Solo AD Style DIY Acoustic Guitar Kit

Assembly Manual
ADK-1

V 2.0

Show Off Your Custom Built Guitar!

When you have your guitar finished, please take a few pictures and send them to us for potential posting into the picture gallery on our website.

Post your photos to our Facebook page
http://Facebook.com/SoloMusicGear

Remember, you can always find us online at SoloMusicGear.com to upgrade your parts, try a new kit, or ask us a question. Alternatively you can call us at 1-800-632-SOLO (7656) for any questions that you might have.

Hi! Welcome to Solo DIY Instrument kits, and congratulations on either starting or continuing a terrific new hobby! Thank you for purchasing a Solo DIY guitar kit. This unfinished guitar kit has everything for building an Acoustic guitar – you will need only some basic tools and finishing supplies. All challenging wood cutting, drilling and shaping is already professionally done, as well as fret leveling and dressing.
We hope that you will find everything either equal to or exceeding your expectations with this Solo DIY Instrument kit. We are however human, so if there is something in this kit that you have a question about, please feel free to contact us at www.solomusicgear.com , we will be happy to answer all your questions. Remember, all the major manufacturing has been professionally completed on this instrument. All the cutting, rounding, routing, binding and sealing has been completed by our factory. Only some basic skills and patience are required in order to complete the work and end up with a beautiful and playable instrument! Let's get started!

Tools and Materials :

Before you start working on your DIY guitar project, please check all the parts received in this kit.

You may or may not require the following tools and materials to complete this instrument kit :

1. Sandpaper with varying grits

2. Selection of files both flat and rounded

3. Chisels and sharp razor knife

4. Fine toothed handsaw (although extremely unlikely)

5. Selection of screwdrivers both large and small

6. Selection of allen keys

7. Selection of flat open ended wrenches

8. Drill (either hand or powered) and selection of drill bits

9. Small hammer and/or dead-blow hammer

10. Soldering iron and flux core solder for electrical components

11. Measuring instruments will include two straight edges at least 12" long

12. Masking or painters tape

13. Glues including wood glue, epoxy and cyano-acrylate (super glue)

14. Various clamping devices (plus you may need to create clamping cauls)

15. Wood veneer for shimming (different thicknesses)

16. Certain kits will require some specialized tools not listed here.

Safety : There will always be some woodworking and wiring that is required, whether it be sanding drilling cutting or soldering. We expect that you will use common sense in making sure you are working safely; in a ventilated area, and that you use the proper safety equipment including eye and ear protection. Whether you are doing the wood portion, the electrical or the finishing, always enlist the help of people who are familiar with these skills in order to be safe. It's always better to be safe than to be sorry!

Checklist : Now that you have received your new Solo DIY kit, we suggest that you read through all the instructions at least once, so you are familiar with the process of assembling this instrument, and so that you can recognize the parts described. Once you have read through, take a few minutes and check all the parts you have received. Because you are familiar with the manual, you should be able to ensure you have everything required to complete this kit.

