



Technical Tips

Our knowledgeable technicians give you tips, secrets and advice.



Tech Tip From the Custom Shop

[\(click for schematic\)](#)

This tip comes to us from Steve Metcalfe, artist relations representative for Aria (UK), Seymour Duncan's UK and Republic of Ireland distributor.

I needed a really versatile guitar. I decided a three-pickup Strat® configuration would suit my purpose best. I also wanted the guitar to look right cosmetically — I prefer the look of three single coils rather than a full-size humbucker and two single coils. With the hard but warm sound of a '59™ humbucker in mind, I fitted an SL59-1b Little '59™ in the bridge position; I wanted a Strat sound, so in went an SVR-1n Vintage Rails™ in the middle; and I wanted a "big single coil" sound, so I put an SCR-1n Cool Rails™ in the neck. Using a Schaller 5-Position "Mega-Switch" Switch (Ref. No. 105S), I was able to get the following set-up with the following sounds.

Position One: Full Little '59 bridge humbucker sound of a Les Paul®

Position Two: Split Little '59 (front coil) with full Vintage Rails rear notch position of a Strat.

Position Three: Split Little '59 (rear coil) with full Vintage Rails "warm but bright" Tele middle position country sound.

Position Four: Full Vintage Rails and full Cool Rails "big warm Strat" in the front notch position.

Position Five: Full Cool Rails "big Strat" and if the string is played at the neck, you get a nice warm P-90 sound, "just perfect!"

The Little '59 is connected to the lower tone control to warm the pickup further, if necessary. The upper tone pot is not wired up, as I don't like using the tone control on a Strat type sound. Have you a really cool use for an unused tone pot?

Tech Tip From the Custom Shop

[\(click for schematic\)](#)

The "Joe Wilson" wiring for Telecaster®

This wiring was designed for one of our sales reps in the Southeast, Joe Wilson, who wanted to add some extra versatility to his Tele®, while retaining the stock look. For this scheme, we use our "tapped" Hot Lead (STL-2T) and a Vintage Rhythm (STR-1) pickups. We used a special 4-pole 5-way switch in place of the standard 3-way switch. In position 1, you'll get a hotter Tele lead sound. Position 2 will give a traditional Tele lead sound. Position 3 gives you both the rhythm and "traditional" lead sound in "parallel" (the typical Tele wiring). Position 4 gives the rhythm and "traditional" lead sound in "series," a warmer and fuller sound for smooth jazz runs. Position 5 gives you the rhythm pickup by itself. We also put in a push-pull pot on the tone control that reverses the phase of the neck pickup. This gives a nice, chiming, James Burton-esque sound in positions 3 and 4. Make sure that you cut the short bare wire between the cover and the black wire on the rhythm pickup. You must then run an additional wire from the cover to ground, so that the cover still shields the rhythm pickup. The 5-way switch we show here is Yamaha's 4-pole 5-way switch. The value of the push-pull pot should be 250k. Take your time wiring this one, and always take your guitar to your local technician if you are not comfortable wiring your own instrument.



Tech Tip From the Custom Shop

[\(click for schematic\)](#)

This is for those of you looking for some extra tones from your Strat®(or any three pickup guitar). Here is a simple but effective mod that doesn't change your existing sounds, nor does it call for any pickguard or body work. But before taking a hot soldering iron to your precious guitar, please seek assistance from a qualified repair person if you're not totally comfortable doing the work yourself.

All you do is change the #2 tone pot to a 250k push-pull pot and wire it like the diagram. This gives you two cool, new tones with the pot pulled up: 1) the neck and bridge pickup together (like a Tele® in the middle position) when your selector switch is in either the first or fifth positions; and 2) all three pickups together when the switch is in the second, third or fourth positions. Push the pot down and you have your regular 5-way switching, just like before.

Cool, huh.

Tech Tip From the Custom Shop

[\(click for schematic\)](#)

Spin-a-Split - A humbucker is split when only one coil is engaged full output. This is often used to achieve a single coil sound from a humbucker. Here's one of easiest and most controllable ways to split a humbucker. It not only allows you to split your pickup, but it gives you precise control over the amount of split -- in gradual increments. And the best part is that no major guitar surgery is required.

By utilizing one of your existing tone controls as your splitter switch, you can dial in just the amount of split you desire. Imagine: one coil at full output, mixed with any amount of the other coil -- 0%, 50%, 100%, 86.085xpr2%, or whatever. This is a vast improvement over the old conventional way of splitting a humbucker and hopefully it will help you get a little closer to achieving your own "signature" sound. Give it a try! But please remember to ask your local tech for help if you're not totally comfortable doing repair work on your guitar. And remember do not get the potentiometer too hot when you solder on the wire. From all of the Toneologists here at Seymour Duncan, good luck! And don't forget to commit "total random acts of music" every chance you get!

Tech Tip From the Custom Shop

[\(click for schematic\)](#)

There comes a time in every Tele® player's life when you try to find the right sound for the middle position on your three way switch. One of the questions asked is: How do I change the sound of the middle position without changing the sound of the other two? Here is a simple way to wire your middle position that allows you to put your bridge and neck pickups in parallel or series with the push or pull of your tone control, without affecting the other two traditional sounds. All you need is a push/pull potentiometer, a soldering iron, and a little knowledge of how to solder. If you prefer you can use a DPDT mini toggle-switch and mount it between the two pots on the control plate, whichever works best for you. Either way, the wiring diagram will work.

Tech Tip From the Custom Shop

[\(click for schematic\)](#)

Stratocaster Bridge Pickup Switch Of all the cool Stratocaster mods I've been asked to do in my 25 years of guitar building, this one is by far the most requested and one of the easiest. As nearly all Strat players know, there is seldom call for two separate tone controls. Here's an easy way to simplify your volume/tone setup and add two very useful sounds to your instrument -- all at the same time. This mod replaces one of your tone controls with a double throw, double pull switch that enables you to activate the bridge pickup any time, no matter which position your selector switch is in. This adds the option of the neck and bridge pickups in series together (switch in position one) or all three pickups in series at the same time (switch in position four). Best of all, you don't have to rout, cut, hammer, fold, spindle, or mutilate your prized axe. However, as with any guitar modification, if you're not totally confident with a soldering gun, you should probably take your instrument to a qualified technician. Good luck and keep pickin'!

