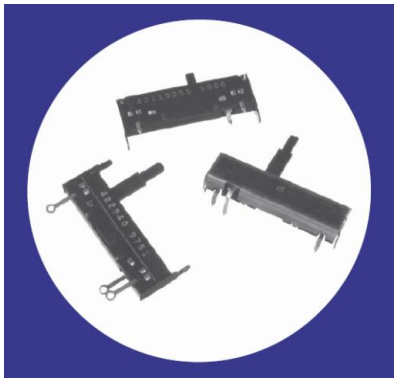
TCUBED (T^3) project... (Bringing a T1 back to life) ***March 2010***

This Taurus 1 Revisited began its life as a reject, a 'scrap' Moog Taurus 1 main-board purchased on eBay for ($300USD) in April of 2008.

The board was previously sacrificed to repair other Taurus 1's and was sold as-is. From the pictures of the board it didn't look like there were too many parts missing and I do like a good challenge. I banked on my background in electronics engineering to take on this project when I envisioned a table-top unit with the switches and sliders mounted on a sloped chassis with MIDI implementation. Originally, my plan was to re-create the Taurus around this one component. I was thinking a rack-mount unit, but the main-board was longer than 17 inches. When I received the main-board, I was pretty excited except for broken preset slider handles, missing transistors, missing op amps, missing capacitors, a few holes in the PCB that weren't supposed to be there and a 'scrap' notation written in magic marker. The extra holes in the board looked like someone tried to drill a hole into the top of the original Moog chassis and the drill went through to the PCB by mistake.

Here's how the project progressed…

Broken Preset Sliders: Since some of the preset slider handles were broken, I had to source some type of replacement…I found that CTS model 442 had the same physical dimensions but CTS had not sold any to distributors so I couldn't get any.



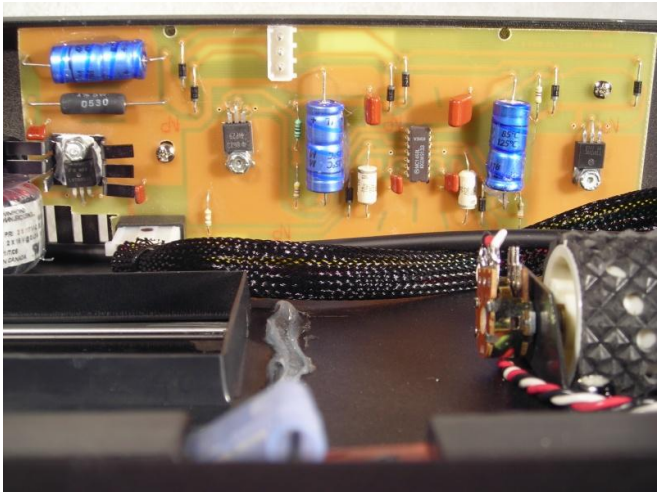
A good fellow from CTS sent me some model 442 slider samples of different values to play with, but, the resistance values that he sent me didn't match any of the values or tapers that I required. I realized that the old slider resistive parts were very close to the new slider dimensions and I was able to transplant the old resistive elements into the new CTS housings to get working sliders of the correct value with the handles intact.

Missing Semiconductors: I also ordered a few new FETs and CA3080 OTA's to replace the missing components on the board.

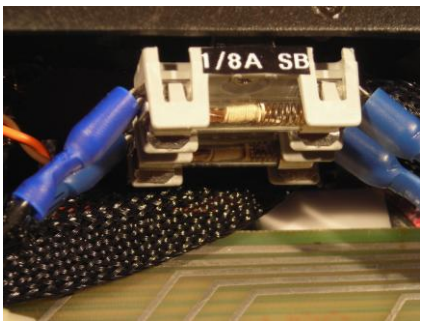
Here are the components that I replaced that were originally missing from the T1 board.

