

Quick Start Guide ...

Keyer Mode

NUE-PSK Digital Modem Software v5

December 2011

OVERVIEW

The biggest change in Version 5 is the addition of a built-in keyer. After making a simple modification to install a connector for a CW paddle, the operator will be able to key in transmit text as well as operate and control the modem without a keyboard. Nearly all modem control functions that can be initiated from the keyboard can be initiated with the CW paddle. (Entering macros still requires either a keyboard or a CONFIG.TXT file on a USB flash drive.)

- DLE code, or tap of the Select pushbutton, identifies control characters
- Keyer modes supports: Iambic A & B, Dot preferred and Ultimatic

The CW control sequences are essentially the same as those used with a keyboard. A special Data Link Escape (DLE) code has been defined to identify control character sequences where necessary to avoid ambiguity. Where ever possible, control sequences may be entered with or without DLE characters – operator's choice. Keyer input of text and control characters is available in all operating modes, not just in CW mode. The keyer may be configured to operate in any of five modes: Iambic A, Iambic B, Dot Preferred, Dash Preferred, and Ultimatic. The keyer may be used in any operating mode, not just CW mode.

- Hot keys available with paddle input

The control characters or CW "hot keys" are the same or similar to the hot keys entered with the keyboard so it is not necessary for the operator to learn a new "language". Where appropriate, the letter 'A' is used to indicate the Alt- key and the letter 'C' is used to indicate the Ctrl- key. All control sequences are one or two characters long. Where there are no Morse code equivalents for special function keys, common sense letter combinations are used. For example "LA" is used for "Left Arrow" and "PD" is used for "Page Down". There are a few things that that may require some practice for the operator to get comfortable with.

- CW Practice Mode available

CW Practice mode has been added to the Configure mode menu. This capability allows all normal modem functions to work but does not key the transceiver. The built-in keyer always generates a 400 Hz side tone making it easy to distinguish it from the normal Rx or Tx side tones which are generally set to higher frequencies.

- CW Direct Mode allows use of any transceiver (SSB and CW) with the Modem in CW Mode

In addition to the keyer and the CW Practice operating mode, Version 5 includes a number of additional enhancements and increased functionality. One significant enhancement is a new operating mode: CW Direct. In this mode, the modem keys the PTT line so the transceiver can be operated in CW mode. The rig does not need to be in Data, Packet, or SSB mode, thus allowing the modem to be used with virtually any transceiver, with or without SSB modes. CW Direct mode eliminates the frequency offset problems experienced with some transceivers and allows QSK operation which cannot be done using SSB tone generation. Many modern transceivers have a setup option where the transceiver's keyer and the data input share a common PTT line. CW Direct mode can be used with these transceivers without requiring a different

cable. CW-only and many QRP rigs will require a special modem interface cable with two plugs at the rig end: one for the key jack and one for the phones jack.

➤ [Normal QSO practices automatically switch back to Rx mode](#)

Another cool Version 5 feature is the automatic switching from Tx mode to Rx mode after sending any normal, Tx ending character sequence. This includes 'K', "KN", "BK", and "SK" and the corresponding prosigns 'kn', 'bk', and 'sk'. This feature works in all operating modes: PSK, RTTY and CW.

➤ [New status information in the modem display](#)

There have also been a couple additions to the top line of the LCD display. Indicators have been added to show when AFC is active and to indicate the current gain level (x1, x5, x16, and x32) of the Programmable Gain Amplifier (PGA). Version 5 also does not clear the text display when switching from Rx mode to Tx mode as previous versions did. Instead, Version 5 places a marker at the end of the last line of the Rx text display, scrolls up one line and displays transmit text starting with the first character position of the bottom line.

