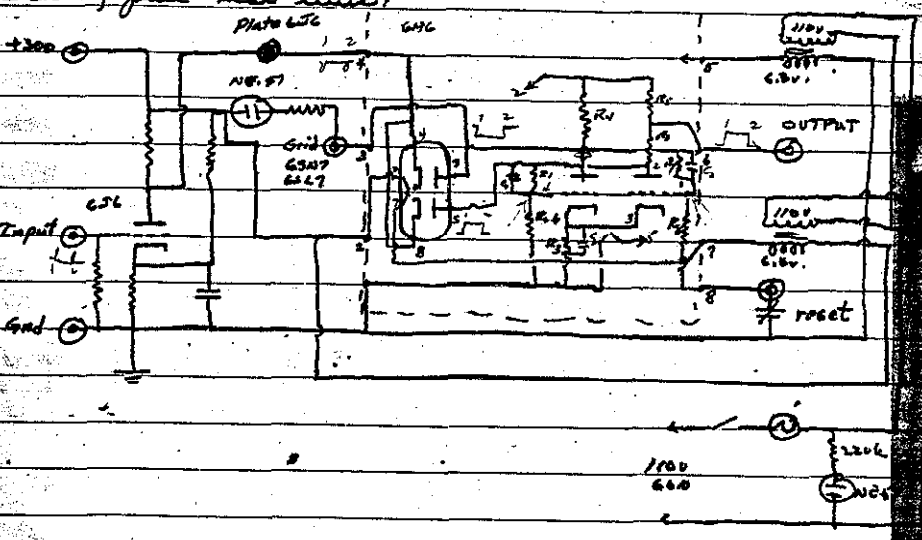
From 100 : 1 on scale sel. increases meter reading



Endpages

5-19/57 Unit on test 5 slab lots, etc.
Units still marked -

5-27-53 Scaling pair test unit.



Scaling Pair Components 6SL7 - 6H6: 6SN7 - 6H6

R_1	1 meg	200k
R_2	500k	100k
R_3	40k	10k
R_4	100k	20k
R_5	25k	5k
R_6	75k	15k
R_7	1 meg	200k
R_8	500k	100k
C_1	40 μμf	50 μμf
C_2	40 μμf	50 μμf
C_3	.01	.01

Using Grid 6SL7 unit took Voltage readings:

Signal for test 100 pulses, 4 pulses @ lo-freq. of 15 v.

Voltage threshold 5.2 volts = equals to 20 v. Same on 1 & 2

Voltage on 6J6 plate (Scope) 15-18 volts (neg pulses)

Grid output ≈ 30 volts { grid trigde: pulse 210 ; off 260 ; on 136
output : " 275 ; " 258 ; " 292

reset 70v. cathode dc. 64 ; read. 70

20 25 / 50 70

Scan unit: 100 μs pulse: Voltage range 100 μs: 6.8 - 9.2 v.

10 μs 6.8 — 20

1 μs 8.3 — 20

to 15 / 5 20

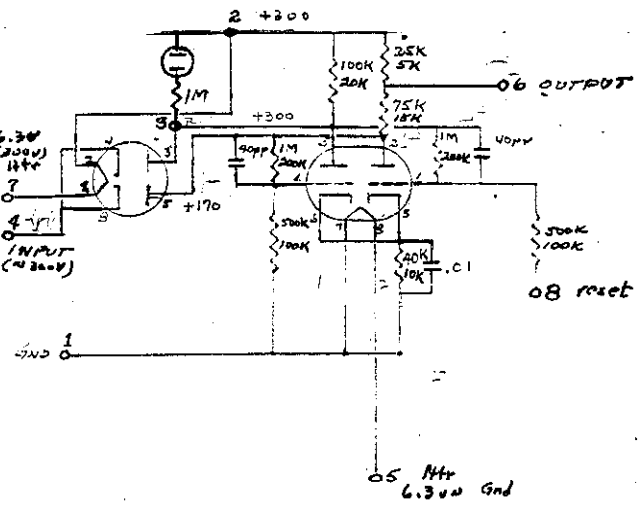
grid trigde - pulse ≈ 210 v. ; off 275 ; on 142

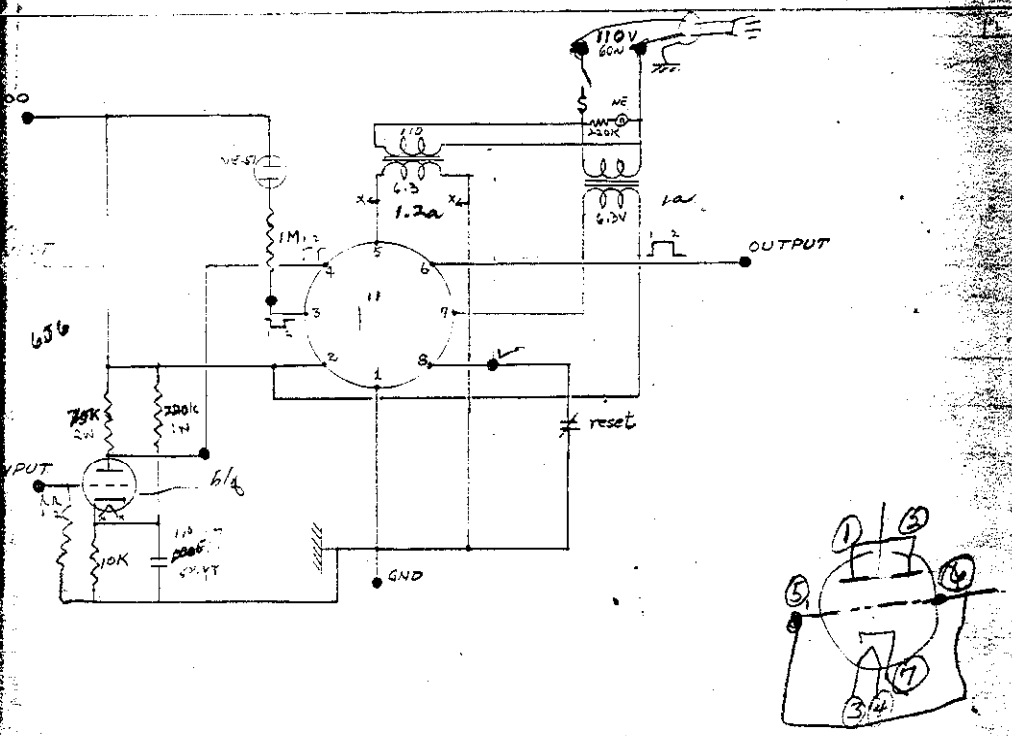
output " 275 " " 262 ; 240

reset 80 v

cathode dc. 64 - 80 on reset

Scaling Tester:





6-8-53 NEPA Log N - Worked on shop for a 3 wks to check out. Calibrated input stages. new 9004 in (not aged) After several hrs. could not to calibrate meter negative after several wks began - returned to job on 6-4-. Put in new 5803. Put in good hi meg resistor (Next 1/3 rated value) Seemed OK. Sent out with Record Tape Simulator. -

6-15. Inventried 3.3 x 10" a resistor (proper value) in unit -

6-17-53 Linearity Check -.

(16 d to cal at 100 & .001 %)

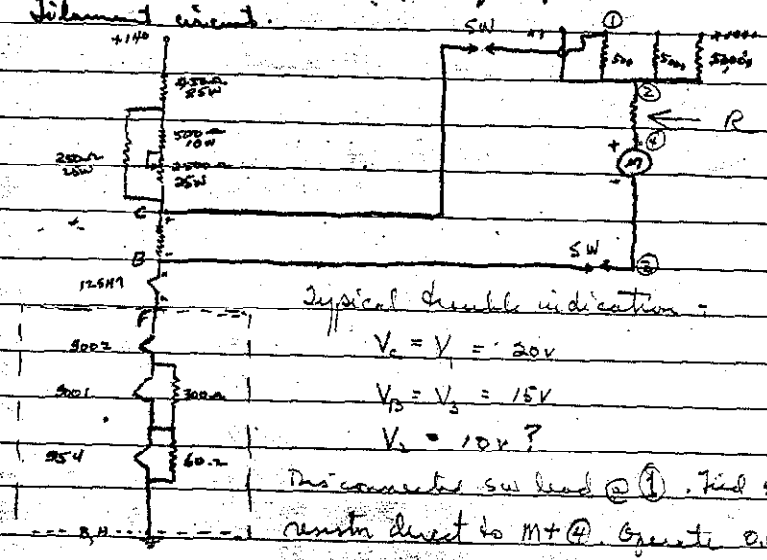
meter	24. Voltage	1c.	
.0001	~~.2415~~	.001	.2380
.001	.2405 .2415	.2390	.2057
.01	.2109 .4536	.4447	.2119
.1	.2079 .6665	.6566	.2117
1.0	.2073 .8678	.8683	
10			
100			

6-23-53 D.C. Amp ER-19 Tube check:

Replaced: 6A2, 6AU6, ~~6BE6~~, 12SH7, 2-6JT6 - in Amp.
9002 in pre-amp.

