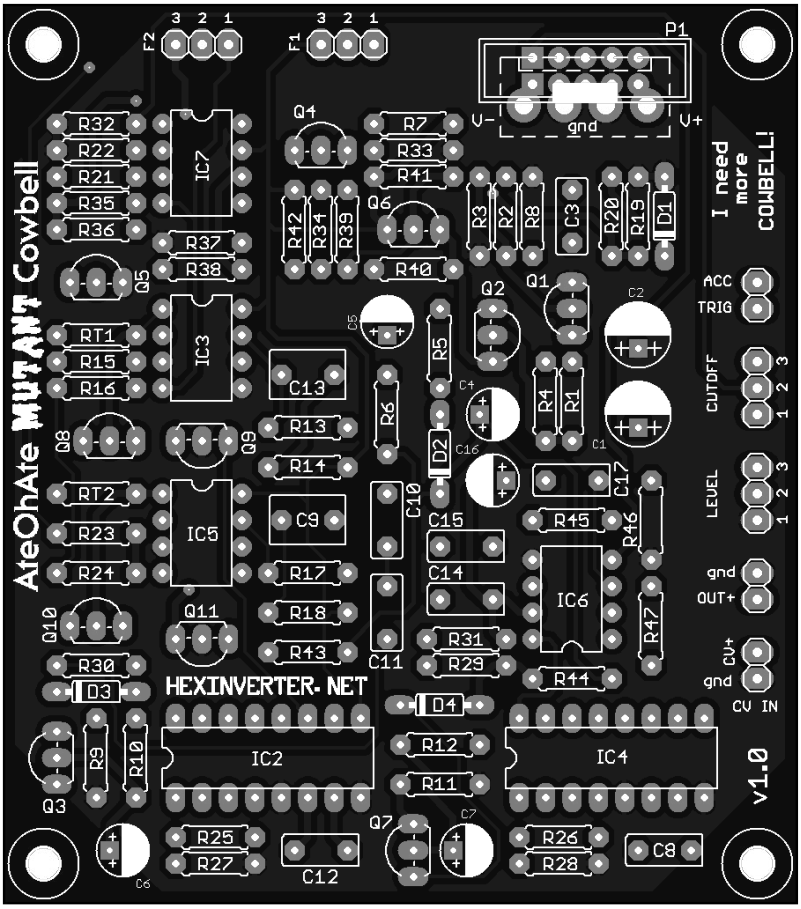
HEXINVERTER.NET

presents:

AteOhAte: MUTANT CowBell

an analogue voltage controlled cowbell module based on the TR-808

ASSEMBLY MANUAL v1.0



Introduction

This manual exists to aid DIYers in creating their own AteOhAte: Mutant CowBell module from a bare PCB acquired at hexinverter.net

Please note that **this is an advanced project** and a lot of mechanical and electronics ability is taken for granted. If not purchasing a dotNET 4U format panel from me (coming soon), you will have to craft your own panel and of course decide how to mount the PCB to the panel when you are done.

You will need to figure out how to mechanically construct your module. I have made a video demonstrating how I make brackets from sheet metal to mount PCBs to front panels. Find it at the hexinverter.net DIY FAQ by clicking **(HERE).** Should you have any further questions, please ask the Muffwiggler synthDIY forum! Someone there will be happy to help you!

Technical Notes

The Mutant CowBell circuit is based on the infamous TR-808's cowbell circuitry. While some new features have been added (hence the "mutant" in the name), it is still capable of generating sounds identical to the circuit which inspired it.

The modified cowbell circuit features voltage control over the pitch of the principal oscillators which generate the cowbell tone. The original cowbell circuit is simply two square wave tones fed into a bandpass filter (opamp IC6B). The two square wave tones' frequencies make up the overall pitch of the cowbell. Upon inspection of the circuit, it was obvious to me that the two square wave oscillators could easily be replaced by a pair of square wave VCOs. For these, I turned to the excellent application of a CD4046 PLL chip presented by Thomas Henry in his **X-4046 VCO design (CLICK FOR LINK).** Thomas Henry's work is excellent and I suggest you build some of his designs for your system! The inspired circuit is a very low parts count square wave VCO that is capable of going from sub-audio to audio frequencies with a small change in voltage, making it perfect for this application.

Voltage control is fed to both 4046 oscillators simultaneously. In this way, it is possible to tune the cowbell to the same pitch in the TR-808 and keep the pitch spread between the two oscillators as you modulate the pitch with voltage control.