KEYER MODE TUTORIAL

[This section contains references to the CW Keyer Manual. You can \(and should\) download this document from the NUE-PSK web site. It is your main reference for Version 5.](#)

Many new capabilities are present in the Version 5 software, so it would be a good idea to play with it for a while before going online. The easiest way to become familiar with the new software would be to sit down with the modem and go through the commands and hot keys, both with the keyboard and with a CW paddle. Practice can be done in any operating mode with the transceiver turned off or unplugged from the modem. For full featured practice mode, select the CW Practice operating mode with the transceiver turned on. This will enable you to use all the modem's features without keying the transceiver. We recommend and assume you will have a keyboard plugged into the modem and the modem in CW Practice mode while going through the following tutorial.

➤ [Try Out the Keyer](#)

After the modem is powered up, familiarize yourself with the keyer by keying the word "TESTING" while still in Rx mode. You will hear the keyer but the keyed text will not be displayed. Do not worry about the text appearing in the upper right corner of the LCD, it is appearing because the letters 'T', 'S', and 'G' are hot keys. After you are done keying, you should see the Goertzel threshold display since the last hotkey in "TESTING" is a 'G' which is a hot key for this display. The threshold display can be turned off by either pressing the Enter key on the keyboard or by entering the prosign 'ar' with the keyer. (Remember that lower-case letters represent Morse codes that are combined with the following character with no inter-character space between them to form prosigns.)

➤ [Keyer Set Up](#)

Before going on, let us set up the keyer to meet your preferences. The CONFIGURE menu can be used to select the type of iambic keyer operation you are used to (see 3.2). If you are curious, try them all and see what happens when you squeeze the paddles together. Now, let us switch to transmit mode and see how good you are with the CW paddles. This can be done by pressing F10 on the keyboard or by keying the prosign 'ka'. Note the right-pointing triangle at the end of line six of the LCD. This marker indicates the end of received text and the start of transmit text. Now you can use the Tune control to adjust the CW rate (wpm, see 5.0). The same rate is used for both transmit text input and modem control input. You can also adjust the Rx and Tx side tone frequency by holding down the Select button while turning the Tune control. (If the tone display is not shown, the Tx side tone is turned off. Press Esc to turn the side and the display on.) The same

side tone frequency is used for transmitted and received text but the keyer input is fixed at 400 Hz (see 3.3). Set the side tone frequency to a higher frequency like 800 Hz to make the two tones easily identified.

➤ [Keyer Practice](#)

Key "TESTING" again. You should see the letters appear on the bottom line of the LCD with an over line. If your timing is good, you should see all seven letters displayed in upper case followed by a space followed by the cursor ("TESTING _") with no extra spaces. If you see something like "NSD* _", you are running your letters together, increase your space between letters. (An asterisk will be displayed for Morse characters not recognized by the modem.) If you see extra spaces between letters, your inter-character spacing is too long, close it up. After the trailing space is displayed, the modem will "transmit" the word, clearing the over lines as each character is transmitted. You should hear the Tx side tone as the text is "keyed". Practice keying general text, pausing for transmission after each word to avoid mixing the side tones. Normally, the Tx side tone will be turned off when transmitting text from the keyer.

➤ [Data Link Escape \(DLE\) and More Practice](#)

Next, practice keying the DLE character ('uu' or ...-.- see 3.4). Nothing should be displayed on the bottom line of the LCD. Instead, a backward slash ('\') will be displayed at the start of the third line(see 4.0). Key it a second time and the Tx side tone will be disabled. Key it twice more and the Tx side tone will be enabled. This is the same as pressing the Esc key on the keyboard. Go back and practice keying transmit text with the Tx side tone turned off. **Alternatively, you can also enter the DLE character with a quick tap of the modem's Select pushbutton.** This is may be your preferred method for entering command mode when first learning the Keyer mode operation, as well as while transmitting since it avoids inadvertently inserting garbage in the transmit text stream when the DLE character is miss keyed. But as you become more proficient in reliably keying the DLE character, your will benefit from full paddle control of the modem.

➤ [Automatic Return to Rx Mode](#)

Key a single 'K'. The modem recognizes this as a normal end of transmission so, after the 'K' has been transmitted it automatically switches to Rx mode. Key 'ct' to return to Tx mode. There are several other normal end of transmission character sequences (see 3.6), try them all and practice toggling between Tx and Rx modes.

