



FEI BAO/FB Jets Large 2.5m Viper

FB Jets/ Feibao

2.5m Viper Construction Manual



Written by Tyson Dodd in Collaboration with Fei Bao Jets



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 modellers. It is a wise idea, no matter what level of skills you possess, to have a second experienced modeller 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 one 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.



Introduction

You have chosen a model that represents the pinnacle of ARF technology and factory testing with the new manufacturing processes implemented by FB Jets. While there is not a lot of building to do in comparison to traditional modelling techniques, there is enough to keep you busy for quite a few evenings. Even if you have assembled other ARF jets, we highly recommend following our assembly sequence and procedures anyway. Chances are it will save you a lot of time or having to redo sections given some specific sequences and will prevent you from running down dead ends, and perhaps remind you of a few small things that might end up saving your aircraft.

I have assembled this manual to try and keep things moving while you are awaiting 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. This is still an airframe that required minor assembly and general complete building techniques. 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?" I continually ask myself during the building of any jet and if there is any doubt about the work you have done, please back up, and re-do it properly. We have included as many pictures as possible to give you an idea of the ultimate location of components within the airframe you minimise any balance work for perfect CG.

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 or control horn ...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 the long-type mixing nozzles where needed. 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 can use to finish your kits from FB Jets. One cartridge should be plenty to assemble your Large FB Jets Viper, however depending on how you prefer your setup; it is a good idea to have spare available.

Working with pneumatic systems the Viper uses pneumatic brakes and retracts if you have chosen this feature from FB Jets. Some kits have the option of electric retractable undercarriage. 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 your day and the paint on the bottom of your model.



Construction

Preliminary steps

The following setup are recommended by FB jets for all kits that they manufacture and request the modeller to conduct these quick and simple steps to not only make your build easier, but cleaner.

- Clean and inspect all parts. Inventory them against the parts list at the end of the manual and notify the kit supplier of any missing components as soon as possible.
- If the paint scheme you have selected is glossy, it is recommended that you apply a coat of wax. This will help resist dirt, stains and fingerprints during construction, and will provide some limited protection against errant glue.
- Vacuum out the remnants of packing materials that remain in the fuselage.

While the kit is comprehensive, there are additional parts required, as follows:

- Recommended Servo List (JR or Hitec) We have used a mixture for this build however it is not recommended to use servos less than 14kg torque
- Elevators: (2) 8411 or 8911
- Aileron: (2) 8411
- Rudder: (1) 8411 or 8911
- Nose Steering: (1) 8411
- Retracts: depends on retract and door solution selected (a 5 function valve can be utilised on this aircraft)
- Brakes: (1) 351 or equivalent, or an electronic brake unit in a combination unit
- The abovementioned servo list is ideal. However given the quality of the kit manufactured by FB Jets, there is sufficient room for all servos required for this build.

Other Parts

- Intairco UAT
- Fuel tank vent bulkhead fitting
- Festo fuel shutoff valve *2
- Wire twist tie (optional)
- Blue Loctite
- Red Loctite
- Glues: Thin CA, 30 minute epoxy, Hysol,
- Electronic gear sequencer, I have used REECB Sequencer and 2 dual action valves for the retracts, doors and brakes
- Or Brake valve
- Batteries, regulator and switch
- Matchboxes, Powerbox, Smartfly EQ10 or Spectrum Power Safe (I have utilised a JR 12 channel RX with a Power box competition dual regulator device to assist with simple and quick servo matching for this build)
- Servo extensions (length may vary, depending on receiver placement)

General Construction Notes:

The order of construction may be changed to suit your personal preference; however, the model is more easily worked in a tight space if work is completed on each fuselage section before they are joined. The tail surfaces must be attached before the aft fuse is joined to the forward fuse, as the pipe must be in place during this step and it blocks access for wiring.

The retract system doors operate in two different ways. The main gear doors and the large nose gear door open, the landing gear cycle either up or down, and the doors close again. For this action, you will need two separate valves with a sequencer or precision dual function units, I have used the Fly Eagle 5 function unit for this build to conserve space,

You will likely need to match twin rudder, twin flap and twin elevator servos for this model. This may be accomplished with servo reversing "Y" harnesses, JR Matchboxes, the Smartfly EQ10, a Competition Powerbox or equivalent.



