Configuring Icom radios for USB Operation

Contents

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Introduction

Newer Icom radios are equipped with a USB (Universal Serial Bus) interface that allows you to use the digital modes on your radio. This is a general guide for basic computer and radio configuration when using USB equipped Icom radios.

This guide describes the following:

- Locating an assigned COM Port(s)
- Configuring the sound devices for proper modulation, and reception
- Explaining radio settings used in digital mode
- Sample configurations for Ham Radio Deluxe, FLdigi, and WSJT

Prerequisites

- A basic understanding of the Windows operating system
- Successfully installed USB drivers for your radio
- Your radio connected to your computer
- A basic understanding of Ham Radio Delux, Fldigi or WSJT, if used

Computer Settings

COM Port assignment

To verify which COM Port(s) are assigned to your radio, go to **Windows Device Manager** > **Ports (COM & LPT)**. Ensure that the Silicon Labs CP210x driver is installed. Some radios may have two of these devices listed. Use the top most listed/first device as your rig control COM port.

Windows Device Manager

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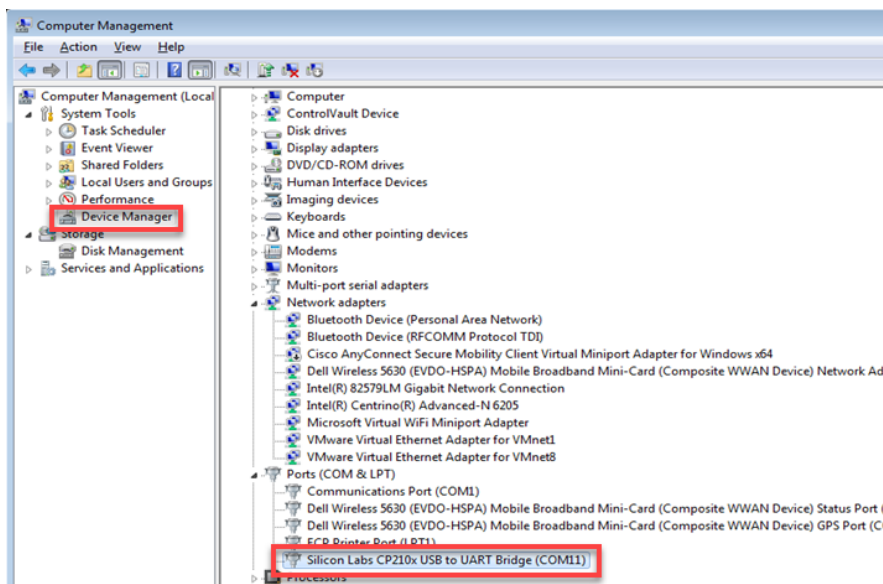
Soundcard Settings

Sound/Speakers

The speaker's **USB Audio Device** Driver provides sound from your PC to your radio. Select **Speakers**.

At the **Levels** tab, set your initial output sound level. Setting it to 50 will provide enough audio output to drive your radio. This adjustment is used in conjunction with the **USB MOD Level** setting on your radio for the optimal signal.
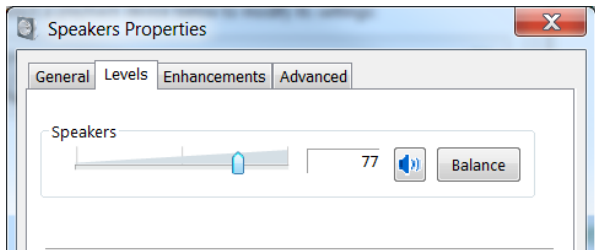
In the **Enhancements** tab, disable all audio enhancements. Keeping these enabled will distort your audio to the radio making your signal unreadable to others, and will cause interference.
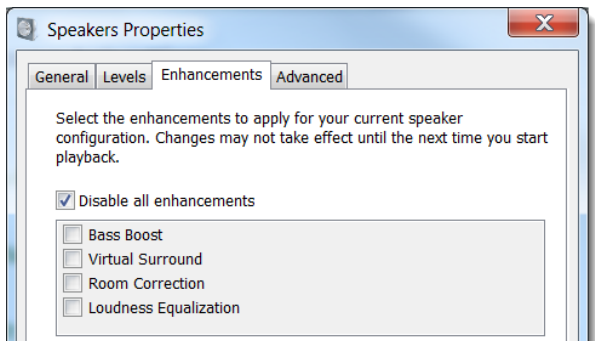
Microphone

Click the **Recording** tab. The Microphone **USB Audio** Driver receives the audio signal from your radio into your PC. It can be found in the **Audio Device Manager** under the **Recording** tab.

