

ZORGVERDRIVE DELUXE KIT MOUNTING INSTRUCTIONS



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Important notice.

This DIY kit is not that easy and require a bit of knowledge. If you're a beginner, you're likely to go into some hardcore problems and should try easier kits before. There's a debugging chapter that you can check in case of emergency, but:

- I cannot be held responsible of any malfunction or a component burning. This board has been tested and I use it in when I build pedals myself. It's 100% functioning when everything is done correctly.
- The debugging chapter cannot take in account all the problems you may reach. (Murphy's law you know....)
- I won't refund any malfunctioning kit that has been mounted.
- Here's what you should do in case of problems:
 - 1- Keep calm.
 - 2- Check another time that each component is at it's right place and all the solders are ok.
 - 3- Check the debugging chapter at the end of this document.
 - 4- Ask for help in your surrounding family or friends. Someone who can see, plug, check and test your board is more valuable than someone on a forum or mail 10000km far.
 - 5- Check the freestombox forum, and ask for help if needed. When asking for help be sure to give the maximum of informations:
<http://freestompboxes.org/viewtopic.php?f=7&t=27124&sid=c0f7c639e6b023fe5b67fc71c54b9590>I may reply to you on freestombox, I check it sometimes.
- 6- Mailing me is the very last thing you will do. And if you do, be sure to write the maximum of informations I need to answer you. Yes you may add pictures if you think it's relevant. Mails with only "My kit is not working" will be either ignored, either replied with a kind of passive aggressive tone, if not clearly aggressive... After all this is "Do it YOURSELF" and not "Zorg, can you do it for me please?", and I'm always under a heavy load of work, so please spare me at the maximum!!!
- Any feedback on this document is welcome. If there's something missing, something you don't understand, something you're not sure, if you reworked the document with better explanations, pics and pink elephants, grammatic or ortografik faults, please feel free to mail me.

What's in the kit?

This is all you must find in your Zorgverdrive Deluxe kit:

Reference	Value	Units
+9V1, BOOST1..Boost4 GND1..GND4 in1 Out1 P4	Socket SIL 14 pins	14
BASS1	Potentiometer A5k (log)	1
C1	3,3nF	1
C2	10uF	1
C3	100uF	1
C5	1uF	1
C7	10uF	1
C8	22pF	1
C11,C12,C14,C15	100nF	4
C13	0.01uF	1
C16,C17	3.3nF	2
D1	DIODE 1N4001	1
D2,D3	LEDs green	2
D4,D5, D10	Ge 1N34	3
D6..D9	1N4148	4
GAIN1	Potentiometer A500k (log)	1
MID1	Potentiometer B100k (lin)	1
P5	ICL7660S	1
Q1,Q2	MOS_N 2N7000	2
R1	1M	1
R3	1.5k	1
R4	2k	1
R5	1k	1
R6	100 ohms	1
R7..R12	1k	4
R13	10k	1
R14	470k	1
R15	10k	1
R16	470k	1
SW1	CODING_SWITCH	1
SW2 SW4	Switch DPDT on-on	1
SW3	Switch SPST on-on	1
TREBLE1	Potentiometer A50k (log)	1
U1	TL072	1
U2	OPA2604	1
VOLUME1	Potentiometer A10k (log)	1
GPot1	Trimpot 1k	1
BPot1	Trimpot 10k	1
Jacks		2
DC jack		1
Led socket		1
Bypass led 2 colors		1
Knobs		6
PCB		1
Box 1590BB		1
3PDT Footswitch		2
Cable, heat shrink tube, 10 cm Window insulator		1

Components numbers in the left column, C1, R1 etc. are tied to the PCB's marks.

Rotating SW1 switch can be found here: <http://www.musikding.de/Print-rotary-switch-1P4T>

