

FCC Special Temporary Authority License

Antenna(s)

- Small Loop Antennas ($\lambda/8 < \text{circumference} < \lambda/4$)
 - 8ft Diameter Loop: 5MHz to 9.5MHz
 - 4ft Diameter Loop: 9.75MHz to 19MHz
 - 2ft Diameter Loop: 19.25MHz to 38MHz
 - 1ft Diameter Loop: 38.25MHz to 50MHz
 - Gain Relatively Poor somewhat isotropic with <75% efficiency
 - Pattern Similar to $\lambda/2$ dipole frequency dependent
- Folded Dipole Antenna (Likely used for > 30 MHz bands)
 - 40 ft long ½ in. copper pipe

Frequencies

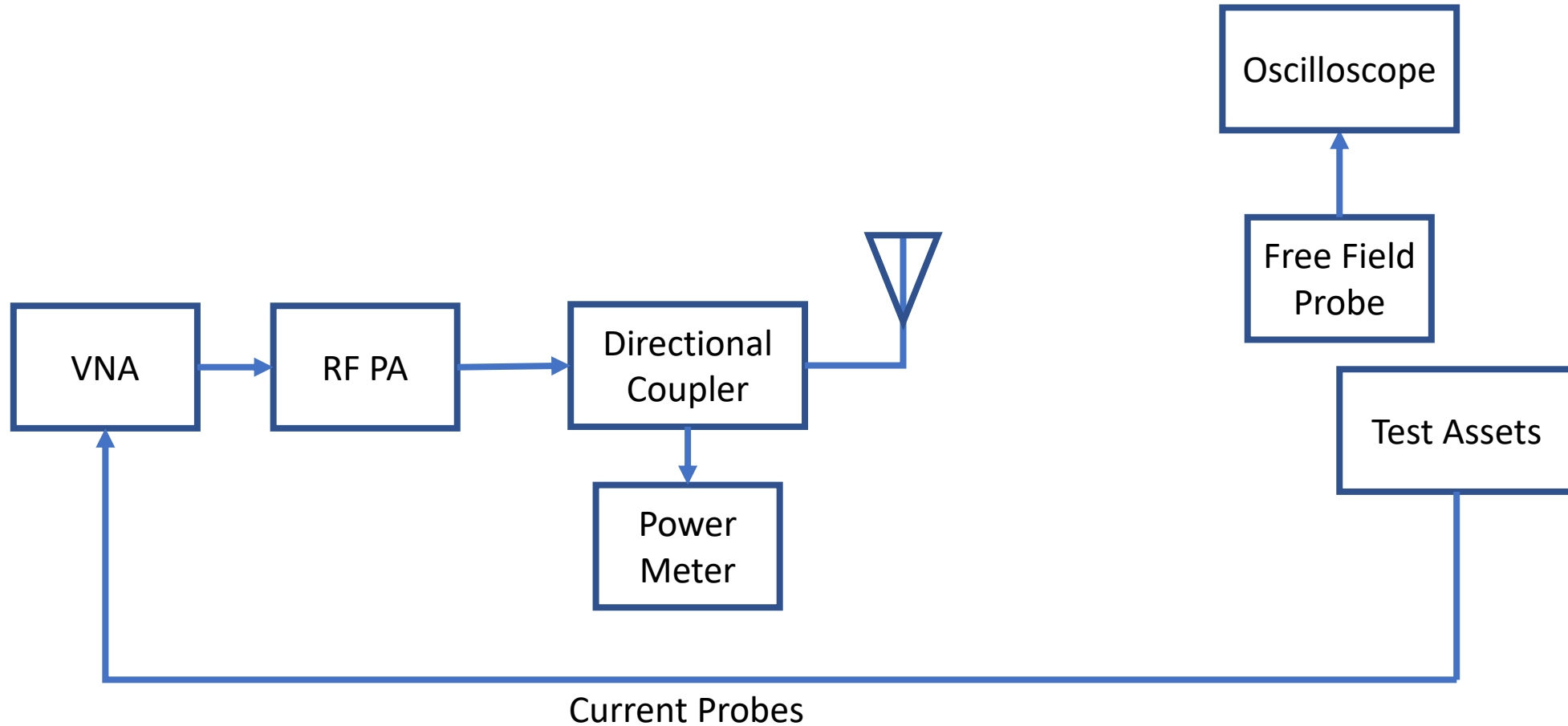
| | | | |
|----------|----------|----------|--|
| 5 MHz | 23 MHz | 41 MHz | |
| 5.5 MHz | 23.5 MHz | 41.5 MHz | |
| 6 MHz | 24 MHz | 42 MHz | |
| 6.5 MHz | 24.5 MHz | 42.5 MHz | |
| 7 MHz | 25 MHz | 43 MHz | |
| 7.5 MHz | 25.5 MHz | 43.5 MHz | |
| 8 MHz | 26 MHz | 44 MHz | |
| 8.5 MHz | 26.5 MHz | 44.5 MHz | |
| 9 MHz | 27 MHz | 45 MHz | |
| 9.5 MHz | 27.5 MHz | 45.5 MHz | |
| 10 MHz | 28 MHz | 46 MHz | |
| 10.5 MHz | 28.5 MHz | 46.5 MHz | |
| 11 MHz | 29 MHz | 47 MHz | |
| 11.5 MHz | 29.5 MHz | 47.5 MHz | |
| 12 MHz | 30 MHz | 48 MHz | |
| 12.5 MHz | 30.5 MHz | 48.5 MHz | |
| 13 MHz | 31 MHz | 49 MHz | |
| 13.5 MHz | 31.5 MHz | 49.5 MHz | |
| 14 MHz | 32 MHz | 50 MHz | |
| 14.5 MHz | 32.5 MHz | | |
| 15 MHz | 33 MHz | | |
| 15.5 MHz | 33.5 MHz | | |
| 16 MHz | 34 MHz | | |
| 16.5 MHz | 34.5 MHz | | |
| 17 MHz | 35 MHz | | |
| 17.5 MHz | 35.5 MHz | | |
| 18 MHz | 36 MHz | | |
| 18.5 MHz | 36.5 MHz | | |
| 19 MHz | 37 MHz | | |
| 19.5 MHz | 37.5 MHz | | |
| 20 MHz | 38 MHz | | |
| 20.5 MHz | 38.5 MHz | | |
| 21 MHz | 39 MHz | | |
| 21.5 MHz | 39.5 MHz | | |
| 22 MHz | 40 MHz | | |
| 22.5 MHz | 40.5 MHz | | |

