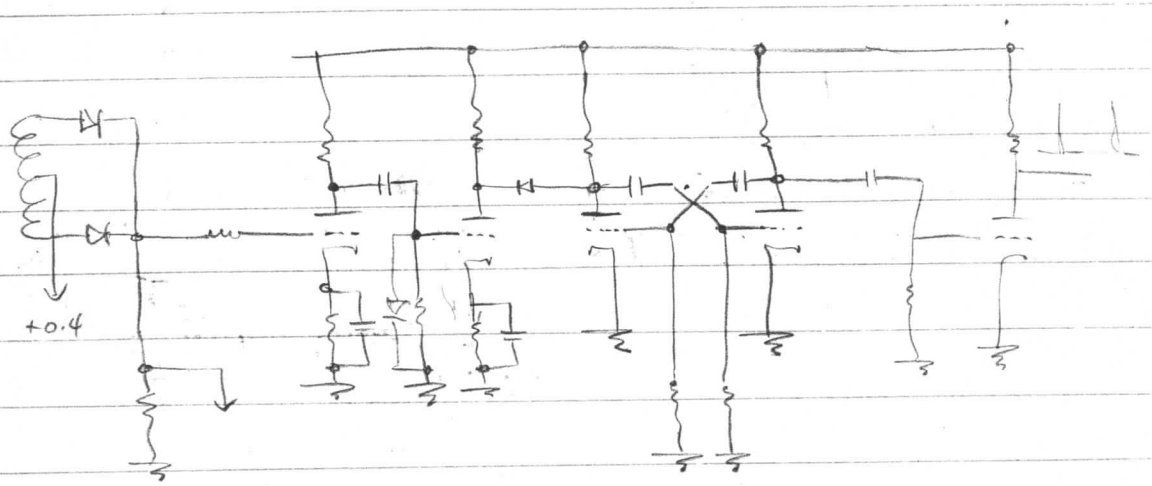
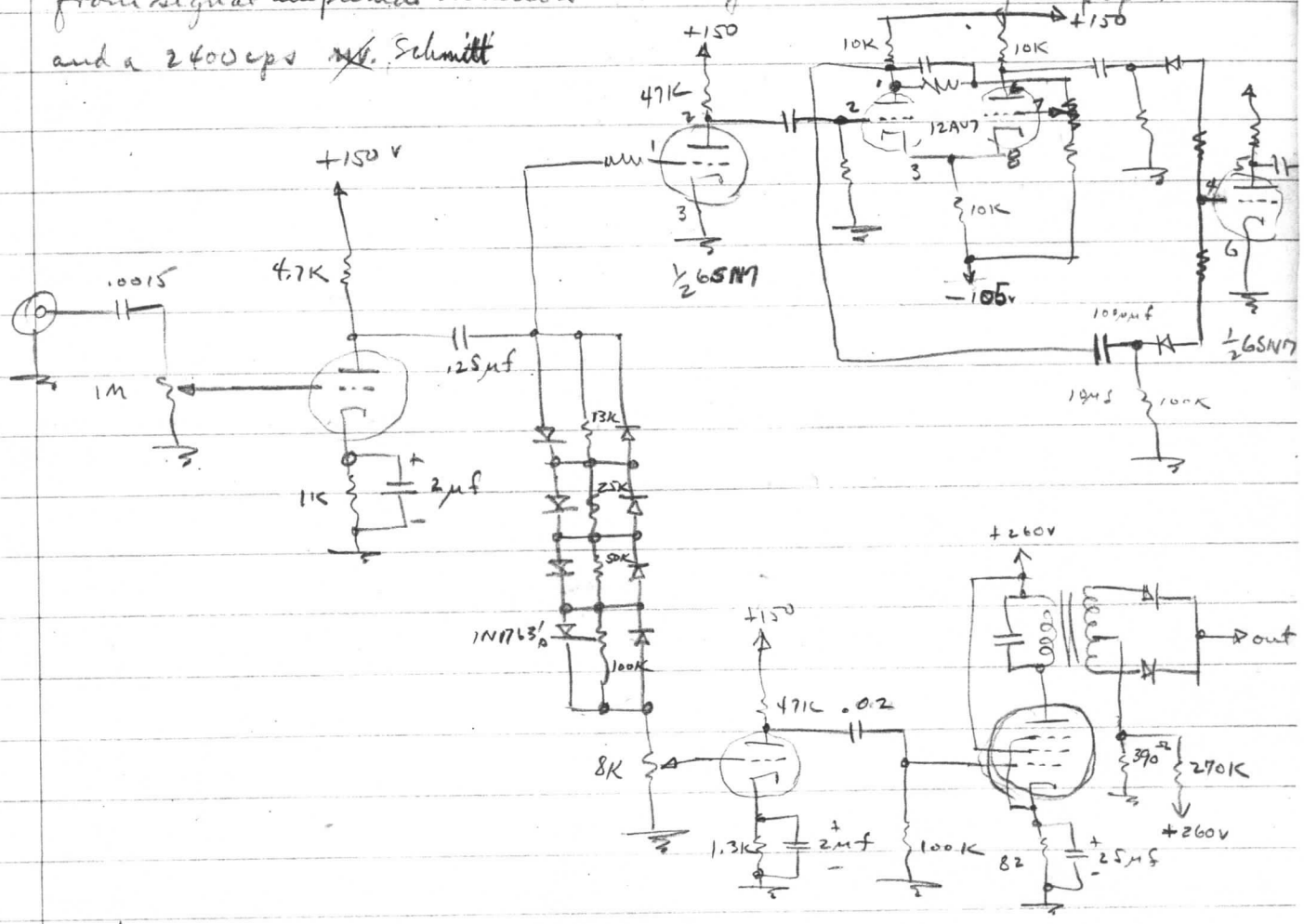
2/5/65 Another possibility is a synchronized free running MV running at 4.8KC



Advantage here is continuation of clock pulses in the absence of signal.

Another possibility is a separate limiting amplifier for the signal to avoid the compression of low amplitude.

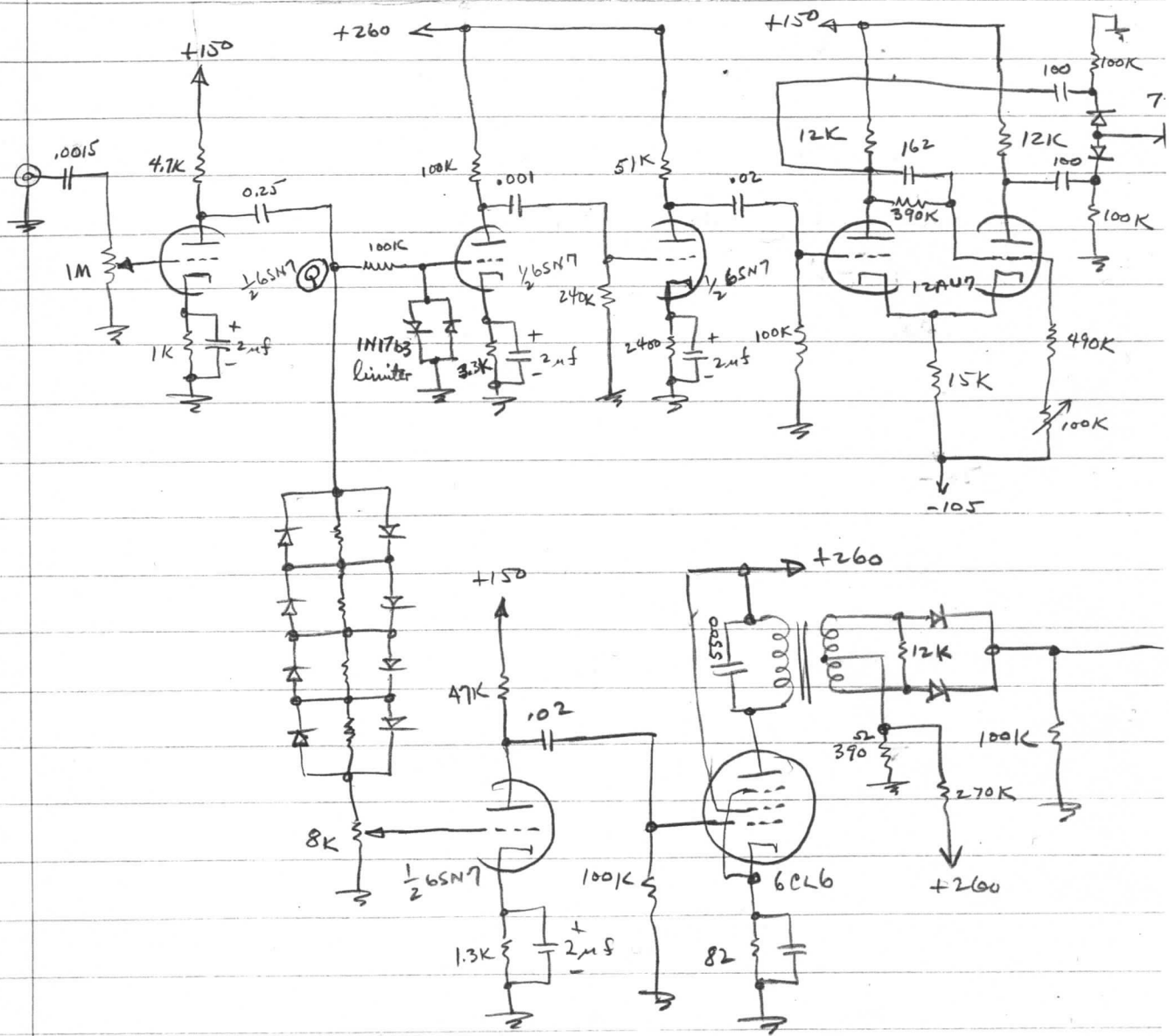
2/7/65 Pulse width using the rectified signal will vary with signal amplitude since rate of change through zero is proportional to amplitude. Using a limiting amplifier and a 2400 cps synced MV, perhaps symmetrically synced 180° out each side, with diode coupling out of both sides would give the required freedom from signal amplitude variation. First objective a limiting amplifier and a 2400 cps ~~MV~~ Schmitt

