

29/6/56

Test of GENESI neon bulb.

Operating freq  $\approx$  3.0 mc, C = 40.0 pf

|                  |        |                 |
|------------------|--------|-----------------|
| Q without bulb   | 180    | } Base on bulb. |
| Q with bulb      | 171    |                 |
| Capacity of bulb | 1.8 pf |                 |

|                  |         |                  |
|------------------|---------|------------------|
| Q without bulb   | 180     | } Base off bulb. |
| Q with bulb      | 180     |                  |
| Capacity of bulb | 0.36 pf |                  |

# Antenna Test

17/7/58

A small coil about 2" dia + 1" long consisting of about 15 turns of enameled wire was connected across bottom of down lead of each antenna. Using the grid dip meter it was found resonance occurred at 7.5 and 7.6 on dial. These dial readings are approximately 544 KC for south antenna and 547 KC for north antenna. The resonance is third harmonic mode. Thus the fundamental mode is about 182 KC which frequency is below range of grid dip meter.

Very loose coupling from antenna coil to grid dip meter was necessary to prevent pulling due to an overcoupled condition. Thus, it is clear that even these large antennas have a great amount of reactance in them. Apparently the loss in the iron wire is negligible.

Length of wire on flat top 2200 ft each antenna  
Length of down lead at north 281 ft  
Length of down " " south 291 ft  
North antenna total length 2762 ft = 843 meters  
3rd harmonic resonance = 561 meters = 535 KC computed  
547 KC actual  
South antenna total length 2782 ft = 849 meters  
3rd harmonic resonance = 565 meters = 531 KC computed  
544 KC actual

at 520 KC,  $\lambda = 576$  meters

Flat top 2200 ft = 670 meters = 1.16 wavelength long

24/7/56

Tested south antenna using tuning box, grid dip meter and R.F. ohmmeter.

Grid dip meter set to 7.6 on dial.

Tuning box impedance switch to use full secondary.

Resonance with inductance switch on position 1 meaning no inductance; capacity switch on position 5. Ohmmeter read 55 ohms approx.

Grid dip meter set to 6.7 on dial.

Impedance switch same.

Resonance with inductance switch on position 3; capacity switch on position 6. Ohmmeter read 49 ohms approx.

~~Very~~ Very loose coupling is necessary between grid dip meter and ohmmeter to prevent pulling of grid dip meter frequency. This is especially bad when antenna out of resonance due to large amount of reflected reactance.

Began to rain hard so gave up and returned to town.

5/5/57

The pulling in frequency mentioned above was due to very low Q coil which came with grid dip meter. This caused the circuit under test to nearly control the frequency. Care has been to make a better coil for grid dip meter.

6/8/56

South Antenna, Box A, leads crossed.

North Antenna open

| Grid Dip<br>Meter Dial | Inductance<br>Position | Capacity<br>Position | Impedance<br>Position | Output<br>Ohms. |
|------------------------|------------------------|----------------------|-----------------------|-----------------|
| 4.2                    |                        |                      |                       |                 |
| 4.4                    |                        |                      |                       |                 |
| 4.6                    |                        |                      |                       |                 |
| 4.8                    | 5                      | 1                    | 2                     | 47              |
| 5.0                    | 5                      | 4                    | 2                     | 44              |
| 5.2                    | 5                      | 7                    | 2                     | 45              |
| 5.4                    | 5                      | 8                    | 2                     | 46              |
| 5.6                    | 4                      | 1                    | 2                     | 43              |
| 5.8                    | 4                      | 4                    | 2                     | 43              |
| 6.0                    | 4                      | 7                    | 2                     | 44              |
| 6.2                    | 4                      | 8                    | 2                     | 44              |
| 6.4                    | 4 (3)                  | 8.5 (1)              | 2                     | 47 (45)         |
| 6.6                    | 4 (3)                  | 9 (3)                | 2                     | 48 (48)         |
| 6.8                    | 3                      | 6                    | 2                     | 46              |
| 7.0                    | 3                      | 8                    | 2                     | 45              |
| 7.2                    | 2                      | 3                    | 2                     | 45              |
| 7.4                    | 2                      | 4                    | 2                     | 49              |
| 7.6                    | 1                      | 3                    | 2                     | 50              |
| 7.8                    | 1                      | 6                    | 2                     | 52              |
| 8.0                    | 1                      | 8                    | 2                     | 53              |

~~50~~  
~~50~~  
51

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North Antenna, Box B, leads straight  
South Antenna open.