Inserted meter reversing on fil. position

filament circuit.



Typical trouble indication:

$V_c = V_1 = 20V$

$V_B = V_3 = 15V$

$V_2 = 10V$?

Disconnected SW lead @ ①. Find 5100Ω resistor direct to M+ ④. Operate OK.

Resistors of N 20s on mounted front panel & brot. to resistor in series with meter - value N 5Ω

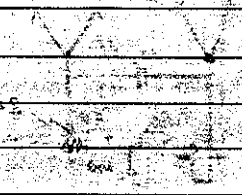
Put in 5Ω, WW resistor in its place -

8-25-53 Hanford B&E counters.

1050: AH 4 Dim 20 } 1/2" x 4". Operate V=2000 v. [1700 - 3200 v]

AH 4 Dim 15 5/16" x 1 1/2". - 1800 v - [1400 - 1800]

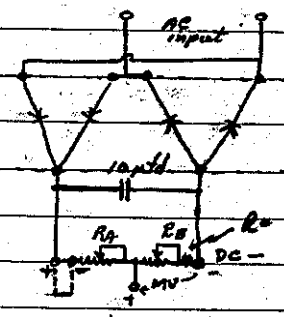
Data & Curves for runs with 1048 linear amplifier and 1010 scaler in file at Hanford B&E counters.



8-24-53

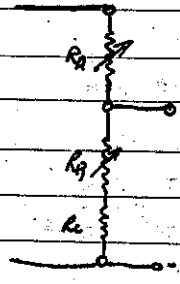
Can test using thermocouple & new millivoltmeter.
Test one.
Developed rectifier unit to attach to output
to apply signal to recorder -
Wanted: signal to drive recorder full scale at 100°C.
For Speedomax = 7 mv.
Brown = 10 mv.
Esterline Angus = 1 ma
For Copper-Constantan 100°C = 4.28 mv. when ref.
thermocouple is @ 0°C.
With DC sensing device at .01 attenuator setting
(10 mv full scale for ~~voltmeter~~ A.C. output of 1 rms volt)
Rms output for 100°C ~~=4.28~~ 0.428 volts.

Rectifier unit.



(terminal board)

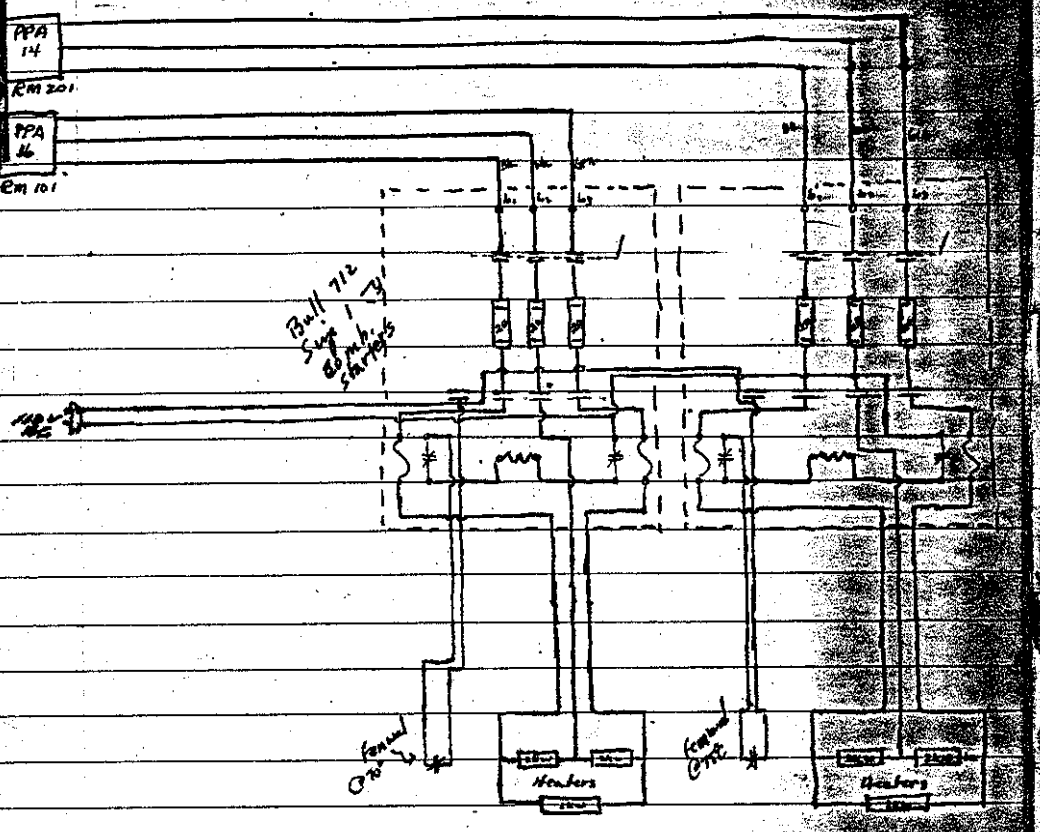
1-15-54 – $R_A = 250{,}000$ $R_A = 250 \times 10^3$ $V_i \doteq 10^3$ v
$R_B = 5000$ $R_C = 10^3$
$R_C = 1000$ $R_B = 0$
$V_o = 4A$ MV $2.5 \times 10^2 \times 4.4 \times 10^{-3}$
$\frac{8.8}{2.2}$
$\frac{1}{1.0} \times 10^{-1} = 1.10$ v dc.



5-53 Big Sid Water Heater -

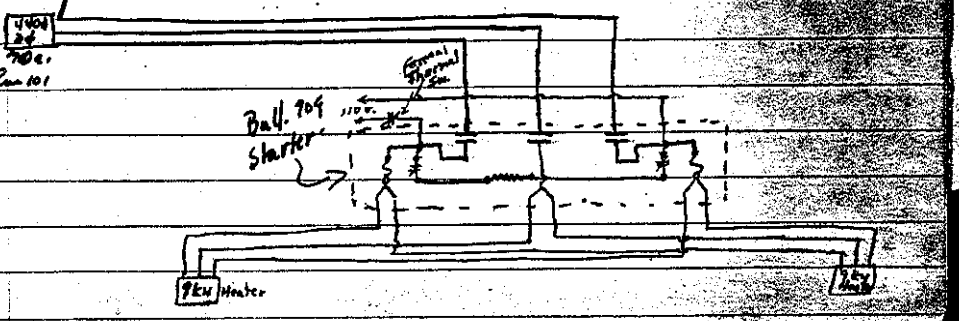
Weird heater system suggested by D.F.C. for maintaining elevated temperature of reflector water

WIRING DIAGRAM:

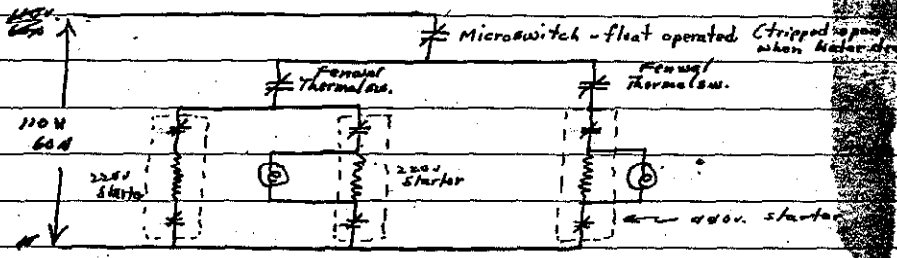


8-26 Tests showed that the system was not enough to heat or hold Sid water to temperature. Additional heaters required.

