

42
4

Measurements

&

Standards

Pri. stds

Current

Accuracy
(least)

Voltage

Resistance

Freq.

WWV. AF & AF

Abs.

Crystals

100 & 1000 Kc

.01%

5655 - 5722 - 6125 - 5633 - 5700-7,350 - 5744 Kc

.01%

s

stations

.001%

Power line

1%

Inductance

capacitance

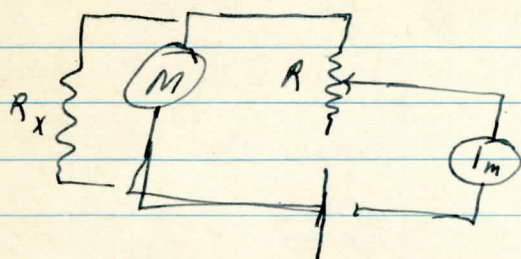
Resistance

1 meg.

1%

6/20

calibration of Simpson 125



full scale defl

$$I_{m1} = 7.75 \times 10^{-3} \text{ Amp}$$

$$R = 200 \text{ m}$$

$$R_x = 2.7$$

$$I_{m2} = 17.0 \times 10^{-3} \text{ Amp}$$

$$E = 1.8 \quad E_1 = E_2$$

$$I_1 R_m \neq I_2 \left(\frac{R_m \times R_x}{R_m + R_x} \right)$$

$$(R_m + R_x) I_1 R_m = I_2 (R_m \times R_x)$$

$$R_m^2 I_1 + R_x I_1 R_m = I_2 R_m R_x$$

$$7.75 \times 10^{-3} R_m^2 = 17.0 \times 10^{-3} \left(\frac{R_m \times 2.7}{R_m + 2.7} \right)$$

$$7.75 \times 10^{-3} R_m^2 + 2.7 \times 7.75 \times 10^{-3} R_m - 17 \times 10^{-3} R_m = 0$$

$$- 2.7 \times 17 \times 10^{-3} = 0$$

$$7.75 \times 10^{-3} R_m^2 + 20.9 \times 10^{-3} R_m - 17 \times 10^{-3} R_m - 45.9 \times 10^{-3} = 0$$

$$7.75 R_m^2 + 3.9 R_m - 45.9 = 0$$

$$\frac{-3.9 \pm \sqrt{6^2 - 4 \times 7.75 \times 45.9}}{2 \times 7.75}$$

$$\frac{-3.9 \pm \sqrt{(3.9)^2 + 4 \times 7.75 \times 45.9}}{2 \times 7.75}$$

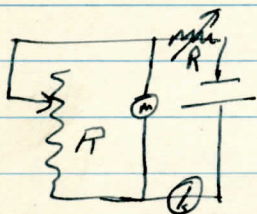
$$\frac{-3.9 \pm \sqrt{15.2 + 1529.9}}{15.5}$$

$$= \frac{-3.9 \pm 39.3}{15.5}$$

$$R = \frac{36.2}{15.5} = 2.3 \text{ m}$$

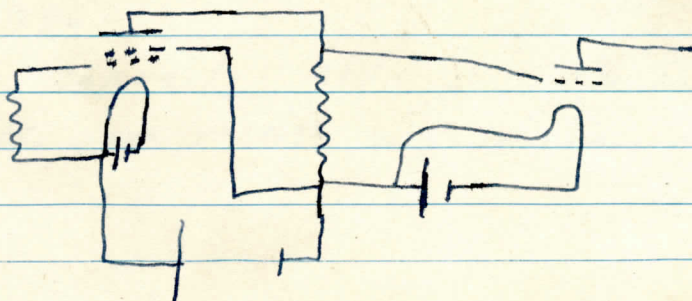
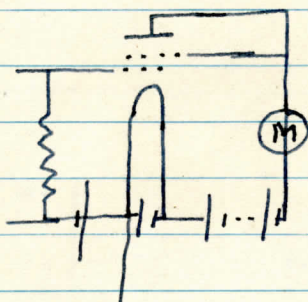
$$\begin{array}{r} 15.5 \overline{) 362} \\ \underline{310} \\ 420 \end{array}$$

