9-Layers RGB LED Flashing Tower DIY Kit

1.Introduction:

It is a 9-Layers RGB LED Flashing Tower DIY Kit. It can works in LED automatic animation mode and audio spectrum mode which can flashing with music.

It is a very interesting DIY electronic product which enables users to understand the circuit more clearly and learn soldering skills.

2.Feature:

1>.9 layers LED Flashing Lamp Tower: It consists of 9 layers of LED rings and 1 tower top which comes to be a LED flashing light. 13pcs 3mm RGB LED per layer.

2>.Animation/Spectrum Mode:It has 14 automatic flash animation modes and 7 audio frequency flash modes. LED automatically switches flashing state at Animation Mode and LED flashes with music at Spectrum Mode.

3>.Remote Control: It can control the working state through the remote control, which is convenient for testing and switching the display effect you want.

4>.Easy Installation: We provide a complete installation manual with pictures and text to guide the installation step by step, which can greatly improving the installation time and reducing the difficulty.

5>.DIY Hand Soldering. It's a DIY kit which comes with various components. User need to install each component by hand. It not only can exercise and improve soldering skills, but also increase the interest in electronic technology. Great for electronics hobbyists, school and home education.

3.Parameter:

1>.Product Name:9-Layers RGB LED Flashing Tower DIY Kit
2>.Work Voltage:DC 4.5V~5.5V
3>.Controller type: Remote Control
4>.LED Type: 131pcs 3mm RGB LED
5>.Work Mode:Animation/Spectrum Mode
6>.Work Type: LED automatic flashing
7>.Audio Input: Yes
8>.Audio Output: No
9>.Play Music: No
10>.Work Temperature:-40℃~85℃
11>.Work Humidity:5%~95%RH
12>.Size(Installed):60*60*310mm

4.Component Listing:

NO.	Component Name	PCB Marker	Parameter	QTY
1	Metal Film Resistor	R13	10Kohm	1
2	Metal Film Resistor	R1-R11	510ohm	11
3	Electrolytic Capacitor	C1	220uF	1
4	STC15W408AS Controller	U1	DIP-28	1
5	IC Socket	U1	DIP-28	1
6	White Wire		200cm	1
7	3mm RGB LED			150
8	5mm RGB LED	D1-D4		4
9	Mini USB Socket	P3		1
10	Toggle Switch	S1,S2		2
11	Nylon Column		M3*20mm	4
12	Nylon Screw		M3*6mm	4
13	LED Soldering Template			1
14	Audio Converter			1

15	USB Audio-Power Wire			1
16	Infrared Receiver	P4		1
17	Infrared Remote Controller			1
18	PCB		60*60mm	1

5.Application:

1>.Training welding skills
2>.Student school
3>.DIY production
4>.Project Design
5>.Electronic competition
6>.Gift giving
7>.Crafts collection
8>.Home decoration
9>.Souvenir collection
10>.Graduation design
11>.Holiday gifts

6.Installation Tips:

1>.User needs to prepare the welding tool at first.
   1.1>.Soldering iron (<50 Watt)
   1.2>.Rosin core ("radio") solder
   1.3>.Wire cutters
   1.4>.Wire strippers
   1.5>.Philips screwdriver
2>.Please be patient until the installation is complete.
3>.The package is DIY kit.It need finish install by user.
4>.The soldering iron can't touch the components for a long time(1.0 second), otherwise it will damage the components.
5>.Pay attention to the positive and negative of the components.
6>.Strictly prohibit short circuit.
7>.User must install the LED according to the specified rules.Otherwise some LED will not light.
8>.Install complex components preferentially.
9>.Make sure all components are in right direction and right place.
10>.It is strongly recommended to read the installation manual before starting installation!!!
11>.Please wear anti-static gloves or anti-static wristbands when installing electronic components.

7.Installation Steps(Please be patient install!!!):

1>.Step 1: Install 11 pieces of 510-ohm metal film resistors at R1 to R11.
2>.Step 2: Install 1 piece of 10,000-ohm metal film resistor at R13.
3>.Step 3: Install 1 piece of DIP-28 IC socket at U1. Look for the gap mark on one end of the IC socket and match it with the gap mark on the PCB silk screen. This will show you the correct direction to install the IC socket.
4>.Step 4: Install a Mini USB Port at P3.
5>.Step 5: Install 2pcs Toggle Switch at S1,S2.
6>.Step 6: Install one 220uF electrolytic capacitor at C1. Make sure to distinguish between the positive and negative terminals. The longer pin is the positive terminal. Note: The capacitor must be placed horizontally, otherwise, you won't be able to install the following components.
7>.Step 7: Identify the positive(anode) and negative(cathode) lead of LED.The leads of the LED must be installed correctly, otherwise the LED cannot be turned on.Here are four methods as following:
  7.1>.According to the length of the LED lead to distinguish. The longer pin is positive(anode) lead. The shorter pin is negative(cathode) lead.
  7.2>.Identify the negative(cathode) of the LED is to look into the plastic case where one can see that

the negative(cathode) is much thicker/bigger inside the plastic case than the anode lead.

    7.3>.Identify by edge of plastic case.The negative(cathode) lead of the LED should be the pin nearest the flat on the plastic case.

    7.4>.Test by 3V battery or multimeter.The pin is positive(anode) lead which has connect to the positive of 3V if LED can light up after connect 3V power supply.(LED should not be powered directly from the 3V for a short time:less then 0.5second)

    7.5>.It is positive(anode) where the white mark "+" pointing to on PCB.

    8>.Step 8: Install four 5mm RGB LEDs at D1 to D4. The longer pin is the positive terminal and should be connected to the square pad.

    9>.Step 9: Install one Infrared Receiver at P4.

    10>.Step 10: Install one DIP-28 IC STC15W408AS Amplifier or IC Socket at U1. There is a gap mark on one end of the IC and also on the PCB silk screen where the IC is to be placed. These two marks correspond to each other and indicate the correct direction for installing the IC.

    11>.Step 11: Test the circuit by powering it on. The circuit is working correctly if the four LEDs flash automatically.

    12>.Step 12: Install four M3*20mm Nylon Columns and four M3*6mm Nylon Screws on the LED Soldering Template. Follow the rules shown in the diagram, where the outermost ring is the first ring (1st Ring) and the innermost ring is the sixth ring (6th Ring). The 1st to 9th rings are labeled for reference.

    13>.Step 13: The diagram shows the structure of each layer of LEDs. The first layer of LEDs is the closest to the PCB.

    14>.Step 14: Prepare the LEDs by bending the longer pin (positive pole) at a right angle. Be careful not to damage the LED while doing so.

    15>.Step 15: Assemble the first layer of the LED tower main body. Place the prepared LED on the first ring (#1 Ring) with the shorter pin (negative pole) facing outward and the longer pin (positive pole) connecting to the next LED.

    16>.Step 16: Use a soldering iron to solder the positive pole (longer pin) of the LED in place. Be careful not to touch the LED pins with the soldering iron for too long, as it may damage the LED.

    17>.Step 17: Cut off any excess pins, but only CUT the LONGER PINS!

    18>.Step 18: Use the same method to make the 2nd to 9th layer of LED for the Tower main body. Follow the LED Soldering Template.

    19>.Step 19: The spire has four layers of LEDs, distributed as 6-6-1-1. This means that the 1st and 2nd layers have 6 LEDs each, while the 3rd and 4th layers have 1 LED each.

    20>.Step 20: Take out the 4 M3*20mm Nylon Column and 4 M3*6mm Nylon Screw from the LED Soldering Template and put them on the PCB.

    21>.Step 21: Bend the LED pins at a 45-degree angle.

    22>.Step 22: Install the 1st layer of LEDs onto the PCB, ensuring that they are level.

    23>.Step 23: Use a white wire to connect the positive pole of the 1st layer to T1. After connecting and turning on the power, this layer should flash normally.

    24>.Step 24: Place some tin on the pins of the LED to make it easier to connect and secure the next layer.

    25>.Step 25: Attach the second layer of LEDs to the PCB and connect it to T2. Test the connection afterwards. Tip: Secure the diagonal LEDs first, and then attach the rest of the LEDs.

    26>.Step 26: Mount the third to ninth layers of LEDs on the PCB and connect them to T3 to T9 respectively. Test the connection using the same method as before. Note: The sixth layer is the smallest LED ring.

