

Before you start, **read these instructions first** to understand what you need to do to install this product.

Assumptions

This patented S-Board **Pickup Switch Upgrade™** switching system is designed to use only one Volume and one Tone control for all of your instrument's pickups. We assume that you have either 3 or 2 coil-wound magnetic pickups installed in your instrument. **Note:** *Pizeo* or *Active* pickups cannot be used with this product.

The S-Board can be assembled to control two pickups (pickup coils), giving you six pickup tones from your instrument. You can also assemble the S-Board to control three pickups (pickup coils) to give you 35 pickup tones from your instrument.

Tools Needed

You may need one or more of the following tools to install this S-Board product.

- Wire cutters / Wire strippers
- Regular pliers
- Small Phillips & straight slot screwdriver (a 4-way screwdriver can be used as a deep-well socket to remove switch mounting nuts.
- Ohmmeter to measure continuity
- Soldering iron (25/30 watt max.) with fine tip, rosin-core solder .022" dia.

Preamble

Before you start, determine if the strings are in the way of the installation. If so, completely **remove all strings** from your instrument for easy installation. The strings are probably already old and replacing them will make your instrument sound even more *brilliant* after you install this product.

This installation will have you cutting existing wires on your instrument. You may need to make wire connections, increase the length of existing wires, rewire the volume and tone control, and drill several holes in your pickguard or instrument body.

Because you will be making several changes to your instrument, you need to have a plan to install this S-Board **Pickup Switch Upgrade™** product.

See the *Reference Drawing* on a later page of this document. Use a pencil to draw the original circuit of your instrument before you proceed. When you document where the wires (and the colors) were disconnected from your instrument, you will have a way to restore it to its original condition should it become necessary. Since there is a large variation of pickup switch wiring that spans 50 years, you will need to draw your own pickup switch used in your original circuit

Adding Extra Wire

If your pickup or input wires are too short to easily reach the specified connection of the green terminal strip on the S-Board, here is what to do. Measure out the length of 22 gauge insulated stranded RED or BLACK hookup wire to reach the applicable connection. Insulate all wire connections using electrical tape, UY2 solderless connectors, 71B grey wire nuts or similar items to connect the wires.

Note 1: If either your pickup or input wires use a shielded/braided cable, you will need to solder BLACK wire to the cable because the green terminal strip (J1) does not directly accept shielded cable.

Note 2: If your pickup wires are 26 gauge (thin) wires, see Document #T in our Document Library to find out how to connect 22 gauge and 26 gauge wires using our UY2 connector.

1. S-BOARD INSTALLATION

You are installing a user-assembled S-Board into your electric guitar, electric bass and other instruments with magnetic coil-wound pickups.

The S-Board installation specifications.

- **S-Board** – designed for instruments that can accommodate its size. This board type can be made as either a 3-pickup version or a 2-pickup version. The switches are mounted in two rows of three.
Physical clearance needs: 1.75" wide, 1.75" long, 1.15" deep
Switch Hole Spacing: 1/2" center-to-center for two rows of three switches, each row is 1" center-to-center

Preparation

If applicable, remove your strings. As needed, remove your existing pickguard or control plate screws. Document your instrument's existing wiring *before* you disconnect them (see Preamble on page 1).

For the hot and ground wires that come from your instrument's input jack, disconnect them from the component to which they are attached. You want to keep the wires that are attached to the input jack as long as possible.

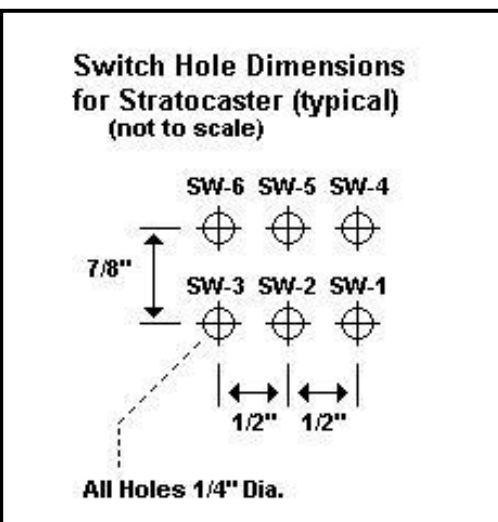
Cut each of the pickup wires from the pickup switch keeping these wires as long as possible.

