



DISCLAIMER:

THIS IS NOT A TOY. This is a high-performance miniature aircraft, capable of high speeds and damage to life, limb, and property. The manufacturer and its distributors cannot control how you assemble this model, what equipment you use to fit it out, or how you fly it, and can assume no liability whatsoever for any damages that may occur when you fly your aircraft. By assembling this model, you are agreeing to indemnify and hold blameless the manufacturer and/or his agents from any and all torts and liability associated with the use of this product. Please inspect all parts before beginning assembly. If any parts appear to be suspect, contact your dealer or the manufacturer for repair or replacement **BEFORE** you begin. Once you have assembled the aircraft, you are the pilot in command and assume any and all

responsibility for the use of the model and any damages that might occur by flying or attempting to fly this aircraft. R/C model jets require a high level of skill in both their assembly and their flying. If you do not feel confident in either your building or flying skills, **PLEASE** seek assistance from more experienced modelers. It is a wise idea, no matter what level of skills you possess, to have a second experienced modeler go over your installation after assembly. A second set of eyes may spot a problem you have missed. If you have not flown a model like this before, it is **HIGHLY** recommended that you get an experienced turbine pilot to do your maiden flight. Very often, the first few seconds of a maiden flight are critical until the aircraft is trimmed out, and having an experienced pilot at the controls can make the difference between a wrecked aircraft and once that enjoys many hundreds of flights. Be sure to select a suitable field for flying...take the time to find a large paved runway if at all possible, especially for test flights, until you feel comfortable getting the aircraft in and out of smaller grass fields.

BEFORE YOU BEGIN:

Keep this in mind as you proceed:
Look at **EVERY** assembly step you finish, and ask yourself:

"Is this going to crash my airplane?"

A chain is only as strong as its weakest link, and this is a high-performance aircraft that will be very intolerant of sloppy assembly techniques. Even the smallest component is important and can cause the loss of your

airplane, so take the time to do things right. Or REdo them if they are wrong. Careful work will result in a long-lasting plane that gives you years of pleasure, one loose component could result in the complete loss of the aircraft and all the components inside it, and someone can even get hurt. So pause every once in a while when building it and double-check your workmanship.

A. Introduction:

You have chosen a model that represents the pinnacle of ARF technology. While there is not a lot of building to do, there is enough to keep you busy for a few evenings. Even if you have assembled maybe other ARF jets, we highly recommend following our assembly sequence and procedures anyway.

Chances are it will save you a lot of time, prevent you from running down dead ends, and perhaps remind you of a few small things that might end up saving your aircraft.

We have tried to arrange a construction sequence that will allow you to keep moving forward, rather than standing around waiting for glue to dry before you can proceed to the next step.

Just because the model is almost completely built does not mean you can rush through the final assembly.

You need to employ fine craftsmanship every step of the way, turbine models are critical. Keep this in mind with everything you do, every part you install...look at the work you just did, evaluate it critically, and ask yourself "is this going to potentially crash my airplane?" If there is any

doubt about the work you have done, back up, and re-do it properly.

B. Adhesives:

The correct adhesive to use for all procedures is Loctite Hysol 9462. This is a very strong white epoxy that is thixotropic. "Thixotropic" means it does not run at all, but stays only where you put it. It is infinitely superior to regular epoxy, even slow-setting epoxy, for our purposes, because of this characteristic.

Regular epoxy will run downhill with gravity as it dries, taking it away from where it is supposed to be.

A good example is in the hinges...using regular epoxy, a good portion of the glue will migrate down away from the hinge into the inside of the wing as it dries, and you won't even know it is happening. Hysol stays where you put it.

The downside of Hysol is it takes overnight to dry properly, but we have tried to arrange things to keep you busy while waiting for glue to dry.

We also highly recommend that you only use a proper Hysol dispensing gun, and only the long-type mixing nozzles.

The short nozzles do not mix this glue enough, and only a thin nozzle and gun will let you fill the hinge and control horn holes properly with glue, you can't do it mixing your Hysol on a flat surface and trying to get the glue in the proper place by a brush or stick.

You can buy a complete Hysol setup with a gun, nozzles, and two cartridges of glue from your dealer for approximately \$60.

Consider it a great investment, the glue is the best you will use. One cartridge is plenty to assemble your T45.

C. WORKING WITH PNEUMATIC SYSTEMS:

The T45 uses pneumatic brakes and retracts. If you follow a few tips, you should have very reliable, leak-free operation. Neatness counts.

All airlines should be secured to the airframe to keep them from flopping around or getting kinked. Use tie wraps for this.

The other very important thing is to cut off the end of each airline dead square before installing it on the nipple.

This is VITAL. You can either purchase a professional tubing cutter from your dealer (they are approximately \$10), or you can make up a little jig to hold the airline and keep a sharp, new razor blade perfectly upright as you cut.

Either one works, just ensure that all ends of all airlines are cut off dead square. Make sure all airlines are pushed ALL THE WAY onto their nipples.

They should not need to be secured otherwise, but you can add fine wire safety wraps if you like. Make sure all left and right matching airlines are the same length, particularly the brake lines, or you will get uneven retraction or braking action.

