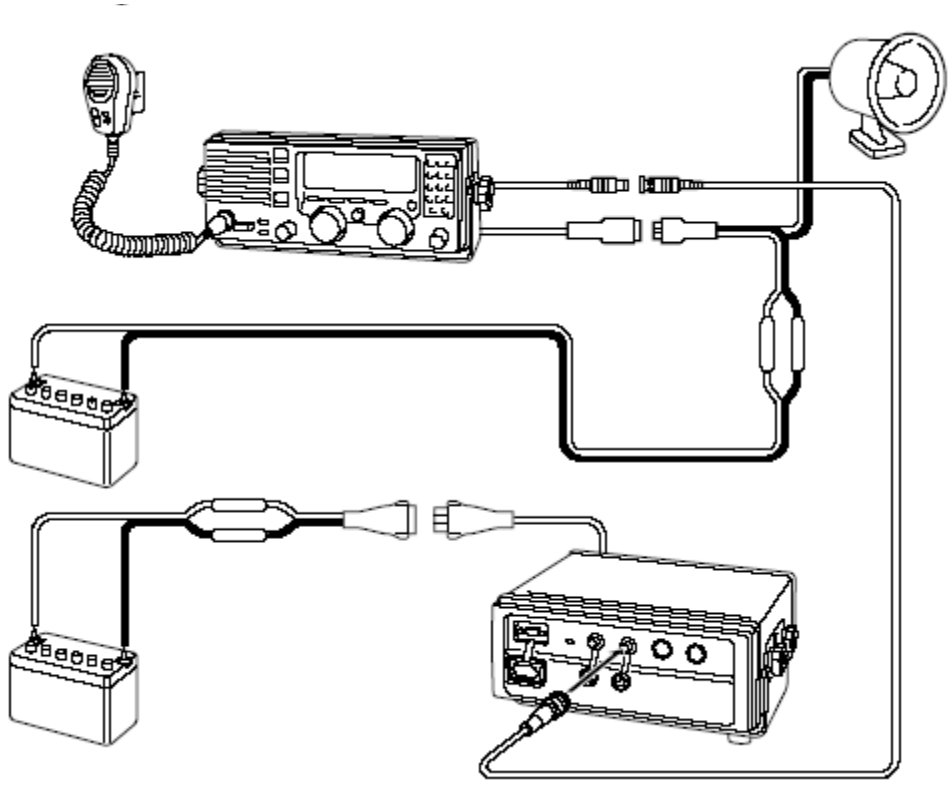
Paul Elliott, S/V VALIS
www.sailvalis.com

Adding a headphone jack to the Icom M710 or M710-RT

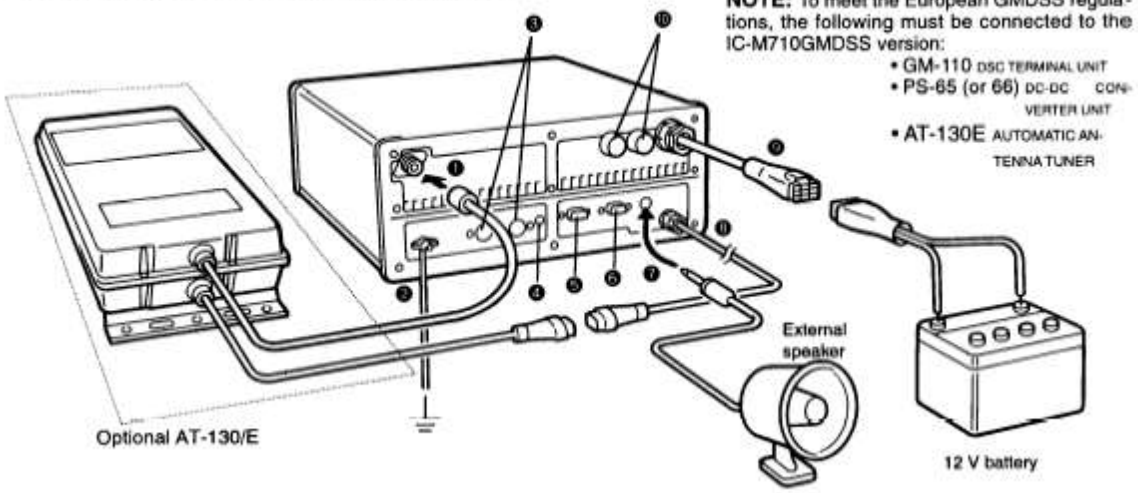
While the M710 and M710RT are excellent marine SSB radios, neither one has a headphone jack. In difficult receiving conditions headphones can make a big difference. The good news is that these rigs do provide for an external speaker, and we can use this to drive our headphones.



