



## A suggested Method for Aligning the CW Filter(s) in the K2

### Equipment required:

- K2 (naturally)
- An external received signal source (WWV, the 'birdie' at 7.000MHz, or your 'big rig' connected to a dummy load and transmitting at 0W output). This will be referred to as "RF SOURCE".
- An external source of an audio signal at the frequency you wish to copy your received signals (I used my CMOS Super Keyer III, set to give me a 600Hz tone, but any stable signal source should work). This will be referred to as "AF SOURCE".

You MUST be able to receive the external RF source with the K2 AND generate the sidetone signal (externally) at the SAME TIME.

NOTE: It is CRUCIAL that the BFO frequency be adjusted to the proper SIDEBAND of the crystal filter in order for the filter to work properly. When performing the alignment on a band between 80M and 17M, the BFO setting should be BELOW the BFO setting for crystal filter center when aligning the filters for CW NORMAL operation (see FT manual, p. 80, "Modifying Filter Settings", step 4, or Production Manual, Rev. B, p. 55, "CAL FIL Example", step 10). When aligning the filters for CW REVERSE, set the BFX setting ABOVE the filter center setting.

### Procedure:

- 1) Select MENU|ST P (Sidetone Pitch) and set the frequency of the K2 sidetone to that tone you wish to hear when sending AND receiving CW on your K2. Note the pitch you select (0.60 = 600Hz, 0.75 = 750 Hz, etc.). Exit from MENU mode back to RX (normal receive) mode.
- 2) In the RX CW mode of the K2, select MENU|CAL FILT|FLx and set the FLx value for each of the available filters you wish to use. Use the XFIL button to switch between each of the filter choices. Do NOT worry (at this time) about the current settings of the BFX values. Once all FLx values have been selected and set, exit MENU back to RX.
- 3) Pick a band between 80M and 17M and set your low power RF SOURCE to produce a continuous carrier, into a dummy load, on that band. Or, if possible, you may use the CARRIER (not the tone they often transmit) from WWV at 10.000 MHz, or the 'birdie' (no antenna connected) at 7.000 Mhz as your RF SOURCE.



*In the next step, your intent is to CENTER the received signal within the passband of the filter bandwidth you have selected.*

4) Tune the K2 to the signal from the RF SOURCE, and (disregarding the tone of the received signal) tune the VFO so that the RF SOURCE signal is at its maximum on the S-meter. For wide filter settings, you may have to get a 'feel' for the edges of the filter passband and then place the signal midway between them since the signal may indicate virtually the same S-meter reading across several hundred Hz of frequency. At wider bandwidths, you may notice that there is a slight amount of ripple in the passband of the filter, as evidenced by the received signal level varying +/- 1 S-unit as you turn through the passband range of the filter. This is normal. Just determine the edges of the passband and then tune for signal center within this range.

5) With the K2 tuned as above, turn on the external AF SOURCE (your external sidetone source) and adjust its output tone to match the frequency of the sidetone you wish to hear when receiving CW (the SAME frequency of the K2 sidetone you set in step 1 above).

Switch the K2 to MENU|CAL FILT|BAND-|BFx and adjust the VFO knob (which now tunes the BFO frequency) so that the frequency of the tone coming out of the K2 speaker matches that of the signal from the AF SOURCE. As you bring the BFO closer onto frequency you will hear an audible sub-beat note (between the two tones).

With a bit of experience, you should be able to obtain an audible 'zero-beat' of the two tones, at least within +/- 10 Hz, or less. You may find that you can obtain a better 'audible' beat note by slightly varying the audio level of the received tone so it more closely matches the level of the AF SOURCE sidetone. The more closely the LEVEL of the two tones match, the deeper the beat nulls will appear to your ear.

Exit MENU. The new settings for this particular filter bandwidth should be saved and you will return to RX mode.

6) Press XFIL to go to the next preset filter bandwidth and perform steps 4 through 5 once again at the new bandwidth.

It is essential that you re-tune the receiver to center the received signal within the new filter passband each time you select a new bandwidth, so don't try to cheat and bypass step 4.

7) Repeat steps 4 through 6 for all CW filter bandwidths you have programmed into your K2.

8) Switch to CW REV and repeat steps 4 through 7.



This completes the alignment of the CW filters. To tell whether you have been successful in getting the BFO frequencies set to the correct sides of the xtal. filter, do the following:

1) Tune in a signal (say, WWV) and ZERO BEAT that signal using the K2's SPOT function to match the received signal's tone against that of the SPOT sidetone. Press SPOT again to turn that feature off.

2) Press and HOLD CW Rev to select the CW REVERSE mode.

If CW filter alignment is correct, you should hear the SAME received signal (e.g. WWV) at virtually the identical tone at which you heard it when you were in CW Normal mode.

If the tone received in CW Rev mode is slightly different (say less than a hundred Hz), chances are that you need to either re-zero beat the signal in one (or both) of the CW modes.

If the received tone disappears when you switch from CW Normal to CW Rev, then one of the BFO settings is on the WRONG SIDE of the xtal. filter, and will have to be redone.

Repeat these checks for each of the filter bandwidths you have chosen.

DONE!