# FEI BAO JETS

## Velox Assembly Manual


**Written by Curtis Mattikow**
**In collaboration with R/C Jet Models**

## 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 Velox.

## C. WORKING WITH PNEUMATIC SYSTEMS:

The Velox 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.

## D. FUEL SYSTEM:

The Velox has a very simple fuel system...one main tank leading to a UAT or similar header tank.

There is not much to go wrong, but like the pneumatic system, it does need to be done right the first time, with some careful craftsmanship.
Like the airlines, all fuel lines must be cut off Dead Square. Each fuel connection should be given a tie-wrap or two for extra security.

Everything needs to be dead clean, especially the inside of the main tank.
The front tray is set up to accommodate a BVM Ultimate Air Trap or it's equivalent, to keep any bubbles from getting to your engine.
You can also make up your own header tank with a bubbles filter, or a geometrically centered pickup, but any way you do it, you should not attempt to

fly without a header tank system.

## 5. Hinging the control surfaces:

While there are many ways of doing this, this method will let you do all the surfaces at once, assures proper alignment and movement, and let you move on to other assembly work while the glue on the hinges dries.
Most techniques involve gluing one side of the hinges, letting it dry and then doing the other side the next night. This lets you do both sides at once, and guarantees proper alignment. Follow the procedure fully for best results.

1. Put a towel or cloth down on your bench to keep the airplane from being scratched. Locate all the control surfaces to their correct place on the wings and tails. Note that the factory has kept some hinges in place on the control surfaces to help you locate which surface goes where, left and right. Check for proper mating, hinge location, and movement on all surfaces. Start with one wing. Remove the control surfaces and remove the hinges.

2. Coat the center portion of each hinge with petroleum jelly. Use enough to keep any glue from sticking, but make sure you do not get any petroleum jelly on the ribbed portion of the hinge that needs to be glued.

3. Coat the leading edge of each control surface with a thin layer petroleum jelly to keep any glue from sticking.

4. Fill each hole in the control surface with Hysol. Be generous with the glue. The ONLY place where glue should be is in the hole itself...clean up any excess right away.

5. Twist each hinge into place on the control surface. Align each hinge by raising each one 90 degrees and checking for straightness.

6. Fill each hinge-locating hole in the wing with Hysol. Again...the only place glue belongs is in the hole itself.
7. Keeping the hinges at 90 degrees to the control surface, gently push the control surface into place on the wing. Keeping it at right angles keeps the hinges from getting pushed further into the surface and getting misaligned. When you get to the final quarter inch or so of insertion, start reducing the angle of the surface until the surface slides home the final bit.

8. Carefully align the trailing edges of the flap and aileron surfaces, using the trailing edge of the wing at the tip, and the paint stripes, as a guide.

9. Check for adequate freeness and movement on the surfaces, paying particular attention to having enough downward movement on the flaps. When you are satisfied, tape both the flap and aileron into place with masking tape to prevent any misalignment while drying, set the assembly aside, and do the same procedures to the other wing.

10. Hinge the elevator the same way. Pay attention to the orientation of top and bottom, if you have trouble fitting the elevator, you may have it upside down.

11. Do the same for the rudders. Note the bottommost rudder hinges have been trimmed at the factory to keep them from protruding into the servo bays. Set all these assemblies to dry overnight.


12. Move on to the main fuel tank. Blow out the main fuel tank, be sure that no debris of any sort is left in there before proceeding. This is a vital step, do not omit it.

13. Assemble the stopper. Note that only two holes are large enough for the tubing. Do not tighten the screw on the stopper yet, just engage the threads slightly.

14. Assemble the clunk as shown. The provided tubing is cut to the appropriate length at the factory. Insert the assembly into the tank and check that the clunk goes as far back as possible into the tank, but does not hit the back wall of the tank, even in an inverted position. When satisfied, secure the clunk tubing at both ends using small tie wraps or safety wire. Gently bend the vent line to reach the top of the tank.

