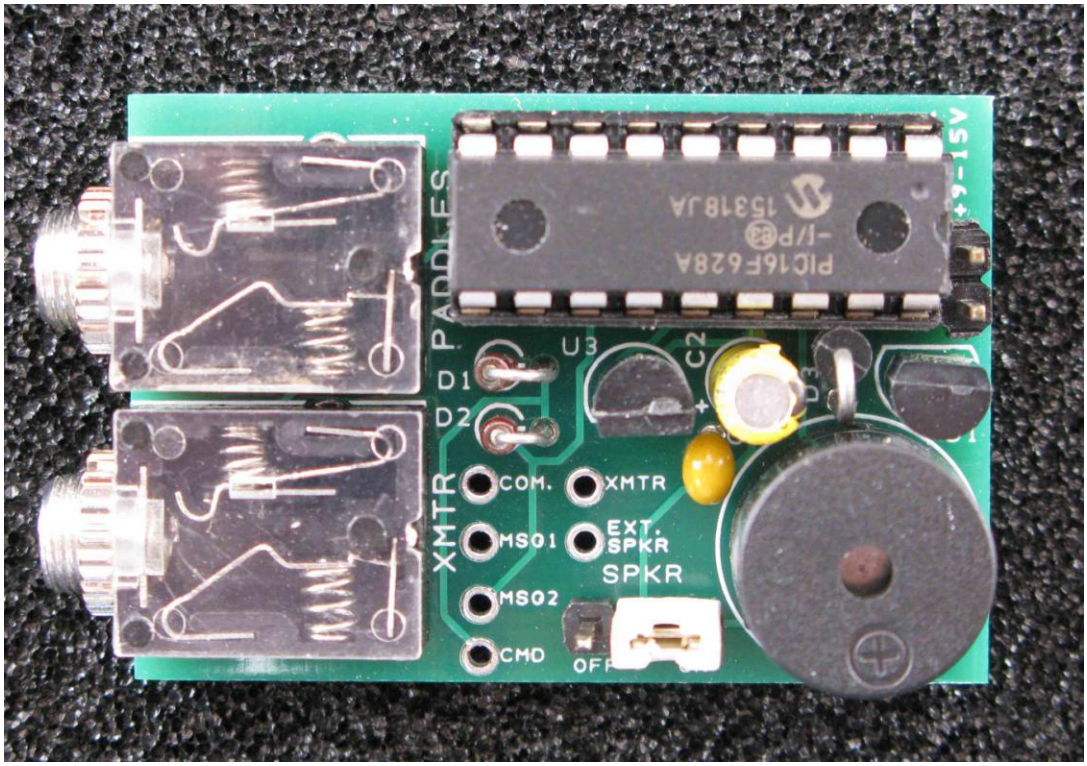
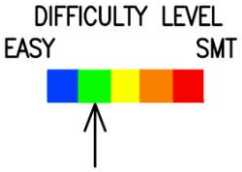
QRPGuys Mini Keyer Version 1



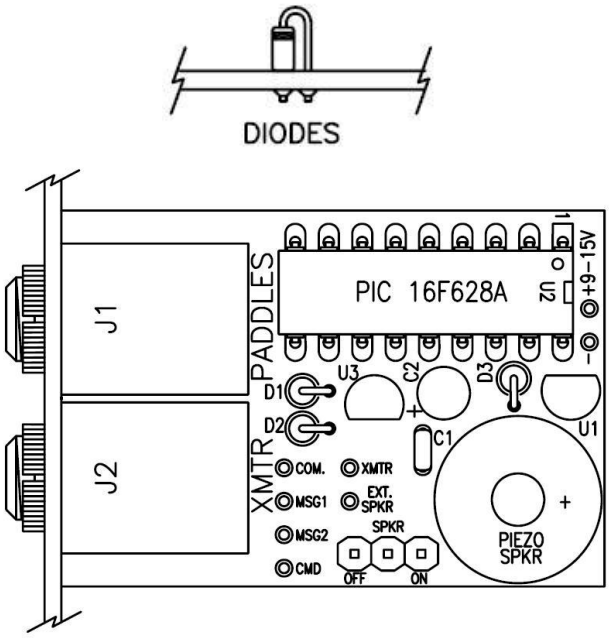


First, familiarize yourself with the parts and check for all the components. If a part is missing, please contact us and we will send one. You must use ***qrpguys.parts@gmail.com*** to request a part.

