

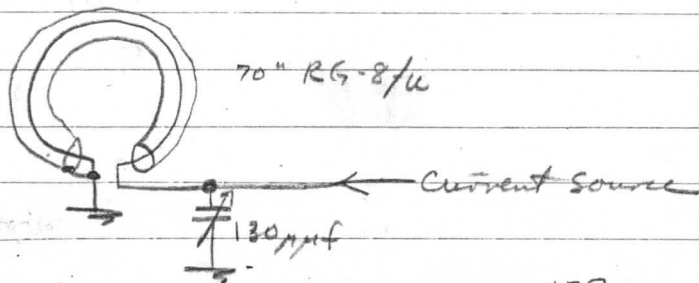
Jan 18, 1964.

TNS. Installing coupling condenser  
at <sup>audio</sup> output of SX25 outboard  
permits squelch operation of TNS -  
naturally have to watch IF gain  
setting to keep noise level  
appropriate -

Feb 16, 1964

Added 2 diodes back to back silicon  
at input to outboard chassis as a noise  
limiter. Just in between two connectors  
as a temporary lashup.

I have significant hash level in receiver -  
all across band - I am trying to monitor  
Gander (Newfoundland) Radio on 8820 kc.  
Am trying a direction finder experiment -  
about 70" RG-8U in a single turn loop.  
Resonates with 130  $\mu$ f external



$$29\frac{1}{2} \mu\text{f}/\text{ft} \times 6' = 177 \mu\text{f}$$

$$\begin{array}{r} 177 \\ +130 \\ \hline 307 \mu\text{f} \end{array}$$

$$L = \frac{1}{4\pi^2 f^2 C} = \frac{1}{(39.4)^2 (2.8 \times 10^6)^2 (307 \times 10^{-12})} = \frac{1}{77.5 \times 10^{+12}} = 0.94 \times 10^6$$

$$= 1.06 \mu\text{h}$$

$$Z = \sqrt{\frac{L}{C}}$$

$$L = Z^2 C = (52)^2 (29.5 \times 10^{-12} / \text{ft})$$

$$= 80000 \times 10^{-12} = .08 \mu\text{h} / \text{ft}$$

$$.08 \frac{\mu\text{h}}{\text{ft}} \cdot 6' = 0.48 \mu\text{h}$$

Show twice this value -

Length of line in wavelengths -

$$C = \frac{1}{\sqrt{LC}} = \frac{1}{\sqrt{0.08 \mu\text{h} / \text{ft} \times 29.5 \mu\text{m} / \text{ft}}} = \frac{1}{\sqrt{2.4 \times 10^{-18}}}$$

$$= \frac{1}{1.55 \times 10^{-9} / \text{ft}} = \frac{1}{1.55} \text{ ft} / \text{ns}$$

$$T = \frac{6 \text{ ft} (1.55) \text{ ns}}{1 \text{ ft}} = 9.3 \text{ ns}$$

$$T = \frac{1}{8820 \text{ kc}} = 0.113 \mu\text{s} = 113 \text{ ns}$$

$$\frac{9.3}{113} = 0.08 \mu$$

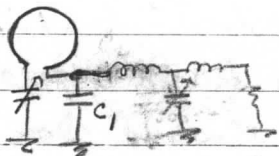
$$\omega L = 2\pi (8.8 \times 10^6) = 55.4 \times 10^6$$

$$\omega L = 55.4 \times 10^6 \times 1.06 \times 10^{-6} = 58.5 \Omega$$

Assume RCVR in is  $300 \Omega$

$$\text{Loaded } Q = 20 \text{ (desired)} \quad R_{\text{load}} = \frac{58.5}{20} = 2.92 \Omega$$

at



$$\frac{1}{\omega C_1} = 2.92 \Omega$$

$$C_1 = \frac{1}{2.92 (55.4 \times 10^6)} = 6200 \mu\text{f}$$

make it  $5000 \mu\text{f} - \text{mica}$

$$\text{For } X_C = 6000 \Omega \quad C = \frac{1}{6000 (55.4 \times 10^6)} = 3 \mu\text{f}$$