15. Insert the stopper and clunk assembly into the tank and tighten the screw. Do not over tighten the screw and strip out the stopper assembly. It only needs to be tight enough to prevent leaks. Mark on the tank which tube is for the vent and which is for fuel. Attach some tubing to the tank, immerse the tank into water, and blow into the tubing to check for leaks. When satisfied, put the tank aside.


16. Use a hand pump to extend both main landing gears.

17. Using the provided allen key, loosen the strut trunnion bolts slightly to allow the struts to rotate.

18. Rotate each strut from the traveling position set at the factory through 90 degrees so the wheels face forward. Check on the fuselage if you are unsure. Note the cylinders face outwards, and the brake nipples on the wheels should be aft.

19. Use your hand pump to pressurize the gear very slightly until it is not locked either up or down, but can move freely in the middle. Insert the landing gear into the mounts and wells and check the fit.

20. Mark off any areas where the wheel wells might interfere with the wheels or struts.

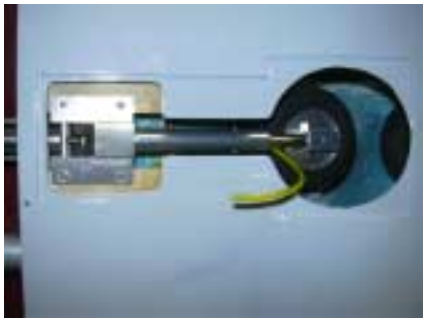
21. Dremel or sand away any needed material, and vacuum up any dust left in the fuselage.

22. Carefully align the retract assemblies, double check that they clear the wells properly, and mark the four mounting holes for each retract.

23. Check that the mounting holes are in the right place, not too close to the edges of the wood on the retract mounts.
24. Drill pilot holes in the mounts.

25. Attach a 12" section of YELLOW airline to the inner nipple on each retracts.

26. Screw each retract into place.



27. Attach the rest of your yellow airline (the entire coil) to a y-connector.

28. Connect the two yellow lines on the retracts to the y-connector from Step 27 attached. Stick the excess tubing inside the fuselage to get it out of the way for now.

29. Attach a piece of ORANGE tubing approx. 12" long to each outer nipple on each retract and run it back inside the fuselage as shown.

30. Again, like you did with the yellow tubing, attach a y-connector to the remaining long length of tubing and connect that to the two pieces coming off the retracts and stuff it in the fuselage for now.

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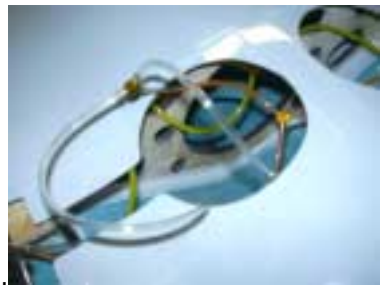
31. Attach a 14" length of CLEAR tubing to each brake nipple. Hemostats are handy for this.

31. Like you did for the orange and yellow up and down airlines, connect the remainder of the clear brake line to a y-connector and to the two brake lines.



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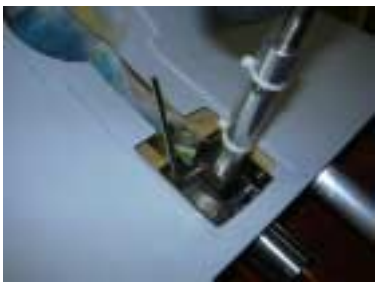
32. Secure the brake lines to the struts using tie wraps. Do not over tighten the tie wraps and restrict the air flow through the lines.

33. Check the wheel alignment for toe in and toe out. The wheels should be pointing straight forward. When satisfied. Tighten up the strut trunion bolts that you loosened when you began installing the landing gear in step 17.



34. Route the three long air lines through one of the upper holes in the main fuselage former and send them forward to the nose. Use your hand pump to check the proper up/down/braking action.

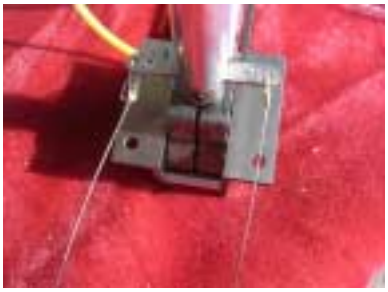
35. Rotate the nose gear around from its traveling position from the factory until the strut is aligned as shown, so it will clear the nose gear opening on the fuselage.

