LED Tower DIY Kit

Version : V20171221

Update Time : 2017.12.21

1. Introduction

LED Tower is imitated from Guangzhou Tower. Guangzhou Tower, also known as Guangzhou new TV tower, nickname Xiaoman Yao. 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 STC12C5A60S2 as a control system, the display part is 16*16 dot matrix display, through the production of the Guangzhou Tower, can better enhance the microcontroller on the principle of dot matrix display.

2.Parameter

1>.PCB size:78*78mm

2>.Shell size:84.8*84.8*495mm(If user do not buy the shell, please ignore this information).

3>.Tower size:90*78*450mm(Different people installed, the height will be slightly different)

4>.Power:DC 5V

3.Feature

1>. 16*16 led lattice design

2>.A variety of modes can be freely converted:

----Offline animation mode(More than a dozen)

----Music spectrum mode(Flash with music)

3>.Plug-in components used to make high success rate

4>.Give some code(The default code inside the chip, the function is more abundant,So please do not update the code inside arbitrarily)

5>.USB power audio line

4.Application

1>.Home Furnishing decoration

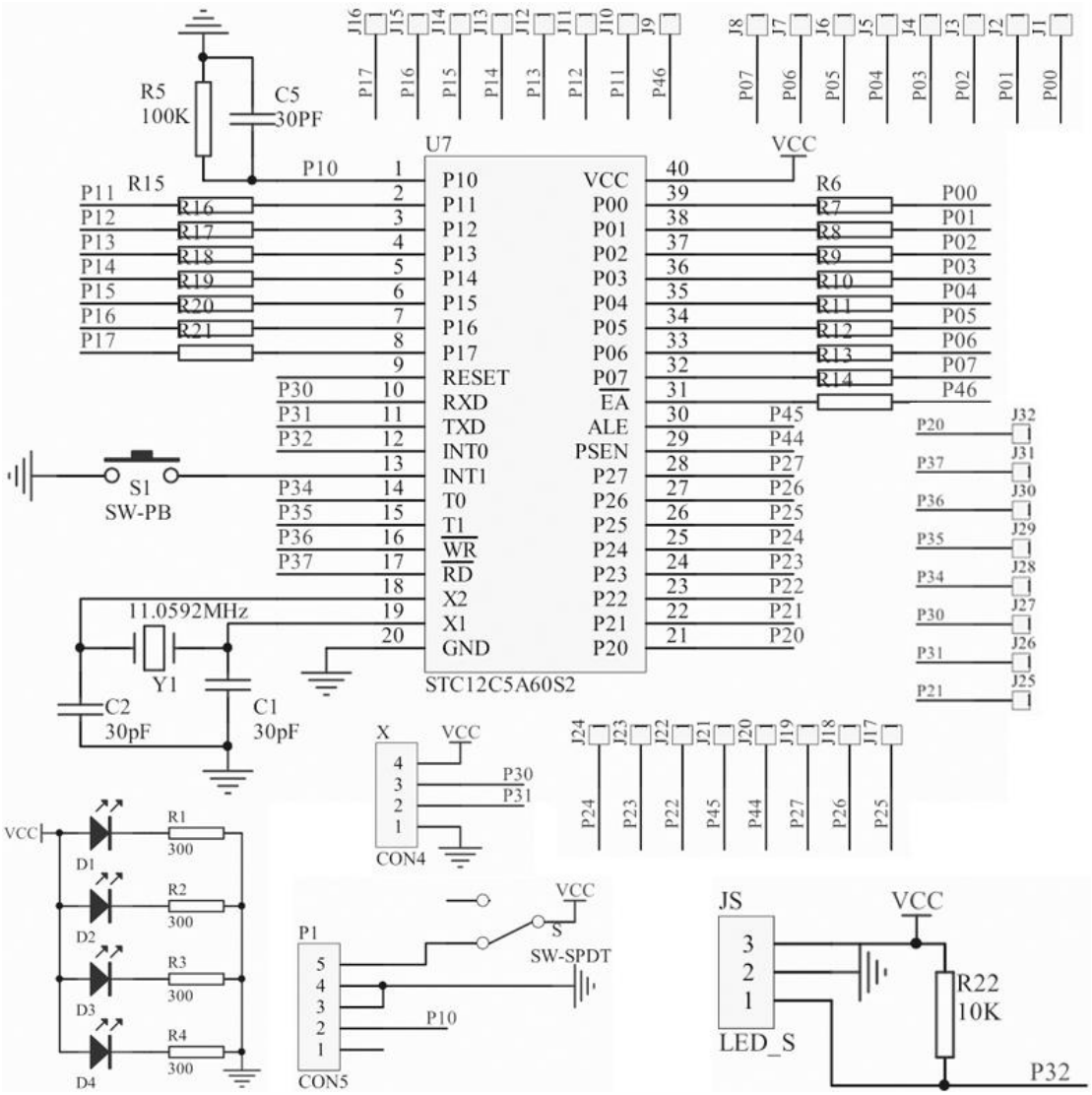
2>.Store decoration

3>.Graduation design

4>.Practice for electronic enthusiasts

5>.Holiday gifts

5.Schematic

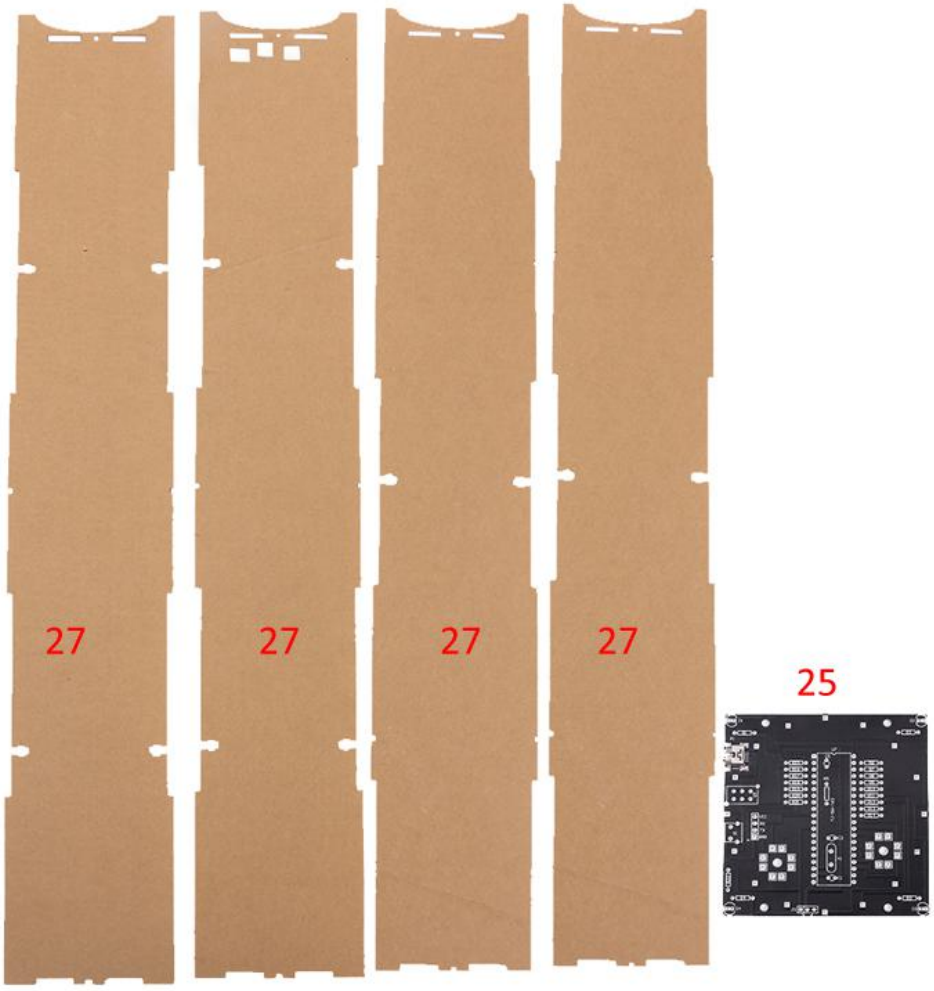


6.Component listing

NO.	Component Name	PCB Marker	Parameter	QTY	Remarks
1	STC12C5A60S2		DIP-40	1	
2	IC Socket	U7	DIP-40	1	
3	Metal film resistor	R1-R4,R6-R21	300ohm	20	
4	Metal film resistor	R5	100K	1	
5	Metal film resistor	R22	10K	1	
6	Ceramic capacitors	C1,C2,C5	30pF	3	
7	5mm LED	D1-D4	Colorful	4	
8	Crystal	Y1	11.0592MHz	1	
9	Mini USB Socket	P1		1	
10	Round Pin	J1-J16	16P	1	
11	Infrared sensor	JS	VS1838B	1	
12	Self-locking switch	S		1	

13	Button	S1		1	
14	Male Pin	X	4P	1	
15	3mm LED		Colorful	271	
16	USB/Audio Cable		45mm	1	
17	Copper pillars		M3*10	4	
18	Screw		M3*6	4	
19	USB-TTL Downloader			1	
20	DuPont line		20mm	5	
21	Remote control			1	Include CR2025 battery
22	Screw		M2	20	for Shell
23	Nut		M2	20	for Shell
24	Cable		4.2m	1	
25	PCB		78*78	1	
26	Acrylic welding template		90*90mm	1	
27	Acrylic shell			6	

7. Component Description



1>.1pcs STC12C5A60S2 DIP-40

2>.1pcs IC Socket DIP-40

3>.20pcs 300ohm Metal film resistor

4>.1pcs 100K Metal film resistor

5>.1pcs 10K Metal film resistor

6>.3pcs 30P Ceramic capacitors

7>.4pcs Colorful 5mm LED

8>.1pcs 11.0592MHz Crystal

9>.1pcs Mini USB Socket

10>.1pcs 16P Round Pin

11>.1pcs VS1838B Infrared sensor

12>.1pcs Self-locking switch

13>.1pcs Button

14>.1pcs 4P Male Pin

15>.271pcs Colorful 3mm LED

16>.1pcs USB/Audio Cable

17>.4pcs M3*10 Copper pillars

18>.4pcs M3*6 Screw

19>.1pcs USB-TTL Downloader

20>.5pcs 20mm DuPont line

21>.1pcs Remote control

22>.20pcs M2 Screw

23>.20pcs M2 Nut

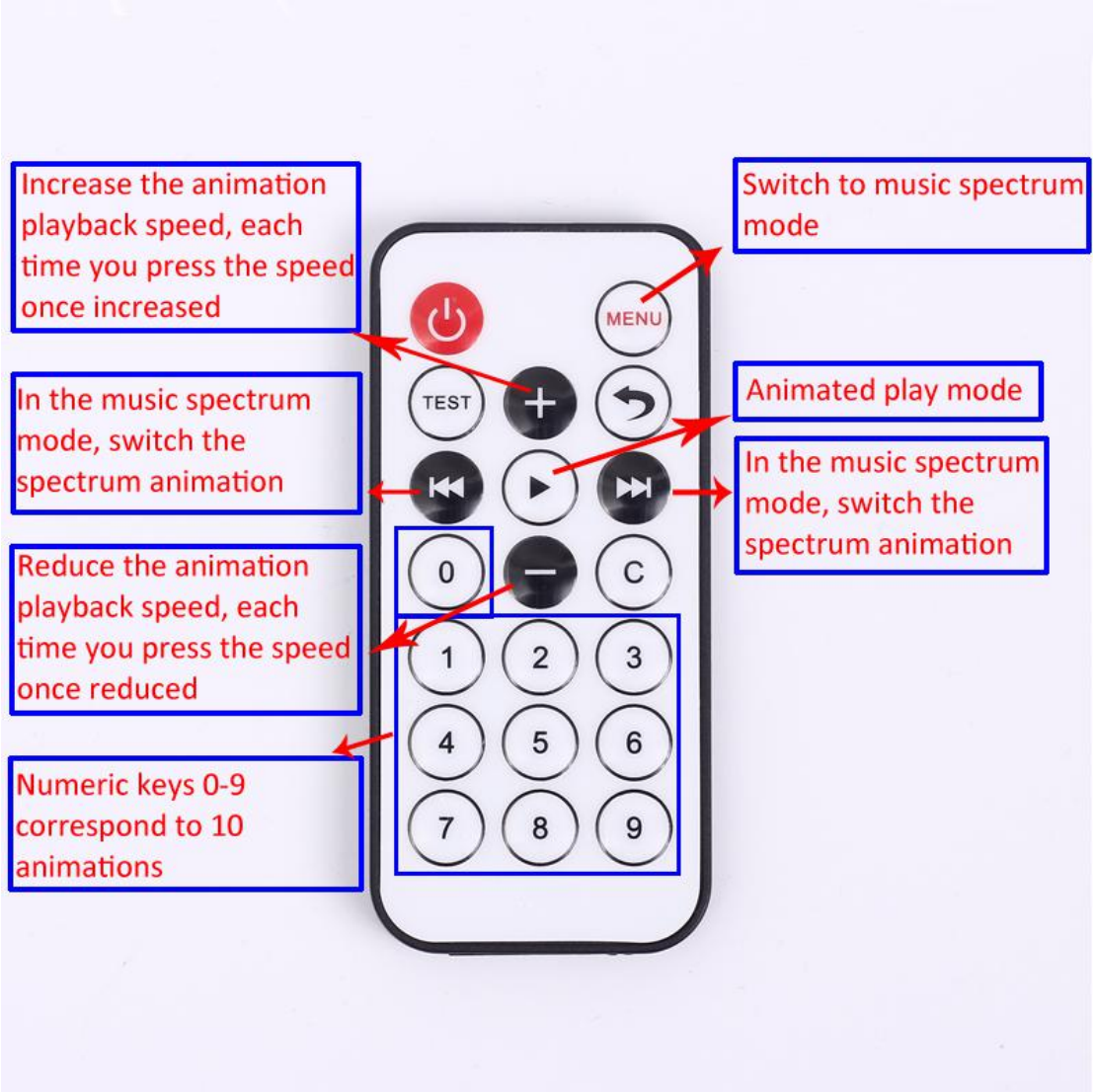
24>.1pcs 4.2m Cable

25>.1pcs PCB

26>.1pcs Acrylic welding template

27>.6pcs Acrylic shell

8.Remote Description



9.Installation Steps

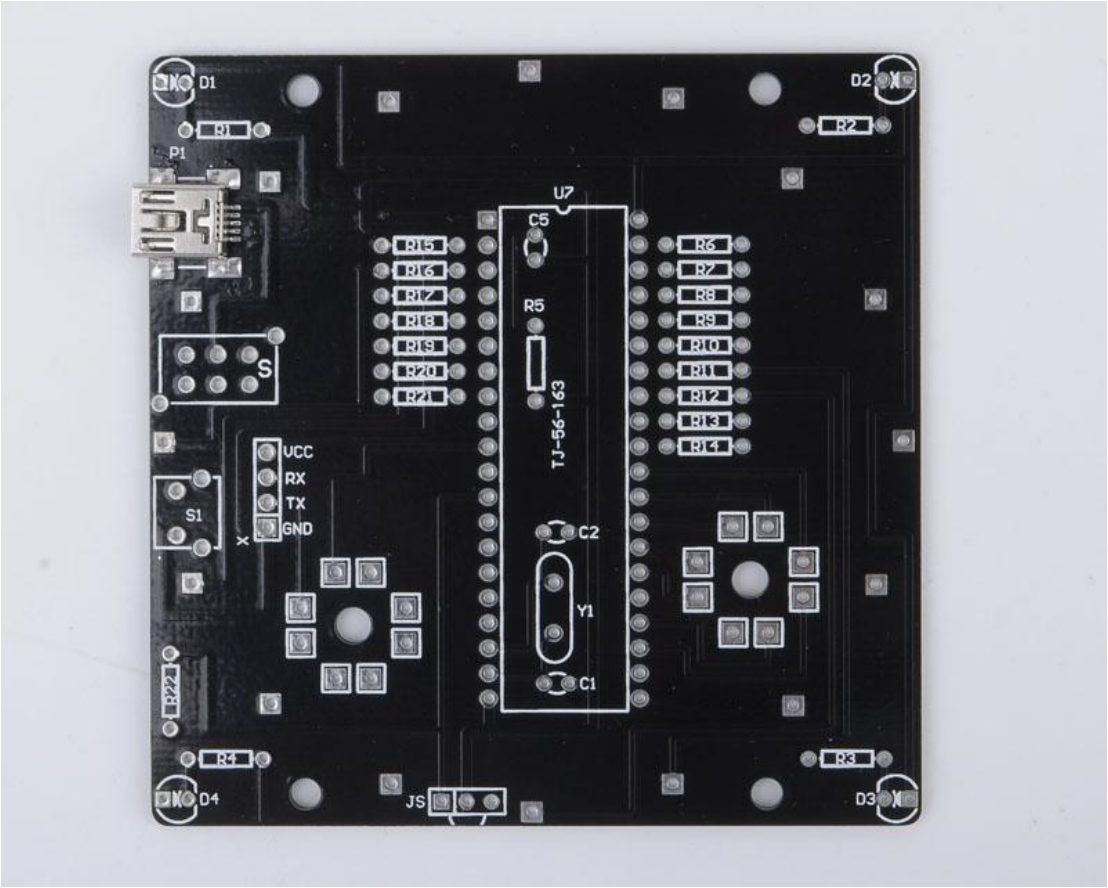
1>.Tips before installation:

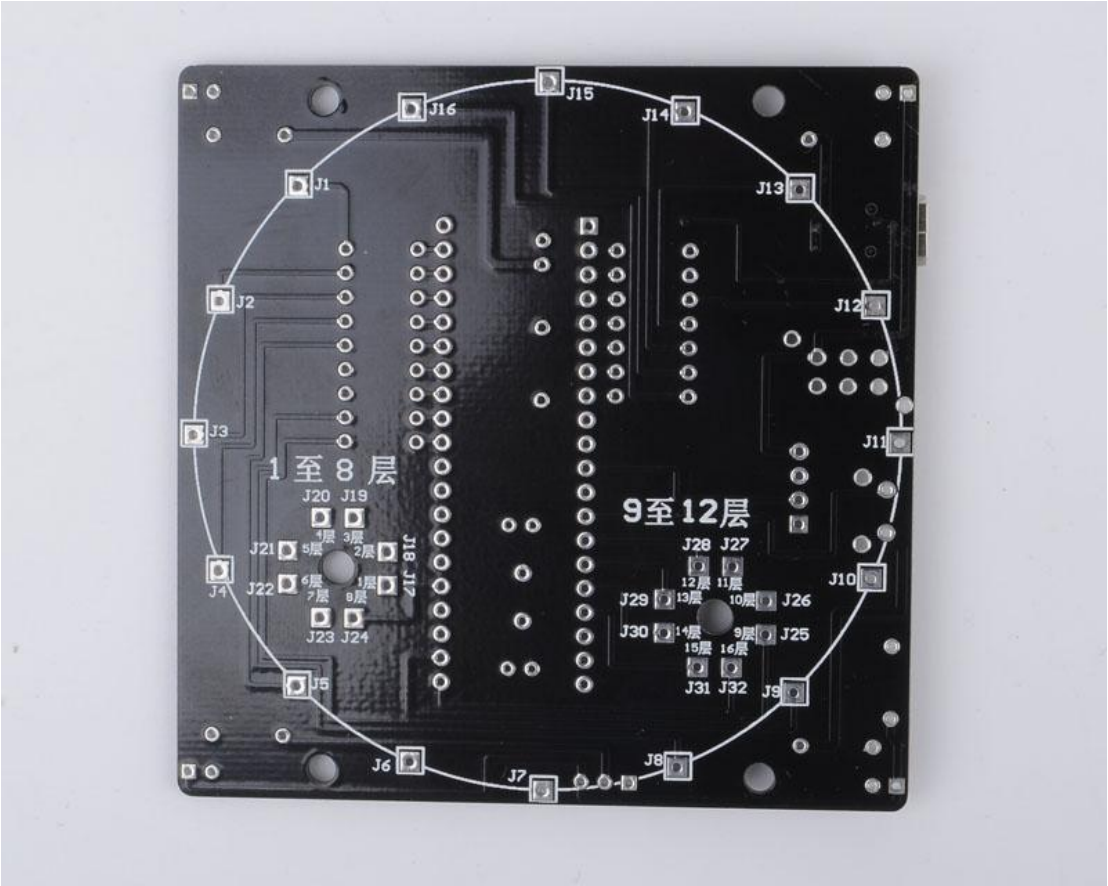
1).Check that all of the LED can be illuminated;

2).Note the direction of each component;

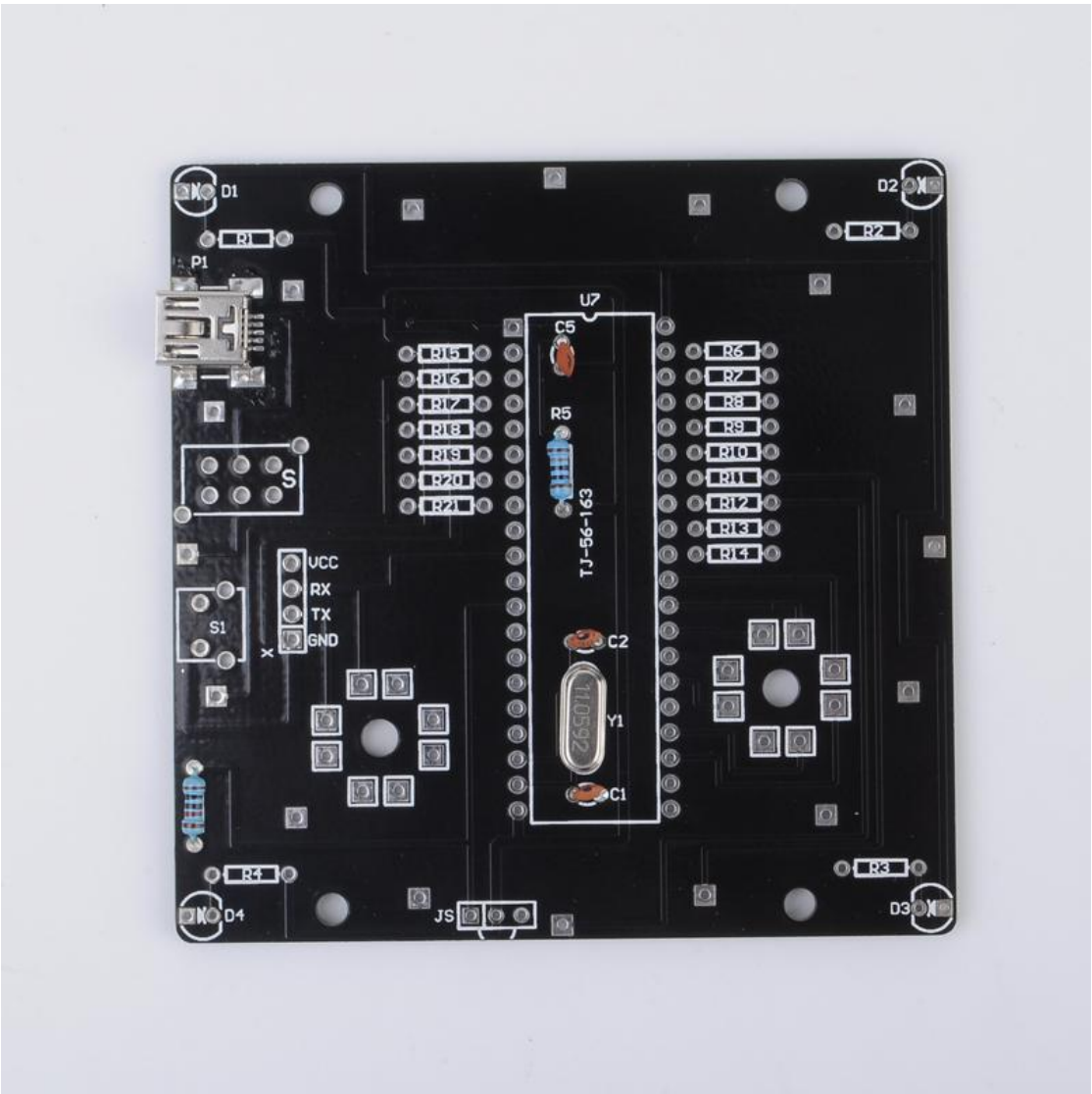
3)The following is a detailed description of the installation. There are other installation methods in the end of the document;

2>.Install Circuit board(SMD MINI USB may have been installed):

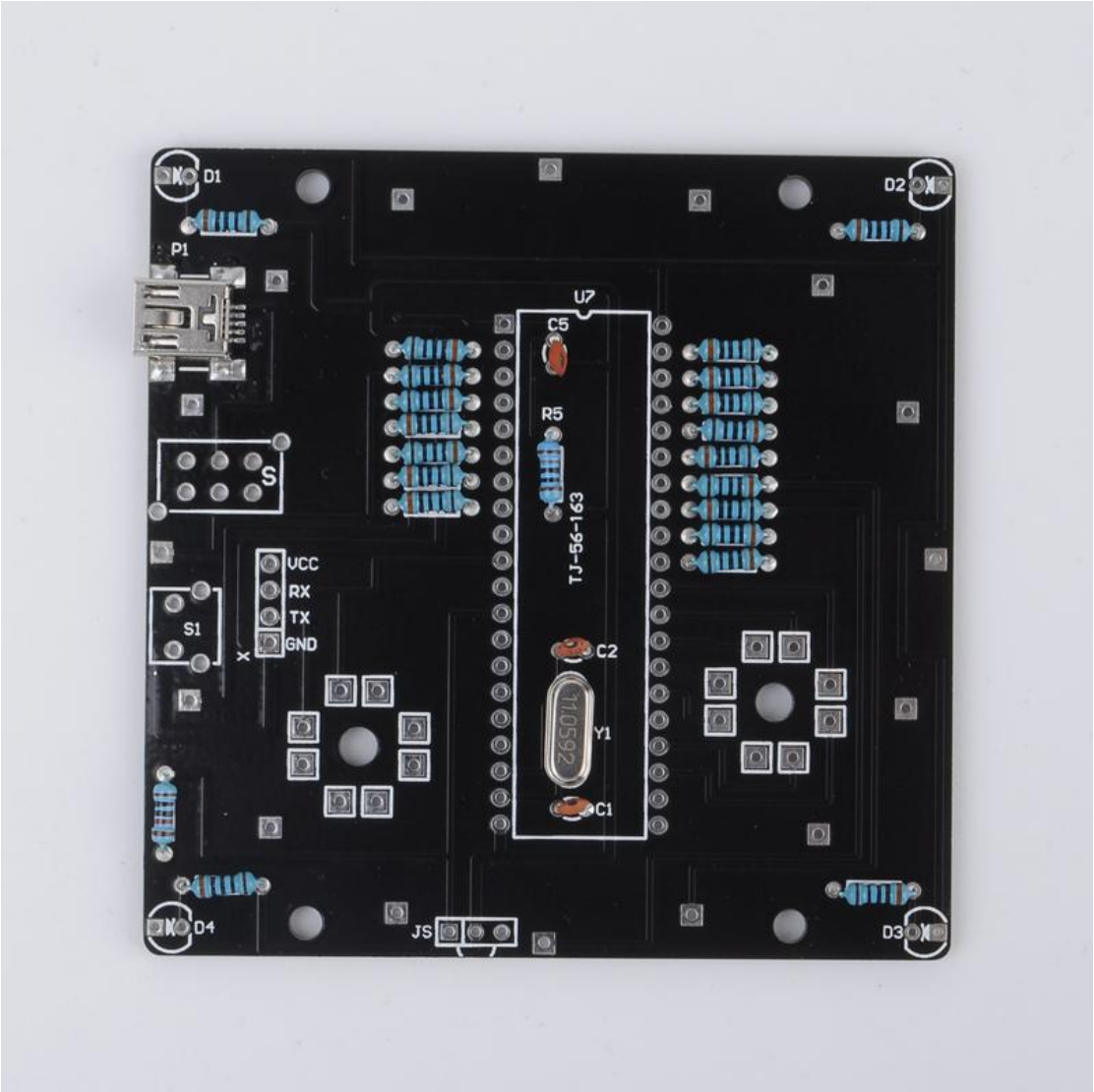

D1
D2
R1
R2
P1
U7
C5
R5
R15
R16
R17
R18
R19
R20
R21
R6
R7
R8
R9
R10
R11
R12
R13
R14
TJ-56-163
S
VCC
RX
TX
GND
S1
C2
Y1
C1
R22
R4
R3
D4
JS
D3


J16
J15
J14
J1
J13
J2
J12
J3
J11
1至8层
J20 J19
J21
J18 J17
J22
J4
J23 J24
J5
9至12层
J28 J27
J10
J29
J26
J30
J25
J31 J32
J9
J6
J7
J8

1).Step 1:Install 10K,100K resistor,3pcs 30pF capacitor.



2).Step 2:Install Crystal and 20pcs 300ohm resistor



3).Step 3:Install DIP-40 IC socket.

4).Step 4: Install Self-locking switch,Button,VS1838B Infrared sensor and 4P male pin(Recommended use male pin and do not use round female pin as shown)

5).Step 5:Install 4pcs 5mm colorful LED and note direction

6).Step 6:Install 16pcs Round Female pin on other side of PCB on J1-J16 pad.It is use for LED

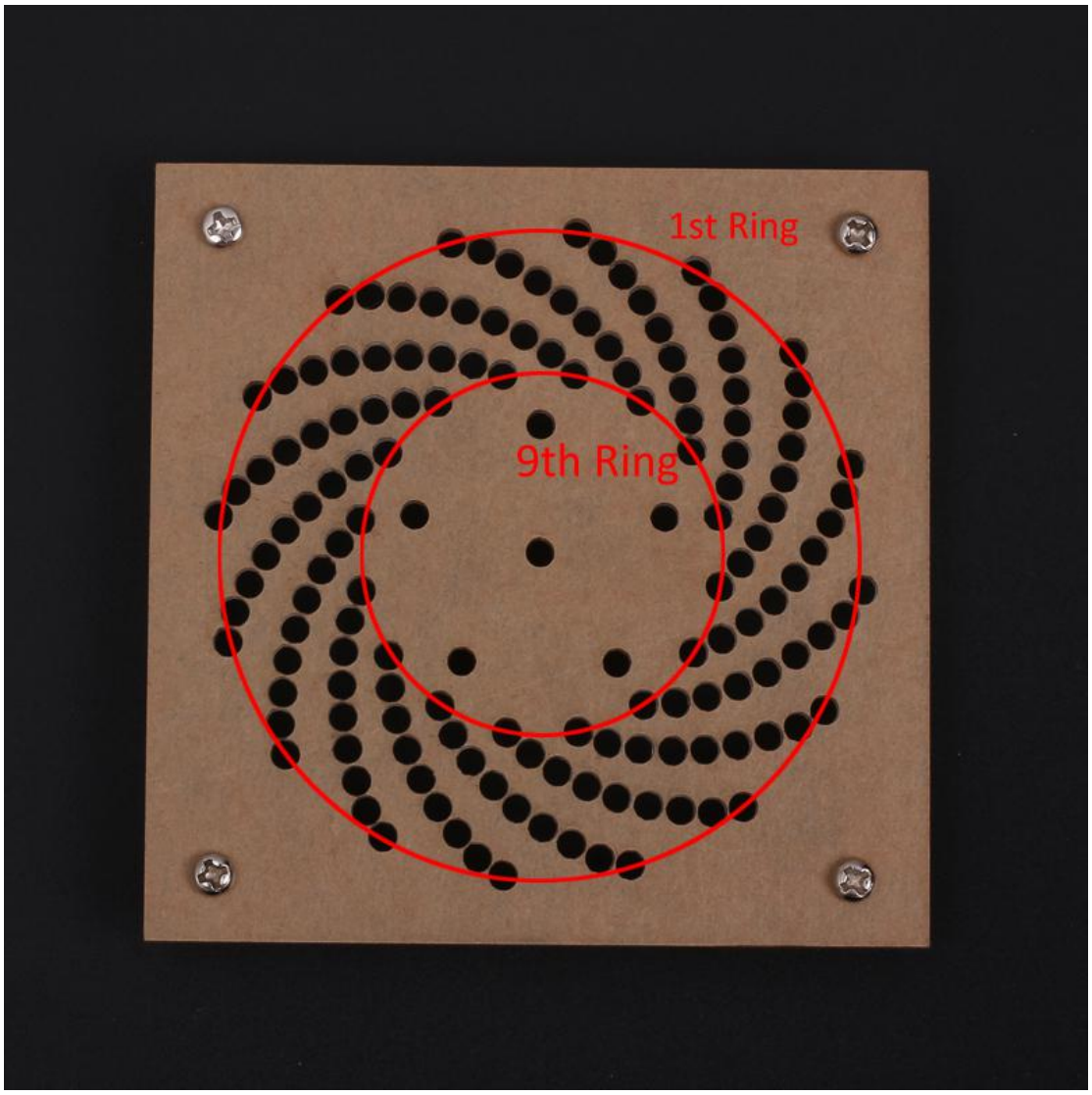
7).Step 7:Install and test.Connect power by MINI USB,Colorful LED will flash.Otherwise:

A. Check for the presence of Weld

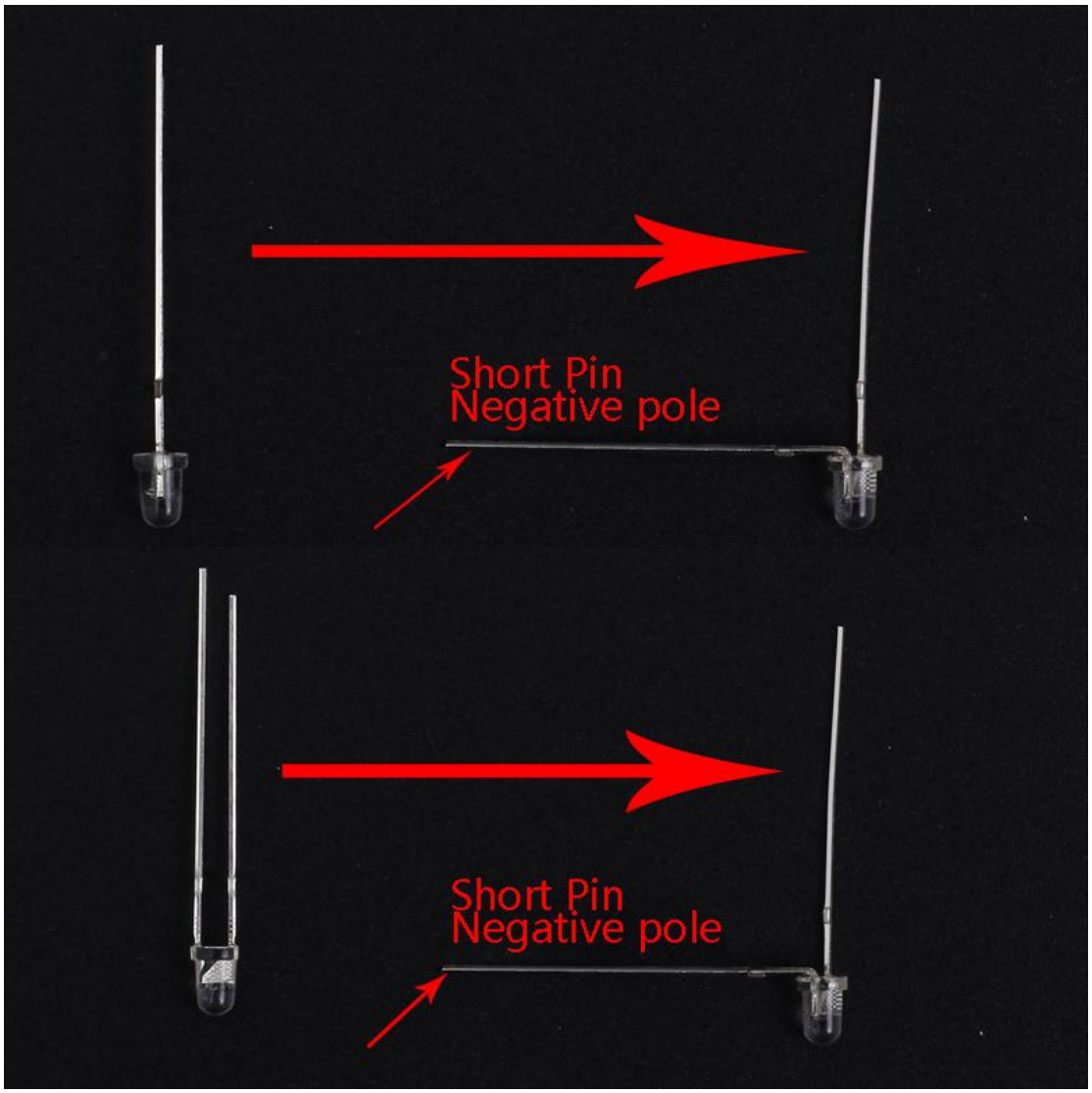
B. Check if there are components installed incorrectly

3>.Install LED of Tower main body

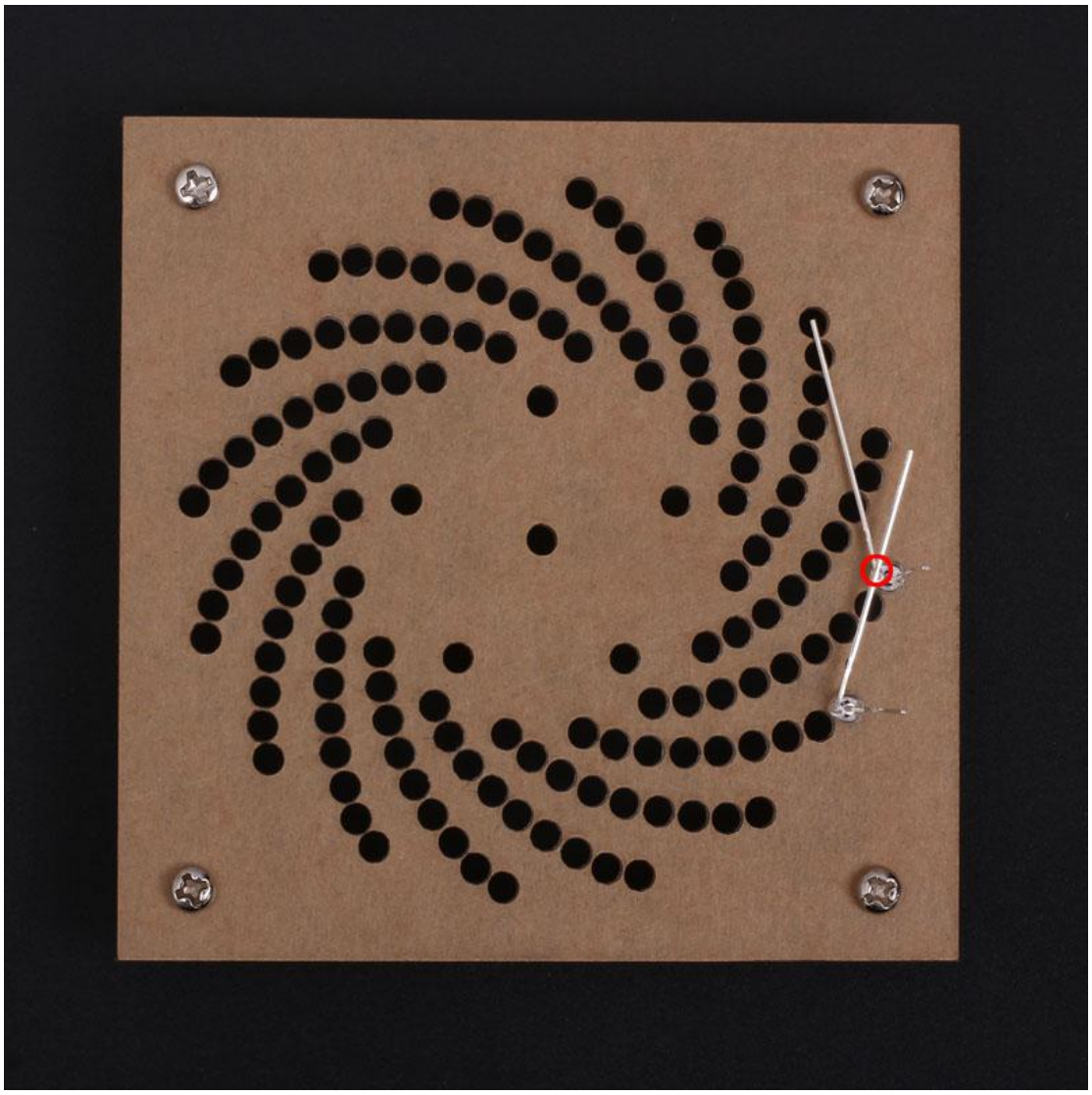
1).Step 8:Install 4pcs Copper pillars and M3 Screw on Acrylic welding template.According to the rules shown,the outermost is the first ring:1st Ring

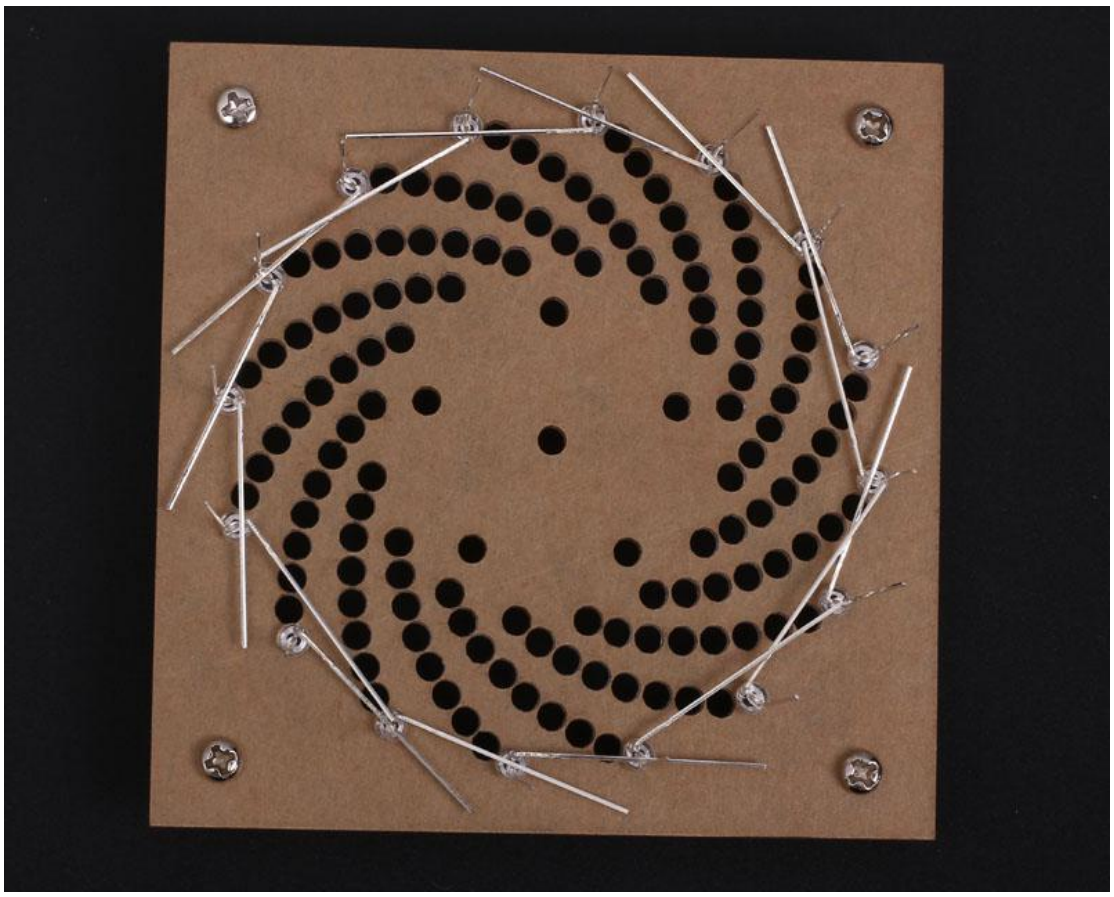


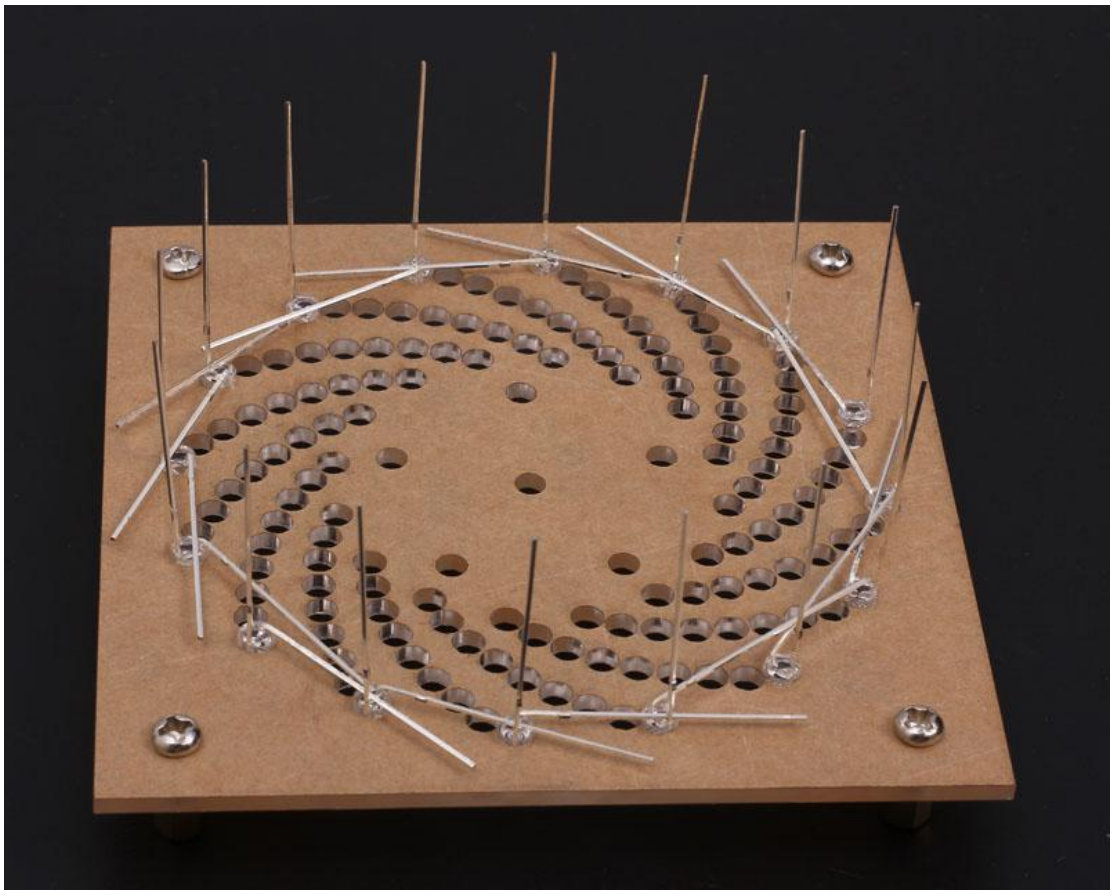
2).Step 9:Process LED.Curved LED’s shorter pin(Negative pole) and form a right angle.Please be careful not to damage the LED.

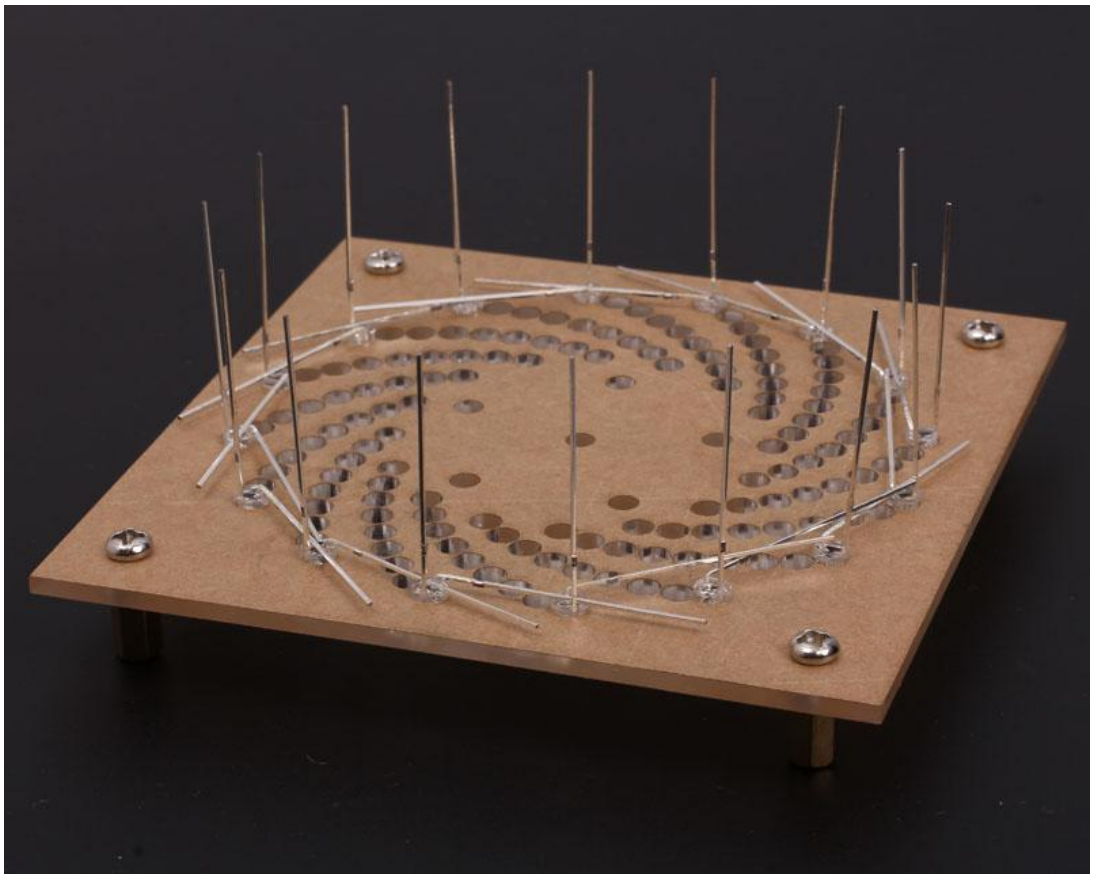


3).Step 10:Make the 1st layer LED of Tower main body.Put the already processed LED on 1st Ring.Long pin(Positive pole) outward,Shorter pin(Negative pole) interconnection.

