



Are you ready? Let's start by pumping your creative juices with this time lapsed video on building a semi-hollow ST style DIY guitar.

## **Project Toolbox**

Before we get started check the list below and ensure you have the necessary tools and consumables required to complete the project.

### **Tools**

- 2 X Timber clamps (\*set neck guitar only)
- Electric jigsaw or coping saw (\*If shaping the headstock)
- Steel ruler (at least 40cm)
- Hard sanding block
- Center punch (or similar tool for marking hole locations)
- Electric drill and assorted drill bits
- Large and small screwdrivers (phillips head and flat head)
- Pliers (needle nose preferably)
- Soldering iron

### **Consumables**

- Disposable gloves
- Titebond, PVA, or similar wood glue (\*set neck guitar)
- Small paintbrush
- Wood grain filler (If open grain timber such as Mahogany or Oak)
- Sandpaper. Various grades, from 120 up to 1500 (\*depends on finish)
- Finishing supplies. (This depends on your choice of finish)
- Painters masking tape
- Assortment of clean rags and paper towel
- Denatured alcohol (or cleaning product with degreasing ability)
- 0000 fine grade steel wool
- Solder (and sponge for cleaning tip of iron)
- Container for storing finishing supplies.

Next, check that all parts have been included.

## **Parts List**

Below are the parts you will find included in your packaging to complete an STH guitar kit.

- STH body and neck
- Neck plate, neck plate cushion and screws (if bolt-on neck)
- 2 x Strap buttons
- 6 inline tuners
- Stud mounted Tune-O-matic style bridge
- Floating tremolo system
- Neck and bridge P90 pickups
- 1 x volume. 1 x tone controls. 1 x capacitor, 1 x 3 way pickup selector, and input jack
- Electronics cavity cover
- 2 x string trees
- Cable and hex wrench (for adjusting truss rod)
- Tone and volume knobs
- Assorted screws and washers

## **Safety Precautions**

To complete your guitar kit safely, also ensure you have the following on hand, and a well ventilated work space to work in.

### **Protective eyewear**

Use protective safety glasses or a genuine face shield, not regular prescription, reading, or sunglasses.

### **Disposable gloves**

Use disposable gloves if applying stains or oil finishes directly to the guitar.

## **Masks**

Use an N95 rated dust mask for sanding and an R95 rated particle mask for finishing. If using water based finishing products an N95 dust mask may suffice for both sanding and finishing, but be sure to check the finishing suppliers recommendations first. Paint fumes are dangerous.

## **A well ventilated work area**

Ensure your work space is well ventilated, especially when finishing to prevent a build up of potentially toxic fumes.

# **Making your DIY Guitar Play & Sound Great**

There are four stages to building a great kit guitar, these are:

## **1. Preparation and finishing**

The finished surface appearance of your guitar e.g. staining, painting, or applying a hand rubbed oil finish.

## **2. Hardware Installation**

Fitting the tuners, strap buttons, bridge, and pickups.

## **3. Connecting the electronics**

Connecting the pickups to the input jack, and incorporating a pickup selector and volume and tone potentiometers.

## **4. Final Setup**

Adjusting the neck relief, action, intonation and pickup height.

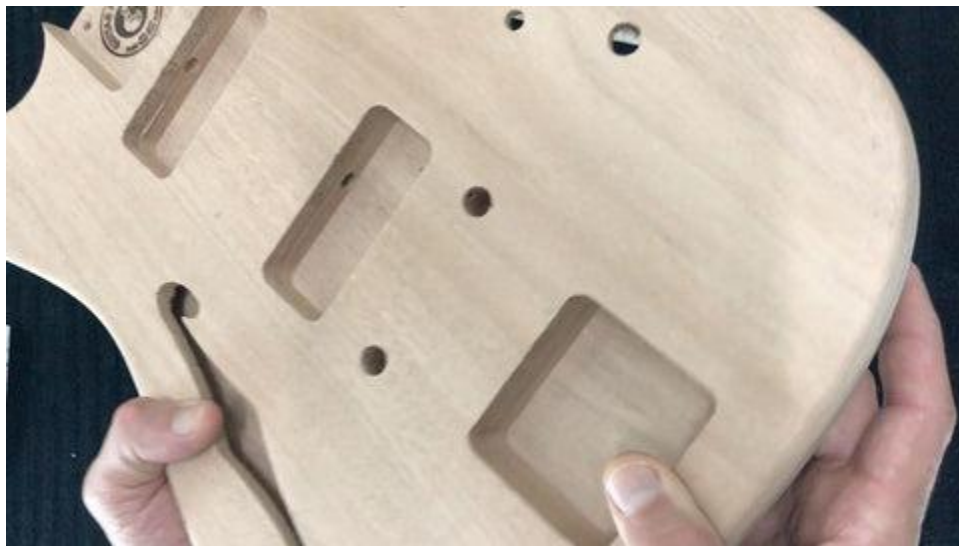
We'll cover each of these below, starting with preparation and finishing.

# 1. Preparation and finishing

## Inspecting and prepping the body

Once unboxed, carefully inspect the guitar body and neck under decent light.

Identify problem areas, as these should be addressed early on before commencing the project.



This includes large dents that require filling, deep scratches that require sanding and glue residue on the surface of the guitar that will prevent your finish from being absorbed evenly.

Glue stains are only a potential issue for guitars with binding, and/or a veneer top.

Once you have identified problem areas you can begin prep sanding the guitar.



1. Start by sanding the entire body using 180 grit sandpaper
2. Follow that up with 240 grit paper. If you are applying a stain directly to the raw wood sand up to 400 grit, but sanding any smoother than this may begin to affect how well the stain is absorbed.
3. Once you have completed sanding up to 240 grit, wipe a small amount of moisture on the surface of the guitar. Using denatured alcohol is a good option here as it evaporates before it is absorbed into the timber, but water will also suffice. This will raise the grain of the timber which can then be sanded flat. Generally grain will only raise once, so you can be confident you won't have any problems during the finishing process.

### **Dry Fitting the Neck**

You should also check the neck fit. While the STH is a bolt-on neck guitar, it's still important to dry fit the neck and check how well the neck fits the neck pocket, along with neck alignment, neck angle and scale length.

## Insert the Neck



First push the heel gently into the back of the neck pocket, then push the neck down flat.

This reduces the risk of chipping the thin edges of the neck pocket before the neck has been installed.

## Check the scale length

You can check the location of your bridge post holes with regard to scale length by measuring the distance from the edge of the nut closest to the fretboard and the middle of the 12th fret and then doubling that number. An STH guitar kit should have a scale length of 25.5" or 650mm.

If your scale length appears out by a few mm, keep in mind the position of the bridge is angled to compensate for the additional mass of the thicker bass strings and the saddles can be adjusted forward or back via the intonation adjustment screws.

### **Check the neck fit**

The neck, once inserted into the neck pocket, should have very little sideways movement. If there is a gap on either side of the neck, you may need to shim the neck by cutting small sections of scrap wood with a craft knife and gluing these to the sides of the neck pocket. Otherwise smaller gaps can be filled prior to finishing using a filler.

### **Check the neck angle**

Keeping the bridge and steel ruler in place after checking your neck alignment, run the steel ruler along the fretboard and over the bridge. The steel ruler should sit just above the saddles on the bridge when the bridge is sitting flat against the body.

### **Cutting the Headstock**

If shaping your headstock, start out by sketching out some rough concepts before transferring the chosen design to paper at the correct size. When designing your headstock be sure to leave a margin of at least 15mm from the last tuning hole and the edge of the headstock (the equivalent distance between the tuning peg holes).





1. Once you have a completed design at the correct size cut the shape out and glue it to a thin scrap piece of timber to be used as a template. (You can also use cardboard which in many cases will be easier to work with).
2. Using a coping saw, jigsaw, or ideally a bandsaw cut out the headstock shape and sand the edges of your template smooth.
3. Taking a small clamp, clamp the template to the headstock and carefully trace the outline.

From there you can either cut the new headstock shape using the template as a guide, or remove the clamps and cut following the outlines you just made.

When cutting out your headstock shape protect the neck of the guitar when cutting, cut well outside the lines to allow room for sanding and keep your saw as vertical as possible to ensure straight lines on your headstock.

If unsure keep the design simple. A well executed simple design is better than a poorly executed complex one. Once complete, sand the edges until as smooth as the rest of the body and neck.

## Masking

Before we start grain filling and finishing we should mask the neck pocket, and body cavities of the guitar.



Mask the tuning peg holes on the headstock to keep the holes clean, along with the holes for the bridge and tailpiece and pay special attention to the truss rod. You should also mask the fretboard when spraying the back of the neck.

If your guitar has binding you can either attempt to mask off the binding, which in most cases will mean some finish still permeates the masking tape and will need to be removed, or not masking, and scraping the binding clean with a razor blade before spraying your clear coats.

I'd normally scrape the binding as this is a more effective use of time, rather than attempting to mask. But it's best to mask the binding if you notice any cracks as the finish you apply will permeate the binding staining it permanently.

### **Grain Filling**

Grain filling is optional, and mostly depends on the wood your guitar is made from and whether you are aiming for a flat finish.



If your guitar is made from an open grain timber such as Oak or Mahogany, the open pores of the timber will prevent a flat finish unless filled.

Basswood for the most part is optional. In most cases it's advisable to grain fill but if painting a solid color you can get by using a primer which will level and seal the surface.

If you are staining, depending on the product you are using, you can grain fill either before or after. In most cases I've found grain filling first results in a more even application, and a better result.

There are a number of different grain fillers available, including solvent, water and oil based options, along with pre-tinted options. Oil based grain fillers penetrate deeper into the wood, but water is obviously easier to work with with regard to drying times and clean up.

We'll be using an ebony tinted grain filler in the images below. Using a tinted grain filler is a great option if you would like to accentuate the grain pattern of the guitar as the excess will be removed when sanding but the filler used to fill the pores will remain in place and emphasize the grain pattern of the wood under a transparent finish.

**Below are the steps required for applying grain fill:**

1. Mix up enough product to grain fill the entire guitar. Follow the recommendations for the product you are using in terms of application, cleanup and safety, then mix your grain fill into a workable paste in a spare container.
2. Apply to the guitar using a clean rag, working in line with the grains pattern of the wood. Next, work across the grain really pushing the grain fill into the wood, making several passes.
3. Once finished applying, leave the guitar for ten minutes and then wipe away any excess using a clean damp rag.
4. Once dry, sand back to the surface level of the guitar, working through the grades of sandpaper from 120 grit to 240. Sand sufficiently to remove the excess grain fill but not enough to dig into the wood and create more open pores.
5. Inspect the surface of the guitar and repeat the process if required.

## Finishing

It's beyond the scope of this guide to cover every available way to finish an electric guitar but below are a few rules that apply to almost all finishing options:



- Carefully consider your finishing options with regard to how protective they are and how they might affect tone along with aesthetics.
- Choose your type of finish based on the wood itself. For example, it would be a shame to cover up a beautiful grain pattern with a solid color finish. Alternatively, staining a less figured piece of basswood for example may not provide a great aesthetic either.
- Wear gloves and a mask and work in a well ventilated area as required. Fumes from some finishing products can be toxic.
- Clean the body of the guitar using a product that includes a degreasing agent
- Wear disposable gloves when handling the guitar after cleaning.
- Make sure you are working in a relatively dust free environment and make sure to clean the cavities of the guitar body thoroughly after sanding. Dust accumulates in the cavities of the guitar, and when turning the guitar over that dust will become airborne.
- If staining, make sure to wipe away any excess that hasn't been absorbed after approximately ten minutes.

