



BAOFENG HT PROGRAMMI NG

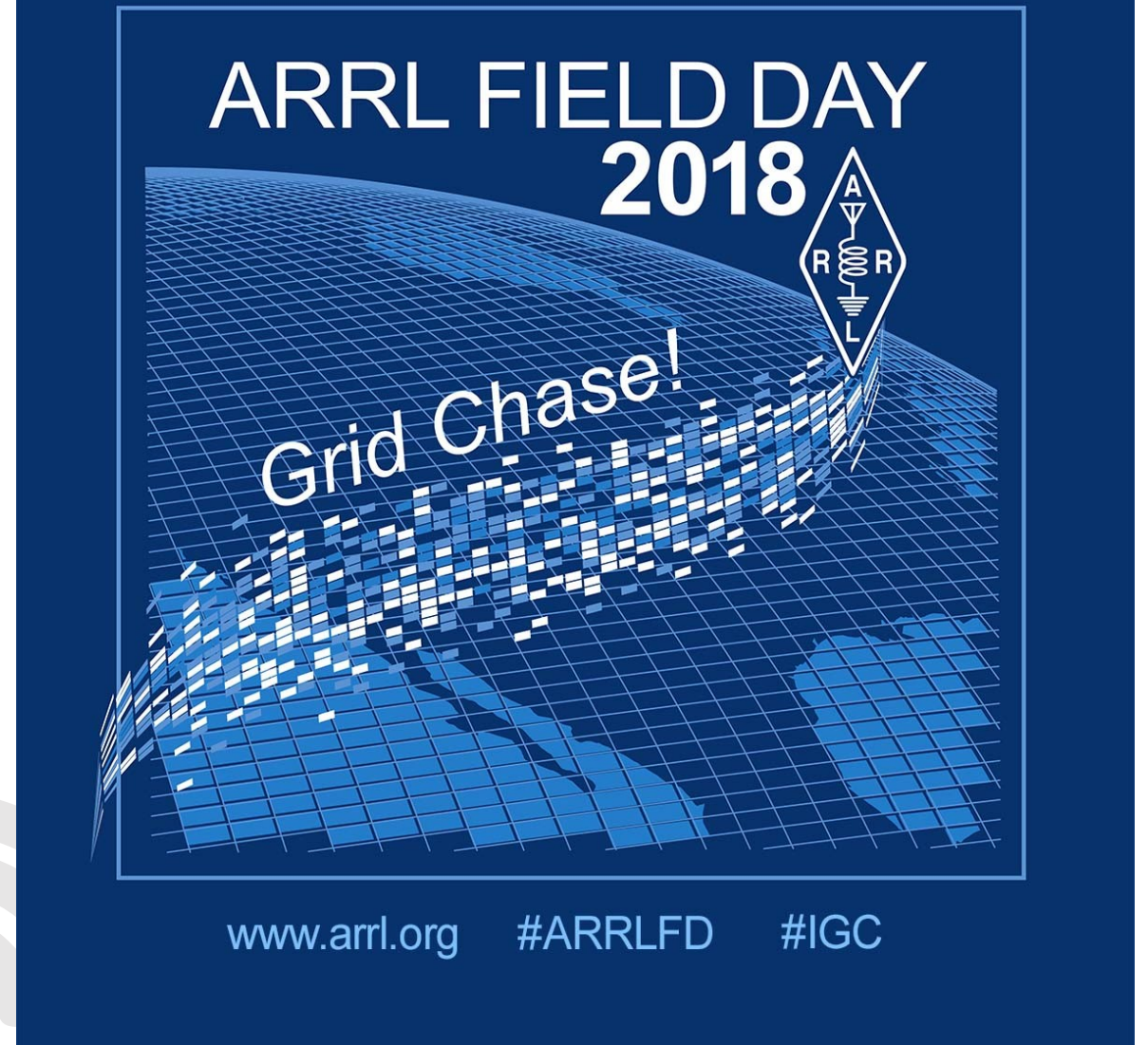
BELLBROOK AMATEUR RADIO CLUB TECH NIGHT

JOHN WESTERKAMP, W8LRJ

W8LRJ@ARRL.NET

CONTENT

- Go over the radio's features
- How to get a list of repeaters
- **Sorting and adding repeaters to list (optional)**
- Downloading *Chirp* (programming software)
- Connecting *Chirp* to your radio
- Importing repeater list to *Chirp*
- Add additional channels
- Set default working parameters
- Save the *Chirp* image
- Program the radio
- Test the radio
- Demonstration



BAOFENG RADIO FEATURES

- First, how do you pronounce Baofeng?
- *Bow* like the front of a boat and then *Foong*
- Inexpensive starter radio (use as backup later) under \$30 and often on-sale for under \$25
- FCC issues?

