Newcomers and Elmers Net: Getting Your Computer to Talk to Your Radio
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Amateur Radio and Computers

Computers and radios are a natural mix, especially since radios nowadays are little more than computers connected to an antenna.
-- Modern radios are a mix of analog and digital controls, with the newest radios moving to almost all digital controls.
-- the knows and switches and dials are analog pieces, but they merge into digital controls as evidenced by the control of computers through software
-- almost every radio made for the last 20 years or so has had some ability to connect to a computer
-- unfortunately many manufacturers have been slow to move with the times regarding connections such as USB ports, but more on that later
-- HTs, mobiles, and base stations all allow connecting to computers for various functions
-- I'll start with computer control, and then move on to logging

Computer Control

Computer control of a radio is pretty much like it sounds – you can use a software interface to send commands to the radio for tuning, adjusting filters, memory storage and so on
-- one of the advantages of software control is that if your radio uses a lot of menus where you have to perform several button presses to get to the option you want, software is usually faster
-- For a long time only base station radios offered computer control capabilities, but as base/mobile operations have converged, so too many mobiles allow for computer control if the radio has HF capabilities
-- usually all that is required is a cable to run between your radio and the computer, either a serial cable or a USB cable/converter
-- this is where things can get a bit tricky

Cables

Many radios still use the old-fashioned serial cables – meaning 9-pin or 25-pin connecting ports out of the radio to a 9-pin connector on the computer.
-- the problem is, new computers for the last 10 years or so do not have a serial port on them
-- this means one has to either buy a serial port adapter, or a serial-to-USB convertor cable
-- pros and cons to both
-- most people opt for the converter as in theory it is a better choice
-- the problem can be drivers; operating systems which create virtual com ports in software are more prone to configuration problems and software lock-ups

-- things are better now than they used to be, but it can still be a real issue
-- on the other hand, hardware serial ports are still easily recognized by operating systems, and once the hardware is installed, usually they system sees it as hardware – no virtual driver is used
-- this also keeps a USB port free
-- on laptops this might not be a good option, but still possible if you are willing to use a pcmcia-based adapter card for the com port hardware
-- so your choice; many times I would recommend the hardware option if possible, but converter cables for USB work fine too

USB converters
The main problem with the USB converters as I mentioned are the drivers – the two main chipsets are prolific and FTDI chipsets
-- in recent years FTDI has become known as the more reliable chipset, less pirated chipsets out there than prolific, but genuine prolific chipsets can work too
-- they are to a degree software version limited; different operating systems may require different versions of the software, and driver updates can help or hinder operation
-- the other thing which is required is for you to understand how to find the com port the software has assigned to the usb convertor, and how to give it a number should your radio or other software require it
-- finally, the cable may be needed to be plugged into the same USB port each time or not – depends on the operating system and the chipset software
-- this is not much of a problem on a desktop machine, but if using a laptop which gets moved around a lot, this might be something of an issue.
-- which you choose will be up to you, and either solution is fine – just be aware of the issues

Computer Ports
-- some more modern radios also allow a keyboard to be attached to the computer to handle some in-radio software
-- but most radios send data out a special port for computer control
-- this can get a bit confusing depending on the radio, since data ports can also be used for other things such as modems, digital processing, and programming; and of course there are accessory ports
-- most base radios have several ports on the back of the rig to separate these functions, but mobile radios can sometimes interchange these functions
-- make sure you understand what your radio can and cannot do (and what does what!) before purchasing anything or hooking anything up to it!
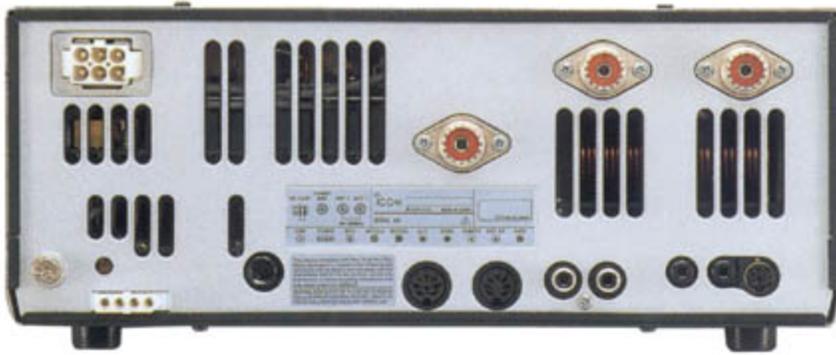
The back of a typical base radio has connections for CAT control (computer command control of the radio), one or two data ports for things like digital modes, amplifiers, etc., and other connections
-- your particular radio will need the appropriate connector which you can build or buy, and then software to recognize your radio
-- most radios from Alinco, Icom, Kenwood, and Yaesu are recognized going back quite a few years, so if your radio allows for computer control most major programs will be able to control it