36. Add two 8" lengths of airline to the nose gear assembly as shown. Note the different airline colors to match the main gear.
37. Use your hand pump to unlock the nose gear retract so it can move freely up and down. Insert the nose gear assembly in the fuselage and check location and clearance in the fuselage.

38. Mark and drill pilot holes in the nose gear mount for the nose gear assembly.

39. Flip the plane over and feed the steering cables through the small white plastic tubes preinstalled in the fuselage.

40. Flip the plane back to an inverted position and crimp the steering cables into place on the outer holes on the steering arm on the nose gear. Use a double crimp, with the line going through the crimping tube twice.

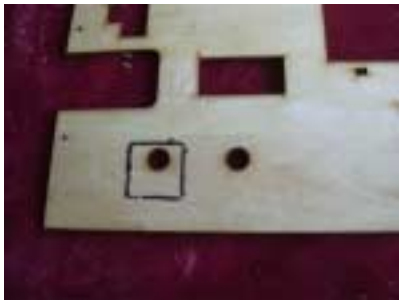


41. Screw the nose gear assembly into place on the mount.

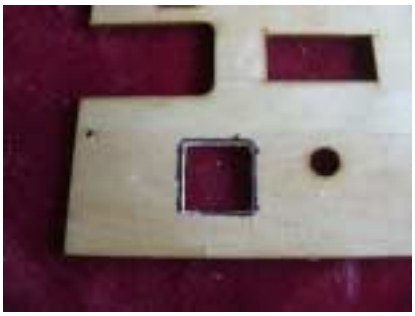
42. Flip the plane over. Remove the radio tray. Put the screws back into place in the fuselage to keep them from getting lost.

43. Put two quality micro servos in place for the brake and retract valve actuation.

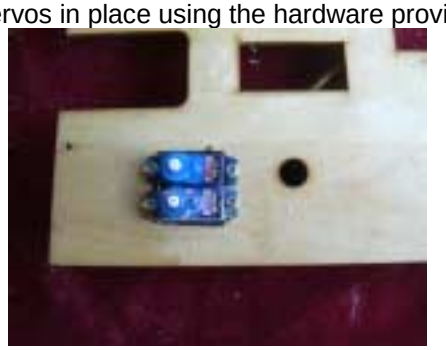
44. Mark around the servos.



45. Cut out the servo hole.  It is easy to do with a few strokes of a new exacto knife.



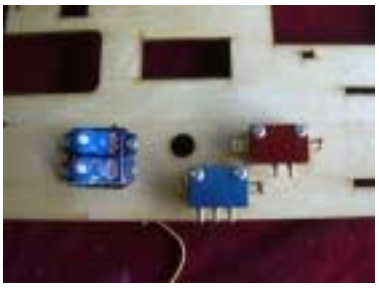
46. Mount the servos in place using the hardware provided with the servos.



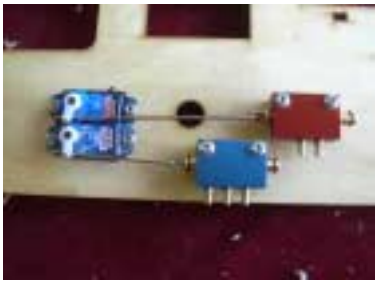
47. Make up some scrap plywood packing blocks for under your air valves. What you want to do is raise the valves up so they are level with the servo arms, so that there are no side loads on the valves.  You want as straight as possible a link from the servos to the valves.

48. Screw the valves to the plywood blocks.

49. Glue the blocks with the valves into place using thick CA.  Notice how the valves are staggered to keep from hitting each other, and to keep the airlines that will be attached from interfering with each other.