-Larry L. Brooks, Custom Shop

Tech Tip from the Custom Shop - Potentiometer Values

[\(figure 1, figure 2\)](#)

We often get calls from people asking what value of potentiometer that they should be using for the volume controls on their guitars. As a general rule of thumb, for single coil pickups we recommend 250k audio taper pots, and for humbuckers we generally recommend 500k audio taper pots. The most basic reason for these recommendations is that it allows a smooth swell in volume from zero to full out. The purpose of this article is to show you what effect changing the value of the pot can have on your pickup's tone. Let's start with the pickup itself: a single coil pickup like our SSL-1 Vintage for Stratocaster. The SSL-1 has a DC Resistance of approximately 6.5k and a resonant peak (the pickup's voice, or sweet spot) of about 10kHz. The characteristic of an SSL-1 (and other single coil pickups) is such that when a note is plucked, the tendency is for the tonal spectrum to leap towards the peak frequency, giving that characteristic "sparkle" in the attack. The amount of "sparkle" can range from minor to overkill depending on what value of potentiometer you use to "load" the pickup's circuit with. In [figure 1](#) you can see the peak characteristics of an SSL-1 with different values of volume pots attached to it. The top curve indicates virtually no load, the second curve down indicates a 1meg pot, the third down is a 500k pot, the fourth is a 250k pot and the bottom curve represents a 100k pot. As you can see, the peak doesn't shift in frequency, but it does shift in amplitude. The difference between a no load state and the load induced by a 100k pot is 19dB (a significant difference)! In [figure 2](#), we show the same settings as they relate to one of our SH-8b Invader™ pickups. You'll notice that in a high output pickup, the difference is not as great. As you reduce the

amplitude of a pickup's peak frequency, the surrounding frequencies come into play more and more. This can give a more pleasing balance of frequencies, and is part of the reason for the guitar manufacturer's selection of the volume control's value. What does this mean to you? It means that if you like a pickup's basic character (its peak), you can further shape the tone by increasing or decreasing value of the pot in your guitar. Have fun in your tonal quests!

Tech Tip from the Custom Shop - "Scratchy Pots"

Here's a quick test to determine if your potentiometers need to be replaced or just cleaned. With the guitar plugged in, try turning the scratchy pot back and forth quickly a few times. If the scratchiness starts to lessen, then the pot needs cleaning. If the scratchy sound doesn't go away or sounds more like a "click," then the pot needs to be replaced.

To clean dirty pots, you'll need a spray cleaner or lubricant commonly available at any electronics parts store. With the guitar unplugged and the pots exposed, give the pot one shot of spray through the opening in the back of the cover that protects the pot. The access hole is small, but by using the tube supplied with the spray can, the spray will reach inside the pot. One shot should suffice. Let it set for about 10 seconds and then rotate the pot back and forth quickly. Plug the guitar back in and give it a test. The noise should be gone or reduced significantly. If there is still some scratchiness, unplug the guitar and repeat the process one more time. If the scratchy sound doesn't go away at this point, it's probably a bad pot and it'll need to be replaced. Just a note of caution -- before you spray anything in or around your guitar, protect the paint job by putting a towel or old T-shirt around the body.

Tech Tip From the Custom Shop - Installing Active Basslines Pickups

[\(click for schematic\)](#)

Basslines® bass pickups range from the most authentic vintage reproductions to the most modern active pickups. This month's Tech Tip looks at installation of active pickups. These include: "Phase I" soapbars (replacements for Bartolini® P-2 and P-4), "Phase II" soapbars (replacements for EMG® model 40 and 45), and Jazz Bass® and P-Bass® replacements. Of course, if you're not comfortable with instrument repair, take your instrument to a qualified tech before taking a hot soldering iron to your instrument.

(1) Install the pickups in their proper locations and wire them up according to the diagram. Make sure the bridge and neck pickups are in their correct respective positions. (Obviously, if you're upgrading a P-Bass®, you won't have a bridge pickup). (2) Start off with the pickup-to-string clearance as follows:

Neck 11/64" (.171)

Bridge 7/64" (.109)

Hint: Drill bits work great as height gauges.

(3) Fine tune the string-to-string balance by listening to each pickup individually

and adjusting the tilt to produce equal output on the high and low strings.

(4) Fine tune the pickup-to-pickup balance by alternatively comparing the output of the neck and bridge pickups and adjusting the overall height of each pickup to produce equal output. Some additional adjustments may be required to produce the particular blended sound that may be desired.

Pretty simple, huh.

Celebrity Tech Tip: Saddle Up Your Telecaster®- By Jerry Donahue [\(click for schematic\)](#)

This month, we asked "Bendmaster of the Telecaster" Jerry Donahue to share some of his secrets for setting up a Telecaster® bridge and keeping it properly intonated. Jerry demonstrates this technique in his clinics. "Attention all current and would-be Tele® slingers! You needn't resort to six individual bridge saddles to improve your intonation. The original Broadcaster design called for three brass saddles: and that's still the best design today (see Fig. 1). The larger saddles mean more mass, providing greater output, sustain and tone. Also, with two strings per saddle, you have twice the string pressure against the body. [Editor's note: The Fender® Custom Shop Jerry Donahue model and "JD" Tele® use three brass bridge saddles]. Now, on to intonation. Until fairly recently, I felt that a guitar couldn't really play in tune unless each string's 12th fret harmonic and 12th fret note had the exact same reading on the electric tuner. And of course, they never do. I finally settled on a technique that not only deals with this problem, but to my delight, solves a few other inherent problems also.

Here it is: Adjust the middle saddle's intonation screw so that the "D" string's 12th fret note is marginally flat of the 12th fret harmonic. Then, check out the "G" string. The note should be only slightly sharp of the harmonic. Are you with me? Now, tune the guitar with the open "G" string reading around A439 and the others at A440. Final adjustments can be made by ear when you compare first position E major and E minor chords. The E major's G# note (third string, 1st fret) should no longer seem sharp in the chord; and the open "G" string should still be perceptively in tune within the E minor chord. Here's another for-instance. . . An "A" chord barred at the fifth fret sounds fine. But when the nearest "E" chord is played (see Fig. 2) it typically sounds "off." The major third is the culprit ("D" string, 6th fret): it typically sounds sharp. But since with my adjustment the 12th fret note is slightly flat, the problem no longer exists. There's a small margin of error here which works to the guitarist's advantage.

A piano tuner may use a strobe tuner as a reference. But if he tuned the entire keyboard to be "perfect," it would sound weird. The bottom keys are tuned sharp and the high ones are tuned flat. This way the human brain perceives the whole piano to be in tune. It's the same concept adopted to the Telecaster®.

