



California requires the following notice:

# WARNING

Some dust created by power sanding, sawing, grinding, drilling, and other construction activities contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm. Some examples of these chemicals are:

- Lead from lead-based paints.
- Crystalline silica from bricks, cement, and other masonry products.
- Arsenic and chromium from chemically treated lumber.

Your risk from these exposures varies, depending on how often you do this type of work. To reduce your exposure to these chemicals: work in a well ventilated area, and work with approved safety equipment, such as those dust masks that are specially designed to filter out microscopic particles.

## Warning

Always wear safety glasses or goggles when operating equipment. Everyday glasses or reading glasses are not safety glasses. Be certain the safety glasses you wear meet the appropriate standards of the American National Standards Institute (ANSI). Because there are various ways to cut and join wood, you can make substitutions for the methods stated in this manual. We try to suggest the easiest methods possible. However, only you know your skills with each piece of machinery. Never compromise your safety by using a cutting method with which you are not comfortable. Instead, find an alternative approach that will yield the same result.

## Warning

These instructions assume that you are familiar with the safe operation and use of woodworking machinery and woodworking tools, and understand the techniques used to assemble this project. If you do not qualify for both of these criteria, STOP building this project for your own safety. Read and understand the owner's manual for the machinery you intend to use, take a woodworking class or visit your local library for more information. Woodworking machinery and tools are inherently dangerous because they use sharp edges that can and will cause serious personal injury including amputation and death. Do not underestimate the ability of these tools and machinery to cause injury. Never operate any tool without all guards in place and always wear approved safety glasses. For your own safety, please heed this warning.

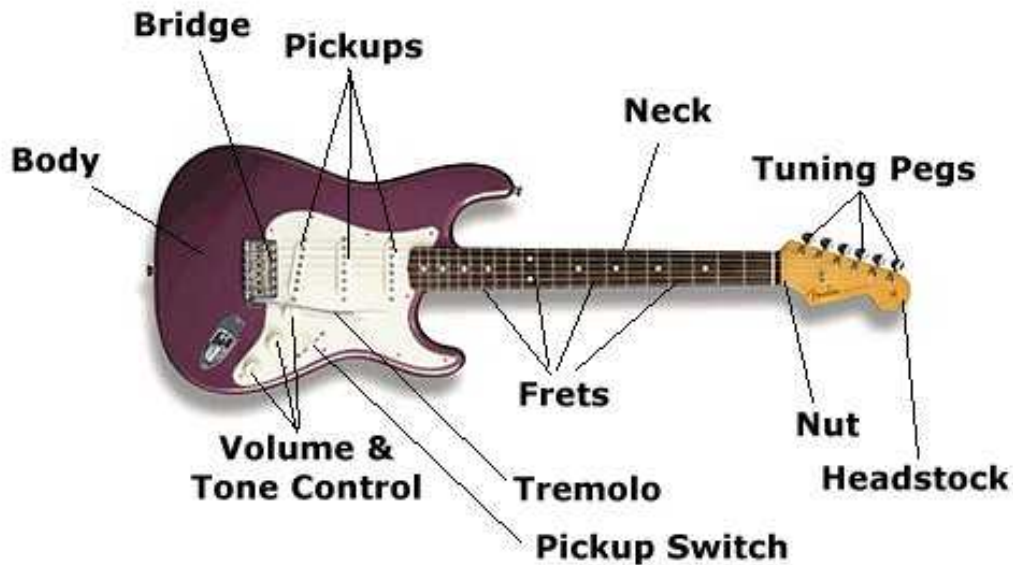
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## Introduction

Thank you for purchasing a BYOGuitar.com guitar kit. This kit includes everything you need to build a complete custom guitar.

These instructions assume you are familiar with the anatomy of a guitar. Many of the terms used are shown in the below diagram.



Here is the order of operations to complete the guitar:

- Fit the neck.
- Drill the mounting holes for the bridge.
- Sand the body and neck.
- Sand some more!
- Finish the body and neck.
- Assemble the guitar.
- Wire it up.
- Final set up and adjustments.
- Plug it in and enjoy!

