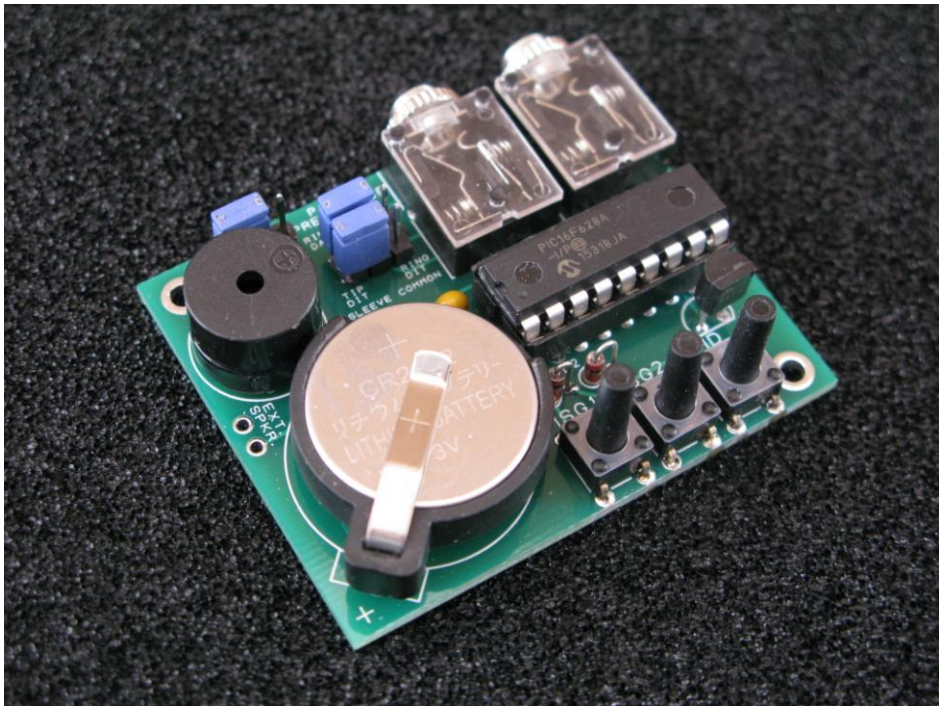
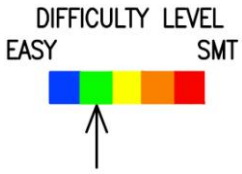
QRPGuys Mini Keyer Version 2



