

Aligning ICOM Trunking Radios IC-F4TR

Satisfactory operation of any trunking radio depends upon the proper alignment of all radios operating in the fleet. This document describes the procedure for tuning and aligning the ICOM IC-F4TR trunking radios. Follow these step-by-step instructions to insure that your radio is operating properly and within specification.

It is important to understand that proper tuning of any radio depends upon the accuracy of the test equipment used. If the test equipment that is being used to tune a radio is out of calibration itself, then proper tuning and alignment of the radio will be impossible.

Default Tuning Files

It is recommended that you maintain a copy of the factory default files for any radios that you service. These files may vary depending upon the revision of the firmware contained in the radio. For this reason it is advised that you maintain a copy of the default file for each version of firmware that is considered current. You may contact ICOM Landmobile Technical Support for a list of the current revisions of radio firmware and cloning software.

The best method of maintaining a current set of default files is to read and save the file from a radio that is new out of the box. When a firmware revision occurs, simply read a radio that contains the new firmware and store it with your other default tuning files. It is good practice to make a backup copy of these files on a regular basis.

The default tuning file for any revision of F4TR must contain a system (or channel) entry that is programmed as a conventional channel operating in wide band mode. You will select this channel on the radio during the tuning process.

Log On as Advanced Dealer

The tuning and alignment program for the F4TR is contained within the standard radio programming software. In order to enter the tuning and alignment section of F4TR you must first “log in” as an “Advanced Dealer”.

From the main menu select “Options”, and then “Log On as Advanced Dealer” as seen below.



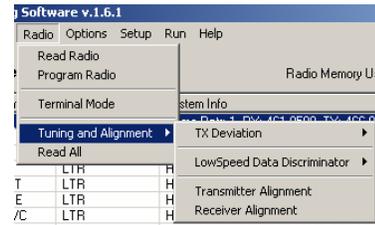
Password Entry



A password entry dialogue box will appear as seen below. Enter the password provided by your ICOM Landmobile Technical Support Representative. Call 800-858-3437 to reach an LM TSR. You may be required to provide your dealer account number to obtain password information.

Tuning and Alignment menu

Once you have logged in as an advanced dealer, new options will appear throughout the main menus. Enter the adjust screens by selecting the “Radio” menu, and then “Tuning and Alignment”. Once you have selected this menu there are a number of areas where you may adjust various parameters of the F4TR, as seen below.

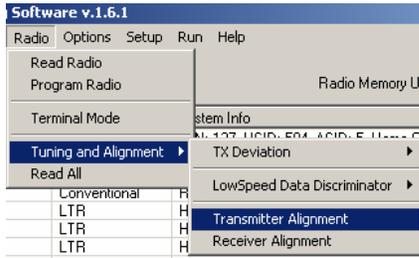


Sequence of Alignment

For proper operation of the radio it is important that a complete alignment of the radio is performed. It is also important to perform these steps in the correct order. This instruction sheet guides you in the proper order of procedures. Align the IC-F4TR in the following order:

- Transmitter Reference Frequency (TX Frequency Error)
- TX Power – Low
- TX Power – High
- Receiver BPF
- TX Deviation – Wide
 - Low Speed Data Deviation
 - CTCSS Deviation
 - DTCS Deviation
- TX Deviation - Narrow
 - Low Speed Data Deviation
 - CTCSS Deviation
 - DTCS Deviation
- Low Speed Data Discriminator
 - Wide
 - Narrow

Transmitter Alignment



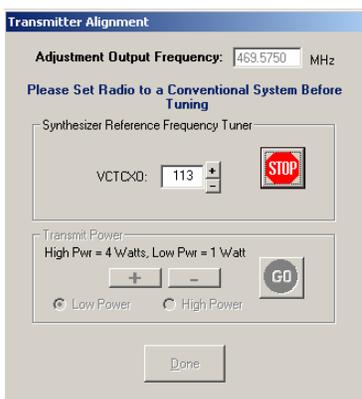
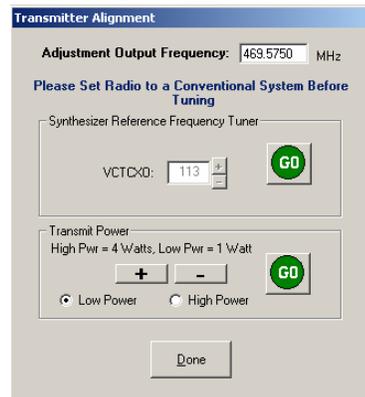
You may access the various transmitter alignment parameters by selecting “Radio” menu, then “Tuning and Alignment”, “Transmitter Alignment”.