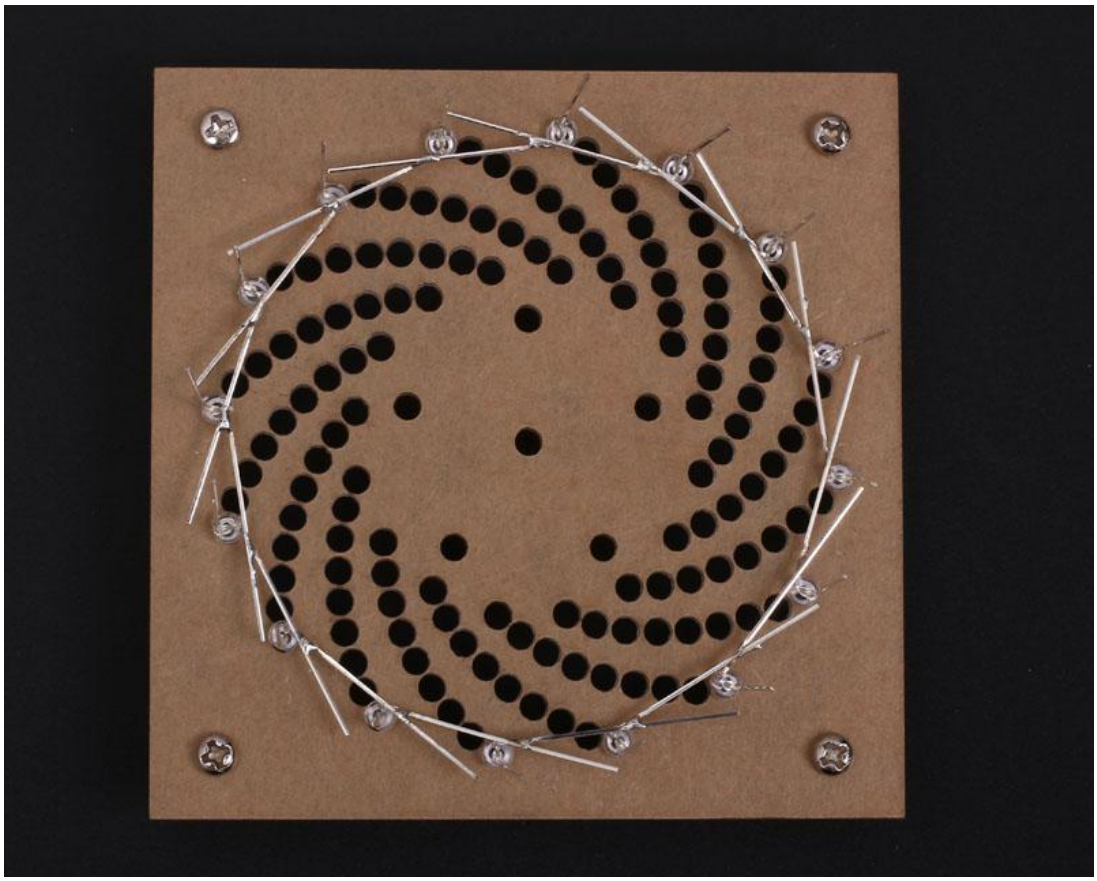


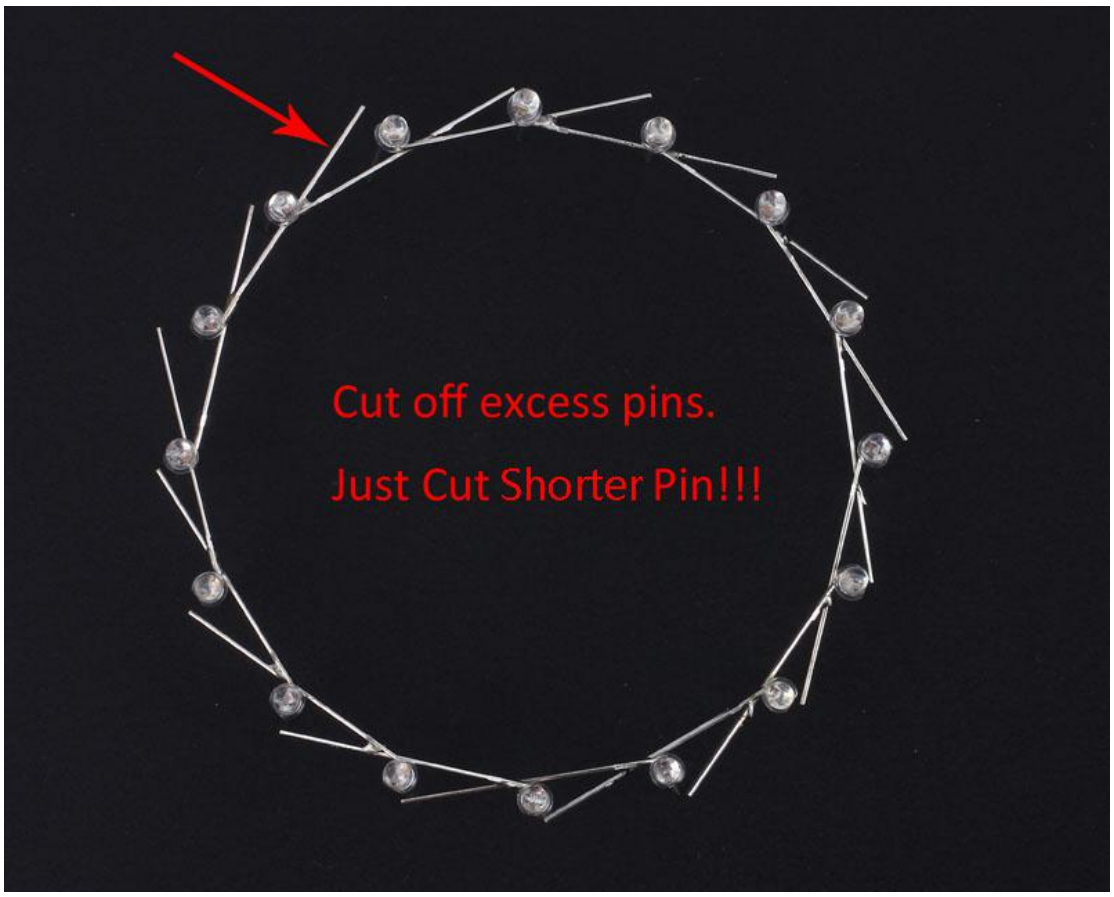


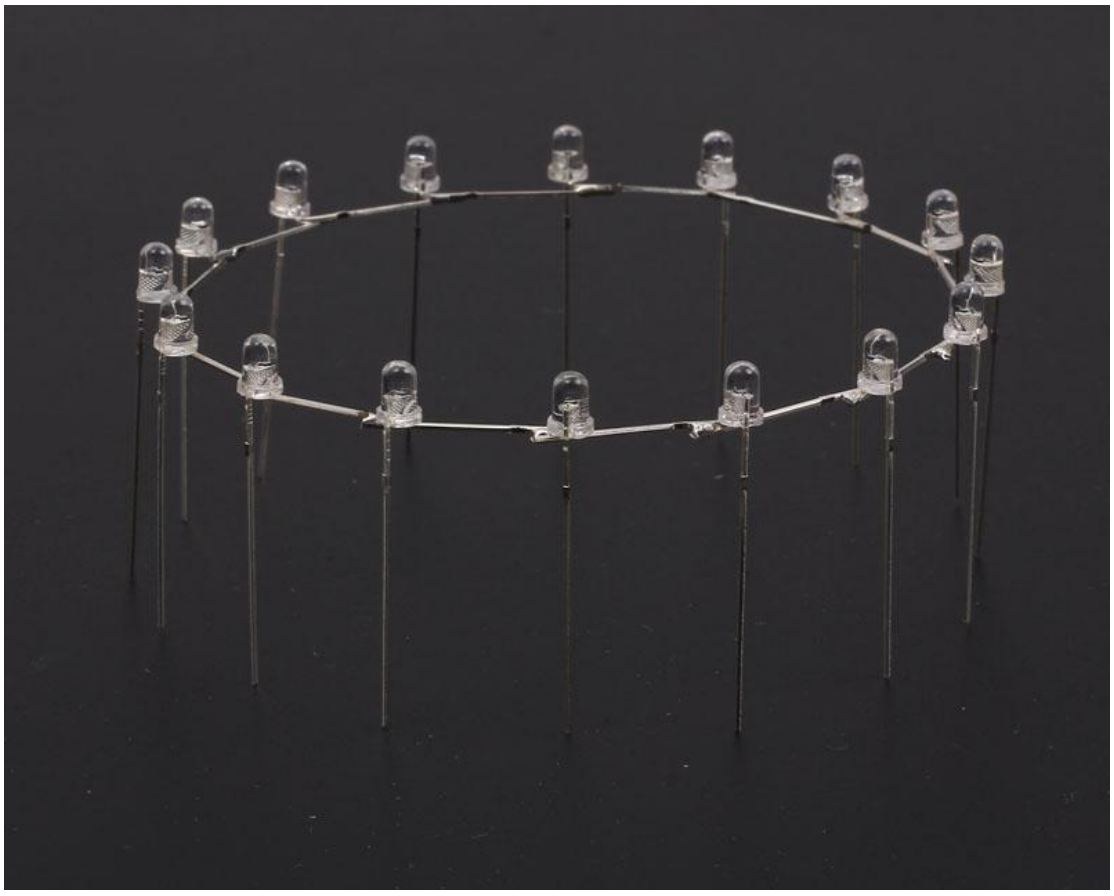




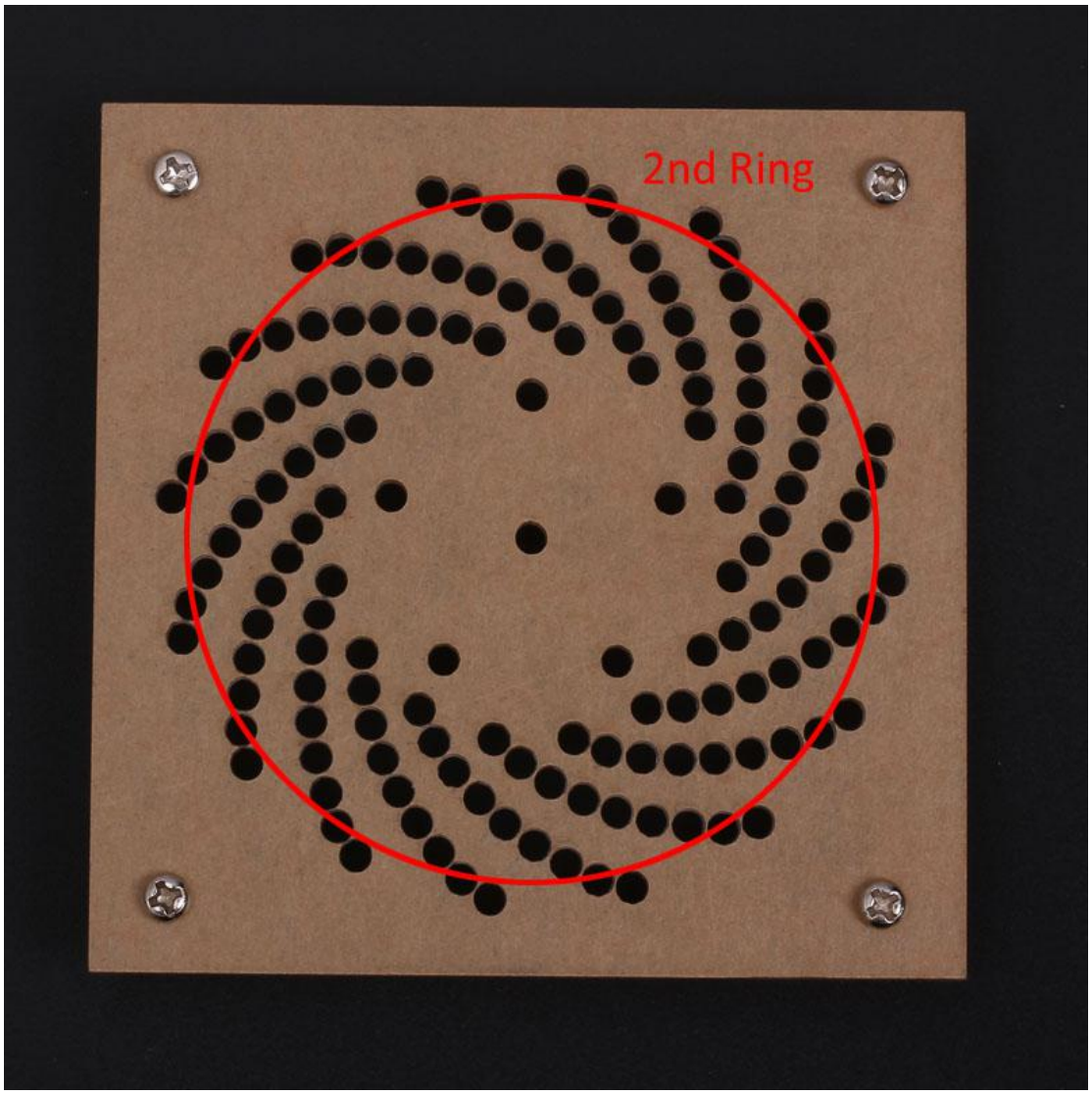
Use solder to fix.Cut off excess pins.Just Cut Shorter Pin!!!




Cut off excess pins.
Just Cut Shorter Pin!!!



4).Step 11:Make the 2nd layer LED of Tower main body.Choose the 2nd Ring on Acrylic welding template as shown.The make method is the same as the 1st layer.



5).Step 12:Make the 3rd layer LED of Tower main body.Choose the 3rd Ring on Acrylic welding template.

6).Step 13:Make the 4th layer LED of Tower main body.Choose the 4th Ring on Acrylic welding template.

7).Step 14:Make the 5th layer LED of Tower main body.Choose the 5th Ring on Acrylic welding template.

8).Step 15:Make the 6th layer LED of Tower main body.Choose the 6th Ring on Acrylic welding template.

9).Step 16:Make the 7th layer LED of Tower main body.Choose the 7th Ring on Acrylic welding template.

10).Step 17:Make the 8th layer LED of Tower main body.Choose the 8th Ring on Acrylic welding template.

11).Step 18:Make the 9th layer LED of Tower main body.Choose the 9th Ring on Acrylic welding template.

12).Step 19:Make the 10th layer LED of Tower main body.Choose the 9th Ring on Acrylic welding template.

13).Step 20:Make the 11th layer LED of Tower main body.Choose the 9th Ring on Acrylic welding template.

14).Step 21:Make the 12th layer LED of Tower main body.Choose the 8th Ring on Acrylic welding template.

15).Step 22:Make the 13th layer LED of Tower main body.Choose the 7th Ring on Acrylic welding template.

16).Step 23:Make the 14th layer LED of Tower main body.Choose the 6th Ring on Acrylic welding template.

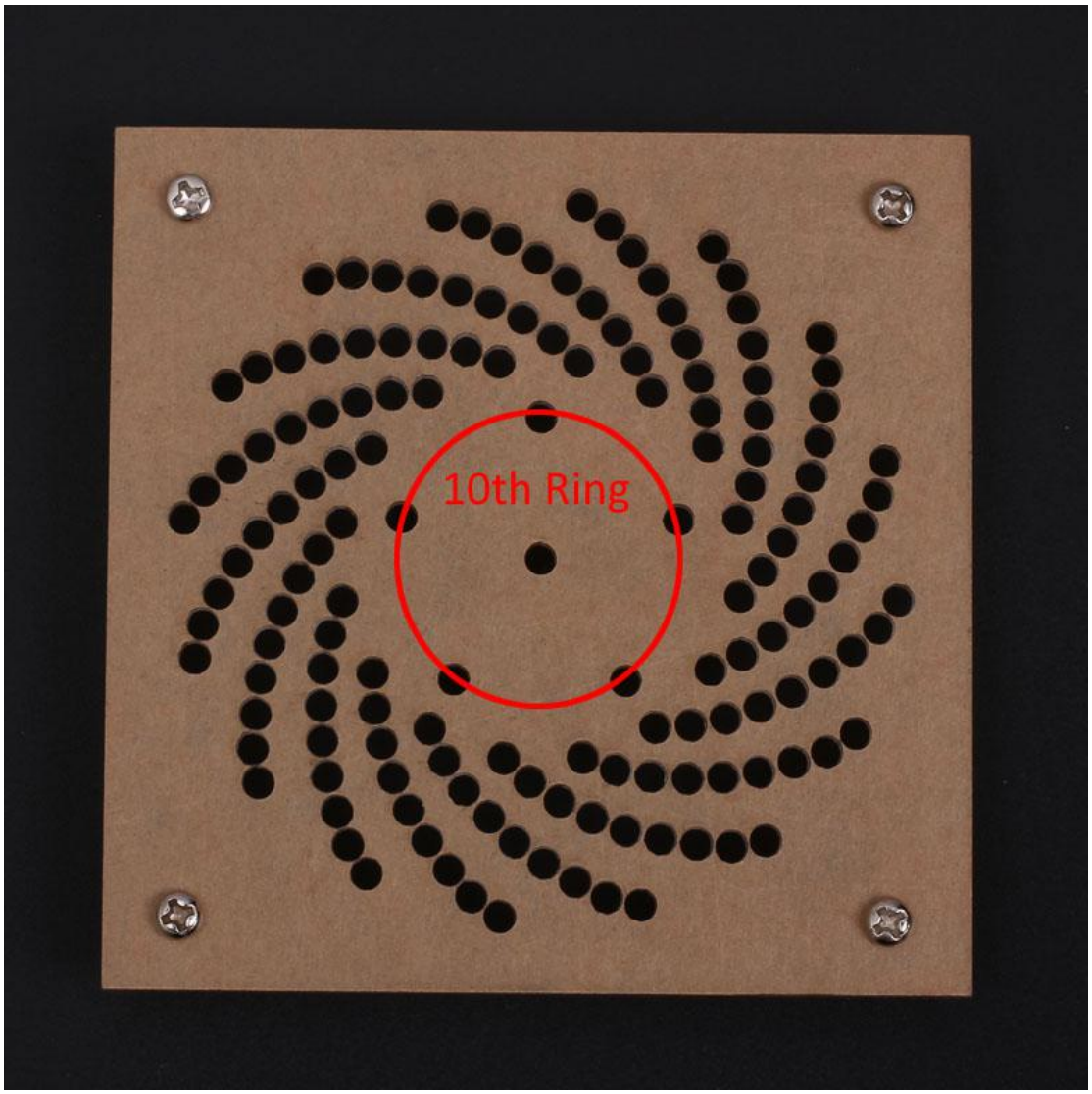
17).Step 24:Make the 15th layer LED of Tower main body.Choose the 5th Ring on Acrylic welding template.