    27>.Step 27: Bend the LED pins at an angle of 45 to 135 degrees and apply some solder to the ends.
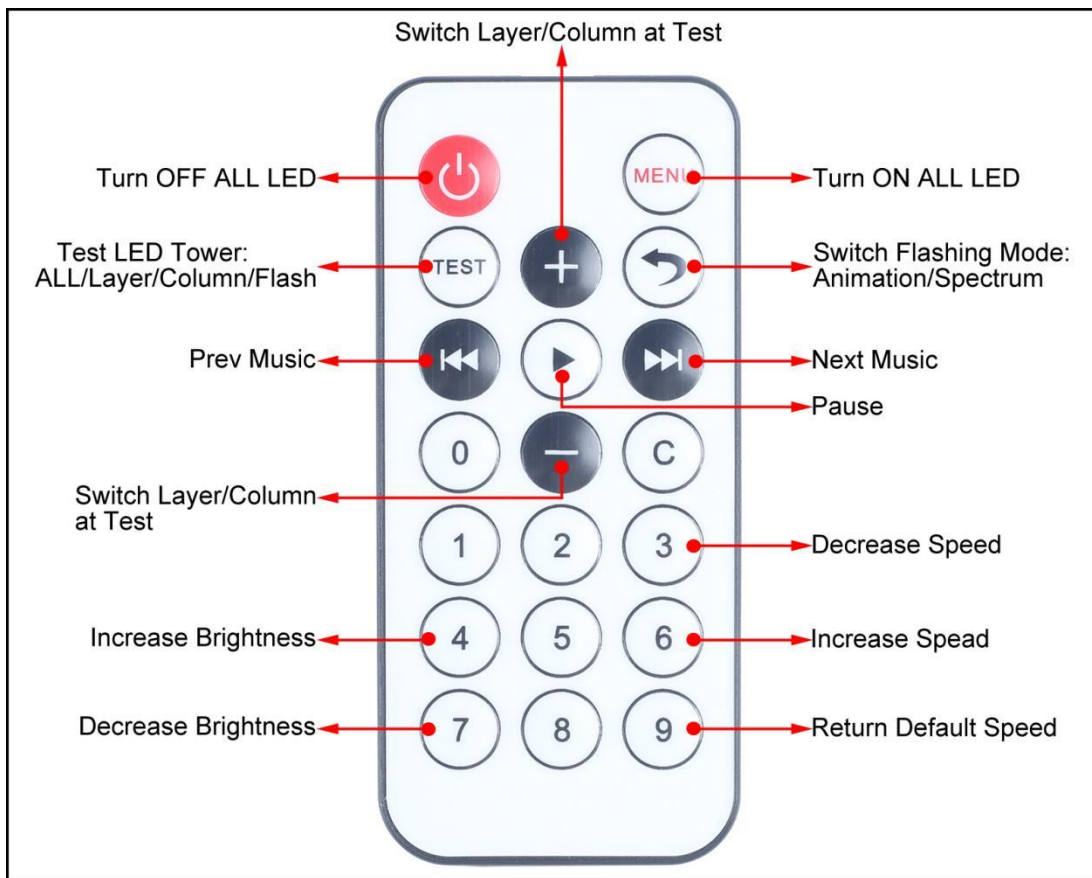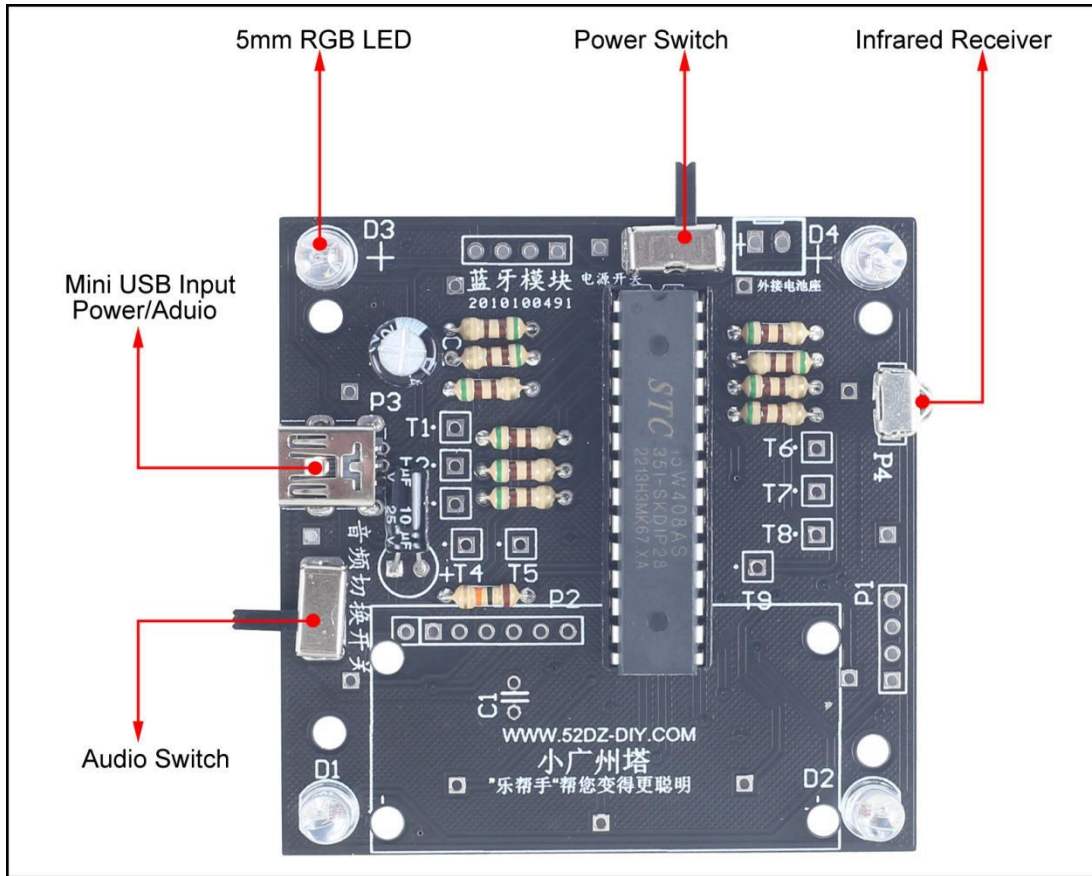
    28>.Step 28: Fix the pins to the ninth LED ring. Note: The LED pins are the negative pole on the outermost part.

    29>.Step 29: Fix another 6pcs LED ring by the same methods.Then connect two 6pcs-LED-Ring to the 9th ring by metal wire.Note that they are connected by their internal metal rings.
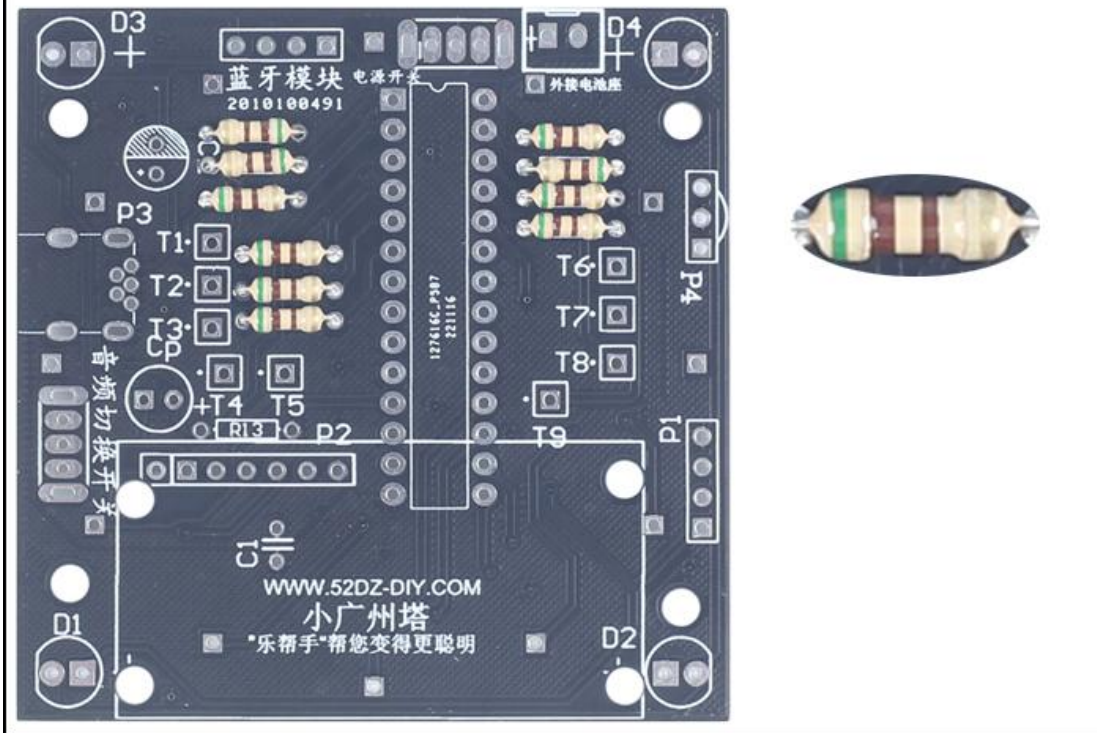
    30>.Step 30: Fix the last 2pcs LED. Note: LED pins are negative pole at outermost.

    31>.Step 31: Test after power ON.

10.Install shown steps:

5mm RGB LED   Power Switch   Infrared Receiver

Mini USB Input
Power/Aduio

Audio Switch

Switch Layer/Column at Test

Turn OFF ALL LED   MENU   Turn ON ALL LED

Test LED Tower:
ALL/Layer/Column/Flash   TEST   Switch Flashing Mode:
Animation/Spectrum

Prev Music   Next Music

Pause

Switch Layer/Column
at Test

Decrease Speed

Increase Brightness   Increase Spead

Decrease Brightness   Return Default Speed

Step 1: Install 11 pieces of 510-ohm metal film resistors at R1 to R11.