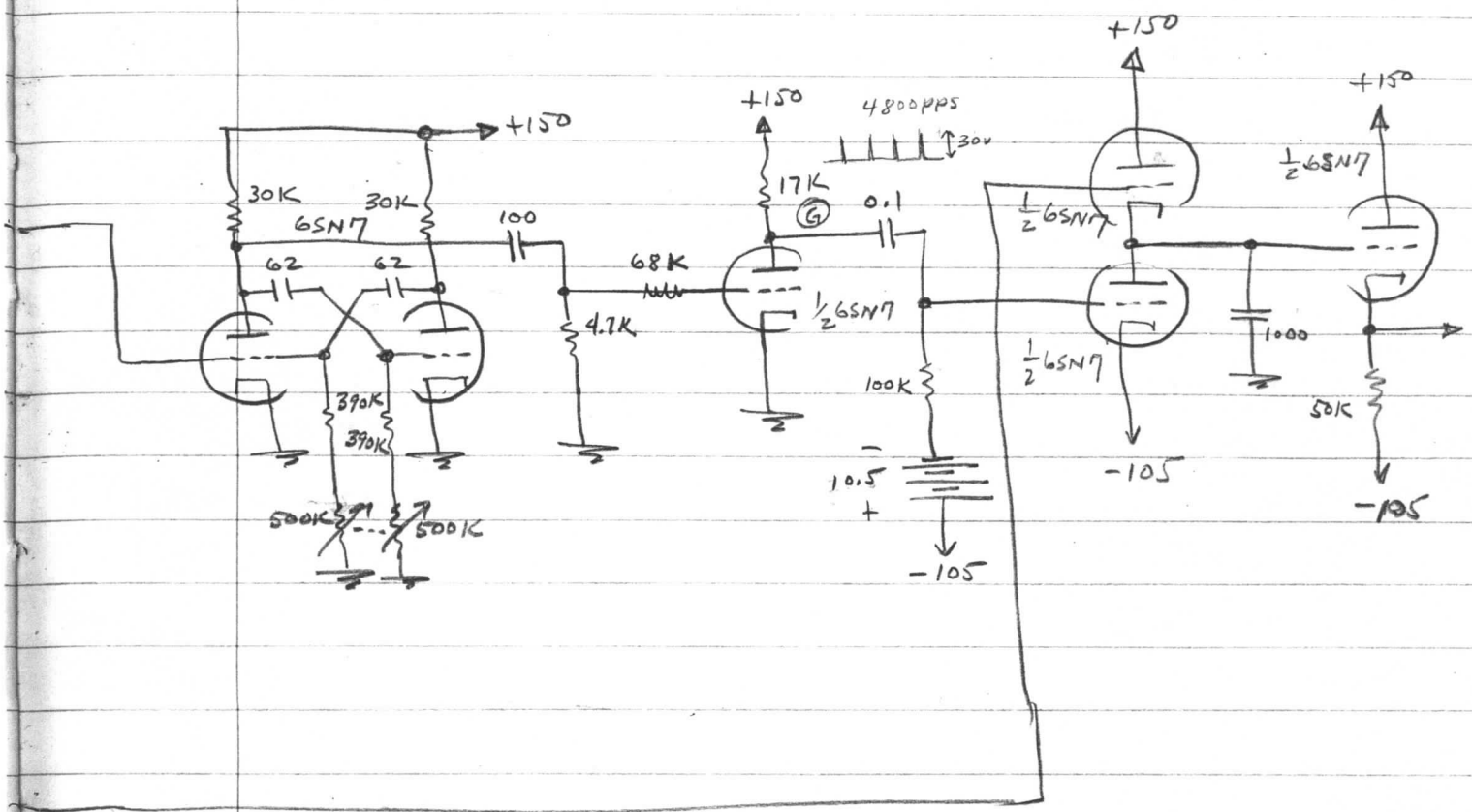


$\frac{1}{4800 \text{ cps}} = 0.2 \text{ ms}$

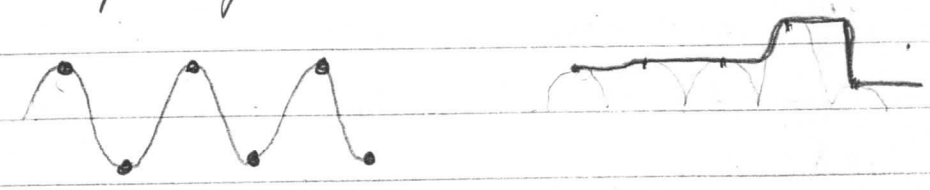
$= 200 \mu s$

2/8/65


+150
.0015
4.7K
0.25
1M
1/2 6SN7
1K
2 mf
100K
.001
+260
1N1763
limiter
3.3K
2 mf
51K
.02
1/2 6SN7
240K
2400
2 mf
100K
+150
100
100K
12K
162
121K
100
390K
100K
12AU7
490K
15K
100K
-105
+150
47K
.02
8K
1/2 6SN7
1.3K
2 mf
+260
0.05
12K
390
100K
270K
100K
6CL6
82
+260

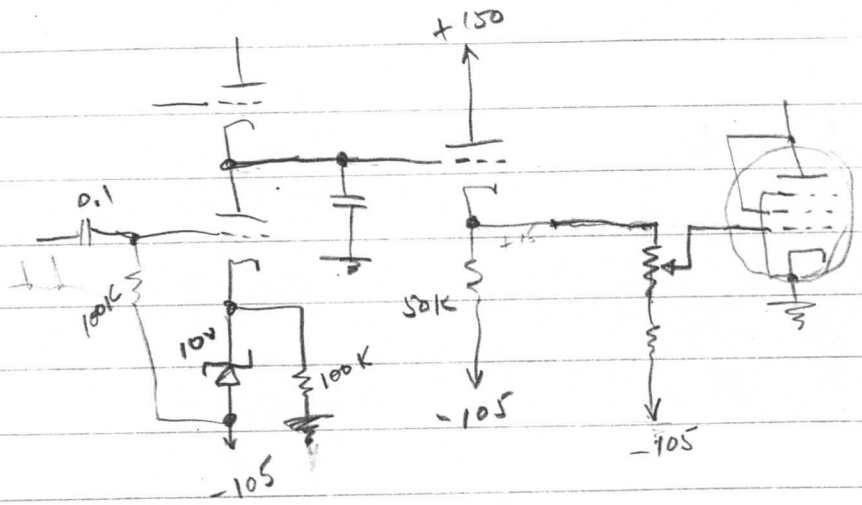

+150
30K
30K
6SN7
62
62
100
68K
4.7K
390K
390K
500K
500K
+150
4800PPS
30V
17K
G
0.1
½6SN7
100K
10.5
−105
+150
½6SN7
½6SN7
−105
+150
½6SN7
1000
50K
−105

Checked operation with Z axis brightening from (G) dunk pulses against input signal. Dron below 0.1 to over 1.2V RMS



Boxcar works very well with the 10.5V battery biasing the dunk off interpulse. Will not self bias. Noise on signal seems to be worse due to better high frequency response but it may be an illusion due to the square tops of the boxcar.

