

VORG

build guide



VORG BUILD GUIDE

Thank you very much for acquiring the Vorg DIY kit. This guide will walk you through the whole assembly process.

Before you start we recommend you to read the guide, specially the Notes that some of the steps have.

Since this is an SMD kit, you need to be very careful when you solder the components. Especially some of the small IC components since you can create bridges and not see them with a naked eye. Using a magnifying glass or a microscope is highly advisable.

Disclaimer

Remember that by purchasing a DIY kit you are responsible if your build fails. We cannot provide repair services for failed builds. The main reason is that, depending on the extent of the damage, the total cost you'll end up paying would be higher than buying the assembled module in the first place.

We want you to succeed. For that reason we tried to make this guide as detailed as possible. We also provide you the components organized to minimize the risk of mixing them up.

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How to use this guide

This guide contains one page for each different component you are gonna place. The components are organized starting from the lower values. For example, 1k Ω resistors are placed before the 2k Ω resistors.

At every step we have highlighted with **RED** the locations where you need to place the components. The locations marked with **GREY** are where you should have already placed a component in a previous step.



Place a
component
here



You should
have placed a
component here
at a previous step

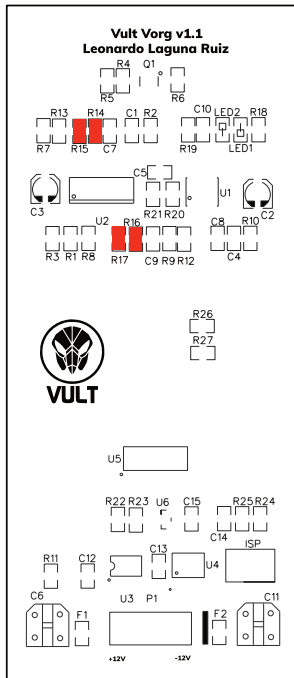
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We hope you enjoy building your own Vorg and if you like it share your results in social media.

Leonardo, Radost and Andrey

ASSEMBLING THE MAIN BOARD

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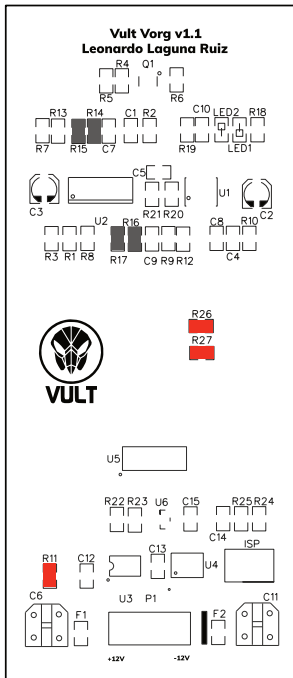
Component: **Resistor**

Value: **220Ω**

Quantity: **4**

Designators: **R15, R14, R17, R16**

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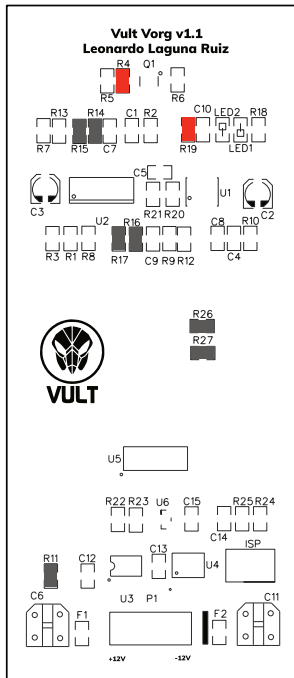
Component: **Resistor**