VFO - Type frequency
MR - Memory channel

PTT - Push-to-Talk

Switch between top
and bottom frequency

Cable & speaker
mic jack





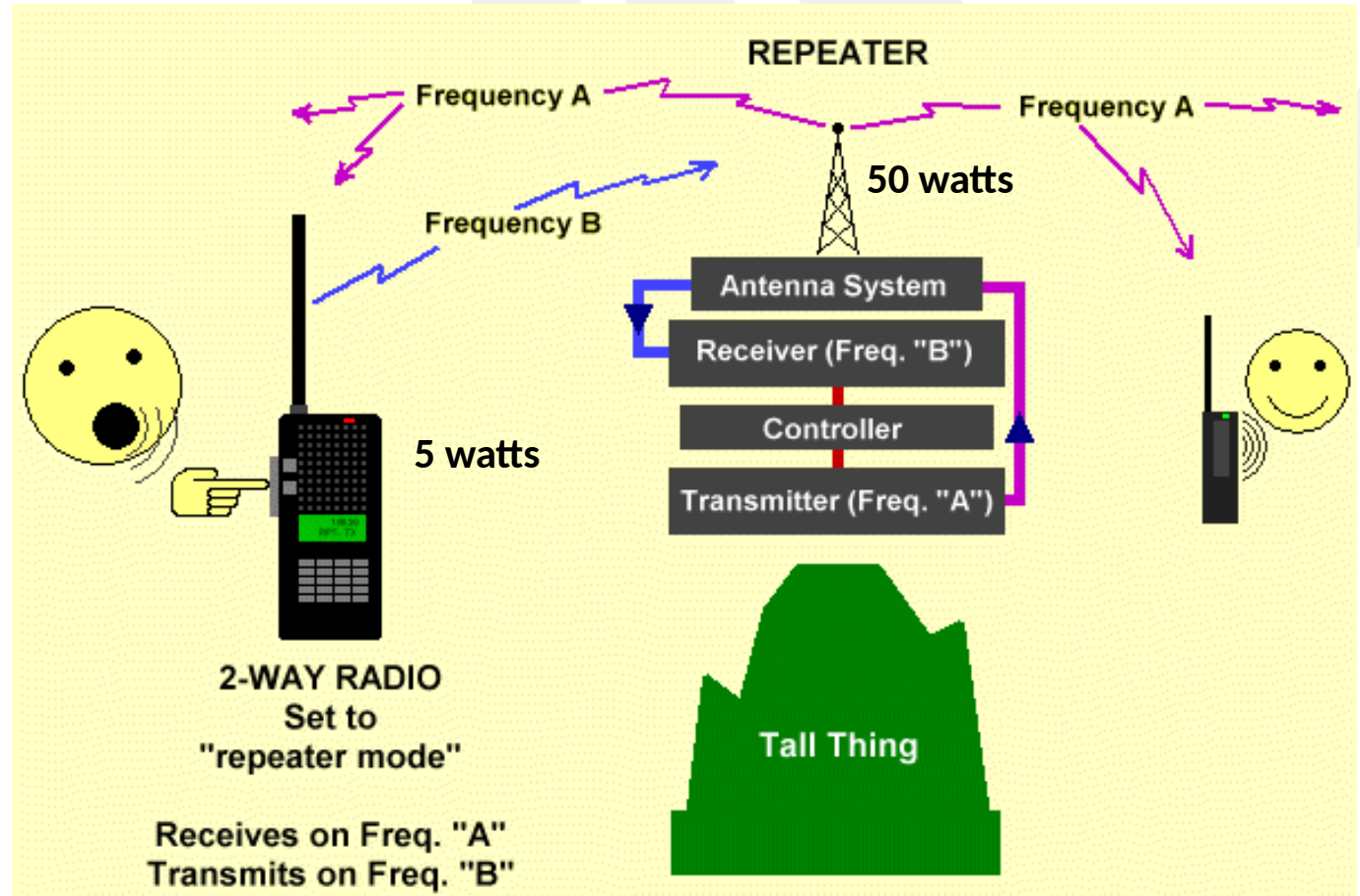
BAOFENG RADIO FEATURES

- 128 Channels
- Dual Band
- 136-174 MHz VHF Frequencies
- 400-520 MHz UHF Frequencies
- Repeater Capable
- 4W/1W Transmit Power
- Li-Ion Battery Pack
- Rechargeable Battery Included
- Battery Charger
- FM Radio
- Emergency Alarm
- Channel Scan
- Busy Channel Lockout
- Call Tone
- Skip Channel
- Dual Watch
- CTCSS Manual Input (Continuous Tone-Coded Squelch System)
- Backlit LCD Display
- Power-On Display Message
- Battery Meter
- Low Battery Alert
- Power Saver
- Timeout Timer
- VOX (Voice Activated Transmit)
- Keypad Lock
- Audible Button Beeps
- Voice Prompts
- Drop-In Charge Capable
- Audio Accessory Connector
- PC Programmable (Requires Optional Cable)
- Flashlight
- DTMF Code



REPEATER OPERATION

- Since a repeater is typically high in the air, you get improved coverage
- HT power is low but repeater power is high so you get a “boost”
- **Repeater is defined by its *Transmit Frequency*** (i.e., the frequency you listen on)
- Repeaters use an offset between the *Transmit* and *Receive* Frequencies (0.6 MHz for VHF and 5 MHz for UHF)
- If the *Transmit Frequency* is below 147 MHz, offset is negative
- If the *Transmit Frequency* is equal to or above 147 MHz, offset is positive
- Repeater may require a *Tone* to accept your transmission (overlapping frequencies)





BAOFENG RECOMMENDED ADDITIONS

Recommended

- Programming cable (if not included)
- After market antenna such as the Nagoya 701 (8 inch) or Nagoya 771 (15 inch)
- Spare battery
- Good handheld external speaker microphone (the Baofeng model is notoriously bad; quiet and cavernous)

Optional

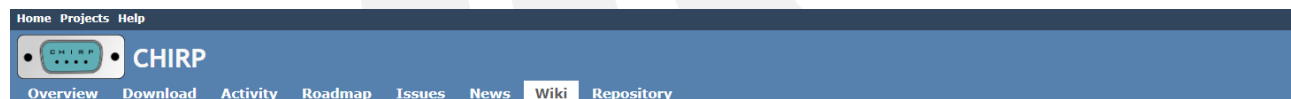
- Battery eliminator (cigarette lighter)
- Belt carrier
- SMA adapters for external antenna connections
- Ed Fong Dual Band J-Pole antenna (eBay)





DOWNLOADING CHIRP

- Go to <https://chirp.danplanet.com>
- Review list of supported radios and make sure yours is included
- Select *Download* from the menu along the top
- Download and install the *Chirp* version for your computer



Development of CHIRP is an all-volunteer effort and is offered as open-source software, free of charge. If you like CHIRP, please consider contributing a small donation to help support the costs of development and hardware:



CHIRP downloads

CHIRP is distributed as a series of automatically-generated builds. Any time we make a change to CHIRP, a build is created for it the next day. Thus, CHIRP is versioned by the date on which it was created, which makes it easy to determine if you have an older build. We don't put experimental things into CHIRP before they are ready, except where specifically called out with a warning. Thus, you do not need to worry about finding a stable version to run. **You should always be on the latest build available.**

You can find a complete test report of the current build [here](#) and a matrix of supported models and features [here](#)

Windows Users

[Click here to download the latest Windows version](#)

- CHIRP runs on Windows 2000, XP, Vista, 7, 8, and 10. Older versions of Windows are **not** supported
- Most users will want to download the installer.exe file, which installs CHIRP like a normal application
- The win32.zip file is for advanced users wishing to run CHIRP without installing

MacOS Users

[Click here to download the latest Mac OS X version](#)

- New Mac OS X must install the runtime once before running CHIRP. After it is installed, the runtime does not need to be downloaded or installed each time. Download the [Python runtime for Mac OSX](#).
- OS X support is limited to Intel architecture. PowerPC is not supported.
- Chirp.app is unsigned. With default security settings, you will need a special procedure to run it: [Application Security in 10.9](#).

[Homebrew users can install Chirp without the KK7DS runtime by running `brew install tdsmith/ham/chirp` and then running `chirp` from the terminal.](#)

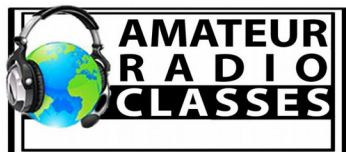
More useful tidbits can be found at [MacOS Tips](#).

Ubuntu Linux Users

If you are using Ubuntu linux (or a compatible variant such as Mint) you should install and use the PPA like this:

```
sudo apt-add-repository ppa:dansmith/chirp-snapshots
sudo apt-get update
sudo apt-get install chirp-daily
```

After installing the build from the PPA, new updates will be included in your normal system software updates. Also see the [Running on Linux](#) page for additional steps required to gain access to your serial port.





