DISCLAIMER:

T**HIS 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 aircraft.

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:

Rudder: JR 3301 (2)
Flaps: JR 8611A (2)
Elevators: JR 8711 or equivalent (Use highest torque servos available)
Nose Gear Steering: JR 8411 or JR 2721
Air and Brake Systems: As necessary

Parts List:

- Forward Fuse with Component Boards and Nose Gear
- Pitot Tubes (2)
- Aft Fuse, Main Landing Gear
- Parachute Stinger
- Canopy
- Cockpit Tub and Glare Shield
- Main Upper Hatch with Speed Brake
- Left Intake
- Right Intake
- Wings, Flaps
- Vertical Stabs (2), Rudders (2)
- Ventral Strakes (2)
- Fuel Tanks
- Pipes (2)
- Air Kit
- Hardware Kit

Notes

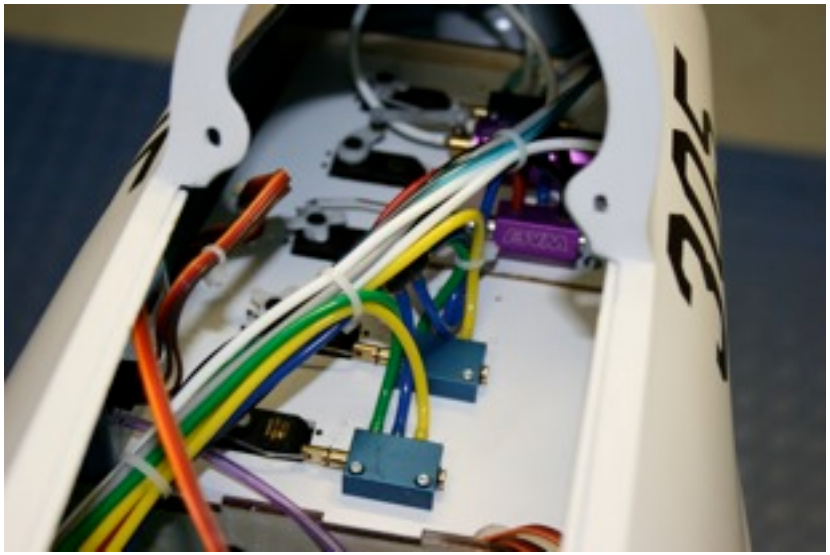
These instructions were written based upon the prototype kit from the Fei Bao factory. Please note that the kit and components may have undergone changes through the production process. Center of Gravity and control surface throws were confirmed as a good starting point through limited flight testing, but it is important that you contact your Fei Bao representative prior to your first flight to obtain the most current information on these important parameters.

Begin construction by prepping the airframe

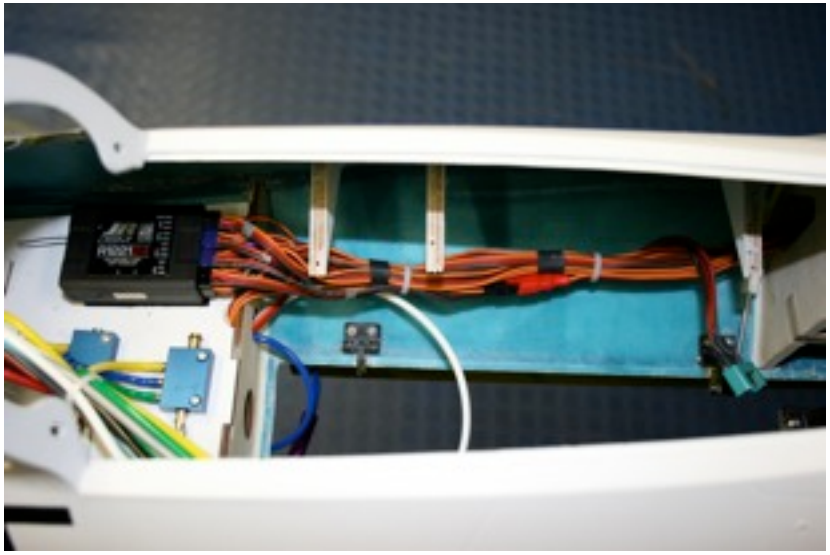
- ☐ If already assembled, remove the bypass modules from the airframe (see photo). They are attached by two bolts accessed through the hatch on each side.
- ☐ Remove the engine hatch covers, marking them for side and orientation as you do so.
- ☐ Using a hand pump and a short piece of tubing, check each of the gear door air cylinders for leaks. If they hold air under pressure, secure the nuts and bolts attaching the cylinders to the fuselage and doors with a small drop of thin CA.
- ☐ Insert the stabs, wings and vertical stabs into their respective mounts. Check each mount for security, tightening bolts and nuts if necessary.
- ☐ *it is recommended that you run a bead of Aeropoxy around the mounts to secure them firmly in position on their formers.*
- ☐ Check all accessible areas for the integrity of glue joints and add Aeropoxy if necessary. Pay special attention to the formers that secure the horizontal stab bearings, adding glue to make sure they are firmly affixed to the fuselage. Take care not to get any glue into the bearing components.
- ☐ Join fuselage halves and bolt securely in five places.

