

Before you start, **read these instructions first** to understand what you need to do to install this product. These installation instructions are for our T2-Board, T3-Board and T4-Board products.

Assumptions

This patented **Pickup Switch Upgrade™** product is designed to use only one Volume and one Tone control for all of your instrument's pickups. Your instrument will have 2, 3 or 4 magnetic pickup coils with two separate wires attached to each coil.

Note: Active or *Pizeo* pickups are not supported.

Tools Needed

You may need one or more of the following tools (not included with purchase) to install this product.

- Wire cutters / strippers, regular pliers
- Drill bits: 1/16" (1.59mm), 5/16" (7.95mm)
- 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 electrical continuity
- Soldering iron (25/30 watt max.) with fine tip, rosin-core solder .022" dia.

Preamble

Before you start, completely **remove all strings** from your instrument for easy access to its parts. The strings are probably already old and replacing them will make your instrument sound even more *brilliant* after you install this product.

This **Pickup Switch Upgrade™** installation will have you cutting existing wires on your instrument. You may need to make wire connections, increase the length of existing wires, and drill several holes in your pickguard, control plate or instrument body.

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

See the *Figure 2 – Reference Drawings* 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 connected on 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 (J1) on the **Pickup Switch Upgrade™** board, here is what to do. Measure out the needed length of the RED or BLACK wire in the included **PARTS BAG** to permit the wire to reach the applicable connection. A length of 3" (7.62cm) is budgeted for each pickup wire and input jack extension. Insert the unstripped end of each wire completely into the provided 2-wire UY2 yellow/clear connector.

Use pliers to squeeze the UY2 connector top button so it is flush with the body to create a permanent electrical connection. Verify electrical continuity between the two pickup wires using an ohmmeter (some coil resistance will be present). The 71B grey wire nuts are used to make a firm and insulated connection to the input jack wires, but let you easily disconnect and remove this product if needed.

Note: 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.

Product Variants

This document contains installation instructions that are for our **Pickup Switch Upgrade™** Board. Other products we produce contain their own installation instructions and are available on our website at:

www.AweSome-Guitars.com/docs

1. PICKUP TONE MULTIPLIER BOARD INSTALLATION INSTRUCTIONS

You are installing either a factory assembled and tested *or* user-assembled KIT version of this *revolutionary* patented **Pickup Switch Upgrade™** growing family of products. These products have been designed for any electric guitar, electric bass and other instruments with magnetic coil-wound pickups.

To accommodate a number of instrument configurations, the PTM comes in the following board types.

- **T2-Board** – This board type is for instruments with two separate pickup coils or one 4-wire humbucker. It uses three switches mounted in one row.
Clearance dimensions: 1.00” wide x 1.75” long x 1.15” deep (2.54cm x 4.45cm x 2.92cm).
Switch Hole Spacing: 1/2” (12.7mm) center-to-center
- **T3-Board** – This board type is for instruments with three single-coil pickups (SSS) or with one single-coil pickup and one 4-wire humbucker. It uses six switches mounted in one row.
Clearance dimensions: 1.00” wide, 3.05” long, 1.15” deep (2.54cm x 7.75cm x 2.92cm).
Switch Hole Spacing: 1/2” (12.7mm) center-to-center
- **T4-Board** – This board type is for instruments with four separate pickup coils, such as two 4-wire humbuckers or one 4-wire humbucker and two single-coil pickups. Uses six switches mounted in a row.
Clearance dimensions: 1.00” wide, 3.05” long, 1.15” deep (2.54cm x 7.75cm x 2.92cm).
Switch Hole Spacing: 1/2” (12.7mm) center-to-center

The assembled board and KIT version includes a **PARTS BAG** that has the following items used for installation.

- Headstock decal, paper drill hole template, Styrofoam block, 3 or 6 stainless switch finishing washers
- An equal length each of black and red insulated wire (to lengthen pickup and input jack wires if needed)
- 2 or 4 yellow/clear connectors (UY2) to extend pickup wires and input jack wires if needed
- 2 grey wire nuts (71B) to connect input jack wires to revised volume/tone control assembly

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).

Locate the hot and ground wires that come from your instrument’s input jack and disconnect them from the components to which they are attached. Keep the wires that are attached to the input jack as long as possible.

Cut each of the pickup wires from the original pickup switch, keeping these pickup 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 “T-Board”

If you are installing the **Pickup Switch Upgrade™** board into an existing (or replacement) pickguard or control plate, you need to determine two things. First, you need to confirm that there is adequate clearance for the PTM board. You also need to identify the specific location to drill the switch mounting holes.