It's worth taking the time to get everything pneumatic right the first time, as having your landing gear fail to retract is not THAT bad, but having it fail to deploy can really ruin you day and the paint on the bottom of your model.

Sample Servo List:

Ailerons and Rudder: JR 3421 (3)

Flaps: JR 8611A (2)

Elevators: JR 8611A (2)

Nose Gear Steering: JR 8411

Air and Brake Systems: As necessary

Parts List:

- Forward Fuse with Component Boards and Nose Gear
- Aft Fuse
- Canopy
- Cockpit Tubs (2) and Glare Shield
- Main Upper Hatch
- Lower Aft Hatch
- Ventral Fin
- Tail Hook
- Wings, Main Gear, Ailerons and Flaps
- Wing Tube
- Aileron and Flap Covers (4)
- Vertical Stab and Rudder
- Horizontal Stab Strakes
- Wing Fences (2) (Not used on T45)
- Fuel Tanks (2)
- Bypass
- Pipe
- Air Kit
- Hardware Kit

Construction

- Carefully inspect all components. Check the security of all bolts and nuts. Seal with a small amount of thin CA for extra security. If any of the stab bearing plate bolts are stripped, re-tap holes and replace with 6-32 cap head bolts. Reinforce bearing plate and stab former with extra Aeropoxy. See photos

Join Fuselage Halves

- Position front of fuselage to rear of fuselage. Loosely secure in place with four XXX bolts and washers at the aft attach points and two XX bolts and large washers on the side attach points. Use Loctite.
- Position top hatch in place and fit canopy. When everything aligns, permanently tighten 6 bolts.



Horizontal Stabilizers

- Remove lower hatch and set aside.
- Slip one large and one thin nylon washer on the stab spar and insert into bearing box. Check for at least 40mm throw as you move stab. Use the minimum number of nylon washers to achieve clearance.
- Tighten and loosen control horn bolts one time to ease installation.
- *Option: you may choose to replace the FB clevis with a heavy duty ball link (see pictures). If so, drill out the middle hole on the control horn for the bolt that will attach the titanium FB ball end to the horn now. Use the wire size drill that is just large enough to insure the bolt will fit with no play.*
- To tighten the horn bolts, you will need an allen wrench, an allen bit (see photo) and patience!



- Slip a nylon washer over the end of the stab spar. Loctite snuging bolts and tighten just enough that control horn will barely slide over the stab spar.
- Tighten bolts from underneath. Make absolutely sure you push in on the stabs fully so there is no lateral play. **IMPORTANT:** do not over-tighten or strip heads on horn snuging bolts. If you need to remove in the future use a small pencil torch to heat aluminum horn blocks and loosen Loctite.



- *Option: For added security, chuck a #45 drill into a dremel tool and machine a small hole down through the horn block and stab spar. Insert a 1 inch 4-40 bolt or equivalent and secure with self locking nut. See photo for position of bolts.*



- There are several ways to attach the twin stab servos to the ply plate that is pre-installed in the fuse. FB supplies wooden blocks with L brackets, you can buy a commercial side mount, or make your own side mount from ply. I elected to make my own out of ply.
- Attach your servos (8611A used here) to a matchmaker and attach heavy duty or metal arms such that they are approximately mirror images of each other.
- Bolt servos to mounting bracket. Do not use the rubber grommets, as you are looking for minimal servo movement..
- Make sure your linkages are equal in length.
- Working one stab at a time, attach linkage to arm, tape stab in neutral position, set servo arm at center point (vertical) and mount to ply plate. Make sure linkage is line up straight between servo and horn. In the mounting method shown here, the servo brackets were glued to the plate with 6 minute epoxy.
- Repeat for the other stab, making sure the installation mirrors the other side.

Aft Wiring Harness

- Make up your aft wiring harness, You will need extensions for both stab servos and a rudder servo, plus air line for speed brake open and speed brake closed. I use nylon wrap to better protect the wires from heat in the aft section around the pipe. Determine length based on the placement of your equipment. I made the harness long enough to allow the stabs and rudder servos to be plugged in at the aft former to allow for easier maintenance in the future.



- Run the harness through the top holes of the two aft formers and affix to the side former at the aft of the engine compartment to insure the harness will stay clear of the pipe.
- Connect air lines to the speedbrake cylinders. I recommend you check the cylinders as you attach the air lines to make sure they do not leak. Make sure all air lines stay completely clear of the pipe area, and do not interfere with the operation of the speed brake doors.

