The Source
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Watt's Going On?

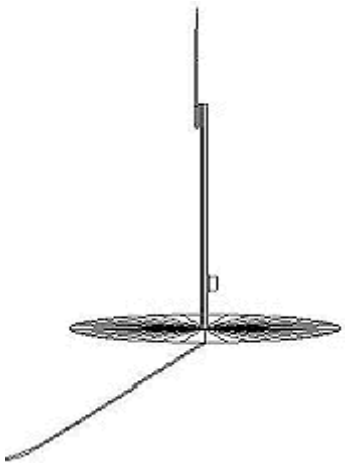
Troubleshooting with a Wattmeter

A wattmeter is essential for station maintenance.

Whether you're operating a Travelers Information Station (TIS), a Highway Advisory Radio (HAR) or an Emergency Advisory AM station, a wattmeter is a valuable tool for installing and maintaining your radio station. A wattmeter can be used to tune the station's antenna and to determine if the antenna and transmitter are working properly (by allowing the measurement of the system's forward and reflected power).

There are a couple of ways to use it.

Both the SX100 Wattmeter and the new SX200 model now provided on all new radio stations are passive units, placed between the transmitter and the antenna. They may be inserted for test purposes, or they may be "hard-wired" into the system for convenience.



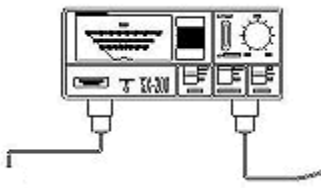
On the back of the meter, find two UHF coaxial termination points. Route the coax from the lightning surge arrestor and antenna to the connector, labeled "ANT." From the connector labeled "TX", route the coaxial cable to the transmitter.

Measurement steps include . . .

With the wattmeter now placed in series and the transmitter off, you can measure the forward RF power. Here's how:

1. Set the meter's FUNCTION switch to the POWER position.

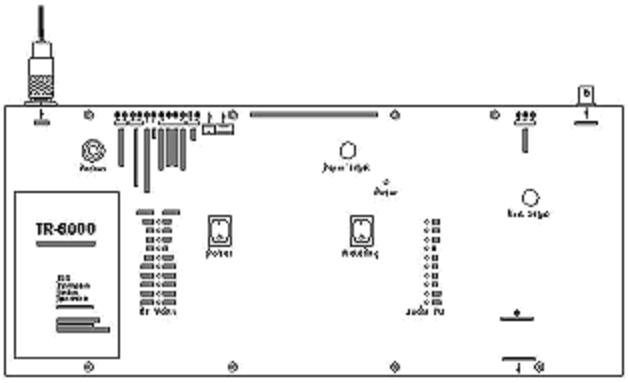
2. Set the RANGE switch to the appropriate setting. (For the SX100, use the 30W range; and for the SX200, use the 20W range).



3. Verify that the TX and ANT output connections are secure.

4. Turn on the transmitter and turn up the output power to 10 watts.

5. Set the POWER switch on the wattmeter to FWD (forward) and record the reading. If you're using the TR6000 transmitter, the power-adjust dial is labeled on the front of the unit. If you have the TR20 (Phase II) transmitter, open the transmitter lid and adjust the blue power potentiometer, located vertically just above the power-switch. (A properly tuned antenna should allow a reading of 10 watts.)



6. Record the reflected power by turning the meter's POWER switch to REF. This reading should be less than 1, and less than 1/10 the forward power reading.

The higher the ratio of forward to reflected power, the healthier your system. A radio system with a high ratio operates more efficiently, resulting in longer transmitter life.

If your readings show reflected power to be nearly the same as forward power, turn the transmitter off. There is a problem with the antenna system. Confirm that your coaxial, feedline and groundplane connections are secure. If these connections are secure, with a VOM meter, verify that coaxial lines have not shorted or opened; and check the antenna for disconnects and damage.

If the wattmeter indicates that there is very low forward power and reflected power, there is internal transmitter difficulty. Turn the transmitter off and place a dummy load on the "ANT" connector of the wattmeter (in place of the coaxial connection to the lightning arrestor and antenna.) Turn the transmitter back on. If the meter continues to show low forward and reflected power with the dummy load in place, service the transmitter. (With a dummy load in place and the transmitter's power at full, the reading should be 10 watts forward power and 0 watts reflected.)

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