

# High Voltage Electromagnetic Transmitter DIY Kit

## I. Introduction:

It is a DC 6V High Voltage Electromagnetic Transmitter DIY Kit. It can turn electrical energy into magnetic energy, sending it into a metal cylinder. With this kit, users can learn the working principle of electromagnetic transmitters and explore the basics of electronic technology..

It's an intriguing DIY electronics project that lets users get a better grasp of the circuit and practice soldering skills.

## II. Feature:

1>.Instructions & Steps for Usage:To launch the metal rod, first press the green button to charge the capacitor, and the voltage display meter will start to increase. Then insert the cylindrical metal rod through the rear end of the plastic tube, its tail should be flush with the tail of the tube. When it reaches 50V/100V/150V/200V, press the red button to launch, and the metal rod will be sent out.

2>.DIY Hand Soldering: This is a great DIY kit for electronics hobbyists, beginners, schools, and home educators. It comes with various components that need to be installed by hand. Not only does this provide an opportunity to practice and enhance soldering skills, but it also helps to spark an interest in electronics technology.

3>.Easy to Assemble: We have included a detailed user manual to guide you through the assembly process. The connections are clearly mapped and labeled on the board, making it easy to build, though a basic understanding of electronics theory and hands-on ability is necessary.

4>.Please Pay Attention: 1>.When charging, do not touch the metal parts with your hands as the finished project operates under high voltage. 2>.Before troubleshooting, please discharge the energy storage capacitor - refer to the user manual for detailed instructions. 3>.Children under the age of 14 should use this device only under adult supervision.

5>.Warm Tips: 1>. The launch pad can be rotated to adjust it from left to right and up and down. 2> It can be launched once each time, and after a launch is completed, it needs to be recharged. 3> Be sure to relax as soon as possible after pressing the launch button.

## III. Parameter:

1>.Product Name: High Voltage Electromagnetic Transmitter DIY Kit

2>.Work Voltage: DC 6V

3>.Power Type:AA\*4 Battery(Not Included!)

4>.Work Temperature:-20°C~85°C

5>.Work Humidity:5%~85%RH

6>.Size(Installed):200\*80\*45mm

## IV. Use Steps:

1>.Follow the installation manual to correctly install the device.

2>.Turn ON Self-locking power switch in the middle then the red power indicator will turn ON.

3>.Keep press green button to charge the capacitor and the voltage value of the voltage display meter starts to increase.

4>.Note that the charging voltage should not exceed 200V. The charging can be stopped when the voltage is between 50V-200V.

5>.Insert the cylindrical metal rod from the rear end of the plastic tube, and its tail should be flush with the tail of the tube.

6>.Rotate the launcher to adjust the launch direction.

7>.Press the red launch button, the metal rod will fly out, and the launch is complete.

## V. Notes:

1. The voltage inside the circuit board can reach 210V, so do not touch components during charging.

2. Do not damage or remove the insulation layer on the surface of the wire.

3. The capacitor must be discharged first before circuit testing. The capacitor is discharged if the voltmeter shows less than 5V.

4. Its power consumption is relatively high, the working voltage is about 50mA while charging, so it is recommended to use a new battery.

5. The input voltage must not exceed the working voltage of 6V.

6. It can be launched once each time and after the launch is completed, it needs to be recharged.

7. The launch distance is related to the horizontal position, Iron Pillar' s position, and many other factors.

8. Before stopping use, it is recommended to fire several times to release the electric energy inside the capacitor.

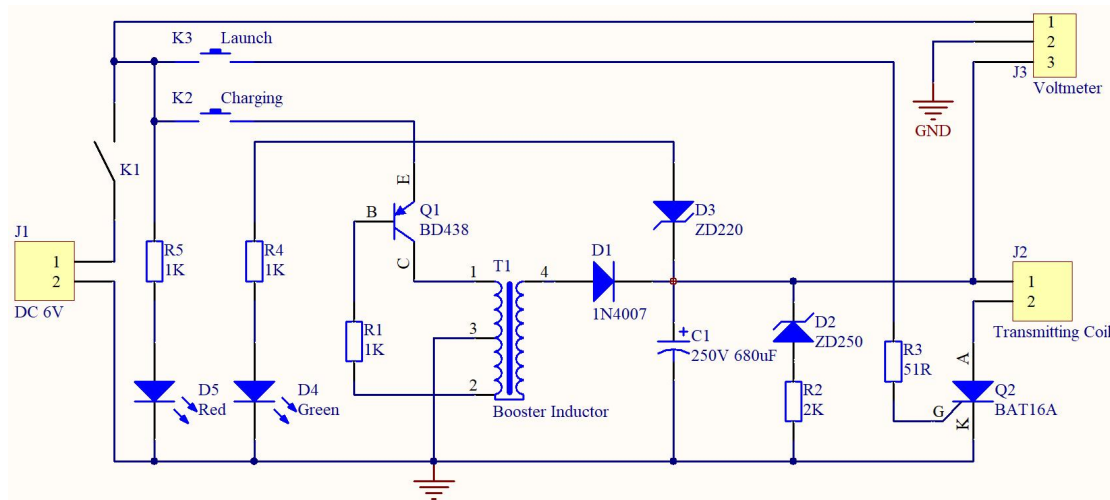
## VI. Component Listing:

NO.	Component Name	PCB Marker	Parameter	QTY
1	Metal Film Resistor	R1,R4,R5	1Kohm	3
2	Metal Film Resistor	R2	2Kohm	1
3	Metal Film Resistor	R3	51ohm	1
4	1N4007 Diode	D1	DO-41	1
5	ZD250 Zener Diode	D2	DO-41	1
6	ZD220 Zener Diode	D3	DO-41	1
7	5mm Green LED	D4		1
8	5mm Red LED	D5		1
9	Self-locking Switch	K1	5.8*5.8mm	1
10	Red Self-locking Switch Cap	K1		1
11	Button	K2,K3	12*12mm	2
12	Green Button Cap	K2		1
13	Red Button Cap	K3		1
14	KF301-2P Blue Terminal	J1,J2	5.08mm	2
15	KF301-3P Blue Terminal	J3	5.08mm	1
16	BD438 Power Transistor	Q1	TO-126	1
17	BAT16A Bidirectional Thyristor	Q2	TO-220	1
18	Inductor	T1	4Pin	1
19	Electrolytic Capacitor	C1	250V 680uF	1
20	Tie		15cm	2
21	Transmitting Coil	J2		1
22	3D Printer Base			1
23	3D Printer Bracket			1
24	Plastic Clip			1
25	AA*4 Battery Box			1
26	Voltage Display Meter			1
27	Black Cushion			4

28	White isolation column			4
29	Wood Base Plate			1
30	M2*10mm Self Tapping Screw			4
31	M2*6mm Self Tapping Screw			2
32	M2*5mm Self Tapping Screw			1
33	M2*4mm Self Tapping Screw			1
34	M2*3mm Self Tapping Screw			1
35	M3*20mm Cylindrical Metal Rod			10
36	M4*20mm Cylindrical Metal Rod			10
37	PCB			1

NOTE:Users can assemble device following instructions printed on the PCB and the list of components

### VII. Schematic Diagram:



### VIII. 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 gift

### IX. 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>.Users should take their time and be patient as they complete the installation.
- 3>.This is a DIY kit and will require users to finish the installation.

- 4>.Users should be careful not to leave the soldering iron on any component for more than 3 seconds, or else it may cause damage.
- 5>.Pay attention to the positive and negative of the components.
- 6>.Strictly avoid short circuit.
- 7>.User must install LED according to the specified rules.Otherwise some LED will not light.
- 8>.Complex components should be installed first.
- 9>.Make sure all components are in right direction and right place.
- 10>.Check that all of the LED can be illuminated.
- 11>.It is strongly recommended to read the installation manual before starting installation!!!
- 12>.Please wear anti-static gloves or anti-static wristbands when installing electronic components.