CONNECTING CHIRP TO YOUR RADIO

- This is the only tricky part as you must have the correct driver installed (makes USB port look like a Serial port)
- Try connecting radio to computer with the programming cable and see if it will let you import data from the radio (just in case Windows already has the driver; see next slide for how to do this)
- If you get an error, install the driver using the procedure on this page:



<https://www.buywowayradios.com/blog/2013/11/how-to-install-the-baofeng-usb-programming-cable-and-software-1.html>





IMPORTING REPEATER LIST TO CHIRP

The basic procedure is as follows:

- Connect the radio to the computer using the USB programming cable
- Read the existing data image from the radio
- Use *Save As* to save this image with a date and the word *Original* in the filename, e.g., BaofengUV5R_20181203_Original.img
- Delete all the entries from the radio data
- Use *Save As* to save this image with a date and the word *Original* in the filename, e.g., BaofengUV5R_20181203_Ohio.img
- *Use Chirp to read and sort the repeater list directly from repeaterbook.com*
- Add additional stations and update working parameters
- Write to radio and save the image file

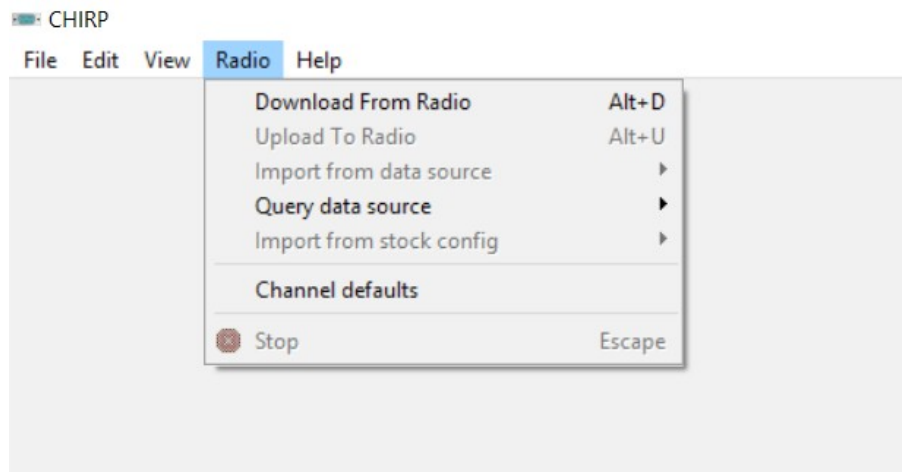
*Note: A CSV file can only be imported into an **existing** radio image file.*



IMPORTING REPEATER LIST TO CHIRP (CON'T)

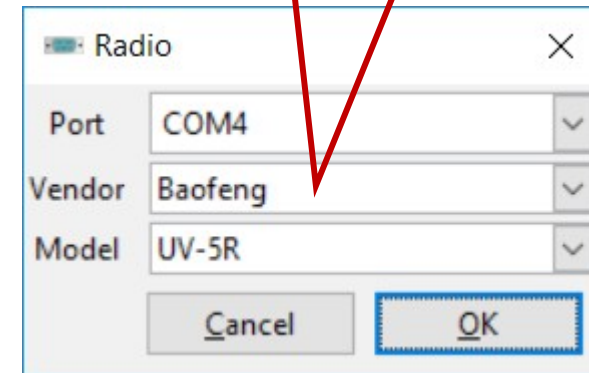
- Connect radio to computer using the USB programming cable and turn the radio on
- Read the existing data image from the radio

1



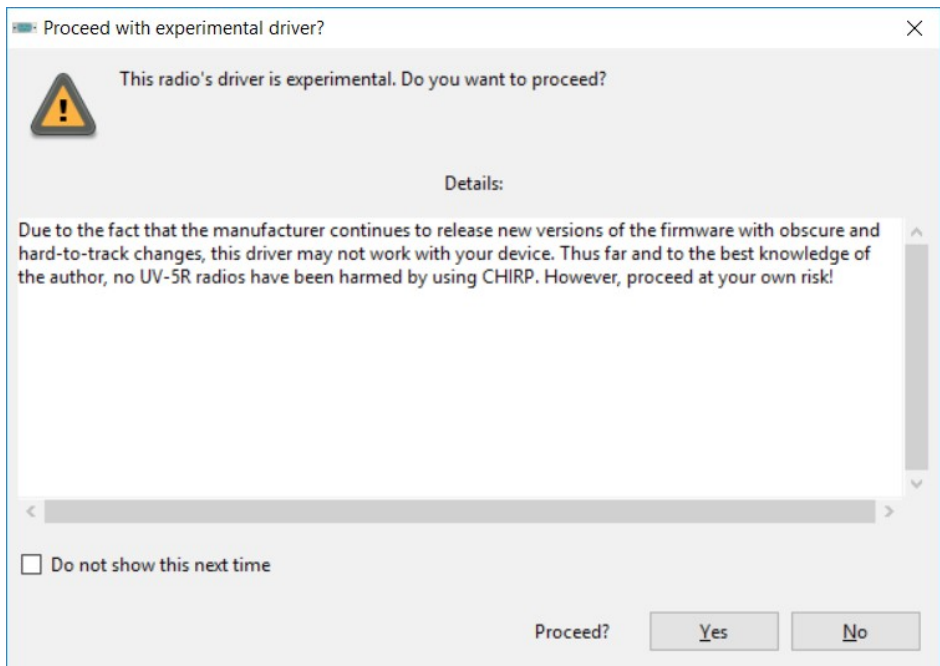
First time through
may have to enter the
Vendor and Model

2

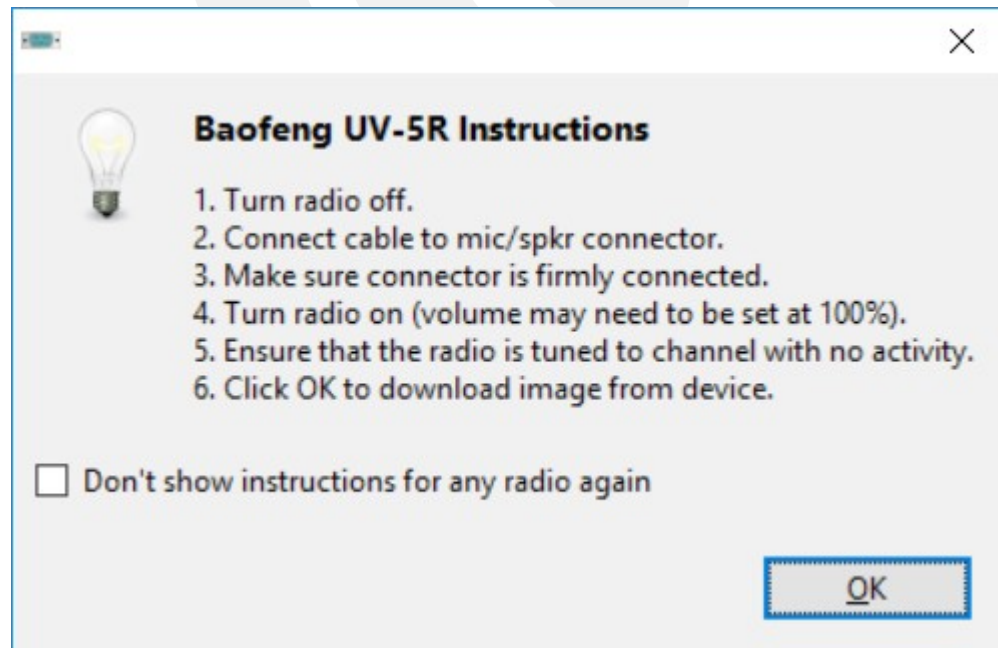


IMPORTING REPEATER LIST TO CHIRP (CON'T)

3



4



- *If this is your first time reading data from a new radio, after reading the data from the radio, immediately save the file with a new name like Baofeng_UV5R_20181212_Original.img*

IMPORTING REPEATER LIST TO CHIRP (CON'T)

- Now choose *Edit...Select All*. (Note that I had to select the first row by clicking on the 0, then choose *Edit...Select All*)
- Finally, select *Edit...Delete*
- You now have a usable image file for your radio
- *Immediately save the file with a new name like Baofeng_UV5R_20181212_Ohio.img*

