

ONE BOARD FILTER™

For the Yaesu FT-817 & FT-817ND

The ONE BOARD FILTER (OBF-817) is an accessory for the YAESU FT-817 and FT-817ND. W4RT Electronics provides the OBF-817 as a high-performance, lower-cost alternative to the YAESU optional filters for the FT-817 and FT-817ND, and the OBF-817 allows the inclusion of two filters rather than the single one by YAESU. The filters used in the OBF-817 and FT-817ND are the famous Collins Mechanical filters. The 7-pole CW filter has a 500-Hz bandwidth and the 10-pole SSB filter has a 2300-Hz bandwidth. Proper termination is included on the PCB. For simplicity, FT-817 should be taken to also refer to the FT-817ND in the following material.

Please READ the following BEFORE INSTALLING your OBF-817. Installation is not trivial, so you should be confident that you have the tools (SMT level), skills and experience needed to do the job correctly. You can damage your FT-817, so be very careful. W4RT Electronics assumes NO responsibility for any damage that may be caused by your installation. Further, W4RT Electronics doesn't provide technical assistance during your installation. If you need help, then have W4RT Electronics perform the installation for the stated fee on www.w4rt.com BEFORE you attempt the install. W4RT Electronics is not a radio repair facility. If you damage your radio, you will have to send it to YAESU or another repair shop.



Figure 1

1. Remove the top cover from the FT-817 by carefully removing the seven (7) retaining screws. Retain these screws to replace the top cover. Look in your FT-817 Operating Manual if you are unsure of which screws to remove. As you take off the top cover, remember to disconnect the speaker plug from the MAIN-UNIT PCB.
2. Next remove the two (2) screws on the mic jack side of the radio and the one (1) bottom screw, each denoted by the yellow arrows in Fig. 1. Retain these screws to reassemble the radio.



Figure 2

3. Referring now to Fig. 2, carefully unplug the rear ribbon cable connector (blue arrow) and two (2) coax connectors (turquoise arrows) from the PCB shown in Fig. 1 by the red arrows.
4. Carefully lift the brown color piece on the front ribbon cable connector (red arrow) and remove the ribbon cable connector.
5. Remove the five (5) screws holding the MAIN-UNIT PC board in place (yellow arrows). Retain these screws to replace the PCB.
6. Next, place the radio on its side opposite the mic jack and carefully push up on the MIC/EAR jack housing to remove the MAIN-UNIT PCB.
NOTE: The connector shown in the yellow circle in Fig. 2 is connected to a three (3) pin plug mounted in the chassis below the MAIN-UNIT PCB. Take care when removing the PCB. You will have to realign the plug and jack when reassembling the radio.
7. Note the location of the MuRata filter (white arrow in Fig. 2) that will be removed to allow installation of the OBF-817.

