

Kid-Friendly Morse Code Key Project

A low-cost project for children that can be done at your ARRL Field Day station.

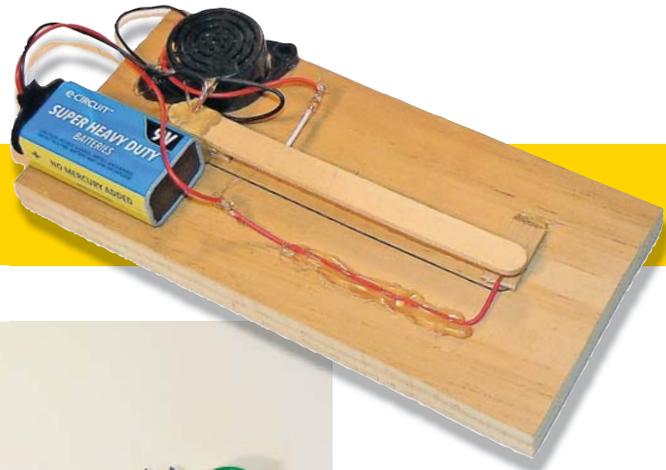


Figure 1 — The materials needed for the project, laid out and ready to go.

Bob Knoblauch, KA2YXX, and Michele Knoblauch, KD2BPN

Before computers and the internet, cell phones and text messaging, Morse code was the way people communicated with each other across great distances. Morse code was used to warn of danger, ask for help, save lives, and share vital information.

Here's a simple Morse code practice key and oscillator for kids and adults to make. It can be made with materials from any craft store and electronics from Amazon (see Table 1 and Figure 1 for necessary materials and tools).

Table 1 — Materials List		
Quantity	Material	Comments
2+	Craft sticks	Two are needed, but extras are recommended.
1	Tin snips or cutters	Used for cutting craft sticks into sections.
1	4 × 6-inch piece of wood	Used for mounting the project.
1	Wire strippers	
2	4 inches of 18-gauge copper wire	Need 8 inches in total, will be cut into two pieces. I used 18-gauge thermostat wire, but any 18-gauge copper wire will do.
1	Wood glue	
1	Hot glue gun	
2	Small clamps	We used clothespins.
1	Tape	
1	9 V battery	
1	9 V battery clip	
1	Buzzer	We used the Cylewet Electronic Buzzer Alarm CYT1083 from Amazon.
1	Small ruler	

Construction

Step 1 | Place a craft stick on the block of wood.

Make sure it's centered in all directions, then use a pencil to trace the outline of the stick onto the block of wood. Choose one end of the traced outline (it doesn't matter which one), and make a mark in the very center (see Figure 2).

Step 2 | Make the L wires.

You need two pieces of wire, each approximately 4 inches long. Using a wire stripper, strip a little more than $\frac{1}{4}$ inch from each end of the wires. Bend each wire 90 degrees, about 1 inch from one end of each wire (see Figure 3). Your wires should form an L shape.

Step 3 | Glue the L wires in place.

Position the long section of one of your L wires alongside the outline you drew of the craft stick, so the stripped end of the short section crosses the mark you made at one end of the outline. Tape that stripped wire end in place, and hot-glue the long section of the wire to the block of wood, alongside the outline of the craft stick (see Figure 4). Do not get glue on the stripped wire ends.

Step 4 | Hot-glue the other bent L wire.

Position it down the center of the craft stick. The stripped end on the long side of the wire should be almost at the end of the craft stick (see Figure 5). We used clothespins to help hold the wire in place while the glue was drying. If you use a clothespin to cover the stripped part of the wire at the end of the craft stick, the clothespin will help keep glue off of it.

Step 5 | Cut up a craft stick.

Cut one of your craft sticks into four pieces, each about $\frac{3}{4}$ inch in length, or about the size of a penny. The size doesn't have to be exact (see Figure 3). You will use three of these pieces to set up the height of the craft stick that has the wire glued to it. The fourth piece is for a temporary spacer.

Step 6 | Glue three of the small cut pieces into a stack.

Position that stack onto the block of wood, inside the outline you drew of the craft stick, at the end without the wire. Use wood glue to glue it in place (see Figure 6).

Place the uncut craft stick, wire side down, on top of the stack. The tip of the wire at the end of the craft stick should cross the tip of the wire that's on the block of wood. They need to align so they touch each other in a cross, forming the contact for the circuit. Once the wires are aligned properly, use wood glue to glue the craft stick on top of the stack.

Figure 5 — Glue the long end of one L-wire down the center of a craft stick. Position the wire so that the stripped part of its long end is nearly at the end of the craft stick.