Step 2: Install 1 piece of 10,000-ohm metal film resistor at R13.
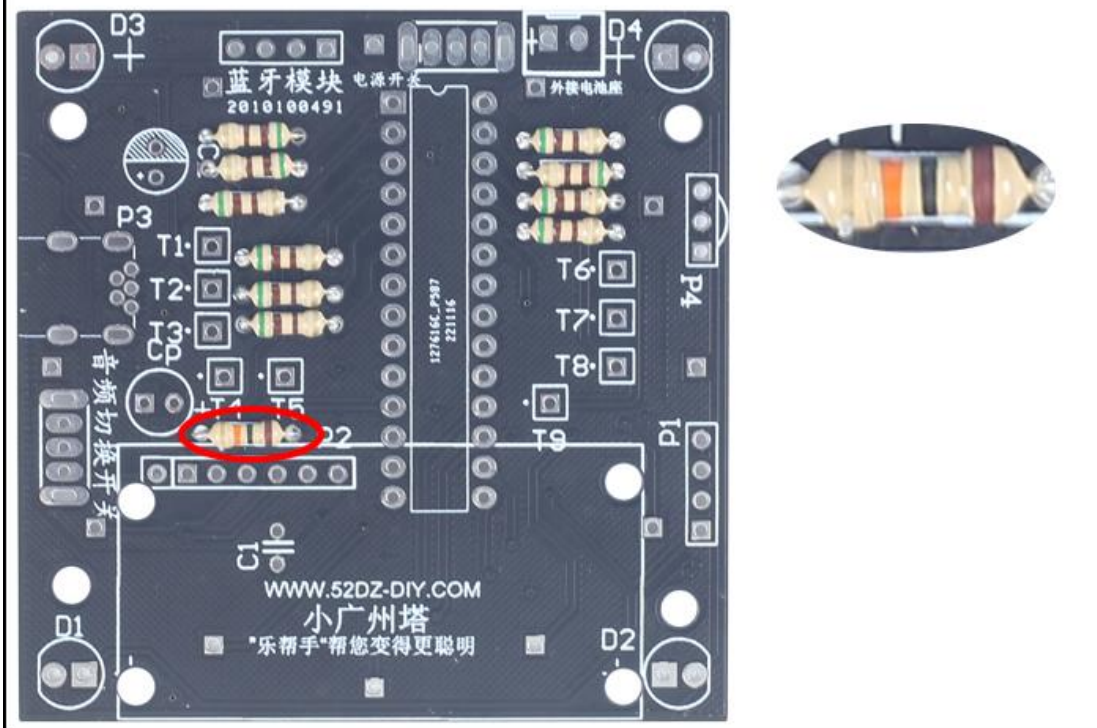
Step 3: Install 1 piece of DIP-28 IC socket at U1. Look for the gap mark on one end of the IC socket and match it with the gap mark on the PCB silk screen. This will show you the correct direction to install the IC socket.
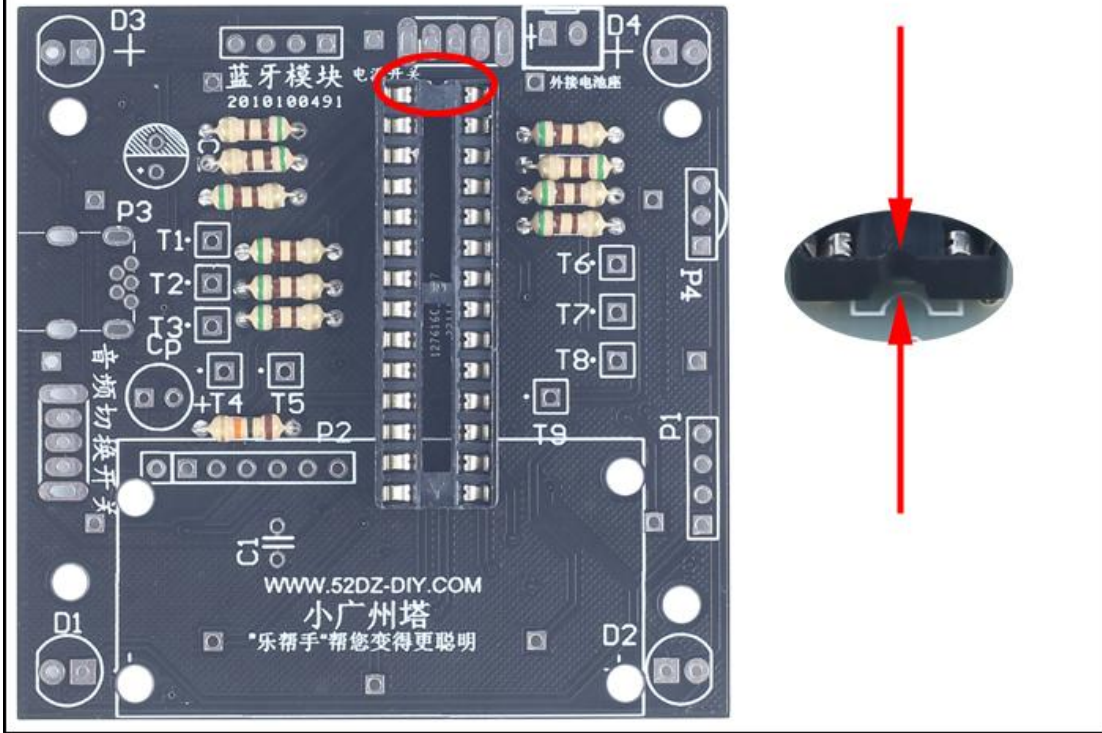
Step 4: Install a Mini USB Port at P3.
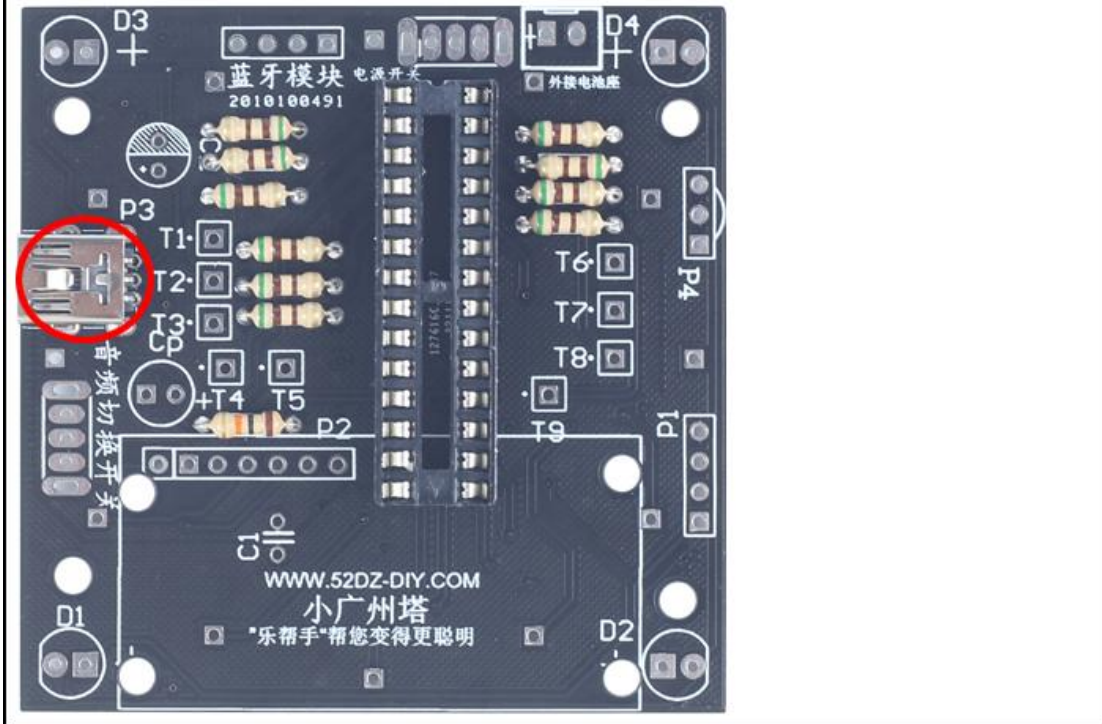
Step 5: Install two Toggle Switches at S1 and S2.

Step 6: Install one 220uF electrolytic capacitor at C1. Make sure to distinguish between the positive and negative terminals. The longer pin is the positive terminal.
Note: The capacitor must be placed horizontally,
otherwise, you won't be able to install the following components.

Ignore
(NO NEED)

Step 7: Identify the positive(anode) and negative(cathode) lead of LED.The leads of the LED must be installed correctly, otherwise the LED cannot be turned on.Here are four methods as following:

7.1>.According to the length of the LED lead to distinguish. The longer pin is positive(anode) lead. The shorter pin is negative(cathode) lead.

7.2>.Identify the negative(cathode) of the LED is to look into the plastic case where one can see that the negative(cathode) is much thicker/bigger inside the plastic case than the anode lead.

7.3>.Identify by edge of plastic case.The negative(cathode) lead of the LED should be the pin nearest the flat on the plastic case.

7.4>.Test by 3V battery or multimeter.The pin is positive(anode) lead which has connect to positive of 3V if LED can light up after connect 3V power supply. (LED can not be powered directly from 3V for a short time:less then 0.5second)

7.5>.Note:If the flat on package disagrees with other indicators(short lead,large cathode lead end), then other indicators take priority. I.e. if the flat disagrees with the lead length,use the lead length as the cathode indicator.

Shortor pin
Negative
Cathode

Thicker/bigger Metal
Negative(cathode)

Flat edge
Negative(cathode)