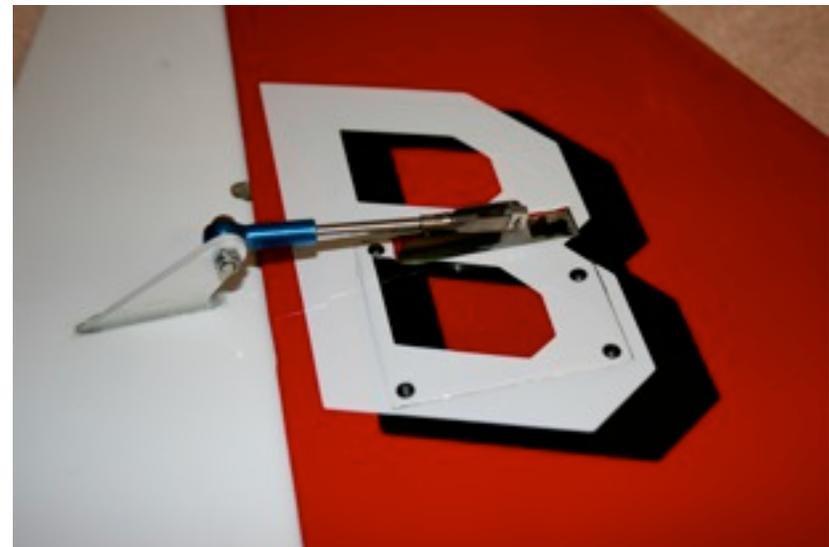
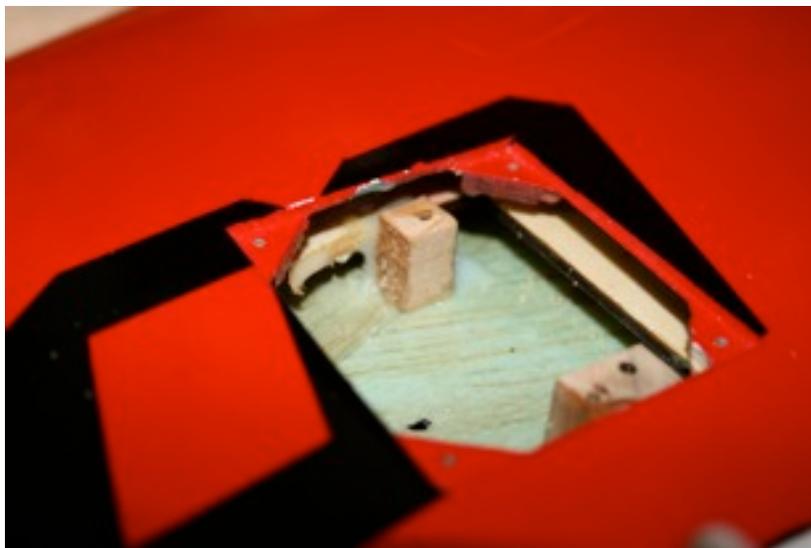
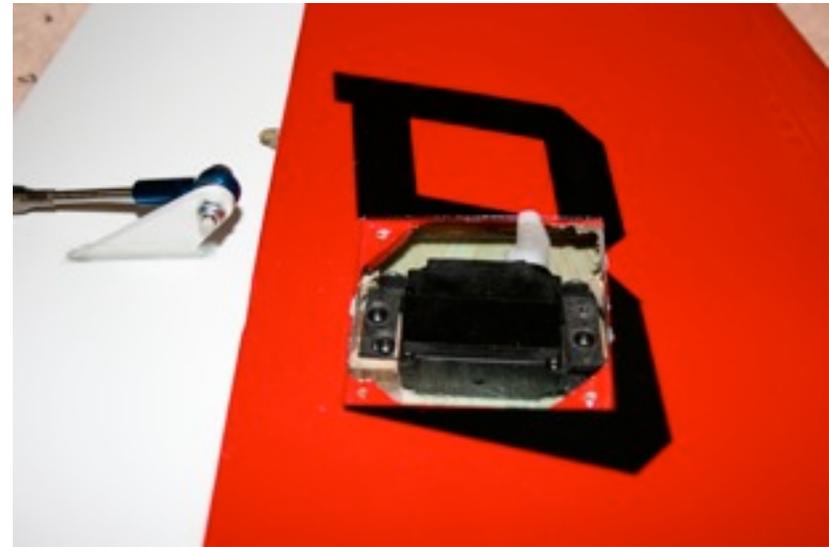


Rudder and Lower Hatch

- Apply Aeropoxy carefully into the hinge point holes in the vertical stab trailing edge. Wipe away any excess. Put a small amount on the hinge points installed in the rudder and insert into hinge holes. Make sure you have enough throw for the control horn slot to just about reach the vertical stab. This will ensure full rudder throw. Check to make sure you haven't left any fingerprints and set aside to dry.
- Using a small carbide cutter in a Dremel tool, enlarge the slot in the rudder for the control horn. It may also need to be cut a little deeper for the horn to sit down completely in the control surface. Be extra careful not to cut through the control surface.
- Drill the control horn using a wire size drill just large enough to allow the link bolt to fit tightly. Paint the horn white at this time.
- Rough up the gluing surface of the horn with coarse sandpaper. Mask the area around the horn slot with tape, fill the slot with Aeropoxy and insert the horn. Make a nice fillet and remove the tape. Let dry.
- Mount the servo to wood blocks as shown, using the aluminum mounts supplied with the kit or aftermarket carbon fiber pieces as shown in the photo. Sand the blocks such that they are even with the rear of the servo, and that the servo sits as low as possible on a flat surface.
- Using a matchmaker or equivalent, find the neutral point on the servo and attach a long single control arm to the spindle.

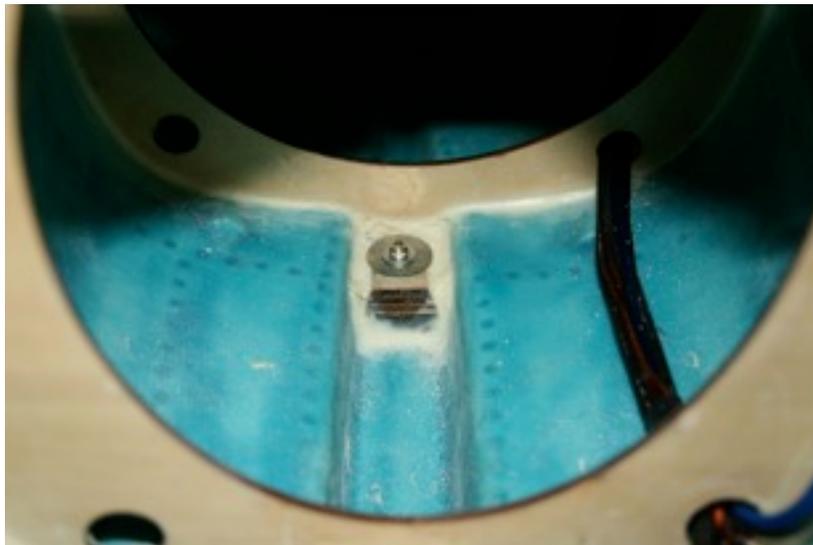
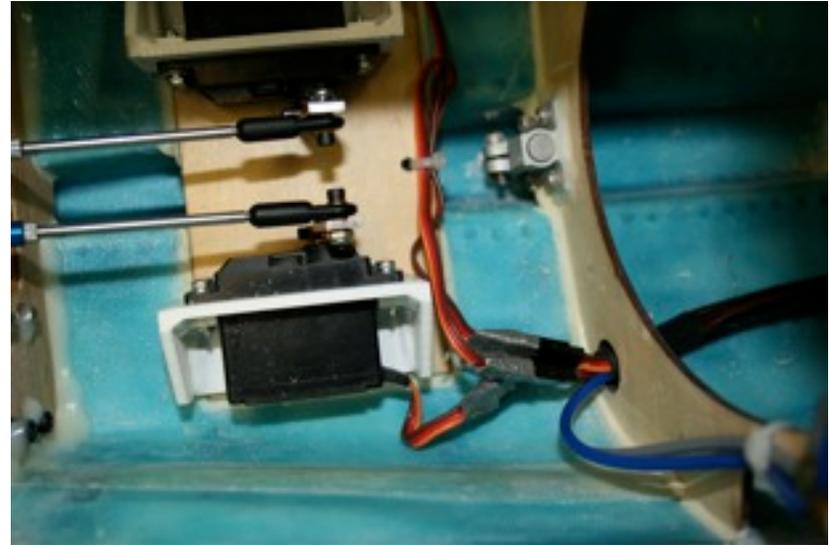


- Make up the servo linkage. You will likely need to remove the locking nuts and thread the links fully on the rod to make it short enough. See photo.
- It is important that the servo is positioned such that the linkage is 90 degrees to the hinge line. You may need to remove part of the mounting plate with a cutter to allow positioning of the servo.
- When you are satisfied, glue the blocks in place with small amounts of 5 minute epoxy. Remove the servo, and add Aeropoxy. It is important to glue the blocks to the ply plates so the loads when the servo is actuated are not transferred fully to the skin. See photo.
- Remount servo. Note the heads may need to be countersunk to allow the hatch to fit.
- Cut a slot in the hatch cover, mount, and connect linkage. Check for adequate throw.



- Insert rudder into aft fuse. Tighten aft locking clamp.

- Using the large washer and cap head bolt, secure the forward rudder spar. See photo.
- Connect rudder servo to the harness and tape all three connections. Secure wires such that they are clear of the stab servos and will not drop into the vicinity of the pipe when it is installed.
- Locate aft ventral fin and trial fit the cap head bolt into the pre-cut slot in the bottom of the fuse. Carefully enlarge the slot if necessary to insure a tight slip fit.
- Attach the ventral fin to the lower hatch with two cap head screws and washers. If they don't snug securely, put a few drops of thin CA into the holes in the ventral fins, allow to dry, and then reinsert the bolts.



FEI BAO T45

- Relieve the aft part of the ventral fin for the tail hook end. See photo.
- Paint the tail hook as shown.
- Make a bumper block out of scrap wood and paint it flat black.
- Glue the tail hook and the bumper block in place. Glue the bumper block to the fuse, but not to the hook. Drill a couple of small holes in the area the bumper block will be glued to the fuse to allow small “buttons” of glue to strengthen the joint.
- Drill a small hole through the tail hook into the bumper block and attach with a long screw. Use thin CA to harden the thread area in the block.
- This completes the aft fuse construction. As an option, after market vinyl graphics were applied to dress up the rudder.



