

## Errata to date

12-8-05: Page 26 below figure #17. Wire length for switching supply core: **3'** **#32** wire instead of **8'** **#32** wire. Even so, 3' is a bit of an over kill. Use 3 ft, but expect to need only about 2 ½ ft of wire.

12-12-05: Under Figure 117, a PTO coil connection note was added. Text was added to emphasize that the PTO coil needs to be connected as shown in the pictures. Hooking the coil up backwards will cause the frequency to shift as the tuning knob is touched. Hooking the PTO coil up properly places the RF cold end of the coil at the front of the radio, thus getting rid of the frequency shift problem.

12-12-05: Page 20. Add note about 30pf trimmer and 5 100 uf caps. These were left out of the original kit. These have since been shipped out separately.

12-12-05: Page 106. Add note on low PA output power and L18. A new section call "Transmitter test" was added. The new text is as follows:

"At this point the transmitter can be tested to make sure it is meeting it rated power output. With a 12v supply, it should put out ~3w on 30m and 4w on 20m. Using 13.8v, this should be closer to 4w on 30m and 5w on 20m. If the power output is low, adjust the turns spacing on L18. The inductance can be varied by changing the % of the core the turns occupy. By compressing the turns into a small area on the core, the inductance increases, spreading the turns out more decreases the inductance. This can be used to fine tune the power output to get to the final expected power output."

12-18-05 Page 48. The text shows the headphones as connected to "J5". This should be "J4" as correctly shown in figure 50.

12-18-05: Page 54. Figure 59. I think most folks feel that the RIT as shown tunes backwards. In order to reverse the directions, the yellow and the blue wire need to be reversed on the panel mount pot R52

12-18-05: Page 53. For the 20m version, the 10K resistor should be used in place of the short for R55. The short causes instability when 0v is placed across the VXO tuning varactor. An even better fix would be to use a user supplied 470 ohm resistor. This does not need to be a surface mount resistor. A 1/8w or 1/4w resistor can be formed as shown in figure 19 and soldered to the pads for R55.

12-18-05: Page 71, figure 85. This picture shows R1 and R2 (upper left corner) hooked up in the wrong direction. The correct direction is shown on figure 84 and is also shown correctly in figure 63, page 56. If you need to remove these,

place a small pressure on the side of the resistor using a small screw driver, then quickly heat one side and then the other to work the resistor off the pad. Be gentle! Resistors are fairly rugged (note: **caps are not**), but we do not want to damage the PC board pads.

12-12-05: Page 123+. Updates to the keyer instructions. The new keyer instructions are reproduced below:

# Keyer Instructions

## Operation:

General notes on using the dit, dah and mem switch to control the keyer: The switch on pin 4 of the keyer chip will be referred to as the mem switch. Multiple functions result from multiple switch-press combinations (mem alone, mem+dit, mem+dah, mem+both dit and dah). Also, the switches can be pressed and released (PAR) OR pressed and held for two seconds (PAH). This doubles the number of combinations of the three control switches.

Generally, PAR is used for actions: send the code speed or send a memory. PAH is used for settings: change the code speed (no pot) or record a memory or change the iambic mode.

4 menus are used for setting various options - they are activated by a PAH of the mem switch alone or plus a simulpress of dit or dah or both. The menu selections are made by pressing either the dit or dah switches - you will then normally hear a corresponding dit or dah via the sidetone, the selection will be made and you are then returned back to normal keyer mode. In general, the operator can skip a menu item by a PAR of the mem switch.

Note that the keyer sidetone will be lower in pitch (about 270 Hz) for keyer commands such as the menu prompts. The normal sidetone pitch for routine sending defaults higher at about 580 Hz and can be changed with the SS menu command.

keys used	PAR (press and release)	PAH (press and hold)
mem switch	send memory 3	record memory 3, O?, also beacon items: BE and BA
mem + dit	send speed	paddle set of speed, pot options, main menu
mem + dah	send memory 2	record memory 2: M?
mem + both	send memory 1	record memory 1: T?

Figure 1. A Function Table of the Keypress Combinations

## Powerup:

After powerup the keyer will send an FB through the sidetone to signal correct operation. If either the dit or dah input is pressed during powerup the opposite paddle input will act as a straight key. An easy way to do this is to plug in a mono plug from the external key or keyer cable into the stereo paddle jack of the NC2030. The ring contact of the paddle jack will then be grounded.

## Speed Readout:

The speed (in WPM) will be played through the sidetone if the mem switch is simulpressed with the dit switch and then both are released. I normally press the

mem switch first and hold it, press the dit switch and finally release both.

**Speed Control and Menu:**

Initially the keyer will powerup at a default speed of 16 WPM in paddle speed set mode. The speed can be adjusted by pressing and holding the mem switch along with the dit switch. Usually I press and hold {PAH} the mem switch and then tap the dit switch. After 2 seconds, the keyer will send an S (for speed set). Press the mem switch to advance to the next menu item without changing the speed. Or, pressing the dit switch will increase the speed by 1 WPM and send a dit. Pressing the dah switch will decrease the speed by 1 WPM and send a dah. You can continuously adjust the speed by holding either switch but note that if you run the keyer "off the scale" at either 8 or 49 WPM, the keyer will "wrap around" to the opposite speed extreme. Exit the speed adjust routine by pressing and releasing the mem switch.

If the pot circuitry is connected AND the P menu is invoked to turn on the pot speed control the speed can be adjusted by turning the pot. Maximum possible speed is 49 WPM, minimum possible speed is 8 WPM. Note that the minimum speed can be affected by component tolerances on the speed pot and the capacitor - see the pot calibration menu item if an 8 WPM minimum speed is required. The pot position is read continuously when the keyer is sending code, just before each dit, dah or space is sent. This allows the operator to adjust the code speed even in the middle of a memory send or record.

	Menu item	pressing a dit:	pressing a dah:
S	Speed set from paddle	increases speed by 1 WPM	decreases speed by 1 WPM
P	Pot / paddle speed control	selects pot speed control	selects paddle speed control
C	Calibrate pot speed control	enters the calibration routine	restores default pot calibration
B	Bug / straight key mode	enables bug mode (dah = key)	disables bug mode (default)
A	iambic mode A or B	enables iambic mode A	enables mode B (default)
R	Reverse paddle mode	reverse dit and dah switches	return dit and dah to normal
AU	Autospace on / off	turns on character autospace	turns off autospace (default)

Figure 2. Mem + dit menu (PAR mem to advance to the next menu item)

**P - Select Pot or Paddle speed control:**

Allows the keyer to be switched between pot or paddle speed control. The keyer defaults to paddle speed control.

**C - Calibrating the Pot speed control:**

Due to the variation in capacitors and pots it is likely that the minimum setting of the pot will result in a minimum speed higher than 8 WPM. This menu item will compensate and store an updated calibration value. Before entering the menu, be sure to turn the pot to the minimum speed. Then press the dit to go into the calibration routine - then one or more dits will be sent after a short delay and the keyer will exit from the menu. If the pot calibration is run with the pot not set at the minimum, rerun the cal with the pot correctly set. Pressing a Dah will restore the default powerup calibration value.

**B - Bug / Straight-key mode:**

Dits are sent normally but dahs are sent like a straight key.

**A - Iambic mode A or B:**

The A mentioned above signifies the mode A/B select menu item. The iambic mode of the keyer can be set to either mode using this routine. Check the JHP web site for an Acrobat (.pdf) file which explains the difference between the A and B keying modes.

**R - Reverse paddle mode:**

Reverses the dit and dah switches (easier than resoldering a jack). Remember that the pot speed control will be changed to the dit paddle which means that pot speed control changes while the dit is pressed will be ignored until the dit is released.

**AU - AUtospace on/off:**

The autospace feature inserts a character space (1 dah in length) automatically if the operator has not pressed a paddle switch 1 dit space after the last dit/dah sent. This feature is always on in the memory record routines (needed for the recording process).

**Recording Memory 2:**

A memory of up to 40 characters long can be recorded. The memory 2 record menu is entered by simulpressing the memory and the dah keys and holding them for 2 seconds. I usually PAH the mem switch and then tap the dah key.

	Menu item	Pressing a dit:	Pressing a Dah
SS?	Sidetone Set	Lowers sidetone	Raises sidetone
M?	Record memory	records a dit	records a dah

Figure 3. Mem + dah menu (PAR mem to exit)

### **SS? - Sidetone Set:**

Press either a dit or dah to enter the SS menu and turn on the sidetone. A dit PAR (or PAH) will decrease the sidetone frequency, a dah PAR (or PAH) will increase the sidetone frequency. The sidetone will "wraparound" at the high (about 1700 Hz) and low (about 320 Hz) frequency limits. When the sidetone is at the desired frequency a PAR of the mem switch will exit the menu and store the new sidetone frequency in EEPROM. The SS menu item affects only the normal sidetone, the command sidetone is unchanged.

### **M? - Record Memory 2:**

The memory is recorded by sending normally. Note that the keyer output is off during the recording and that the lower command sidetone is used. When complete, PAR the mem switch. The routine will be exited automatically after the 40th character is sent. The memory is saved in flash memory which means that it will still be there even if power is removed. If this menu item is entered by mistake, PAR the mem switch to exit without changing the memory.

### **Playing Memory 2:**

Play memory 2 by simulpressing and releasing the memory and the dah keys. I usually PAH the mem switch and then tap the dah switch - the memory starts to play after the mem switch is released. A tap of either the dit or dah switch will stop the message play.

	<b>Menu item</b>	<b>pressing a dit:</b>	<b>pressing a dah:</b>
<b>BE</b>	<b>BEacon mode</b>	<b>starts the beacon going</b>	<b>Exits the menu</b>
<b>O?</b>	<b>Record memory 3</b>	<b>records a dit</b>	<b>records a dah</b>
<b>BA</b>	<b>Beacon Alternate mode</b>	<b>selects alternate beacon sends of mem 1 and mem 2</b>	<b>selects send of mem 1 only (default)</b>
<b>ST</b>	<b>SideTone on/off</b>	<b>turns off the sidetone</b>	<b>turns the sidetone on (default)</b>

Figure 4. Mem switch menu (PAR mem to advance to the next menu item)

### **BE - Beacon Mode:**

Beacon mode will send the contents of mem 1 continuously. Start the beacon by pressing the dit switch - the beacon starts to play. Exit beacon mode by tapping the dit or dah switch.

### **O? - Record Memory 3:**

The memory is recorded by sending normally. Note that the keyer output is off during the recording and that the lower command sidetone is used. When complete, PAR the mem switch. The routine will be exited automatically after the

40th character is sent. The memory is saved in flash memory which means that it will still be there even if power is removed. If this menu item is entered by mistake, PAR the mem switch to exit without changing the memory.

### **Playing Memory 3:**

Play memory 3 with a PAR of the memory switch. - the memory starts to play after the mem switch is released. A tap of either the dit or dah switch will stop the message play.

### **BA - Beacon Alternate between mem 1 and mem 2 mode:**

This routine selects/deselects alternating the beacon play between memory 1 and memory 2.

### **ST - SideTone on/off:**

*Since most rigs have a built-in sidetone, it is handy to be able to silence the NorCal Keyer sidetone, especially when the tone is injected into the rig audio. Note that the sidetone will still be engaged during any menu or recording entry even if it has been turned off.*

	Menu item	pressing a dit:	pressing a dah:
T?	Record memory 1	records a dit	records a dah

Figure 5. Mem + both menu (PAR mem to exit)

### **T? - Record Memory 1:**

Enter record mode for memory 1 with a PAH of the mem switch and both paddle switches for 2 seconds. Hold the mem switch down, then squeeze both paddle switches simultaneously (they both must be down at the same time), then release the paddle, keep holding the mem switch until after 2 seconds the keyer will send T?. Memory 1 can now be recorded. Start sending your message. when complete, press the mem key. The memory is 40 characters long - recording will terminate automatically after the 40th character. If this menu item is entered accidentally, just PAR the mem switch to exit without recording.

### **Playing Memory 1:**

First, hold the mem switch down, next, squeeze both paddle switches (they both must be down at the same time) then release the paddle and finally release the mem switch before 2 seconds elapse. The memory will start to play right after the mem switch release.

### **Notes:**

To perform a full keyer reset (parameters to their default values, memories

untouched):

- 1) remove power to the keyer
- 2) press and hold the mem switch
- 3) powerup the keyer keeping the switch depressed until the FB is sent.

One unique feature of the NorCal Keyer is 5 ditdah tune mode. If both paddles are held for at least 5 ditdahs and then released, the keyer will enter tune mode (key down, sidetone on). To exit, tap either the dit or dah. Thanks to Lew Paceley, N5ZE, for inventing this mode.