## **X. Installation Steps(Please be patient install!!!):**

- 1>.Step 1: Install 3pcs 1Kohm Metal Film Resistor at R1,R4,R5.
- 2>.Step 2: Install 1pcs 2Kohm Metal Film Resistor at R2.
- 3>.Step 3: Install 1pcs 51ohm Metal Film Resistor at R3.
- 4>.Step 4: Install 1pcs DO-41 ZD220 Zener Diode at D3. Making sure to pay attention to the installation direction. There will be a white mark on both the ZD220 and the PCB to help confirm the installation direction. Note: Retain the cut metal pins, as they will be used in step 16.
- 5>.Step 5: Install 1pcs DO-41 ZD250 Zener Diode at D2. Making sure to pay attention to the installation direction. There will be a white mark on both the ZD250 and the PCB to help confirm the installation direction. Note: Retain the cut metal pins, as they will be used in step 16.
- 6>.Step 6: Install 1pcs 5mm Green LED at D4 and Red LED at D5. Note: The longer pin is the positive pole and should be connected to the '+' square pad.
- 7>.Step 7: Install 1pcs DO-41 1N4007 Diode at D1. Users should pay attention to the installation direction of the 1N4007. There will be a white mark on both the 1N4007 and the PCB to help confirm the installation direction.
- 8>.Step 8: Install 2pcs 12\*12mm Button at K2,K3.
- 9>.Step 9: Install 2pcs KF301-2P Blue Terminal at J1,J2 and KF301-3P Blue Terminal at J3. Pay attention to the installation direction.
- 10>.Step 10: Install 1pcs 5.8\*5.8mm Self-locking Switch at K1.
- 11>.Step 11: Install 1pcs TO-126 BD438 Power Transistor at Q1. Pay attention to the installation direction.
- 12>.Step 12: Install 1pcs Inductor at T1. Note: The two longer pins connect to #1 and #2 pad.
- 13>.Step 13: Install 1pcs TO-220 BAT16A Bidirectional Thyristor at Q2. Pay attention to the installation direction.
- 14>.Step 14: Install green button cap on K2 and red on K3.
- 15>.Step 15: Fix 1pcs 250V 680uF Electrolytic Capacitor at C1 by 2pcs ties. Note: The negative pole of the capacitor will have a white mark and a '-' symbol, and it should correspond to the white area on the PCB. Align the pins and pads at the same time.

16>.Step 16: Connect the pins from the capacitor to the PCB using the metal pins that were cut from the ZD220 or ZD250 in Step 4/5.

17>.Step 17: Scrape off the insulating layer about 1cm from the surface of the copper wire.

18>.Step 18: Place 4pcs White Isolation Column on Wood Base Plate.

19>.Step 19: Fix PCB board on Wood Base Plate by 4pcs M2\*10mm Self Tapping Screw.

20>.Step 20: Prepare the launcher accessories.

21>.Step 21: Fix 1pcs 3D Printer Base by 2pcs M2\*5mm Self Tapping Screw.

22>.Step 22: Place 1pcs 3D Printer Bracket on 3D Printer Base. Note:The size of the hole can be adjusted appropriately using tools.

23>.Step 23: Fix 3D Printer Bracket by M2\*3mm Self Tapping Screw.

24>.Step 24: Fix 1pcs Plastic Clip on 3D Printer Bracket by M2\*4mm Self Tapping Screw. Note that the screws are aligned with the reserved mounting holes.

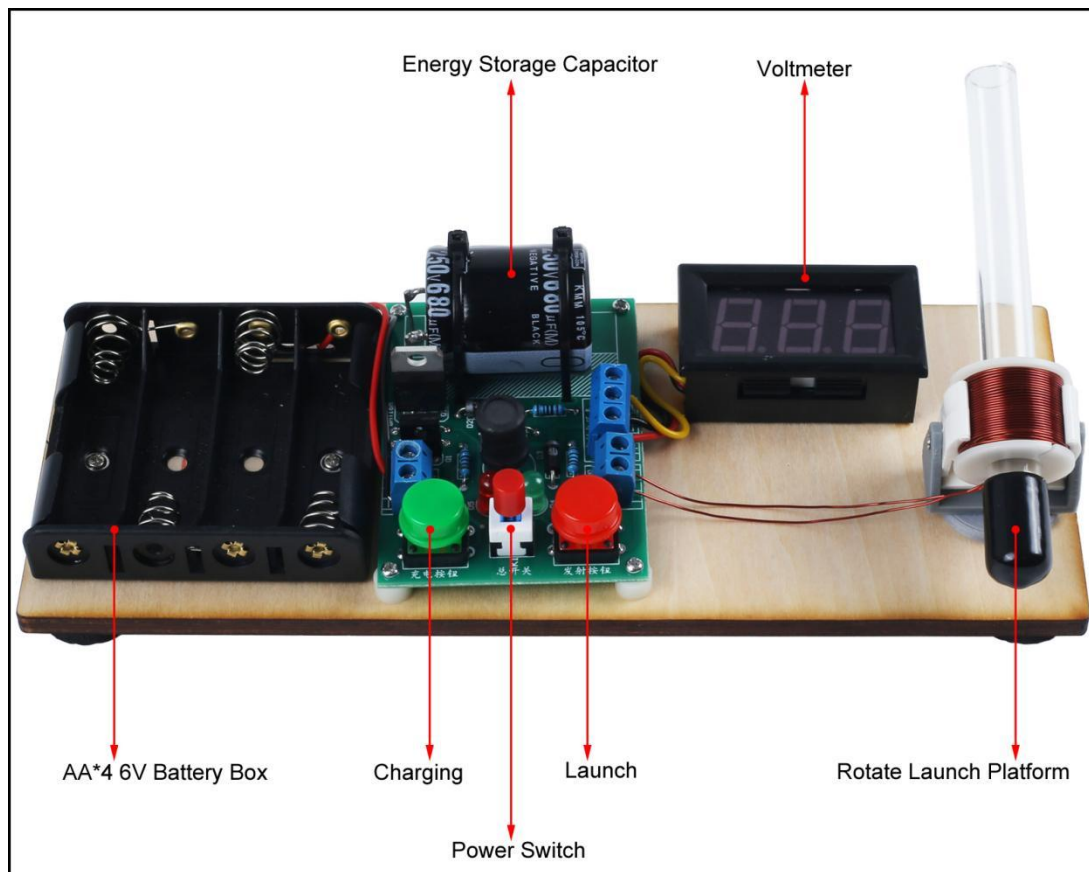
25>.Step 25: Fix AA\*4 Battery Box by 2pcs M2\*6mm Self Tapping Screw and reserve about 10cm wire, then red wire connect ' + ' and black wire connect to ' - ' terminal.

26>.Step 26: Clamp the voltmeter onto the Wood Base Plate by its own bayonet. Then reserve about 10cm wire, then red wire connect ' + ' and black wire connect to ' - ' terminal and yellow wire connect to another.

27>.Step 27: Fix Transmitting Coil and connect it to J2 blue terminal.