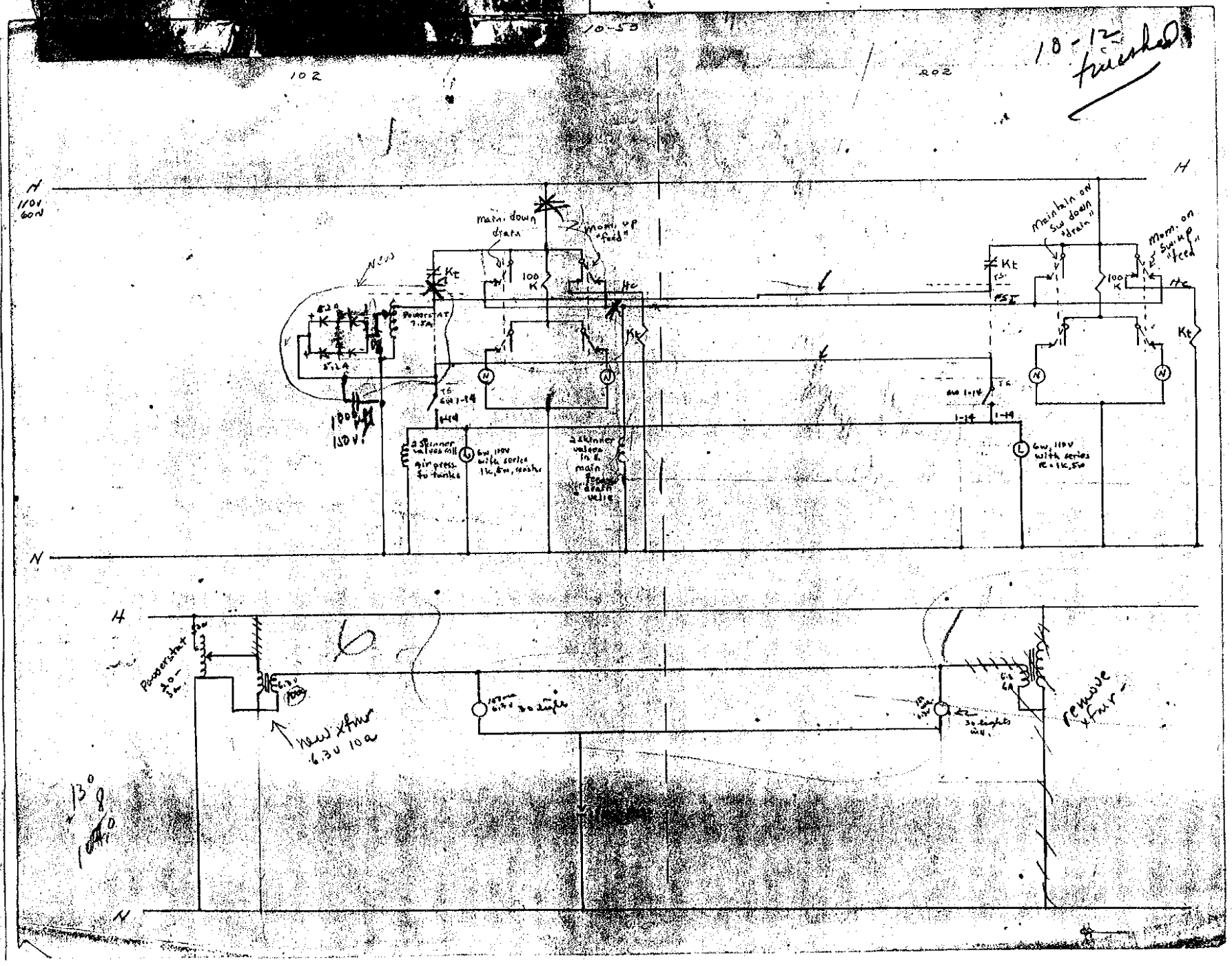
8-27 Installed 2 immersion heaters, 9 KW each, operating from 440v, 3ø, power. Incorporated in system safety interlock to cutoff heaters when water level drops. WIRING - 440v Heaters.

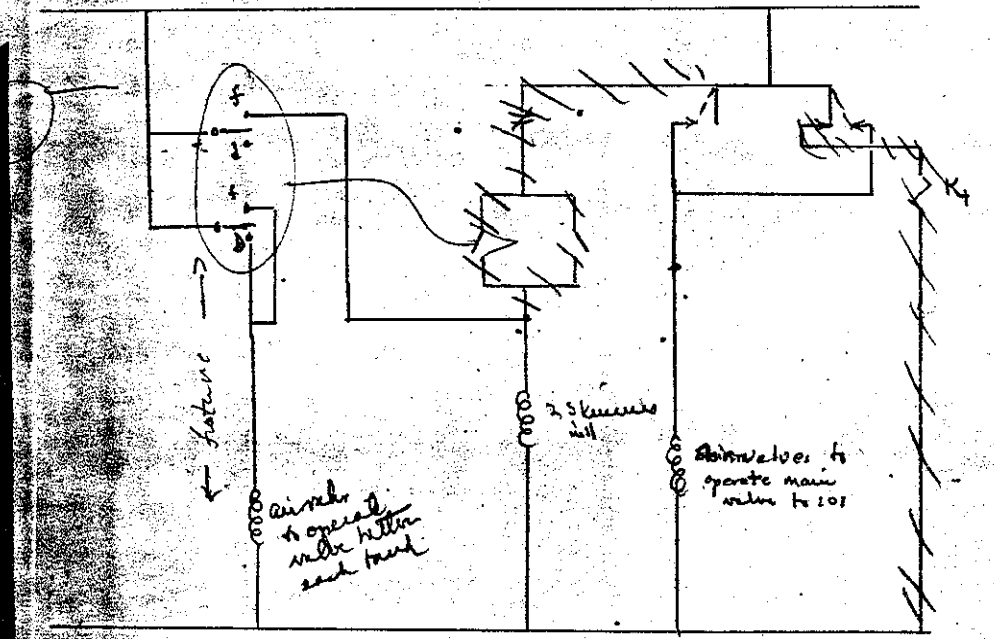


8-23-53 (cont) Control wiring completed - 110v. control system -



Change Over
Oct - 1953
a. New battery ignition & spark plug
b. New D.C. supply for Skinner Valves


102
202
10-12 finished
main down "train"
momt. up "feed"
Kt
100 K
Hc
Powerstat 7.5A
5.1A
100 MFD 100V
To 6w 1-19
1-19
2 skinner valves on air press. to tanks
6w, 110V with series 1K, 5w, resistor
2 skinner valves in 4" main steam "train" valve
maintain on sw down "train"
momt. on sw up "feed"
6w, 110V with series R = 1K, 5W
110V 60W
Powerstat 3.0 - 3.4
new xfmr 6.3V 10A
remove xfmr
30 amp 6.3V
30 amp 6.3V
13.8
10.4



proposed possible change in sol. storage system

9-18-53

Solution Storage System - Suggested wiring modifications -

9-21-53

D.F.C. suggestions previous week -

- D.C. on Skinner -
- Additional electrical operated valves in place manual valves on bottom each tank
- Lower voltage & low current on spark plugs: ✓
  a. lower voltage transformer - 4 2 volt lights with
  b. same transformer & resistor in primary -

9-21-53 Skinner valve D.C. operation -

holds @ 16.5 volts - 146 ma

20 - 178 ma

28 - 220 ma

drops out @ 1.1 volts -

10 v - 84 ma.

For 28 Skinner valves: @ 16.5 v, 146 ma - 4.1 amps

@ 20 v, 178 ma - 5.0 amps.

@ 28 v, 220 ma - 6.2 amps.

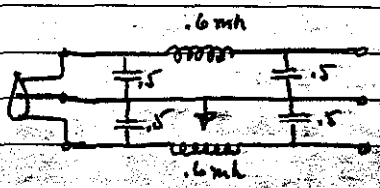
9-22-53 Took DC power supply to 102 for test.

13 SPDT (2C) valves drew 5 amps @ 50 volts -

10-21-53 Poppy Disturbance —

As had been several times before reported, the IBM typewriter in 212 was cause for the Raytheon Poppy giving auto discharge. Poppy had been in 209 for several months for observation. Had been cutting up in 212. Possible for disturbance to get on building power distribution —

Made line filter to insert in 212.



3-conductor cable with 3-prong plug in end to plug in comm. outlet.

Duplex Receptacle 3-wire polarized

This cut out interference to Poppy —

Adjustment of poppy sensitivity from max. to an intermediate level lessened likelihood of other disturbances of low amplitude —

10-22-53 Poppy check at present setting of sens.

H/c 2000 v - sets at M and max. fine adj.

	107 c/m	481 c/m	1513 c/m
Bldg	L. 30	f.s.	M 20
<10	20	45	15
	30		17

2-2-54: Neutron Survey Meter (Cont'd from p. 176)

Serviced - New batteries 2@ 300; 1@ 675; 10-3

Adjusted for proper response.

(a) Disc ccw adj mv to point of deflection on scale and back off slightly.

(b) Turn Disc cw til get Hg. J ≤ 1 psia

(c) Adj mv & Disc for good response & recovery and proper reading on switch changes.

2-3-54 Calibration with PB 222: $N_0 = 3.67 \times 10^7$ on 11/5/53

$N = N_0 e^{-\lambda t}$ $\lambda = \frac{.693}{140} = 4.95 \times 10^{-3}$

$t = 814$ d.

