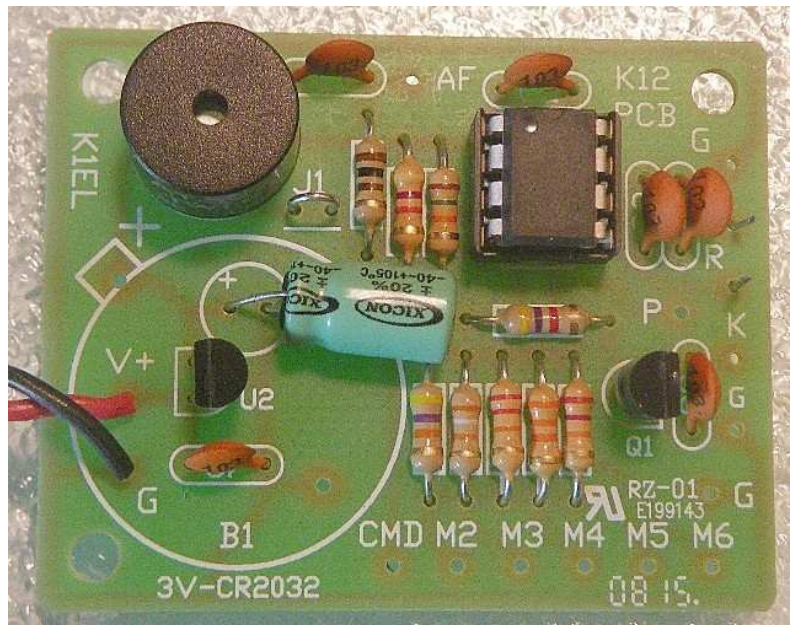


# K1EL K12 CW Keyer Kit Review

By: Edward R. Breneiser, WA3WSJ

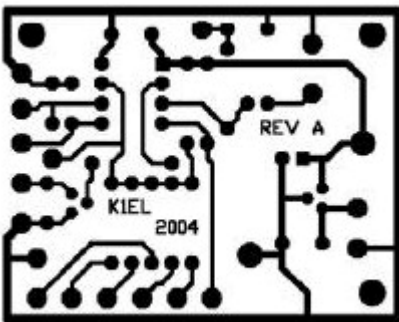
I was looking for a keyer to install in my [30M Walkabout Radio](#) and picked this keyer for its advertised functions. Here are the advertised specs on this keyer:

- Speed range: 5 - 59 WPM
- HSCW: 1000 - 6000 lpm
- QRSS Speeds (LOWFER)
- Messages: 236 letters/6 slots
- Embedded commands
- EEPROM message storage
- Dynamically allocated messages
- Backspace on message entry
- Dit and Dah paddle memory
- Bug, Iambic A or B, and Ultimatic keyer modes
- AF keying mode
- Adjustable inter-letter spacing
- Autospace
- Adjustable Weighting
- Keying Compensation
- Serial No. w/auto-increment
- Paddle swap command
- Beacon: 1 to 99 seconds
- Sidetone: TTL Square wave
- Adjustable Sidetone frequency
- 8 PIN DIP package
- Optional Speed control pot
- Fast paddle speed change
- Push-button user interface
- 22 easy to use commands
- Operating Voltage: 3-7 VDC
- Current: 1 ma, <1 $\mu$ A standby



The first thing I did was to open up the parts bag and check to see if I had all the parts. I looked like I was given all the parts, but not the 3.3V regulator IC LM2936Z-3.3. I did however have a L4931 -50 IC. After looking up the specs on this IC, it looks like I should install this 5V regulator because I don't plan to use the on board 3.3V battery. The manual does mention to use 5V when not using the battery option, but I couldn't find any reference to the L4931 IC.

The entire kit has only twenty parts and doesn't take long to put together at all. If you look at the picture above, you'll also see I placed C6 on its side as I want a lower profile to install this keyer in my Walkabout Transceiver. I will probably remove the speaker too as it just draws too much current for my Walkabout QRP Project.

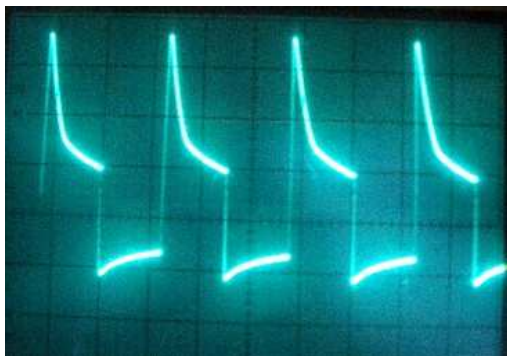


The PCB is only 2" x 1" and that's small enough to mount in a transceiver.