CHIRP

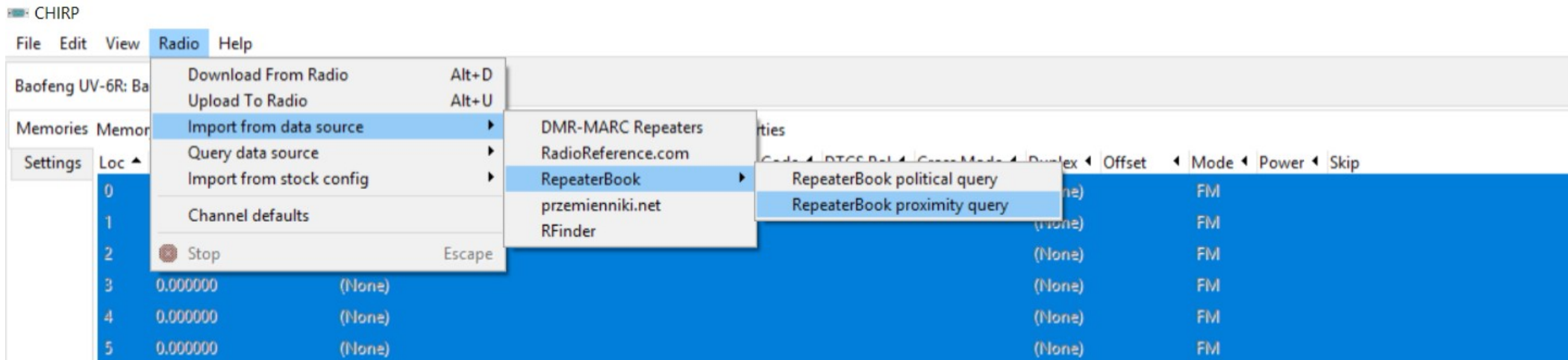
File Edit View Radio Help

Baofeng UV-6R: BaofengUV5R_20181212_Original.img

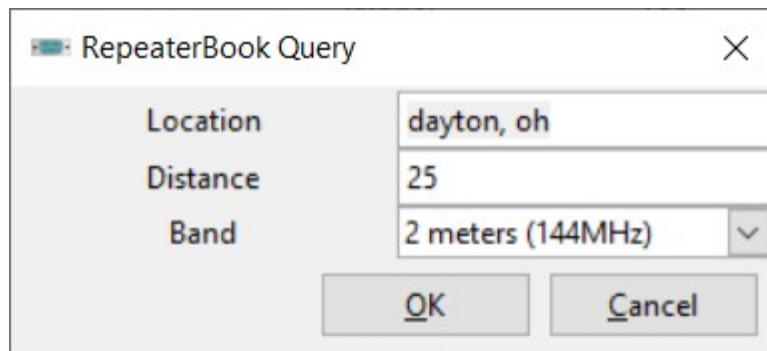
Memories Memory Range: 0 - 127 Refresh Special Channels Show Empty Properties

Settings	Loc	Frequency	Name	Tone Mode	Tone	ToneSql	DTCS Code	DTCS Rx Code	DTCS Pol	Cross Mode	Duplex	Offset	Mode	Power	Skip
	0	146.010000		(None)							(None)		FM	High	S
	1	145.110000	WC8OH	(None)							-	0.600000	FM	High	S
	2	145.110000	WC8OH	Tone	67.0						-	0.600000	FM	High	S
	3	145.230000	WB8MMR	(None)							-	0.600000	FM	High	S
	4	145.270000	WA8PYR	Tone	82.5						-	0.600000	FM	High	S
	5	145.310000	N8SIM	Tone	123.0						-	0.600000	FM	High	S

IMPORTING REPEATER LIST TO CHIRP (CON'T)

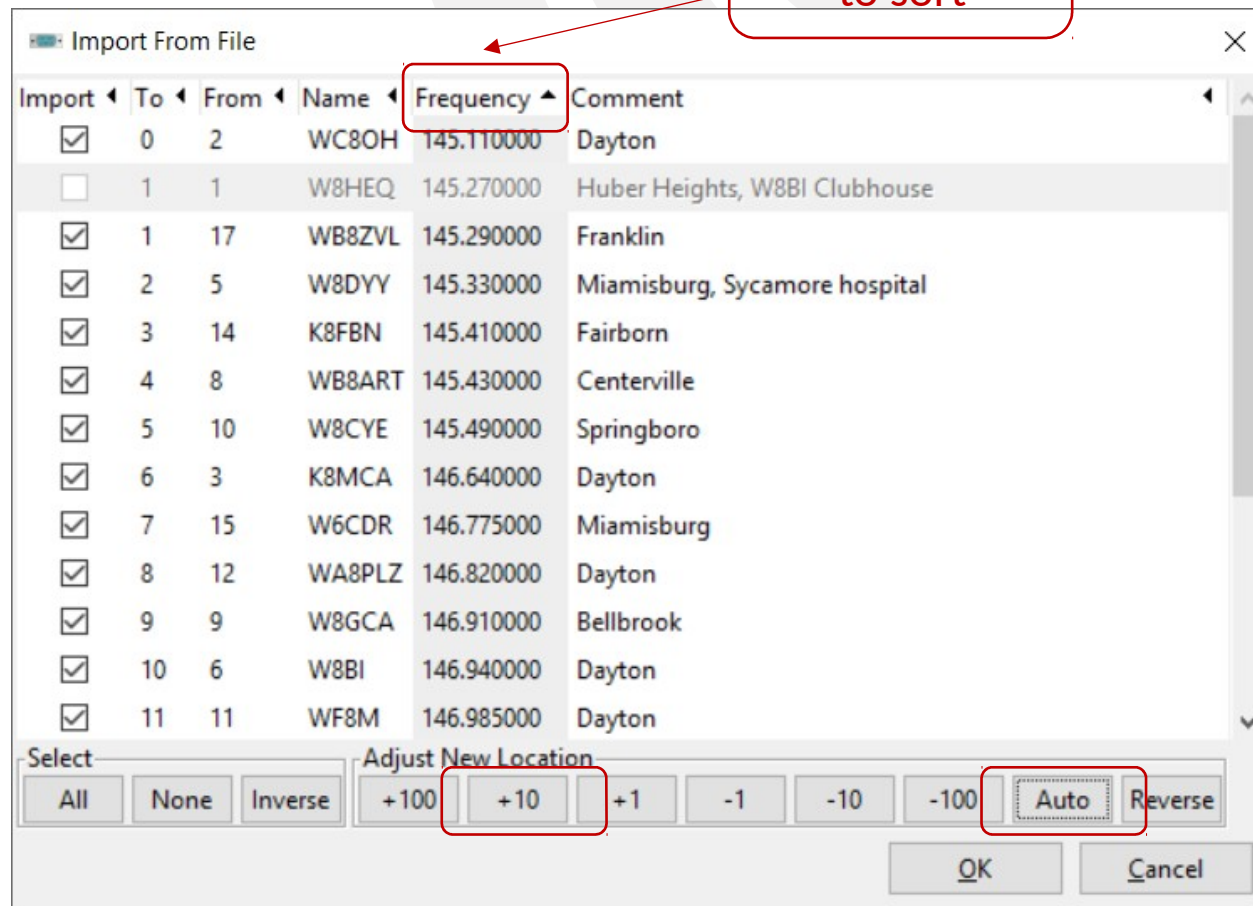


- Now select Radio...Import from data source...RepeaterBook...RepeaterBook proximity query.
- Enter parameters for query and hit OK.



