

Installation Procedure for the TT1254P2 LCD Kit in a Built Radio

This kit replaces the radio's original display board, PIC processor, and rear aluminum panel with updated components. No modifications are made to main radio board, save the attachment of a few wires from the kit's new LCD display board. These instructions show how to install the basic LCD replacement kit. Two optional kits are available to also replace the volume and clarifier pots and the antenna connector. Separate instructions detail the two optional kits.

Radio Disassembly and Removal of Components to be Replaced

For the first step, the original LED display board must be removed from the radio:

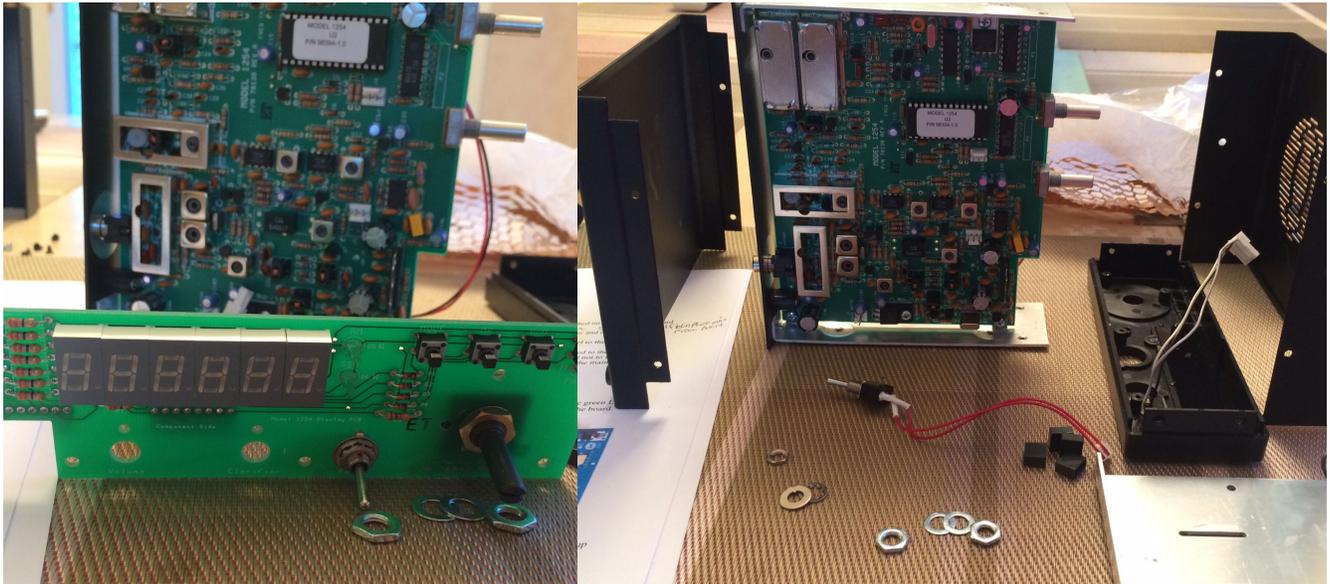
- Using a hex wrench remove the plastic tuning, volume, and clarifier knobs.
- Remove the four screws holding the top and bottom case covers then remove the covers.
- Unplug the cables for the headphone, power switch, and tuner that are attached on the main radio board from the front display board.
- Remove the four flat head screws holding the speaker/battery shelf on the inner case side rails then remove the assembly and unplug the speaker connector. Unsolder or clip the 9V battery leads at the circuit board level as it is no longer used for backup power.
- Reach into the inside area of the black front panel with a screwdriver and remove the five attachment screws that hold the display board to the front black plastic case.
- Unscrew the four flat head screws on the side of the plastic front panel to the rails of the inner aluminum case.
- Remove the plastic front case exposing the display board that is bolted to the main radio board by the nuts on the volume and clarifier potentiometers.