Installed [4] Missing CA3080's OTA's
Installed [2] E112 JFET Transistors for OSC A and B
Installed [1] E401 Dual FET in Glide circuit
Replaced a broken 2N3906 Transistor
Installed C112 0.1uF poly bypass cap in Sample and Hold circuit

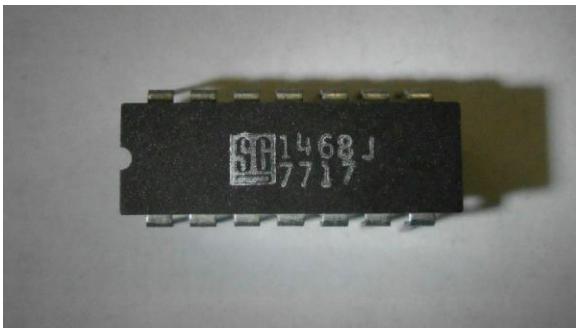
T1 Power Supply: Since I only had the T1 main-board to work with, I had to build my own power supply. Wanting to be as accurate as possible to the original power supply, I scanned the Power Supply PCB layout from the T1 manual, I sourced all of the components and recreated the PCB and from scratch.



I purchased a Hammond 30 VAC centre-tapped Torroid transformer as opposed to an open-frame style for the power transformer.

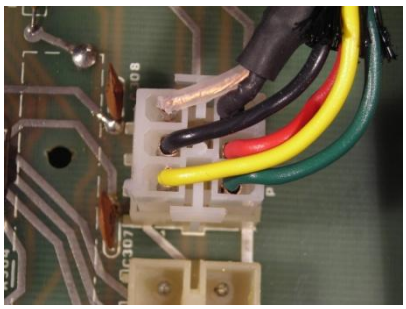


The Voltage Regulator, (SG1468N), was the hardest to find. Luckily, a local parts distributor had one MC1468L in new old stock. Works like a charm. This power supply provides +15, -15 and +5 VDC to the T1 Main-board.



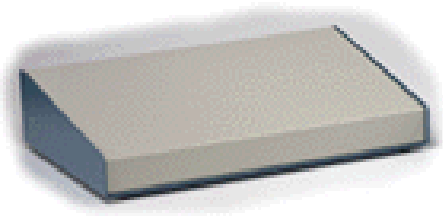
New Parts: It was foreshadowing to the new T3 when I envisioned wheel controls for the Loudness and Filter controls. These came from Boomerang; they are part of their looper product.

For the preset pushbutton switches, I found the exact cross-reference from C&K's Unimax Line (Digikey CKN1413-ND). To connect the power supply to the main-board, AMP Mate-N-Lock connectors and pins were purchased. Those connectors are also used to connect the audio connectors to the T1 main-board as well as an interface to the keyboard connectors.



Vintage Parts: I purchased an original variables bezel/door from MOOGCE that really gives the TCUBED a retro look. I also purchased the original Foot-Pedal sliders from MOOGCE but they are not needed since I am using rotary foot controls.

Chassis: I purchased a generic Hammond sloped-front aluminum chassis that I punched for the preset buttons and cut and sawed and drilled all of the other holes and openings. The blue Chassis bottom was unneeded and discarded.

