Installing a LIF port into the IC-7000 transceiver

Intro

This document describes the procedure for installing an LIF (Low Intermediate Frequency [9 – 18kHz]) port into the IC-7000 transceiver. This transceiver has a high level of integration and already offers IF-DSP technology. Nevertheless, connecting it to the MDSR has the advantages of improving audio clarity and the reduction of hiss on low level signals. The noise reduction system of the IC-7000 is effective, but also makes the RX audio “boomy”. The MDSR has a real-time spectrum analyzer, which does not affect the audio quality. The demodulation system of the IC-7000 works very similarly to the MDSR. But the MDSR has the advantage that it utilizes the PC, which has a much more powerful processor.

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 taken by the author of this document for any damage or malfunction caused by user modifications.

LIF port installation

Dismantling the Transceiver

The top cover of the radio must be removed. There are 8 screws that need to be removed and then the lid will become loose; there are 4 screws on the top cover and 2 on each side. Remove the lid carefully; the speaker cable will still be connected to the circuit board. Unplug the speaker. In order to extract the DSP assembly, two screws must be removed. When taking the DSP assembly out, make sure that the gray audio cable does not get pulled with the assembly.
An easy way to route the shielded RG-174 cable outside is to remove the automatic antenna tuner plug. If this plug is required, an SMA connector can be mounted on the left corner just above the ground screw. This requires drilling a hole. To do this safely, all the PCBs on the top must be removed, and all the holes that connect to the lower PCB must be covered with masking tape to prevent metal shavings from falling onto the PCBs. After drilling, all the metal shavings have to be wiped up with a slightly wet cloth. Reassembling the unit can be difficult, especially the refitting of the ribbon cables.

Connecting the RG174 cable to the PCB

The connection point is the 455kHz FL901 filter. This provides bidirectional (RX and TX) connectivity of the IF. If the transceiver is in RX mode the 455kHz IF can be extracted from this port and if it is in TX mode and a 455kHz signal is inserted, the radio will up-convert it and send it to the TX PA.
A 10n ceramic capacitor is connected to the left top pin of the FL901 filter. This capacitor is connected to the center conductor of the RG174 coaxial cable. The ground for the shield is connected to the lower (in center) ground connection of the filter. When the DSP is placed back on the PCB, this capacitor has to clear the rim of the DSP shield. Replace the two screws that hold the DSP assembly and tighten them.

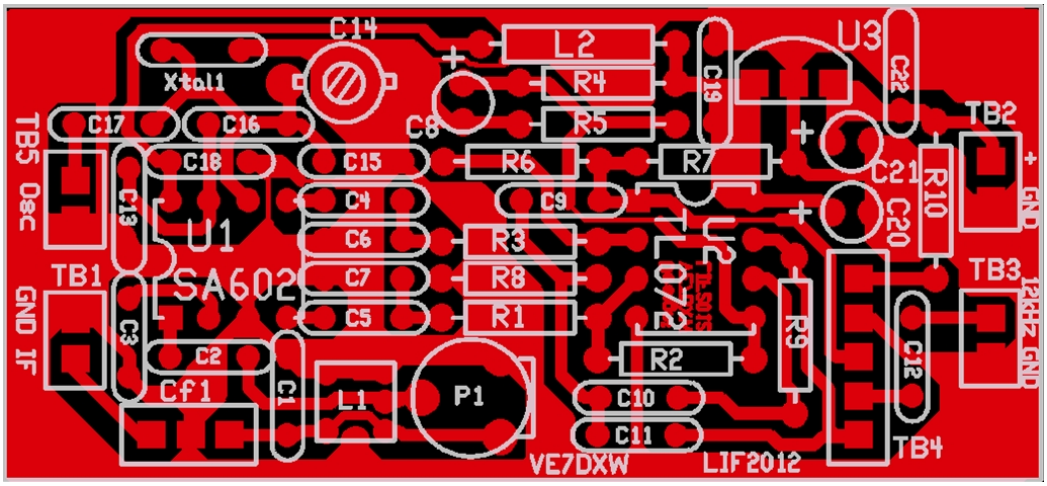
Routing the cable and reassembling of the transceiver

The RG174 routes on the left side underneath the DSP assembly. If the coaxial cable is routed outside where the antenna tuner plug used to be, a tie wrap is needed to secure the cable to prevent pulling.
If the SMA connector is mounted on the enclosure, the cable shield has to be soldered to the shield for the RG45 (rear mic.) connector.
Before the lid is placed back, the speaker needs to be plugged in.

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 3-4 to by pass the 7kHz high pass filter or between 4-5 to enable it.

Note: The transmit audio is still filtered with the DSP filter inside the IC-7000. 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.

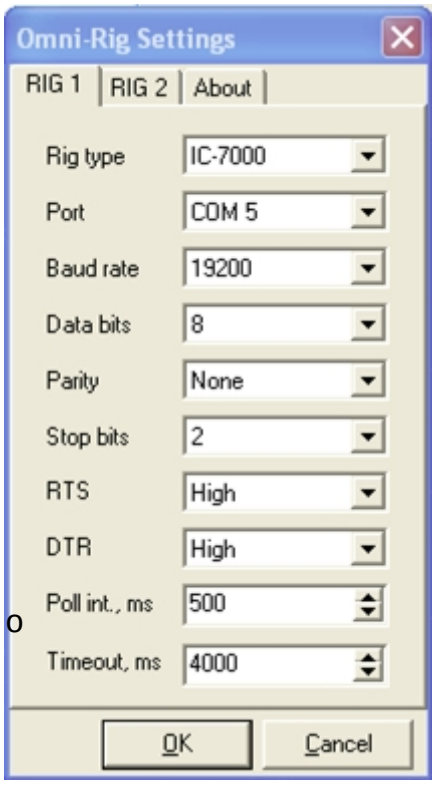


Setup of the CAT interface

The MDSR software controls the transceiver via the CAT port. The connector cable CI-V is the Icom version of the interface cable that plugs into the back of the radio and the RS-232 port of the computer. There are also virtual RS-232 cables available that connect via the USB bus to the computer.

OmniRig Setup for the IC-7000 series transceivers

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 IC-7000 is “auto”. The highest rate is 19200.
- All the other settings should be as displayed here.

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That completes the installation of the LIF port of the FT-950. 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;
Note: if you are interested in the TX – BiLiF option contact VE7DXW directly.
http://users.skynet.be/myspace/mdsr
specify: 455kHz IF