Step 1: Check Forward Fuselage

- Remove the fuel tanks from the fuselage.
- Also remove the forward component boards. Now would be a good time to put a coat of paint on these parts if you would like to protect the wood surfaces.
- Vacuum and thoroughly clean the fuselage completely including light sanding on the mould joins to ensure there are no internal burrs (unlikely given the construction process). These are painful if they "bite" you during building and could potentially cause an air leak to tubing or damages to servo wires etc.
- If the nose gear was installed at the factory with bolts and lock washers, check these for security now. I also recommend checking the functioning of the nose gear now with a hand pump. Make sure the extension and retraction of the nose wheel is smooth before final installation. The Nose steering however needs to be set up before final installation with your chosen servo.
- Once the nose gear and servo is done, install but place a very small dab of thin CA into the screw hole first. A small toothpick helps limit the amount of glue applied if you don't have limiting tip on you CA bottle.
- Check the nuts and connections of the gear doors. If required place a small amount of thick CA on the nuts to secure.
- Repeat this step for the three nuts that attach the door cylinders to their respective mounting blocks.
- Check all door hinges for security.

Step 2: Prepping the Fuel System

Disassemble and inspect the tank cap hardware. The process used to cut the tubes may leave behind a rim that constricts fuel flow and could result in excess tank pressure and leakage. Given the optional use of three tanks that we have opted for be sure to pressure check and fill prior to installation in your model. Every care is taken at construction, however sometimes a pin hole leak within the glass weave may occur. Checking this prior to installation will save cleaning and time for pulling the tanks back out.

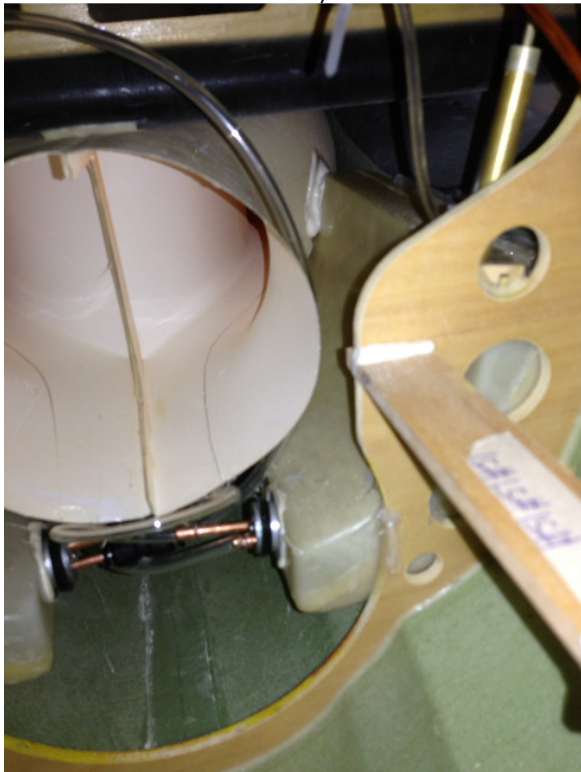
- Loosen the Philips head screw and remove the stopper assembly from the tank.
- Use a small, round Perma-Grit rat tail file or a knife to remove the excess metal. You will need to inspect the ends of all tubes.
- When finished, make sure to blow out the metal fragments and clean up any sharp edges.
- While the components are apart, check the Tygon pickup line for equal lengths in both saddle tanks. They should be long enough to reach the back of the tanks without being so long as to restrict their ability to move to the top of the tank when the aircraft is inverted. Allow a small amount of play to allow the tubes to stretch slightly over time.
- You should also notch the vent tube with a small file to provide for continued air flow should the tube come into contact with the top of the tank.
- Make sure the bends to the vent tubes applied at the factory have not restricted airflow to any significant extent. Also, check the Tygon for any nicks or cuts and secure to the tubing with wire ties before re-assembly.
- Reassemble and mark the tank for vent and fuel for later reference.
- Once the tanks are back together, they should be leak checked before installation in the aircraft. Connect extra lengths of fuel tubing to the fuel and vent lines and submerge the tank in water. Pinch off one line and gently pressurize the tank by blowing into the other, looking for signs of air bubbles. If the tank shows evidence of air leakage around the vent cap, tighten the Philips head screw and check again. If you have a stubborn leak, you can re-tap the inner plate for a slightly larger 6/32 cap head bolt.
- Additionally, you can connect them in either series or parallel (whichever is your preferred method) and use your field pump to fill the tanks. Leave them sit for a couple of hours and inspect to ensure no leaks are evident.

Step 3: Tank Installation

Photo 1 – Tank Layout Front tank installed (4.25L capacity)



Photo 2 – Smoke Tank Layout added for Deisel. Used some saddle tanks around ducting.