A dialogue box appears as seen below. A SSG should be connected to the transceivers antenna connector, and set to receive the frequency indicated in the top left corner of the dialogue box.

TX Reference Frequency Adjustment

The first step in aligning the F4TR should always be setting the TX Reference. This setting calibrates the frequency accuracy of the transmitted signal for minimum frequency error. Excessive frequency error may impair proper trunking or conventional operation.

Calibrate the TX Reference by clicking the “GO” button in the section titled “Synthesizer Reference Frequency Tuner”. After you click “GO”, the dialogue box changes to appear as seen below.



While watching the TX Frequency Error indicator on your SSG, adjust the radio for minimum frequency error by clicking on the “+” or “-” buttons seen at “VCTCXO”.

Once you have tuned for minimum frequency error as displayed on your SSG, click “STOP”. The dialogue box will change to appear as seen above.

TX Power (High / Low)

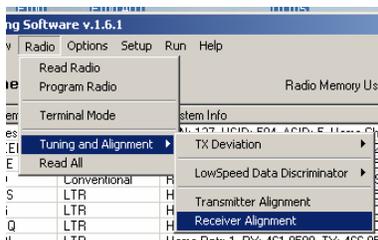
While watching the TX Power Level indicator on your SSG, adjust the radio 1 Watt (low power) and 4 Watts (high power) by clicking on the “+” or “-“ buttons seen at “Transmit Power”.

Once you have tuned for appropriate power level as displayed on your SSG, click “STOP”. The dialogue box will change to appear as seen above.

Click “DONE” when all TX adjustments are complete.



Receiver BPF Alignment

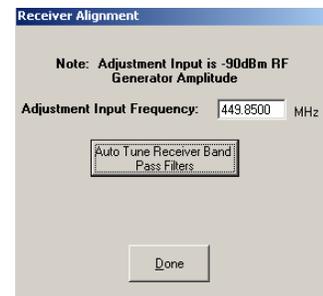


You may access the receiver BPF alignment parameters by selecting “Radio” from the main menu, then “Tuning and Alignment”, “Receiver Alignment”.

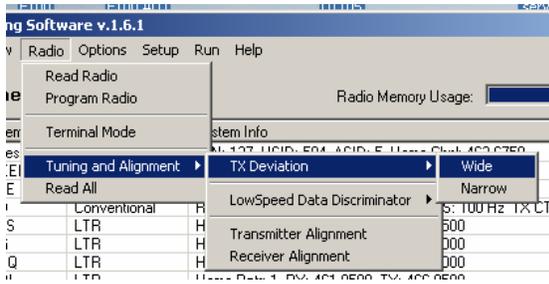
A dialogue box appears as seen below. A SSG should be connected to the transceivers antenna connector, and set to transmit the frequency indicated in the dialogue box.

Once you have set the SSG to generate a signal at the frequency and signal level indicated, click “Auto Tune Receive Band”.

After tuning is complete, click “DONE”.



Transmit Deviation Alignment

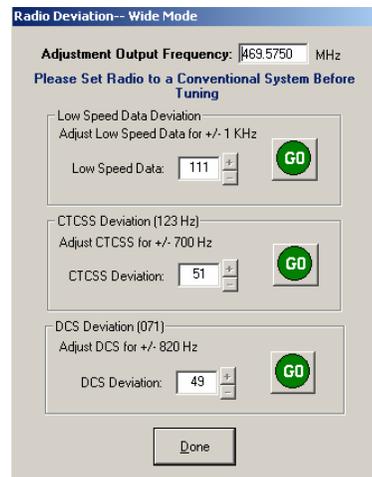


You may access the various transmitter deviation parameters by selecting “Radio” menu, then “Tuning and Alignment”, “TX Deviation”, then “Wide” or “Narrow”. Always adjust both parameters when performing a complete alignment.

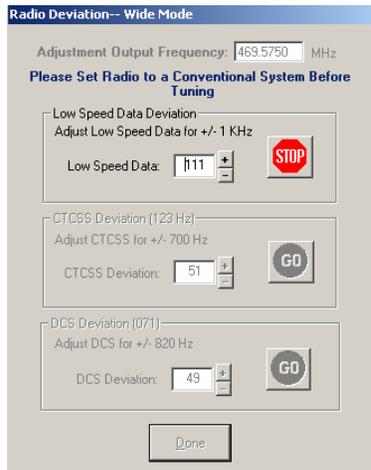
A dialogue box appears as seen. This screen provides access to adjust TX Deviation for Low Speed Data (for LTR), CTCSS, and DTCS. Always adjust all parameters when performing a complete alignment.

