



OFFSET HARDTAIL GUITAR KIT

Assembly Instructions

Welcome to guitar building! If you're a first-time builder, this kit is a great way to start. You'll have fun and learn a lot.

This simple kit is an excellent entry into electric guitar assembly. It can be built with basic tools. You'll learn to cut the peghead shape, attach the neck, and apply a finish. After you build it, we'll show you how to set it up to play tip-top.

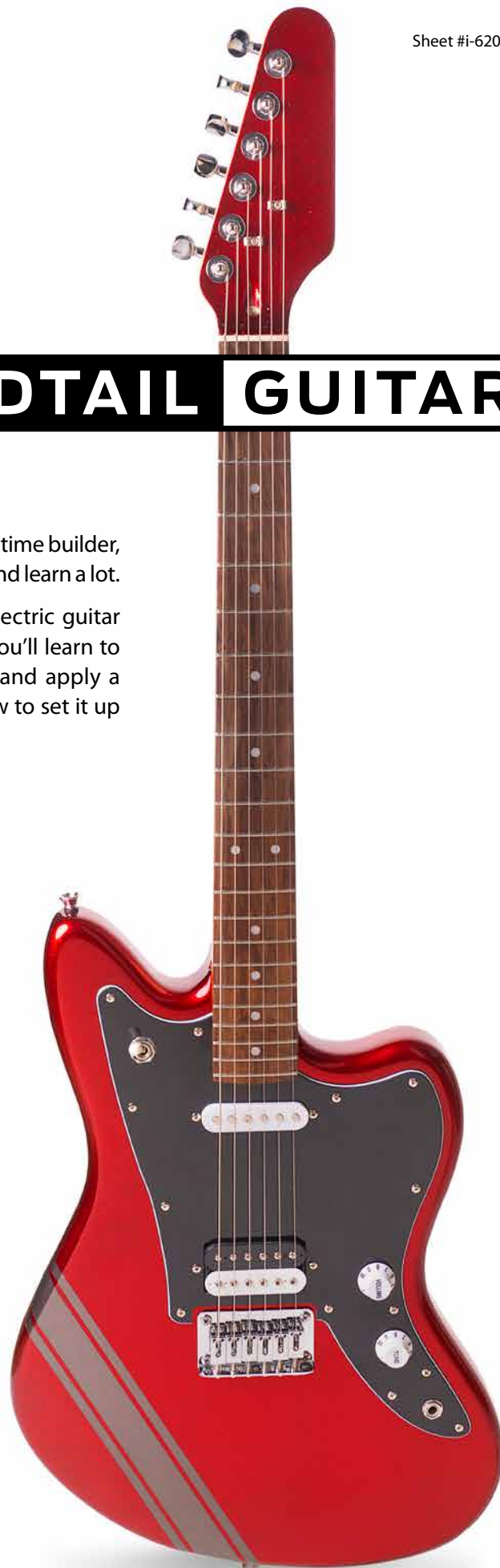


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Tools and supplies

These are the tools and supplies we recommend for assembling this kit. Stewmac item numbers are included where applicable.

Tools

Electric hand drill
Foam sanding block (#3701 or 3699)
Fretting hammer (#4895)
Phillips screwdrivers, size #1 & #2 (#3000)
Center punch or awl (#3000)
Drill bits:
 1/16" (#1710)
 5/64" (#1712)
 3/32" (#1714)
10mm nut driver (#5890) or wrench (#3691)
Nut-slotting files:
 0.013" width (#0823)
 0.020" width (#0828)
 0.035" width (#0832)
Saw for peghead: bandsaw, jigsaw, or coping saw
14" radius sanding block (#0407)
Fret dressing file (#1602)
Ruler (#4905)
Straightedge (#3849)
Feeler gauges (#1811)

Supplies

Sandpaper: 150, 220, 320, 400 grits (#5562)
Light Duty 3M Scotch-Brite Pad (#7445)
 or 0000 steel wool
Naphtha solvent (#0775)
Gloves
Blue permanent marker
Masking tape (#0692)
Double-stick tape (#2711)

Finishing supplies

There are many finishes and application methods to choose from. We use ColorTone Aerosol Guitar Lacquers because they're easy to use and you can get a beautiful nitrocellulose finish without investing in spray equipment.