- Be aware of the compatibility of the products you use. If painting using spray cans I'd recommend using the same brand and type of paint for your seal coat, color coat and clear coats.
- If you have to spray outside avoid spraying on windy days.
- Spray the sides of the body first. That way when spraying the front and back you will be spraying over any overspray from the sides of the guitar.
- Don't spray heavy coats. In many cases, several lighter coats are a better option than 1-2 heavy coats due to the potential for runs.
- Check your binding for cracks. If cracks are present, mask the binding prior to applying a colored finish or the finish will penetrate the binding and become impossible to restore to its original state.
- Don't apply too many coats within recommended drying times. If you spray more than 3 coats in a day for example, your first coat may have trouble curing.
- If you are using steel wool on the body of the guitar prior to finishing ensure you remove all fibers from the steel wool.
- Always hang your guitar in a cool dry environment. Do not leave your guitar outside to dry, it will attract dust.
- In most cases, you can respray within an hour. If you leave it longer than this, you may need to leave the guitar for 24 hours and then lightly scuff up the paint with 600 - 800 grit sandpaper to ensure the ensuing coats will adhere to the previous coats. (This depends on the product you are using, so check the label).

If you're looking for a resource that covers guitar finishing in great detail, check out *Guitar Finishing Step-by-Step* by Dan Erlewine and Don MacRostie.

## Installing the neck

Now that the finishing stage is complete we can safely install our neck.



Within your packaging there will be a neck plate, neck plate cushion and four long screws.



Place the neck into the neck pocket and ensure it is pushed right up into the back of the cavity.

Place the black neck plate cushion followed by the chrome neck plate (as per the image above) and then loosely place the 4 screws, but don't begin tightening these yet.

Next, double check your alignment and begin installing the screws. Install the top left screw first, followed by the bottom right screw, working diagonally. Once all screws are in place, tighten and double check the neck alignment.

## **2. Hardware Installation**

Installing hardware usually involves installing the tuners, strap buttons, bridge, string trees, and pickups. There are some best practices to follow including drilling pilot holes and aligning your hardware correctly which we'll cover in more detail below.

### **Pilot Holes**

Drill pilot holes for all screws used on the body and neck of the guitar. The small screws used for securing your tuners for example are small, fragile and easily stripped.

### **Whenever installing hardware:**

1. Use masking tape on the guitar to mark the location of the hole using a pen (pencils usually don't result in sharp lines on masking tape).
2. Mark the location of the hole making an indentation in the wood through the masking tape using a hole punch or similar tool.
3. Decide on the correct size drill bit ( $\frac{2}{3}$  thickness of the screw) and mark the drill bit depth using a small piece of masking tape at approximately  $\frac{2}{3}$  the depth of the screw to be installed.

4. Always aim to drill your holes straight. If you have a drill press this is preferred.
5. Use a countersink drill bit (or similar) to chamfer the edges of any holes in the body of the guitar, especially if painted using a solid color finish, to prevent chipping. You may want to drill less than  $\frac{1}{3}$  depth on less dense timbers such as Mahogany and Basswood.

## Installing strap buttons

Strap buttons not only support your guitar when playing standing up, the placement of the strap buttons also affects the balance of the guitar. On an STH guitar, the rear strap button is located in the center of the lower bout. The front strap button is inserted into the top horn on a downward facing angle

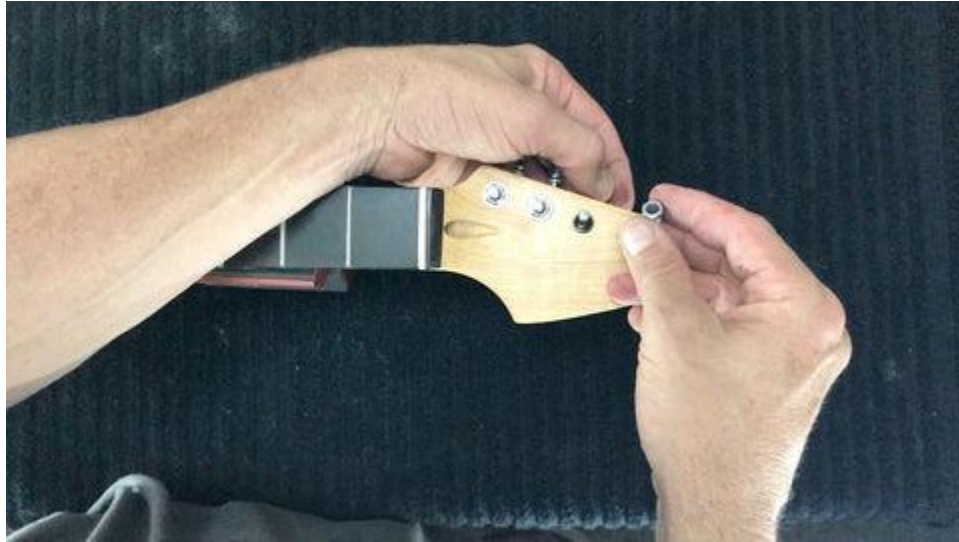


Follow the method described above for all hardware installation including using painters marking tape for marking the location of pilot holes, and drilling to the correct size.



## Installing the Tuners

STH guitar kits utilize inline tuners, so you won't need to separate your tuners into left and right.



1. Start by inserting the tuner in the back of the headstock with the mounting hole facing back toward the body.
2. Place the washers over the tuning posts, then place the bushings and install the tuners by hand tightening.
3. Align the tuners using a steel ruler (see image below).
4. Mark the location of the mounting screws, drill your pilot holes and install the small screws.
5. Remove the protective covering by firmly pressing masking tape onto the back of each tuner and removing both the covering and masking tape in one action.



You can also install the first and last tuner, and using a steel rule mark a straight line between them on masking tape to ensure a straight line to mark out the location of the pilot holes.

### **Installing and grounding the bridge**

Next, we need to insert the ground wire into the bridge post hole and insert the bridge bushing.