To determine if there is adequate perimeter clearance for the PTM 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 outside dimensions will have clearance in the body routing underneath the pickguard or control plate at the proposed position. Confirm that your routed body cavity has the 1.15” (2.92cm) depth requirements.

If you are installing a **T2-Board** (2-pickup coil board type), you should trim the *drill hole template* on the dotted lines. This board uses SW1, SW3 and SW5.

Once you have found the location with the needed clearance, slip the included paper *drill hole template* underneath the Styrofoam block. It will be between the pickguard or control plate and the Styrofoam block, with the printed side facing towards the Styrofoam block and with the solid line on the bottom edge (where the switch designations are printed) facing towards the bottom of your instrument (closest to the ground when strapped on). The drill hole template has outlines for all board types. It also has the specific locations for each of the holes: 3 holes for T2-Board (2-pickup coil version) and 6 holes for both the T3-Board (3-pickup coil version) and T4-Board (4-pickup coil version.) Align the drill hole template for your board type to match the Styrofoam block outline.

Firmly tape all 4 edges of this *drill hole template* to the back of the pickguard or control plate and remove the Styrofoam block. This identifies where the holes must be drilled to mount the PTM board. Use a center punch to *dimple* each of the centers. This will help to prevent the drill bit from “walking” when you first start drilling and result in a more precisely-drilled hole position. Before drilling, use a piece of wood stock to serve as a backing to avoid rough holes. Use an electric drill and 1/16” (1.59mm) drill bit to drill “pilot” holes at the location marked with the “+” symbol. After drilling the pilot holes (either 3 or 6) follow through with the 9/32” (7.14mm) drill bit for each of the holes. The switch mounting shafts are designed for 1/4” (6.35mm) holes, but all of the switch mounting holes must be 9/32” diameter (slightly larger) to compensate for assembly variances.

A note about switch mounting nuts. Sadly, these switches are no longer made in the U.S.A. Because they are made by different companies, the switch nut threads *frequently* are not interchangeable. When removing the switch mounting nuts, keep track of which nuts are for which switches to avoid parts-mismatch frustration.

Mount the board using **Figure 1** as a general guide for either right-hand or left-hand use.

DO NOT REMOVE THE BACKING NUT from the switches to gain extra length if the threaded shaft of the switches are not long enough to be mounted. If you do, this will cause the threaded shaft to be pulled out of the switch body when you tighten the mounting nuts. This issue does not enjoy warranty coverage. If you are mounting the switch product in an area with excessive thickness, it is advisable to either remove the excess thickness or cut it out and fabricate a plastic cover plate to mount the switches.

Attach the board to the pickguard or control plate. 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 lightly against the switch body and back off 1 complete turn to arrive at a general starting position for mounting.

Place the keyed flat washer on top of the backing nut with the locking “tang” facing towards the switch body. Discard the serrated washers as they are not used.

Insert the board's switches through the previously drilled holes. The board will be in the orientation shown in **Figure 1** examples. Put the provided stainless steel washers over each switch and screw on the tightening nuts.

Confirm that the pickguard or control plate with the attached 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 (but do not remove) all of the switch mounting nuts so that the **Pickup Switch Upgrade™** board can be slightly "Shifted" to achieve the needed clearance. If that doesn't work then temporarily remove the PTM board by removing all the switch mounting nuts (remember to to avoid parts-mismatch frustration.) Use a rat-tail file to "extend" the holes, elongating them in the direction opposite of the interference area . 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.

Rewire the Volume control and Tone control as indicated in the **Figure 2** illustration presented later in this document. You can also get a **volume and tone control kits** at our website. We offer two kits; one kit contains 2 separate controls, the other kit is a "stacked" control for tight space constraints. Each kit includes wiring instructions via download from our website.

Terminal Strip

Here is how to attach wires to the **green** terminal strip (J1) that is on the PTM 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 terminal strip wire hole from left to right. Attach each wire to the correct terminal strip hole. In all instances, connect the **GND** and **VOL** wires from the Volume/Tone control circuit displayed in **Figure 2** to the wire connection holes on the terminal strip.

