HEXINVERTER.NET

presents

AteOhAte TOMS v1.0

a DIY clone of the TR-808 toms

ASSEMBLY GUIDE v1.0

HARDWARE v1.0

TR-808 is a trademark of Roland

Technical Notes

The 808 toms are a staple of classic analogue beats. Owning them in hardware offers significant technical advantages over using samples for audio production! This particular circuit features some interesting control modifications to the original TR-808 circuit which makes these toms incredibly useful in a modern studio or performance environment. There are no hard-to-find parts used in this design, as well, so, building a set should be relatively easy and fun for the intermediate to advanced builder!

I do not recommend this project as a first build. Start with something a bit easier first, as many things are taken for granted in this build -- soldering ability and many mechanical abilities are assumed by the builder and will not be explained here.

Part Substitutions

There aren't really any part substitutions to make with this design. If you really want, you can use germanium diodes in place of D4 and D5 like in the original, but I found it to be pretty much the same. Standard silicon diodes work great!

Noise Generator

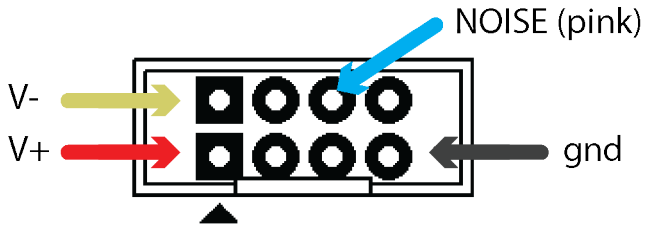
THE TR-808 uses a common noise generator for a lot of the sounds synthesized in the drum machine. With your PCB set, you have an additional small PCB which serves as the noise generator for the toms. The noise generator on the TR-808 uses a single transistor to generate white noise, which is then fed to drum circuits as different noise colours. The toms use pink noise from this noise generator.

The AteOhAte TOMS PCBs are designed so that you can share this noise generator card's signal between multiple AteOhAte PCBs. In order to share a noise generator, you just make sure one of the modules DOES have a noise generator circuit installed, then chain the PCBs together behind the panel via the pads called "RAW" on each of the PCBs. Both these pads are the same connection -- they're just duplicated for easy "daisy chaining".

To tune the noise generator, adjust the trim pot until you get a 130mV RMS (approximately) signal on an oscilloscope at pin 1 of the TL072 on the noise generator card. I just trim mine by ear while listening to the toms with the "Reverb" control at maximum volume. Either way works great!

AteOhAte

Noise Connector Pinout



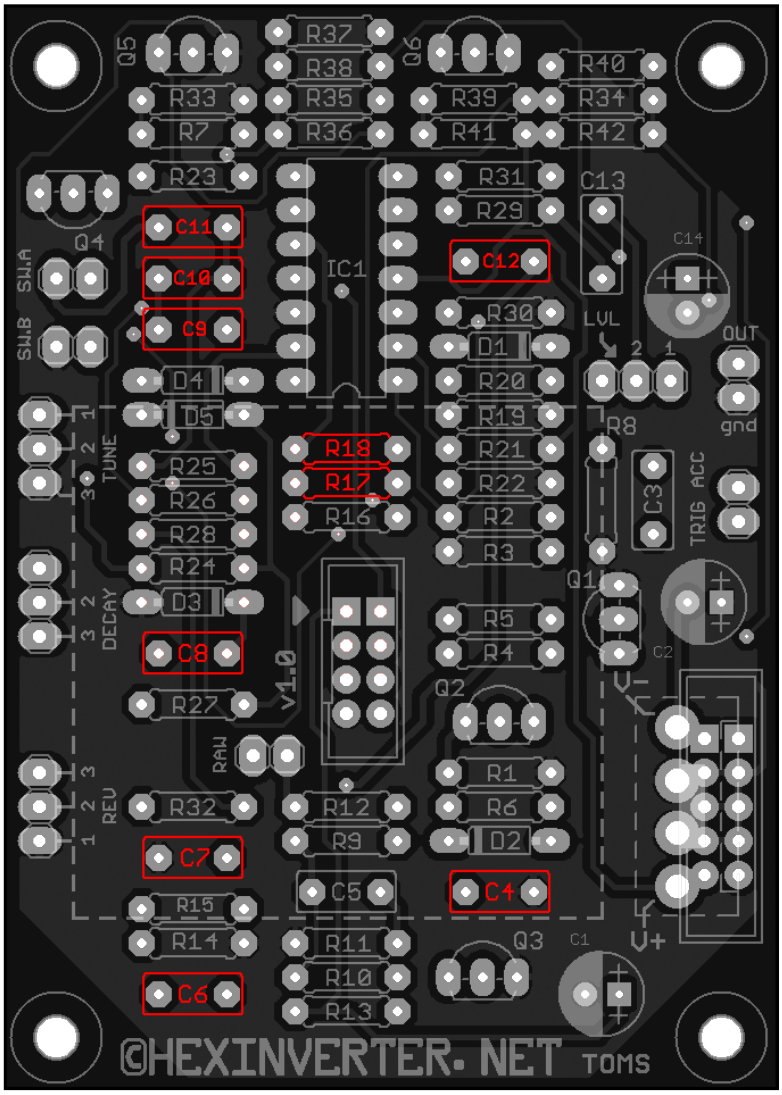
Building a Full Tom Set

In the TR-808, there are actually three instances of the toms circuits present -- low, medium and high toms. There are only minor differences in component values of the circuits between the three different configurations of toms, so, I have designed the AteOhAte TOMS PCBs to work for any of the toms -- low, medium or high. The AteOhAte TOMS PCBs are designed so that they can stack on top of one another, enabling you to provide for 3 (or more) PCBs with one power connector and noise card. As you can see from the noise card pinout above, if you use stacking headers (included with PCB sets), the PCBs will automatically share power and noise signals!