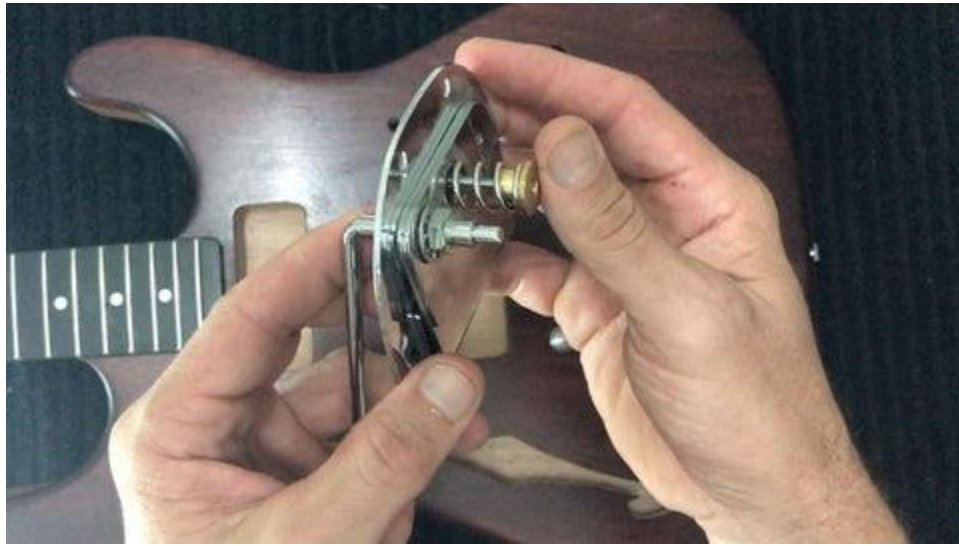
There should be a loose black ground wire in your packaging. Look for a small hole on the side of the bridge post hole nearest to the control cavity. There should be a small hole just large enough to thread the ground wire through to the bridge pickup cavity.



1. Remove a few mm of the PVC coating and expose the bare wires. Thread the wire, ensuring the bare wires are exposed and will sit flush against the side of the bridge or tailpiece post bushing once installed.
2. Make a small 'hook' in the top of the wire so the ground wire sits at the top of the bridge or tailpiece post hole before installing the bushing.
3. Remove the post from the bushing.
4. Insert the bushing into the predrilled hole, ensuring the ground wire ends up sitting flush against the bushing. In many cases you may require a rubber mallet to force the bushing into place.
5. Screw the bridge posts to the bridge bushings and the tailpiece posts to the tailpiece bushings.
6. You can then fit the bridge over the bridge posts, but leave the tail piece for now as it will not remain in place until the strings are installed.

## Installing the Floating Tremolo

Next we'll install our floating tremolo system. The design is based on the Fender Jazzmaster®. The tremolo arm sits between the high E and B strings once installed, so make sure you position it with the stop bar (the raised section) closer to the back of the guitar.



The simplest way to install the tremolo system is to push it hard against the front edge of the cavity to ensure it is square to the cavity and then mark your pilot holes. The tremolo system can be adjusted by raising or lowering the spring, which is adjusted by turning the screw in the center of the base plate, just beside the tremolo bar when installed.



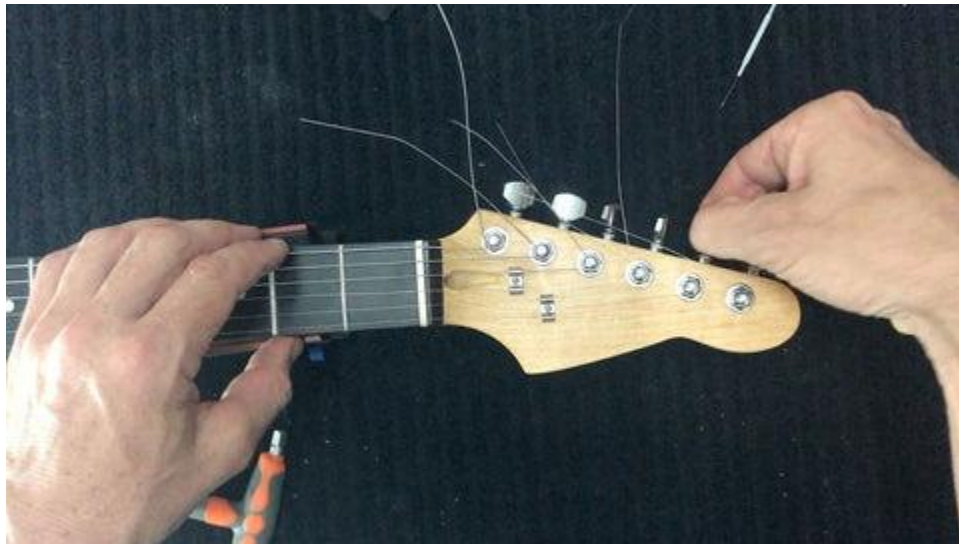
### **Installing the String Trees**

String trees serve to increase the break angle from the nut to the tuners, for the high E, B, G, and D strings, providing greater stability for the nut and preventing strings moving around in their slots.



This is fairly typical of Fender® style guitars, as the majority of necks have much less of a backward tilt compared to Gibson® style guitars which typically do not utilize string trees.

You should have two string trees in your packaging. One will feature a longer barrel which is to be used for the string tree between the D and G strings, with the shorter one reserved for the B and high E strings.



To install your string trees, you will first need to install your strings to allow for perfect alignment.

Once the strings are in place lay the top face of the string trees across the E,B and D and G strings.

Align the D and G string tree between the first and second tuning post and the D and E string tree in line with the second tuning post.

Once in place mark the holes as we have done for all hardware up to this point and drill your pilot holes before placing the string tree barrels in place and screwing the string trees in place.

## Installing Pickups

We'll be installing soap bar style P90 pickups.



As this style of pickup has no obvious discerning features that allow us to differentiate between the neck and bridge, flip the pickup over and look for either an 'N' for neck, or 'B' for bridge. From there:

1. Thread the pickup wires for the neck pickup through the hole to the rear of the neck pickup cavity and through the hole in the side of the bridge pickup cavity.
2. Next, install the bridge, also threading the wires through the hole in the side of the cavity leading to the electronics cavity.
3. Position the pickups at the very front of the pickup cavity and then align the outside E strings to the individual pole pieces corresponding to the low E and high E. (you can also use a square to check the alignment relative to the edge of the fretboard).
4. The pickups are direct mount, meaning the screws pass through the body. Mark your pilot holes as done previously, directly through the holes on either side of the magnetic pole pieces corresponding with the G and D strings.
5. Remove the pickups from the cavity, drill the pilot holes and install the screws.