It's recommended that you assemble your guitar before applying the finish. Drill all the holes to eliminate any accidental chipping of the finish while drilling. Fit the neck and locate the bridge before finishing the guitar. After the finish is complete all you should need to do is put it together and do some fine-tuning.

Always centerpunch the hole locations before you drill; this will ensure that the holes are properly located (very important with bridge screws). If you don't have direct access to a drill press, have a friend with a drill press drill a series of holes through a block of wood that correspond to the holes required for your bridge. Then put the block on top of the body and use it to guide your drill bit.

## Installing the Bolt on Neck

Unless otherwise indicated, we strongly recommend using a drill press for the majority of drilling to obtain the most precise results. However, an electric/cordless drill fitted with a depth stop or a drill stand can be used if you do not have a drill press.

## Drilling the Mounting Holes in the Guitar Body

If the mounting holes have been pre-drilled, skip to the next section.

1. Use the neck plate as a template to locate the mounting holes in the neck pocket.
  - a. The simplest way is to place the neck plate into the pocket and properly position it so it is centered in the pocket.
2. Mark the holes
3. Center punch your marks.
4. Drill the holes using a 3/16" drill bit.

## Drilling the Mounting Holes in the Neck

You should be able to fit the neck in the neck pocket by hand. If you are unable to press the neck in by hand the some work

1. Place the neck in the pocket.
  - a. Make sure the neck is aligned properly with the pickup cavities and bridge.
  - b. Clamp the neck in place.
2. Use the same drill bit you drilled the holes in the body with to center punch the locations on the neck.
  - a. Place the bit in the hole through the body and tap it a few times to make a mark on the neck.
3. Remove the neck from the body.
4. Determine the neck mounting hole depth.
  - a. Place one of the neck mounting screws through the neck plate and body into the neck pocket.
  - b. Measure the amount of the mounting screw that extends up into the neck pocket, and mark your drill bit (a piece of masking tape around the bit works great).
  - c. Double check the depth by holding the marked drill bit to the side of the neck and be certain the drill won't go through the fingerboard.
5. Drill the holes in the neck with a 1/8" drill bit. **Make sure you don't drill through the fingerboard!**

Temporarily attach the neck so you can locate the bridge. If the holes are tight, use some soap or wax on the screw before hand and it will drill in easier. The last thing you want to do is snap the screw off in the hole!

## Installing the tuners

Each tuner consists of the tuner, washer, and a threaded bushing. The tuners are attached to the headstock with a small wood screw that attaches between the tuners.

### To install the tuners:

1. Place the six tuners into the holes on the back of the headstock. The holes may need to be widened with a peghead reamer or a round file. DO NOT widen the holes too much—the tuners should fit snug.
2. Slide a washer over the tuner shaft and screw the threaded bushing onto the tuner.
3. Align the tuners perpendicular to the edge of the headstock and parallel to each other. Use a strip of masking tape to secure their position on the headstock.
4. Using a 1/16" drill bit in a drill press, drill 3/8" deep holes into the headstock.

*Note—Drilling the holes deeper than 3/8" could result in drilling out through the front face of the headstock. Use a depth stop or tape wrapped around the drill bit at the correct depth as an indicator.*

5. Secure the machine heads to the guitar headstock with the tap screws.

## Finish

Before starting the finish make sure all holes are drilled for any remaining hardware (pickguard, jack plate, strap pins etc).

### The Body

Sand the body and neck with #220 dry sandpaper, followed by #320. If you are applying a finish, other than natural, you should consider using a grain filler on the body. This will fill in the valleys in the grain and result in a nice flat surface allowing you to get a nice high gloss finish. An oil based grain filler is recommended. For most finishes use a natural colored filler. The dyes used in darker fillers may over time find their way through the color coat.

Apply the filler by wiping across the grain. You can use a course cloth or your fingers to wipe the grain in. After it has dried about ten to twenty minutes the excess can be removed with a cloth dampened with mineral spirits. After about an hour repeat the process and let dry overnight. If you have removed most of the excess with mineral spirits the remaining filler on the field of the wood can be sanded off (use

#220 again) in a few minutes. It is also a good idea at this time to reopen any of the screw holes in the body. Use a toothpick or small drill held between your fingers to clean out any filler in the holes. The body is now ready for a sand and sealer coating.

Sand and sealer is used to give the final coat a level base. It is also helpful in filling scratches which are too deep to sand out.

## **Solid Color Finish**

The last step before applying the color coats is to apply a white primer coat. B.I.N.s makes a white pigmented shellac in an aerosol can that will cover the grain and prevent any previous finishes from bleeding through. The white background will also let you apply an opaque color coat with less paint. You can find this sealer at most hardware stores and again, at Home Depot. Spray on two coats. When dry you may notice that the surface feels rough. Sand off the roughness with #320 dry and respray. Sand again. If the surface now appears smooth and all grain is opaqued you are ready for the color coat.

## **The Neck**

On a maple fingerboard you can apply a clear finish to the entire neck and fingerboard. Apply several coats and remove buildup on the frets between coats. An easy way to remove the finish buildup on the frets is to take a nail and file a half round slot in the head about the same size as the frets. You can then use this to easily scrape any finish build up.

If the neck has a Rosewood or Ebony fingerboard be sure to tape off the fingerboard before applying the finish.

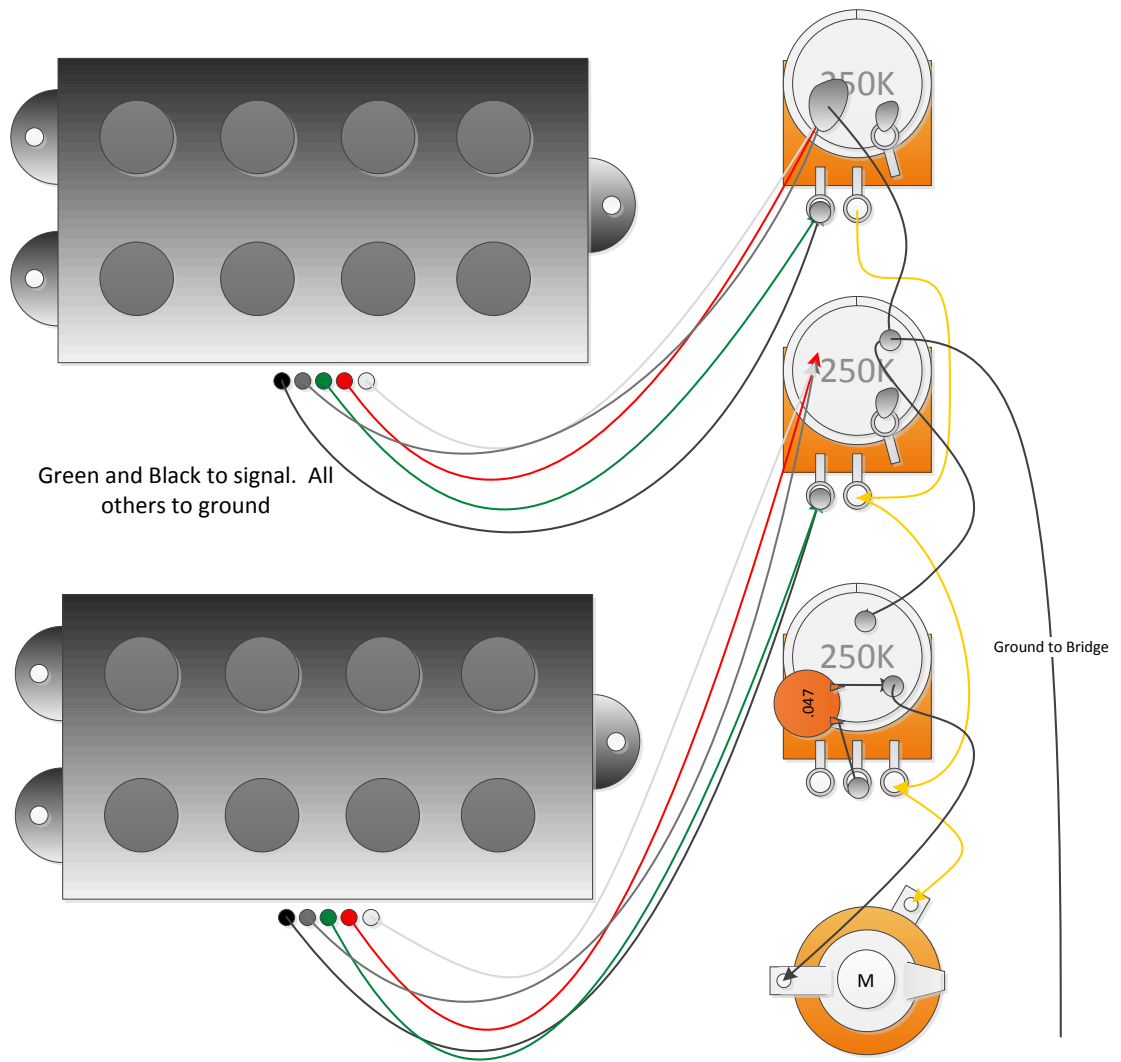
## **Electronics**

After the finish is complete you can begin installing the pickups and pots. All the electronics can be mounted in the pickguard and wired. The body is routed to allow the wires to run under the pickguard. The pots and switch come pre-wired in a harness. Mount them in the pickguard along with the jack. Solder the pickups to the switch and pots using the below wiring diagram.

The following diagram shows the connection of the pickups to the pots and switch.

## **Pickup wiring diagram**





Stringray wiring diagram

## Setup

### Truss Rod

First, check your tuning. Put a capo at the first fret and press the sixth string at the last fret. With a feeler gauge, check the gap between the bottom of the string and the top of the 8th fret—you should have about  $4/64^{\text{th}}$

Sight down the edge of the fingerboard from behind the headstock, looking toward the body of the guitar. If the neck is too concave (action too high), turn the truss rod nut clockwise to remove excess relief (only adjust  $\frac{1}{4}$  turn at a time) If the neck is too convex (strings too close to the fingerboard), turn the truss rod nut counter-clockwise to allow the string tension to pull more relief into the neck. Check your tuning, then re-check the gap with the feeler gauge and re-adjust as needed.

### Adjusting the Action

#### The Nut

Setting the string action that is right for you starts at the nut. The slots should already be close, but you might want to make some adjustments.

Push the sixth string down between the second and third fret. The space between the first fret and the bottom of the string should be about .006" or just about the thickness of two sheets of paper. If the gap is wider than .006" you should deepen the slot with a small needle file. **DO NOT FILE TOO DEEP!** Make sure when you file, the file is angled down toward the headstock. This will ensure the string sits on the edge of the nut closest to the fretboard.

Repeat the procedure for the remaining 5 strings.

#### The Bridge

This will adjust the height of the strings over the 12<sup>th</sup> fret. Minor adjustments are made by raising or lowering the bridge. This adjustment is a matter of personal preference. There should be a gradual increase in height from the first string to the sixth string.

#### Intonation

Adjustments should be made after all of the above have been accomplished. Set the pickup selector switch in the middle position, and turn the volume and tone controls to their maximum settings. Check tuning. Check each string at the 12th fret, harmonic to fretted note (make sure you are depressing the string evenly to the fret, not the fingerboard). If sharp, lengthen the string by adjusting the saddle back. If flat, shorten the string by moving the saddle forward. Remember, guitars are tempered instruments! Re-tune, play and make further adjustments as needed.

We hope you have enjoyed building your guitar! If you have any questions along the way please email us at [support@byguitar.com](mailto:support@byguitar.com).