I ordered 25 sheets of 8"x10" Royal X Pan from the Camera Corner on Saturday. They will have it Wednesday. Speed rating ASA 1250. ~~XXX~~ Pan that I have been using is ASA 400. Blacks are not really dense. Price of both is the same: $11.75.
Perhaps I should invest in a 10 volt Zener diode for bias.



2/10/65 Added 10v Zener last night - worked very fb. right off. Checked holding with signal waveform. Changing $\frac{1}{4}$"-20 traverse drive to $\frac{3}{16}$"-24

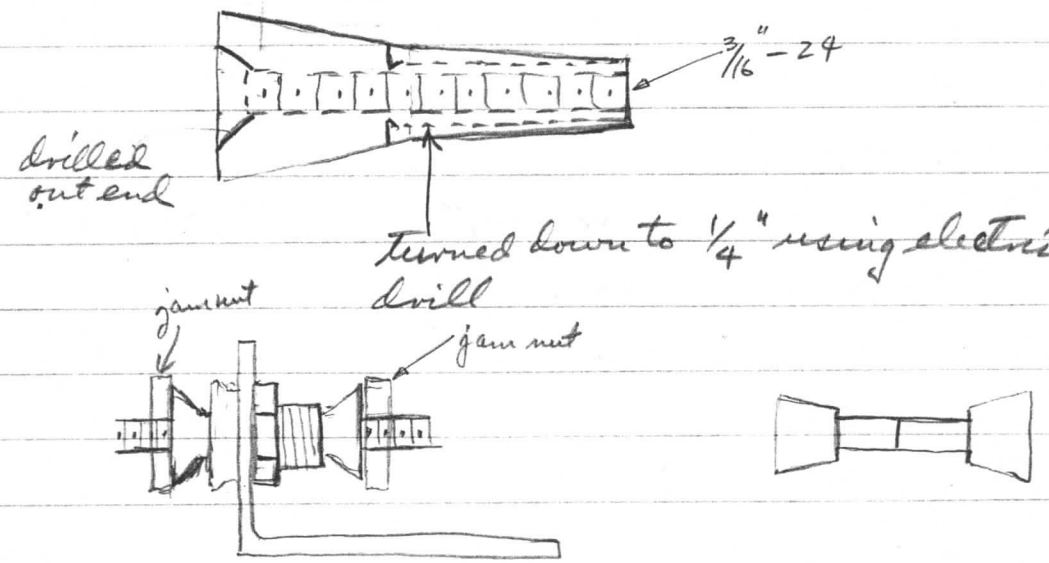
Drum circumference is $2" \times \pi = 6.28"$

Traverse will now be

$$\frac{48 \text{ RPM}}{24 \text{ rev/in}} \times 3\frac{1}{2} \text{ min} = 6.5"$$

giving a picture almost square.

Trying a bearing made from 2 lead anchor inserts



If I later try to use 4" × 5" film

$$\frac{48\ \text{RPM}}{32\ \text{RPin}} \times 3\tfrac{1}{2}\ \text{min} = 5\tfrac{1}{4}\text{"}, \text{ too much traverse}$$

$$\frac{48}{36}\ 3\tfrac{1}{2} = 4\tfrac{2}{3}\text{"}$$

$$\frac{48}{40}\ 3\tfrac{1}{2} = 4.2\text{"}$$

3.5
.7
4.2

I will have to change motors unless I could get a 48 thread per inch rod.

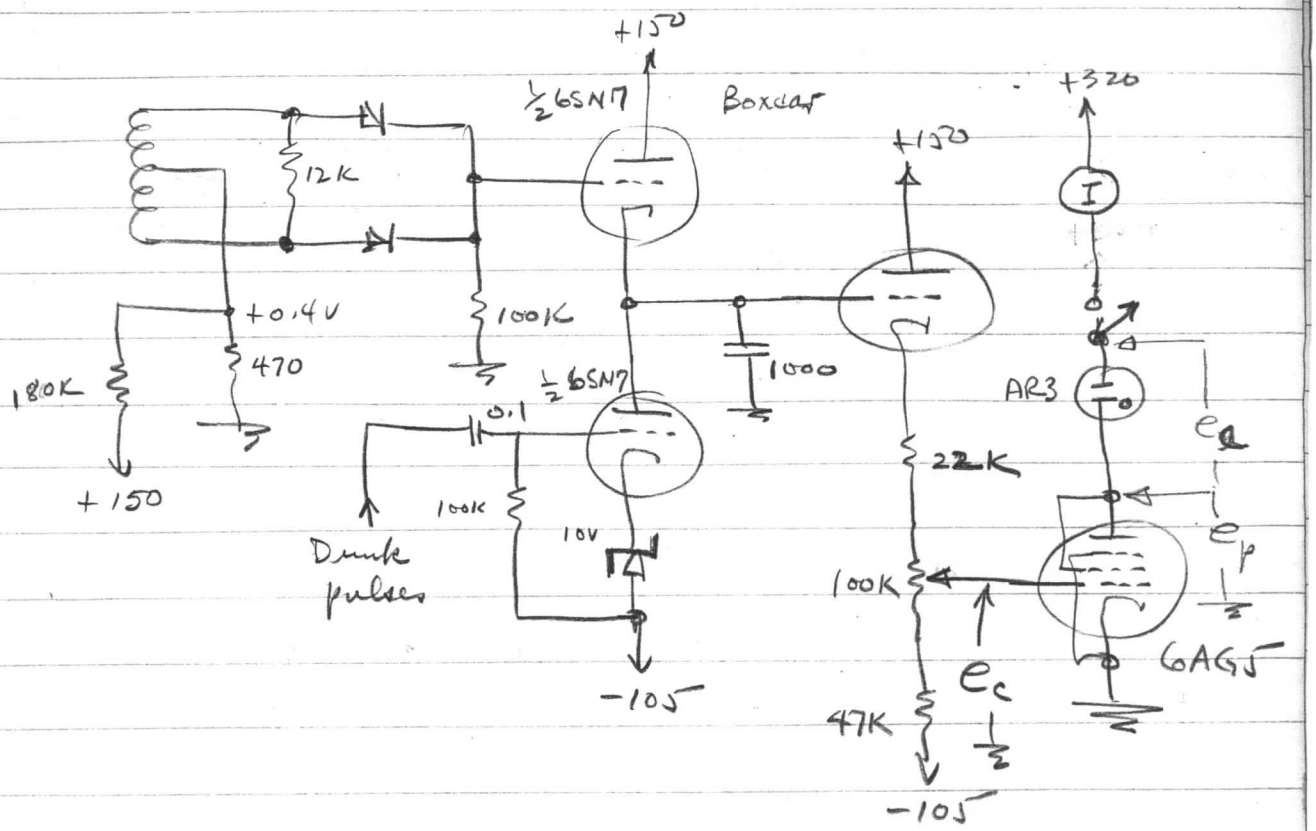
Aside from the 4:1 reduction in film cost, I could use the enlarger to make map overlays with arbitrary scales.

I have 10-32 ~~rod~~. To make 4" ~~traverse~~ in 3.5 ± 0.1 min

$$\frac{4\text{"} \times 32\ \frac{\text{rev}}{\text{in}}}{3.6\ \text{min}} = 36.2\ \text{RPM}$$

Next motor size lower is 33⅓

2/13/65

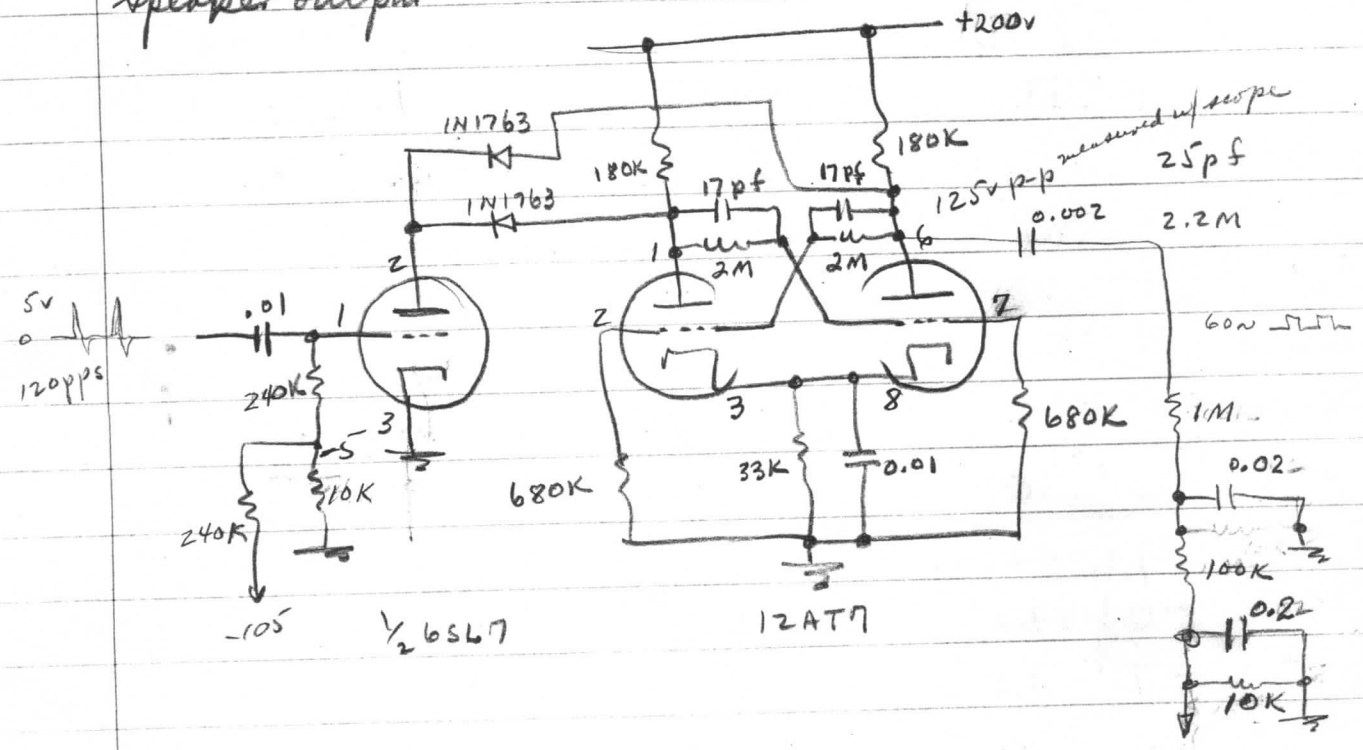


e_c	e_p	I (ma)	e_L	Power in lamp (mw)	$10 \log_{10} P_L$
-9	+230	0	90	0	$-\infty$
-8	+230	0.1	90	9	8.54
-7	+230	0.25	90	22.5	13.52
-6	+225	0.45	95	42.7	16.30
-5	+210	1.05	110	115	20.60
-4	200	1.80	120	216	23.40
-3	175	2.9	145	420	26.23
-2	148	4.5	172	775	28.90
-1	115	6.3	205	1290	31.10
0	80	8.0	240	1920	32.83

See p 26, 30

AED Test pattern tape.

Signal is 120 pulses per second. From Miranda level is +0.5v peak with tone at 6, volume at 6. Monitor output, right channel. +5.0v peak at speaker output



Counter from "Thesis notes" p 278

"6SL7 cutoff -2.5v at +150v

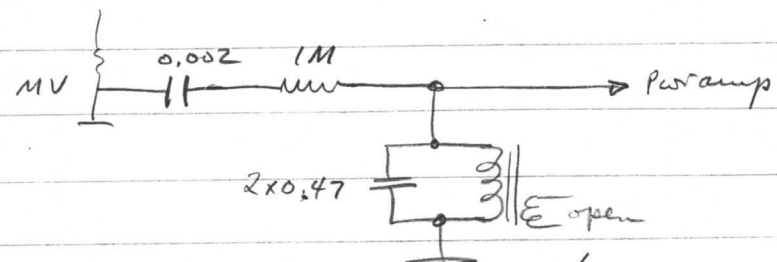
60 ~ square wave - no even harmonics.

180 ~ and up.

3:1 each section. 1 volt p-p should be enough

$\omega_{co} = 377$ $\quad C = \frac{1}{1M(377)} = 0.00265\,\mu f$

2/14/65 The output was not enough for the power amplifier - Went back one section. Motor runs on the 125 v but waveform is very spikey. More response in the power amp at 180 ~ and above than at 60 ~. Tried one of the RCA surplus output transformers; it tunes to 60 ~ with $2 \times 0.47\,\mu f$. $Q \approx 4$.



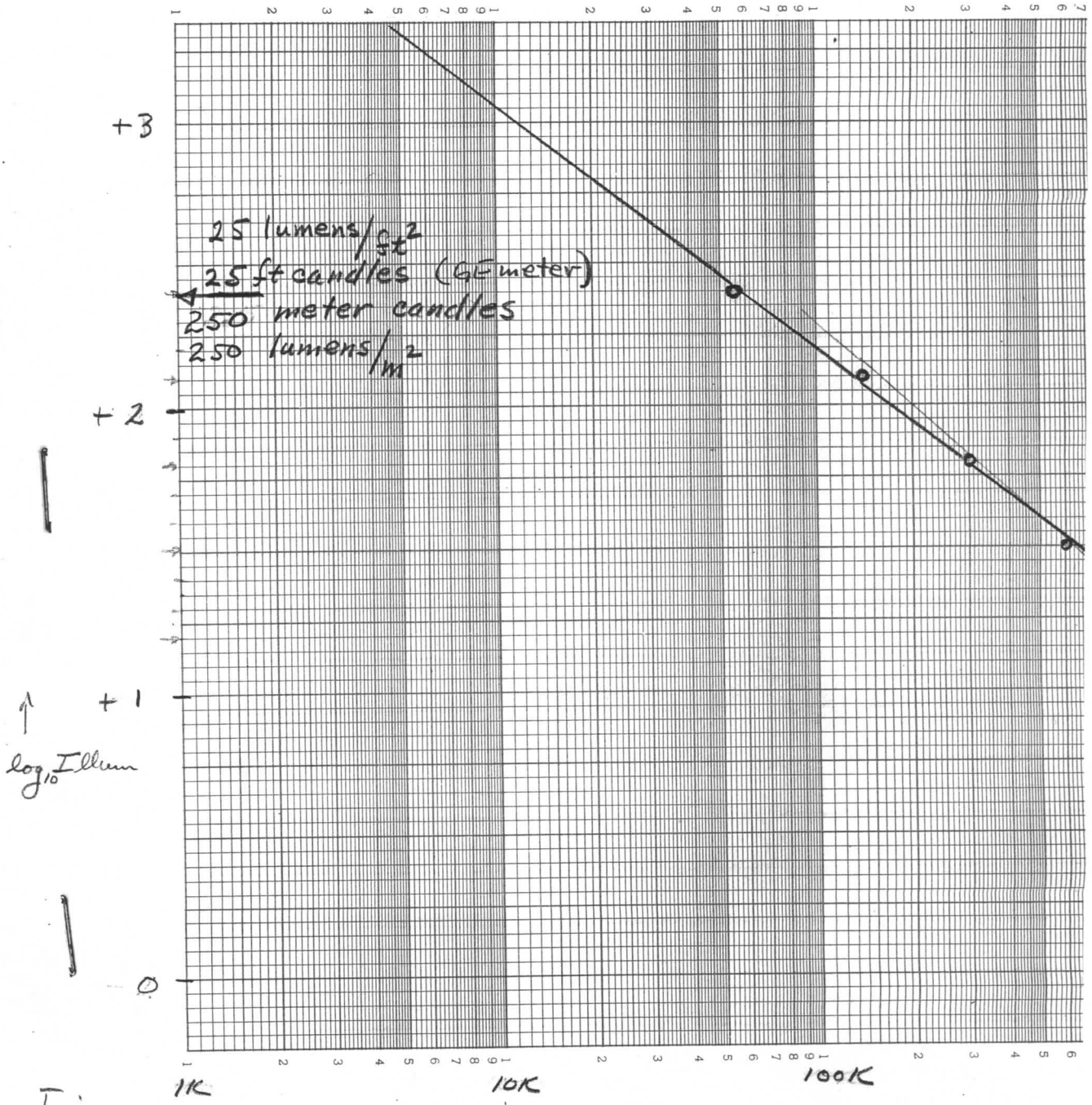
$X_c = \frac{1}{377(0.47 \times 2)10^{-6}}$

