

RAS KITS

INTRODUCTION

Congratulations on your purchase of your RAS Kit. While it can be a great challenge for an inexperienced builder, with care and attention to details, it can produce an excellent instrument that can last a lifetime.

TOOLS

You will need some tools. Mostly, they're tools you probably have around the house, anyway.

- Very good straightedge. I use a long aluminum yardstick, available at most home repair stores
- An electric drill. A 3/8 standard drill works just fine. However, I use a drill/screwdriver with torque control, which will keep you from stripping most screws.
- Drill bits. See the section on drilling holes for the bridge and stoptail studs. You will especially need a 1/16 inch bit for screw pilot holes You will also need a 7/16 inch bit for drilling the holes for the bridge anchors. A Forstner bit is best, a brad-point drill will work, and a high-speed metal/wood bit should be your last choice.
- Screwdrivers. Get good quality; it will save you a lot of grief.
- Pliers
- 10mm box-end wrench. Good for installing the tuners.
- Soldering iron and electronic (resin core) solder. DO NOT USE ACIDCORE

SOLDER. It will cause all sorts of problems with your electronics, over time. I use a fairly inexpensive Weller solder gun; you can get them for about \$20 and they seem to last forever. A smaller soldering pen or iron will work, but you're more likely to burn yourself or something else. I haven't had any luck with the "cool solder" units.

- Caliper. This one is an electronic digital version, available at Harbor Freight for about \$15. It makes it possible to measure very accurately.
- Finishing supplies. That includes sealers, stains, polyurethane or lacquer, sandpaper, brushes, etc. I can give you some pointers, but a complete instruction on finishing is beyond the scope of these instructions.
- Masking tape. Get the good stuff. At a minimum, use the blue tape that is good for 7 days. Anything less than that will bleed through, leave residue, and otherwise disappoint you. Get a wide roll and a narrow roll.

TEST FITTING PARTS

Before you are ready to put a final finish on the guitar, you need to be sure everything is going to fit properly. Take each piece and check it's fit on the body and neck.

TUNERS

Install the tuners from the back of the headstock. If the pilot holes for the screws are not already drilled, drill them now. Be sure not to drill all the way through the headstock!

NECK

Now, you need to test-fit the neck. Slide the neck into place. It's usually best to slide it in from the top, rather than the end. The neck does get a little wider as you get closer to the end, so it might not even be possible to slide it in horizontally rather than vertically.

If the holes for the screws that secure the neck to the body are already drilled, use something like an awl or a toothpick to be sure the holes in the body line up with the holes in the neck. Then, put the neck plate and its plastic pad in place and install the neck screws. Don't install any of the screws all the way until you're sure they're going in properly. Use a power screwdriver with adjustable torque.

This allows the screwdriver to stop before damaging the screw heads or strip out the holes. Also, if you do this by hand, use a good screwdriver. One that is worn out may also strip the heads.

FRONT STRAP BUTTON

Mark the locations for the strap buttons, drill a pilot hole, and test fit the buttons. The usual locations are on the upper front bout of the body and the center of the tail of the body. Note the small rubber cushion between the strap button and the body.

PICKUPS

The pickups need to be in place, but not screwed down. Insert the neck pickup into its rout, putting the wire through the hole into the other pickup. Put the bridge pickup in place. Be sure the pickups lie in place properly.

BRIDGE

It is very easy to damage the body while inserting the Tune-o-matic-style bridge anchors. The anchors are, necessarily, a tight fit and have to be forced into their holes, usually with a hammer. You may want to use a hammer with a softer face, but it will still damage the body veneer if it hits it.

Tip - Use a 1/4 inch thick piece of wood with a number of holes drilled in it to protect the body while installing the bridge anchor, and while installing screws. One slip of your hammer or screwdriver can make a scar on your guitar body that will be very difficult or even impossible to repair.