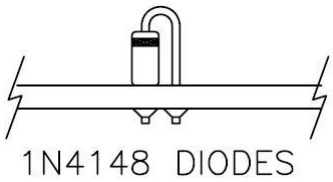


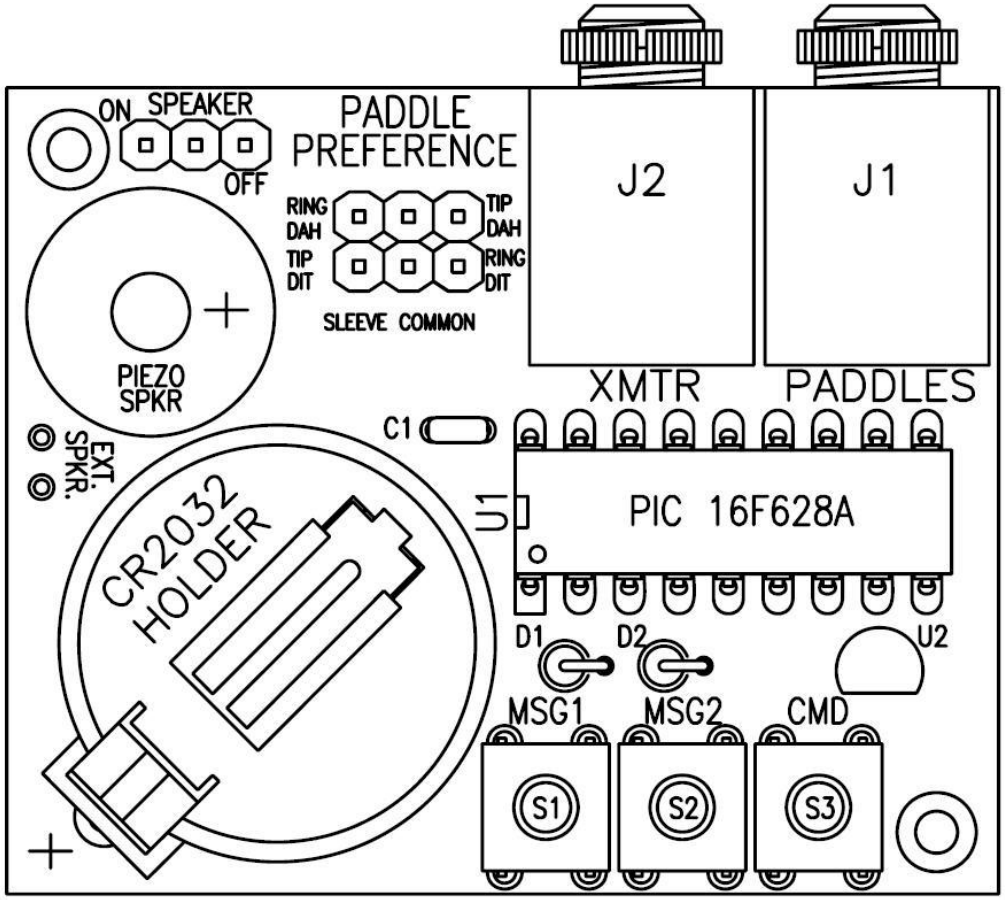
First, familiarize yourself with the parts and check for all the components. If a part is missing, please contact us and we will send one. You must use ***qrpguys.parts@gmail.com*** to request a part.

Parts List

1 – QRPGuys Mini Keyer v2 PCB
1 – U1, PIC 16F628A MPU, 18pin DIP
1 – U2, BS-170 field effect transistor
2 – D1, D2, 1N4148 diode, sm. glass, w/black band
1 – C1, .1uF capacitor, marked 104
2 – 3.5mm stereo audio jacks
3 – S1, S2, S3 momentary, N.O., PCB mount, pushbutton switch
1 – 18 pin DIP socket
1 – Piezo speaker
3 – 3 pin header strips
3 – Header shorting clips (Berg connectors)
1 – CR2032 coin battery holder

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





Parts placement graphic

[ ] 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 C1, .1uF capacitor, marked 104

[ ] Install U2, the BS-170 field effect transistor. Observe the outline shown on the board and placement figure.

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

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

[ ] Install S1, S2, S3, the PCB mounted pushbutton switches, flush with the board.

[ ] Install the three, 3 pin headers for SPKR and PADDLE PREFERENCE where shown.

[ ] 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.