Center of Field:
38° 49' 30" latitude
104° 49' 48" longitude

Antenna gain: < 3dB
Antenna Height: 6-10ft
Antenna will move around inside the field



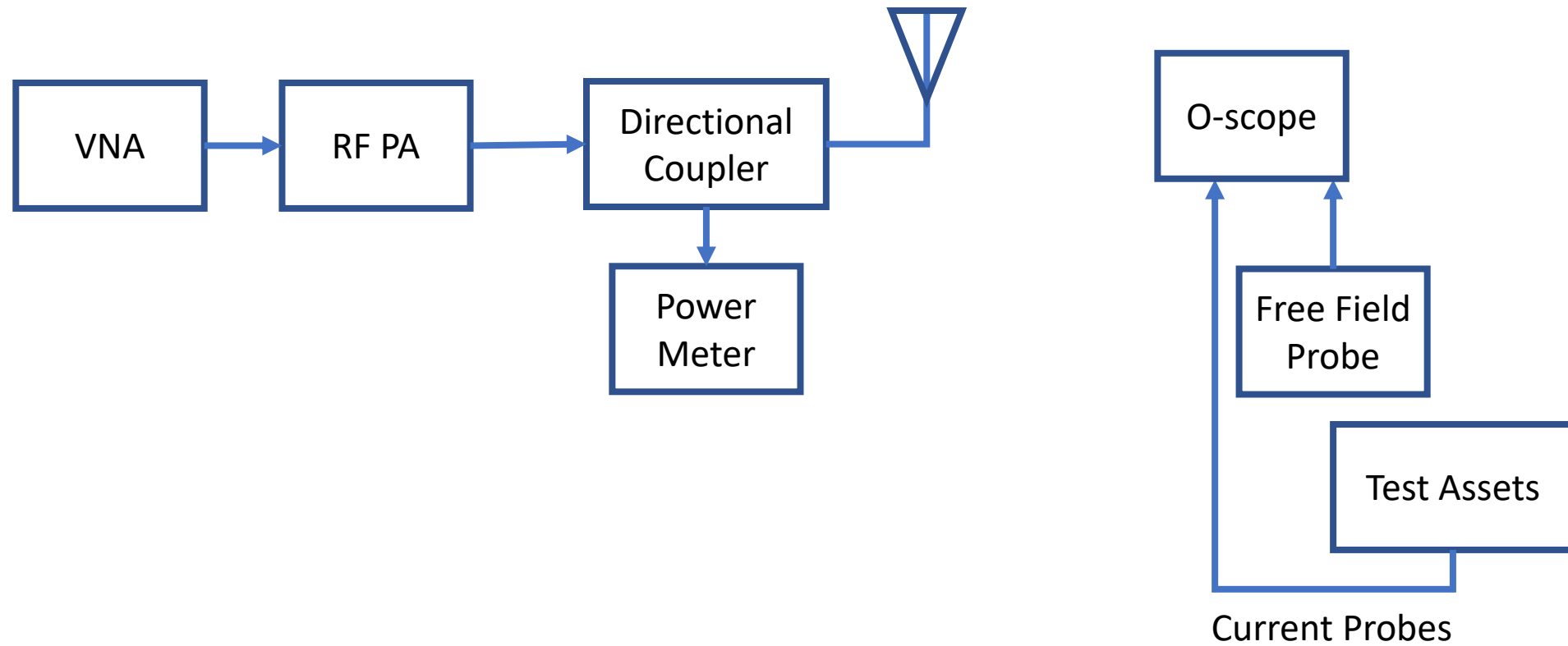
Experiment Block Diagram 1 (Sweep Mode)



Sweep Mode Description

- Many assets will be tested with the loop antennas
- The VNA will conduct a frequency sweep at the discrete frequencies listed in the frequency table that are appropriate for the loop antenna in use.
- The sweep will last approximately 250 ms per frequency
- Then we have to change the loop antenna out and sweep the next set of frequencies.
- We will likely do a maximum of 4 complete data sets per day

Experiment Block Diagram 2 (Discrete Mode)



Discrete Mode Description

- This mode will test a single asset at a single frequency
- The VNA will source a discrete frequency for ~250 ms
- The sweep will last approximately 250 ms per frequency