Once you get the anchors installed, screw the studs into them and mount the bridge on the studs. It may be a tight fit. If so, you may have to carefully tap it down with a soft mallet.*** Note that the spring securing the saddle screws faces toward the neck.***

If one of the bridge anchors would not go all the way down to its lip, DO NOT TRY TO FORCE IT. You will damage the anchor and you may damage the back of the guitar. Instead, you will need to deepen the anchor's hole. The best way is with a 7/16 Forstner bit. Second best would be a 7/16 inch brad-point bit. Last choice would be a regular high-speed steel bit; it's very easy to drill right out the back of the guitar body.

You'll need to remove the bridge anchor in order to finish the guitar, at any rate. The easy way to remove them is to leave the stud installed, put your drill protector or other pad close to the stud,

and use a large screwdriver or pry bar over that handle as a lever. The anchors should pull out fairly easily.

BRIDGE GROUND WIRE PASSAGE

After removing the bridge anchors, you will need to drill a passage for a bridge ground wire. This is crucial to helping eliminate hum in your guitar electronics.

Without it, you may hear a hum in a room with fluorescent lights, or when you touch the strings. It ties the ground from all the other controls together with the strings.

- Using a long ¼ inch drill bit, drill from the anchor hole into the bridge pickup rout. You will pass the wire through there, then through the passage from the pickup rout into the body cavity.

CONTROL MOUNTING HOLES

Test fit the tone and volume controls, the output jack, and the pickup selector switch. Remove the nut and washer off the threaded shaft and insert the controls from the outside of the body to check the diameter of the hole. If they need a little adjustment, use a drill to open them up a little. "Easy does it" is the motto, here.

PICKGUARD

With the pickups in place, compare the pick guard to their position. If openings are not exactly as you want them, trim the pick guard a little to get it to fit. Do not remove the plastic film covering the guard until after final assembly is finished.

FINISH

This would probably be a good time to put your finish on the guitar. Remove all the hardware that is on the guitar, such as tuners, pickups, tailpiece parts, strap buttons, bridge anchors, etc.

Masking the neck- Cover the fingerboard, being sure to get the masking tape all the way down next to the frets, and cutting the masking tape at the edge of the fingerboard. Then go around the fingerboard with tape, covering down to the edge of the binding. That way you can pull off the second wrap when

you are ready to put a finish coat on.

Detailed finish instructions are way beyond the scope of these instructions, and there are many web sites and books that can give you very good pointers. Just in passing, although the gold standard in guitar finishes is nitrocellulose lacquer, it can be a very fussy and time-consuming finish. For an easy finish, stick to polyurethane.

Example- Stain the neck & glue it in place. Then apply 2 coats of sanding sealer over the entire guitar before beginning to install the hardware. Once the hardware is in place, remove it all and sand the body with 220 grit sandpaper. Apply 2 coats of preferred finish. Then sand with 400 grit and apply 2 more coats of finish. Then sand with 600 grit and apply 2 more coats of finish. After that, if you want a true stunner, you can wet sand it with 2000 grit and then polish.

ASSEMBLY

PICKUPS

Thread the neck pickup's wire through the hole leading to the main electronics cavity and put the pickup in place. It should right up next to the end of the neck, not necessarily touching, but it can if that's where it has to be. Screw the corner screws in carefully, with the torque of your screwdriver turned down or by hand, so as not to strip the screwholes.

Install the bridge ground wire. Strip the wire about ½ inch on each end. Thread it in through the bridge anchor hole into the bridge pickup rout, then from there into the body cavity. Spread the stripped end that will be in contact with the bridge anchor so that it won't crowd the anchor much. Pull the so just the stripped end is protruding into the anchor hole and install the bridge anchor. It will be a tight fit, and it will hold the wire in place.

Thread the bridge pickup wire through the hole leading to the body/control cavity and put the pickup in place. Again, center it up on the seam and make it parallel to the neck bridge. Then drill the corner screws' pilot holes.

