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USB Connection

> **Note:**
> *Important: Please read and understand the instructions in this document prior to connecting your radio to the computer.*

The most common way of interfacing your radio to the computer is via a standard A/B type USB cable. No other cables or interface (e.g. SignaLink, Rig Blaster, Rig Expert, or other interface) is required because this USB cable provides the connection for the Rig Control and it also carries the Audio for the radio's built-in soundcard which is accessed by a "USB Audio CODEC" once the proper driver from the radio's manufacturer is installed.

Below is an image of the USB cable we recommend. Notice the "Ferrite Chokes" on each end of the cable. These chokes help prevent RF radiation, which may be present in any shack, from feeding back into the computer, which can sometimes cause some very strange behavior in the HRD software. If the cable you are currently using or plan to use doesn't have the ferrite chokes, it's recommended you purchase some of the "snap-on" chokes that are available from Amazon.com or on eBay and attach them to the cable you are using.

The USB interface provides for Rig Control and an Audio Codec for the radio's internal soundcard. This method requires a Virtual Com Port driver, which can be downloaded from the radio manufacturer's website.

> **Note:**
> *Insure you have installed the Virtual Com Port drivers for your radio or interface before connecting the USB Cable to the computer. Connecting the cable before installing the proper driver could result in a "Generic" driver being installed by Windows which could result in issues later. Follow the manufacturer's instructions to install the drivers, or, if you have problems locating or installing the drivers, please contact the device manufacturer's support team for assistance.*

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Installing USB Drivers

> **Note:**
> *Never connect your radio or other peripherals using a USB cable to your computer prior to installing the proper driver recommended or supplied by the equipment manufacturer.*

When connecting your radio to the computer using a USB cable, if the proper driver for your radio has not been previously installed, Windows will automatically search the internet and install a "<u>generic</u>" driver to create the Virtual USB Com Port needed to allow the computer to access the CAT system of the radio. The same holds true for almost every radio, hardware interface and other peripherals that connect via a USB connection. In many cases the radio or peripheral will function using these generic drivers, however, in most cases using the generic drivers can create problems that resemble bugs in the software, when in reality, the problem is incompatibility between the drivers and the equipment.

Equipment manufacturers license generic drivers from the driver authors. In most cases, the driver author will provide ways the equipment manufacturers can "tweak" the generic drivers to optimize it's performance with the equipment being used, the computer, and any software used to operate the equipment. Many radio and other peripheral manufacturers will provide the properly "tweaked" drivers on installation CDs that come with the equipment, while others will provide instructions in their user manuals to access a website to download the proper driver.

It's IMPORTANT that you check in your radio owner's manual to see if a specific driver is required. Most radio manuals will provide a page that displays the rear panel of the radio, similar to the one below.

The USB drivers for most today's modern amateur radios, not only provides connection to the radio's CAT functions, it also sets up the "USB Audio CODEC" which is used by the built-in audio capabilities of the radio for the amateur radio digital modes.

Once the proper USB drivers are installed in the computer, we can move on to the next part of our installation process.
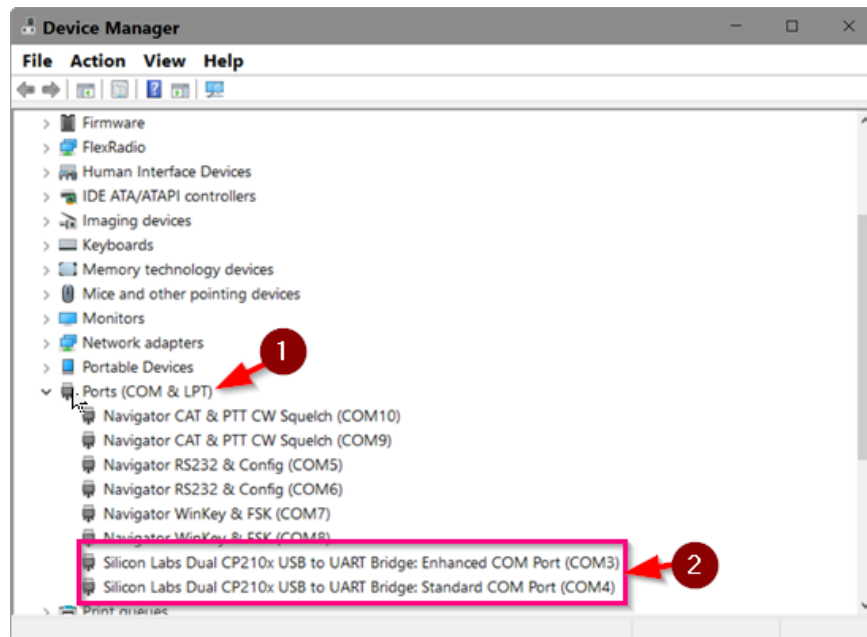
Locating The COM Port#

Regardless of whether you are interfaced to your radio, for Rig Control, using a direct USB from the radio to the computer or using a USB/Serial converter, this procedure will identify the COM Port/s used by your radio. Once the drivers for the device are installed we need to determine the COM Port that has been assigned by Windows. To do this, make sure your USB cable is now connected between the radio and the computer. Turn your radio ON. We can now open our Windows Device Manager and locate the Port# the radio is connected to.

