4SQRP “Mentho-Morse” Touch Keyer

Assembly Manual v. 1.01

Four State QRP Group

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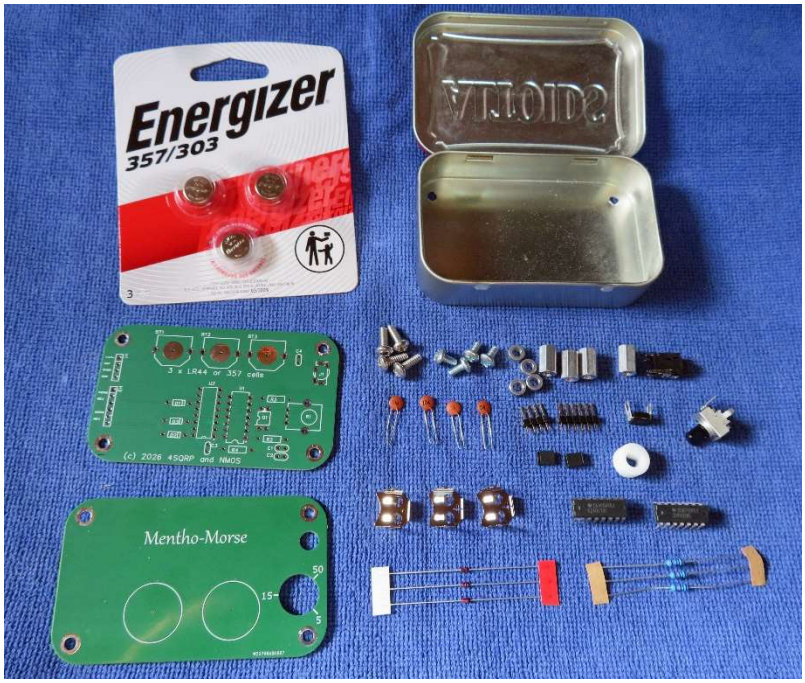
Step 1 – Inventory Parts and Identify the two PC Boards

This kit is a very simple CW keyer that operates by touching two circular pads. Check the parts list on Page 6 to be sure you have all the parts that are included in your kit. Your kit may also include an Altoids tin that is pre-drilled. If you are supplying your own tin, you will need to drill four holes to mount the PC boards.



There are two PC boards, the main board and the Mentho Morse touch pad board. The Mentho Morse board has only surface mount components on it, and they are all pre-mounted.

To drill an Altoids tin, use the main board as a template by centering it on the bottom of the tin and using a Sharpie to mark the four outer holes. Using a Dremel or other small rotary tool, use a tiny bit to drill a pilot hole in the center of each mark drilling from the bottom of the tin. Once the four pilot holes are drilled, place the tin upright on a piece of wood suitable for drilling into. Drill the tin coming from the top using a 5/64” bit to widen each hole. Drill carefully to avoid

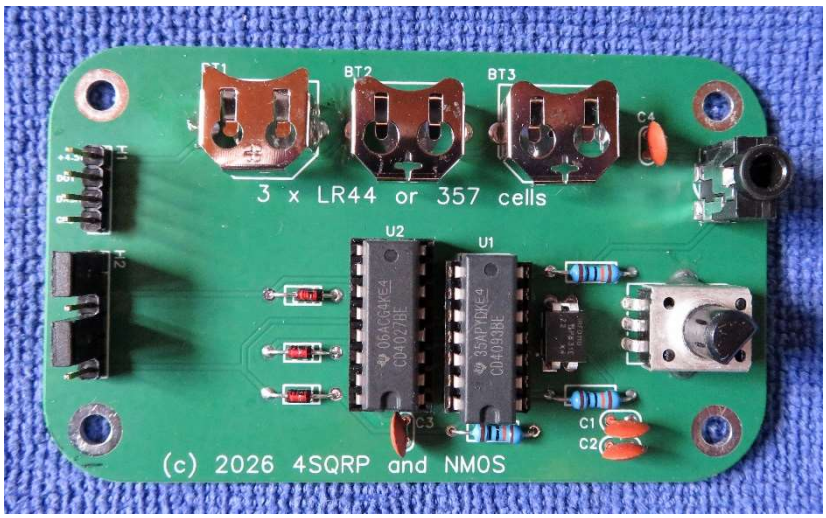
damaging the very thin metal tin. The holes may not appear perfectly flat after drilling, but when the screws and standoffs are installed later and tightened, they will flatten out.