Click the **Levels** tab. You can adjust the audio your PC receives from the radio. Setting the level to 50 for initial configuration then adjusting accordingly afterwards for optimum signal quality.
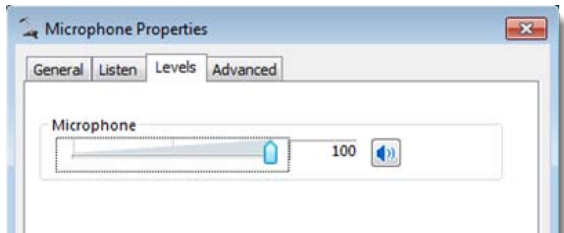
Radio Settings

The following are basic settings on your radio. Please refer to your radio's Instruction Manual for the location of these settings within the Set Mode menu.

Please note that the IC-7300 is used as an example. The actual location of these settings will vary from radio to radio within the Set Mode menus.

USB MOD Level / DATA OFF MOD

The **USB MOD Level** is used in conjunction with the **Speakers USB Audio Device** output from your computer. This is how you modulate your radio when the radio is set to **DATA MODE**. **DATA OFF MOD** should be set to **MIC,ACC**.

Note: Changing it to another setting will disable your hand microphone when operating in non-DATA MODE.

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DATA MOD

The **DATA MOD** setting is for when your radio is in **USB-D** (Upper Sideband – Data Mode). Here you can select which connector(s) for data modulation input in Data Mode. When set to USB (Universal Serial Bus) all sound data is directed through the USB port.
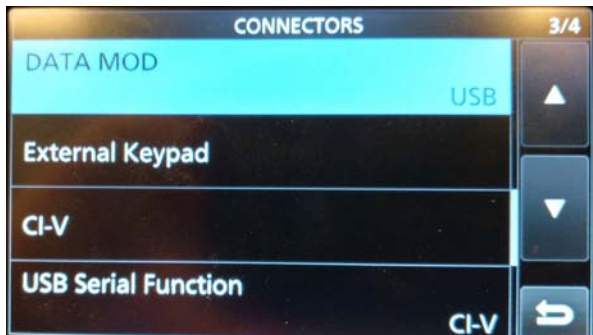

CI-V Baud Rate / CI-V Address

The **CI-V Baud Rate** sets the data transfer rate between the radio and the radio control software. Leave the baud rate set to **Auto** unless there is more than one of the same radio connected.

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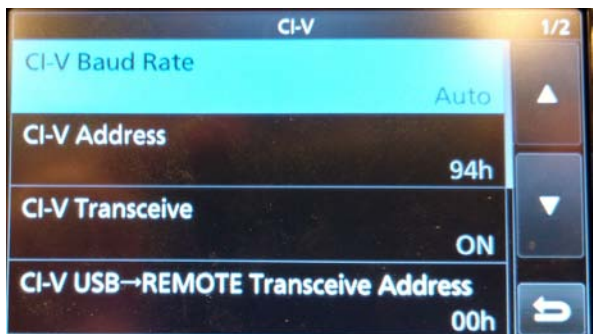
CI-V USB Baud Rate (7300 & 7851 7610 only)

This sets the CI-V data transfer rate when remotely controlling the radios through the USB CI-V port. This setting is only valid when the **CI-V USB Port** setting is set to **Unlink from [REMOTE]**.
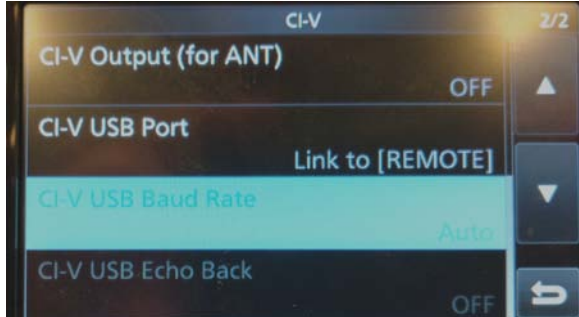
USB-D / Filter Settings

To use digital modes, set to **USB-D**. This can be set on the radio or through the software that you are using. Most digital mode software will display a 3KHz waterfall. Set your filter wide enough to fully display signals within the waterfall.

CI-V USB Echo Back

Most software applications require this to be ON. This tells the radio to echo any commands sent to the radio to be sent back, and any changes made via the radios front panel to be reflected in the software display.

About ALC

Technically, you should not see any ALC (Automatic Level Control) when using digital modes. The reason for no ALC on digital modes is that some of those modes (like PSK31) have an amplitude component to them. ALC will limit the output power by flattening the peaks of the PSK waveform. This creates distortion (IMD), which will make the signal wider and more difficult to decode. Modes like FSK (RTTY) have no amplitude changes therefore ALC will have no affect on them. The amount of distortion ALC adds to a PSK31 signal depends on the time constants of the ALC circuits in the particular transmitter.