50. Link the valves to the servos using scrap pushrod wire.

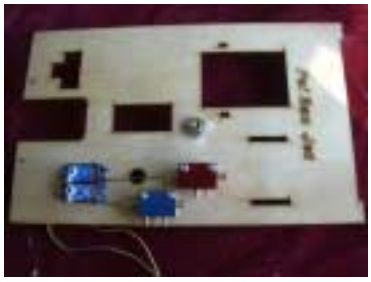


51. Locate the filler valve.  Remove the air-filling fitting and put it into a safe place, remove the nut on the valve, too.

52. Drill a hole where shown near the center of the radio tray for the air

valve. You can locate it where you want, but keep in mind that you need easy access to this valve to fill your air systems.

53. Install the air fill valve using the nut provided.



54. Cut two 10" lengths of airline off the clear line, and link the two air tanks together using these two pieces of airline and a y-connector.

55. Install the air tanks into the fuselage on either side of where the main fuel tank goes. Do not block the holes in the rear former. Silicone is a good way to install these tanks, in case you need to remove them later for servicing. You may also use epoxy.

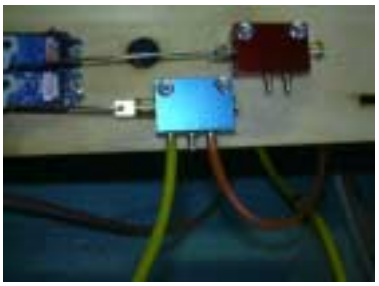
56. Route the three airlines from the main gear and brakes through the hole

in the forward former at the rear of the radio tray.

57. Cut off the orange line running from the rear a few inches ahead of the former. Cut off another piece approximately 6" long from the leftover airline. Link together the orange airline from the rear, the orange airline from the nose gear, and the 6" piece, using a y-connector.

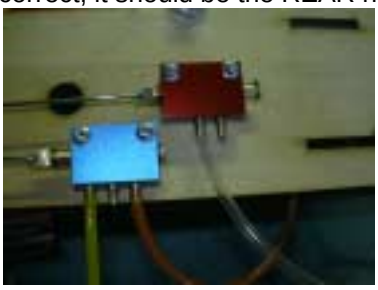
58. Follow the same procedure to link together the yellow lines, again, adding a 6" piece of line.

59. Connect these 6" pieces, both orange and yellow, to the front and rear nipples of the blue retract valve. Does not matter which goes where.



60. Cut off the clear brake airline, leaving about 8" from the rear radio tray

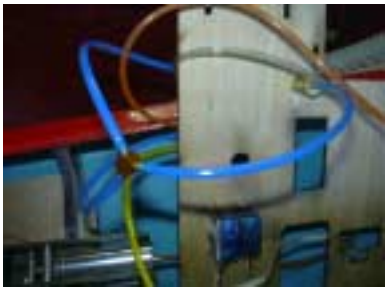
former. Connect this line to the rear nipple on the red brake valve. Note the picture is incorrect; it should be the REAR nipple.



61. Connect a 6" piece of any colored airline (I have used blue airline here for clarity, but that is not included in the kit) to both of the remaining nipples on the valves.

62. Cut that line in the middle and add a y-connector.

63. Connect a 4" piece of line between that y-connector and the filler valve.



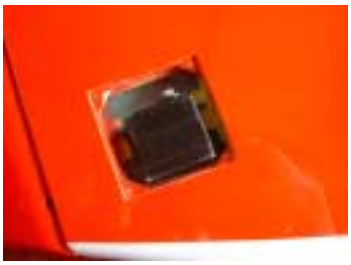
64. Cut that line in two and add another y-connector between.

65. Cut a 10" piece of line and connect that y-connector to the y-connector between the two tanks.
66. This completes the assembly of your pneumatic systems. At this point, you should test the systems. Pump them up using an electric pump to 100 psi. There should be NO leaks. You should be able to hold a full charge of air for days or even weeks. If you have any air bleeding whatsoever, fix it now. Do not attempt to use soapy water to find leaks. While that may work fine on motorcycle tires, it does a poor job on model airplanes, and leaves a terrible mess. Better off using a gauge and a pair of hemostats, pinching off each section of airline, starting at the "outside" of the system by the retracts, and testing each section one by one, until the leak or leaks is found. It's a faster and better way of doing things.