- ❑ Remove the retaining nuts on the potentiometers and carefully remove the front display board, unplugging it from the main radio board's card edge connectors. *Note: Do not flex or bend the potentiometer leads in the process of disassembly and assembly. These potentiometers if flexed can be easily broken, and they can even fail internally with normal use. An option to this upgrade kit is available to replace both of the radio's potentiometers if required.*

From the now detached front LED display board:

- ❑ Remove and save the four black plastic caps from the push button function switches.
- ❑ Unscrew, then remove and save, the power toggle switch and its cable from the display board. Note the order of the washers and nut for reassembly later on the new display board.



The LED display board with its attached tuning encoder is no longer required.

- ❑ Remove the processor IC from the main radio board. The processor is either the part shipped with the kit from Ten-Tec, or from a previous upgrade kit.



The original PIC processor used in the radio is also no longer required.

Reassembly

Front Case Window Replacement

- Remove the original smoked dark plastic window from the front plastic case. If the posts on the case around the window were damaged by melting, as per Ten-Tec's original assembly instructions, clean up the melted leftover fragments from the posts.
- A new clear plastic window is provided in the kit. Note that one side of the of the window is cut at a slight angle, so the part fits in correctly only one way. Remove the paper protective coverings on the replacement window and put it in place. Keep the window free of finger prints.

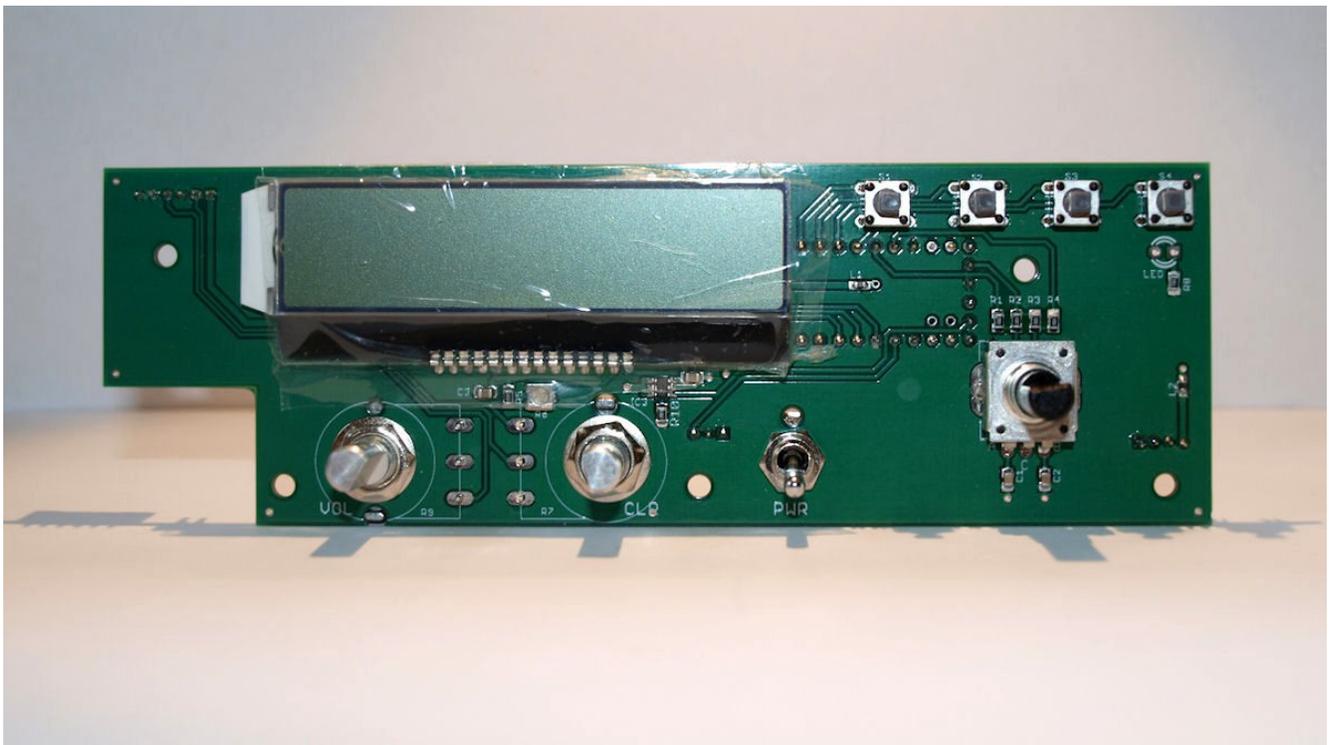
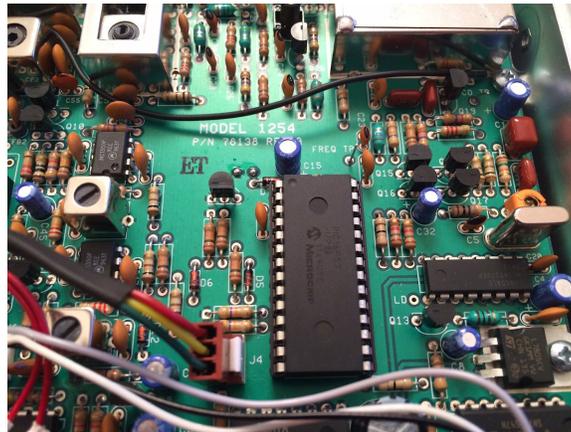