by juggling



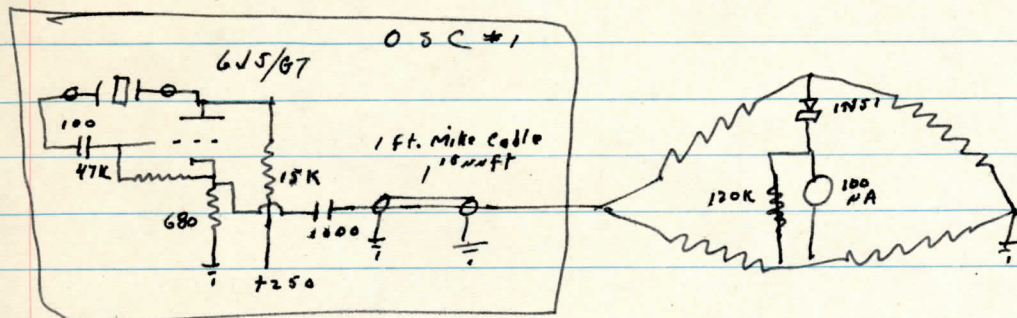
$$\frac{7.75}{2} = 15.50$$

adj. R & R_x until
 I_m is $2X$ then
 measure $R_x = R_m$
 $R_x = 3.45 \text{ m}$

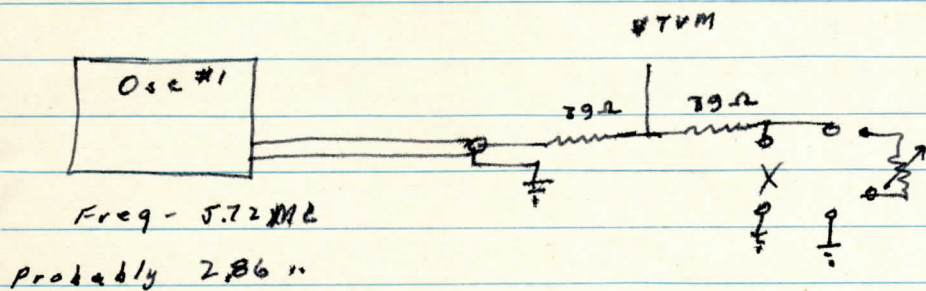


3/11/51 Impedance Measurements (RF)

Set up bridge ckt as follows.

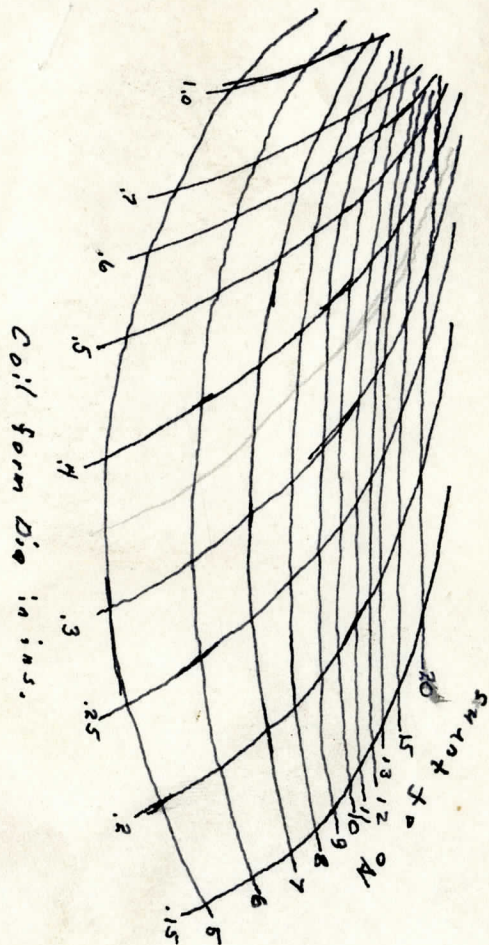


Complete Failure — possibly caused by excess capacity of meter



With Capacity std. of 10% Tol. to Freq.
2.86 MHz gave results well within Exp. Error

[illegible]



Enameled Wire Sizes