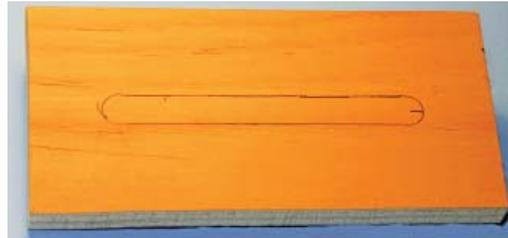


Figure 2 — The traced craft stick outline on the block of wood, with a mark in the center of one end.

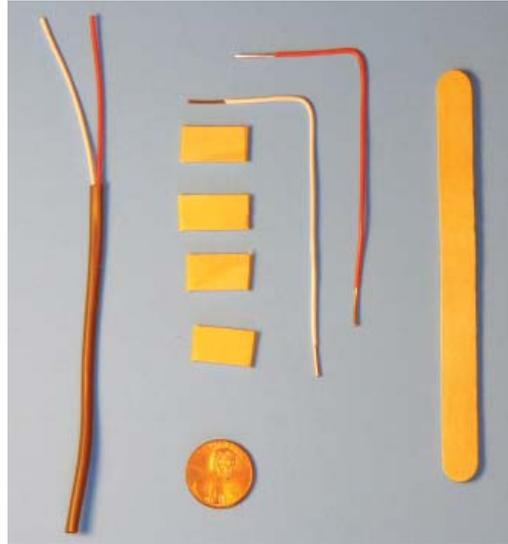


Figure 3 — The bent L wires that you made in Step 2. One of the craft sticks was cut into four $\frac{3}{4}$ -inch pieces (see Step 5).

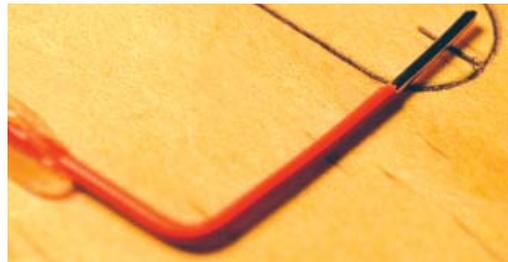
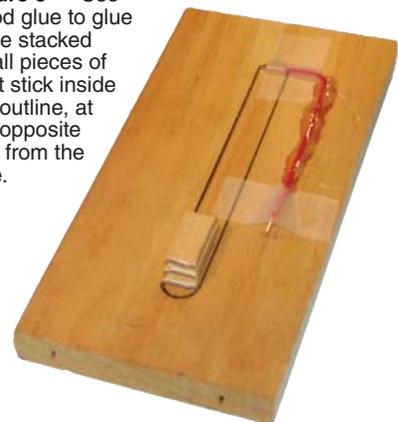


Figure 4 — The long section of the wire is glued to the wood, alongside the traced outline of the craft stick.

Figure 6 — Use wood glue to glue three stacked small pieces of craft stick inside the outline, at the opposite end from the wire.



Step 7 | Put the remaining small piece of craft stick between the two wire ends.

The small piece of craft stick acts as the temporary spacer to keep the wires from making contact (see Figure 7). (We taped all the sticks in place so they would not move.) Then hot-glue the other end of the craft stick to the board, over the top of the three small pieces where the wood glue is (see Figure 8).

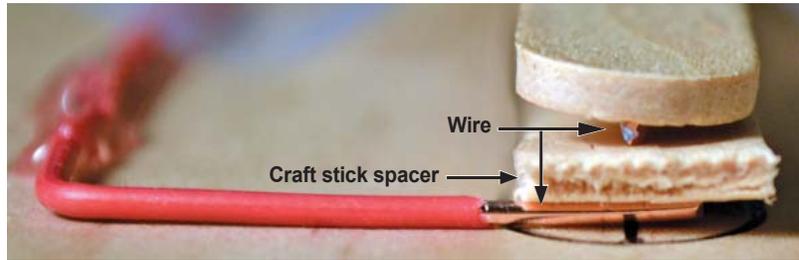


Figure 7 — The craft stick acts as the temporary spacer to keep the top wire and the bottom wire from making contact.

The hot glue will hold everything in place while the wood glue is drying. The hot glue will not be strong enough to hold by itself, but it will be strong enough to allow you to test the key.

Wiring

Step 8 | Cut and strip the wires.

If you bought a battery clip and buzzers with the wires pre-soldered, cut the soldered ends off (so they don't prevent you from twisting the wires together easily) and strip the wire ends.

Position the battery next to the glued-down end of the craft stick, with the wires facing the end of the board, and glue it in place. Glue the buzzer on the other side of the craft stick.

