

LED Spectrum FM Bluetooth Speaker Recording DIY Kit

1.Introduction:

HU-075 is a LED Spectrum FM Bluetooth Audio Speaker Recording DIY Kit with Infrared Remote Control. The kit features a 12-piece display of pink, blue, and green LED that move with the rhythm of the music. It can play music from FM radio, Bluetooth-enabled devices, AUX, MIC Recording, U-disk, and TF cards, and the 3W 4ohm speakers produce clear and loud sound.

This DIY electronic product is an intriguing way for users to gain a better understanding of circuits and develop their soldering skills.

2.Feature:

1>.Multi-Audio Source Selectable: This device offers a variety of audio input options, including Bluetooth, FM, AUX, MIC Recording,U-disk, and TF Card, enabling the playback of MP3 or lossless music files with a screen display indicating the current audio source. Users can control the music playback functions such as play/pause/next/prev/vol+/vol- using either the remote controller or on-board buttons.

2>.Voice Recording: It can record audio without limit in time and memory by the U-disk or TF Card.

3>.Bluetooth Player : With its built-in Bluetooth audio receiver and power amplifier, this device can directly drive 4ohm 3W speakers, producing clear and high-quality sound.

4>.LED Spectrum Display: The device also features 12 pink/blue/green LED spectrum indicators that flash in sync with the music, creating a dynamic and visually stunning lighting effect. The LED audio indicator flashes at both ends simultaneously, and the sensitivity is adjustable using the potentiometer.

5>.Dual Channel Stereo Speaker: The device can drive two 2.0 3W*2 speakers, producing clear and powerful stereo sound.

6>.DIY Hand Soldering: This is a DIY kit that comes with various components, and users need to install each component by hand. This process not only enhances soldering skills but also fosters an interest in electronic technology. It's an excellent option for electronics hobbyists, beginners, as well as school and home education.

3.Function:

- 1>.FM/Bluetooth/AUX/U-disk/TF-Card Audio Player
- 2>.Voice Recording/Playing/Calling
- 3>.Colorful Display Screen and LED Spectrum Display
- 4>.FM Frequency is 87.5M to 108.0MHz
- 5>.Dual Channel 3W*2 Stereo Speaker
- 6>.Play/Pause/Next/Prev/VOL+/VOL-/Mode
- 7>.Music Format MP3/WMA/WAV/FLAC/APE
- 8>.Power Memory Function
- 9>.Infrared Remote Controller
- 10>.LED Spectrum Sensitivity Adjustable

4.Parameter:

- 1>.Work Voltage: DC 5V
- 2>.Work Current: >1.0A
- 3>.Speaker: 3W 4ohm
- 4>.Channel: Dual-Channel Stereo
- 5>.Audio source:Bluetooth/FM/AUX/U-disk/TF Card
- 6>.FM station: Automatic radio search
- 7>.Receiver Frequency:87.5MHz~108.0MHz
- 8>.Frequency accuracy:0.1MHz
- 9>.Control Type:Bluetooth/Remote Controller/On Board Button
- 10>.LED Color:Pink/Blue/Green
- 11>.Output type: Speaker
- 12>.Audio format:MP3/WMA/WAV/FLAC/APE
- 13>.Power interface: DC-005 Power Socket
- 14>.Work Temperature:-20℃~85℃
- 15>.Work Humidity:5%~85%RH
- 16>.Size(Installed):130*75*61mm

5. Use Methods:

- 1>.Switch Red/Black Switch to turn ON/OFF work power supply.
- 2>.MODE Button: Switch Audio Mode. Press the button to alternate between Bluetooth, FM, AUX, U-disk, and TF Card playback modes. Note: Priority Play from U-disk or TF Card after insert them.
- 3>.VOL+ Button: Short press to switch next music or FM station. Keep press to increase the volume (V++).
- 4>.PLAY/PAUSE Button: Short press to play or pause music. Keep press to initiate automatic radio search in FM mode and save searched FM station.
- 5>.VOL- Button: Short press to switch previous music or FM station. Keep press to decrease the volume (V--).
- 6>.Potentiometer: It is used to adjust sound sensitivity by screwdriver for LED spectrum display.
- 7>.Recording Function:
 - 7.1>.It must be inserted into a U-disk or TF-Card which are used to store recorded music.
 - 7.2>.Keep press MODE button about 3 second to start recording.
 - 7.3>.Keep press MODE button about 3 second again to stop recording and start playing recorded.
 - 7.4>.The recorded file will be stored in the last of U-disk or TF-Card.

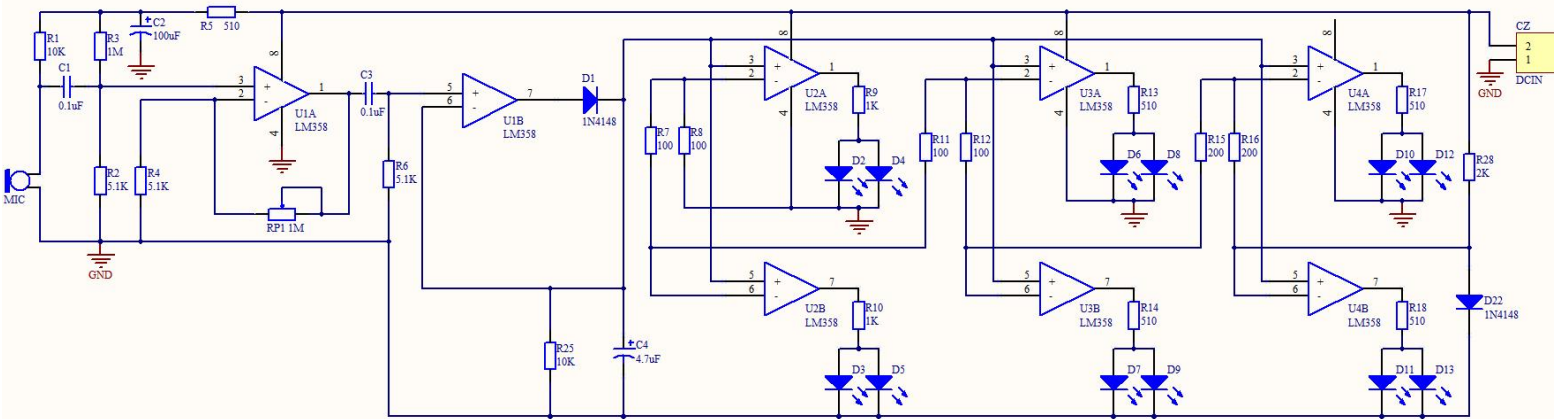
6. Component Listing:

NO.	Component Name	PCB Marker	Parameter	QTY
1	LM358 IC	U1-U4	DIP-8	4
2	IC Socket	U1-U4	DIP-8	4
3	3mm Pink LED	D2-D5	2Pin	4
4	3mm Blue LED	D6-D9	2Pin	4
5	3mm Green LED	D10-D13	2Pin	4
6	1N4148 Diode	D1,D22	DO-35	2
7	Monolithic Capacitor	C1,C3	0.1uF(104)	2
8	Electrolytic Capacitor	C4	4.7uF	1
9	Electrolytic Capacitor	C2	100uF	1
10	Metal Film Resistor	R7,R8,R11,R12	100ohm	4
11	Metal Film Resistor	R15,R16	200ohm	2
12	Metal Film Resistor	R5,R13,R14,R17,R18	510ohm	5
13	Metal Film Resistor	R2,R9,R10	1Kohm	3
14	Metal Film Resistor	R28	2Kohm	1
15	Metal Film Resistor	R6	5.1Kohm	1
16	Metal Film Resistor	R1,R4,R25	10Kohm	3
17	Metal Film Resistor	R3	1Mohm	1
18	Potentiometer	PR1	1Mohm(105)	1
19	MIC Microphone	MIC	9.7mm	1
20	PH2.0-2P Red/Black Wire		15cm	3
21	Red/Black Wire for Speaker	CZ	10cm	1
22	Red Wire for Antenna		15cm	1
23	Bluetooth Receiver			1
24	Infrared Remote Controller			1
25	4ohm 3W Speaker			2
26	FM Antenna			1
27	DC-005 Power Socket			1
28	Black Power Switch			1
29	USB-DC005 Power Wire			1
30	AUX Audio Socket			1
31	AUX Audio Wire			1
32	Transparent Acrylic Board			6

33	M3*50mm Nylon Column			4
34	M3*28mm Nylon Column			2
35	M3*12mm Screw			4
36	M3*8mm Screw			18
37	M3 Nut			10
38	PCB Circuit Board		100*30mm	1

Note:Users can complete the installation according to the PCB silk screen and component list.

7.Schematic Diagram for LED Spectrum Indicator:



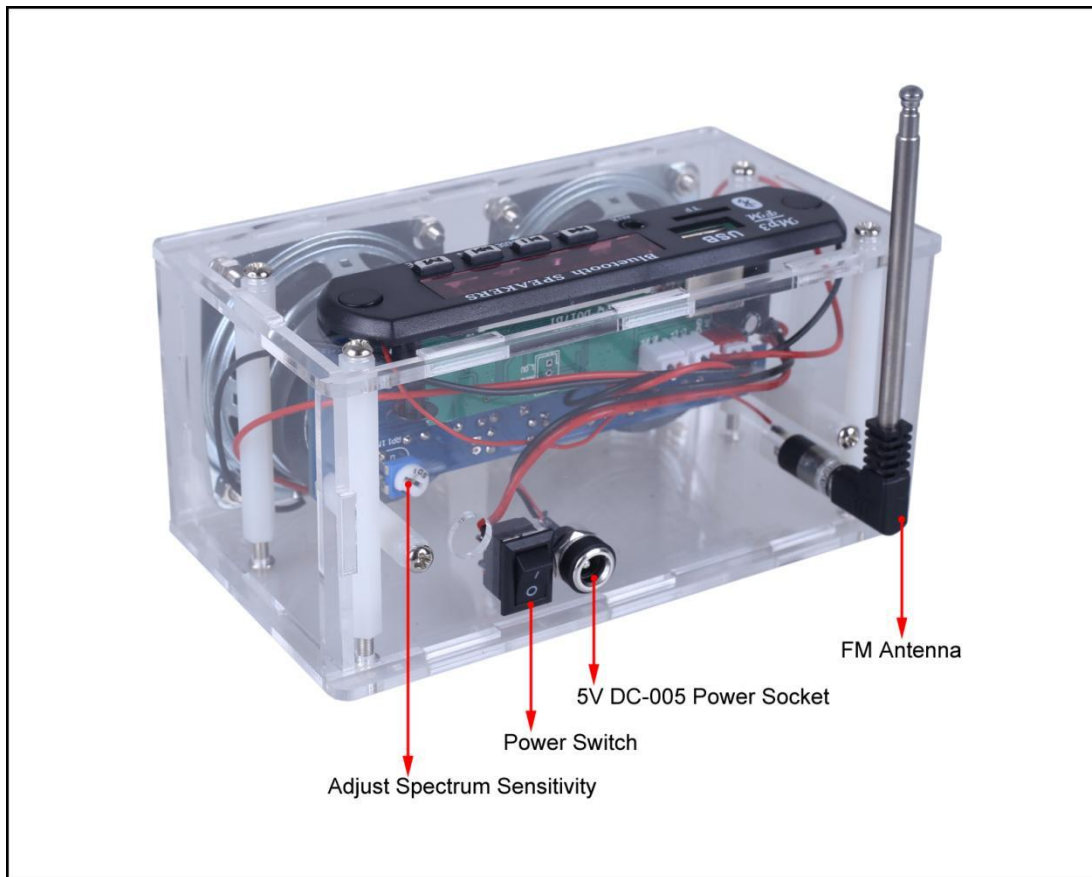
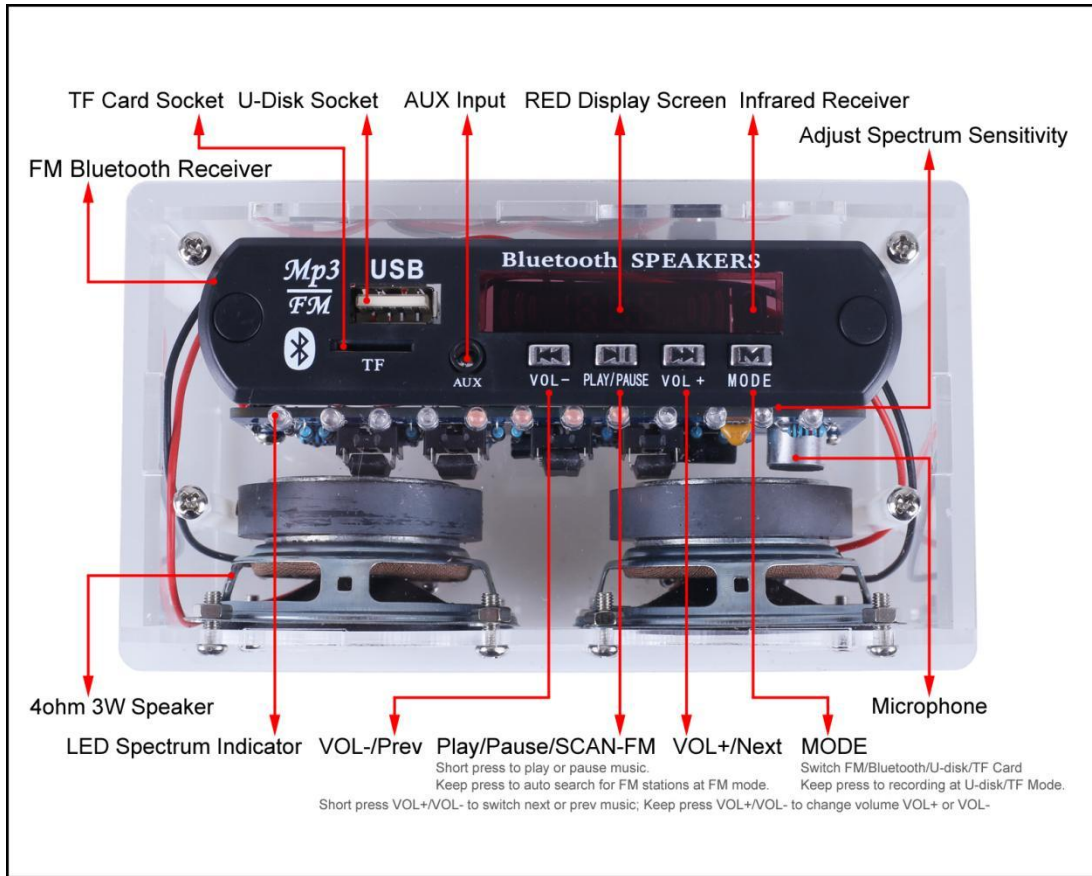
8.Application:

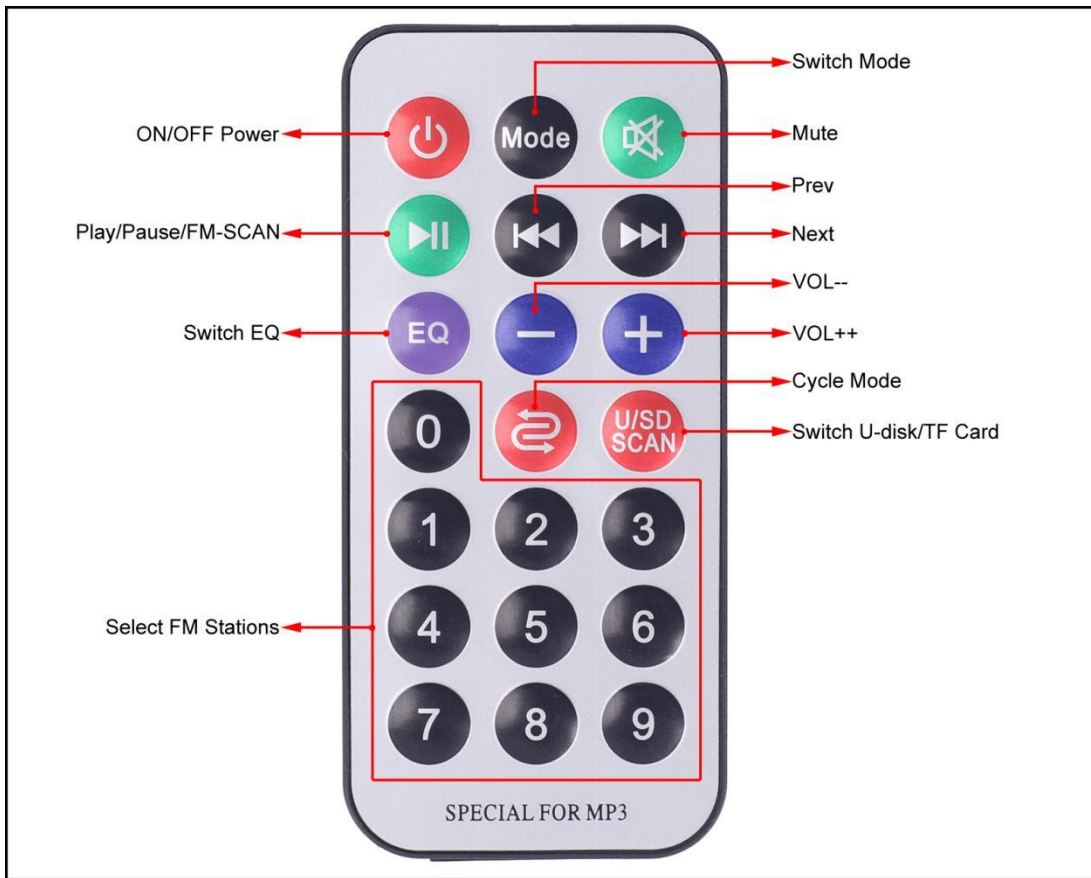
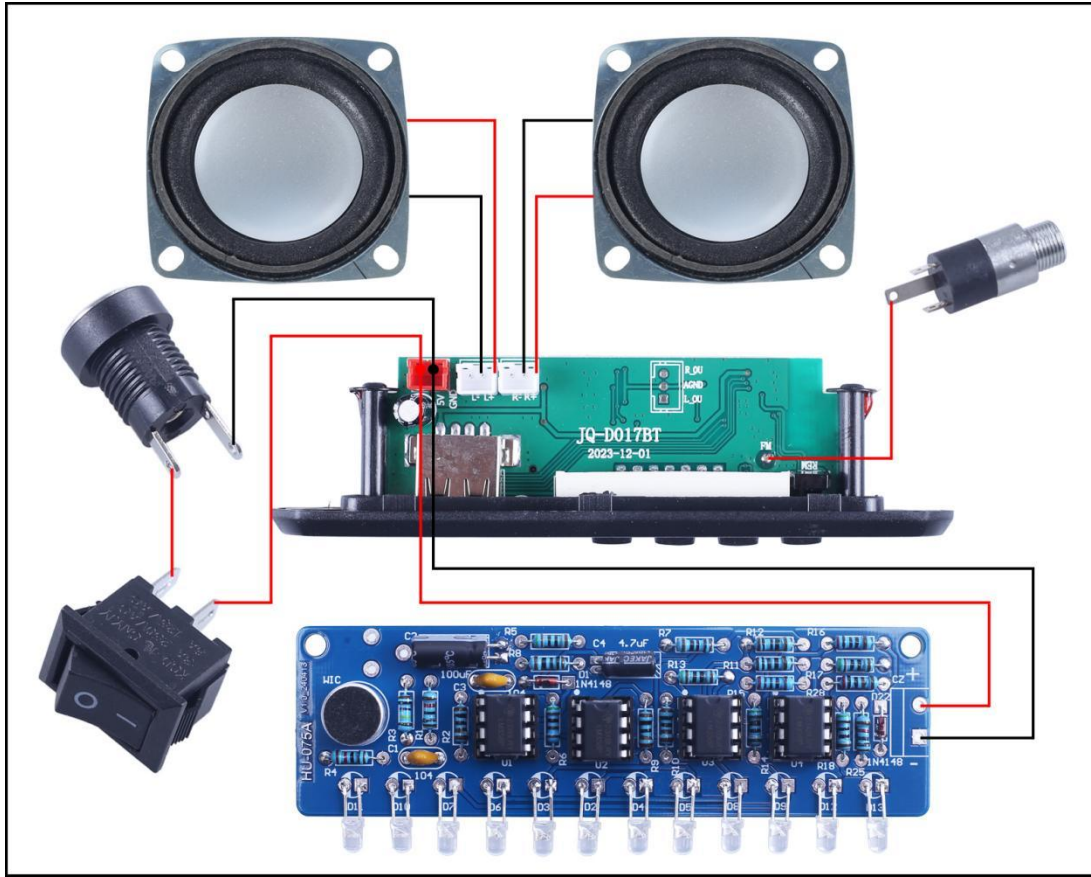
- 1>.Training welding skills
- 2>.Student school
- 3>.DIY production
- 4>.Project Design
- 5>.Electronic competition
- 6>.Gift giving
- 7>.Crafts collection
- 8>.Home decoration
- 9>.Souvenir collection
- 10>.Graduation design
- 11>.Holiday gifts

9.Installation Tips:

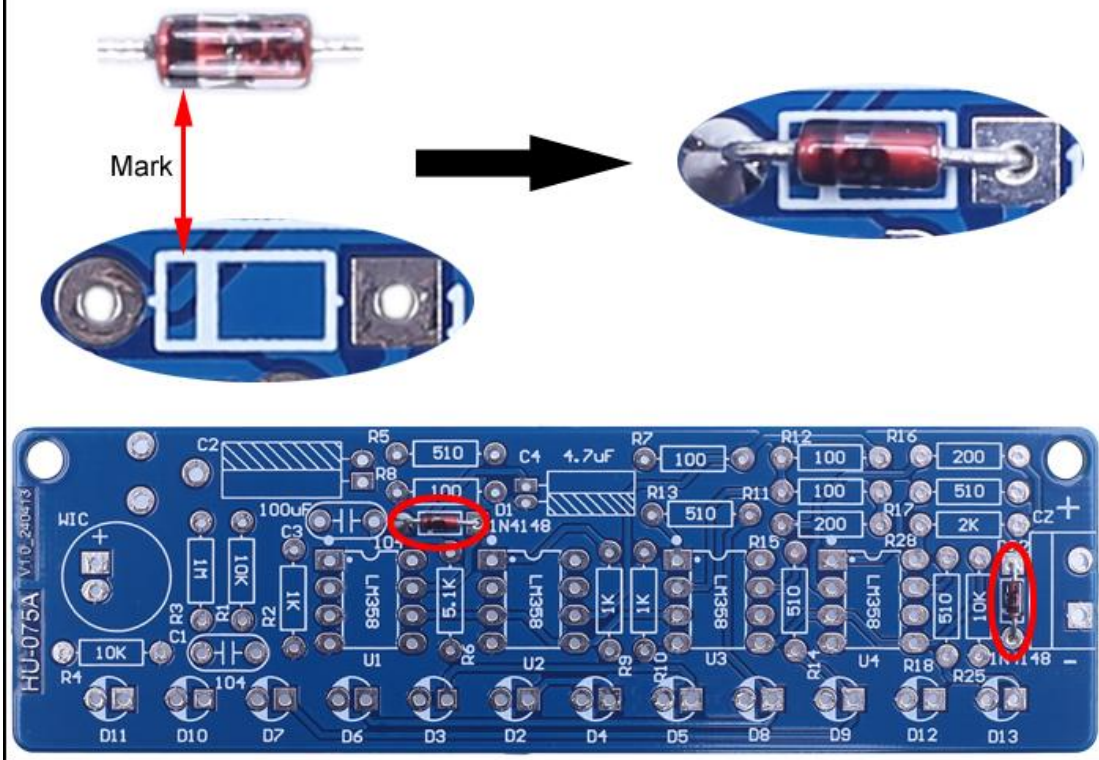
- 1>.User needs to prepare the welding tool at first.
 - 1.1>.Soldering iron (<50 Watt)
 - 1.2>.Rosin core ("radio") solder
 - 1.3>.Wire cutters
 - 1.4>.Wire strippers
 - 1.5>.' + ' screwdriver
- 2>.Please be patient until the installation is complete.
- 3>.The package is DIY kit.It need finish install 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.

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

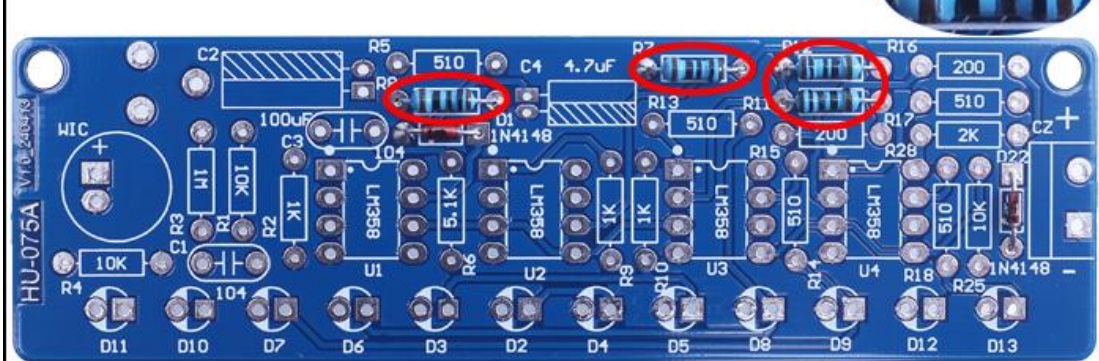




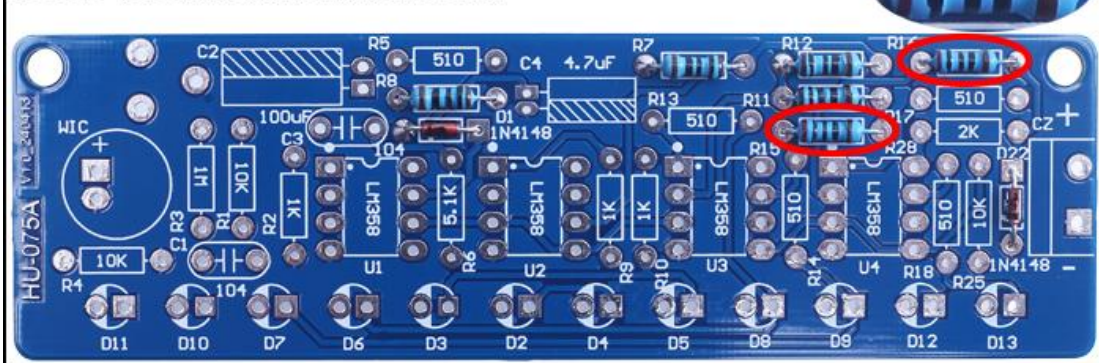
Step 1: Install 2pcs DO-35 1N4148 Diode at D1,D22. Please ensure you pay attention to the direction of installation. The 1N4148 has a black mark and the PCB has a white mark that are used to verify the correct installation direction.