- Remove the protective paper from the front and back of the black plastic display mask supplied with the kit. If the case plastic posts were undamaged snap the mask on the posts on the case over the clear window. If the post are not available due to melting damage, line up the mask's mounting holes to where the posts formerly were, and use a small amount of tape on the edges of the mask to hold it in place on the case. Keep all parts clean and free of dirt, dust, and finger prints.



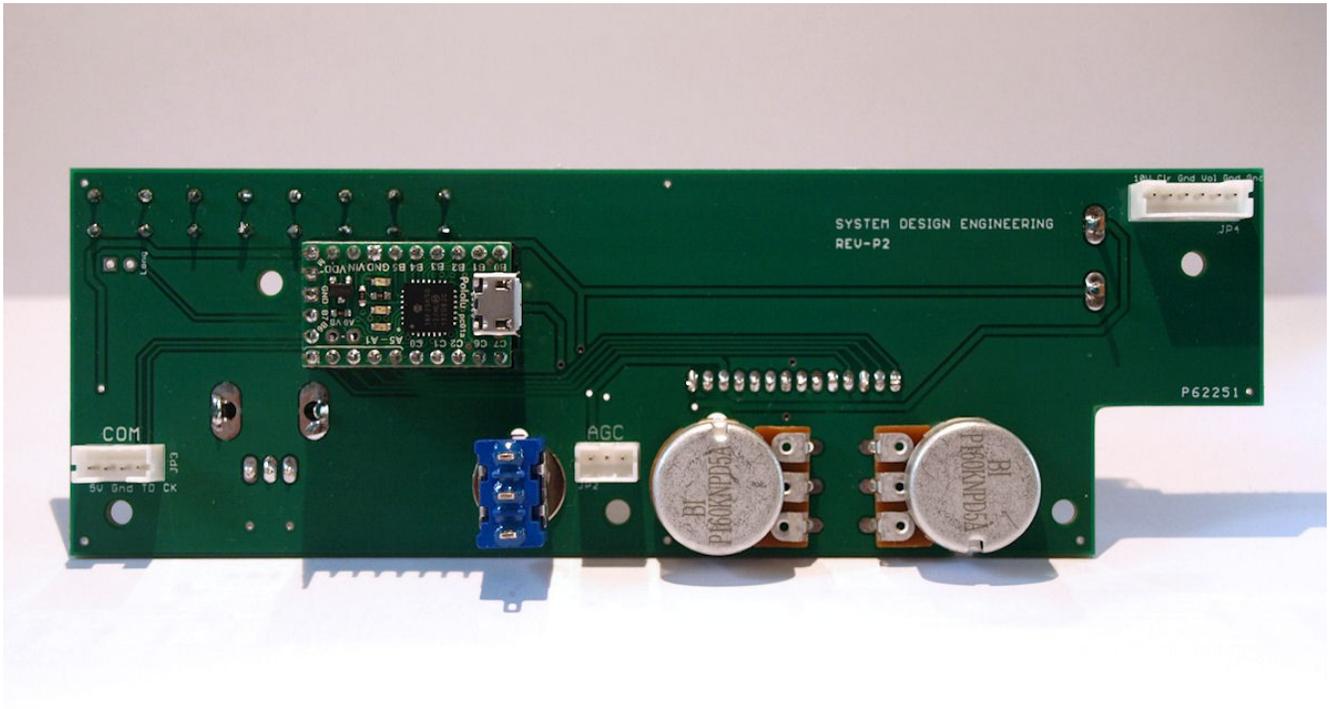
Main Radio Board Processor

- Insert the new PIC16F57 processor provided with the kit into the main radio board's processor socket. The notch on the chip must face the same way as the Ten-Tec processor did, toward the back of the radio. Make sure the pins are straight and aligned before pressing the chip into the socket.



Display Board Front
(shown with optional potentiometer replacement kit installation)

Note the small trimmer pot under the display on the front of the display board. This is the display contrast adjustment. It has been preset but can be readjusted with a small screwdriver for best viewing contrast when the radio is powered up and before it is attached to the front black plastic case.



Display Board Back

(shown with optional potentiometer replacement installation)

There are a number of connectors on the back of the LCD board. From left to right these are:

- 4 Pin COM and 5 Volt Display Backlight Power Input
- Processor sub-assembly daughter board with microUSB connector
- 3 Pin AGC Input
- 6 Pin 10 Volt power input and optional Volume and Clarifier connection feed through

FAST LED Installation

- Slip the LED supplied with the kit in place on the display board. The shorter lead goes in the hole closest to the outside of the board. Before soldering the LED, position the display board in the black plastic case. Position the LED into its place in the black plastic case to set the required length of the LED leads. With the LED in position solder the two leads, then clip off the excess lead ends.