To modify your existing pickguard or control plate (or create a replacement) you need to remove the attached components. This will make it easy to use it as either as a template to make a replacement part, or identify where to drill the switch mounting holes.

Installing the S-Board

If you are installing the S-Board into an existing (or replacement) pickguard, you need to determine two things. First, you need to confirm that there is adequate clearance for the S-Board. You also need to identify the specific location to drill the switch mounting holes. Note that all switch mounting holes are now 9/32" diameter.

To determine if there is adequate clearance for the S-Board, tape the supplied Styrofoam block to the back side of your pickguard or control plate at the proposed position of the switches and confirm that the circuit board dimensions will have clearance in the body routing underneath the pickguard at the proposed position. You also need to confirm that that your routed body cavity has the needed 1.15" depth.



If you are installing a 2-pickup board type, you should circle the **drill hole template** centers (the "+" symbol) for SW1, SW3 and SW5. This way, you know which holes need to be drilled without error.

The switch mounting shafts are designed for 1/4" holes, but you need larger 9/16" diameter mounting holes to compensate for assembly variances.

Once you have found the location with the needed clearance, mark the specific locations for each of the drill hole (3 holes for 2-pickup board versions and 6 holes for 3-pickup board versions.)

Use an electric drill and 1/16" drill bit to drill "pilot" holes at the marked locations. Use a center punch to *dimple* each of the centers to help prevent the drill bit from "walking" when you first start drilling and result in a more precisely-drilled hole position. Before drilling your pickguard, use a piece of wood stock to serve as a backing to avoid rough holes. After drilling the pilot holes (either 3 or 6) follow through with the 9/32" drill bit for each of the holes. The switch mounting shafts are designed for 1/4" holes, but you need larger holes to compensate for assembly variances.

Attach the S-Board to the pickguard. First, adjust each backing nut so when the locking nut is installed, the top surface of the locking nut will be flush with the switch shaft threads. Screw each backing nut against the switch body and back off 2 complete turns to arrive at a general starting position for mounting.

Confirm that the pickguard with the S-Board will lay completely within the routed body cavity with no interference by the wood body. If it doesn't lay down flush, here is what to do.

Loosen all of the switch mounting nuts so that the S-Board can be slightly "Shifted" to achieve the needed clearance. If that doesn't work then temporarily remove the S-Board by removing all the switch mounting nuts. Use a rat-tail file to "extend" the holes, elongating them in the direction opposite of the interference. This should give you the needed clearance. If not, you need to cut a small amount of wood from your body in the interference area to provide the needed clearance. This must be done before you can proceed.

Mount the S-Board into your instrument using Figure 1 as a guide for either right-hand or left-hand use.

Rewire the Volume control and Tone control as indicated in the *Figure 2* illustration presented later in this document.

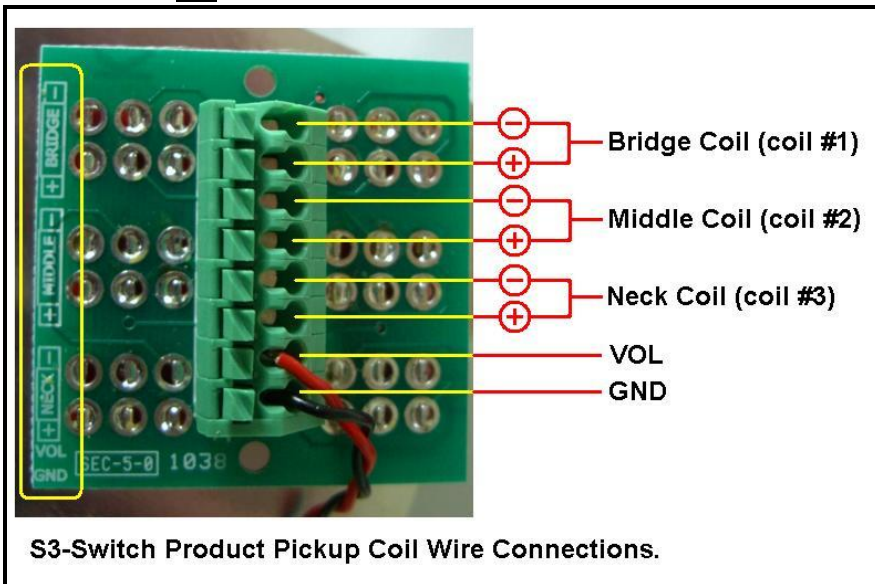
Note: The Volume and Tone control is wired for RH instruments.