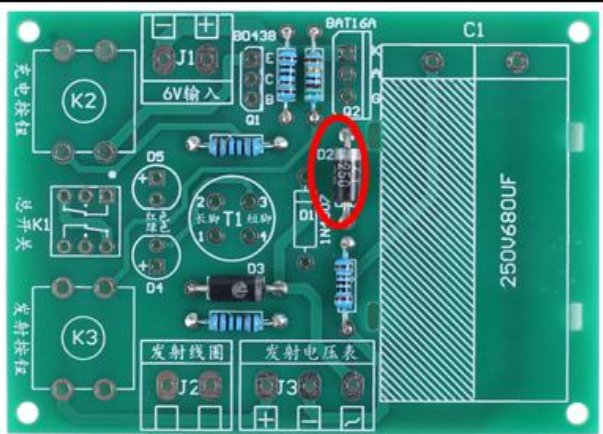
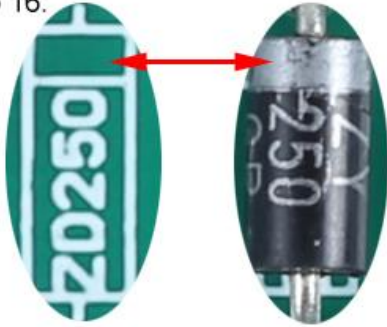
28>.Step 28: Place 4pcs Black Cushion on another side of Wood Base Plate.

## XI. Install shown steps:

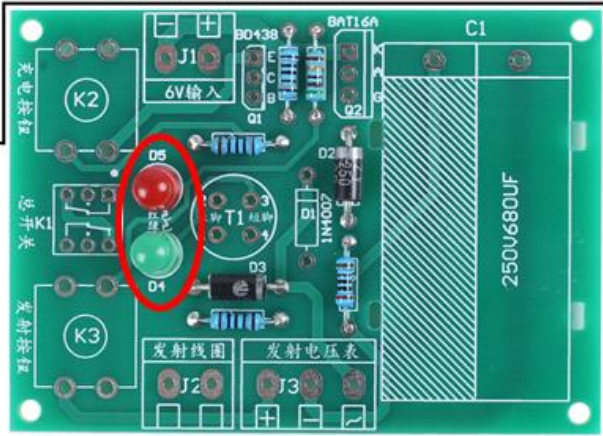




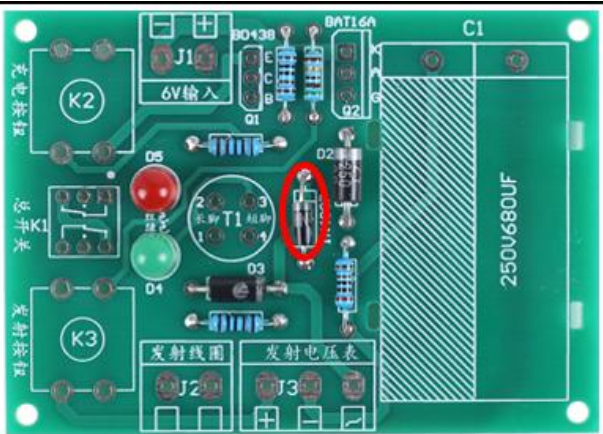
Step 5: Install 1pcs DO-41 ZD250 Zener Diode at D2. Making sure to pay attention to the installation direction. There will be a white mark on both the ZD250 and the PCB to help confirm the installation direction. Note: Retain the cut metal pins, as they will be used in step 16.



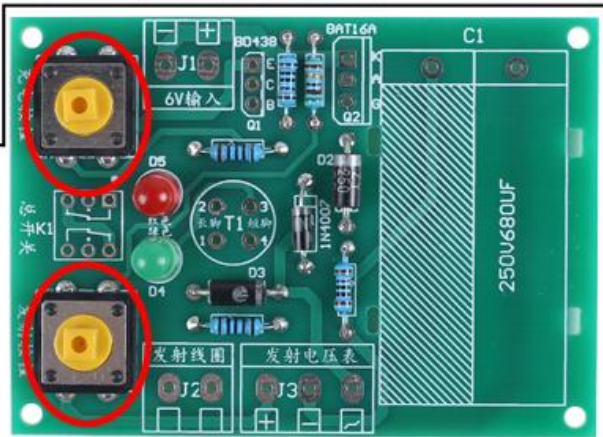
Step 6: Install 1pcs 5mm Green LED at D4 and Red LED at D5. Note: The longer pin is positive pole and connect to '+' square pad.



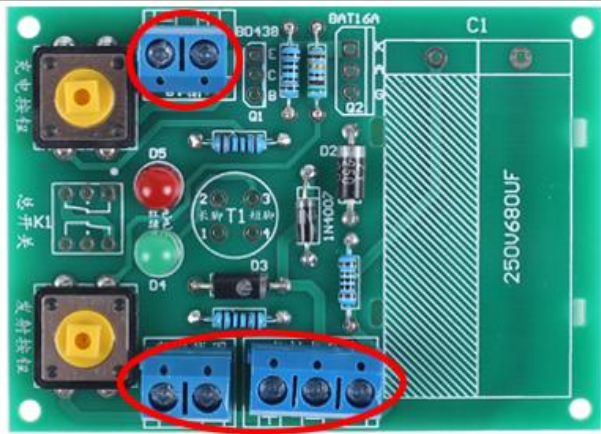
Step 7: Install 1pcs DO-41 1N4007 Diode at D1. Pay attention to the installation direction of the 1N4007. There will be a white mark on both the 1N4007 and the PCB to help confirm the installation direction.



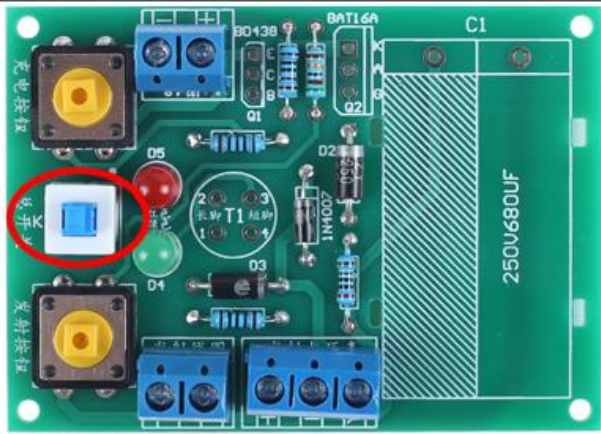
Step 8: Install 2pcs 12\*12mm Button at K2,K3.



Step 9: Install 2pcs KF301-2P Blue Terminal at J1,J2 and KF301-3P Blue Terminal at J3. Pay attention to installation direction.



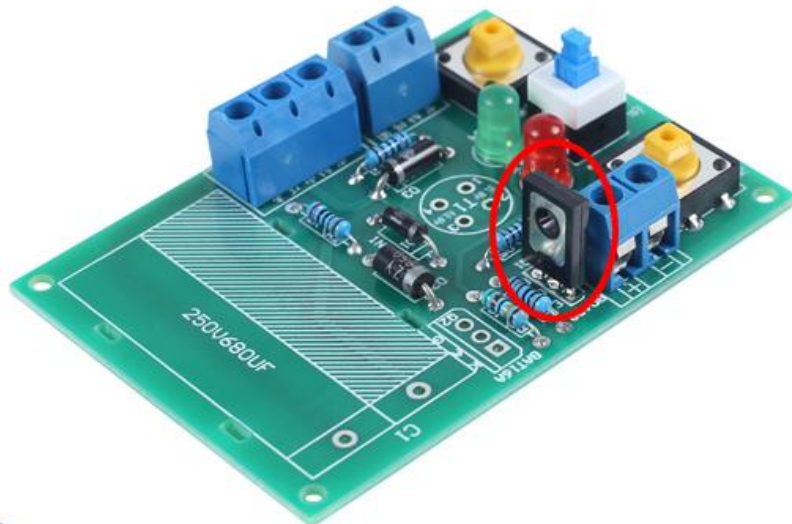
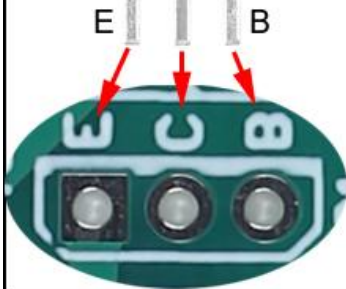
Step 10: Install 1pcs 5.8\*5.8mm Self-locking Switch at K1.



