

Radio Installation Maintenance



For a radio system to function efficiently it is important that the two way radio devices used are well maintained and properly installed. Following is a practical list of checks for use during maintenance and repairs.

Antenna Checks

The number one cause of bad radio transmission and reception is damage to the antenna system caused by general wear and tear. A check of the following once a month will help keep your radio working in top condition

Check the following:

- antenna is the correct type and is tight and secure
- antenna mount and base is tight and secure
- antenna base cable entry is clean and no water has ingressed
- antenna cable connector is fitted correctly
- antenna cable has no excessive lengths

Installations using small rubber whip antennas:

- remove whip and ensure centre pin is present and intact
- connector base is not worn and thin
- connector bulkhead mount is secure
- bulkhead mount cable entry is sealed against moisture
- check that cable shield into connector mount is connected

A Practical field test

For anyone having the job of checking radio installations, the basic tool kit should consist of a good multi-meter, a reasonable quality SWR bridge, a 1000V megger, a set of coaxial crimping pliers and an observant eye.

A big contributor to poor radio performance is the antenna feeder cable where water has ingressed either through a nick in the outer jacket or through absorption at the antenna base, especially if a standard base is being used on an external bracket. A practical test that can be done in the field by anyone armed with a 1000 Volt megger is described below. A general purpose multi-meter or SWR bridge could be used as well. However, often these tools will indicate that everything is ok and will only give an indication when there is lots of water ingress into the antenna cable. Run your eye over exposed cable as well to check there are no nicks or cuts.

- 1). Disconnect antenna lead from the radio.
- 2). Apply 1000V megger test between centre pin and outer housing of antenna cable plug.

The reading should be (infinity). Even a minor reading indicates that moisture is present in the cable. Moisture degrades cable efficiency and should be changed if possible. The effects are more pronounced in UHF systems, but any water ingress has an accumulative effect and gradually degrades antenna system efficiency on any band. This check has been found to be particularly useful by underground miners when diagnosing problems with tele-remote antennas.

Power Supply:

Another common problem is the radio power supply causing intermittent or inconsistent operation. Bad joints or ground wires which are not connected properly can cause noise, low output power or both. Have a good look at the following:

- power cable plug - tight and secure
- negative wire is screwed directly to chassis ground
- positive wire connected via fused accessory power
- Voltage is correct when the radio is transmitting - Generally between 12.5 - 13.8 Volts.

Installations using 24V to 12V converters:

Loose ground wires in these systems can cause voltage spikes which damages the radio. The damage is often minor but it can render the radio inoperable because the internal voltage protection is designed to short out causing the external fuse to blow. This is called crow bar protection and is very effective. The problem is the inconvenience caused by having to send the radio off to be repaired...

- ensure the ground wire of the converter is screwed directly to the chassis, preferably together with the radio negative
- ensure the ground wire of the radio is screwed directly to the chassis
- Voltage into the converter is correct when the radio is transmitting - Generally between 24 - 28 Volts.
- shake microphone ensuring it doesn't rattle internally
- ensure bollard is firm and secure

External Speaker:

- mounted securely
- both mounting knobs attached
- operational and not distorted
- plugged in at the back of the radio and the plug is not loose or sloppy

Installation positioning:

A badly positioned or installed radio makes for an agro operator. If they can't reach or see the radio to operate it conveniently then it has the potential to cause an accident. A badly installed radio is also a constant irritant to an operator, especially one who takes pride in their machine.

- ensure the radio is not subject to direct sprays of water or located underneath air conditioner ducts etc
- ensure radio mounted in convenient position for operator