

Cautionary and Warning Statement

- This kit is designed and intended for educational purposes only.
- Use only under the direct supervision of an adult who has read and understood the instructions provided in this user guide.
- Read warnings on packaging and in manual carefully.
- Safety glasses required when soldering.
- Always exercise caution when using soldering iron.

Soldering Iron Safety Tips

- Always get permission from an adult before using a soldering iron.
- Be sure to read and follow all of the manufacturer's instructions provided with your soldering iron.
- Never touch the element or tip of the soldering iron.
- Always return the soldering iron to its stand when not in use.
- Turn unit off or unplug it when not in use.

Included Materials

Part Name	Location on Circuit Board (Figure 2 below)
• Circuit board	N/A
• 2 transistors A	Q1 and Q2
• 4 LEDs B	LED1, LED2, LED3, and LED4
• 2 capacitors C	C1 and C2
• 2 330Ω resistors D	R3 and R4
• 2 10kΩ resistors D	R1 and R2
• 9-volt battery snap E	9-volt
• Switch F	Power
• Length of solder	N/A

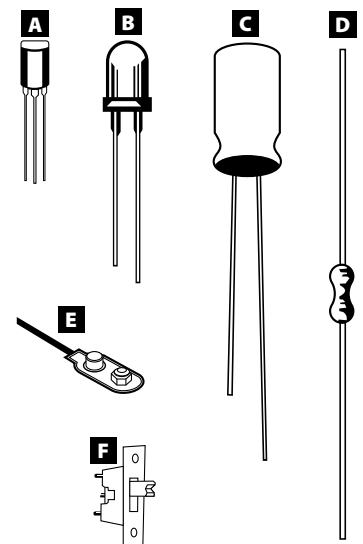


Figure 1 – Blinky components

Tools Required (not included)

- Soldering iron or pencil
- Diagonal pliers
- 9-volt battery

Instructions

As you begin this electronic soldering activity, remember the proper way to solder. First, heat the foil strip and then touch the solder to it. The solder then flows to the trace and the component lead. Use just enough solder to cover the connection. Be sure to read and follow all directions.

1. Using the Included Materials section, make sure you have all of the Blinky parts. The letters next to the Part Name correspond to the part's image (Figure 1). Notice the location(s) of each part on the circuit board are to the left of the part names.

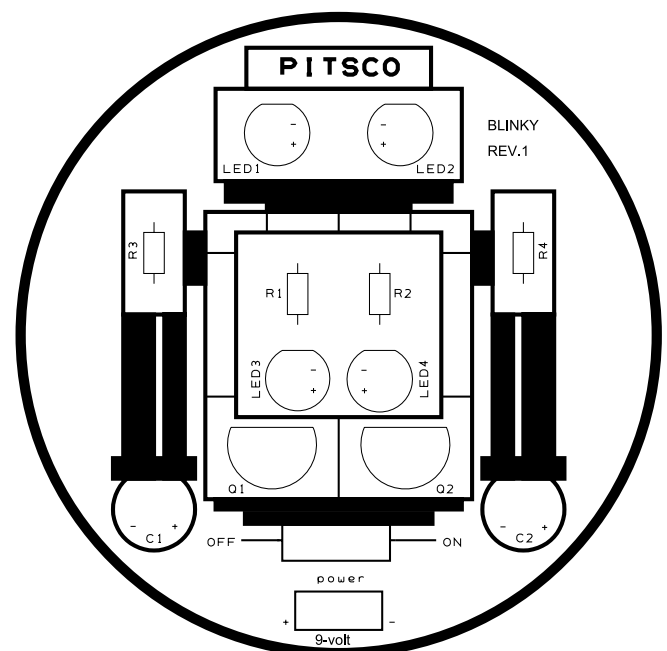


Figure 2

- The circuit has one side with strips of shiny metal called traces. The other side has traces and a picture of a robot. Place the components through the picture side of the circuit board (Figure 3).
- Place the board in front of you with the picture of the robot facing up (Figure 4).
- Locate the 9-volt battery snap. Insert the ends of its two wires through the holes in the bottom of the circuit board labeled **9-volt**. Insert the red wire (positive) through the hole labeled with a positive (+) sign. Insert the black wire (negative) through the hole labeled with a negative (-) sign.
- Turn over the circuit board (facedown) and solder the two ends of the battery snap wires using the following soldering technique. Heat the end of the battery snap wire and the trace by holding the tip of the soldering iron against both the trace and the wire. While holding this position, place the end of the roll of solder at the point of the soldering iron. The solder will melt and flow onto the joint. Melt just enough solder to cover the point. Too much solder could cause a short circuit.

Tip: If you use too much solder and connect two leads, place the tip of the soldering iron between the two leads and melt the solder from between them.

- Turn over the circuit board (faceup); select one of the LEDs. Notice that the two wires, or leads, are different lengths. Insert the LED at location **LED1** with the short lead in the negative (-) hole. The LED should be on the picture side of the board.

Caution: When installing LEDs, notice the two wires are very close together. If the wires touch, a short circuit will occur and the robot will not work. Be sure excess solder does not bridge the gap between the two LED leads.

- Solder each lead using the solder technique in Step 5.
- After soldering the LED in place, use diagonal pliers to clip off any part of the leads above the solder joint.
- Install the second LED in location **LED2**. Again, the short lead should be inserted in the negative (-) hole.
- Install **LED3** and **LED4** the same way. Clip off excess leads.
- Locate the two 330Ω resistors (these have orange, orange, and brown stripes). Insert and solder in locations **R3** and **R4**. Clip the excess leads.

