The "Everything" Strat Mod

This modification is based upon(or blatantly stolen from) Wolf's "triple humbucker, 94-sound wiring option", which can be found at http://www.1728.com/guitar3.html (email contact: wolf@1728.com.

Wolf's premise is to obtain all possible series and parallel combinations of three pickups. In his case, he is employing three humbuckers, each with a coil tap switch. Mathematically, this calculates to 94 different combinations of series/parallel, single/double-coil sounds. What appears at first to be a way over-the-top modification, requiring 12 toggle switches (9 SPST and 3 DPDT), has some real embedded gems in it. I was first attracted to the mod by a desire to apply it to a standard Strat copy (Peavey Predator) with 3 single coils. Naturally, I was a little dismayed at the prospect of adding 9 SPST toggle switches to the pickguard, so after a little studying, here's what I came up with.

Prior to any modifications, I first employed Atchley's "Quieting the Beast / Shielding a Strat" procedure (http://www.guitarnuts.com/wiring/shielding/shield3.php).

Please refer to Figure 1, which is taken from 1728.com. Here we see the basic "94-Sound" schematic.

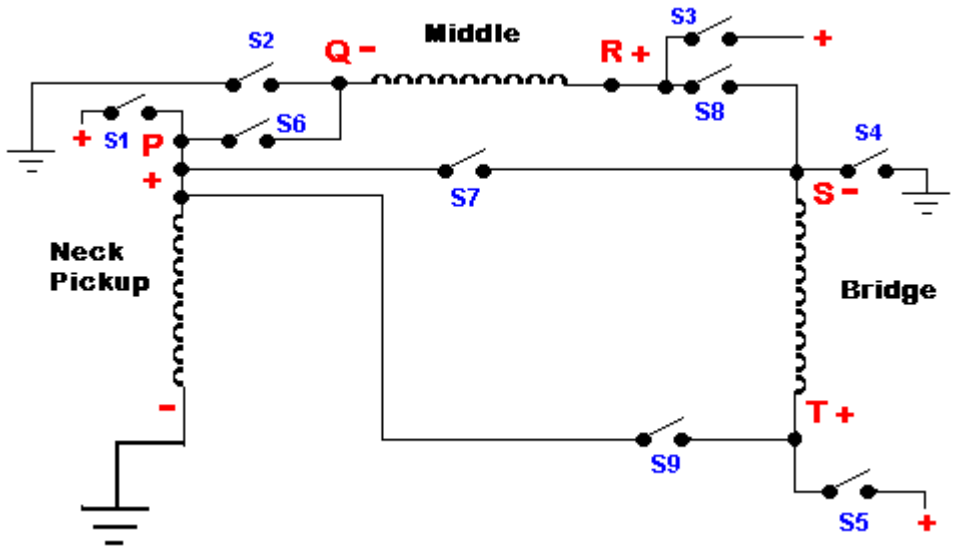

Figure 1. Wolf's "94 Sound" wiring diagram.

I made a switching diagram for this schematic, which is included as Table 1, and shows all 17 series and parallel configurations that can be obtained with 3 pickups, and the appropriate switch pattern for each. Examination of these switching states reveals some important clues about how to go about simplifying the system for three single coils. When certain switches are closed (or contacted), certain other switches are never used simultaneously. These combinations are given in Table 2. This suggests that without taking up any more space on the pickguard, we can "double-up" some of the switching functions on each switch by going to SPDT (ON/NONE/ON) switches instead of SPST.

The results are shown in the far right column, where we see that while switch 1 is unpaired, switch 2 is paired with switch 6, 3 with 8, 4 with 7, and 5 with 9. If we choose the switch orientations such that switches 1 through 5 are in the "up" position (or at least the same orientation), then all the parallel combinations will use "up" switch positions.