Your radio should be set to Data Mode (LSB-D, or USB-D), the power set to 90~100% power. Use either the USB Data MOD setting or Windows Audio Mixer (USB Speaker CODEC device) to adjust your power output to approx 20W, with Compression OFF. The reason for setting the power control to maximum and adjusting the output power using the USB Data MOD setting or computer, is that some radios use their ALC setting to limit the power output. If you try to control the output on digital modes with the radio's power control it will be difficult to stop ALC from occurring. If you set the power control on a 100W transmitter for 30W output, ALC will engage any time you have enough audio power to approach 30W. If you max out the power setting on a 100W transmitter ALC will not engage until you approach 100W.

Example Configuration Settings

The following are configuration settings that can be used as examples of configuring for USB operation. Please use the developer's instructions for properly configuring the software to operate with your radio.

Note: Your Windows COM ports must match the COM Ports shown in Windows Device Manager and not those the following examples.

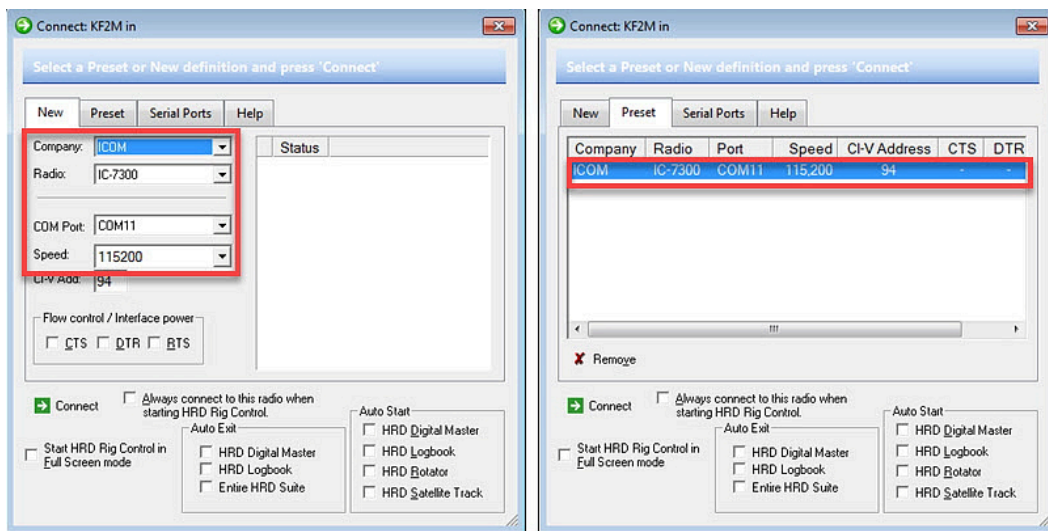*CI-V settings: Examples for the IC-7610*
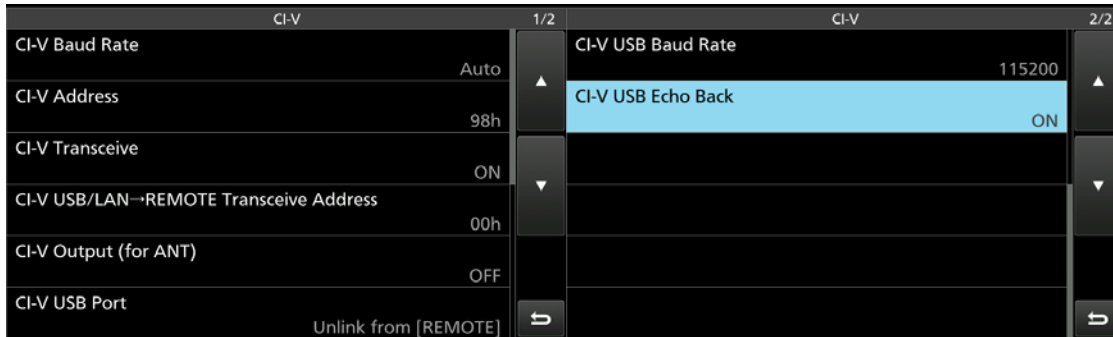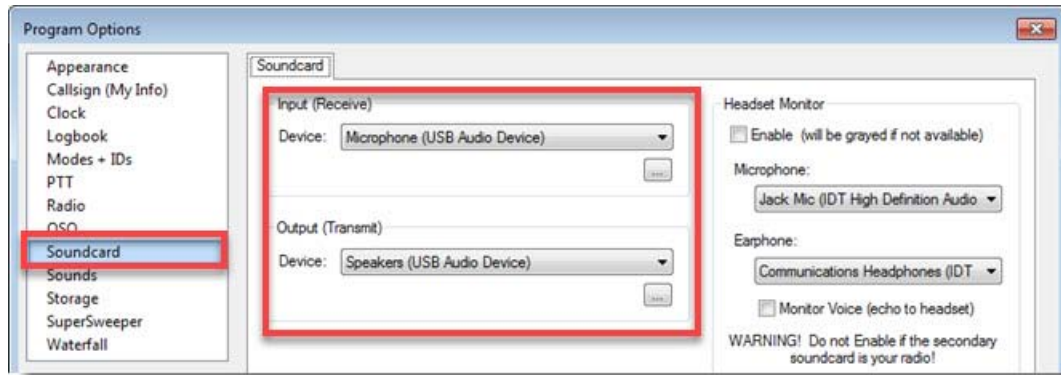