Air systems

- Remove the nose gear from the aircraft.
- Using a Matchmaker or a receiver and your transmitter, center the nose steering servo and attach a heavy duty steering arm.
- Bolt in the nose gear steering servo as shown in the photo. Do not use the rubber mounts and brass eyelets. Loctite the bolts.
- While the nose gear is out, make sure there are no kinks or bends in the air lines.
- Check the security of all screws and C clamps on the struts and retract units.
- *Option: If your nose and main gear were attached to their mounting plates by wood screws, you may opt to reattach them with cap head bolts and blind nuts. If so, remove the mains, drill and install blind nuts for all three landing gear, and reinstall.*
- Once the nose gear is reinstalled, operate the strut by hand and insure that the nose gear door will close completely over the nose wheel mud guard. If not, shim the retract unit with washers or ply until the door closes.
- It is recommended that you install your air systems for doors, retracts, brakes and speed brake on the removable board in the nose of the aircraft. Remove the board, paint if desired, and install servos and valves. Make sure to allow clearance to the sides of the board for the curvature of the nose section.

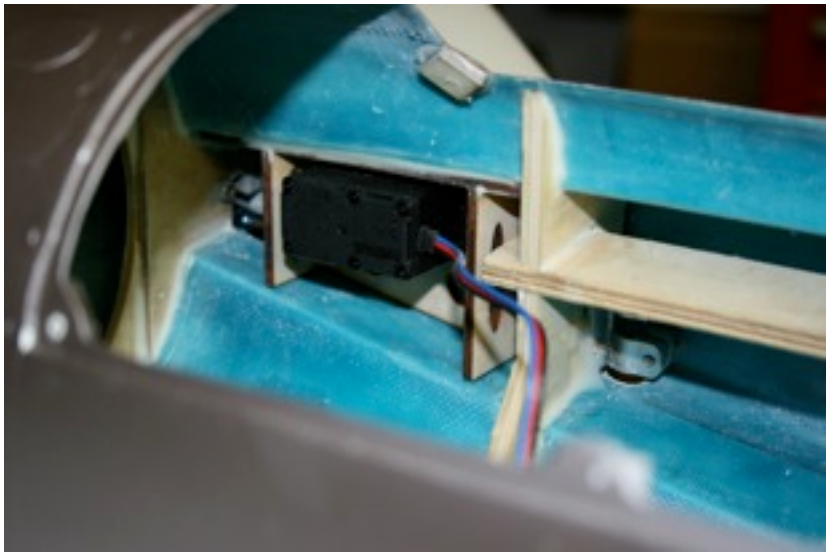


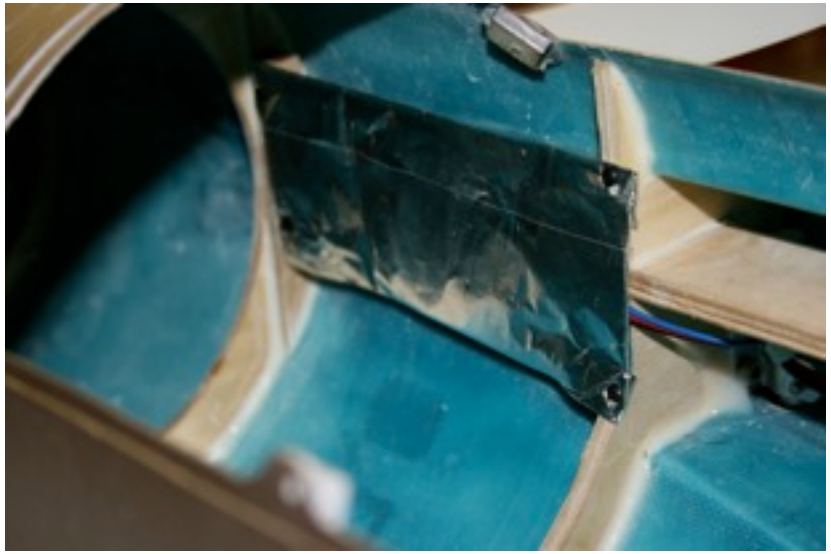
- The receiver may also be installed on this board.
- As the three main gear all retract forward, you may wish to provide more air to each unit. To accomplish this, set up the nose gear on one air valve designed for large scale aircraft and supply air to the mains from a second, separate valve. Use separate air supplies for each. Run separate lines to each main from the valve ... do not "T" from a single supply. Make sure to pull up the landing gear before the aircraft picks up speed after liftoff.
- As you position these components, make sure to leave room for the cockpit installation.
- You will need to supply sequencing for the doors. On the full scale aircraft, all doors remain open with the gear extended.
- Run air lines to all the door cylinders, the retracts, the brakes and the speed brake. Hook up fill valves, air meters if used and supply tanks.
- Test the system for operation and leaks. Adjust as necessary.



