

How to Program a Chinese Hand Held Amateur Radio

These questions and answers apply particularly to the Baofeng and Wouxun brand radios and probably Pofung and TYT and others as well.

Do I need to know how to use the radio? Yes you need to know how to charge the battery, turn it on using the Volume knob, how to select the A (upper) or B (lower) display command levels, and select the VFO or Memory modes – although this document will only be concerned with the Memory mode.

You will also need to know how to change channels using the Up and Down arrows (or enter 3 numbers) and what the Menu and Exit keys are for.

Why do I need to program a radio? So that it will receive and transmit on the desired frequencies.

Why are the Chinese radios different? Some of the manual programming methods are different from the traditional methods of programming found on other radios.

Can I program the unit from the keypad? You certainly can but we have found that the Chinese radios are very particular about the timing of keypad press and can result in frustration of the programmer. See another document for this.

Can I program the unit from a computer? Yes you certainly can. You will need both a programming cable and some free-to-download software. Details below:

Programming Cable:

Many Chinese hand held radios can use the same cable independent of the brand. The typical cable has a USB type A connector (the usual charger connector) on one end and dual three segment phone plugs on the other end, one approximately 2.5 mm in diameter (0.1") and one approximately 3.5 mm in diameter (0.125 or 1/8"). These dual phone plugs will fit into the dual jacks on the radio that can also be used for an external speaker and microphone or headset.

Not all programming cables that look the same are equivalent in performance. The ones that use USB integrated circuit chips from Future Technology Devices International (FTDI) are found to work extremely well and use software drivers found in most modern Windows operating systems. The ones that appear to use USB chips from Prolific Technology not necessarily so well. In many cables found at a lower price, the chips are actually counterfeit chips not from Prolific and the drivers found on Windows operating systems will reject them. These cables will often be accompanied with a mini-CD that contain drivers for these chips but the operating system may still reject these as well.

Yes the cables with FTDI chips are usually a bit more expensive (around \$20 or so) but this is one of the cases where you do get what you pay for. It pays to read the description from previous users and the cable specifications found on, for example, the Amazon web site. Don't be fooled by the \$8 (or less) cables.

Can this cable be used with other types of radios? Yes, with the correct radio end of the cable. Some Kenwood HTs may use the same connector. Icom and Yaesu radios generally use a different cable and connector.

How do you test the cable that you bought? Just plug it into an operating USB port on your computer but not into the radio, just yet. If your computer finds the cable and installs the driver for that cable, you are good to go once your computer tells you so. That will generally happen if your cable uses the FTDI chips and sometimes if your cable uses genuine Prolific chips.. If that does not happen, unplug the cable from the computer and run the software found on the mini-disk that came with the alternate cable. Then you can plug the cable back into the USB connector. Good luck.

There have been some cables available that use the traditional COM port found on earlier computers. Unless you are using a computer with a traditional COM port (the 9 pin D connector with male pins) you will not want this cable. There are some USB to COM port adapter cables available that make a cable like this usable but, just like the HT programming cables, there are differences depending on the USB chips in the adapter cable.

Programming Software

The best general purpose radio programming software we have found is known as Chirp Software. You can do a search for that or simply go to <https://chirp.danplanet.com/projects/chirp/wiki/Home> This software is totally free to download and use although they will accept donations.

Then click on the Get It Icon and select the program for your computer operating system. The software will generally install itself in one of the Programs folders unless you tell it to install somewhere else. You may choose to put a shortcut icon on the Desktop page, or not if you wish. Note that the default shortcut icon looks like the traditional COM port connector.

There is an alternate to this software and the cable discussed on the previous page. This is a complete cable and software package from RT Systems (<https://www.rtsystemsinc.com/>) but the \$50 package will only work for the specified radio model and can only be installed on one computer. It may program some features that Chirp does not but we have generally found that Chirp is sufficient. Read the reviews for RT Systems on www.eham.com.

Some manufacturers offer their own free programming software but most of us have found that the Chirp software works better.

How to Use the Chirp Software

Start your computer and plug in the USB end of the cable into the computer. If you have done this previously, the computer should post a message and/or make a tone indicating that you are good-to-go. Perhaps some Light Emitting Diodes will flash on the cable USB connector if it has them. If you have used a different USB connector on the computer previously perhaps this will take just a little bit longer.

Then plug the radio end of the cable into the radio. Be sure that the twin plugs are in the correct size holes (they are different) and that the connector is fully inserted. Sometimes the rubber sealing flap gets in the way and prevents a complete insertion.

Now start the Chirp software in the usual way and turn on the radio.

Now select Radio, then Download from Radio (Yes, I know it should say Upload from Radio but they didn't ask me)

The first time you do this you will be asked to select the COM port that Windows configured. With some luck it will be COM3 but don't count on it. Sometimes Chirp will detect what Windows set the virtual COM port to and just use that. More on this on the Wiki page discussed below.

