Document revision 1.1 – Last modification : Oct 24, 2024

TRUE GRIT Assembly guide

Safety warning

The kits are main powered and use potentially lethal voltages. Under no circumstance should someone undertake the realisation of a kit unless he has full knowledge about safely handling main powered devices.

Please read the "DIY guide" before beginning.

Print or open the following documents:

- TRUE GRIT Schematics
- TRUE GRIT Components layout
- TRUE GRIT Parts list

Follow this guide from item number 1 till the end, in this order. The assembly order is based on components height, from low to high profile, in order to ease the soldering process : The component you are soldering is always taller than the previously assembled ones and it is pressing nicely against the work area foam.

Soldering

All the PCB holes are metallized. It means the connection between the top and bottom pads is already done. The parts must be soldered only from below (unless differently stated).

Use only small diameter solder, 0.5 or 0.7 mm, 1mm maximum. Use the minimum possible amount of solder. Bad joints are almost always caused by too much solder.

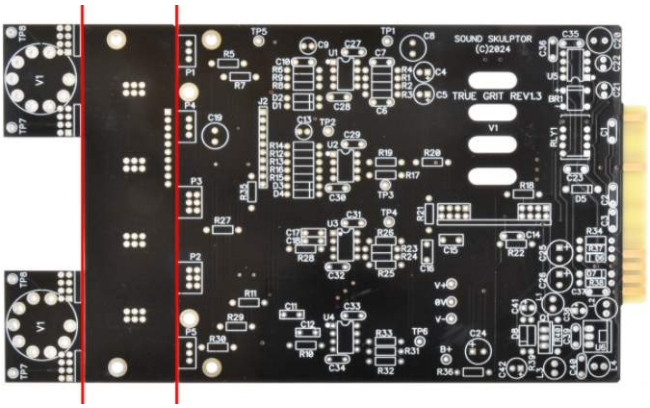
Cut the component leads and pins totally flush with the PCB after soldering. A too long tail could create an electric connection with the side plate.

Here are two excellent introduction to soldering videos:
http://www.eevblog.com/2011/06/19/eevblog-180-soldering-tutorial-part-1-tools/
http://www.eevblog.com/2011/07/02/eevblog-183-soldering-tutorial-part-2/

TRUE GRIT Assembly guide – Main PCB

1. PCB split

Split the PCB into 3 parts along the grooves. Use extra thin sandpaper to polish all the rough sides



TRUE GRIT Assembly guide – Main PCB

2. Resistors

The best method to select and install the resistors is the following:
1. pick a row of resistors in the resistors bag,
2. Measure one of the resistors with your DMM,
3. Look up the parts-list PDF for the closest value,
4. Check the color code and quantity for confirmation,
5. Use the search function on the Layout PDF page with the resistor value: All the corresponding resistors are highlighted,
6. Insert and solder.
(You can use the same method later, for the capacitors)