Parts List

1 – QRPGuys Mini Keyer v1 PCB
1 – U1, 78L05, TO-92 case
1 – U2, PIC 16F628A MPU, 18pin DIP
1 – U3, BS-170 field effect transistor
1 – D1, D2, 1N4148 diode, small glass, w/black band on one end
1 – D3, 1N4001 diode, black, w/silver band on one end
1 – C1, .1uF capacitor, marked 104
1 – C2, 10uF electrolytic capacitor
2 – 3.5mm stereo audio jacks
1 – 18 pin DIP socket
1 – 3 pin header
1 – Header shorting clip
3 – S1, S2, S3 momentary, N.O., panel mount, pushbutton switch
1 – Piezo speaker

We will assemble the smallest components first. All the components mount on the front of the board.



Parts placement figure

[ ] Install D1 and D2, the small glass 1N4148 diodes, vertically, with the black cathode band **"UP"** as shown in the earlier graphic. The circle diagram on the board must match the body of the diode to get the polarity correct.

[ ] Install D3, 1N4001, the black diode, vertically, with the silver cathode band **"UP".** The circle diagram on the board must match the body of the diode for correct polarity.

[ ] Install C1, .1uF capacitor, marked 104

[ ] Install C2, the 10uF electrolytic capacitor. Observe the polarity. The long lead is **"Positive"**, and must match the silk screened **"+"** on the board and placement figure.

[ ] Install U1, the 78L05 regulator, observe the outline shown on the board and placement figure.

[ ] Install U3, the BS-170 field effect transistor, observe the outline shown on the board and placement figure.

[ ] Install the 3 pin SPKR header.

[ ] Install the 18 pin DIP socket, with the notched end of the socket towards the end with the rectangular pad.

[ ] Solder J1, J2, the two 3.5mm audio jacks where indicated.

[ ] Install the piezo speaker where shown. Match the "+" polarity marked on the board and part when installing. The header clip is to enable/disable the piezo speaker.

[ ] Install U2, the PIC 16F628A into the dip socket, observing the pin 1 location. See graphic below.

When inserting IC's the pins are flared so that they can be retained by auto insertion tools. Gently rock them on a flat surface so the pins are parallel and they will insert into the sockets more easily.

This completes the pcb assembly.

The keyer board is designed to mount inside your chassis, and is held in place by the two threaded rings supplied with the 3.5mm jacks. All that is needed is to drill two 1/4" diameter holes, 1/2" apart and mount the board directly with the 3.5mm jacks that are soldered to the pcb.

Board connections:

1. COM pad goes to ground.

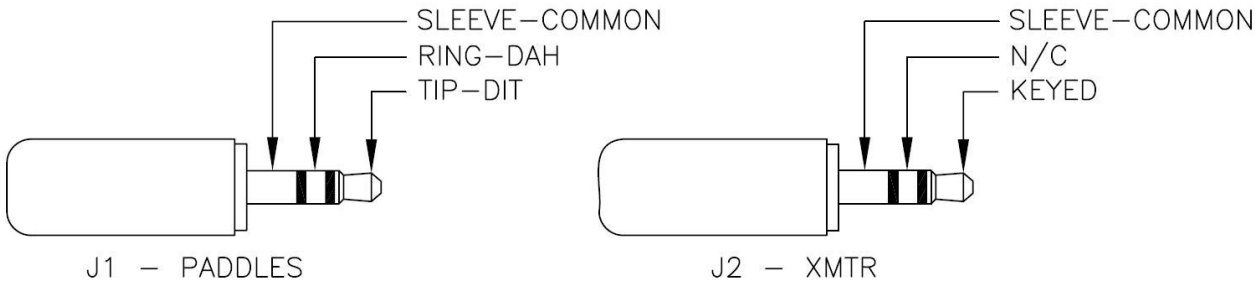
2. MSG1, MSG2, CMD pads go to each external pushbutton switch. These mount where they are convenient to initiate the pre-recorded messages and command functions. They each require a 9/32" diameter hole. One side of all the switches tie together to ground.