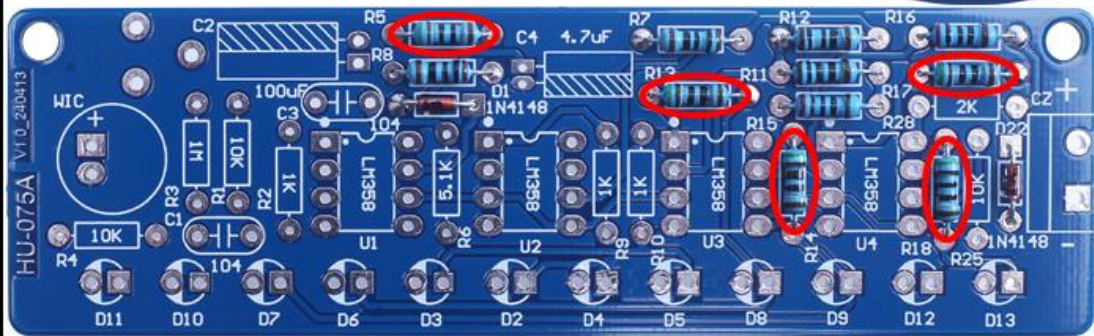
Step 2: Install 4pcs 100ohm Metal Film Resistor at R7,R8,R11,R12. Its color is brown/black/black/black/brown.



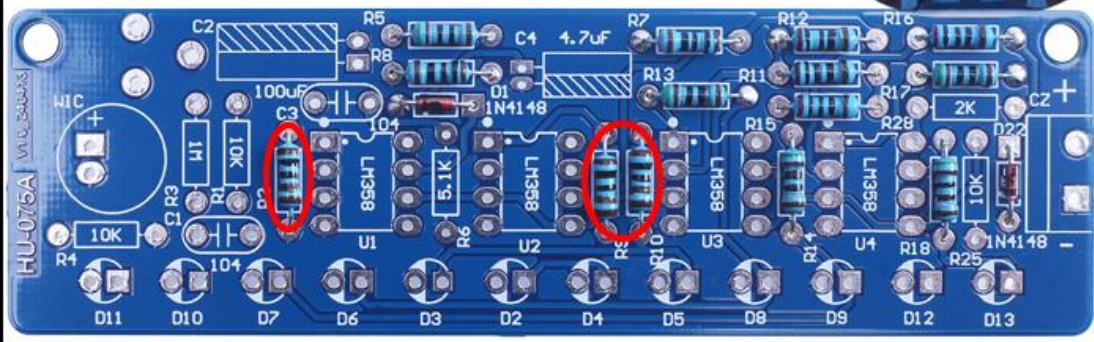
Step 3: Install 2pcs 200ohm Metal Film Resistor at R15,R16. Its color is red/black/black/black/brown.



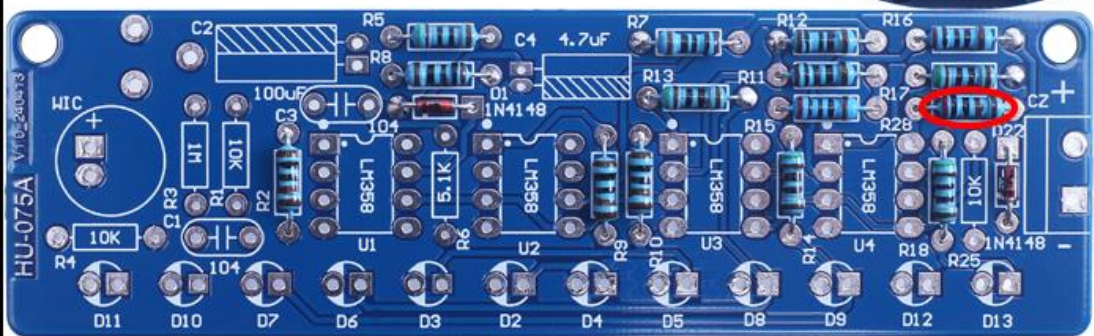
Step 4: Install 5pcs 510ohm Metal Film Resistor at R5,R13,R14,R17,R18. Its color is green/brown/black/black/brown.



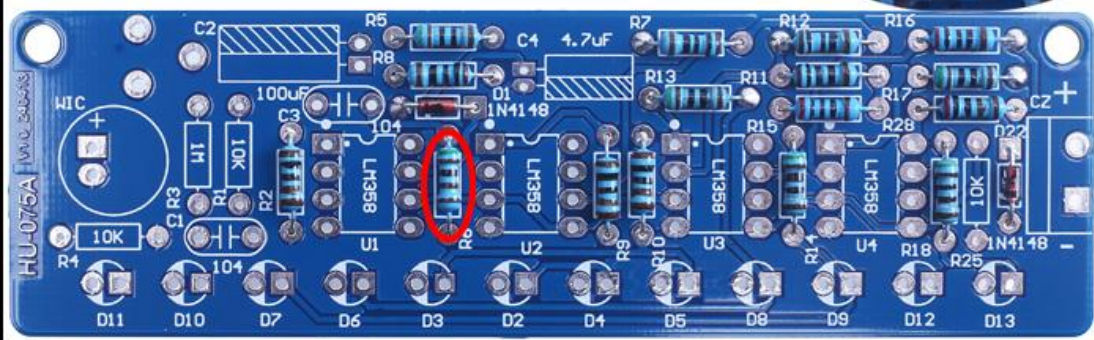
Step 5: Install 3pcs 1Kohm Metal Film Resistor at R2,R9,R10. Its color is brown/black/black/brown/brown.



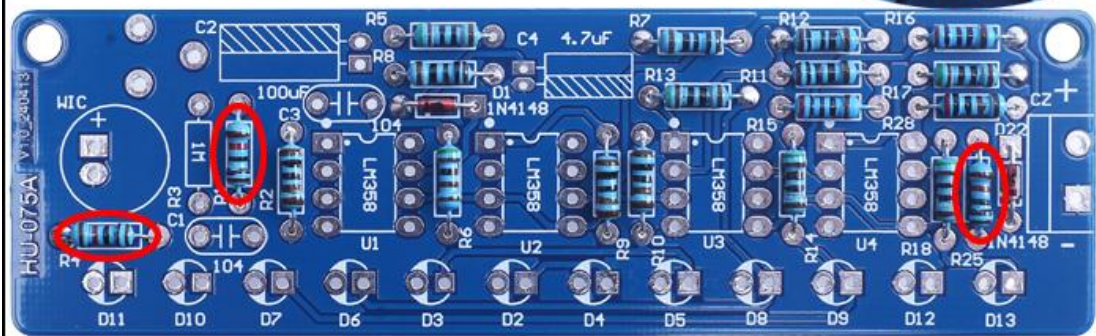
Step 6: Install 1pcs 2Kohm Metal Film Resistor at R28. Its color is red/black/black/brown/brown.



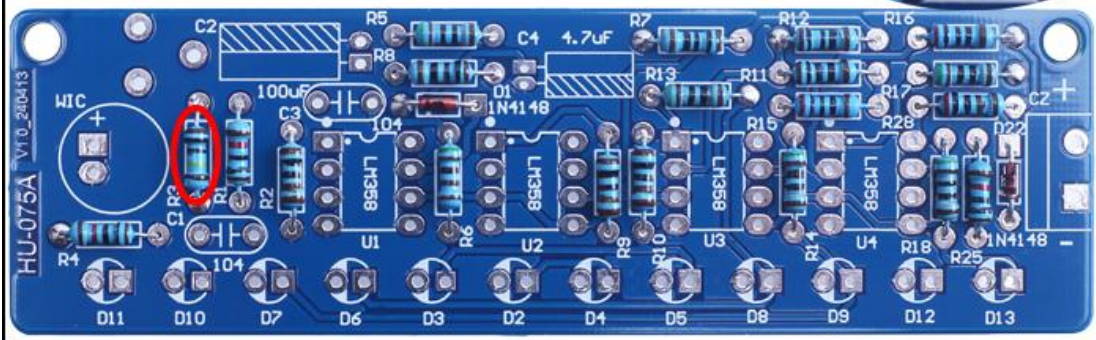
Step 7: Install 1pcs 5.1Kohm Metal Film Resistor at R6. Its color is green/brown/black/brown/brown.



Step 8: Install 3pcs 10Kohm Metal Film Resistor at R1,R4,R25. Its color is brown/black/black/red/brown.

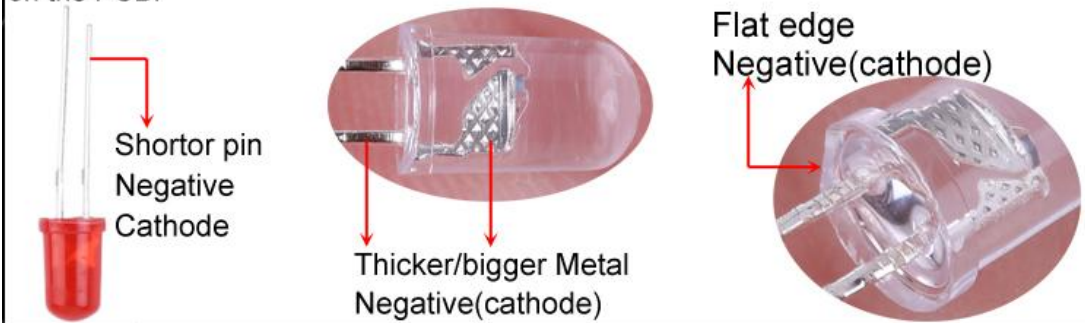


Step 9: Install 1pcs 1Mohm Metal Film Resistor at R3. Its color is brown/black/black/yellow/brown.

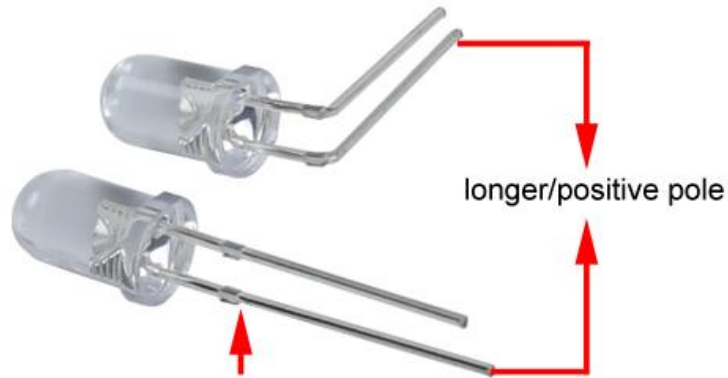


Step 10: Determine the positive (anode) and negative (cathode) leads of the LED. It is crucial to install the leads of the LED correctly to ensure that the LED functions properly. There are several methods to identify the leads:

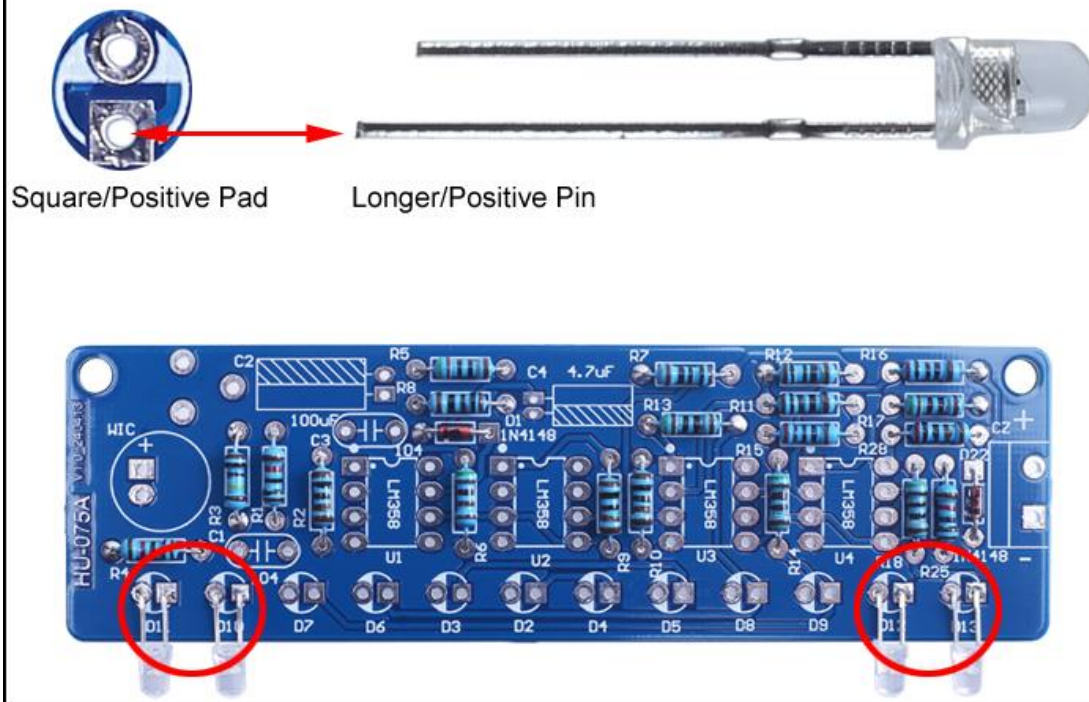
- 10.1> One way to differentiate between the leads is by their length. The positive (anode) lead is longer, while the negative (cathode) lead is shorter.
- 10.2> To identify the negative (cathode) lead, inspect the plastic case of the LED. The negative (cathode) lead is thicker or bigger inside the plastic case compared to the anode lead.
- 10.3> Another way to identify the negative (cathode) lead is to observe the edge of plastic case. The negative (cathode) lead should be the pin closest to the flat on case.
- 10.4> One can also use a 3V battery or multimeter to test the leads. The pin connected to the positive of the 3V power supply is the positive (anode) lead if the LED lights up after being powered. However, it is crucial to note that the LED should not be directly powered by 3V for a period shorter than 0.5 seconds.
- 10.5> Additionally, the positive (anode) lead is where the white mark "+" is pointing on the PCB.



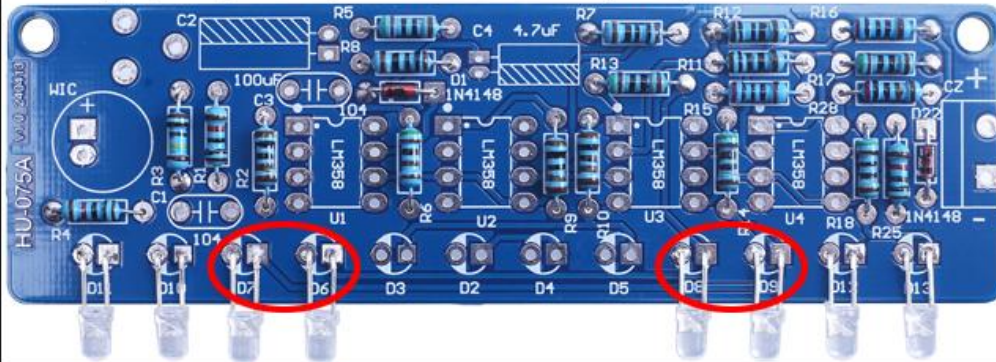
Step 11: The pins of an LED should be bent to a 90-degree angle, taking care to note the bending point and direction. It is important to pay attention to the direction in which the pins are bent to ensure proper functionality



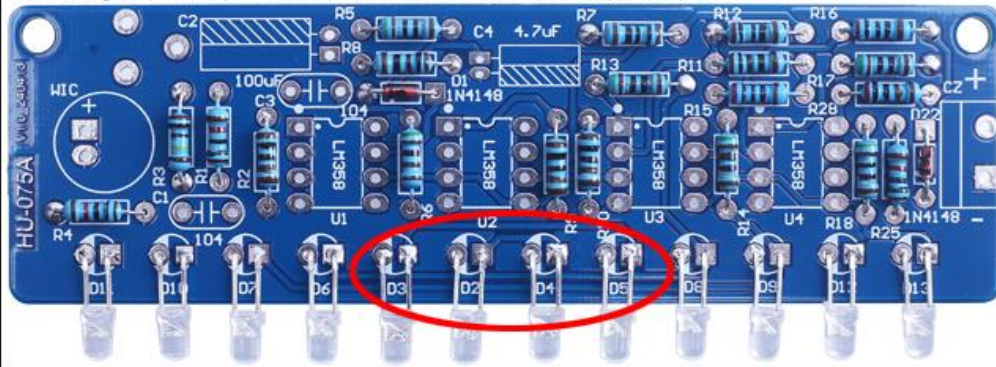
Step 12: Install 4pcs 3mm Green LED at D10,D11,D12,D13 in the tow end. The longer pin is positive pole and connect to square pad.



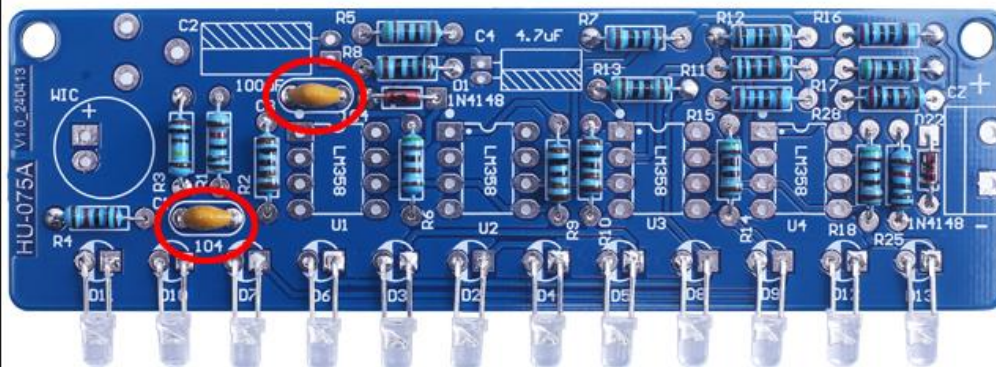
Step 13: Install 4pcs 3mm **Blue** LED at D6,D7,D8,D9.
The longer pin is positive pole and connect to square pad.



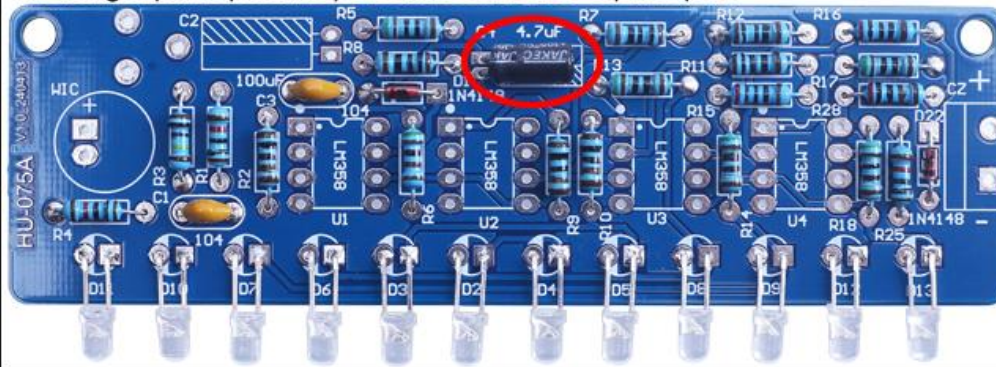
Step 14: Install 4pcs 3mm **Pink** LED at D10,D11,D12,D13 in the middle.
The longer pin is positive pole and connect to square pad.



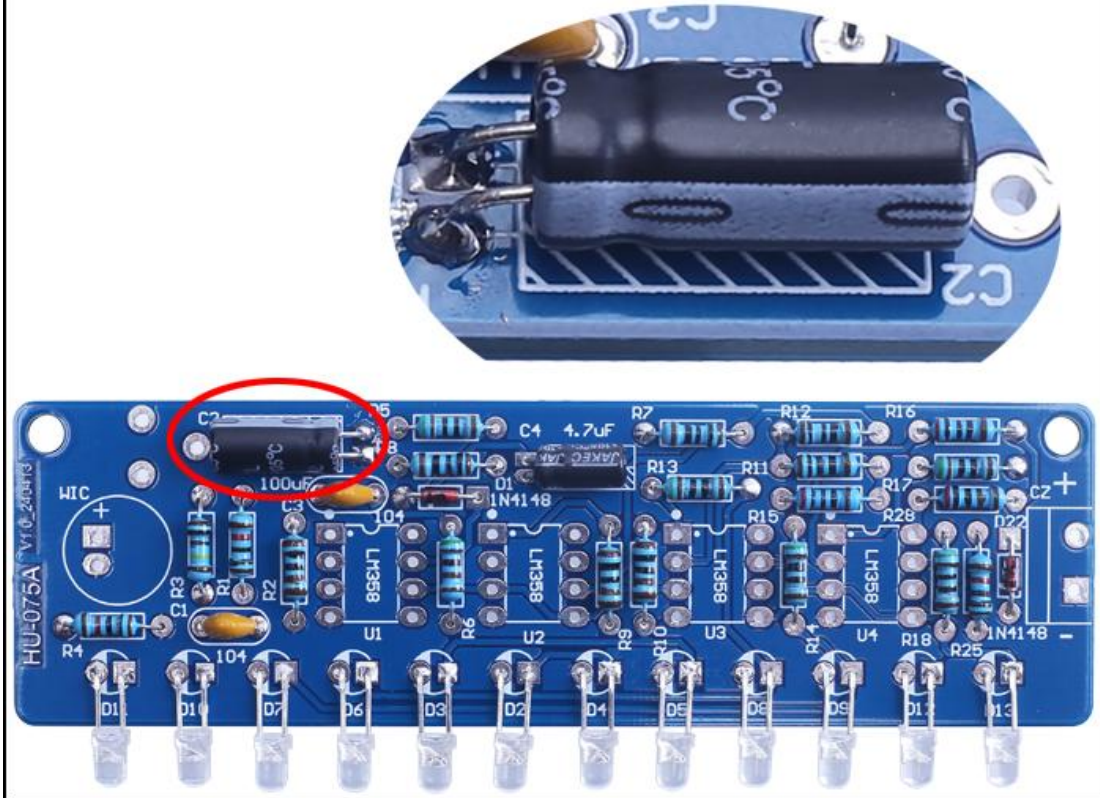
Step 15: Install 2pcs 0.1uF 104 Monolithic Capacitor at C1,C3.



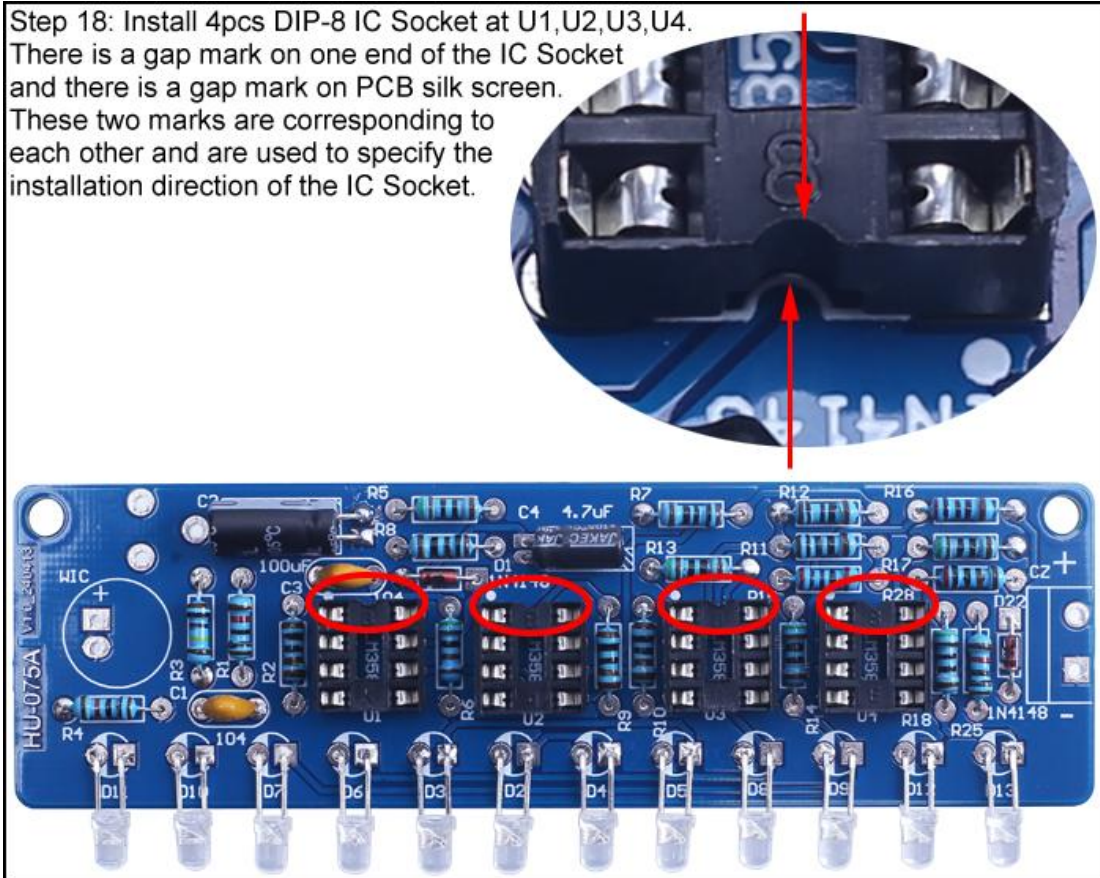
Step 16: Install 1pcs 4.7uF Electrolytic Capacitor at C4 and must be placed horizontally
The longer pin is positive pole and connect to square pad.