Step 8: Install four 5mm RGB LEDs at D1 to D4. The longer pin is the positive terminal and should be connected to the square pad.
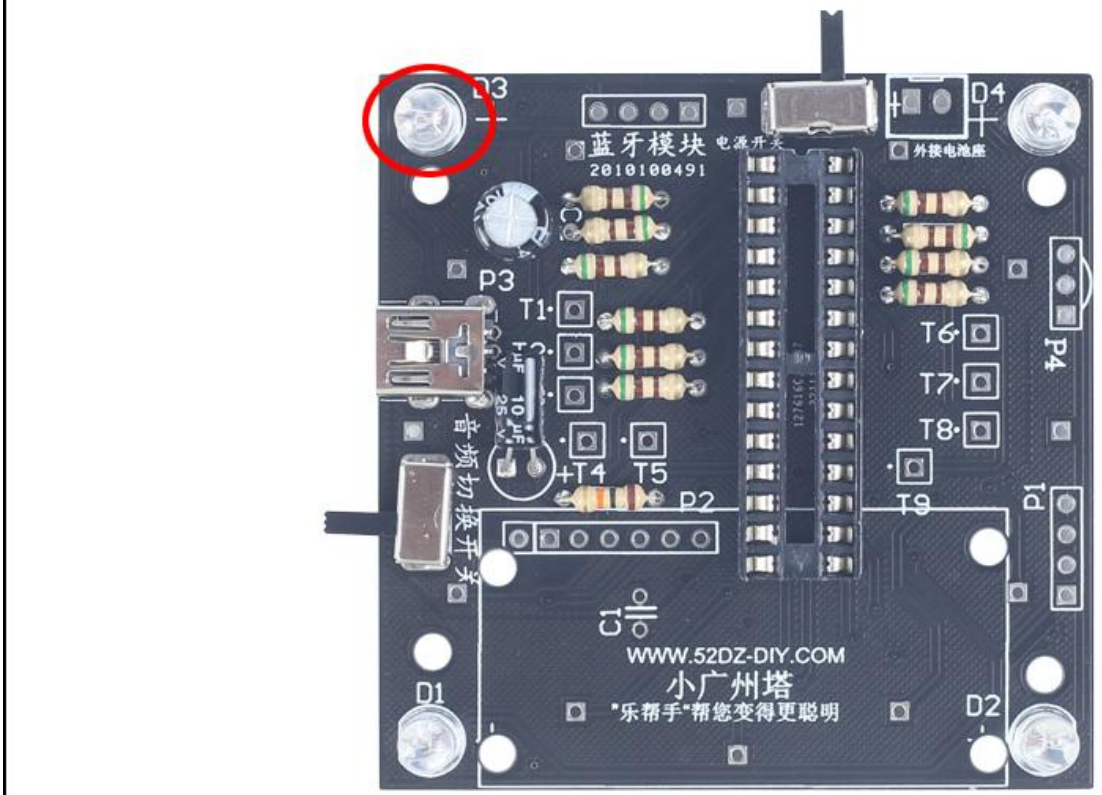
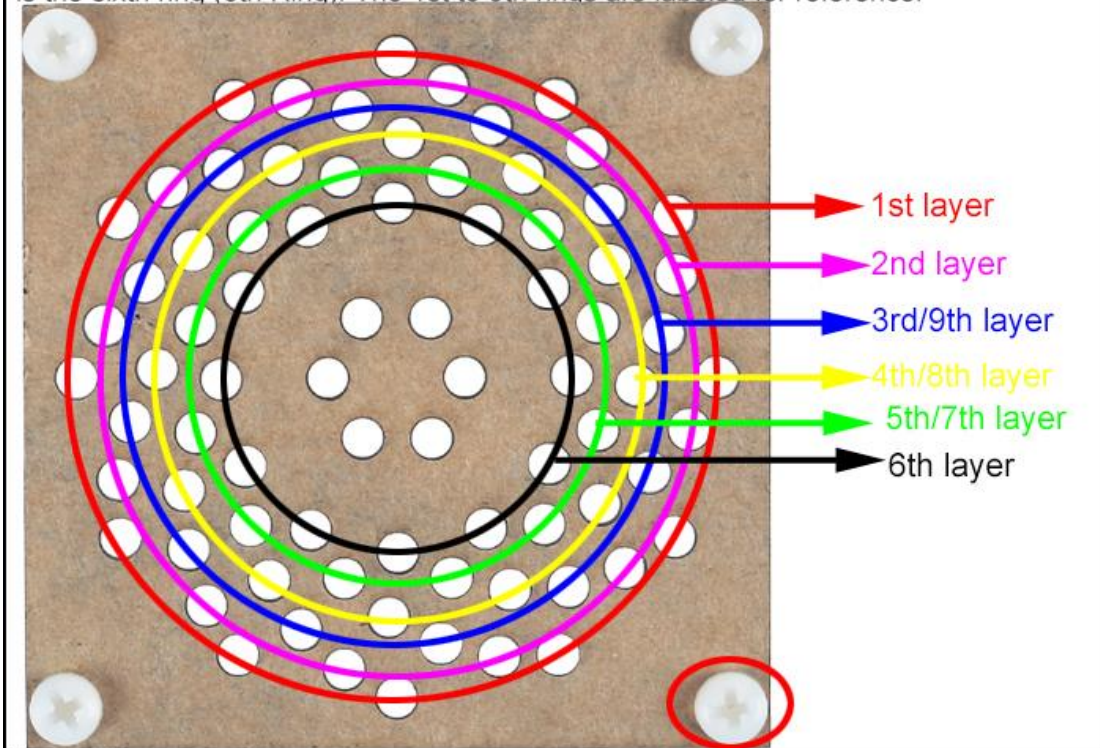Step 9: Install one Infrared Receiver at P4.
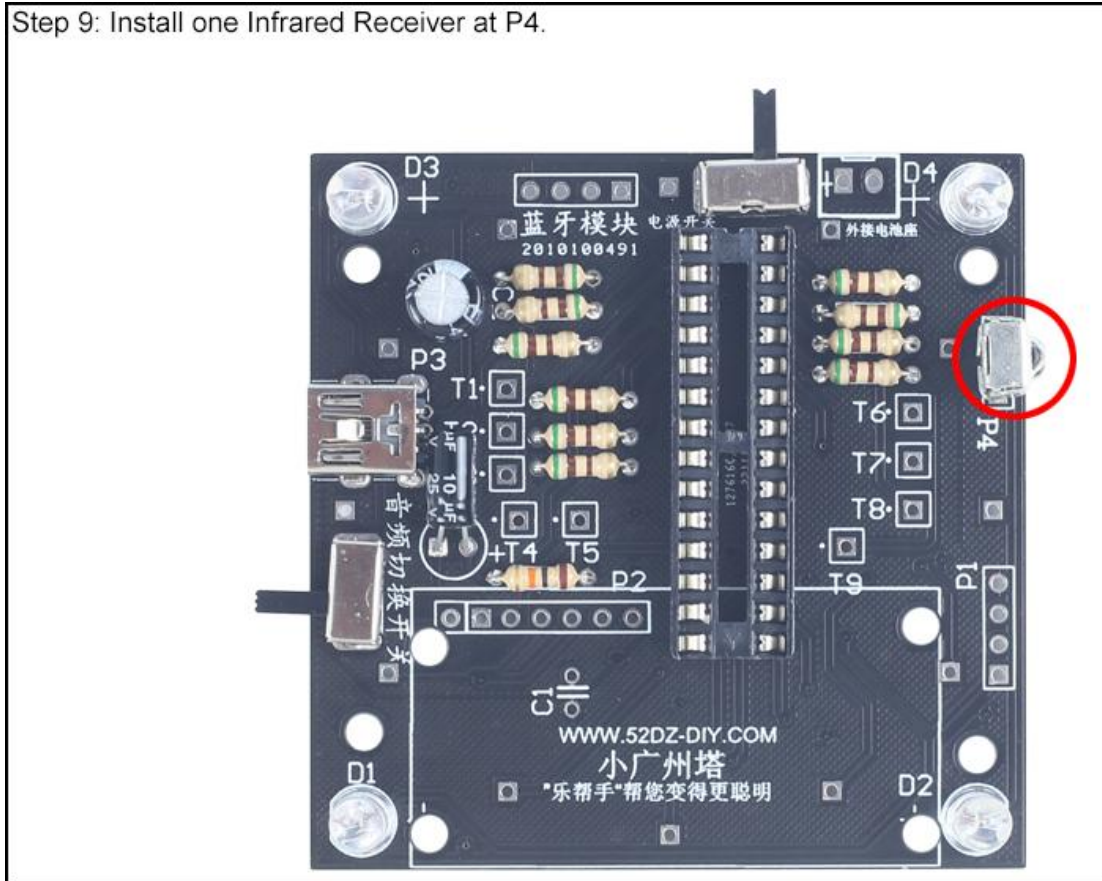
Step 10: Install one DIP-28 IC STC15W408AS Amplifier or IC Socket at U1.
There is a gap mark on one end of the IC and also on the PCB silk screen
where the IC is to be placed. These two marks correspond to each other
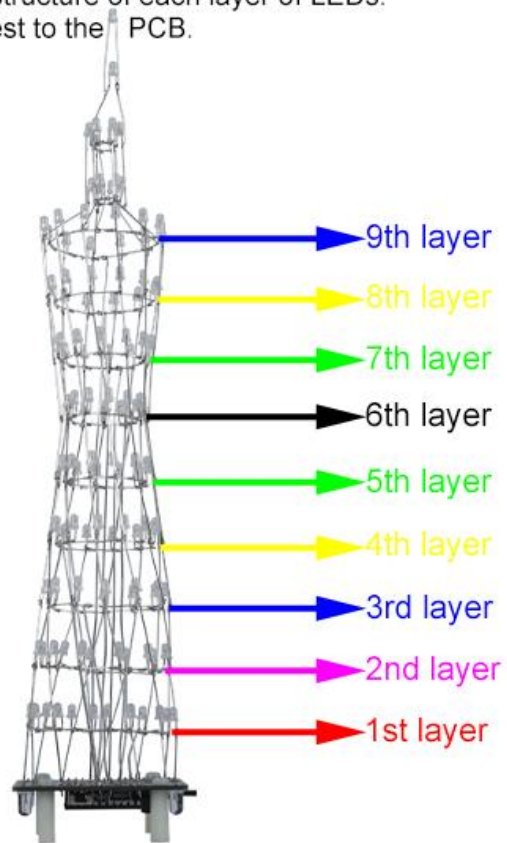and indicate the correct direction for installing the IC.
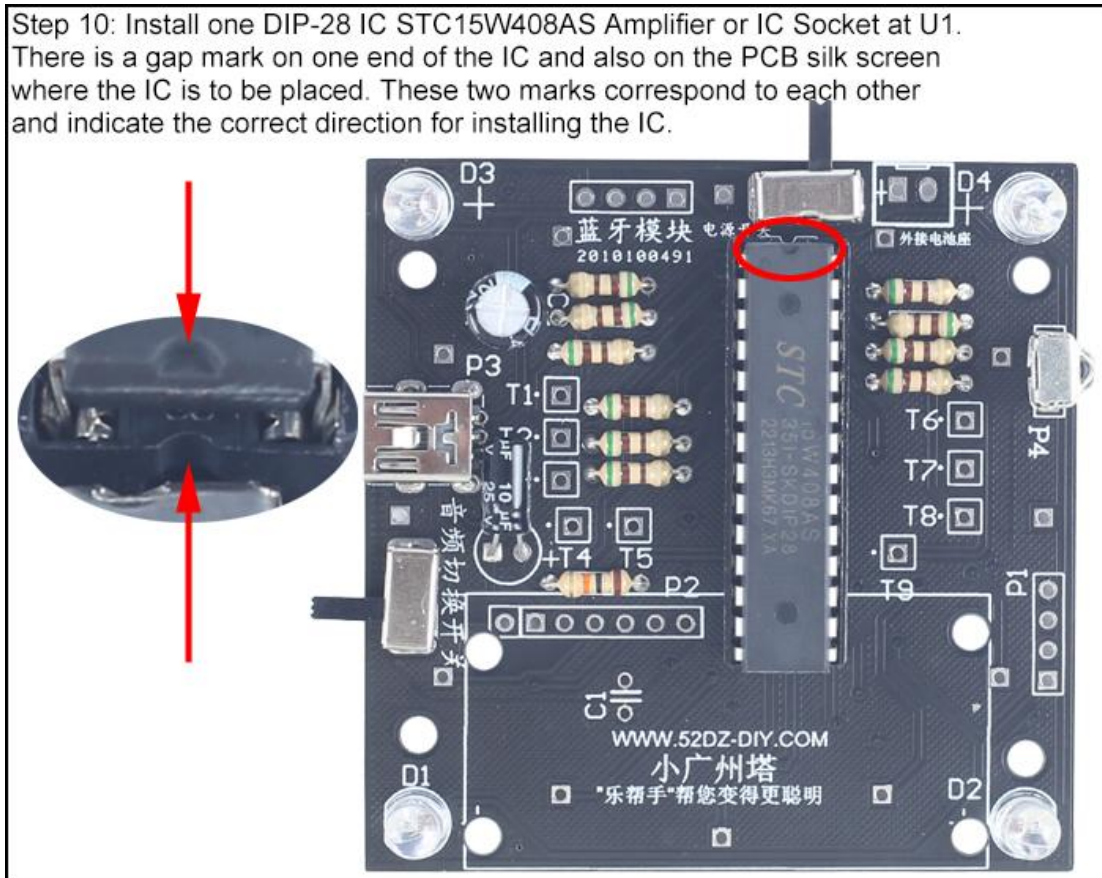
Step 11: Test the circuit by powering it on. The circuit is working correctly if the four LEDs flash automatically.
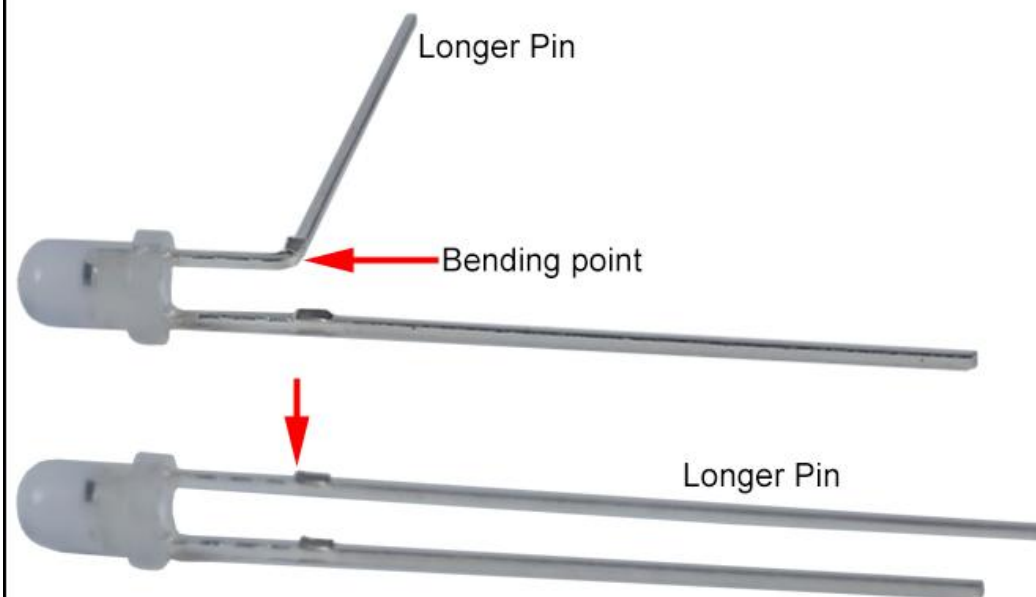