67. Remove the servo cover from the rudder servo bay. Keep the orientation of the servo cover correct, do not flip or rotate the servo covers, as there may be slight variations in the screw holes and they may not fit perfectly if you rotate the covers. You can do both rudder servo assemblies at the same time, if you like.


68. Test fit your rudder servos. You want a metal-geared, high powered mini servo. A standard servo will not fit, and full micro servos generally lack

enough mounting area on their ears to make them really safe, even though many of them have plenty of power for your rudders. You could also fit a surface-mounted flat servo. In this case, the Hitec 225MG BB is excellent for this application, and very inexpensive. Beware of just gluing the servos into place...if you break a servo gear and have to remove the servo for maintenance, you are in big trouble.

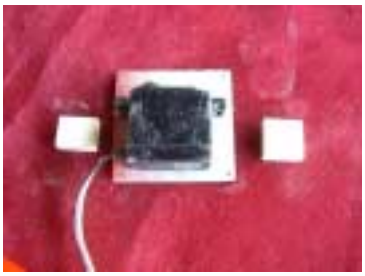


69. Put a couple of drops of thick CA on the servo.

70. Spray the backside of the servo cover with accelerator and put the cover into place over the servo.

71. When dry, remove the cover and the servo you just tack-glued to it.

72. Make up two plywood blocks to fit under the servo mounting ears. Use good quality plywood.



73. Epoxy the blocks into place. Clamp while drying. 5-minute epoxy is sufficient IF you clamp it while drying. CA glue is NOT sufficient, it bonds very poorly to plywood.

74. Drill pilot holes in the blocks. Be very careful not to drill into your servo leads.

75. Fix the servos into place using the screws provided with the servos. Do not use any rubber grommets or brass spacers. The servos should be rigidly mounted.

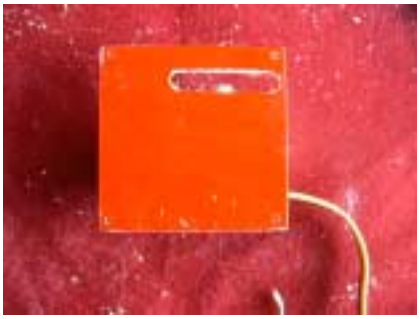
76. Put a horn into place to establish where the horn will emerge from the servo cover door.

77. Mark out where you need the slot for the servo horn.

78. Drill a hole at each end of the slot. Be sure to put a piece of scrap plywood on the back side before you drill, it will give you a clean hole without marking up the finish that way.

79. Flip the servo cover assembly over and draw two lines between the holes with a straightedge and soft pencil.

80. Cut at the lines using an exacto with a new sharp blade.



81. Attach your servo horn to one of the provided linkages. If you need to make the hole in the horn larger, go slowly. If the hole is oversize, discard the horn and start over.

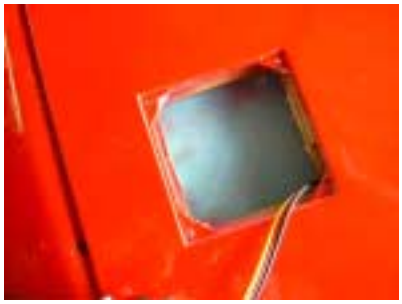
82. Attach the horn and linkage to your servo.

83. Attach a 36" heavy-duty 22 gauge extension to the servo. Tape the connection for safety.

84. Feed the extension through the boom as shown. It should go easily. If

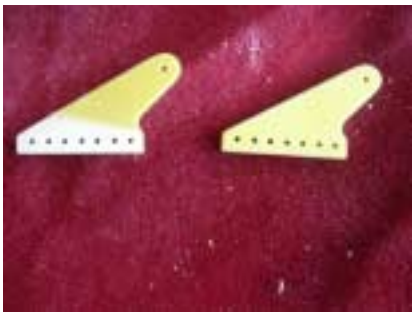
not, see the wheel collar technique shown in step 94. Note the servo leads need to come out of the correct hole, on the same sides that the servos are on.