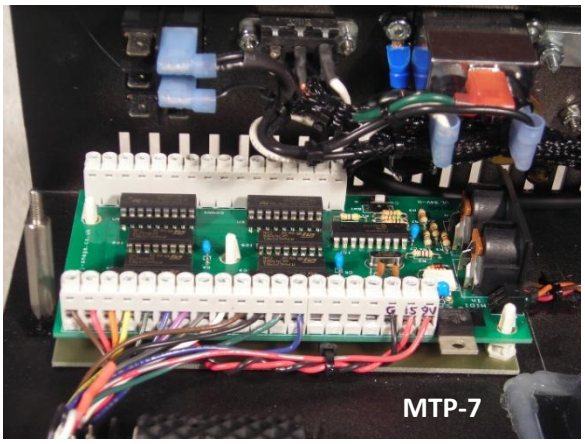


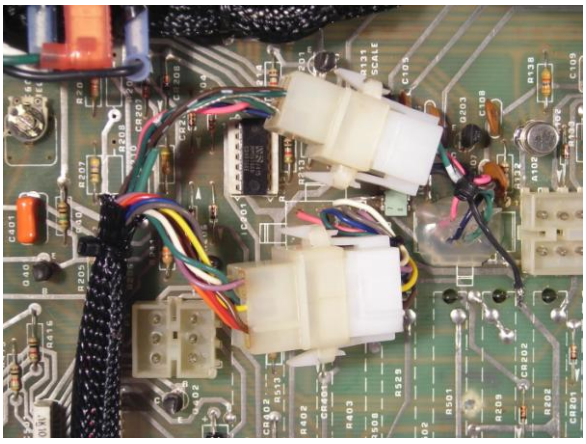
I designed a reproduction of the button overlay and had it printed and laminated and punched the 1” holes for the preset buttons. I cut some maple sides and stained them and added a few coats of polyurethane and attached them to the aluminum chassis.

A Plexiglas bottom showcases the original board in its former glory.

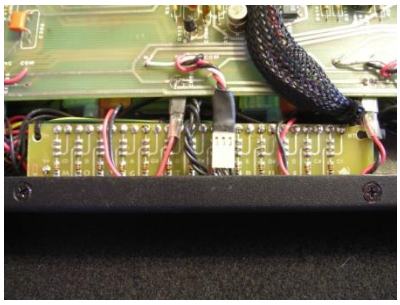
The following finishing touches really make a visual statement to the chassis… a Plastic Chrome fighting-bull Logo from a car parts store for a few dollars for the front of the chassis that covers the hold-down screw for the torroid power transformer and a Moog sticker on the rear panel that covers two of the countersunk screws that hold the internal power supply.

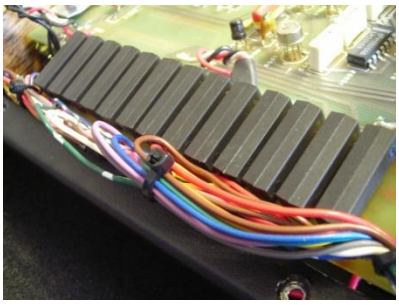
MIDI to CV: After I received the T1 main-board, I immediately started to plan MIDI implementation. Since I had such good success with my MIDI conversion on my Rogue, I decided to purchase a MIDIJack II MIDI to CV converter from Synhouse for the V/Hz and trigger on the Taurus 1 Main-board. The MIDIJack II was never installed and I recently decided to go with a MIDI to parallel converter (MTP-7) from j-omega.co.uk for the MIDI to switch contact.

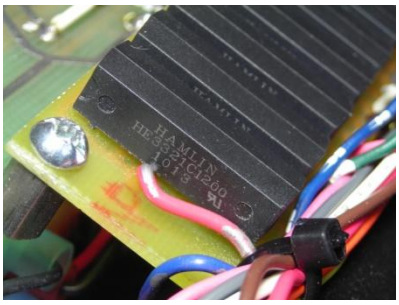




This Midi to Contact Closure board will directly switch the T1 keyboard voltage divider voltages for each note to the VCO's just like the original foot pedals did. There is one advantage to providing the CV and trigger to the VCO's like that... With the MIDIJack II, to switch octaves you need to change the octaves on your MIDI-controller. With the MTP-7, the OCTAVE switch on the Taurus front panel will be active to switch octaves. I liked that option because I wanted to keep as much of the original Taurus functionality as possible. The MTP-7 was originally designed to retrofit into old organs to make them MIDI compatible. It is a 32 channel MIDI to Switch contact converter; I will only be using 13 of the outputs. The MTP-7 has open-collector outputs that will be used to close 13 discrete reed relays mounted on a small board connected to a wiring harness with AMP Mate-N-Lock connectors that mate with the two keyboard connectors on the Taurus main-board.