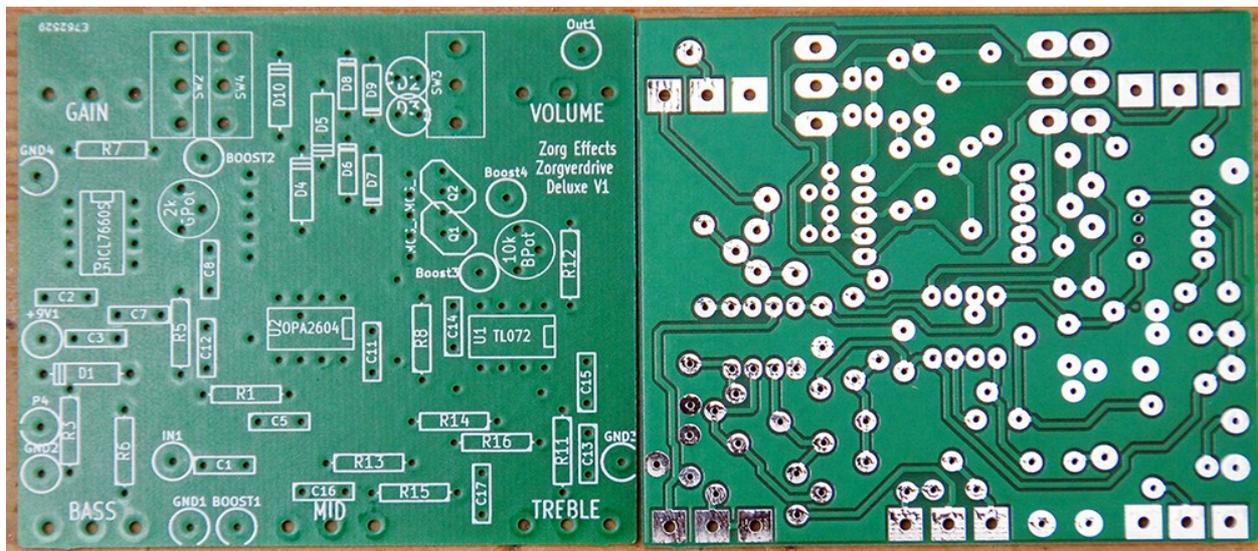
What you'll need.

The following tools are needed to build your Glorious Basstar pedal:

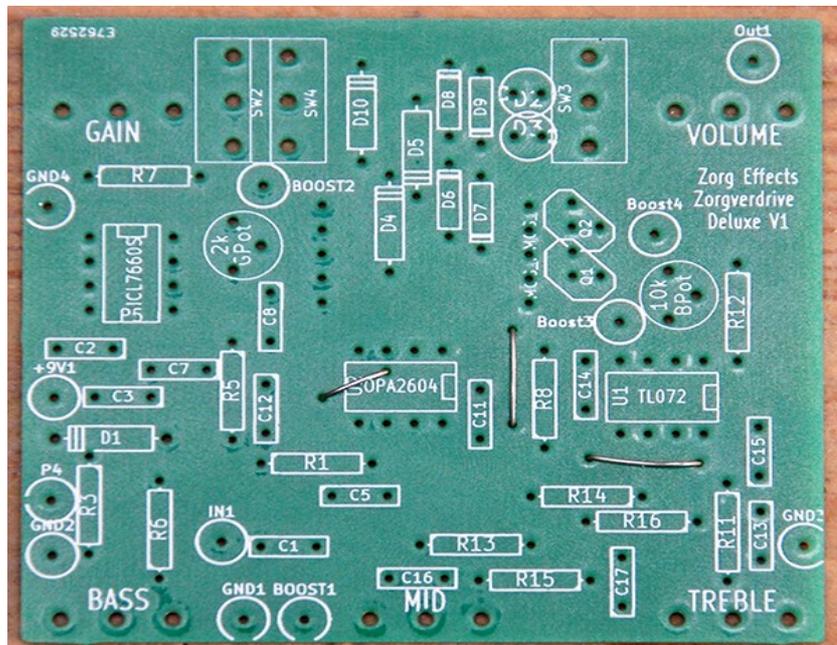
- A soldering iron.
- A un-soldering pump.
- A voltmeter/ohmmeter.
- Pliers to cut wire and remove the wire sheath.
- Pliers to screw nuts.
- A cruciform screw driver.
- And eventually wrenches.
- A 9v dc power unit, center negative.
- It's best to have an oscilloscope, and a frequency generator but not mandatory.

Soldering on the pcb.

