



MFJ-46 A/B/C
MFJ-47 A/B/C

Mailbox Memory Expansion
For the MFJ TNC or MFJ Multimode

INSTRUCTION MANUAL

CAUTION: Read All Instruction Before Operating Equipment

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MFJ-46 A/B/C and MFJ-47 A/B/C

Thank You for purchasing the MFJ-46A/B/C and MFJ-47A/B/C mailbox memory expansion board for your MFJ TNC or the MFJ multimode. The MFJ-46 is for MFJ-1278 and MFJ-1278T. MFJ-47 is for MFJ TNCs (MFJ-1270/1270B/1274/1270BT/1274T). Both MFJ-46 and MFJ-47 memory boards are supplied with the most recent EPROM firmware upgrade. Documentation for the firmware is also supplied.

You will notice that some sockets on the memory expansion are not populated (U413, U422 & U425) when received. These sockets will be populated with ICs to be transferred from the motherboard.

The various versions memory expansion boards are as follows:

Model No.	SRAM Size	MFJ TNCs or Multimodes
MFJ-46A	32K	MFJ-1278/1278T
MFJ-46B	128K	"
MFJ-46C	512K	"
MFJ-47A	32K	MFJ-1270/1270B/1274
MFJ-47B	128K	"
MFJ-47C	512K	"

Note that the above models use the same memory expansion board but are packed with different RAM IC and firmware.

The extra memory provided by the expansion boards are dedicated solely for the use of the packet mailbox. The firmware of the TNC or multimode does not allocate this additional memory to other operations. Battery back up for the memory board is supplied from the mother board.

Memory Board Installtion for MFJ TNCs and MFJ-1278/1278T

In this installation you will be required to remove three ICs from the mother board and transfer them to the memory board. Please handle the ICs carefully and make note of the IC number and its orientation.

Throughout this installation instruction we will use "TNC" to refer to both the TNC2 & MFJ-1278 multimode.

Please perform the following procedure very carefully:

1. Disconnect all cables from the TNC, including power, radio and computer.
2. Remove the top cover of the TNC by removing the four (4) screws on the sides the unit. Then lift the cover off.
3. Remove the jumper off of JMP5. This takes the lithium battery out of the circuit. If your TNC has a MFJ-2400 modem installed, remove it. Set it aside, it will be re-installed later.

NOTE: When removing ICs from your TNC ensure that you do bend or break any of the pins.

4. Using a small flat tip screwdriver remove the following ICs from your TNC:

U13--74HC4066

U25--NEC 43256-10L or Equiv.

U22--Z0840004PSC Z80 CPU

U23--SYSTEM EPROM

5. Install the ICs which were removed from your TNC in the above step. Take note as to the orientation of the IC. Match up the NOTCH on the IC to the NOTCH on the IC socket on the expansion board. Refer to Figure 2 parts layout diagram for proper installation of the ICs.

Install the ICs removed from the mother board to the memory board as follows:

74HC4066 (U13) in socket IC-413

43256 (U25) in socket IC-425

Z80 CPU (U22) in socket IC-422

A new EPROM with the new firmware is packaged with the memory kit. You will install the new EPROM at U23 on the mother board. Be sure to orient the new EPROM the same way in which you removed the old one. In order to do this properly you must first position the TNC so the front panel is facing you, this is very important. Then locate the NOTCH on the new EPROM. Now install the new EPROM with the NOTCH pointing to your left.

NOTE: The old EPROM removed from the mother board will not be used.