Step 2 – Begin mounting the components on the main board

Mount the three 100K resistors (brown-black-yellow) at R2, R3 and R4, and solder all three and trim.

Mount the four 0.1uf disk capacitors (104) at C1, C2, C3, and C4. Solder and trim.

Mount the three 1N4148 glass diodes at D1, D2, and D3. Pay attention to the position of the stripe, so it matches the stripe marked on the board. The stripes should be on the right side facing the IC at U2. Solder and trim.



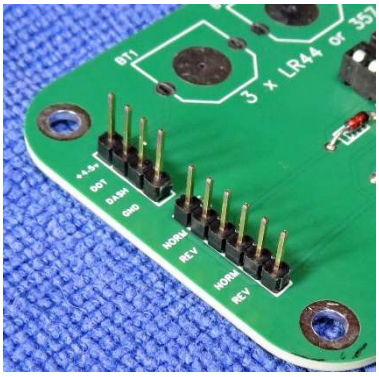
Mount Q1, a 4-pin device marked IRFD110 with the two shorted pins on the side facing the three battery holders. Pay attention to the orientation. Solder and trim.

Mount U1, the 14-pin CD40938D IC with the notched side facing towards the notched outline of U1 on the board. Solder and trim.

Mount U2, the 16-pin CD4027BE IC with the notched end also facing the notch outlined on the board. Both the U1 and U2 IC notches will be facing the same way. Solder and trim.

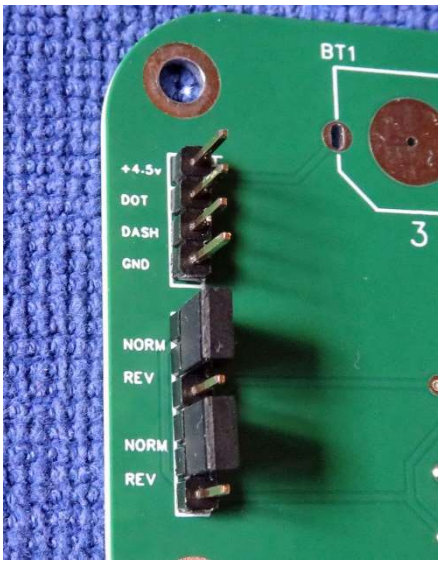
Mount the three battery holders on the board, making sure they are completely seated and follow the printed outline so the pointed end is facing towards the ICs. It is best to solder only one side at a time and make sure the clip is all the way on the board. Be careful touching them as they get VERY HOT when soldering them. DO NOT install the batteries until STEP 3!

Mount the 4-pin connector in the top left set of four holes. Keep this connector upright by soldering only one pin, then reheating it while using your finger on the other pins to straighten it to be exactly vertical. Once you are satisfied it is vertical, solder the other three pins.



Mount the 6-pin connector to the board in the six holes immediately next to the 4-pin connector. Like the 4-pin connector, they also must be exactly vertical. These pins will be used with the two jumper shunts supplied to select normal or reverse keying. Place the jumper shunts on the 6-pin connector as follows:

For “normal” keying, (Dah is left circle, Dit is right) place a jumper shunt on pins one and two then place the other shunt on pins 4 and 5. (pin numbers are as viewed from the top of the board)