I really like this method. When I adopted it, my Tele's® were more in tune than my Strats® (across all the chord shapes) so I made the same adjustments to the Strats®. Remember, life is about compromise. Check it out." - Jerry Donahue

Tech Tip From the Custom Shop - 5-Way Switch Humbucker Split

[\(click for schematic\)](#)

Here is a wiring scheme that we get many calls for. It's for a Strat™-type guitar with a humbucker in the neck position, a single coil in the middle position, and a humbucker in the bridge position. The diagram allows for a master volume control, a neck pickup tone control, and a bridge pickup tone control. The 5-way switch gives you the following options: In the #1 position, you have the neck humbucker alone in series humbucking mode. The #2 position gives you the neck humbucker in split coil mode (only one coil on) with the middle single coil. The #3 position is the middle single coil by itself. The #4 position gives you the bridge humbucker in split coil mode with the middle single coil. In the #5 position, you have the bridge humbucker alone in series humbucking mode. The neat thing about this wiring is that you still get that Strat™ "quack" in the #2 and #4 positions without adding any additional switches. If you use our single coil and humbucking pickups, you'll also have a hum-canceling effect in the #2 and #4 positions. As with any guitar wiring modification, if you're not confident with your soldering abilities, take it to your local guitar tech. Happy soldering!

Tech Tip From the Custom Shop - Add Versatility to your Les Paul®

[\(click for schematic\)](#)

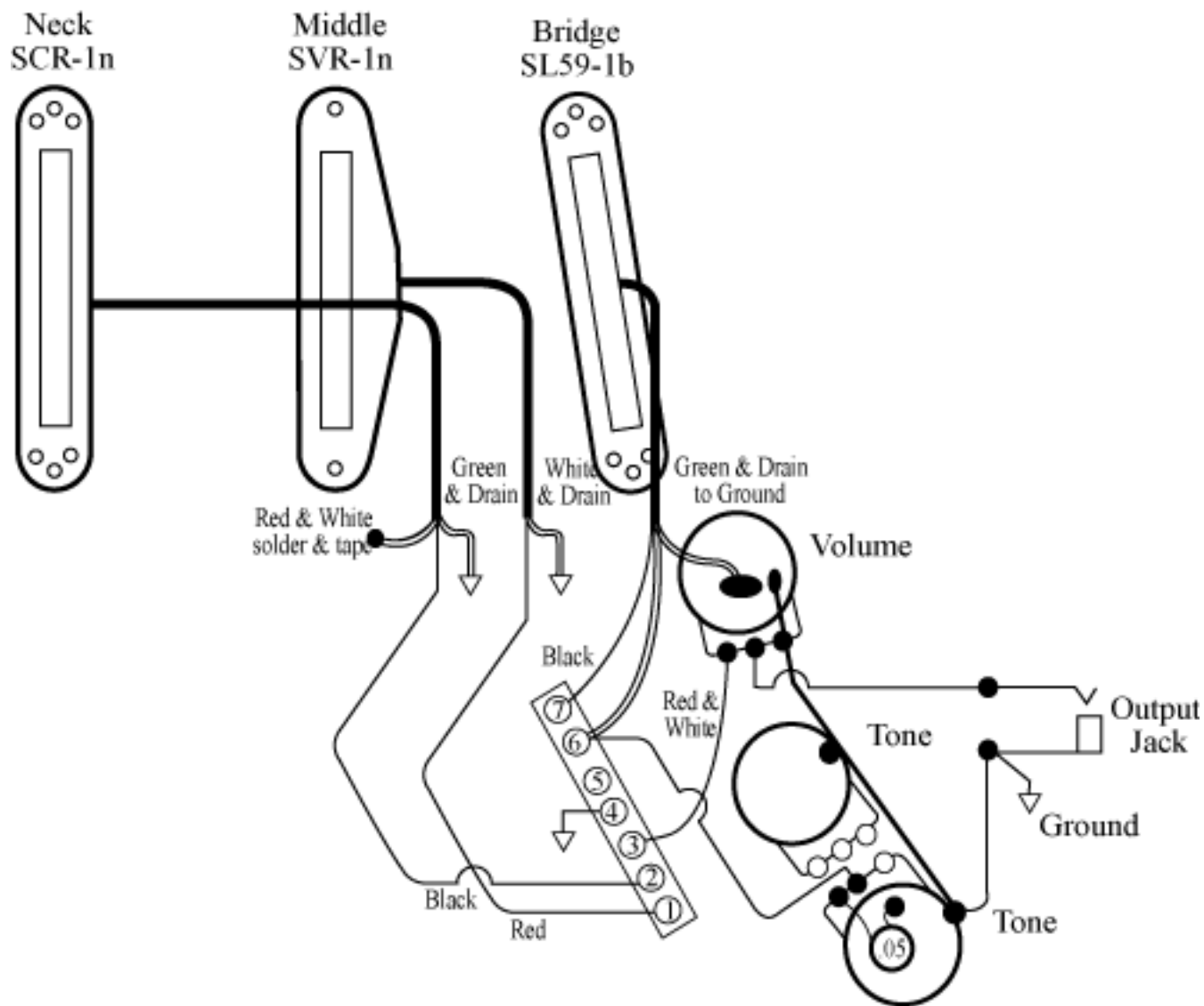
Here's a diagram that can add a good deal of versatility to your Les Paul®. You have four knobs and want to get a good amount of variation in your tone, but you don't want to drill holes in that drop-dead flame-top. With this diagram, you can use a push-pull pot on your volume control to give you series/parallel wiring and another push-pull pot on your tone to give you a split coil.

With the volume and tone knobs in the down position, you get the "series" sound (the standard, fat humbucker sound that we're all familiar with). When you pull up on the volume knob, it switches the humbucker to "parallel" mode (a thinner, brighter humbucking mode). When you pull up on the tone knob, you cancel out one of the coils on the humbucker giving you the "split coil" mode. This will give you a classic single coil pickup sound (it will also have the single coil hum). When you pull up on the tone knob, it bypasses the switch on the volume knob, so it doesn't matter what position the volume knob is switched to if the tone knob is up. Just double this diagram to use it with both pickups. You should use 500k audio taper push-pull pots with a DPDT switch configuration for the volume and tone. As with any guitar wiring modification, if you're not confident with your soldering abilities, take it to your local guitar technician. Have fun!