## **3. Connecting the electronics**

### **Soldering**

If you haven't soldered before you're going to need a soldering iron, solder, and a damp sponge to clean the tip of your iron. I'd also recommend practicing before committing solder to your electrical components.

Most entry level soldering irons will do the job, and your kit will come with more than enough solder.

Be careful when soldering. Solder won't melt until it reaches 185°C (365°F) and soldering irons get very hot, up to 392°-896° F in some cases.

When soldering there are two key areas to keep in mind.

#### **1. Tinning**

Tin your soldering iron and the components you are connecting to. Tinning refers to maintaining a light coating of solder over the tip of your soldering iron and prevents the iron tip from oxidizing.

#### **2. Preheating**

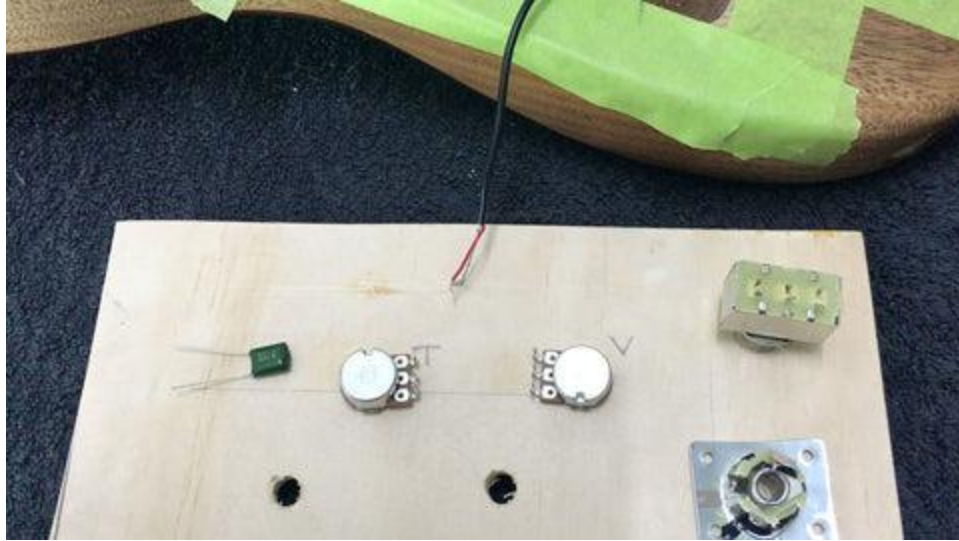
Soldering is really about transferring heat. The lug or component you are connecting to should be preheated so the solder is drawn to it rather than staying on the already hot iron.

### **Wiring**

Next we'll connect the electronics. The STH does not come with the wiring pre-connected so we'll need to complete all the connections ourselves.

As a basic overview, the pickups generate the initial signal which is then sent to the pickup selector where the signal is switched to either neck or bridge position or a combination of both (middle position).



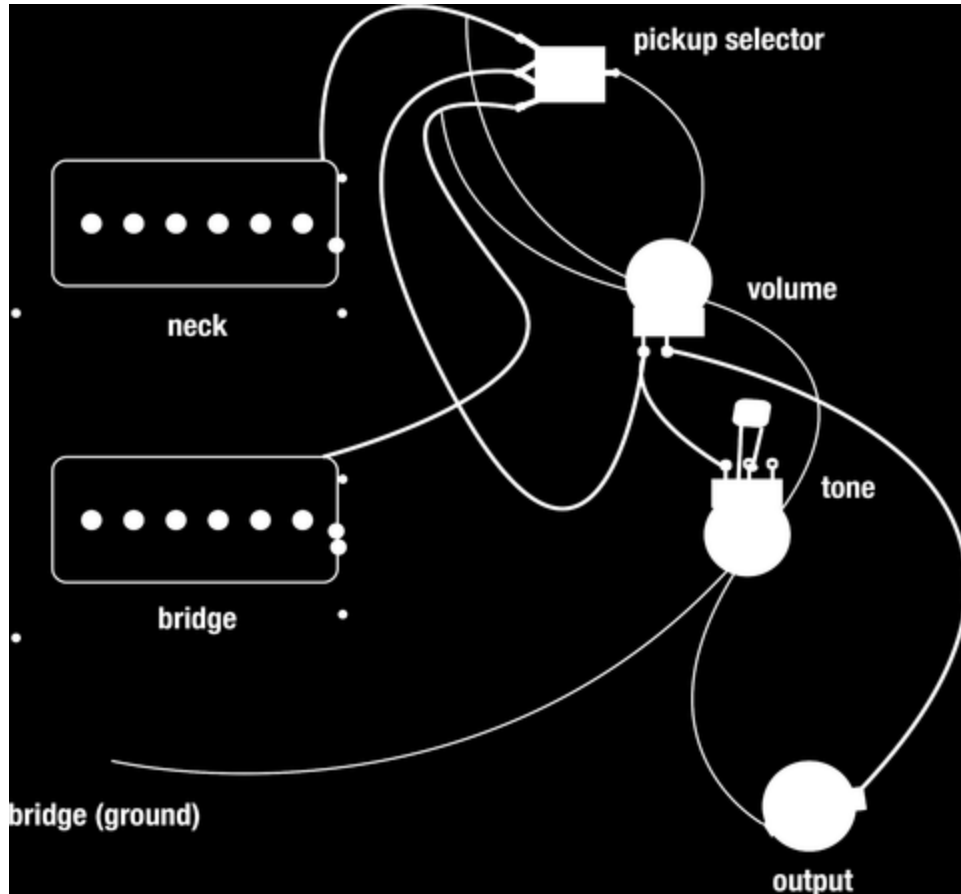


From here, the output from the pickup selector travels through the volume pot, and based on the position of the pot some of the signal is sent to ground reducing the overall voltage and in turn reducing volume.

The tone pot based on it's position will also direct some of this voltage through the capacitor and high frequencies will pass through it (it works like a filter) and are sent to ground, reducing some of the high frequencies. Finally, the 'hot' lug of the input jack is connected which allows the signal to be sent to the amplifier.