6000  
1000000

300000

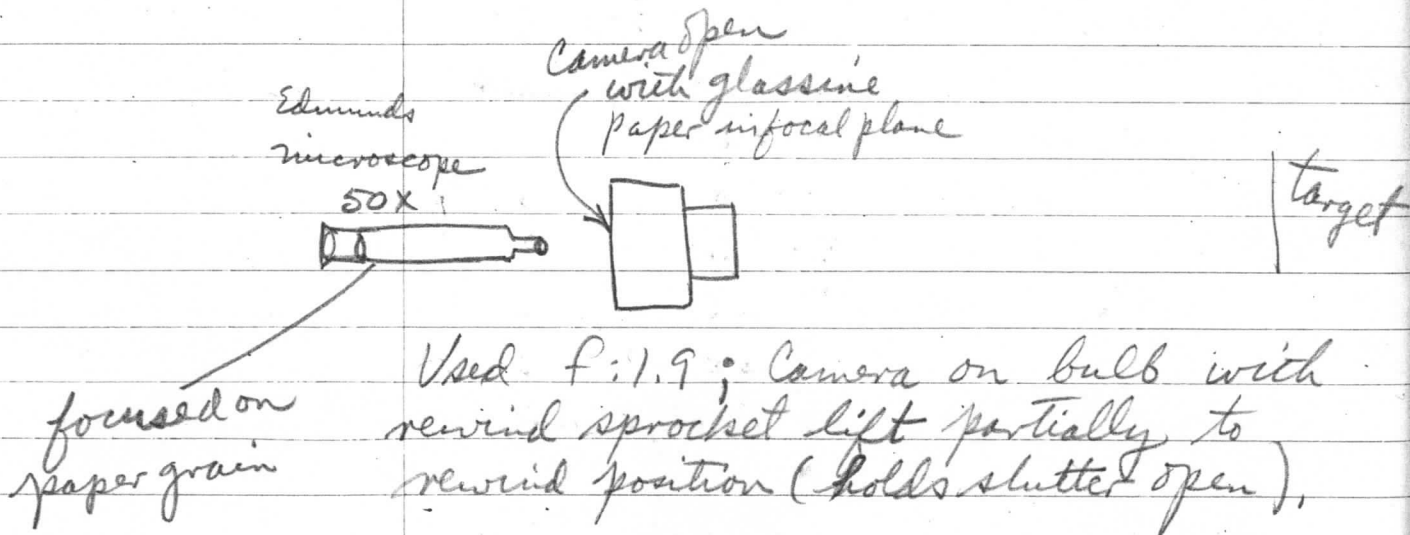
March 8, 1964

Using National Bureau of Standards  
resolution charts - Standard test -  
Pictures taken at

$$26 \times f.l. = 26 \times 40 \text{ mm} \times \frac{1 \text{ in}}{25.4 \text{ mm}} = 41''$$

Used standard focus 3.5 ft - In running  
through range, used 4.5 ft at f:4, <  
much, much better.

Took camera apart, found that  
one of the mounting pads (screw) was  
not down as far as it should be;  
fixed it. Still off - measured as 7



Used f:1.9; Camera on bulb with  
rewind sprocket lift partially to  
rewind position (holds shutter open).

Verified original observation that  
 4.5 ft on camera setting focuses at  $3\frac{1}{2}$  ft.  
 after fix; closer -  
 [Also removed spacers on lens mount;  
 too much].  
 I made a "magic marker" mark  
 at proper fiducial position -

July 6, 1964

Using Alpha Wire Corp  
 FIT shrinkable plastic.

~~Bill says FIT 275-1", probably  
 this is FIT 295-1", however,  
 it is black like the PVC-105  
 Catalog number 48T644 in the  
 Allied catalog (1964) p 322.~~

General Radio Supply FIT 275-1"

[shown in Allied Radio Catalog (1964) p 323]

4 ft length, Size 1 inch, Minimum  
 ID expanded 1.555", Recovery  
 ID 1.036", Irradiated polyolefin.

"Shrinks to recovered ID within 7 seconds -  
 withstands 135°C continuously without  
 further shrinking"

Shrinks at 275°F

$$(275^{\circ}\text{F} - 32) \frac{5}{9} = 135^{\circ}\text{C}$$

24 3

Wall thickness (expanded) measures 0.019.  
fully reduced 0.036". Catalog gives  
nominal wall as 0.035".

Heating over alcohol lamp  
is reasonably satisfactory. The  
plastic will burn, however.

August 7, 1964

Trinibus I and Tiro 8 converter.  
Space telemetry band 136-137mc  
Trinibus I 136.95mc

Plan to modify the 108mc converter  
of page 20. L.O. 113.152mc

136.95

113.152

23.798 mc is too high.

n.b.: note of p23, It never worked.