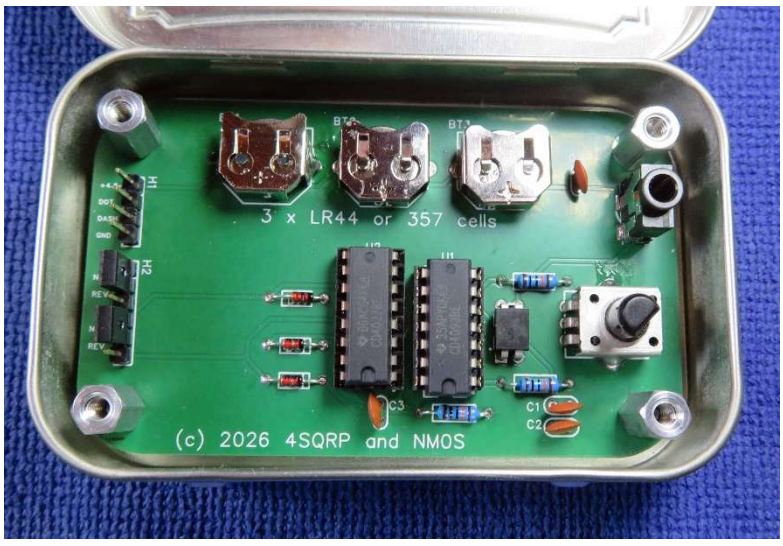


or if you prefer reverse keying, (Dit is left and Dah is right) place the jumper shunts across pins 2 and 4 and pins 5 and 6.

Mount the 3.5mm audio jack at J1, making sure the pins are fully inserted in the board and that it stands vertical. This must be exactly vertical for it to fit properly with the top board mounted above it. Solder just one pin and reheat it while straightening it to be exactly vertical. Then solder the remaining pins.

Mount the 1M pot at R1 and be sure it is also fully seated vertically before soldering. Solder one pin first and check it to be sure it is exactly vertical. If it is not, you can reheat that one pin to reposition the pot before soldering the remaining pins.

Step 3 – Final assembly



Place the main PC board on a non-metallic surface. Install the three LR44 batteries with the marked + side on top as per the markings on the batteries and holders.

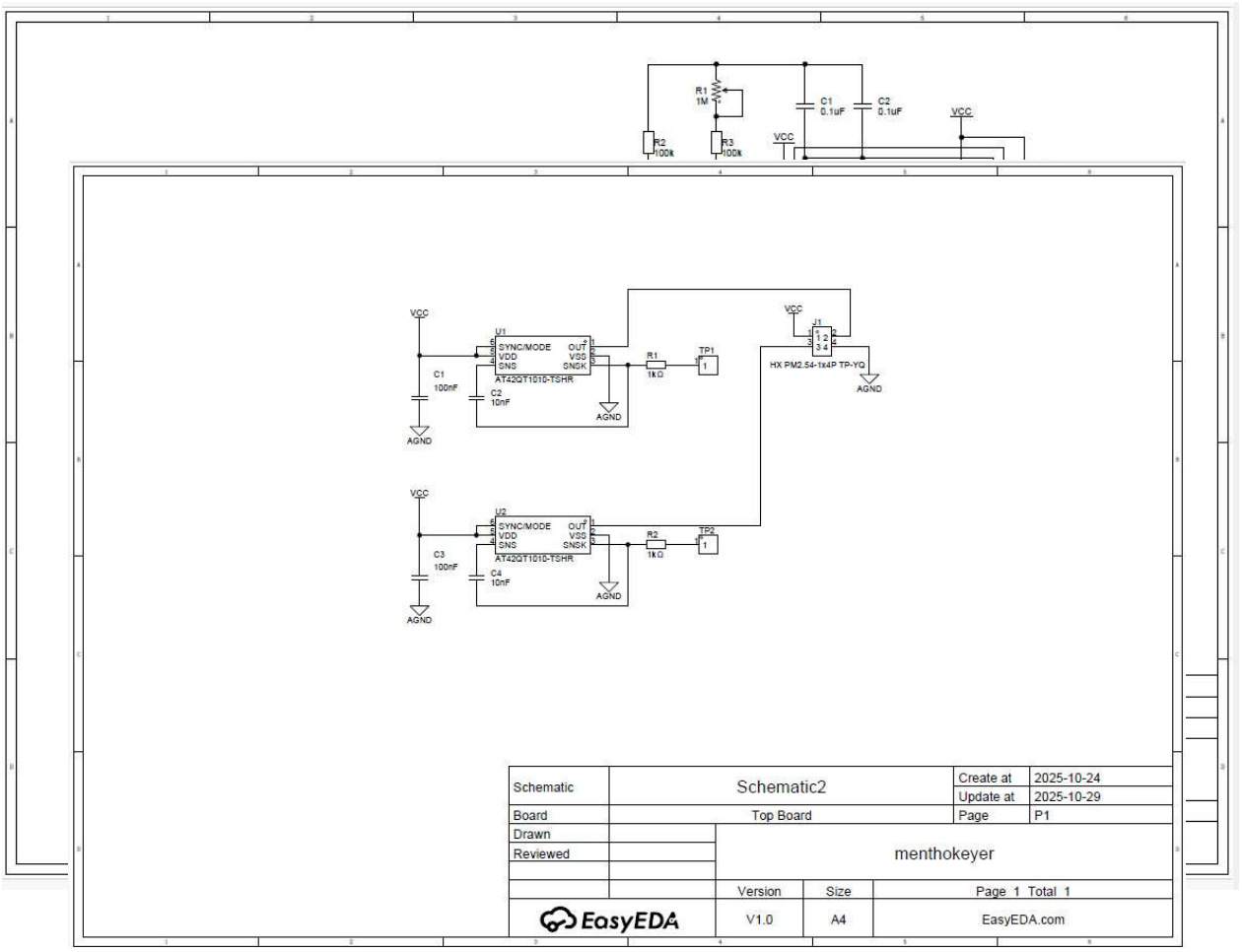
Insert the four 6-32 X 3/8” screws from the bottom of the tin. These are the four longer screws. Drop a standoff ring from the top of the tin onto each of the screws. Lay the main board onto the four ring standoffs and lightly thread the four threaded standoffs onto each screw. Using a screwdriver, tighten each screw until the main board is snugly in place.