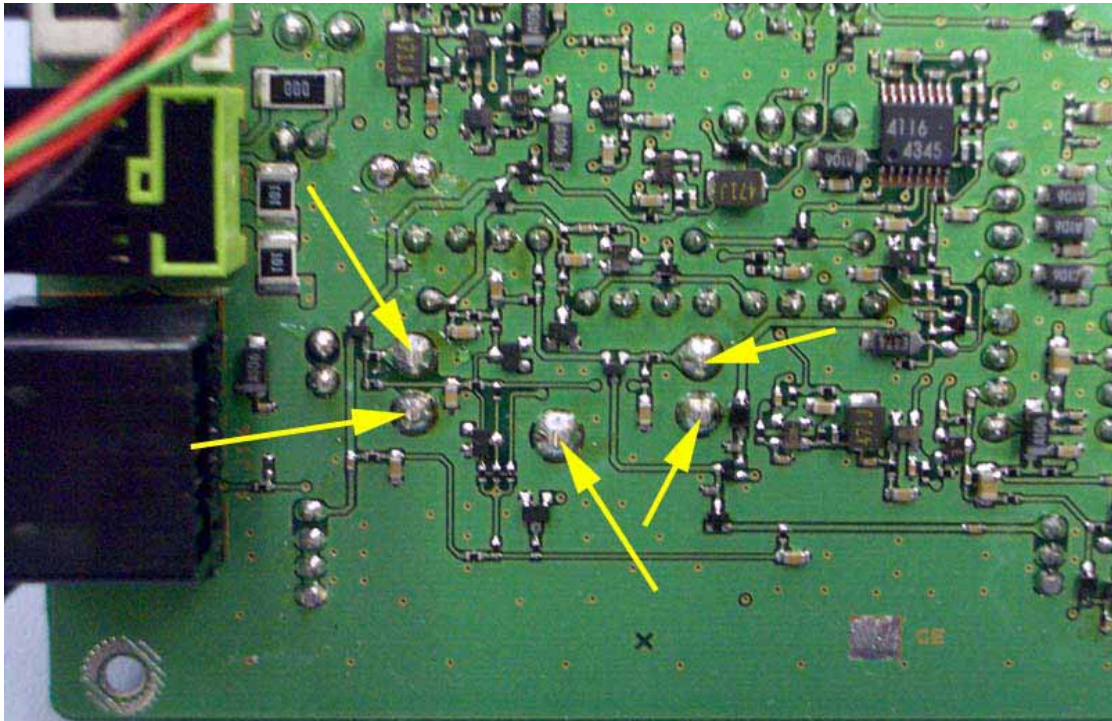


Figure 3

8. To remove the MuRata filter from the PCB, CAREFULLY remove the solder from the five (5) points shown in Fig. 3 and pull it off from the other side of the PCB. **WARNING: Don't use too much heat or damage the various SMT components located near these five points.**
9. Now, CAREFULLY remove the MuRata filter and place it aside since it is no longer needed for the FT-817.

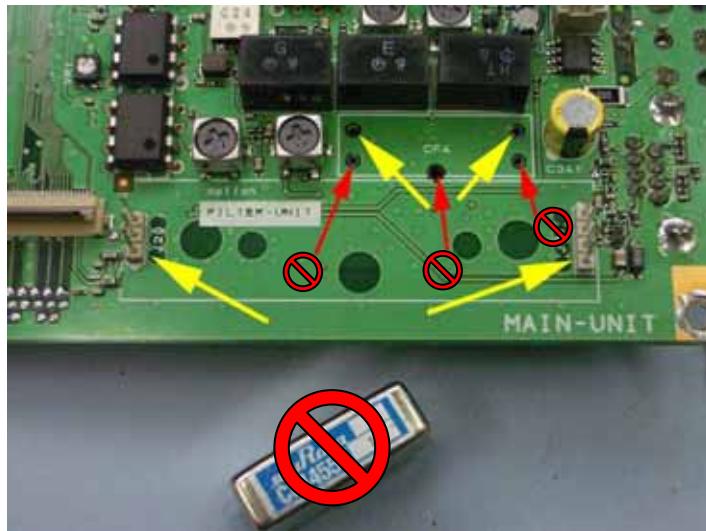


Figure 4

10. Locate the OBF-817 to be installed and notice the two (2) wires coming off on the OBF-817. Now examine Fig. 4 and observe the two holes denoted by yellow arrows in the CF4 area (where the MuRata filter was mounted) and the two (2) connectors (J20 and J21) also shown by yellow arrows. **DO NOT** insert anything into the holes in CF4 denoted by the red arrows.

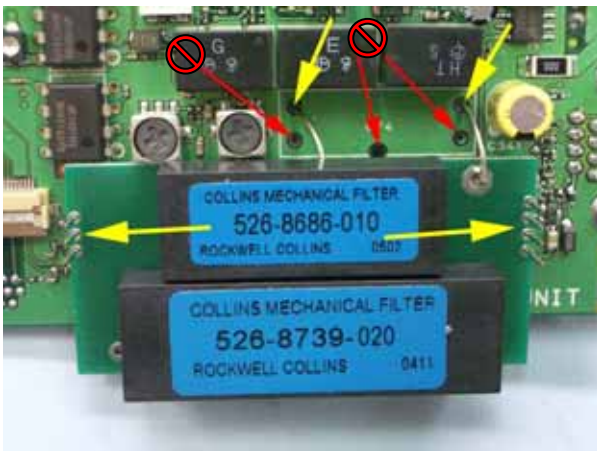


Figure 5



Figure 6

11. CAREFULLY place the two (2) wires from the side of the OBF-817 into the two (2) holes shown by yellow arrows in Fig. 5. Also, carefully guide the pins from J20 and J21 on the PCB through the holes (yellow arrows) on the OBF-817 as can be observed in Fig. 5. It is best to attempt to route the wires and guide the pins at the same time you place the OBF-817 onto the FT-817 PCB. **DO NOT** put wires in the holes denoted by the red arrows.
12. Now, CAREFULLY solder the four (4) locations denoted by yellow arrows in Fig. 6. These are the two pins from each J20 and J21 that are the farthest from edge of the PCB.
13. Next, turn the PCB over and solder the two wires protruding through the PCB from the OBF-817. Cut excess wire length appropriately.