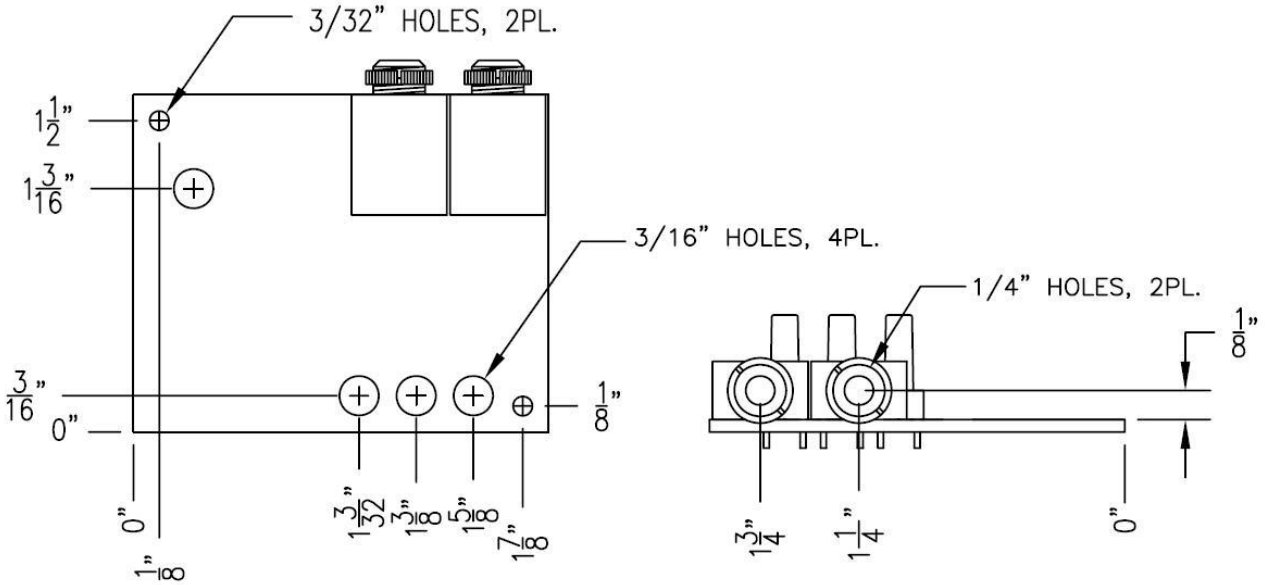
[ ] Install the CR2032 battery holder

[ ] Install U1, the PIC16F628A into the DIP socket, observing the pin 1 location.

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.

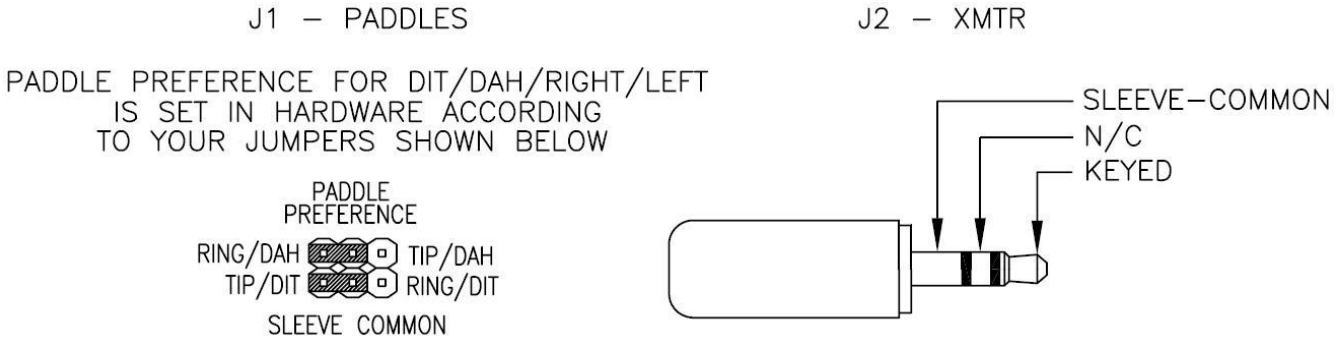
This completes the PCB assembly.

The keyer board is designed to use outside your equipment or installed into a box of your choice. If you decide to mount it in a box, there are mounting holes in opposite corners for #2 hardware. You will need two 3/8” long spacers for the pushbuttons to protrude through the chassis. The figure below will help with the hole locations. Alternatively, it is small and light enough to be mounted using the two threaded retainers for the 3.5mm jacks alone. In that case, drill two 1/4” diameter holes 1/2” apart. Position them close enough to the top so that the switch buttons protrude through the chassis.



Cable configurations for J1-J2:

The XMTR output at J2 goes low, when keyed. See below.



Test Drive

Insert a 3v. CR2032 lithium coin battery, **"+"** side up. Set your jumpers for paddle preference in respect to dit/dah/right/left. Place a jumper on the speaker header to "ON". Energy usage is very low (1mA active, 1*u*A standby) and the battery will last quite some time. Plug in your paddle.

Try sending some code. You should hear your sending at the default speed of 15WPM. If you don't hear anything, 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 battery.

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

Entering a message

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

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. This 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: