

# Electro-Resales

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## RF Sampler Meter Probe

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### Background

The meter probe is an RF probe that allows the user to monitor the voltage appearing at the sense coil of a traditional RF sampler. The meter probe when used as described in this document replaces the Oscilloscope or spectrum analyzer that may often be connected to the sense coil.

The RF probe is of conventional design using a signal diode to convert the AC voltage to a DC voltage; it is configured as a half wave rectifier.

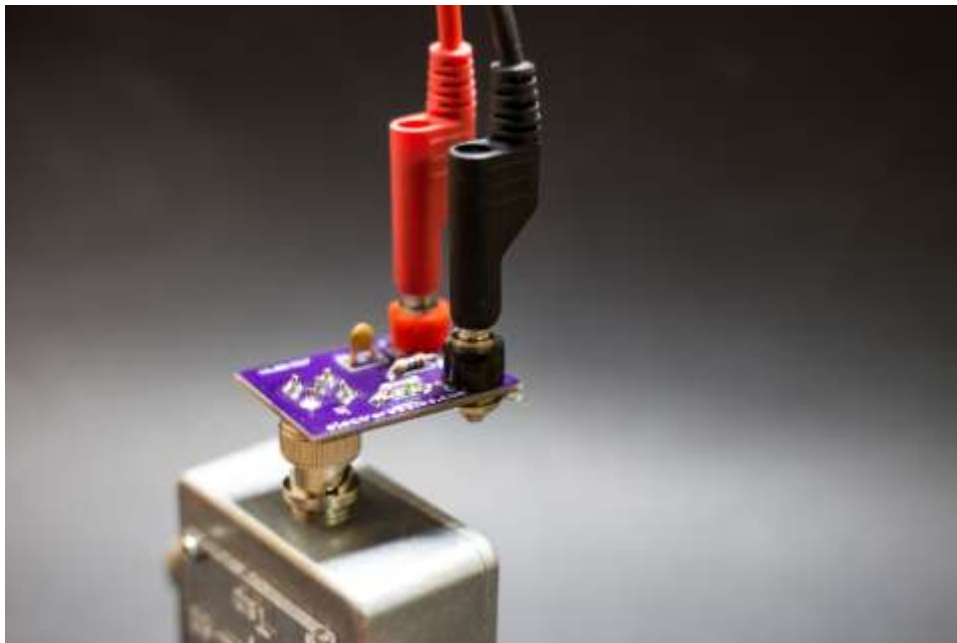
The meter probe is suitable for meters that have a 10 – 11 M $\Omega$  input resistance (most digital meters) and samplers based on toroid sense coils rather than resistive or capacitive types.

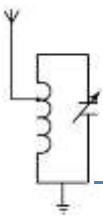
### How to use – Basic set up

The meter probe is simplicity itself to use. The PCB has a male BNC jack on the reverse side of the PCB that mates with the female BNC typically found on RF Samplers. Once the PCB has been attached to the Sampler, attach your meter to the banana sockets on the PCB.

Remember to attach the positive of the meter (Red) to the positive of the PCB and ground (Black) to the black banana socket on the probe PCB.

This photo illustrates the connection format:





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With the probe connected to the sampler, we are ready to get some readings. The multimeter should be set to DC Volts and if needed a range that reads to about 50 Volts, most meters will auto range so this step is not required.

As an initial check of the unit, if possible, run an FM signal of around 50 Watts through the sampler, at a dial setting of 7.200MHz. Your meter should give a voltage reading of about 0.8 – 1.0 Volts. Once this step is completed your meter probe is ready for use.

## Making Measurements

Once the basic setup is completed the next step is to make a series of measurements at different operating frequencies and modes and power. Typically completing this for the frequencies generally used and a power of say 100 watts is sufficient to provide a reference to compare to for the future. A typical chart is shown below:

### Reference Chart\*

Frequency MHz	Mode	Power	Meter Reading	Notes
3.850	SSB	100 Watts	1.520 VDC	11-10-17
7.150	SSB	100 Watts	1.521 VDC	11-09-17
14.200	SSB	100 Watts	1.499 VDC	
18.100	SSB	50 Watts	0.950 VDC	11-22-17

\*This for example only, your readings may differ.

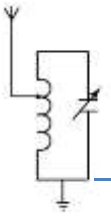
When you have the reference chart completed, you can quickly use this to compare the readings on the same band and mode at a future date. Generally across a band the voltage readings should not vary that much so only one reading is generally needed per band. An exception to this may be 10 Meters due to its wide frequency bandwidth.

A blank chart is included in the appendix for your use.

## Other Uses for the Meter Probe

As supplied the meter probe is specifically designed to be used with an RF sampler, however, it is a basic RF probe by design so can be used in RF probe applications to sense RF in a circuit or to use in troubleshooting the RF stages of a radio.