$= 3180$

It oscillates around 400 ~. Then something snapped. Motor is still OK but no pwr amp output. — one side of output is grounded - I grounded the hot through the scope. Also had bad input cable

FORM NO. 105 ENGINEERS PUBLISHING CO. PHILA. 8. PA.

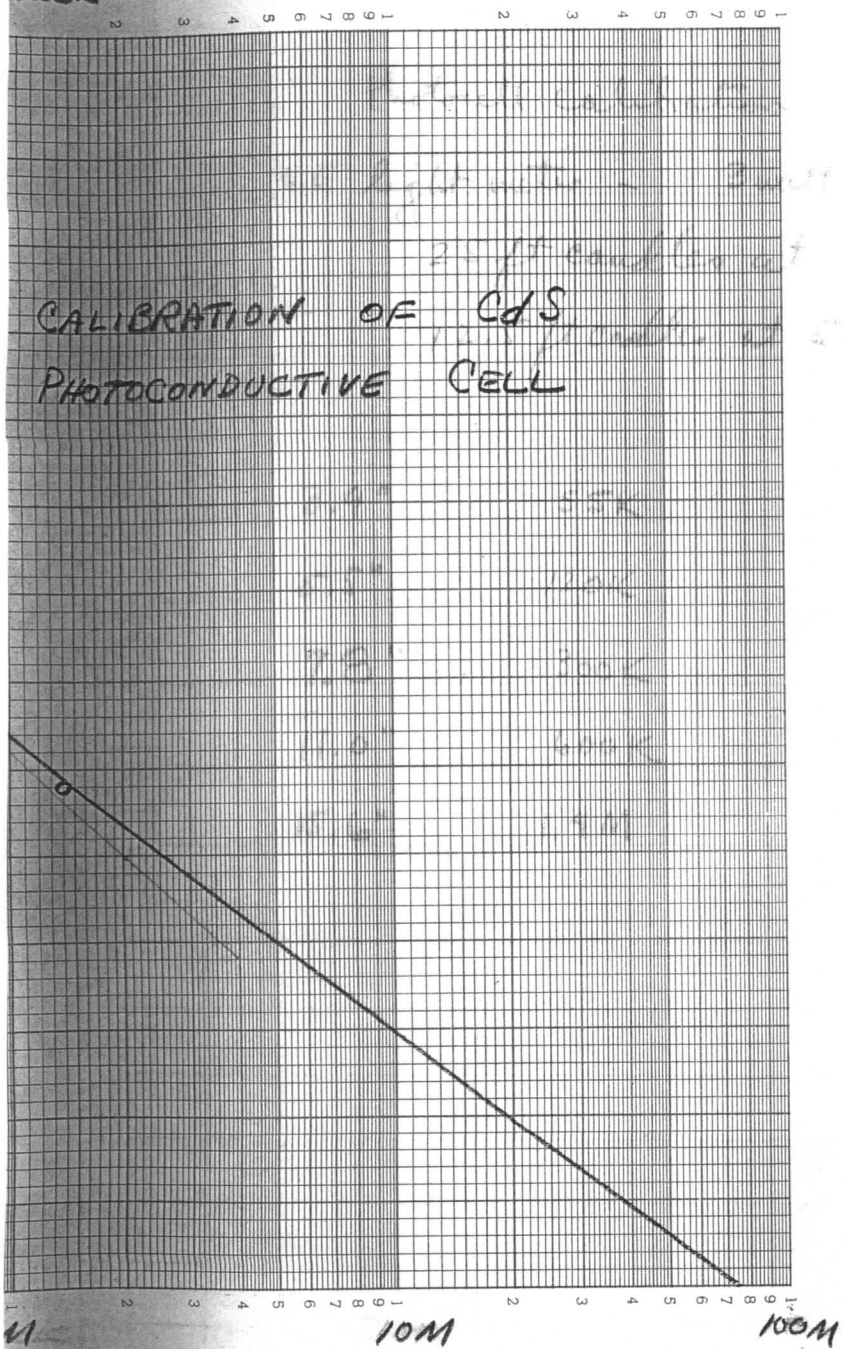
C50
with



I in meter candles

R — CELL

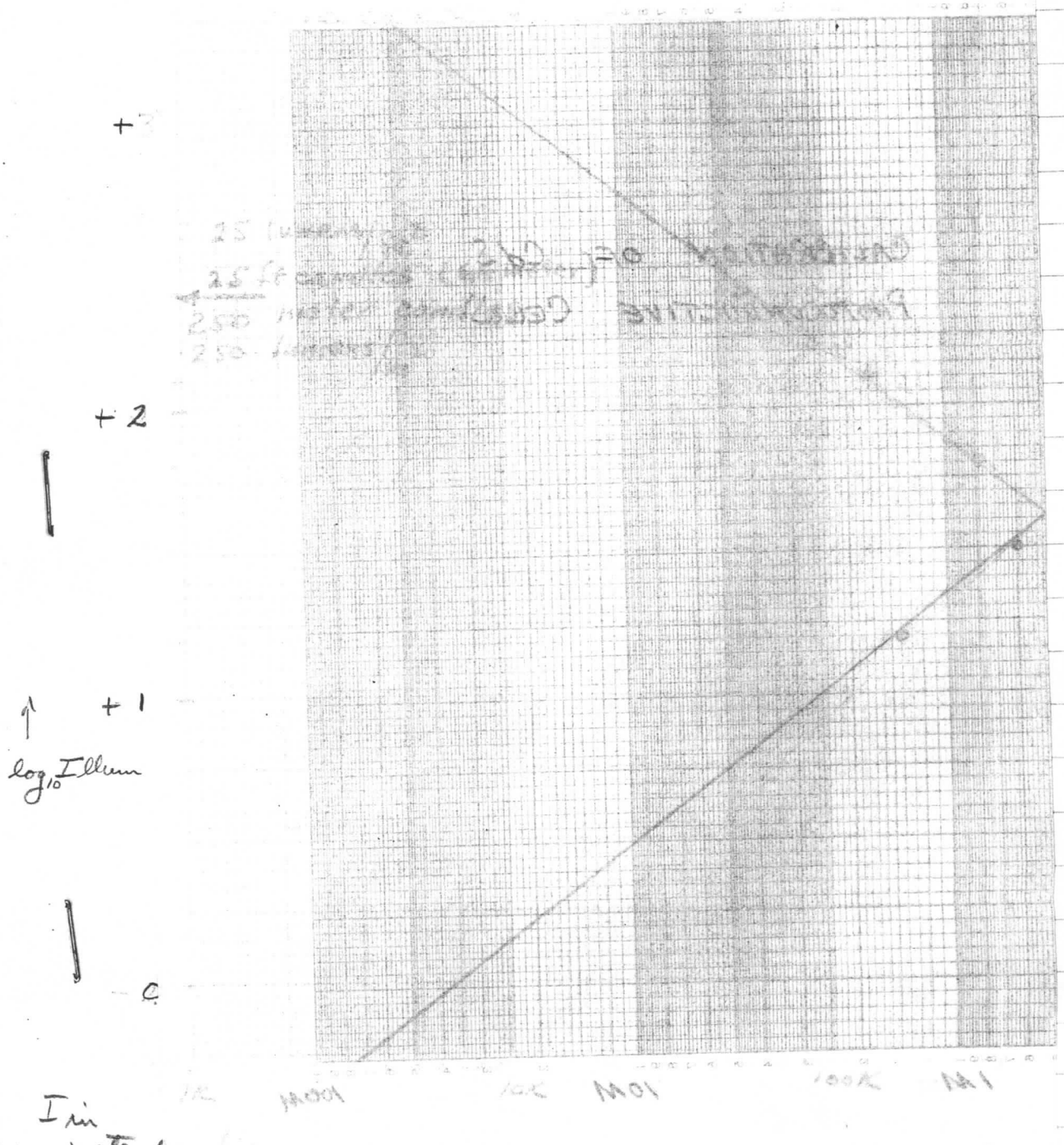
G4 (IR)
rack



SISTANCE

5

labra base white lamp
= 2.5 meter candles.
($\sqrt{2}$ 3.9")


+2
+ 2
+ 1
log10 Illum
I in meter-candles

Photocell calibration 2/14/65

GE light meter – 3 watt candelabra base white lamp

25 ft candles at 3.9" = 2.5 meter candles.