Configuring with Radio Control Software

Ham Radio Deluxe

To configure HRD Rig Control to communicate with the radio you will need to set the following:

- Company (Icom)
- Radio (your radio model)
- COM Port

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Ham Radio Deluxe/Digital Master 780

1. Set DM780 to use the USB Audio devices.
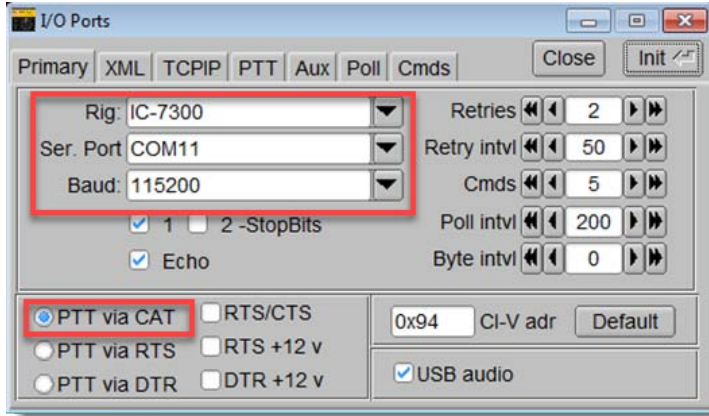

2. Set PTT to use Ham Radio Deluxe.
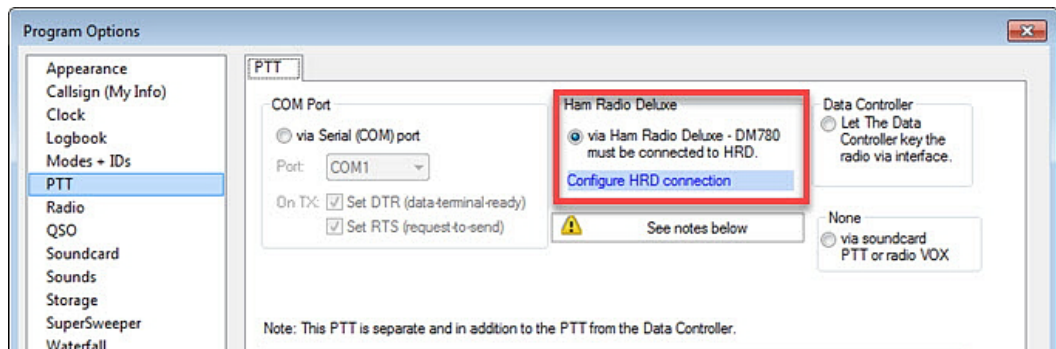
3. Customize your radio interface as desired, and you will be ready to use HRD.
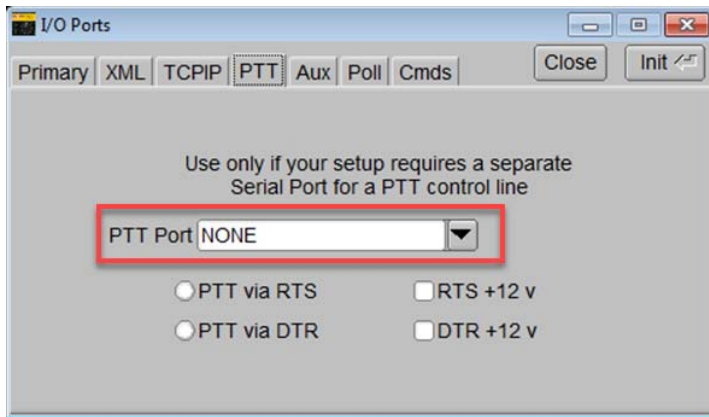
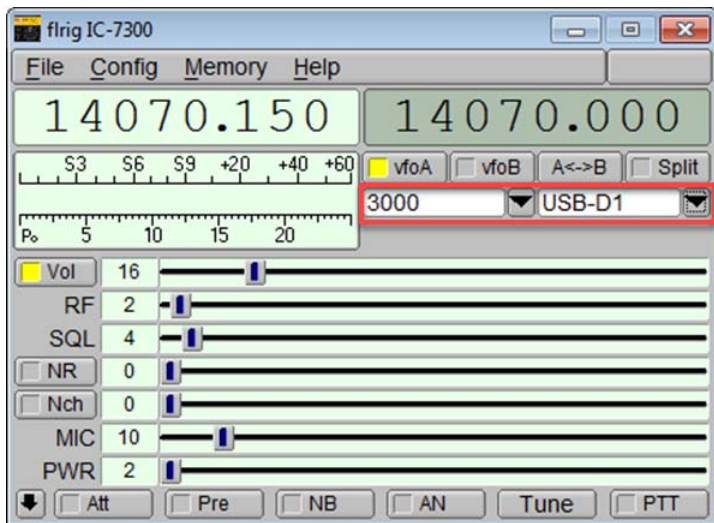## FLRig and FLDigi Software (All radios except the IC-7610)

