

## MFJ-818 Mobile SWR/Wattmeter

### Introduction

The MFJ-818 Mobile SWR/Wattmeter measures forward and reflected power and SWR simultaneously and is designed to operate on 1.8-30 MHz. The MFJ-818 has two power scales, which are selected with the top panel push button switch. The high power scale measures 0-300 Watts forward power and 0-60 Watts reflected power. The low power scale measures 0-30 Watts forward power and 0-6 Watts reflected power. The MFJ-818 utilizes a large illuminated three-inch Cross-Needle meter to read the SWR from 1:1 to  $\infty$ . A slide switch turns the back light on or off. This compact SWR/Wattmeter is rugged enough to take the abuse of brutal mobile and portable operation.



*Figure 1: MFJ Mobile SWR/Wattmeter*

### Installation

1. Connect your transmitter to the connector labeled TRANSMITTER and your antenna to the connector labeled ANTENNA. It is important that you use good quality coax and properly installed connectors.
2. An internal lamp backlights the meter scale. The lamp circuit requires 12 VDC supply such as the MFJ-1312B. Use a 2.1 mm coaxial plug with the center conductor positive and the sleeve ground. A slide switch turns the internal lamp on or off.
3. To measure the power output capability of a transmitter/amplifier you should connect a quality 50-ohm dummy load to the ANTENNA connector of the MFJ-818.

## Operation

1. The meter's full-scale forward and reflected power range is controlled by the **POWER RANGE** button. When the button is pushed **in**, the forward power scale is on **300 Watts** and the reflected power scale is on **60 Watts**. When the button is pushed **out**, the forward power scale is on **30 Watts** and the reflected power scale is on **6 Watts**. If your transmitter/amplifier runs more than 30 Watts of output power, push the button **in** for 300 Watts. If your transmitter runs less than 30 Watts of output power, push the button **out** for 30 Watts.
2. Forward power is displayed on the left-hand FORWARD meter scale. This scale is calibrated from 0 to 300 Watts and is read directly in the **300W (in)** position. Each picket (scale mark) represents 5 Watts below 10 Watts, 10 Watts between 10 and 100 Watts, and 25 Watts between 100 and 300 Watts. In the **30W (out)** position, the forward power scale must be divided by 10. Each picket represents 0.5 Watts below 1 watt, 1 watt from 1 to 10 Watts, and 2.5 Watts from 10 to 30 Watts.
3. Reflected power is displayed on the right-hand REFLECTED meter scale. Reflected power is 60 Watts full scale when the **300W (in)** power scale is selected, and 6 Watts full scale when the **30W (out)** power scale is selected.
4. The most accurate power readings occur in the upper half of the meter scales. When trying to measure power with a less than perfect match, the reflected power should be subtracted from the forward power reading in order to find the true power.
5. The SWR is read directly from nine red SWR curves that range from 1:1 to  $\infty$ . SWR is measured by observing the point where the forward and reflected power needles cross. The SWR is indicated by the red curve closest to the needle crossing point.

## Calibration

The MFJ-818 has been calibrated at the factory. If it should ever need to be recalibrated, then follow this procedure:

### Equipment Needed

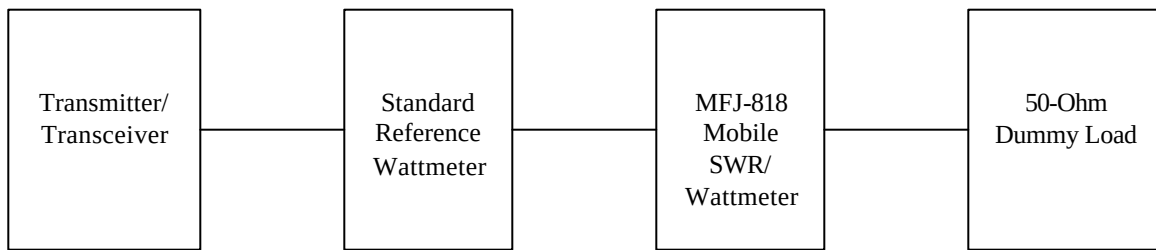
1. Transmitter capable of supplying enough power to obtain  $\frac{1}{2}$  to full-scale reading at 14 or 21 MHz.
2. 50-ohm dummy load that is capable of handling full transmitter output power and has better than a 1.15:1 SWR.
3. Power meter of known accuracy. The calibration will only be as good as the standard reference meter.
4. 50-ohm cables capable of handling the power. RG-58/u is recommended. DO NOT USE RG-59 or RG-11.