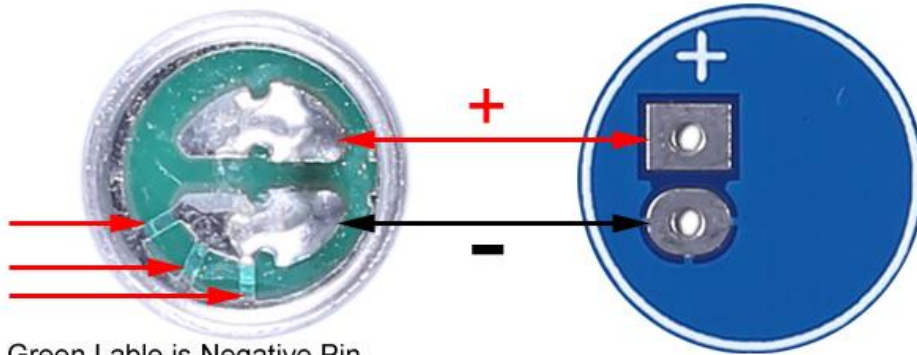
Step 17: Install 1pcs 100uF Electrolytic Capacitor at C2 and must be placed horizontally. The longer pin is positive pole and connect to square pad.



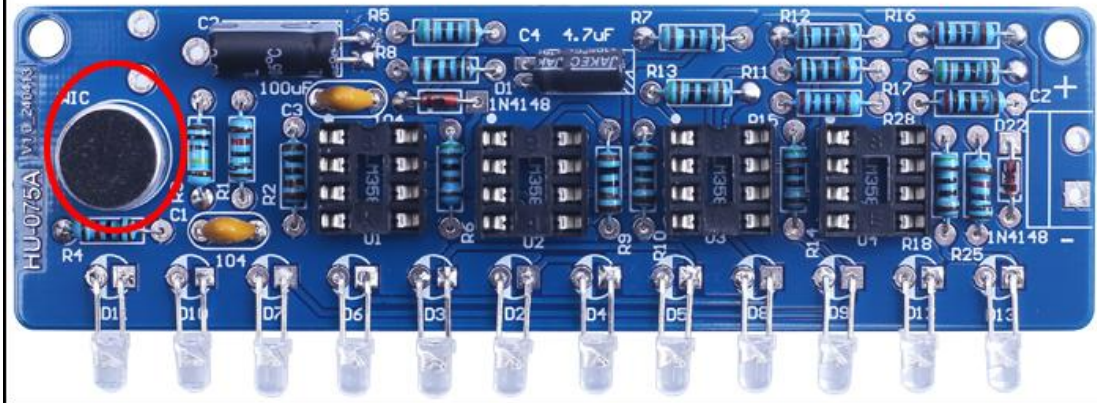
Step 18: Install 4pcs DIP-8 IC Socket at U1,U2,U3,U4. There is a gap mark on one end of the IC Socket and there is a gap mark on PCB silk screen. These two marks are corresponding to each other and are used to specify the installation direction of the IC Socket.



Step 19: Install 1pcs 9.7mm MIC Microphone at MIC. Green Label is negative pole and connect to the round pad.

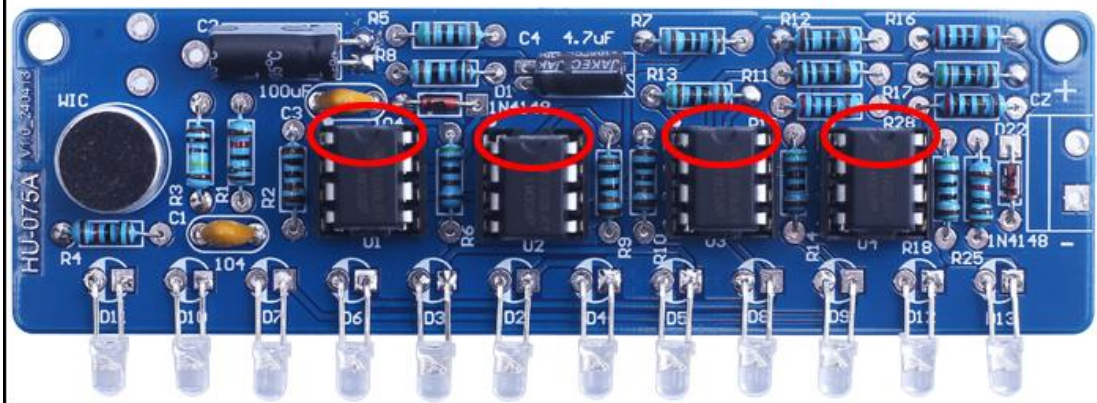


Green Label is Negative Pin

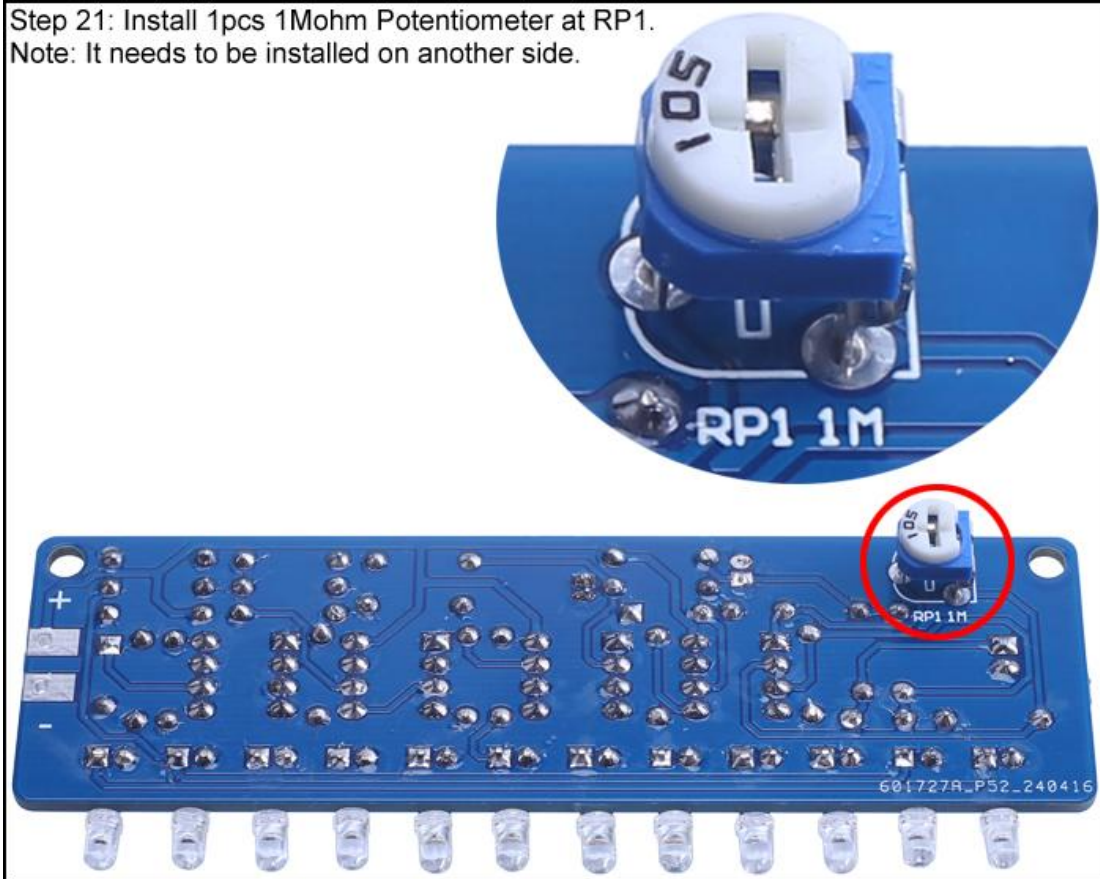


Step 20: Install 4pcs DIP-8 LM358 Amplifier at U1,U2,U3,U4.

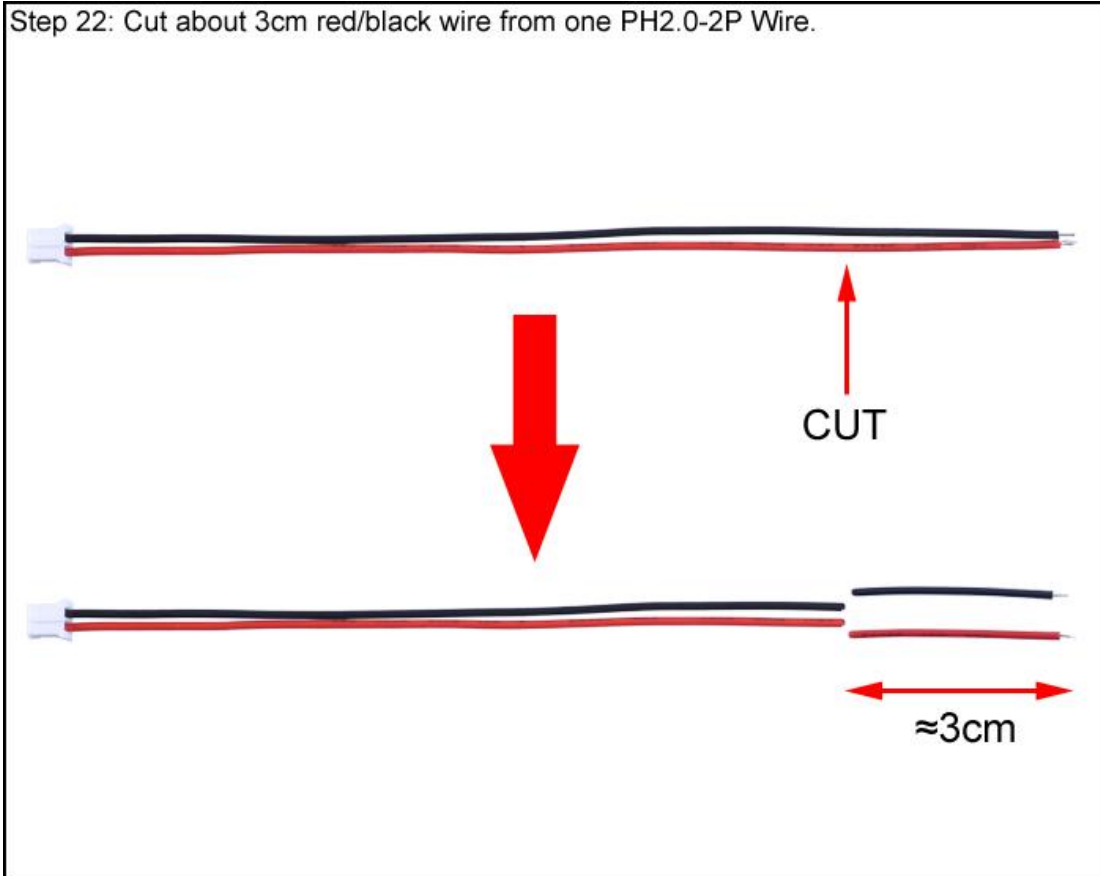
There is a gap mark on one end of the IC and a gap mark on IC Socket. These two marks are corresponding to each other and are used to specify the installation direction of the IC.