➤ [DLE Modem Control Sequences](#)

We have seen how two DLE characters will toggle the side tone on and off. Hot keys are simulated by keying one or two characters between two DLE characters. There are a number of Tx mode hotkeys for entering things like call signs into transmit text, for playing macros, and for toggling to Rx mode (see 3.6). Practice them and see how they work. Some hotkeys, like Insert Beacon Count, probably do not make much sense to key, as they are better suited for use in macros. They have only been included here for the sake of completeness. If you have not set up My Call and Their Call, go back to Rx Mode and do it. Try setting them up using only the keyer (see 3.7).

➤ [Entering Text Strings](#)

The Rx hotkey list (see 3.7) contains a number of text enter functions for entering date and time, call signs, and RECOrd file name (\CN). (Note that an early version of the manual failed to include "\CN" but it could have been surmised since "CN" represents Ctrl-N on the keyboard.) When entering text for these functions, pauses (spaces) in the keyed input is ignored, text strings cannot contain spaces and special hot keys are used to terminate the input. This greatly simplifies inputting these text strings. Now, while in receive mode, key a single 'X'. You should see the S/N (serial number) display in the upper right corner of the LCD with a blank line under it. Key my call letters "AD7JT". They should appear on the blank line under the S/N display. In this mode, entering eight or more dots ('hh' or error code) will simulate a single backspace. Keying this prosign in five times will completely erase my call sign. My call sign can also be erased by keying

\BK\ or the prosign 'bk'. Now enter George's call sign "N2APB". Call signs up to 11 characters long can be entered. The modem will beep if you try to enter a 12th character. There is no check on characters; anything will be accepted.

➤ [Tweaking](#)

Several parameters can be tweaked with the '+' and '-' keys on the keyboard or by keying \U\ and \D\. Try these DLE sequences and watch the serial number increment and decrement. The serial number can also be incremented by keying the prosign 'up' and decremented by keying the prosign 'do'. If you miss key these prosigns, you will probably see some unwanted characters at the end of the call sign.

➤ [Exiting Text String Entry](#)

Serial number and call sign values are effective immediately; you do not have to terminate the input operation to complete the change. This allows you to leave the X display active continuously during a contest and just update the display as needed without closing the display for each contact. Time and date and file name entry must be terminated for the changes to become effective. Text entry is terminated by DLE sequences and by the prosign 'ar' (All Right). Key 'ar' with the X display on the LCD then key 'X' again. Note that the display is the same; nothing is changed by activating the display. This is true of all the enter text hot keys (see 3.7).

➤ [More Tweaking](#)

Many variables associated with CW receive operation can be tweaked ("tweak" is a highly technical term for making an incremental adjustment like adding one to a serial number). In Rx mode, key a single B (CW Bandwidth) and then key 'U' to tweak the bandwidth up and 'D' to tweak the bandwidth down. With each change you should see the value change and the bandwidth indicator centered on the cursor. Note that this method of tweaking will not work with the 'X' display because all normal characters are acceptable in the call sign. This method will work with all other tweaks.

➤ [Gain and Tuning](#)

Key \PU\ and \PD\ and see the gain display just in front of the time display on the top line change accordingly. These DLE sequences simulate the Page Up and Page Down keys. The Arrow keys are simulated by a DLE sequence with an 'A' preceded by a single letter indicating the arrow direction (L, R, U, and D). These DLE sequences will tune the modem as if the corresponding arrow keys were pressed.

PLAY TIME!

By now you should be pretty familiar with the keyer operation and entering hot keys with the keyer. Try the above exercises in other operating modes. Some of the tweaking functions only apply to CW mode so those displays cannot be activated in other operating modes.

Now go have a ball with your newly updated, Version 5.00 NUE-PSK Digital Modem!

73, Dave Collins – AD7JT