

Bluetooth Amplifier LED Tower DIY Kit

1.Introduction:

LED Tower is imitated from Guangzhou Tower. Guangzhou Tower, also known as Guangzhou new TV tower, nickname XiaoManYao. It is the tallest building in Guangzhou, the design of the tower is very characteristic, especially in the night under the lighting decoration, it is beautiful. Now become a landmark in Guangzhou. How can such a beautiful building can not let people heart. We combined with the single-chip micro-chip display technology, we can make the beauty of the Guangzhou Tower. We use STC15F2K60S2 as a control system, the display part is 16*16 dot matrix display, through the production of the Guangzhou Tower, can better enhance the micro-controller on the principle of dot matrix display.

2.Feature:

- 1>.Bluetooth Audio Controller
- 2>.Animation Work Mode
- 3>.Spectrum Work Mode
- 4>.MP3 Play Mode
- 5>.Remote Control
- 6>.Power-off Memory Playback
- 7>.Built-in 3W Amplifier
- 8>.Audio Output
- 9>.TF Card Audio Input
- 10>.MP3+WAV Lossless Decoding
- 11>.More than 35 Animation Flashes
- 12>.More than 8 Spectrum Flashes
- 13>.Frosted 5mm RGB LED
- 14>.More than 10-minute Comprehensive Animation Display
- 15>.Adjustable Animation Flash Speed
- 16>.Adjustable Spectrum Display Sensitivity
- 17>.Large Size High Quality Speaker

3.Parameter:

- 1>.Work Voltage:DC 4.5V~5.5V
- 2>.Work Current:1300mA
- 3>.Work Module:Bluetooth and Remote Controller
- 4>.Work Temperature:-40℃~85℃
- 5>.Work Humidity:0%~95%RH
- 6>.Size(Installed):90*90*450mm(Different people installed, the height will be

slightly different).

4.Function:

- 1>. 16*16 led lattice design
- 2>.A variety of modes can be freely converted:
 - 2.1>.Offline animation mode(More than a dozen)
 - 2.2>.Music spectrum mode(Flash with music)
- 3>.Plug-in components used to make high success rate
- 4>.The default code inside the chip, the function is more abundant,So please **do not update the code inside arbitrarily!**

5.Component listing:

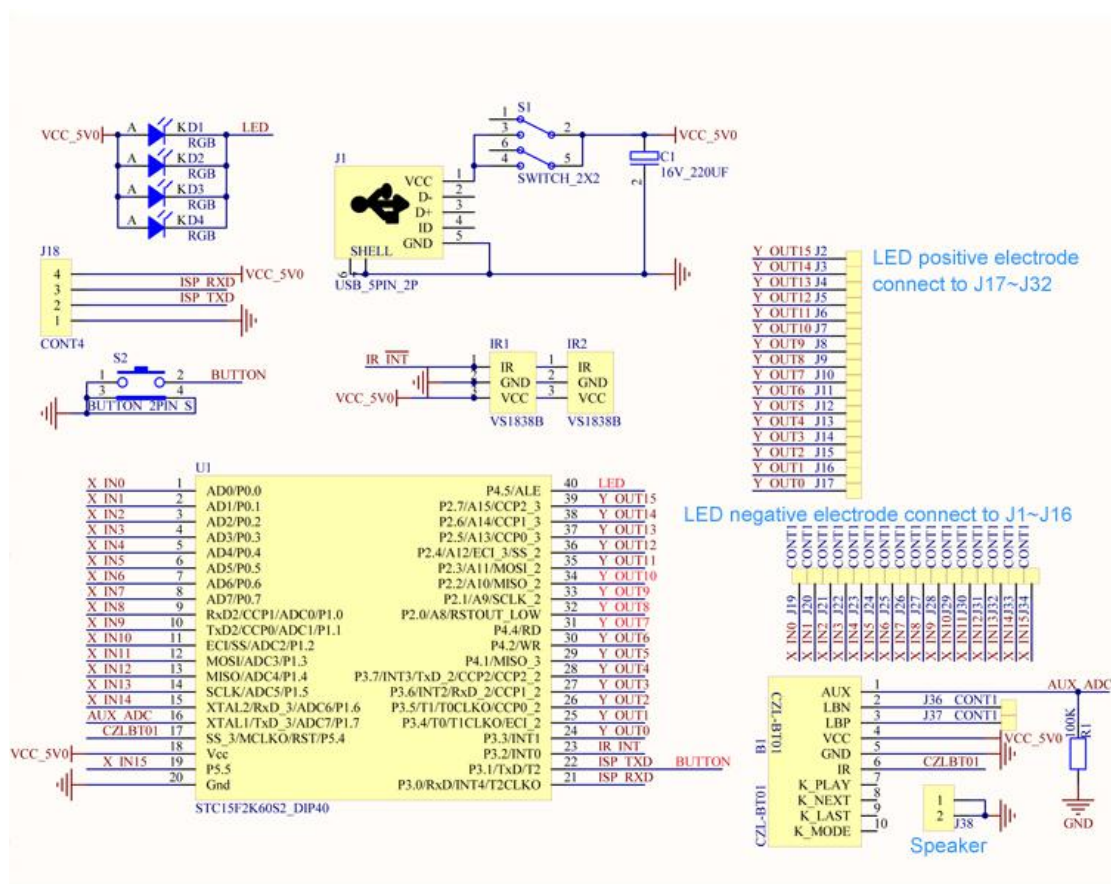
NO.	Component Name	PCB Marker	Parameter	QTY
1	Metal Film Resistor	100K	100K ohm	1
2	Electrolytic Capacitor		220uF 16V	1
3	Mini USB Female Socket			1
4	Infrared Receiver	IR1	VS1838B	1
5	1*10Pin Female Socket		2.0mm	1
6	IC Socket	U1	DIP-40	1
7	STC15F2K60S2 Controller	U1	DIP-40	1
8	Self-locking Switch			1
9	RGB LED		5mm	271
10	Bluetooth Amplifier Module			1
11	Speaker		3W 4ohm	1
12	Remote controller			1
13	USB Cable		50cm	1
14	Acrylic Welding Template		78*78*2mm	1
15	Acrylic Welding Template		74*74*2mm	1
16	White Cable		1meter	1
17	PCB		74*74*1.6mm	1
18	M3 Copper Pillar		M3*18mm	4
19	M3 Copper Pillar		M3*5+6mm	2
20	M3 Screw		M3*9mm	2
21	M3 Screw		M3*5mm	6
22	M3 Nut		M3	12

Note:Please refer to the installation manual to complete the installation and use.

6.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

7.Schematic:



8.Remote Controller Description:



9. Frequently Asked Questions:

1>. Why some of the LED in the same layer or in the same column can not be bright?

Q:The pin is not soldered firmly or missing.Please check out the soldered pins and fix them again

2>. Why a column or a layer is not bright?

Q>Please refer to the schematic, find the corresponding chip, re-soldering the pin, the chip may be pin soldered or unsoldered.

10. Installation Tips:

1>.User needs to prepare the welding tool at first.

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>.This DIY installation is more difficult to be installed, please be patient until the installation is complete!!!

8>.User must install the LED according to the specified rules.Otherwise some

LED will not light.

9>.Install complex components preferentially.

10>.Make sure all components are in right direction and right place.

11>.Check that all of the LED can be illuminated。

12>.It is strongly recommended to read the installation manual before starting installation!!!

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

1>.Step 1: Install 1pcs 100K ohm Metal Film Resistor.

2>.Step 2: Install 1pcs Mini USB Female Socket.

3>.Step 3: Install 1pcs 2.0mm 1*10Pin Female Socket.

4>.Step 4: Install 1pcs 220uF 16V Electrolytic Capacitor.Pay attention to the positive and negative pole.The longer pin is positive pin.

5>.Step 5: Install 4pcs 5mm RGB LED at four corners.Pay attention to the positive and negative pole.The longer pin is positive pin.

6>.Step 6: Install 1pcs Self-locking Power Switch.

7>.Step 7: Install 1pcs DIP-40 IC Socket.Pay attention to the installation direction and it was installed on another side of PCB.

8>.Step 8: Install 1pcs DIP-40 STC15F2K60S2 Controller on IC Socket.Pay attention to the installation direction.

9>.Step 9: Install 1pcs VS1838B Infrared Receiver on the same side to STC15F2K60S2.

10>.Step 10: Install 2pcs fix screws for Bluetooth Amplifier Module.

11>.Step 11: Install 1pcs Bluetooth Amplifier Module and fixed by screw.

12>.Step 12: Install 1pcs 3W 4ohm speaker.

13>.Step 13: Test main controller.

13.1>.Please check to make sure all components are installed correctly, and cannot short circuit.

13.2>.Connect 5V work voltage form Mini USB female socket.

13.3>.The power system works normally if the 4pcs RGB LED flashes automatically.

13.3>.Speaker works normally if user can hear 'du du du' from speaker.

13.4>.Bluetooth Amplifier Module works normally if the phone Bluetooth can search for the Bluetooth device 'CZL-AUDIO' and connection succeeded to play music.

13.5>.MCU STC15F2K60S2 and Infrared Receiver work normally if user can hear from speaker when press button 'CH' on Remote Controller.

13.6>.Please increase the input current to be greater than 800mA if animation display is abnormal when increase the volume.

13.7>.The main controller is successfully installed if the test is normal.

14>.Step 14: Install RGB LED Tower.Its basic steps as following:

14.1>.Bent LED pin.

14.2>.Connect and install the LED of each layer and test whether each LED

can work normally.

14.3>.Cut off the extra pins of each layer of LED.

14.4>.Connect the LED of each layer to the main controller.

14.5>.Power on and test if each LED works.

15>.Step 15: Install 4pcs Copper pillars and M3 Screw on Acrylic Welding Template.According to the rules shown,the outermost is the first ring(1st Ring) for the bigger Acrylic Welding Template and the outermost is the second ring(2nd Ring) for the smaller Acrylic Welding Template.

16>.Step 16:The structure of each layer of LED is shown in the figure.The first layer LED is closest to the PCB.