Fuel System

- You can choose to install the smaller tank flat on top of the larger tank, or if you wish to leave more room above the engine for a smoke tank, follow the installation procedure outlined below. Details for smoke tank installation are at the end of the manual.
- *Optional: disassemble the stopper assemblies from the tanks and inspect for kinks, tube constriction from the cutting process or burrs at the ends of the copper tubes. If you want to move to 3/16 inch tubes, drill the steel stopper plates at this time. You may wish to replace the pickup tubing supplied with high quality large Tygon. Wire tie all internal connections.*
- Leak check both tanks.
- Cut a piece of hard foam to sit under the main tank.



- Install smaller tank in front of large tank (see photo). Fuel should flow from the large tank to the smaller tank and then to the air trap or pump.
- Cut a piece of scrap ply approximately 1/2 inch by 6 3/8 inch. Bolt in place to the formers at the top of the small tank to keep it from moving upwards in flight.
- Remove tanks, and re-plumb lines if necessary.
- Reinstall tanks and hold down ply. Drill a hole in the lower right side for the vent fitting (not supplied) and connect line.
- Using wire tie as shown, clamp small tank to ply hold down to keep it from shifting forward in flight.
- Now would be a good time to fill the system and check one last time for leaks. When completed, plug the lines to keep the kero from leaking as you finish work on the airframe.



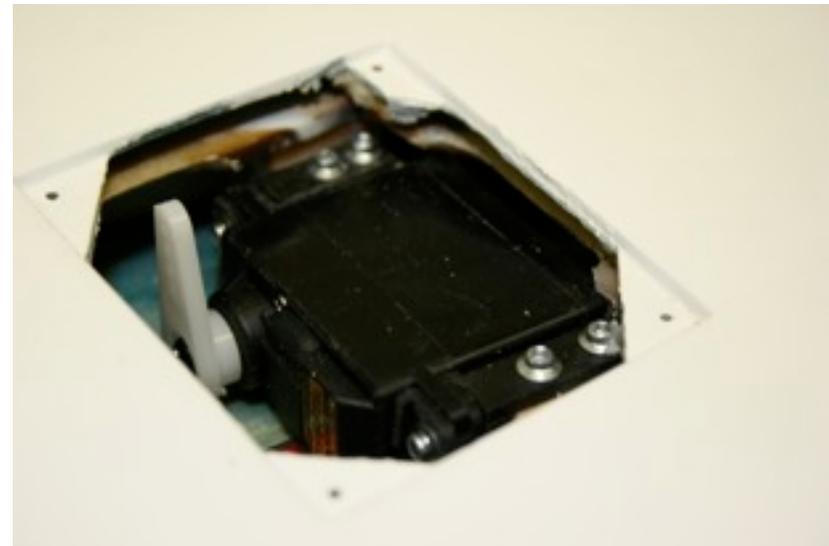
Wings

- Begin construction on the wing by gluing the flap and aileron hinges into the predrilled holes in the root edge of the wing. Before gluing, insure that you are able to achieve necessary throws, there is adequate separation between flap and aileron, and that the aft edges align. Use Aeropoxy to provide adequate time to align and tape the parts in place.
- Using a Matchmaker or receiver, center the aileron servos and attach servo arms in mirroring positions.
- Mount the servos to the aluminum L brackets.
Optional: as the brackets may need to be trimmed, you may choose to substitute carbon fiber pieces for the aluminum brackets supplied with the kit. These may be easier to work with.
- Remove the servo hatches, marking them for location and orientation as you do.
- Trim and position the wooden mounting blocks into the servo pockets such that the servo arms are aligned with the slots for the servo horns. Allow for the offset of the ball ends. You may need to trim back the mounting plates pre-installed in the wings to achieve alignment. The servos are all positioned such that the servo arm is toward the front of the wing.
- When satisfied, put a drop of thick CA on the bottom of the blocks and position in the wing. When dry, remove the servos and use Aeropoxy to permanently affix the blocks. Tie the servo mounting blocks into the former structure with glue to prevent the upper wing surface from flexing under load.