IMPORTING REPEATER LIST TO CHIRP (CON'T)

- Click on headers to sort by that column (I usually sort by *Frequency*).
- Then click on *Auto* so that the entries are renumbered and blank entries are skipped.
- If adding another band (like 70 cm), increment the location using *+10* or *similar* until you get to an open row.
- Then click OK.

A screenshot of the "Import From File" dialog box in Chirp software. The dialog has a table with columns: Import, To, From, Name, Frequency, and Comment. The "Frequency" column header is highlighted with a red box, and a red arrow points to it from a text box above that says "Select header to sort". The table contains 11 rows of repeater data. At the bottom, there are two groups of buttons: "Select" (All, None, Inverse) and "Adjust New Location" (+100, +10, +1, -1, -10, -100, Auto, Reverse). The "Auto" button is highlighted with a red box. "OK" and "Cancel" buttons are at the bottom right.

Import	To	From	Name	Frequency	Comment
<input checked="" type="checkbox"/>	0	2	WC8OH	145.110000	Dayton
<input type="checkbox"/>	1	1	W8HEQ	145.270000	Huber Heights, W8BI Clubhouse
<input checked="" type="checkbox"/>	1	17	WB8ZVL	145.290000	Franklin
<input checked="" type="checkbox"/>	2	5	W8DYY	145.330000	Miamisburg, Sycamore hospital
<input checked="" type="checkbox"/>	3	14	K8FBN	145.410000	Fairborn
<input checked="" type="checkbox"/>	4	8	WB8ART	145.430000	Centerville
<input checked="" type="checkbox"/>	5	10	W8CYE	145.490000	Springboro
<input checked="" type="checkbox"/>	6	3	K8MCA	146.640000	Dayton
<input checked="" type="checkbox"/>	7	15	W6CDR	146.775000	Miamisburg
<input checked="" type="checkbox"/>	8	12	WA8PLZ	146.820000	Dayton
<input checked="" type="checkbox"/>	9	9	W8GCA	146.910000	Bellbrook
<input checked="" type="checkbox"/>	10	6	W8BI	146.940000	Dayton
<input checked="" type="checkbox"/>	11	11	WF8M	146.985000	Dayton



IMPORTING REPEATER LIST TO CHIRP (CON'T)

- The resulting Chirp file should look like this.

CHIRP

File Edit View Radio Help

Baofeng UV-6R: BaofengUV5R_20181212_Original.img*

Memories Memory Range: 0 - 127 Refresh Special Channels Show Empty Properties

Settings	Loc	Frequency	Name	Tone Mode	Tone	ToneSql	DTCS Code	DTCS Rx Code	DTCS Pol	Cross Mode	Duplex	Offset	Mode	Power	Skip
	1	145.110000	WC8OH	Tone	67.0						-	0.600000	FM	High	
	2	145.150000	W8RNL	(None)							-	0.600000	FM	High	
	3	145.230000	W8FW	Tone	100.0						-	0.600000	FM	High	
	4	145.270000	W8HEQ	(None)							-	0.600000	FM	High	
	5	145.290000	WB8ZVL	Tone	118.8						-	0.600000	FM	High	
	6	145.310000	W8OG	Tone	82.5						-	0.600000	FM	High	
	7	145.330000	W8DYY	(None)							-	0.600000	FM	High	
	8	145.410000	K8FBN	Tone	118.8						-	0.600000	FM	High	
	9	145.430000	WB8ART	Tone	88.5						-	0.600000	FM	High	
	10	145.450000	K8IRA	Tone	123.0						-	0.600000	FM	High	
	11	145.470000	K8VP	Tone	100.0						-	0.600000	FM	High	





ADD ADDITIONAL CHANNELS

- Typical channels I add are the FM Simplex Frequencies for VHF/UHF and the local NOAA Weather Station
- Simplex is basically radio-to-radio (without using a repeater) using the same frequency for transmit and receive
- Often used for small events where amateur radio operators assist or when away from repeaters
- According to the ARRL Band Plan:
 - VHF Simplex National Calling Frequency is 146.520 MHz
 - Simplex range is from 146.40-146.58 and 147.42-147.57 MHz
 - Channel spacing varies but 15 kHz and 30 kHz are common
 - UHF Simplex National Calling Frequency is 446.000 MHz
 - Simplex range is from 445.00-447.00 MHz
 - Channel spacing varies but 12.5 kHz is typical
- Because the Baofeng HT's have a limited amount of storage (only 128 channels), I recommend just adding the Simplex National Calling Frequencies. When you need the others, just add them in VFO mode (or program them in before your event)



ADD ADDITIONAL CHANNELS (CON'T)



- NOAA Weather broadcast frequencies vary by location
- Go to <http://www.WeatherRadios.com>
- Select *Find Stations & Frequencies* in menu along the top
- Select your state (Ohio in my case) after scrolling down to the list of states
- This takes you to the *NOAA Weather Radio Station Listing* for your State (you can also go directly to the NOAA website, but it is hard to find the station listing)
- I used WXJ46 at 162.475 MHz



NWR Station Listing for Ohio

Click on a column heading to sort.

Site Name	Transmitter Name	Call Sign	Frequency	Power	WFO
Akron	Akron	KDO94	162.400	1000	Cleveland, OH
Cleveland	Chesterland	KHB59	162.550	750	Cleveland, OH
Sandusky	Bellevue	KHB97	162.400	1000	Cleveland, OH
Columbus	Columbus	KIG86	162.550	1000	Wilmington, OH
Chillicothe	Ross County	KJY68	162.500	300	Wilmington, OH
Athens	Elliottville	KZZ46	162.425	1000	Charleston, WV
Carey	Carey	KZZ47	162.525	300	Cleveland, OH
Grafton	Lorain County	WNG698	162.500	300	Cleveland, OH
Marietta	Washington County	WNG734	162.400	300	Charleston, WV
New Philadelphia	Tuscarawas County	WNG735	162.425	300	Coraopolis, PA
Bridgeport	Bridgeport	WWF35	162.525	1000	Coraopolis, PA
Youngstown	Youngstown	WWG56	162.500	300	Cleveland, OH
Mansfield	Darwin	WWG57	162.450	300	Cleveland, OH
Dayton	Miamisburg	WXJ46	162.475	1000	Wilmington, OH
High Hill	High Hill	WXJ47	162.475	1000	Coraopolis, PA
Lima	Cridersville	WXJ93	162.400	1000	Wilmington, OH
Toledo	Holland	WXL51	162.500	300	Cleveland, OH
Otway	Moon Ridge	WXM69	162.525	1000	Wilmington, OH

Number of Stations in Ohio = 18



ADD ADDITIONAL CHANNELS (CON'T)

Click Show Empty first to reveal unused rows

Settings	Loc	Frequency	Name	Tone Mode	Tone	ToneSql	DTCS Code	DTCS Rx Code	DTCS Pol	Cross Mode	Duplex	Offset	Mode	Power	Skip
	120	444.787500	N8ZS	(None)							+	5.000000	FM	High	S
	121	444.800000	K8DDG	Tone	94.8						+	5.000000	FM	High	S
	122	444.862500	K8YOJ	(None)							+	5.000000	FM	High	S
	123	444.900000	W8CJB	Tone	131.8						+	5.000000	FM	High	S
	124	444.900000	N8ADL	(None)							+	5.000000	FM	High	S
	125	146.520000	2m Cal	(None)							(None)		FM	High	
	126	446.000000	70cm C	(None)							(None)		FM	High	
	127	162.475000	WXJ46	(None)							off		FM	High	S

Enter all these by hand

Put these at 125, 126, 127

No Tone

Simplex so no Duplex

Don't transmit on Weather Channel!



