



Universal QSYer

Direct Frequency Entry for ICOM, Yaesu, and Kenwood Radios

Assembly Instructions

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Assembly Instructions

The kit is supplied with the following parts. Please verify that all parts are included before proceeding:

- Printed Circuit Board
- Pre-drilled box
- 16 Key Keypad
- Programmed 16F648A IC
- 812C50AY Voltage Regulator
- 4.00MHz Ceramic Resonator
- 100 ohm 8 Resistor DIP Network (Looks like an IC but is light brown)
- 10 uf electrolytic capacitor
- IC Socket
- 1 – 8 Pin header
- 1 – 8 Pin SIP socket
- Panel Mount 1/8 stereo phone jack

- Piezo Speaker
- Pushbutton
- hookup wire
- 9 volt battery clip

You will need a low wattage soldering iron (15 to 30 watts is fine) and either some strong glue or, better yet, a hot glue gun. Small hot glue guns are generally available at discount stores such as Kmart or Walmart for under \$3. In addition, a voltmeter will be very helpful.

Begin construction with the keypad and the 8 pin header. The header is the part that has the row of pins sticking up.

- Install the header in the keypad and solder it in place.

Install the header so that the middle 8 holes on the keypad are used (each pin should have a corresponding solder pad on the keypad). The header should be installed so that the side with the shorter pins sticks through on the side of the keypad with the keys. Thus the shorter pins are soldered to the keypad. Make sure there are no solder bridges between pads.

- Install and solder the 8 resistor DIP Network on the printed circuit board.

All parts are installed on the side of the printed circuit board that has the part numbers on it. The resistor DIP Network looks like a 16 pin IC but is light brown in color. It is not socketed. Install it in the spot marked RN1. Line up the notch on the network with the notch on the PC board. You may have to bend the pins slightly to get them to fit in the corresponding holes in the PC board.

- Install and solder the IC socket in place.

If the socket has an indentation on one end, make sure that this end matches the marking on the PC board. Also be certain that the socket is flush against the PC board before soldering.

- Install and solder the Ceramic Resonator.

The ceramic resonator is the blue part with 3 leads. There are only 2 parts in this kit with 3 leads; the resonator is the larger of the two. It should be installed in the 3 holes just to the left of RN. (There will be 5 more pins below it). It is not a polarized part, so it is impossible to install backwards. After installation, clip the excess leads.

- Install and solder the Voltage Regulator.

The voltage regulator is the other part with 3 leads. It is black and looks like a transistor. It is a polarized part and must be installed so that the outline matches the part outline on the PC board (at VR) After installation, clip the excess leads.

- Install and solder the electrolytic capacitor.

The electrolytic capacitor should be marked 10 uf. It should be installed at C1. Place the part so the longer lead is in the hole marked +. After installation clip the excess leads.

- Install and solder the 8 pin SIPP socket.

This part is installed along the edge of the board. It is not polarized.

- Connect and solder the 9 volt battery clip (indicated POWER).

Install the 9 volt battery connector in the holes that are to the right of the SIPP socket. The black wire goes to the hole marked – and the red wire goes to the hole marked +.

- Connect a battery and test for the proper voltage.

Turn the PC board so that the notch on the IC socket faces away from you. After the battery is connected, place the negative lead from your voltmeter on the center pin on the left side of the IC socket (pin 5) and the positive lead on the center pin on the right side of the IC socket (pin 14). The meter should read about 5 volts. After this test disconnect the battery.

- Solder wires for the piezo speaker and phone jack.

There will be a row of 5 unused holes on the notch end of the IC. Cut five 4" wires and solder one wire into each of these holes. The wires are for the following connections, but do not connect the other end of the wires yet.

The ceramic resonator was installed above these connections.

- Piezo Speaker
- Piezo Speaker
- Phone Jack Shield (connection on the side of the jack)
- Phone Jack Tip (connection furthest from the shield)
- Phone Jack Ring (the center connection)

- Install the phone jack.

The jack goes in the hole at the top of the box. It may be tricky getting the nut to screw on the jack, but with some effort it will work.

- Mount the keypad in the box.

Place the keypad in the plastic box so that the keys show through right side up. There will be more space in the box below the keypad than above it. Use hot glue (or glue) around the two sides and the top of the keypad to secure it in the box. It is best to not glue the bottom edge to ensure that there is enough room for the battery. If using a hot glue gun (which is the best approach) run a thick bead of glue all the way around the three sides of the keypad.

- Mount the reset button and piezo speaker in the box.

Place the pushbutton through the hole in the side of the box and carefully glue it in place. Make sure that you don't use so much glue that the button won't operate. The piezo speaker will be glued onto the keypad in the box. Mount it fairly close to the phone jack and the reset button, far enough from the header on the keypad so that there will be room for the printed circuit board to plug into this header. The speaker should face down (the side with the hole toward the keypad) and be glued in place with two dots of glue. Make sure that the glue does not get into the hole in the speaker. Allow the unit to dry.

- Install the IC. Make sure that the notch on the end of the IC lines up with the drawing on the printed circuit board.
- Plug in the printed circuit board.

Plug the printed circuit board into the keypad. The parts side of the circuit board will be between the keypad and the PCB itself. Make sure the holes on the two connectors line up properly.

- Solder the remaining wires.

Solder the wires from the five holes on the side of the PC board to their connections on the phone jack and the piezo speaker. It does not matter which piezo speaker wire goes to which connection on the speaker. Solder the remaining wires from the PC board (the ones near the capacitor) to the leads on the pushbutton. Use two of the pushbutton leads that are diagonally across from one another on the button.

- Finish up

Finish the assembly by installing a battery (if needed, see configuration instructions) and sliding it in just below the keypad assembly. Install the back of the box with the four supplied screws. Add the rubber feet to the bottom of the box. Retest the unit to make sure it still works. **Congratulations! You're done!**

Connect the cable between the phone jack and your radio. Refer to the section of this manual on "configuration" and verify that the keypad works properly.