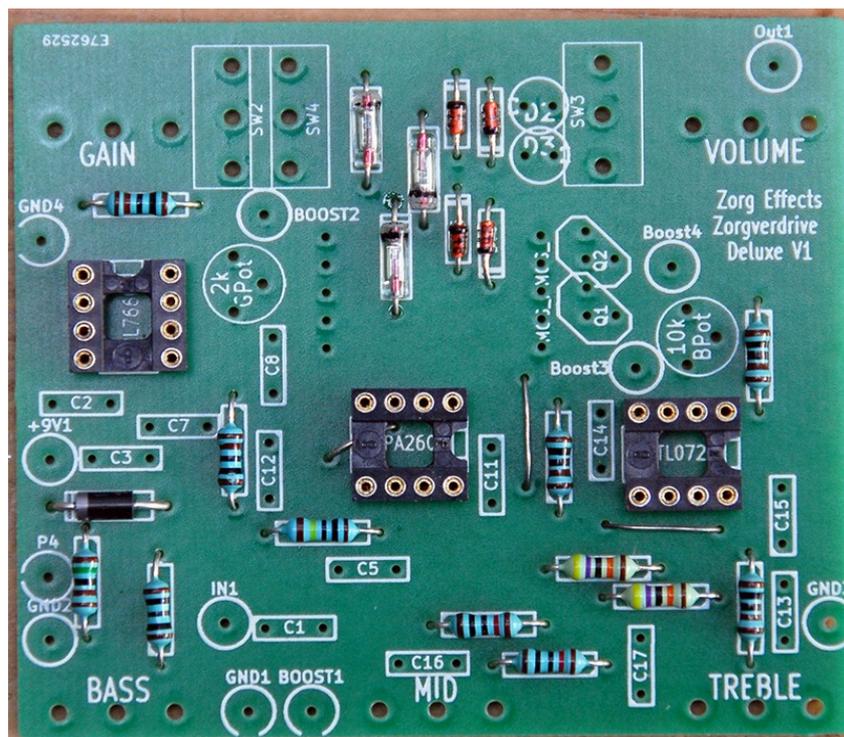
This is the PCB (Top/Bottom):



First let's solder wire jumpers. You wanna cut part of resistances legs to make them. There are 3 of them, as you can see here :

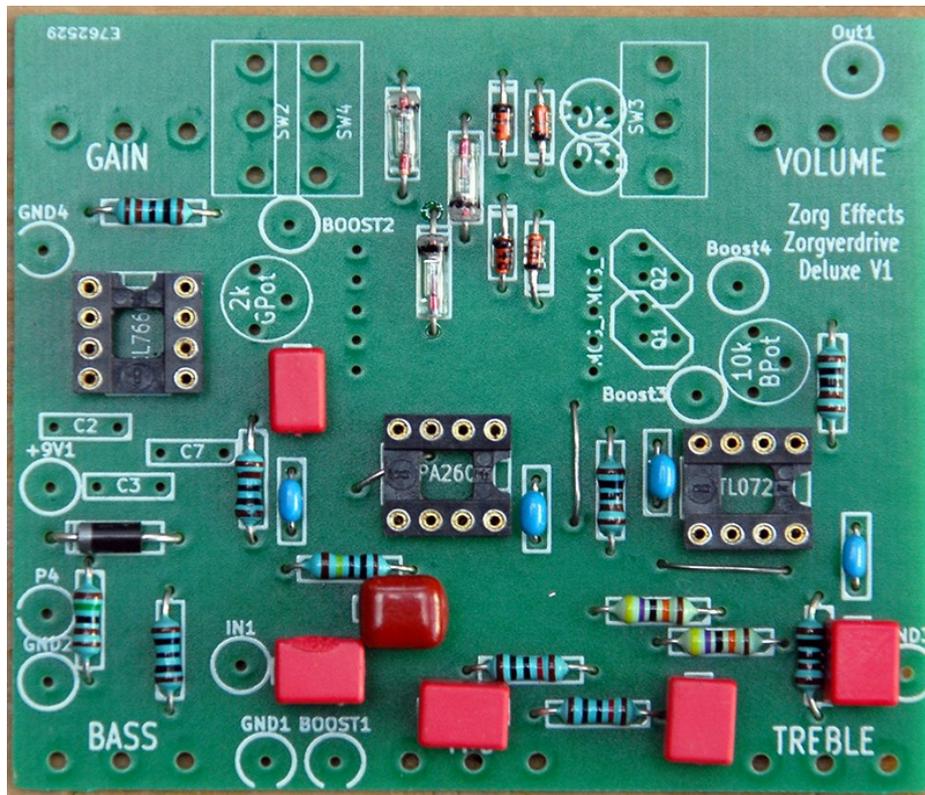


Then we're going to solder components from the smaller to the taller. First, diodes and resistances. You shall take care of the diodes positions. They MUST be on the same direction as on this picture :