T2-Board (6-hole terminal strip): [GND] [VOL] [+]NECK[-] [+]BRDG[-]

T3-Board (8-hole terminal strip): [GND] [VOL] [+]NECK[-] [+]MIDDLE[-] [+]BRIDGE[-]

T4-Board (10-hole terminal strip): [GND] [VOL] [+]NECK2[-] [+]NECK1[-] [+]BRDG2[-] [+]BRDG1[-]

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 lead colors. More 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 which wire color for each pickup coil will be attached to the applicable [+] and [-] green terminal strip connector 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 coil to *comfortably* reach the corresponding connectors on the green terminal strip on the **Pickup Switch Upgrade™** board. If not, refer to the "Adding Extra Wire" topic (page 1).

WARNING: If your pickups have a metal bottom and if either pickup coil 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 and the pickup housing does not have a separate grounding wire. **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" (4.76mm) 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 above "Terminal Strip" topic. Attach the wires using either of the following instructions.

Use the two gray wire nuts (71B) to connect the labeled wires to your **input jack**. The red wire goes to the hot lead (normally red) on the input jack and the black wire goes to the ground lead on the input jack.

Note: If you have a ground wire coming from the bridge (and maybe from body cavity shielding), connect them to ground lead on the input jack.

Connecting your two pickup coils to our T2-Board

Connect your **NECK** pickup coil wire pair to the [+]_{NECK} [-] connections on the green terminal strip
Connect your **BRIDGE** pickup coil wire pair to the [+]_{BRDG} [-] connections on the green terminal strip

T2-Board Switch Identification and Use Summary

Here is a summary of switch use for this product (see **Figure 1** for switch identification).

A complete *Switch Table* contains more details about how the switches are used for each product. It is available for download from our website's Document Library at <http://www.AweSome-Guitars.com>

SW1 and SW3 are ON-OFF-ON switches that turn on individual pickups in normal or reverse phase
SW5 is an ON-ON switch that changes the pickups from *Parallel* to *Series* connectivity

For a Right-Handed Instrument:

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

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

SW5 When this switch is **down**, the pickups will be in a *Parallel* circuit.

When this switch is **up** it puts the **bridge** and **neck** pickups in a *Series* circuit. Both pickups must be on, either in normal phase(down) or reverse phase (up).

For a Left-Handed Instrument:

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

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

SW5 When this switch is **up**, the pickups will be in a *Parallel* circuit.

When this switch is **down** it puts the **bridge** and **neck** pickups in a *Series* circuit. Both pickups must be on, either in normal phase(down) or reverse phase (up).

Connecting your three pickup coils to our T3-Board

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

T3-Board Switch Identification and Use Summary

Here is a summary of switch use for this product (see **Figure 1** for switch identification).

A complete *Switch Table* contains more details about how the switches are used for each product. It is available for download from our website's Document Library at <http://www.AweSome-Guitars.com>

SW1, SW2 and SW3 are ON-OFF-ON switches that turn on individual pickups in normal or reverse phase
SW4, SW5 and SW6 are ON-ON switches that change select pickups from *Parallel* to *Series* connectivity

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).
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
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
SW4+SW6 when these switches are **up**, all three pickups are in *Series*. All three 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).

For a Left-Handed Instrument:

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 this switch is **down** it puts the **bridge** and **middle** pickups in *Series*. Both pickups must be on.¹
SW5 when this switch is **down** it puts the **bridge** and **neck** pickups in *Series*. Both pickups must be on.¹
SW6 when this switch is **down** it puts the **neck** and **middle** pickup in *Series*. Both pickups must be on.¹
SW4+SW6 when these switches are **down**, all three pickups are in *Series*. All three 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).

Connecting your four pickup coils to our T4-Board

Connect your NECK1 pickup coil wire pair to the	[+]NECK1 [-]	connections on the green terminal strip
Connect your NECK2 pickup coil wire pair to the	[+]NECK2 [-]	connections on the green terminal strip
Connect your BRIDGE1 pickup coil wire pair to the	[+]BRDG1 [-]	connections on the green terminal strip
Connect your BRIDGE2 pickup coil wire pair to the	[+]BRDG2 [-]	connections on the green terminal strip

T4-Board Switch Identification and Use Summary

Here is a summary of switch use for this product (see **Figure 1** for switch identification).