$= 3.67 \times 10^7 e^{-4.95 \times .814}$

$= 3.67 \times 10^7 e^{-4.028}$

$= 3.67 \times 10^7 \times .0178 = 6.53 \times 10^5$ n/sec

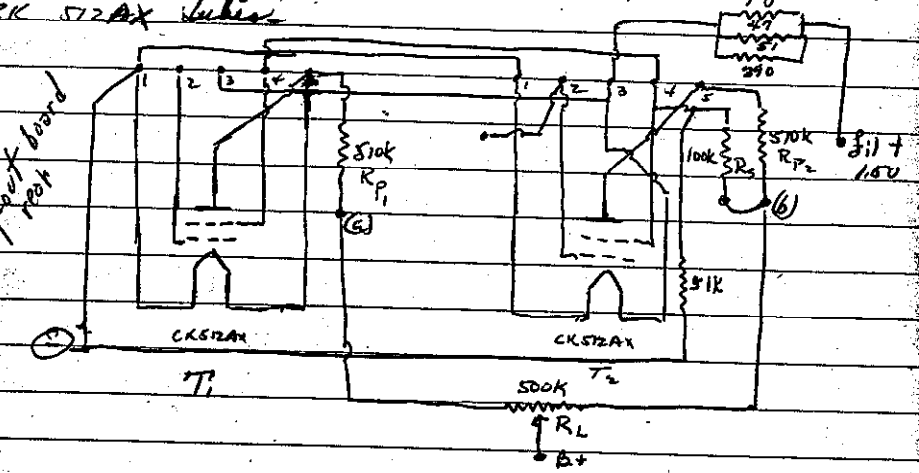
$\text{Flux} = \frac{N}{A} = \frac{6.53 \times 10^5}{4\pi r^2} = \frac{6.53 \times 10^5}{1,257 r^2 \times 10} = \frac{5,200}{r^2}$

r	r^2	F	.495 x 3	155/205	x 30
bkg	—	—	0.3		
100	10^4	5.20	1-2	1.5/1.5	
80	6.4×10^3	8.12	1-2	1/1	
65	4.23×10^3	12.3	2-4	1.5/3	
50	2.5×10^3	20.8	3-5	2/3	
40	1.6×10^3	32.5	4-12	2.5/6.5	
35	1.23×10^3	42.3	8-13.5	6/10	
30	9.0×10^2	57.8	9-15	7/10	
25	6.25×10^2	83.2	11-18	13/12	
20	4.0×10^2	130	14-20	12/14	
15	2.25×10^2	231	0.5	20/03	1.2
10	10^2	520			2.0
6	3.6×10^1	1445			3.0

8-19-54 DC Amplifier for Thermocouple -

Experimenting with sub-miniature, battery-powered, CK 5726X tubes.

8-24-54



$V_{i_{sig}}$ = .62 volts ; $V_{i_{B+}}$ = 42.5 v

remove d Thermocouple from T_{1-2} & T_{1-3}

With no input check voltages on T_1 & T_2

i. $R_{L_1} = 0$ ii $R_{L_1} = 500k$

$T_{1-1} = 0$	$T_{2-1} = 0$	$T_{1-1} = 0$	$T_{2-1} = 0$
$T_{1-2} = -.82$	$T_{2-2} = -.87$	$T_{1-2} = -.69$	$T_{2-2} = -.57$
$T_{1-3} = +1.61$	$T_{2-3} = +1.61$	$T_{1-3} = +1.61$	$T_{2-3} = +1.61$
$T_{1-4} = +3.45$	$T_{2-4} = +3.5$	$T_{1-4} = +13.6$	$T_{2-4} = +13.4$
$T_{1-5} = +41.5$	$T_{2-5} = +10.5$	$T_{1-5} = +26.7$	$T_{2-5} = +14.5$
(a) = 41.5	(b) = +10.5	a = 34	b = +40

$R_{L_1} = 0$

as above - with R_{g_1} = 100 k (T_{1-2} fired in to [-])

$T_{1-2} = -.21$	T_{2-2} -.78
$T_{1-4} = 3.4$	T_{2-4} +3.4
$T_{1-5} = 38.5$	T_{2-5} +10.4
a = 42	b +10.4

R_{g_1} # 10k R_{L_1}=0	R_{L_1}=500k	R_{g_1} # 1 k R_{L_1}=0	R_{L_1}=500k	R_{g_1} # 100
T_{1-2} = -.04v	-.03	T_{1-2} -.01	-.01	T_{1-2}
T_{1-4} = +3.4 v	+10.8	T_{1-4} +3.3	10.9	T_{1-4}
T_{1-5} +34.5	+2.6	T_{1-5} +33.5	+2.7	T_{1-5}
a = 41.5	+26.7	(a) # 2	22	

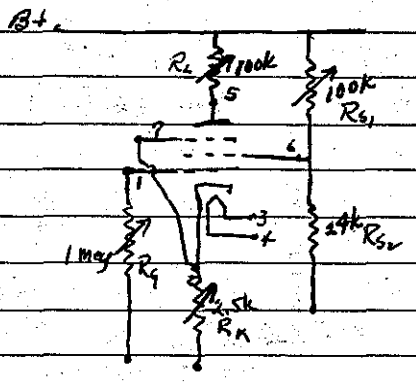
8-25-54 (a) 6CB6 Characteristics — Sharp-Cut-Off Pentode

B+

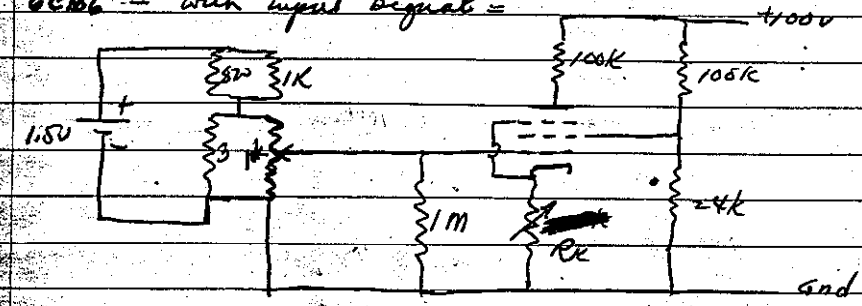
R_L 100K 5 — 100K 0

E_B	R_L	R_G	R_K	R_{S_1}	R_{S_2}	E_P	E_{S_1}	E_{G_1}	E_K	E_{S_2}	Also floating (—)
100	max	Gnd	max	max	24K	79	17.5	0	0	0	Supp. tied to cathode = input grounded
									.25	.73	
						75	17.2		.30	.78	
						70.5	16.9		.45	.65	
						65	16.6		.65	.60	
						59	16.0		.80	.55	
						53	15.2		.90	.60	
						46.4	14.2		.85	.55	
						35.7	13.3		.94	.20	
						25.2	12.2		1.0	.10	
						18.6	9.0		.1	.0	
						12.8	11.2		.15	.15	
100	max	Gnd	—	max	24K	76.5	8.2	0	0	0	Grounded pin 3 thr'd metal frame
						72.5	9.5		.05	.05	
						64.5	10.4		1.0	1.0	
						53.8	11.2		.13	.13	
						42.2	11.8		.15	.15	
						18	12.40		.20	.20	
						9.6	12.60		.30	.30	
						4.45	12.72		.40	.40	
						2.2	12.83		.55	.50	
						1.1	12.87		.60	.60	
						.55	12.9		.65	.65	
						.29	12.93		.68	.68	
100	max	max	max	max	24K	84.5	19.5	+.26	.50	.50	Unshunted grid.
						84.5	19.6	+.25	.50	.50	
						83	19.84	+.28	.45	.45	
						82.5	19.8	+.21	.40	.40	
						80	19.3	+.26	.30	.30	
						78.5	19.3	+.27	.20	.20	
						74.5	19.2	+.26	.10	.10	
						73	19.12	+.24	0	0	
100	max	Gnd	0	max	24K	79	19.0	+.69	0	0	Cathode grd
						72	18.5	+.68			
						66	17.4	+.55			
						61.5	15.3	+.89			
						48	11.5	+.40			
						33.6	7.6	+.20			
						21	5.2	+.20			Build clr, maybe some diff. in E_{S_2} readings
						12.5	11.5	+.10			
						15.9	9.0	0			
100	max	Gnd	0	max	24K	84.5	19.7	+.73	+.54	.54	Cathode R used
						83.5	19.5	+.70	.54	.54	
						82.5	19.6	+.75	.58	.58	
						81.5	19.7	+.70	.56	.56	
						76.5	19.4	+.65	.63	.63	
						80	19.5	+.82	.65	.65	
						73	19.2	0	.60	.60	
						58	17.0	0	1.5		R_L set at point = E_{S_2} = 500 v
						47	15.0		1.4		Grid grnd
						33	12.5		1.3		
						20.1	8.5		1.2		
						16.0	7.2		1.1		
						8.1	4.6		1.0		
						2.6	1.45		.9		
						1.5	.40		.8		
						1.1	.10		.7		
						.6	.05		.6		
						.31	.02		.5		
						.15	.01		.4		
						.07	.00		.3		
						.04	.00		.2		

8-25-44 (c) 6CB6 Characteristics — Sharp-Cut-off Pentode



8-26-54 6CB6 — with input signal =



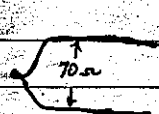
Adjusted R_k to point above max E_p -
R_1 & R_2 2 meg, or 10K values. Rg at max 1 meg.
Readings with 0 input.