17>.Step 17:Process LED.Curved LED's longer pin(Positive pole) and form a right angle.**Please be careful not to damage the LED.**

18>.Step 18:Make the 1st layer LED of Tower main body.Put the already processed LED on #1 template Ring at the Bigger Template.Shorter pin(Negative pole) outward. Longer pin(Positive pole) interconnection.

19>.Step 19:Use a soldering iron to fix LED the positive pole(Longer pin).The soldering iron cannot touch the LED pins for a long time, otherwise it will damage the LED.

20>.Step 20:Cut off excess pins.**Just Cut Longer Pin!!!**

21>.Step 21:Make the 2st layer LED of Tower main body.Put the already processed LED on #2 template Ring at the Smaller Template.Shorter pin(Negative pole) outward. Longer pin(Positive pole) interconnection.Use a soldering iron to fix LED the positive pole(Longer pin).

22>.Step 22:Cut off excess pins.**Just Cut Longer Pin!!!**

23>.Step 23:Make the 3rd layer LED of Tower main body.Choose the #3 template Ring on the Bigger Template Acrylic welding template.

24>.Step 24:Make the 4th layer LED of Tower main body.Choose the #4 template Ring on the Smaller Template Acrylic welding template.

25>.Step 25:Make the 5rd layer LED of Tower main body.Choose the #5 template Ring on the Bigger Template Acrylic welding template.

26>.Step 26:Make the 6th layer LED of Tower main body.Choose the #6 template Ring on the Smaller Template Acrylic welding template.

27>.Step 27:Make the 7rd layer LED of Tower main body.Choose the #7 template Ring on the Bigger Template Acrylic welding template.

28>.Step 28:Make the 8th layer LED of Tower main body.Choose the #8 template Ring on the Smaller Template Acrylic welding template.

29>.Step 29:Make the 9rd layer LED of Tower main body.Choose the #9 template Ring on the Bigger Template Acrylic welding template.

30>.Step 30:Make the 10th layer LED of Tower main body.Choose the #9 template Ring on the Bigger Template Acrylic welding template.

31>.Step 31:Make the 11th layer LED of Tower main body.Choose the #9 template Ring on the Bigger Template Acrylic welding template.

32>.Step 32:Make the 12th layer LED of Tower main body.Choose the #8 template Ring on the Smaller Template Acrylic welding template.

33>.Step 33:Make the 13th layer LED of Tower main body.Choose the #7 template Ring on the Bigger Template Acrylic welding template.

34>.Step 34:Make the 14th layer LED of Tower main body.Choose the #6 template Ring on the Smaller Template Acrylic welding template.

35>.Step 35:Make the 15th layer LED of Tower main body.Choose the #5 template Ring on the Bigger Template Acrylic welding template.

36>.Step 36:Make the 16th layer LED of Tower main body.Choose the #4 template Ring on the Smaller Template Acrylic welding template.

37>.Step 37:There are four layers for spire.The distribution of LED is 8-3-3-1.That is the 1st layer is 8pcs LED. The 2nd and 3rd layer is 3pcs LED. The 4th layer is 1pcs LED.Make the 1st layer LED of spire.Choose the #9 template Ring on the Bigger Template Acrylic welding template by reduce LED by half.The make method is the same as the 1st layer of Tower main body.

38>.Step 38:Make the 2nd layer LED of spire.Choose the #11 template Ring on the Bigger Template Acrylic welding template.

39>.Step 39:Make the 3rd layer LED of spire.Choose the #11 template Ring on the Bigger Template Acrylic welding template.

40>.Step 40:The 4th layer LED just consist of 1pcs LED.

41>.Step 41:Use a multimeter to check whether each LED on each layer can be bright, please replace the faulty LED.

42>.Step 42:So far, each layer of LED are made well.And now need to connect layer and layer together.

43>.Step 43:Install the 1st layer of LED on the PCB.Pay attention to the level of the LED.

44>.Step 44:Connect the positive pole of the 1st layer to Y15 by white wire.If the power is turned on, this layer of LED will flash normally.

45>.Step 45:Put some tin on the root of negative pole in order to fix next layer LED.

46>.Step 46:Bend the next layer LED pins slightly in order to connect the 1st layer.Please be patient when connecting each layer.

47>.Step 47:Connect the positive pole of the 2nd layer to Y14 by white wire.If the power is turned on, this layer of LED will flash normally.

48>.Step 48: Install the 3rd layer of LED on the PCB and this layer connect to Y13.

49>.Step 49: Install the 4th layer of LED on the PCB and this layer connect to Y12.

50>.Step 50: Install the 5th layer of LED on the PCB and this layer connect to Y11.

51>.Step 51: Install the 6th layer of LED on the PCB and this layer connect to Y10.

52>.Step 52: Install the 7th layer of LED on the PCB and this layer connect to Y9.

53>.Step 53: Install the 8th layer of LED on the PCB and this layer connect to Y8.

54>.Step 54: Install the 9th layer of LED on the PCB and this layer connect to Y7.

55>.Step 55: Install the 10th layer of LED on the PCB and this layer connect to Y6.

56>.Step 56: Install the 11th layer of LED on the PCB and this layer connect to Y5.

57>.Step 57: Install the 12th layer of LED on the PCB and this layer connect to Y4.

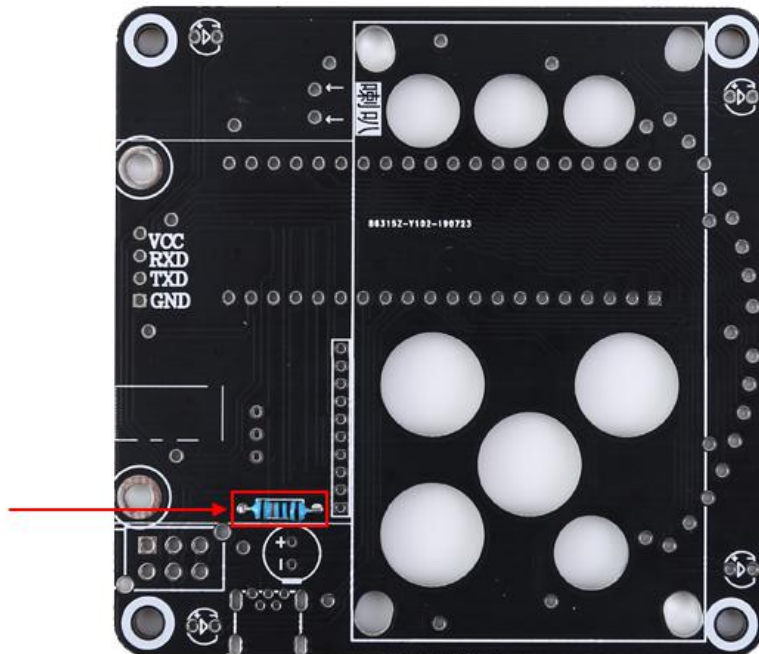
58>.Step 58: Install the 13th layer of LED on the PCB and this layer connect to Y3.

59>.Step 59: Install the 14th layer of LED on the PCB and this layer connect to Y2.

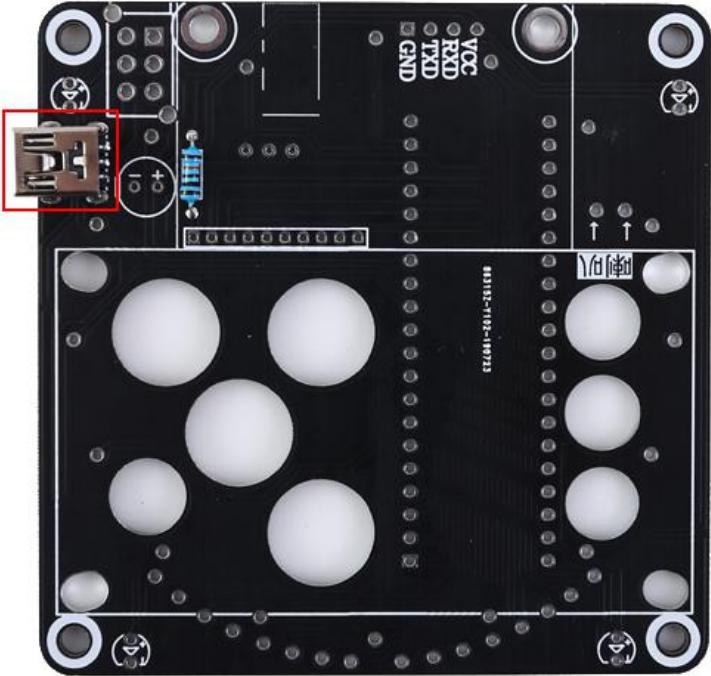
- 60>.Step 60: Install the 15th layer of LED on the PCB and this layer connect to Y1.
- 61>.Step 61: Install the 16th layer of LED on the PCB and this layer connect to Y0.
- 62>.Step 62: Please be patient when connecting each layer and keep test.
- 63>.Step 63: Install the 4 layers spire in the same way.Connect each layer of spire together by wire and then connect it to the 16th layer of Tower main body.
- 64>.Step 64:Install IC and Connect power to test!So far, finished. To check own results.

12.Install shown steps:

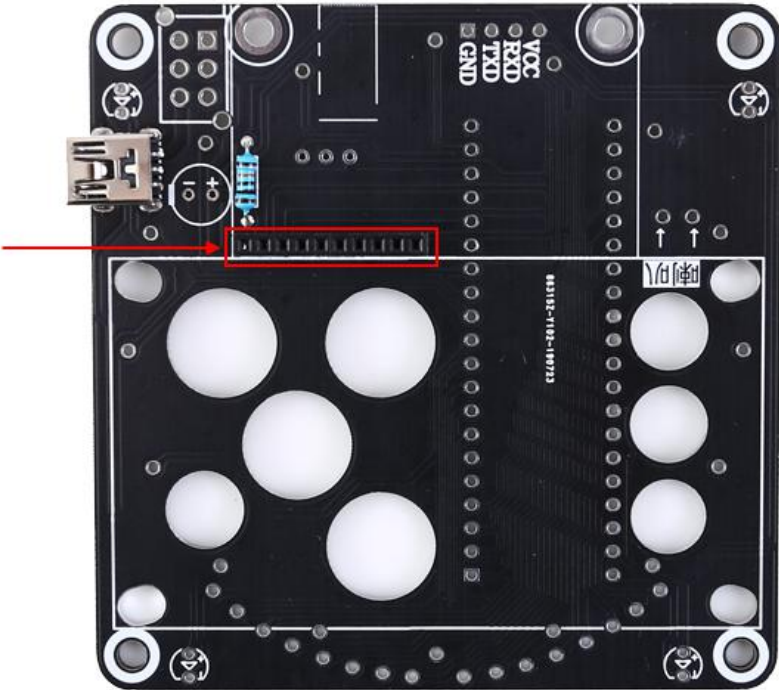
Step 1: Install 1pcs 100K ohm Metal Film Resistor.