A complete *Switch Table* contains more details about how the switches are used for each product. It is available for download from our website's Document Library at <http://www.AweSome-Guitars.com>

S1N, S2N, S1B and S2B are ON-OFF-ON switches that turn on individual pickups in normal or reverse phase
S5N and S5B are ON-ON switches that change select pickup coils from *Parallel* to *Series* connectivity

For a Right-Handed Instrument:

- S1B turns on **BRIDGE1** pickup coil, either in normal phase (down), or reverse phase (up).
S2B turns on **BRIDGE2** pickup coil, either in normal phase (down), or reverse phase (up).
S5B When this switch is **down**, both bridge pickup coils will be in a *Parallel* circuit.
When this switch is **up** it puts **BRIDGE1** and **BRIDGE2** pickup coils in a *Series* circuit. Both pickup coils must be on, either in normal phase (down) or reverse phase (up).
- S1N turns on **NECK1** pickup coil, either in normal phase (down), or reverse phase (up).
S2N turns on **NECK2** pickup coil, either in normal phase (down), or reverse phase (up).
S5N When this switch is **down**, both neck pickup coils will be in a *Parallel* circuit.
When this switch is **up** it puts **NECK1** and **NECK2** pickup coils in a *Series* circuit. Both pickup coils must be on, either in normal phase (down) or reverse phase (up).

For a Left-Handed Instrument:

- S1B turns on **BRIDGE1** pickup coil, either in normal phase (down), or reverse phase (up).
S2B turns on **BRIDGE2** pickup coil, either in normal phase (down), or reverse phase (up).
S5B When this switch is **up**, both bridge pickup coils will be in a *Parallel* circuit.
When this switch is **down** it puts **BRIDGE1** and **BRIDGE2** pickup coils in a *Series* circuit. Both pickup coils must be on, either in normal phase (down) or reverse phase (up).
- S1N turns on **NECK1** pickup coil, either in normal phase (down), or reverse phase (up).
S2N turns on **NECK2** pickup coil, either in normal phase (down), or reverse phase (up).
S5N When this switch is **up**, both neck pickup coils will be in a *Parallel* circuit.
When this switch is **down** it puts **NECK1** and **NECK2** pickup coils in a *Series* circuit. Both pickup coils must be on, either in normal phase (down) or reverse phase (up).

Validating

Connect your instrument to an amplified source with the volume set to low. Turn the switches on and off as described in “*Switch Identification and Use Summary*” topic while gently tapping the magnet of the pickup coil that should be “on” with a small screwdriver to confirm pickup response. Also confirm the correct operation of the Volume and Tone controls.

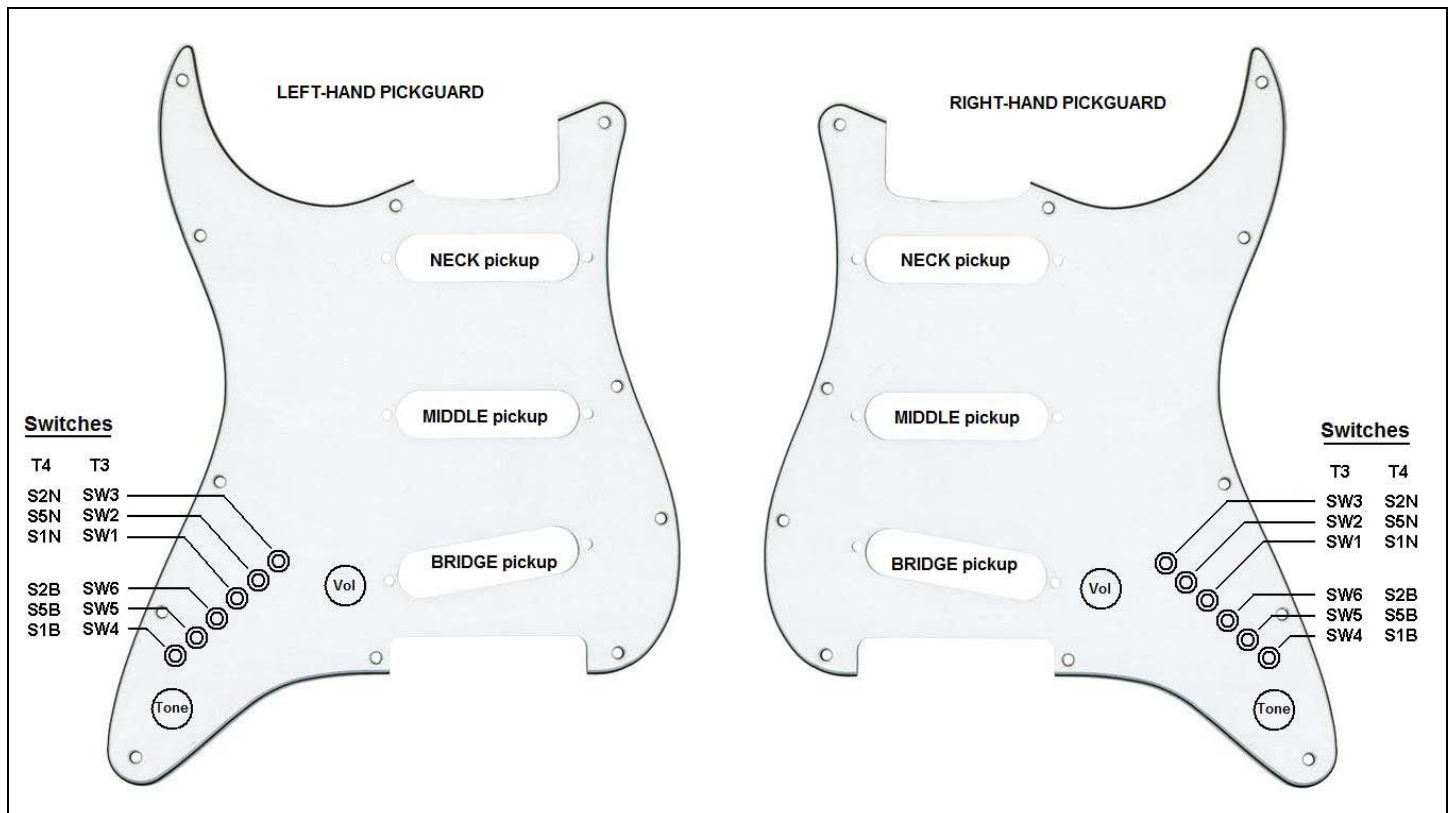
Left hand use note: Our VT-1 stacked pot control and VT-2 volume/tone pot controls are only available as right-hand audio taper item. Because only the larger diameter knob of the VT-1 control supports reliable “pinky” swells, the suggested wiring is presented for Volume swells.