$E_p = 14.4v$ $E_g = -.000125v$
$E_k = +.055v$
$E_c = 12v.$

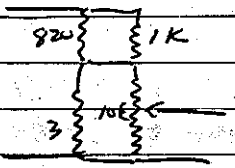
Helipot rotation	E_g	E_p	E_c	E_k	
½ turn	-.000125	14.4	11.8		This indicates input
¼	.013	14.8	12.2	.05	greater than desired,
½	.024	15.6	12.4	.05	false indication of high gain.
¾	.040	16.5	12.7	.05	

Dry w. low resistance input
(a) 100Ω — no change in plate voltage for
5 turns of helipot, about ¼ turn of equiv
of grid voltage value (≅ 4 mv)
when
When tie in equal to grid reads
2.75 mv.

Measured resistance of thermocouple circuit - 70Ω



5/22/50 Measured output resistance of signal device —



Helipot turns		R_o	R_o 3 ea shunt res
CW —	10K 5°	5 Ω	4.4
1/8		120 Ω	
1/4	9.9K 275	270 Ω	275
1/2	9.8 502	480	500
1	9K 9K	900	1000
1 1/2		1.3 k	
2	8K 2K	1.68 k	2.1 K
2 1/2		1.94 k	
3	7K 5K	2.2 k	3k
3 1/2		2.4	
4	6K 4K	2.55	4k
5	5K 5K	2.65	5k
6	4K 4K	2.55	6k
7	3K 7K	2.2 k	7k
8	2K 8K	1.65	8K
9	1K 9K	910	9k
10	8.6Ω 10K	8.6 Ω	10k

This explains change in E_p as signal helipot changed input grid resistance changed giving variable grid potential -

With 68 Ω as input resistor to test stage - no change noted in E_p as input signal varied until at end of run in the last 1/4 turn of helipot

E_g read — 2 mv.

Readings of input signal were as follows.

E_g was changed to 2 mv & after ~ 4 turns E_p began slowly to drop reaching null at ~ 9 3/4 turns, rose sharply to 7.3 mv at extreme CCW pot position

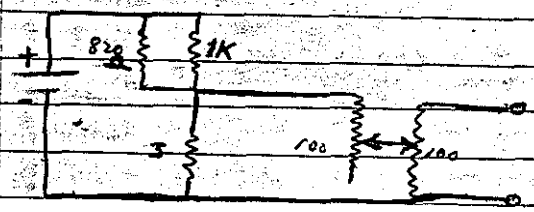
112

8/24/54

Measurements of network not attached to test stage gave explanation —

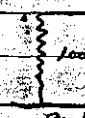
Hp setting	1/8	1/4	1/2	1	2	4	5	6	7	8	9	9½	9¾	1
M Volts	.04	.05	.06	.06	.07	.09	.11	.14	.18	.26	.5	.95	1.8	7

Modified Voltage source —



Output continuous rise from 0 to 7.8 mp.

8/27/54



$E_g = -1.5$ mv. $E_p = 25$ v

$E_g = +2.6$ mv. $E_p = 21$ v

→ E_s means By removing 24k — E_p negligible

→ Shield to P_1 no good response

→ Back to pentode connection, with screen tied to divider point — 100k–24k —

E_s	E_{cf}	E_K	E_s	R_s	E_p
0	-1.38	.15v.	13.7 mv	24.8	
	+1.4	.155	13.8	24.6	
max	2.6	.153	13.8	23.8	

Adjusted R_s to lower values E_g & R_K

E_g	E_p	E_s	E_{cK}
-.4 mv	24.8	18.4	.285
7.6 mv	24.3	18.4	.285

E_s adj to lower value by shunting 24k by 30k —

Adj E_s to 10 v & R_K to get E_p @ 32v

at grid signal $E_g = 2.76$ mv — $E_p = 29.9$ v

max 7.6 mv + $E_p = 38.4$ v → 1.5v

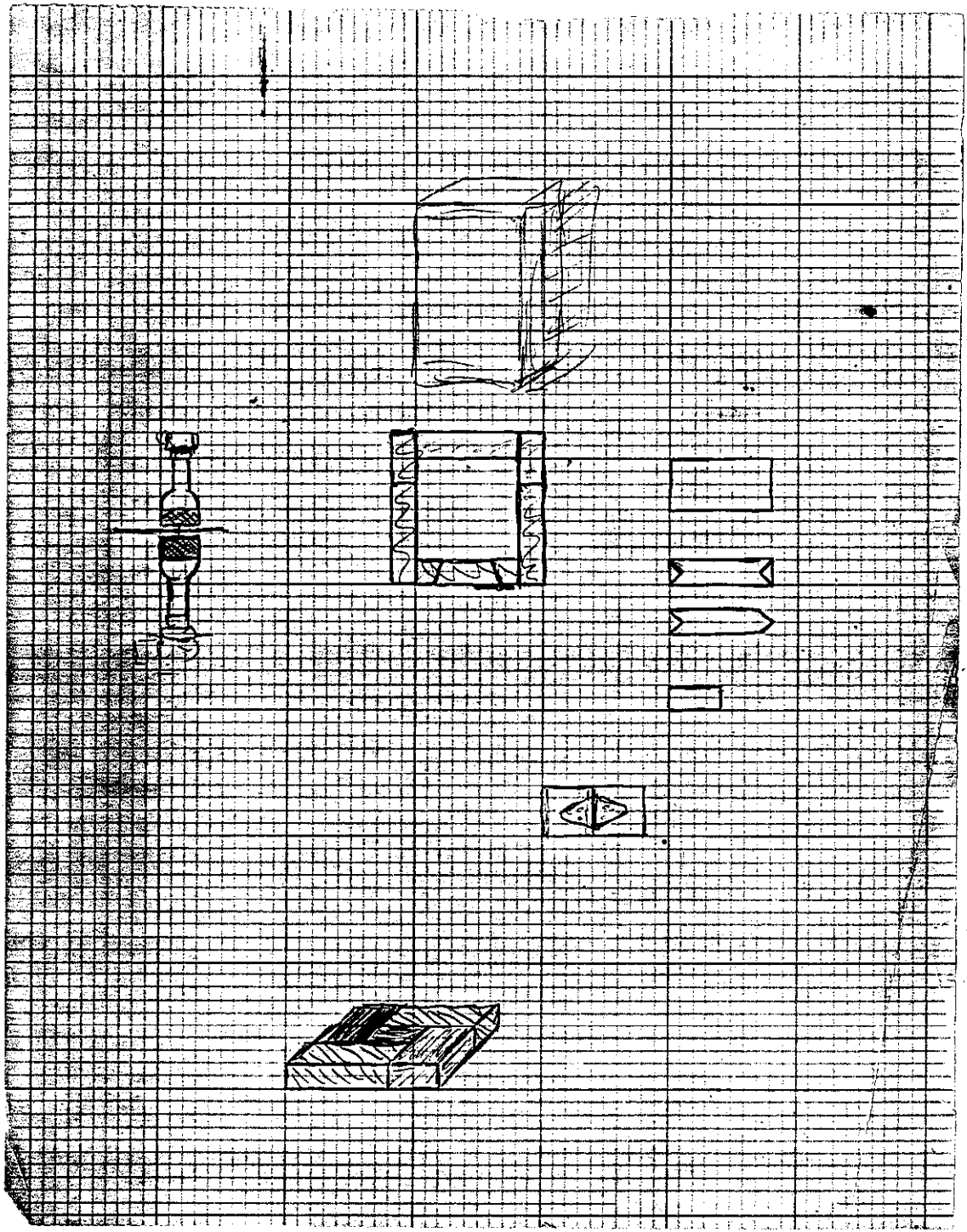
Use S to K. Shows E_p +83. — same order of magnitude gain —