ADD ADDITIONAL CHANNELS (CON'T)

ARES Training Net

Wednesday evenings at 8:00 PM on one of the following systems:

146.820 MHz (77.0 Hz Tone) WA8PLZ repeater system

145.11 / 224.16 MHz (67hz tone) WCOARA repeater system.

Public Service Events

December 31, 2018:
» PSE: Resolution Run 31
December (7:00 pm)

County ARES Sites

- You can also enter a new repeater or simplex channel here for special events or travel.
- For a repeater, you will need to know the frequency, offset, and tone.

CHIRP Baofeng UV-6R: Baofeng_UV-6R_20180821.img* x

Memories Memory Range: 0 - 127 Refresh Special Channels Show Empty Properties

Settings	Loc	Frequency	Name	Tone Mode	Tone	ToneSql	DTCS Code	DTCS Rx Code	DTCS Pol	Cross Mode	Duplex	Offset	Mode	Power	Skip
	120	444.787500	N8ZS	(None)							+	5.000000	FM	High	S
	121	444.800000	K8DDG	Tone	94.8						+	5.000000	FM	High	S
	122	444.862500	K8YOJ	(None)							+	5.000000	FM	High	S
	123	444.900000	W8CJB	Tone	131.8						+	5.000000	FM	High	S
	124	444.900000	N8ADL	(None)							+	5.000000	FM	High	S
	125	146.520000	2m Cal	(None)							(None)		FM	High	
	126	446.000000	70cm C	(None)							(None)		FM	High	
	127	162.475000	WXJ46	(None)							off		FM	High	S

[0] Completed Writing memory 125 (idle)

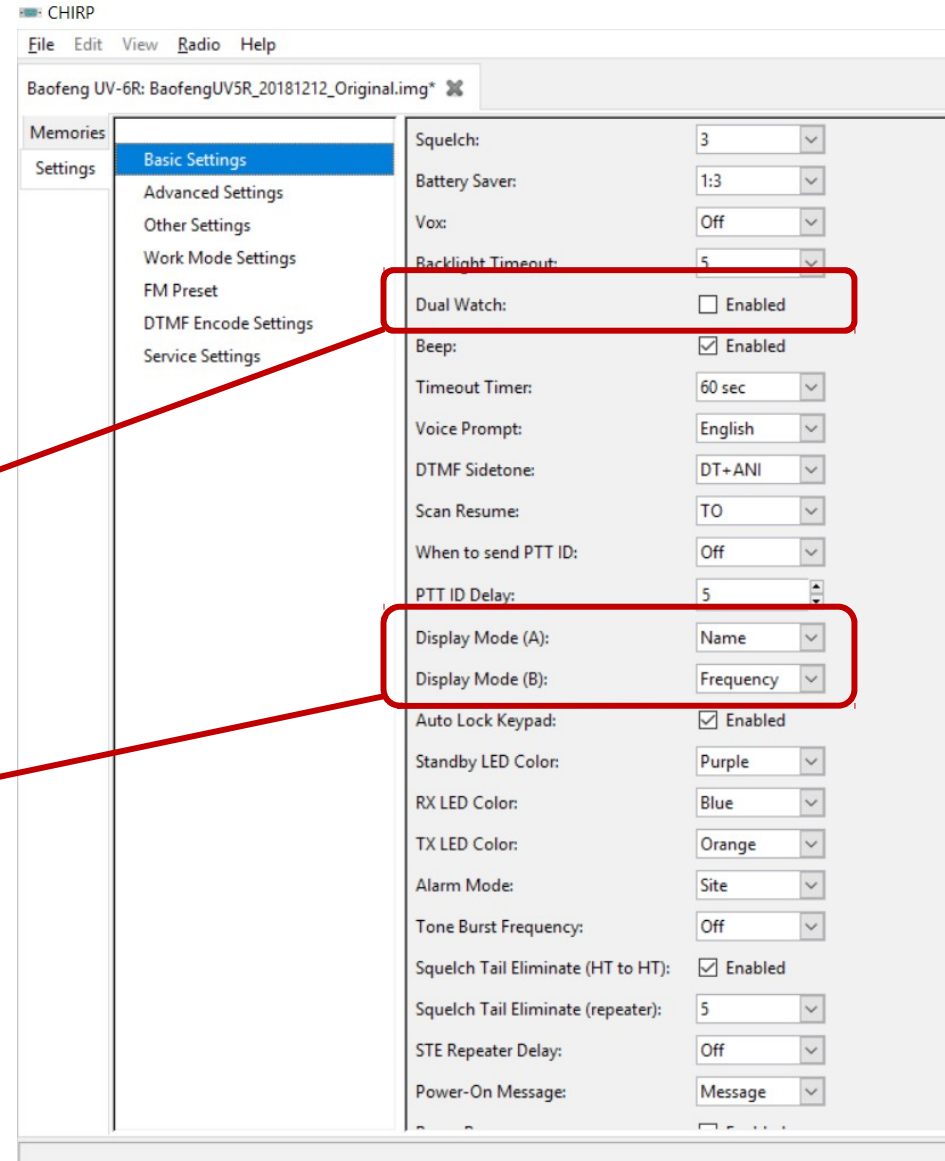


SET DEFAULT WORKING PARAMETERS

- I like to set the following default parameters:
 - Whether *Dual Watch* is Enabled
 - The default *Display Modes*
 - The default *Power On Channels*
 - The default FM station
 - Set the channels to *Skip* during a *Scan*
- First, go to to *Basic Settings*