3. XMTR pad is the keyed output to your transmitter, or use the jack. It goes low on keying.

4. SPKR pad to an external speaker if needed.

5. Configure the 3.5mm plugs for the jacks on the pcb, as shown below.

The XMTR output at J2 goes low, when keyed.



Test Drive

Connect 9-15VDC at the board connections observing the polarity, and the speaker header to "ON".

Try sending some code. You should hear your sending at the default speed of 15WPM. If you don't receive these responses, the most common errors are faulty solder joints. Inspect carefully for a bridged, or a missed solder joint. Verify that the PIC chip is installed with pin #1 in the correct position. The next most common mistake is the polarity reversed on a diode. It is helpful to have someone else looks for errors, as you can easily miss your own mistakes.

The software for the PIC16F628A is in the public domain and used here with the consent of the author governed by the GNU General Public License, Version 2, June 1991. You are permitted to use and modify the PIC program for your own use. The chip is not locked, and can be reprogrammed. The complete documentation can be found at http://www.strozzi.it/users/carlo/hamradio/iz4kbs-keyer/

Using the keyer

The default speed of the keyer is ~15WPM. To change the speed you must enter the command mode. The command mode is initiated by pressing the "**CMD**" button for 1 sec., and the keyer will respond by sending "C" in a lower pitch tone. ***All command responses are sent in the lower pitched tone, indicating that you are in the command mode.*** Each touch of the "dah" side of the paddle will increase the speed one increment, "dit" will decrease the speed one increment. There are 31 increments to cover 6 to 45WPM. You exit the command mode by pressing the "**CMD**" button for 1 sec., or by sending a "D" character. The speed setting is stored in the PIC EEPROM, so it is not lost if you disconnect the power.

Most the commands listed, the keyer will respond with announcing an "R". The exception to that are the speed and tune commands, (E, T, U).

Entering a message

Button labeled "**MSG1**" has about 63 characters stored in the PIC EEPROM, and is stored if the power is disconnected. Button labeled "**MSG2**" has about 55 characters and is stored in the PIC internal RAM. This message will be deleted if you disconnect the power.

To enter a message, press the message button you want for about 1/2 sec. until the keyer responds with an **"M"** for message record. Enter your message. Then press the same message button to store it. The keyer will respond with an **"S"** for stored. If you exceed the character limit, the keyer will respond with an **"F"** for full, indicating that you have exceeded your limit and stops recording.

To play your recorded message, lightly tap the appropriate button.

Commands:

The command mode is initiated by pressing the "**CMD**" button for 1 sec., and the keyer will respond by sending "C" in a lower pitch tone. ***All command responses are sent in the lower pitched tone, indicating that you are in the command mode.*** You exit the command mode by pressing the "**CMD**" button for 1 sec., or by sending a "D" character.

Command D: Exits command mode.

Command F: Play forever. Loops playback mode. Ends by another "F", or tap paddle.

Command T: Increases CW speed.