FLRig

1. Open the software, and in **I/O Ports > Primary**, enter/select the following:

- Radio

- Serial Port

- Baud Rate

- PTT via CAT
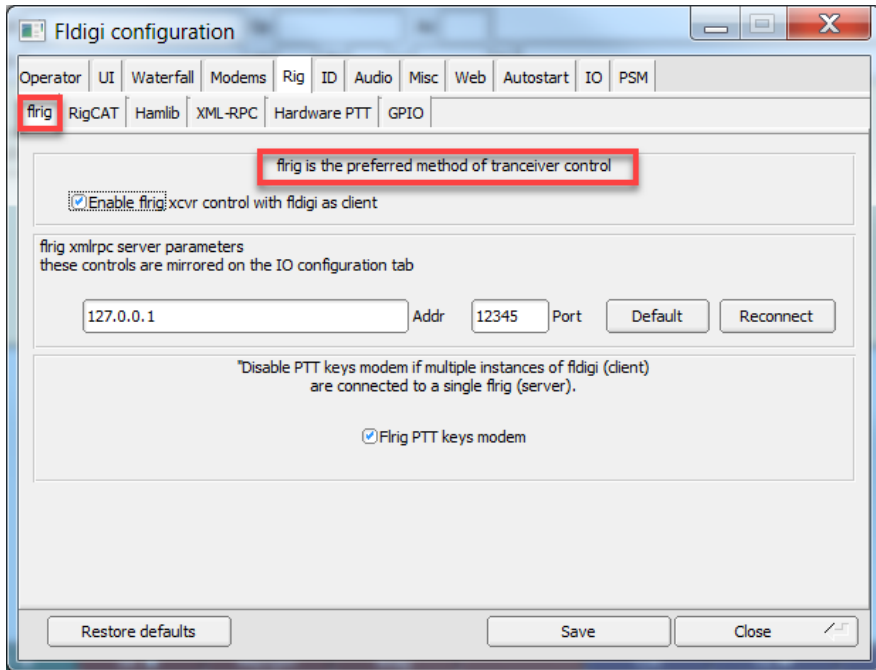
2. At the **PTT** Tab, set **PTT Port** to **NONE**.