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- Attach the Tygon tubing to the main tank. Exercise care not to break the tanks while fitting the Tygon. Slowly wiggle the tubing into place. Wire tie for security.
- Insert an optional saddle tank for smoke into position forward of the engine if you have opted to add additional smoke tanks. They should be a fairly tight fit. Here I have used clear silicon or you can use goo to secure in place but silicon makes it easy for removal if needed.
- As photo 1&2 shows, the tanks fit in nice and tight.

You will need to make a front tank support from scrap ply and fit to the base of the fuse for support. This tank needs to slide to the rear of the front bay right up against the intake ducting as pictured so that the scale cockpit can fit later.

- Temporarily install the engine bypass and thrust tube for fit.
- This will also assist in the stabilisation of the thrust tube and help to centre this with the thrust line of the engine.
- Connect the fuel tank and UAT together. As I prefer to run my fuel tanks in series when using multiple tanks, the sequence of filling of tanks is as follows:
 1. Intairco UAT
 2. Front Tank.
- Check the position of the tanks once more with the engine bypass in place. When satisfied, tack glue the tanks in place with silicon, hot glue or goo.
- If you prefer to establish the tanks in parallel first:
- Check the fuel lines for nicks and cuts as you proceed through the next steps.
- Connect the fuel pickup from the front tank to the optional UAT or to the fuel pump. I have located the UAT at the front of the component board which has worked well with balance.

Step 4: Nose gear

To ensure a smooth operation nose steering and retraction function on the Viper nose wheel, it is ideal to pull the front nose retract from the airframe to work on it. In doing this you can check the retraction function of the nose wheel assembly with ease.

- Install your nose wheel steering servo. Remember not to use the rubber grommets. Connection the arm of the servo to the steering arm of the nose wheel and centre with the nose wheel extended.
- Connect your servo to your RX, centre the servo and while it is powered up, check the retraction of your nose wheel with a hand pump.
- When you are satisfied with the function of the nose retract and the servo arm etc, re-install the front retract into the airframe and check function again with a hand pump.
- Do not use rubber grommets and make sure to use Loctite on the screws.
- If your servo has a reinforcing ridge on the mounting tab, you may need to remove it with a razor knife to allow the servo to sit flat.
- When satisfied, use a small drop of thin CA on each clevis to lock it on to the threaded rod.



Step 5: Nose Doors

It will be helpful at this point to ensure that you are happy with the function of the nose door. The manufacturing process on this model is very high and we did not have to change this at all.

- Refer to the general construction tips for an explanation on gearing up the air systems.
- Install two air tanks in the space behind the component compartment, we found that they tucked into the leading edge section of the fuse as details in the attached photo.



Photo 3 – air tanks tucked into the leading edges of the fuse section.

- Use several dots of silicone glue such as Zap-a-Gap-a-Goo. Don't overdo the glue, however, as you may want to remove the tanks in the future.
- When the glue is dry, run air system lines to the tanks. In our Viper, all air and fuel fill lines are run to the centre of the component boards for air and fuel filling and gauges as this assisted in balance and the prevention of the use of lead.
- Layout the air system components on the front or rear board and then bolt the board into place with four small wood screws. Your layout on this area is optional.
- Run air lines to the nose gear and nose door cylinders. A little patience and good skills with a forceps will be required. Test each line as you go with a hand pump for leaks. It will also help to follow a colour coding scheme for future line identification and trouble shooting.
- Be sure to locate the main undercarriage air tubing clear of the engine and with the modification of the bypass protection of the air tubes to the main undercarriage can be achieved.



Photo 4 – air lines colour coded and run to the centre area of the component boards. The Speed brake air lines have been run to this spot too.

Step 6: Vertical Fin and Rudder

- Before attaching the aft section of the fuse, the vertical fin and horizontal stabilizers need to be attached and the wires run from the servos. This will make it easier.
- In most kits, the hinges are preinstalled in the control surfaces, but must be glued into the flight surface. This however is not true for the rudder and fin and elevators as FB Jets has utilised the screw pin method. The servos for the rudder and elevator fit nicely into both the fin and the tailplane making it easy for you to install the servo arms and pushrods together with the control horns.
- Trial fit the rudder into the vertical stab and makes sure the screw pin is securely fitted.
- Trim and sand to achieve the maximum throw your servo arm will allow.
- Attach two aluminium "L" brackets to a 7955TG servo or equivalent. Position the brackets such that the spindle of the servo faces forward when installed in the servo well. Do not use the rubber grommets supplied with the servo, but bolt it directly to the brackets. Use Loctite as required.

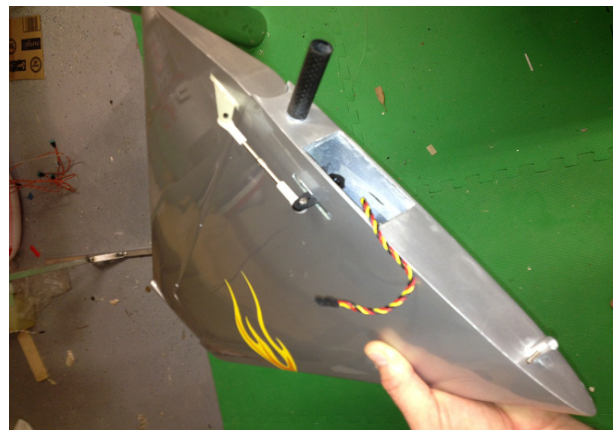


Photo 5&6 – Rudder Servo and push rod.



Photo 7 – Rear section with the tailplane and vertical stab removed.

- Position the servo on the two ply mounting tabs and attach the “L” bracket with 15mm wood screws.
- Run the servo wire out of the bottom of the vertical stab.
- Trial fit the phenolic control arm in the slot routed in the rudder at the factory. You may need to use a small carbide cutter to enlarge the slot slightly for a good fit. Be careful not to route through the other side of the control surface. A small piece of tape wrapped around the cutter at the proper depth will help prevent a mishap.
- Roughen the surface of the control arm where it will glue into the rudder with 100 grit sandpaper.
- Tape around the slot with masking tape and apply a liberal amount of Aeropoxy or Hysol into the slot (photo 4) to ensure it is secure but with no glue on your surfaces.
- Locate lock clamp in the fuse rear section and slide the fin into place while routing the servo wire through the hole. Tighten the clamp. If you feel necessary, drill and tap and additional screw in the front locating pin of the fin as pictured.
- Install a servo extension of the proper length to reach your receiver and secure the connection with a large piece of heat shrink or tape.



Photo 8 – additional front screw to the front pin of the vertical stab.



Step 7: Horizontal Stabilizers

- The horizontal stabs build up in a similar fashion to the vertical stab in terms of the servo installation. Install your servos in the space provided and modify slightly as required if your selected servo does not fit. Repeat all steps, including the installation of the servos.
- Before installing the servos, use your Matchmaker or equivalent to centre the servos and match the positions of the control arms.
- If you are using JR Heavy Duty Arms and the positions don't match, try rotating one arm 180 degrees before deciding which half of the arm to trim off.
- If you are installing 8611 servos, you will need to trim the ply mounting tabs and metal arms to get a good fit.
- Install the elevator servos into each tailplane and connect to the control arm attached to the elevator mechanism.
- This is an important step to ensure that the installation is tight and all screws and fasteners are tight and installed with Loctite.
- Do not use the rubber grommets as they may cause flutter if there is too much play.
- Attach a 36" heavy-duty 22-gauge extension to each servo. Heat shrink the connections for safety.
- Copy these steps for the other elevator and then centre and match both elevators to the RX system.
- Run the elevator servo extensions from the rear of the fuse forward. I tend to run these extensions and the rudder extension lead through a Teflon tube for heat protection from the thrust tube.
- With control arms in the vertical position and the control surface centred, adjust the linkages to the proper length for both elevators and the rudder.
- With the two elevator servos activated through the Matchmaker, set the length of control linkage such that the elevators are equally cantered and attach. Make sure not to over tighten the bolts such that the arm binds.



Step 9: Speed Brake Setup

- I setup the speed brakes at this stage. Do this while you are finalising the install of the elevator servos as I pulled the air tubing for these rams through with the servo wires to the front of the fuse.
- Setup the air ram connected to your dual action air valve. I used a dual action Xicoy air valve for simplicity, however the manual valve works perfectly fine that is supplied with the kit. Using this valve, operate the air ram to ensure all function is working.
- Re-install the air ram into the holder and mount as pictured above and secure.
- Attach it to the Speed brake function and test the ram using the manual valve to setup.
- Check that the Speed brake opens and closes nicely with appropriate pressure to stay closed.

