

# INSTRUCTION MANUAL

WM-3000

PEAK READING WATTMETER



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### CONGRATULATIONS.

One of the finest, high quality wattmeters available today is now with you. To fully appreciate the features and efficient operation available with your new wattmeter, we recommend you study the instruction manual thoroughly prior to operation.

### GENERAL:

The WM-3000 is a precision built thru-line wattmeter providing P.E.P. and R.M.S. power indication.

Our newly designed flat frequency response directional coupler enables you to read forward power (from transmitter to antenna) and reflected power (from antenna to transmitter) with maximum accuracy from 3.5 MHz to 30 MHz.

### UNDERSTANDING P.E.P.

With an S.S.B. transmitter, the output power occurs only sporadically during voice transmission and has no direct relationship between the peak and average power, the ratio of peak to average power varies widely with voices of different characteristics.

The power contained in the signal at the maximum peak is the basic transmitter rating. It is called the "peak envelope power," P.E.P. for short. This makes the Peak Reading Wattmeter essential for S.S.B.

General power meters indicate average or RMS (root mean square) value and calibrated by using a continuous sine-wave signal which a voice-modulated signal definitely is not. Such a power meter means little in peak envelope power of S.S.B.

### SPECIFICATIONS:

Measuring method	Directional coupler
Power Range	0 — 200, 500, 1000, 2000 W
Impedance	50 ohm
Measuring accuracy	7%
Frequency range	3.5 — 30 MHz
Connector	SO-239
Power source, SSB only	117 V A.C. $\pm 10\%$
Dimensions	8"W x 4"H x 5.2"D

### INSTALLATION:

Installation of this unit is simple and the same as other thru-line wattmeters, except it requires a 117 volt A.C. source for peak indication.

Connect the antenna coax cable to the "ANTENNA" receptacle of this unit and connect a short coax jumper between the "TRANSMITTER" receptacle and the transmitter output.

### POWER SOURCE:

This WM-3000 requires a 117VAC power source for peak readings. The power transformer has three taps on the primary for operation with 117, 100, or 230 volt A.C. supplies.

Remove the wire on tap No. 3 to No. 4 for 230 volt A.C., and to No. 2 for 100 volt A.C.

### OPERATION AND FRONT PANEL INDICATION:

#### I. POWER SWITCH: rotary switch

Power range selector switch. Set this switch to a convenient power reading as available on the meter scale.

#### II. SSB-RMS SWITCH: left hand slide switch

In the SSB position, the meter indicates P.E.P. and the pilot lamp is bright.

In the RMS position, the meter indicates RMS power and the pilot lamp is off.

The power supply is not necessary for RMS power reading.

#### III. FWD-REF SWITCH: right hand slide switch

In the FWD position, the meter indicates forward power (from transmitter to antenna).

In the REF position, the meter indicates reflected power (from antenna to transmitter), this should be as small as possible.

Any combination of the above three switches is possible.

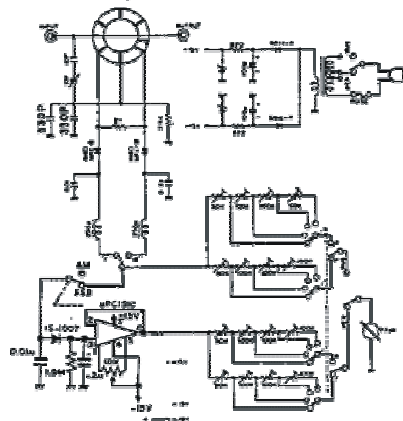
### V.S.W.R. MEASUREMENT:

SWR has a direct relationship with the TRAVELING WAVES and the SWR measurement is available with the WM-3000 with good accuracy. The formula of SWR calculation by traveling waves is as follows:

$$SWR = \frac{1 + \sqrt{\frac{P_r}{P_f}}}{1 - \sqrt{\frac{P_r}{P_f}}}$$

$P_f$  = forward power  
 $P_r$  = reflected power

SWR also could be read on the Graph — Reflected power vs SWR. The principles of SWR are described in most high frequency textbooks.



### CAUTIONS:

Do not disconnect the antenna cable while transmitting.

Tighten all cable connections.