In the image above I am using a template to keep the various components stable. You could also use a set of helping hands.

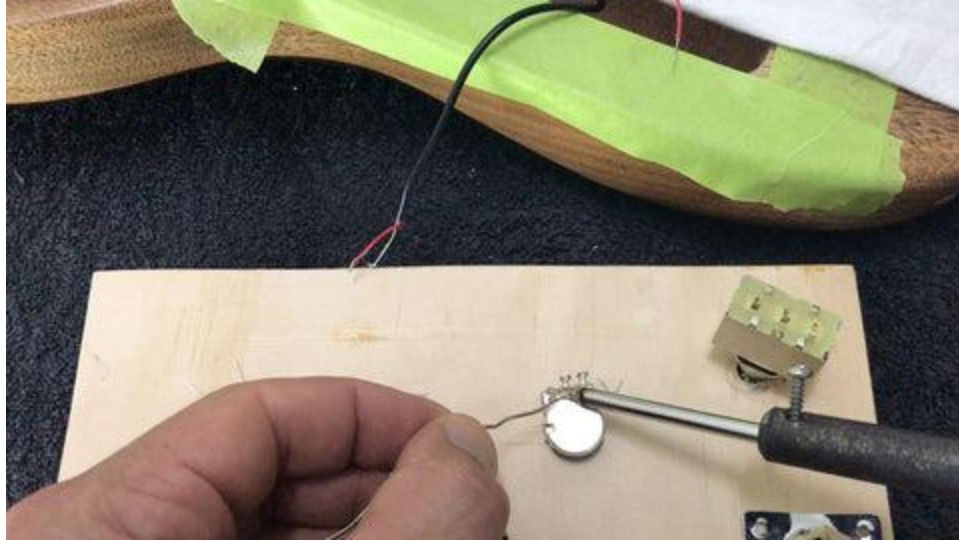
The wiring diagram below shows the completed wiring. We'll work through each in a step by step process below.



### Grounding the volume pot

Our components must be grounded to limit electrical interference, namely 60 cycle hum from lights and household appliances. Single coil and P90 pickups are especially susceptible to this.

We'll eventually connect all our components as part of a ground circuit and connect to the ground wire we previously installed against the bridge bushing but first we need to ground our volume pot.



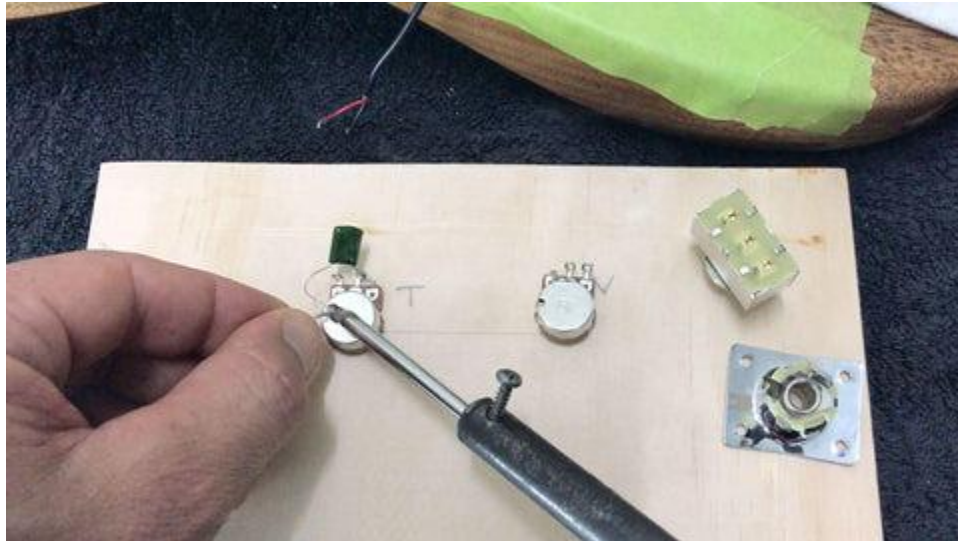
This can be done by either pulling the lug on the left of the potentiometer when facing away from you (ground lug) onto the case of the potentiometer and soldering into place, or soldering a small wire from the ground lug to the back of the case.

Remember when soldering to ensure the tip of the soldering iron is tinned, along with the lug you will be connecting to. Preheat the lug before adding a small amount of solder.

Once the solder reaches melting point remove the iron and wait for the connection to cool. Then, test the connection by gently pulling on the wires.

## Connecting the capacitor

Next, we'll connect the capacitor.



This is essentially a filter that passes high frequencies to ground allowing us to adjust our tone. We connect one end of the capacitor to the middle lug (the output lug) and the other end to the back of the case. Follow the method outlined above with regard to soldering, and once complete trim any excess wire.

## Installing the input jack wires

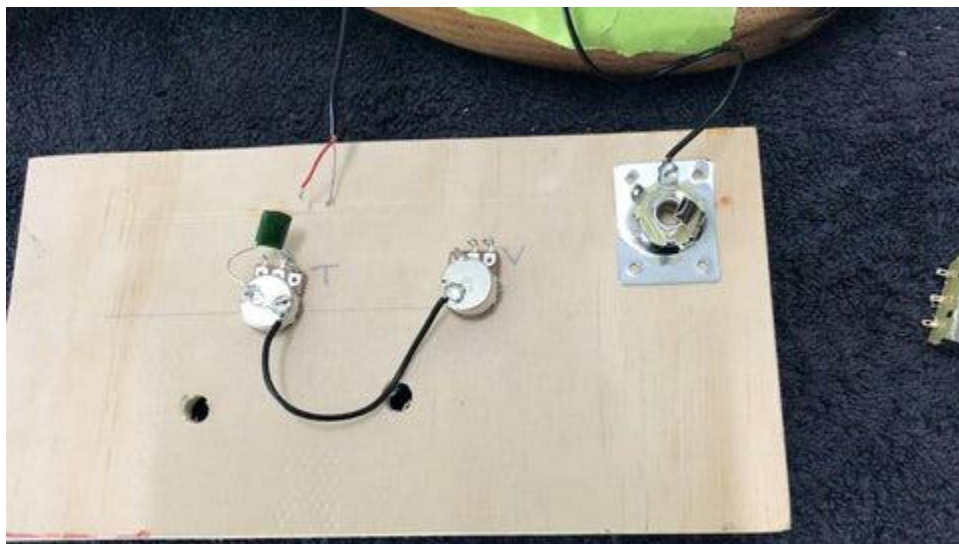
Next, taking one of the shorter wires in your packaging we'll connect the ground wire to the input jack (black is usually the color used for all ground wires).