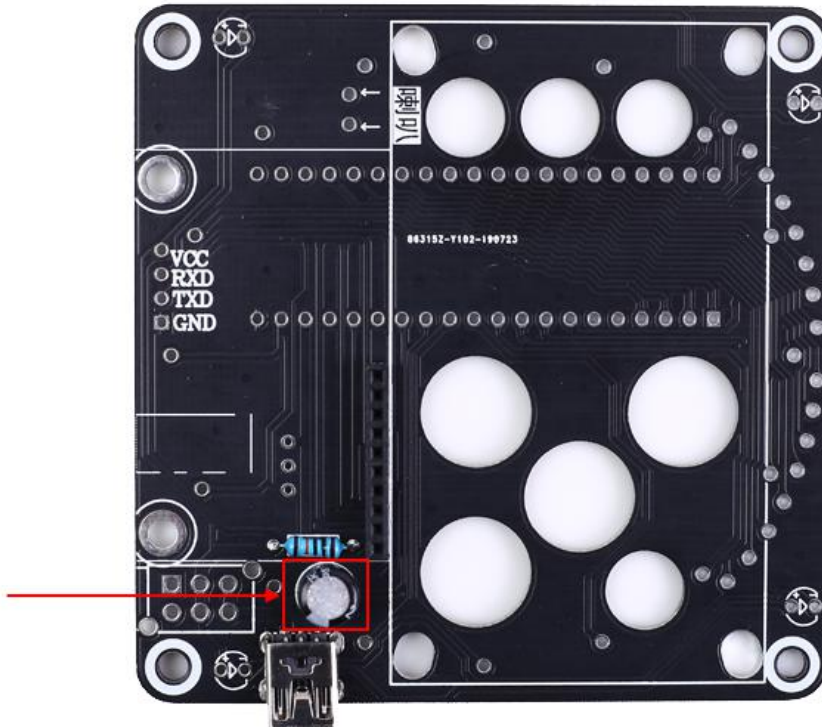
Step 2: Install 1pcs Mini USB Female Socket.



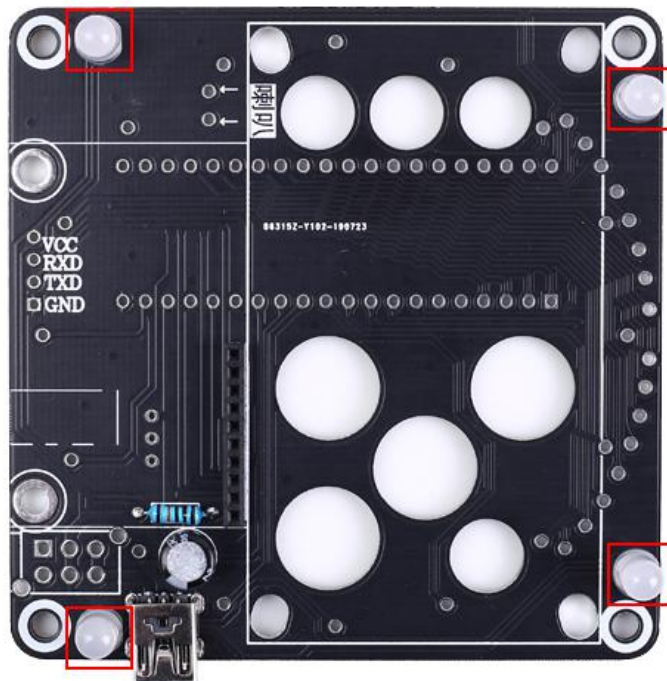
Step 3: Install 1pcs 2.0mm 1*10Pin Female Socket.



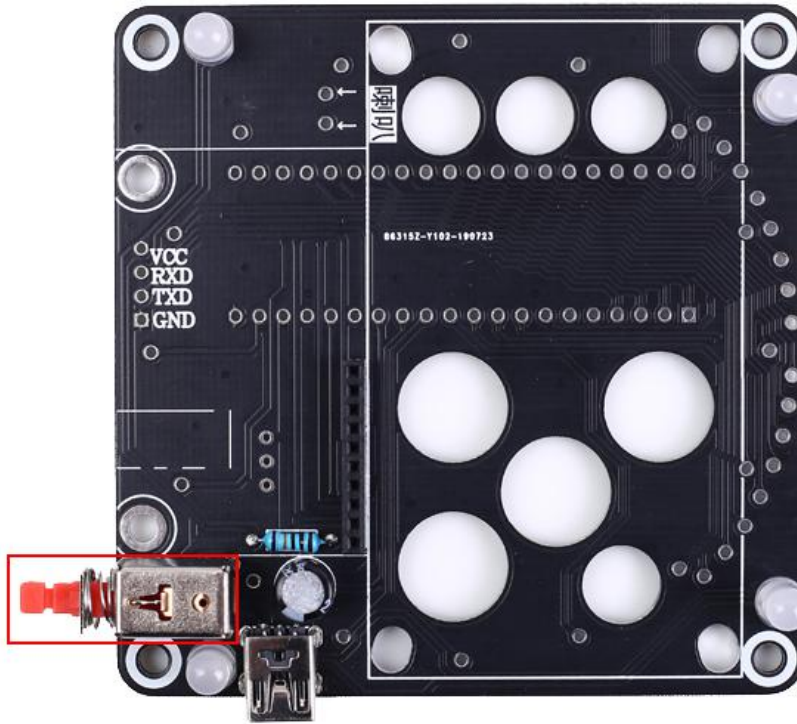
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Pay attention to the positive and negative pole.
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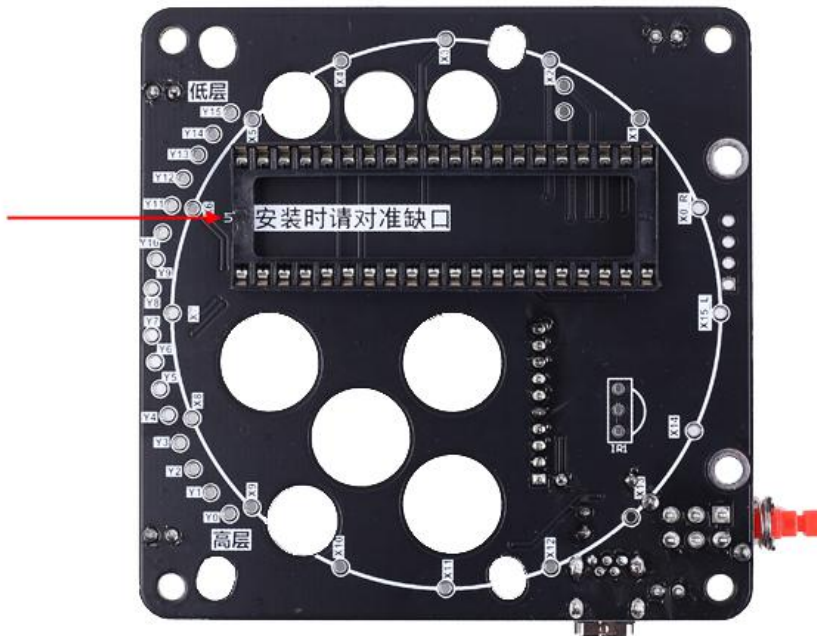
Step 5: Install 4pcs 5mm RGB LED at four corners.
Pay attention to the positive and negative pole.
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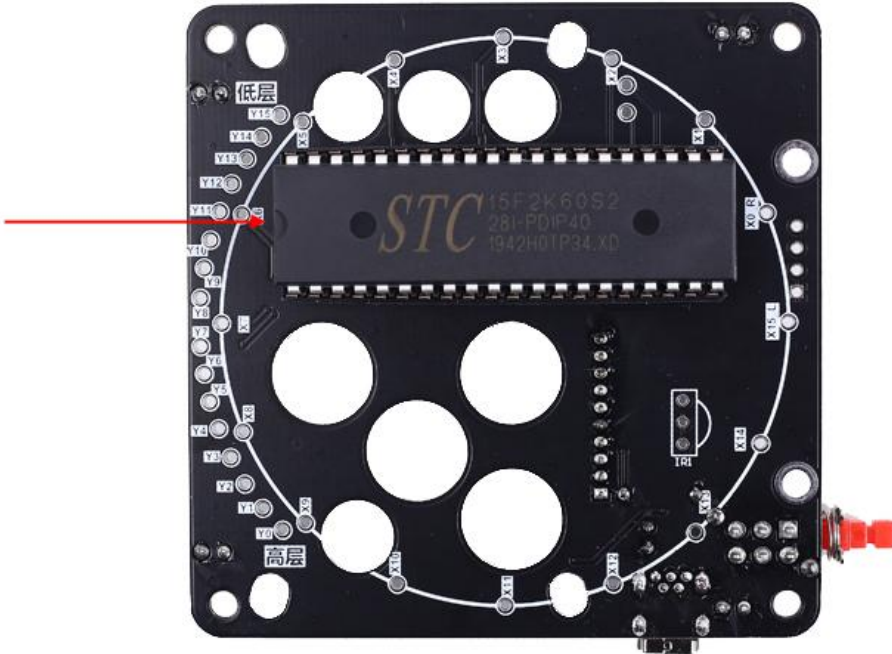
Step 6: Install 1pcs Self-locking Power Switch.