Here's a suggested list of the basic aerosol finishing products you will need to finish your kit:

ColorTone Powdered Grain Filler, Neutral (#0269-N)
ColorTone Aerosol Guitar Lacquers:
 1 can Sanding Sealer (#3883)
 1 can Aged Clear (#5887)
 1 can of the color coat of your choice (optional)
 2-3 cans of Clear Satin (#3882)

Getting started

The offset-style guitar has been a hallmark of alternative music since its introduction in 1958. It's equally at home on a rock stage as it is playing grunge, surf, or even country. The unmistakable curves of the body belie the gnarly bite and claw of that classic tone. Kurt Cobain thrashed his like no other. They've also been beloved by John Frusciante, Chris Stapleton, Elvis Costello, Carl Wilson, Bob Dylan, Sharon Van Etten, Courtney Barnett, Eddie Perez, and countless others.

Offset guitars are also incredibly popular to mod. This kit makes creating and customizing your own offset-style guitar easier than ever. You don't need production tools for shaping the body, fretting the neck, or machining the neck joint. The pickups and control pots are even pre-soldered! The complicated steps are done, which allows you to focus on the handwork of building.

The kit is made for the small shop builder with a modest tool budget. With the exception of a few essential guitar-making tools, you probably already own most of what you'll need to build this guitar.

Before you start

We strongly recommend you read all of this book before you start building your kit. Understanding the later steps now will be helpful to you as you start to build.

Also note that some photos in these instructions may depict guitars with different woods or appointments, but the building techniques shown are the same for your kit.

While you're probably excited to get started, you need to take a little time to acclimate your kit. Wood can be extremely sensitive to changes in humidity and temperature. The ideal building environment is 70-80° Fahrenheit (21-26° Celsius), with a controlled relative humidity of 45-50%. The woods in your kit should be laid out and allowed to acclimate in your shop for at least a few days before you start your build. Flip the wood daily to neutralize excessive warping.

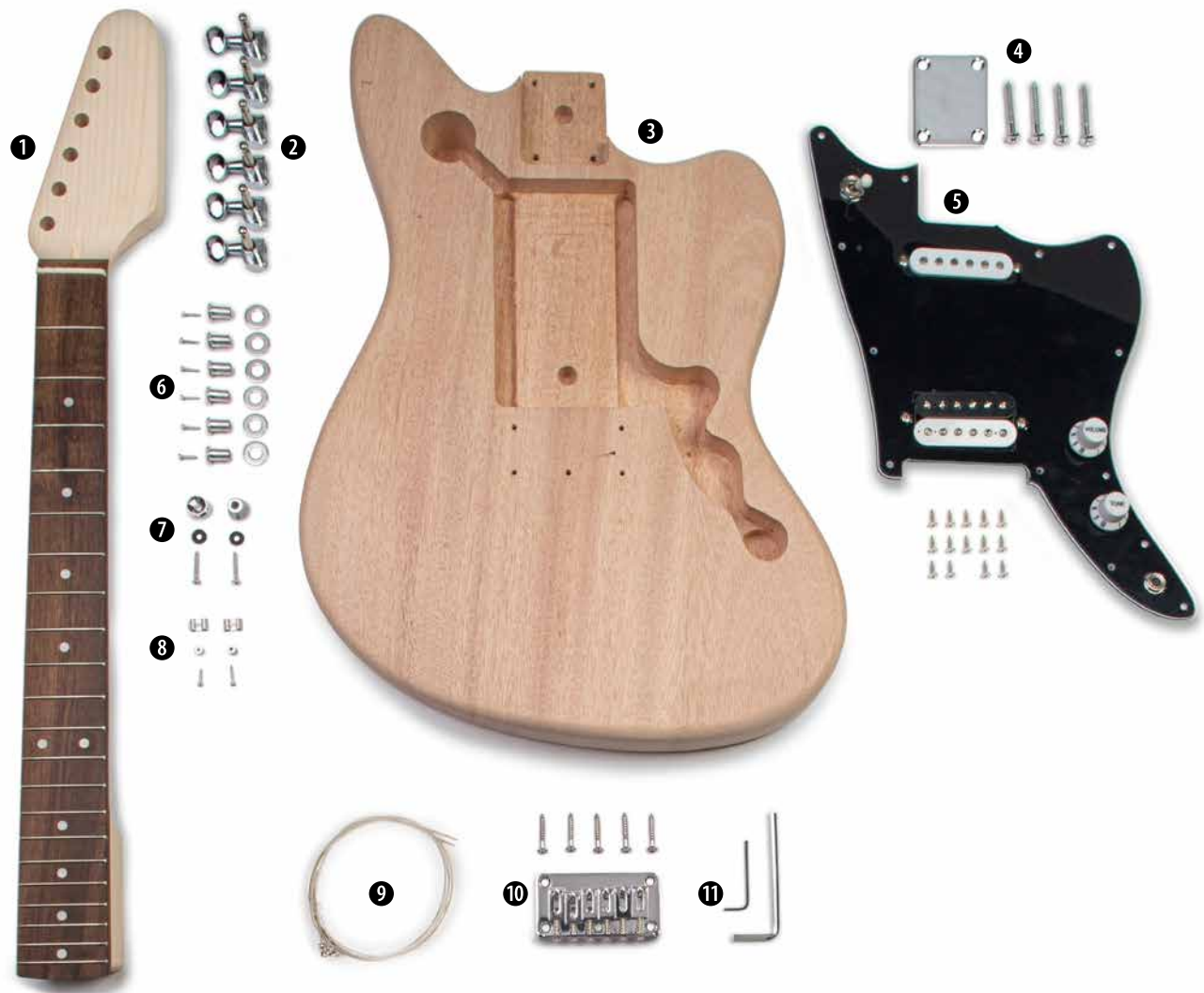
Depending upon your location and the season, you may need to humidify or dehumidify your shop to maintain the desired relative humidity. We advise you to purchase a decent quality thermometer/hygrometer to monitor your shop's climate. Radical changes in humidity, especially during season changes, can cause warping, splitting, and other serious complications. If you're unable to control the relative humidity in your shop, we discourage building the guitar during the transition from dry to wet seasons, or vice versa.