18).Step 25:Make the 16th layer LED of Tower main body.Choose the 4th Ring on Acrylic welding template.

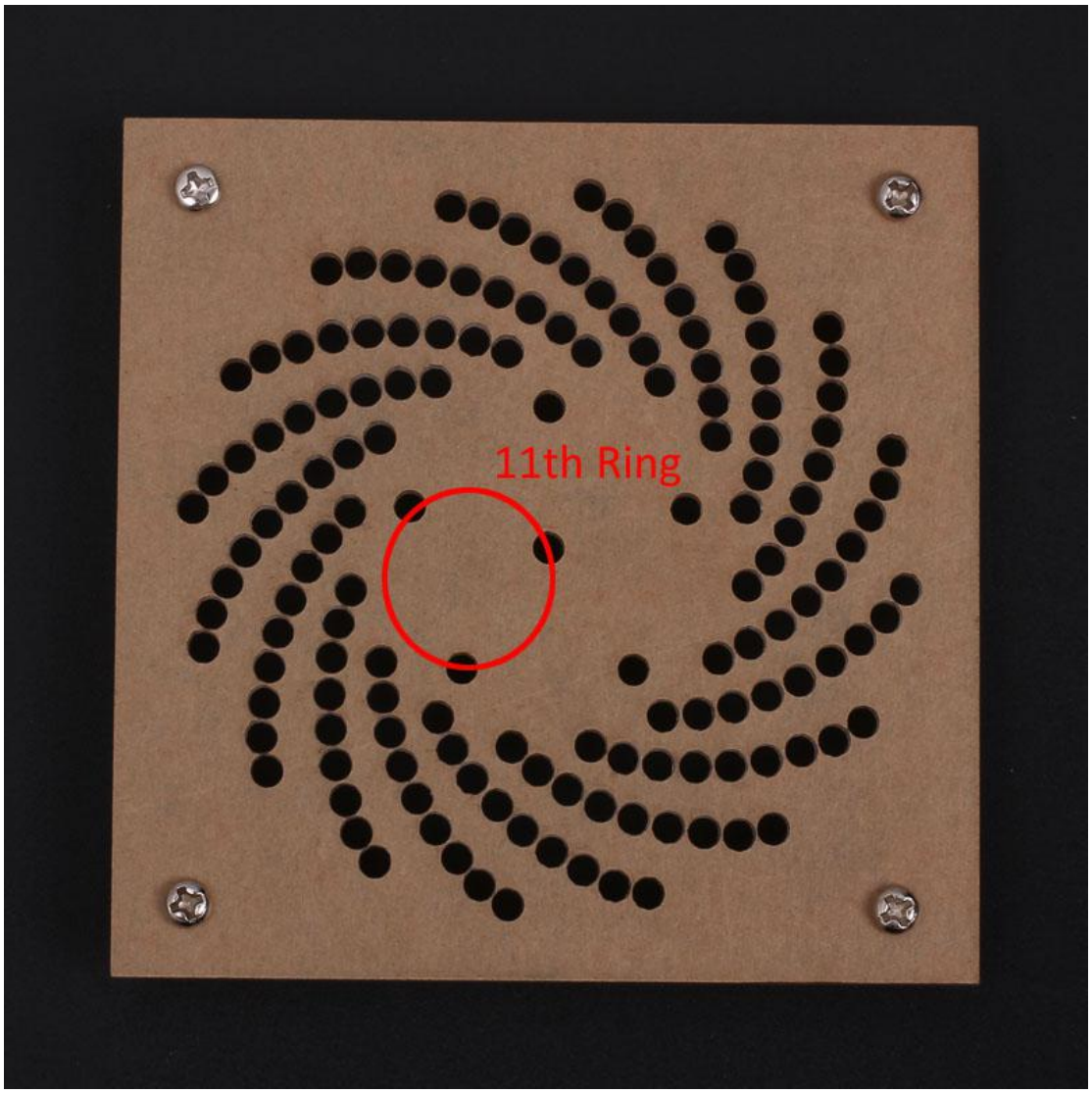
4>.Install LED of Spire.

There four layers for spire.The distribution of LED is 5-3-3-1.That is the 1st layer is 5pcs LEDs,the 2nd and 3rd layer is 3pcs LEDs,the 4th layer is 1pcs LED.

1).Step 26:Make the 1st layer LED of spire.Choose the 10th Ring on Acrylic welding template.The make method is the same as the 1st layer of Tower main body.



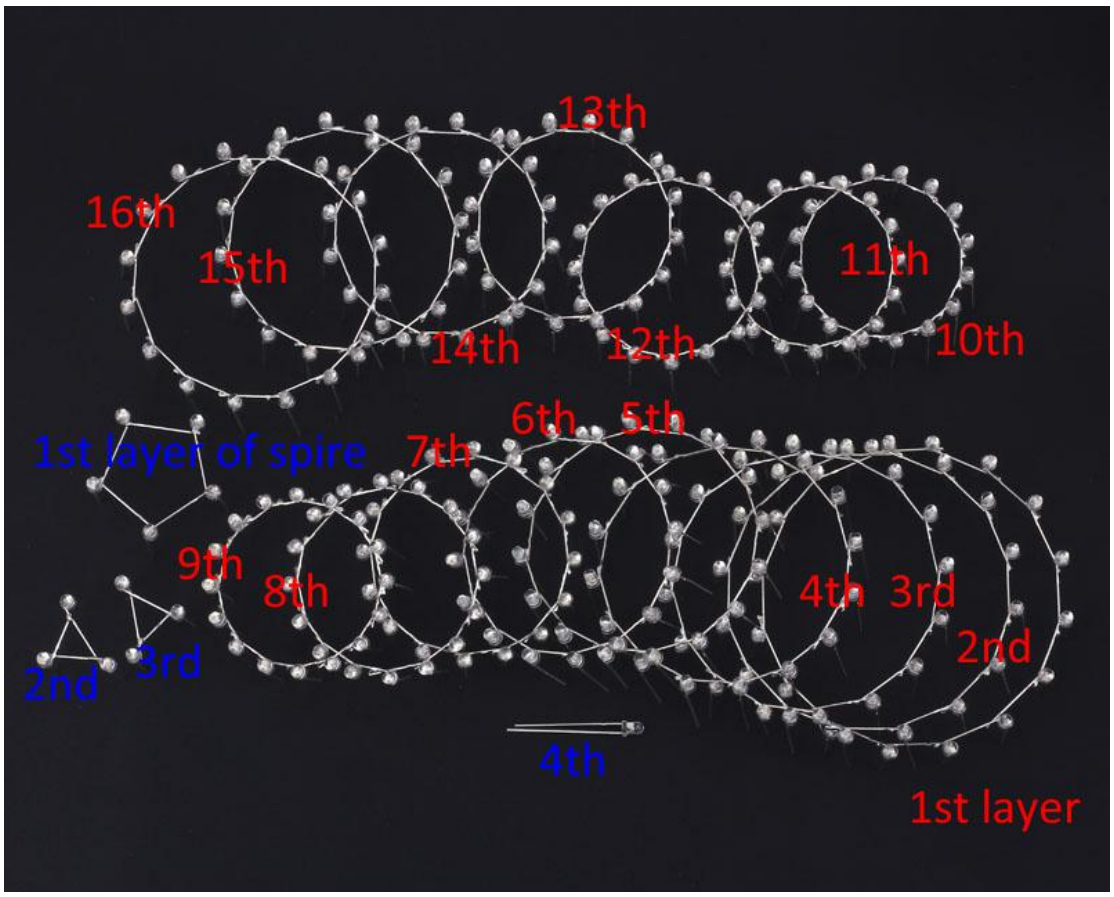
2).Step 27:Make the 2nd layer LED of spire.Choose the 11th Ring on Acrylic welding template.

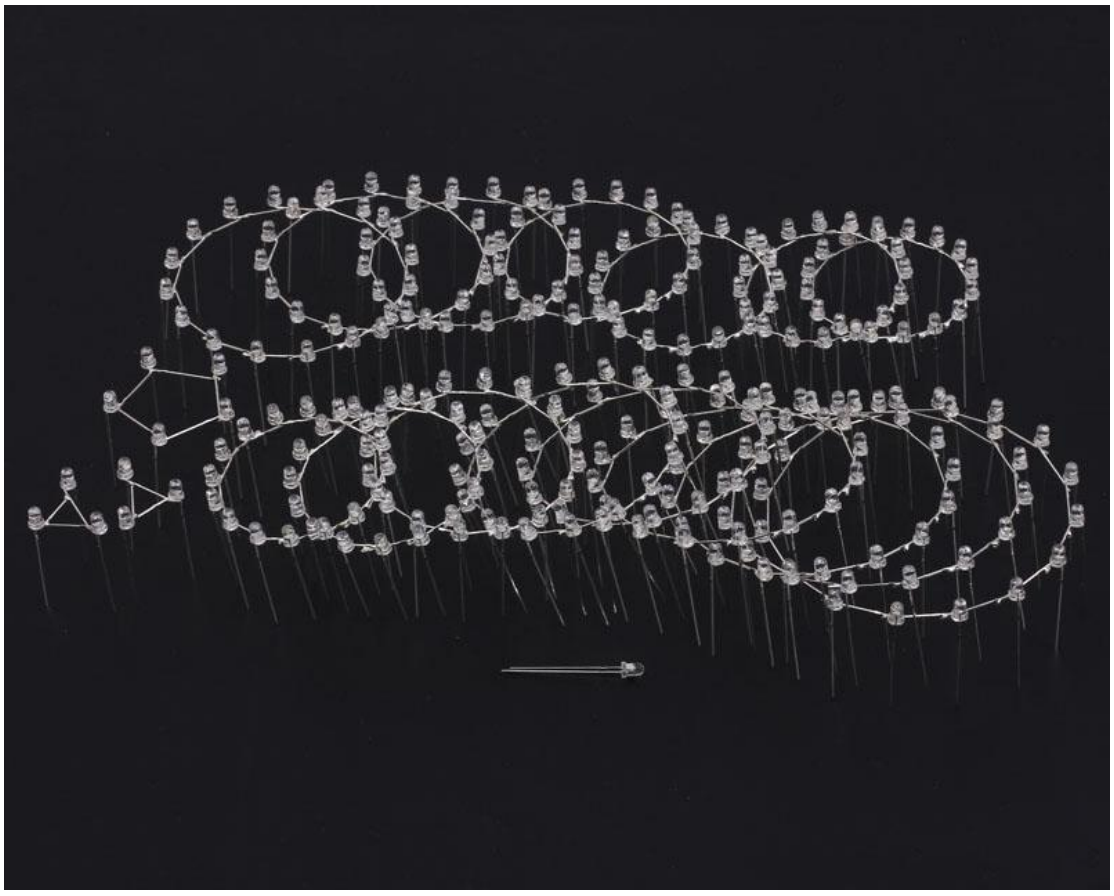


3).Step 28:Make the 3rd layer LED of spire.Choose the 11th Ring on Acrylic welding template.

4).Step 29:The 4th layer LED just consist of 1pcs LED.

5).Well, so far, each layer of LED are made well, and now need to connect layer and layer together.

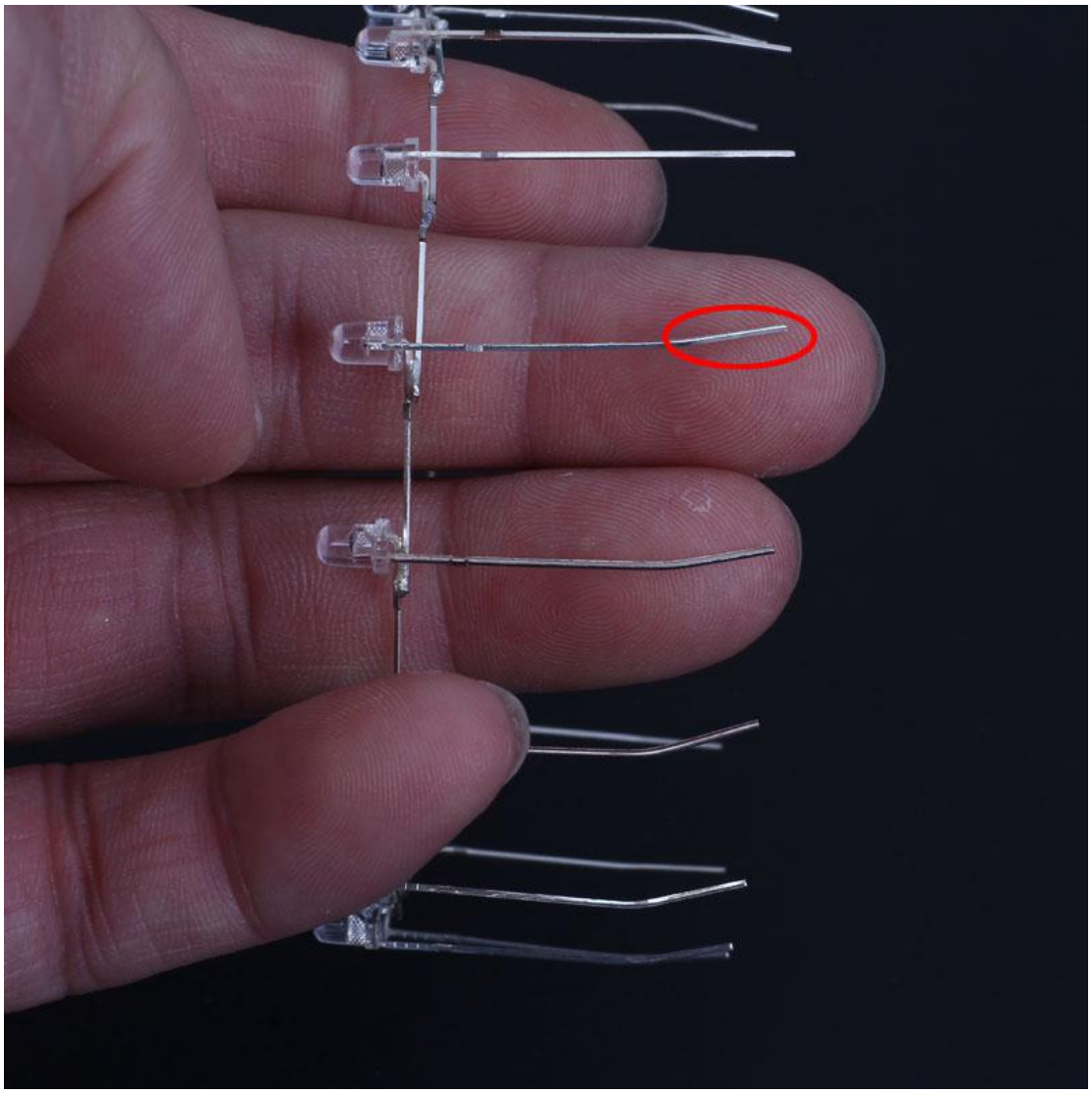

13th
16th
15th
11th
14th
12th
10th
6th
5th
1st layer of spire
7th
9th
8th
4th
3rd
2nd
2nd
3rd
4th
1st layer

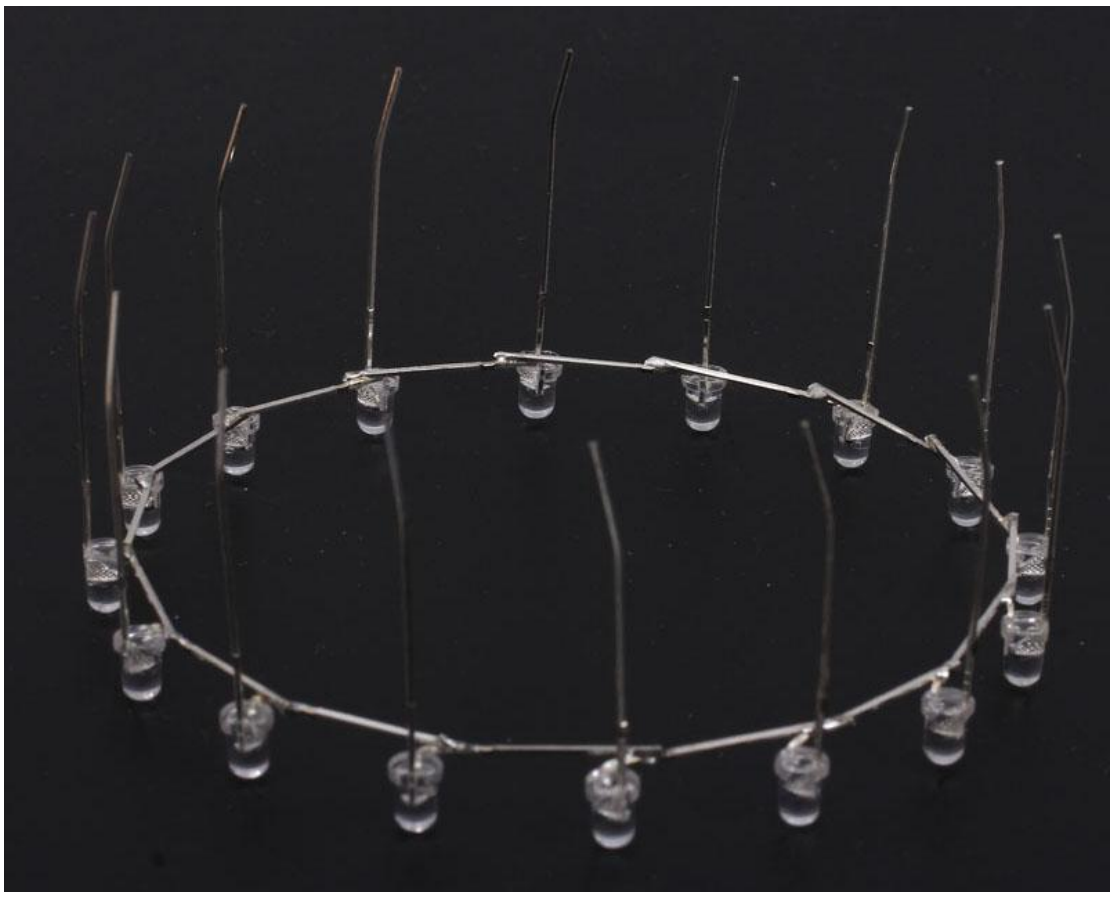


5>.Connect layer each other.

