Congrats with your DIY BATTLE! Let's start building!

First of all, get your desk ready and make sure you have the necessary tools:

- soldering iron & soldering tin
- cutter (the ones like in the picture are the best, but a small nail clipper will do the job too)
- tweezer
- on the last page of this manual you can find drawings of the position of each component on the PCB.

Follow the steps in the order it is written down. After each step flip the board and clip off the wires.

We will start soldering on the smaller back PCB (although the numbering of the parts starts on the front PCB)

1. We start with the smallest parts, the diodes

Make sure you solder them in the right direction! There is a black marker on one side of the diode, which should correspond with the marker on the PCB (like on the drawing).

- Solder the BAT43 diodes on D1/D2/D3/D4/D5/D6/D7/D8 (blue with black stripe)
- Solder the 1N4001 diodes on D9/D10 (black with white stripe)

2. Now we solder the resistors on the back board

- Solder the 1K resistors on R47/R48/R49/R50 (brown – black – black - brown – brown)
- Solder the 10K resistors on R52/R53/R54/R57 (brown – black – black -red – brown)
- Solder the 47.5K resistors on R46/R51 (yellow – purple – green – red – brown)
- Solder the 1.5K resistor on R58 (brown – green – black – brown – brown)
- Solder the 100K resistors on R55/R56 (brown – black – yellow – gold)

3. Now we solder some of the capacitors and the ic sockets

- Solder the 100nF capacitors on C5/C6/C7/C8/C9/C10/C11/C12/C13/C14

- Solder the two ic sockets (16pin and 14 pin). Make sure that the round notch on one side of the sockets corresponds with the opening in the square drawn on the PCB. The square pad is on the same side.
- Place the ic's in their sockets. Make sure that the nuts on the ic correspond with the nuts in the ic sockets. (TL074 and TA7630P)

- Solder the 330nF capacitors on C15/C16
- Solder the 47uF capacitors on C17/C18/C19/C20/C21/C22 (mind the direction: the square pad is minus)
- Solder the 4700pF capacitors on C25/C26 (small red WIMA)
- Solder the 0.12uF capacitors C23/C24 (these are the white/yellowish one)

4. Now we solder the two power regulators

- Solder the two power regulators on positions 78L06 and 79L06. Do not mix them up and mind the direction drawn on the PCB!

5. Now we solder the four big capacitors

- Solder the 1uF capacitors on C27/C28/C29/C30 (the big red capacitors)

6. Power header & trimmer

- Turn the PCB around and solder the power header onto the other side of the board. Make sure that the direction corresponds with the drawing on the PCB.
- The trimmer also goes onto the other side of the board. It goes into the square with the dot in one corner, which is in the corner of the board. Make sure you position it with the screw on the side of the dot (=the edge of the board).

7. Headers

- Turn the PCB around again and insert the two female headers (don't solder them yet)
- Put the male headers in the female headers and place the large front-PCB on top of them
- Then, solder the female headers to the component side of the back PCB and the male headers to the large PCB, while the headers are on top of each other.
- After soldering, take them apart again.

Now we start soldering the front PCB!

8. First we solder the resistors and the two diodes

- Solder the 1K resistors on R17/R19/R42/R43/R44/R45 (brown – black – black - brown – brown)

- Solder the 10K resistors on R1/R2/ R6/R7/R8/ R10/R11/R12/ R15/R16/ R20/ R22/ R24/R25/R31/R32/ R34/R35/R36/R37/R38/R39/R40/R41 (brown – black – black – red – brown)
- Solder the 6.8K resistors on R5/R9/R18/R26 (blue - grey - black - brown – brown)
- Solder the 20K resistors on R21/R23 (red – black – black – red – brown)
- Solder the 120R resistor on R30 (brown – red – black – black – brown)
- Solder the 187R resistors on R28/R29/R33 (brown – grey – purple – black – brown)
- Solder the 82R resistors on R3/R4 (silver – red – black – gold – brown)
- Solder the 9.31K resistor on R27 (white – orange – brown – brown – brown)
- Now the most tricky one, solder two 1K resistors (brown – black – black - brown – brown) on R13 and R14 together with the two 1N4148 diodes (small orange), mind the direction of the diodes! See the scheme on the last page of this manual for instructions how to solder the resistors and diodes together and in which direction.

9. Now we solder the capacitors

- Solder the 100nF capacitors on C3/C4
- Turn the PCB around and solder the two big 1uF capacitors on C1/C2

10. The ic sockets

- Place the ic sockets, one 8pin and three 14pin sockets, on the PCB. Make sure that the round notch on one side of the sockets corresponds with the opening in the square drawn on the PCB. The square pad is on the same side.
- Flip the board and fold the pins flat to the PCB towards the inside of the square (just press them with one of your fingers/nails).
- **Now you can solder them.**
- Then, place the ic's in their sockets and make sure that the notch on the ic correspond with the notch in the ic sockets.

11. Take a break before you move on to the next steps. Cheers!

12. Let's continue with the front panel elements. DO NOT SOLDER ANYTHING YET!

- First, insert all the jack sockets on the two top rows.
- Then, place the tiny switch in between the sockets on the second row.
- Insert the blue potentiometers marked with B on the third row from the top, the squares are marked on the PCB as XF, VCA, Low, High, and Sense.
- Insert the two blue potentiometers marked with A in GAIN A and GAIN B.
- Insert the three green potentiometers in Bass, Treble and VCA.
- Insert the smaller blue potentiometer in the square called curve.
- Now, insert the fader.
- As the last parts, insert the two LEDs above the fader. Make sure that you put the long leg in the square pad marked with a plus.

13. Now we place the front panel. Before soldering!

- Place the frontpanel on top of all the parts. This may take a while to get right, but do not force anything! It will fit. Use the tweezers to move the heads of the potentiometers until they all fit.
- Put three small nuts on three jack sockets (one on each side and one in the middle), and put two big nuts on the big Bass and the VCA potentiometers. This will temporarily hold the front panel in place.
- **Important:** wiggle the PCB and frontpanel relative to each other to make sure the fader is in the middle of the slot.

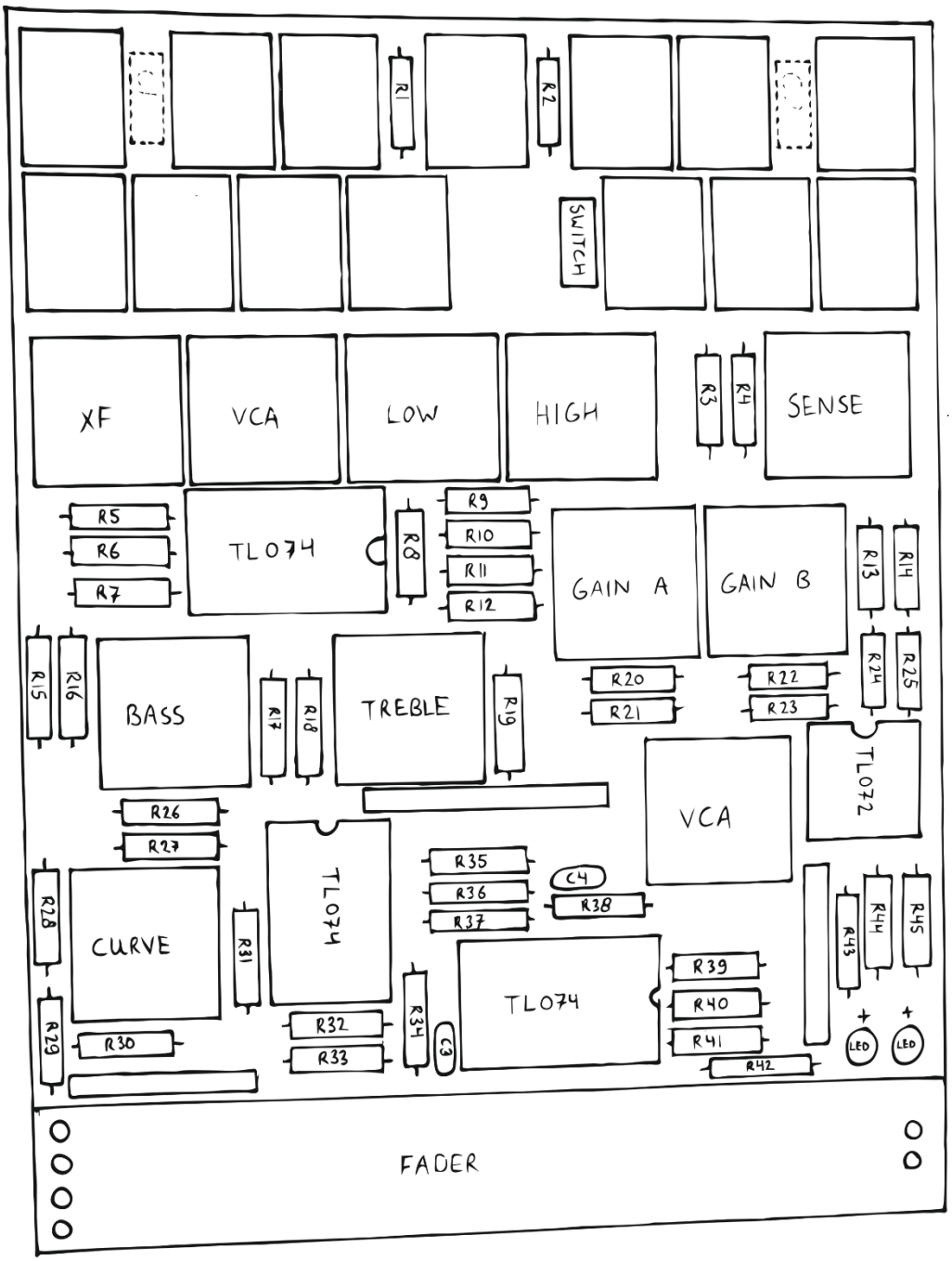
14. Soldering and assembling

- While pressing the PCB and frontpanel firmly together, turn it around and make sure you start soldering first the parts that you screwed on to the panel. Then solder the rest of the parts.
- After this, place all the nuts on the frontpanel and place the knobs on the potentiometers and fader.
- Attach the small back PCB to the front PCB on the headers and place the long screw with spacer in the one hole left over.

15. Calibrating

Calibrate to your own taste. You can calibrate the maximum CV voltage output with the trimmer on the back. This can be done by putting the fader to the right and the cv switch in downward position. Now you can dial in the desired maximum voltage output with the trimmer.

Now you are ready! Enjoy!


R1
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VCA
LOW
HIGH
R3
R4
SENSE
R5
R6
R7
TL074
R8
R9
R10
R11
R12
GAIN A
GAIN B
R13
R14
R15
R16
BASS
R17
R18
TREBLE
R19
R20
R21
R22
R23
R24
R25
TL072
VCA
R26
R27
R28
CURVE
R31
TL074
R35
R36
R37
C4
R38
R29
R30
R32
R33
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TL074
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R41
R42
R43
R44
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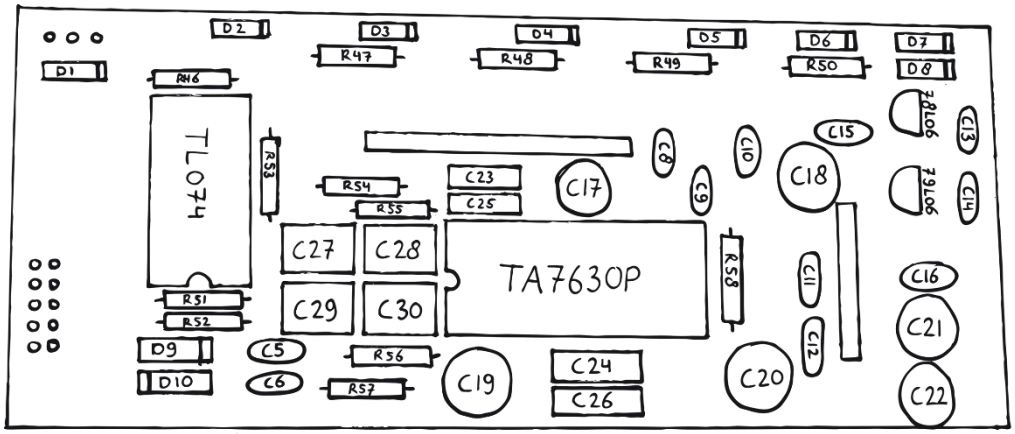
LED
LED
FADER


D1
D2
D3
D4
D5
D6
D7
D8
RN6
R47
R48
R49
R50
TL074
R53
R54
R55
C23
C25
C17
C8
C9
C10
C15
C18
79L06
C13
C14
C27
C28
C29
C30
TA7630P
R58
C11
C12
C16
C21
C22
R51
R52
D9
D10
C5
C6
R56
R57
C19
C24
C26
C20