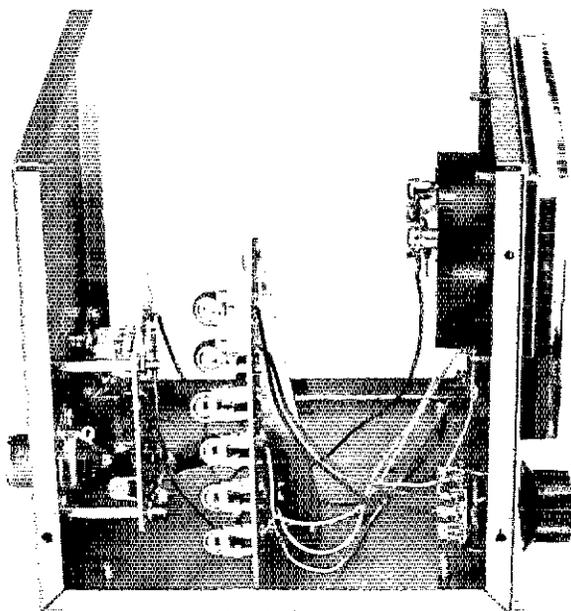




The Swan Model WM-1500 RF Wattmeter

ONE OF THE MOST useful accessories in the ham shack is a device to measure transmitter output power in watts. A forward- and reflected-power meter differs from the more common SWR meter (Monimatch) circuit in that readings with the former are not materially affected by frequency or line impedance. For this reason, relatively accurate measurements can be made of transmitter power output on various bands and under different antenna or load conditions. The frequency range of the WM-1500 is 2 to 30 MHz



The Swan Wattmeter has four ranges for reading transmitter power output. The QRP operator will find the five-watt full-scale range to be very useful.

with an accuracy of better than 10 percent at full scale. The device may be used up to 50 MHz, but, according to the manufacturer, accuracy is reduced somewhat at that end of the useful range. No tests of the unit were made at six meters in the ARRL laboratory.

The Circuit

The principle upon which this unit operates was described in April, 1959, *QST*, by Warren Bruene. A toroidal inductor is used to sample current on the transmission line, see Fig. 1. Rectified rf voltage from either set of diodes is selectable by S1, located on the front panel of the unit. S2 allows the choice of one power range for a full-scale reading of 5, 50, 500, or 1500 watts.

Station Interconnection

Interconnecting the WM-1500 with the amateur station is quite simple. Two coaxial UHF connectors are located on the rear panel of the wattmeter. A cable should be connected between the OUTPUT connector and the station antenna (or antenna switch if one is used) and another cable connected from the station transmitter to the wattmeter INPUT connector. Any form of 50-ohm coaxial cable may be used, provided it will handle the transmitter output power. The power-sensing circuitry is mounted permanently inside a heavy-duty cabinet.

Swan warns the operator (and rightly so!) against applying more power to the input connector than the range selector indicates. Damage could occur to the sensitive meter movement. Since two switches are incorporated to allow the selection of power level and forward or reverse watts, care must be taken *not* to check the reflected power using a sensitive range (assuming a near perfect match is observed while applying high power to the antenna) without resetting the power selector to a higher range before switching to forward power. "Programming" this operator not to make that mistake was not difficult.

Perhaps the most unique feature of the wattmeter is the actual meter itself. A very large meter face (4-1/4 inches wide) containing four ranges labeled in bold numerals makes reading the power very easy from a distance of several feet. In fact, this bifocaled writer has no difficulty reading the meter even through the "wrong" portions of his spectacles! — *W1FBY*

Inside view of the Swan Wattmeter WM-1500. The calibration potentiometers are mounted on a circuit board shown at the center of the U-shaped chassis.

