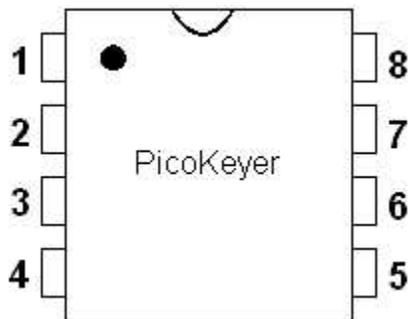

Memory Keyer for the Rock-Mite

The PicoKeyer is a single chip, automatic iambic Morse code keyer with two message memories. Perfect for portable or QRP operation or for integrating into transmitters or transceivers, its low power requirements and low component count make it ideal for limited space applications or battery operation. These instructions detail the use of the Rock-Mite / Hi-Mite compatible model.



Pinout Information		
Pin	IN/OUT	FUNCTION
1	Power	Vdd (2.5 – 5.5 V)
2	OUT	Keying output
3	OUT	XTAL shift output
4	IN	Button input
5	OUT	Sidetone output
6	IN	DASH paddle input
7	IN	DOT paddle input
8	Power	Vss (Ground)

Features of the PicoKeyer-RM:

- Direct drop-in replacement for the Rock-Mite or Hi-Mite keyer chip
- Low voltage - from 2 to 5.5 V
- Low current - typical sleep current .005 μ A, under 1 mA when keying.
- Simple one-button "menu" interface
- Works with any dual lever ("squeeze") or single lever keyer paddle or straight key
- Setup and message entry using your paddle
- Speed adjustable from 5 to 60 WPM
- Variable pitch audio sidetone
- Adjustable weight
- Selectable iambic Mode A or B or Ultimatic operation
- Tune mode with hands-free constant carrier or 50% duty cycle dits
- Beacon mode with adjustable 0 – 99 second delay
- Two message memories, 100 characters each can be chained together
- Memory "pause" allows manual insertion of QSO number, RST etc. into message
- Auto-incrementing QSO/serial numbering with repeat and optional cut numbers and leading zeros
- Paddle switching - select left or right handed operation
- Memory and parameter settings retained with power off
- Auto straight key detect, both memories available with straight key
- Menu selectable paddle, bug or straight key mode

Installation:

Remove U3, the PIC 12C508A, from your Rock-Mite. It's a good idea to save it just in case. Your PicoKeyer-RM is supplied with a 1 or 10 K Ω , 1/8 Watt resistor. This resistor is used to connect pins 1 and 4 of the chip. It is not necessary to modify your Rock-Mite to install this resistor. You may solder it in place on the underside of the PCB if you wish, or tack solder the leads to the chip pins near the body of the new chip. An even easier way is to trim the leads to approximately 3/8" and simply insert the leads into the U3 IC socket before plugging in the chip. The leads should plug into the locations for pin 1 and pin 4 before the chip is inserted. You should still be able to install the chip into the socket without any trouble. Make sure you have the IC oriented properly!

Operating with the PicoKeyer:

One momentary pushbutton switch input is used just like the original Rock-Mite configuration. A single, brief tap of the button will switch the oscillator offset the same as the normal Rock-Mite chip. There are a couple of significant differences, of course! The PicoKeyer-RM has a more extensive setup menu and two message memories that can be programmed with up to 100 characters and word spaces each.

Tapping the dot paddle while pressing the button briefly (less than half a second) will send the contents of Message Memory 1; tapping the dash paddle while pressing the button briefly will send the contents of Message Memory 2. Holding in the pushbutton more than half a second will tell the keyer to enter setup mode. In setup mode the keyer will use the sidetone only and will not key the transmitter. As you hold in the button the keyer will cycle through the available menu choices. You can simply release the button when you hear letter corresponding to the item you want to check or change. Once you finish with that menu item, press and immediately release the button to exit the menu, or hold the button down to advance to the next item.