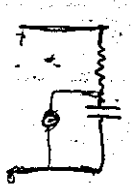
8/22/84

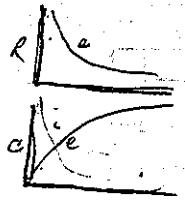
$R_{sh} = 0$

$E_p = 21.8$ @ E_g -4 mV. E_s 9.8 V

$E_p = 20$ @ E_g +7.6 E_s 9.7 V






R
a
C
e

RDK.
2-15-52

Scale of 16 - 15 Min

#1	#2	#3	#4	
1125-4	1218-15	1125-2	1124-2	
1124-12	1191-2	1124-14	1124-12	
1124-14	1133-6	1125-2	1124-15	
1124-11	1253-8	1124-2	1124-9	
1124-13	1302-13	1124-10	1124-10	
1124-12	1179-13	1124-10	1124-10	
	Scale of 64/5 min			
281-12	281-16	281-11	281-12	
281-13	281-31	281-13	281-13	
	Shot BB.			
724-14	6-11	7-15	7-9	10:52A
8-12	969-11	16-0	16-6	
17-6	6-8	872-11	23-15	
84-7	18-0	8-0	756-0	
	Scale 256/5 min			
70-77	70-71	70-78	70-71	
70-79	70-92	70-71	70-70	
70-79	70-214	70-71	70-72	
70-74	70-240	70-72	70-73	
	Scale of 16/5 min			
1124-14	1129-6	1124-13	1124-13	
1124-12	1124-13	1124-12	1124-15	
1125-2	1125-1	1125-0	1125-2	
1124-12	1124-10	1125-0	1124-9	
	Shot BB			
771-4	7-3	9-3	8-5	12:36P
8-6	950-7	18-0	15-9	
17-10	7-5	842-11	23-3	
25-2	15-2	8-0	738-14	

WCX-805 (Jan'48) Y-12 DATA SHEET

Room 215 - Record of Servicing

previous record: p 76

1-23-53 Counters 2 & 3 not operating. — others not counting
ex-ctr: replaced 504 in scaler unit.
C-2: not registering scale 16. Replaced 114 unit.
Pulled unit: all 6J6's ½ bad
6AL5: ½, ½ — replaced
C-3: Put in 114 unit - still counting at extremely high rate -
original 114 in.
Replaced input strip - count rate only doubled —
after warming up ok. on 60V.
Input Sensitivity check on C_1-C_4:
Signal: NICC pulse generator output fed into input of 118 strip
NICC setting: 60V, 1μs, neg.
C_4: @ .19 volts
C_3: adj to .19 volts.
C_2: adj to .19 volts.
C_1: reading .15 adj to .19 volts. ok 1-28-53

2-2-53 #2 tube on scaler 4 out - needs to be checked & replaced -
2-9-53 1611 Checked output stages of Power supplies (except HV) Fisher
at C_1-C_4 Made replacements - Bad tubes 80%
This seemed to fix C_4 not lighting 248 or registering -
3-26- C_2: Strip 118 - had tubes replaced all - (Must have shorted
in counter HV off)
C_4 Replaced bad sockets in input strip (118)
weak and runs, string count check - none on C_2, 4+16 on C_1, none C_3, C_4

4-2-53 Counter check -:

		C_1	C_2	C_3	C_4
0853:	5-min 60V:	1126-12	1202-7	1210-10	1128-12
		ext			
0859:	"	1125-2	1125-7	1125-2	1125-2
0906:	"	1127-0	1154-11	1126-13	1126-12
0914:	"	1124-14	1125-8	1124-12	1124-11
0920:	"	1126-7	1128-3	1126-6	1126-7
Std & Bkg:		807-0	8-1	7-15	8-12
no reset thru out		816-5	980-9	16-4	15-11
		823-8	987-15	853-13	26-4
		832-3	994-11	891-13	820-1

(cont)

Counter Check: 5th & 6th:

		C_1	C_2	C_3	C_4
4-2-53					
Tabulation	S:	807-0	972-8	867-9	795-13
of data p125	B:	9-5	8-1	7-15	8-12
		7-3	7-6	8-5	6-15
		8-11	6-12	7-15	8-9
Compare 9-23-52:					
	S:	802-10	959-3	867-0	791-1
		809-14	995-4	867-12	827-7
	B:		6-11	8-12	8-3
		8-14	7-0	7-8	7-6
			6-10	8-4	
		7-9	7-6	7-15	
		OK.	High	OK.	OK.

Input Sense of C_1 checked. Was -.11 volts changed to -.19.

60w test etc.

	C_1	C_2	
	1126-9	1126-6	$\Delta C = 3$
	1126-13	1127-1	$\Delta C = 4$

4-10-53 C-2 not counting, registering on scale of 16, but OK on 64. Scaled "8" out on ×16. Replaced strip 219.

C-3 not satisfactory on 60w adj. slope set. - OK.

4-13-53 Abandoned 119 strips of C-3, replaced tubes.

Adj to .2 - input + signal > 1 volt removed - Put in new strips - 60w high count - checked all strips. Replaced bad tubes. Installed strips adj gain set. -

4-17-53 C-2: No adj on HV - High coarse position may same as low - coarse max -

6AQ5 & 6AH6 (V301, V303) replaced.

Still bad -

Voltage check showed only 200+ volts to supply material. Rated 300

Checked 6AS7 & 6AU6 in Lo-power supply: 6AS7 dead - OK.

4-21-53 Re-installed in 215 - Hi V OK.

Not scaling - scaled only thru "3". Replaced 114 strips. Put in new fuses after blew on reapplication of power - 60w, 1 min, count OK. for C_2 & $C_{3,4}$ -

6-8-53: Dead Time Scope Measurements -
Connection (scope direct - no attenuator -
scaler
1 500-525 μs
2 400 425
3 460
4 425 ppm 3[illegible]

Connection
7-17-53 Dead Time on C_4 - Hakansson stove - 338 μs.

9-21-53 ✱5 Internal 60∞ runs every -
External 60∞ (W.C.C. pulse generator) quite reproducible -
Input sensitivity ∿ -27 volts -
10 min - 60∞ - 582 ± 46
1000∞ - 10 min. - background - 1 KeV ± 62
S/A 697 KeV ± 45
S/A 685 KeV ± 55
S/A. 686 KeV ± 54

1-4-53 Serviced C_3 & C_4 - tube check & replacement

East End Mon 30

6-5-53 Unit in 107. Blown fuse. Tube check - Replaced 5Y3, 6X5, 6V6, 1-6SN7, 6SJ7, 1-6AL5. Most of tubes. Turned on VR-150 glows too bright. Removed to 210.

6-8-53 Series resistors in regulator 150v. supply appeared burned - Measured - R_1 & R_2, each 22,000Ω, 2W. Were each 4500Ω. R_3 & R_4 each rated 4700Ω, 2W, measured <100Ω.

6-17-53 Dumont 304H - Vertical deflection sensitivity on D.C.

Horizontal Amplification (cf p 15-2 Rec. amp. rough check)

Y-Attenuator	Y-Amplitude	Screen Amplitude (1 cm div #1)	Rec. ref. #	M.V. potentiometer
1	10	—	1	5 mv.
	58	1		
	100	1.6	1	
1	28 → 37	1		10 mv
	52	2		
	70 → 71	3		
	92	4		
	22	1		20 mv
	35	2		
	47	3		
	56	4		
	62	5		
	70	6		
	81	7		
	93	8		
	17	1		30 mv.
	28	2		
	37	3		
	45	4		
	52	5		
	58	6		
	65	7		
	72	8		
	80	9		
	91	10		
	97	11		
	108	28		62.3 mv.
1	100	25		76.9
1	100	30		93 mv.
1	100	40		123

152
4/11/51

Calibration of Scopes.

DuMont 304H:

AC volts (rms)	Amplitude p-p	Y Gain Setting	Deflection (each small square)
1 mv	1.414	AC 1 - 100	1
10 mv	14.14	AC 1 - 100	10 above center
"		1 - 10	1
"		10 - 100	1
100 mv	141.4	10 - 100	9.5
		100 - 100	10
1000 mv	1414	100 - 100	10
		1000 - 100	1