Grid Dip Meter dial      Inductance Position      Capacity Position      Impedance Position      Output Ohms.

|     |      |       |  |    |
|-----|------|-------|--|----|
| 4.0 |      |       |  | 75 |
| 4.2 | 6(3) | 1(3)  |  | 68 |
| 4.4 | 6    | 2     |  | 60 |
| 4.6 | 6    | 3     |  | 57 |
| 4.8 | 6    | 8     |  | 57 |
| 5.0 | 5    | 2     |  | 53 |
| 5.2 | 5    | 6     |  | 50 |
| 5.4 | 5    | 7     |  | 51 |
| 5.6 | 5(4) | 8(10) |  | 51 |
| 5.8 | 4    | 3     |  | 51 |
| 6.0 | 4    | 6     |  | 55 |
| 6.2 | 4    | 7     |  | 53 |
| 6.4 | 4    | 8     |  | 54 |
| 6.6 | 2(3) | 9(3)  |  | 52 |
| 6.8 | 3    | 6     |  | 52 |
| 7.0 | 3    | 7     |  | 55 |
| 7.2 | 3(2) | 8(1)  |  | 52 |
| 7.4 | 2    | 4     |  | 55 |
| 7.6 | 2(1) | 7(3)  |  | 53 |
| 7.8 | 1    | 8     |  | 62 |
| 8.0 | 1    | 8     |  | 65 |

10/8/56

Measured in building, South Antenna Open.  
Antenna box resonated at 6.8 on grid dip meter.

| Grid Dip Meter | Output Ohms. | Output resistance |
|----------------|--------------|-------------------|
| 6.6            | 90           | negligible        |
| 6.8            | 52           | "                 |
| 7.0            | 45           | small             |

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# Receiver Calibration

| Grid Dip<br>Meter reading. | Receiver<br>Dial. | Antenna<br>Dial. | Best calibration<br>dial 44.5<br>should have been<br>set at 46.0<br>This will raise<br>all receiver dial<br>readings 0.8 division |
|----------------------------|-------------------|------------------|---|
| 4.0                        |                   |                  |   |
| 4.2                        |                   |                  |   |
| 4.4                        |                   |                  |   |
| 4.6                        |                   |                  |   |
| 4.8                        |                   |                  |   |
| 5.0                        | 16.1              | 91.0             |   |
| 5.2                        | 19.5              | 88.5             |   |
| 5.4                        | 22.0              | 87.0             |   |
| 5.6                        | 25.0              | 85.0             |   |
| 5.8                        | 27.8              | 83.0             |   |
| 6.0                        | 30.7              | 81.5             |   |
| 6.2                        | 32.9              | 80.0             |   |
| 6.4                        | 35.4              | 78.0             |   |
| 6.6                        | 37.8              | 76.0             |   |
| 6.8                        | 40.4              | 74.5             |   |
| 7.0                        | 42.6              | 72.5             |   |
| 7.2                        | 45.0              | 70.0             |   |
| 7.4                        | 47.1              | 67.5             |   |
| 7.6                        | 49.6              | 65.5             |   |
| 7.8                        | 51.7              | 63.0             |   |
| 8.0                        | 53.6              | 60.5             |   |

PACKING SLIP

NAME - UNIVERSITY OF TAS.  
ADDRESS - ELEC. ENG. DEPT.  
INVOICE NO. - 19226.  
DATE - 5-1-56

I T E M S

W. 6 ONLY. E/R. 770 BATTERIES.

O/N H 465

South Antenna, Box A, leads crossed.

North antenna tuned to 6.8 and terminated at house in 50 ohms.

| Equalizer<br>Wavelength | Inductance<br>Position | Capacitor<br>Position | Impedance<br>Position | Output<br>Value |
|-------------------------|------------------------|-----------------------|-----------------------|-----------------|
| 4.0                     | 7                      | 7                     | 2                     | 52              |
| 4.2                     | 6                      | 1                     | 2                     | 51              |
| 4.4                     | 6                      | 4                     | 2                     | 50              |
| 4.6                     | 6                      | 7                     | 2                     | 49              |
| 4.8                     | 6                      | 8                     | 2                     | 50              |
| 5.0                     | 5                      | 3                     | 2                     | 49              |
| 5.2                     | 5                      | 6                     | 2                     | 48              |
| 5.4                     | 5                      | 8                     | 2                     | 46              |
| 5.6                     | 4                      | 1                     | 2                     | 44              |
| 5.8                     | 4                      | 4                     | 2                     | 43              |
| 6.0                     | 4                      | 7                     | 2                     | 46              |
| 6.2                     | 4                      | 8                     | 2                     | 47              |
| 6.4                     | 3                      | 1                     | 2                     | 45              |
| 6.6                     | 3                      | 3                     | 2                     | 48              |
| 6.8                     | 3                      | 6                     | 2                     | 47              |
| 7.0                     | 3                      | 8                     | 2                     | 46              |
| 7.2                     | 2                      | 1                     | 2                     | 49              |
| 7.4                     | 2                      | 5                     | 2                     | 49              |
| 7.6                     | 2                      | 7                     | 2                     | 50              |
| 7.8                     | 1                      | 5                     | 2                     | 51              |
| 8.0                     | 1                      | 7                     | 2                     | 54              |