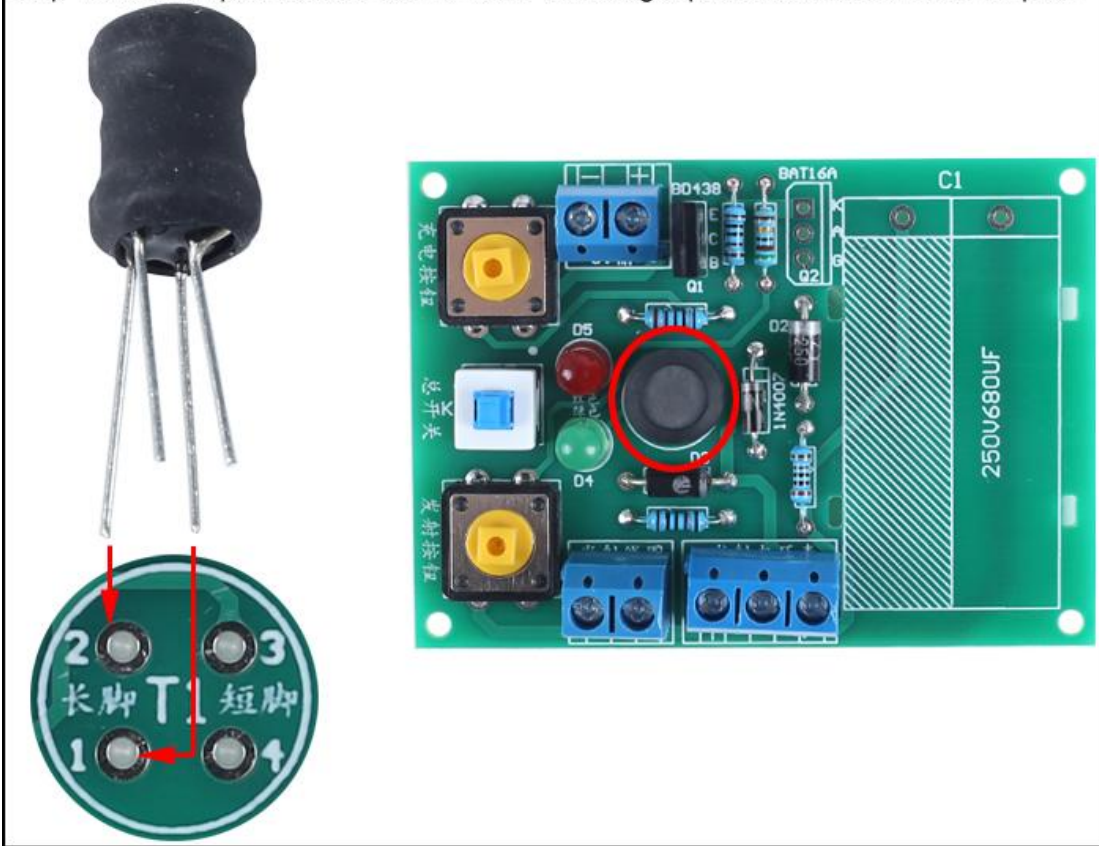
Step 11: Install 1pcs TO-18 BD438 Power Transistor at Q1. Pay attention to the installation direction.



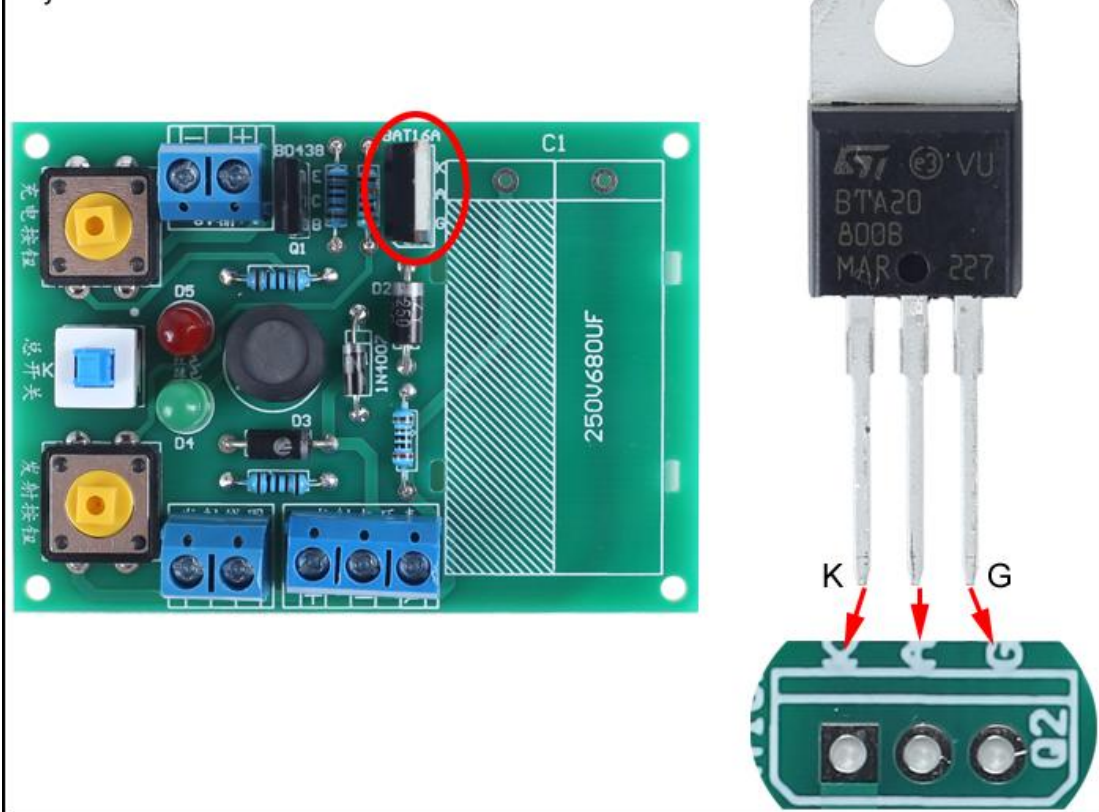
E C B



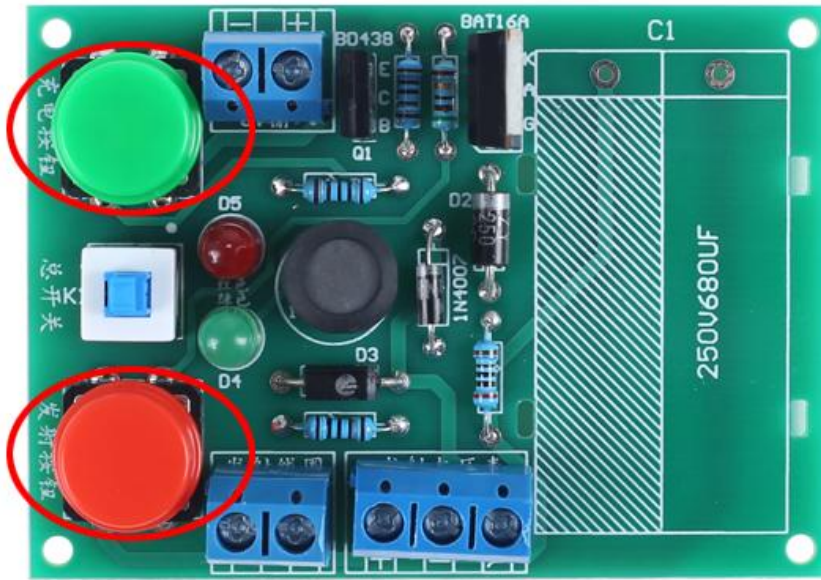
Step 12: Install 1pcs Inductor at T1. Note: Two longer pins connect to #1 and #2 pad.



