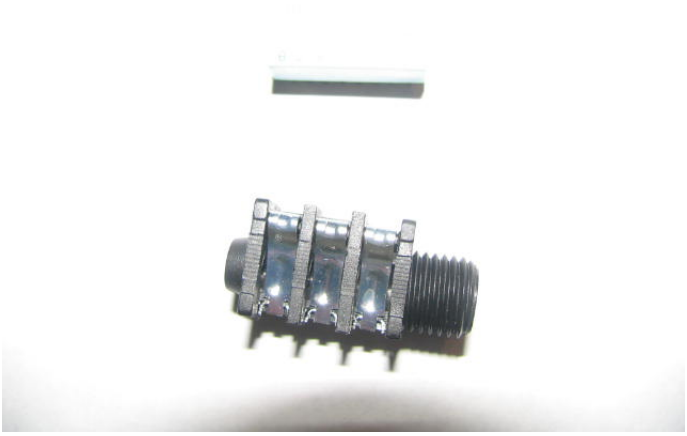
SSS – Super Simple Switcher

The name says it all – this switcher is fairly low-tech for what it does. No PICs or ICs were harmed in the making of this project.

Eight effects or 'Loops' of effects can be switched between the input jack (guitar) and output jack (amp). Eight foot (stomp) switches control which combinations ('Patch') of those loops are enabled at any time. Relays are employed to provide true bypass of all effects. Each Patch is 'programmed' using a bank of 8 dipswitches. To program Patch1, enable the dipswitch(es) in Patch1's dipswitch bank that correspond to the Loops to be enabled. Then, when Patch1's stomp switch is switched on, those Loop's relays will be energized.

There are 2 main functional blocks. The main control board houses the relays and associated circuitry, DIP switch banks, power supply, as well as the Input, Output and Loop jacks. Since the Patch stomp switches (and their associated LEDs) need to be spaced some distance apart, these are all wired off-board and do not appear on the PCB. As mentioned, there is an LED for each Patch, and an LED for each Loop.

One shortcoming of this design is that enabling any Patch does not disable any previously selected Patch(es). You have to disable the Patch manually. Another design decision made was to save PCB real estate, space and cost by using T(ip) R(ing) S(leeve) Re-an style PCB mount jacks (see below). This means the Tip and Sleeve contacts on the Loop jacks 'send' the signal to the effect's input, and the Ring and Sleeve are where the signal 'returns' from the effect's output.



A couple of design choices were made to increase interoperability with a range of effects. Component locations for 1 Meg resistors (which are optional) have been provided at the input and output of each Loop jack. This can help minimize popping when effects are switched in or out. Component locations for 2 pin headers have been provided to disconnect each Loop's ground. In a system with 8 effects or even loops of effects it is likely that a common power supply will be used. These ground disconnects (which could also connect to panel switches instead of pin headers) should help to minimize the likelihood of ground loops.

You'll notice that the power supply section is somewhat vague. Choice of relays (and to a lesser degree, LEDs) will dictate power supply requirements. Obviously if you have 5v relays, your supply voltage has to be 5v or slightly higher. A few different relays were tested using a 5v supply, with the resistor values as per the schematic and PCB layout (470R for the transistor base and 220R for the LED current limiters). Following are current requirements for an enabled complete single Loop circuit, including both LEDs, as well as the total current requirement:

Relay Type	Current per Loop	Total Current Required
Omron G5V-2-H	70 mA	560 mA
Omron G6A-274P-ST-US	52 mA	416 mA
Aromat DS2E-M-DC5V	74 mA	592 mA

My choice for power supply will be a miniature external switching power supply from a cell phone charger. 5v DC at 750mA in a 2" x 2.75" x .70" package! This allows mounting the control board PCB in a Hammond 1444-15 case, (with 1434-16 lid) which puts the complete control assembly box at a mere 10" x 6" x 1". In a pedal board with a raised platform for pedals and lower cavity for cables, this control assembly can sit under the main platform and not rob valuable real estate from pedal space.