Then, it is necessary only to hook up one (assumedly the top) PCB to your power busboard in your system.

When you look at the PCB silkscreen, you should notice that most of the part values are printed on the PCB (as with all hexinverter.net projects), but, select components have the part NAMES printed, instead. These components with their part names printed (highlighted in RED in the PCB render on the next page) only are parts that have differing values between the low, medium and high toms. Please pay careful attention to select the right values for these components, based on the values for the tom you are building in the handy chart I have provided on the next page.

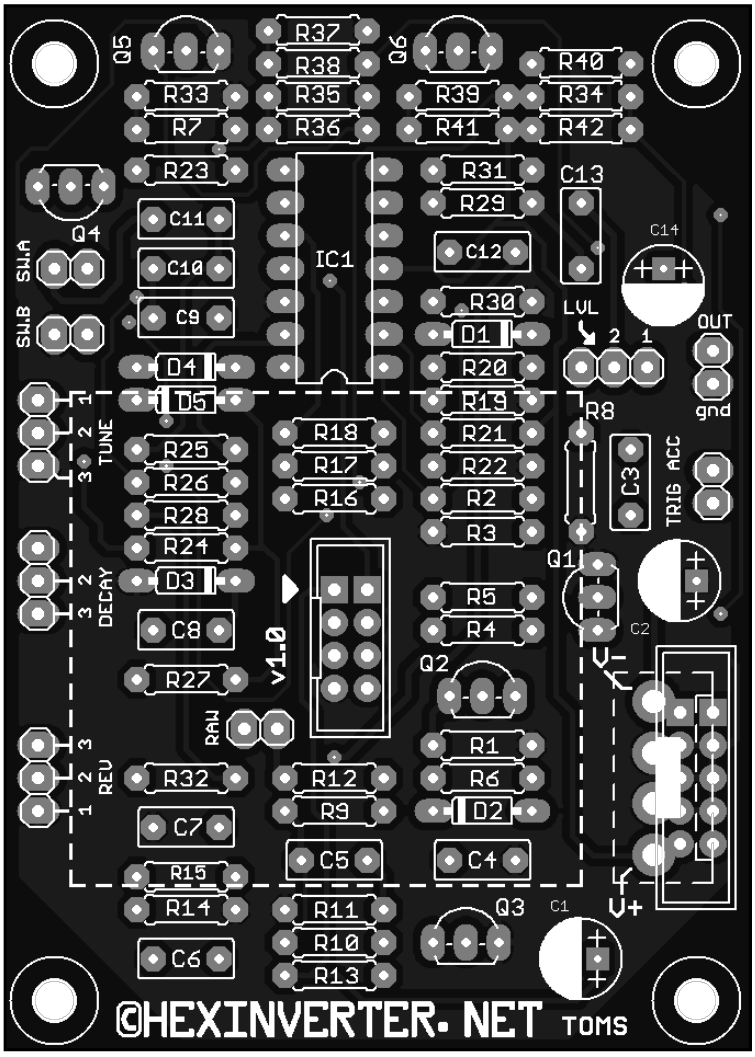
Once all of your PCBs are wired up and tested, you can use PCB standoffs to stack all of the PCBs together as one module.



TOM CONFIGURATION VALUES:

	C4	C6	C7	C8	C9	C10	C11	C12	R17	R18
LOW	39nF	47nF	18nf	6.8nF	56nF	12nF	47nF	47nF	1.5k	4.7k
MED	33nF	33nF	15nF	2.7nF	27nF	12nF	27nF	39nF	2.2k	6.8k
HIGH	33nF	27nF	10nF	2.7nF	27nF	5.6nF	22nF	33nF	1.5k	5.6k

Part Names Overlay



Panels are/will be available at Re:Synthesis (click) for this project.

Control/Panel Descriptions

LEVEL -- This controls the volume of the toms.

TUNE -- You can tune the pitch of the toms using this control.

REVERB -- This controls the volume of pink noise feeding into the tom circuit, and thus, controls the volume of the “reverb” effect the clever Roland engineers used this pink noise to create.

DECAY -- You can alter the amount of decay in the tom with this control.

MODE SWITCH -- The AteOhAte TOMS have two modes of operation -- tom synthesis and conga synthesis. This switch allows you to select between the two. In conga mode, with the decay turned up, the synthesis can self-oscillate! This creates some cool sounds if used in a drum track with other elements.

Trigger/Gate -- Input either a trigger or gate around 5V or higher to trigger the drum module.

Output -- This is the sound output for the module.

(panel wiring on following page)

POTENTIOMETERS VIEWED FROM FRONT