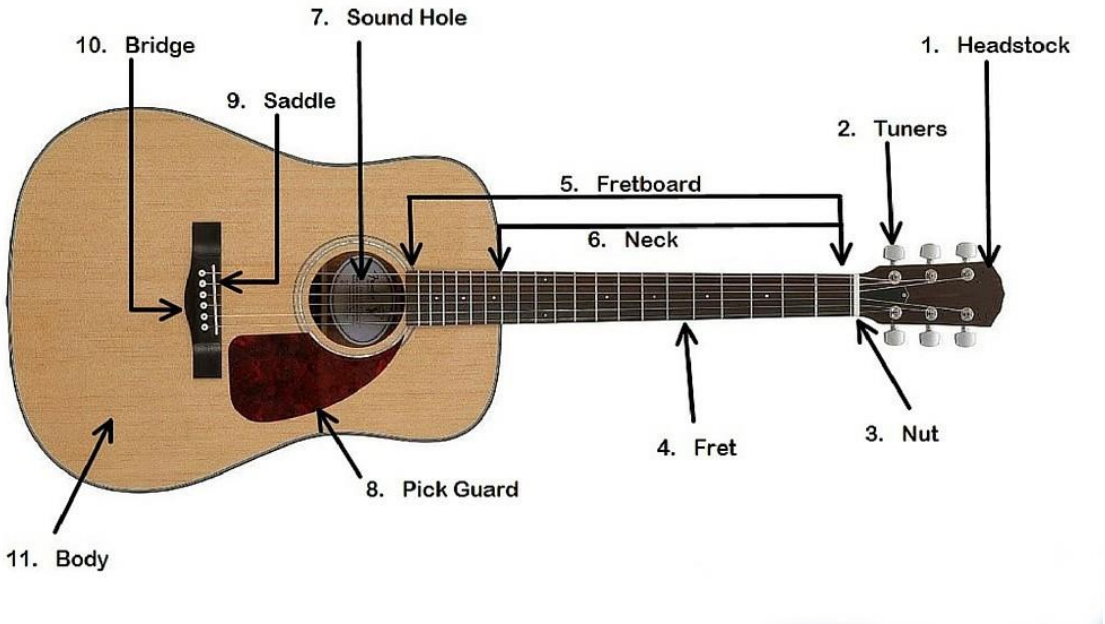
Before you begin to assemble any of the Solo kits, setting out a schedule of how you want to go about each instrument is vital. Not all our kits follow the same path when it comes to finishing and assembly. First examine all the parts, especially the bodies and necks. Are there imperfections? Are there dings and bumps you may have to sand out or fill? Are the frets all seated properly and are there any sharp ends that extend past the edge of the neck that may need to be filed smooth. Making sure all of the parts are as close to perfect as you can make them, will aid in a successful assembly. If you have decided to apply a finish or paint to the body and neck of this instrument, you may want to go through the whole assembly to make sure everything fits and all the holes are drilled before you embark on the finish (or paint).

Then, when your finish (or paint) has been applied and cured, you can assemble the instrument with the confidence that comes from knowing everything will fit. Even the electronics can be pre-assembled to some degree (if they aren't already) so that you can check wire length and pickup function. * in the case of bridges and tailpieces that have posts to be pressure inserted into the body, you may not want to insert these until the finish (paint) has been applied, or you may elect to insert them but cover the opening on the post with tape to protect the threads.

Also on the headstocks, many tuners have grommets that may need to be inserted....these too should wait until after the finish (paint) is applied.

Disclaimer : We make sure the materials we include in our kits are safe to use and do not present any significant health risk. However, we cannot take responsibility for any existing health conditions that may affect the person building these kits, nor any responsibility arising from the assembly or work required in order to complete the kit. The kits can be assembled without any finish or coating being applied, so we leave the entire subject of applying a finish or coating to the bodies and necks up to the individual. There are ample websites and videos on the internet that can assist you in putting a beautiful and lasting finish on this instrument, plus there are often classes available in night school and local businesses that will be an aid to this process. We therefore do not take any responsibility in any issues that may arise from or because of the finish application to this instrument. Likewise, we are not here to instruct in the art of soldering or woodworking, so the responsibility lies with the person assembling this kit to obtain the proper instruction or help on any part of the assembly process, and to complete the assembly process in a safe manor. If we could be there with you to help you along, we would.....but we can't.

Assembling the Solo DIY Acoustic Guitar Kit



Your DIY kit may vary from this photo/Pickguard sold separately

If you have read through the two introductory pages, you will have already taken account of your parts and made sure everything is correct and fits where it needs to. The neck and body are both flawless, the tuners and grommets fit the holes in the headstock, and you have the rest of the required parts.

Attaching the neck to the body :

This appears to be quite a simple task, but wait! The truss rod which extends from the neck under the finger-board doesn't fit in the slot. The slot on the top of the body will have to be adjusted so you can slide the truss-rod in as you slide the dovetail on the neck into the body route. Take your time on this, we don't really want to open the slot anymore than we absolutely have to because we will reduce our gluing area. You may have to widen the slot slightly and possibly extend it, so that attaching the neck is a smooth and fast operation. Remove very small amounts of wood until you are successful. DO NOT remove any wood from the dovetail on the end of the neck.

You will now have to determine whether the dovetail and the slot will fight tightly enough for the glue to hold properly. When the neck has been slid into place on the body, there should be very little movement from side to side. If this is the case, you may go ahead to the next paragraph and glue the neck in place. If you find that the dovetail joint is loose and sloppy, you will have to add some shim material. This could be in the form of paper or veneer from you local lumber supply. Once again, this is the most critical operation in this assembly, so take your time and be 100% sure you have the correct shims in place and please remember, if you are using shims, you must glue both sides of the shim in order to achieve a 100% bond for the glue.

We are now ready to glue the neck in place. There may be more experienced builders who have access and experience with hide glue, but for the everyday person who is assembling this kit, basic white wood glue will do the trick! If you use a waterproof glue, you will not be able to ever remove the neck from the body for a reset or adjustment, so use just the plain white wood glue....it is water soluble. You will need to create two clamping 'cauls'. These will be pieces of wood that fit into the places where you will require a clamp (the cauls will protect the wood from being damaged). The first caul will be a small block that sits on the flat piece of wood inside the body, under where the finger-board will be glued to the top. The second one will be a a block to sit on top of the fingerboard with a piece of foam under it to protect the frets. Remember to dry fit the neck (with the shims) and clamp the finger-board to the top a few times so you are familiar with the process...believe us, it will help! If everything works properly together, the dovetail will pull the neck into the slot on the end of the body. Since you are gluing this part as well, it is always nice to put some pressure on the heel of the neck so that it glues tightly to the body. Since you cannot use a clamp over the length of the body to hold the neck in place, you can use string wrapped around the body several times, surgical tubing is great if you have some, or just plain old rubber bands fashioned from old inner tubes. Be creative and come up with something that won't force the neck sideways, won't hurt the wood on the heel of the neck, and won't damage the other end of the guitar body.

So, you have created your shims and your gluing cauls, you have dry fit the neck a few times and you are now confident to glue the neck to the body. If you are using shims, make sure you glue both sides so that when this joint dries, it is one solid neck/body joint! Don't use too much glue, because it will squeeze out and you will have to clean it up. Apply the glue to the underside of the exposed finger-board, and to the dovetail components. Be careful not to put any glue on or too close to the truss-rod...if you glue it in place, it will not function properly. A smaller amount on both surfaces is advisable. Slide the truss-rod into it's newly adjusted slot, and the dovetail into the end of the guitar. Try to wiggle it a little bit if possible to make sure the glue spreads and the bubbles come out. Now, take your C-clamp and your cauls for gluing the finger-board and put them in place, but do not tighten the clamp too much at this point. Make sure the neck is seated firmly against the end of the guitar, all the way down, and on both sides. Go ahead and wrap your string or tubing around the body so that the lowest part of the heel of the neck gets enough pressure to hopefully squeeze a bit of glue out. Now tighten the finger-board clamp until again, you have some glue squeezing out. When you are satisfied that all surfaces are tightly clamped, go head and remove whatever excess glue you may have squeezing out. You may be able to scrape it off, or just use a damp cloth to clean it up.

(Remember that if you use a damp cloth to clean up the glue, you will have to carefully re-sand those areas that got wet.....the water will lift the grain of the wood and it will appear quite different when you apply a finish to it, unless you sand it again). When you are satisfied that the joints are tight, and that the excess glue has been cleaned up, set the guitar aside for at least twenty four hours. At that point, you can remove your clamping devices and do your sanding or any other clean up required.

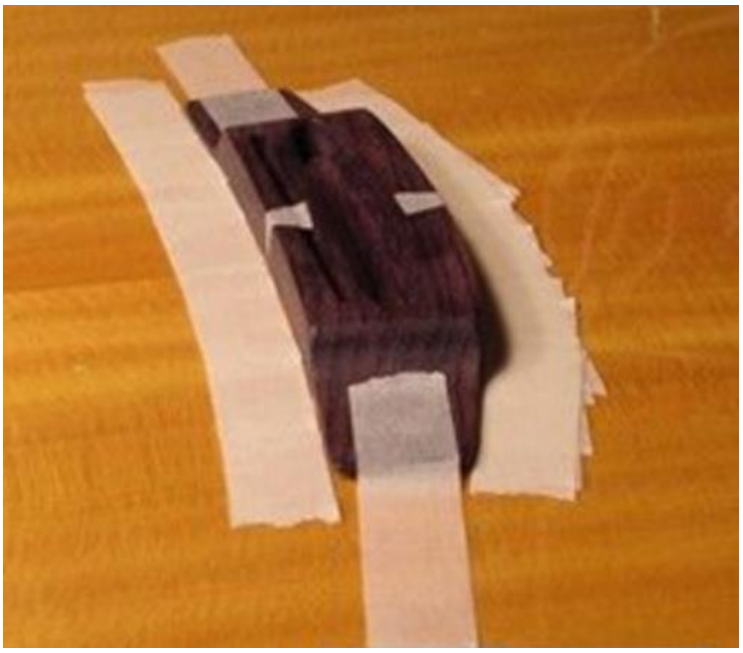
Gluing the Bridge :

By now you have noticed that assembling the acoustic guitar kit, is quite involved. For production companies, there are jigs and specialized tools for all these details, but since we are building just one guitar, we have to go through the entire exercise. This next operation is no different. The placement of the bridge will ensure that the guitar will play in tune. A mistake here will render the guitar useless, so please take your time and plan this out!

Proper intonation requires that the distance from the nut to the 12fth fret, is the same as from the 12fth fret to the saddle on the bridge, so therefore the scale length will be two times the distance from the nut to the 12fth fret. Hopefully that makes sense.
Now because of string thickness/diameter and the fact that you have to 'bend' the string slightly when you fret notes, there is usually a small compensating measurement added to the length of the scale. The Solo DIY Acoustic Guitar Kits have scale lengths of 25 1/2", so your scale length measurement with a medium string will be about 25 19/32" measured down the centre of the neck from the fret side of the nut to where the string contacts the saddle in the exact middle of the bridge. This is a difficult process again but patience and proper measurement techniques are crucial! If you are off slightly with your measurement the effect will be an inability to intonate the guitar.

How do we find our center lines? First let's look at the bridge. On the top of the bridge measure to insure that the string peg holes are located in the exact middle of the bridge. We can do this by measuring from the edge of the outside hole to the end of the bridge and comparing that to the corresponding measurement on the other end of the bridge. The measurements should be the same. Now you can flip the bridge upside down and mark the middle of the bridge on the bottom and then place a small mark on the flat side of the bridge so you can line up the centre marks on the bridge and guitar properly. Now take your straight edge and lay it on top of the guitar body with one edge against the neck. Make two marks at 7" past the end of the finger board and 10" past. Do the same on the opposite side of the neck. (You can use a small piece of painters tape so you do not mark the top of the guitar) Measure in between these marks so you can determine the centre line of the neck and body. This line will now correspond to the centre mark you made on the flat side of the bridge.

Next, insert the saddle into the slot of the bridge (the compensated notch is for the B string) and lay the bridge on top of the guitar body approximately where it will be glued. Measure from the end of the fingerboard (or the inside edge of the nut) to the point where the string will touch the saddle in between the 3rd and 4rth strings (between the D and G strings). You will need a measurement of 25 19/32". The flat side of the bridge should be parallel to the end of the fingerboard and the centre mark you made on the flat side of the bridge should be lined up with the centre line of the guitar body. When you have positioned the bridge correctly, take 2 pieces of tape and tape it down to the guitar top. Remember to remove the saddle and put it in a safe place for later. Double and triple check your measurements and then create a small wall around the bridge. We do this by sticking 5 or 6 layers of tape on top of each other so that they will stop the bridge from moving when we glue it down. We suggest creating this 'wall' on the flat side and the opposite side because the back side of the bridge is contoured, the tape will prevent any sideways movement.



You now need to create 4 clamping cauls in order to glue the bridge down properly. One will sit on top of the bridge in the middle, and there will be two small ones to sit on the two ends of the bridge. The final caul will be inside the guitar body. There is already a flat plate of wood glued to the underside of the guitar top exactly where the bridge will be located. You will need a flat piece of wood that is close to the same size as this plate, so that your 3 clamps do not damage the plate. Once you have these cauls, practice clamping the bridge in place a few times so that you are familiar with the process. When you are ready, apply a small amount of glue to the underside of the bridge making sure there is a thin layer of glue covering the bottom of the bridge. You may put a small amount in the space allotted on the guitar top as well, although we are going for minimal glue squeeze. Place the bridge in it's location and using your three deep throated clamps, and your custom cauls, slowly add pressure to the bridge until you are 100% sure that maximum contact and pressure have been achieved. It will take probably 20 to 30 minutes before you can remove the 'wall' of tape and clean up any excess glue around the edges of the bridge. You must leave the clamps on for 24 hours so the glue can cure properly. Note, if you are having difficulty holding the inside caul in place, sometimes we use a piece of 2 sided tape to hold the caul until we can clamp it....just remember to remove the caul when you take the clamps off.