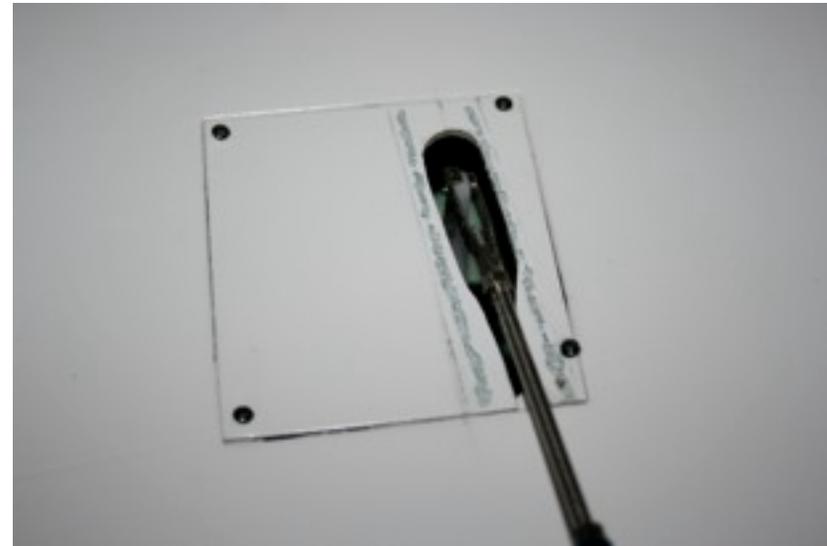


- When the aileron servos have been fitted, repeat steps for the flap servos. You may wish to back up the flap mounting blocks with scrap balsa blocks to provide added security for the larger servos.
- Add servo extensions to the aileron servos. The wires will exit the wing at the aft hole just in front of the anti-rotation pin. You will find it easier to fish the servo wires through the wing if you attach a string to a large nut and drop it down through the rib holes. Tape the servo wire to the string and pull it through the wing.
- If using 8611A servos on the flaps, the wires should be long enough without the use of extensions.
- Reinstall the servos into the wing pockets and test with a receiver or Matchbox to make sure you have adequate clearance for the servo arms. Trim as necessary.



- As you did for the rudder servo horn, carefully route out the mounting slot so the horns sit down fully into the control surface.
- Enlarge the hole in the phenolic control arm horns for the ball link bolt at this time. Find the wire size drill that is the tightest fit possible to avoid slop.
- Paint the horns if desired.
- Rough up the gluing surface on the horns.
- Tape around the horn slots in the control surface.
- Glue the horns in place using a sufficient amount of Aeropoxy. Make a nice fillet, and remove the tape.
- Insure that the horns are kept in a vertical position as the glue dries.
- When the glue has dried, fit the linkages. The two shorter linkages are for the Ailerons, the two longer linkages are for the flaps. To allow for the linkage cover to fit, the ball link must be attached to the control surface horn.
- Make sure when fitting the linkages that the servo output arms for both ailerons and both flaps are in identical positions to avoid uneven movement.
- For each servo, mark and cut slots in the servo hatch cover for the linkage and servo arm.
- Cut the aft end off the linkage covers. Position them on the hatch such that they just clear the ball link attached to the control surface in their lowest position. Mark the edges of the linkage cover on the hatch.
- Carefully grind away the paint just inside these lines, to provide a good gluing surface (see photo).
- Position the covers into place and lightly CA them to the hatch only. When dry, remove the covers and reinforce the joint from the inside with Aeropoxy.

- Reinstall hatch covers.



Engine and Pipe

- It is highly recommended that you use at least the lower bypass in the installation. The gear doors are cut into the fuselage just in front of the engine intake and a significant amount of debris might easily be pulled into the engine intake if not protected.
- Fit the pipe to the rear of the bypass. Note that the tabs on the pipe are not exactly centered. Position the pipe so the tabs are oriented toward the top of the bypass.
- Straighten the tabs to remove any folds. The tabs should be relatively straight.
- Make sure the pipe is fully positioned up onto the bypass. Drill holes through the tabs and the bypass and fit bolts. Do not tighten at this point.
- Remove the pipe and paint the exhaust end with flat black paint if desired.
- Trial fit the pipe, the bypass and your engine into the fuse. The fixed intakes may require trimming to allow forward clearance for larger engines. The intakes may also need to be notched at the top to allow clearance for the starter assembly. Position the bypass such that the engine is as far forward as practical, while allowing the pipe to protrude slightly from the aft of the fuselage.
- Make sure the engine is centered in the bypass to the pipe, and that you allow the appropriate separation between the exhaust cone and pipe as specified by the engine manufacturer.
- If necessary, trim the bypass to allow the engine tabs to sit flat on the mounting rails (see photo).



- Remove the engine temporarily and fix the bypass to the mounting rails with wood screws.
- Reattach the pipe to the aft of the bypass and secure with bolts. If desired, a drop of thin CA can be used to insure the nuts do not loosen.
- Check the pipe where it passes through the aft former for any play. If there is a lot of play and the pipe moves freely about, cut additional supports out of scrap wood and glue them to the aft former. Allow just a little play so the band around the aft of the exhaust pipe will fit through in the event it must be removed.
- Insure that the wiring and speed brake lines are secured well away from the pipe.
- Completely clean the intakes, bypass and aft area of the model with a vacuum or compressed air.
- Reinstall your engine, securing it to the mounting rails with wood screws or cap screws with blind nuts. Check again to make sure it is centered and that the angle of the engine matches the angle of the pipe. Use washers under the mounting tabs if necessary to achieve the proper alignment.
- If you elect to use the upper bypass, trim, fit and secure to the engine rails using wood screws.
- The photo on the right shows a Jet Central Super Eagle/Rhino installation. Wooden plates were used to widen the mounting tabs to sit on the rails. Note the smoke system tubes secured to the tops of these mounting tabs.