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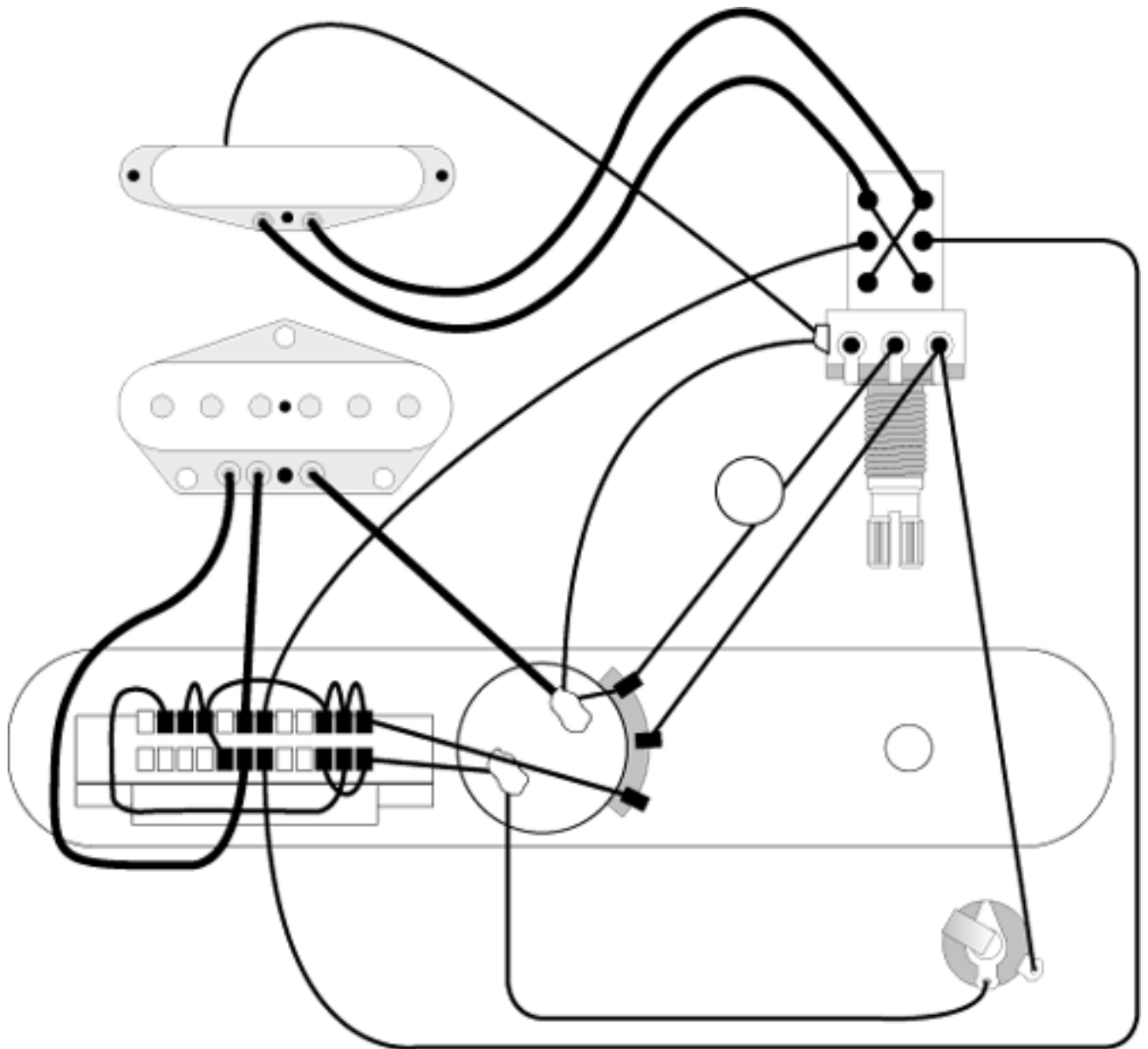
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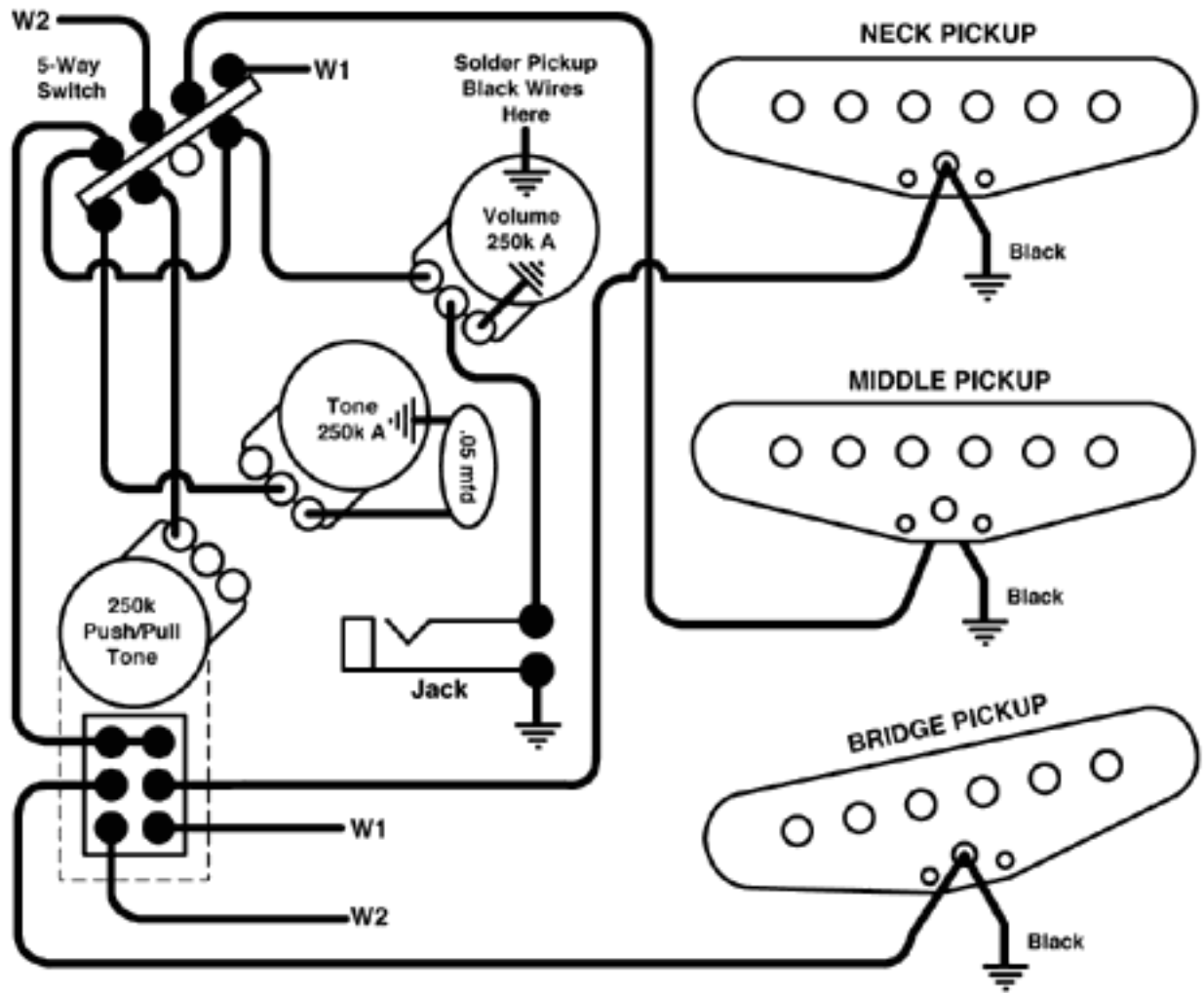