Terminal Strip

Attach wires to the **green** 8-position terminal strip (J1) that is on the S-Board circuit board. Use a small screwdriver or writing pen tip and press down on the square *release button* located directly above the wire hole. Hold the button down and insert the stripped wire completely into the wire connection hole and then release the button. Lightly tug on the wire to confirm it is firmly gripped by the Terminal Strip. A legend is printed on the circuit board with the name of each of the terminal strip wire holes from left to right. Attach each wire to the correct terminal strip hole.

[GND] [VOL] [+]NECK [-] [+]MIDDLE [-] [+]BRIDGE [-]

Caution: Do not insert hard items in the wire holes because it will decrease reliable electrical connection.



Connecting Your Wires

There is no industry standard for pickup wire colors. Common color pairs are red/black, red/white, black/white and white/shield. You are advised to use consistency when connecting *your* pickup wire color pairs to the (+) and (-) pickup connections on the green terminal strip (J1).

Determine in advance which wire color on each pickup will be attached to the applicable (+) and (-) connector of the green terminal strip on our PTM board. If one of the pickup wire connections is a shielded lead, always connect the shield to a BLACK (-) wire to be inserted in the green terminal strip on our Switching System.

Determine if there is enough wire length from each 2-wire pickup to *comfortably* reach the corresponding connectors on the green terminal strip on the **Pickup Tone Multiplier™** circuit board. If not, refer to the “*Adding Extra Wire*” topic (page 1). If you have humbucker pickups (or stacked coils in a single coil package) with 4 separate wires, follow the instruction on pages 8 and 9 of this document.

WARNING: If your pickups have a metal bottom and either pickup wire is grounded to this housing (use an ohmmeter to check each wire to body), make sure your instrument’s body cavity is not lined with grounded metal shielding. **Reason:** This will cause the pickup to “short” to ground when the pickup switch is put into the regular/reverse phase. To fix this, isolate the pickup housing from the body cavity shielding with soft foam.

Strip off 3/16” insulation from the end of each pickup wire and also the input jack wires then twist the exposed wire strands so they are tightly bound.

Insert the wires of each pickup pair into the correct location on the green terminal strip (J1) using the process described in the “*Terminal Strip*” topic on page 3. Attach the wires using either of the following instructions.

If you have installed our S-Board into a “Strat-style” pickguard.

For a Right-Hand Pickguard:

Connect your NECK pickup to	[+]NECK [-] connections on the green terminal strip
Connect your MIDDLE pickup to	[+]MIDDLE [-] connections on the green terminal strip
Connect your BRIDGE pickup to	[+]BRIDGE [-] connections on the green terminal strip

For a Left-Hand Pickguard:

Connect your BRIDGE pickup to	[+]NECK [-] connections on the green terminal strip
Connect your MIDDLE pickup to	[+]MIDDLE [-] connections on the green terminal strip
Connect your NECK pickup to	[+]BRIDGE [-] connections on the green terminal strip

Switch Use Summary

A complete *Switch Table* (available as a PDF document) contains more details about how each switch is used. It is available for download from our website at <http://www.AweSome-Guitars.com/docs>

Here is a summary of switch use (see Figure 1).

SW1, SW2 and SW3 are ON-OFF-ON switches turn on individual pickups

SW4, SW5 and SW6 are ON-ON switches put select pickups in *series* to create a humbucker/compound pickup

If you installed our S-Board into a “Strat-style” pickguard.

For a Right-Handed Instrument:

SW1 turns on the **bridge** pickup, either in normal phase (down), or reverse phase (up).

SW2 turns on the **middle** pickup, either in normal phase (down), or reverse phase (up). *(for 3-pickup S/T-board)*

SW3 turns on the **neck** pickup, either in normal phase (down), or reverse phase (up).

