

Radio Setup Sheet – Item Explanations

WB4YJT – 10/2016

SUMMARY -

- 1) Mode Select - VFO / Memory
 - 2) VFO Mode Operations
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 - 3) Memory Operations
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 - 5) Cross-Band Operation
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 - 7) Radio Reset
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DETAILS -

1) Mode Select - VFO / Memory -

Ham Radios have two methods for setting the operating frequency and associated parameters. The “VFO” mode requires that all of the various operating settings be set up individually. (The term “VFO” is a legacy term from the old days of HF operations, when most radios used quartz crystals to set the operating frequency. The invention of the “Variable Frequency Oscillator”, or “VFO”, allowed the operator to change frequency by turning a dial instead of changing the crystal.)

The “Memory” mode has various frequency and operating setups stored in memory “channels”, which can easily be recalled, making changing frequency setups easy.

If you are just starting out with the radio, you will have to start in VFO mode, setting up all the parameters for a frequency, and then using the radio on that frequency, and/or storing the VFO setup in memory.

2) Freq Step (VFO Mode) -

VHF and UHF frequencies are "channelized" - that is, there are, by convention, specific frequency spacings between adjacent used frequencies. On two-meters, in Idaho, the convention is 20 KHz spacing - in some other areas of the country it is 15 KHz. On the 440 band, the conventional spacing is 25 KHz. However, there are exceptions, so your radio has some other step sizes that can be chosen.

Typically, on two-meters, you would normally use the 10 KHz step (20 is not an option, but 10 will work for 20), and on 440, you would normally use the 25 KHz step.

3) Freq Set (VFO Mode) -

You first have to choose a frequency to use – by looking at a list of repeaters, or by mutual agreement with another Ham. Then you must set the radio to this frequency.

Some radios allow you to enter the frequency from a keypad. Other radios must be put in “Frequency-Select” mode, and then a dial is turned or up-down buttons are pushed to set the frequency.

Many modern radios are able to be set up by a computer program. Often this is much easier than setting it up from the keypad.

4) TX Offset Shift Direction (VFO Mode) -

If you are going to talk through a repeater, the frequency you set in Step 2 was the frequency of the signal *transmitted* by the repeater. You have to set your radio so that it shifts its transmit frequency to the repeater’s *receive* frequency when you push the transmit button.

The shift setting is either “+”, for shifting the transmit frequency higher, “-“, for shifting the transmit frequency lower, or no shift, for simplex operation (where you transmit and receive on the same frequency). You will need to know which shift direction is correct for the repeater you are going to use. (Note that some radios will automatically set the shift direction to the standard setting for the frequency you entered.)

5) TX Offset [Shift] Amount (VFO Mode) -

Most 2-meter repeaters are set up for a 600 KHz offset, and most 440 repeaters are set up for a 5 MHz offset. In other parts of the country, there are a few exceptions, and the local repeater list will tell you if there are odd-split repeaters locally. (Note that some radios will automatically set the shift amount to the standard setting for the frequency you entered.)

6) Set PL Mode (VFO Mode) -

“PL” is a system frequently used by repeaters (and others) so that the receiver will only produce an audio output if the incoming signal has a designated sub-audible tone on it. Turning this feature on causes your radio to transmit the required tone during each transmission.

If you are not transmitting to a repeater which requires it, or to a “cross-band” setup (described later), PL is best left “Off” as the so-called “sub-audible” tone frequently IS audible, and will draw complaints.

7) PL Tone Freq Select (VFO Mode) -

In addition to turning PL on, you must set the sub-audible tone to the correct frequency for the repeater you will be using. This will be a specific frequency in the range of 67 to 250 Hz. Most modern radios have these built in, (for older radios, it was often an extra-cost plug-in option) and will show you a list, from which you must pick the correct one.

Note that the exact PL frequency is specified to the tenth of a Hertz, but the repeater list may show the frequency without the tenths digit. Just select the closest number from the radio’s list.

8) Scan Frequencies (VFO Mode) -

Many radios have the ability to scan through a range of frequencies, stopping when one is found to be in use. This can be helpful if you are in a place where you don't know what repeaters are on the air, and want to find out.

Note that you will probably have to monitor the radio while scanning, because the radio will usually only stop on an active frequency for a short time, and then resume scanning. Some radios have an option to cancel scanning when an active frequency is found.