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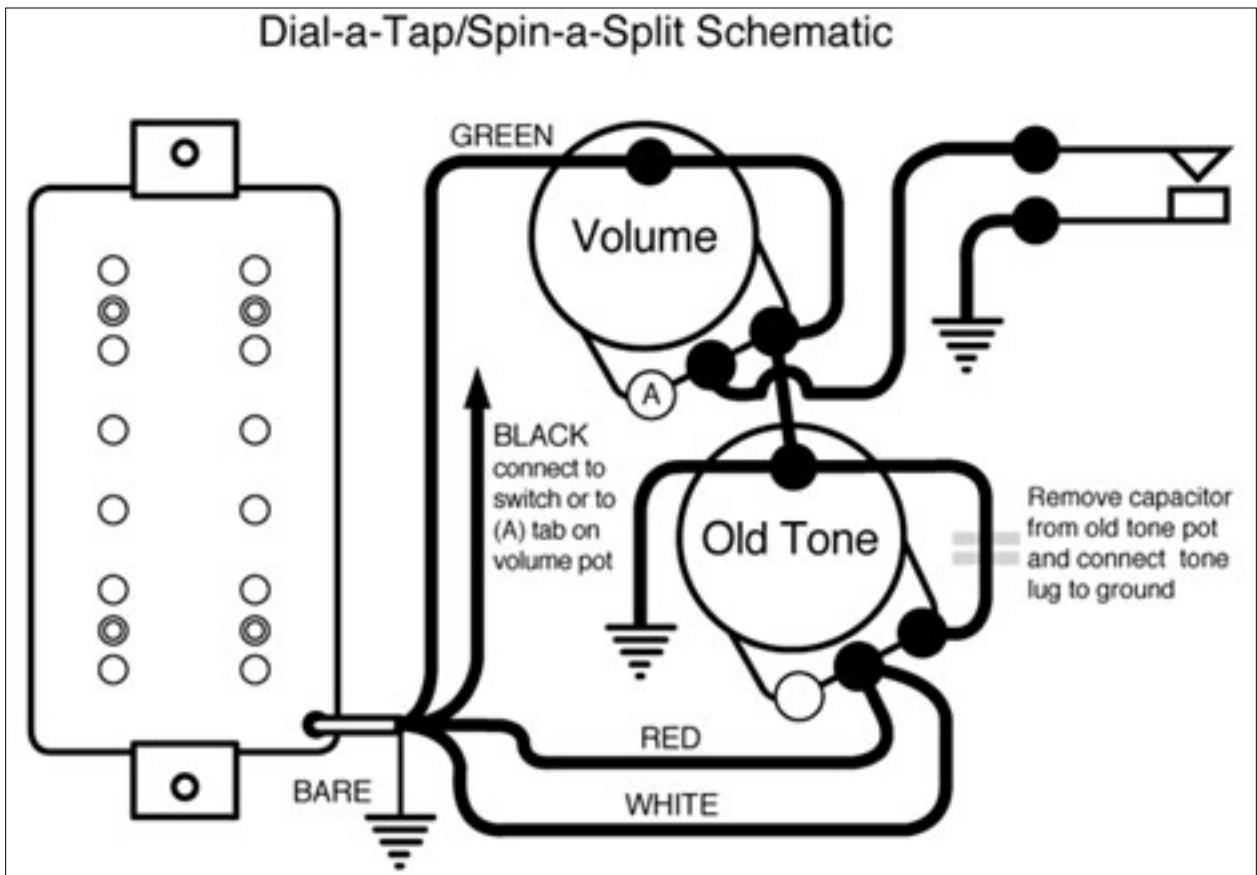
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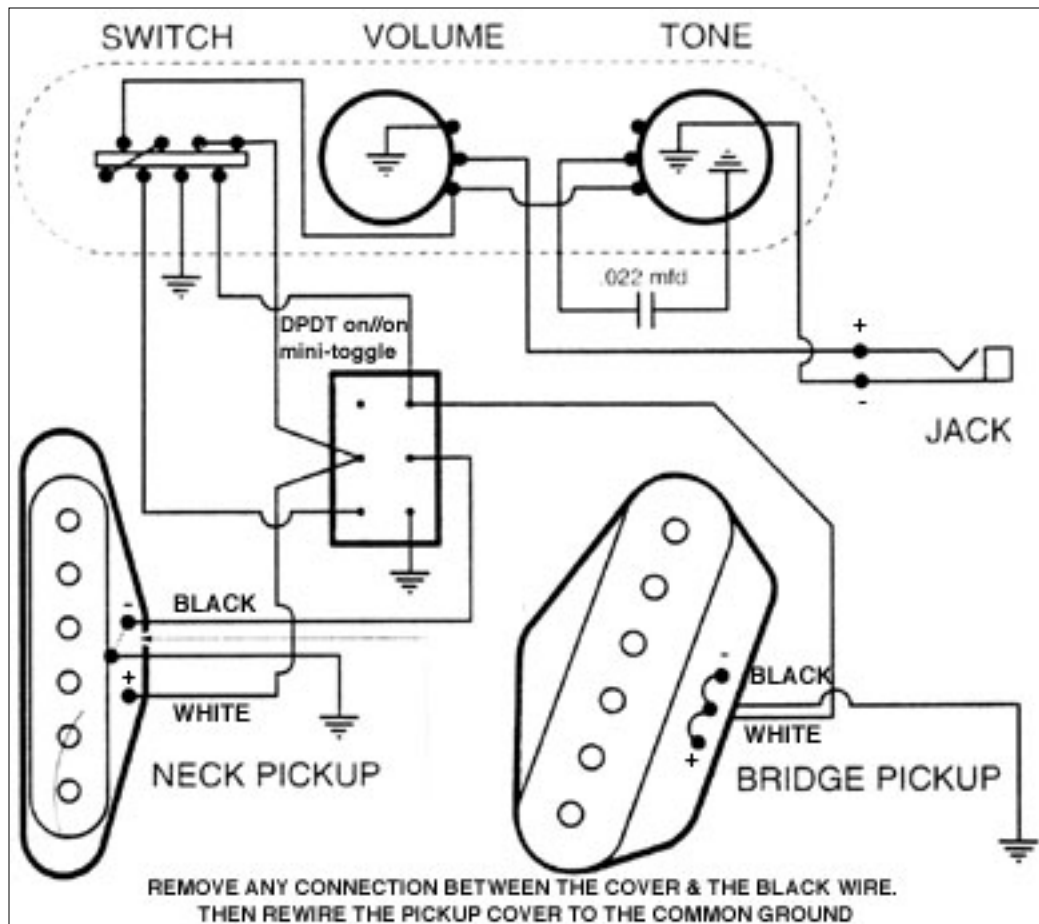