Typically in use the PCB would need to be housed in an enclosure or at the least have the top and bottom of the PCB protected by blank PCB material or metal to prevent hand capacitance effects .



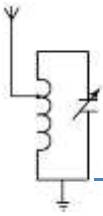
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A probe tip would need to be fabricated to attach to the BNC to allow probing and minimize antenna effects. A simple probe can be fabricated from a 2-3" piece of 1/16" diameter brass rod, sharpened to a tip and soldered into a BNC plug. In the photo below a probe constructed like this is shown.



Bear in mind that the probe diode has a breakdown voltage of around 50 Volts, voltages above this will short out the diode.



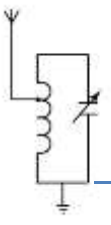
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## Appendix A - Example blank tables for creating a reference chart

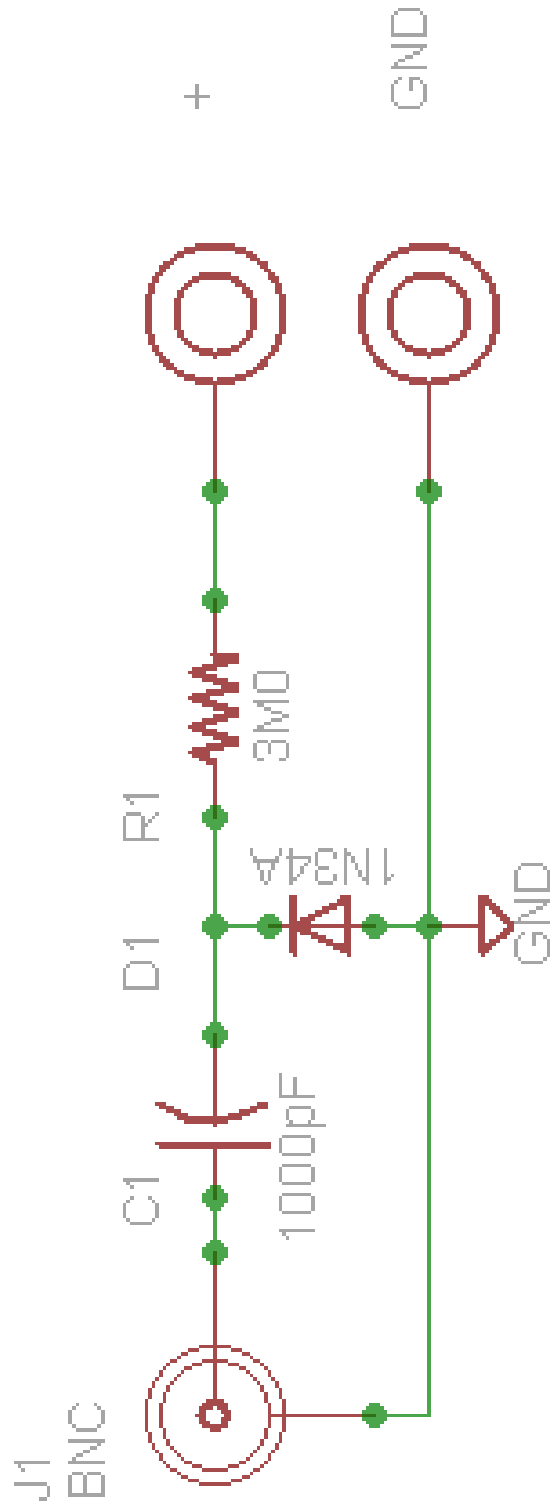
Frequency	Mode	Power	Meter Reading	Notes

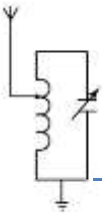
Frequency	Mode	Power	Meter Reading	Notes



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## Appendix B - Schematic





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## **LIABILITY DISCLAIMER**

**A person who constructs or works on electronic equipment may be exposed to hazards, including physical injury, the risk of electric shock or electrocution.. These hazards can result in health problems, injury, or death. Only qualified persons who understand and are willing to bear these risks themselves should attempt the construction of electronic equipment. By purchasing this item, the buyer acknowledges these risks.**

**There is a risk of electric shock, electrocution, burns, or fires that is inherent in the construction and use of electronic equipment. By purchasing this item, the buyer acknowledges these risks.**

**IN NO EVENT SHALL THE SELLER BE LIABLE FOR ANY SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY NATURE including, but not limited to, property damage, personal injury, death or legal expenses. Buyer's recovery from Seller for any claim shall not exceed the purchase price paid by Buyer for the goods, irrespective of the nature of the claim, whether in warrant, contract or otherwise. By purchasing this item, BUYER AGREES TO INDEMNIFY, DEFEND AND HOLD SELLER HARMLESS FROM ANY CLAIMS BROUGHT BY ANY PARTY REGARDING ITEMS SUPPLIED BY SELLER AND INCORPORATED INTO THE BUYER'S PRODUCT.**