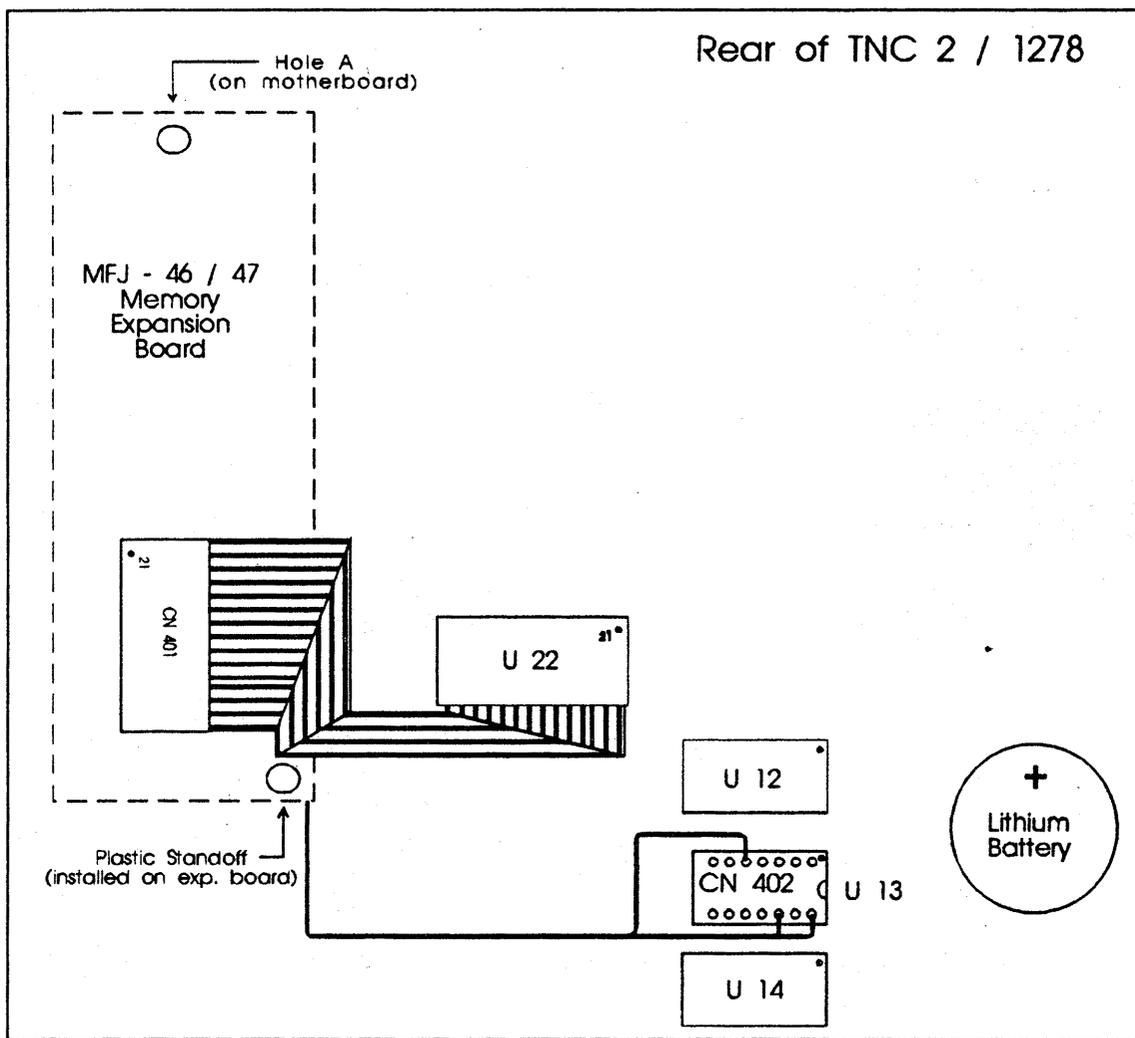


Figure 1
Memory Board Location

Front of TNC 2 / 1278

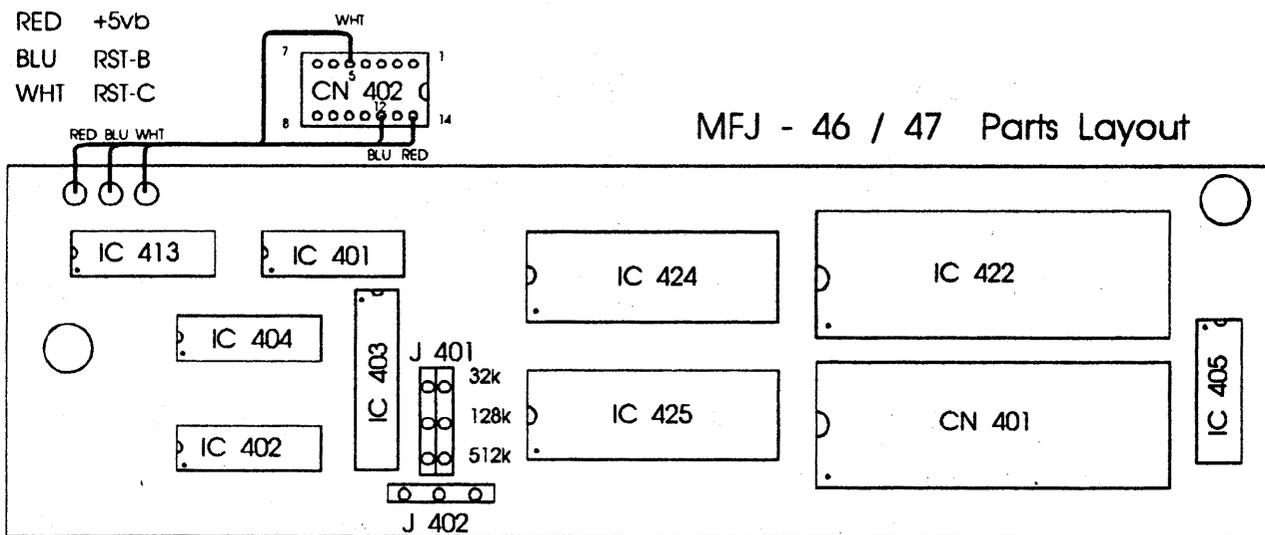


Figure 2
Memory Board
IC Location

CN 401
CN 402
IC 401-402
IC 403
IC 404

Ribbon Cable
14 Pin Socket
74HC138HC
74HCT374
74HC21

IC 405
IC 413
IC 422
IC 424
IC 425
* FROM MOTHERBOARD

74HCT00
* 74HC4066
* Z-80 CPU
SRAM
* 43256

NOTE: When installing ICs onto the memory board ensure that you do not bend or break any pins. Ensure all pins are in the IC socket.

6. Check and make sure that there no IC pins are bent under the IC itself. Check and make sure that no IC pins are broken off. Do this before proceeding beyond this point.
7. Set the memory board aside for now.
8. Please refer to Figure 1 when performing this step. Using a small phillips screwdriver remove the PC hold-down screw in the left rear corner of the TNC mother board, this is refered to as HOLE "A". Do not let this screw out of your sight, you'll be using it here shortly.
9. Take the 1/2" hex spacer supplied and install it in HOLE A, as noted in Figure 1 in this instruction. This is the same place where you removed the screw in Step #8, and tighten it down. This is an aluminum spacer DO NOT OVER TIGHTEN it, you will STRIP the THREADS.
10. Now with the memory board in one hand, plug the free end of the 40-pin ribbon cable into the IC socket labeled U22 (please refer to Figure 1; this is the same one which you removed the Z80 CPU from earlier in this procedure) on the mother board. Be sure to orient the blue connector so that pin 20 and 21 on the blue connector are oriented to the right side of the IC socket, (with the front panel of the TNC facing toward you). You will need to twist the cable slightly. Ensure that you leave the CN402 pigtail free and clear, do not let it become pinched or caught up underneath anything.

NOTE: If you do not have an MFJ-2400 board installed in the TNC skip to step 14.

11. If you have an MFJ-2400 modem installed position the 40- pin cable, so the cable is not going to be pinched by the mounting stud for the MFJ-2400 modem.