When all of the following switches are **down**, the pickups will be in a parallel circuit.

SW4 when this switch is up it puts the **bridge** and **middle** pickups in series. Both pickups must be on.^{1,2}

SW5 when this switch is up it puts the **bridge** and **neck** pickups in series. Both pickups must be on.¹

SW6 when this switch is up it puts the **neck** and **middle** pickups in series. Both pickups must be on.^{1,2}

SW4+SW6 when these switches are up all three pickups in series. All pickups must be on. SW5 has no effect.

¹ The remaining *non-series* pickup may be either off -or- on (either in regular or reverse phase).

² Only SW5 is available with a 2-pickup PTM S-Board

For a Left-Handed Instrument: (with S-Board mounted "upside down")

SW1 turns on the **neck** pickup, either in normal phase (down), or reverse phase (up).

SW2 turns on the **middle** pickup, either in normal phase (down), or reverse phase (up).

SW3 turns on the **bridge** pickup, either in normal phase (down), or reverse phase (up).

When all of the following switches are **up**, the pickups will be in a parallel circuit.

SW4 when switch is down it puts **neck** and **middle** pickups in series. Both pickups must be on.^{1,2}

SW5 when switch is down it puts the puts **bridge** and **neck** pickups in series. Both pickups must be on.¹

SW6 when switch is down it puts the puts **bridge** and **middle** pickups in series. Both pickups must be on.^{1,2}

SW4+SW6 when switches are down all three pickups in series. All pickups must be on. SW5 has no effect.

¹ The remaining *non-series* pickup may be either off -or- on (either in regular or reverse phase).