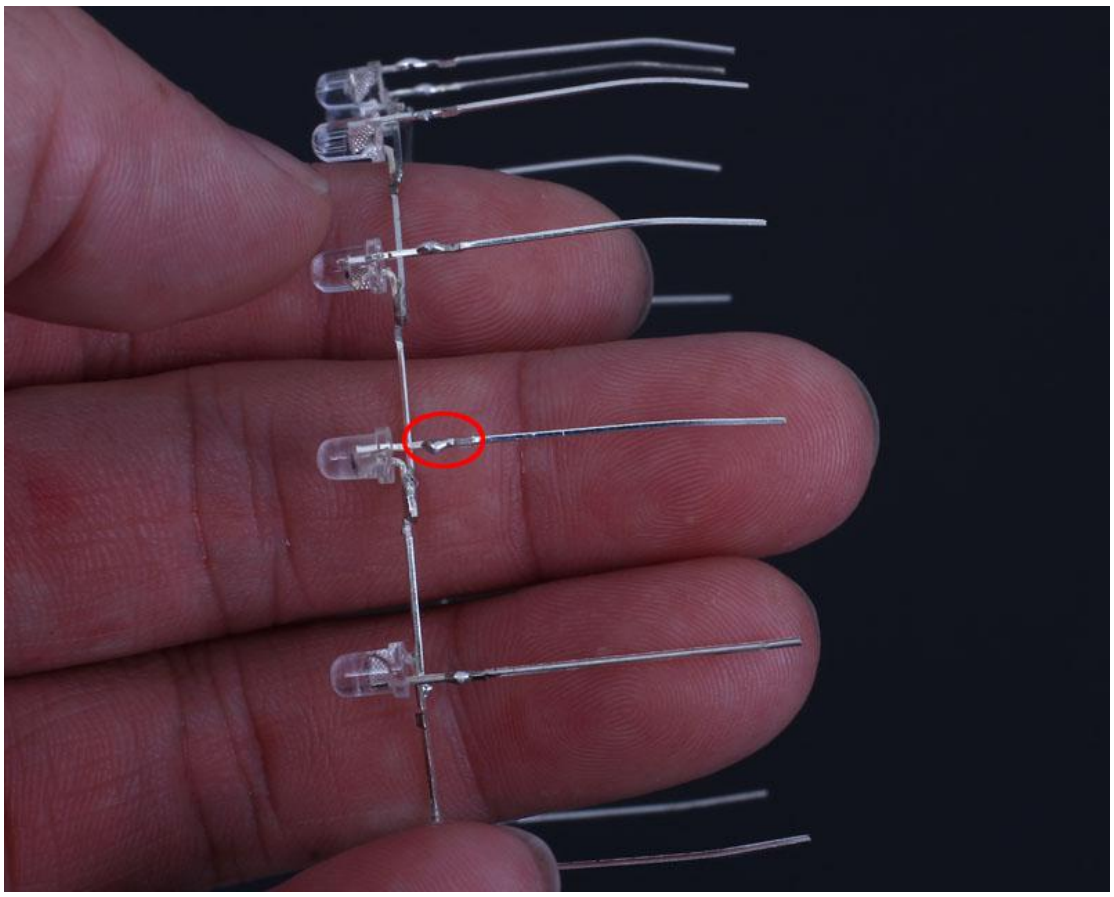
1).Step 30:Bend the LED pins slightly as shown the pins are bent upwards and inward.The purpose of the bend is to connect the next layer of LEDs.

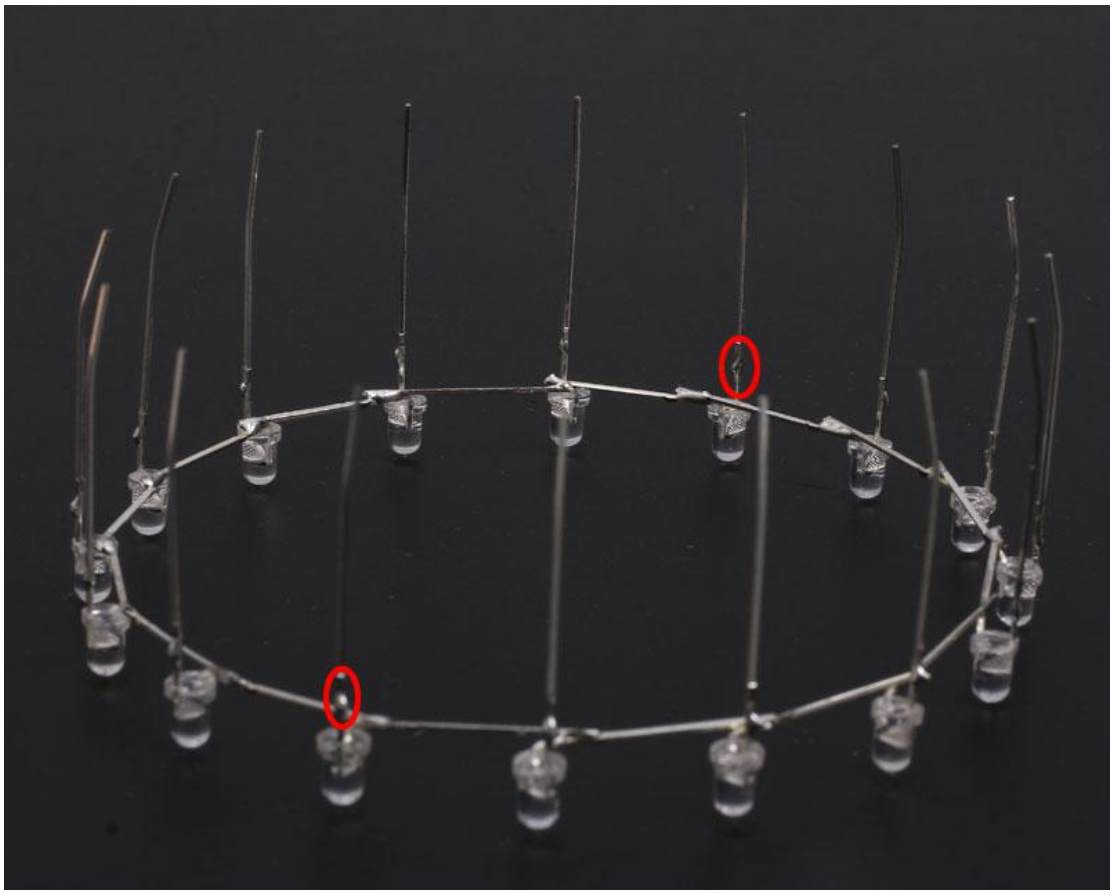
NOTE:The 1st layer have no need to bend pins.It can insert into female round pin or welding on J1-J16 directly.



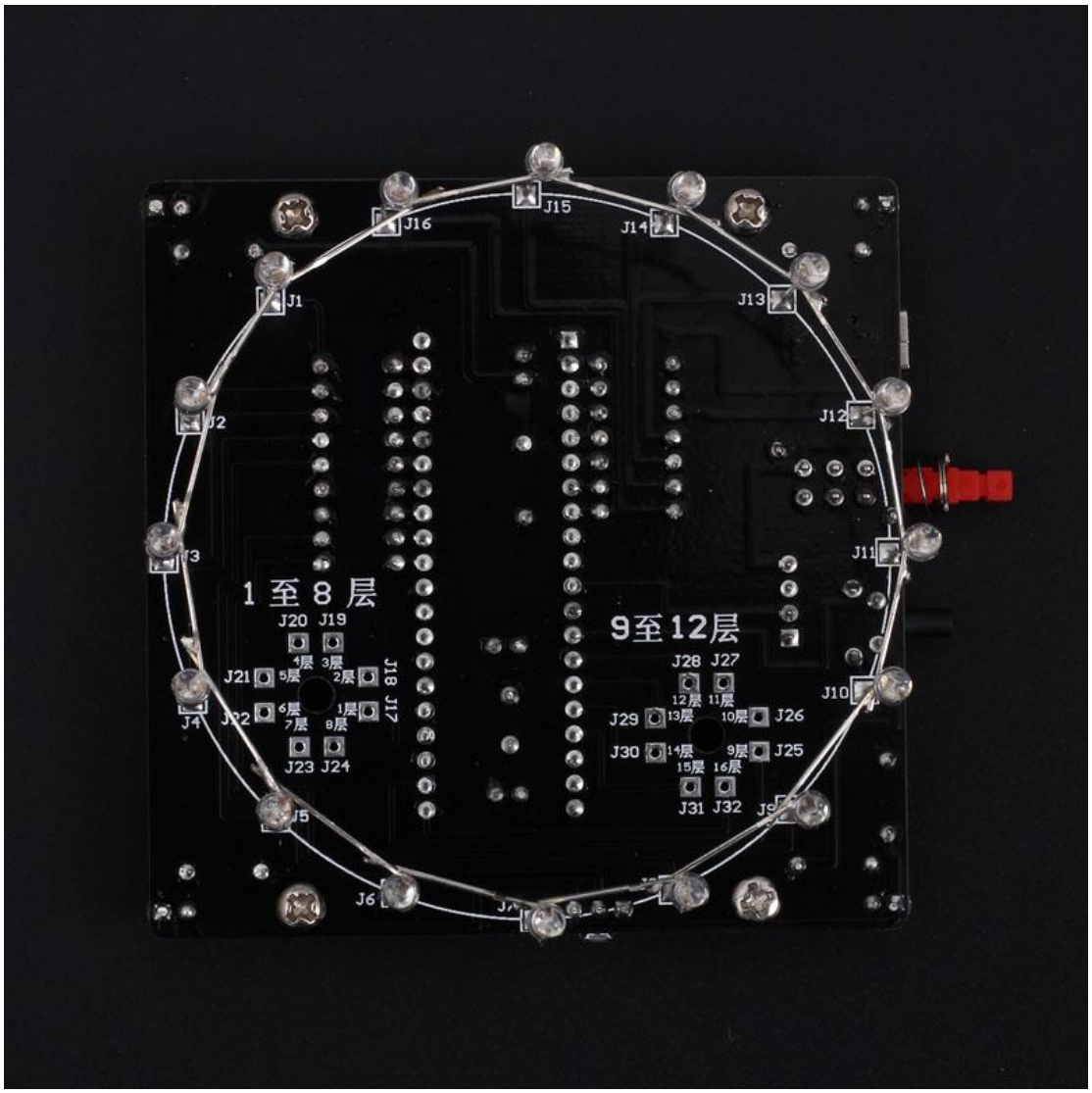


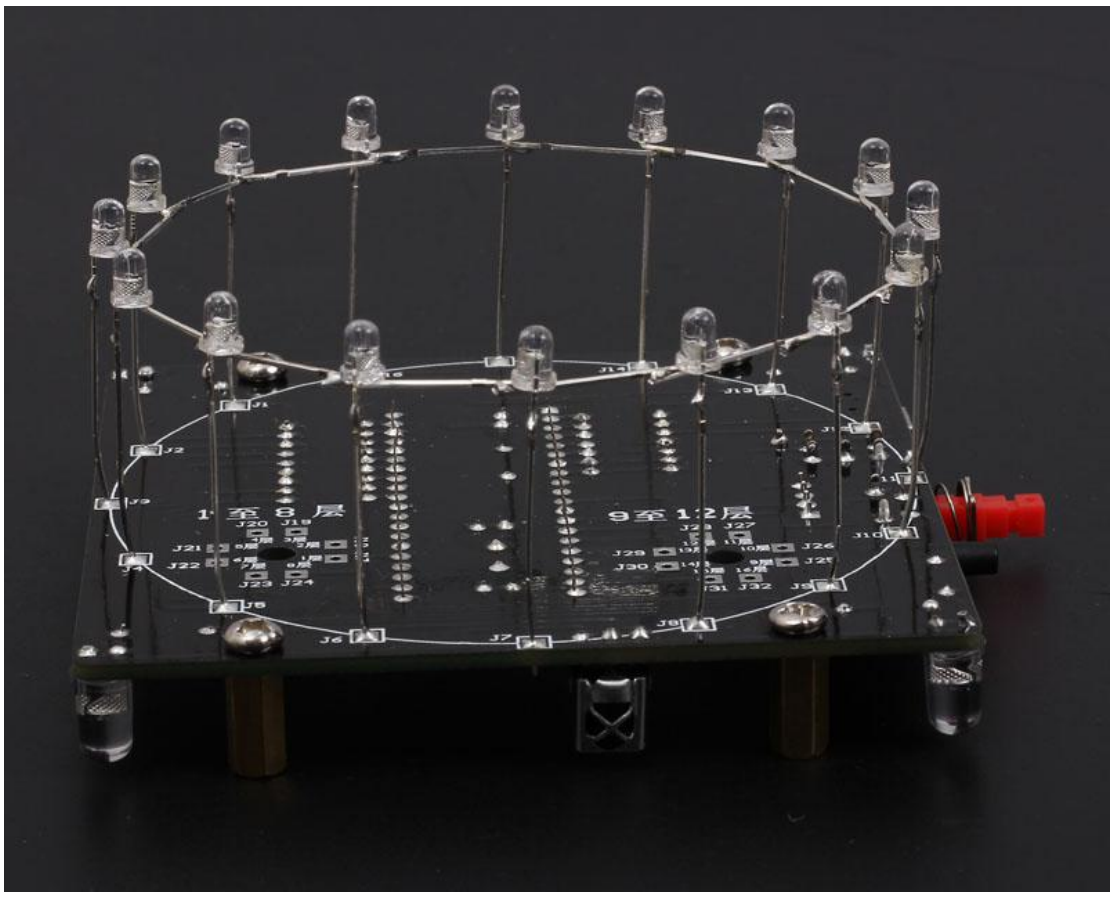
2).Step 31:Put some tin on the root of positive pole in order to fix next layer LED.

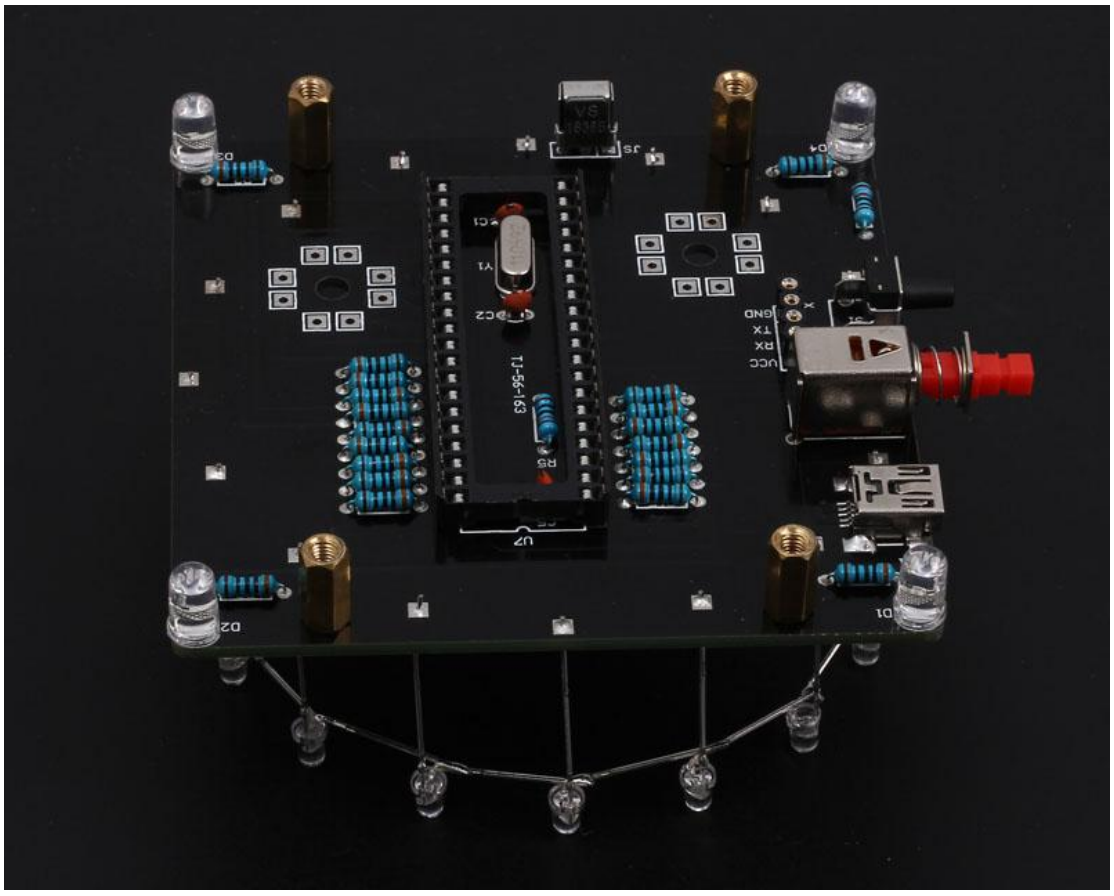




3).Step 32:Install the 1st layer on PCB.NOTE:It is install on the other side!!!