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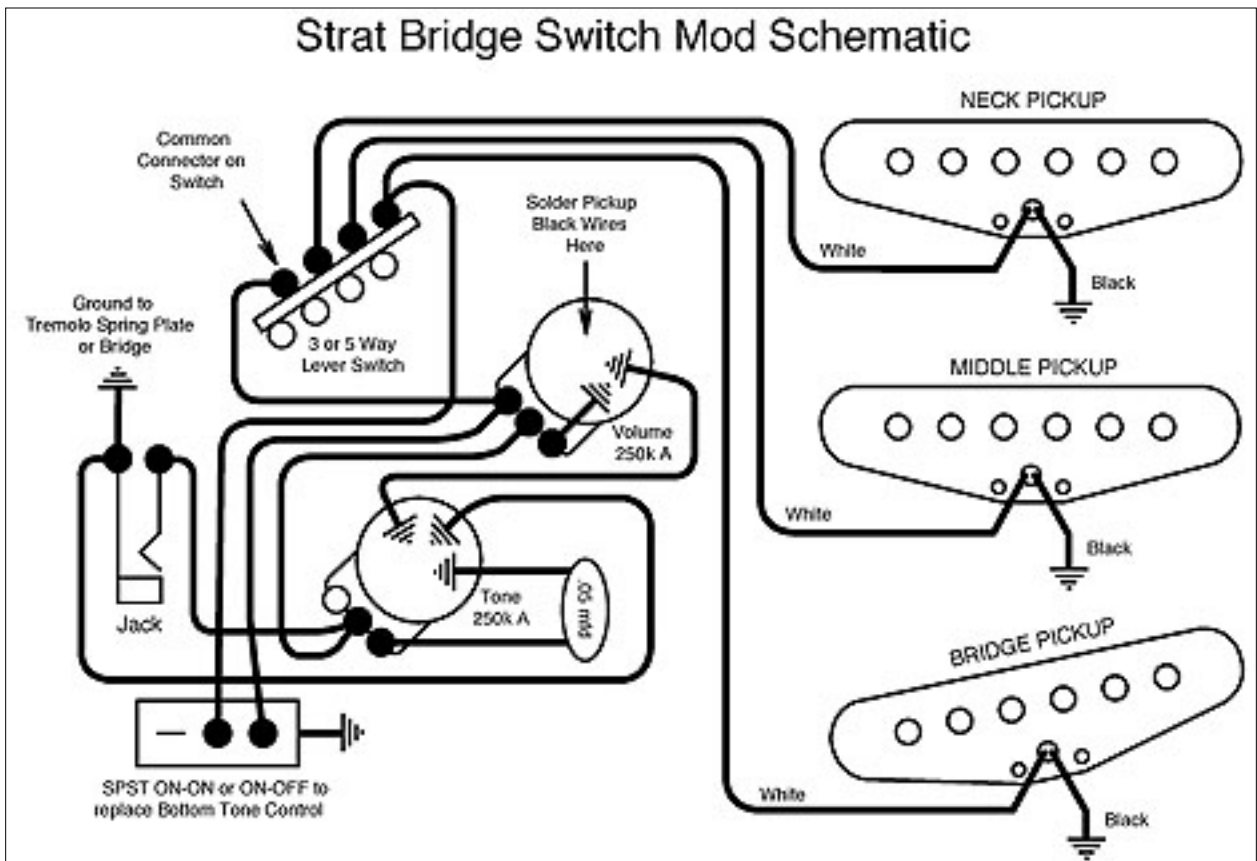
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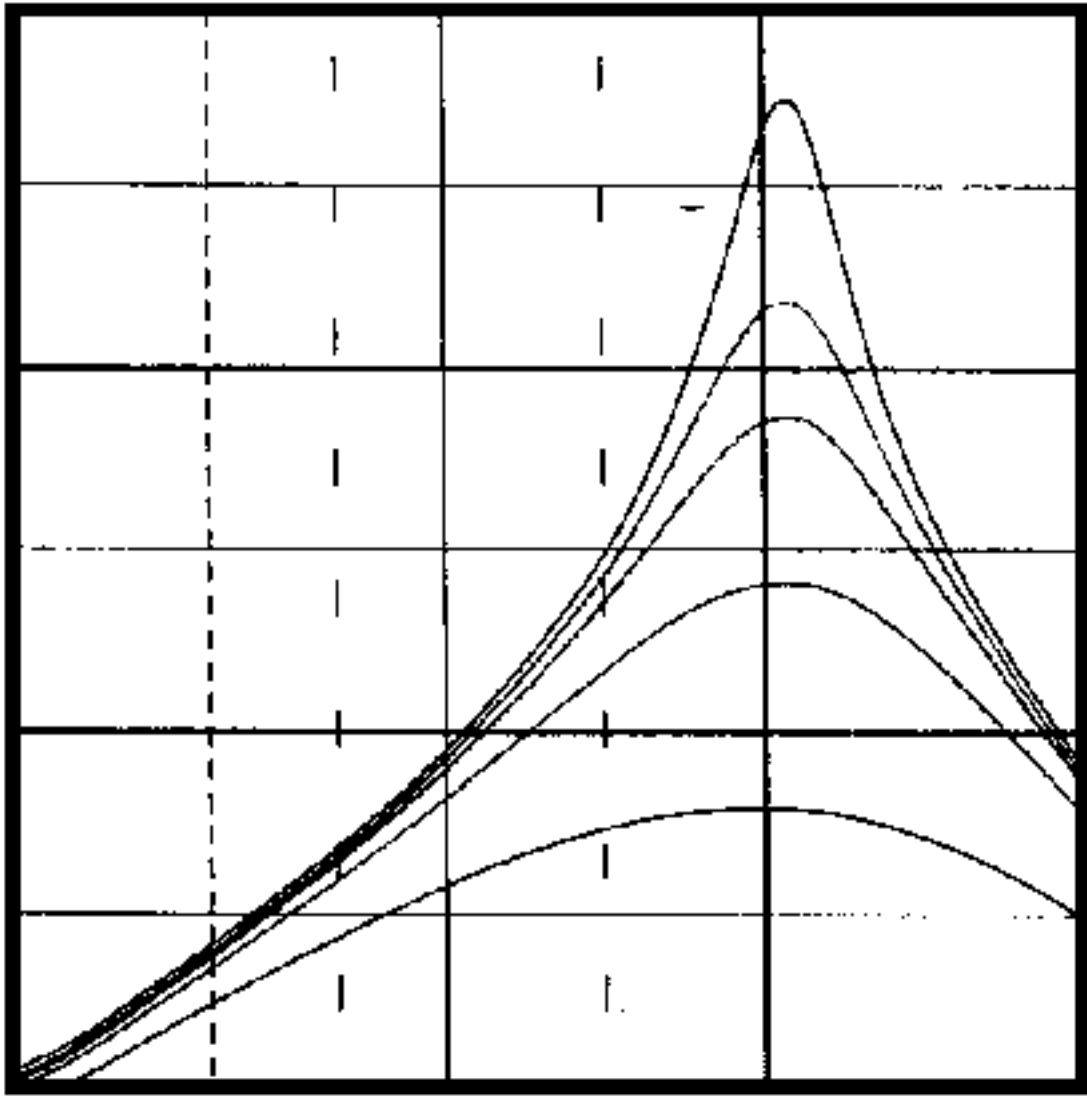