Step 12: Install four M3*20mm Nylon Columns and four M3*6mm Nylon Screws on the LED Soldering Template. Follow the rules shown in the diagram, where the outermost ring is the first ring (1st Ring) and the innermost ring is the sixth ring (6th Ring). The 1st to 9th rings are labeled for reference.

- 1st layer
- 2nd layer
- 3rd/9th layer
- 4th/8th layer
- 5th/7th layer
- 6th layer

Step 13: The diagram shows the structure of each layer of LEDs.
The first layer of LEDs is the closest to the PCB.

→9th layer
→8th layer
→7th layer
→6th layer
→5th layer
→4th layer
→3rd layer
→2nd layer
→1st layer

Step 14: Prepare the LEDs by bending the longer pin (positive pole) at a right angle.
Be careful not to damage the LED while doing so.

Longer Pin

Bending point

Longer Pin

Step 15: Assemble the first layer of the LED tower main body. Place the prepared LED on the first ring (#1 Ring) with the shorter pin (negative pole) facing outward and the longer pin (positive pole) connecting to the next LED.

Step 16: Use a soldering iron to solder the positive pole (longer pin) of the LED in place. Be careful not to touch the LED pins with the soldering iron for too long, as it may damage the LED.
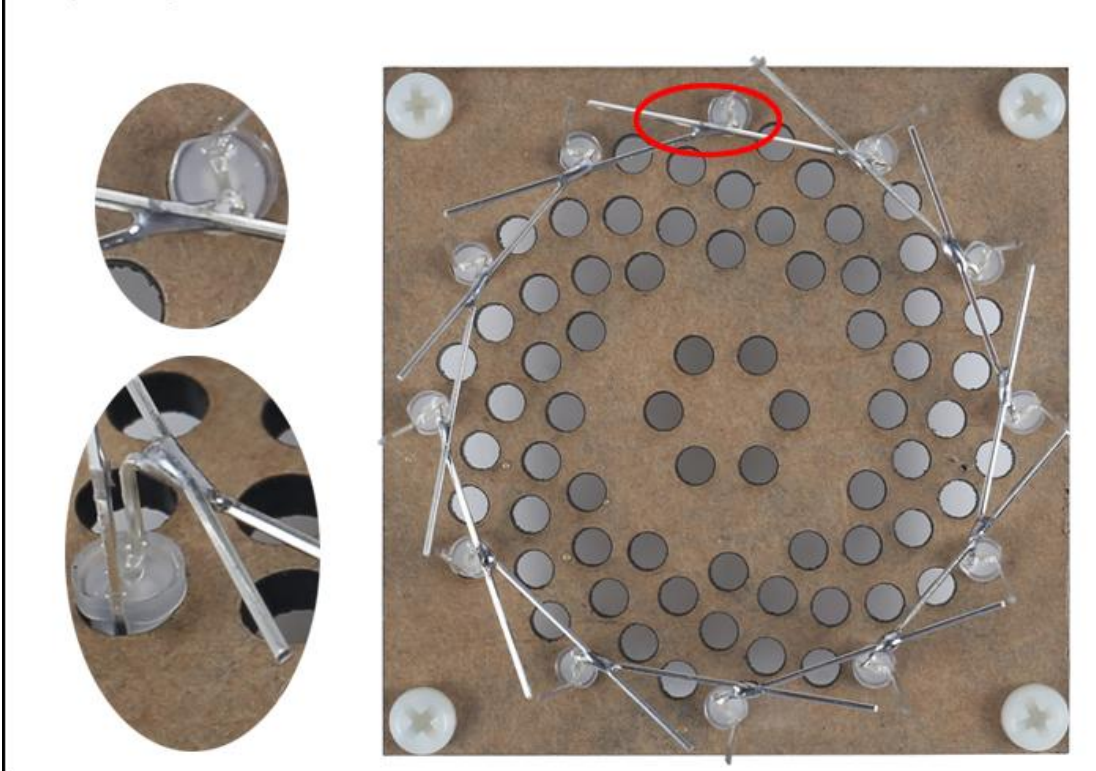
Step 17: Cut off any excess pins, but only CUT the LONGER PINS!
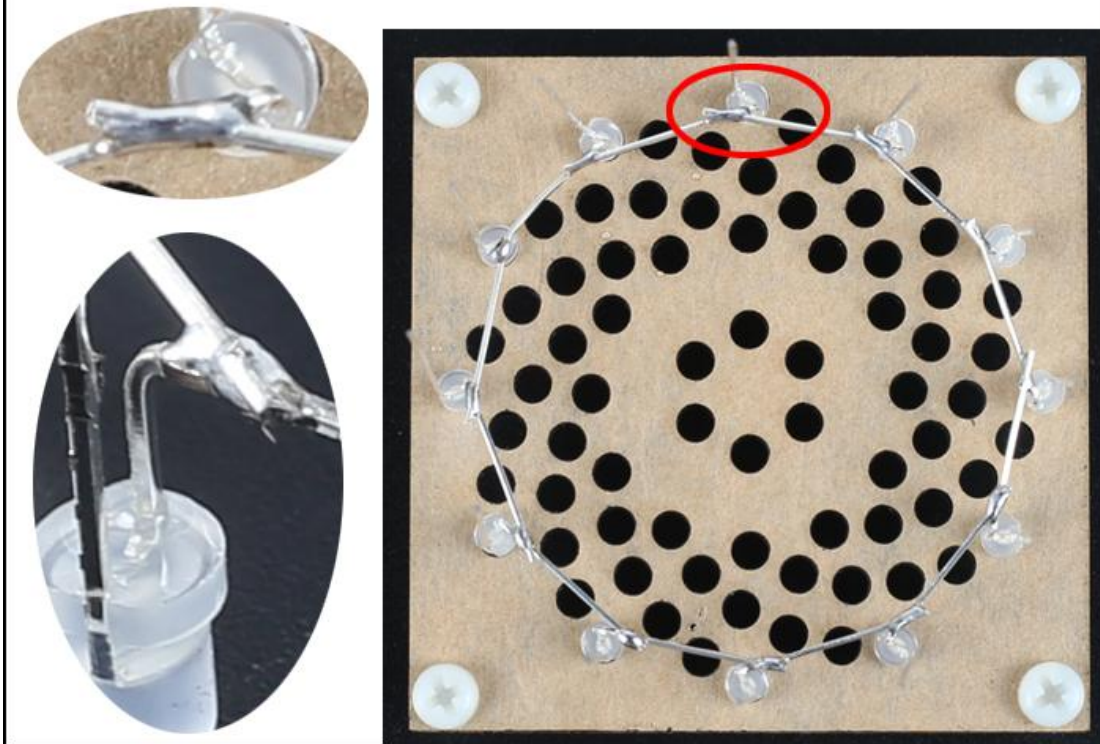
Step 18: Use the same method to make the 2nd to 9th layer of LED for the Tower main body. Follow the LED Soldering Template.