You're going to put a lot of love into this build, and paying attention to the climate conditions while doing so is well worth it.

Always use eye protection, and wear gloves when working with glues and chemicals.

We wish you all the best on your build. If you get stuck or have any questions along the way, contact us. We're here to help.

Parts List



- ❶ Neck
- ❷ Tuners
- ❸ Body
- ❹ Neck plate and attachment screws (4)
- ❺ Pickguard with pickups and mounting screws
- ❻ Tuner bushings, washers, and screws (set of 6)
- ❼ Strap buttons with screws and protective washers (2)
- ❽ String retainers with screws (2)
- ❾ Strings
- ❿ Bridge with mounting screws
- ⓫ Allen wrenches (2)

Parts and materials may vary.

Create the peghead shape

Some kits may ship partially assembled. If your kit arrived with the neck and any hardware attached, remove it before getting started.

You can leave the peghead shape as-is, trace a favorite peghead, or come up with a look all your own. You'll be cutting your design from the blank peghead on the kit's neck.

Make a paper template

Sketch out your peghead design on a piece of heavy paper and cut it to shape with scissors. Using a pencil, trace the shape onto the peghead. Use a light touch that doesn't dent or compress the wood which could make sanding out any unwanted lines difficult. Don't use ink, because it leaves permanent stains that can even bleed up through an opaque guitar finish.

Cut the peghead to shape

It's important that your saw stays square to the face of the peghead while you cut. If it tilts to an angle, you'll get a sloppy result that takes a lot of sanding to correct. Use a bandsaw if you have one; a jigsaw is also good. A hand-held coping saw can also be used, but it's tough to hand-saw smooth clean curves.

Never cut on the line

Always cut just outside the line, so you can sand to the line afterward. Smooth your saw cuts to create your peghead shape using rasps, files, and sandpaper. Don't rush; rough patches will disappear into a good final shape if you take your time.

When you're happy with your peghead shape, sand it smooth using 150-grit sandpaper followed by 220-grit, then 320-grit.



Prep the neck


Note: If your kit has a maple fretboard, skip to the Prep for Finish and Finishing sections on pages 8 and 9. After finishing, return to this Prep the Neck section and proceed as shown.

Straighten the neck

Use the 4mm hex wrench to adjust the truss rod. With a straightedge on the frets, adjust the truss rod until the straightedge touches all of the fret tops without rocking.