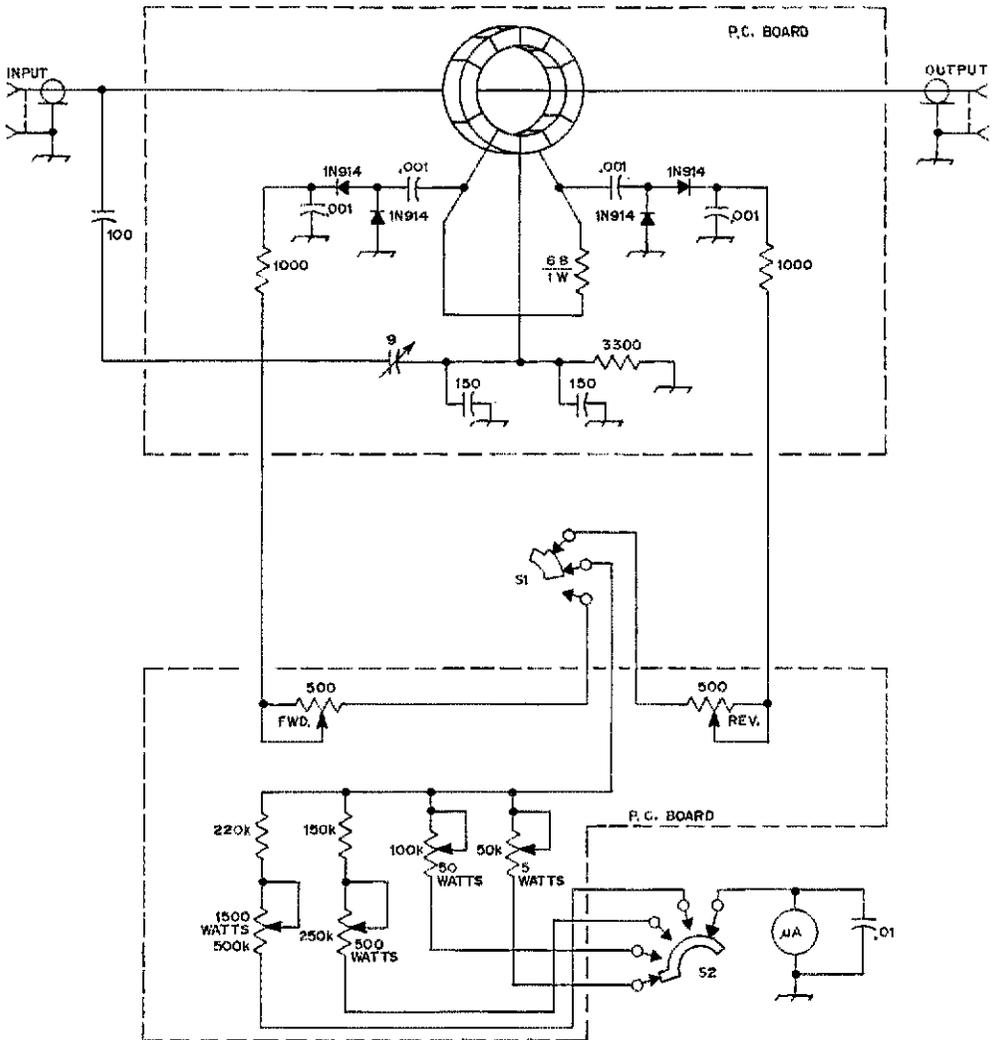


Fig. 1 — Circuit diagram of the WM-1500 wattmeter. Component designations are those given by the manufacturer.

Swan Model WM-1500 Wattmeter

Power range: 0-5, 0-50, 0-500, 0-1500 watts.
 Frequency range: 2-30 MHz, and up to 50 MHz at reduced accuracy.
 Accuracy: ± 10 percent at full scale.
 Impedance: 50 ohms.
 Dimensions (HWD) and Weight: $6\frac{1}{2} \times 4\frac{3}{4} \times 6\text{-}3/4$ inches, 2- $3/4$ pounds.
 Price Class: \$50.
 Manufacturer: Swan Electronics, Oceanside, CA 92054.

Technical Correspondence

(Continued from page 51)

the XR-205 IC has been omitted from both the schematic diagram and the printed circuit board.

A 3000- to 5000-ohm resistor *must* be connected from pin 11 of the XR-205 to ground in order to have any output of a sine wave. The internal circuitry of the IC has an emitter connected to pin 11, and to make the circuit work it must have this resistor, which then makes it an emitter follower. The circuit board has no pad to which the resistor may be connected, but one may be included if the builder is laying out his own artwork. — F. Everett Emerson, W6PBC, Box 153, Tahoma, CA 95733.