Step 13: Install 1pcs TO-220 BAT16A Bidirectional Thyristor at Q2. Pay attention to the installation direction.

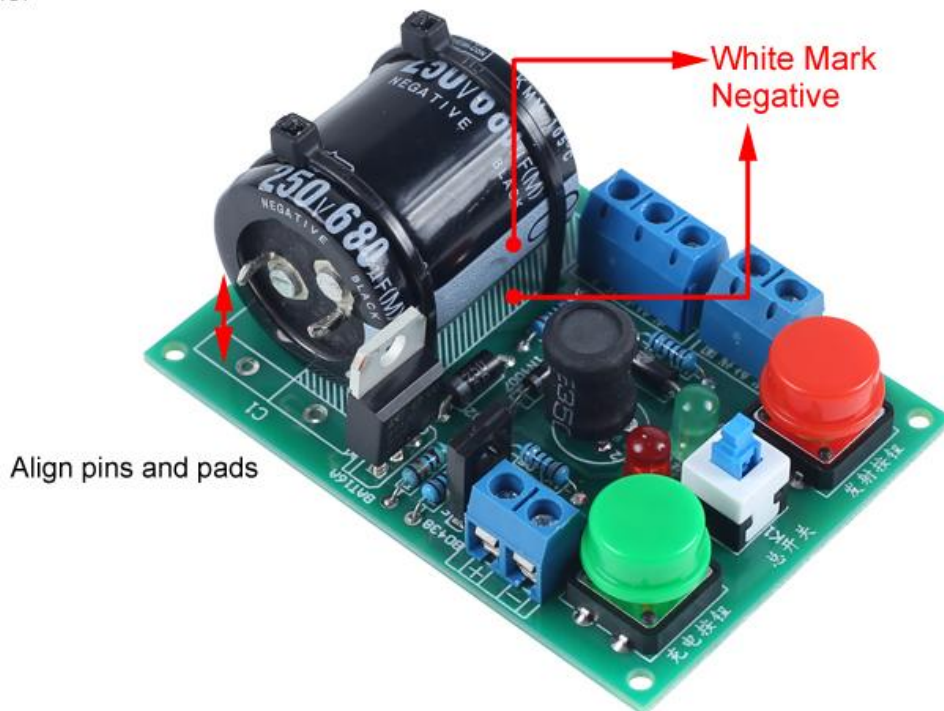


Step 14: Install green button cap on K2 and red on K3.

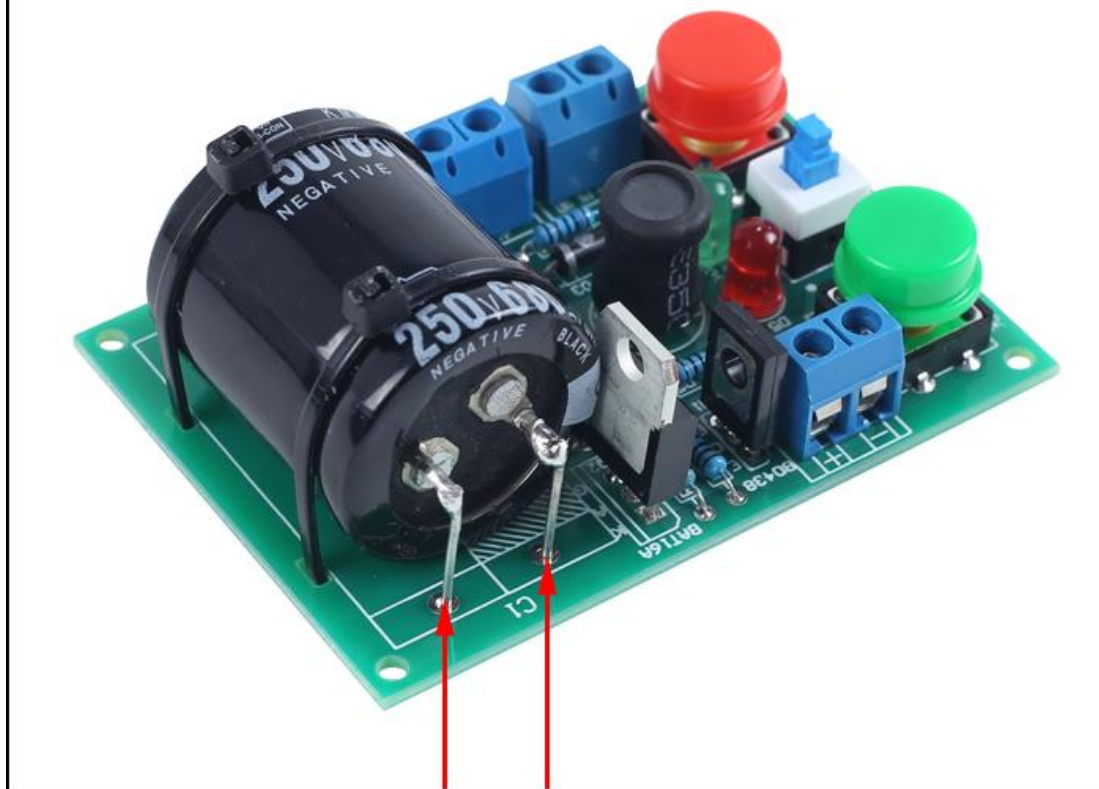


Step 15: Fix 1pcs 250V 680uF Electrolytic Capacitor at C1 by 2pcs ties.

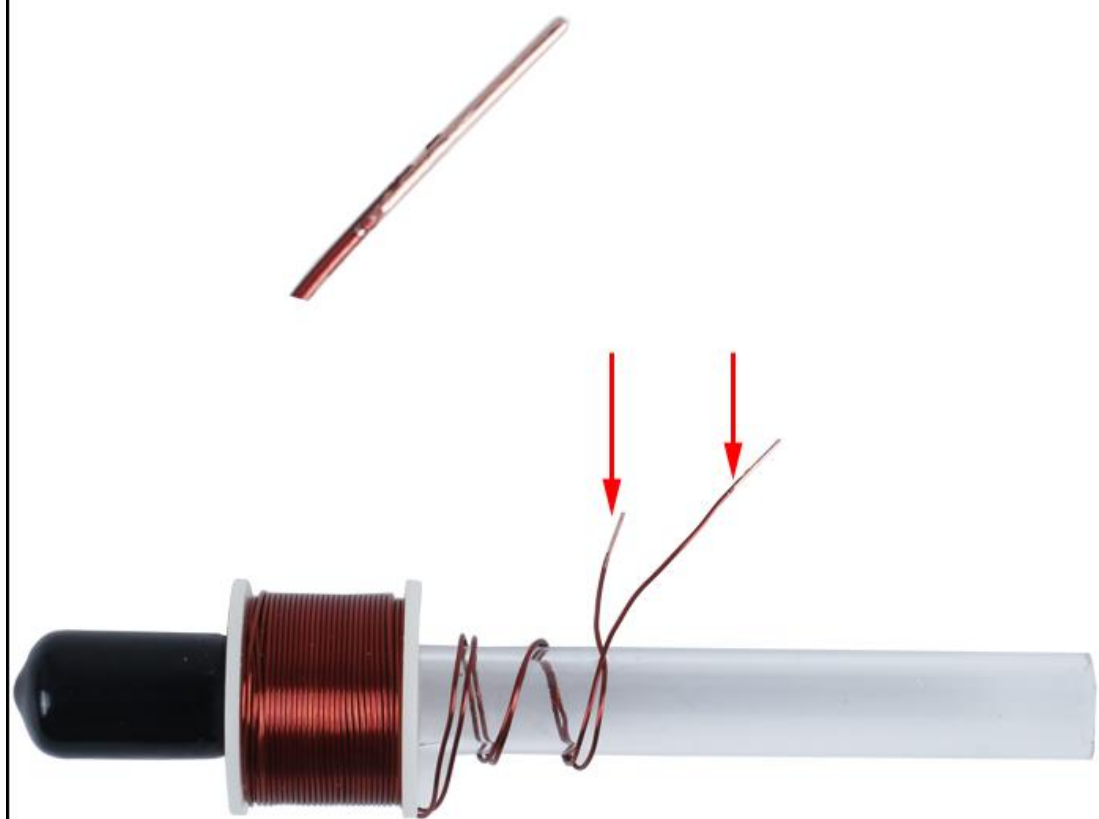
Note: The negative pole of the capacitor will have a white mark and a '-' symbol, and it should correspond to the white area on the PCB. Align the pins and pads at the same time.



