

Troubleshooting marine SSB radio

R Medero 14-Julay-2013 – Partially complete, still working on this doc

Low transmit power

1. Verify antenna connections are good – Check connections between tuner and antenna as any connections exposed to elements will eventually fail.

Check coax connections between radio and tuner. Verify that they are snug and clean. Perform continuity test by disconnecting both ends and verify no continuity between shield and center conductors on one end (end A) then connect shield and center of other end (end B) together. Verify not more than 10 ohms is measured on end A.

Whip antennas can fail and can be verified with SWR meter. Connected SWR meter between radio and tuner, perform tune operation and verify SWR is low. Remove one section of antenna at a time including connection at base, and verify that SWR (without retuning) changes as each is removed.

2. Verify power to radio is good – Verify power at radio is good while transmitting. Set radio to high power (if feature present) Measure voltage at as close to radio as practical while transmitting and whistling into mic. Verify you have at least 12v. If large voltage change is observed it could be the meter is sensitive to radio frequency interference, connections are resistive, wire is too small or too long, or battery is weak. To help determine meter reading is true, connect 12v light bulb where meter is connected and observe change in brilliance. Use different meter if you suspect reading is false.

3. Verify tuner is operating – Listen to tuner when tuner is turned on. On most rigs such as ICOM this is when the transceiver is turned on. You should hear relays in the tuner make a click sound. This verifies the tuner is powered up. If no sound is heard verify tuner control cable connections. On ICOM radios verify there is near 12 volts between the red and black wires. NOTE: Take care to not connect the red wire to any other wire as this can blow a fuse in or damage the transceiver or tuner. Another method to verify tuner is powered, set radio a frequency where a weak signal is heard (can use static if weak station not found). Disconnect tuner control cable while listening and verify signal level decreases. Reconnect control cable and very signal level increases.

If radio has a tune button verify that radio momentarily indicates it is transmitting when button is pressed. If it does not, verify tuner control cable connections. On ICOM radio: Momentarily connect green(key) wire to black(GND) wire and verify radio indicates transmitting while connection is made. If it does not then problem is in cable or radio. Momentarily connect white(start) wire to black(GND) wire and verify radio indicates transmitting while connection is made. If it does not then problem is in cable or tuner. When tune button is pressed you should hear relays in the tuner click.

On ICOM M802 the display will indicate when tuning is successful by indicating TUNE in upper area of the display. If not successful it will indicate THRU. If radio is indicating it is transmitting when tune

button is pressed, but not indication that tune operation succeeded, check coax connections between radio and tuner and antenna and ground connections on tuner.

Tune succeeds on some frequencies and not others. Very ground is good (see counterpoise info in this forum), antenna connections are good, and antenna length including wire from tuner to antenna is not near $\frac{1}{2}$ wave length (about $502/\text{frequencyInMegaHertz}$). If you suspect it is the near $\frac{1}{2}$ wave problem then add few feet of wire to antenna. Then verify other frequencies tune ok.