ICOM M710-RT

The M710-RT speaker connection is provided by the wiring harness that feeds power to the remote head. In addition to the heavy 12V wires that leave the connector, there are two lighter-gauge wires that are unconnected. These are designed to feed a low-impedance external speaker, but they can be used to drive headphones as well.

■ Connections on rear panel



❶ ANTENNA CONNECTOR (p. 19)
Connects a 50 Ω HF band antenna with a 50 Ω matched coaxial cable and a PL-259 plug.

❷ GROUND TERMINAL (p. 18)
IMPORTANT! Connects a ship's (or vehicle's) ground. See p. 18 for details.

❸ ACC(1) and ACC(2) SOCKETS
See p. 16 for details

❹ CLONE JACK
For Dealer use only.

❺ DSC or REMOTE SOCKETS
- DSC socket for GMDSS versions — Connects an optional GM-110DSC DSC TERMINAL UNIT for DSC operation.
- REMOTE socket for Marine and General versions.

❻ MOD/AF SOCKET (GMDSS versions only)
Connects an external terminal unit.

❼ EXTERNAL SPEAKER JACK
Connects a 4–16 Ω external speaker using a 1/4 inch monaural plug. This external audio is not muted by the [SPEAKER] switch on the front panel.

❽ TUNER RECEPTACLE
Connects a control cable to an optional AT-130 or AT-130E ANTENNA TUNER. A female connector is supplied for connection.

❾ DC POWER RECEPTACLE
Connects to a regulated 12–16 V DC power source such as 12 V battery or DC power supply using the supplied DC power cable.
CAUTION: DO NOT connect to a 24 V battery. This will damage the transceiver.

❿ FUSE HOLDERS
Hold two 30 A fuses for ⊕ and ⊖ terminals. Replace both fuses when one fuse is blown.

ICOM M710

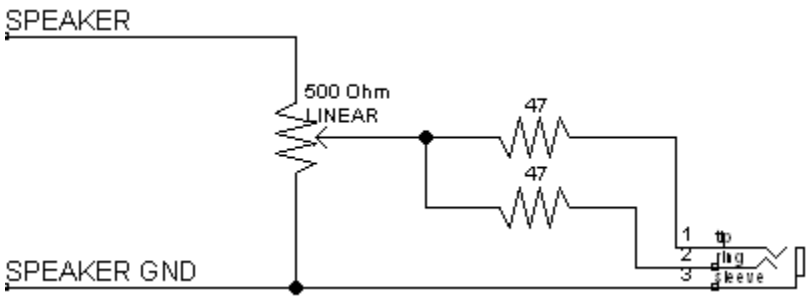
In the M710, the external speaker connection is made through a ¼" mono phone jack (like that used on an electric guitar).

While you can directly connect a headphone jack to the Icom's speaker wires, I decided to add a simple volume control to the circuit. This control lets me semi-independently adjust the headphone volume while still letting the radio's built-in speaker be audible. Of course, the radio's "speaker mute" button still lets you shut off the speaker while the headphones remain active. While you can use an audio or logarithmic taper potentiometer for the volume control, The loading of the potentiometer by the medium-impedance headphones will create a somewhat audio-taper even with a linear potentiometer.

The typical impedance of modern headphones is about 32 Ohms, and this has worked well. Most any headphone will work though.

I also connected two 47 Ohm resistors from the volume control's wiper to the tip and ring connections of the headphone jack. This lets me plug in either a mono or a stereo headphone. The radio puts out enough signal that the losses in these resistors are not an issue. If you will only be using stereo phones you can omit these resistors and just connect the tip and ring together.

Neither the potentiometer or resistor values are particularly critical. Any potentiometer between 100 and 1000 Ohms should work well enough, although with a 100 Ohm pot an audio taper may be desirable. A 100 Ohm pot should have at least a 500mW power rating, but at 500 Ohms or more a 100mW power rating will be sufficient. The 47 Ohm resistors can be 5% 1/4W.



Using a piece of scrap aluminum, I made a quick-and-dirty mounting plate for the volume control and headphone jack. The jack is a standard "mini stereo" (1/8") unit, but you can obviously use whatever matches your favorite headphones. Should you change your mind there are always adaptors, or you could wire both 1/4" and 1/8" jacks in parallel.