Value: **1k Ω**

Quantity: **3**

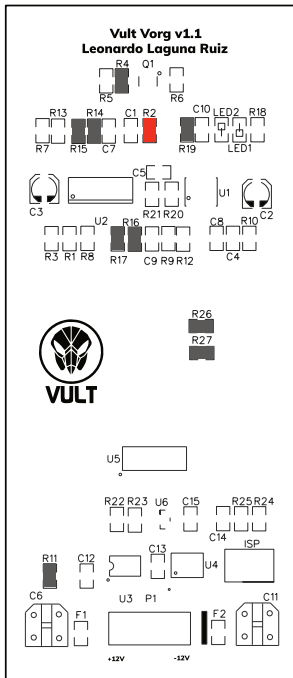
Designators: **R11, R26, R27**

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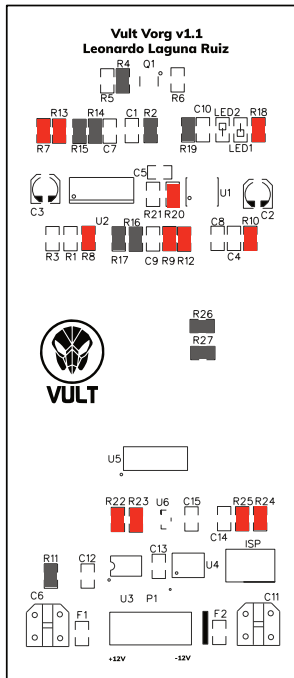
Component: Resistor
Value: 1.8k Ω
Quantity: 2
Designators: R19, R4

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Component: **Resistor**
Value: **4.7k Ω**
Quantity: **1**
Designators: **R2**

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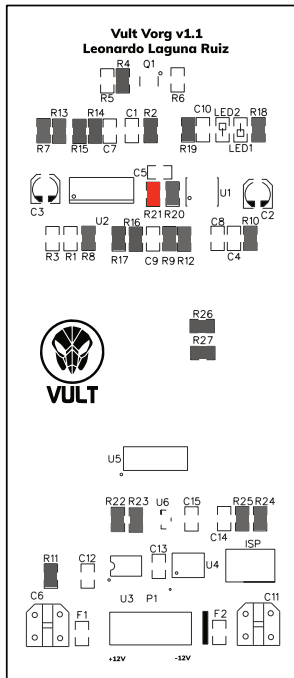
Component: **Resistor**

Value: **10k Ω**

Quantity: **12**

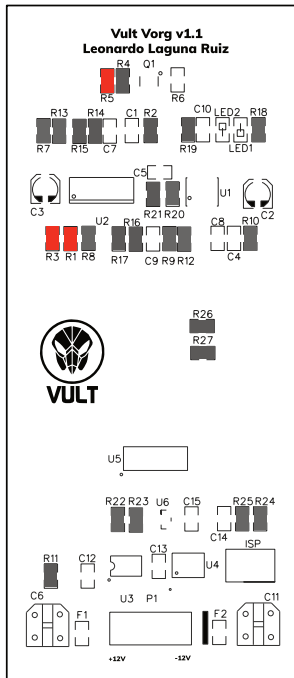
Designators: **R9, R12, R10, R18, R13, R7, R8, R20, R22, R23, R24, R25,**

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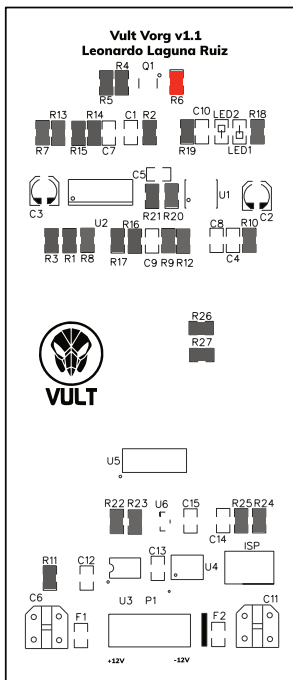
Component: **Resistor**
Value: **22k Ω**
Quantity: **1**
Designators: **R21**

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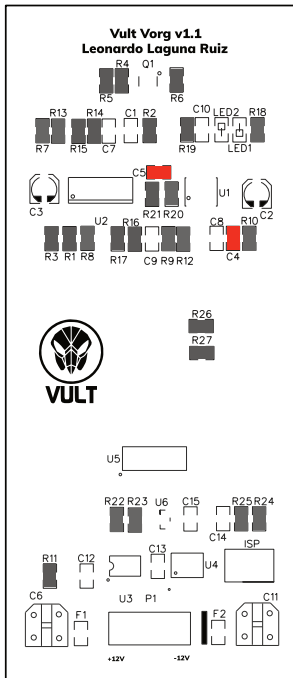
Component: Resistor
Value: 100k Ω
Quantity: 3
Designators: R1, R3, R5