Both Antennas tuned to 6.8, other one terminated in 50Ω at building.

| Equalizer<br>Dial | North<br>Antenna | South<br>Antenna |
|-------------------|------------------|------------------|
| 6.6               | 80Ω              | 70Ω              |
| 6.8               | 50Ω              | 45Ω              |
| 7.0               | 40Ω              | 32Ω              |



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| Freq | Ind. | Cap. | Ohms           |
|------|------|------|----------------|
| 140  | 8    |      |                |
| 155  | 12   | 3    | 55Ω            |
| 160  | 10   | 2    | 52             |
| 165  | 9    | 3    | 52Ω            |
| 170  | 8    | 3    | 46Ω            |
| 175  | 6    | 2    | 52Ω            |
| 180  | 5    | 3    | <del>60Ω</del> |
| 185  | 4    | 3    | <del>63Ω</del> |
| 190  | 3    | 3    | <del>68Ω</del> |
| 195  | 2    | 3    | <del>72Ω</del> |
| 200  | 1    | 3    | <del>80Ω</del> |

← lowest frequency box may be adjusted to as 12 inductance and 1 capacitor is about 154 KC.

Tuner box A

Impedance switch on position 2

- 60Ω
- 63Ω
- 68Ω
- 72Ω
- 80Ω

5/1/57

# Test of Cores in Antenna Loading Coils

all cores centered in coils of tuning box A.

Test on south antenna. Cores of Ferroxcube

| Grid Dip Meter | Antenna Tuner Box | Antenna | Frequency     |
|----------------|-------------------|---------|---------------|
| Main dial      | Inductance Point  | Meter   | in Kilocycles |
| Dial           | Dial              | Ohms    |               |

| Cores each | 12 dishes making slug | 1 1/2" dia, 2 7/8" long |   |                   |
|------------|-----------------------|-------------------------|---|-------------------|
| 10         | 6.5                   | 11                      | 3 | 51 147            |
| 10         | 0                     | 12                      | 3 | 58 143            |
| 5.5        | 0                     | 12                      | 1 | 5.5? doesn't tune |
| 0          | 0                     | —                       | — | —                 |

| Bent | Cores each | 1 rod | 3/8" dia + 8" long |   |        |
|------|------------|-------|--------------------|---|--------|
|      | 10         | 6.5   | 10                 | 5 | 51 147 |
|      | 10         | 0     | 10                 | 3 | 50 143 |
|      | 5.5        | 0     | 10                 | 2 | 49 141 |
|      | 0          | 0     | 11                 | 2 | 46 136 |

| Cores each | 4 rods | 3/8" dia + 8" long in bundle |       |             |
|------------|--------|------------------------------|-------|-------------|
| 10         | 6.5    | 8                            | 2     | 44 147      |
| 10         | 0      | 9                            | 5     | 48 143      |
| 5.5        | 0      | 9                            | 4     | 48 141      |
| 0          | 0      | 9 (10)                       | 1 (6) | 45 (45) 136 |

| Cores each | 10 rods | 3/8" dia + 8" long in bundle |   |        |
|------------|---------|------------------------------|---|--------|
| 10         | 6.5     | 8                            | 6 | 52 147 |
| 10         | 0       | 8                            | 3 | 51 143 |
| 5.5        | 0       | 8                            | 2 | 52 141 |
| 0          | 0       | 9                            | 5 | 50 136 |

11/1/57

Antenna 3, Tuner box C  
Inductance 4 52 ohms  
Capacitor 7 520 KC  
Impedance 1

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Antenna 4 Tuner Box D  
Inductance 4 50 ohms  
Capacitor 8 520 KC  
Impedance 1

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#2 Antenna returned.

Best Inductance 4, Cap 8, Imp 1, 55Ω

Next good " 3, " 1, " 1, 60Ω  
(not quite resonance)

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Grid Trap Meter 6135

#1 Antenna Test: Lead crossed on input, Box to south of antenna  
Ind. Cap. Imp. Output

Best 3 1 2 52Ω

Next best 4 8 2 55Ω  
(not quite resonance)

#2 Antenna Test: Leads straight on input, Box to north of antenna

Best 3 1 1 55Ω

Next best 4 8 1 58Ω  
(very good)

Present tuner boxes

12" long, 9 5/8" wide, 8 7/8" deep.