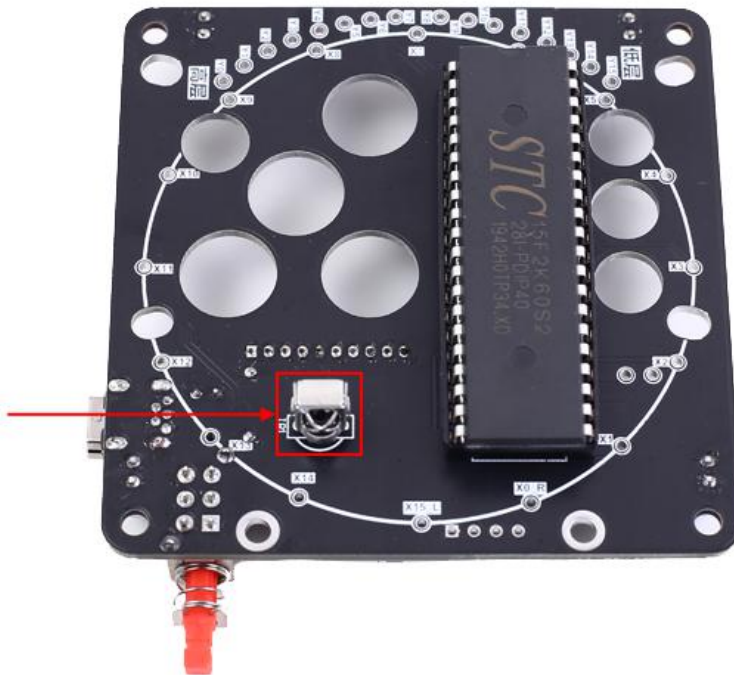
Step 7: Install 1pcs DIP-40 IC Socket.
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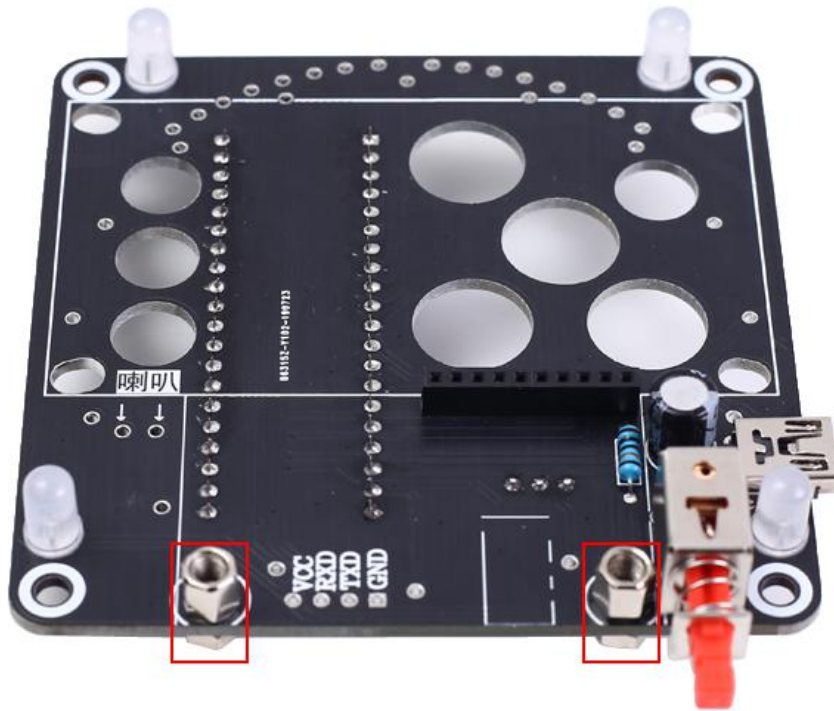
Step 8: Install 1pcs DIP-40 STC15F2K60S2 Controller on IC Socket. Pay attention to the installation direction.



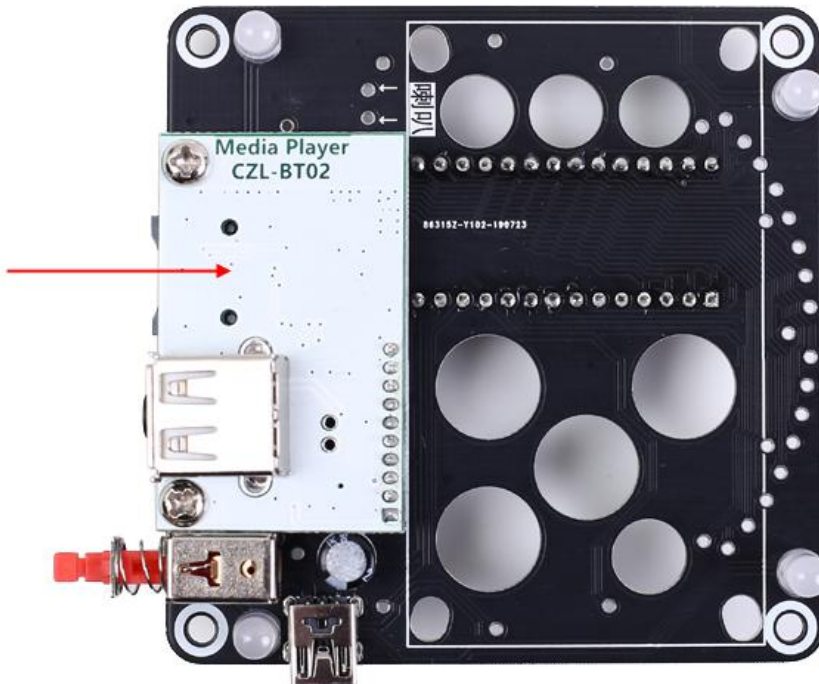
Step 9: Install 1pcs VS1838B Infrared Receiver on the same side to STC15F2K60S2.



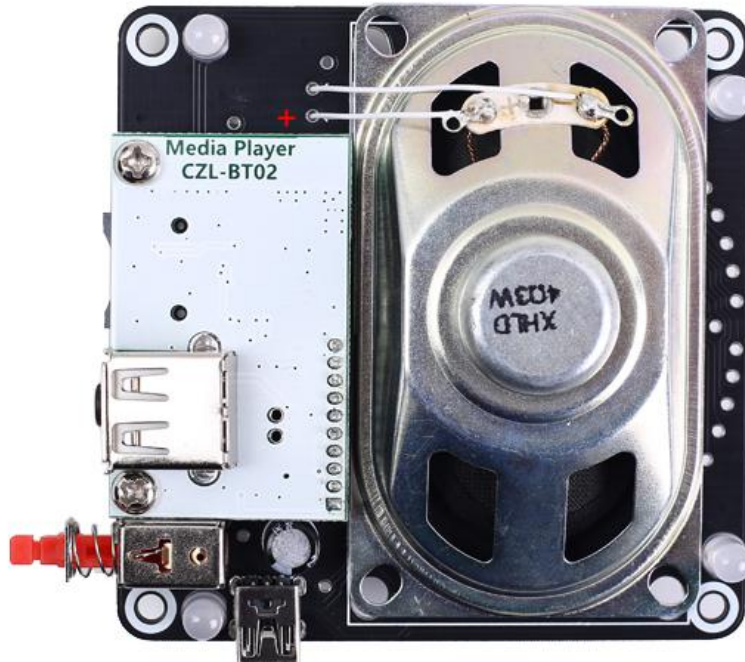
Step 10: Install 2pcs fix screws for Bluetooth Amplifier Module.



Step 11: Install 1pcs Bluetooth Amplifier Module and fixed by screw.



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13>.Step 13: Test main controller.

13.1>.Please check to make sure all components are installed correctly, and cannot short circuit.

13.2>.Connect 5V work voltage form Mini USB female socket.

13.3>.The power system works normally if the 4pcs RGB LED flashes automatically.

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13.6>.Please increase the input current to be greater than 800mA if animation display is abnormal when increase the volume.

13.7>.The main controller is successfully installed if the test is normal.

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14.1>.Bent LED pin.

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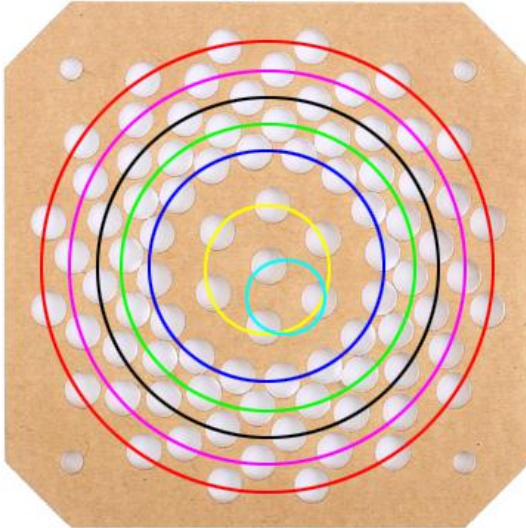
14.3>.Cut off the extra pins of each layer of LED.

14.4>.Connect the LED of each layer to the main controller.

14.5>.Power on and test if each LED works.