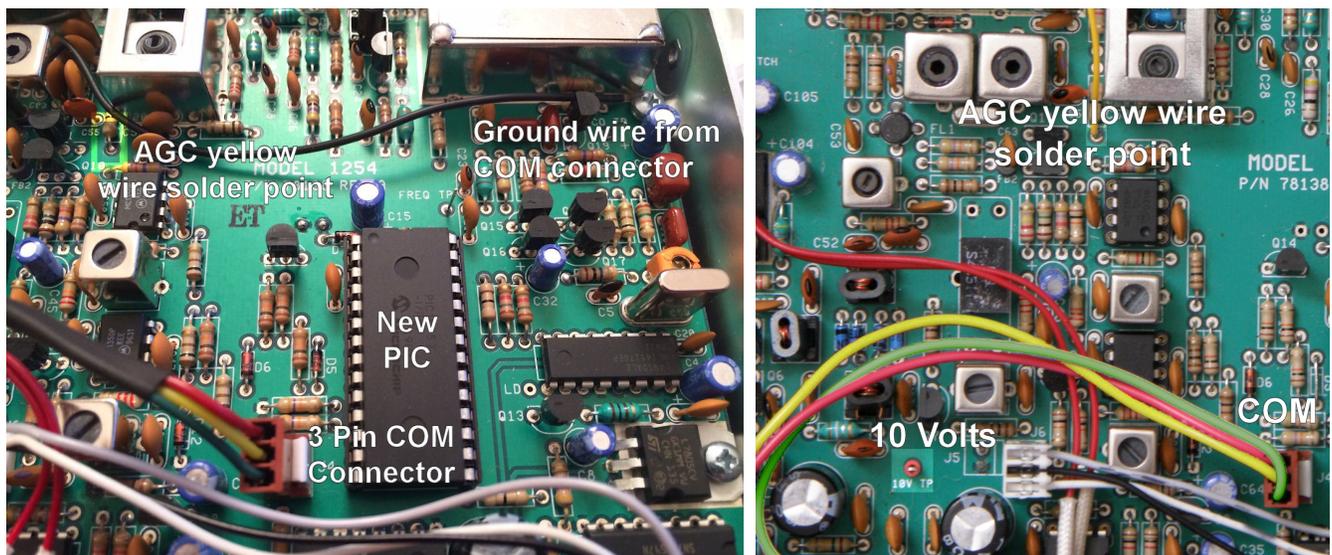


Assembly of the Display Board onto the Radio

- Mount the power switch onto the LCD display board just as it was connected on the original board.
- Plug in the six pin connector (with a single red wire) into the display board position marked JP4.
- Plug in the four pin connector into the display board position marked COM JP3.
- Plug in the three pin connector (with the single yellow wire) in the connector marked AGC JP2.
- Remount the four plastic caps to the switches on the LCD display board.
- Bring the display board close to the radio chassis and guide the loose cables to component and solder sides of the main radio board. Component side cables are COM and AGC. Solder side cable is the 10 Volt power cable and the USB extension cable. The original headphone jack cable on the plastic case (not yet to be attached) and the power switch cable on the display board connects to the component side of the main radio board.
- Slide the display board assembly over the pots on the main radio board and attach it with the pots' nuts and washers. Again be careful not to flex or bend the leads on each pot when mounting the display board.

Attachment of the loose ends of the cables from the display board to the main radio board.

- Plug the three pin connector on the free end of the COM cable to the three pin encoder header near the PIC processor on the main radio board. The black wire is attached to any convenient ground point.
- Solder the single yellow wire from the AGC connector to either end of resistor R66 on the main radio board.
- Solder the single red wire from the 10 Volt power connector to the spot marked "10V TP" on the main radio board. (This step is only for a kit that is not installing the pot option.)



