

Headfirst - Marshall Origin 20h mods

January 2021

*** José clippers added May 2021 (end of doc)**

Bill of Materials

1/2 watt metal film resistors

R69 2.7k

R62 2.7k

R59 100k

R54 1k

R90 470k

R55 100k

R56 470k. (Don't solder in R56 470k - see notes)

R50 220k. (Don't fully replace R50 - see notes)

These metal film resistors are a good choice. 1w and thin legs to get through the tiny holes in Origin PCB!

<https://au.mouser.com/ProductDetail/594-5073NW100K0J/>

Electrolytic caps

C43 0.68uF 50v (or 100v)

C37 0.68uF 50v (or 100v)

<https://au.mouser.com/ProductDetail/UKL2AR68KDD/>

Coupling & Bypass Caps

C42 2n2 630v WIMA

<https://au.mouser.com/ProductDetail/MKP10112203C00JSSD>

C50 22nF 630v WIMA

<https://au.mouser.com/ProductDetail/505-M10.022-630-10/>

C29 22nF 630v WIMA

<https://au.mouser.com/ProductDetail/505-M10.022-630-10/>

Bypass cap across R59 470pF 630v

Bypass cap across R90 470pF 630v

<https://au.mouser.com/ProductDetail/FKP3J004702B00KSSD>, or,

<https://au.mouser.com/ProductDetail/cd15fd471jo3f>

Fixed depth addition to R50

0.0047uF 630v film cap

<https://au.mouser.com/ProductDetail/150472J630BB>

Bright cap for gain pot:

1nF ceramic

<https://au.mouser.com/ProductDetail/810-CK45-B3AD102KYVN/>

Instructions

Remove chassis from the head cab and remove all the tubes.

Flip it over and take lots of pictures of the stock amp. Especially where all the wires come on and off the PCB.

Remove the main PCB from the amp. You'll do this by unclipping all wires, unscrewing the 4 small bolts holding the power tube sockets in (on top of the amp), and the 9 larger bolts holding the PCB in place.

Once out, you can start to remove components. You can place the iron on the pad underneath the leg of the component you need to remove, or do it from the top. I found it easiest working from the top for the resistors. Do not try to yank the component out until the solder has melted through - you'll need your iron set at around 340 Celsius, no hotter than 360 otherwise you risk smoking the PCB traces. Do one leg at a time.

Remove the following:

C38, C39

R66, R67

All of the components listed in the BoM - the existing ones all need to come out.

R58

R60

R65

C33

C32

R57

R76

C30

R51

R52

R55

Wire in the Mods!

Solder in all of the new components pre the BoM, in their respective positions.

Run a wire from the bottom of R67 to the top of R65. (This could equally be done under the board)

For the gain pot bright cap (1nF ceramic), you can place this by soldering it between the bottom of R67 and the bottom C42.

Add the 470pF bypass across the new 100k in the R59 position.

To setup the 470k//470pF & 470k voltage divider heading into V2b, you need to

- solder in a 470k resistor with the 470pF in parallel, into the R90 position
- solder another 470k from the top of R90 to Ground, via the bottom of the R56 footprint.

Run a wire (link) across R58 to connect these pads together.

Lift the bottom leg of R50. Place one end of the 220k, in parallel with the 0.0047uF film cap, into the bottom pad of R50. Then join the free end of the existing R50 100k resistor to the free end of the 220k/4n7 combo. This is your fixed depth.

Under board connections (see pic)

You need to solder in two links here which reconfigure the signal flow to V2.

When viewed from the top of the PCB...

- 1) From the first pin (left most) of the second header (CN22) that leads to the EQ/tone pots. The wire needs to run from that first pin to the bottom of C50. C50 now has a new 22nF WIMA coupling cap in it.
- 2) From the top of C33 to the left hand side of C30.

Connections to the pots

Clip the very end off the leads at the PCB end of CN102, which runs to the EQ pots.

Solder the left most white wire to the top of R59. Leave the black wire free (it's a ground wire and can be left free)

Solder the right most white wire to the bottom of R51, you'll need to extend this a bit as it won't reach. Leave the black wire free (it's a ground wire and can be left free)

Reassembly

Check your soldering is true with a multimeter as far as possible. Check for continuity (beep) between obvious links.

Place the PCB back in, screw in all the bolts removed.

Consult the pictures you took right the start to make sure you place all the terminals back into the correct location on the PCB. This is very important!!!

Power on, and test!

Good luck with this mod.

Adding the José zener clipper diodes (May 2021)

Here are the parts you need:

1 x 220k resistor

1 x 10k resistor

1 x 3 way mini switch (On - Off - On). <https://au.mouser.com/ProductDetail/100sp3t1b1m1qeh>

Short length of shielded coax

2 x 20v Zener diodes, 1N4747A. <https://au.mouser.com/ProductDetail/1N4747A>

1 x 5.1v Zener Diode. 1N4733A. <https://au.mouser.com/ProductDetail/1n4733a>

1 x 24v Zener Diode. 1N4749A. <https://au.mouser.com/ProductDetail/1n4749a>

1 x film coupling cap 0.22uF to 0.47uF, rated to 630VDC. You can try anything here, I can suggest these Panasonic's as a starting point: (All 0.33uF)

ECQ-E6334KF

ECW-FD2J334J

ECW-FE2J334J

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