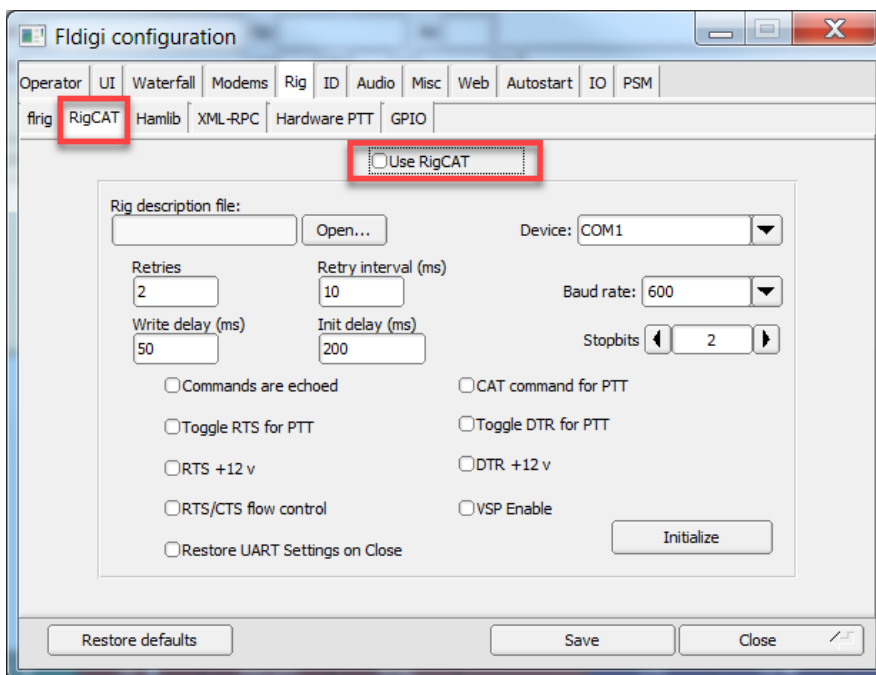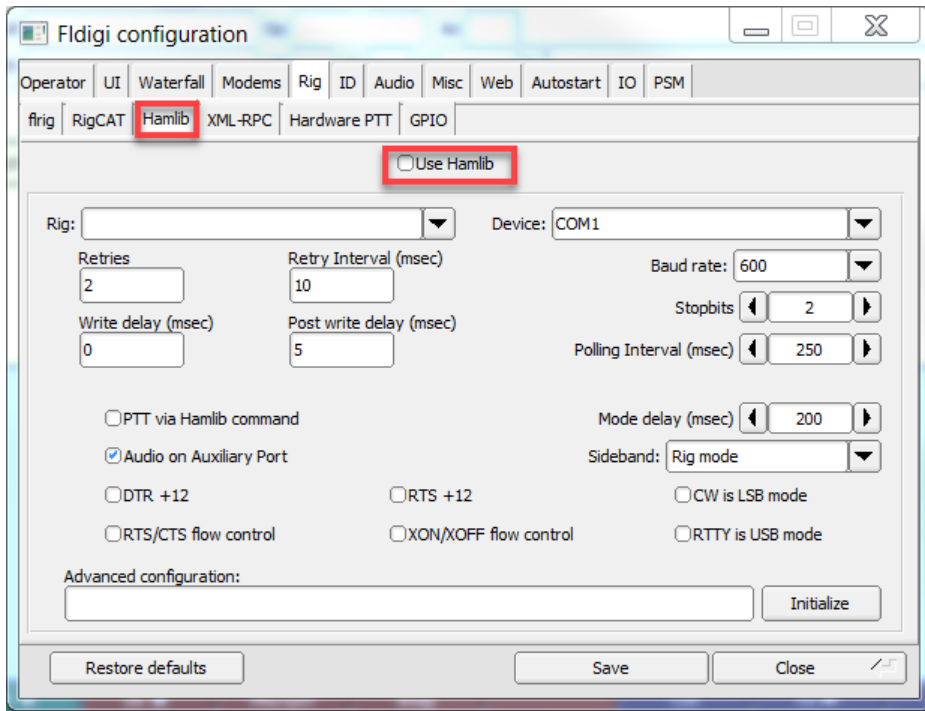3. At the main menu, set the bandwidth, and mode.

FLDigi

1. Open **FLdigi** and click **Configure** > **Rig Control**.

2. At the **Flrig** tab, select **Enable FLRig xcvr control with Fldigi as client**.
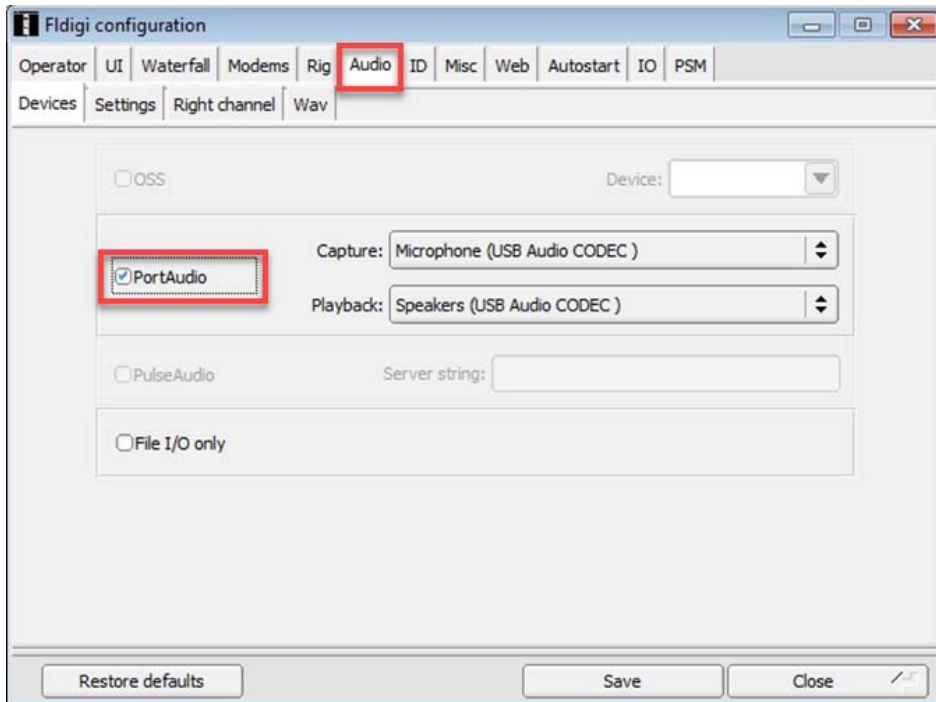

At the **RigCAT** tab, deselect **Use RigCAT**.
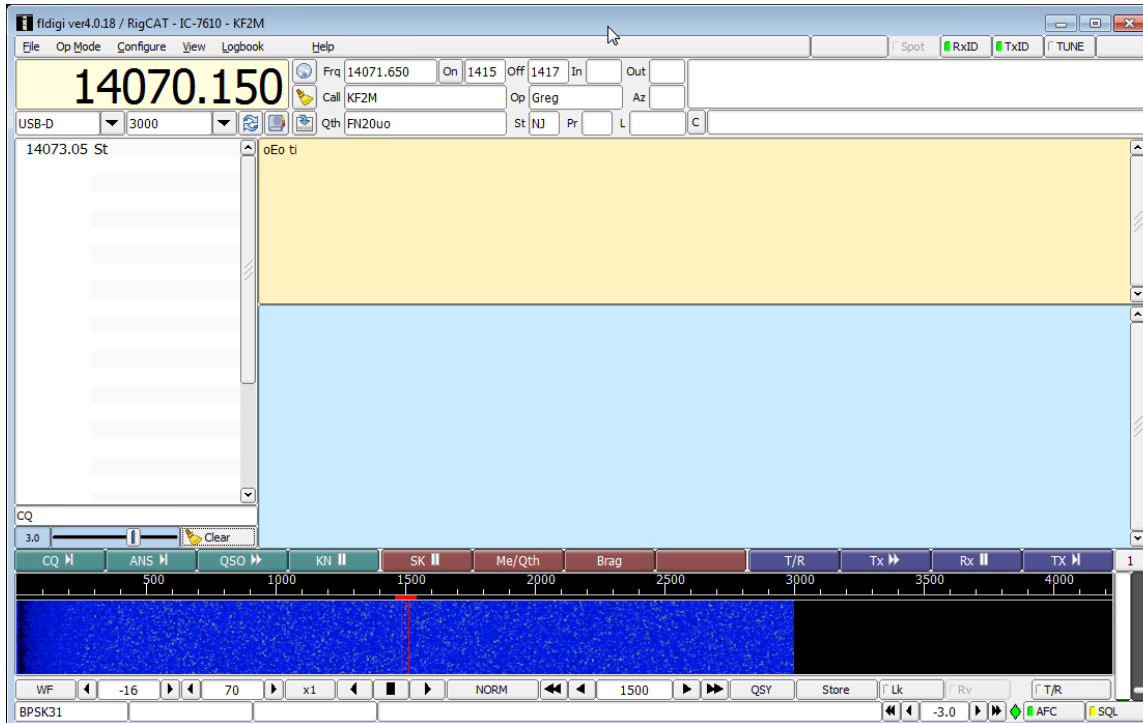
At the **Hamlib** tab, deselect **Hamlib**.

At the **Audio** tab, be sure that **Port Audio** is selected and that Capture and Playback are defined as in the following window.

FLDigi for the 7610

The 7610 is currently not supported in FLDigi, but you can download the following linked XML file to make it work. Add this file it to the hidden fldigi.files folder located in C:\Users*yourusername*\.
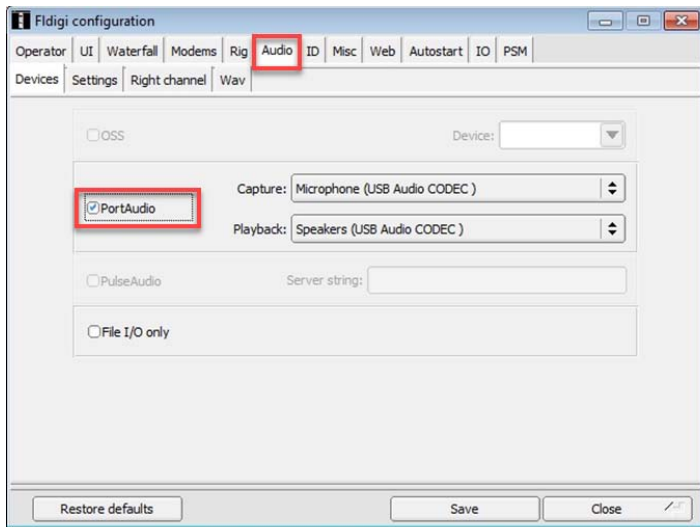
7610 XML: https://www.george-smart.co.uk/wordpress/wp-content/uploads/2018/05/IC7610_M1GEO.zip

