



## Setting up your CW filters for the Tonally Challenged

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Download this [Filter Adjustment Spreadsheet for the Tonally Challenged](#), by Bill Acito, W1PA

After a couple of telephone calls to Wayne and Eric, I have come up with yet ANOTHER way of setting up your CW filters (not great for SSB). This method is for us old turkeys that do not have a good ear for tones. Wayne is a musician as well as a consummate radio designer and he can spot a bad pitch a mile away.... I am almost tone deaf... not quite but almost.

**Here is a procedure that works well and really nails the filters.**

Note: This method described here can be simplified by using an external counter to read the BFO frequency as you make the adjustments. However, if you do not have an external counter, follow the method described below. *(Make sure your counter probe is on TP2 - Ed)*

1. For each filter setting find the center of the passband by listening to noise (not a test signal). Using CAL FIL set FLx to the desired bandwidth. Tap the Band button to change to BFx. I used CW normal to locate the center of the passband. Rotate through the BFO settings until you no longer hear the receiver noise. Rock the BFO back and forth through this position to make sure you have found the center of the passband. Once you have determined the center point, (be quick with a pencil in hand) hold the CW Rev button and quickly jot down the displayed BFO frequency. It will only appear for a few seconds so watch carefully. Write this frequency down --- this is the center frequency of the passband AT THE CURRENT FLx SETTING. This frequency will change with each different passband setting. If you weren't fast enough to catch the frequency, just go back to CW Norm by holding the CW Rev button and rotate the BFO one count and return it to the original position --- hold CW Rev and read it again. The frequency will be display each time a change is made in the BFO setting. No change --- no frequency display.

2. Now you must add and subtract your offset frequency to the center frequency measured above. You subtract your offset for CW Normal and you add your offset for CW Rev. An example is given below from my K2.

**Example**

FL1 = .00; CW Tone Offset = 650 HZ (.65 for the calculation)

**Center Frequency** = 4913.59 (on my K2)

**CW Norm:** 4913.59 - .65 = 4912.94 < Target Value

**CW Rev:** 4913.59 + .65 = 4914.24 < Target Value



3. Now all you have to do is set the BFO frequency for CW Norm and CW Rev to the target values in Step 2. If you have an external frequency counter this step is much easier. Otherwise, you have to use trial and error to set the BFO to the calculated values.

Here is how I did it with the internal counter. Again, you must be quick with the pencil and paper to read the BFO frequencies. I started with CW Norm (it doesn't make any difference).

Rotate the BFO for a couple of counts. Press and hold the CW Rev button. Quickly read the displayed frequency. Jot it down. Now press and hold the CW Rev button to go back to CW Norm. Rotate the BFO a couple of counts (remember which direction you rotated the BFO up or down in counts) press and hold the CW Rev button again to display the frequency of the BFO. Jot it down. At this time you should be able to tell which direction you need to go to adjust the BFO to match your calculated value. If you find the displayed frequency is increasingly moving away from your desired number, reverse the direction of rotation and try again. This is much more difficult to describe than to actually perform. The key is to make sure you return to CW Norm before adjusting the BFO.

The reason for switching back and forth between CW Norm and CW Rev is simply to read the BFO frequency without changing the FLx setting. Once you have CW Norm zeroed in on your desired frequency, start the same process with CW Rev. Just remember to always switch back to CW Rev this time before adjusting the BFO.

4. Perform Steps 1 through 3 for each of your FLx settings.

The nice feature of this method is that you really don't need a test signal to set up the filters --- just some random RF noise to find the center point of the passband. I tested my filter settings using the 7.000 MHz birdie as a test signal (you must remove any external antenna to hear it). I used the Spot feature to zero beat the birdie (I am not TOTALLY tone deaf .. but almost). I then stepped through all four passbands listening to CW Norm and CW Rev.... **THERE IS ABSOLUTELY NO TONE DIFFERENCE BETWEEN CW Norm AND CW Rev.** (Again, subject to my questionable ability to hear subtle tone differences). If you have your filters centered about the middle of the passband there should be no difference in tone and S unit readings between CW Norm and CW Rev.

If you have an external frequency counter, you don't have to switch back and forth between CW Norm and CW Rev to read the frequency... you can monitor it in real time with the external counter and just tweak the BFO until it matches your calculated value.

I hope this method helps those of us who are tonally challenged.