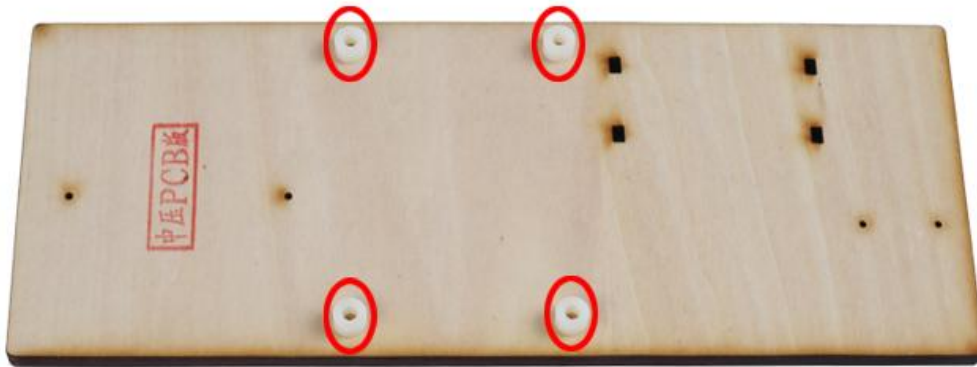
Step 16: Connect the pins from the capacitor to the PCB using the metal pins that were cut from the ZD220 or ZD250 in Step 4/5.



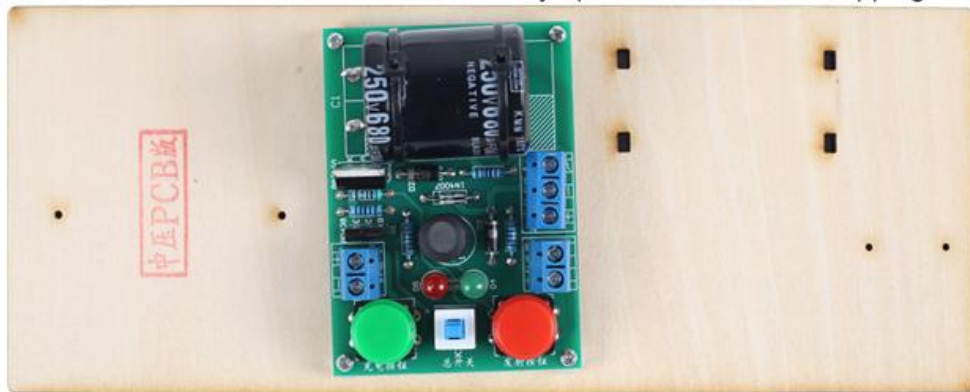
Step 17: Scrape off the insulating layer about 1cm from the surface of the copper wire.



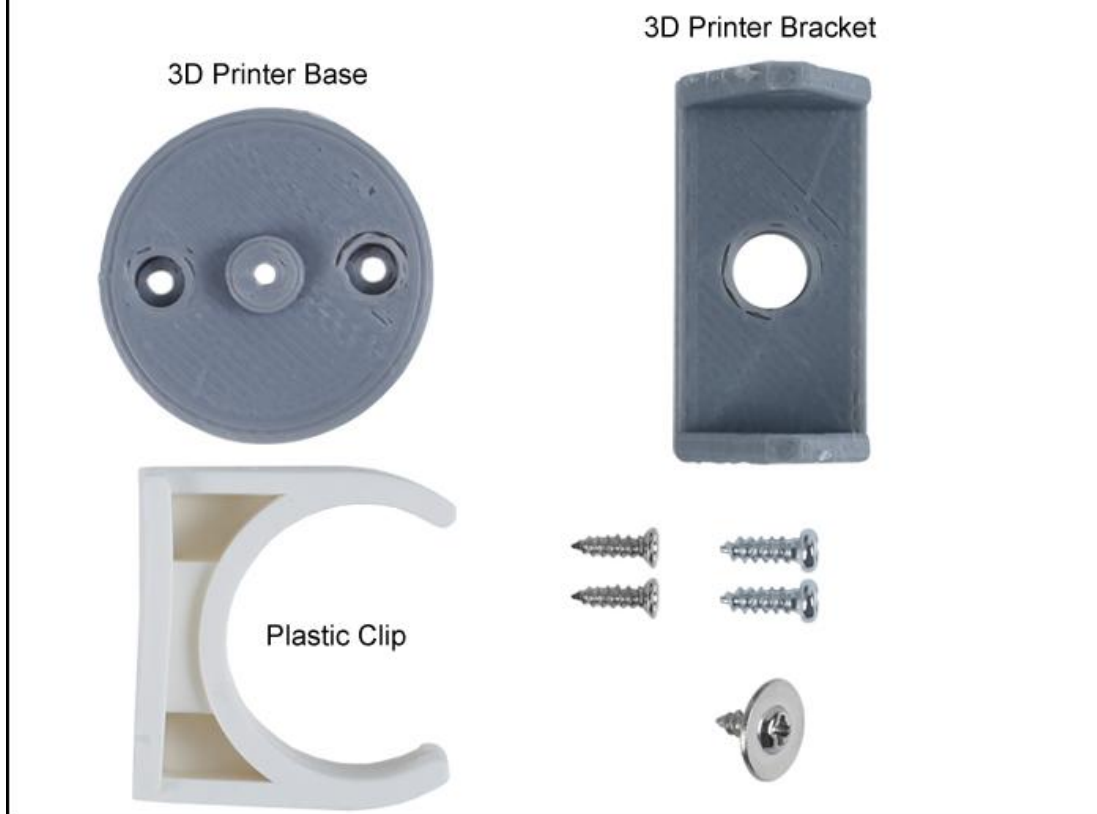
Step 18: Place 4pcs White Isolation Column on Wood Base Plate.