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For Windows 10 users: right-click on the "Start" button (Little Window button in lower left corner on the task bar). When the menu opens select "Device Manager". You could also open the Windows Control Panel and locate and open the "Device Manager"

For other versions of Windows: navigate to your Device Manager by clicking on the "Start" button, then RIGHT-CLICK on "**Computer**" and select "**Properties**". In the upper left corner of the Properties screen, click on "**Device Manage**r". You could also open the Windows Control Panel and locate and open the "Device Manager"

In the list of devices in the Device Manager, locate the hive called "Ports (COM & LPT)" (#1 above) and double-Left click on it to open it.

Once the "Ports" hive is open, you will see one or more Com Ports listed. If you have more than one Com Port showing, make a note of all the port numbers. Then, the easiest way to determine which one is connected to the radio you are attempting to connect, just follow the USB cable from the radio back to the computer. Unplug that cable **from the computer** and the Com Port that is being used will disappear from the list. Plug the cable back in and the Com Port being used will reappear.

With many of today's modern radios that connect via a USB cable, when the drivers are installed, two Com Ports are created. In the image above, the driver for an Icom IC-7100 has created 2 Silicon Labs ports. If you have two or more radios that require two Com Ports, the Com Ports for the ports for each radio should be numbered sequentially (3 and 4, 5 and 6, etc.). You can locate the port combination that's connected to the radio you are adding in the same manner as explained above. The pair of ports connected to that radio will "disappear" from the Device Manager when the cable is unplugged. Plugging the USB cable back in, and the pair of ports will re-appear.

If no COM ports disappear or re-appear when the USB cable is unplugged from the computer and plug it back in, this indicates either the device driver is not installed, installed incorrectly or in some

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way not recognized by Windows then you need to contact the device manufacturer for assistance with installing the proper drivers for the device.

Now that you know which port/ports your radio is connected to, make a note of the COM Port number that reappeared when you plugged the USB cable back in. For those with 2 COM Ports, make a note of what the "STANDARD" port number is. You will need to know the ports in the next step to connecting your radio.

NOTE:
Up to this point, if you have had any problems installing the drivers and the COM ports are not showing in the Device Manager, DO NOT contact HRD support. Here is where you need to contact the radio manufacturer's technical support team for assistance.

Once the drivers are properly installed we can move on to configuring options in the radio's internal menu system to enable it to properly connect to the computer and the HRD software.

FT-991 Menu Settings
Preliminary setting changes must be made in the radio prior to connecting it to your computer. For more detailed information see Page 127 of your FT-991 operating manual. If you don't have the manual, it can be downloaded in PDF format from the Yaesu website.

You may need to refer to your manual for instructions to change the following settings.

> Set Menu 31, CAT Rate to 19200.
>
> Set Menu 32, CAT TOT to 10 which is the default
>
> Set Menu 33, CAT RTS to Enable which is the default
>
> Set Menu 62, PSK
>
> Set Menu 63 PSK Tone, 1000 Hz
>
> Set Menu 64, 0Hz
>
> Set Menu 65, 0 Hz
>
> Set Menu 70, Rear
>
> Set Menu 71, RTS
>
> Set Menu 72, USB
>
> Set Menu 73, 50

1. APSK Setup using DATA (PSK) Operation (Page 118). You will find other pages in the online manual for other digital modes. These instructions assume you're planning on using PSK-31.
   a. Set Menu 110 SSB PTT Select to RTS
   b. Set Menu 111 SSB Port Select to USB

All other menu settings will remain at their default.

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HRD Rig Connect Setup

Launch the HRD software on your computer. When the Rig Connection Screen appears, set the fields as shown below.

1. COMPANY: Yaesu
2. RADIO: FT-991
3. COM PORT: If you're not sure of the Com Port, use "Auto-Detect"
4. SPEED: 119200
5. In the "Flow Control/Interface Power" Place a check in "RTS" (see note for Menu 33 above in menu settings)

Check to make certain there are no other check boxes marked in any of the options in the lower portion of the connection screen. At this time, we are ONLY interested in making the Rig Connection between HRD and your radio. The other options can be selected AFTER we're sure we can get the radio connected and and have configured the other modules of HRD.

Double-check your settings, at this point, since some might change when making other selections. Be especially alert for the proper Speed setting since changing the setting on the Flow Control after setting the speed can cause the speed to revert back to some default setting in HRD. Once you have double checked your settings and are sure they are correct, click the "Connect" button to begin the connection process.

If you have selected the "Auto-Detect" in either the Com Port or the Speed fields, you will see activity in the Status window. HRD will check each Com Port on your computer, at every speed available, until it finds the proper Port and Speed combination that will connect to the radio. When the connection is made the main HRD Rig Control screen will open.

For further basic setup of the HRD software, please go to the www.ham-radio-deluxe.com website. From our home page, click on "Downloads" at the top of the screen and download the "**HRD Quick Start Guide**". This is not the full manual but gives you the basic things you need to setup in the software before getting on the air with Ham Radio Deluxe.

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