First thread the wire through the input jack hole and then thread the bare wire through the eyelet of the ground lug (the lug connected to the inner sleeve of the jack) and make the connection as we have done previously.

### **Connecting the ground circuit**

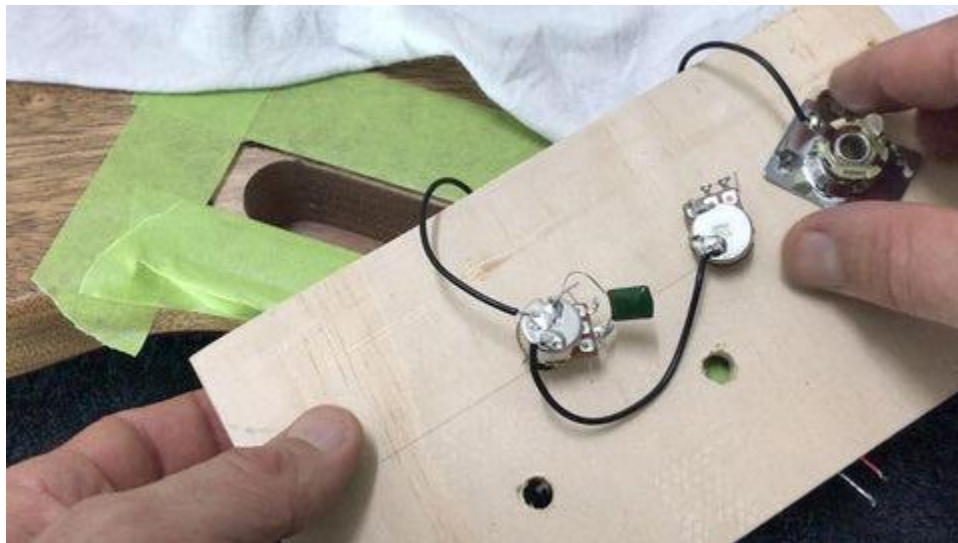
We'll complete our ground circuit next, by connecting all of the components together in a circuit and then connecting to the ground wire we installed earlier against the bridge bushing.



Now's also a good time to also know the tone pot goes to the front of the cavity and the volume to the back, so be sure to connect them in that order so they can be moved to the electronics cavity without any problems.

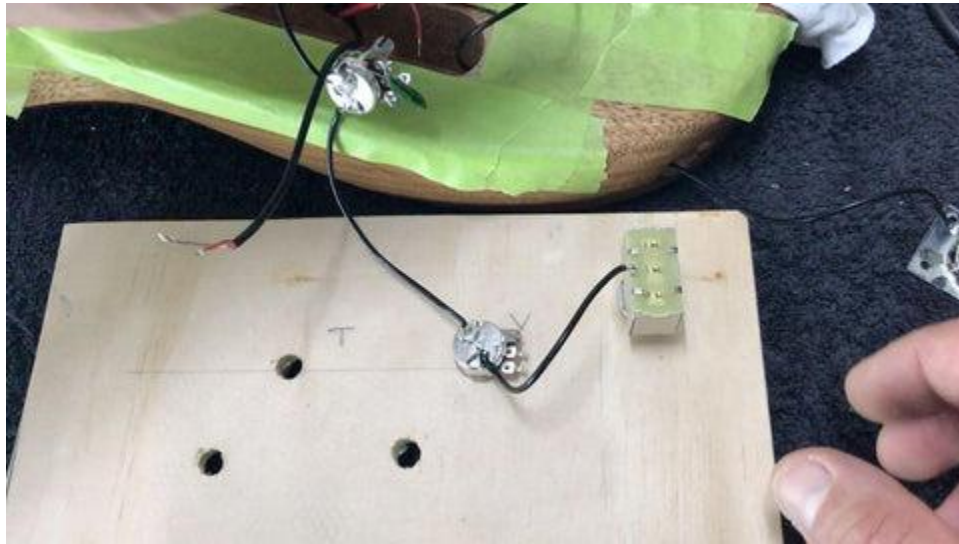
The first connection we'll make is connecting the volume and tone pot. Using a short piece of black wire, expose bare wires on both ends and then solder in place to the back of both cases, as per the image above.

Next we'll install the ground wire we installed against the bridge post bushing earlier.



Follow the same process as above and connect the ground wire to the back of the tone pot. It doesn't matter which of the pots you connect to, but in this case the tone pot is the most accessible.

Next we'll ground the pickup selector.



Connect another black wire from the back of the volume pot to the ground lug on the pickup selector.

This is the lug directly connected to the case of the selector switch and is the only lug on one of the sides (as per the image to the left).

### **Connecting the pickup wires**

Next we'll connect the pickup wires to the pickup selector. This allows the bridge, neck or a combination of both pickups to be output from the selector to the volume pot.



Connect the shielded 'hot' wire from the neck pickup to the top most lug, this is the lug that will be used for the neck pickup.

Once complete, next, connect the unshielded bare wire to the back of the volume pot.



Do the same for the shielded and ground wires from the bridge pickup.

In the image below I am making these connections from inside the control cavity as the wires are too short to work outside the guitar.





### **Connecting the output from the pickup selector**

Our third last connection is the output from our pickup selector. This is the wire that takes the signal from the pickup selector (whether it is neck, bridge or a combination of both pickups) to the input lug of the volume pot (the lug on the right if facing away from you).

