Document revision 1.1 – Last modification : 08/01/15

Stereo Tape Simulator Assembly guide

Please read the "DIY guide" before beginning.

Print or open the following documents :

- STS Schematics
- STS Components layout
- STS 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.

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Components numbering

The component names for the left channel are followed by an **L**. The component names for the right channel are followed by an **L**. Example: **R1L** and **R1R** have the same value.

The components that are common to both channels have no suffix, like C44, C47.

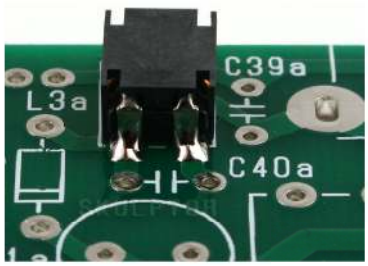
There are 2 options for the PSU:

- The standard components for the kit have an **a** suffix, lake L3a, C40a.
- The components for the optional PSU have a **b** suffix like U6b, C48b

Only one of these 2 options must be wired: **a** or **b** but not both. The present document shows the standard (**a**) option.

1. Common mode inductor L3a

Tin the 4 contact surface of the PCB by spreading a thin layer of solder on it. Next, tin the 4 corresponding surfaces on the inductor. Place the inductor in the right position and warm up one contact from the side, while pressing the inductor down, until the solder melts. Check the position then heat the other contacts while adding some fresh solder until a good joint is done.



2. Diodes

Add D1, D2 (L & R) et D5a. Use a lead forming tool to cleanly bend the leads at 0.4". D3 et D4 will be added later, with the transistors.
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.

3. Resistors

Add R1 to R49 (L & R).
Control the resistor values with a digital multimeter. Bend the leads at 0.4" with a lead forming tool, except for R29L and R29R which are bended at 0.6".

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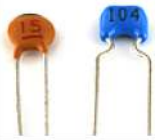
4. IC Socket

Insert and solder the 8 IC sockets. Do not insert IC's at this time.
Warning : Make sure to respect the socket direction, marked by a notch.

5. Test pins

Solder the 11 test pins TP1, TP2, TP3 (L & R), 0V (x3), V+, V-.



6. Ceramic capacitors

Add C17, C21, C29 (L & R), C39a, C40a.

7. Film capacitors

Add C12, C1, C2, C37, C38, C25, C27, C11, C22, C26, C3, C6, C33, C36 (L & R).

8. DC-DC converter

Insert and solder U5a.

9. Connectors

Solder the jumper headers CN4 L & R. The kit offers 5 pins connectors for availability reasons but 4 pins could be enough.
Warning : Check the position of the latch, it must not be mounted backwards.

10. Electrolytic capacitors

Add C7, C8, C9, C10, C13, C14, C15, C30, C4, C5, C18 (L & R).
Solder one lead first, adjust verticality then solder the second lead.
Warning : The +lead must go into the +hole. Do not reverse (they may explode !)

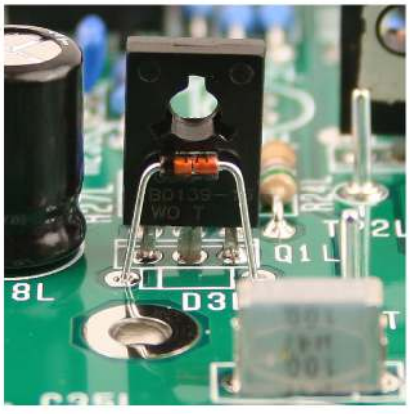
11. Transistors

Add transistors Q1 and Q2 (L & R). Insert as far down as possible, solder one pin, adjust the verticality, then solder the two other pins.

Warning : Watch out the direction, the metal tab at the back of the device is symbolized by a double line on the PCB marking.

12. Diodes D3, D4 (L & R)

Bend the legs of diodes D3 and D4 at 90°, at the edge of the diode body. Insert the diodes at about 6mm from the PCB, the diode body resting against the transistor case. Solder then glue the diode and transistor together with a drop of super-glue.



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13. DC-IN connector

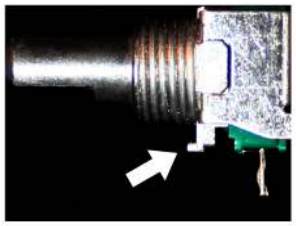
Insert the CN1a connector. It must be firmly pressed against the PCB. Bend the pins towards the outside before soldering to increase mechanical rigidity.

14. Potentiometers

Important: It is necessary to start by breaking the positioning lug below the pot spindle. Use a small flat nose pliers.

Insert P1 and P2 (L & R). The position of the potentiometers is critical for a good front-plate matching. They must sit flat on the PCB.

Warning : P1 and P2 are different, don't swap them !
P1 is marked 10 3B, P2 is marked 10 3A.



15. Switches

Add SW1 and SW2 (L & R). The position of the switches is critical for a good front-plate matching. They must sit flat on the PCB. Press firmly the switch on the PCB and solder one of the front pins (housing). Check verticality and horizontality. Then solder the other pins.

Warning : SW1 and SW2 look the same but they are not ! SW1 is 3 positions, SW2 is 2 positions.

16. Inductors

Add L1, L2 (L & R), L4, L5, L6, L7.

17. Electrolytic capacitors (continuing...)

Add C16, C23, C24, C28, C31, C32, C34, C35 (L & R), C19, C20.

18. Simulation inductors

Add H1 and H2 (L & R) and solder the shield.

19. Electrolytic capacitors (the end)

Add C41, C42, C43, C44, C45, C46, C47.

20. XLR sockets

Add CN2 and CN3 (L & R). The position of the socket is critical for a good backplate matching. It must sit flat on the PCB. Press firmly the socket on the PCB and solder one of the centre pins. Check position then solder the other pins.

21. Integrated circuits

Insert U1, U2, U3 et U4 (L & R) into their respective sockets. You will need to bend the pins slightly inwards before inserting.

Warning : Make sure to respect the IC direction, marked by a notch.

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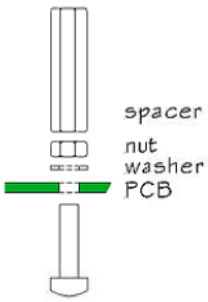
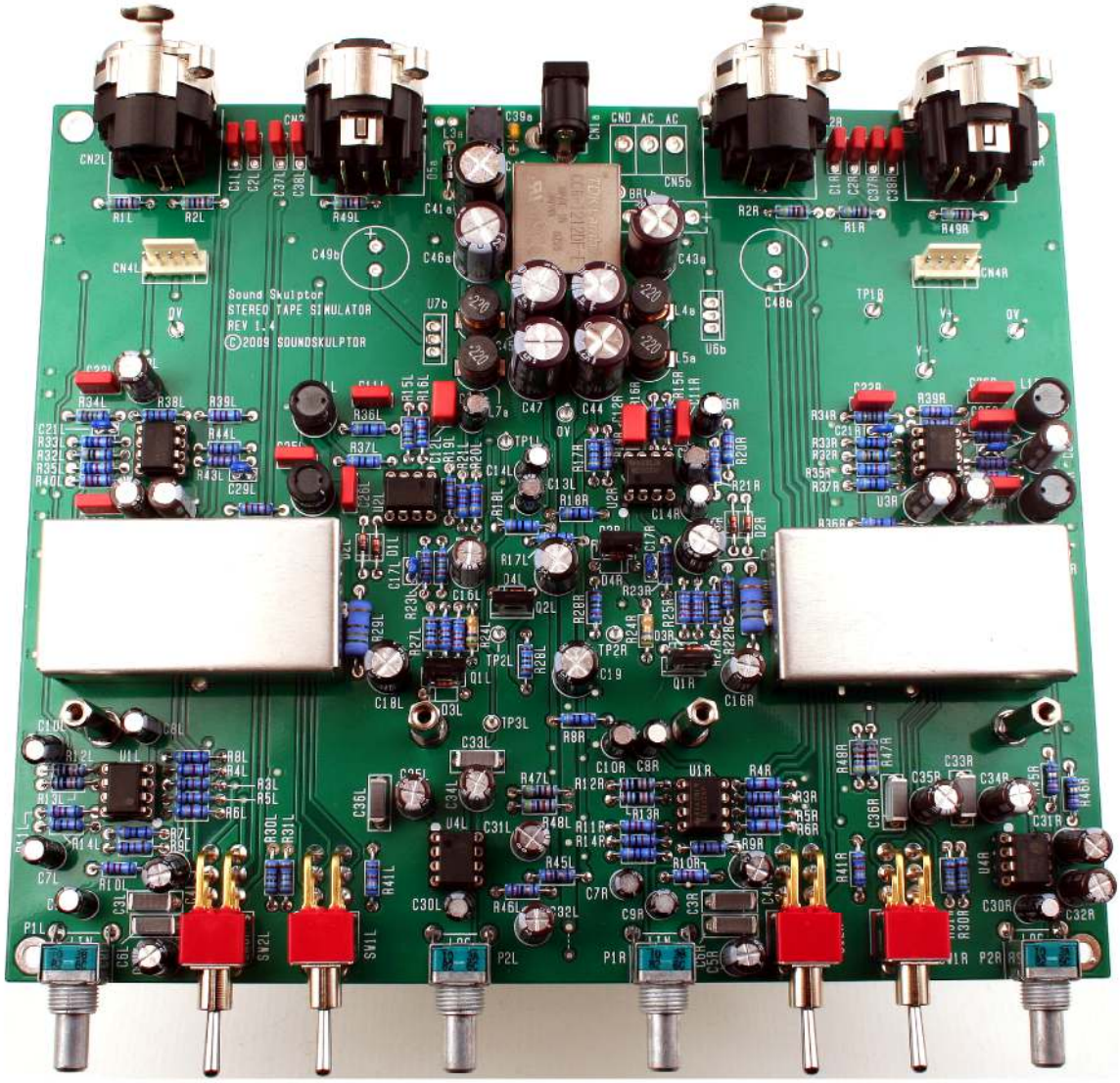
22. Vu-meters

Each vu-meter is sitting on 2 columns which are made of an M3x12mm screw inserted from PCB solder side, one metal washer, one M3 nut and one 20mm spacer. 2 M3x6mm screws secure the vu-meter on top of the columns.
After attaching the meters, plug their respective connector into CN4L (left) and CN4R (right).





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23. Checking

After your board has been stuffed, 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 ? Any remaining component in the box ?

24. Test

When everything is correct, your STS is ready for testing and setup. Please follow instructions in the "STS Setup Guide" document.

25. Case assembly

Assemble the front plate and the two sides of the case with four black M4 countersunk screws.
The internal face of the sides is the one with a single groove.

26. Top and bottom cover fixing nuts

Insert 2 nuts in the top and bottom grooves of both sides of the case (for a total of 8 nuts). They will be used to attach top and bottom covers.

27. PCB insertion

Insert the PCB into position then assemble the back plate with 4 black M4 screws.

Add the potentiometers screw using a 11mm socket spanner. Tighten moderately.

Add the 8 XLR fixing screws.

28. Knobs

Add 4 knobs on the potentiometer spindles. Tighten the fixing screws with a small screwdriver.

29. Closing the case

The top and bottom cover have a 5mm front fold that must be placed against the front pannel.

Place the bottom cover and secure it with 4 black screws.

Place the top cover and secure it with 4 black screws.

Stick four self adhesive rubber feet on the bottom of the case.

30. Congratulations, you're done !

VuM-16 Assembly guide

Please read the "DIY guide" before beginning.

Print or open the following documents :

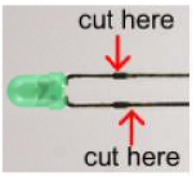
- VUM16 Schematics
- VUM16 Components layout
- VUM16 Parts list
- VUM16 Circuit options

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.

VuM-16 Assembly guide

1. LEDs

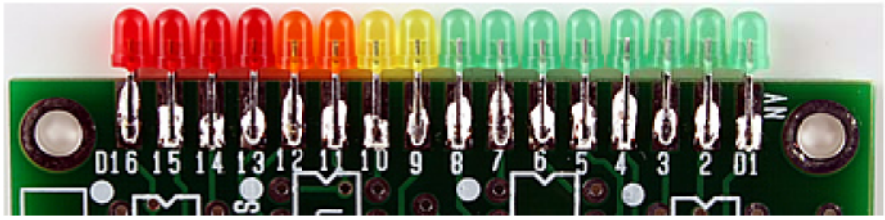
For each one of the 16 LED's cut the short leg (cathode) at 5mm from body and cut the long leg (anode) at 6mm.



Then insert the first green LED on the PCB, long leg (anode) on top. Make sure that the leg is perfectly parallel to the pad. Solder the anode but leave the cathode free for now. The position is still easy to adjust until both legs are soldered.

Insert and solder the next LED and repeat until the 16 LEDs are in position.

Make a last visual check and correct LED's that are not perfectly lined up, then solder the cathodes on the PCB back side.



2. Diodes

Add D17 and D18. Use a lead forming tool to cleanly bend the leads at 0.4".

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.

3. Resistors

Add R1 to R23. Control the resistor values with a digital multimeter. Bend the leads at 0.4" with a lead forming tool.

VuM-16 Assembly guide

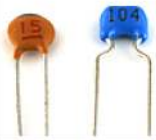
4. Integrated Circuits

Insert U1, U2, U3, U4 and U7 and solder. You will need to bend the pins slightly inwards before inserting. Make sure you are not charged with electrostatic electricity before handling the IC (or remove your shoes).

Warning : Make sure to respect the IC direction, marked by a dot.

5. Trimmer potentiometers

Add P1.



6. Ceramic capacitor

Add C3.

7. Electrolytic capacitors

Add C1, C2, C4, C5.

Warning : The +lead must go into the +hole. Do not reverse (they may explode !)

8. Regulator IC's

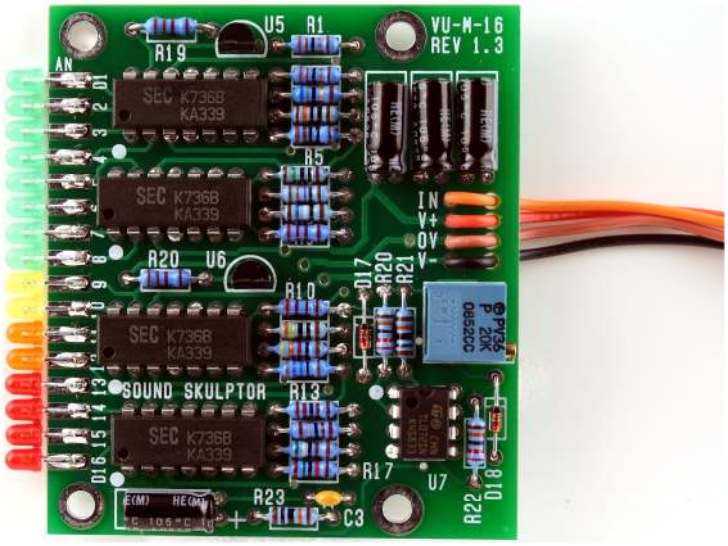
Add U5 and U6. Press the IC's down as far as possible in order to keep the components height low.

Warning : Watch out the IC direction.

9. Wiring

Install and solder the wires that come from the driving board. The wires are inserted from below the card through 4 holes and from top into 4 pads for soldering.

If the driving board is the Stereo Tape Simulator, connect orange to IN, red to V+, Brown to 0V, black to V- and remove the yellow wire.



10. Setup

Adjust P1 in order to let D16 light up a few dB before clipping.