



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 marked MDP1603)
- 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.

In 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 pins 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 – 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.

- Solder the Piezo speaker.

There will be a row of 5 unused holes on the top (notch) of the IC. Trim the piezo speaker wire so it is about 1 ½ inches long. Save the wire clippings. Connect the red lead from the piezo speaker to the hole closest to the ceramic resonator. Connect the black lead to the next hole down.

- ❑ Connect wires for the phone jack and reset button.

Use the wire trimmed from the piezo speaker to provide connections to the phone jack. Connect the black wire to the next hole down from the piezo speaker connection. Connect the red wire to the hole just below. Connect a 4" piece of wire to the last (bottom) hole.

Solder the phone jack on the ends of the red and black wires. The black wire should go to the pin on the phone jack on it's side (nearest the front). The piece of hookup wire goes to the middle connector on the socket. The red wire should go to the other pin on the rear (furthest from the ground pin).. You will see two additional holes in the PC Board near the capacitor (marked RESET). Cut two additional 5 inch pieces of wire and hook one to each of these holes.

- ❑ Install the IC. Make sure that the notch on the end of the IC lines up with the drawing on the printed circuit board.
- ❑ Test the unit.

Plug the keypad into the printed circuit board so that the parts side of the board is sandwiched between the keypad and the printed circuit board. Thus the printed circuit board should not extend beyond the bottom of the keypad. Connect the battery and press the # key. You should hear a beep. 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.

- ❑ Mount the keypad in the box.

Disconnect the battery and unplug the keypad from the printed circuit board. Place the keypad in the plastic box so that the keys show through right side up. 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. Do not apply the glue too thickly in the area of the hole for the phone jack because you want to make sure that there is room to install the jack. Allow the unit to dry.

- ❑ Mount and wire the Reset Button.

You will find a small 5/32 inch hole in one side of the box. The pushbutton can be mounted on the inside of the box so that the button part is visible through this hole. Glue the switch to the inside of the box so that the button goes into the hole. Be careful when gluing the reset button to make certain that you do not glue the button so that it can't be pushed (or unpushed!). After the glue cools (or dries) 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.

- ❑ Finish up

Plug the printed circuit board into the keypad once again. Install the phone jack in the hole in the end of the case using the supplied hardware. Place a blob of hot glue on the back of the keypad and push the piezo speaker into the blob (the speaker hole should be towards you). It may be necessary to slide the speaker slightly under the printed circuit board to fit it in.

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