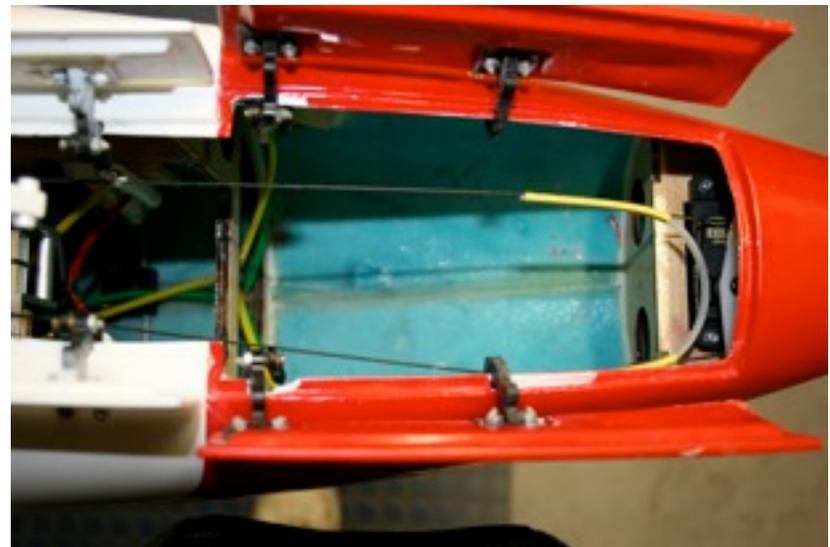


Component Boards

- At this time, lay out your electrical, air and engine systems on the component boards in the cockpit area. Make sure to allow adequate clearance for the cockpit tubs.
- Remember to make all your components accessible for maintenance. While it may look extra neat to hide everything away, things do break and leak, and you want to keep your repair time to a minimum.
- Run air lines to all cylinders and gears. You will need to plan for a three sequence installation, gear and two different door cycles. The main gear doors and forward nose gear doors close after gear extension while the two doors that flank the nose strut remain open. A UP2/4 valve combination or one of the growing number of gear sequencers will be required.

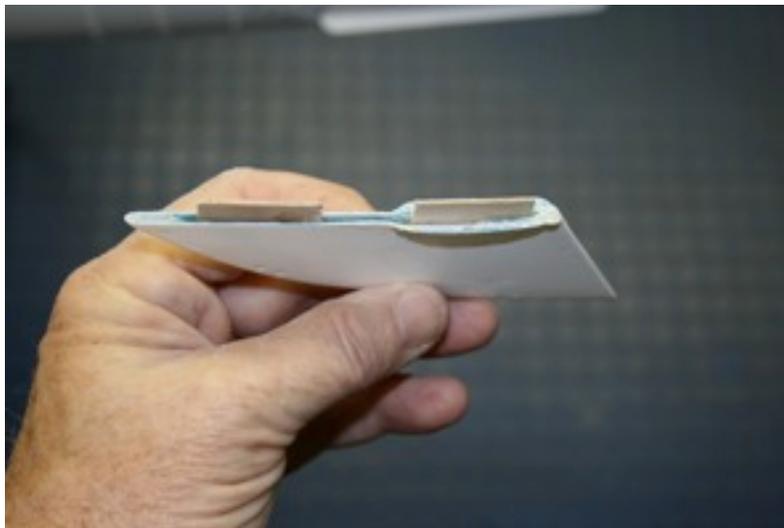
Nose Gear Steering

- Install a control arm on the nose gear servo. Make sure it is centered using a Matchmaker or receiver. Note the orientation is along the axis of the servo, not perpendicular as is normally the case.
- Install your nose gear servo into the mount pre-installed at the forward end of the nose compartment.
- Run steering cables to the nose gear. A nylon wire tie may be attached to the cables with heat shrink to act as a spreader when the gear retracts.
- Make sure the steering cable is not too tight with the gear extended to prevent binding on retraction.



Aft Fins

- Mark a line on the fuselage just about an inch above and parallel to the top of the speed brake.
- Shape the small horizontal fins to match the shape of the fuselage. You may need to relieve the lower edge a bit to get the fin to project horizontally. Use the line as a reference, with the rear of the fin just ahead of the horizontal stab leading edge.
- CA small ply tabs inside the fins (see photo).
- When dry, mark the position of the tabs on the line you drew on the fuselage and carefully cut slots.
- Test fit the fins. Make sure they are positioned identically on both sides. Tape around the edges, and on the surface of each fin for glue protection.
- Aeropoxy the fins in place. Immediately remove tape. Secure fins horizontally with tape until dry.