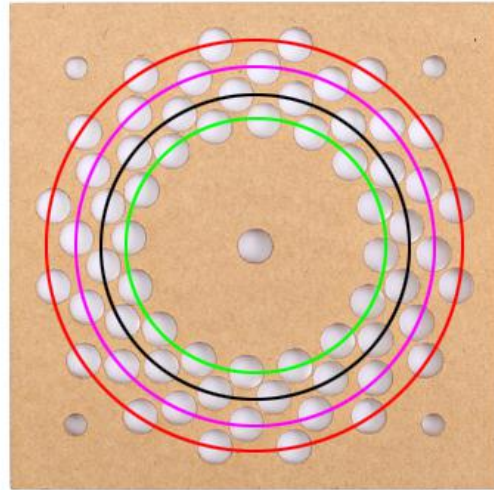
Step 15: Install 4pcs Copper pillars and M3 Screw on Acrylic Welding Template. According to the rules shown, the outermost is the first ring (1st Ring) for the bigger Acrylic Welding Template and the outermost is the second ring (2nd Ring) for the smaller Acrylic Welding Template.

the Bigger Template

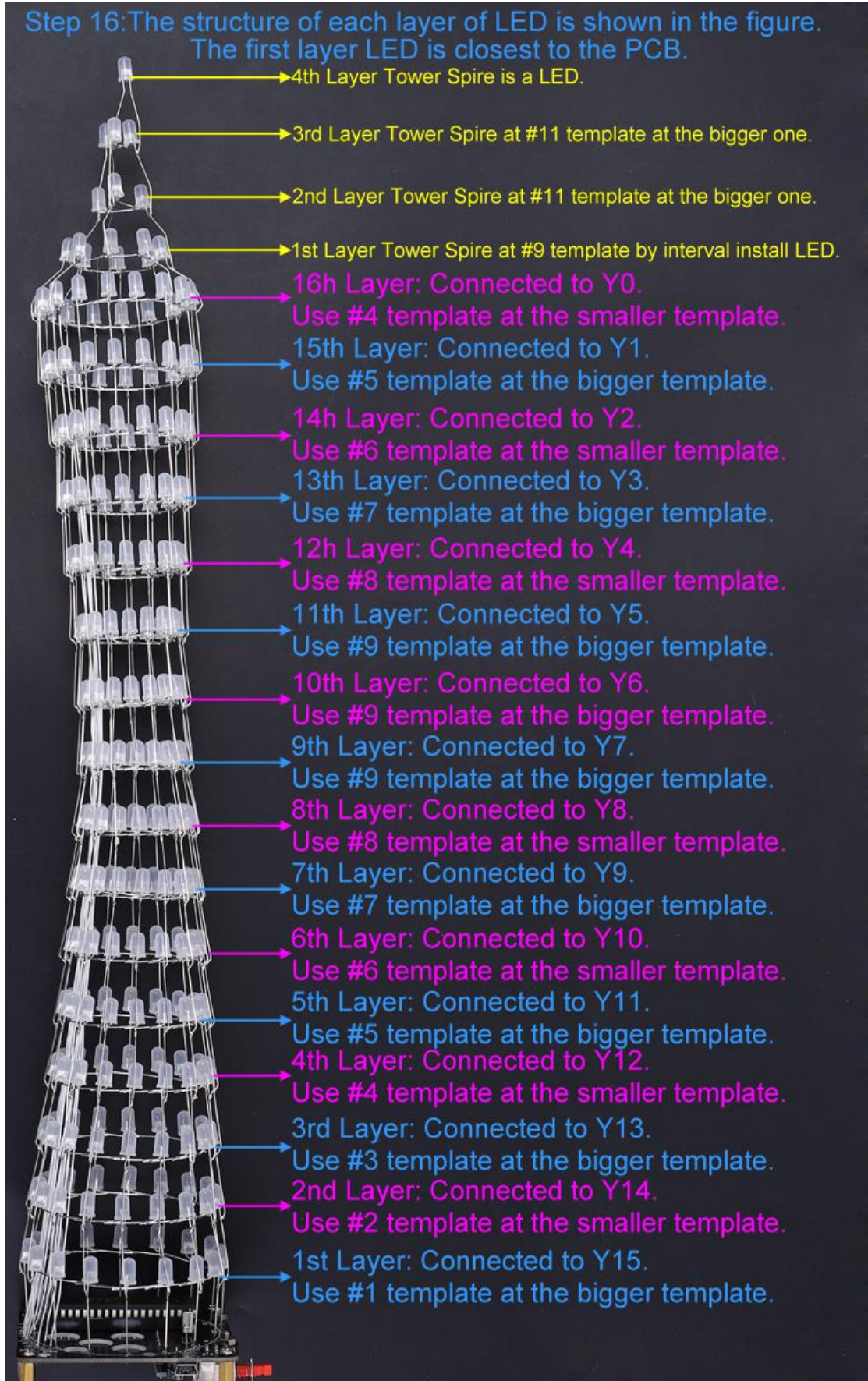


- #1 template
- #3 template
- #5 template
- #7 template
- #9 template
- #10 template
- #11 template

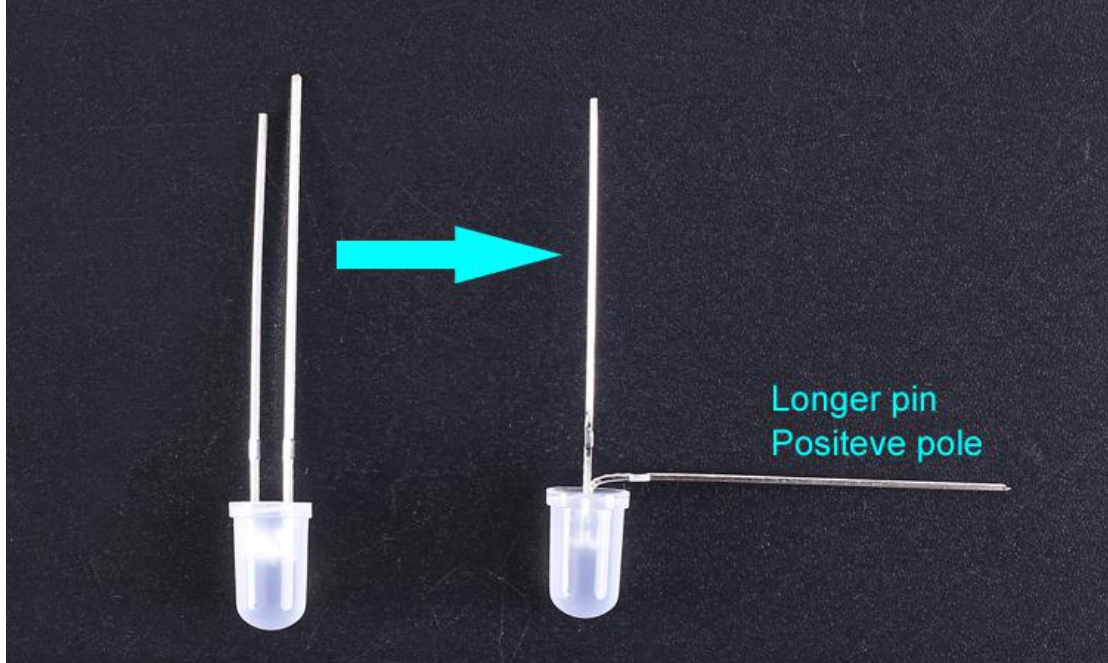
the Smaller Template



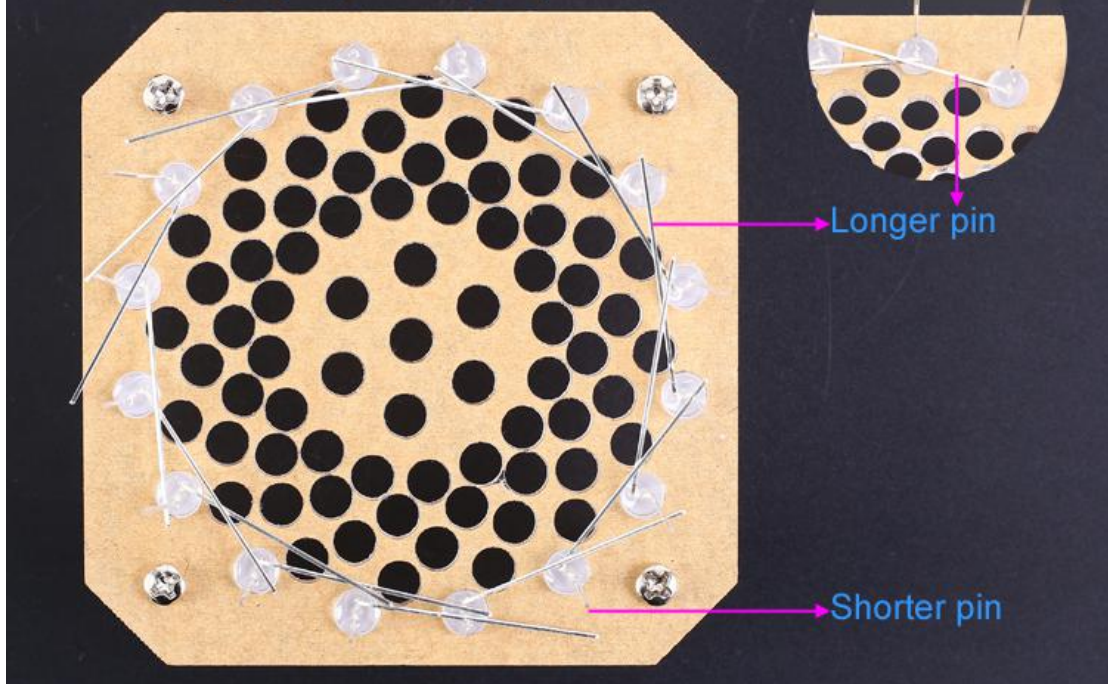
- #2 template
- #4 template
- #6 template
- #8 template



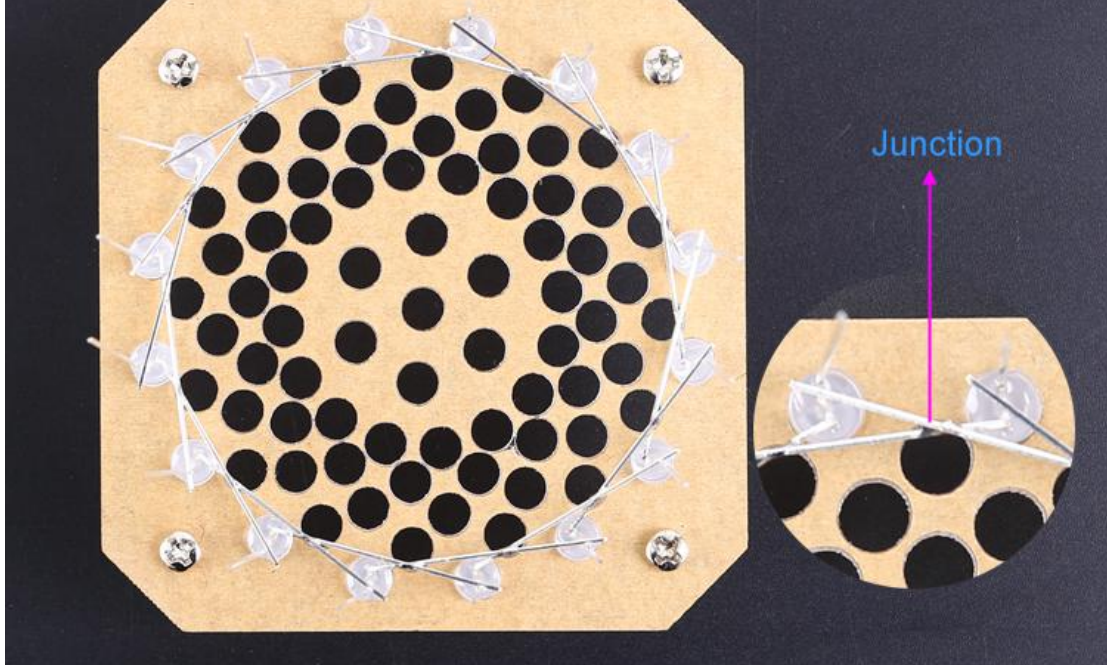
Step 17: Process LED. Curved LED's longer pin (Positive pole) and form a right angle. Please be careful not to damage the LED.