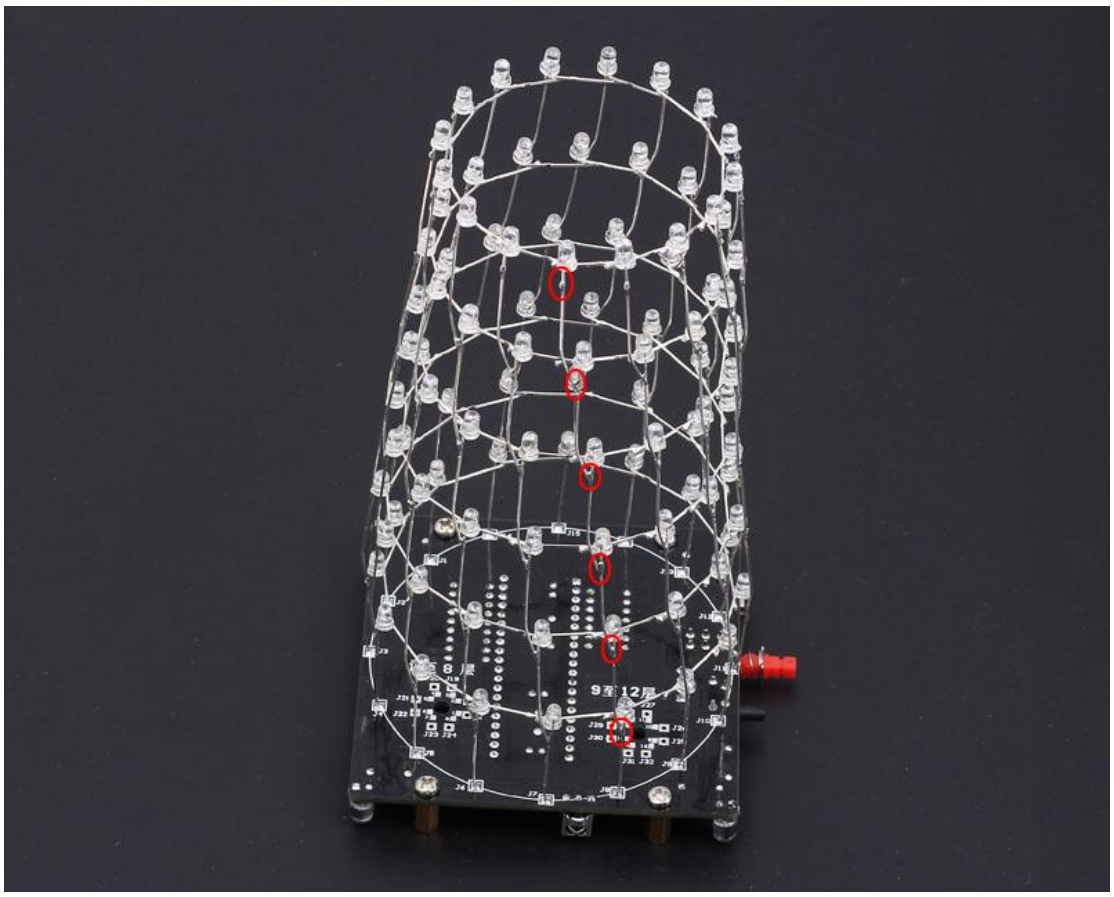



1至8层
9至12层

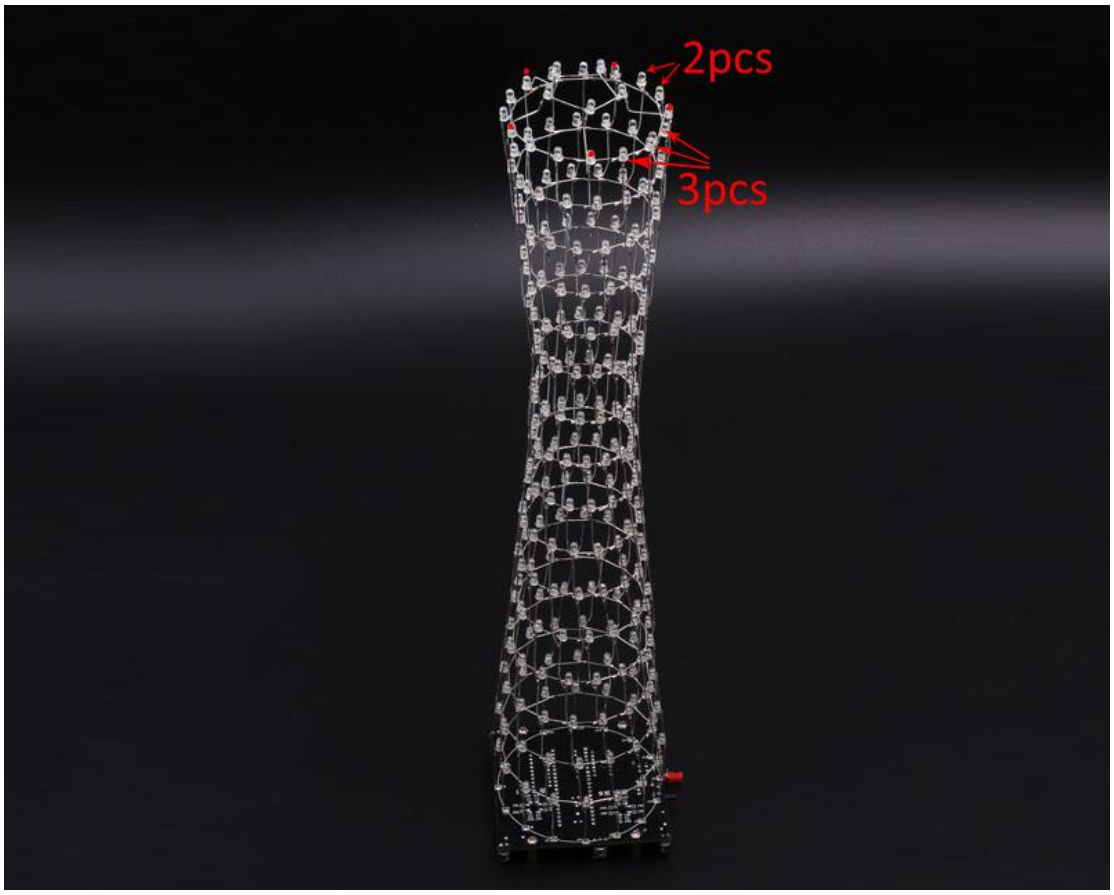

GND
TX
RX
VCC

4).Step 33:Weld bend pin from the 2nd layer on tin on the root of positive pole.But also to ensure that the current layer and the next layer a little bit of dislocation

5).Step 34:Install the 3rd ~ 16th layer as the same method.



6).Step 35:Install spire.There are 16pcs LED on the 16th layer of Tower main body and 5pcs LED on the 1st layer of spire.So there are 3pcs LED on the 16th layer between 2pcs LED on the 1st layer of spire,and others just have 2pcs LED.Please see picture,you can understand clearly.

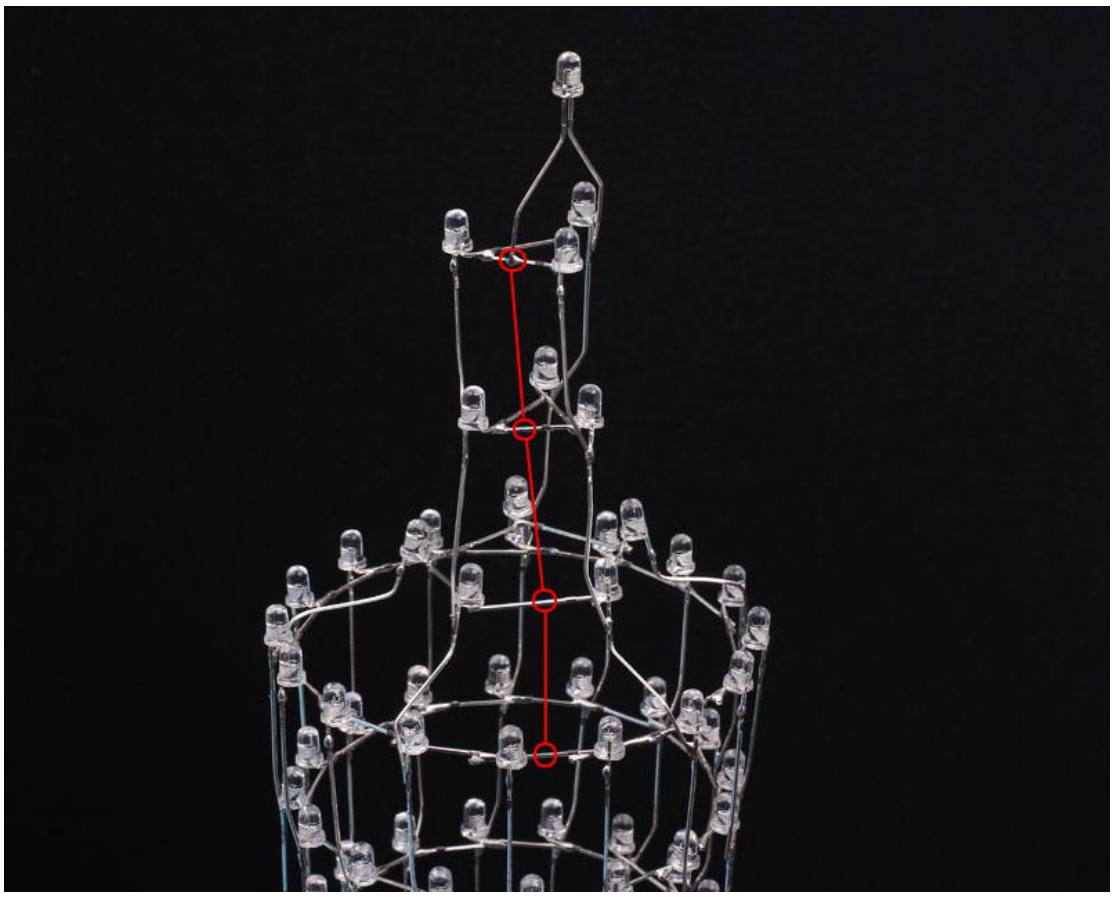


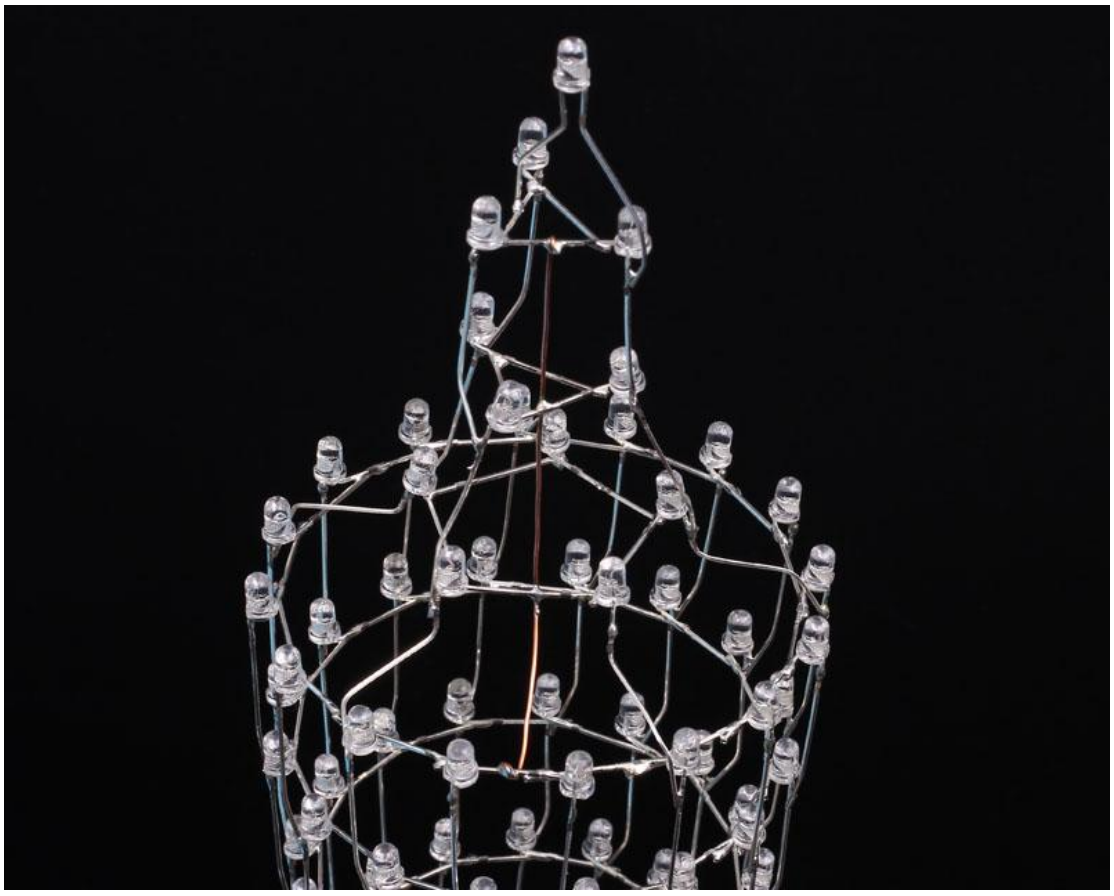
7).Step 36:Install the 2nd layer and the 3rd layer of spire.

8).Step 37:Install the 4th layer of spire.Negative pole connect to the negative of the 3rd layer and positive pole connect to the positive of the 3rd layer of spire.

6>.Connect layer each other.

1).Step 38:Connect all negative pole the four layer of spire together by jumper and then connect it to the 16th layer of Tower main body.





2).Step 39:Connect each layer of Tower main body to J17-J32.