Tektronix

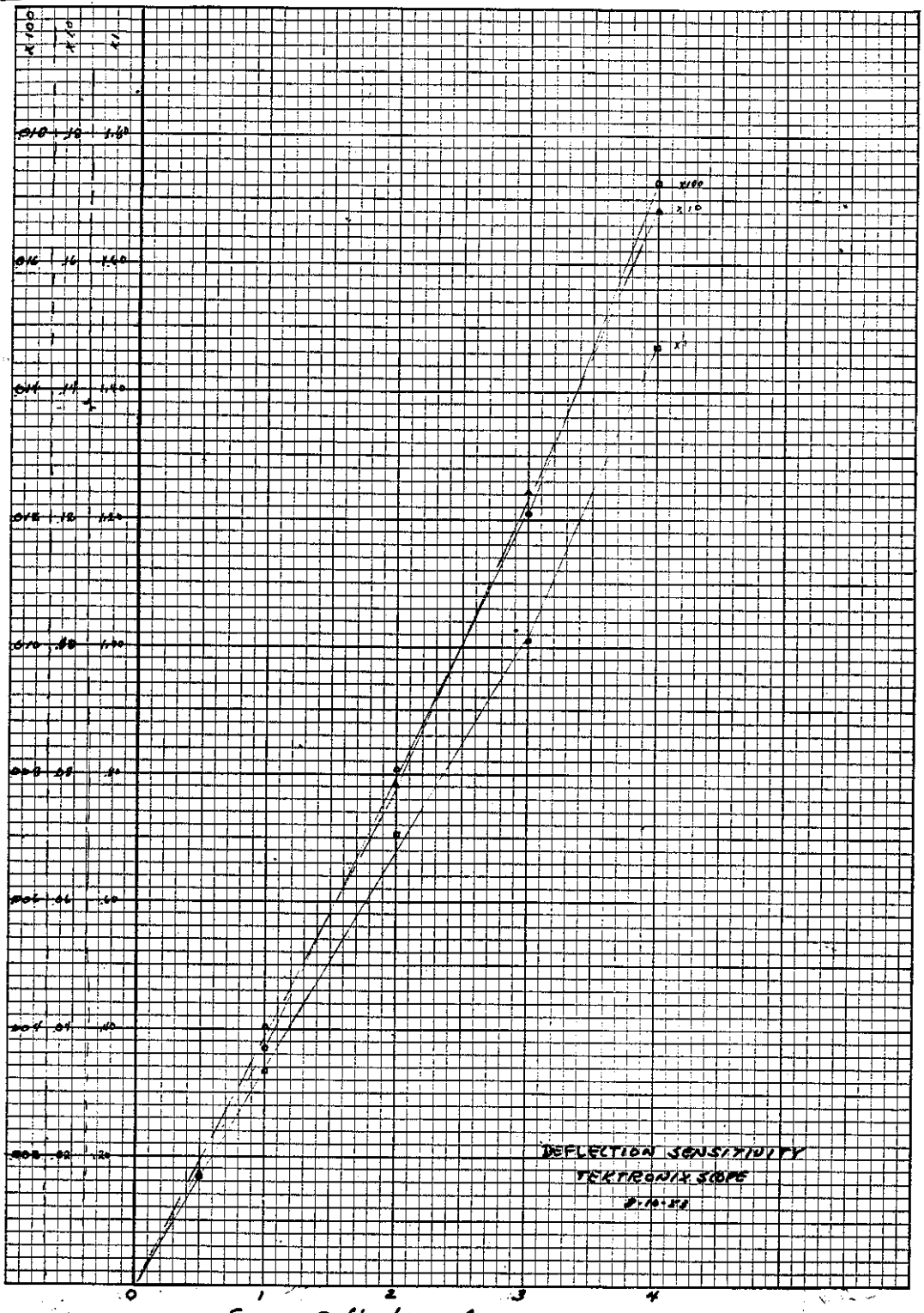
AC volts	P-P volts	Amp Deflt.	Gain	Input Attn.
.7 mv	1 mv	1 cm	x100; 1	2 st x1
7.07	10 mv	1 cm	x10; 1	2 st x1
70.7	100 mv	1 cm	x1; 1	2 st x1

Input probe Attenuator x10. Sine wall gen 10 mc/s

Scope Calibration - Tektronix 2/24/53

(A) Direct - checks out as rated on front panel -

	C4	C5	C5
8-90	89	88	
16-55	87	81	
32-33	85	66	



KEUFFEL & ESSER CO.
10 × 10 to the inch, ½ in. lines accented.
MADE IN U. S. A.

Check on Voltage Sensitivity of Scope, Deflection sensitivity.

Input HP Audio Sig Gen → General Radio AF microvolter → scope

Known AC voltages are impressed on Scope from GR instrument

Scope Input RMS.	Scope Input peak to peak	Deflection
1.3 mV	3.68 mV	1 cm x100 x1
2.85	8.06	2 cm x100 x1
4.25	12.10	3 cm x100 x1
6.10	17.25	4 cm x100 x1
6.10	17.25	5 cm
14.2	40.2	1 cm x10
27.7	78.4	2 cm x10
44.0	124.2	3 cm x10
59.5	168.1	4 cm x10
59.5	168.1	4 cm x1
118	333.8	1 cm x1
248	701.5	2 cm x1
372	1052	3 cm x1
520	1470	4 cm x1

With Discriminator Set at 35

Voltage	Background	source		Voltage	source	Background	
1350	0x16+10	0x16+10	0.0333 0.0330	1350	0x16+7	0x16+5	.0233 .0167
1400	0x16+9	0x16+11	0.0300 0.0367	1400	0x16+4	0x16+11	.0133 .0367
1450	0x16+10	0x16+15	0.0333 0.0500	1450	0x16+2	2x16+5	.0067 .0167
1500	0x16+7	19x16+0	0.0233 1.0133	1500	0x16+2	2x16+12	.0067 .1467
1550	0x16+8	128x16+7	0.0267 6.8300	1550	0x16+7	3x16+9	.0233 .1900
1600	0x16+9	89x64+60	0.030 19.1867	1600	2x16+5	1x16+13	.1233 .0967
1650	0x16+8	21x256+147	0.0267 18.41	1650	1x16+13	3x16+9	.0967 .1900
1700	0x16+4	38x256+216	0.0133 33.147	1700	0x256+245	15x16+5	.8167 .8150
1750	0x16+7	58x256+15	0.0233 49.543	1750	1x256+164	1x256+110	1.400 1.220
1800	0x16+7	78x256+183	.0233 67.3000	1800	2x256+112	35x16+15	2.080 1.916
1850	1x16+10	73x256+81	0.0867 79.630	1850	6x256+14	3x256+228	5.167 3.220
1900	300 sec from one run 2x16+2	100 Sec. from next run 38x256+70	.1133 97.98	1900	100 Sec from next on 10x256+104	100 Sec from next on 3x256+169	26.60 3.323
1950	8x16+7	44x256+107	.450 113.710	1900	57x256+77	2x256+151- 71x16+13	146.240 3.020
2000	Spasmodic 18x16+3	45x256+24	.970 114.44	2000	129x256+18	17x256+227	330.420 15.263
2050				2050	208x256+225	35x256+73	534.630 30.110
2100				2100	981x256+13	53x256+69	719.360 45.790
2150				2150	337x256+146	76x256+196	874.18 65.567
				2200	391x256+209	161x256+214	1003.05 138.04
				2300		225 - 172	Not Accurate too erratic 963.48

Discriminator set at 40

Voltage	Background	source	counts/sec	Voltage	source	background	counts/sec.
1350	0x16+8	0x16+10	.0267 .0333	1350	0x16+0	0x16+0	
1400	0x16+10	0x16+12	.0333 .0400	1400	0	0	
1450	0x16+11	0x16+14	.0367 .0467	1450	0	0	
1500	0x16+12	3x16+4	.0400 .1703	1500	0	0x16+6	.000 .020
1550	0x16+10	64x16+9	.0333 3.4433	1550	Sudden burst 1x16+11	1x16+0	.090 .053
1600	1x16+0	57x64+60	.0533 12.36	1600	0x16+3	Sudden burst of fast 18x16+9 counts 12x256+47 took recount	.001
1650	1x16+0	13x256+69	.0533 11.3233	1650	8x256+287	0x256+24	
1700	1x16+0	29x256+81	.0533 25.0166	1700	In 2 bursts 0x256+154	1x16+2 Sudden fast burst	
1750	0x256+21	44x256+195	.0700 37.546	1750	0x256+175	205x256+138	
1800	0x256+17	58x256+183	.057 50.103	1800	worse	worse	
1850	1x16+5	78x256+225	.0700 67.3100	Stopped operation			
1900	1x16+8	97x256+102	.0800 83.3100				
1950	0x256+58	112x256+168	.1933 96.1333				
2000	13x16+6	118x256+130	.7133 100.6833				
2050	1x256+100	125x256+250	1.1867 106.67				

[redacted]

HANFORD — [redacted] COUNTERS

Plateau Data
8-5-53
Time of Counts 5 min. (300 sec.)