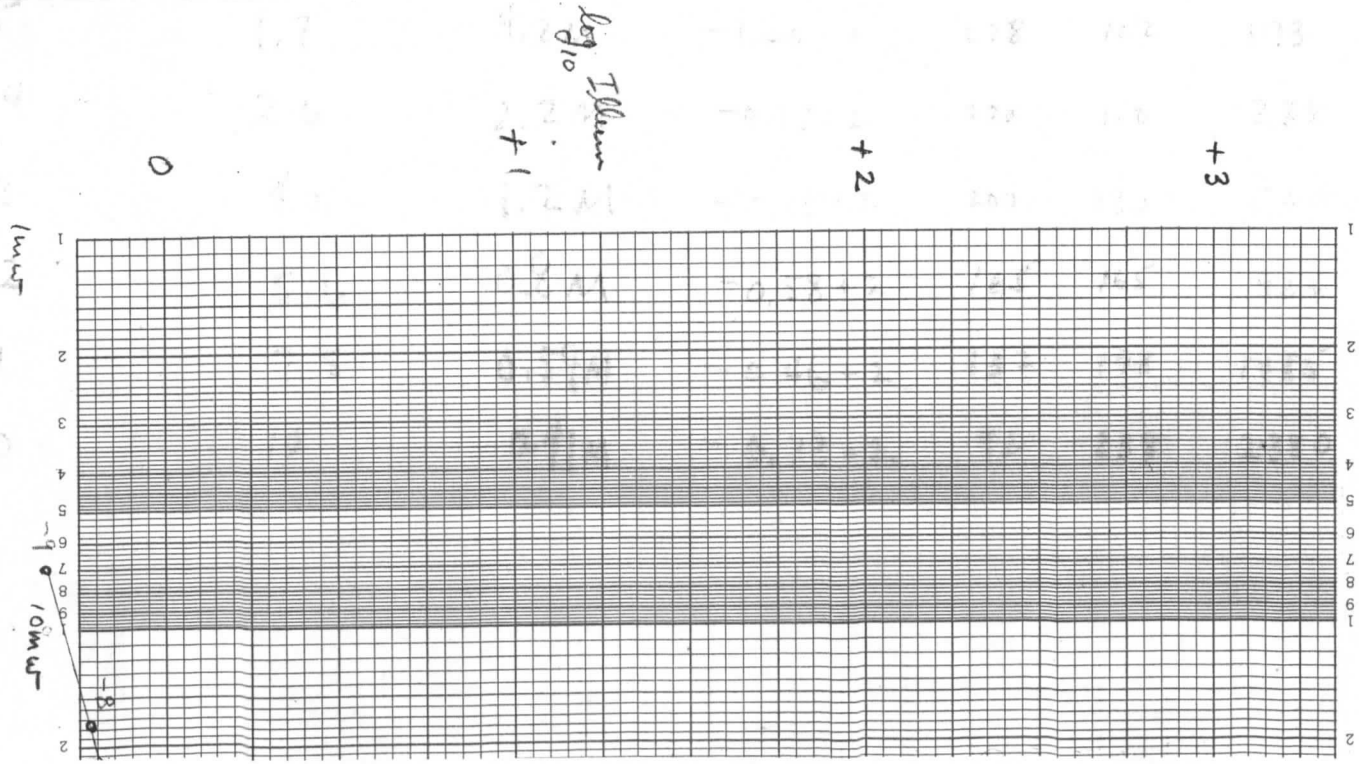
12.5 ft candles at 5.5" ($\sqrt{2}$ 3.9")

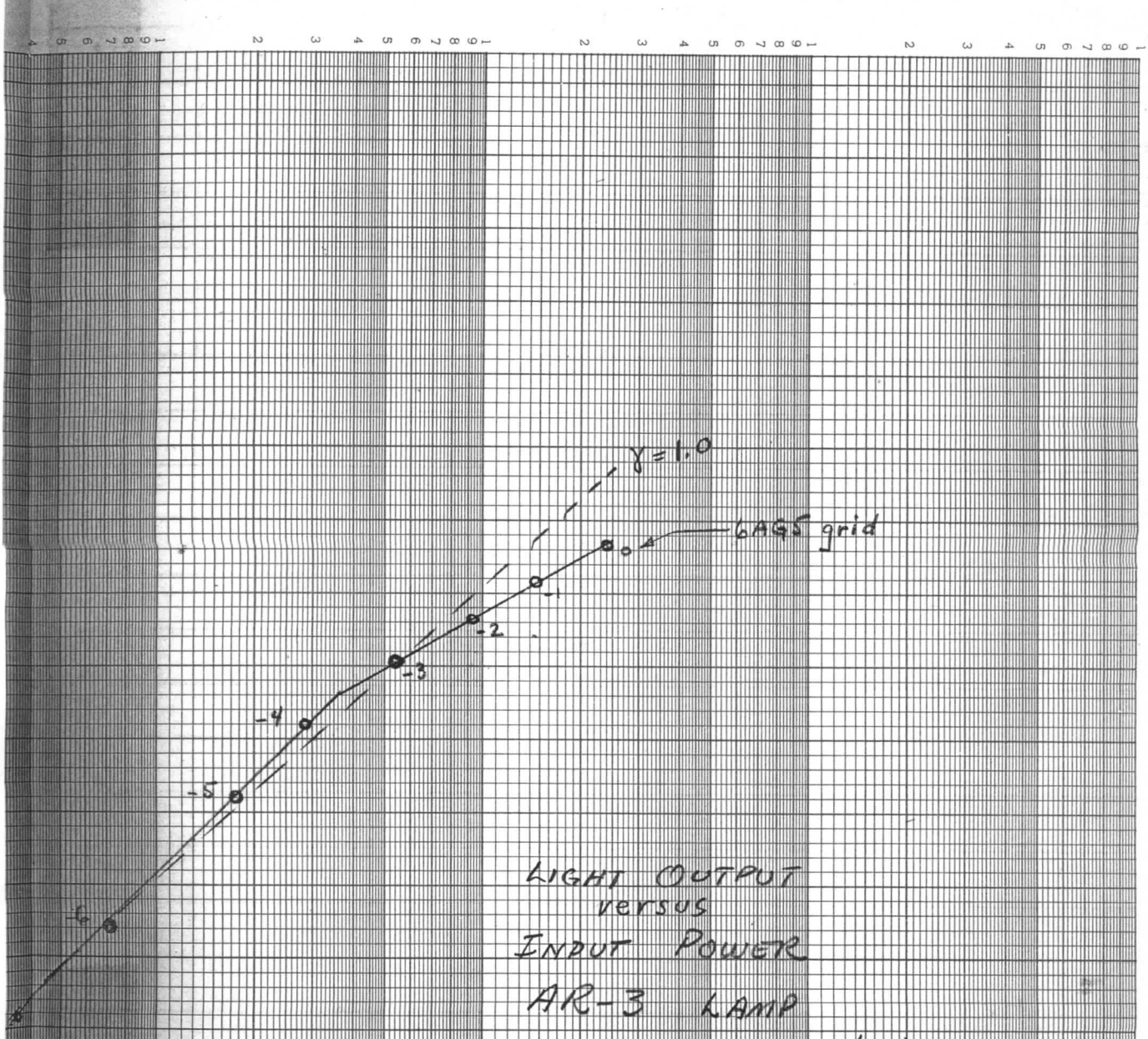
3.9"	55K
5.5"	120K
7.8"	300K
11.0"	600K
15.6"	1.4M

CdS Resistance versus AR 3 lamp current $\frac{3}{4}$" electrode to CdS. E supply = +330v

6AG5 grid	I_{lamp} ma	R	$\log_{10}$ Illum	Ep	E lamp	P lamp
−9	0.1	100M	−2.35 +2	260	70	7mw
−8	0.25	70M	−2.22 +2	260	70	17.5
−7	0.5	34M	−1.96 +2	260	70	35
−6	0.95	14M	−1.64 +2	255	75	71.2

See p 21.

