Installation guide for the Yaesu FT857 and FT 857D

Please read through this guide to the end **before** you begin this installation.

The installation of the BHI module in the 857 is much like the 897. The two radios are virtually the same design with mechanical packaging the main difference.

The installation of the BHI module in an 857 is very straight forward. However, it is strongly recommended that you have the proper tools and experience working with tiny Surface Mount Technology (SMT) components.

There is one part of the installation that needs extreme care. This is the connection to the Main PCB. Care must be taken to not overheat the board or apply any mechanical force to the pads where C1473 is mounted.   This is especially true on the pad where the blue wire and capacitor are connected. Just like the 897, this pad is connected to a blind via, meaning the connecting trace is buried inside the layers of the PCB. If this pad is lifted there is no way to repair that connection. Adding a long jumper wire from the top of the board to the back side of the PCB is the only functional repair possible. In the installation steps I will mention some *hints* I use to have successfully installed many of these modules with no issues. Keeping in mind that this radio is used for mobile applications, I add a few extra items such as heat shrink around the BHI module, tie wraps in a couple of locations and 5-minute epoxy to the PCB leads. This helps prevent any failure due to vibration over time.

Installation steps:

Remove the top three screws and 4 side screws. There are two screws for the speaker do not remove these.

Carefully lift the top cover and disconnect the speaker wire plug.

The BHI switch assembly is best located in the front righthand corner of the radio. It allows access when the radio is in mobile mounts and go boxes. *Hint* (use the top two vent holes as a starting point). I offset drill one hole and enlarge both holes to match the switch footprint. Other locations can be used, however, I have found most customers like this location.
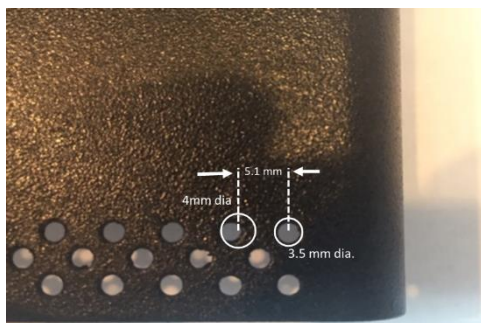
Once you have finished modifying the top cover set it aside.

Next: Locate the PCB mounting screw located in the front right corner of the radio. It is just below the ribbon cable connection. Install the BHI ground lug under that screw.

Hint (I install heat shrink around the module to prevent any possibility of a short circuit with long term vibration on a mobile radio.)


Next solder the red power wire to the output lead of the 8-volt regulator (green triangle). Next route the switch wiring under the felt wire hold down (blue circle). It is important to make sure the wires are routed in the access relief to prevent pinched wires when the cover is installed. *Hint* (use a razor blade to lift one side of the felt, then re-glue it back in place.)

When these steps are complete, tuck the BHI module in the righthand corner open space. Make sure the module is DSP chip is facing up and the module is lower than the chassis wall. *Hint* (you do not want the lid to press on the module and put undue pressure on the components. The module will tuck nicely in the corner with the lid gently holding it in place).
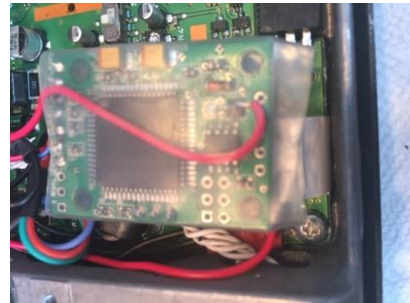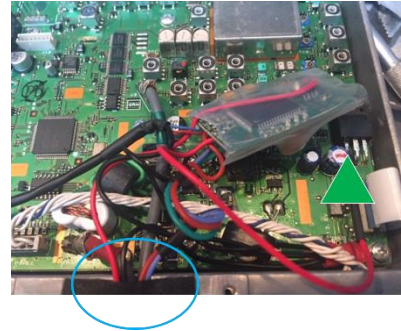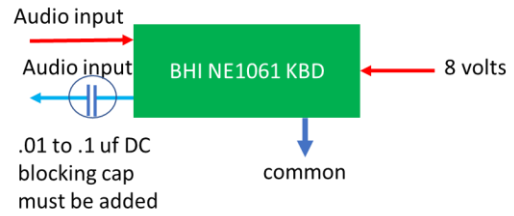

Next: In the next few steps, it is critical that you use caution when soldering on the PCB. I included an SMT explanation at the end of this instruction. If you are not SMT experienced, please read it now.

Now locate C1473. C1473 is located just behind pin 7 of IC Q1120. Be careful, there other circuits that look similar. I suggest you look at a service manual to accurately find this capacitor. *Hint* (Service manuals can be searched and down loaded from Ham helpful web sites free of charge.)
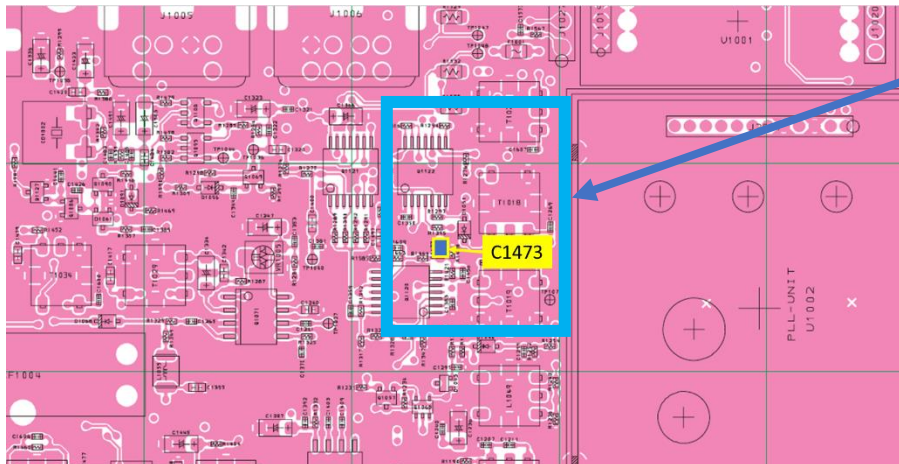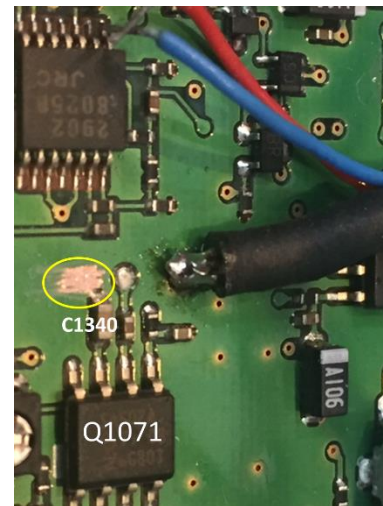

C1473

When removing C1473 use either a dual SMT tip on a temperature-controlled soldering station or two temperature-controlled irons with small (1/16 inch) tips. It is important to melt the solder on both ends of the cap at the same time and gently lifting the cap off the pads. **Hint** (I simply stand C1473 on end on the blue wire pad. This does two things: Provides the DC blocking coupling cap required for the circuit and prevents re-soldering the fragile pad.) If you do not use C1473, a leaded cap of a value .01 to .1uf will work.

Audio input

Audio input   BHI NE1061 KBD   8 volts

.01 to .1 uf DC
blocking cap   common
must be added

Just remember If you are heating pads for more than a few seconds stop and let the board cool.

Do not attach any wires from the connecting cable to these pads at this time.

Next locate C1340 and IC Q1071. Remove a small area of solder mask as seen in the picture, adjacent to C1340 ground pad (yellow circle). Trim the shield ground lead to a short stub as seen in the picture. Pre-tin the exposed copper and solder the shield lead to the board and ground end of C1340. Make sure you have cleared the adjacent lead and not shorted it. **Hint** (for this solder connection I use a ¼ wide tip to insure good flow and a strong mechanical connection. The red and blue wires are intentionally small gage. With the cable now firmly secured via the shield, there is no stress on the pads from the cable.

Now solder the red and blue wire with series capacitor to the pads where C1473 was mounted as shown here. Check the service manual for a clearer picture.

After the BHI input and output leads are connected I place a tiny drop of 5-minute epoxy to the cable end and use it to secure the red and blue wires to the top of IC Q1120. The finished work should look like this.
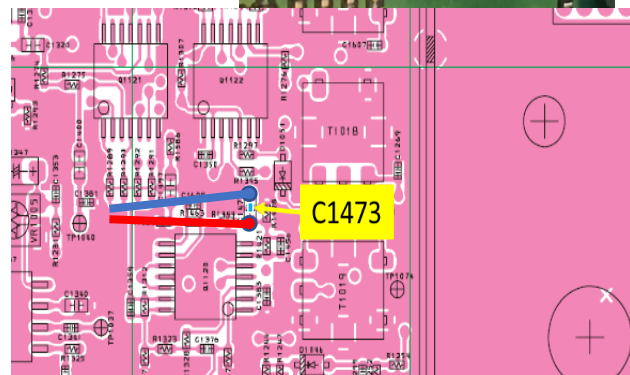
I put in a service loop and tie wrap the cable as shown.

The next step is to secure the switch to the double-sided tape on the aluminum bracket provided. Route the switch wires along the top frame of the fan. Use a cut piece of the supplied double-sided tape to hold the switch-bracket in place. This tape is only used to place the switch in position. The compression of the lid to the frame holds the switch in place during operation. Connect speaker wire and place the lid in position and install screws. Install the BHI label, read the BHI manual and enjoy.

I offer turnkey installation.
Please contact me for pricing. International customers welcome.
Andrew Ruggiero WD8BWW
Email: andyit28@gmail.com
73s WD8BWW.

Explanation of SMT: When SMT boards are assembled the parts are laid onto pads with solder paste already applied to the pads. The paste holds the parts in place. The boards then travel through an oven with multiple zones, which step the entire assembly up to the reflow solder temperature and then zones to cool the board assembly. At the reflow point 100s to 1000s of components are all soldered in the same few seconds. This process produces low mechanical stress and controlled solder amounts. When complete, this process produces highly reliable and rugged assemblies.

SMT, however, does not do well with localized heating or mechanical stress, especially if the two are combined. When working with SMT components and PCBs this must be kept in mind. Whether you are doing a mod, an installation like this, or a repair, this needs to be understood. The technology is not designed for localized heating or mechanical stress. Because of this many radio service manuals dedicate a few pages on SMT repair guidance. I have lost track of how many customers have sent me radios to repair that, unfortunately, have been damaged by not using the proper tools or proper technique.