Counting Equipment
AIC Model 1040 Scaler
Attenuator set at 4
Discriminator set at 20
Example Scaler Readings: 58×16+10 / 57×64+48

5/16" x 1½" Ctr. Voltage	Scaler Background	Reading Source	Ects	c/s	½"x4" Ctr. Voltage	Scaler Background	Reading Source	Ects	c/s
1300		0×16+3	3	.01	1400		2×16+2	34	.163
1350		0×16+8	8	.02.67	1450		35×16+5	565	1883
1400		1×16+5	21	.07.0	1500		52×16+4	836	2,787
1450		53×16+1	849	2.83	1550		58×16+6	934	3163
1500		72×64+25	4633	15,443	1600		57×16+11	923	3.08
1550		52×256+71	13383	44.61	1650		51×16+3	819	2.73
1600 ✓		87×256+129		94.67	1700		32×16+8	→ 41×16+2	1.33
1650		121×256+130		103.69	1750		133×16+0		7.09
1700		141×256+93		120.63	1800		498×64+18		106.3
1750		154×256+250		132.25	1850		430×256+133		367.38
1800		164×256+49		140.11	1900		754×256+104		643.7
1850 ✓		179×256+189		153.35	1950		1000×256+128		853.76
1900		195×256+29		166.50	2000		1212×256+118		1034.6
1950		296×256+112		253.89	2050		1275×256+57		1088.19
					2100		1238×256+53		1056.60
					2150		1788×256+49		1525.81

8-6-53

5/16		Discriminator setting: 20		½		
1350 ✓	152×16+1	123×16+0		1350	60×16+13	80×16+3
1400	150×16+0	125×16+3		1400	80×16+5	81×16+10
1450	197×16+15	168×16+8		1450	94×16+8	104×16+8
1500	101×16+2	309×16+2		1500	129×16+11	92×16+7
1550	308×16+3	1013×16+12		1550	382×16+9	439×16+2
1600	299×16+10	334×64+34		1600	62×64+57	56×64+63
1650	7×64+35	397×64+38		1650	38×64+9	41×64+47
1700	25×64+2	138×256+9		1700	10×64+41	16×64+4
1750	9×64+44	129×256+94		1750	7×64+46	95×64+20
1800						

Bad connection accounts for irregular counting.
This recorded counts with no leads or cable.

NCX-865 (Jan'48) Y-12 DATA SHEET

2-3/7-63

Dwell = 20

5/16 x 1 1/2

Voltage	Background	Source	a/b
1350	0x16+5	0x16+4	5.013/.010 b .017
1400	0x16+3	1x16+0	.053/.063 .012
1450	0x16+3	27x16+15	1.49/1.98 .010
1500	0x16+8	184x16+2	9.82/11.17 .027
1550 (4:20 PM)	0x16+3	124x64+16	2651/31.66 .010
1550 (8:30 AM)	0x16+3	148x64+40 / 592x16+13	actual reading 31.66 .01+
1600	0x16+2	269x64+6	57.41 .007
1650	0x16+4	90x256+249	77.63 .013
1700	0x16+10	111x256+93	95.63 .033
1750	3x16+1	122x256+250	104.99 .163
1800	1x16+2 (0x16+8)	125x256+122	107.15 .007
1850	4x16+1	131x256+120	112.19 .217
1900 started random fast counts	3x16+14	148x256+115	126.68 .209
1950	75x64+35	179x256+162	153.24 16.12

1/2 x 4"

Voltage	Source	Background	a/c
1350	0x16+10	4x16+5	3.033 c .28
1400	0x16+13	5x16+15	643 .317
1450	1x16+1	7x16+13	4.057 .417
1500	0x16+10	6x16+14	used Resistor To Eliminate Charge on Tube .033 .367
1550	4x16+2	8x16+15	
1550	3x16+2 / 2x16+8	14x16+13 / 15x16+1	.193 .69
1600	6x16+13	8x16+15	.363 .477
1650	14x16+12	10x16+15	.786 .583
1700	32x16+10	8x16+6	1.74 .447
1750	9x256+80	14x16+3	3.45 .959
1800	104x256+106	15x16+11	89.1 .837
1850	337x256+208 / 340x256+79	2x256+64	340.4 1.92
1900	609x256+66	12x256+76	519.9 10.49
1950	839x256+65 / 854x256+65	41x256+143	729.0 35.46
2000	1035x256+33	92x256+220	888.3 79.24
2050	1215x256+153	213x256+203	1039.3 182.44
2100 started random FAST counts	1286x256+55	311x256+1	1092.6 265.39
2150	1321x256+108	268x256+205	1127.7 229.38

With Discriminator set at 30

Voltage	Background	Source	counts/sec.	Voltage	Source	Background	counts/sec.
1350	1x16+11	0x16+10	.09 backgnd .033 source	1350	0x16+12	1x16+14	.04 - source .1 - backgnd.
1400	4x16+6	1x16+9	.1267 .0833	1400	0x16+4	2x16+13	.0133 .150
1450	0x16+9	2x16+9	.030 .133	1450	0x16+7	3x16+13	.023 .230
1500	1x16+7	72x16+6	.0767 3.869	1500	6x16+4	7x16+0	.333 .3733
1550	0x16+14	247x16+13	.047 13.22	1500	6x16+14	16x16+4	.367 .867
1600	0x16+9	33x256+85	.03 28.16	1500	1x256+103	34x16+10 0x256+200	1.1967 1.256 + quiz 3.0266
1650	0x16+10	55x256+54	.033 47.113	1650	3x256+140	0x256+171	.570
1700	0x256+14	78x256+135	.0467 67.01	1700	4x256+145	5x256+77	3.8969 4.5233
1750	1x16+9 1x16+10	97x256+9	.0867 82.833	1750	5x256+246	1x256+152	5.0867 1.360
1800	1x16+3	92x256+147	.0633 78.9967	1800	37x256+178	43x256+193	31.573 37.337
1850	1x16+3	113x256+91	.0633 96.73	1850	11x256+251	13x256+37	10.223 27.883
1900	0x256+49	127x256+97	.163 108.6966	1900	80x256+179	8x256+9	68.83 6.8566
1950	23x16+15	133x256+11	1.2076 113.493	1950	368x256+36	19x256+200	228.813 16.88
2000	50x16+9	148x256+1	2.6967 126.2967	2000	554x256+33	38x256+109	509.413 32.79
2050	320x16+14	161x256+204	17.113 138.067	2050	718x256+53	53x256+158	612.870 47.953
2100	erratic here on			2100	437x256+141	35x256+88	746.53 60.956
				2150	522x256+25	62½ sec. 25x256+91	891.046 103.956

FCX-865 (Jan'48) Y-12 DATA SHEET

with Discriminator set at 25

5/16 x 1 1/2" Voltage	Background	Source	counts/second	1/2" x 4" Voltage	Source	Background	counts/second
1350	0x16+10	0x16+10	.033-background .033-source	1350	1x16+2	2x16+13	.06-source .15-background
1400	3x16+8	1x16+4	.167 .067	1400	1x16+1	4x16+0	.0567 .213
1450	1x16+15	27x16+1	.1003 1.443	1450	0x16+14	11x16+3	.0467 .223
1500	0x16+13	152x16+15	.043 8.160	1500	6x16+0	5x16+0	.320 .266
1550	0x16+15	126x64+4	.05 27.226	1550	7x64+4	14x64+55	1.5067 3.17
1600	0x16+14	52x256+114	.0467 44.753	1600	4x256+127	16x64+40	3.8367 3.5467
1650	1x64+19	75x256+21	.2767 64.007	1650	6x256+33	5x256+24	5.23 4.3467
1700	1x16+3	101x256+57	.0633 86.3767	1700	9x256+4	2x256+11	6.906 2.33
1750	1x16+5	96x256+21	.07 81.99	1750	6x256+19	4x256+34	5.1833 3.5266
1800	1x16+15	110x256+161	.133 94.403	1800	6x256+247	4x256+10	5.943 3.4467
1850	3x16+8	121x256+219	.18667 103.983	1850	39x256+130	5x256+234	33.713 5.38
1900	started skipping counts on background 14x16+6	with source in background 133x256+206	.767 114.113	1900	159x256+61	12x256+139	136.086 10.23
1950	55x16+5	142x256+234	2.95 121.953	1900	383x256+130	27x256+146	323.927 23.5267
2000	8x256+73	155x256+25	7.0367 132.017	2000	596x256+227		509.343
2050							
2100							
2150							

With discriminator set at 45

5/16" tube

Voltage	background	source	(background) counts/sec.	(source) counts/sec
1350	0 X 16 + 10	0 X 16 + 10	.0333	.0333
1400	0 X 16 + 10	0 X 16 + 11	.0333	.0366
1450	360 sec. 0 X 16 + 12	0 X 16 + 14	.0333	.0466
1500	0 X 16 + 14	1 X 16 + 3	.0466	.0633
1550	0 X 16 + 12	30 X 16 + 5	.0400	1.6166
1600	0 X 16 + 13	124 X 16 + 8	.0433	6.640
1650	0 X 16 + 14	8 X 256 + 16	.0466	6.880
1700	0 X 16 + 14	19 X 256 + 164	.0466	16.746
1750	0 X 16 + 14	31 X 256 + 155	.0466	26.970
1800	0 X 16 + 14	44 X 256 + 80	.0466	37.813
1850	1 X 16 + 4	61 X 256 + 65	.0666	52.270
1900	1 X 16 + 7	82 X 256 + 25	.0766	73.390
1950	0 X 256 + 36	101 X 256 + 136	.1200	86.640
2000	0 X 256 + 168	113 X 256 + 162	.5600	96.426
2050	0 X 256 + 246	119 X 256 + 180	.8200	102.146
2100	irregular count 3 X 256 + 28	100 secs. 42 X 256 + 263	2.953	109.150