

ONE BIG PUNCH™

INSTALLATION MANUAL

GENERAL

One BIG Punch (OBP) is a custom add-on accessory for the Yaesu MH-31 microphone commonly used with many Yaesu amateur radios. The One BIG Punch is an AF-based speech compressor specifically configured to provide remarkable increase in talk power while maintaining good audio quality. The unit is mounted inside the MH-31, requires no additional electrical power, and can be turned on or off by using the MH-31's TONE switch.¹ Performance of the One BIG Punch will vary from user to user because of variations in the individual's voice power spectrum. As with any device used to increase the average output/talk power, some users will realize more or less increase than other users. Measurements using a stock FT-817 and a MH-31 containing the One BIG Punch showed that the average talk power increased by about 5 dB over the unmodified MH-31. When the optional SSB filter (Collins Mechanical Filter) for the FT-817 was used in conjunction, the talk power increased another dB or so. This information is provided for general expectations, not as a firm specification. Explanation of speech processing (compression) theory can be found in many places and, consequently, isn't provided herein. As with any audio device, you may experience interference when it is placed in an RF field environment. The One BIG Punch utilizes a well-designed PCB, components, and six ferrite-beads to effectively mitigate RF pickup. Since the FT-817 covers 1.8 to 440 MHz, W4RT Electronics uses a mixture of Type #43 and #73 ferrite beads. The Type #73 performs better in the HF spectrum while the Type #43 performs better in the VHF and UFH spectrums.

WARNING - WARNING - WARNING
READ CAREFULLY BEFORE PURCHASING THIS PRODUCT.

Installation of the OBP into the MH-31 requires reasonable skill with a soldering iron and simple tools typically found in most amateur radio operators' ham shack. W4RT Electronics DOES NOT PROVIDE ANY TECHNICAL SUPPORT TO THOSE THAT INSTALL THE ONE BIG PUNCH THEMSELVES. If you don't feel that you have the necessary skills to install the OBP after reading this instruction sheet thoroughly, then DON'T purchase this product. Instead, please consider having W4RT Electronics install the OBP for you for an additional fee.

INSTALLATION PROCEDURE



Figure 1.

1. Remove the three screws from the rear of the MH-1 microphone as shown in Fig. 1. Take off the Back Cover. Save these screws and the Back Cover.

¹ The installation approach presented in the *One BIG Punch Installation Manual* uses a simpler method; however, the tone switch is used to short the input and output of the One BIG Punch together in the bypass mode. In very few cases, a popping or buzzing sound is heard. It is related to the specific FT-817. The Advanced Technique presented in this document resolves the issue by using the tone switch to completely switch the One BIG Punch in and out of the signal path. The complexity of installation is somewhat greater.



Figure 2.

- 2. Locate the three black screws labeled #1, #2, and #3 that attach the MH-31 PC Board to the front case.

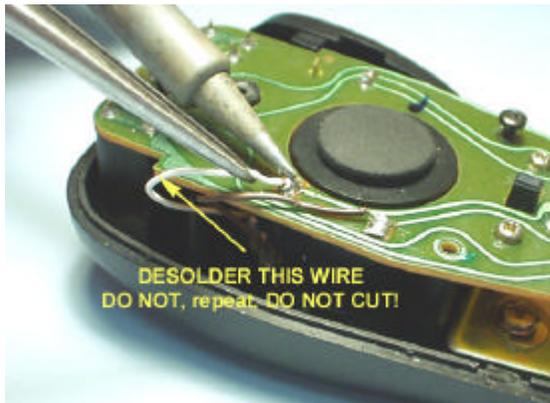


Figure 3a.