Horizontal Stabilizers

- Using a Matchmaker or receiver and transmitter, center both horizontal stab servos. Install the servo arms such that they are matched as closely as possible for both servos.
- *Option: for added security, use metal servo arms for this application. If you use a tapped metal servo arm, you will need to replace the clevis supplied with the kit with an appropriate ball link. You can secure with a small amount of CA for extra security. See photo.*
- Install servo into its mount, securing with four screws. Do not use rubber mounts and brass eyelets.
- To keep the heat away from the servo during engine operation, make a small shield that can be bolted to the formers. In the prototype, BVM heat insulation covered by aluminum tape was used. Leave some space for air circulation. See photo on following page.
- Insert stab spars into control arms, using large Delrin washer for spacing from fuselage. Hold pressure against fuselage and tighten allen bolts securely. Check for smooth operation and minimal play.

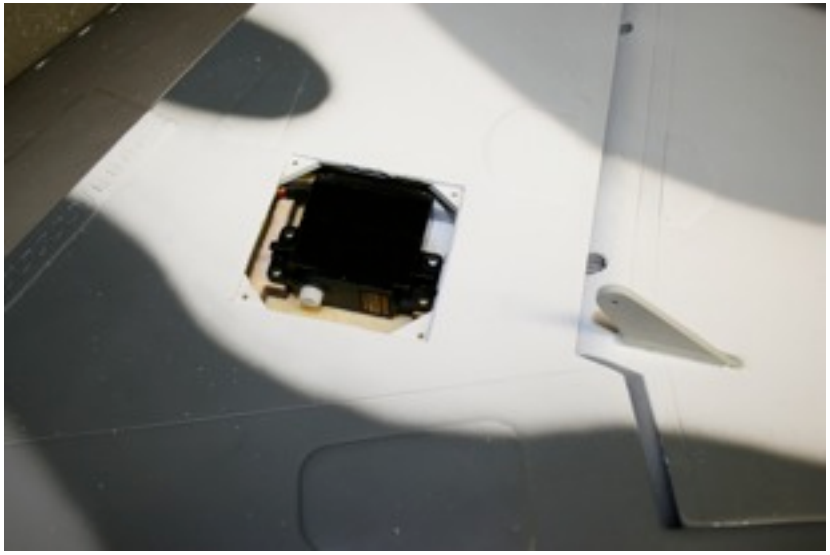


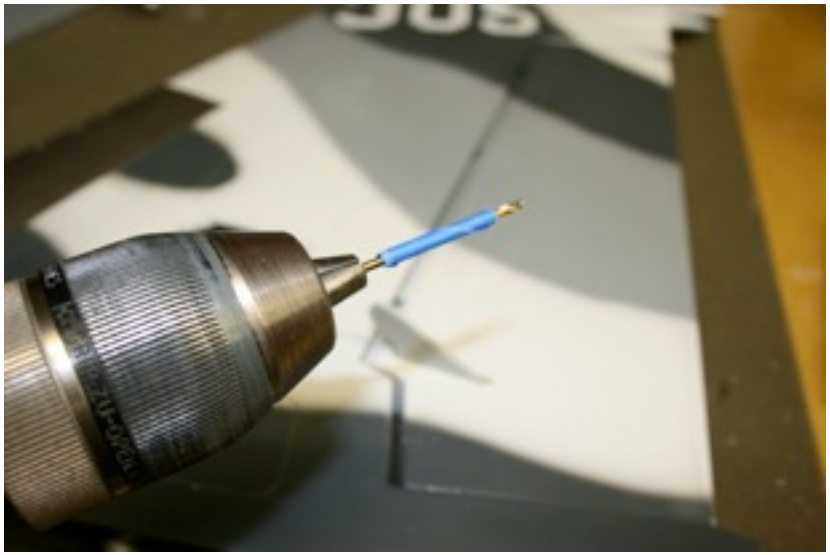


- Using a cutter, open up a small hatch above the servo opening on the upper rudder mount platform in order to access the servo arm. See photo. Make up two servo linkages of exactly the same length.
- Install linkages on to the servo arms and bearing box control arms.
- Check to make sure horizontal stabs have full movement on both top and bottom. Adjust and trim material around the stab control arm as needed to achieve full throws.
- Test fit the vertical stab in place. You may need to trim the lip around the bottom of the opening to provide control arm clearance. Check linkage cover for adequate clearance.

Vertical Stabs and Rudders

- ☐ Begin by gluing rudders into vertical stabs as follows: fill the hinge point holes in one vertical stab with a generous amount of Aeropoxy. Insert rudder. Install vertical stab into the fuselage and temporarily tighten mounting bolts. Move the rudder inward to the point where it just contacts the exhaust tube on the fuselage. Press the rudder forward such that it contacts the hinge cover equally along its length. This will set the appropriate depth of the hinges. Visually check for even spacing along the length of the hinge line.
- ☐ Repeat for the other side.
- ☐ When the glue is dry, remove the vertical stabs.
- ☐ As with the elevator servos, locate neutral and install servo arms.
- ☐ Drop the servos into their pockets, oriented as shown, route servo wire to the bottom of the rudder, and secure with screws. Use masking tape on the drill bit to make sure you do not drill all the way through the stab when installing screws.





- ☐ Open up the slot in the rudder with a small cutter and Dremel tool for the control horn. Be very careful not to cut through the rudder as you enlarge the slot.
- ☐ *Optional: paint the control horn to match your color scheme.*
