

Installing a LIF port in the TS-590 Transceiver

Introduction

This document describes the procedure for installing an LIF (Low Intermediate Frequency [9 – 18kHz]) port in the TS-590 transceiver. This transceiver uses an interesting approach of IF filtering and pass-band tuning. It is a hybrid system that uses DSP filtering and crystal filters simultaneously. The IF bandwidth is changed by using IF band-pass tuning and two high quality IF filters. If the pass band settings go below filter one (10.695MHz) the radio switches to an in-band 1st. IF of 11.374MHz. This allows seamless adjustment of the analog filter bandwidth for CW mode up to 5kHz for AM.

For the 20kHz maximum IF bandwidth of this receiver the MDSR provides a real-time spectrum analyzer. Connecting it to the MDSR has also the advantages of improving audio clarity and the reduction of hiss on low level signals. The noise reduction system of the TS-590 is effective, but hard to set up and change.

The MDSR has the advantage that it runs on a PC, which has a much more powerful processor, easy to use user interface and sharper digital filters at the IF level.

Note: To able to calibrate the MDSR software, the transceiver needs to be run in transponder mode. This means the mode is always set to USB for all modes. The Hi-Shift has to be set to 5000Hz and the Low-Shift to 0. Once this is set it cannot change. Mode and filter bandwidth are changed using the MDSR software.

Note: The TS-590SG model provides two virtual RS-232 ports. This makes it very easy to set with the MDSR software and other software that requires CAT control.

This procedure requires a level of expertise to dismantle the transceiver and to solder. Nonetheless, the installation is straightforward and should not cause any difficulties for the experienced HAM operator.

It is important to unplug all connectors and power before working on any transceiver. It is also important to be grounded to avoid static discharges.

Please note: No responsibility or liability will be accepted by the author of this document for any damage or malfunction caused by user modifications.

LIF port installation

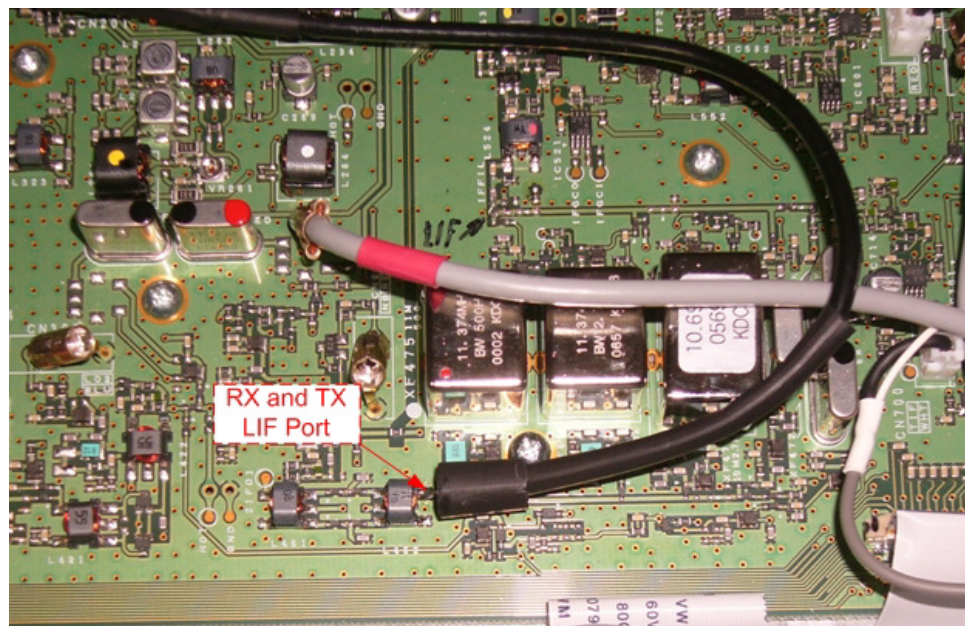
Dismantling the Transceiver

In section 14 “Installing Options” in the Kenwood instruction manual is described how to remove the bottom cover. After removing the bottom cover, the DDS board and the IF board are accessible. The IF board is the larger one and it contains the IF filters where the LIF port is connected to (see picture below).

Note: This receiver uses an IF of 10.695MHz for the LIF. When ordering LIF please specify the required IF on the notes field. This is only available with the LIF-2016 unit.

Connecting the RG174 cable to the PCB

The center conductor is soldered to top right output of the IF transformer (as shown with the red arrow). The shield is soldered to a small lug (not visible in picture) and then tightened to the screw that is visible above the coaxial cable.



Routing the cable and reassembling the transceiver

An easy way to route the shielded RG-174 cable outside is to fish it through the space between the top and bottom PCBs. One of the venting slots can be used as an exit hole. Secure the cable with a tie-wrap to the back of the chassis.