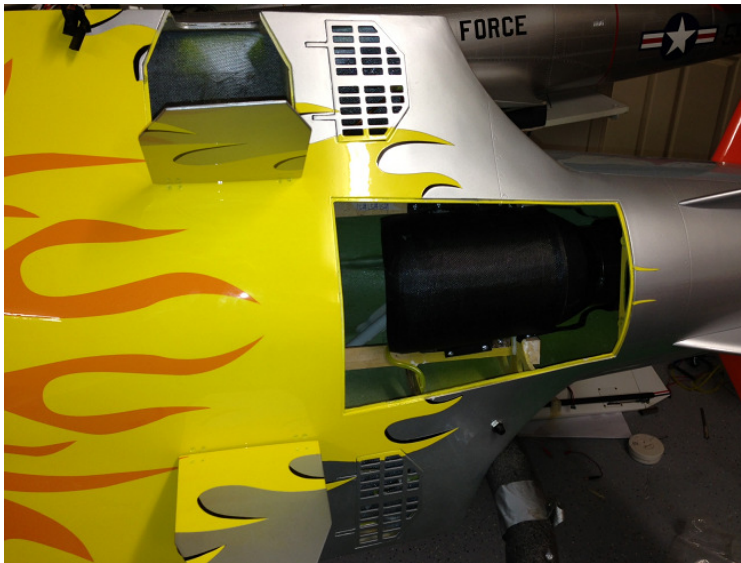


Photo 9 – view of the speed brakes on the underside behind the gear doors.

Step 10: Engine and Pipe

- Clean the fuselage thoroughly before installing the engine. If you need to trim the intake for engine clearance, use a vacuum while you work. This will reduce the chance of a foreign object finding its way into your engine later;
- Drill a hole in the thrust pipe mounting tabs at their mid-point.
- Position the pipe on the rear of the lower bypass. The tabs are slightly offset to one side of the pipe this is the top (when working on the plane, but bottom when plane is right way up).
- With the pipe fully on the lower bypass, and the mounting tabs equally spaced from the top, drill holes through the engine block mount and attach/secure the pipe tabs to the block. If needed glue additional ply blocks for greater support.
- Note that for additional support we have placed two Stainless Steel pop rivets through the front of the thrust tube and the rear of the by-pass.
- Install the engine now on the mounting rails. Using a Kingtech k170, we did not have to make any adjustments at all to the engine mounting rails. These were perfect and the engine centred perfectly in the trust tube.