- ☐ Tape around the slot with low grip masking tape and fill the slot with Aeropoxy.
- ☐ Rough up the gluing surface of the control horn and insert into the slot. Make a nice fillet around the horn, and then remove tape. Allow to dry thoroughly.
- ☐ Repeat for other vertical stab and rudder.
- ☐ Prepare and install linkages.
- ☐ Trim hatch cover to clear linkage and arm, then reinstall.
- ☐ Reinstall vertical stabs permanently, tightening two clamp bolts per side.
- ☐ Now is a good time to install servo extensions to the elevator and rudder servos. Make sure they are fastened securely away from the exhaust pipe area.

Exhaust Cones

- ☐ If the exhaust cones are not already installed, slip them over the bolts on the rear former and rotate unit until the bolts seat in the slots.
- ☐ Tighten bolts securely.

Wings

- Fill the hinge point holes in the flap leading edge with a generous amount of Aeropoxy. Insert the flaps and press forward to the point that you achieve approximately 45 degrees of throw.
- As you did with the Elevator and Rudder servos, find center and install servo arms in horizontally opposing locations.
- *Option: use metal servo arms for this application. If you do, you will need to use ball ends as you did for the elevator linkages.*
- Install servos in wing, using screws. Do not use rubber mounts or brass eyelets.
- Carefully measure the distance to the servo arm, and mark position on the bottom of the wing. Double check your calculations, and if satisfied, drill a small pilot hole at this location.
- If located properly, open up a slot for the servo arm.
- Mark the slot location on the flap for the control horn, using a 90 degree square to insure it is perpendicular to the hinge line. Line it up with the servo control arm. If you are using a clevis on the servo arm rather than a ball link, allow for some offset of the ball end that will attach to the control arm.

- Open up the slot in the flap with a small cutter and Dremel tool for the control horn. Be very careful not to cut through the control surface as you enlarge the slot.
- *Optional: paint the control horn to match your color scheme.*
- Drill the control arm for the ball end bolt. Start with smaller wire size drills and find the one that is just large enough for the bolt without allowing play.
- Tape around the slot with low grip masking tape and fill the slot with Aeropoxy.
- Rough up the gluing surface of the control horn and insert into the slot. Make a nice fillet around the horn, and then remove tape. Allow to dry thoroughly.
- Repeat for other wing and flap.
- Prepare and install linkages.
- Run flap servo extensions to receiver location.
- Test fit wing to fuselage. Make sure the inboard root edge of the flap clears the fuselage in all positions. The part most likely to rub will be the inboard root edge of the flap as you move the control surface to its extents.
- Tighten wing attach bolts and check for any play.

