

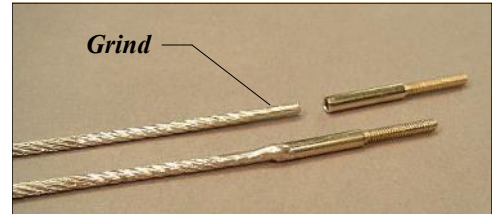
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TAIL PUSHRODS

Technically, the linkages for the elevator and rudder in this design are push-pull cables, but for the sake of simplicity, I will refer to them as pushrods. They do, after all, serve the same purpose as a rigid rod, but their flexibility makes them easy to install. Make sure your elevator and rudder servos are in place.

❑ Stiffen one end of each cable by flowing solder into the first two inches. Use good soldering techniques here: clean the cable with alcohol, apply flux, then heat until the solder flows smoothly into the cable. Allow to cool, then clean off the flux residue with dope thinner or lacquer thinner.

❑ Solder a steel 4-40 threaded coupler onto each cable. You will have to grind the soldered cable ends just slightly to make them fit into the couplers. Heat the coupler and add more solder to the joint. When cool and clean, any globs of solder hanging off the coupler should be ground or filed away.



❑ Worried about the solder joint? After all, if the joint fails, your model will probably crash. I suggest you apply this highly-scientific test. Put three or four hex nuts on the threaded coupler, clamp the nuts in a vice, grab the cable, and give it a firm tug! If you can pull it out with your hands, you may have just saved your model. If not, you did a good job of soldering and you can proceed without worry.

❑ Now it's time to install the nylon housings (tubes), starting with the elevator. Before you put it in the model, swipe the outside of the tube with sandpaper to roughen it up, then wipe it clean with alcohol. Make sure each end is cut cleanly and the cable slides in without binding. Insert the 50" elevator cable into the 50" tube, then thread a 4-40 jam nut and gold clevis onto the threaded coupler. Route the tube through the holes in F-5, F-6, and the hardwood clamp at the tail. Connect the clevis to the elevator servo arm.

❑ Cut a four-inch length of 5/16" square balsa to use as a guide for the tube as shown on the plan. Notice that the end of the tube should be positioned 3/4" behind F-5, and the end of the balsa stick is about an inch back from the end of the tube. Get everything aligned, then glue the balsa stick and the tube (medium CA works well) to the fuel compartment top. Leave the front inch of the tube unglued so it is free to wiggle side-to-side with the movement of the servo.



❑ Now work your way back, gluing the tube to the fuselage side as you go. It should pass right over the top corner of F-8. The idea is to route the tubing as smoothly as possible back to the elevator. Glue it to the hardwood clamp, but leave it free aft of the clamp.

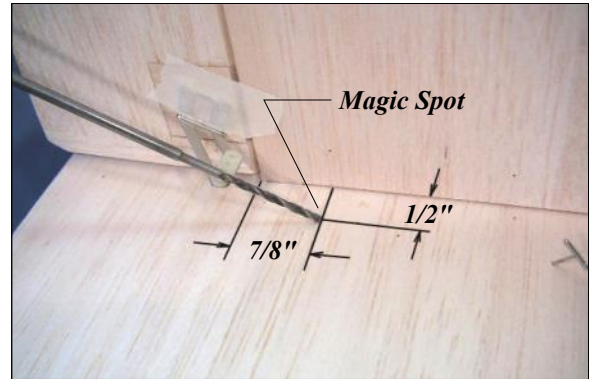


❑ Pin the stab to the fuselage, and tape your elevator in place. You can now establish the final position of the elevator control horn. The long arm of the horn should be very close to the model's centerline, but you can adjust as necessary to make sure the cable flows smoothly to the control horn. You can trim the tubing (remove the cable first) to its proper length, but I like to leave the cable extra long until later. Mark the mounting holes for the control horn, drill at the marks with a 3/32" drill bit, then harden the wood around the holes with thin CA. **NOTE:** The final solder clevis will be installed after the model is finished and the stabilizer and elevator are in their final position.

❑ Add the fin to the top of the stab with the rudder taped in place. Temporarily tape the rudder control horn to the rudder in the position shown on the plans (see Sheet 5). The angled orientation of the horn is required to match the angle of the pushrod as it emerges from the stabilizer.

❑ This might be the trickiest step in the whole building process. You need to drill a hole through the stabilizer and stab mount at a low angle for the rudder pushrod. Use a long drill bit that is undersize, say 3/32". When viewed from the side, the drill is obviously pointing down towards the stabilizer at an angle of about 30°. When viewed from the top, the drill is also angled towards the center of the model.

Ideally, the drill bit needs to pass directly through the outermost hole in the rudder control horn. It's nice to have the horn in position for reference, but it's also in the way of the drill bit. Once you have a good idea of the drill position, you can remove the horn or swing it out of the way while you drill. The "magic spot" for drilling through the stab is shown in the photo.



❑ Ultimately, this hole must be enlarged to 3/16" to fit the pushrod housing. You can use progressively larger drills, or work more slowly with a small file. Remove the stabilizer.

❑ Now you can route the rudder pushrod through the holes in F-5, F-6, and the stabilizer mount hole. Again, route the tubing as smoothly as possible and glue it to the fuselage as you did with the elevator tube. When you get to the aft end, carefully glue the tube to the stab mount only (not the stabilizer). Cut off the housing flush with the top of the stab mount.



❑ The hole in the stabilizer needs to be enlarged to a diameter of 1/4" or more to provide clearance for the cable and solder clevis. Use a drill, file, or Dremel tool to enlarge the hole. **Optional:** You can leave the wood bare inside the hole, or line it with some type of large tubing (not provided in kit - I used some black plastic tubing about 5/16" diameter).



❑ Finally, re-install the stab and fin, and use the installed pushrod to locate the final position of the rudder control horn. Drill holes and harden the wood in the rudder with thin CA.

Come back to this final step after control surfaces are hinged

❑ Once the tail surfaces are glued in place and the control surfaces are hinged, you can add the final solder clevis to the ends of pushrods. Start by cutting the cables to their final lengths. Remove the cables and stiffen the last 2" with solder as you did at the front. Grind the ends if necessary to fit the clevises.

Re-install the cables and carefully position the solder clevises. The clevises must be soldered in place on the model, so protect the surrounding area with a rag while you solder. Make final length adjustments at the front end of each pushrod. ◀R54▶