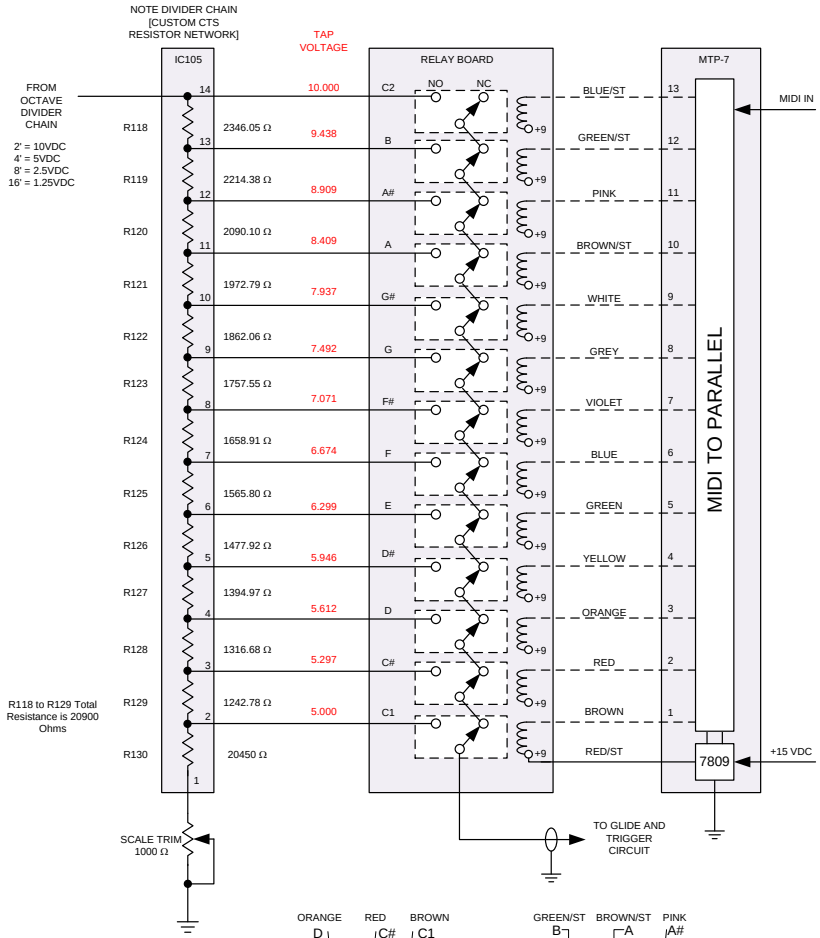






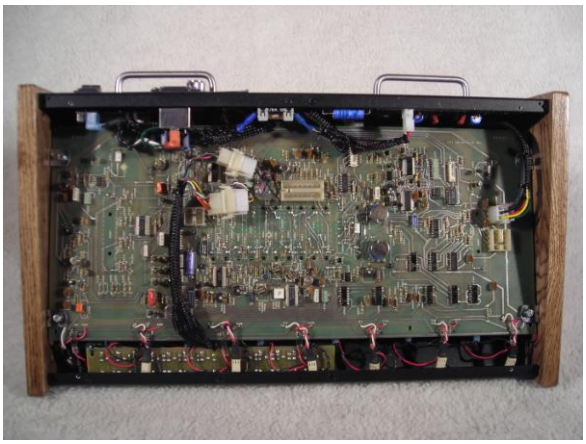
The power for the MTP-7 is fed from a 9 VDC regulator that is tapped from the +15 VDC rail from the T1 Power Supply. The LM7809 9V Regulator is mounted on the MTP-7 PC board and also feeds the common of the small relay board. The relay board has thirteen 12VDC SPDT reed relays with SMD diodes across the coils to snub the relay's back-EMF current. As the relays are triggered by the MTP-7, the relays switch the linear volts/Hz from the T1 note divider chain to the sample & hold circuit.

TAURUS I MIDI IMPLEMENTATION



KEYBOARD CONNECTORS

LOUDNESS
PROGRAMMED PRESET
FILTER
moog
Taurus Synthesizer
VARIABLE
TAURUS
TUBA
BASS
PRESETS
GLIDE
DECAY
OCTAVE



moog Taurus
MODEL 205A
MADE IN U.S.A.
SERIAL NO.
OUTPUT
OUTPUT LEVEL
MIDI IN
ON
POWER
OFF
LINE SELECT
115/230 VAC
48-440 Hz 12 VA

LOUDNESS
FILTER
moog
Taurus Synthesizer
GLIDE
DECAY
OCTAVE

FILTER