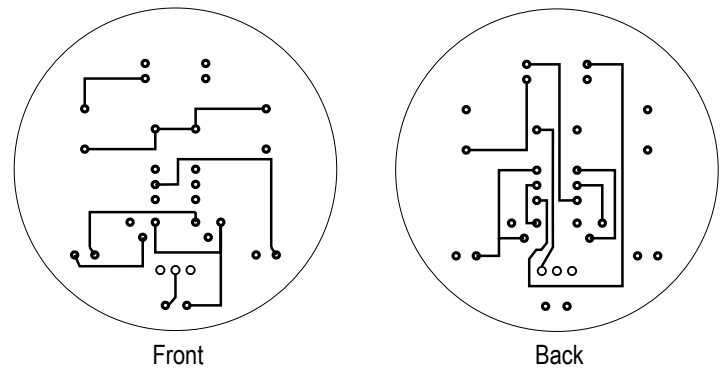


Figure 3 – Both sides of the circuit board have traces, copper strips that carry electricity from one component to another creating a circuit.

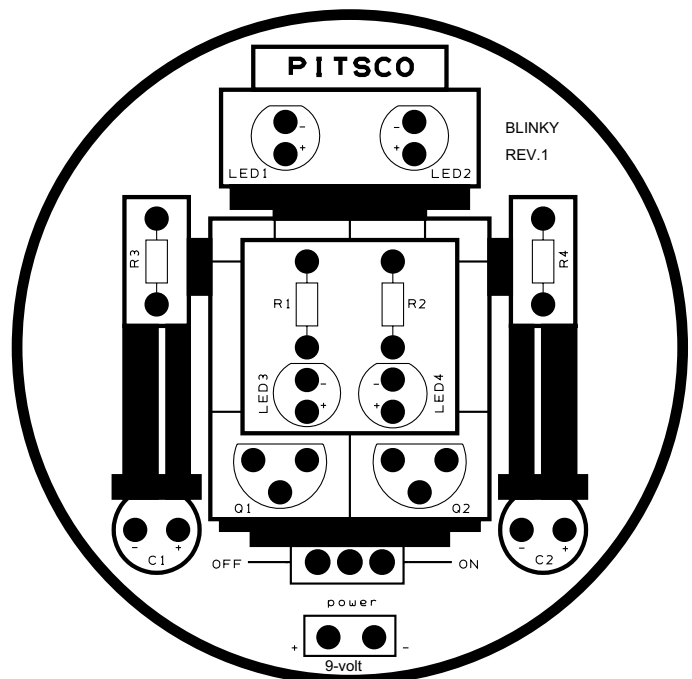
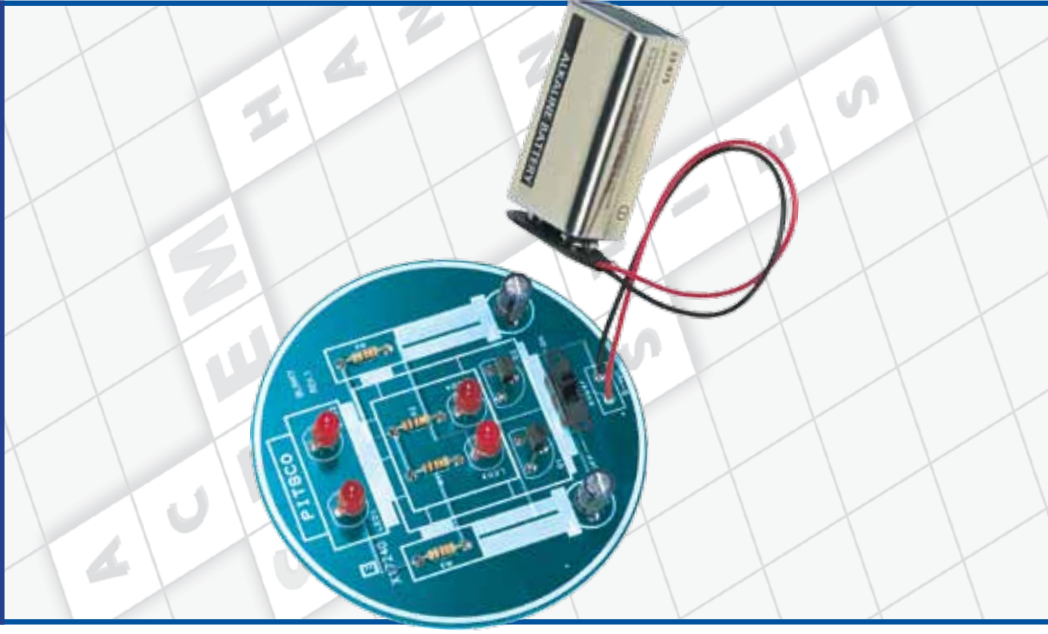


Figure 4 – Circuit board face up

12. Locate the two 10k Ω resistors (these have brown, black, and orange stripes) and insert them in the **R1** and **R2** locations. Solder in place and clip excess leads.
13. Locate the two transistors and insert them in the **Q1** and **Q2** locations. Place the transistor so the flat side faces the top of the board (toward the robot's head) before soldering. Solder, and then clip excess leads.
14. Locate the two capacitors. Insert the leads through the holes at locations **C1** and **C2** with the negative (-) side of the capacitor facing toward the negative (-) sign marked on the circuit board. Solder and clip excess leads.
15. Locate the switch. Insert it into the holes labeled **power** and solder it in place.
16. Connect a 9-volt battery to the battery snap.
17. Slide the switch to the On position to test the circuits. The lights on the robot should flash intermittently. If the robot does not light, check each of the solder joints to ensure you have not created a short circuit.

Blinky Kit



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User Guide

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