Thankfully, most of the really difficult work is now behind you. Let's quickly address the next few operations so we can concentrate on setting up your Solo DIY Acoustic Guitar Kit!

Installing the Tuners :

Install the Machine Heads on the neck's headstock, line the edges of the tuners up with the edge of the headstock. You might find it easier or helpful at least to use a straight edge to line up each set of 3 tuners. Mark the hole in each tuner with an awl, and then predrill the screw hole with a 1/16" bit to a depth of 1/8" - 3/16". Use the threaded hex bushings with washers initially tightening them with your fingers only. Align each machine head to match the holes for mounting screw and use the screws to secure the heads. Finally, tighten the hex bushings with a socket wrench (or regular hex wrench). Double check that they all function properly.

Installing the Nut :

The nut has been supplied slotted and sized, but sometimes the nut is slightly long and extends a little on each side of the neck. If you have already applied a finish to your guitar, you will want to sand each end equally until the nut does not protrude beyond the edge of the neck. If you have not yet applied a finish to the guitar, you can carefully file and sand the nut after it has been glued in place. Place two drops of super glue to the bottom of the nut and two or three along the flat surface that will sit against the end of the finger board, and then place the nut exactly where it belongs. With the super glue you have one chance and not a lot of time, so if you feel like you want to take your time here, use wood glue in the same manner. You will have to let the guitar sit for at least 3 hours however, and 24 hours before you string it up.

Strap Pin and Rosette :

You may elect to install the strap pin or not, it is your choice. At the end of the guitar body, you will see a wood joint that runs from the top to the back. Measure the halfway point on this line, and drill a 1/16" pilot hole 3/4" deep. Take the 3/4" screw, the black plastic washer and the strap pin and screw them in place (the washer goes between the strap pin and the body).

Again, you may elect to use the rosette supplied or not. It is a water slide decal, so you will want to have a larger bowl of slightly warm water available, an some soft towels to absorb excess water. You can trim the excess paper if you like before you immerse the decal in the water. It will immediately curl and then slowly uncurl. When this occurs, remove the decal from the water and gently and carefully slide it onto the guitar body around the sound hole. Make sure it stays wet initially so you can adjust the location. When you are happy, gently dab a towel onto the decal to absorb excess water, and look closely to make sure there are no bubbles. If you have some bubbles, use the edge of a credit card on an angle and 'pull' the bubbles to the edge of the decal. Once again, make sure you have soaked up the excess water and let the decal dry.

Final Set Up and Stringing :

There are two more things we have to do as we prepare to string the guitar. If you look into the 6 holes on the bridge, you will notice they have not been completely drilled through. Typically we use a tapered bit that matches the string pegs (included) that will anchor the strings. If you do not have access to tapered drill bits, start by drilling through the bridge and top with a 1/8" drill bit (the sharper the better). Drill through all 6 holes and then attempt to insert the pegs into the holes. They will likely not go all the way in, and they have to. Move up one size of bit to a 3/32" bit and try again. If you happen to have a tapered file that small, you can also use that. The idea is to not have them loose, but big enough that the round head of the peg will sit firmly on top of the bridge. Next we need to take the saddle and insert it into the slot on the bridge (remember, the compensated slot is for the 'B' string). This is where we will likely require some shims to raise the saddle up. You can use veneer cut into thin strips, thin plastic or even metal. Make sure they are a consistent thickness and are long enough to fill the slot. A good starting point will be to have the top of the saddle 1/8" - 3/16" above the bridge. If the saddle is already at that height approximately, then don't bother with shims. When you are ready, install the 2 'E' strings but do not bring to pitch. As long as they are tensioned a bit we can tell how high the saddle is in relation to the neck. The saddle must be low enough so that the guitar plays effortlessly, but high enough so the strings do not buzz. If you are too high, either remove shims or take a sheet of sandpaper and sand the bottom of the saddle until it is the correct height. Once you are satisfied with the height, go ahead and install the rest of the strings and bring them to pitch. Take a look at the saddle again. Is it high enough? Take a look at the neck, is there relief or is the neck either flat or back-bowed? Take a capo and install it on the first fret, now fret each string at the 16th fret and measure the space between the string and the 8th fret. You should have about 1/16" of space. If you have less, you will need to loosen the truss rod, and if you have more space, you will have to tighten the truss rod. This will take several adjustments over the first month or two, until the guitar neck settles down in it's new role. Double check your tuning and start playing!!