VHF/UHF radios (mobiles and HTs) generally do not have computer control capability, but this is changing as these units are becoming more and more complex
-- more often than not these radios will only allow channel programming (which is vital in today's radios with 500 or 1000 channels!) and data output to a TNC or sound card for the digital modes
-- HTs usually only offer programming, but some allow data out and some D-Star radios allow for remote control operation

Control Software
There are many software programs out there with various strengths and weaknesses, and I recommend you try out several different flavors to see what you like
-- I will use Ham Radio Deluxe (or HRD) as an example because it is what I regularly use, but this is not a push in their direction by any means
-- HRD is typical of many programs out there (Resource list at the end for some other examples)

Control software requires some basic setup, just like any other program
-- connection port and speed information, radio type/model, layout etc.
-- some programs also come with logging software which integrates into the computer control section so that information can be passed between them
-- usually there will be a basic graphic representation of the radio you have selected, or a common interface which then contains your radio's controls

-- tuning, filters, switches, almost every control possible will be represented on the screen (so a big monitor is a plus!)
-- the layout can often be customized to your particular liking, as well as color schemes etc.
-- data modes are also a part of most control software, and this allows both radio control and data input for things like PSK31, RTTY, and so on
-- data modes like PSK31 also show a waterfall display of a range of frequencies and activity over time, while another window shows tuning controls and another the test being sent/received
-- many control programs will also give you control over an antenna rotor if you have one, as well as assist with satellite tracking

Logging
Logging software allows you to record and track your contacts, see visual representations of the Grayline, monitor DX clusters, and give you a visual representation of stations on a given band
-- computer radio control may be built into the logging program or be separate, but usually when connected to a radio the software will allow changing bands or frequencies by just clicking on the appropriate button
-- in a listing of stations on a band or in a DX cluster window, the frequency of the radio will be set to the cluster sighting, as well as some form of automatic callsign lookup if you are a member of a website like QRZ
-- fields for the station callsign, name, frequency, band, location information are all auto-filled if available, and this greatly simplifies the logging process
-- in fact one of the dangers with logging software is that you get so used to clicking on a few buttons based on the stations shown you forget to search the bands yourself
-- just because stations are not showing up on a DX Cluster or band on the software, doesn't man no one is there!
-- logging/cluster software depends on sightings by other hams who enter in their contacts, called "spots"
-- many times I have found a band quite active with little or no spots being shown

Logging software is really a database
-- not only can your contacts be logged, but the data can then be manipulated in numerous ways
-- awards can be tracked, regions and locations can be mapped out, some software even keeps track of who you need to work to get awards, and with a click or two you can see who you have worked before and on what bands
-- like any database the information can be sorted numerous ways, so you can see listings by country, name, station worked, bands worked, etc.
-- many of these programs can also upload contact reports to Logbook of the World (ARRL), eQSL, HRDnet, and so on

-- a lot of other useful features are available, such as solar propagation tracking, QSL card tracking, notes and comments about a contact, contest information and tracking, recording audio to computer, etc.
-- most programs use several standard formats for maintaining the log, and these can be imported and exported to other programs as needed
-- while a lot of people do not log their UHF/VHF contacts from a local area, there is nothing wrong with doing it, and it is a good way to keep track of new contacts, interesting discussions, or special propagation conditions

Computer Control and Logging Links
(Web search will turn up dozens more, just a few listed here; some are free others cost $$ -- you have to decide what is best for you!)

http://www.dxlabsuite.com/commander/
http://www.dx-buddy.net/en/
http://www.hrdsoftwarellc.com/
http://www.dogparksoftware.com/MacLoggerDX.html
http://www.dxlabsuite.com
http://www.n3fjp.com/
http://www.arrl.org/logbook-of-the-world
http://www.logger32.net/
http://www.prologsystem.com

Linux Info
http://lhspodcast.info/