1st layer
2nd layer
3rd/9th layer
4th/8th layer
5th/7th layer
6th layer
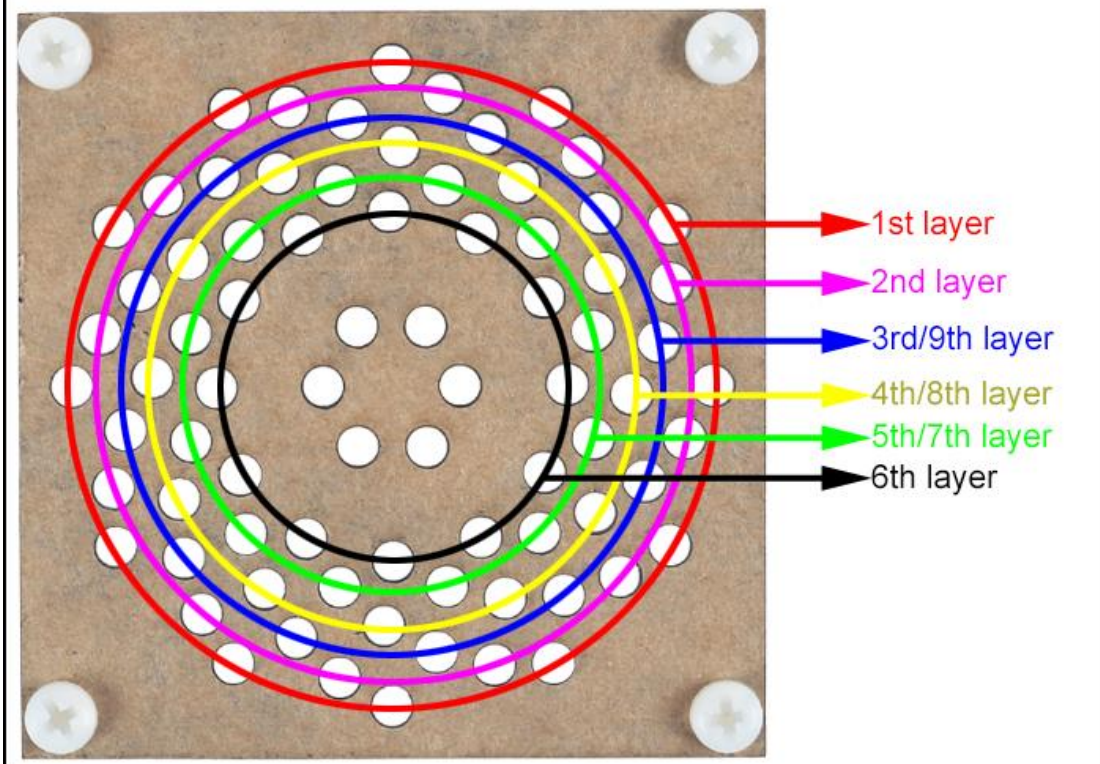
Step 19: The spire has four layers of LEDs, distributed as 6-6-1-1.
This means that the 1st and 2nd layers have 6 LEDs each,
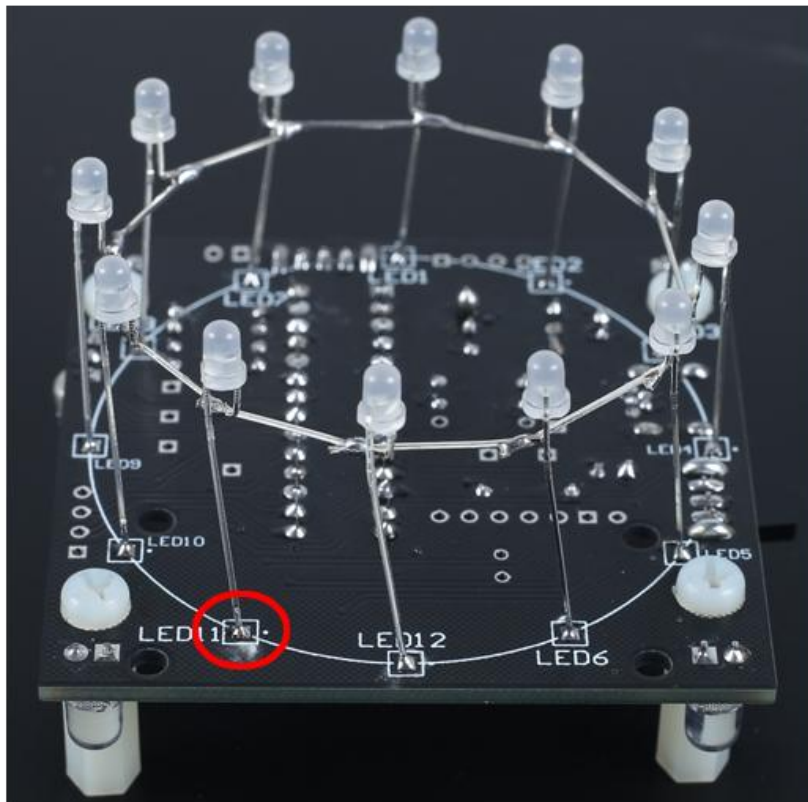while the 3rd and 4th layers have 1 LED each.
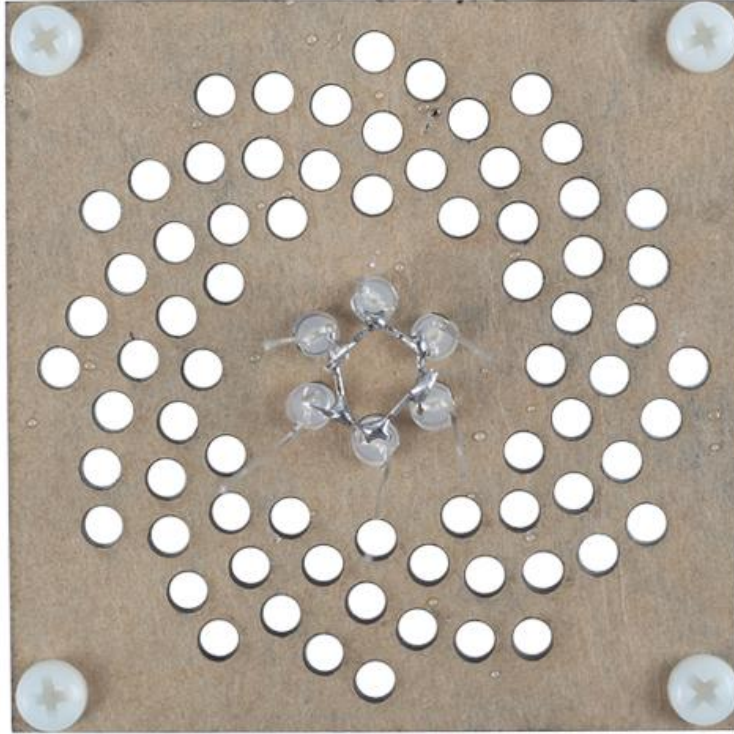
Step 20: Take out the 4 M3*20mm Nylon Column and 4 M3*6mm Nylon Screw from
the LED Soldering Template and put them on the PCB.

Step 21: Bend the LED pins at a 45-degree angle.