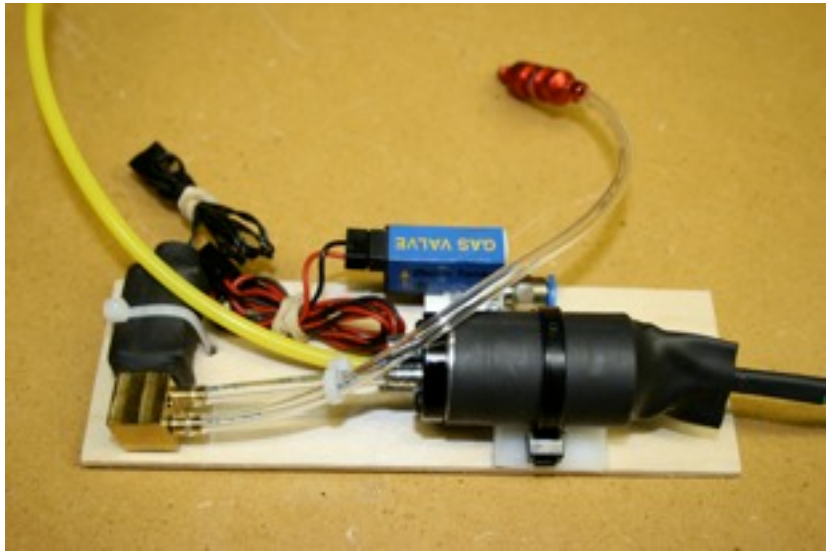
Engine Installation

- If you haven't already removed the engine hatch covers, do so now, labeling each side.
- Completely straighten the taps on each side of the pipe. Note that the tabs are closer together on one side, this will be the "bottom" of the pipe, though it will be oriented "up" as you work on the aircraft upside down.
- *Note: if you are using a bypass, mount the pipe to the aft end and drill tabs and bypass for mounting bolts. Reinsert pipe in fuse aligning aft end with the rear of the exhaust cone, position bypass on rails and secure pipe to bypass with bolts. Skip the remaining steps on this page.*
- Insert the pipe into aft former.
- Align aft end with the rear of the exhaust cone. Mark the tabs about 1/4 inch in front of the aft engine mount former.
- Remove pipe and drill a 1/16 inch hole at the marks. A drill press will make this job go quickly.
- Reinsert the pipes.
- Using scrap ply, make a triangular mounting plate glue securely between the engine rail and the aft engine mount former. See photo.
- Do not attach pipe tabs to this mounting former yet. This will be completed once the engine is in position.

- Position the engine on the mounting rails. If need be, make a supplemental mounting plate if the engine tabs do not completely span the gap between the rails.
- Confirm that the engine to pipe clearance is set at manufacturers specifications, drill and bolt the engine to the rails.
- Check the angle of the engine and make sure it follows the slope of the exhaust pipe. You may need small shims under the front tab to achieve the appropriate angle.
- Raise the pipe, check to make sure it is centered on the engine exhaust cone, and permanently attach the tabs to the triangular plates.

- Repeats steps for other engine.
- On the prototype, the engine valves and fuel pump are located on either side of the fuel tank compartment, in the center section adjacent to the main wheel when retracted, underneath the fuse side. See photos on the following page.
- Make sure to tape all extensions securely.
- On the prototype, the ECUs were attached with Velcro to the main center tank for ease of access. See photos in the fuel system section.
- Run wiring, fuel and gas lines to these positions.
- Insert intakes temporarily to make sure there is adequate clearance for tubing and wiring.
- Leave off the engine covers for now to avoid cracking them as you complete construction.

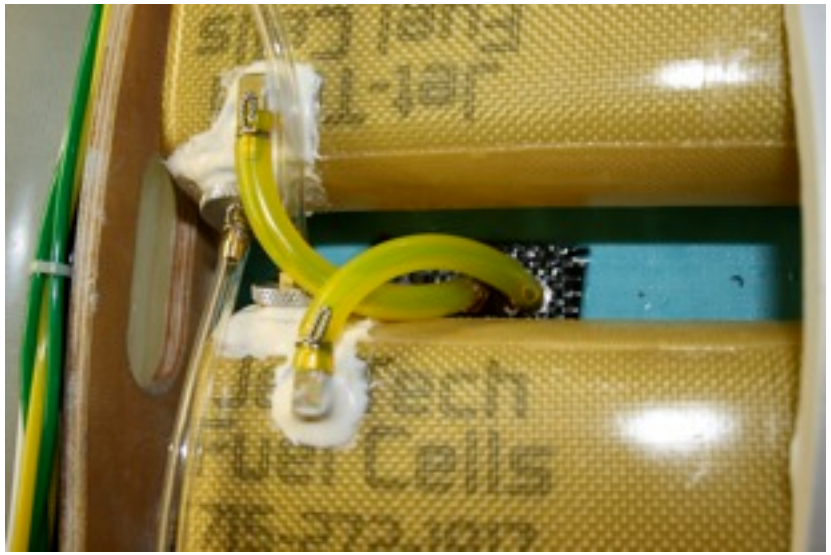
- Cut a valve/pump mounting plate out of scrap ply, approximately 2 inches wide by 6 inches long.
- Mount components as shown in the photo.
- Make a mirror image arrangement for the other side.
- Using velcro, temporarily position plates in the wheel bay, making sure that there is adequate clearance when the main retracts. Make sure the main tank will fit in its bay.
- You may hook up the fuel and gas lines to the engine at this time. Insert intakes temporarily to check for adequate clearance of the various lines. Don't forget the manual shut-off valve.