Turn the truss rod nut counterclockwise (viewed from the peghead end) to loosen the truss rod, allowing the neck to bow upward. Turning it right tightens the rod, pulling the neck back.

For more information, see our Trade Secrets article “Don't be nervous about adjusting that truss rod!” at stewmac.com.

stewmac.com search: 



Seat the frets

The frets come installed in the fretboard, but they'll need a little work to achieve the best playability. Use a fretting hammer to make sure the frets are all seated properly. The more even your frets are, the less leveling there is to do later.

After seating with the hammer, check for any high spots across the frets—a short straightedge or a Fret Rocker work well for this. Spanning three frets at a time, work down the neck. If the tool rocks, you have a high fret. Knock down the high frets you encounter with a file or Fret Kisser. Taking care of these high spots now will prevent your leveling tool from hanging up on them when sanding and will give you a more even overall leveling job.

With the hammer handle running parallel to the frets, start at one end of a fret and work your way across using light taps that are square to the face of the hammer. Use care not to edge of the hammer head as it can cause a bend in the fret, making it difficult to seat properly.

The idea is to use light taps, just enough to seat the frets flush to the fretboard. Hitting too hard can make a slight kink in the fret that can cause the ends to spring and be difficult to reseal. Using a heavy hand can also damage the fretboard by driving the fret down into it. A drop of super glue works well for keeping stubborn frets in place.



Level the frets

Color the fret tops with a blue permanent marker to prepare them for leveling. The blue ink will show your sanding progress.

Use double-stick tape to attach 320-grit sandpaper to the 14" radius sanding block. With this, level the frets by using full-length strokes down the fretboard. Work slowly and check every few strokes to monitor progress.

The frets are level when the blue ink is removed from the fret tops. The idea is to remove as little material as possible while still achieving a completely level fretboard.



Recrown the frets

Leveling will leave flat tops on the frets. Using a fret crowning file will restore the rounded look of the frets and improve your guitar's intonation.

Reapply blue marker to the fret tops. Using the crowning file of your choice, work the file side to side to re-round the top of the crown until the remaining flattened top is a very thin line. Don't remove this line entirely; filing the fret tops would undo your leveling job.


Sand the frets with 400-grit, then 600-grit sandpaper wrapped around a foam block, running up and down the entire length of the fretboard. Follow up with Light Duty Scotch-Brite Pads or 0000 steel wool for a final finish. This will remove any of the remaining lacquer from the frets and polish them to a smooth finish.



Prep for finish

Preparing the neck and body for finish is just as important, if not more important, than the final spray. The key to a great looking finish is patience and lots of it. Be thorough with your sanding and follow the finishing schedule on page 9 for best results.

Inspect the body and neck for any dents, chips, or other imperfections and repair them. Small dents can be steamed out by placing a damp cloth over the dent and applying heat with a soldering iron. To learn more, see our Trade Secrets video #0317 “Fixing a guitar dent by steaming it out” at stewmac.com.

stewmac.com search: 

Chips and knotholes will need to be filled. Remove the bridge if you haven't already and set it aside.

Fill the grain

If your kit has an open grained wood, such as mahogany or ash, the grain will need to be filled before finishing in order to achieve a flat surface. As a general rule, if you can see the pores of the wood with the naked eye, you should use grain filler before finishing.

We suggest using our Neutral ColorTone Powdered Grain Filler following the instructions below. Three applications are recommended to get a nice flat surface to build finish coats over. Tight grained woods such as alder and poplar do not need to be filled.

ColorTone Powdered Grain Filler is supplied as a fine powder, ready to mix with water (a 1:2 ratio of water to filler works well). Mix thoroughly until you have a smooth consistency, without any lumps.

Prepare surface by sanding to 220-grit. Remove all dust, oil, and solvents from the surface.

Apply the filler liberally in the direction of the grain, then against it. Allow to dry for 5 to 10 minutes depending on thickness of the filler.

Use a grain filler spreader or plastic card to squeegee off any excess. Wipe at a 45° angle to the grain.

When dry, wipe off remaining residue with a clean dry cloth.

Sand the surface with 320-grit sandpaper. Clean up with warm water.