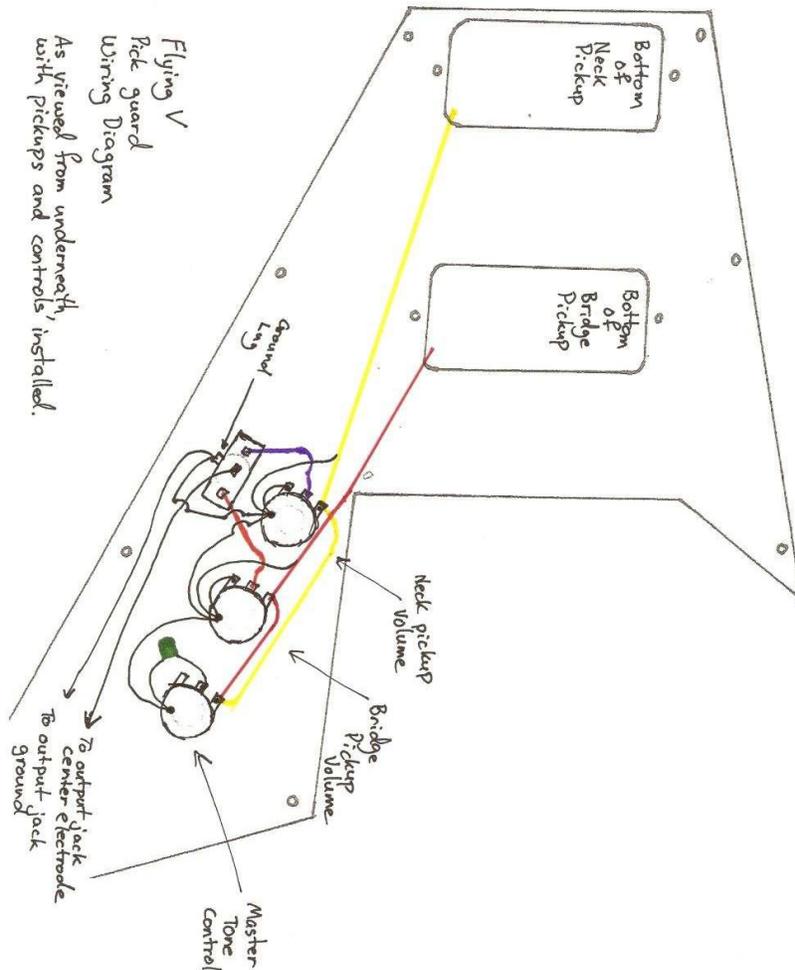
***Note that each pickup lead really contains 2 wires. There is an internal white wire with a thin

conductor inside it, and wrapped around it is another stranded wire that serves to shield the inner lead from extraneous signals and is also the ground wire for the pickup. The internal wire is connected to one of the lugs on a volume control, and the shielding/ground wire is soldered to the back of the volume control to put it in the ground circuit.***

CONTROLS

Some kits have pre-wired controls with the exception of the pickups. This is because the pickups are separated from the controls by a part of the body. If your kits does not have pre-wired controls, you will need to solder both controls and pickups as shown in the wiring diagram below.

WIRING DIAGRAM



When soldering the controls, put something on the body of the guitar to protect the finish. A drop of solder will damage the finish on the guitar that you've put so much work into. Don't ask how we know this.

Be very careful to keep any stray strands of wire from touching somewhere it shouldn't. Even one tiny strand of wire is enough to keep the guitar from working correctly, since an electric guitar works on such miniscule voltages

BRIDGE ANCHORS

Install all the remaining bridge anchor, using the body-protecting cardboard again. Tap them down until the flange of the anchor just contacts the surface of the body. Then screw in the bridge anchor studs.

Leave them about ¼ inch high.

Now, the moment of truth. Install the bridge on the studs, with the intonation adjustment screws facing the pickup. I hope you already check them, but I always hold my breath at this point.

TUNERS

Install the tuners in the headstock. If your tuners like mine, they have top washers with a flat side and a smoothly rounded side. Put the rounded side up. Tighten the nuts on the tuners only after you have installed the screws on the back of the headstock. The nuts do not need to be extremely tight, just tight enough that they don't come loose. Too tight, and your tuners might not work smoothly. If you find that any of the tuners turn too easily or too stiffly, you can adjust their tension with the screw in the end of the knob. Install the truss rod cover at this time, too.

NECK

Slide the heel of the neck into the neck pocket, being sure it's completely seated by checking with an awl or a very small screwdriver that the screw holes in the body are aligned with the screw holes in the neck.

Put the neck plate on its plastic bed and put it on the back of the body, starting one or two of the long Neck screws into place.

Install all four screws loosely before you tighten any of them down completely. Get the screws as tight

as you can manually, but don't try to use a power screwdriver or anything that will damage the screw heads, strip out the screw holes, or break the screws. You're screwing into hard maple, and all of those outcomes are possible.

PICK GUARD

Install the pickguard, using the holes you drilled earlier. Be sure the machine screw holding the pickguard support to the pickguard is tight before you finish installing it.

STRAP BUTTONS

Install the strap buttons in the holes you drilled and tested earlier. Remember to use a long screw (included in the kit), and the little round cushion between the button and the guitar body.

STRING TREES

The idea of the string trees is to hold the strings down at a sufficient angle to put pressure on the nut and keep them from jumping out of the nut slots. This is due to the "flat" construction of Fender-style headstocks.

There are 2 string trees: One with a short stand, and one with a tall stand. The short stand goes on the two smallest strings; the taller one goes on the next two strings.

NECK ANGLE ADJUSTMENT

Most kits won't need neck adjustment, but we include this info if yours does. Lay your long straightedge along the middle of the neck, atop the frets. Holding it against the frets, slide the end down toward the bridge. It should clear the front edge of the bridge (where the screw heads are) by about 1/8 inch, when the bridge is lowered all the way (screw in the studs all the way). If there is significantly less than 1/8 inch, say, hitting the bridge right on the saddle screws, you're going to have to shim the neck a little bit to be able to get the action (the height of the strings above the frets) reasonably low. Be sure to do this before installing strings, as it's really a pain to do it after the strings are installed. You can use a variety of things as a shim. Heaven knows there have been plenty of credit cards, coins, pieces of wood, maybe bubblegum inserted. Loosen the strings, then loosen the front neck screws (closest to the headstock)

and removed the rear neck screws. Check the playing card's width, trimmed the edges a little, and inserted it all the way into the neck pocket. Hold the neck steady, got the rear screws restarted, and slowly tighten down all the screws, being sure to lead with the front screws. You can see the result of the change above. What card is it traditional to use? The Joker, of course!

STRINGS

Lay the guitar on a flat surface, preferable with a soft cloth under it to protect the finish. Install the bridge and stoptail studs in their anchors. Place the Tune-omatic bridge on its studs, with the saddle adjusting screws facing the neck. Adjust the studs with a small screwdriver so the bridge is about $\frac{1}{4}$ inch above the body. Then place the tailpiece on its anchor. It won't stay in place until you have a couple of string on the guitar, and a helping hand will pay off here. Thread the thinnest string through the hole in the tailpiece closest to the control knobs. Place it over the last saddle on the bridge, then through the last (thinnest) slot in the nut. Finally, wind it onto the first tuner post from the nut. (If you are unsure how to secure it, there are a number of web sites that can explain it fully. I put the string through the hole in the post, leaving a couple of inches of play in the string. I use a string winder to wind the string onto the post, getting it tight enough that it has some tension over its length.

DO NOT FULLY TIGHTEN THE STRING YET. INSTALL THE LARGEST STRING BEFORE YOU DO SO.

Be sure it has stayed on the bridge saddle and in the nut slot. Then do the same with the thickest string, threading it through the hole in the tailpiece farthest from the knobs, over the saddle of the bridge, through the widest (top) slot of the nut, and wind it onto the post of the first tuner on that side of the headstock. Continue, putting the strings in the proper order, thickest to thinnest, top to bottom.

KNOBS

Install the four knobs onto their shafts. They are just a press fit.

TESTING

Plug the guitar into an amplifier and check that all the pickups, switches, and knobs work. If something

doesn't work, check your soldering work; that's the likeliest source of trouble. If you have no sound at all, first be sure your volume knobs are turned up. Then use another guitar to check that your amp is working. Then, again, start checking your wiring.

CONTACT

If you have questions or your kit is missing any parts, please contact us at

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