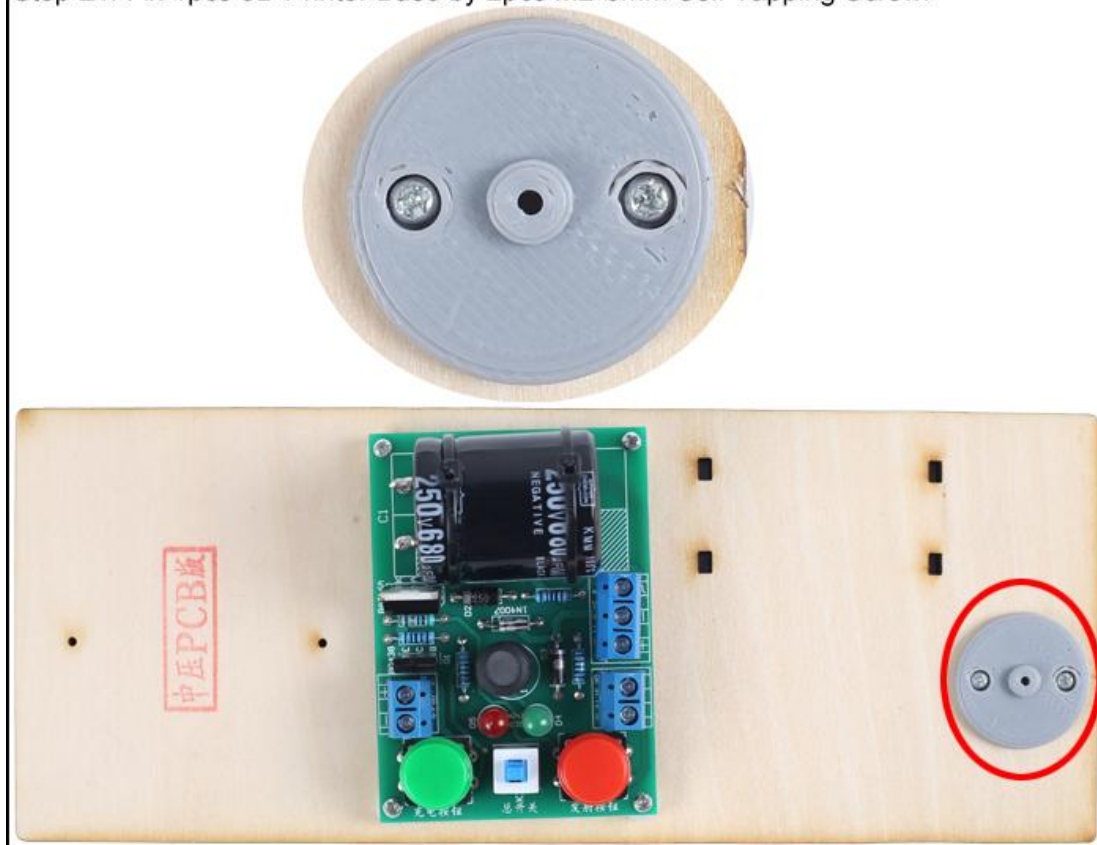
Step 19: Fix PCB board on Wood Base Plate by 4pcs M2\*10mm Self Tapping Screw.



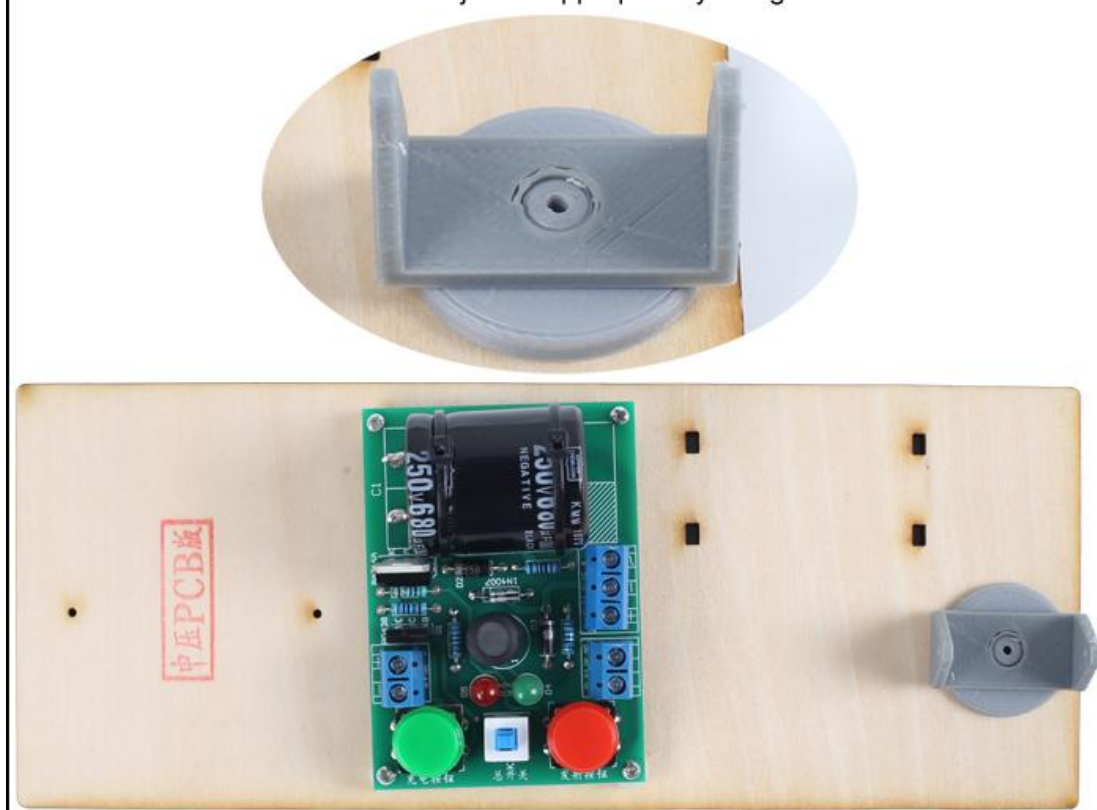
Step 20: Prepare the launcher accessories.



Step 21: Fix 1pcs 3D Printer Base by 2pcs M2\*5mm Self Tapping Screw.



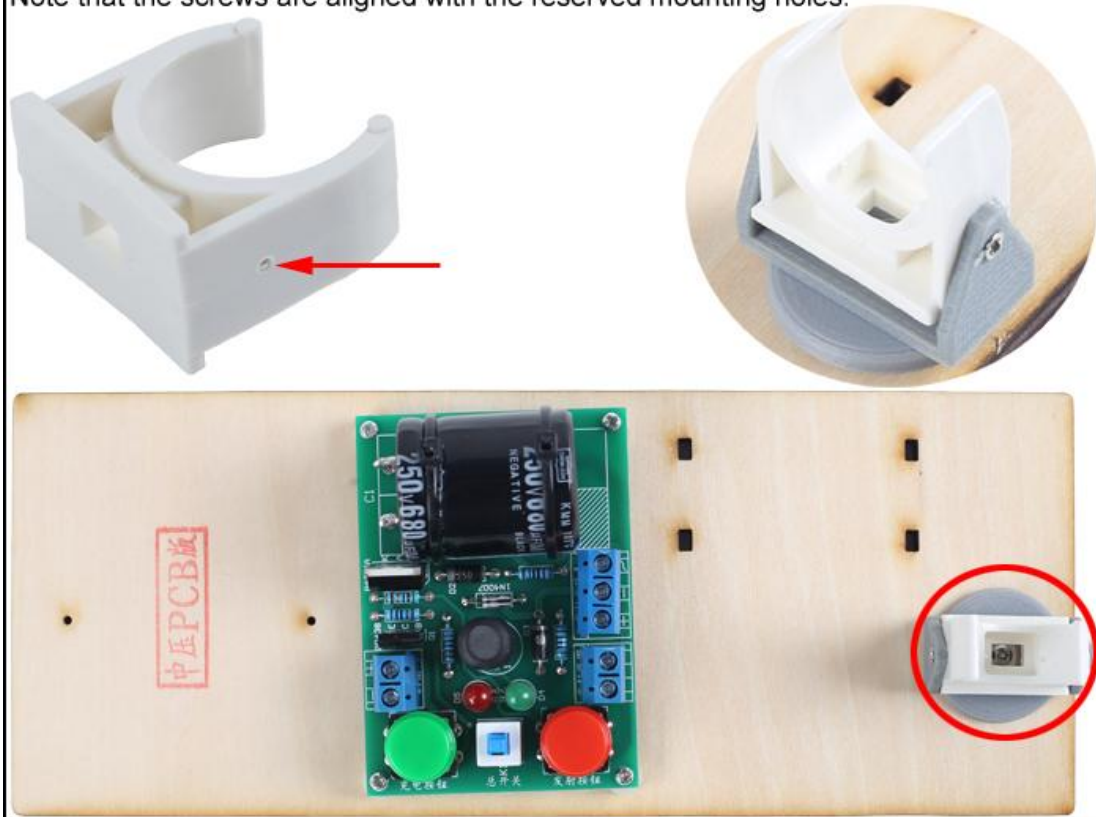
Step 22: Place 1pcs 3D Printer Bracket on 3D Printer Base.  
Note: The size of the hole can be adjusted appropriately using tools.