Sand the body and neck

Run your fingers lightly along the edges of the fretboard and feel for sharp fret ends. If the frets feel sharp where they meet the edge of the neck, gently sand them back with long strokes down the length of the neck. Use care not to sand the top of the frets and fretboard or change the bevel of the frets in the process.



After a complete sanding, wipe down the body and neck with a damp cloth to raise the grain to reveal fibers that need more sanding. Let the wood dry, then sand the raised grain with 220-grit sandpaper. After sanding, raise the grain again and sand a third time, using 320-grit sandpaper.

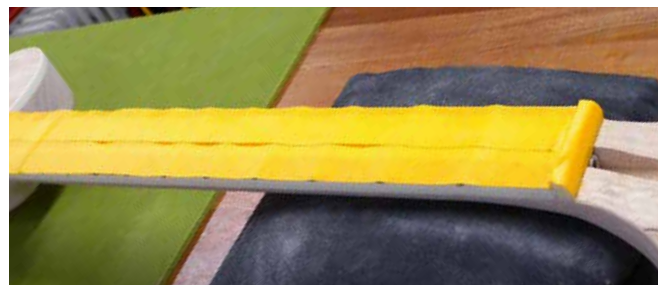
Slightly break and soften any sharp edges on the fretboard, peghead, and body around the neck pocket. Softening hard edges promotes even finish coverage. Later, when you're lightly sanding between coats of finish, these edges are less likely to sand through to bare finish.

Wipe the neck with a damp cloth to raise the grain. After it's dry, sand it again with 320-grit.

Degrease with naphtha

When you've finished sanding, wipe the body and neck with a naphtha-dampened rag to remove any oils or grease. From this point on, wear clean gloves when handling so you won't contaminate the wood.

For rosewood or dark wood fretboards, tape off the string nut and the fretboard face before spraying so it remains free of finish.



Spray the finish

There are many finishes and application methods to choose from. In creating these instructions, we're using ColorTone Aerosol Guitar Lacquers. These aerosols are a fast way to build a quality finish.

Using a clear satin topcoat is recommended, because satin doesn't require much sanding or buffing the way gloss does. If you choose to spray a glossy finish, it will involve more steps. For help with that or any kind of finish, see our book, *Guitar Finishing Step-By-Step* (#5095).

Use scrap wood to make a spray handle. Mark and drill holes in the handle that align with the holes in neck pocket of the body. Use two bolts and nuts to temporarily attach the handle to the body. Drill a hole in the other end of handle and bend a thin metal rod into an S-shape to hang the body and neck during spraying or while drying.

A brushed-on finish like tung oil, waterbase lacquer, or shellac works great too. Any of these finishes will seal and protect the wood from dirt and moisture.

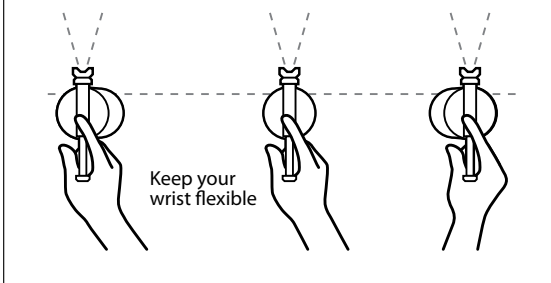
The best advice for finishing: practice on scrap!

Test your finish of choice on scrap wood first, so you can see what you'll get before applying it to your guitar.

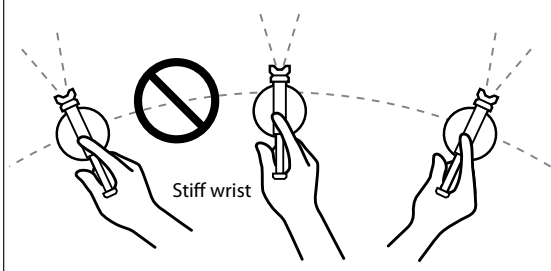
Use warm lacquer, not cold. Professional finishers spray heated lacquer because cold lacquer spatters, requiring extra sanding. Warm up your aerosols before spraying by placing the cans in a sink of warm tap water.

When spraying, keep the spray parallel to the surface of the guitar for even coverage as shown below.

The right way to spray: Move in a straight line, so the distance from the work stays the same. This gives you even coverage.



The wrong way: Swinging in an arc moves the spray closer and farther from the work. Center coverage is heavy, edges are light.



Spray schedule with ColorTone Aerosol Lacquer

This finishing process can be completed in as little as three days, followed by a week of curing. Remember that patience is the key to a successful finish job. Don't rush it! Spray the lacquer using light passes to prevent runs.

Day 1

Body: Spray 1-3 coats of aerosol Sanding Sealer on the body, waiting 1-2 hours between coats.

Neck: Spray 1-2 coats of Clear Satin lacquer, allowing 1 hour between coats. Follow this with 1-2 coats of our Aged Clear lacquer for a warm maple color. Wait 1 hour between coats.

Note: If your fretboard is maple, you will be spraying over the entire neck, including the frets. Finish will be removed from the frets during the leveling and dressing process after it has cured. The nut will be taped off to keep it unfinished. Any excess overspray can be scraped away after finishing.

Allow the body and neck to dry overnight.

Day 2

Body: Spray 2-3 coats of color (optional), allowing 1 hour between coats.

Body and neck: Spray 3-4 additional coats of Clear Satin, 1 hour apart.

Allow to dry overnight.

Day 3

Body and neck: Lightly sand the body and neck with 400-grit paper to remove any finish spatter or dust.

Spray 3-4 additional coats of Clear Satin, 1-2 hours apart.

Allow the finish to cure for a week in a cool, dry room. Around 70° at 50% humidity is recommended.

After the finish has dried for 1 week, go over the entire instrument lightly with Light Duty 3M Scotch-Brite Pads or 0000 steel wool for a nice satin appearance.



GUITAR BENCH PAD

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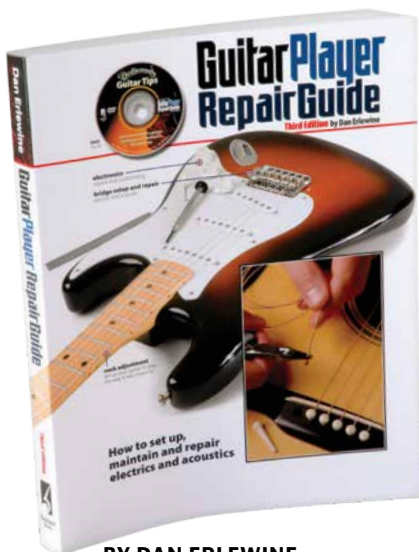
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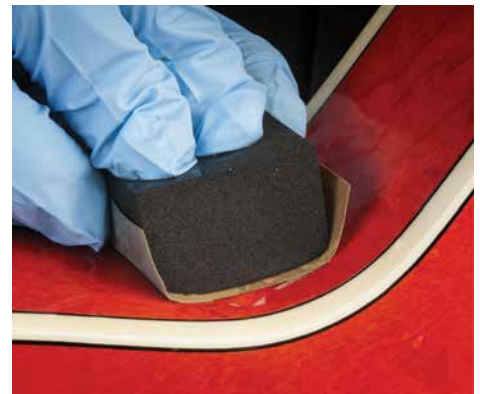
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Get a pro-quality finish (or refinish) on your next guitar! In this 3-part series we show you exactly what you need to do to get a professional-quality guitar finish at home using aerosol lacquers. The results are pretty amazing!! This series covers every aspect, all using nitro aerosol finishes. It's perfect for anyone—no experience necessary! You really CAN get a pro-quality result (even on your first try) if you follow these steps.

Assemble your guitar

During assembly, use a padded surface to protect the finish from scratches and dents.

Run the ground wire

The neck has a 22nd fret extension that prevents the pickguard from seating if the neck is attached. The pre-wired pickguard has a red ground wire attached to it. Feed this wire up through the hole in the control cavity that runs under the bridge. Do not mark out or drill the mounting holes yet. Seat the pickguard and temporarily secure it to the body, a rubber band around the waist of the body will help keep the pickguard in place while attaching the neck.

Attach the neck

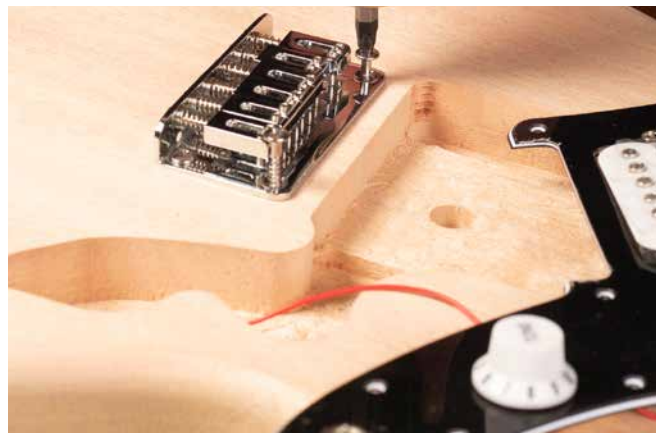
Attach the neck to the body using a #2 Phillips screwdriver.

Install the bridge

Reinstall the bridge, tightening it down over the bare end of the ground wire. Tighten the screws down slowly, being careful not to strip the holes.

Install the pickguard

Lay out the pickguard using the neck and bridge for reference. Once positioned, mark out the mounting screw holes with a scribe or punch. Drill pilot holes for the screws using a 1/16" drill bit. Secure the pickguard with the included mounting screws.



Install the strap buttons

Mark the locations of your strap buttons. At the tail of the guitar, position the button in line with the center of the neck and bridge. The other button is typically located on the tip of the upper horn.

Drill 1/2" deep holes with a 3/32" bit, and install the strap buttons with their protective washers.



Install the tuners

Lay out the tuners, using a ruler to make sure they're in line with one another and square to the edge of the peghead. Mark out your mounting holes with a scribe or punch.

Tuner mounting screws are very delicate and will break off if forced into the wood. Use a 5/64" drill bit to make pilot holes for the screws; if these holes are any smaller you risk shearing off the screw heads. Hold a screw up to the drill bit and wrap tape around the bit to mark your depth. Lubricate the screw threads by dragging them across soap or wax for smooth installation.

With the tuners in place, install the screws in the pilot holes with a #1 Phillips screwdriver. On the tuner string post, add a washer then the threaded bushing. Tighten with a 10mm nut driver or wrench.



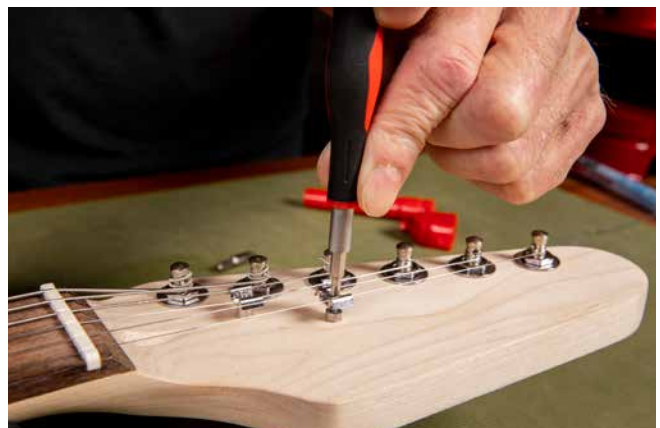
Install the string retainers

Install the included generic strings or your own preferred brand of strings and mark the locations for the string retainers on the peghead. These retainers maintain the proper string angle over the nut for the D, G, B, and E strings.

Install the D/G string retainer between the E and A string posts (approximately 2" from the nut).

Install the B/E string retainer between the A and D string posts (approximately 3" from the nut).

Tune the guitar to pitch, and adjust the neck using the included 4mm hex wrench.



Final setup

Straight neck or a little relief?

Neck relief refers to adjusting a neck so that it has a very slight upbow, rather than being perfectly straight. This relief allows a little more room for string vibration, reducing the chance of hitting the lower frets and causing fret buzz.

Depending on your playing style, and how perfectly level your fret tops are, a neck should be anywhere from perfectly straight to having 0.012" of relief. This measurement refers to additional string height over the 12th fret, compared to a perfectly straight neck.

A straight neck tends to play and sound better, but very few guitars end up with no relief at all, and several thousandths of an inch or more is perfectly normal.

Turn the truss rod nut counterclockwise to bring the neck up, adding relief.



Measure string relief at the 12th fret.



Turn clockwise to pull the neck back, reducing relief. Go slow: a little does a lot!

Set the action at the nut

Lower your string nut slots for better playability, using gauged nut files. Measure string height over the 1st fret, between the bottom of the string and the top of the fret.

