

CW Mode Rapid Start Guide

Requirements:

- NUE-PSK Digital Modem with firmware version 4.00 or higher installed.
- Single-Side-Band transceiver operating in SSB USB or DIGITAL mode – NOT CW MODE!
- Reasonably strong CW signal preferably keyed by a PC or a good quality keyer.

Setup:

Connect the audio interface of the modem to the appropriate connector(s) on the transceiver.

Turn on the modem and press F10 to enable TX mode. (The transceiver should be off.) Use the configuration menu to select CW mode. Press F10 to enable TX mode. Use the tuning dial to select the WPM you want to transmit at. Press Esc to turn on the side tone if it is not already on. Hold Ctrl down while rotating the tuning dial to select the desired side tone frequency. The tone can be tested by keying a character followed by a space. There is no volume control. The Esc key can be used to toggle the transmit side tone on and off. Press F10 to enable RX mode.

If desired, use the configuration menu to save the settings to EEPROM.

Turn on the transceiver and tune to the CW portion of the desired band.

Receive Operation:

Tune the transceiver until a good CW signal is heard and observed on the modem spectrum display near the cursor. Tune the modem by turning the tuning knob or pressing the arrow keys to center the cursor on the highest bar in the spectrum display. If you get it within a couple bars, the AFC logic will fine tune the cursor for you. You can activate a fine tune (acquire) by pressing the End key. The AFC logic will seek to the highest bar within two bars of the present location.

If the signal is strong enough and clear enough and the transmitting operator presents a fairly good “fist”, the CW receive channel should sync in fairly rapidly and start displaying the received characters. If characters are not displayed, press ‘T’ to bring up the Goertzel filter MARK-SPACE threshold fence setting. If you can clearly hear the CW signal but the modem cannot, the threshold may be set too high or too low. If the displayed setting is high in the allowed range, use the ‘-’ key to lower it. Continue to lower it until characters start to appear on the display. This indicates the fence is between the MARK and SPACE levels. Press Enter to clear the display and allow the firmware to take control of the threshold level. Similarly, if the threshold seems too low (not a common occurrence), use the ‘+’ key to raise it until characters start to appear on the display. It is best to not keep the threshold locked. This prevents the firmware from following varying band conditions (QSB).

If displayed characters have extra spaces between them, the code may be being sent in Farnsworth mode where the characters are sent at one speed and the inter-character spaces are extended. Sometimes operators send in this manner when band conditions are bad because it can

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be easier to copy. If this is the case, press the 'W' key to bring up the Word multiple display. This is the time threshold used to identify the end of a character. The fence time can be extended, one tenth of a Tcw at a time, by pressing the '+' key. Repeatedly press the '+' key until the character spacing looks normal. Similarly, if words appear to be run together, the Word multiple can be reduced by pressing the '-' key. Once this setting is changed, it will remain locked at that value until the Enter key is pressed then it will revert to the settings computed by the firmware.

If characters are broken up into "sub characters" (e.g., all dots appear as 'E' and all dashes appear as 'T', the inter character spacing may be too short. This is rare but can happen at very low speeds. The inter-character spacing fence can be adjusted by pressing the 'C' key and using the '+' and '-' keys to lengthen or shorten the fence.

If the band is crowded and you are bothered by QRM (or even QRN) filters may be used to adjust the receiving bandwidth. The transceiver's built in filters can be used but this will limit the bandwidth displayed on the modem's spectrum display and make it harder to tune. The modem's bandwidth can be adjusted by pressing the 'B' key and using the '+' and '-' keys to step through the available options. Doing the filtering at the modem has the advantage of keeping the passband centered on the cursor position. Adjusting the transceiver's filters may move the passband far enough to require retuning to get the cursor centered again. Some transceivers have a control to shift the filter range with respect to the dial frequency which helps but it can still be hard to tell when the transceiver's pass band is centered on the cursor. The band width display is cleared by pressing the Enter key but the selected band width remains in effect.

When the band width is set too narrow, it make it harder for the firmware to decode faster CW transmissions. This will be apparent by observing the WPM displayed on the top line of the LCD display. When this condition is present, the displayed WPM value will vary over 5 to 10, or more, WPM and there will probably be more errors in the decoding.

In RX mode, pressing the Esc key will toggle the receive side tone generator on and off. The side tone frequency is the same for both receive and transmit side tones and can only be changed while in TX mode.

Four special displays are available as operator aids while in RX mode. The first is My Call which is activated by pressing Ctrl-M. This displays the current call stored in the EEPROM and allows editing (backspace) or clearing (Home) of the current value. My Call is stored directly into and recalled from the EEPROM.

The second is Their Call which is activated by pressing Ctrl-T. The value shown may be edited or cleared in the same manner as My Call. Their call is stored in volatile RAM and will not be saved and restored when power is cycled.

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The third is Serial Number which is activated by pressing 'S'. The serial number can be incremented by pressing '+' and decremented by pressing '-'. The serial number value is entered directly into EEPROM and will persist through power cycling.

The fourth is a combination of Serial Number and Their Call and is activated by pressing 'X'. The serial number value can be change with the '+' and '-' keys but the Home key will not reset it. Their Call can be cleared by the Home key and entered or edited from the keyboard.

All four of these special displays are cleared and the entered value(s) saved when the Enter key is pressed. If the modem is toggled to TX mode while one of these displays is shown, the current state will be preserved and the display will be restored the next time the modem goes into RX mode. Note that the entered values are effective immediately, it is not necessary to press Enter to activate them.

Transmit Operation:

The F10 key toggles the firmware between TX and RX modes. When TX mode is displayed, the spectrum display is replaces with the TX WPM display. This also enables the tuning knob to be used to adjust the WPM value. In TX mode, pressing the Esc key will toggle the transmit side tone generator and the side tone display on and off. When the side tone is on, the side tone frequency can be changed as described above in the Setup section.

Once TX mode is enabled, all keyed characters will be displayed on the LCD display but only valid Morse characters will be transmitted. In CW mode, the keyboard is forced into Caps Lock state and all alpha characters will be entered as capital letters. Simultaneously pressing a Shift key will enter alpha characters as lower-case letters. Capital letters are transmitted normally, lower-case letters are transmitted without inter character spaces after them and are used to form prosigns (e.g., "bk" for BREAK).

Characters entered from the keyboard are displayed on the LCD display with over lines. The over lines are cleared when the character is transmitted. Morse characters are transmitted in words only. A series of characters will only be transmitted after a following space character has been entered. Limited editing of input is possible on words that still have the over line displayed (no trailing space). Editing is limited to using the Backspace key and rekeying the text.

All the normal hot keys for entering canned strings (e.g., My Call) are available in CW mode plus Alt-S and Alt-T which enter the current serial number. Similarly, all the standard hot keys for entering special codes in macros are available in CW mode plus Alt-X and Alt-S insert the serial number tag into the macro text. Tags are replaced with the current corresponding value/text when the macro is played.

I hope you enjoy your new CW operating mode and bag logs of DX.

Dave Collins – AD7JT