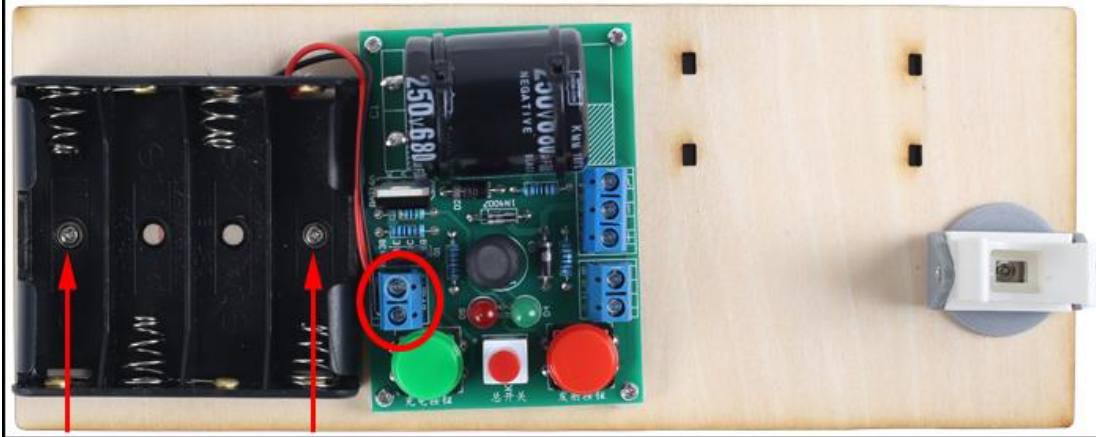
Step 23: Fix 3D Printer Bracket by M2\*3mm Self Tapping Screw.



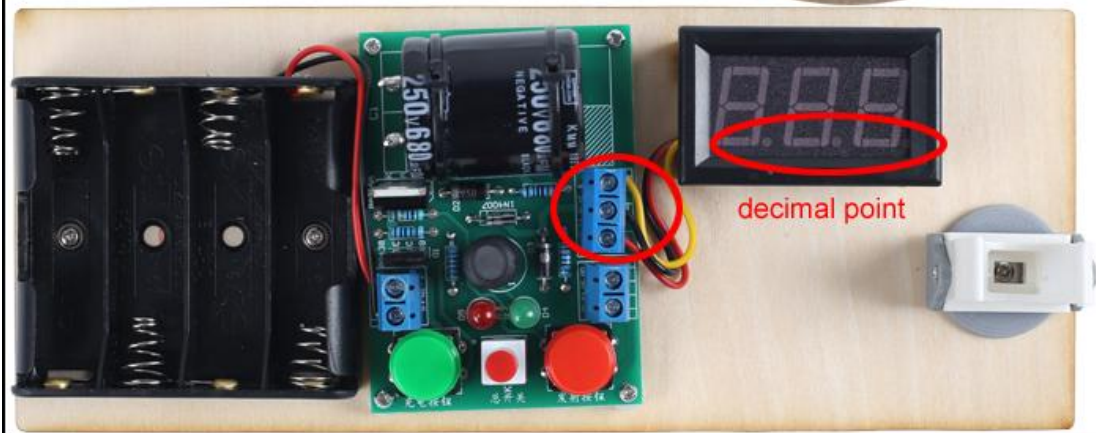
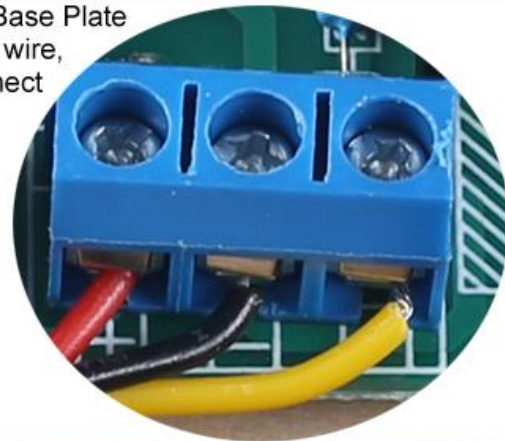
Step 24: Fix 1pcs Plastic Clip on 3D Printer Bracket by M2\*4mm Self Tapping Screw. Note that the screws are aligned with the reserved mounting holes.



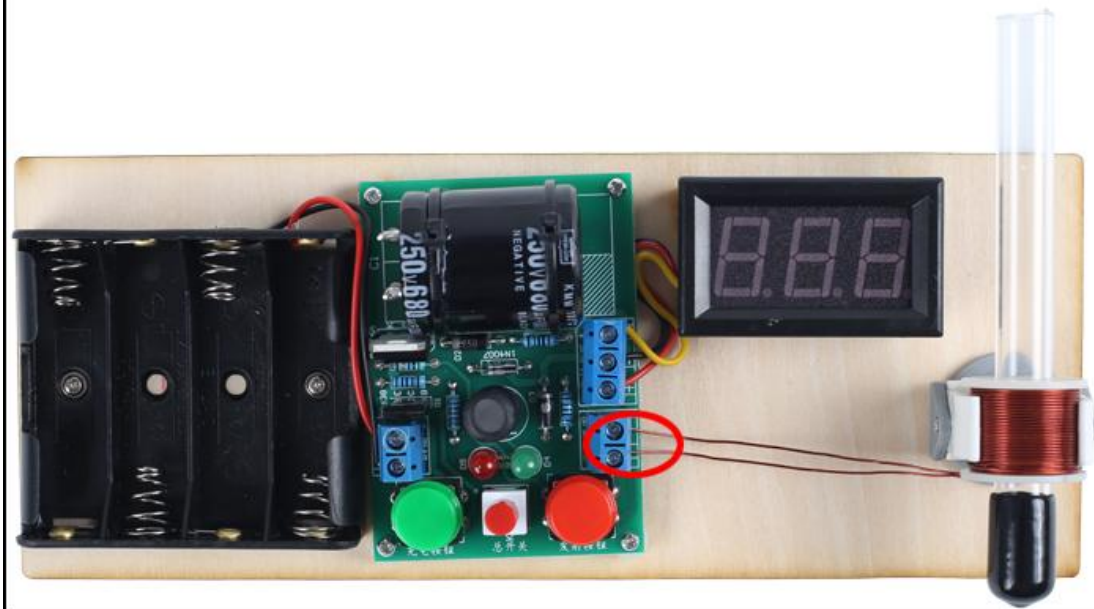
Step 25: Fix AA\*4 Battery Box by 2pcs M2\*6mm Self Tapping Screw and reserve about 10cm wire, then red wire connect ' + ' and black wire connect to ' - ' terminal.



Step 26: Clamp the voltmeter onto the Wood Base Plate by its own bayonet. Then reserve about 10cm wire, then red wire connect ' + ' and black wire connect to ' - ' terminal and yellow wire connect to another.



Step 27: Fix Transmitting Coil and connect it to J2 blue terminal



Step 28: Place 4pcs Black Cushion on another side of Wood Base Plate.

