

ICOM HF rigs with a Spectrum TRC4-10L Transverter

by Alex GD3UMW

I am new to 4 metres. In March 2009 I hoped I could buy a transverter, plug it in to my HF rig, connect an antenna and have a smooth, no fuss entry to 4 metres. I wished to use an existing rig with all the features I found routinely useful on HF like multiple modes, dual receive, spectrum analyser and receive filters. It had to be already built. Life is too short for homebrew or kits at my age.

My essential requirement was to have one switch to toggle the system from HF to 4m and back again while retaining all the connections to the HF antennas, amplifiers, rig control and accessories. Hard wired changeover from the HF rig was preferred

Some manufacturers offer built transverters for HF rigs but none are plug-and play. None offer protection from accidental high levels of HF power from 100 Watt rigs when swapping RF connectors to go from HF to 4m and back again. Accidents happen and can be catastrophic. Patch cables and switching had to be made. It is all beyond many of today's hams. I am sure many potential users of 4 metres have been put off by this situation.

The transverter with the nearest specification to meet my needs was the Spectrum Communications model TRC4-10dL. It is a low power drive transverter with up to 25 watts output on 4 metres and good receive performance. With minor work I could get it to interface with my ICOM 756 PRO II.

The IC735, 756, 756PRO, 756PROII, 756PROIII, 761, 765, 775, 7600, 7700 and 7800 have a dedicated low level drive connector therefore cannot burn out the transverter. Applying a voltage between 6 and 8 volts to pin 6 of the Accy 2 socket puts all the rigs listed into XVERT mode and isolates all the HF power circuits. Other ICOM rigs do not have a low level transverter output and are not compatible with this transverter modification except the IC751 which would only need a different patch cable.



Rear View of the modified TRC4-10L

There are few differences between the Spectrum models. One coax socket is used for the higher power sL version and separate Rx and Tx sockets for the low power drive dL model. Builders may wish to add the modification to existing kits before final assembly. Refer to the documents to go through the mods listed below.

For personal convenience I wished to set the ICOM power control to the same position for both full transverter output and driving my HF amplifier to 400 Watts output. Changing one resistor on the main board achieved this. The Tx-Rx control is hard wired. I disabled the RF switching circuit and reduced its hang time by removing one capacitor and changing another.

Mod List

- Change main board resistor R6 to 1k5 and capacitor C17 to 4.7 mmF
- Remove main board C2 to disable the RF switching circuitry.
- Remove the short coax cable from the RCA jack to main board pins.
- Move the coax cable from the SO239 socket to the RCA phono socket.
- Remove the SO239 socket.
- Fit a 7-way DIN single hole socket in the hole left by the SO239.
- Refit the SO239 flange screws and nuts *after* the DIN socket is fitted
- Connect two 1k5 resistors in series between J9 and J2. Connect the mid point to pin 6 of the DIN socket This provides a XVERT enable voltage for the rig. Alternatively connect one resistor between pin 6 and pin 2 and another from pin 6 to a hook up wire connecting to J9 on the main board. Whatever is neater.
- Add short equipment wires from the 7-way DIN to the main board terminal pins between pin 2 and J2 (ground) and between pin 3 and J10 (send)
- On the main board remove R3 if fitted and fit C1 if not fitted. (sL or dL versions)
- On the main board restore the cut track if the dL version.



Internal View showing the new wiring
Tie wraps keep the new wires tidy

Connection between transceiver and transverter requires a short coax cable with RCA phono plugs each end and a screened cable with 7-way DIN plugs each end wired 2-2, 3-3, and 6-6.



The Patch Cables – other cables omitted for clarity

A simple, once-only, setup for maximum power level is described in the TRC4-10 documentation and requires the main board potentiometer RV1 to be adjusted to give 25 Watts output when the HF rig drive control is set where required and the TRC4-10 front panel power control is at maximum. Please note you can overdrive the transverter and create a lousy signal but you cannot overdrive it to destruction.

The transverter now runs 25 watts when its front panel control is set to maximum and the ICOM power control set to about 50 percent. The combination of ICOM 756 PRO II and Spectrum transverter gives operation on CW, SSB, FM and Data modes. Even AM is available for the dinosaurs. If these simple changes were made available by the manufacturer it should attract more HF people to 4 metres who are good operators but not blessed with the needed technical skills or those who believe that "life is too short for home brew".

Alex Gartshore GD3UMW

I asked Spectrum Communications for comments on this article before submitting it and if they would consider requests to build this model as a special. I was pleasantly surprised to receive an enthusiastic reply that a unit with this specification will be added to their product line and designated **TRC4-10L-ICOM**. The package will come fully assembled, calibrated and set up for use with the ICOM rigs listed above including the patch cables. The choice of 4 metres or HF is made by toggling the transverter power switch on or off. A true plug and play solution.