Fuel System

- In the prototype, two additional tanks were positioned in the area behind the main tanks to increase overall fuel capacity by another 25 ounces. Production kits may have a different tank configuration, but if not, the auxiliary tanks may be obtained from JetTech. Make sure to order them without the clunk opening cut out ... you will do this yourself once the tanks are in.
- To install the aux tanks, you will slide them up through the intake opening on the underside of the aircraft. They may need to be extended slightly to provide clearance. The rear hatch lid may also need trimming.

- ☐ Temporarily position the intakes in place to make sure you have clearance. See photo.
- ☐ Once everything is in place to your satisfaction, mark the pickup and vent fixture positions.
- ☐ Remove the tanks, plumb, leak check and reinstall.
- ☐ Drill fuse for vents and plumb. See photo.
- ☐ At this time, permanently reinstall the intakes, making sure no lines or wires are pinched or kinked, securing with two forward intake attach bolts. Make sure they engage the blind nuts fully, but do not penetrate the inside of the intake. It is important that these two bolts be attached securely.



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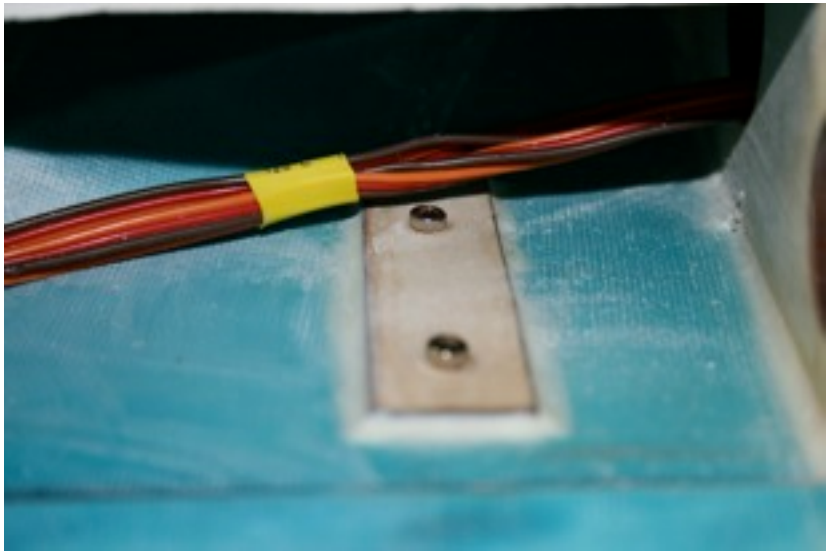
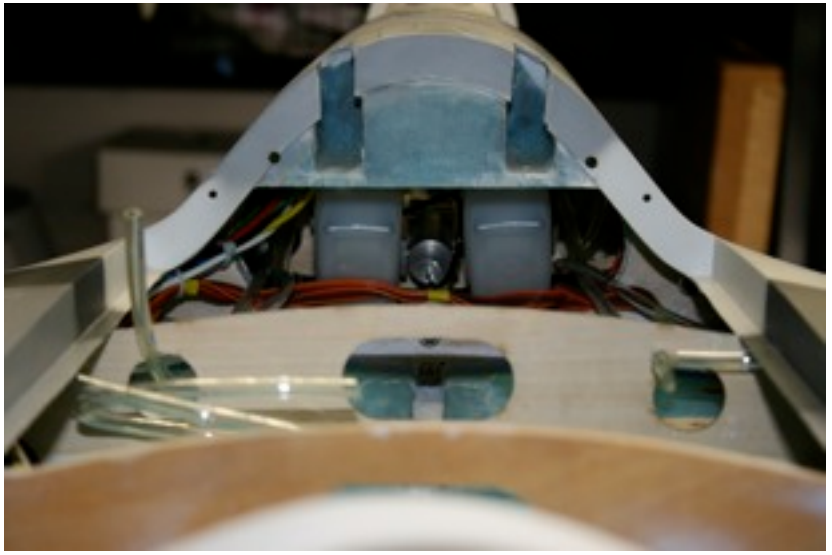
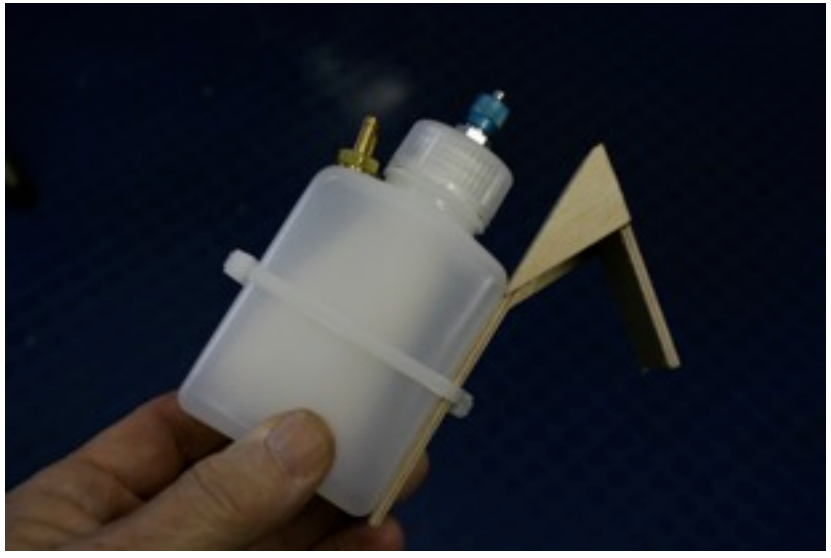
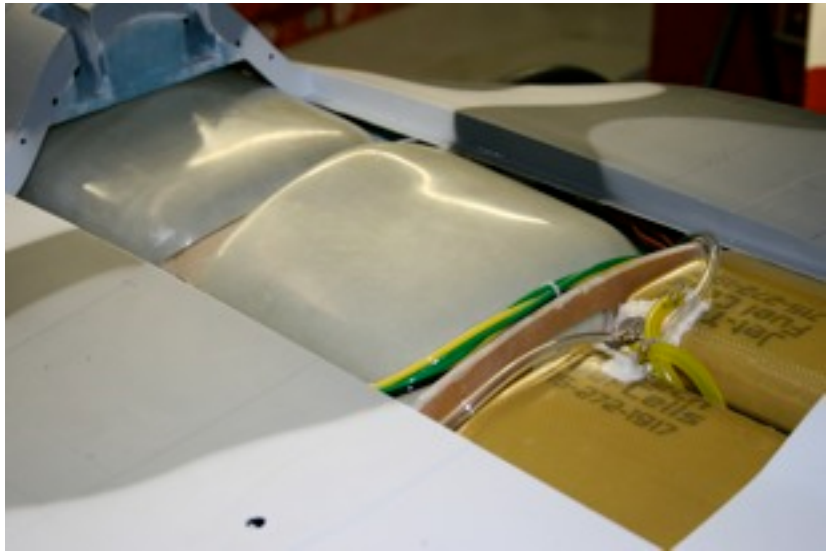


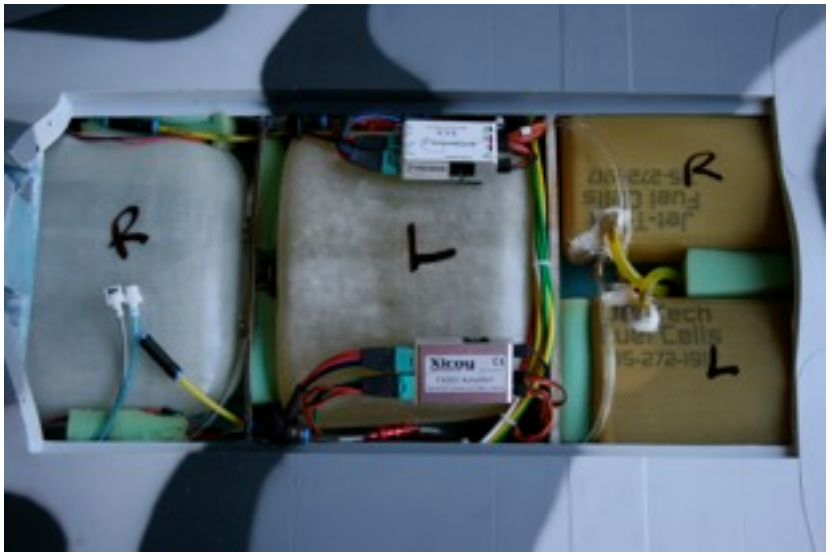
- If you are using UATs, it is recommended that they be positioned in the forward fuse, flanking the nose gear cylinder.
- Make a platform as shown in the photo and affix to the forward former with a large piece of industrial velcro.
- Disassemble the main tank stoppers and check for kinks, obstructions and secure connections. Option: for added security, drill and tap aluminum fittings for 6-32 cap head bolts. It will be easier to tighten these down.
- Both main tanks will face forward. The aft main tank will need to have the pickup lines bent to clear the forward main tank.
- Reassemble both main tanks and leak check.