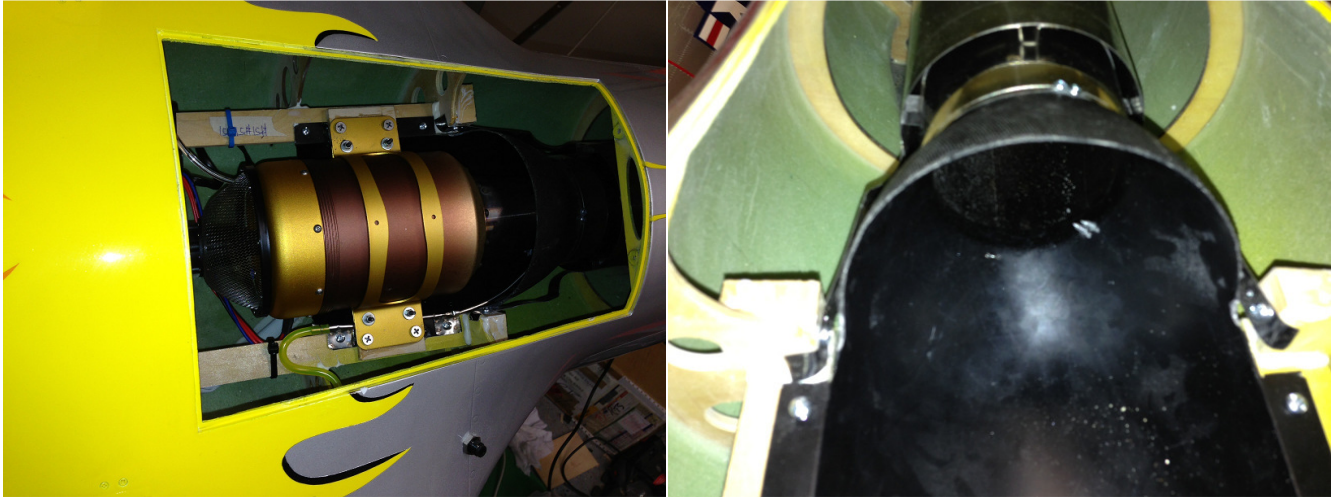


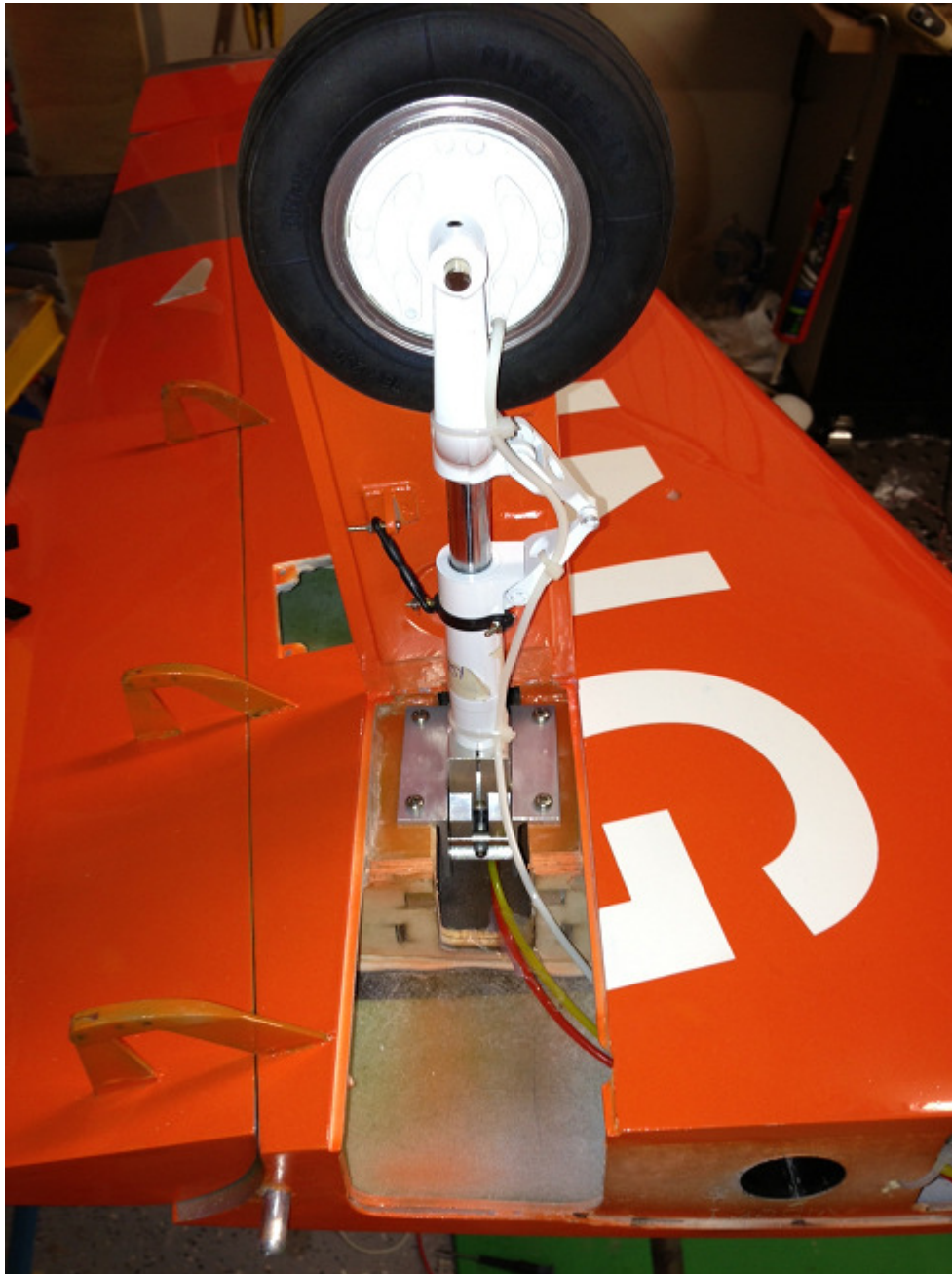
Photo 10 & 11 – mounting thrust tube, bypass and engine.

- Adjust the location of your engine to obtain the clearance specified by the manufacturer between the exhaust cone and the pipe mouth. It is likely it will extend into the intake.
- Shim the engine as necessary to make sure it is centred in the pipe and is aligned with the slope of the pipe from front to rear.
- When you are satisfied, bolt the engine to the side frames with wood screws. Remove the screws and coat the thread holes with thin CA. This will harden the wood.
- Connect service lines to the turbine and bolt permanently in place (photo 7).
- Complete the installation of engine components and mount where necessary depending on your engine.
- Remember to leave clearance for the cockpit above the component board at the front of the fuse. The placement of components in my F16, including the smoke system, is shown in photos 6. The smoke tank was located next to the main tanks and centre tank to reduce as much as possible the change in balance when the smoke is used.
- Resist the temptation to hide wires away under the component boards, as it will make future maintenance more difficult. Keep things neat but accessible.

Step 12: Landing Gear and Doors

- Extend main gear and unscrew and move to once side.
- Put a drop of thin CA into each screw hole to strengthen the ply in the area of the bolts.
- If not already done, attach air lines to the main gear and check for leaks with a hand pump.
- Attach brake line and check for operation of the brakes and leaks with a hand pump.
- Optional step: The gear door cylinder may be attached to a small extended “ear” on the door hinge. To reduce the risk that this ear fails, you may wish to move the ball link attach point to the hole immediately next to the “ear”, but drilled through the main arm itself. If you undertake this optional step, you will also need to move the bolt location on the cylinder base mounting plate so as to maintain appropriate throws. The factory installation is very good so we did not need to undertake this step at all.
- Attach air lines to the door cylinder from inside the fuse if not already accomplished. Test for leaks.
- Put a drop of thin CA on the small nuts at both door cylinder bolt locations to reduce the risk that they loosen over time.
- Route all air lines to the nose and ensure they cannot be damaged by other components.
- Reinstall main gear. Check for smooth operation with a hand pump.
- Wire tie the brake line to the main strut and check operation of the gear once more to make sure brake line has adequate length and clearance.

Photo 9: Main gear



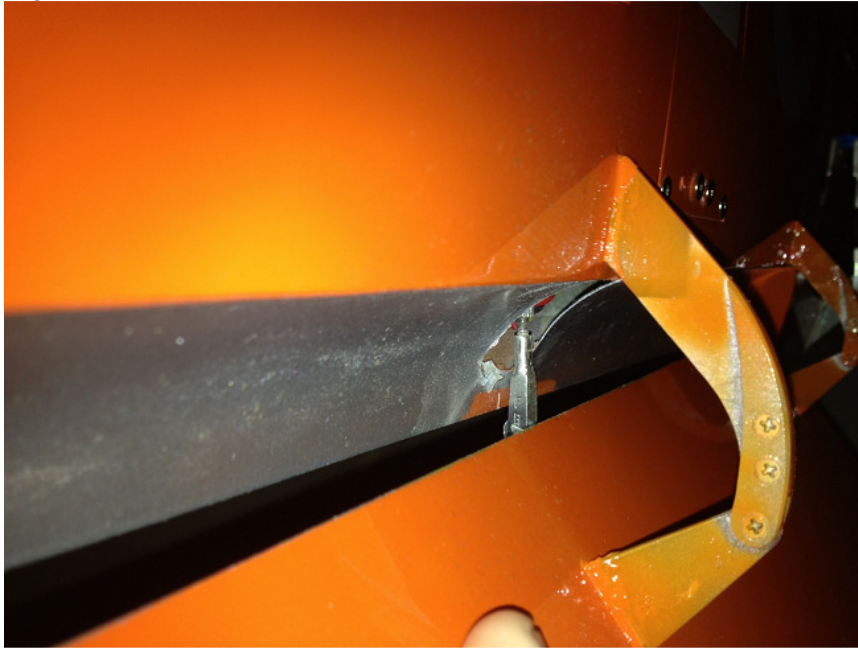
Step 13: Aileron and Flap Servos

- Remove the aileron servo covers. Mark the inside front of the covers so you will know how to orient them for reassembly.
- Attach the aluminium L brackets to the servos as you did for the tail surfaces. The servos will face in opposite directions and the servo spindle is positioned toward the front of the wing.
- Using your receiver or JR Matchmaker, power box or the like, find servo neutral and attach the heavy-duty servo arms to obtain matching positions. If you are using a double-sided arm, you may find that rotating the arm 180 degrees achieves a better match, so complete this step before trimming off the unused side of the arm.
- The ailerons will already be fitted to your plane with the screw pin hinging. A small flat screw drive and do this then fingers.
- Position the servos onto the mounting tabs, paying attention to the position of arm relative to the control horn slot marked on the control surface. Using great care not to pierce through the top of the wing, drill and bolt the servos in place (photo 10).



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Photo 10 – Flap servo installation and pushrod exiting the trailing edge of the wing to the leading edge of the fouler flaps.



- You will need to use an extension on the aileron servo lead.
- Make sure to tape or heat shrink the connection for security and that this connection does not come loose.
- The servo covers shouldn't need trimming given the high level of manufacturing.
- Repeat for the other wing.
- Measure the throws for ailerons. Make sure you can achieve 25 mm in either direction on the ailerons. Carefully trim away the gap cover if needed to get the appropriate travel. Also make sure there is no binding at the ailerons.
- With a small carbide cutter, route out the slots for the control horns.
- Rough up the mounting surface of the control horn, tape around the slot and glue the horn into each control surface with Aeropoxy or Hysol.
- Set the wings aside for the glue to cure. Double check to make sure there are no fingerprints or excess glue on the wing surfaces. (cigarette lighter fluid will help remove fingerprints)
- When the glue has cured, install the linkages.
- Insert the wing tips into the mounting holes. When the pins are fully inserted, tighten the locking clamp bolts through the small holes in the top of the fuse. If you are installing navigation lighting do this now before you permanently install the wing tips.
- The high intensity landing lights from BrainCube fit perfectly into the mounting holes for the landing lights in the wings. Trim the plastic covers for the landing supplied with your kit as detailed in Photo 11 after you have installed the landing lights.