² Only SW5 is available with a 2-pickup PTM S-Board

Validating

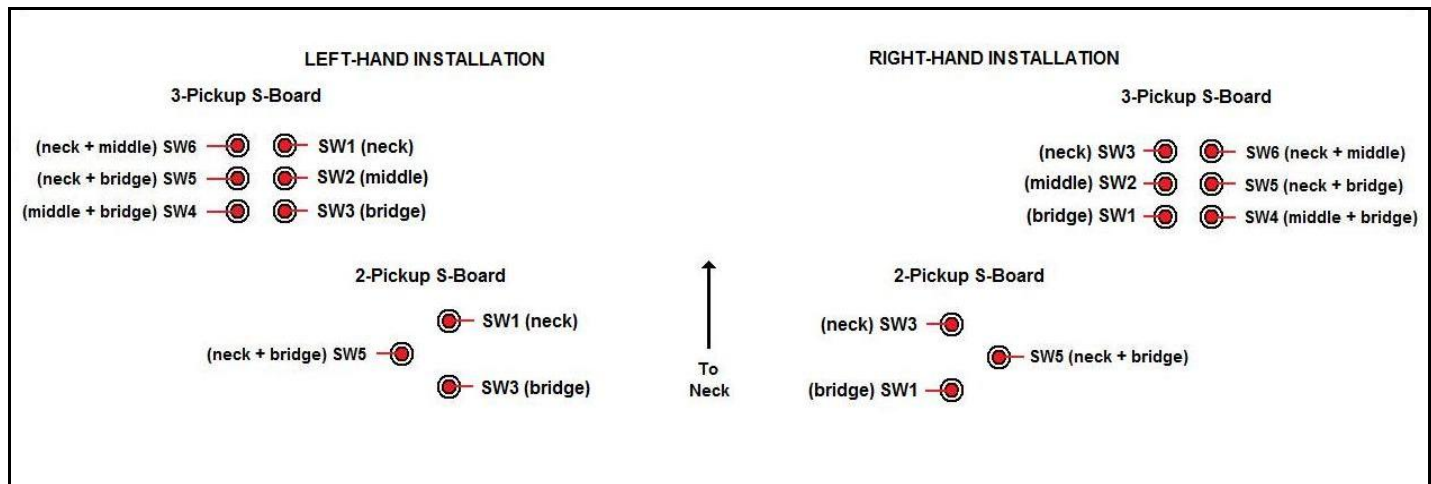
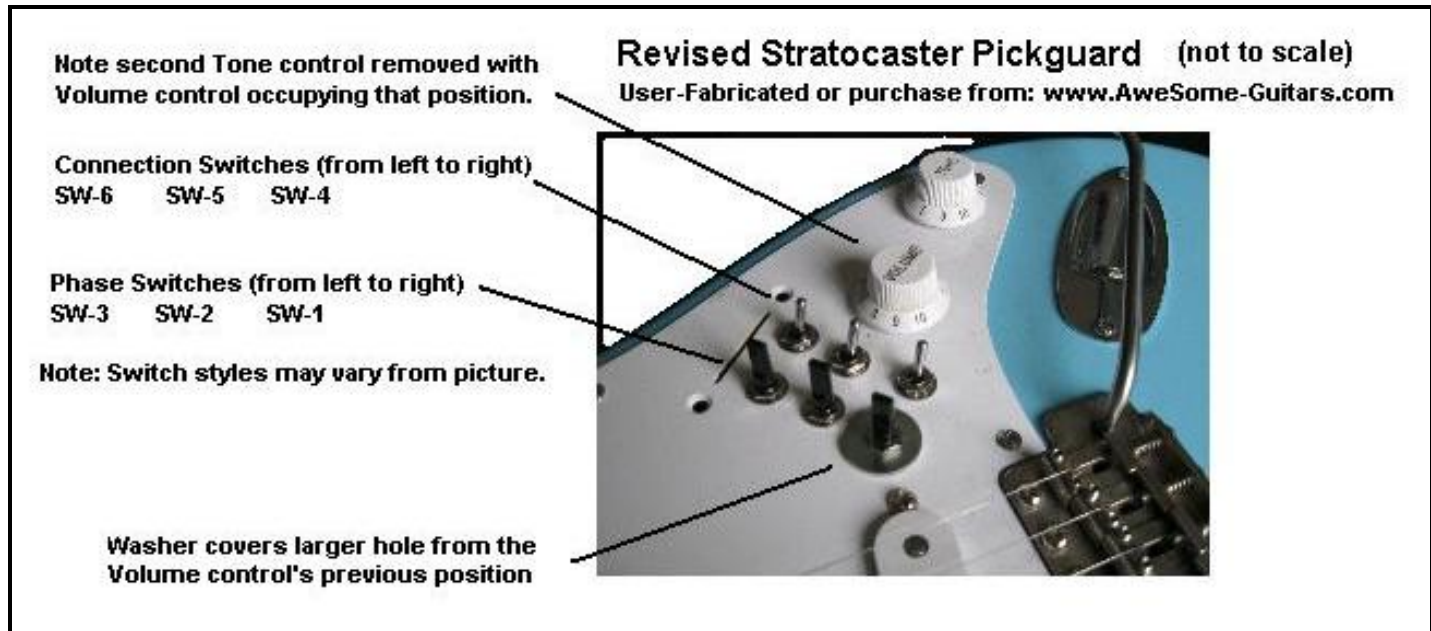
Connect your instrument to an amplified source with the volume set to low. Turn the switches on and off as described in “Switch Use Summary” topic while gently tapping the pickups that should be “on” with a small screwdriver to confirm pickup response. Also confirm the correct operation of the Volume and Tone controls. **Left hand use note:** Our VT-1 stacked pot control is only available as right-hand audio taper item. Because only the larger diameter knob of the VT-1 control supports reliable “pinky” swells, the suggested wiring is presented in two ways, depending on your preference for either Volume swells or Tone swells.

If you receive the stated results, install the pickguard screws. Next, install a new set of strings. Welcome to the world of 35 AweSome pickup tones.

This product gives your 3-pickup instrument a HUGE spectrum of sounds. After this S-Board is installed, you can duplicate the sound of virtually every electric guitar ever made. In fact, this upgrade product will produce many unique pickup sounds that you have NEVER even heard before.

Figure 1 – Typical Switch Mounting Hole Placement

Here are some figures to guide you in identifying locations of switch mounting holes.



The assembled and tested S-Board can be installed in any electric guitar or bass that has the body cavity space to permit installation. Some upgrade projects may require additional routing in the body for installation. Information to do this is beyond the scope of this document.

S3-Switch Pickup Tone "Mapping" Worksheet (for right hand use)

Use a copy of this worksheet to write down (i.e., "map") what each of the 35 pickup tones you can get from your guitar sound like to you. Once completed, this worksheet will let you quickly select a particular unique pickup tone for any current or future performance or recording need.