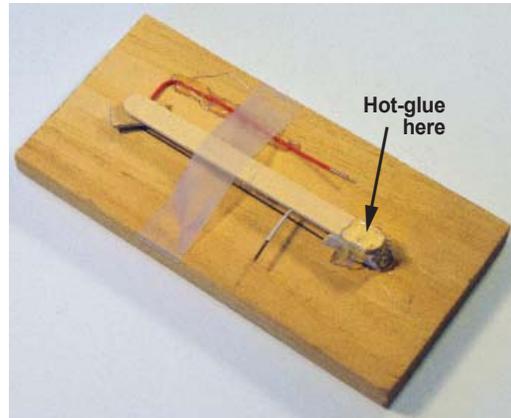


Figure 8 — The sticks are taped in place, so they don't move. Then the raised end of the craft stick is hot-glued to the board over the top of the three small, stacked pieces.

Kid-Testing the Project

Thanks to James Nichols, KQ4YC, and his son, Patrick, the Morse code practice key project has been kid-tested and approved. Patrick was able to do most of the steps under the instruction of his father. The project was a success, and they ended up with a well-crafted practice Morse key. They also had a great time together.

Photos by James Nichols, KQ4YC.



Patrick traced the stick as instructed.



Patrick stripped the wire on the battery clip and buzzer.



Here's Patrick with the finished Morse code practice key.

Step 9 | Twist the wires.

Twist together the stripped ends of the black wire on the buzzer and the black wire from the battery clip. Then hot-glue them, so they don't come apart.

Twist the stripped red wire from the battery around the stripped part of the wire that you hot-glued directly onto the board. (You might have to lift the end up a little to get the wire twisted around it.) Then, hot-glue that connection to hold it in place.

Twist the red wire from the buzzer around the end that is stripped and sticking out from the top craft stick. Then, hot-glue it to hold it in place (see Figure 9).

Calibration

Step 10 | Align the wires.

Contact for the circuit is made when the two wires touch. Remove the spacer and check the alignment of the wires. When the craft stick with the wire is pushed down, that wire should make contact with the wire that's on the board.

On our first try, we found that our two wires did not make contact. We used the temporary spacer under the bottom wire, and hot-glued the shim in place (see Figure 10). This holds up the wire to make better contact.

Conclusion

This is a very simple, low-cost project that you can do with kids — or non-hams of any age — at your Field Day operation to give them a hands-on experience. People can even take their craft stick key home with them.

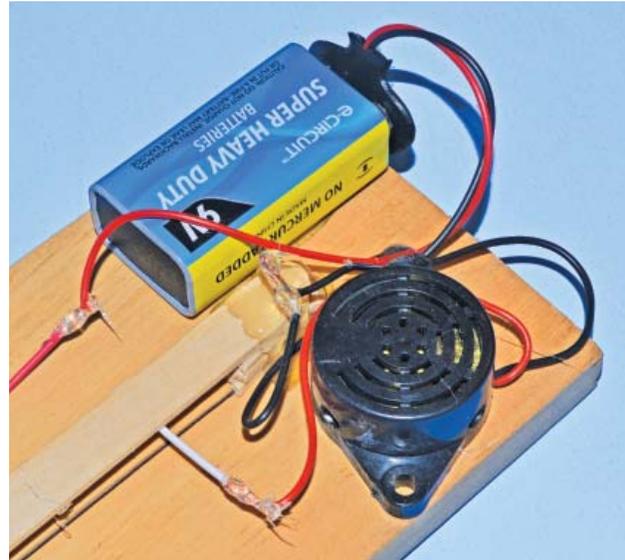


Figure 9 — The position of the battery, buzzer, and glued wires.

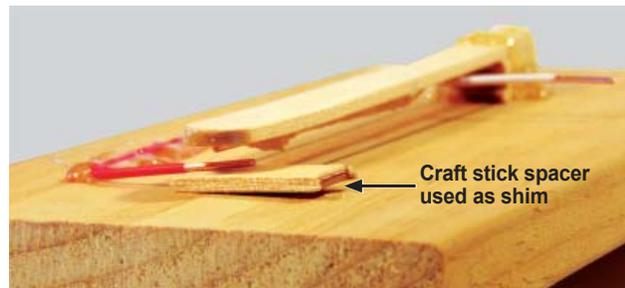


Figure 10 — The temporary spacer is glued in place under the bottom wire.

Photos by the authors, unless otherwise specified.

Amateur Extra-class operator Bob Knoblauch, KA2YXX, has been licensed since 1985. He built his first crystal radio at 10 years old. He has been an electromechanical technician for over 40 years, and he enjoys building small electronics. Bob can be reached at michele_bob@verizon.net.

Michele Knoblauch, KD2BPN, was first licensed in 2012. She became interested in amateur radio while her husband, Bob, was studying for his Amateur Extra-class license. A retired proofreader,

Michele earned her BA in communication theory at Montclair State College in 1984. Michele now works as a school cook. She can be reached at michele_bob@verizon.net.

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