Place the Mentho Mint board on top of the main board, making sure the four pin connector on its bottom mates correctly with the four pins on the main board. Use the remaining four screws to

secure the Mentho Morse board to the top as per the title photo on page 1. Turn the pot fully counterclockwise and slide the 3D printed knob onto the pot shaft.

OPERATION

To turn on the Mentho-Morse, you simply plug in the cable that connects it to your rig. It is preferred to use a mono to mono cable to connect the Mentho-Morse to your radio key input. Like the Cric-Key kit, this kit requires a mono plug so that the Ring and Sleeve connections to J1 are shorted and the tip wire is separate to make the keying connection to the radio. You can use a 1/8" stereo connector as long as you tie the sleeve and ring connections together. You can also make up a custom cable, such as in the case your radio uses a ¼" plug on that end. If using a 2-conductor cable with mono 1/8" plugs, simply wire both sides as normal. If using a stereo plug on one end, tie the ring and sleeve wires together on the end that plugs into the Mentho-Morse. Sending is done by simply tapping a finger on the two circles, like using any keyer. It takes practice! Adjust the speed pot to the desired speed. If you prefer the opposite configuration, simply change the jumper shunt positions as per Step 2. Be sure to unplug the cable from the Mentho-Morse once you are done using it to preserve the battery life.



BOM

1	3	MY-LR44-03-J	BT1,BT2,BT3	Battery Holder
2	4	0.1uF	C1,C2,C3,C4	0.1uF
3	3	1N4148	D1,D2,D3	
4	1	2.54-1x4p	H1	4 pin header
5	1	2.54-1x6P	H2	6 pin header
6	1	3.5mm audio jack	J1	
7	2	Shunt jumper	SH1, SH2	
8	1	IRFD110	Q1	
9	1	1M Antilog pot	R1	1M variable
10	3	100k	R2,R3,R4	100k
11	1	CD4093BD	U1	
12	1	CD4027BE	U2	
13	4	6-32 x 1.4" screw		
14	4	6-32 x 3/8" screw		
15	4	1/8" x #6 spacer		
16	4	6-32 x 7/16" Standoff		
17	1	Knob		
18	1	PCB		