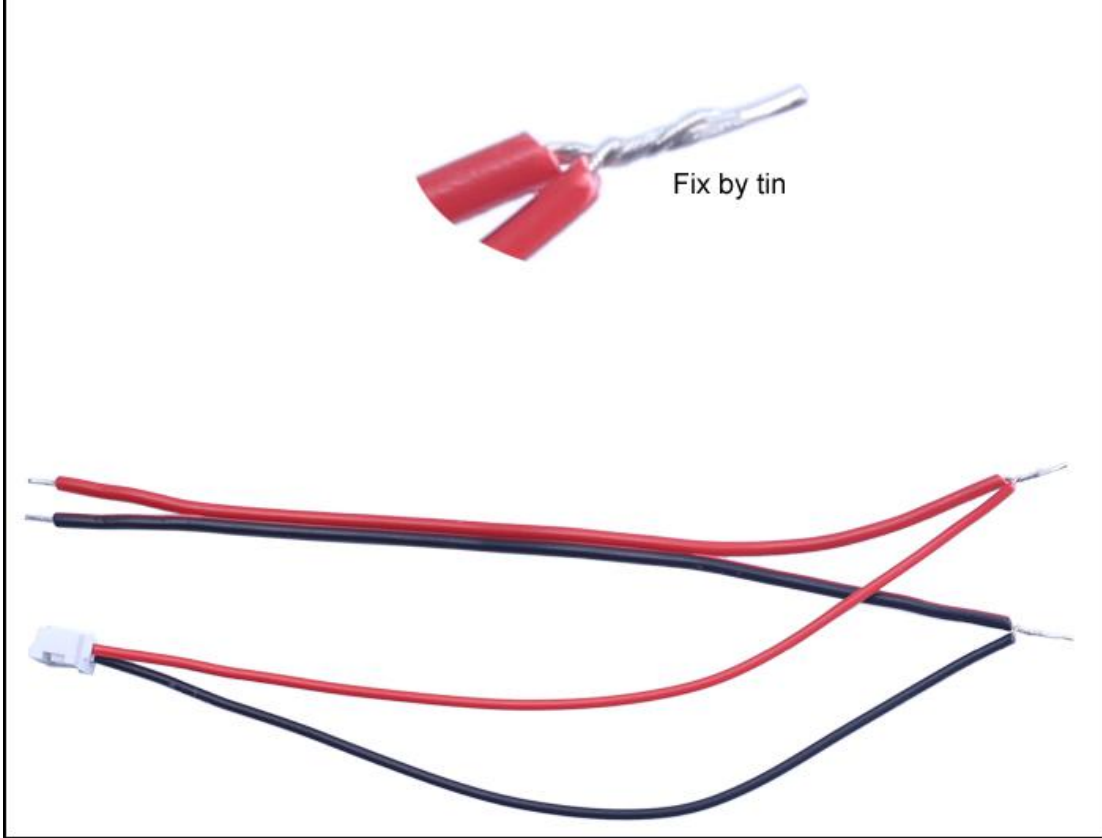
Step 21: Install 1pcs 1Mohm Potentiometer at RP1.
Note: It needs to be installed on another side.



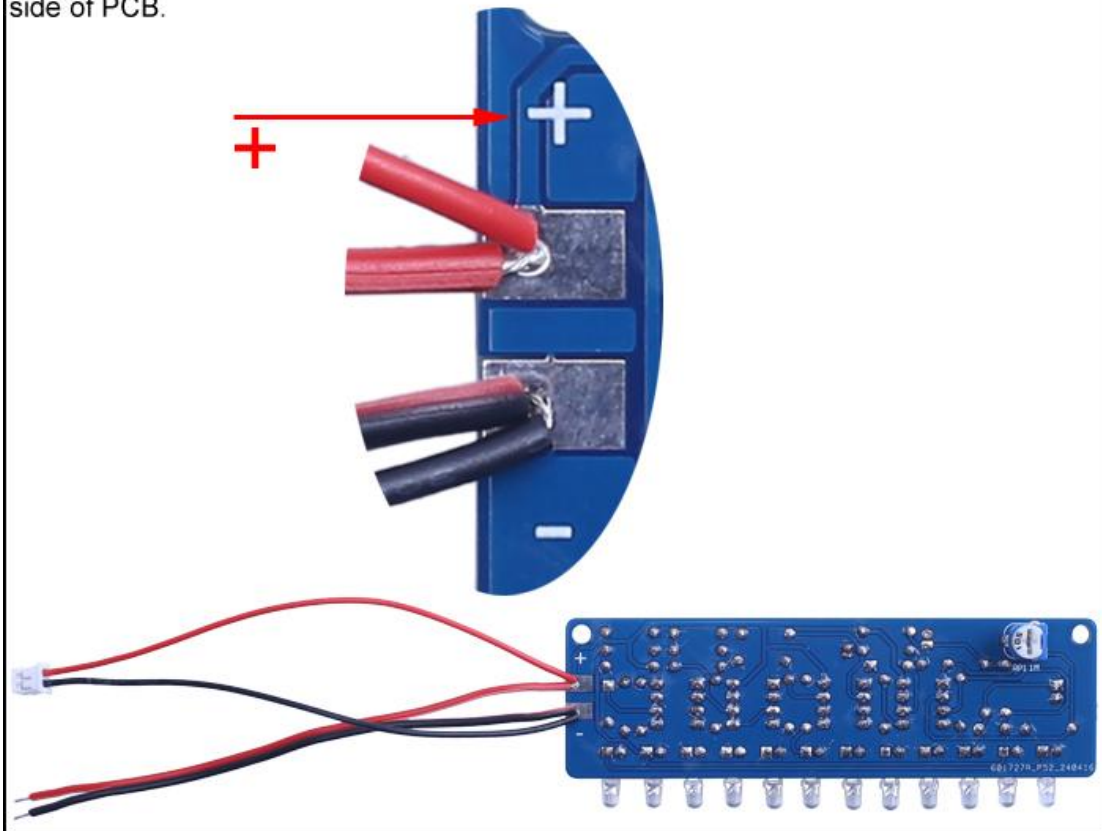
Step 22: Cut about 3cm red/black wire from one PH2.0-2P Wire.



Step 23: Connect this PH2.0-2P Wire to thick Red/Black Wire. Red to red as shown.



Step 24: Red wire connect to '+' pad and black wire connect to '-' pad on the back side of PCB.



Step 25: Connect 2pcs PH2.0-2P Wire to 2pcs 4ohm 3W Speaker.
Red wire connect to ' + ' pad.



Step 26: Tear off the protective film on the surface of the acrylic boards.



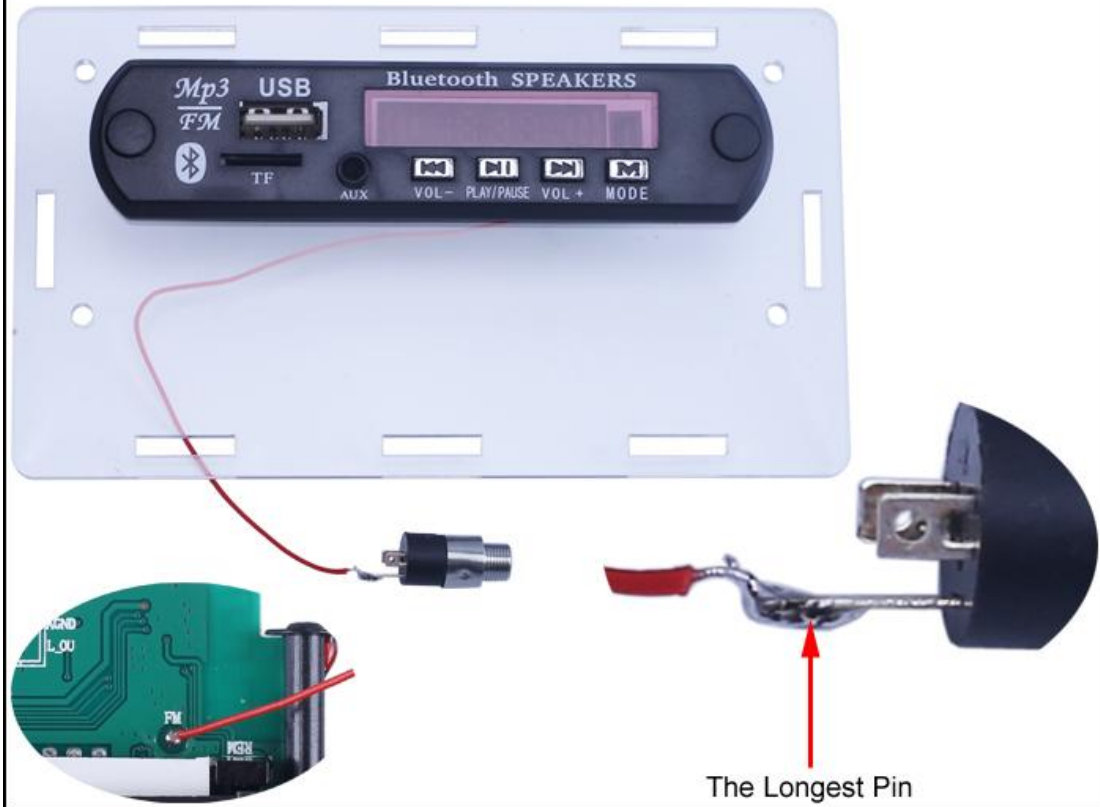
Step 27: Fix 4ohm 3W Speaker on acrylic board by 8pcs M3*8mm Screw and 8pcs M3 Nut.



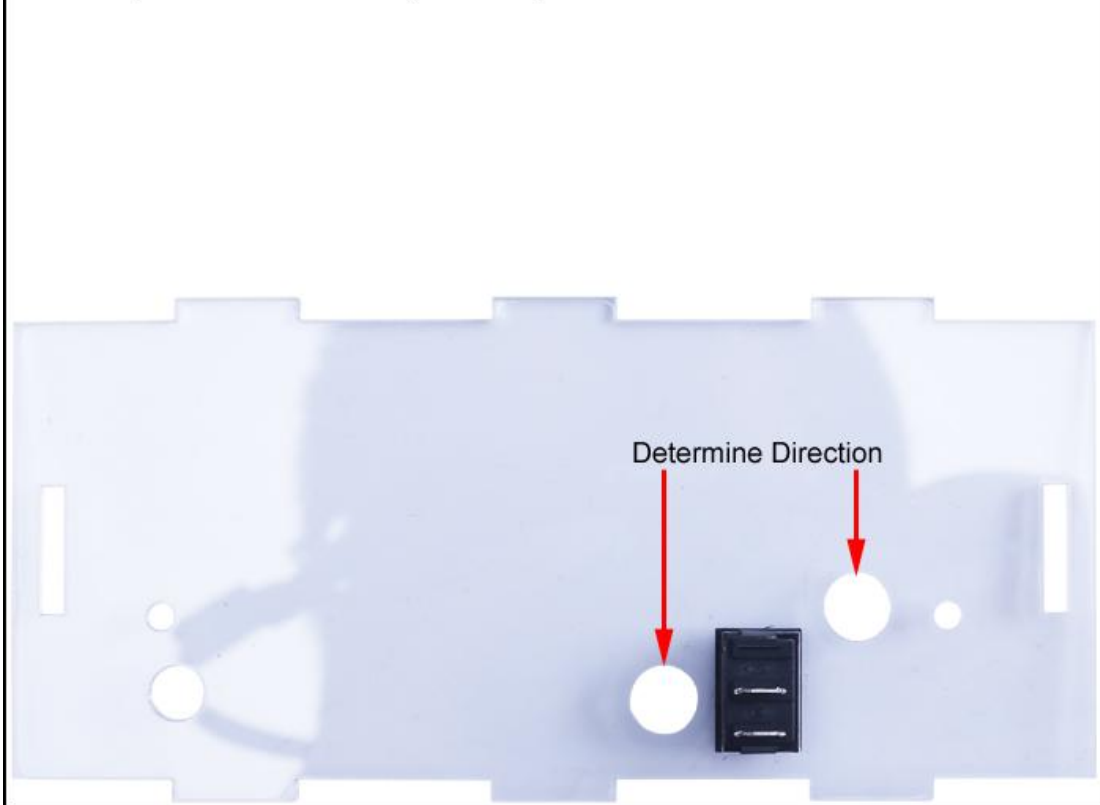
Step 28: Fix Bluetooth Receiver on LED acrylic board by 2pcs M3*8mm Screw and 2pcs M3 Nut. Cover the screw holes with a black plastic cap.