Then scroll down and select the radio's manufacturer and model number. In many cases this will be Baofeng and UV-5R but you may have purchased another make and model. Just look for what you have.

At this point the screen should show a small window showing the data cloning process. When this is completed, the screen should show the programming information already in the radio. In some cases the radio may have been previously programmed for a manufacturing check or test and you will want to over write or delete much or all of this.

If you have trouble or need some more information, click on Help and then Get Help Online. This should open the Wiki page, select Index by Page in the Window on the right side of the page. There is a lot of information here particularly on the FAQ page.

What you should see is a spread sheet with rows for channel numbers and columns for everything that you want to program into the radio. This will include

Frequency (6 or perhaps 7 numbers plus the decimal point for MHz,

Channel Name to display (6 characters max),

Tone Mode (Usually Tone, sometimes TSQL if you wish)

Tone (Usually 103.5 for Mendocino County, 88.5 for Sonoma County)

Tone Sql (optional if Tone Mode is set to TSQL)

Duplex { +, -, (none), or off},

Offset (usually 0.60000 for 2m ham, 5.000000 for 70 cm ham)

Mode (FM for ham, NFM for public)

Power (High or Low as required)

Here are a few words about Tone. Most ham radio repeaters require a sub-audible (low frequency) tone to be activated. Most of them also transmit this tone and many simplex users do so also. When receiving, if the user has a lot of noise or interference, the use of Tone Squelch will prevent this noise being heard in the absence of a signal transmitting this tone. The down side is that makes this receiver slightly less sensitive and slightly longer to respond when receiving signals that are wanted.

Now a few words about duplex. For most repeaters the duplex will be either + or -. Usually the offset (for the user transmit frequency) will be in the same MHz band for receiving repeaters in the 146 and 147 MHz as well as in the 440 and 450 MHz bands. The offset will be - for receiving repeaters in the 145 MHz band. For communicating on simplex frequencies not involving a repeater, the Duplex should be (none). For receiving public safety or other commercial users, the duplex setting should be "off" to preclude accidentally transmitting on these frequencies.

For most 2m repeaters the offset will be 0.600000 MHz and the usual offset in the 70cm band is 5.000000 MHz. There are exceptions including the International Space Station where the offset is -1.310000 MHz.

Now you will want to fill in the spread sheet with what you want to radio to do. If you have a previously filled in sheet in either a Chirp image (img) file or a comma separated file (csv) you can either open the .img file or import the .csv file. Then select the .img or .csv file showing at the top of the page on the screen. You can then modify the data for any channel if you wish..

Here a few personal preferences that you might like to make. Click on Settings at the left side of the screen, then Basic Settings.

Carrier Squelch Level – I would set it to 3 unless you have a noisy location, then set up to perhaps 5 or 6. You can always reset it by menu item 0.

Display Mode: I set Display Mode A to Frequency and Display Mode B to Name. If I ever what to know what a particular frequency is used for, I simply set the channel number to be the same on A and B.

Now click on Other Settings. Enter the Power-On Message A to be your name, 6 characters maximum.

Enter the Power-On Message B to be your Call sign.

Now click on Service Settings. This will be the location that you will adjust the Squelch control range to be actually useful. This is known to work for Baofeng UV-5R and BF-F8HP radios but is unknown for other makes or models. The factory settings don't do much to adjust the actual signal level range for opening the receiver audio on a signal. For both the VHF and UHF Squelch Levels adjust the numbers to be as follows:

0, 0; 1,2; 2,20; 3,30; 4,50; 5,65; 6,75; 7,85; 8,95; 9,105

Most other settings can be left in the default mode or you could experiment a little bit to see what they do.

When you are done entering all the data on the spread sheet that you wish, you may want to save the .img file created or Export a .csv file with the same information in a format that can be edited or printed later using any spreadsheet program that can import a comma separated file. If you use the SaveAs option you will be prompted to specify a file name and location. If you just select Save your file will be saved with a file name and location according to the program defaults.

Now go back to the Radio tab and select Upload to Radio. You will get a pop-up window that identifies the make and model of the radio and the virtual COM port selected. Click on OK if it is OK. You will then get a Cloning to Radio message while the data is being transferred.

When cloning is completed, you are done. Remove the programming cable and close the Chirp software. Turn the radio OFF and then ON to verify the Power Up message is what you want. Select which channels you wish to use either on the A line (Frequency) or the B line (Name). They can be different and chosen by the A/B button.

Note that the A/B button selects which channel will be used for transmitting. The little up or down arrow to the left of the display will indicate which channel will be used and it does not make any difference if it shows frequency or name.

I hope that this document gets you started or helps you to update your Chinese HT.

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