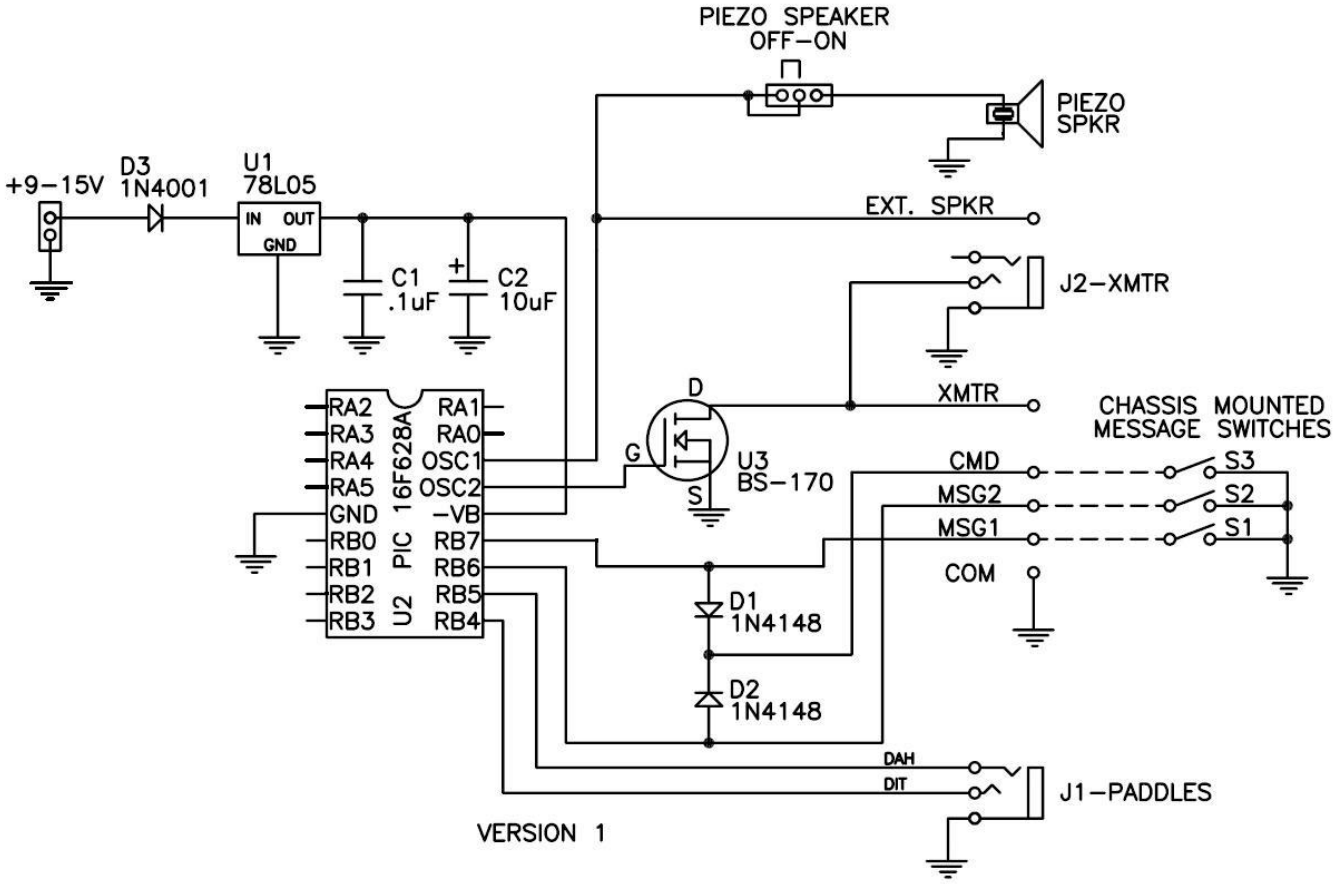
Command E: Decreases CW speed.

Command U: Turns the transmitter on for 30 sec. To end tap paddle.

There are some additional contest mode commands, Consult the complete manual at:

http://www.strozzi.it/users/carlo/hamradio/iz4kbs-keyer/

Schematic:



Notes: