

Cheetah MS6 6xVOICE Output Mod Suggestion

Please note that this mod is quite difficult. You are required to be experienced in both soldering and metalwork. I accept no liability for damage or subsequent failure should you follow this rough guide!

In essence, the Cheetah MS6 is 6x CEM3396 synthesizers in one box. The voice output from each CEM3396 chip is mixed down to a single output via a standard op-amp circuit. Demonstrative evidence of this can be seen on MS6 circuit board and in the practical application circuit diagram shown on the CEM3396 datasheet which is widely available for free download on the internet.

To achieve a single output for each voice we must disconnect each CEM3396 pin 23 (voice output) from the MS6 circuit board and offer a choice of 2x routings via front panel mounted switch:

- 1) Through MS6 main mix
- 2) Through new, op-amp -> individual voice out jack

Preparation

1. Completely disassemble MS6.
2. Mount 6x SPDT mini toggle switches on the front panel.



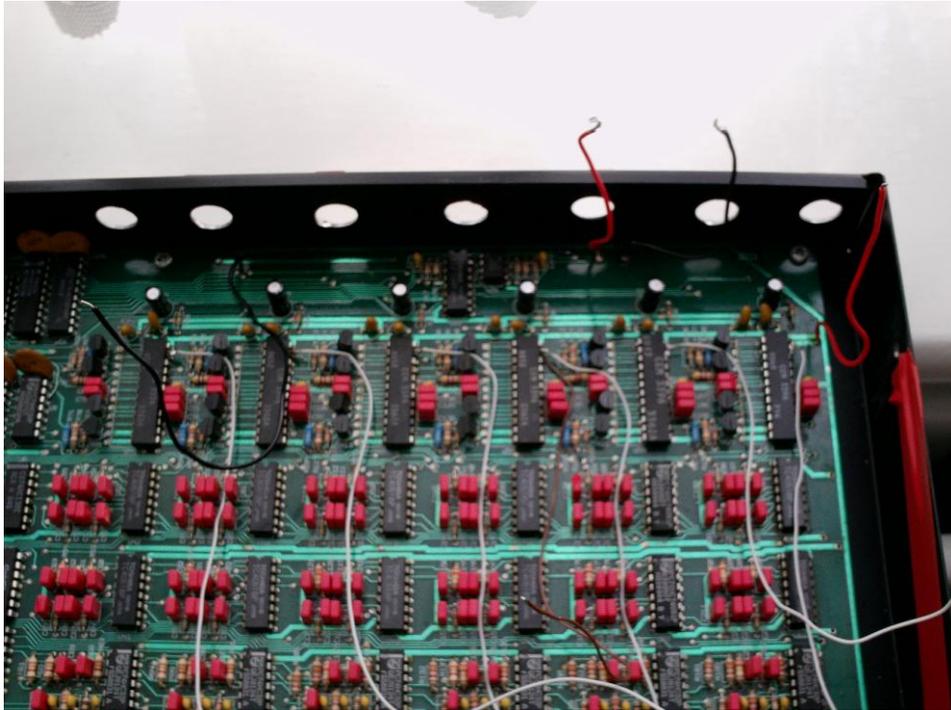
3. Label the front so top position = 'Mix' whilst bottom position = 1- 6 voice output.
4. Wire the bottom poles together. These need to be collectively routed back to the existing MS6 multi-voice op-amp. More on this later.



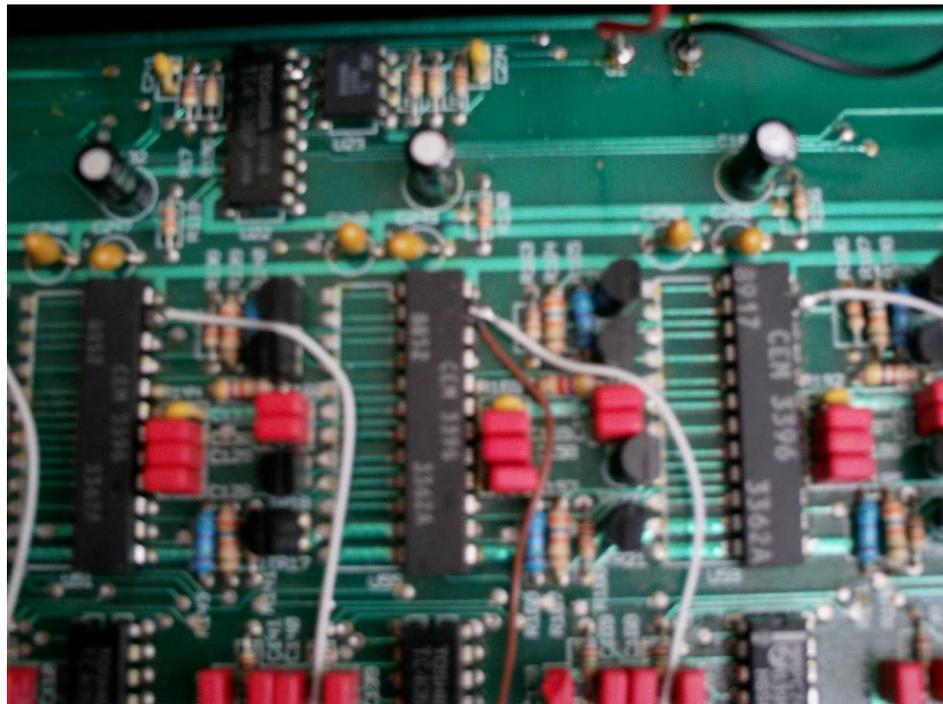
5. Cut holes to mount 6 additional large jack sockets on the rear panel. Label the first as 'Mix'. Label the others from 1 – 6.



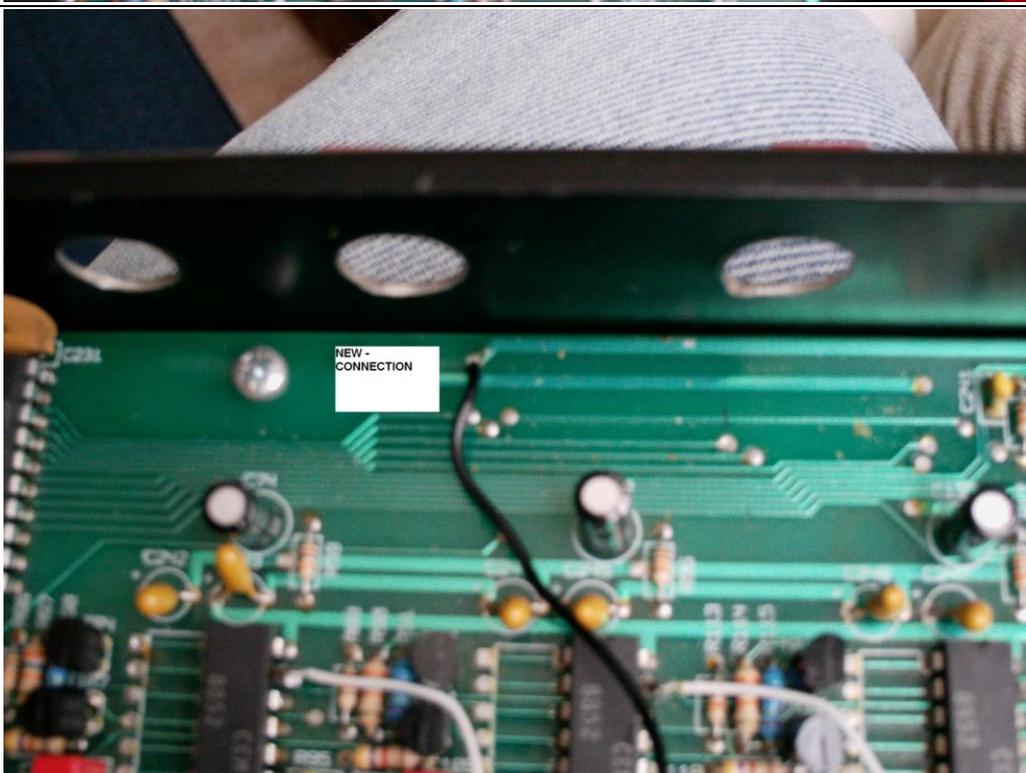
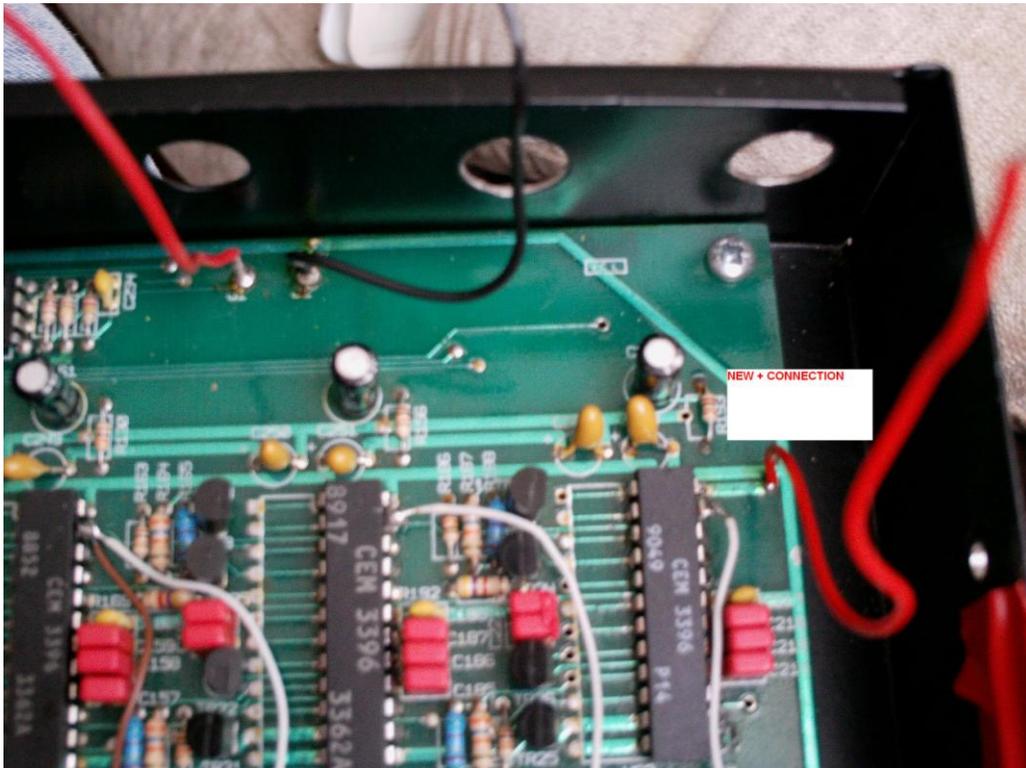
6. Wire all of the grounds together on the jacks and route to the earth point inside the casing.
7. Carefully lift pin 23 of each of the 6x CEM3396 away from its mounting on the PCB. Each pin must be absolutely clear from the PCB track so connection is no longer formed. This is very tricky and much patience is needed. Solder a new wire of reasonable length to each of the 6x CEM3396 pin 23's.



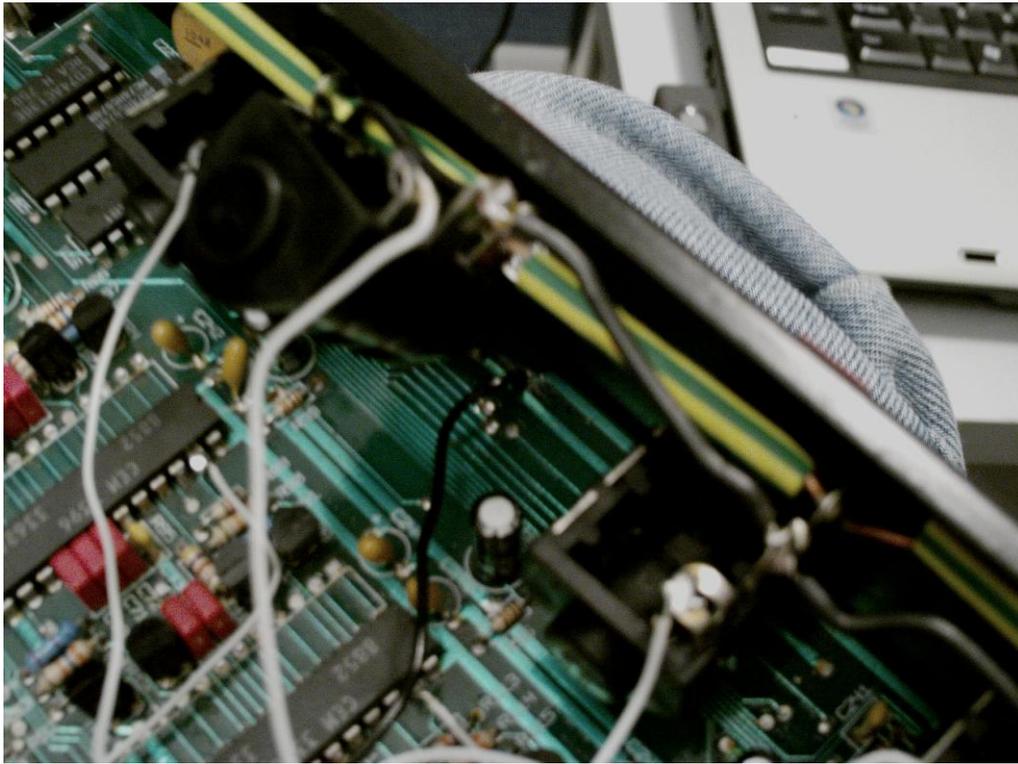
8. Locate the fourth CEM3396 chip from the left (voice 4). Run a new wire between the front panel switch gang's mix out (see step 4) and the pad that used to connect to pin 23 on this chip. This will re-route the voice output to the mix output depending on toggle position.



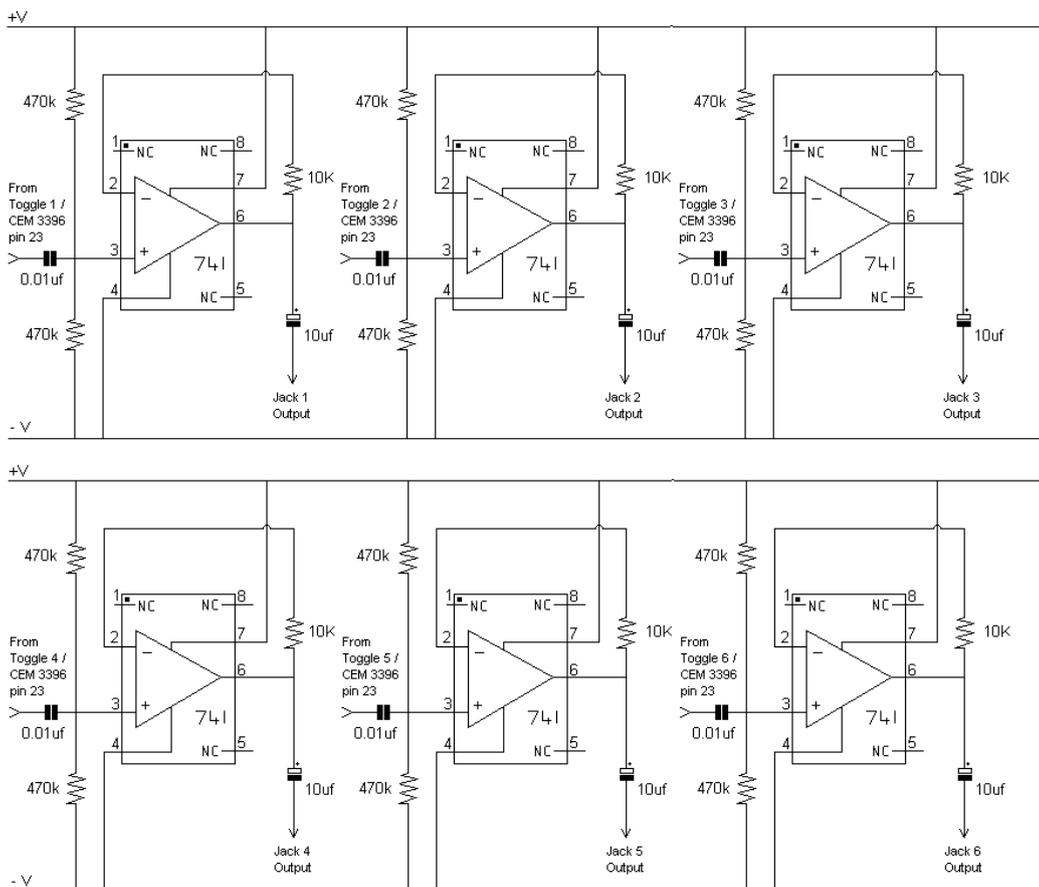
9. Connect two new wires to the MS6 PCB to tap + and - volts to run your new multi-output circuit board. I followed the track to find what was powering the CEM's.



10. Fit 7x jack sockets and route the existing mixed output to the far end jack.



11. That's it for the prep. Now create a PCB based on the circuit diagram:



12. Connect CEM3396 pin 23 voice output wires to the centre pin of each of the toggle switches mounted on the front panel.
13. In sequence connect each of the top toggle switch pins to an op-amp input on the op-amp circuit board.
14. Connect each output from your op-amp circuit board to a jack socket .
15. Connect + and – wires from MS6 PCB to + and – on the op-amp circuit board.
16. Refit MS6 circuit board.
17. Securely mount op-amp PCB inside MS6.
18. Test each voice and output routing. Good luck!