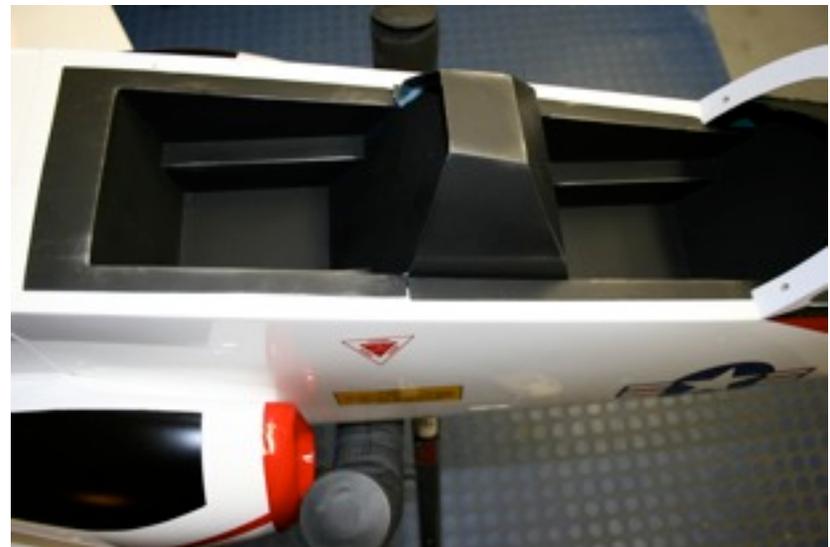
Mounting Wings

- Slide wing spar through fuse.
- Extend landing gear. Slide wing on tube, connect air lines and servo wires and slip the two aluminum anti-rotation pins into their holes.
- Secure wing with 3mm bolt into the aluminum tab through the pre-drilled hole.
- *Optional: it is recommended that you add an additional wing hold down bolt toward the front of the wing to remove play. The bolts pictured here are 1" 1/4-20 socket head. To install, first fit a piece of scrap ply at least 3/16" thick on the inside of the fuselage, against the wing root, just ahead of the gear wheel well. Drill for the 1/4-20 bolt and secure on the wing side with a blind nut. Use a little Aeropoxy around the blind nut to secure it to the former (see photo).*



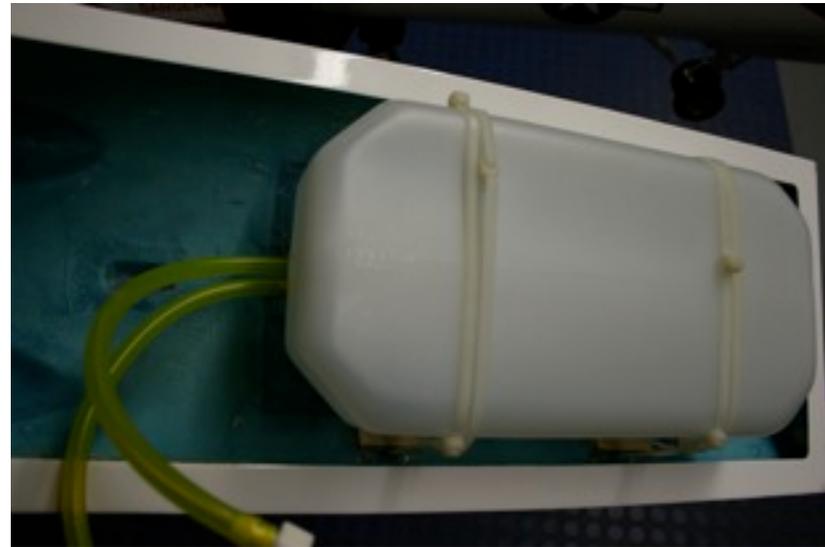
Cockpit Tubs and Glare Shield

- Spray the tubs and glare shield flat black, or gray to your preference.
- Fit glare shield in place and secure in a few places with a silicone or rubber based glue.
- Drop the tubs in place as shown.
- With the engine hatch cover in place, fit the canopy.
- You may glue the tubs to the bottom of the canopy, or just drop them in place and remove separately when access to the component board is necessary.



Smoke System

- Should you choose to install a smoke tank, it may be installed underneath the engine hatch. A 40 oz. Dubro tank is shown here.
- Fabricate four ply hold downs from scrap ply and Aeropoxy two on each side of the tank. Position the tank far enough aft to clear the front main fuel tank.
- Assemble the Dubro tank per the instructions, using the brown gas stopper.
- Using a few dots of silicone glue and tie straps, affix the smoke tank to the hatch as shown.
- Install smoke system components and plumb.
- It is recommended that you use quick disconnects for the lines from the tank to allow removal of the hatch.



Weight and Balance

- Test fuel the airplane and check for leaks. Drain, leaving residual fuel in the UAT and tanks.
- Set the CG at 195 - 210 mm aft of the wing leading edge for the first flight.
- Throws should be at least 40 mm on the elevator up and down, and at least 20 mm up and down on the ailerons. Set as much rudder throw as possible.
- Set approximately 40 degrees of flap. Make sure to slow the plane down before deploying. Use the slider switch for the first flight for flap deployment.
- It is recommended that you also add crow to the ailerons at full flaps for landing. The crow setting should initially be set on a separate switch for the first few flights to remove it if necessary.

Test Flight

For the test flight, try to find a field with a lot of “outs” in case of problems. Do not attempt the test flight if there are known issues with the plane. It will be helpful not to have a lot of spectators, and a spotter familiar with the aircraft would be best.

Quickly check the CG and throws in the first few minutes of flight, then drop the gear and flaps and practice slow flight and approaches. You want to make sure you are comfortable with the first landing and that you have plenty of fuel to troubleshoot issues and become familiar with the approach characteristics of the plane. Do not force a bad landing ... go around if necessary. Have your spotter keep time, and plan to land with plenty of fuel. Good luck!