Table 1. Switching Diagram

	Switch								
Configuration	1	2	3	4	5	6	7	8	9
B				✓	✓				
M		✓	✓						
N	✓								
B + M		✓	✓	✓	✓				
M + N	✓	✓	✓						
B + N	✓			✓	✓				
B + M + N	✓	✓	✓	✓	✓				
B × M		✓			✓			✓	
M × N			✓			✓			
B × N					✓		✓		
B × M × N					✓	✓		✓	
(B + M) × N			✓		✓	✓	✓		
(M + N) × B		✓			✓		✓	✓	
(B + N) × M			✓	✓		✓			✓
(B × M) + N	✓	✓			✓			✓	
(M × N) + B			✓	✓	✓	✓			
(B × N) + M		✓	✓		✓		✓		
Switch "ON" (contacted)	✓								
Parallel	+								
Series	×								

Table 2. Switch Pairing Diagram

	Not Used				Pairings
ON	6	7	8	9	
1	X	X		X	1 - None
2	X			X	2 - 6
3			X		3 - 8
4		X	X		4 - 7
5				X	5 - 9

This is extremely convenient because now it is very easy to fit 5 SPDT mini-toggles in the space left by the stock 5-way switch, and every possible combination is available. But I'm not finished yet. This is only step 1 in the S-transformation.

Step 2 is to simply add two DPDT switches underneath the volume knob for phasing of the neck and bridge. The main additional sound I was going for was Bridge in series with Neck, out of phase, but obviously many others are also possible. In fact, 22 more combinations are available: one additional sound for each two-pickup combination, and two additional sounds for each three-pickup combination. This results in a grand total of 39 combinations.

Step 3 is to rework the tone circuit since the stock neck and middle tone pots are far from optimum for many of the new pickup combinations. I chose to eliminate the middle tone and rewire the neck tone to a master tone configuration, but was worried that I wouldn't have enough variation for some of the pickup combinations. Given the extra hole in the pickguard, I decided to install a single-pole, 3 position rotary switch (SP3T). This is now a "tone selector", with which you can choose an open circuit (no-load), 0.022 µF, or 0.047 µF tone capacitors. I originally tried it with a SP6T switch with 6 capacitors (0.010, 0.018, 0.027, 0.039, 0.047, and 0.056 µF). I got all of this in the control cavity but found that there was not a significant tone variation with such close spacing. [I think a 250K tone pot would also add more variation than the stock 500K.] With this additional tone modification, we now have a total of 17 pickup combinations, with 22 additional sounds enabled by the phase switches on the neck and bridge pickups, effectively multiplied by 3 tone circuits, bright to dark, and we have what appears to be the ultimate tone monster.

There are a few drawbacks, however. Until you become familiar with the switch positions, there are of course a number of "dead" positions and a great number of duplicates. This is greatly simplified by the fact that if all the switches are in either the "up" or "off" positions, you know you have one of the standard 5 Strat selections. Even in the best conditions where the switch positions are memorized, instantly switching from one combination to another, especially during a gig, could be a hassle. Obviously, the best use for this axe is a studio application where you may be looking for a wide variety of sounds on an instrument with the same neck that you've grown accustomed to.

Here's the schematic:

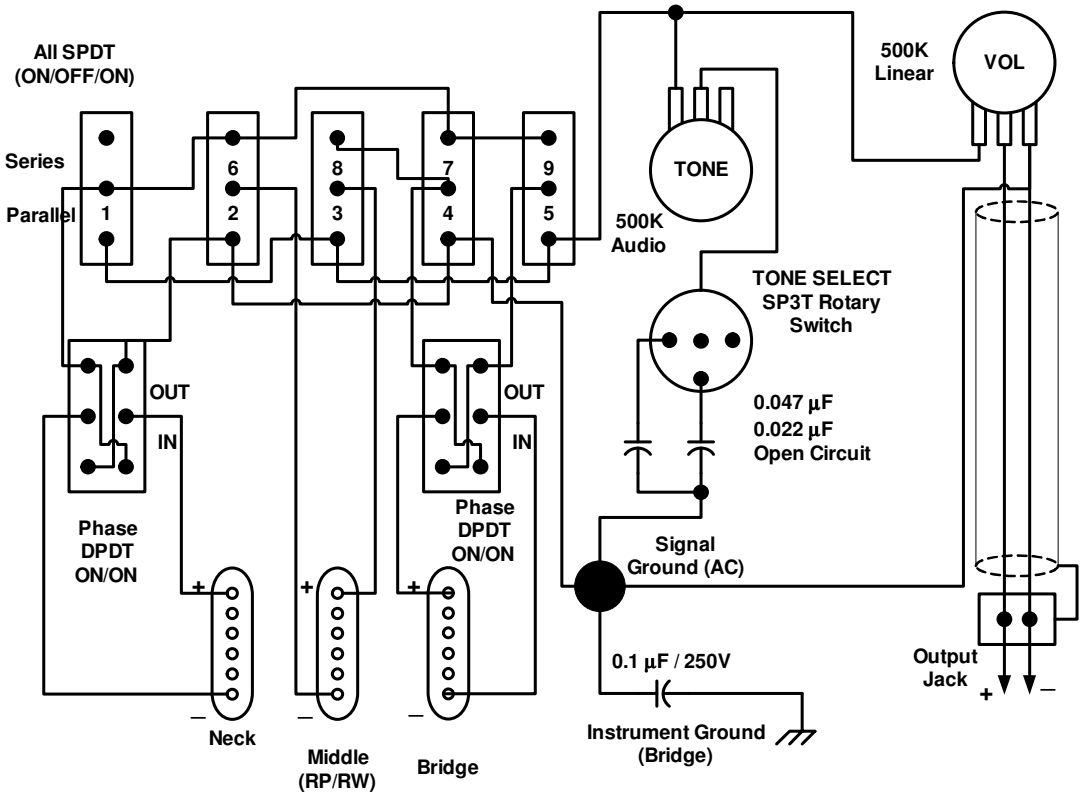

Figure 2. "Everything" Strat circuit diagram

Here are some pictures of the actual modification. First, let's talk about the shielding. I elected to use the 3M copper foil tape with conductive adhesive, which I obtained from Stewart-MacDonald for about $10. Figure 3 shows the back of the pickguard and Figure 4 shows the shielded body cavity. I modified the pickguard by drilling out the two stock screw holes for the 5-way switch to accommodate 2 of the SPDT switches and then spaced the other 3 as evenly as possible in between. I drilled the phase switch holes as close as convenient to the volume pot hole. I then applied this same copper foil tape to the entire back side of the pickguard. After soldering all the components in place, I added patches of black electrical tape inside the body cavity as protection against accidental shorting during assembly and thereafter. The only deviation from the "Quieting The Beast" mod is that I used a 0.1µF/250V cap instead of the recommended 0.33µF/400V cap. It was the only thing I could find at a nearby Radio Shack and I was impatient.

It doesn't look quite as much like a Frankenstein-job as you'd expect if you just read the description without seeing it. Really not too offensive. For cosmetics, I changed the pickup covers, knobs, and tremolo bar to black to add some higher contrast to the boring white pickguard. And that's it. The Peavey Predator (1994 – Made in USA) is a really good platform to work with because the workmanship is exceptional. I'd like to hear some feedback. Thanks.

Figure 3. Pickguard shielding.

Figure 4. Body cavity shielding

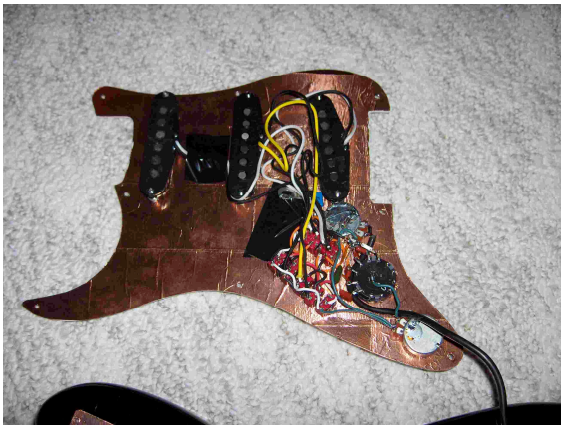

Figure 5. Assembled pickguard

Figure 6. Close-up of switching network

Figure 7. completed wiring, showing shielded stereo cable to input jack. Note black electrical tape to prevent accidental shorting against copper foil tape.

Figure 8. Job complete. Five SPDTs for pickup selection, bridge and neck DPDT phase switches, master volume, master tone, and 3-position tone select (0.047µF, 0.022µF, and open/no-load). You can get nearly any sound you want.