A SSG should be connected to the transceivers antenna connector, and set to receive the frequency indicated in the top left corner of the dialogue box.

Click “GO” in the appropriate field to adjust TX Deviation for Low Speed Data (for LTR), CTCSS, and DTCS.



TX Deviation - Wide



While watching the Deviation indicator on your SSG, **adjust the radio for 800 hz deviation** by clicking on the “+” or “-“ buttons seen at “Low Speed Data”.

Once you have tuned for proper deviation as displayed on your SSG, click “STOP”. The dialogue box will change to appear as seen above.

Repeat this procedure for CTCSS Deviation, and DTCS deviation. Adjust for the values as indicated in the adjustment screen.

Click “DONE” when all TX adjustments are complete.

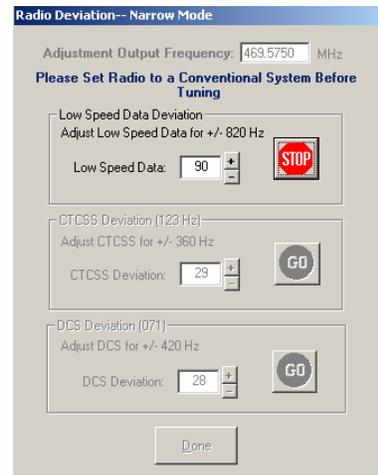
TX Deviation - Narrow

While watching the deviation indicator on your SSG, **adjust the radio for 600 hz deviation** by clicking on the “+” or “-“ buttons seen at “Low Speed Data”.

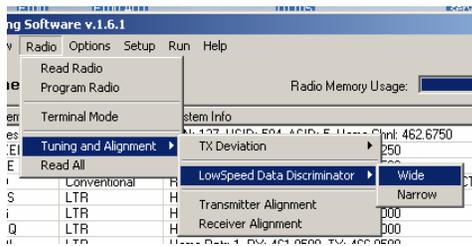
Once you have tuned for proper deviation as displayed on your SSG, click “STOP”. The dialogue box will change to appear as seen above.

Repeat this procedure for CTCSS deviation, and DTCS deviation. Adjust for the values as indicated in the adjustment screen.

Click “DONE” when all TX adjustments are complete.



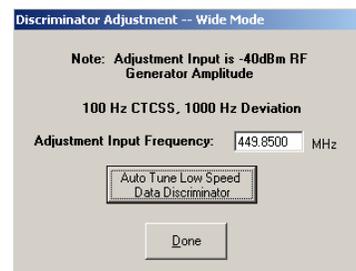
Low Speed Data Discriminator - Wide



You may access the Low Speed Data Discriminator alignment parameters by selecting “Radio” from the main menu, then “Tuning and Alignment”, “Low Speed Data Discriminator”, and then “Wide”.

A dialogue box appears as seen. A SSG should be connected to the transceivers antenna connector.

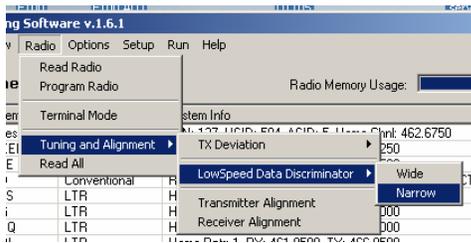
Set the SSG to transmit the frequency indicated in the dialogue box. Set the SSG to **generate a 100 hz tone at 800 hz deviation**. Set the signal level as indicated on this screen (-40 dBm).



Once you have set the SSG to generate a signal at the frequency, signal level, and deviation as indicated, click “Auto Tune Low Speed Discriminator”.

After tuning is complete, click “DONE”.

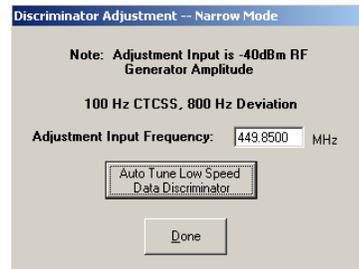
Low Speed Data Discriminator - Narrow



You may access the Low Speed Data Discriminator alignment parameters by selecting “Radio” from the main menu, then “Tuning and Alignment”, “Low Speed Data Discriminator”, and then “Wide”.

A dialogue box appears as seen. A SSG should be connected to the transceivers antenna connector.

Set the SSG to transmit the frequency indicated in the dialogue box. Set the SSG to **generate a 100 hz tone at 600 hz deviation**. Set the signal level as indicated on this screen (-40 dBm).



Once you have set the SSG to generate a signal at the frequency, signal level, and deviation as indicated, click “Auto Tune Low Speed Discriminator”.

After tuning is complete, click “DONE”.