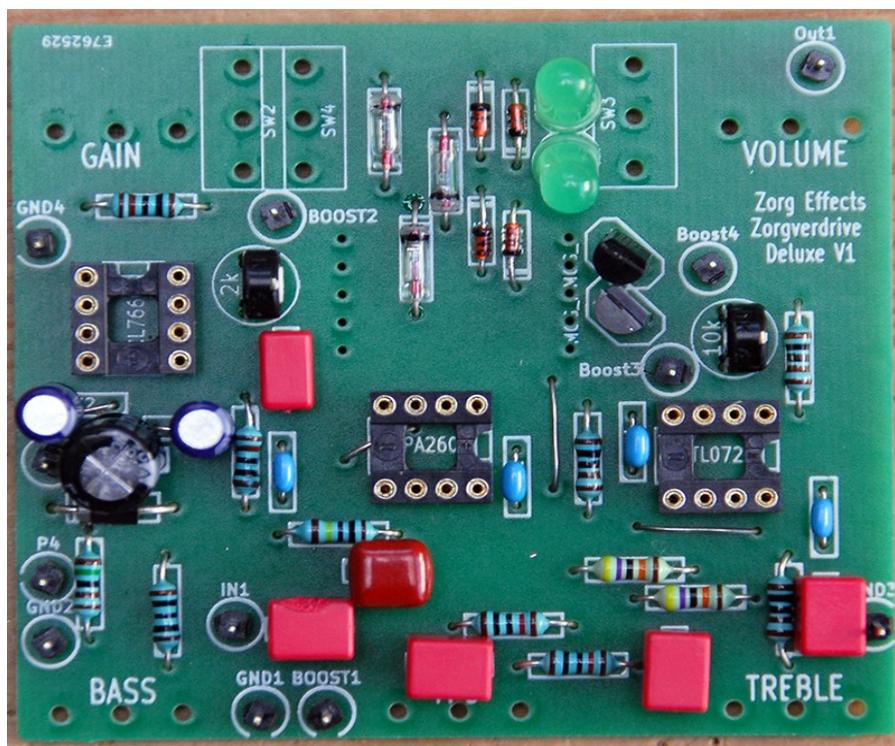


Then by order :

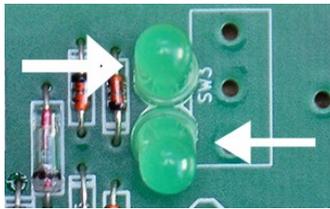
- IC sockets and blue 100nF capacitances which are decoupling caps.
- Panasonic and red Wima caps and DIP switches :



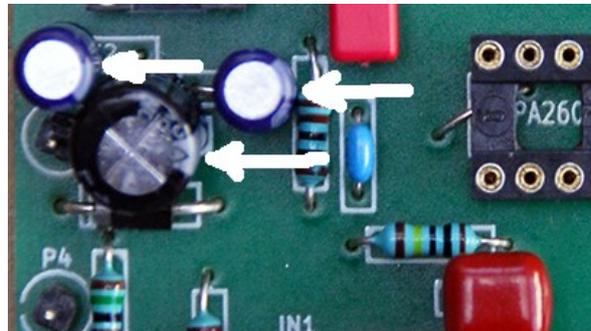
Cut the SIL14 in line socket to make soldering terminals for inputs/outputs (GND1,2,3, IN1 etc...). Then put the transistors, trimpots, leds and electrolytic caps :



Beware of the leds direction, flat side MUST be placed as specified on the board.



Also beware of the direction of electrolytic caps, they must be with the white negative (-) stripe as shown by the white arrows :



Now flip the board. We're going to solder the switch and pots on the other side.

Begin with the DPDT switch, then the SPDT then the rotary switch:



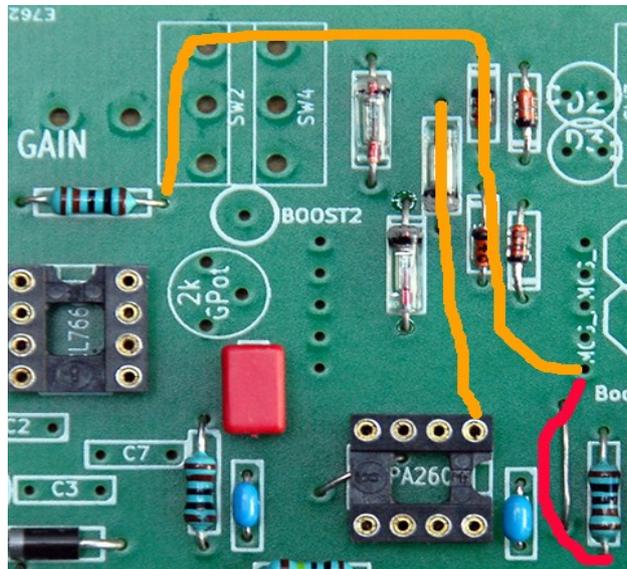
Soldering the switch is a bit shitty. First you should push it all the way into the board. If you let some space between the board and the switch, the problem will be that the height of the switch will be a bit higher than the pots height and this can somewhat be a problem when screwing the pots on the enclosure...