At the **RigCAT** tab, ensure that your settings match (COM port may vary) the following window.
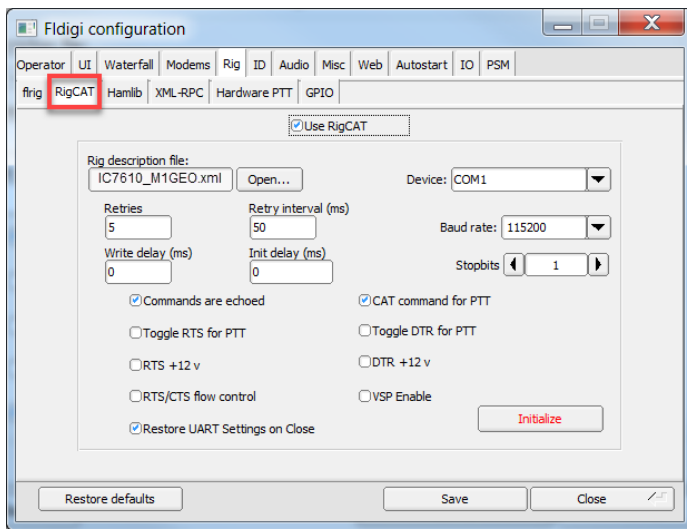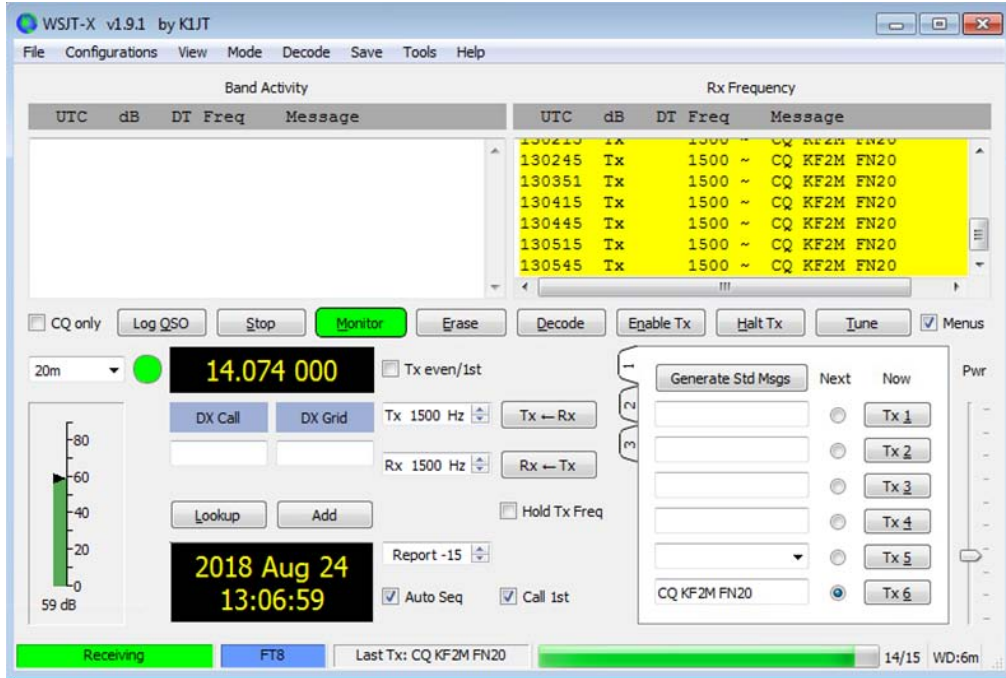
At the **Audio** tab, be sure that **Port Audio** is selected and that Capture and Playback are defined as in the following window.
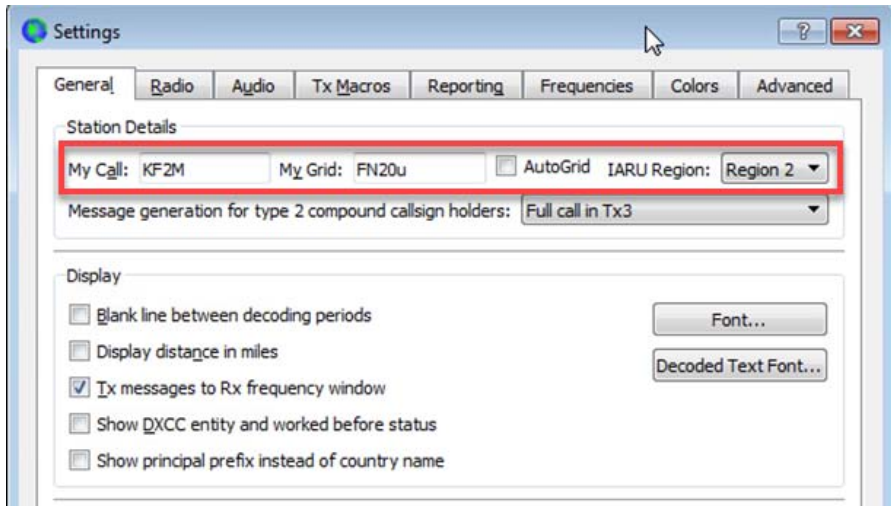

WSJT-X Software

WSJT operational window.

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In the **Settings** > **General** tab, select your region and set **My Call/My Grid**.

In the **Settings** > **General** tab, select your region and set **My Call/My Grid**.

At the **Radio** tab, select **Rig**, **Serial Port**, **Baud Rate**, **Handshake** > **None**.