



Expanded Troubleshooting Guide: Transceiver Control

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I ---- General Transceiver interface

The transceiver interface was created so the SteppIR could automatically track the radio frequency or have the frequency set by remote control.

It has 2 ports; Data-In for commutations to the Radio and Data-Out for connecting to a computer. The connectors are non-standard to make it possible to connect to non-standard radios. The Data-Out port can be connected using a standard 3 wire null modem cable (please only 3 wires, other pins are serving different purposes).

Note when using the transceiver setup menu in the controller to change the settings the changes must be saved and the controller must be switched Off then On for them to take effect.

1 ---- Kenwood not tracking

There are many Kenwood radios, they all use the same basic interface. The older radios use a S15 cable while newer models use a S18 cable. There are some exceptions with homemade interfaces.

Kenwood uses RS232 levels and on some of the radios they can be fussy about the RTS signal.

You should make sure the baud rate matches the controller baud rate.

Also make sure on radios with digital modes that Computer control is enabled and that RTS is set correctly.



Transceiver Control (Continued)

Generally there is nothing special that needs to be done, the controller will request the radio status once a second and update its frequency.

Kenwood returns the Display frequency on most radios but on the newest ones they return VFO-A only. In split operation this can cause problems if the frequency is close to the SteppIR tuning point.

The SteppIR also responds to the set VFO-A command. When using a Y cable with a logging program the SteppIR may tune more frequently than expected. Make sure your logging program poles no faster than 5 times a second.

2 ---- Sorry the FT817 is not supported by the SteppIR.

3 ---- Frequency tracking

The transceiver interface will track across all the bands supported by the antenna.

The frequency step size will depend on the band, the display frequency may change but the antenna will only tune at certain discrete steps (normally every 50 KHz).

This may cause problems in split operation with some radios like Kenwood when the split frequency crosses a boundary.

4 ---- The TS480 is just like the rest of Kenwood radios.

5 ---- Master Slave mode, connecting controllers together.

When you need more than one SteppIR controller to track the radio you can connect them in daisy chain fashion.

For the frequency to get passed on correctly the antenna with the widest frequency range should be attached to the radio.

The Slave controller(s) need to be set to the SteppIR mode.

The Data in of the slave controller needs to be connected to the Data Out of the master, there is no limit to the number of slaves.

A S16 cable is used on the original controller, the SDA100 can use a S16 or a S12 cable.

The slave controllers only track the frequency, Normal, 180, and Bid do not track the Master controller.



Transceiver Control (Continued)

6 ---- Micro-Ham

To make Micro Ham controllers work we round off the frequency to the even KHz (0, 2, 4, 6, 8).

Each brand of radio will behave slightly different depending on how the interface works with the Micro-Ham model you have.

This does not affect the SteppIR's ability to track the frequency because the finest tuning step for the SteppIR is 10 KHz.

7---- Random tuning light

The tuning light should only flash when the controller detects a different frequency.

There are several things that could cause the tuning light to flash randomly.

- The most common reason for this is using the Y-cable with an older Yaesu radio. This is because the older Yaesu radios did not use terminators in their command strings making it easy to get out of sync with the radio.
- Bad grounding can also cause this problem. If RF is coming back into the radio shack on control cables and coax it can cause all sorts of random problems.

Using the Y cable is dependent on the logging program, some are better behaved than others. The pole rate should be no faster than 5 times a second, ideally once a second.

Watch out for out of band frequencies on VFO-B they can cause odd things to happen.

You can disable auto tracking when the problem occurs for a temporary solution.

8 --- Connecting to a computer – Data-Out

There are many programs available that will control the SteppIR through the data out port, we even have a simple one. Since most computers do not have serial ports any more you will need a USB to serial converter, we recommend one with a FTDI chip.

We have 2 cables the S16 (for original controller) and S12 to go between the SteppIR and Serial port, or port converter. Only use 3 wire null modem cables on the SteppIR Data-Out port.

If you are trying to control more than one SteppIR controller they must be individually connected to the computer, you cannot daisy chain the controllers when doing computer control. There is an exception if all the controllers are the same you can have the program talk to one and have the rest listen only, much like using a Y-cable.



Transceiver Control (Continued)

We like PstRotatorAz for controlling the SteppIR. There are others Logger32, Remote Rig, Micro-Ham and TrxManager just to mention a few.

9 ---- Split operation

When operating split (RX and TX frequencies are different) there are some considerations to keep in mind.

Most of the Kenwood and ICOM radios return the display frequency so when operating split the SteppIR display frequency will switch back and forth. If the frequency crosses a tuning boundary the SteppIR will tune, which is not a good thing.

If you are using the Tuning Relay on the SDA100 your linear AMP will be disabled every time the tuning light starts flashing.

The SteppIR monitors VFO-A so if the split frequency is real wide make sure the transmit frequency is on VFO-A

It may be best to disable Auto tracking when operating Split.

10 ---- The Y cable

The Y cable was created to solve the problem of connecting both the SteppIR and a Computer logging program to the radio CAT interface. Due to the nature of the interface used (RS232), the Y-cable is a less than perfect solution.

The SteppIR can only listen to what the radio is sending to the computer so when using the Y-cable it requires a computer control program (logging program) to be running to work. With older Yaesu radios it is easy to get out of sync and display random frequencies on the SteppIR display. In general we do not recommend using the Y-cable, with the advances in computer control software it is much better to direct connect the Data out port to the computer.

The Y cable must be connected correctly, the long lead goes to the SteppIR Data In port. The short cable goes inline with the computer control cable ("S" cable) going to the radio, it is designed to plug into the computer end but in a pinch can be plugged into the radio end.

The Logging program must pole the radio for status at regular interval of between 1 and 5 times a second.

Not all logging programs pole the radio for status.

11 ---- TS990 support

Yes, the TS990 will work with the SteppIR controller using the S18 cable.



Transceiver Control (Continued)

12. Autotrack tunes to wrong frequency

The Autotrack can only tune to what it decodes from the radio or computer port so if the display frequency is wrong there are only a few possibility.

- The Radio being used is not supported by the SteppIR.
- An odd frequency has been saved using create modify, with the Original controller only. Doing default current segment from the setup menu should correct problem.
- Radio is in split mode.

13 ---- ICOM interface

The SteppIR controller has no outgoing signal to ICOM radio using our ICOM cable, it is in a totally passive listen mode.

For it to work the transceiver mode must be enabled on the ICOM radio and the SteppIR controller must be set to the correct baud rate.

On some radios the Remote jack must also be enabled.

The ICOM interface is sensitive to ground voltages so care should be taken to make sure there is a good common ground between all equipment that is connected to the ICOM interface. Do not use a N8LP tuning relay with the ICOM radio.

Also, the ICOM interface is sensitive to being loaded which will limit the maximum Baud rate, do not set the baud rate too high, set baud rate to 9600 or lower.

14 ---- FTDX-9000

The Yaesu 9000DX uses the S18 cable. It is a member of a new family of radios like the FT2000, FT3000 that use a Kenwood like protocol. These radios track better than the older Yaesu radios.

The SteppIR controller needs to be set to FT9000 selection (9000D) in the setup menu. And of course the Baud rate must be set correctly.

We started shipping this Option in October of 2005.

15 ---- RC-1216H Remote rig

The Remote-rig RC-1216 connects to the SteppIR Data Out port using either a S16 or a S12 cable (basically 3 wire null modem).



Transceiver Control (Continued)

All you should need to do is set the SteppIR Baud rate and make sure to save then cycle the SteppIR controller power to update the changes.