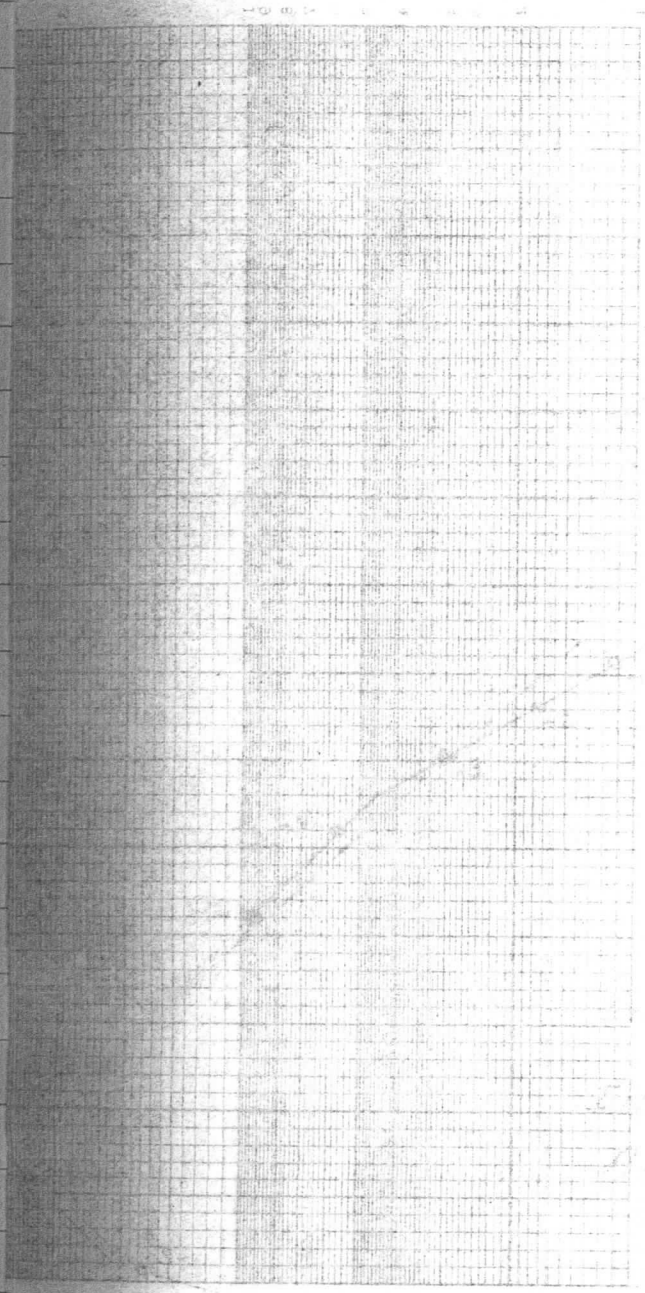


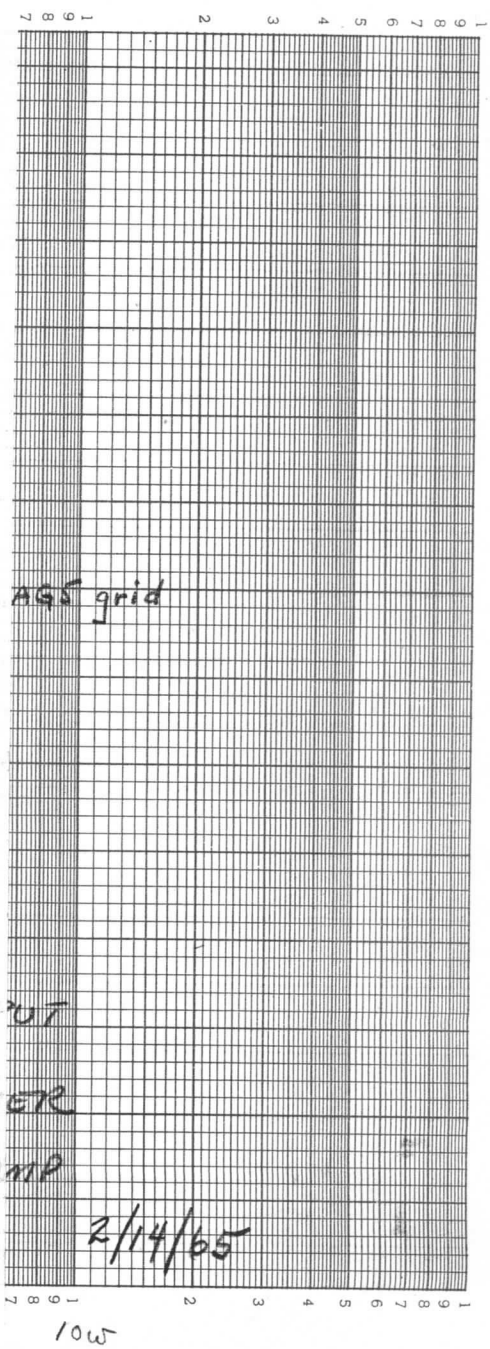

γ=1.0
6AQ5 grid
0
-1
-2
-3
-4
-5
-6
LIGHT OUTPUT
VERSUS
INPUT POWER
AR-3 LAMP
2/14/65
100 mw
1000 mw
1 w
10 w

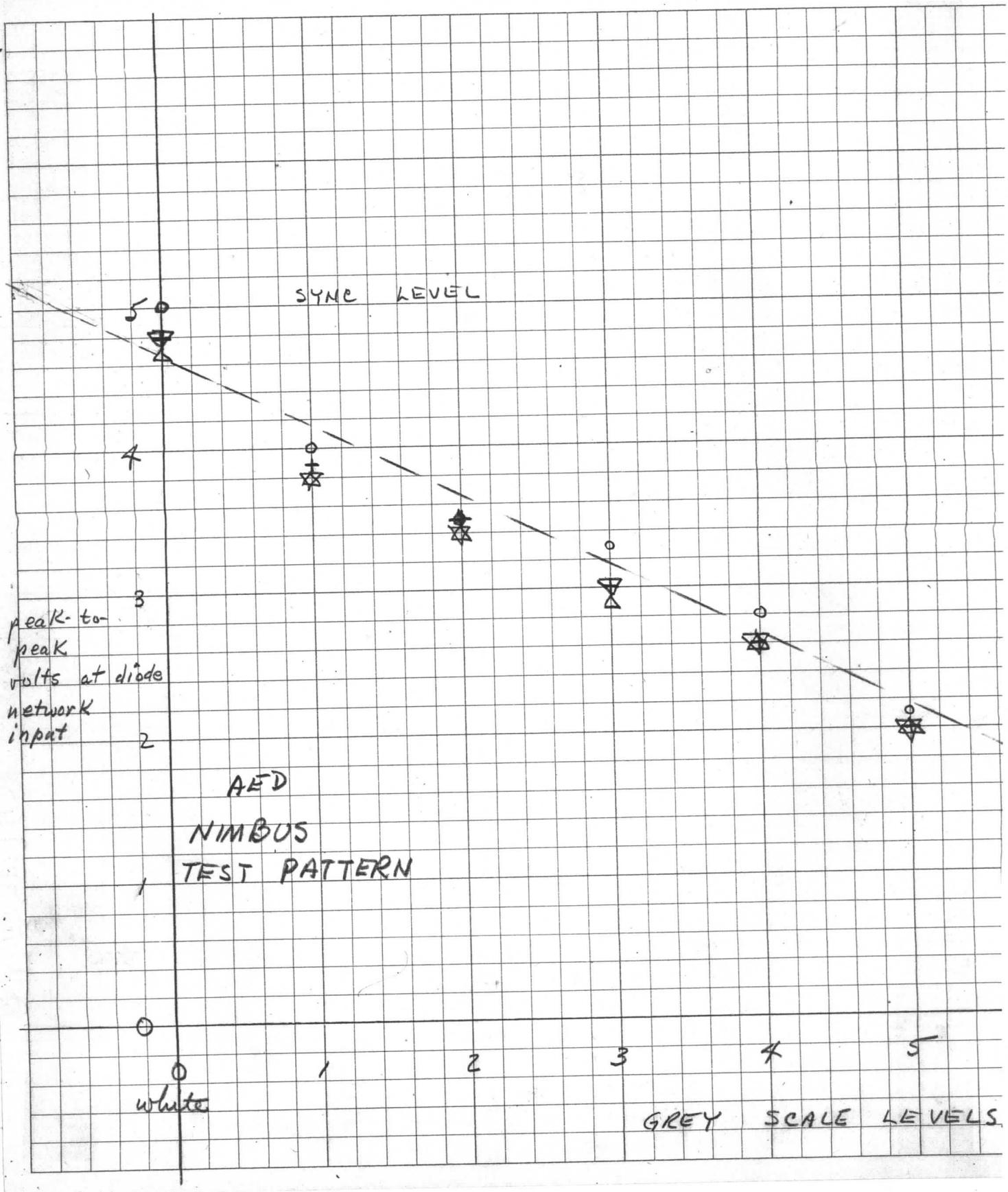
CdS Resistance versus AR 3 lamp current ± 3/4" electrode to CdS. E supply = +330v