The 1st layer connect to J17 by wire;

The 2nd layer connect to J18 by wire;

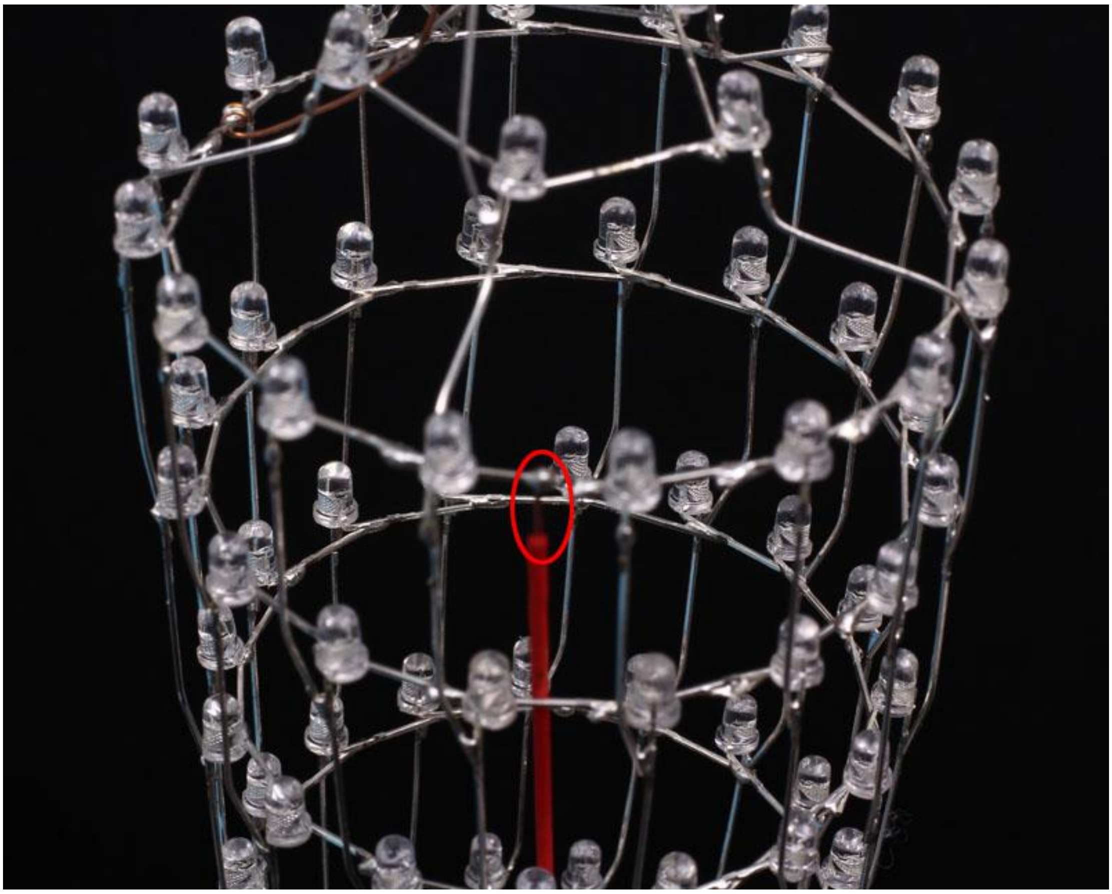
The 3rd layer connect to J19 by wire;

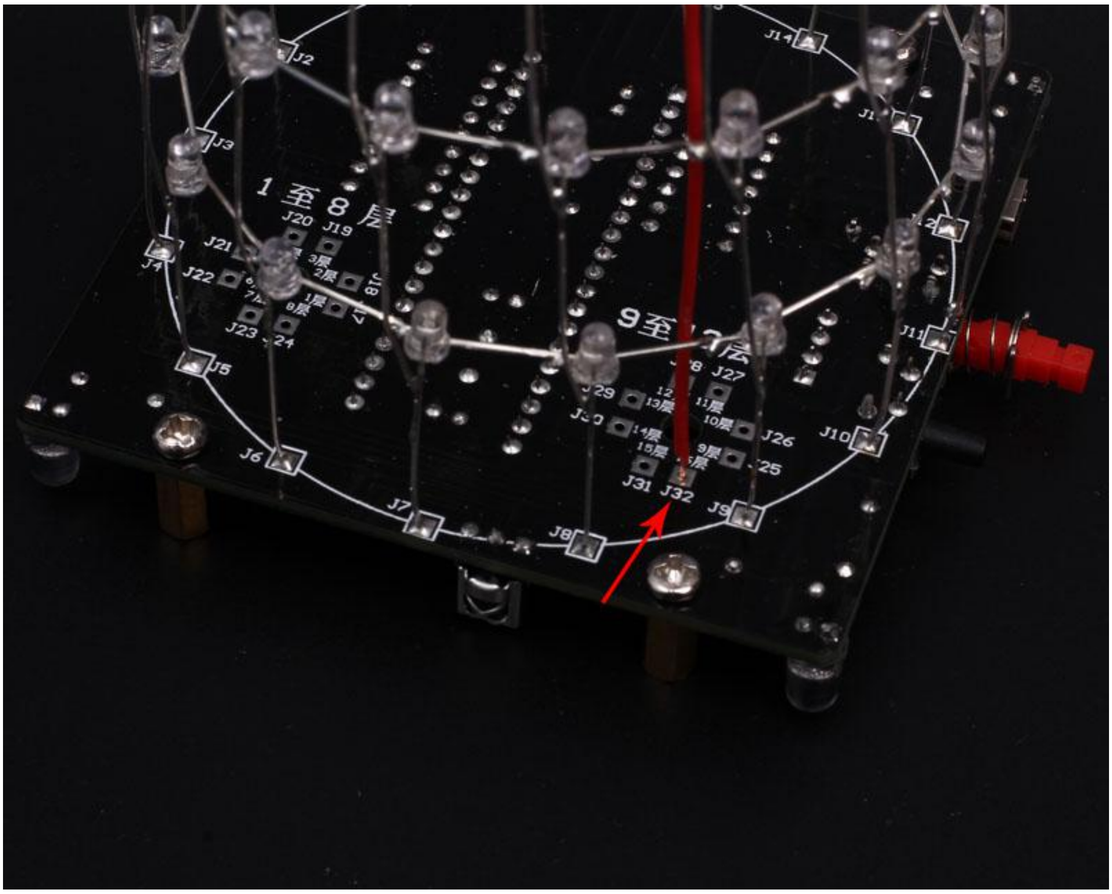
The 4th layer connect to J20 by wire;

.....

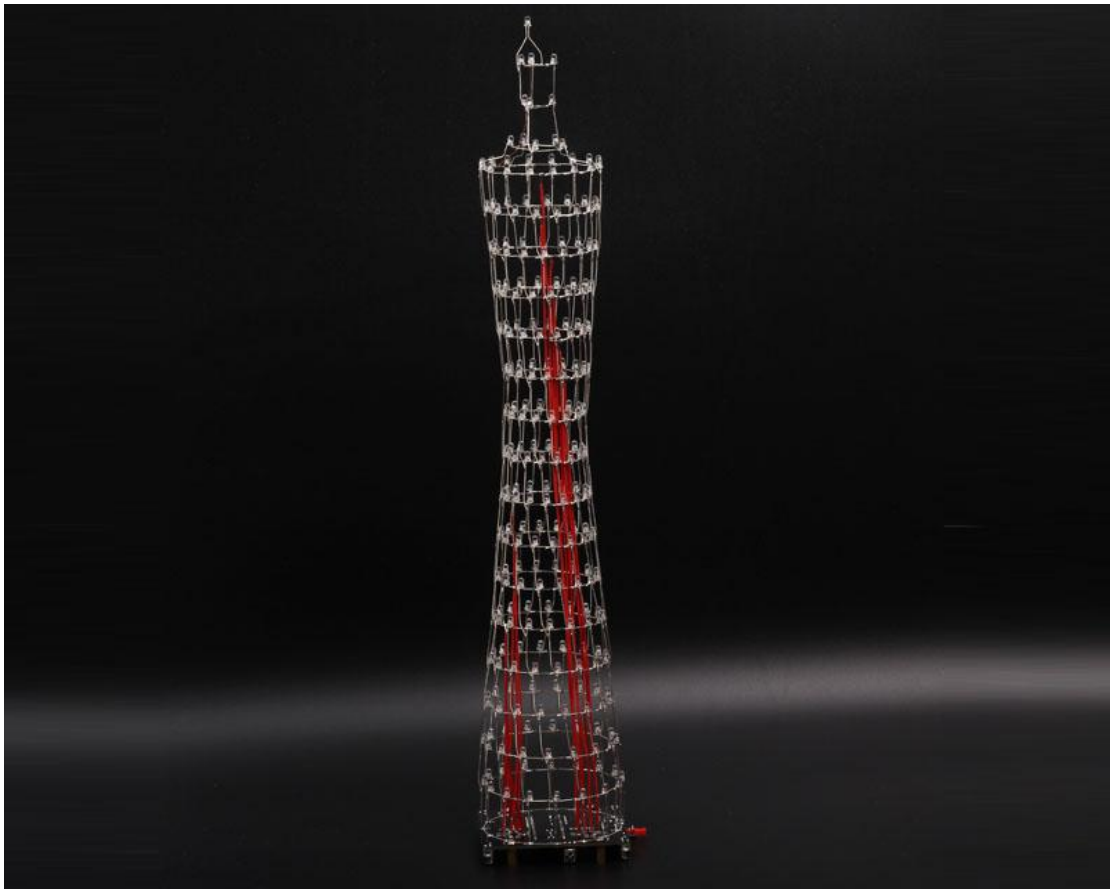
The 15th layer connect to J31 by wire;

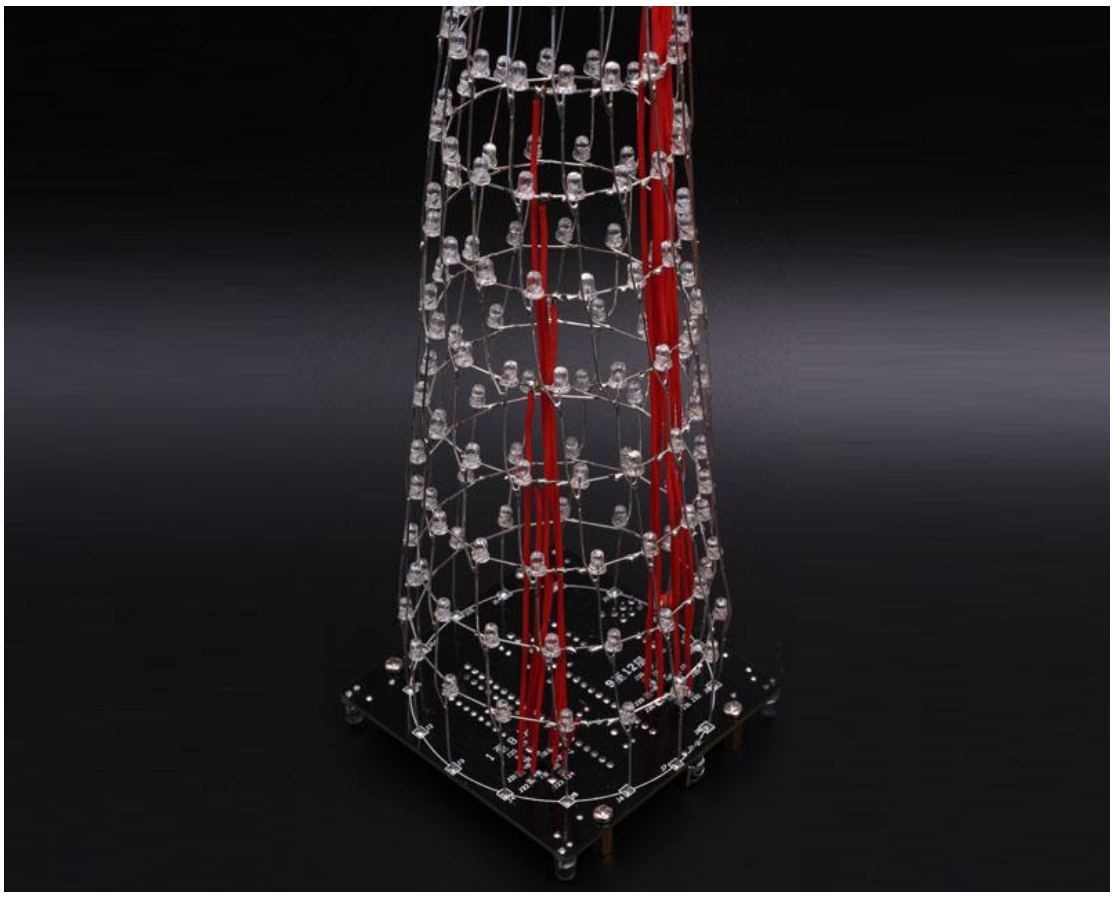
The 16th layer connect to J32 by wire;

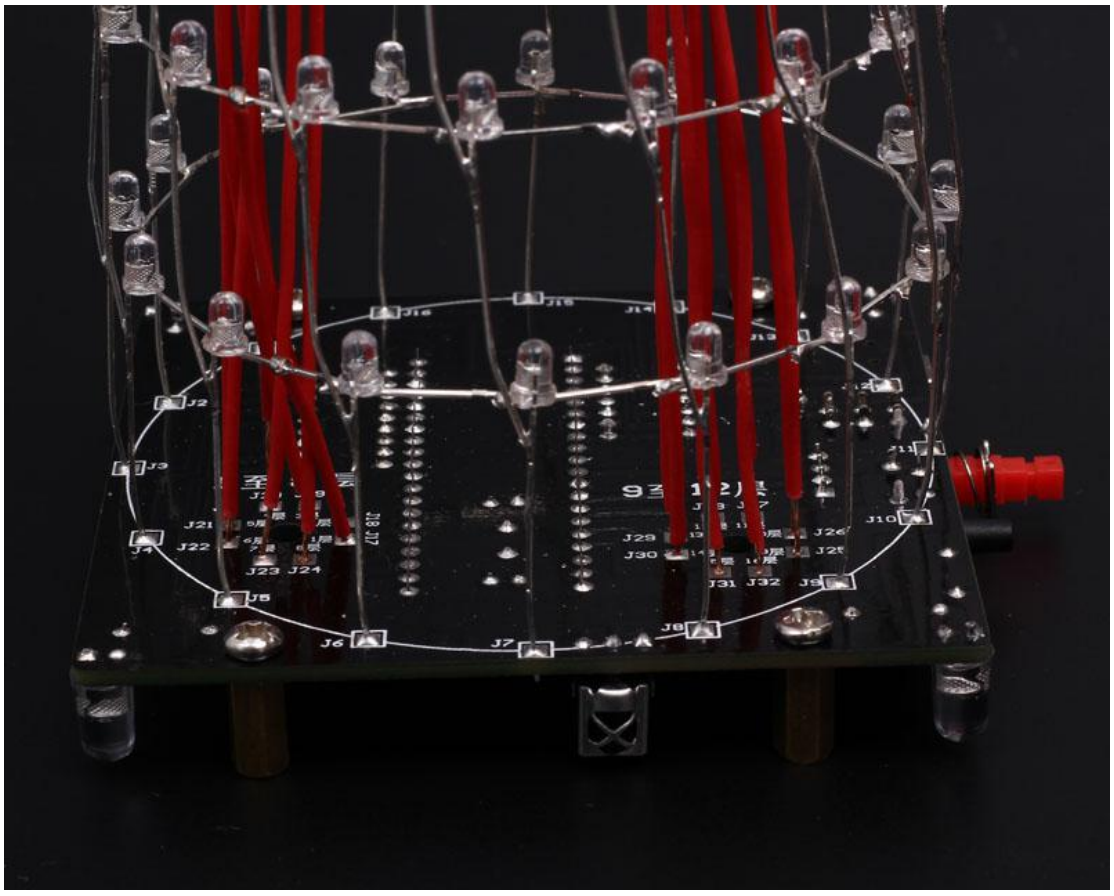


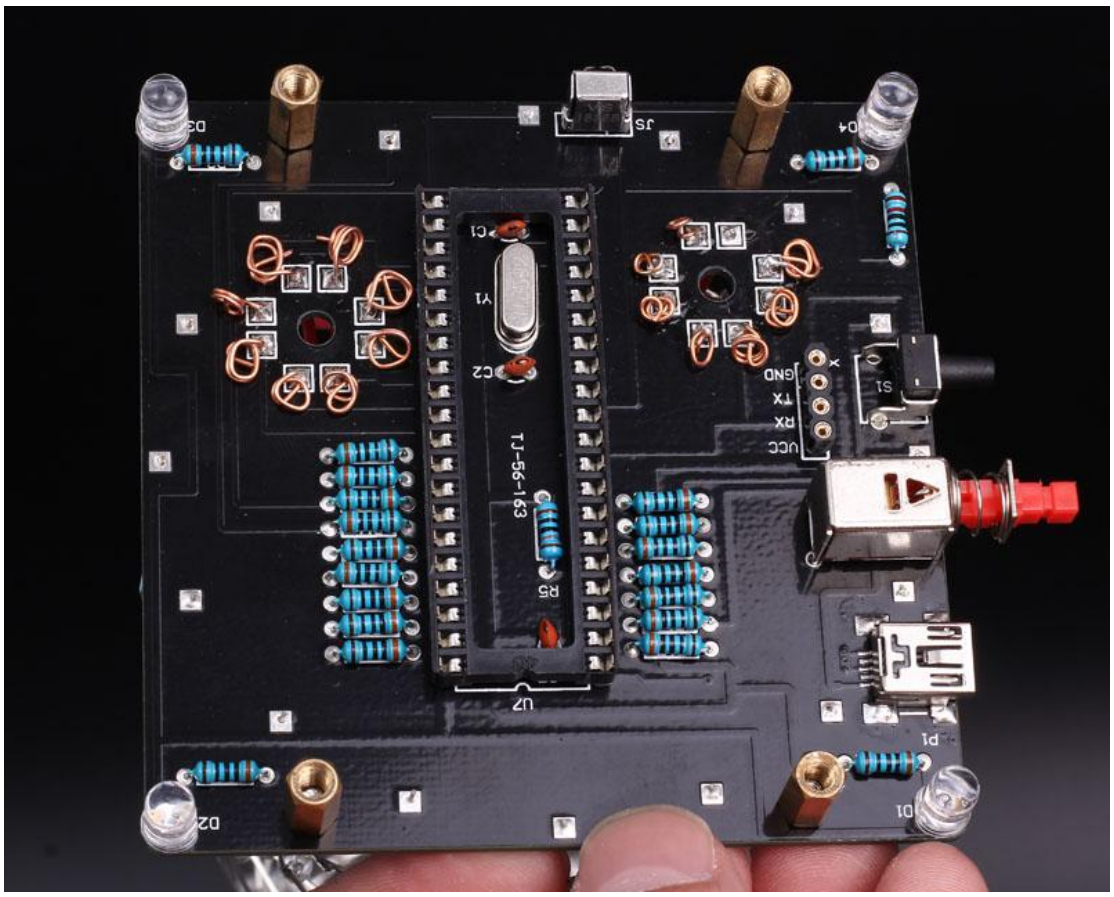

J14
J2
J3
1至8层
J20
J19
J21
J22
J4
J23
J5
J6
J7
J8
J9
J10
J11
J27
J29
J26
J25
J31
J32

3).Step 40:Connect other layers.









4).Step 41:Install IC and Acrylic shell.

5).Step 42:Connect power to test!So far, finished. To check own results.

10.Effect demonstration