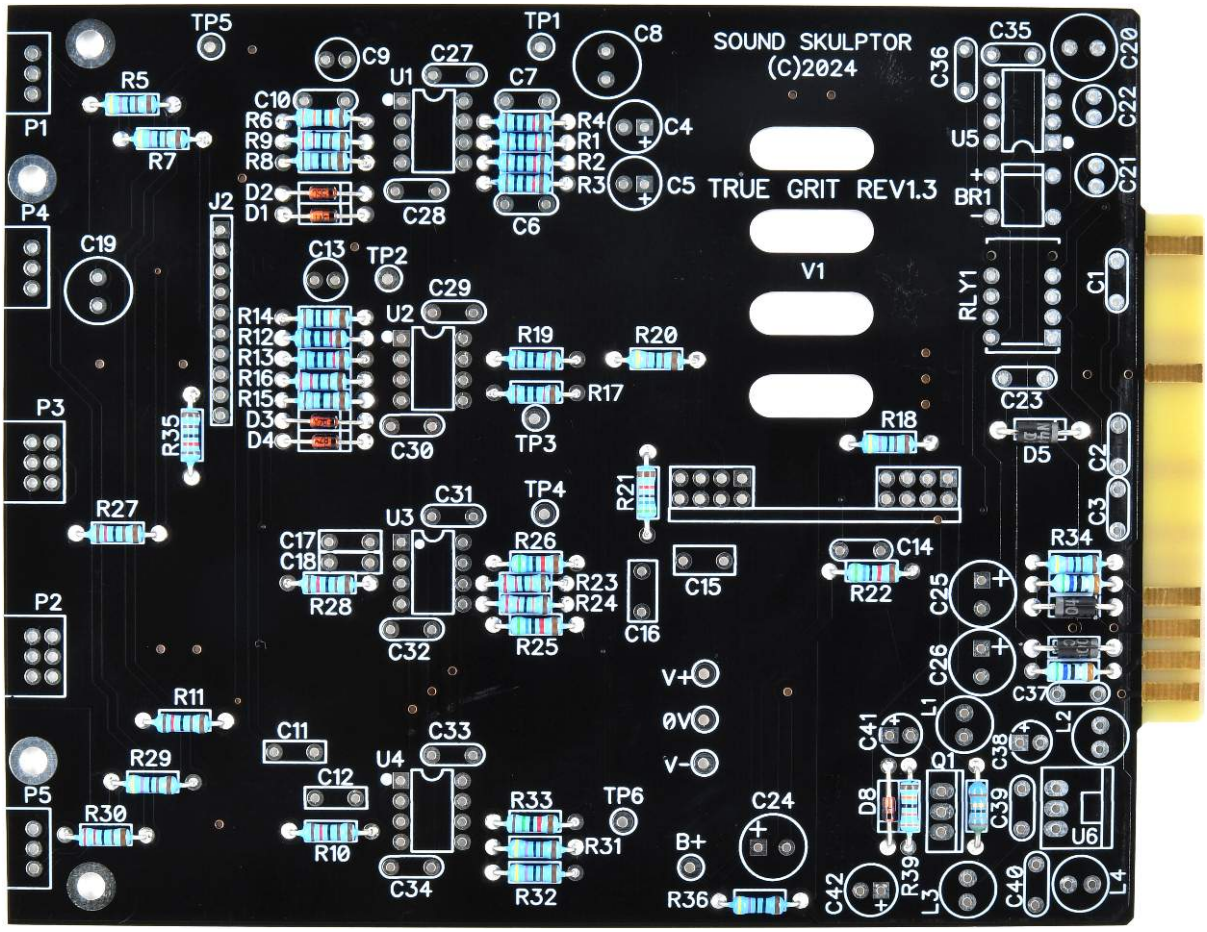
Add all the resistors of the main PCB (black identifier in the parts list).
Control the resistor values with a digital multimeter. Bend the leads at 0.4" with a lead forming tool.

Warning : It is very important to check the resistors value with a DMM because the color code can sometimes be ambiguous. For example 1kΩ (brown-black-black-brown-brown) can be confused with 110Ω (brown-brown-black-black-brown).

Warning : It is a good idea to protect the back connector golden fingers with some adhesive tape because if your iron slips and touches one, it will be immediately and irremediably polluted with tin.

3. Diodes

Add D8. Use a magnifying glass to verify the name and differentiate it from Zener diodes D1 through D4.
Add D1 to D4.
Add D5, D6, D7.
Warning : Make sure to respect the direction of the diodes which is marked by a ring on the component and a double line on the PCB marking.



TRUE GRIT Assembly guide – Main PCB

4. Ceramic capacitors

Add the ceramic capacitors.

5. Bridge rectifier

Insert and solder the bridge rectifiers BR1.
Warning: The direction of the bridge is identified by a beveled side and 2 signs + and – on the case and on the PCB.

6. IC Socket

Insert and solder the five 8 pins socket in.
Warning : Make sure to respect the socket direction, marked by a notch.

7. Relay

Add RLY1.
Warning: Make sure to respect the direction of the relays which is marked by a white line on the component and on the PCB marking.

