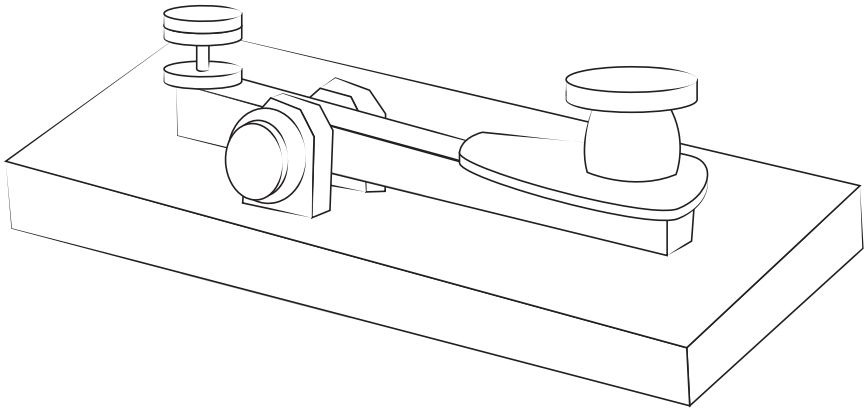
DIY Telegraph

Samuel Morse invented the Morse code system in order to send messages over long distances by using electricity. The very first Morse code message was sent by telegraph in 1844 from Washington, D.C. to Baltimore. Now you can send secret messages to a friend by building your own telegraph!

Collect

- One piece of cardboard, 8 1/2 x 11 inches
- Telegraph template (see page 3)
- Glue
- Scissors
- Ruler
- Insulated wire, 4 feet
- Wire strippers
- 3 volt button battery
- 2 LEDs or buzzers
- Pliers
- Tape
- 4 metal-topped thumbtacks



Build the telegraph base

1. Glue the template to the piece of cardboard.

2. Cut along the dashed lines of the template to separate it into 6 parts: Telegraph A, Telegraph B, two switches, and the two remaining pieces to discard.

3. Place a cardboard switch on each telegraph board where it says, "Place switch here." Tape them along one edge. Bend each cardboard switch piece along the "Bend" line.

Add the wires to Telegraph A

4. Cut three 8 inch sections of wire and three shorter 4 inch sections. Add a small tab of tape to each wire to label the three short wires as "A," "B," and "C," and the three longer wires as "D," "E," "F."

5. Strip 1/2 inch of insulation from both ends of each wire section.

6. Tape one bare metal end of wire "A" and one bare end of wire "B" to the negative side of the battery.
   Hint: the negative side normally looks bumpy and has less surface area than the positive side.

7. Tape one stripped end of wire "E" to the positive side of the battery. Make sure that the bare metal wire is touching the bare metal positive side of the battery before taping it to the telegraph board.

8. Tape the battery to the center of Telegraph A.

9. Poke a tack through the large black dot directly under the cardboard switch. Cover the pointy end of the thumbtack with tape if it sticks out through the bottom of the cardboard.

10. Make a loop in the free end of wire "A" and hook it around the tack. Use pliers to make sure that it doesn't slip off of the tack.

11. The positive leg of the LED is slightly longer than the negative leg. Spread the legs of the LED apart and place it on the LED image on Telegraph A.
Hint: If you are using a buzzer instead, the positive side will be red and the negative side will be black.

12. Attach the free end of wire "B" to the negative (shorter) leg of the LED by looping the wire around the leg and taping it in place.

13. Push a thumbtack up through the underside of the cardboard switch on Telegraph A so that when you push the switch down, the two thumbtacks touch. Cover the point with tape if it sticks through the cardboard.

14. Use pliers to wrap one end of wire "D" around the thumbtack in the top of the switch.

15. Wrap one end of wire "F" around the positive leg of the LED and then tape it in place.

Add the wires to Telegraph B

16. Push a thumbtack through the black dot underneath the switch on Telegraph B. Wrap the free end of wire "E" around the tack, as well as one end of wire "C."

17. Attach the remaining free end of wire "C" to the negative leg of the remaining LED and tape it to the LED image on Telegraph B.

18. Attach the remaining free end of wire "D" to the positive side of the LED on Telegraph B.

19. Push a thumbtack up through the underside of the cardboard switch on Telegraph B so that when you push the switch down, the two thumbtacks touch.

20. Wrap the remaining free end of wire "F" around the top thumbtack. Cover the point with tape if it sticks through the cardboard.

Test out your Telegraph!

21. Push down on one of the switches to complete the electrical circuit and turn on the LED or buzzer.

22. Go online to find a guide to Morse code. To send a dot, press down and immediately release the switch. For a dash, hold down the switch for a longer period of time. A space between letters is the same length as a dot, and the space between words is the same length as a dash.

23. Have a friend sit on the opposite side of you and tap out a message in Morse cose. Can you decode the message and send another one back?

Telegraph “A”

Telegraph “B”

Switch for Telegraph “A”

Bend

Switch for Telegraph “B”

Bend

Discard this piece

+ Battery

Place switch here

Tape

Place switch here

Tape

Discard this piece