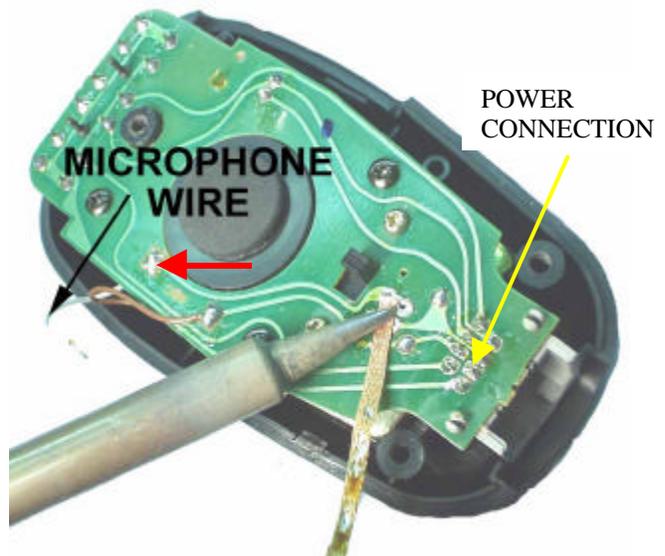


Figure 3b.

- 3. Unsolder (see Fig. 3a) the white wire (from the microphone element) that is connected to the PCB at the location indicated by the red arrow in the Fig. 3. Next, using the supplied solder wick, remove the solder on the pads located as shown in Fig. 3b.



Figure 4.

- 4. Remove screws #1, #2, and #3. Save screws #1, #2, and #3. Keep them separated from the Back Cover screws.



Figure 5.

- 5. Remove the PCB and flip the PCB over as shown in Fig. 5. Be careful not to harm the brown wire from the microphone element.

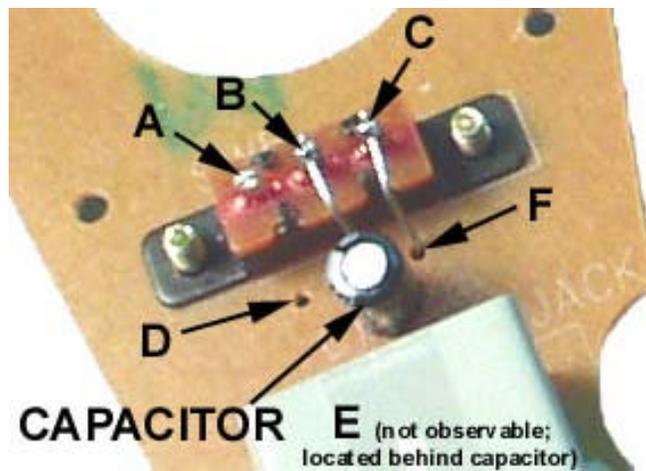


Figure 6.

- 6. Use a pair of appropriately-sized needle nose pliers to remove the capacitor (tubular) shown in Fig.6. Next, remove the wire connecting lug C on the Tone Switch to point F on the PCB. You may need to turn the PCB back over to remove the wire from F by using your soldering iron at that point again. Exercise care.

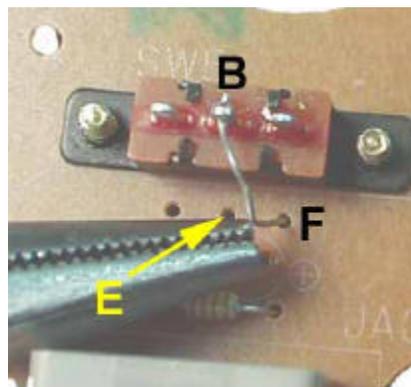


Figure 7

- 7. Remove the wire from point E as shown in Fig. 7. DO NOT cut this wire. Move the free end of this wire into hole F and solder it into place (you will need to turn the PCB over to accomplish this connection).

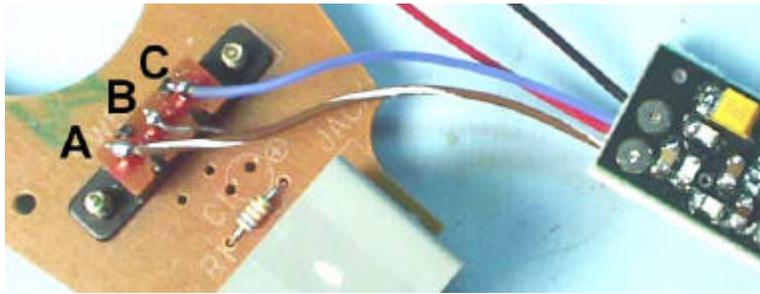


Figure 8.