Photo 10: Aileron Servo installation



Photo 11: Landing lights installed from BrainCube (UK)



Step 15: Cockpit

- Trim the edges of the cockpit area so that the tubs sit inside the canopy. We fitted the scale cockpit supplied into the canopy to make start-up easier and preparation easier.
- We suggest trial fitting the cockpit to the fuselage and trimming where necessary.
- Make sure it is smooth to install and remove as once you secure into the canopy this is important.



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- Once happy with the fit of the cockpit, place it inside the cockpit. Place a small amount of Hysol or the like along the join of the cockpit and canopy.
- Place a large sheet of gladwrap or similar flexible think material over the entire cockpit area of the fuse. This will protect the fuse from any glue on the cockpit when you install the canopy to the fuse.
- Now install the fuse so the right shape of the Cockpit and canopy is achieved while this glue is drying.

Photo 11 – trim the sides of the cockpit area such that the tubs drop in place



- Make sure that the cockpit tubs are clear of any electronic gear sitting on the component boards.
- At this point, you may wish to paint the tub, instrument panel and glare shield with flat black paint.

Step 16: Radio Programming

- Complete the installation of your radio gear and batteries. In our Viper, the switches were mounted on the rear component board together with the RX, ECU shut down, ecu etc.
- The front board has the air equipment and the UAT together with the fuel fill valves;
- Batteries were mounted to the nose forward and above the front nose wheel so they can be removed for charging if required. We used 2* 4000mAh 7.4v Lipo's for the RX, a 7.4 4000mAh for the Turbine ECU and a 4000mAh 7.4v Lipo's for the navigation lights.
- Set your radio for the following throws:
- Ailerons: 25 mm in either direction
- Elevators: 30 mm in either direction
- Rudder: max throw allowable for nice controlled knife edge manoeuvres

Step 17: Weight and Balance

- Test fuel the aircraft. Check for leaks, then drain.
- Set your CG. For the initial flights, the plane should balance slightly nose down with the CG 10mm behind the main wing spar, fuel in the UAT only, with the gear down.
- Adjust CG as necessary.



Step 18: Test Flight

- Before any test flight, make sure all systems are fully tested on the ground and there are no known problems. The gear is essentially important to ensure that it is functioning correctly.
- Try to conduct test flights under ideal weather conditions, at a flying facility that offers plenty of "outs" in case of problems. The Viper will enjoy any wind but a head wind on take off and landing will make for very slow controlled landings and smooth short take offs. We deactivated the speed brakes for a first flight and actually found that this model by FB jets slows up superbly even without speed brakes.
- During the first flight, spend the majority of time on slow flight and approaches. Your primary goal in the first few flights is to get a good feel for throws, CG and most importantly, the nice controlled landing characteristics of the aircraft.
- This is a heavy aircraft, so make sure to carry sufficient power to touchdown to avoid wear and tear on the airframe. Land with a little speed.
- Ailerons = 25mm 0% expo
- Elevator = 30mm up 10% expo – 30mm down 10% expo
- <http://www.youtube.com/watch?v=cf44yw2B-9c>

Equipment Installation Photos

- Equipment, including fuelling tubes, switches, air fill, air gauges and remote ECU board were all installed in on the component boards to have as much weight forward as possible. Also, the wiring for the ECU and for the servos was run down opposite sides of the fuselage to avoid interference. The receiver was mounted on the front component board. This is a good location for both conventional receivers and 2.4 GHZ units, due to the central location, high mounting point and absence of carbon fibre in the area. If you are using multiple 2.4 receivers, this general location allows for additional units both fore and aft. The positioning also allows for the shortest run of extension wires.

Receiver and ECU batteries were located on in the nose within an incline mounting board made up and prevented from sliding backwards by the forward component board.

Parts List

- Forward Fuselage and Component Boards
- Aft Fuselage
- Engine Hatch
- Canopy
- Horizontal Stabs, Elevators (2)
- Vertical Fin, Rudder
- Wings, Ailerons (2)
- Main Landing Gear (2)
- Nose Gear with Integrated Steering Bracket
- Cockpit Tub, Rear Instrument Panel
- Dual Wall Exhaust Pipe with Mounting Tabs
- Upper and Lower Bypass
- Linkage Assemblies (8)
- Air Support Kit
- Hardware Kit





FEI BAO/FB Jets Large 2.5m Viper