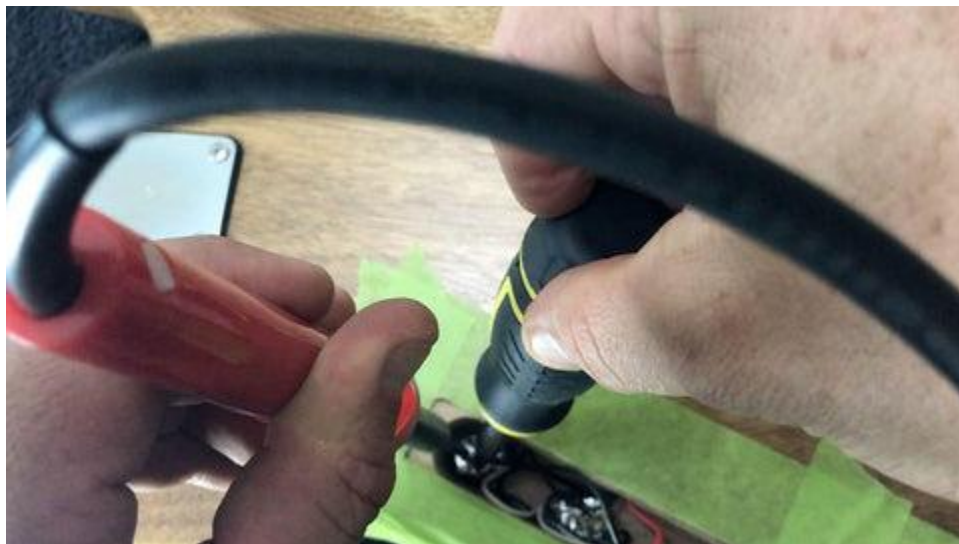
From the input lug of the volume pot it is then connected to the output lug of the tone pot. It's often easier to measure the length of the two wires and twist them together before making just one connection at the volume pot, rather than trying to connect a second independent wire from the volume to the tone pot.

### **Connecting the input jack to the volume pot**

Just a couple of connections left to make now. Next we'll connect our input jack to our volume pot.



Simply solder another white wire to the 'hot' lug of the input jack as per the image below.



The color doesn't necessarily matter, but it will help you identify the wires more easily. Next, connect the other end of the wire you just installed to the input jack to the output (middle lug) of the volume pot.

Once complete we'll connect the ground from the input lug to the back of the volume or tone pot. In the image above I am using the tone pot as this was easier for me to solder to inside the control cavity, but it really won't matter which you choose.

That completes your wiring. You can now test your wiring by plugging a cable into the input jack and connecting to an amp. If you don't have strings on the guitar, simply tap each pickup while in their respective positions and ensure everything is working correctly.

If you hear interference which stops once you touch the guitar it's likely there's an issue with your ground circuit.

## **4. Final Setup**

The last stage of our project is setting up the guitar. This is an important step that makes all the difference with regard to playability and tone. Our final setup will consist of four key areas:

- Neck relief
- String action
- Intonation
- Pickup Height

I'll provide a basic overview of each below. Also, keep in mind the guitar should be tuned to concert pitch and checked regularly during the process to ensure the correct amount of tension is on the neck as adjustments are made.

You may also want to revisit aspects of your setup once you have had time to play the guitar and have identified problems e.g. fret buzz or intonation issues.

## Adjusting neck relief

The ideal guitar neck is one that has a small amount of inward bow or relief to provide clearance for the strings when vibrating. A neck that is too straight will very likely run into problems with fret buzz.

You can measure the straightness of the neck using a steel ruler. I prefer to hold down the first and last fret and then tap the 12th fret lightly of the low E string. If the string is already sitting hard against the fret more relief is required. If sitting well above the fret, the amount of relief can be reduced.



To adjust the amount of relief, adjust the truss rod using the hex key included in your packaging.



Turn counter clockwise to loosen the truss rod which will introduce more relief. Turn clockwise to flatten the neck further.

Remember to only make incremental changes of  $\frac{1}{8}$ th to a  $\frac{1}{4}$  turn each time and make sure the guitar is tuned to concert pitch so the correct amount of tension from the strings is placed on the neck. Be sure to continue to check your tuning through the entire setup process.

### **Adjusting the action**

Action refers to the height of the strings from the fretboard of the guitar. This is usually measured from the top of the 12th fret to the underside of the low E string.



A good starting point if unsure is 2.4mm on the low E side and 1.6mm on the high E side, taking into account the different string gauges.



Make sure the guitar is in tune before checking and making adjustments. Action is adjusted at the bridge. Loosen the bridge posts to raise the action, tighten the bridge posts to lower the action.

## **Intonating the guitar**

Intonation, in essence means, is the guitar in tune with itself. You can check this by tuning to standard tuning and then checking the strings at the 12th fret (an octave up from the open string). If the pitch is sharp you will need to lengthen the string length. If flat you will need to shorten it.



As mentioned earlier. Your scale length is not a precise measurement as there is some compensation required for the additional mass of the heavier bass strings. This is also why most bridges on electric guitar are angled away from the body of the guitar toward the bass strings.

To lengthen the string, turn the intonation adjustment screws at the front of the bridge counter clockwise. To shorten turn them clockwise. Make sure the guitar is in tune before checking and adjusting.

## **Adjusting pickup height**

Lastly, we'll check and adjust the pickup height.



Much like string action, the height of your pickups is mostly subjective and will depend on what you are hearing.

But, if unsure a good starting point is 2.4mm from the top of the magnetic pole piece to the underside of the string. However, this should be measured when pressing down the last fret of the guitar.





To adjust the height of the pickups, adjust the mounting screws on the outside of the pickup surround.

## Summary

And that marks the end of our project.

Once you have completed the steps outlined above. You should have a complete guitar ready to play. Keep in mind, as you become more accustomed to the guitar you may want to revisit some aspects, especially the final setup of the guitar.

You should also test the guitar, by going through each pickup position and testing the volume and tone pot. Also test for interference by taking your hands off the guitar and listening for hum. If you hear any signs of electrical interference you may need to open the electronics cavity and check your ground circuit.

Lastly I'd recommend playing each fret up and down each string and listening for fret buzz or any sign of dead notes. If you notice a problem, chances are it can be resolved by either adjusting your action or adjusting your neck relief.

Thanks for following along!