The major benchmark pickup tones are **(B)**lues, **(J)**azz, **(M)**etal, **(S)**urf, **(C)**ountry, **(T)**in-canny. You can use the first letter of each tone category to help group the category of each tone.

Switch legend for **SW1**, **SW2** and **SW3**: D = Down, U = Up, no symbol is Off (center position)

Switch Legend for **SW4**, **SW5** and **SW6**: U = UP, no symbol is Down

The following switch numbers will give you the stock 5 Stratocaster pickup tones.

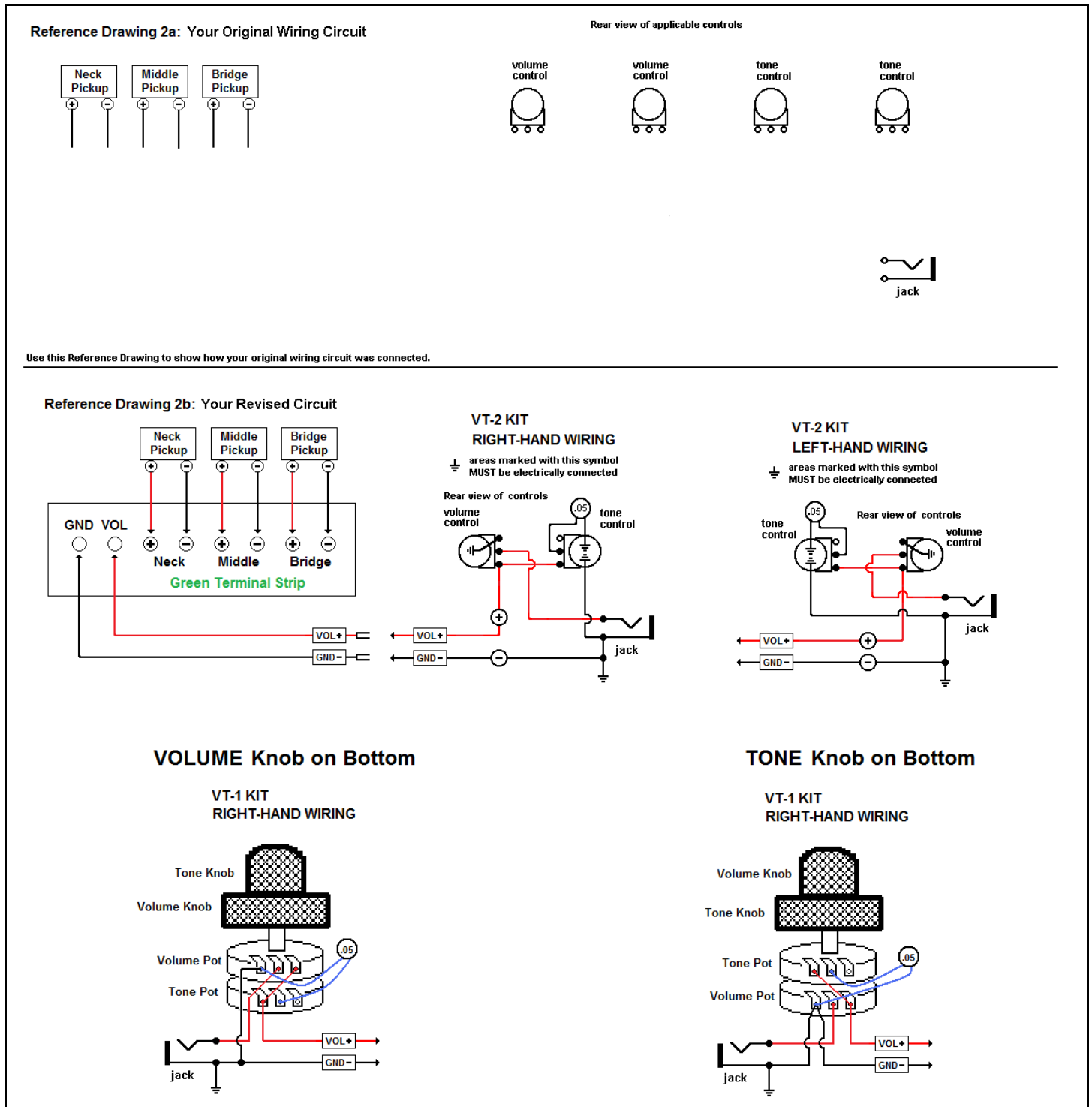
1-Bridge, 4-Bridge+Middle (Parallel), 2-Middle, 8-Neck+Middle (Parallel), 3-Neck