45°
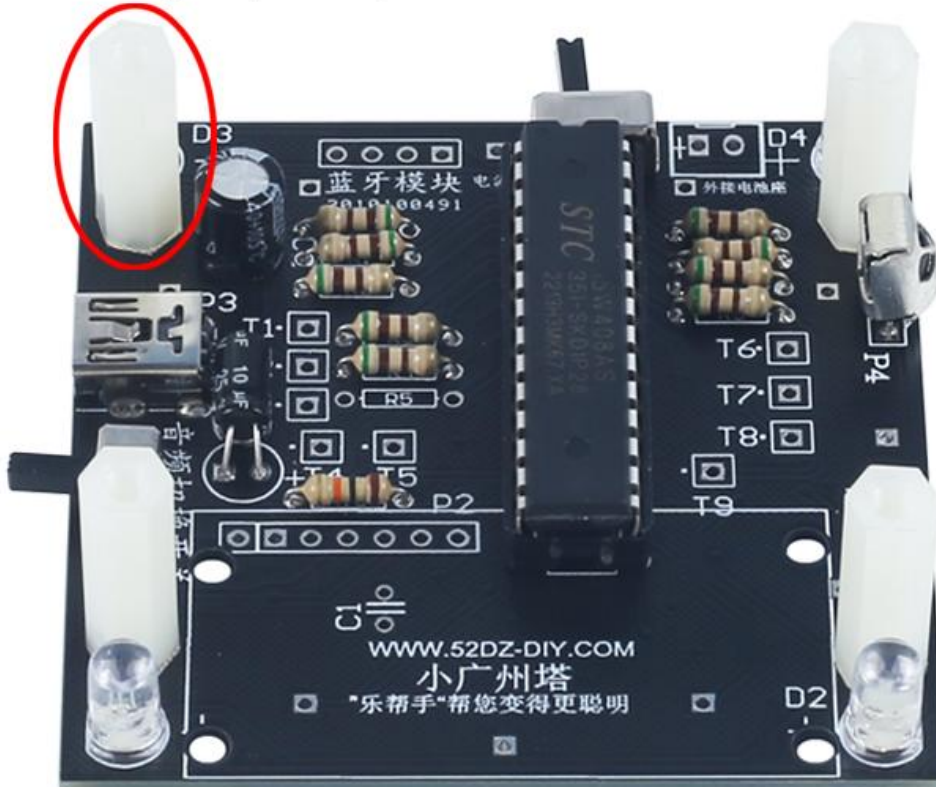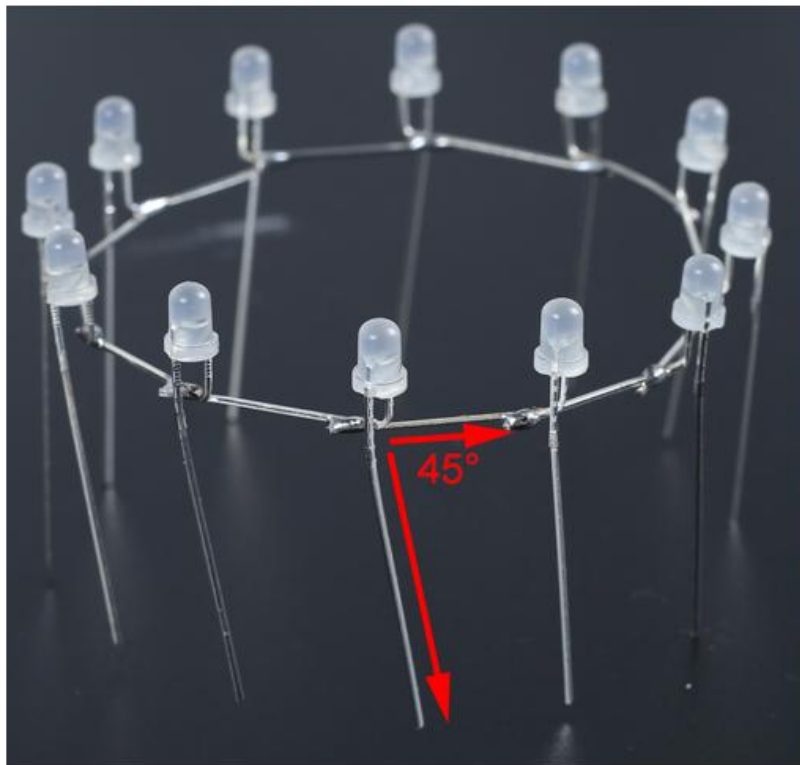
Step 22: Install the 1st layer of LEDs onto the PCB, ensuring that they are level.

Step 23: Use a white wire to connect the positive pole of the 1st layer to T1. After connecting and turning on the power, this layer should flash normally.
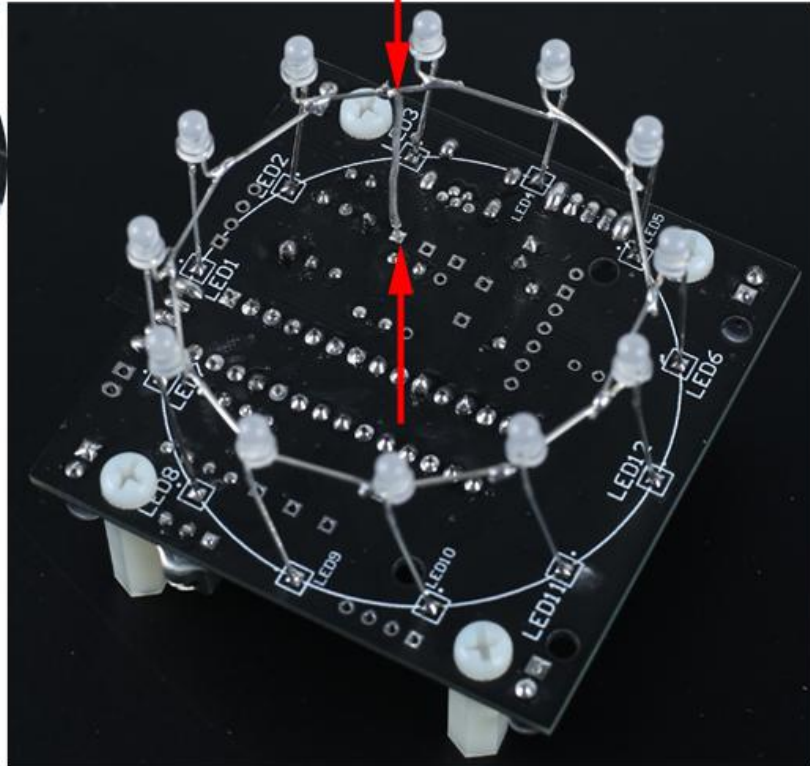

Step 24: Place some tin on the pins of the LED to make it easier to connect and secure the next layer.
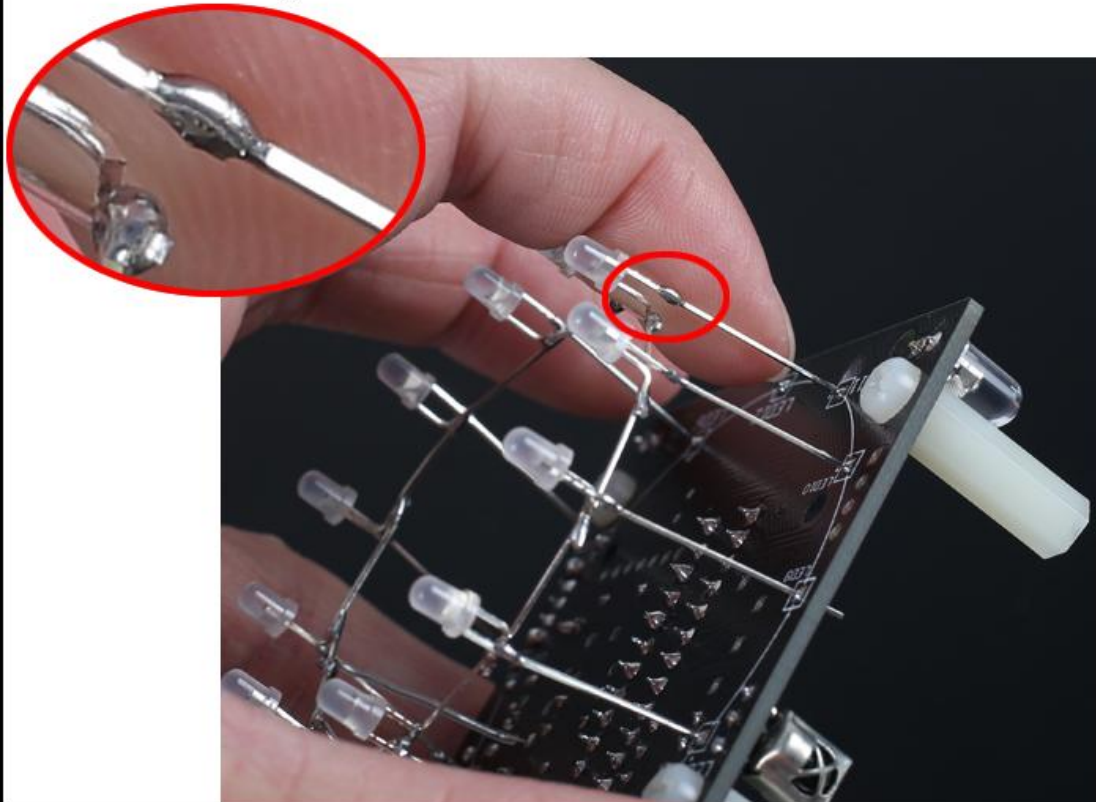
Step 25: Attach the second layer of LEDs to the PCB and connect it to T2.
Test the connection afterwards. Tip: Secure the diagonal LEDs first,
and then attach the rest of the LEDs.
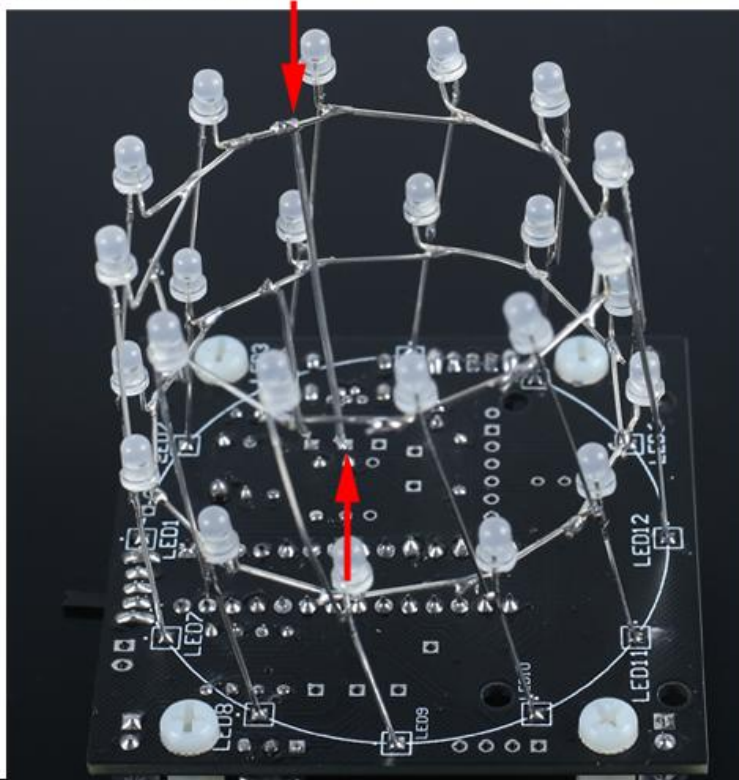
Step 26: Install the 3rd~9th layer of LED on the PCB and connect to T3~T9 and then
test by the same methods. Note: the 6th layer is the smallest LED ring.