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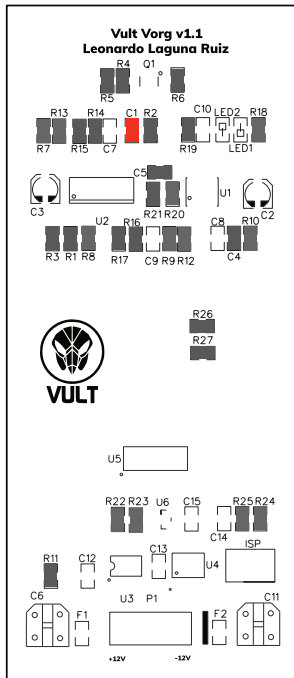
Component: **Resistor**
Value: **470k Ω**
Quantity: **1**
Designators: **R6**

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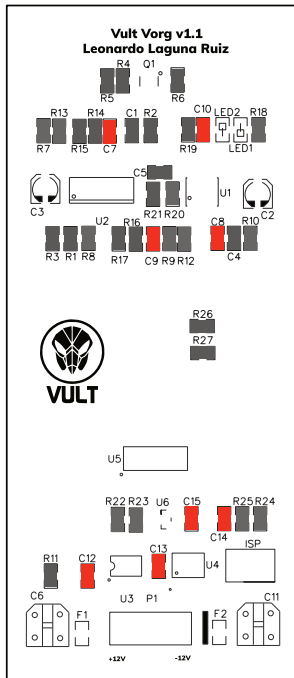
Component: **Capacitor**
Value: **1nF**
Quantity: **2**
Designators: **C4, C5**

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Component: Capacitor
Value: 4.7nF
Quantity: 1
Designators: C1

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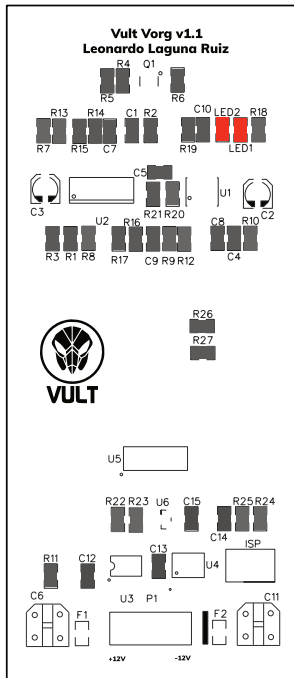
Component: **Capacitor**

Value: **100nF**

Quantity: **8**

Designators: **C7, C8, C9, C10, C12, C13, C14, C15**

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Component: **LED**

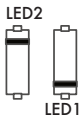
Value: -

Quantity: **2**

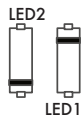
Designators: **LED1, LED2**

Notes: The LEDs must be placed reversely.
The actual placement does not matter as long as the marks are on the opposite side.

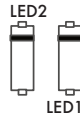
Look for the mark at the bottom of the LED.



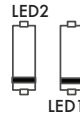
OK



OK



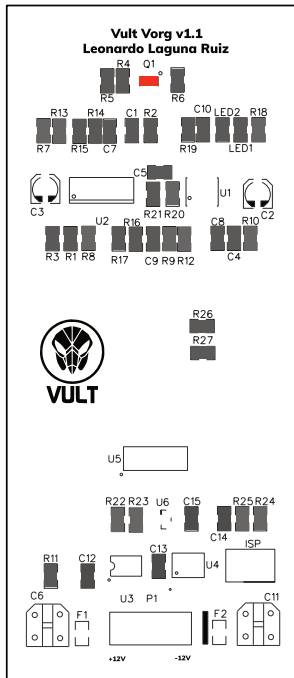
ERROR



ERROR



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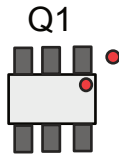
Component: **Transistor pair**

Value: **BCM857**

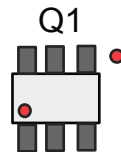
Quantity: **1**

Designators: **Q1**

Notes: Look for the mark in one of the corners of the package. Make sure it matches the orientation. The mark is tiny, you have to use a magnifying glass.



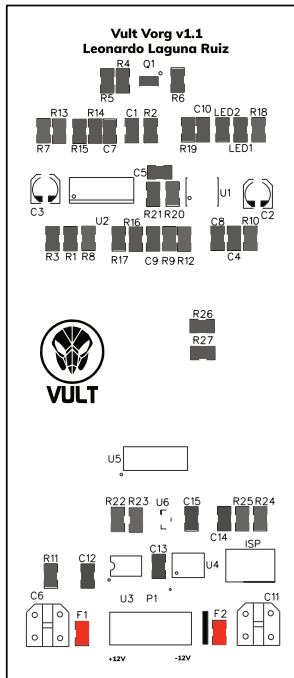
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ERROR

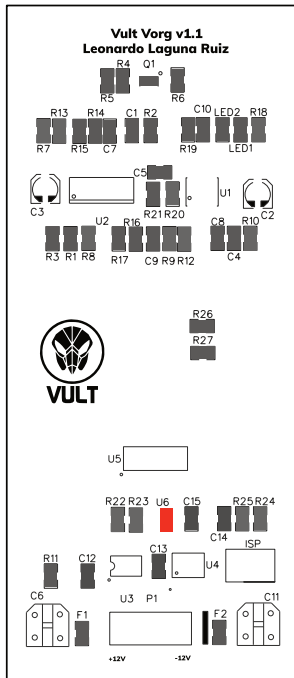


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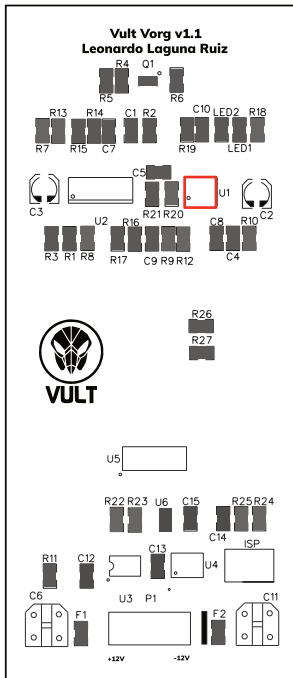
Component: **Ferrite**
Value: -
Quantity: **2**
Designators: **F1, F2**

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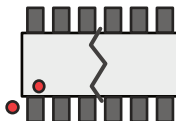
Component: Regulator
Value: TLV7605
Quantity: 1
Designators: U6

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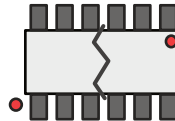


Component: IC
Value: TL074
Quantity: 1
Designators: U1

Notes: Double check the orientation. Look for the mark in the IC package

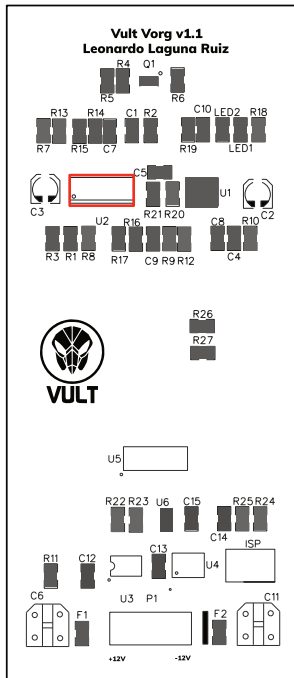


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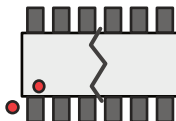
ERROR

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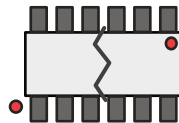


Component: **IC**
Value: **LM13700**
Quantity: **1**
Designators: **U2**

Notes: Double check the orientation. Look for the mark in the IC package

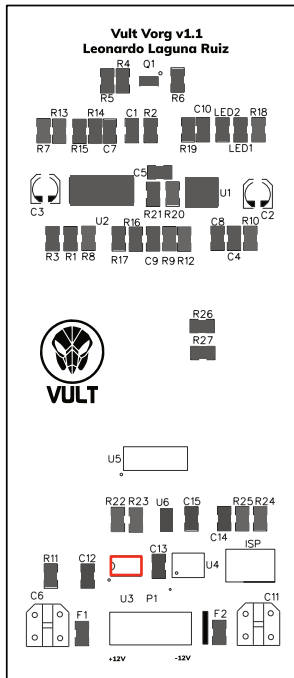


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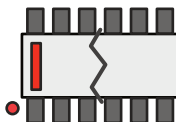
ERROR

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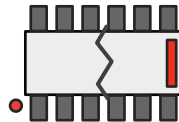


Component: **IC**
Value: **TL072**
Quantity: **1**
Designators: **U3**

Notes: Double check the orientation. Look for the mark in the IC package

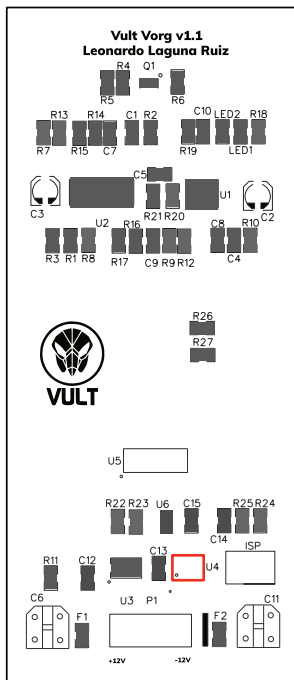


OK



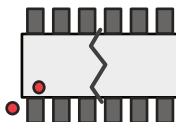
ERROR

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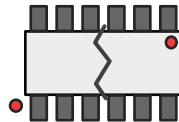


Component: **IC**
Value: **ATTINY85**
Quantity: **1**
Designators: **U4**

Notes: Double check the orientation. Look for the mark in the IC package

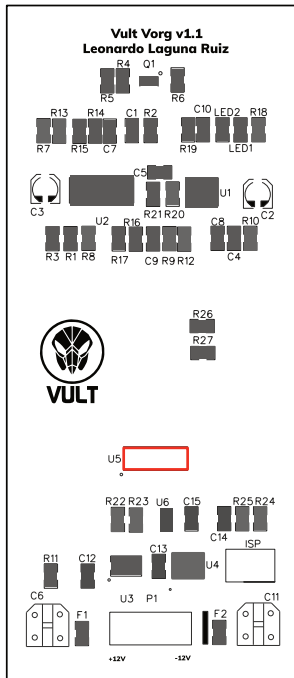


OK



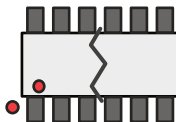
ERROR

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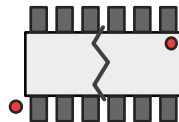


Component: IC
Value: DG403
Quantity: 1
Designators: U5

Notes: Double check the orientation. Look for the mark in the IC package

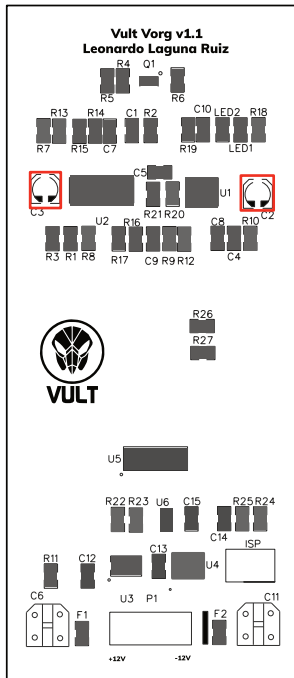


OK



ERROR

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Component: **Capacitor (Polarized)**

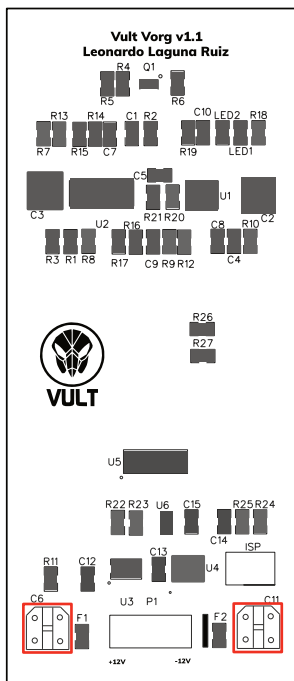
Value: **10uF**

Quantity: **2**

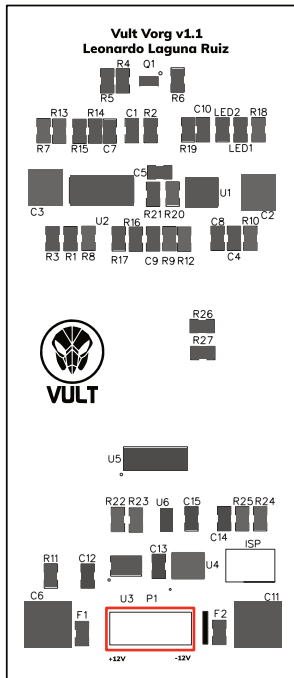
Designators: **C2, C3**

Notes: These capacitors are polarized, make sure they point to the direction marked in the silkscreen.

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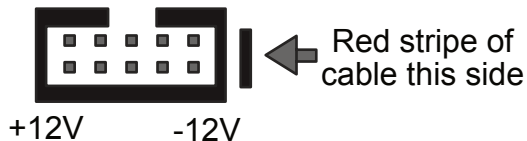
Component: **Power connector**

Value: -

Quantity: **1**

Designators: **P1**

Notes: The connector has a slot, make sure it matches the picture shown below.



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This is a good moment to check your board. Use a magnifying glass or a microscope to check that all the IC terminals are soldered and there are no bridges between the pins.

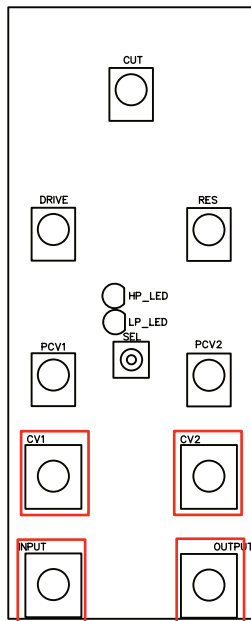
Use a multimeter to measure the resistance between +12V and ground and also from ground to -12V. The readings should be above hundreds of kilo ohms. If you have a low resistance, you may have a short circuit.

ASSEMBLING THE FRONT SIDE

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To assemble the front side, we recommend you to first place all components then the panel. Once you have everything in place, solder the components.

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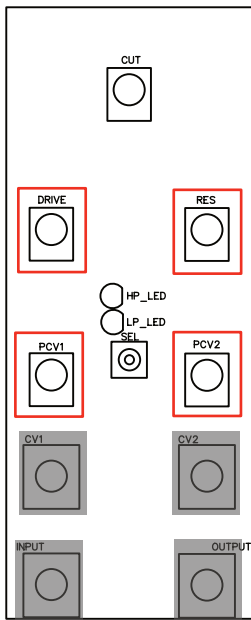
Component: **Jacks**

Value: -

Quantity: **4**

Notes: Make sure the jacks are correctly placed before soldering.

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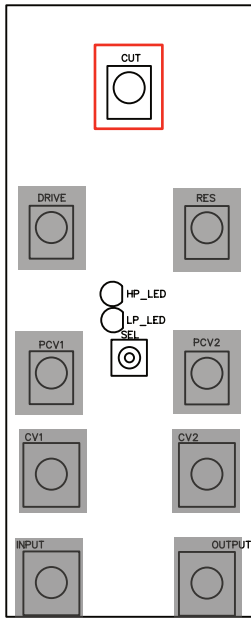
Component: **Potentiometers**

Value: **B100k Ω**

Quantity: **4**

Notes: Make sure the potentiometers have crossed completely through the holes and are aligned. Before soldering, check that the potentiometers can be turned without friction with the panel in place.

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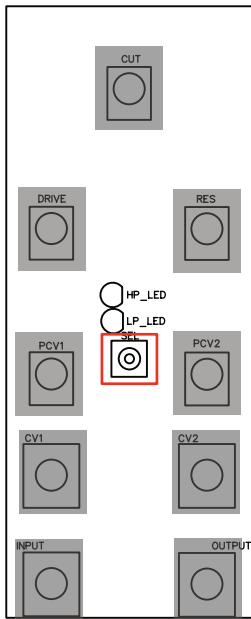
Component: **Potentiometers**

Value: **50k Ω**

Quantity: **1**

Notes: Make sure the potentiometers have crossed completely through the holes and are aligned.

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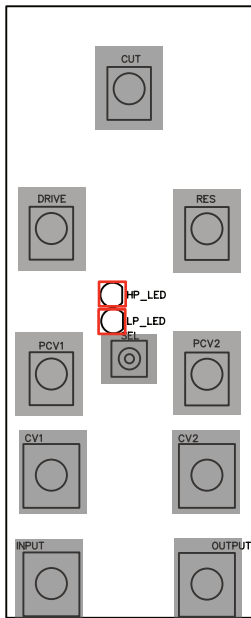
Component: **Push Button + Cap**

Value: -

Quantity: **1**

Notes: Place the switch cap before the putting the panel for the last time.

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Component: **Red LEDs**

Value: -

Quantity: **2**

Notes: The LEDs have a polarity. Make sure the flat side of the LED points to the correct direction.

Before soldering, make the LEDs go through the panel.



OK



ERROR

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Final Steps

One more time, check that you don't have any bridges between the component pins. Look carefully. All ICs are critical.

Make sure that you don't connect the cable backwards. Connecting it backwards will break the module. Check that the red stripe of your cable has -12 volts with a multimeter.

If you think that everything is correct, then power your module.