

WHAT IS IT?

The RS-50M SWR Power Meter helps to ensure your radio installation is transmitting at it's best possible performance. By testing your VHF radio at the radio, and at each junction point of your antenna cable, you will quickly be able to determine if there is an issue with your radio, a cable segment, or antenna that is preventing your radio from transmitting to its maximum range.

QUICK GUIDE

FWD – Forward Power is the amount of power being transmitted from the radio to the antenna in Watts.

REF – Reflected Power is the amount of power being reflected back from your antenna in Watts.

SWR – Standing Wave Ratio is the ratio of FWD to REF power.

HOW DOES IT WORK?

The RS-50M will detect when the microphone button on the VHF radio also known as PTT (push to talk) has been pressed, and measures the Forward Power, Reflected Power and Standing Wave Ratio.

The Forward Power (signal output) from the VHF radio is shown in Watts under **FWD**. The power reflected back from the antenna due to incorrect impedance between the VHF radio, antenna cable, connectors and antenna is shown under **REF** for Reflected Power. The Standing Wave Ratio which is a measurement of how efficiently your radio is radiating the power it produces when you transmit is shown under **SWR**. It is generally referred to as the ratio of FWD to REF power. The smaller the number, the better the SWR reading.

An SWR reading of 1.00 is ideal but rarely achieved, meaning 100% of your signal is transmitted with no reflected power.

1.00 to 1.50	Very good reading.
1.50 to 2.00	Okay, some issue may exist.
2.00 to 3.00	Significant loss. Serious issue exists.
3.00 and up	Potentially damaging amount of REF power to the transceiver.

Note: The highest SRW values occur when the antenna is disconnected or short circuited. Operating a VHF radio with the antenna disconnected or short circuited can damage the radio. Testing the radio with the RS-50M without the antenna attached can also damage the radio.

Battery Installation:

- 1. Remove the black screw from the rear cover to open the battery compartment.
- 2. Be sure to check polarity of batteries before installing.
- Install 2 x AAA batteries. Batteries may be alkaline (1.5v), NiCad or NiMH (1.2v) rechargeable batteries. Power can also be supplied using the included USB cable. The USB port is intended for continuous power, but will not charge the batteries.
- 4. Remove the batteries if the unit will not be used for an extended period.

Measurement:

- Connect the transceiver to the "TX" connector on the RS-50M meter using a 1 meter length of 50-ohm cable (sold separately)
- 2. Connect the antenna or load to the "ANT" connector.
- 3. Turn on the RS-50M power and optionally the LCD backlight switch.

- 4. Turn on the transceiver and tune to Channel 72. The RS50M has been calibrated for Channel 72 as the center frequency and will be the most accurate on this channel.
- 5. Monitor the channel prior to transmitting to ensure you are not disrupting ongoing communications during the test.
- 6. Press the microphone (PTT) button for 1 to 2 seconds and release to read the results on the display. The Forward Power (FWD), Reflected Power (REF) and Standing Wave Ratio (SWR) will be displayed for 5 seconds. While the PTT button is pressed the RS-50M is constantly calculating and averaging the results for the most accurate reading.
 - **Note:** If the meter is not used for 30 seconds, the back-light will automatically turn off. After pressing the PTT button, the back-light will turn back on.
- 7. Be sure to turn off both the Power and Light switches after use to conserve battery power.

WHY IT IS IMPORTANT

In a marine emergency, when you press the VHF radio's Digital Selective Calling (DSC) button, you want the radio to transmit your unique MMSI number identifying your boat and GPS co-ordinates with the strongest and clearest signal to facilitate a marine rescue.

However, your MAYDAY call may not be received if...

1)	Antenna isn't high enough	4) Obstructions
2)	Radio isn't receiving enough	5) Antenna cable / connection
	voltage from your battery to	issues
	generate a strong signal	
3)	Weather conditions	

The RS50M will help you test your radio.

We tested a sailboat and found that the radio was only producing 18 watts of power due to low battery voltage. Corrosion on a short antenna cable leading from the radio to the base of the mast reduced the signal strength by a further 6 watts, and at the antenna at the top of the mast, the signal strength was only 6 watts. Replacing the cable increased the signal strength substantially.

Note: You should test your radio circuit in the Spring after launching and stepping your mast, and before embarking on a cruise.

Troubleshooting:

Symptom	Solution		
FWD Power less than 25	a) Make sure that you are testing on		
Watts	Channel 72, a 25 Watt Channel. Some		
	channels are limited to 1 Watt.		
	b) Check battery voltage on Radio. Most		
	VHF radios will only transmit full power		
	(25 Watts) with 13.8 volts DC power.		
REF shows ""	a) Check to make sure you are testing on		
	channel 72 (25 watt) instead of a 1 watt		
	channel		
	b) Make sure radio and antenna		
	connections are not reversed		
	c) Make sure wiring and connections from		
	radio to antenna are in good condition.		
SWR shows "99.99"	Antenna cable may have a short.		
No display on RS50M	Check batteries. Replace with 2 x AAA		
	Alkaline (1.5v), NiCad or NiMH (1.2v)		
	rechargeable batteries, or use the Micro		
	USB cable supplied.		

Specifications:

Frequency Range	155 – 158 MHz
RF Power:	0 – 30 Watts
Testing functions:	Forward Power, Reflected Power, SWR
Impedance:	50 ohms
Accuracy:	+ / - 5%
Power source:	2 x AAA Alkaline (1.5v), NiCad or NiMH (1.2v)
	rechargeable batteries, or Micro USB
Connectors:	SO-239

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