

Measuring RF Power

Figure 1 illustrates a simple gadget enabling the measurement of RF power dissipated in a 50 ohm dummy load within a few percent. It covers from 10 to 1800 watts in three ranges. It can be calibrated with a variable DC power supply at voltages equivalent to the RF power in watts applied to the dummy load, as modified by the internal circuitry illustrated. The range of RF rms voltages across 50 ohms varies between 22.4 volts at 10 watts to 300 volts at 1800 watts. A voltage divider and a pair of zener diodes reduce this wide voltage range to less than 10 VDC, which is calibrated in watts on three scales.

Table 1 gives the equivalent voltages applied to the meter when the matching power level in watts is applied to the dummy load. The meter, with its series multiplier, is set to measure a full-scale DC voltage of 10 volts.

Figure 2 illustrates the connection of this gadget to the dummy

load and transmitter/transceiver RF output. The transmitter/transceiver must be operating on CW when using this gadget.

This gadget must be built in a shielded enclosure and a shield placed internally to prevent any RF leakage into the meter and multiplier area. A T-connector allows connection of this gadget and the transmitter to the dummy load.

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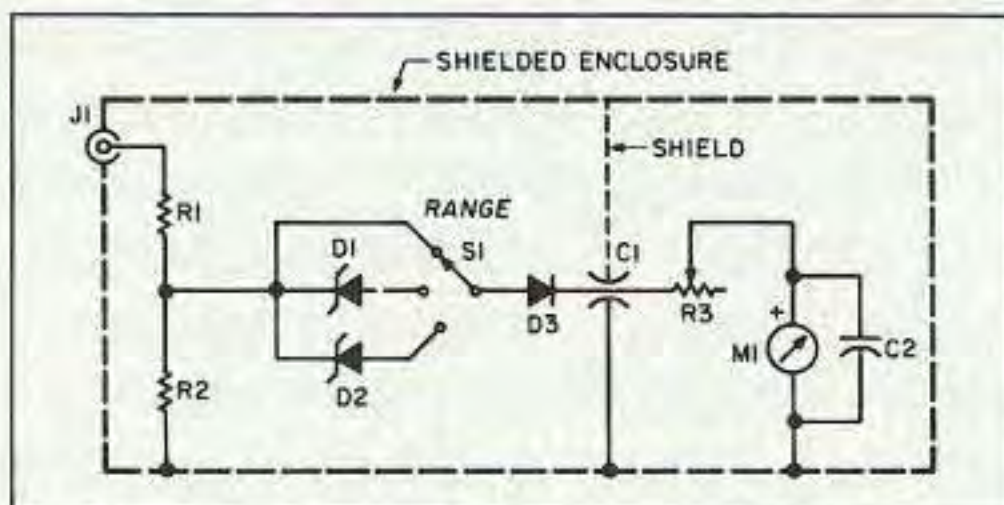


Figure 1. The gadget.

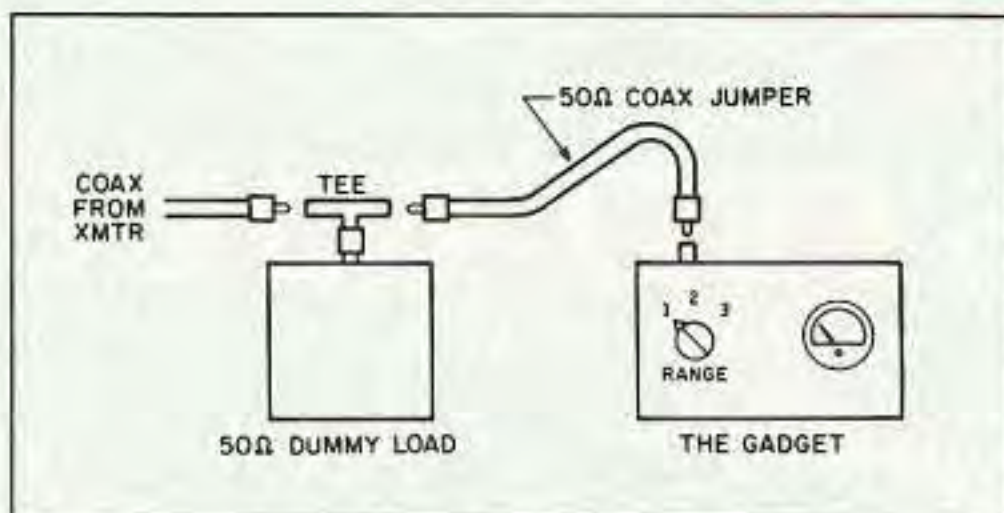


Figure 2. Operation.

Table 1. Calibration

Range 1		Range 2		Range 3	
Watts	Volts	Watts	Volts	Watts	Volts
10	2.24	300	1.20	900	2.12
25	3.54	400	4.14	1000	2.24
50	5.00	500	5.80	1250	5.00
75	6.12	600	7.32	1500	7.40
100	7.07	700	8.71	1800	10.00
125	7.90	800	10.0		
150	8.70				
200	10.00				

Parts List

- R1 9.1k ¼W 5%
- R2 910 ohm ¼W 5%
- R3 Meter multiplier (see text)
- D1 10V zener (1N758; 1N961; 1N5240; 1N5856; 1N6000)
- D2 20V zener (1N968; 1N5250; 1N5540; 1N5866; 1N6007)
- D3 Germanium diode (1N34A; 1N90; etc.)
- C1 Feed-through capacitor, 0.001 to 0.01 µF
- C2 0.01 µF disc capacitor
- J1 SO-239, or connector to match coaxial cable from transmitter
- M1 DC milliammeter, 100 µA to 1 mA
- S1 1-pole, 3-position wafer switch