- 8. With the One BIG Punch unit positioned as shown in Fig. 8, solder the brown wire with the white trace to lug A on the tone switch and the blue wire to lug C.

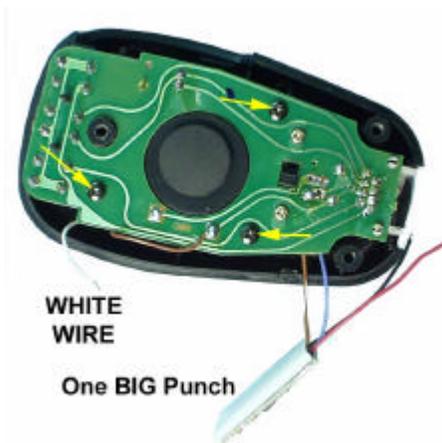


Figure 9.

- 9. Carefully replace the PCB as illustrated in Fig. 9. Replace the three screws (denoted by the yellow arrows) that you removed in Step 4. Tighten snugly, but do not overtighten.

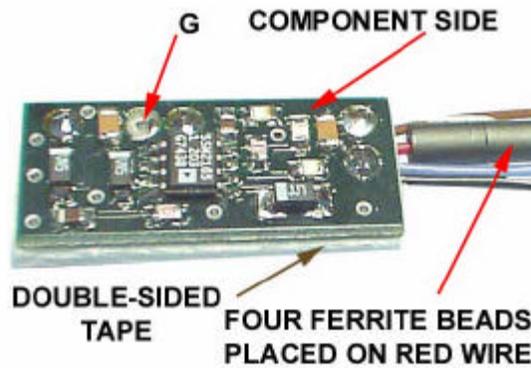


Figure 10.

- 10. Figure 10 shows the One BIG Punch unit. First, remove the paper from the exposed side of the double-sided tape identified in Fig. 10 and keep the exposed tape from touching anything until the next step. The four ferrite-beads will be placed on the red wire in Step 12.

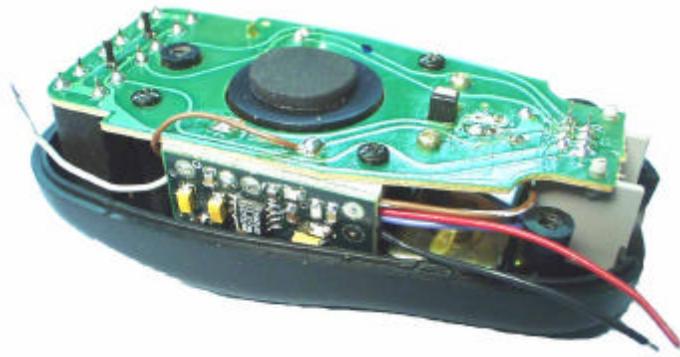


Figure 11.

- 11. Now carefully press the One BIG Punch unit against the microphone element and the screw post as shown in Fig. 11. (In a few cases, you may have to loosen the three screws holding the PCB in place to properly fit the OBP. Retighten screw once the OBP is placed. **Take care not to pinch the wires between the PC Boards.**) Now, place the four ferrite-beads on the red wire as shown in Fig. 11.

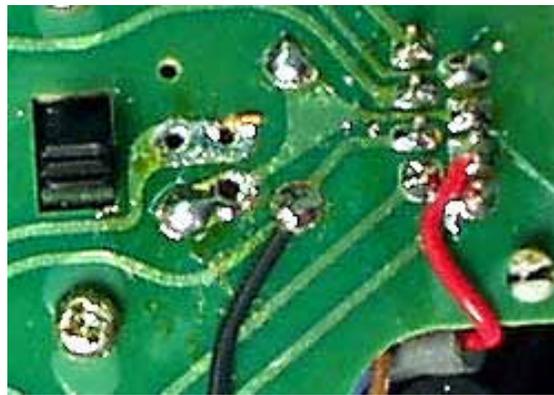


Figure 12.