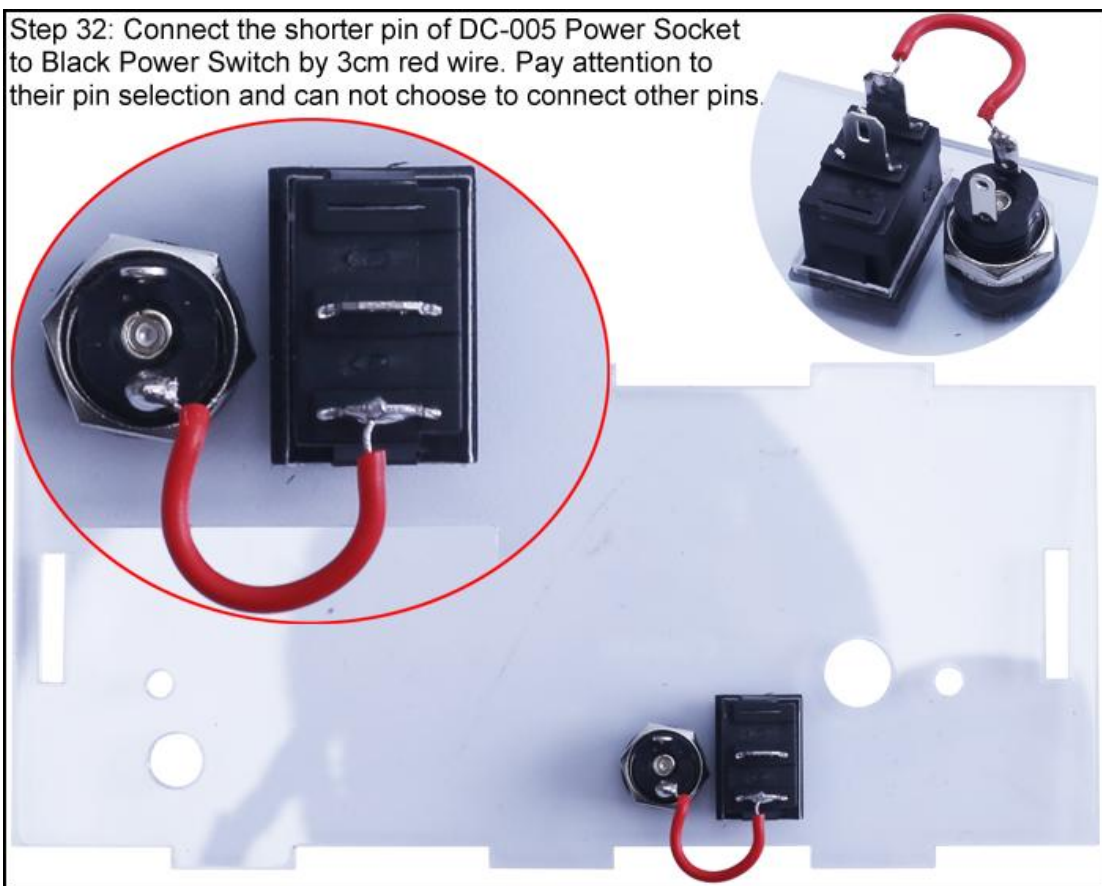
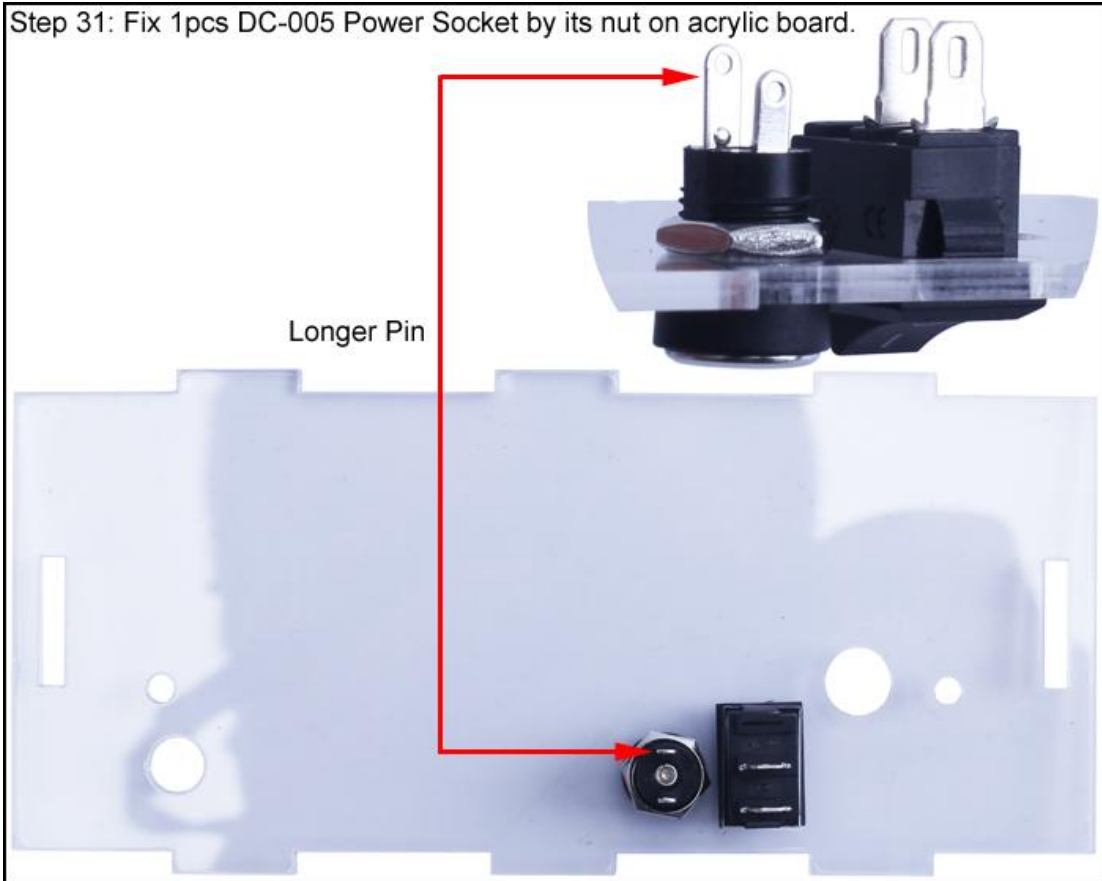


Step 29: Connect red thin wire from Bluetooth Receiver to the longest pin of FM Antenna Socket. Confirm that the red and blue colors are connected on Receiver.

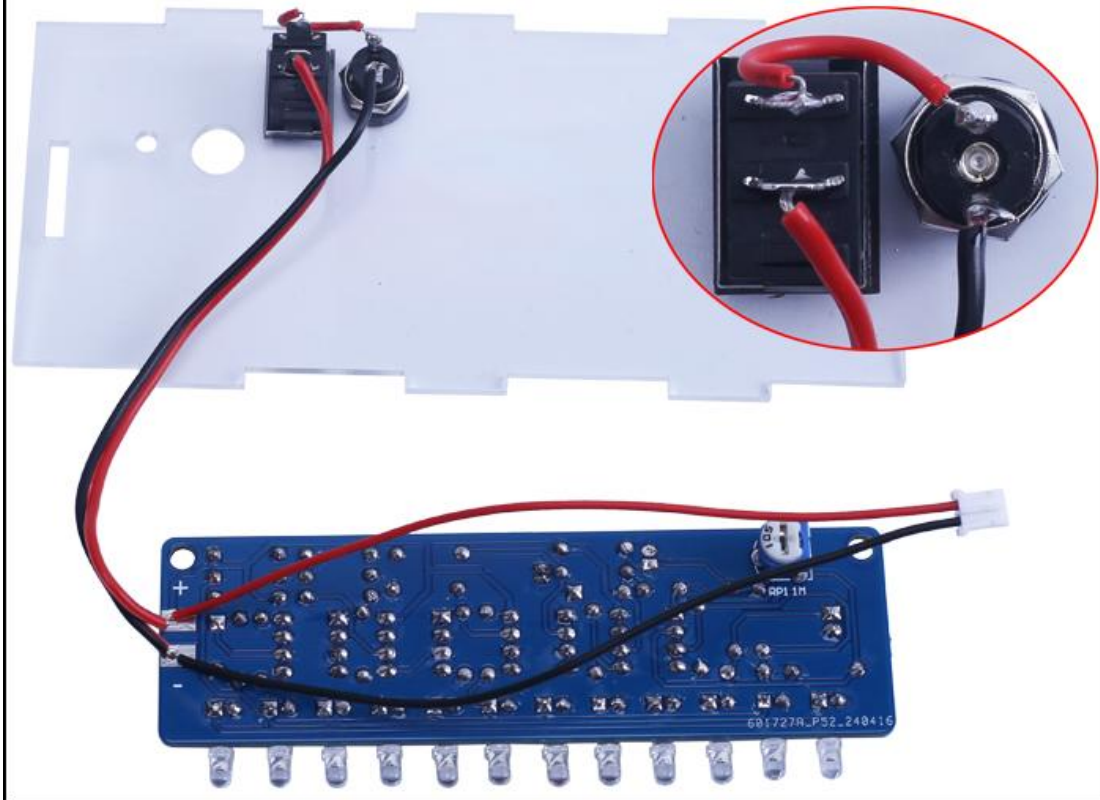


Step 30: Fix 1pcs Black Power Switch on acrylic panel. Pay attention to the buckle on the switch, which can be fixed by itself. Pay attention to the installation direction.

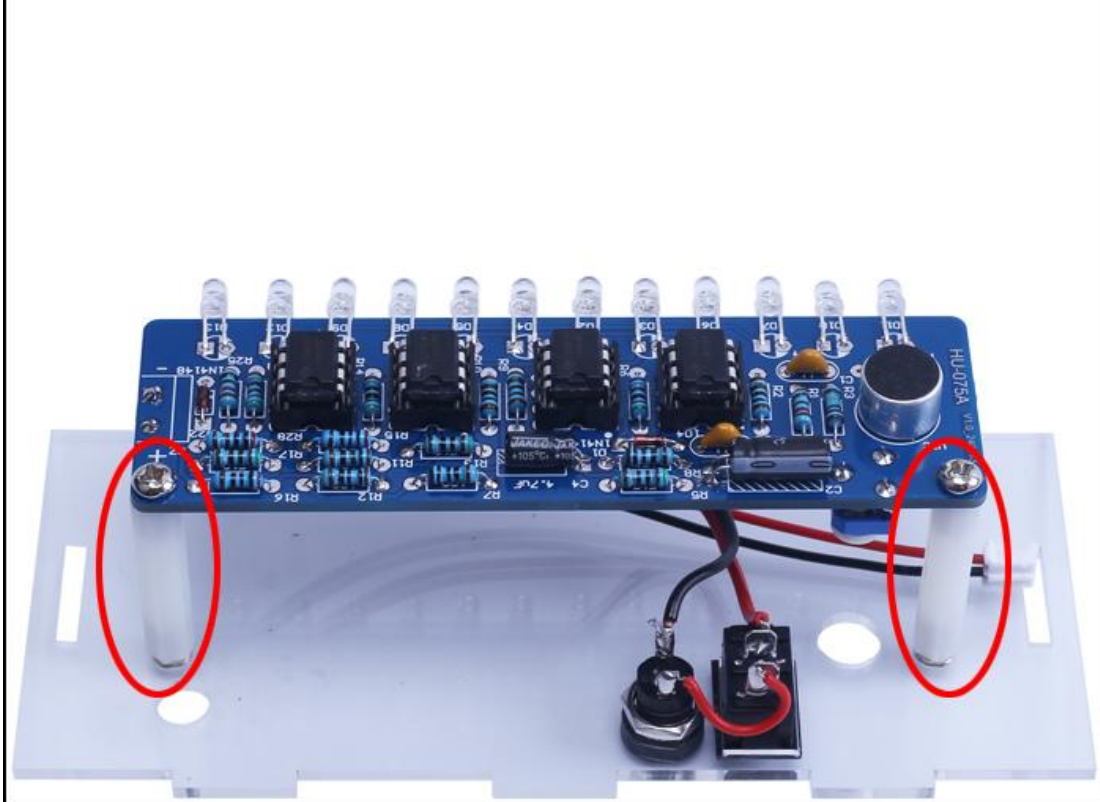




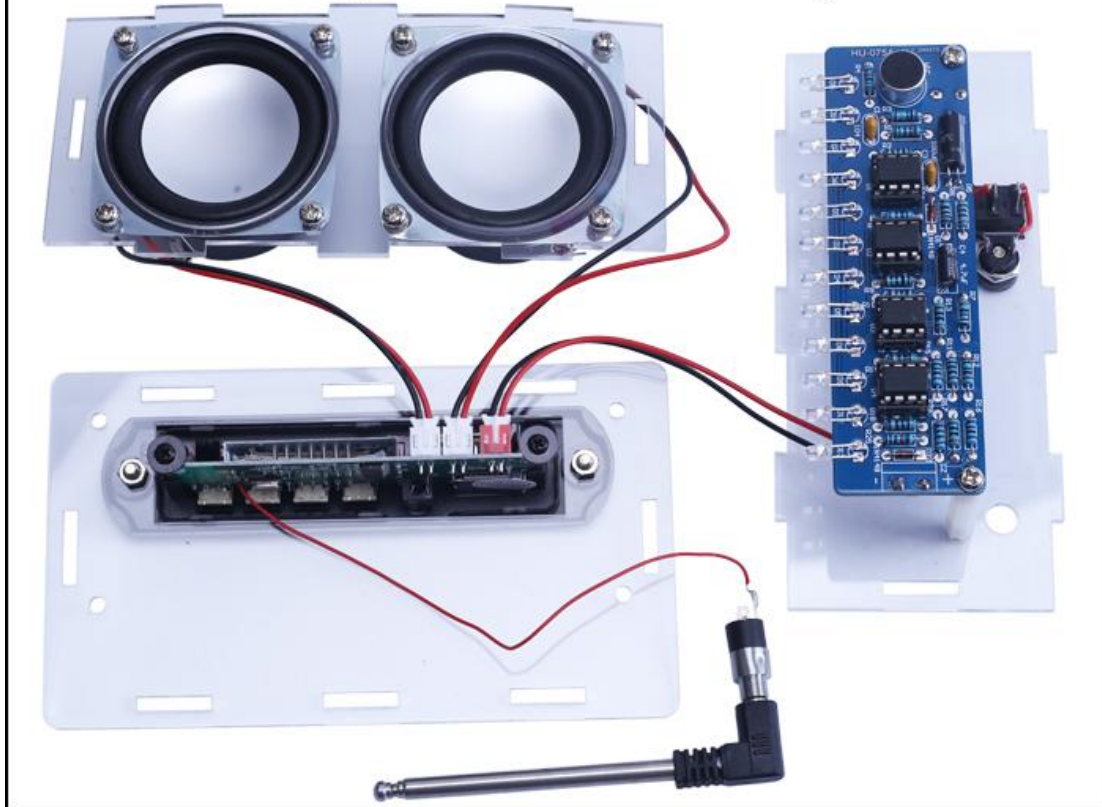
Step 33: Connect Black thick wire from PCB to the longer pin of DC-005 Power Socket. Red thick wire from PCB to another pin of Black Power Switch.