- The ECU batteries fit nicely into the pockets on either side of the forward main tank. Wrap them in foam and insert, padding with extra foam as needed. Watch wiring and air lines.
- Install and plumb main tanks, running pickup from aux tanks to the vents of the mains, and the pickups from the mains to the UATs. The UATs will then connect to the pumps.
- Keep all fuel lines for both sides of equal length. Loop where necessary.
- Block tanks with foam ... they will be a snug fit and should not need any further attach mechanisms.
- Position ECU units as shown and complete wiring.





Completing Construction

- ☐ Glue ventral fins in place. It is recommended that you faintly draw the outline on the fuse and then drill a number of attach holes for the glue to use to "pin" the fin securely in place.
- ☐ Make sure the fins are positioned at equal angles. Use a straightedge as shown to check for equal spacing on both sides.
- ☐ Install the aft fuse strake, attaching with two bolts from underneath the fuse.
- ☐ Glue the pitot tubes to the forward fuse on either side of the cockpit.
- ☐ Reattach the engine covers.
- ☐ Tape or use a flexible cement to install glare shield in cockpit. Install pilot in tub if desired, and drop tub into place.
- ☐ Check the fit of the canopy and adjust as needed.

This completes primary assembly of your SU-27

Throws and CG

The CG and throw recommendations in this manual were based upon limited test flying. Please check with the manufacturer for current information before flying your SU-27 for the first time.

For the first flight, set the CG at approximately 8.5 inches aft of the wing/fuse junction at the leading edge, measured aft along the wing/fuse joint. For an easy method of precisely calculating CG on large aircraft such as the SU-27, visit the Jet Pilots Organization website www.jetpilots.org and access the weight and balance spreadsheets under the "members" tab. You will find instructions on how to use the spreadsheets there, as well as the data used to balance the prototype FB SU-27. You will need to fine tune the CG as you fly the aircraft based upon your fuel tank configuration and personal tastes, so keep this in mind as you install any ballast.

Measure the CG with residual fuel and the gear lowered.

Maximum throw on the elevons measured at the leading edge is 40 mm for elevator function, with 30 mm for aileron throw. Set as much rudder travel as you can without binding.

It is important that you set three rates for elevator and aileron, using the recommended throws as the mid position, with settings higher and lower. In this fashion, you can quickly set the throw to your personal flying taste and habits on the first flight. We used 40% exponential on the first flights for both aileron and elevator.

For first flights, have the flaps on a slider control, such that flaps can be incrementally deployed.

First Flights

- Do not attempt a first flight in adverse weather conditions.
- Make sure there are no known issues with the airplane before attempting the flight.
- Have a qualified spotter handy to help you with trim and rate switches on the first flight. Designate a third individual as a timekeeper.
- Leave the gear down on the first flight.
- Advance the throttles slowly but fully, and keep the turns shallow at first.
- Focus first on trim and rate. Establish these on the first few laps.
- Take the plane to a safe altitude and become comfortable with slow speed handling. Carefully deploy the flaps, looking for any loss of control in roll or pitch as you do. If you experience any issues in this regard, back off the flap setting until the problem abates.

- Descend and shoot several approaches to landing. Keep the first flight short.
- Inspect the plane thoroughly after landing and cool down.

Subsequent Flights

- Once you are comfortable with rates, expo and CG with the gear down, pull up the gear and find settings for normal flight.
- Watch residual fuel after landing and find a timer setting that provides a comfortable reserve.
- Do not stress the airframe with high G maneuvers until you become confident in the model.
- Don’t rush getting to know a new aircraft. Fly it in good weather conditions only until you have a proven model and you are comfortable and confident in your abilities with the plane.