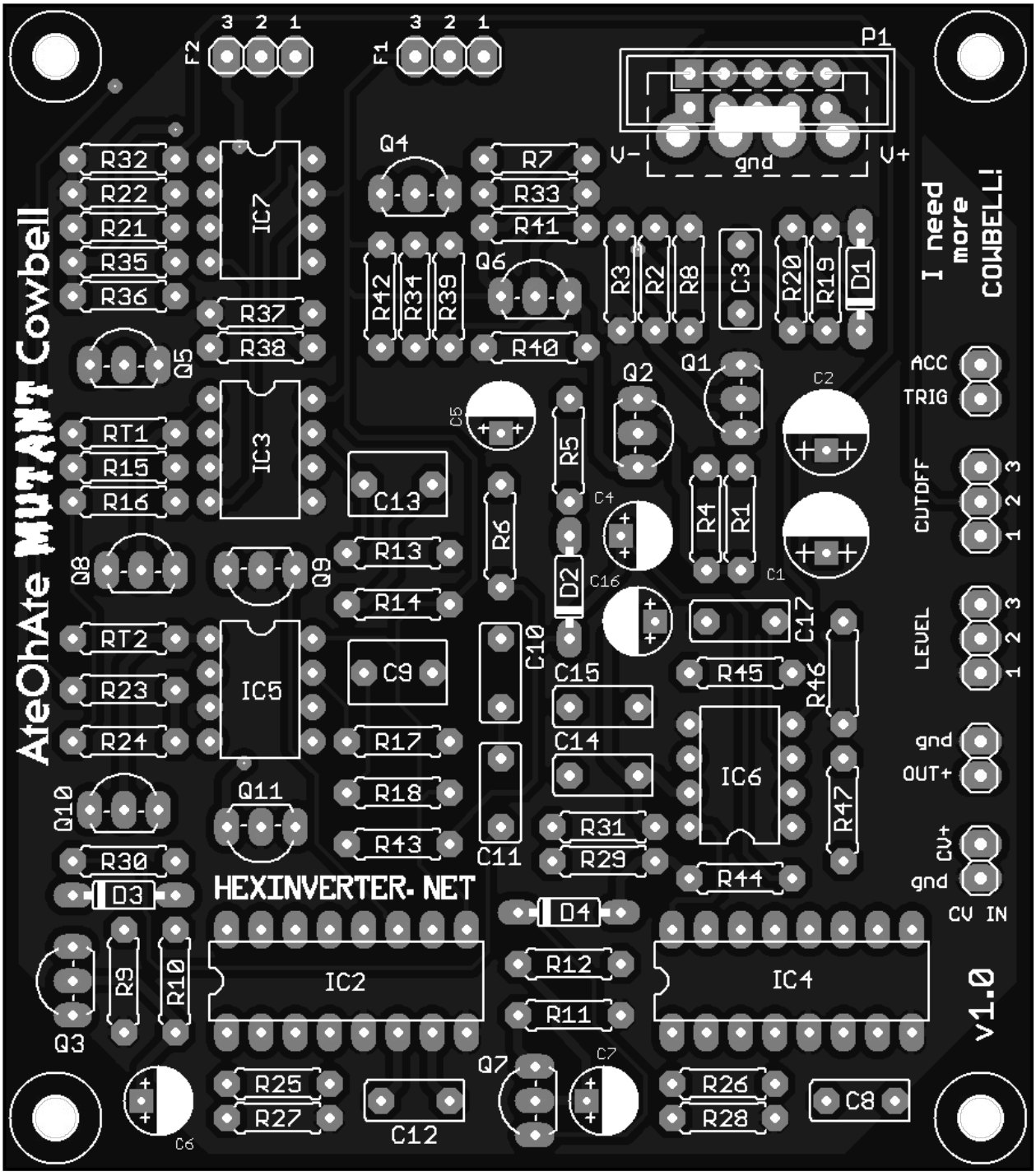
Notes About Parts/Substitutions

You can substitute different transistors for the BC549/559 without any perceived changes, but make sure the pinout matches by comparing the datasheets!

There really are not any rare parts in the circuit. This is a rather easy build to source parts for! Just make sure to use nice quality capacitors and resistors throughout to maintain the proper values for components that make up the sound of the cowbell if you want an authentic TR-808 clone.

If the Cutoff control does not work to your satisfaction, try different values of potentiometer (5k is a good pick. Try logarithmic (audio) taper if you don't like the control response).

PCB Overlay


AteOhAte MUTANT Cowbell
I need more COWBELL!
HEXINVERTER.NET
v1.0
F2
F1
P1
V-
gnd
V+
ACC
TRIG
CUTOFF
LEVEL
gnd
OUT+
CV+
gnd
CV IN
IC7
IC3
IC5
IC6
IC2
IC4
R32
R22
R21
R35
R36
R37
R38
RT1
R15
R16
RT2
R23
R24
R30
D3
R9
R10
Q3
Q4
R7
R33
R41
R42
R34
R39
Q6
R40
R3
R2
R8
C3
R20
R19
D1
Q2
Q1
C2
C5
R5
C4
C16
D2
R6
C13
R13
R14
C9
C10
R17
R18
R43
C11
C15
C14
R31
R29
R4
R1
C1
C17
R45
R46
R47
R44
D4
R12
R11
C7
Q7
R25
R27
C12
R26
R28
C8
C6
Q5
Q8
Q9
Q10
Q11

Wiring Diagram

POTENTIOMETERS VIEWED FROM FRONT