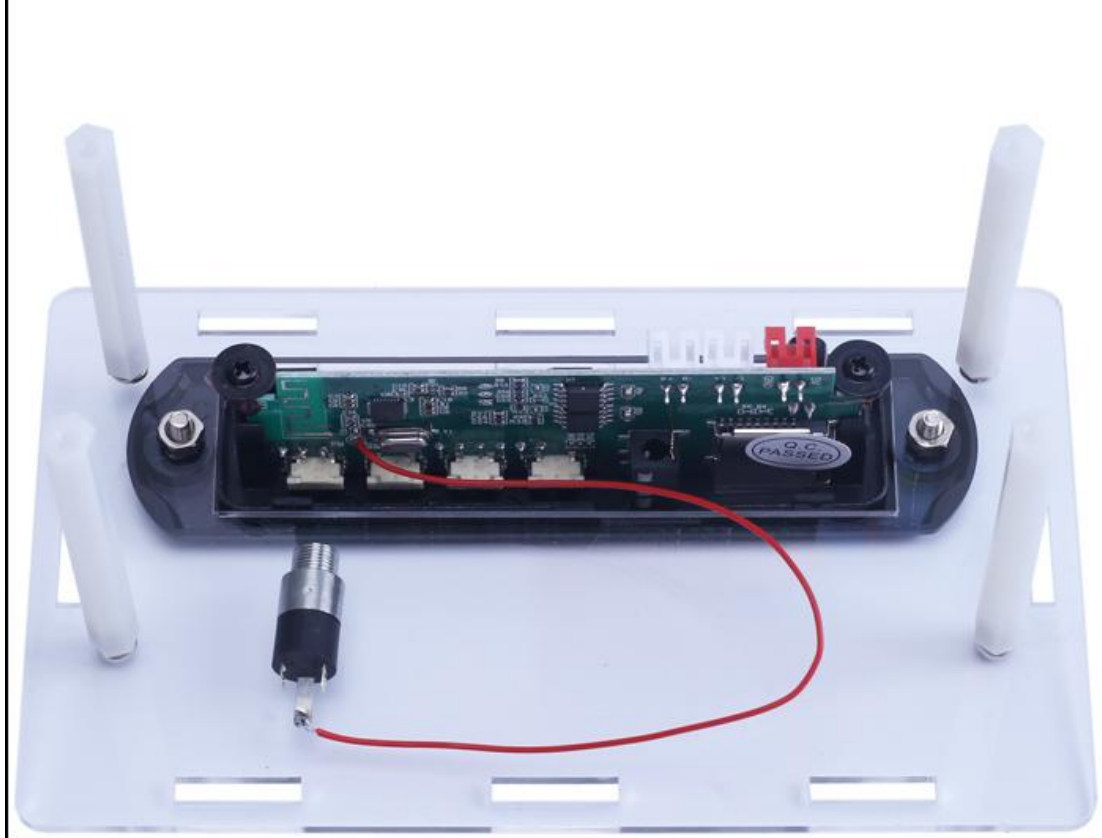
Step 34: Fix PCB on acrylic panel by 2pcs M3*28mm Nylon Column and 4pcs M3*8mm Screw.



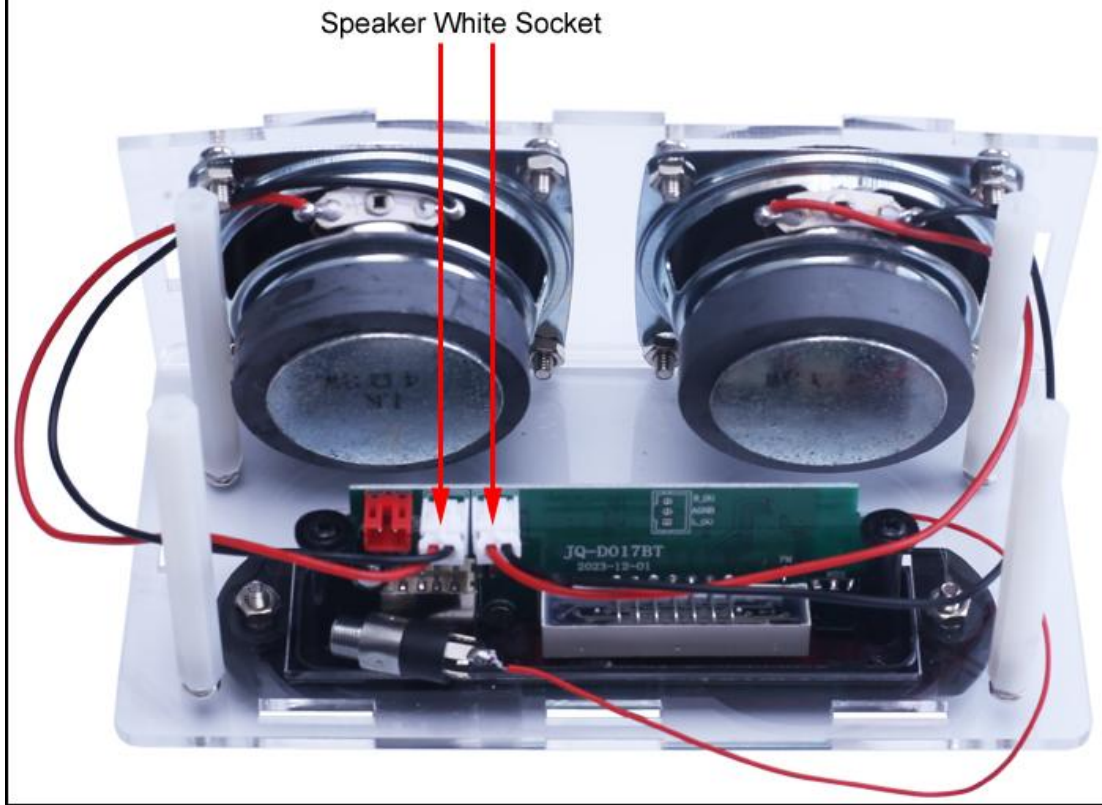
Step 35: Test. PCB wire connect to red socket and speaker wires to white socket as shown. Then connect USB power to test its functions as following 'Use Methods'.



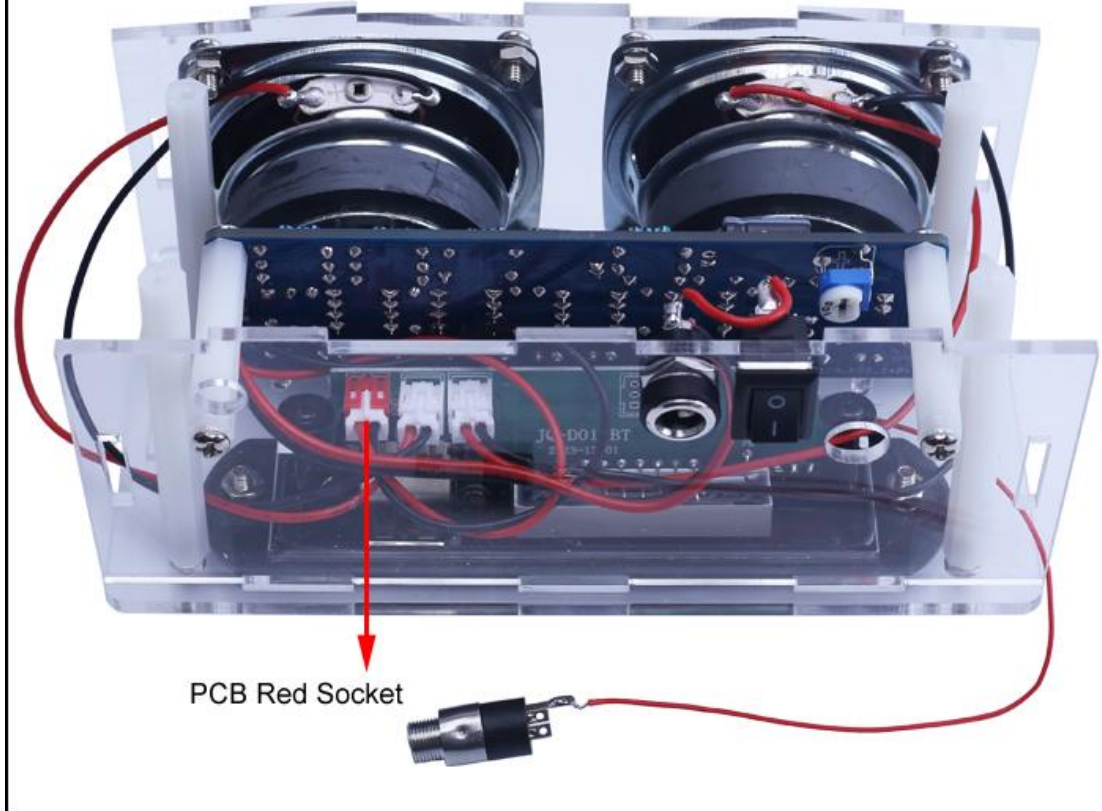
Step 36: Fix 4pcs M3*50mm Nylon Column on acrylic board by 4pcs M3*8mm Screw.



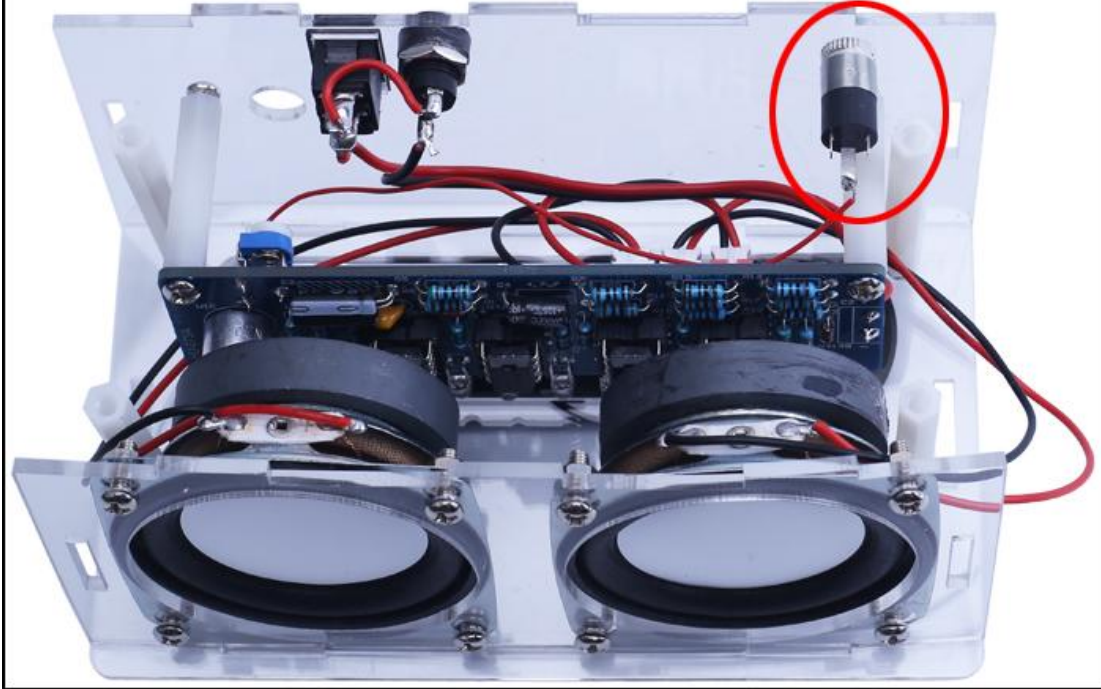
Step 37: Install Speaker acrylic board and connect wires to Bluetooth Receiver on white socket.



Step 38: Install Power acrylic board and connect wire to Bluetooth Receiver on red socket.



Step 39: Fix 1pcs FM Antenna Socket by its nut on acrylic board.



Step 40: Install 2pcs side acrylic board and align installation holes.



Step 41: Fix TOP acrylic board by 4pcs M3*12mm Screw.