9th layer
8th layer
7th layer
6th layer
5th layer
4th layer
3rd layer
2nd layer
1st layer
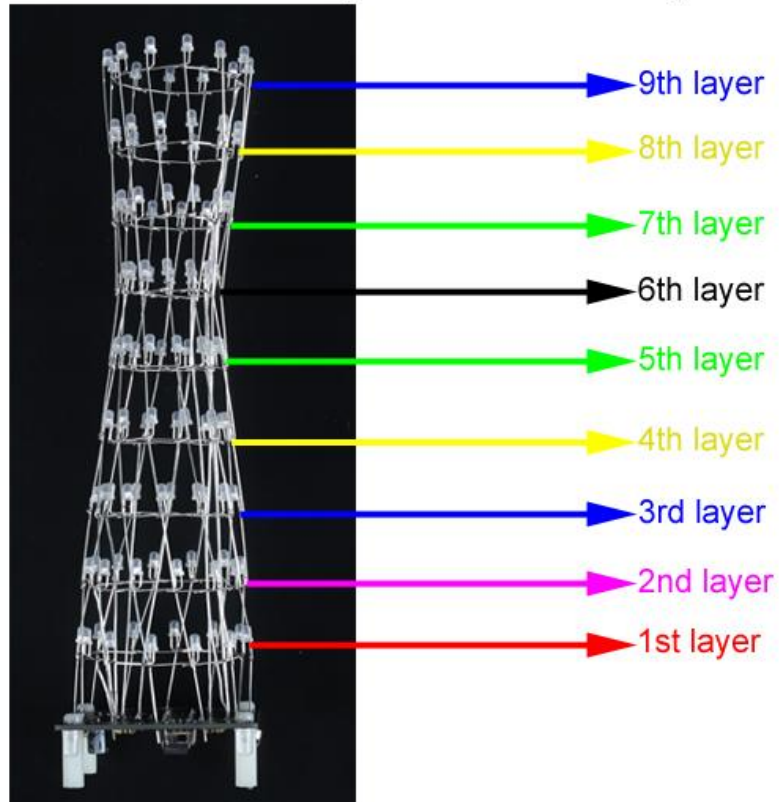
Step 27: Bend the LED pins at an angle of 45 to 135 degrees and apply some solder to the ends.
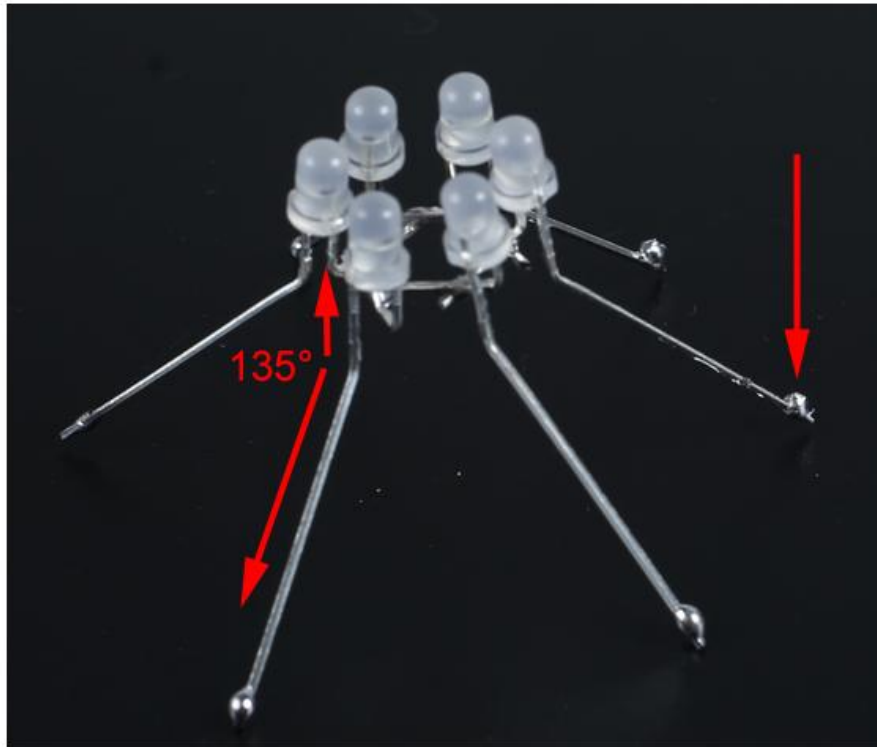
Step 28: Attach the pins to the ninth LED ring.
Note: The LED pins are the negative pole on the outermost part.
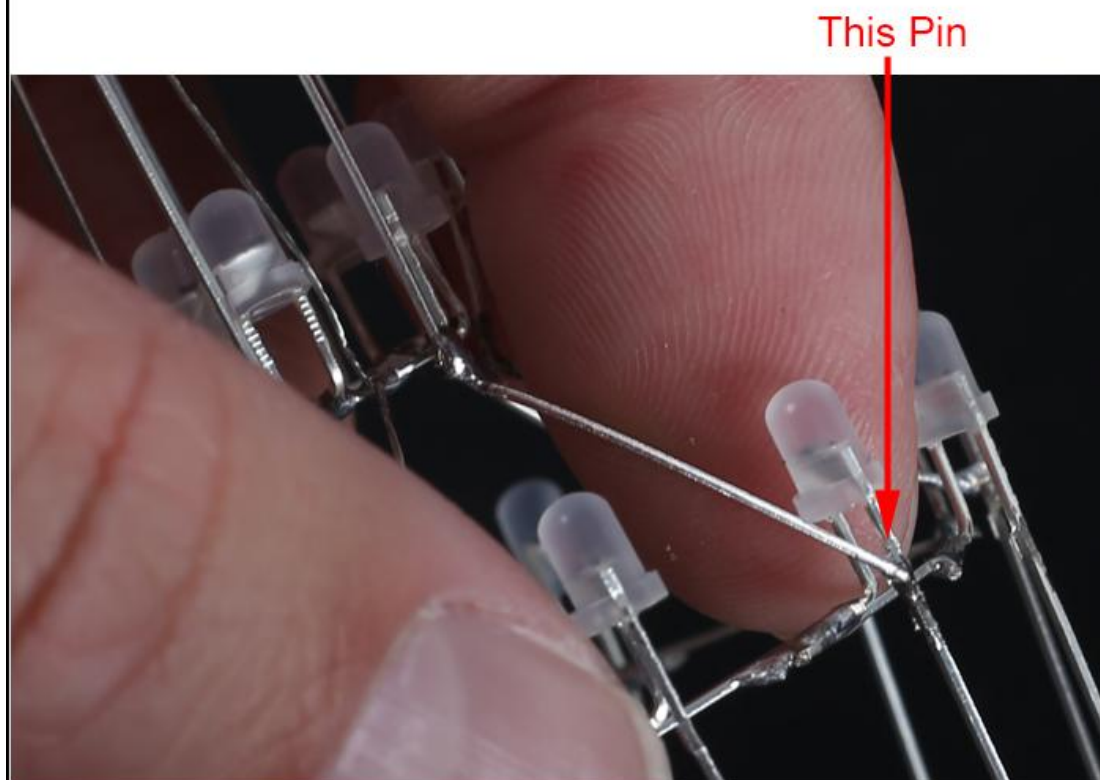
Step 29: Fix six more LED rings using the same method. Then, connect two sets of six LED rings to the ninth ring using a metal wire. Make sure to connect them through their internal metal rings.
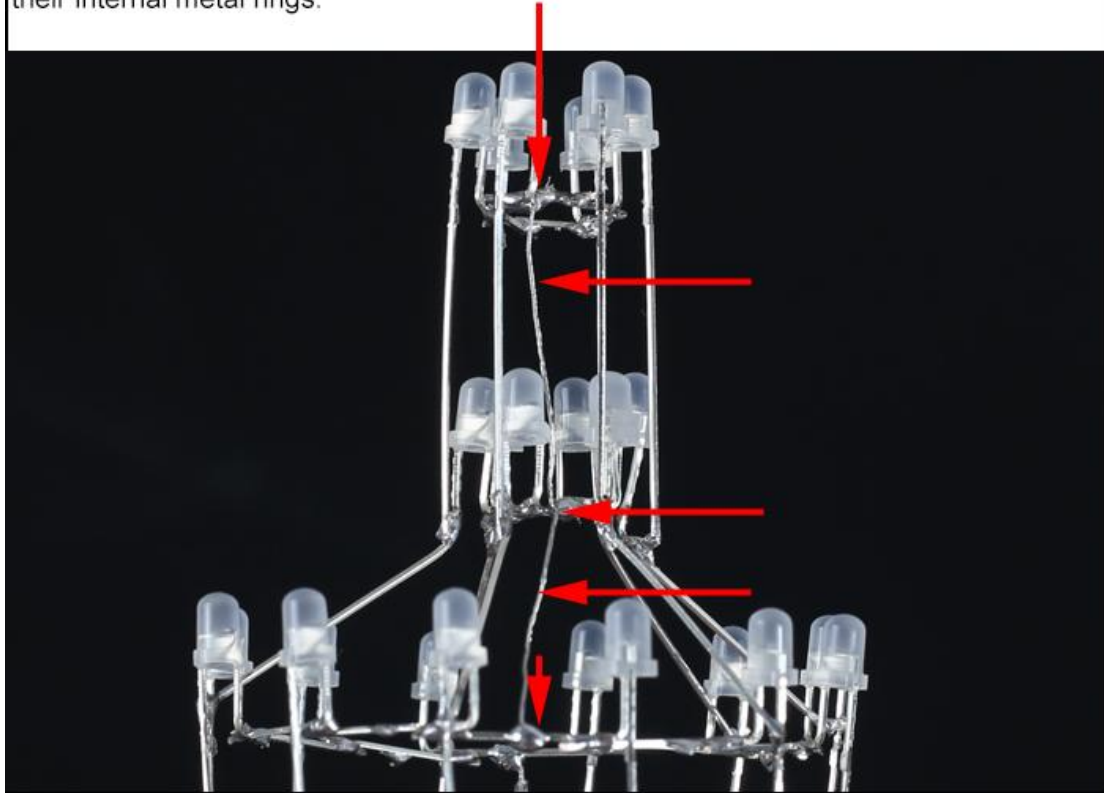
Step 30: Fix the last 2pcs LED. Note: LED pins are negative pole at outermost.

Step 31: Test after power ON.