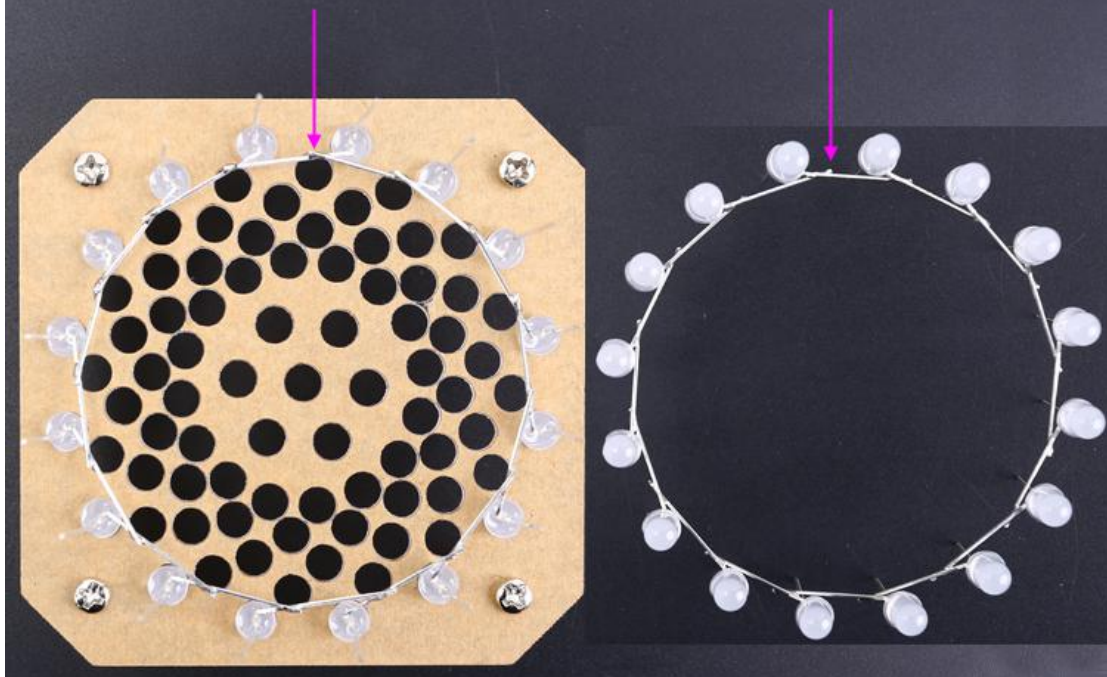
Step 18: Make the 1st layer LED of Tower main body. Put the already processed LED on #1 template Ring at the Bigger Template. Shorter pin (Negative pole) outward. Longer pin (Positive pole) interconnection.



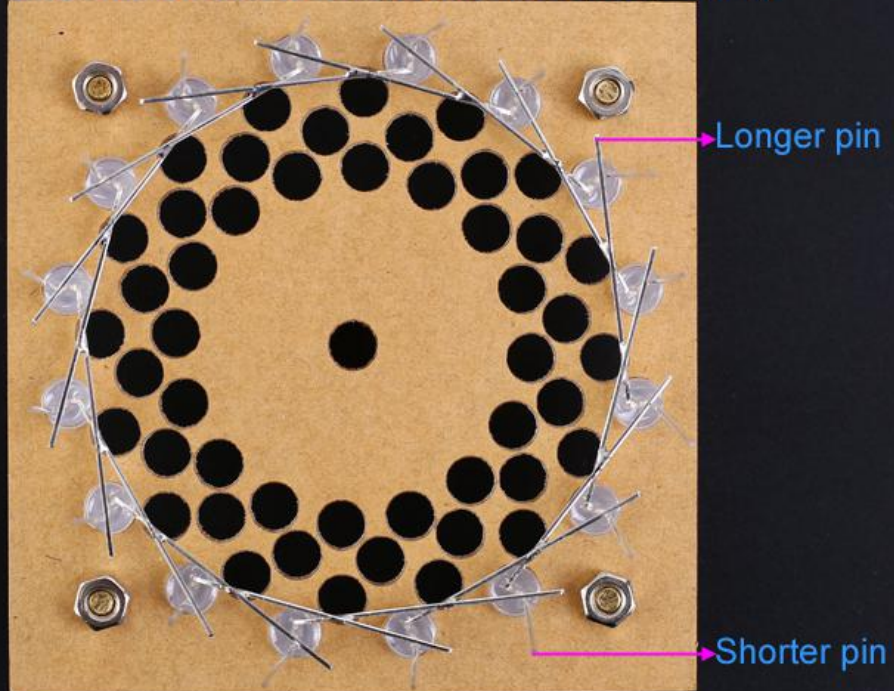
Step 19: Use a soldering iron to fix LED the positive pole(Longer pin). The soldering iron cannot touch the LED pins for a long time, otherwise it will damage the LED.



Step 20: Cut off excess pins. Just Cut Longer Pin!!!



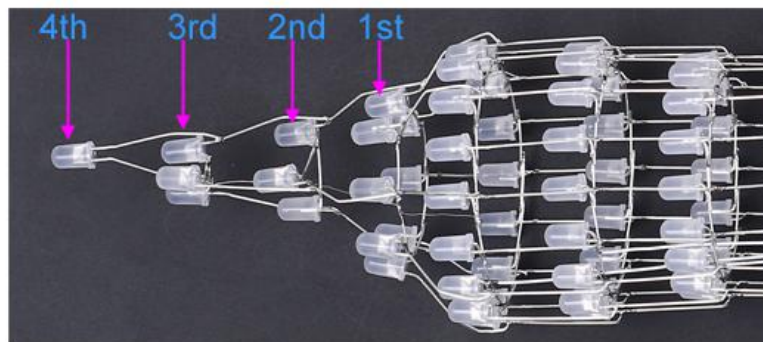
Step 21: Make the 2nd layer LED of Tower main body. Put the already processed LED on #2 template Ring at the Smaller Template. Shorter pin (Negative pole) outward. Longer pin (Positive pole) interconnection. Use a soldering iron to fix LED the positive pole (Longer pin).



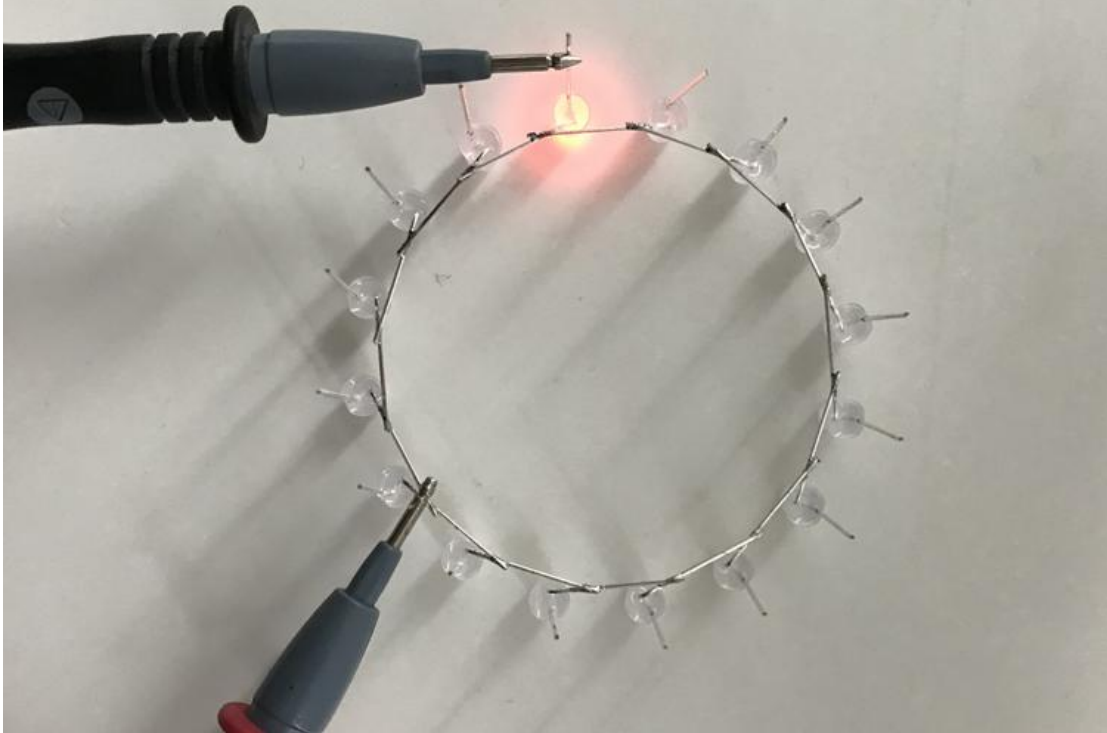
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- Step 23: Make the 3rd layer LED of Tower main body. Choose the #3 template Ring on the Bigger Template Acrylic welding template.
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- Step 40: The 4th layer LED just consist of 1pcs LED.