- 12. Carefully solder the red wire (with the four ferrite-beads) to the power connection as shown in Figs. 3b and 12. Note that this is the second terminal from the bottom as viewed in Fig. 12. DO NOT overheat this connection or any of the following connections.
- 13. Now solder the black wire as illustrated in Fig. 12.

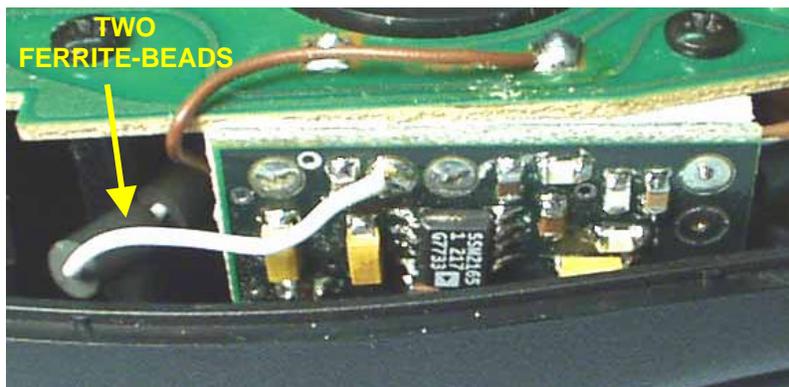


Figure 13.

- 14. Place two ferrite-beads on the wire (typically white) removed in Step 3 and tack solder it, as illustrated in Fig.13, to the Pad G (see Fig. 10) located on the One BIG Punch PC Board. DO NOT overheat this connection. **WARNING:** Be very careful not to short Pad G to the surrounding ground plane. The separation between them is only 0.01". Before you apply power to the OBP, measure the resistance from Pad G to ground. If it is essentially zero, then correct the installation of the white wire. The resistance of the microphone element is typically in the range of 200 ohms.



Figure 14.

- 15. Carefully replace the MH-31 Back Cover (see Figs. 1 and 2) onto the MH-31 microphone. Now replace the three screws (see Step 1) and tighten appropriately. This completes the installation of the One BIG Punch into the MH-31.

OPERATION

Operation of the MH-31 with the One BIG Punch is very easy. When the TONE switch is in Position #1 (numbers are located on the Back Cover of the MH-31 by the TONE switch), the One BIG Punch is OFF. In this position, the MH-31 has characteristics like an unmodified MH-31. When the TONE switch is in position #2, the One BIG Punch is ON and your signal now has real **PUNCH!** If you have the FT-817 without the optional SSB filter, W4RT Electronics suggests you consider its installation for even better TX and RX performance. Remember to adjust your AM MIC (Menu #05), FM MIC (Menu #29), and SSB MIC (Menu #46) for best punch and articulation. You might also try adjusting the T LSB CAR (Menu #56) and T USB CAR (Menu #57) to better fit your voice power spectrum to the FT-817. On-the-air testing at reasonably strong signal levels (S-9 for example) is strongly suggested. Many users have found the One BIG Punch performs fine in the FM mode too. With this installation, you have the choice of using the microphone element alone or with the One BIG Punch.

WARRANTY: One BIG Punch is warranted for a period of one year from the date of purchase to be free of electrical defects in materials and workmanship. If the One BIG Punch module 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, 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 BIG Punch by purchaser voids the warranty. W4RT assumes no liability with respect to the purchaser's MH-31 or other equipment that it may be used with in any manner whatsoever. Any damage to the One BIG Punch or MH-31 due to installation by the purchaser is completely and solely the responsibility of the purchaser. The warranty applies only to the original purchaser and is not transferable. 06 March 2002