Figure 1

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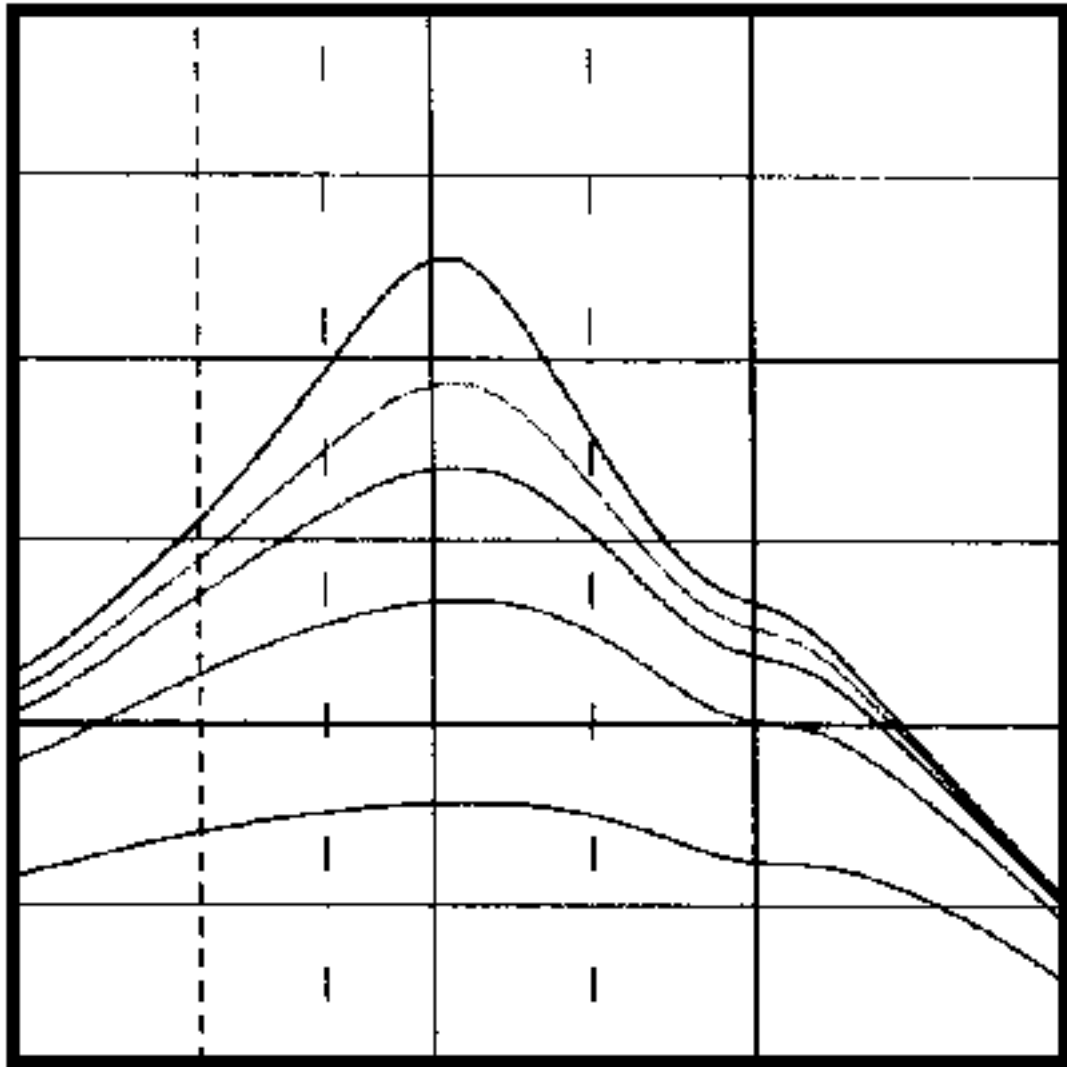


Figure 2

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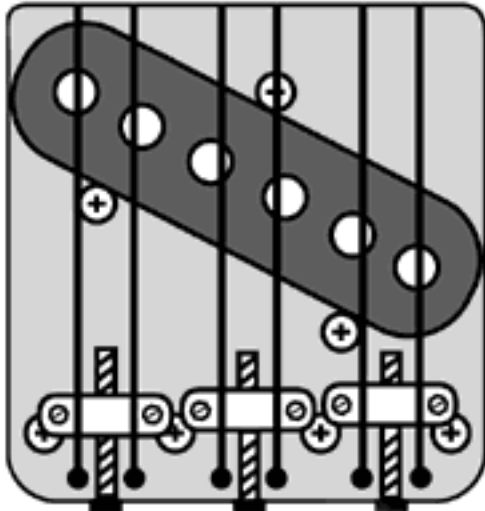