Channel	f (mc)	
2	54-60	
* 3	60-66	
4	66-72	
5	76-82	4mc break
* 6	82-88	8mc break
7	174-180	
8	180-186	
9	186-192	
* 10	192-198	
11	198-204	
12	204-210	
* 13	210-216	

August 13, 1964

Phono motor

45 rev/10 sec =	270 RPM ??
49 rev/15 sec =	196 RPM
38 rev/15 sec =	152 RPM
26 rev/15 sec =	76 1/2 RPM

Probably set for 16 33 1/2 45 and 78 RPM

$$\frac{76\frac{1}{2}}{16} = 4.79$$

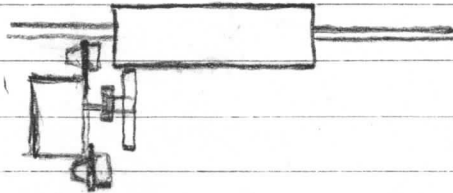
$$4.79(33\frac{1}{2}) = 159.5 \quad 4.79(45) = 212 \quad 4.79(78) = 373$$

These are probably fairly accurate -

For the Minibus APT the line rate is 4/sec -  
If the recorder is a drum it must rotate at 240 RPM

$$\frac{373}{240} = 1.553$$

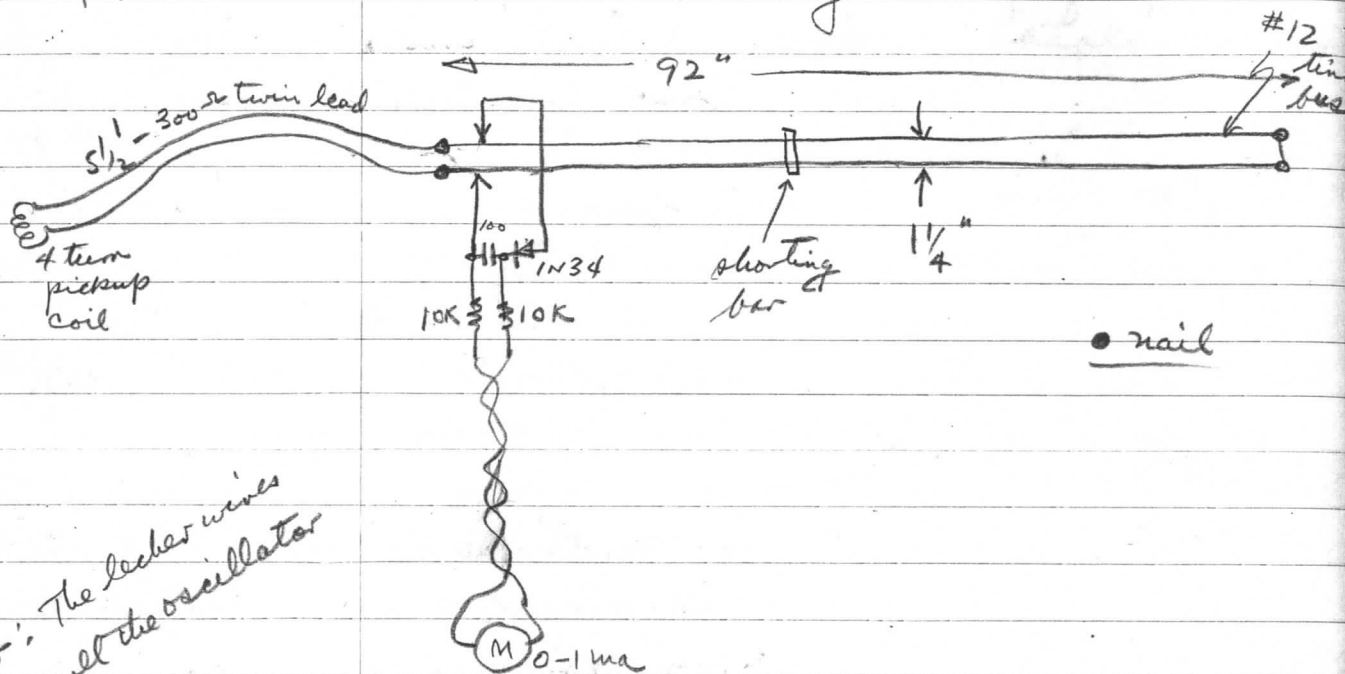
The wheel is 2" in diam - The drum would  
be  $\frac{1.553 \times 2}{3.1416} = 3.11"$  The circumference =  $\pi \times 3.11 = 9.76"$   
Which is as large as I can use with 8x10  
photographic paper.



Considering the alternate approach - using  
external sweeps on the scope: none of my  
camera lenses (or combinations) give a very  
good size image w/ 35mm camera. Closeup  
lens added is best but not much better than barefoot.