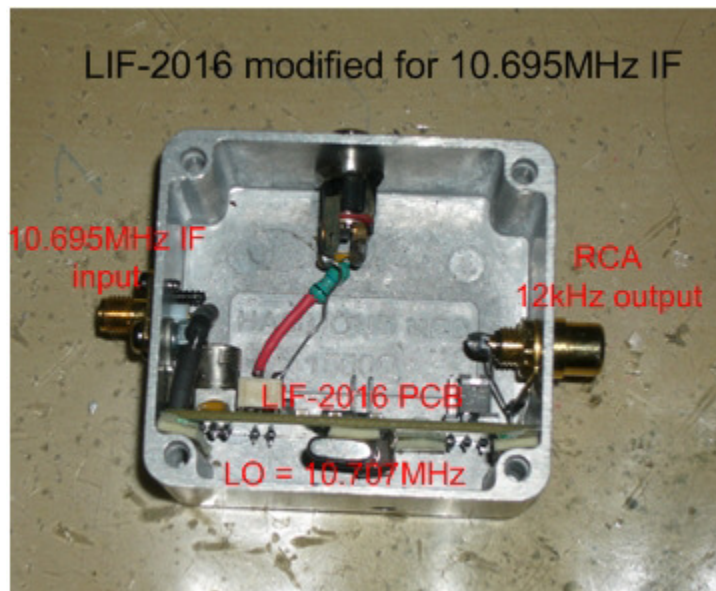
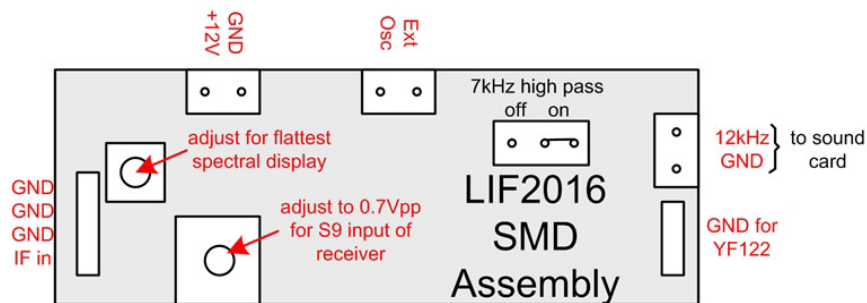
If the LIF-2016 is mounted inside a shielded enclosure, it can be placed there as well.

Note: Please do not forget to plug the LO cables back in before assembly.

Connection of the LIF converter (RX-only)

The LIF RX output of the transceiver connects to the IN port (TB1) of the LIF assembly and the audio Line out (TB3) connects to the tip line-in of the sound card. TB2 provides power (+12V). TB5 is not used for the RX-only version. A jumper has to be placed on TB4 between 1-2 to bypass the 7kHz high pass filter or between 2-3 to enable it.

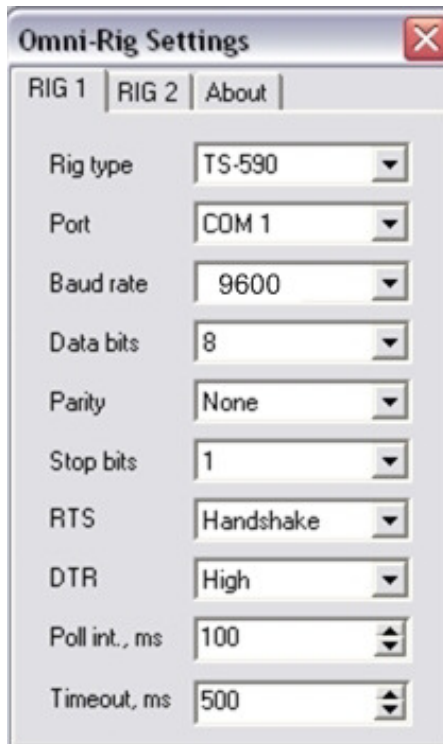
Note: The transmit audio is still filtered with the DSP filter inside the TS-590. If the MDSR is properly configured, the standard microphone can be used to transmit, while the RX is processed through the computer. For more details see the MDSR help menu.



OmniRig Setup for the TS-590 series Transceivers

Specific Settings for the TS-590SG

The SG model offers an additional USB port that can be used for CAT control. The best way to set the MDSR up is to use both ports. The RS-232 port for the MDSR and the USB port for other digital modes software like FL-Digi or WSJT-X. For the RS232 connection a straight through cable is used. If the computer used, does not have a RS-232 port, a virtual USB to RS232 converter can be used.



- To enter setup menu in MDSR-SA, select the tool icon at the bottom right and select “OmniRig Configuration & Status”, select the key icon “Configure OmniRig”. Only configure RIG 1.
- Select the transceiver to be controlled from the drop down menu.
- Select the port of the computer. If the Com port is not known, go to the “Device Manager” and select the Ports icon. The port number should be listed there.
- The Baud Rate has to match the setting in the Transceiver. The default setting for the TS-590 for the RS-232 is 9600. For the USB Port it is 115200 baud.
- For more info go to “Communication Parameters” in the user manual.
- All the other settings should be as displayed here.

Before starting the Calibration of the MDSR Software

All of the bandwidth controls are now moved over to the DSP of MDSR Software.

- The pass band knobs have to set to 0 for the low end, 5000 for high
- The receiver runs in “Transponder Mode”;
 - Set USB for all bands
 - Ant1 or 2 is not changed via software
 - Frequency dial on RIG still usable
 - Scan and Memory functions still work and update RX frequency
 - Modes are only changed at the software level
 - RX Audio now comes from the computer speakers; the AF can be turned off at the transceiver

Note: If these settings change, the receiver frequency will not match the MDSR setup.

That completes the installation of the LIF port of the TS-590. The MDSR team wishes you all the best. If you like the performance of the MDSR software, please tell all your friends about it.

73

The MDSR development team

To order the PCB kit or for more information please go to;

<http://users.skynet.be/myspace/mdsr>

Specify: 10.695MHz IF