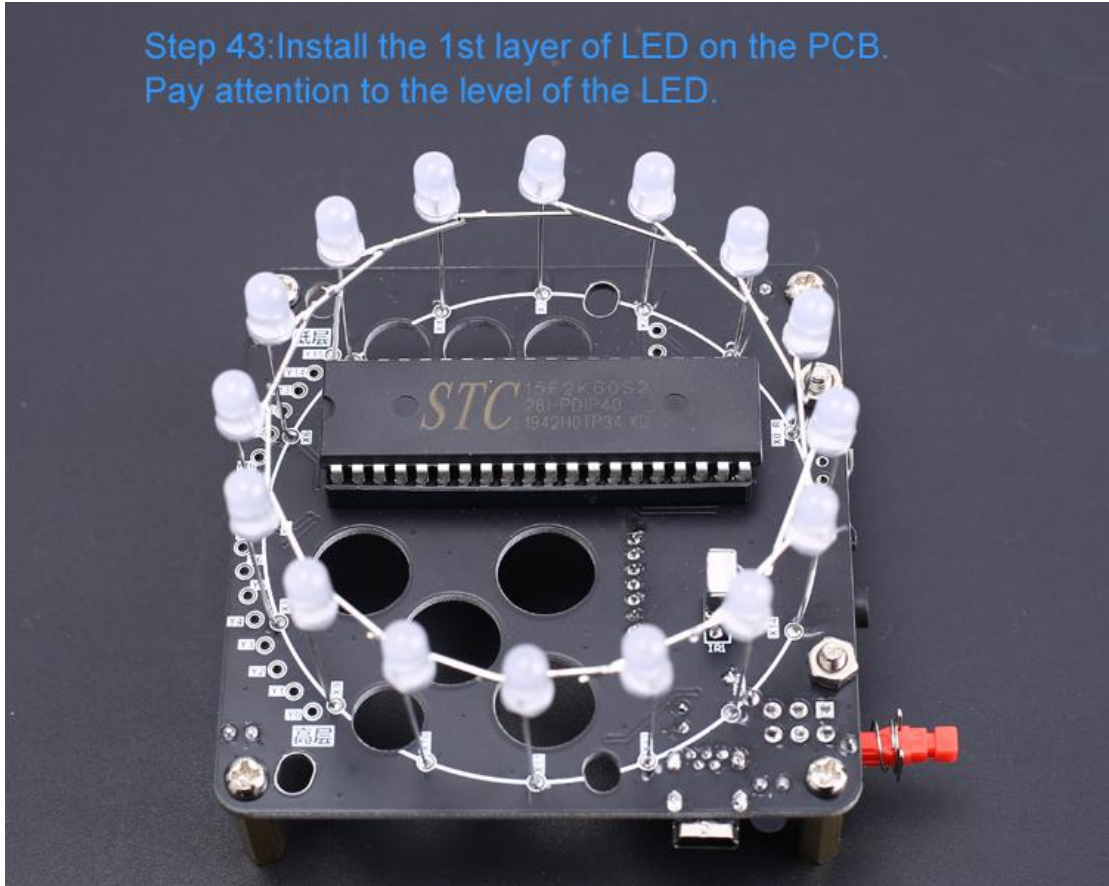
Step 41: Use a multimeter to check whether each LED on each layer can be bright, please replace the faulty LED.



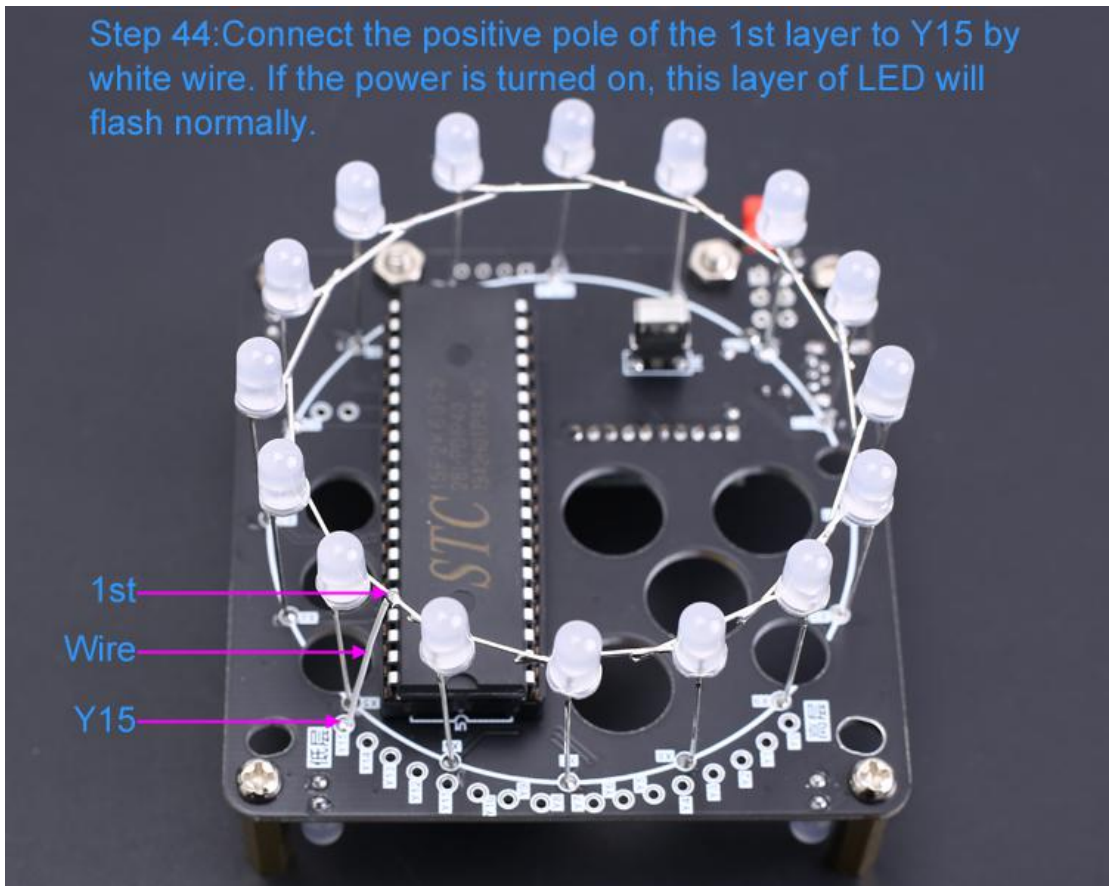
Step 42: So far, each layer of LED are made well. And now need to connect layer and layer together.



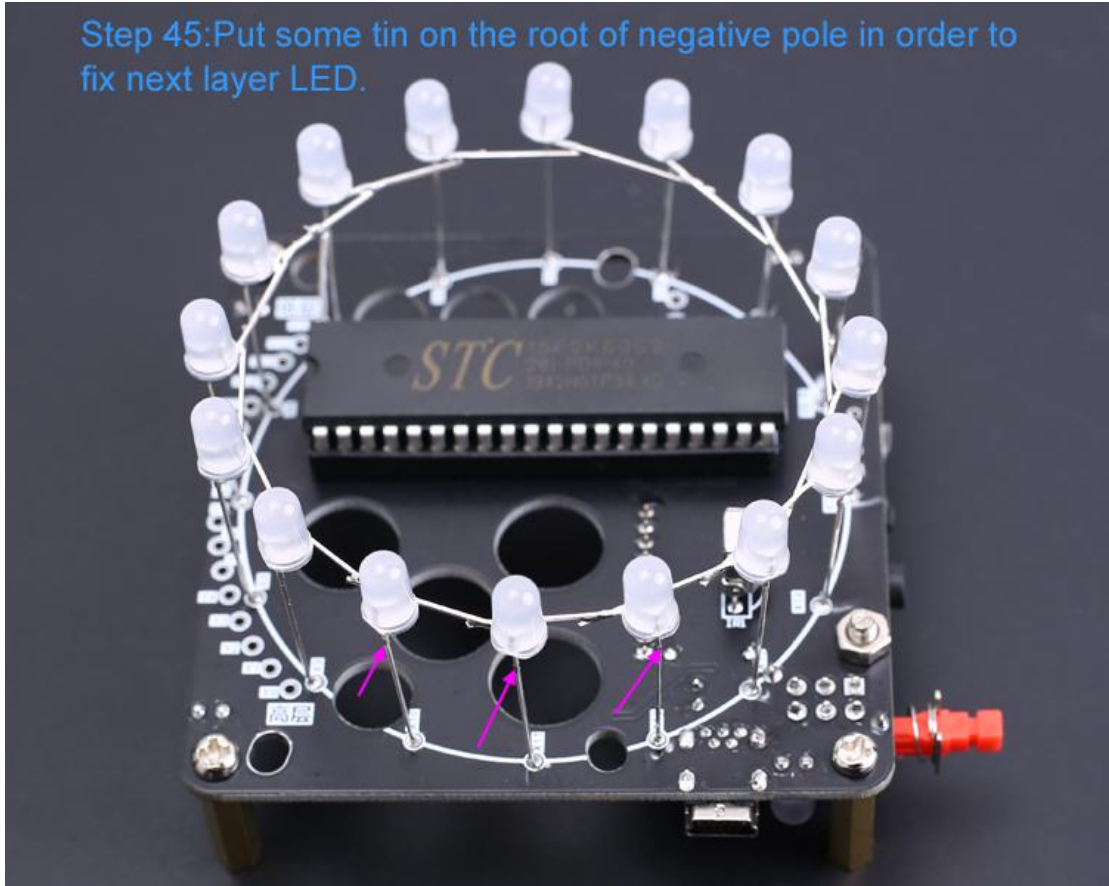
Step 43: Install the 1st layer of LED on the PCB. Pay attention to the level of the LED.