Menu Functions:

S	Speed: The dot paddle will decrease the speed, or the dash paddle will increase it. Holding either paddle will continuously increase or decrease the speed, with a dash or dot sent at the new speed for each step. When the paddle is released, the keyer will send the current speed setting. To change the speed up or down one WPM simply tap the appropriate paddle. Speed may be set from 5 to 60 WPM.
U	Tune mode: Tune mode is used to send either a steady carrier or a series of dits for adjusting or testing your station equipment. While in tune mode, the paddles act as on/off toggle switches. Tap the dash paddle to turn a steady carrier on or off. <i>Use with caution</i> - don't overheat the 2N2222A final PA! Tap the dot paddle to start or stop a continuous stream of dits. This gives you a 50% duty cycle signal that is preferred by some operators as a way to tune up with less stress on final PA, tuner and antenna components.
M	Memory: Two message memories are available, M1 and M2. The dot paddle is used to select Message 1, while the dash paddle selects Message 2. When you enter Message mode, message M1 will be the default selection. You have a choice of actions available to you when in memory mode, selected by sending a single character from your paddle: <ul style="list-style-type: none">• Send the number 1 or 2 to select a message memory. The keyer will respond by sending 1 or 2 to confirm.• Send P (Play) to listen to the contents of the currently selected memory. The keyer will play the message, followed by the Morse prosign <i>AR</i> and the message number.• Send R (Record) to record a new message. If a message already exists it will be erased and replaced. The keyer will respond with <i>K</i> to let you know it is in record mode. Enter your message, with exaggerated word space but normal spacing between characters. If you make a mistake when recording the message, just send 8 (or more) dits and the keyer will backspace one word. You will hear a single dit to confirm this (two dits means you are at the beginning of the message). Tap the setup button once when you are finished recording. The keyer will send <i>R</i> and the message number to indicate the end of the message. You can then Play the message back.• Send C (Continue) to add onto or edit the message. The keyer will play the current message, then enter

	<p>Record mode. You can backspace over existing words if needed. You can use the R, P and C commands to listen and change your message until you're satisfied. Each memory can hold up to 100 characters. If you send something other than 1, 2, P, R, or C the keyer will respond with "?" and let you try it again.</p> <p>Several special prosigns may be used in messages. A prosign is a special character that is written as a combination of letters, but must be sent as a single character (like AR or SK). When playing back a message in setup mode you will hear the prosign itself, not its effect – message chaining, QSO numbers, pause and beacon mode are inactive while in setup mode. For example, you will hear RW instead of the word to be repeated.</p> <ul style="list-style-type: none"> • The special prosign "RW" (-.-) will repeat the last word, including the word space after it. This can save a lot of memory space, since each RW prosign takes up only one character position in memory. For example, to send a 3x3 CQ, you can simply store "CQ <RW><RW>DE K0QRZ <RW><RW>K". This can save a lot of memory locations. • The special prosign "NNN" (-.-) is used to chain the message memories. This should be entered as a single character at the end a message. The next message will be played immediately when NNN is encountered. If you store NNN at the end of M1, the keyer will chain to M2. If you store NNN at the end of M2, the keyer will chain to M1. If both messages end with NNN, they will repeat until you stop it with the paddle or button. • To insert a pause in the message, use the special prosign "PS" (-.-.-). This will cause the message to pause while you manually send information such as QSO number, RST, etc. Tapping the setup button while paused will resume the message. <i>Hint: If you use PS, store it immediately following the preceding characters without a word space. In other words, store "UR RST<PS> ..." instead of "UR RST <PS> ...". This prevents you starting to send before the word space completes, which will terminate memory playback completely.</i> • To use BEACON mode, insert the special prosign "BN" (-.-.-) at the end of your message. This will cause the keyer to delay for the number of seconds set with the B parameter (see below) and re-send the message. You can terminate beacon operation by tapping either paddle or the button. • To insert an extra word space, use the special prosign "IM" (-----). • To insert a steady carrier, send 9 or more dashes. The length of the carrier will be equal to the number of dashes, with no spaces in between. • To send the QSO number and increment it by one, send QI (--.-). • To re-send the QSO number and NOT increment it, send QR (--.-). • To decrement the QSO number by one and send it <i>via the sidetone only</i>, send QD (--.-). This is useful during contests if you need to "back up" one number and don't want to send it over the air. If you do want to transmit it, simply store QR and QD.
W	Weight: The keyer sends the current weight setting and waits for input. Again, the dot paddle may be used to decrease the weight or the dash paddle to increase it. Weight can be set anywhere from 1 (50% "light") to 5 (normal) to 9 (50% "heavy").
C	Curtis A or B mode / Ultimatic: The keyer will send the current mode, "A" or "B" for iambic modes or "U" for Ultimatic. Use either paddle to change the setting.
P	Paddle Selection: Simply hit whichever paddle you want to use for DITs. This can be used to switch from right-handed to left-handed operation without swapping wires.
B	Beacon Delay: The keyer sends the current beacon repeat interval and waits for input. Use the dot and dash paddles to decrease or increase the setting. Delays can be set from 0 to 99 seconds.
A	Audio Tone: The keyer will send a series of dits at the selected sidetone audio frequency. Use the paddles to increase or decrease the audio frequency as desired.
Q	QSO Number: The keyer will send the current QSO number. You can use the paddles to set the QSO number anywhere from 1 to 255. Note that when the QSO number is auto-incrementing, it can go from 1 to 65535.
R	Reset QSO number: Keyer sends "?" and waits. Tapping either paddle will reset the QSO number to 1.

X	Cut numbers: Keyer sends “Y” or “N” and waits. Y (ON setting) will send “cut numbers” for QSO number, T for 0 and N for 9. N (OFF setting) sends all numbers normally. Note that this affects the way QSO numbers are sent and the way settings (speed, beacon delay, etc) are sent in setup mode, but not other numbers in stored messages.
Z	Leading Zeros: Keyer sends “Y” or “N” and waits. Y (ON setting) will send leading zeros for QSO numbers (001, 002, 003, etc). Like the X setting, this affects the way QSO numbers are sent and the way settings (speed, beacon delay, etc) are sent in setup mode, but not other numbers in stored messages.
K	Key Selection: The keyer will send the current keying mode: “S” for straight key, “B” for bug, or “P” for iambic paddle(s). You can use the key or paddle to switch between modes. In “Bug” mode, dots are made automatically with the correct spacing and length with one paddle input, while dashes are made manually with the other. If straight key mode is selected while using a paddle, either paddle input will key the transmitter.
F	Factory Reset: Keyer sends “?” and waits. If you tap either paddle the keyer will be completely reset. All message memories will be wiped, and default settings will be restored (13 WPM, normal paddle orientation, iambic A mode, 5 second beacon delay, 800 Hz sidetone).
V	Version: Keyer sends the firmware version number.

Straight Key Mode:

The PicoKeyer will automatically detect and use a straight key when one is plugged in. When power is applied, the PicoKeyer looks to see if either paddle input is shorted to ground. If one is, the other input is assumed to be a straight key. This way you can plug in a straight key wired to a mono plug and use it without any changes or adjustments. Be aware that while the menu will still function, many parameters will not be adjustable (and would not apply to a straight key anyway). You will not be able to record messages while using a straight key. Note that you must plug in the straight key, THEN turn power on for this to work properly.

Both message memories will be available, which must have already been recorded using a paddle. Message 1 will be sent when the button is pressed and the key is tapped and released while the button is still held. Message 2 will be sent if the key is held down after the button is released. You may want to practice a little to get the hang of it, but after a little practice it will be easy. Remember:

- Button down – key down – key up – button up for Message 1;
- Button down – key down – button up – key up for Message 2.

Reset:

Should it become necessary to reset your keyer chip to its default state, you may hold both paddles while powering on. The keyer should switch to 13 WPM, normal sidetone and send a “?”. Release both paddles. If you are sure you want to reset the keyer, tap either paddle. This should have the same effect as menu option “F” – all settings and memories will be returned to their original state.

Support:

Should you need support, have questions, have feature requests or bug/problem reports, please feel free to contact me via email at n0xas@botkin.org or n0xas@arrl.net. I will make every effort to respond as quickly as possible.

Warranty:

All parts are tested and are guaranteed against defects for one year from date of purchase. This warranty does not cover damage due to incorrect assembly, improper soldering or wiring, overvoltage, static damage or other misuse or abuse. If you have problems, please contact me via email to arrange for an exchange or replacement part.