Figure 1

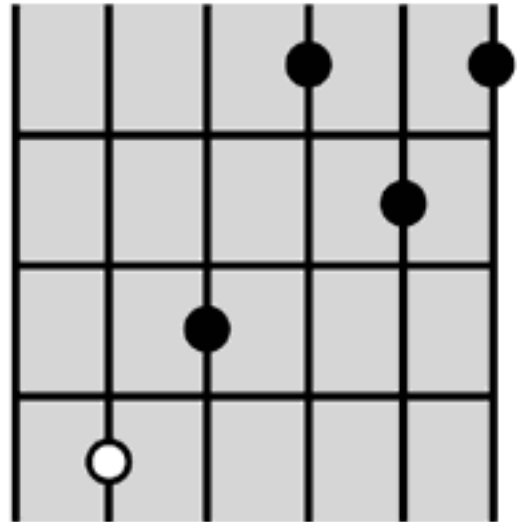
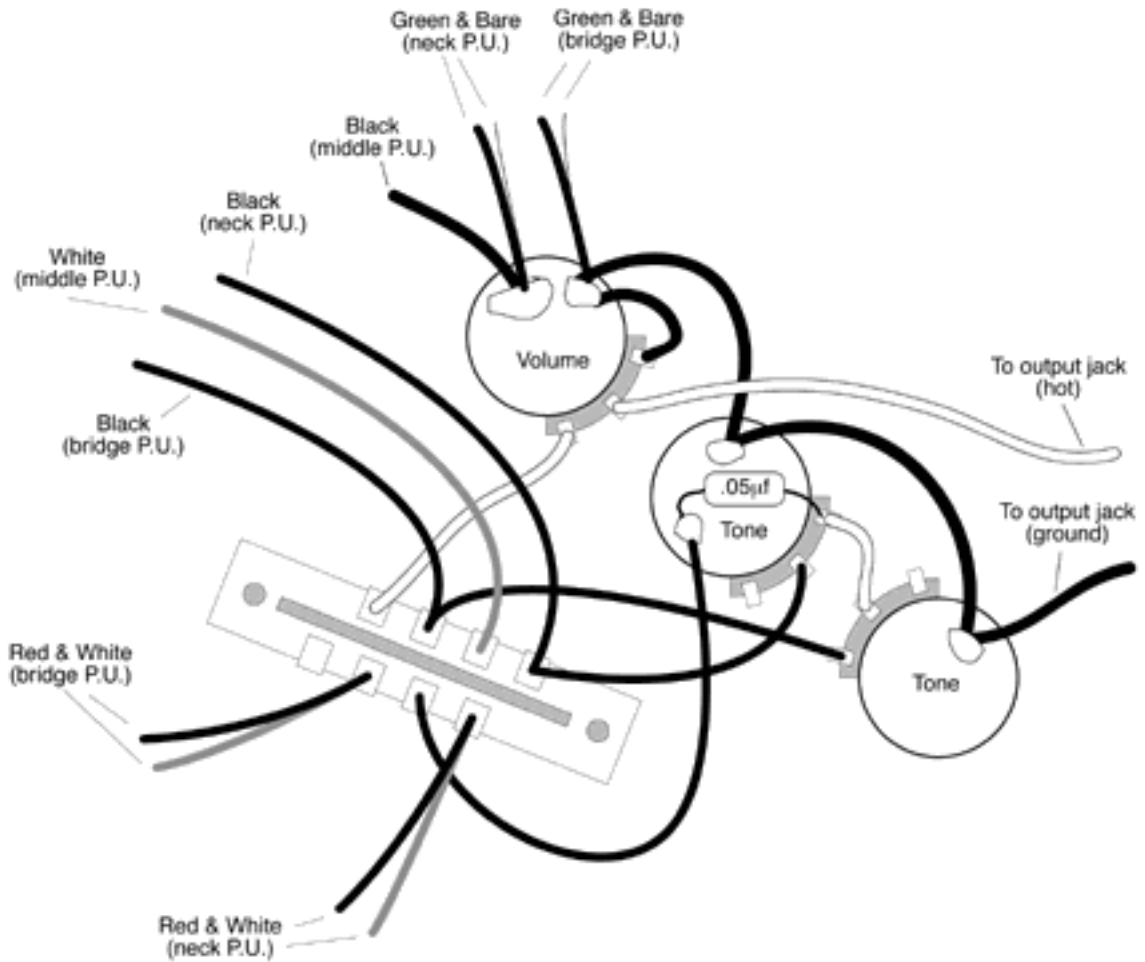


Figure 2

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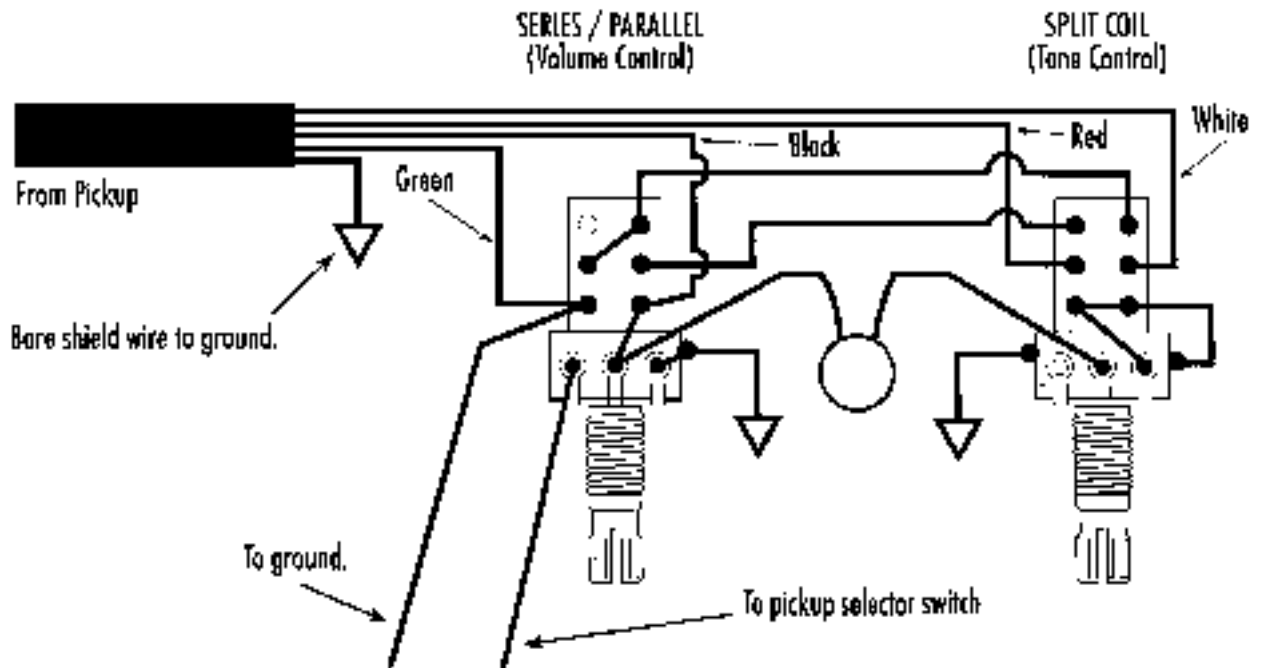
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