If you receive the stated results, install the pickguard screws. Next, install a new set of strings. Welcome to the *Grand Canyon Wide* range of AweSome pickup tones.

These are products that give your 2-pickup coil, 3-pickup coil and 4-pickup coil instruments a HUGE spectrum of sounds ranging from Muddy/Dirty Blues -to- Classic Jazz -to- Ring-in-a-bell Surf -to- Intense Country Twang and will even give you those elusive out-of-phase *Tin-Canny* (Mark Knopfler/Robert Cray) pickup tones. After this **Pickup Switch Upgrade™** product is installed, you can duplicate the sound of virtually every electric guitar (or electric bass) ever made; including a Stratocaster, Telecaster, Les Paul Custom or Studio, Silvertone, National, Mosrite, Airline, Danelectro, Supro, Harmony, Kay, Maestro, Valco or any electric guitar that has ever been manufactured! In fact, this product will produce a wide spectrum of unique pickup sounds that you have NEVER even heard before. No batteries or sensitive electronics to go dead.

Figure 1 – Sample Pickup Switch Upgrade Mounts and Switch Identification

Here are some examples to guide you in installing our PTM and the switch designs.



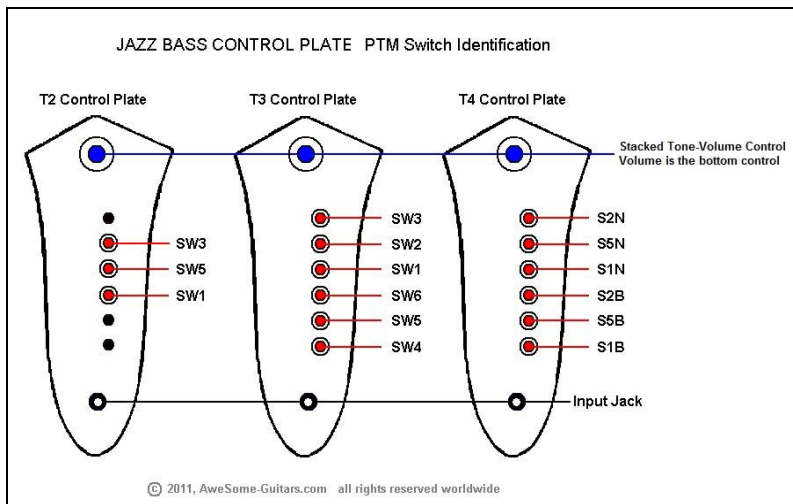
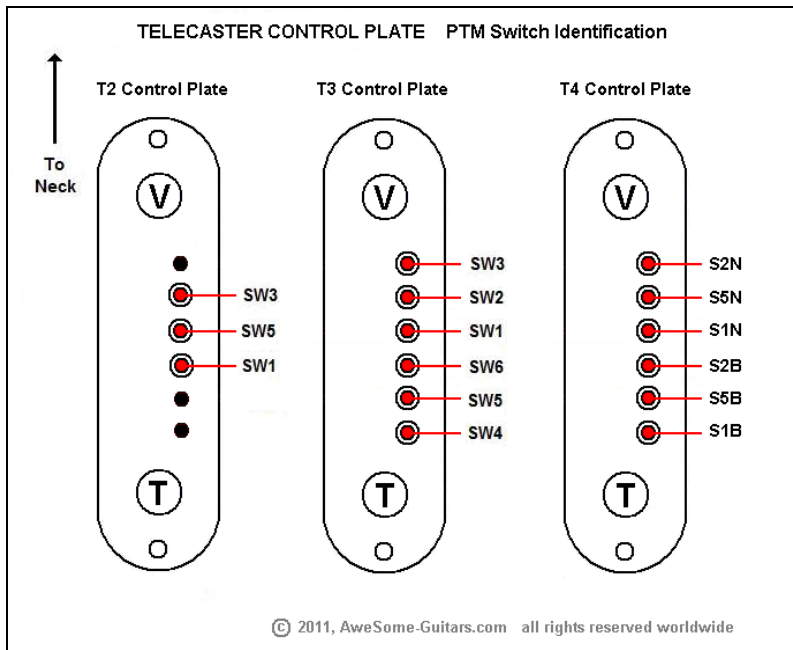
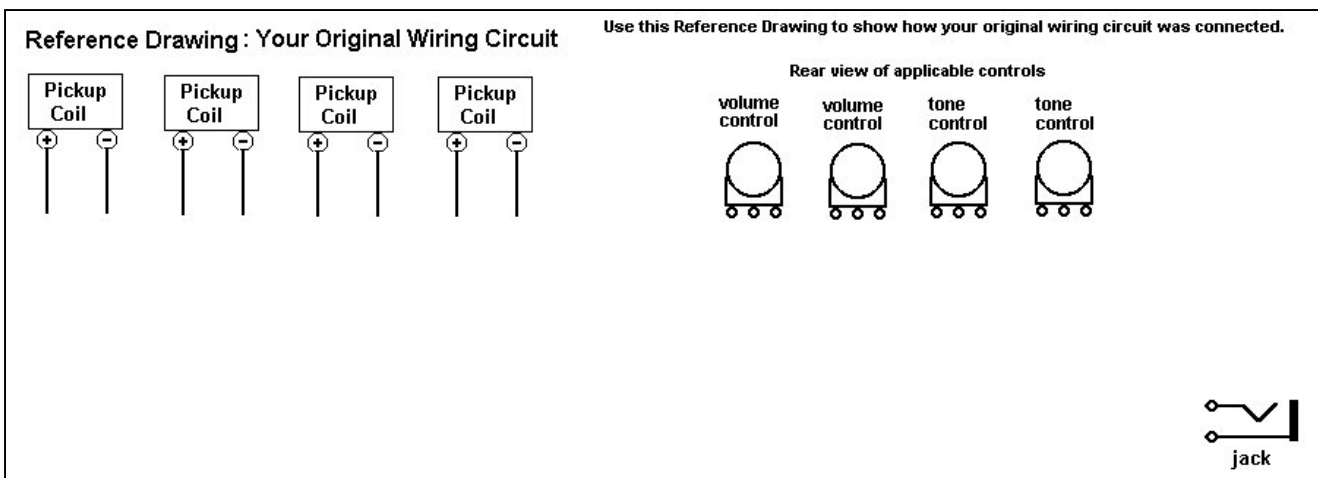


Figure 2 – Reference Drawings

Use the following drawing to document your instrument's original wiring. Using a pencil, identify wire colors where needed. Because of the numerous variations that span 50+ years, you must draw your own pickup switch.



Use the following drawing to identify how to connect this **Pickup Switch Upgrade™** product. It identifies how to wire your Volume and Tone controls using our VT-1 or VT-2 products. Our VT-1 and VT-2 products are only available in Right-Hand audio taper.