But doing so, there's little place left between the switch and the PCB to solder his legs. You'll need a fine soldering iron.

Then just after soldering, you must test that your solders are ok. To do so, use

your ohmmeter and check that the following path are not opened:

- Top left leg when you look on soldering side should be connected to ground.
- When switch is up D5 must connect to pin 1 of U1. Pin 1 of rotary switch must connect to R7. (orange path on the image below)



- When switch is down R8 must connect to pin 1 of rotary selector. (Red path on the image below)

Many of the problems with this board can come from a bad soldering on the DPDT switch.

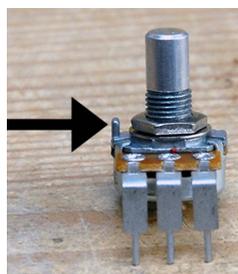
You can let a bit of space between the board and the SPDT switch so that it has the same height as the DPDT. Or you can use a washer to rise it up.

The rotary switch's legs must just outcrop the board on component side to be at the right height

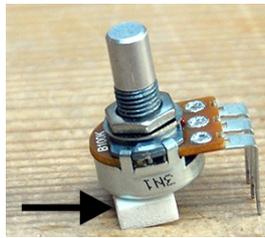
Now we're going to solder the pots on the same side of the switch.

First you'll need to prepare the pots:

Cut the little rectangular shaft next to the axis, you won't need it.

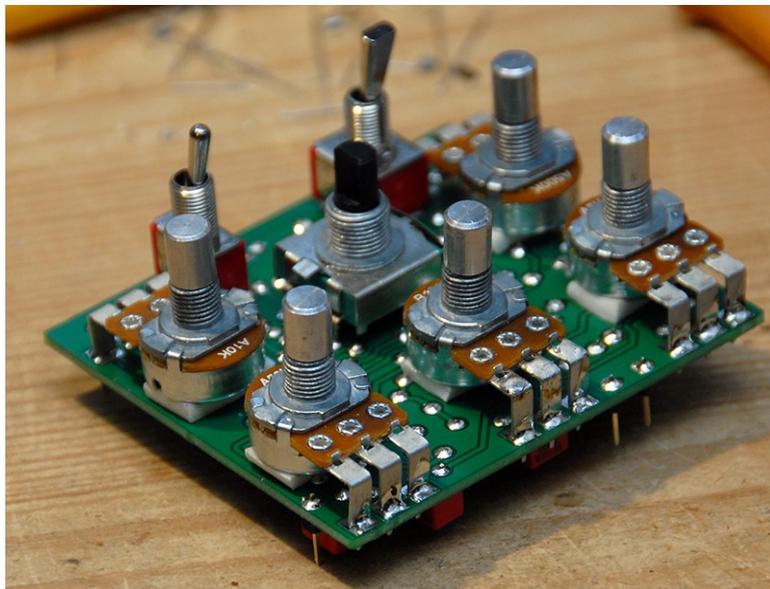


Stick 16mm length of window insulator under each pot. It's in order to prevent solders on the board to connect with the body of the pot and shortcut some circuits.



Now you are ready to solder them on the board. But don't go too quick! First put one of them and solder ONLY the middle leg. Then try to fit the card in the enclosure. It can happen that the pot is not in right the middle of the hole in the enclosure. If it's the case, you have only one solder to heat to move it a bit and rectify the position. Then add them one by one, soldering only the middle leg, and adjusting after each one to have them in front of their holes. At the end it should enter the enclosure without to much force (sometime a bit though).

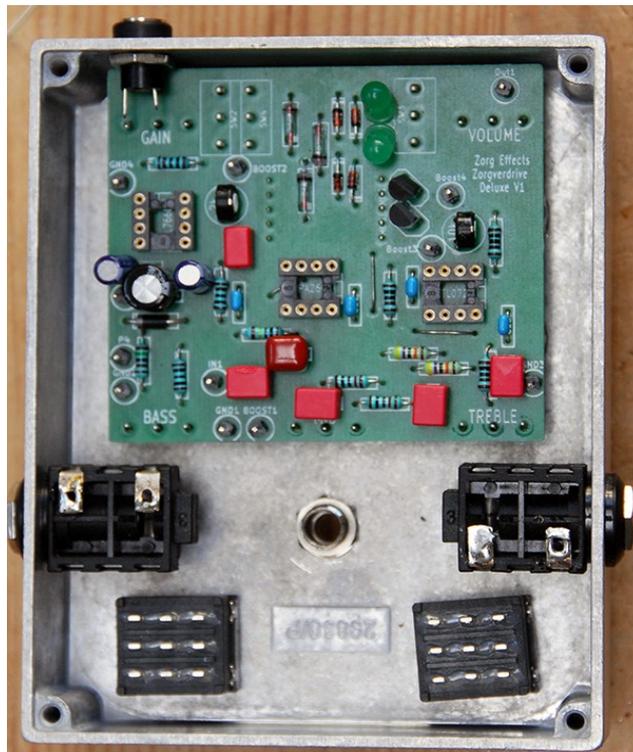
When it's fitting well in the enclosure with all pots, solder the remaining legs. You should now be proud to have that:



Now insert the card in the enclosure a screw the switch on the enclosure. We're going to...

Wiring the pedal.

So there you go with the card in the box:

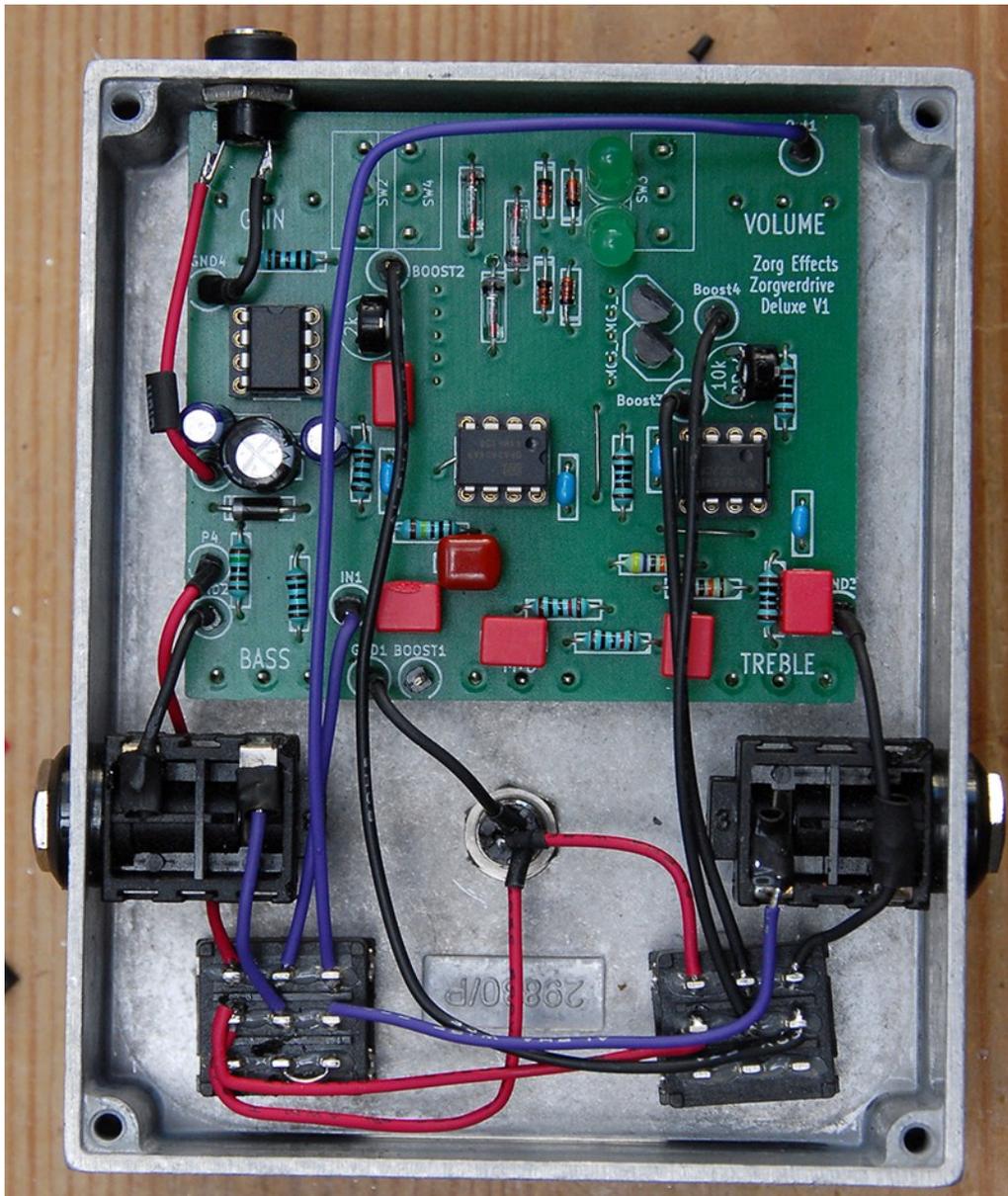


Now you can screw the audio jacks, led socket, footswitches and DC jack.

The led is bicolor with three legs. Center, longer leg is ground. Shorter leg is green color, and the last on the flat side is the red color.

(Notice another mistake: the DC jack is on the left, normally it should be on the right on your box)

We're going to wire that, like this:



Ok this is not very precise so here's a list of the wirings:

+ 9V1 goes to +9v of the DC jack (long leg if you wish to wire it center negative)

Gnd4 goes to gnd of the DC jack (short leg if you wish to wire it center negative)

GND2 and GND3 go to ground of the audio jacks.

GND1 goes to the led center leg (ground).

P4 goes to the left column leg, first line from the top of the switch "bypass".
The led of the green bypass LED (the shortest leg) goes on the footswitch "bypass" 2nd line, left column.

On 3rd row of footswitch "bypass" the right and the middle column should be connected (eg with a resistance leg).

From the middle column of footswitch "bypass" middle line, goes the connection to the input jack.

From the right column of the footswitch "bypass" the middle line connection

goes to the output jack.

In1 goes to the middle column, upper connection of footswitch "bypass".

Out1 goes to the right column, upper connection of footswitch "bypass".

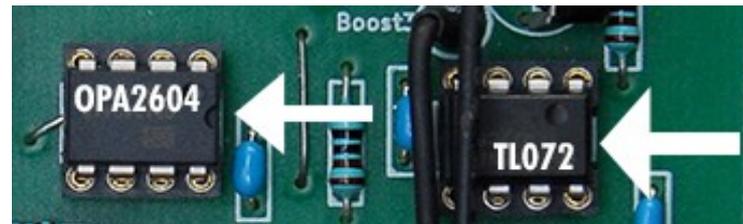
Leg of red LED (flat side) goes to footswitch "more" left column, top line.

The leg of footswitch "more" left column, middle row goes on the bypass footswitch, left column, middle row.

Boost3 and 4 must be connected to the footswitch "more" middle column, top and middle rows.

Boost2 must be connected to footswitch "more" right column, middle row.

The leg of top line right column of footswitch "more" must be connected to ground.



Important: Use the eat shrink tube to strengthen and protect all your wire connections (on the board and on the connectors).

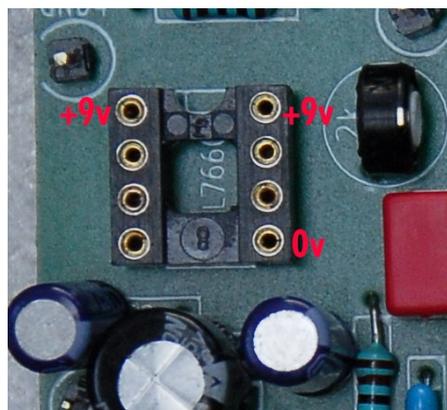
You're ready to plug your Zorgverdrive Deluxe and...

Test the board.

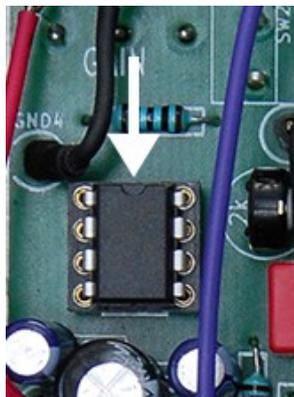
Now don't put the ICs in the box. First we're going to test the power supply.

Step 1: connect your 9v DC power unit to the DC jack. Switch on/off your footswitch. The led MUST also switch on and off. Actions on the more switch will change the led from green to red If not there's likely to be a bad connection somewhere... (See "debug" paragraph)

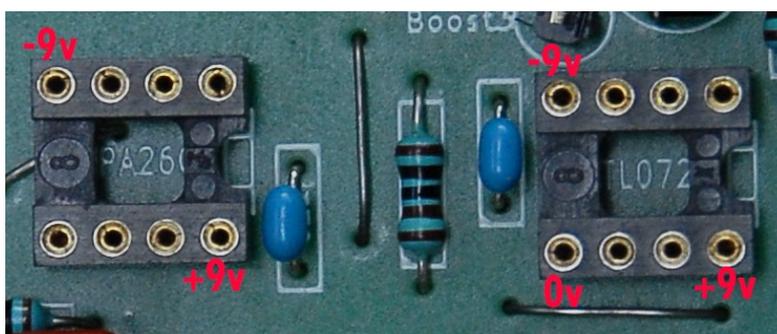
Step 2: check the following voltages with a voltmeter on the ICL7660s socket.