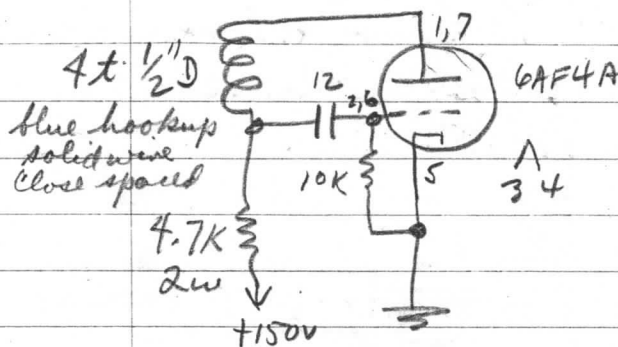
August 15, 1964

Built a Lecher wire rig



Water: The Lecher wires seem to pull the oscillator considerably!

Built bbd 6AF4A oscillator



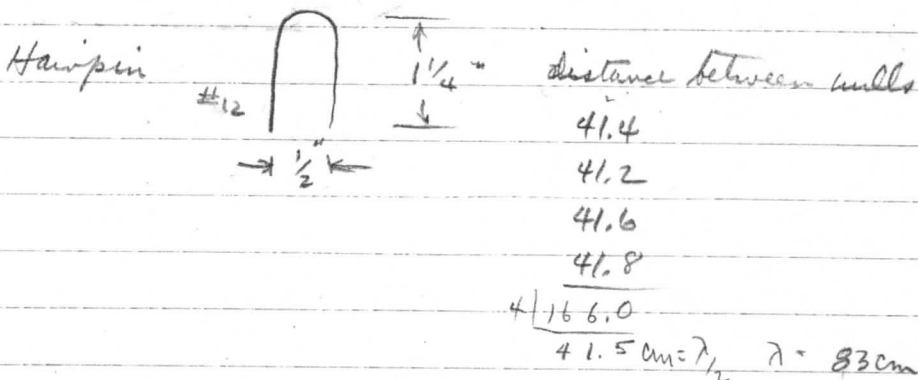
Grid dip oscillator as absorption meter peaks at "89" with coil #7

104.9cm between nulls =  $\lambda/2$        $\lambda = 2.098m$   
 $f = 143mc$

Spreading the oscillator coil -

$$\lambda/2 = 0.809m = \lambda = 1.618m \quad f = 185.5mc$$

Grid dip oscillator dial "96.5" coil #7



$$f = 362mc$$

From the shape of the voltage versus length, the signal has high harmonic content -

August 16, 1964

In an effort to get an approach to a sweep oscillator, I tried applying 6.3v rms 60cs to two crystal phono pickups. No perceptible movement of the stylus carrier. Same negative result with what appears to be a variable reluctance pickup (200  $\Omega$  DCR).

Old loudspeaker with voice coil & no cone goes to both stops with 6.3v applied. Mechanically it is a monstrosity.



f	Dial.	
110mc	3.0	
120mc	7.5	
<del>130mc</del>	<del>10.0</del>	
136	15.0	
108	0	
116	5.0	
126	10.0	Water: 14.0 on dial
135	15.0	is 137mc when
110	2.5	oscillator is not
122	7.5	loaded -
130.5	12.5	

August 18, 1964,

Converting converter from 108mc to 136.95:  
 Used SWR bridge and new VHF oscillator  
 to set up input circuit. Made links  
 to give very low SWR. Tank to hit resonance  
 at about 10  $\mu$ f on 25  $\mu$ f (?) capacitor.  
 Calibrating coil #5 on Grid Dip meter  
 to set up xtal oscillator and X3's  
 for L.O.

Found two front end troubles in converter  
 as originally built 1) No ground on  
 input tank condensers. 2) Ground  
 on output <sup>-tank</sup> was returned to a point  
 far down - chassis.

Grid Dip oscillator with coil #5

DIAL	FREQ
56	56.576 mc
100+++	113.152 mc
12	42.432 mc

Coil #6

DIAL	FREQ
22	56.576 mc
88	113.152 mc
92.5	127.296 mc

Coil 4

88	42.432 mc
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Using my auxiliary RF power source and the bridge, set the impedance looking into the output at 9.66 mc (i.e.  $2 \times 4830 \text{ kc}$  stal) to be  $50 \Omega$ .  
Coil almost melted in the process!  
This is with power off in the converter

I measure -1.6v dc bias from LO injection at  $\textcircled{A}$  p245

Sensitivity seems very low - Was the SX-25 input connected after the move?? No!