6AG5 grid	I_{lamp} ma	R	$\log_{10}$ Illum	Ep	E lamp	P lamp
−9	0.1	100M	−2.35 +2	260	70	7 mw
−8	0.25	70M	−2.22 +2	260	70	17.5
−7	0.5	34M	−1.96 +2	260	70	35
−6	0.95	14M	−1.64 +2	255	75	71.2
−5	1.7	4.2M	−1.20 +2	228	102	173
−4	2.6	2.2M	−0.95 +2	220	110	286
−3	4.0	1.2M	−0.73 +2	200	130	520
−2	5.6	0.8M	−0.58 +2	165	165	924
−1	7.5	0.59M	−0.46 +2	132	198	1485
0	10	0.41M	−0.33 +2	92	238	2380

see p 21.






SYNC LEVEL
5
4
3
2
1
0
peak-to-peak volts at diode network input
AED
NIMBUS
TEST PATTERN
0
white
1
2
3
4
5
GREY SCALE LEVELS

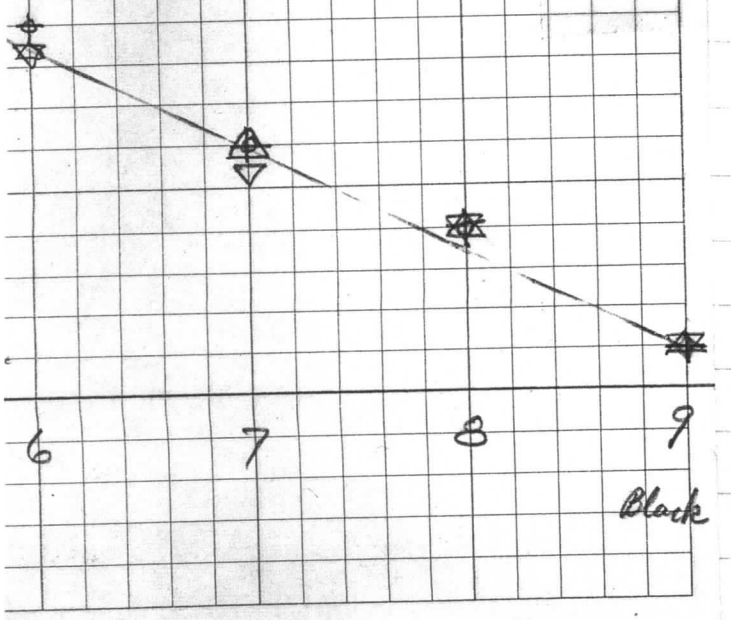
3	#4
.7	4.8
.8	3.8
4	3.4
9	3.0
6	2.6
0	2.0
7	1.7
2	1.1
8	0.8
2	0.2

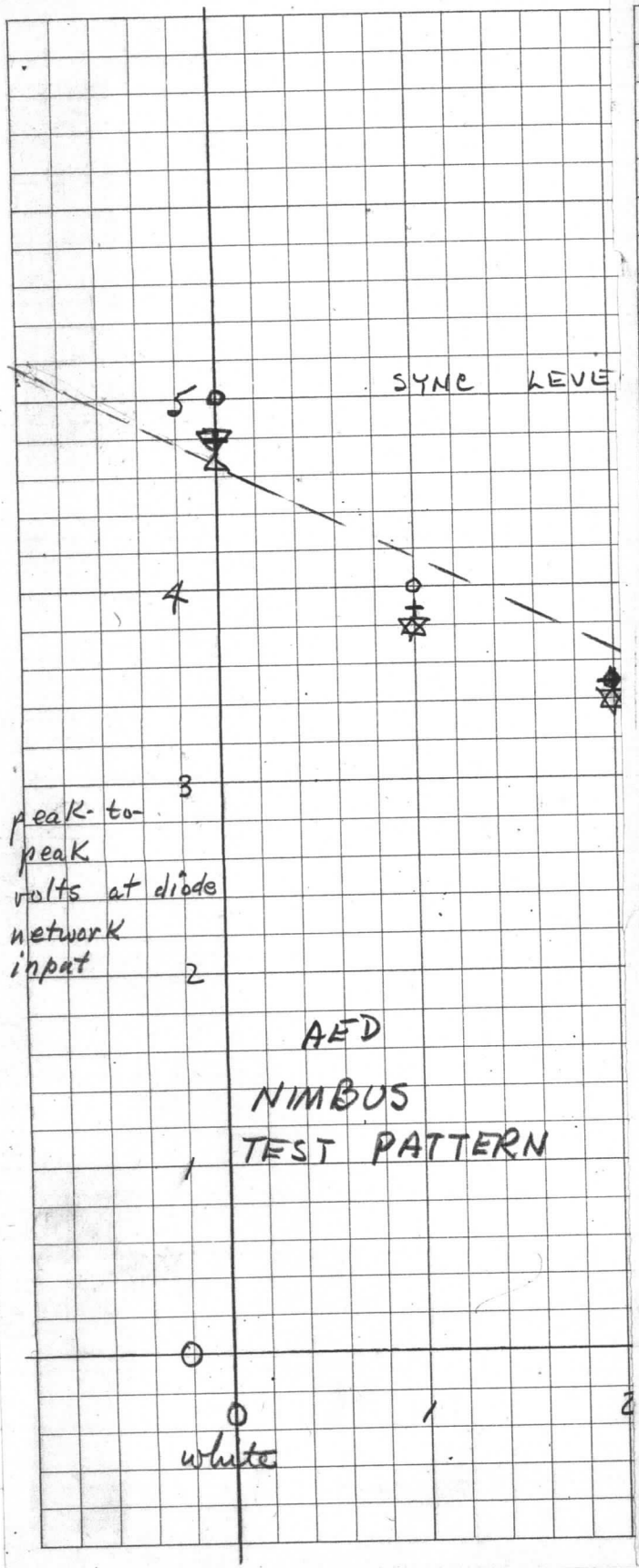
ck measurements at output of
iver for diode network, p16 point Q.
t 5v p-p per p.9.

D TEST PATTERN TAPE

FIRST SCALE
SECOND SCALE
THIRD SCALE
FOURTH SCALE

2/14/65




SYNC LEVE
5
4
3
2
1
0
peak-to-peak volts at diode network input
AED
NIMBUS
TEST PATTERN
0
1
white