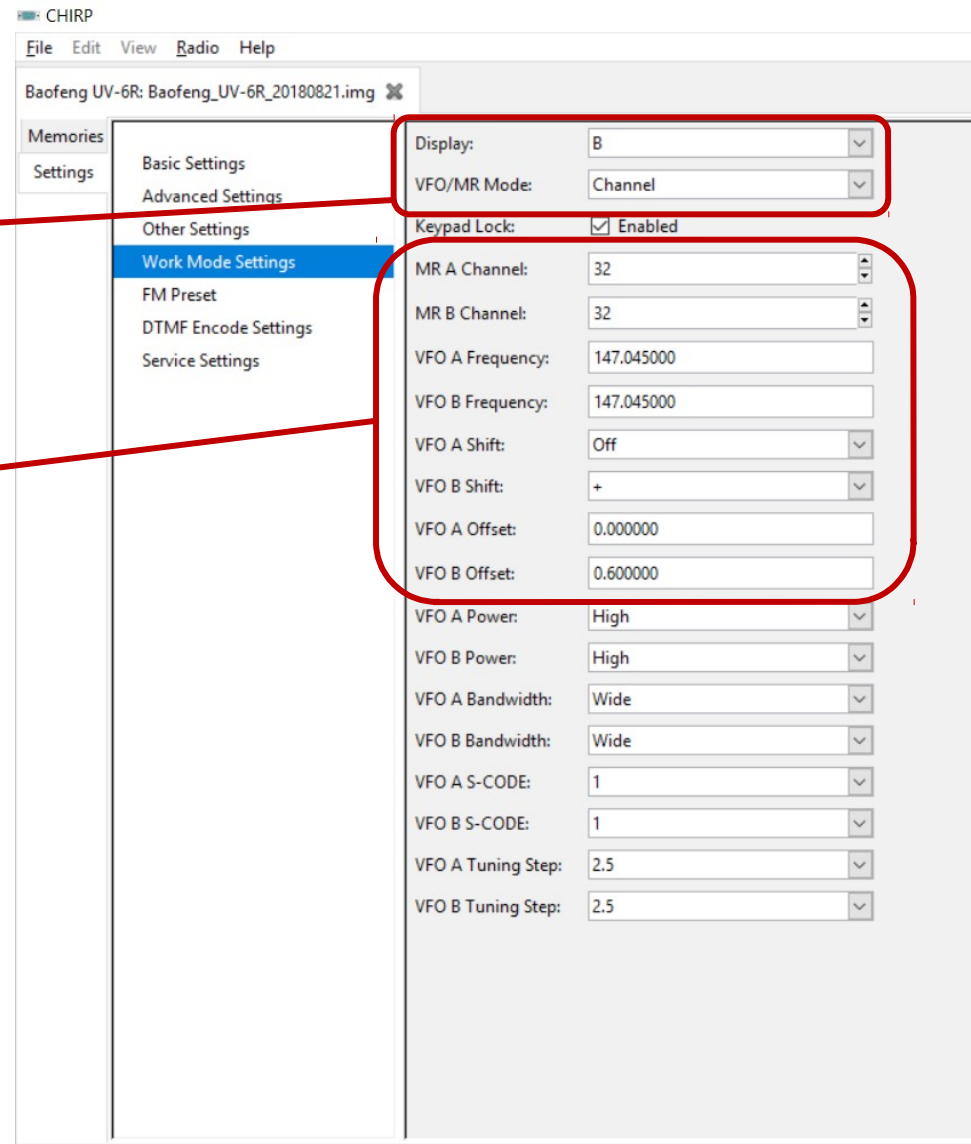
I don't use, but turning on *Dual Watch* allows you to monitor two channels at once

I put the station *Name* on A and the *Frequency* on B



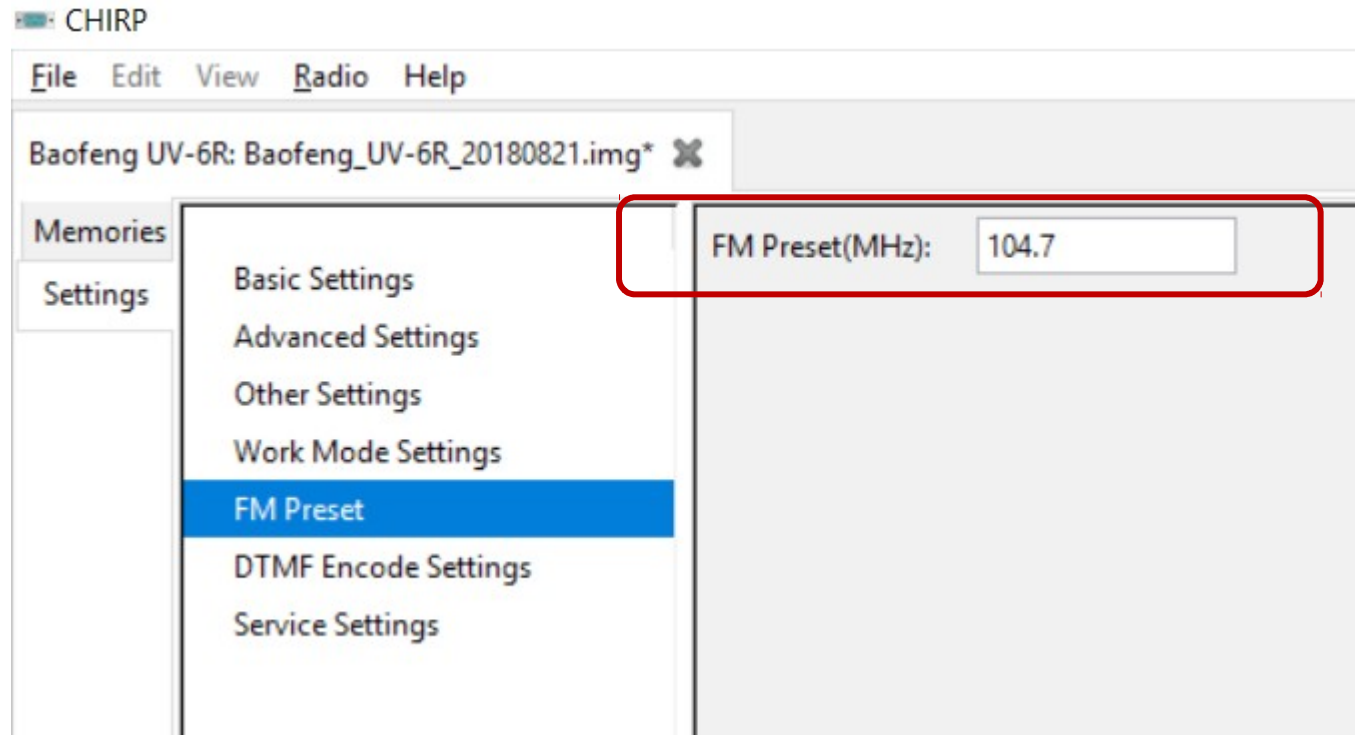
SET DEFAULT WORKING PARAMETERS (CON'T)

- Next go to *Work Mode Settings*
- On power-up, the default active *Display* is B
- The default mode is *Memory Channel*
- Memory A Channel is set to #32 (the local BARC repeater)
- Memory B Channel is also set to #32
- Since my default is Memory mode (not VFO), I don't need to set the VFO parameters, but you can anyway if you want to setup, e.g., simplex channels
- VHF Repeater Offset is 0.6 MHz
- UHF Repeater Offset is 5 MHz