The first thing I looked at was the current draw from this keyer. The advertised specs state 1ma and < 1ua in standby. I checked this and found that this unit didn't meet those specs. I measured .5ma in standby or 500ua. The operating-current will vary from 16ma with the speaker in use to

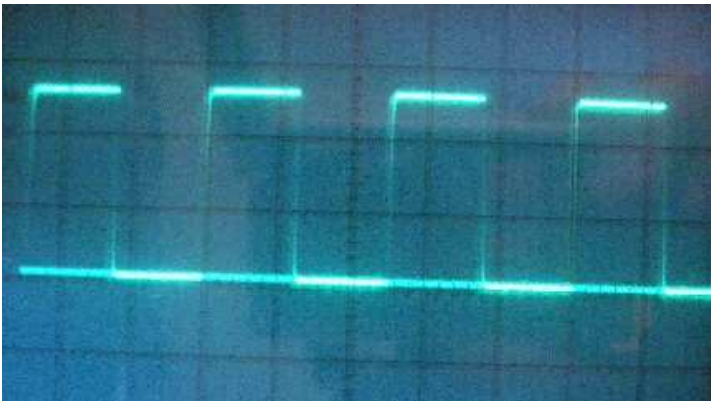
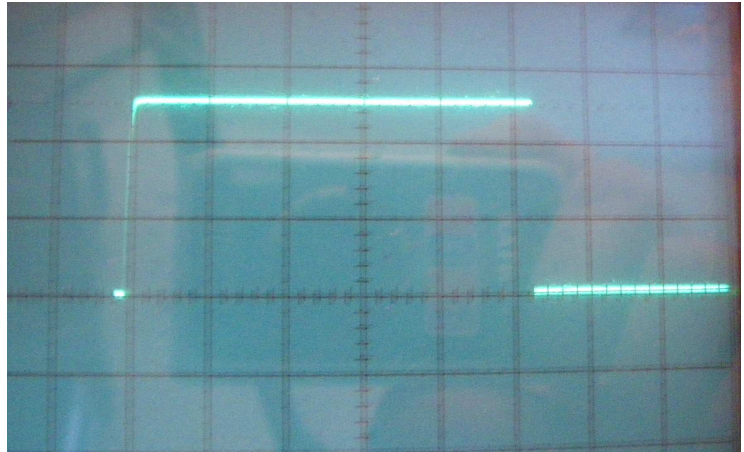
2ma without using the on-board speaker. Jumper-1 selects speaker or no speaker.

I emailed Steve, K1EL, and his response states, "the current specified is for the K12 chip running directly off a battery, that would be using the on board coin cell circuit on the board. A regulator will continuously draw current even when the K12 IC is in sleep mode." So there's the difference!



Next I looked at the audio output or side tone output waveform. The waveform (left) looked like it had a spike component to it. I questioned Steve about this and he stated that, "The little mini speaker presents complex impedance to the driver transistor and will distort the waveform. It's very hard to drive a non-resistive load with a square wave and maintain the square edges."

I then cut jumper-1 which removes the mini-speaker from the circuit. This really cleaned up the side tone output. So, if you don't need the speaker, just remove it from the PCB. This will save you 14ma and give you a cleaner side tone output. Plus it will lower the vertical profile of the keyer. Please note that installing C6 horizontally will also help lower the vertical profile of the keyer.



Next I looked at the keyer output waveform. This waveform looked good. It does have some slight "rounding" on the leading edge, but nothing to worry about here. The picture shown is a series of dahs. The keyer output looked great speaker or no speaker.

I now tried to use the Fast WPM Feature to change the keyer speed. The manual states, "press and hold CMD PB while you tap the paddles. One side increases speed, the other decreases speed. There's a two WPM change for each press..." This worked great, but after I turned off power, my speed wasn't saved in memory. I did later read in the manual that stated, "You can save your settings in internal EEPROM at any time by pressing the CMB PB until the K12 responds with an R and then a P. After I did this, my speed was saved in memory."

Now it was time to load a message into a few memories. Speaking about memories, please note that you only have 240 characters to use for the six memory slots.

I tried loading a message into one memory slot. My first attempt at this sounded like a record playing backwards! I said to myself, "that's not what I sent." I tried loading CQ CQ CQ de WA3WSJ WA3WSJ K. What played back was one CQ and a bunch of garbled characters.

I then as a last resort – again read the manual –hi! The manual states, "a message is entered directly on the paddles at a steady rate, making sure to leave proper space between letters." The key words are **leave the proper space between letters**. I then slowed my spacing between characters and all worked fine!

I also found out that you just can't stop to think what to load in next as the K12 will stop loading characters rather quickly after you stop sending. So I wrote down what I wanted to load into memory and all was fine.

If you want to find out how much memory you have left, just push the CMD PB and enter a "Q" for a command. Listen for the "F" and then a number that will be how much memory is left to use. I programmed a CQ message in memory one, an exchange in memory two and my call in memory three. This gave me 179 characters left to use.

By the way, the F Value comes right after the version number and not last as stated in the manual. After I entered the "Q" Command, here's what the keyer output:

```
001    Version #
F 179  Memory Unused
S 23   Keyer Speed
C 20   Command Input Speed
W 50   Weight
V 0J50 Keying Compensation
I 50   % Spacing Between Characters
```

One last item I looked at was the speed pot option. This would require an additional pushbutton and pot be installed with the keyer. You then simply push the Pot-Enable PB, listen to a string of dits and adjust the speed to suit you. The maximum pot-speed is 50WPM. One item I did notice was on the schematic the pot and PB are connected to "S." On my K12 PCB it is labeled "P." I decided not to install the speed-pot as it's just too easy to change keyer speed by the S Command or to use the Fast Speed Feature.

I really like this keyer and plan to install it into my Walkabout 30M Rig. I will probably only install two or three pushbuttons as I don't need all the six memories. Once you slow down on inputting between characters, loading into memory slots is a breeze. I plan to remove the speaker as I just don't need it and want to save my rig battery. The kit is easy to build and at only \$17.00 from K1EL, it's a buy!

<http://k1el.tripod.com/>