9) Store VFO Setup in Memory Channel -

The radio's memory system allows you to store all of the parameters set up in VFO Mode (items 2-6) into a remembered location, for recall later. This lets you easily change the radio from repeater-to-repeater, without entering all the setup parameters each time.

Usually this storing operation is a two-step procedure – first selecting the memory channel, then storing the VFO setup in the channel.

Some radios have a feature that allows you to name the channels instead of just using the stored frequency numbers to identify them. This makes it easy to see which memory channel is for which purpose.

10) Recall Memory Channel -

Recalling a memory channel sets up the radio with the stored parameters. This is usually not the same as bringing the stored parameters into VFO mode, where you can change them and store them back. You can change some of the recalled parameters, but you usually cannot save the changed setup back to the memory. Some radios have a special recall mode that does bring the stored parameters into the VFO, which then allows you to change them and store them back.

It is a good idea to record the parameters for the setup in each memory channel, in case you want to set another radio up for the same channels, or, in case the radio is reset, causing all memory data to be lost.

11) Erase Memory Channel -

Some radios allow you to erase stored parameters channel-by-channel, while in others you must over-write the old data with new data. Most radios also have a "Full Reset" feature, which erases all memories, and sets the radio to its factory default settings.

12) Scan Memory Channels –

Most radios have a feature which allows you to scan the memory channels, stopping when an active frequency is found. As with the VFO scan, usually the radio will pause for a few seconds on an active frequency, then resume scanning.

Some radios have an option to cancel scanning when an active frequency is found. Some radios also have a feature to select specific channels to be skipped when scanning memories.

13) CTCSS Operation -

“CTCSS” is a system that sets up your radio so that the receiver will only produce an audio output if the incoming signal has a designated sub-audible tone on it. Turning this feature on means that anyone who wishes to talk to you must be using their “PL” feature to send the specific sub-audible tone that your CTCSS setting requires.

To set this feature up, you must first enable it, and then set the required tone to a specific frequency (from the radio’s internal list).

14) Cross-Band Operation -

Most modern dual-band mobile radios include a feature called “Cross-Band” operation. This feature sets up the radio so that the audio from a signal being received on one band is simultaneously re-transmitted on the other band.

The utility of this feature can be seen in the situation where an operator is out of his vehicle, assisting with a public-service event. Because he is out of the vehicle, he can’t hear the vehicle's radio, which is set to the repeater where the event communications are happening. And, because he is quite a distance from the repeater, his handheld radio, with its small antenna, isn’t reliably reaching the repeater.

By setting the vehicle radio to cross-band operation, with one band set to high power on the repeater, and the other band set to low power on a simplex frequency, and then setting his handheld to the simplex frequency, the operator can now communicate to the repeater using his handheld, through the more powerful mobile radio in the vehicle.

When the vehicle radio hears the repeater’s signal, it re-transmits it on the simplex channel to the handheld. And, when the operator transmits on his handheld, the vehicle radio re-transmits his voice to the repeater. This way the operator can walk around the area and still be in clear communication with the distant repeater, even though he is using a low-power handheld radio.

With this setup, it is recommended that the simplex side of the radio be set up with CTCSS, so that only the signal from the operator’s handheld (set up with PL) will operate the cross-band transmitter to the repeater. This will prevent any stray signals or noise from sending unwanted transmissions to the repeater.

Note that some radios will still present the received audio to the radio’s speaker in cross-band mode, so the volume should be turned down. In addition, the radio’s microphone may also be active, and may pick up local sounds, which will be transmitted along with the cross-band audio. For these radios, the microphone should be disconnected while the radio is in cross-band mode.

15) Radio Locking/Unlocking -

There are times when you will want to lock your radio, so an accidental bump will not change the operating parameters. A good example of this would be if you are participating in an emergency communication net, and need to be sure that your radio is working correctly all the time. Another time might be if the radio is set up in cross-band mode, and there is a possibility that someone might bump it or try to adjust it.

16) Radio Reset -

Sometimes a radio will lock up and not respond to any key pressed or to the PTT switch. This could be because of a power glitch, or because a strong radio signal has temporarily scrambled the control module's operation. Either way, the only way out is to reset the radio, (which will usually also erase all stored memory data).

17) Beep -

Many radios have a feature that any button pressed creates a beep sound. Some think this is great, others find it annoying. You may want to know how to disable and enable it.