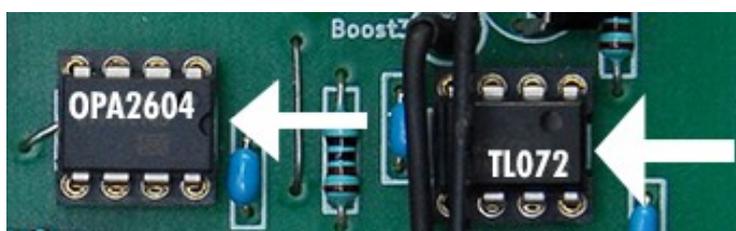
Step3: if step 2 is ok, add the ICL 7660scpa in his socket. Be careful of the orientation or you'll blow it up.



Then check the following voltages on U2 and U1 (-9v values might be a bit lower, -8v will be ok too):



Step 4: insert the TL072 and OPA2604 in their sockets.



If you made everything fine, the Zorgverdrive should be working now. Plug in your favorite instrument and rock it! (And then screw all the pots screws as well as the knobs).

If this is not working you're good to read the...

Debugging chapter.

First, voltages!

If at step 2 of tests chapter you don't have 9v voltages on the 7660 socket, check:

- That your DC power unit is working.
- That the connections between the plug and the board are ok.

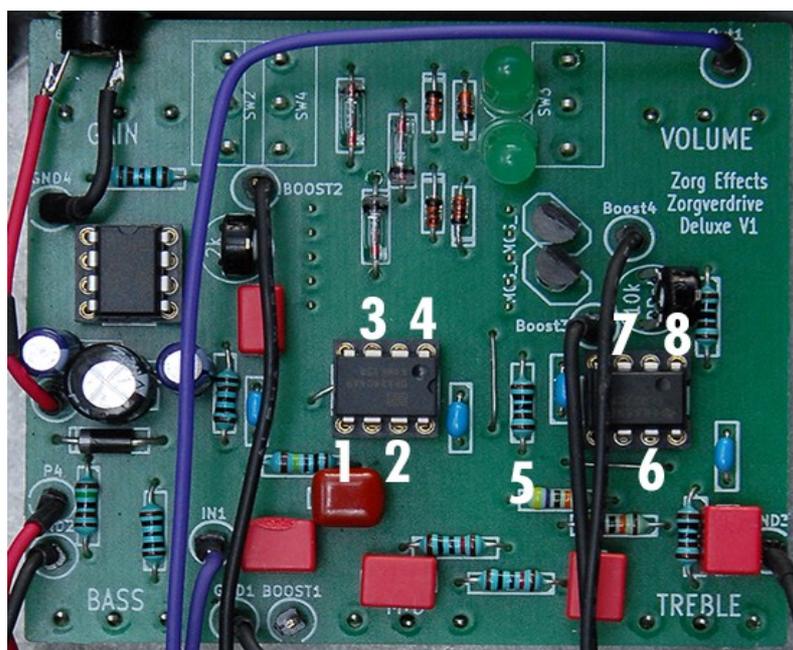
If at step 3 of tests chapter you don't have -9v voltages on the U2 or U3 socket, remove the DC power immediately. Check the temperature of the ICL7660s.

- If it's hot, check the IC and electrolytic caps directions.

- If it's cold, check that you've around -9v on pin 5 of the ICL7660, if not, it's likely to be dead. If there's between -7v and -9v it's ok. If there's between -2v and -7v it's strange, check that all components are at their right place and without shortcuts in between.

No or poor audio? (Even with all volume pots at 100%?)

You'll need an oscilloscope and a frequency generator. Send a 400Hz sin wave in the pedal input. Then check the tests points below for the sin wave. They are in order of signal flow:



- 1- This is the input. If you have no signal here, there's certainly a bad connexion on your wiring.
- 2- output of the input buffer. No signal at that location means your OPA2604 may be dead.
- 3- Output of the high pass filter. If there is no signal at this location there is a trouble with your high pass filter.
- 4- Output of the gain stage. No signal at this point: check your solders of the 3 switches on the card or the OPA2604 may be dead.
- 5- Input of the medium filter stage.
- 6- Output of mid filter. If there is no signal at this point there is a problem with your mid filter or your TL072 may be dead.
7. Input of the output buffer. If there is no signal at this location there is a problem with your low pass filter.
- 8- Output of the output buffer. No signal at that location means your TL072 may be dead.