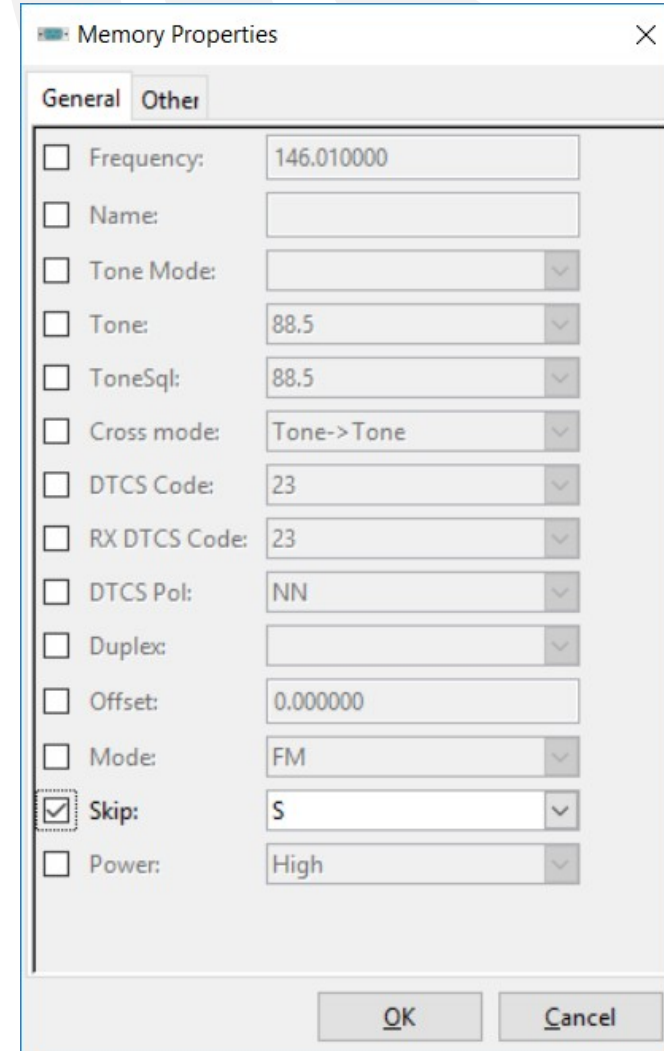
SET DEFAULT WORKING PARAMETERS (CON'T)

- Next go to *FM Preset*
- Type in your favorite FM station
- Save your work



SET DEFAULT WORKING PARAMETERS (CON'T)

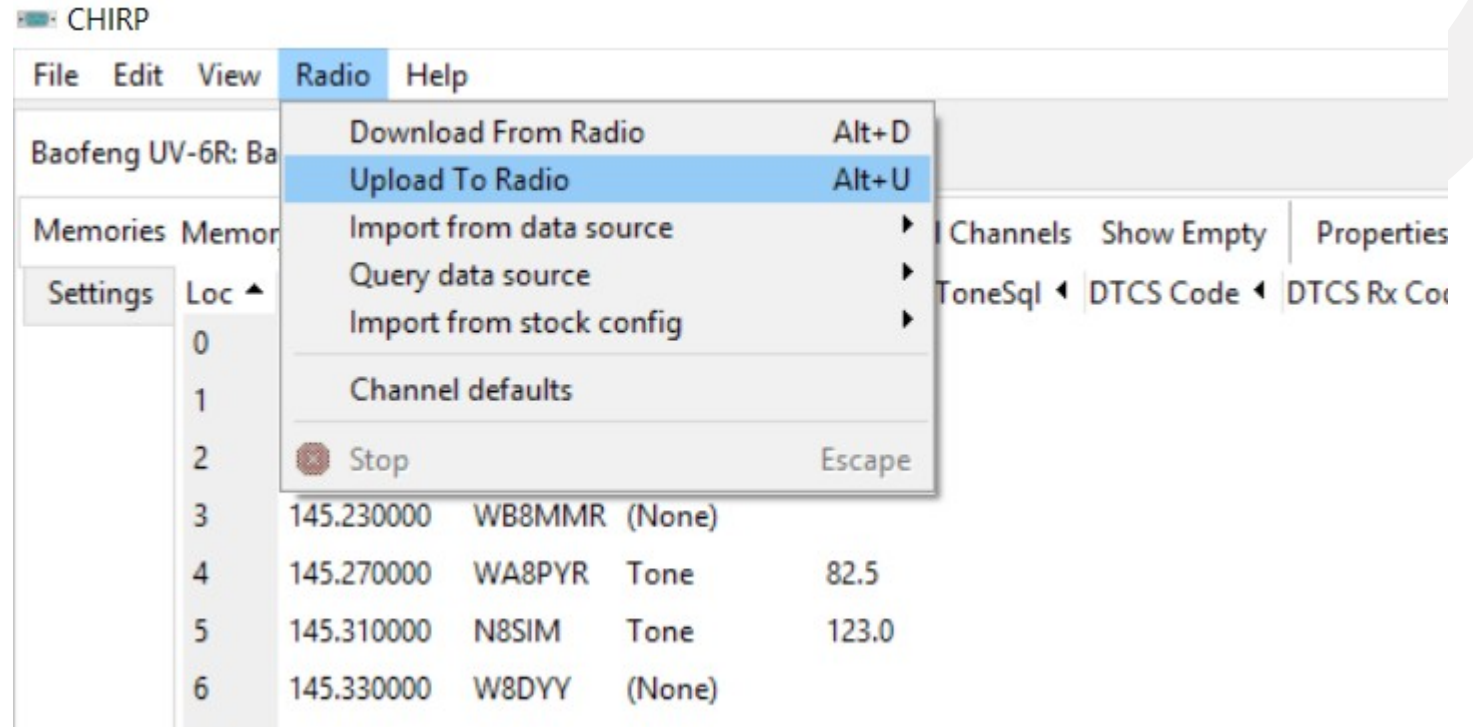
- Next, set the frequencies to *Skip* during a *Scan*
- Select *Edit* and then *Select All* in the menu across the top
- **Make sure all the entries are highlighted**
- Now select *Edit* and then *Properties* to see the pop-up box on the right
- **Make sure all the entries are greyed out**
- Click the check box next to *Skip* (or *Power*)
- Set the *Skip* entry to *S* (or *Low*)
- Hit OK
- Now go through the individual entries you want in your scan and set *Skip* to blank
- Save your work



Property	Value
<input type="checkbox"/> Frequency:	146.010000
<input type="checkbox"/> Name:	
<input type="checkbox"/> Tone Mode:	
<input type="checkbox"/> Tone:	88.5
<input type="checkbox"/> ToneSql:	88.5
<input type="checkbox"/> Cross mode:	Tone->Tone
<input type="checkbox"/> DTCS Code:	23
<input type="checkbox"/> RX DTCS Code:	23
<input type="checkbox"/> DTCS Pol:	NN
<input type="checkbox"/> Duplex:	
<input type="checkbox"/> Offset:	0.000000
<input type="checkbox"/> Mode:	FM
<input checked="" type="checkbox"/> Skip:	S
<input type="checkbox"/> Power:	High

PROGRAM THE RADIO

- When you are finished configuring your radio, *Save the file*.
- Plug programming cable into radio and USB port
- Turn on radio and wait until it is ready
- Select *Radio...Upload To Radio*
- After that, it is the same as *Downloading From Radio* we went through earlier
- *Do not unplug the radio until upload is complete and radio returns to main screen*





TEST THE RADIO

- Unplug the radio and make a call
- “W8LRJ listening on the BARC repeater”
- Give callsign, state that you are listening, and give repeater (in case someone is scanning)
- To call a person, use “WG8KGB this is W8LRJ on the BARC repeater”
- Give callsign of the person you are calling first, then your callsign, then repeater.
- You can also *Kerchunk* the repeater by just hitting the PTT button momentarily and releasing then listening for the repeater to respond
- Try out the FM station and weather station
- Enjoy your radio!





THANK YOU

 W8LRJ@ARRL.NET

 FACEBOOK: HAM CLASS ONLINE

CHECK TIM-YVONNE.COM/HAM SITE FOR COPIES OF THIS PRESENTATION