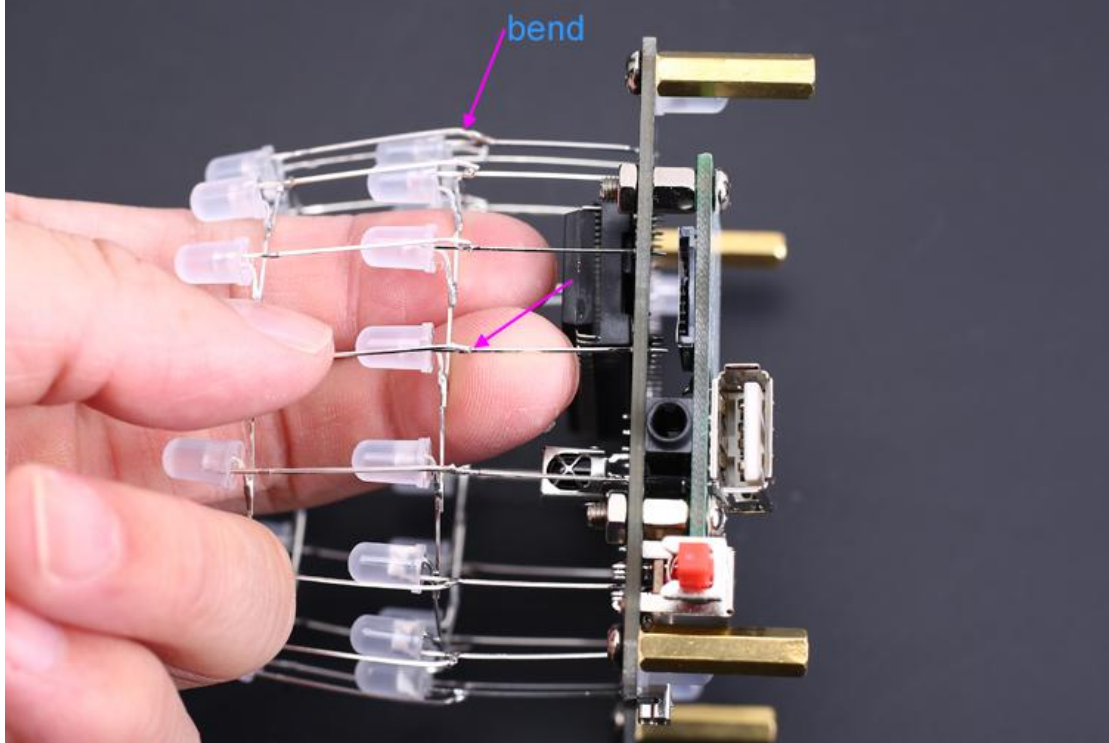
Step 44: Connect the positive pole of the 1st layer to Y15 by white wire. If the power is turned on, this layer of LED will flash normally.



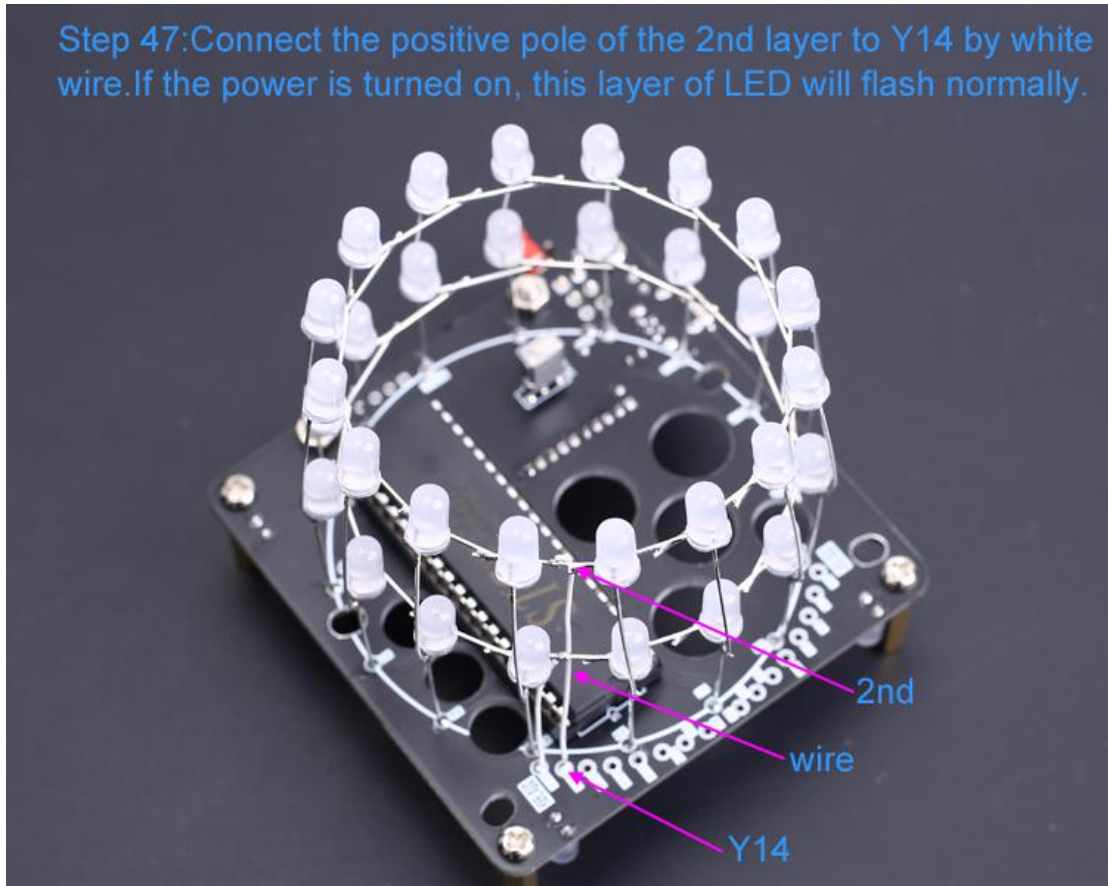
Step 45: Put some tin on the root of negative pole in order to fix next layer LED.



Step 46: Bend the next layer LED pins slightly in order to connect the 1st layer. Please be patient when connecting each layer.



Step 47: Connect the positive pole of the 2nd layer to Y14 by white wire. If the power is turned on, this layer of LED will flash normally.



Step 48: Install the 3rd layer of LED on the PCB and this layer connect to Y13.

Step 49: Install the 4th layer of LED on the PCB and this layer connect to Y12.

Step 50: Install the 5th layer of LED on the PCB and this layer connect to Y11.

Step 51: Install the 6th layer of LED on the PCB and this layer connect to Y10.

Step 52: Install the 7th layer of LED on the PCB and this layer connect to Y9.

Step 53: Install the 8th layer of LED on the PCB and this layer connect to Y8.

Step 54: Install the 9th layer of LED on the PCB and this layer connect to Y7.

Step 55: Install the 10th layer of LED on the PCB and this layer connect to Y6.

Step 56: Install the 11th layer of LED on the PCB and this layer connect to Y5.

Step 57: Install the 12th layer of LED on the PCB and this layer connect to Y4.

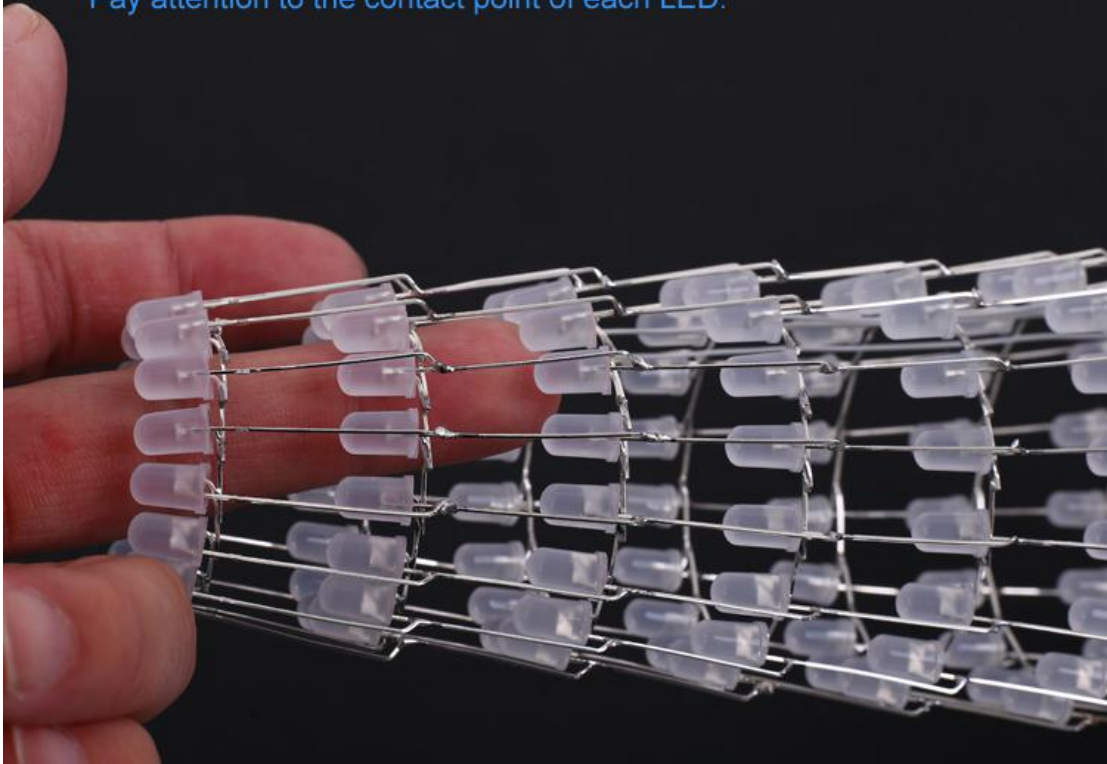
Step 58: Install the 13th layer of LED on the PCB and this layer connect to Y3.

Step 59: Install the 14th layer of LED on the PCB and this layer connect to Y2.

Step 60: Install the 15th layer of LED on the PCB and this layer connect to Y1.

Step 61: Install the 16th layer of LED on the PCB and this layer connect to Y0.

Step 62: Please be patient when connecting each layer and keep test.
Pay attention to the contact point of each LED.



Step 63: Install the 4 layers spire in the same way. Connect each layer of spire together by wire and then connect it to the 16th layer of Tower main body.

Step 64: Install IC and Connect power to test! So far, finished.
To check own results.