SWITCH COMBINATIONS USED BY T3-SWITCH								
##	SW3	SW2	SW1	SW6	SW5	SW4	##	<u>Your description of this pickup tone</u>
1.			D				1.	_____
2.		D					2.	_____
3.	D						3.	_____
4.		D	D				4.	_____
5.		U	D				5.	_____
6.	D		D				6.	_____
7.	U		D				7.	_____
8.	D	D					8.	_____
9.	U	D					9.	_____
10.	D	D	D				10.	_____
11.	U	D	D				11.	_____
12.	D	U	D				12.	_____
13.	U	U	D				13.	_____
14.		D	D			U	14.	_____
15.		U	D			U	15.	_____
16.	D	D	D			U	16.	_____
17.	D	U	D			U	17.	_____
18.	U	D	D			U	18.	_____
19.	U	U	D			U	19.	_____
20.	D		D		U		20.	_____
21.	U		D		U		21.	_____
22.	D	D	D		U		22.	_____
23.	U	D	D		U		23.	_____
24.	D	U	D		U		24.	_____
25.	U	U	D		U		25.	_____
26.	D	D		U			26.	_____
27.	U	D		U			27.	_____
28.	D	D	D	U			28.	_____
29.	U	D	D	U			29.	_____
30.	D	D	U	U			30.	_____
31.	U	D	U	U			31.	_____
32.	D	D	D	U		U	32.	_____
33.	U	D	D	U		U	33.	_____
34.	D	U	D	U		U	34.	_____
35.	U	U	D	U		U	35.	_____

Figure 2 – Reference Drawings

Use “Reference Drawing 2a Your Original Wiring Circuit” to document the original wiring on your instrument. Use a pencil to draw your circuit, paying attention to (and documenting) wire colors. Because of the numerous variations that span 50+ years, you must draw your own pickup switch.

Use “Reference Drawing 2b: Your Revised Circuit” to identify how to connect this **Pickup Switch Upgrade™** switching system. It identifies how to wire your Volume and Tone controls – both for Right-Hand and Left-Hand instruments using our VT-2 KIT. Our VT-1 KIT is only available as a Right-Hand audio taper item.