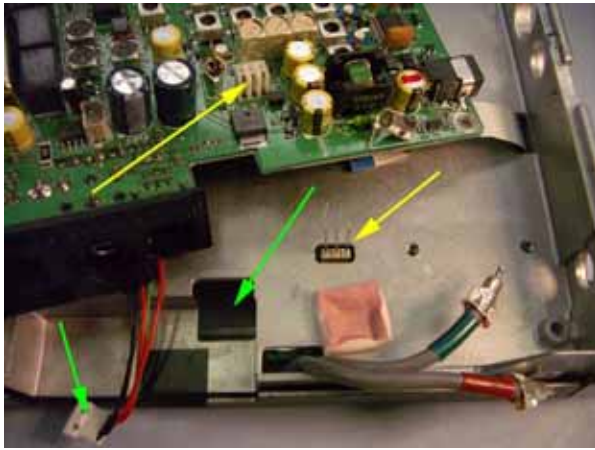


Figure 7

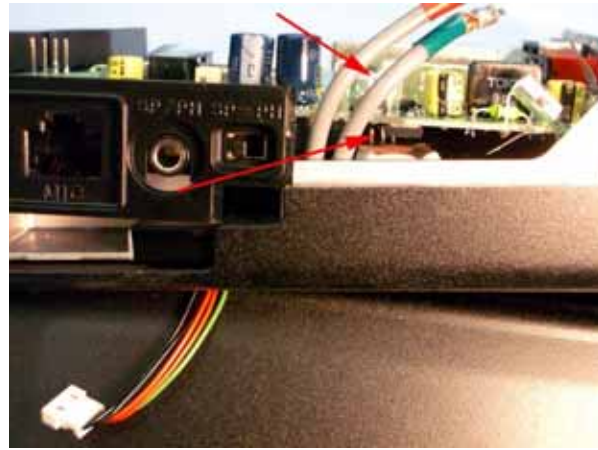


Figure 8

14. To reinstall the PCB, you need to route the battery lead through the cutout in the chassis (see green arrows in Fig. 7) and carefully align the three (3) pins sticking out of the chassis into the mating connector on the PCB (see yellow arrows). This can be a little tricky. Look at Fig. 8 also. The arrows show the pins and jack mating.
15. Replace the five (5) screws that hold the PCB in place and reconnect the two (2) ribbon cables and two (2) coax connectors. Replace the two (2) side screws and the bottom screw.
16. Reconnect the speaker cable as you reseal the top cover. Replace all top cover screws.

OPERATION

The new SSB filter replaces the function of the MuRata filter while the CW filter functions in the role of the Optional Filter. Operation of the One-Board Filter is straightforward.

1. Set Menu #38 to CW. (If you do a system reset, the default is OFF.)
2. When you are in the CW, CWR, or DIG modes, you can turn the CW filter ON or OFF by pressing the NAR key (Function Row 7, Key C).

On receive using the new SSB filter, you will experience the greatest benefit if you use a good-quality combination speaker or headphones. You will hear a modest improvement even using the FT-817's internal speaker.

You can also improve your overall talk-power by adjusting the transmit-carrier insertion to place your voice-power spectrum optimally in the SSB filter's passband. One approach to perform this adjustment is as follows:

1. Use a remote receiver of good quality to receive the transmitted signal from your FT-817.
2. Attach a true rms voltmeter to measure the audio output of the remote receiver. The averaging time constant should be a few seconds.
3. Read any text you desire in a monotone voice with your normal pitch for 30-60 seconds and have the voltmeter value recorded.
4. Now adjust the transmit-carrier point (T LSB CAR → Menu #56; T USB CAR → Menu #57) and repeat step 3. Adjustment of this parameter shifts your voice in the SSB filter passband.
5. After you have collected adequate data, select and store the optimum value for both USB and LSB.

You may be able to improve your receive performance by adjusting the receive-carrier point (R LSB CAR → Menu #54; R USB CAR → Menu #55). This can be done by "ear" or by using the true rms voltmeter to monitor the FT-817 audio output and adjusting the receive-carrier point while monitoring the monotone read text.

NOTE: If you are interested in understanding more about the performance of these filters, then see the *QRP Quarterly* article by K9QI (<http://www.w4rt.com/obf/QQ-Oct-01-Filter-Review.pdf>). Although the radio in the article is the Yaesu FT-817, both the FT-817 and the FT-817ND use the MuRata CFJ455K ceramic filter as the stock filter. The performance of the filters in both radios is essentially the same.

WARRANTY: ONE BOARD FILTER is warranted for a period of one (1) year from the date of purchase to be free of electrical defects in materials and workmanship. If the ONE BOARD FILTER is determined to be defective, the defective item(s) will be repaired or replaced, at the sole option of W4RT Electronics, provided that the purchaser returns said item(s), postage prepaid, with proof of purchase to W4RT Electronics, ATTN: Technical Support, 3077-K Leeman Ferry Rd, Huntsville, AL 35801. Include a description of the problem, daytime phone number, email address, and return mailing information. Any modification to the ONE BOARD FILTER by purchaser voids the warranty. The warranty applies only to the original purchaser and is not transferable. Any damage to the ONE BOARD FILTER due to the installation method or technique used by purchaser is the sole responsibility of purchaser and W4RT Electronics has no liability whatsoever.

22 March 2005

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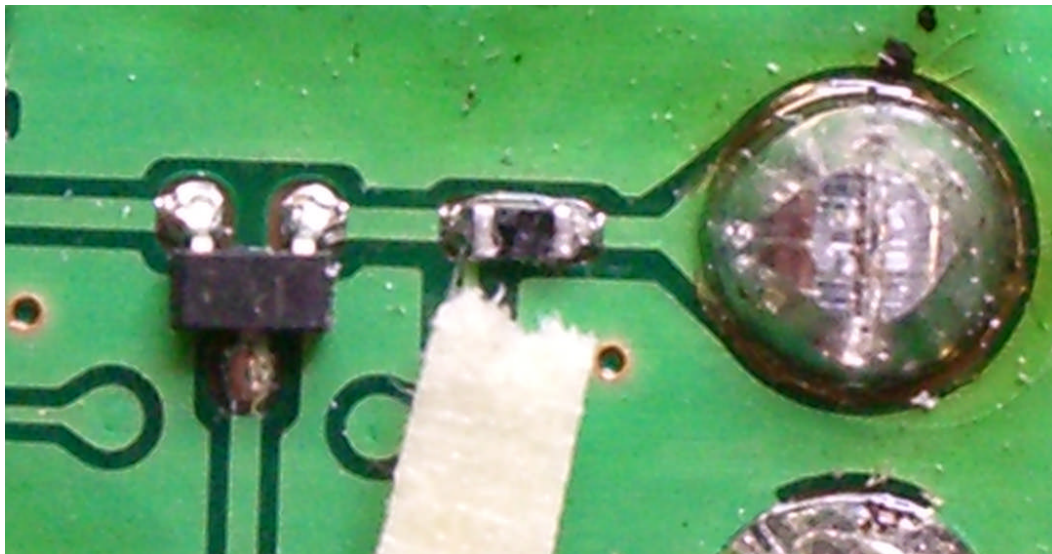
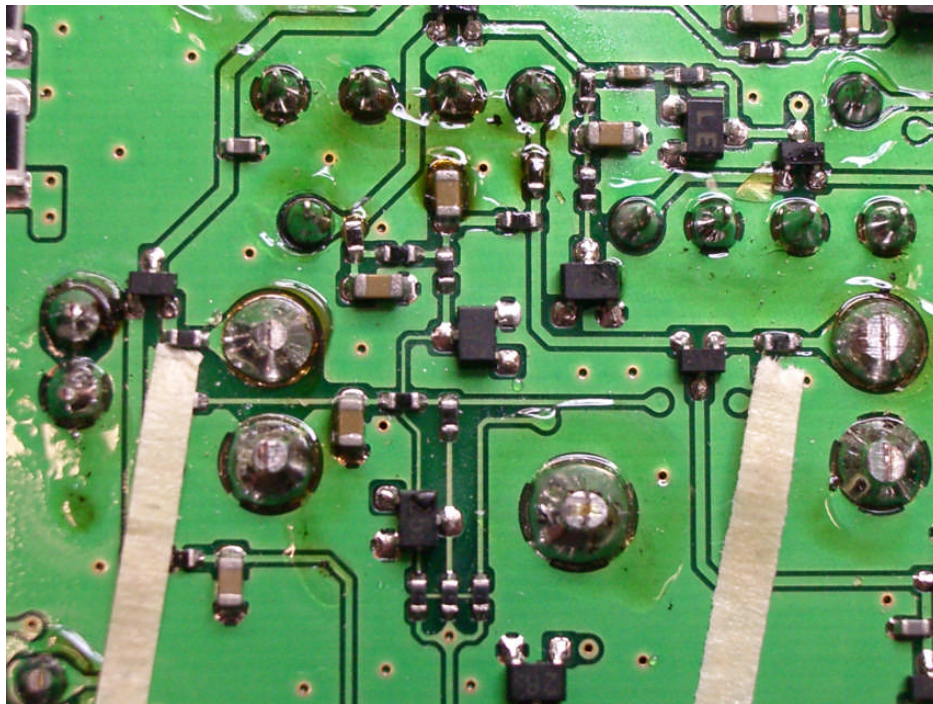
ONE BOARD FILTER for FT-817ND

ADDENDUM

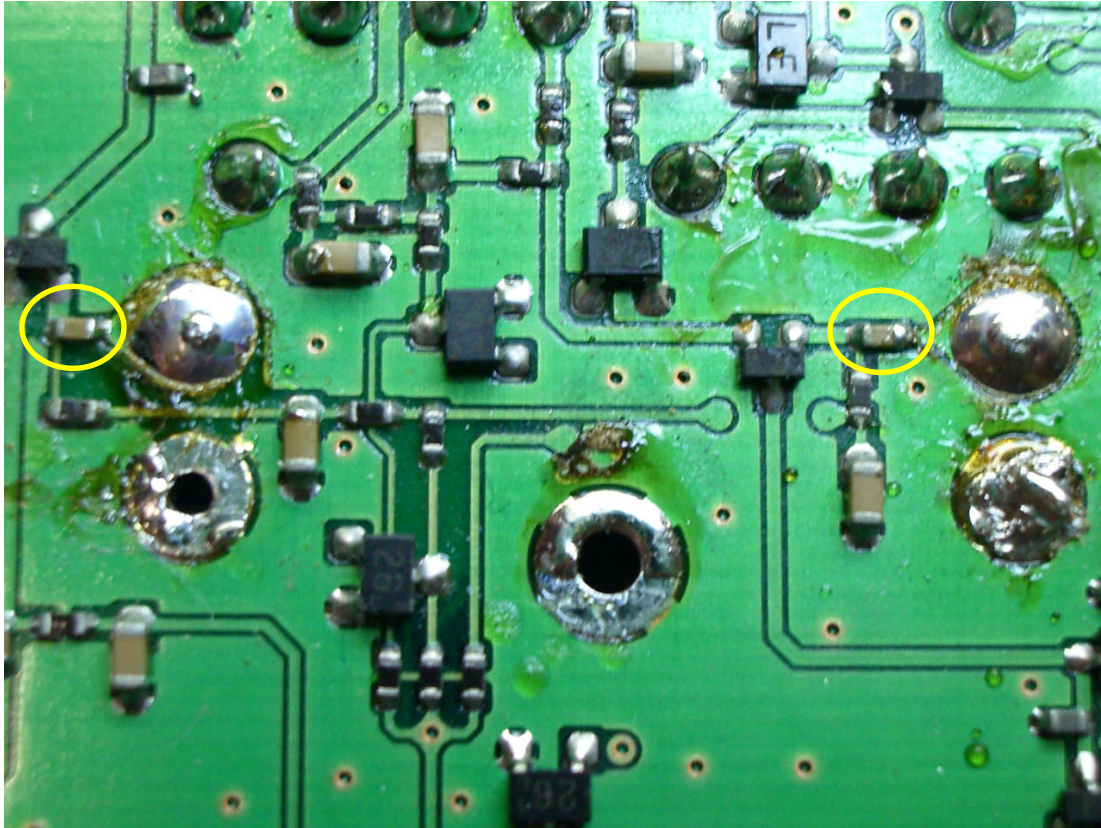
12 January 2006

If you are installing the W4RT One Board Filter (OBF) into your FT-817ND, you need to be aware that Yaesu has made an alteration in some lots of the FT-817ND. The original FT-817 is not affected by this Addendum.

Before installation of the OBF, you need to determine if your FT-817ND has the alteration from the original FT-817. (Read the NOTICE on the next page!) Look at the underside of the Main PCB in the area beneath the MuRata filter. The photo below shows this area. At the end of each indicator strip, the component indicated is an SMT resistor and is very, very small. A close-up photograph is shown next.



The next photograph shows the same area except with capacitors (yellow ellipses) in place of the resistors. This is what the original FT-817's look like. Resistors are black and capacitors are tan.



If you have the resistors, you must replace them with 0.01 μ F SMT capacitors in order for the OBF to work correctly.

NOTICE

Removal and installation of the above SMT components requires appropriate skill and equipment. Damage can occur to your Main PCB and is not warranted by Yaesu or W4RT Electronics. If you feel uncomfortable performing the installation of the OBF and/or the about SMT component interchange, then either have a qualified person perform the installation or have W4RT Electronics perform the installation (for an additional fee).