### Meter Calibration

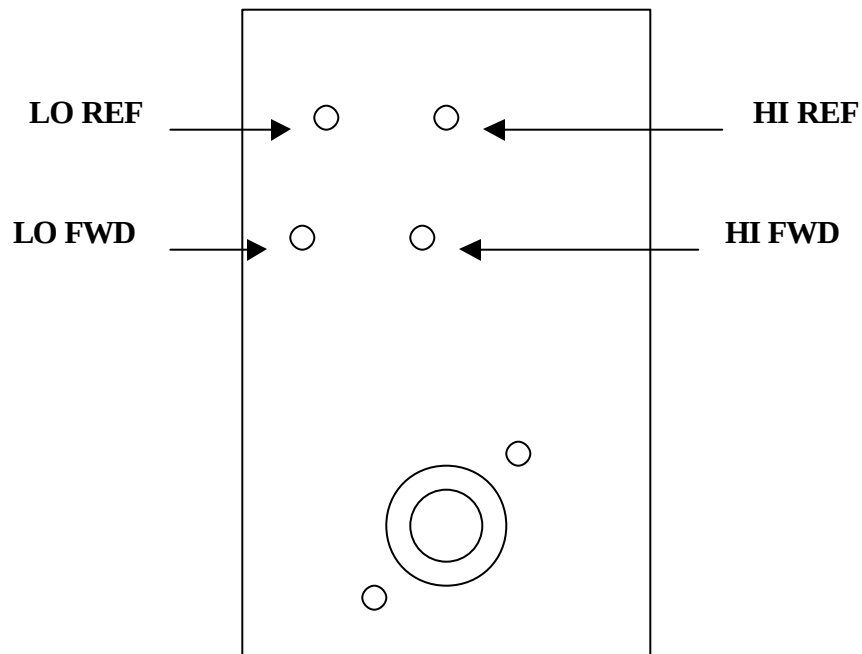
1. Refer to *Figure 2* for the Test Setup and refer to the Trim Pot Location in *Figure 3* for trim pot location.
2. Connect the Test Setup equipment as shown in *Figure 2*. Use a 50-ohm dummy load for the antenna. Set the Transmitter to the 14 MHz in the 20-meter band.
3. With the **POWER RANGE** button pushed **in** for the 300 Watt scale, transmit 100 Watts as indicated on the reference meter. Adjust the HI FWD trim pot to set the forward power scale to 100 Watts.
4. With the **POWER RANGE** button pushed **out** for the 30 Watt scale, Transmit 10 Watts as indicated on the reference meter. Adjust the LO FWD trim pot to set the forward power scale to 100 Watts.
5. To set the reflected power, interchange the TRANSMITTER and ANTENNA coax cables so that the transmitter is connected to the ANTENNA connector and the dummy load is connected to the TRANSMITTER connector.
6. With the **POWER RANGE** button pushed **in** for the 60 Watt reflected scale, Transmit 20 Watts as indicated on the reference meter. Adjust the HI REF trim pot to set the reflected power scale to 200 Watts.

**Meter Calibration (cont.)**

7. With the **POWER RANGE** button pushed **out** for the 6 Watt reflected scale, Transmit 2 Watts as indicated on the reference meter. Adjust the LO REF trim pot to set the reflected power scale to 20 Watts.
8. SWR requires no calibration.



**Figure 2: Test Setup**



**Figure 3: Trim Pot Location (Side View of MFJ-818)**

## Technical Assistance

If you have any problem with this unit first check the appropriate section of this manual. If the manual does not reference your problem or reading the manual does not solve your problem, you may call *MFJ Technical Service* at **662-323-0549** or the *MFJ Factory* at **662-323-5869**. You will be best helped if you have your unit, manual and all information on your station handy so you can answer any questions the technicians may ask.

You can also send questions by mail to MFJ Enterprises, Inc., 300 Industrial Park Road, Starkville, MS 39759; by Facsimile (FAX) to 662-323-6551; or by email to [techinfo@mfjenterprises.com](mailto:techinfo@mfjenterprises.com). Send a complete description of your problem, an explanation of exactly how you are using your unit, and a complete description of your station.

## Schematic