Double-check the wiring: AGC, 10 Volt power, ground, and the PIC processor installation. At this point the radio can be powered up with its power supply to test the installation of the display board. If required, adjust the LCD's contrast using the adjustment potentiometer. There will be no sound until both the speaker and headphone connector cables are attached in a following step.

- Power down the radio and unplug the supply.

Final Assembly

- Remove the protective film from the LCD display surface. Keep the display surface clean during its final assembly.
- Position the black plastic front case over the display board. Verify that the black display mask is correctly aligned. Then using the five screws, mount the case onto the LCD display board.
- Using the four flat head screws attach the display/case to the aluminum main radio rails.
- Align and reattach the tuner, volume, and clarifier knobs. Note that the tuner shaft requires the supplied brass shim tube to match its 6mm shaft diameter to the ¼ inch tuning knob. Align the tuner knob setscrew so it is not over the D cutout area on the tuner shaft!
- Plug in the audio headphone connector to its socket on the main radio board.

Rear Panel Replacement

- Remove the Ten-Tec supplied rear aluminum panel by unscrewing its four screws.
- Take the kit's new replacement rear aluminum panel and mount the USB B connector to it with the two screws and washers provided. Holding the panel in the correct orientation, mount it on the correct side, with the arched part of the connector pointing upwards.
- Plug in the microUSB end of the extension cable to the microUSB connector on the processor daughter board sub-assembly that is mounted on the back of the LCD display board. Route the excess length so that it does not stress the daughter board assembly.
- Place the aluminum panel in place on the back of the radio and mount it to the case with its four screws.
- Plug the speaker connector into the 2 prong connector on the solder side of the PC board and reattach the speaker shelf to the sides using the 4 screws removed earlier.
- Replace the radio top and bottom covers.