A comfortable medium action is:

Unwound strings (G, B, E): 0.012" at the 1st fret

Wound strings (E, A, D): 0.020" at the 1st fret

Use feeler gauges to measure the gap. If you don't have feeler gauges, you can use a guitar string that closely matches the size of the gap you are shooting for. Stop when the string sits on your feeler gauge. Go slow and check your work frequently—it's easy to go too far in this step and ruin the nut.



Bridge set up

Adjust the action at the bridge by raising or lowering the string saddles. Measure string height over the 12th fret, between the bottom of the string and the top of the fret.

A good starting point is:

High (unwound) E string: $1/16"$ at the 12th fret

Low (wound) E string: $5/64"$ at the 12th fret

You can always go lower or higher depending on your playing style. After setting the two E strings, dial in the remaining strings to match the curve of the fretboard's 14" radius using the cut-out gauge included on the last page of this booklet.



Adjust the pickup height

You can adjust the height of the pickups for the best response by turning the two screws on the bass and treble side.

Holding down the low E and high E strings at the 22nd fret, adjust the bass side of the pickups to $5/64"$ from the top of the pickup pole to the bottom of the low E string. Adjust the treble side to $1/16"$. Feel free to experiment with other heights, but the measurements here serve as a good starting point.



Set the intonation

The final step is intonating the guitar by adjusting the string lengths at the bridge saddles so the guitar plays in tune all the way up the neck.

Using a strobe or other accurate tuner, first tune the strings to pitch. Then, press the high E string lightly at the 12th fret using just enough pressure to sound the note. Check it with your tuner.

If the note reads flat, the saddle needs to be adjusted forward towards the nut, shortening the length of the string.

If the note reads sharp, the saddle needs to be adjusted back away from the nut, increasing the string length.



You're done!

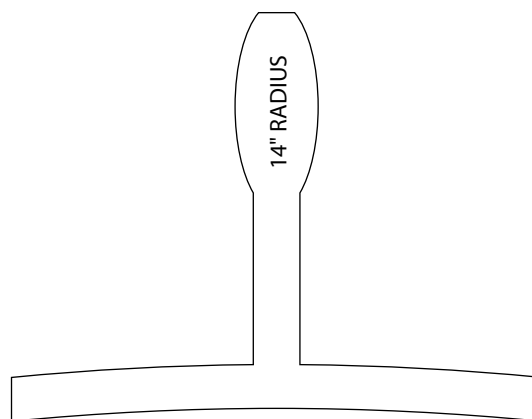
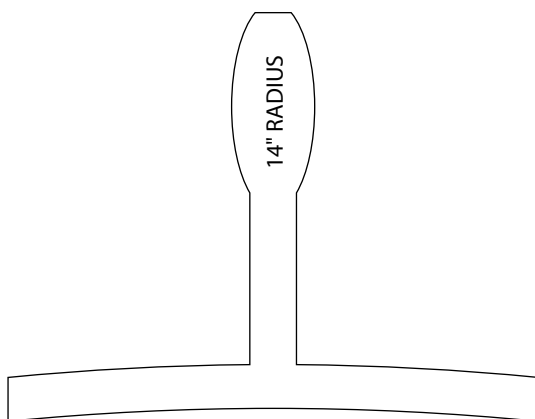
Congratulations! Your guitar is ready to play.

We hope this guitar will be the first of many that you enjoy building. Visit Stewmac.com to view our full lineup of electric and acoustic guitar kits.



Cut-out radius gauge

Carefully cut out this radius gauge to check your saddle heights as shown on page 14. We've included two, so you have a backup.



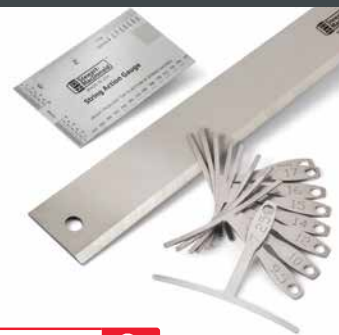
Notes

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WHAT'S NEXT? YOU CAN'T STOP NOW

PERFECT YOUR SETUP

Every great playing guitar begins here. Buy these tools once and they'll last you a lifetime.



stewmac.com **Basic Setup Kit** 



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