12. Now you can re-install your MFJ-2400 modem. Be sure that you do not pinch any of the wires of the 40-pin ribbon cable or the CN402 pigtail when you tighten the MFJ-2400 down. This will cause problems with both the MFJ-2400 and the memory board. So be sure and double check this.

13. Find the original hold-down screw which you removed from the TNC mother board earlier. Secure the memory board to the 1/2" spacer which you installed earlier. Again this an aluminum spacer, DO NOT OVER-TIGHTEN it! You will STRIP the THREADS.
14. Take note of the location of the NOTCH on CN402. Now plug CN402 into the IC socket labeled U13 (socket which the 74HC4066 was removed earlier) on the TNC mother board. Please refer to either Figure 1. Plug it in so the NOTCH is pointing toward the lithium battery. Make sure it is firmly in place!
15. Remove the paint (if any) from around the mounting holes on the outside of the chassis and the inside of the cover. This can be done with either light sandpaper or a knife blade. This will eliminate any EMI from the TNC caused by the additional large ribbon cable. This concludes the installation of the mailbox memory expansion board. However, before you start putting things back to together double check everything you have already done.

Final Inspection

Before closing up the TNC it would be best at this time to do a final inspection. Please check all of the following:

1. Check all connections to ensure that they are all secure.
2. Make sure that there are no pins bent or broken on any of the IC's or connectors installed in this procedure.
3. Make sure that there are no wires pinched or caught up under any of the screws, circuit boards or connectors.
4. Last but not least give your TNC one last physical look over, for any debris or foreign matter on the main PC.

If all of the above checks out then you can re-install the battery jumper JMP5. Connect the computer cable to the TNC, apply power and see if you can obtain the TNC's sign-on message. If not go back and double check the entire installation procedure. If the TNC signed on properly, install the cover.

After properly installing the memory board, reconnect your TNC or multimode to your radio and computer. If the TNC or multimode signed