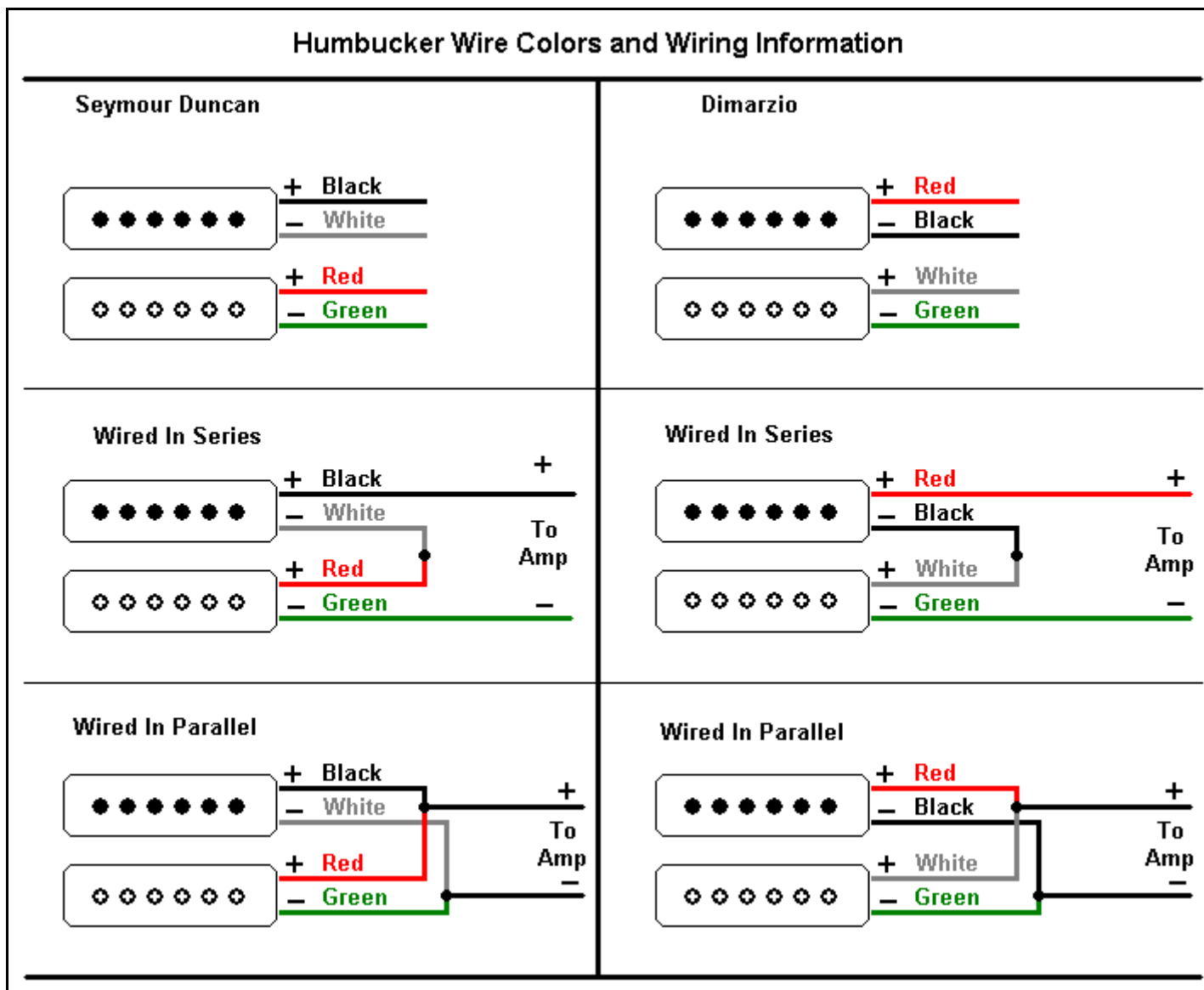


How To Change 4-Wire Humbucker Pickups Into 2-Wire Output

No standard was ever established for pickup wire color codes. Each manufacturer uses their own color codes. Two of the most prevalent manufacturers are Seymour Duncan and Dimarzio. For information specific to the type of humbucker pickups you have, you will need to contact the manufacturer to get the information needed to rewire your pickups. The above graphic is included to give you a general idea of how to modify dual coil/humbucker pickups that have 4-wire output leads into a 2-wire output lead configuration.

When the two coils of a humbucker pickup are correctly wired in *series*, the output is about 20-25% more with a *fat*, slightly overdriven sound. This may be more than you want. The brilliance of high tones is also reduced.

When the two coils of a humbucker pickup are correctly wired in *parallel*, the output is less than series wiring but will still provide “humbucking” results. However, your high tones will be more *ring-in-a-bell* brilliant.



How To Modify a 4-Wire Humbucker To Act As Two Separate Pickups

If your instrument has one or two humbucker pickups with 4 wires, you can modify one of the pickups to act as two separate pickup coils and increase your total number of pickup tones from just 6 pickup tones to 35 pickup tones using our switching system.

If you have a 2-pickup instrument with only one humbucker pickup, it will most often be in the bridge position. If it is, this is the one you want to modify. After this modification, you will be able to get the crisp bridge tones as well as the more overdriven jazzy / blues tones – merely by changing the switch positions. In addition, you will also be able to get 35 pickup tones – instead of getting just 6 pickup tones from your 2-pickup instrument when you use our switching system. **Note:** you must have a 3-pickup version of our switching system to benefit from this pickup modification. Wire colors in the illustration are used as an example and may not be the same colors found on your pickups.

If you have a 2-pickup instrument with 4-wire humbuckers, we have other switch products (T4) that will give you 68 Pure Analog pickup tones. For more information, go to <http://www.AweSome-Guitars.com>