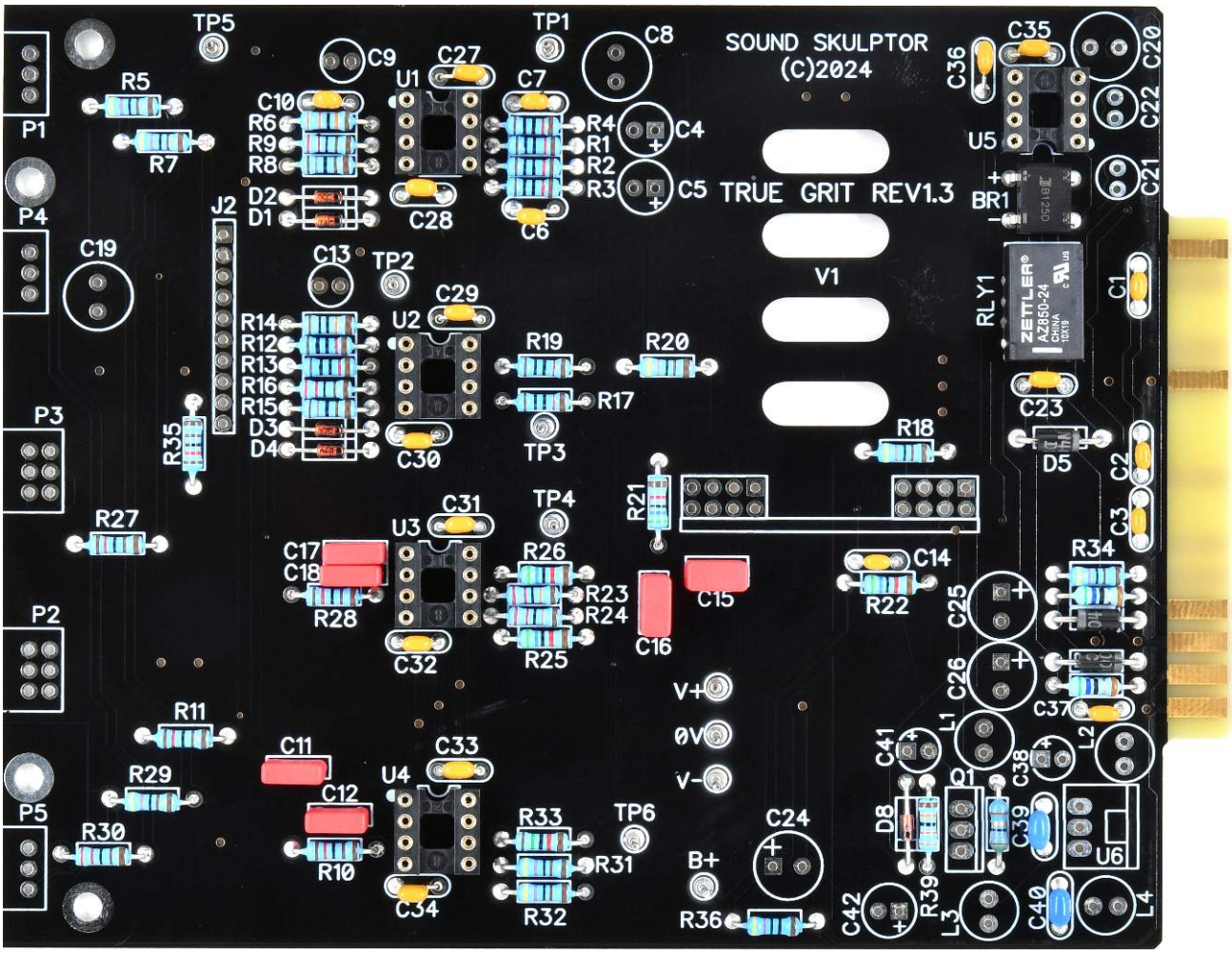
8. Small film capacitors

Add the small film capacitors C11, C12, C17, C18.

9. Test pins

Solder the 10 test pins TP1, TP2, TP3, TP4, TP5, TP6, 0V, V+, V-, B+.

TRUE GRIT Assembly guide – Main PCB



10. Potentiometers

Add P1 to P5.
Make sure to press them firmly onto the PCB. Solder the center pin, check the position and then solder the other pins.

11. Large film capacitors

Add the larger film capacitors C15 and C16.

12. Connector J2

Add J2. Solder one pin, check verticality then solder the other pins.

13. Radial inductors

Add L1 to L4.

14. Non polarized electrolytic capacitors

Add C9, C13, C21, C22, C8, C19, C20.
These caps are not polarized and can be inserted in any direction.

TRUE GRIT Assembly guide – Main PCB

15. Electrolytic capacitors

Add the electrolytic capacitors C38, C41, C4, C5, C42, C24, C25, C26.
Warning : The +lead must go into the +hole. Do not reverse (they may explode!)

16. U6

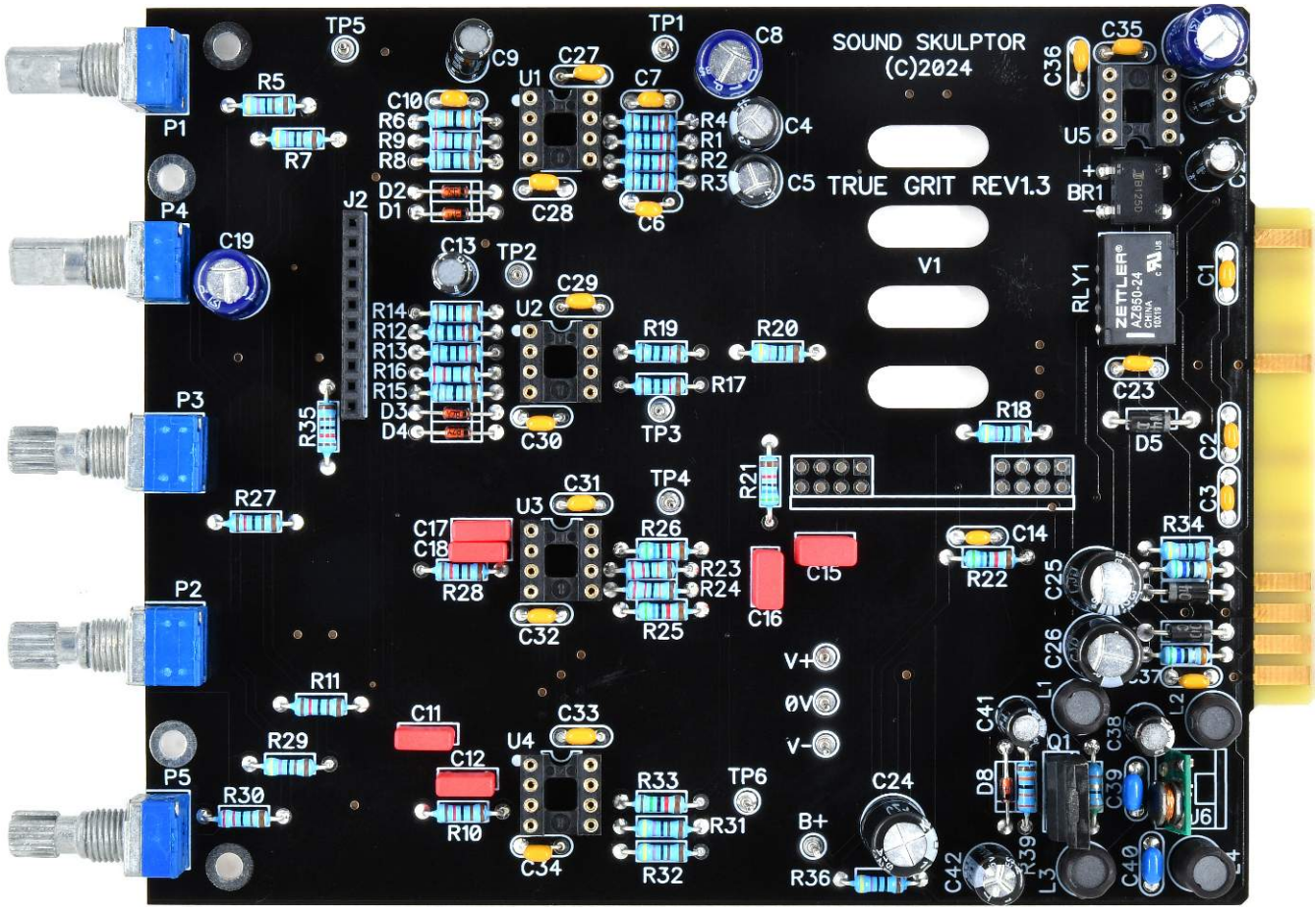
Insert and solder U6.

The small coil should face towards C39.

17. Q1

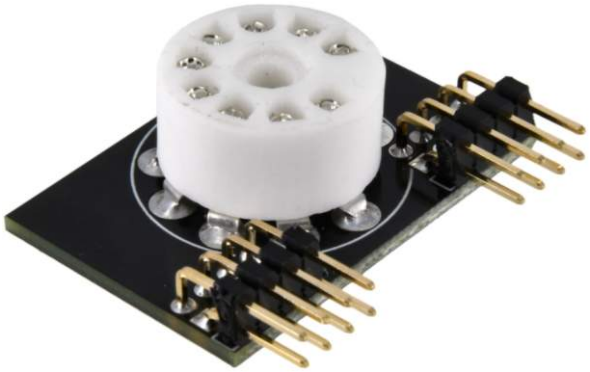
Insert and solder Q1.

Warning : The direction is marked by a double line at the back of the transistor. The marking must face towards R39.



TRUE GRIT Assembly guide – Main PCB

18. Tube support PCB



Solder the two 2 x 4 pins 90° pin headers. Solder one pin first, make sure the header sits flat on the PCB, then solder the other pins.

Add the 2 test pins in TP7 and TP8.

Solder the tube socket and cut the pins flush.

Insert the tube PCB into the main PCB. Solder one pin, check the verticality then solder the other pins.

19. 3D nuts

Attach the two 3D nuts below the PCB with 2 M3x6mm screws.

20. Integrated circuits

Insert the 5 integrated circuits U1 to U5 into their respective sockets.

Warning : U5 is different from the others. The IC's have a direction identified by a notch or a dot.

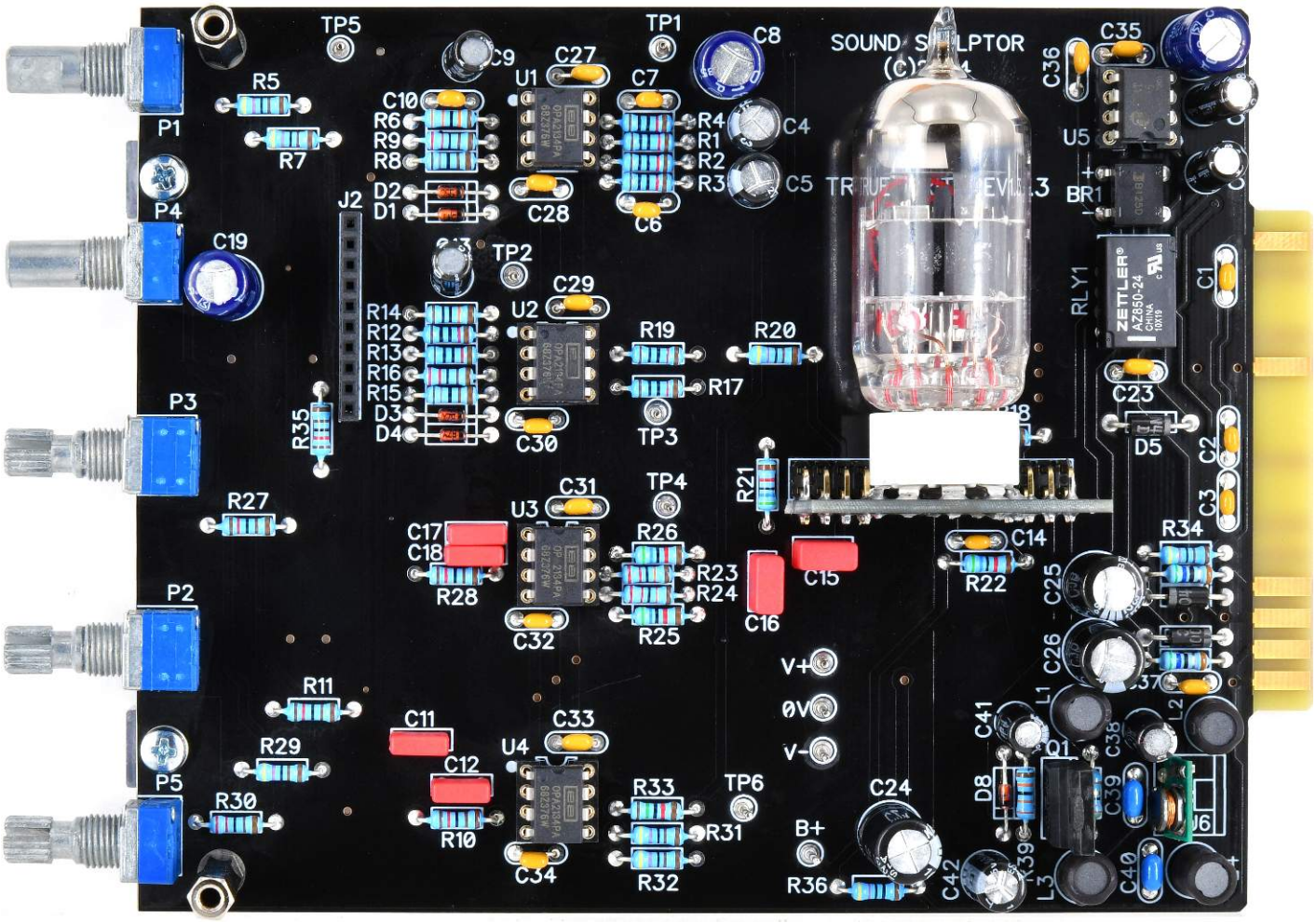
21. Tube

Carefully insert the tube into the noval socket.

22. Fem/fem spacer

Attach 2 M3x25 mm spacers on the component side, with 2 M3x6 mm screws, to the two left corners of the PCB.

TRUE GRIT Assembly guide – Main PCB



23. Visual check

Check that all component leads are cut short. Brush the solder side with a hard tooth brush to remove any remaining solder bits.

Make a full visual check. Any missing component on the board?

When everything looks correct, proceed with the other board assembly.

TRUE GRIT Assembly guide – Top PCB

24. Push switches

Insert the caps to the push switches SW1 to SW4. Insert them flat on the PCB, in the correct direction and solder one pin. Check again the good position then solder the other pins.

The switch wit a red cap is SW4.

25. Connector J1

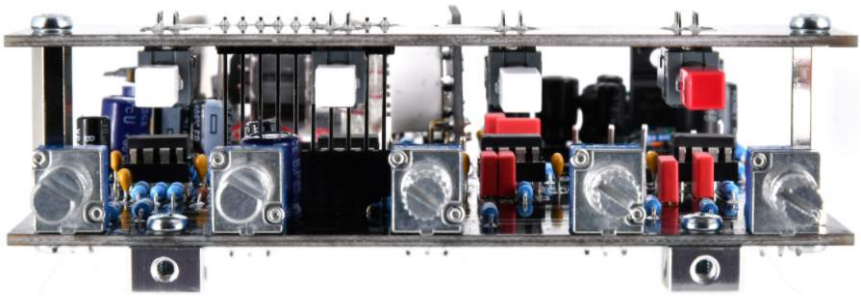
Add J1. Solder one pin, check verticality then solder the other pins.

TRUE GRIT Assembly guide – Top PCB

TRUE GRIT Assembly guide – Final assembly

26. PCB assembly

Insert J1 into J2 and attach the 2 PCB's together with 2 M3x6 mm screws.



27. Front panel

Insert the front panel onto the potentiometer shafts and secure them with their M7 nuts.

Add 2 black countersunk screws to complete the panel assembly.

28. Knobs

Attach the 5 knobs.

29. Power on

Turn on the power and check that the various controls are working.

30. Congratulations

You're done!

TRUE GRIT Assembly guide – Final assembly