85. Cut away the locating tabs inside the servo bay if need be.



86. Install the servo assembly into place. Do not over tighten the screws and strip the holes or ruin the finish on the plane.

87. Prepare all the control horns. Roughen up the bottom portion on both sides using 40 grit sandpaper, to give a better gluing bond.



88. You will also need to open up the top holes to accommodate the bolts for

the ball links. Go very slowly on this, if the holes end up oversize, you will need to replace them. Do all 7 control horns at once.

89. Bolt a horn into place, and adjust the linkage to the correct length.

90. Put a piece of masking tape on the surface of the rudder where the horn will go. This tape will protect the surface while you work there, and keep any markings you need to make from being on the surface itself.

91. Mark the location of the horn.

92. Cut the slot for the horn. Power tools are a little dangerous here, as if

they slip. you can drill all the way through to the other side of the surface. Use an exacto and many small strokes, only resort to the Dremel if you run into a really hard portion. You do not want the slot to be a super tight fit on the horn, you want room for glue in there, but nor do you want huge gaps.

93. If you wait until all the horns on all the surfaces are done, you can glue them all at once, which will save you glue, glue tips, and time. So hold off for now on gluing.

94. You will need to feed a heavy-duty 22-gauge 36-inch extension through the right side boom for the elevator servo. Feeding extensions through the structure can either be a very tedious, time-consuming, and frustrating process, or you can follow my technique and it will only take a minute. All you need is a weight such as a wheel collar, a little bit of string such as dental floss, and a little bit of masking tape. Tie the wheel collar to the string, and read on.

95. Drop the wheel collar on the string in through the hole. Tip the boom up, and use gravity to feed the wheel collar through the structure, tipping the

boom back and forth to get the wheel collar around any obstructions until it comes out the proper hole.

96. Cut off the other end of the string and tie the string to the end of the extension as shown.


97. Fair the extension into the string with masking tape as shown to keep the connector from snagging on the internal structure.


98. Pull the extension through the structure with the string.  If you get snagged, pull the extension backwards a little bit and try again.  It works,

and only takes a minute, and makes this tough job a piece of cake.

99. Remove the elevator servo cover.

100. Fit the elevator servo as shown. Relieve the mounts if need be. Pay attention to the orientation of the servo output and the servo cable.

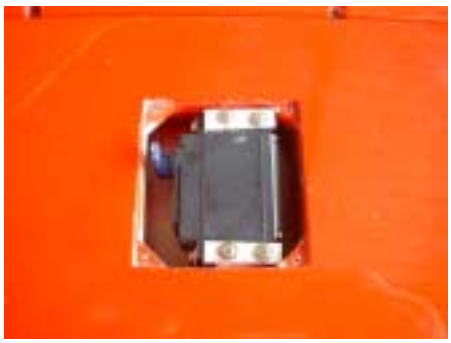
101. Fit the supplied aluminum mounts to the servo, using the supplied screws. Do not over tighten and strip the screws. Do not use any grommets or other servo hardware. Secure the screws with Locktite.

102. Fit a linkage to the servo arm. Make sure the hole in the arm is sized PERFECTLY for the clevis. Zero slop is allowed.

103. Remove the linkage, CENTER THE SERVO, and fit the arm and its retaining screw to the servo.

104. Fit the servo into place, with the servo lead coming out the right side(from the top) of the stabilizer assembly.

105. Drill pilot holes in the wooden mounts and secure the servo with the kit-provided screws. Do not over tighten and strip the screw holes.



106. Slot the servo cover for the horn as you did with the rudder covers. Fit

the cover into place.

107. Fit the linkage, control horn, and slot for the control horn as you did for the rudders. Again, you can wait till later to glue the horns.

108. The flap and aileron servos go in the same way as the elevator servos, with some notes. You will need 12" extensions on the aileron servos. The flap servos, of course, only travel down, so adjust your linkages and servos accordingly, so that they are all the way at one end when the flaps are up(neutral, level with the wing), and all the way at the other end when flaps are down. Note that you will need a servo reverser, a JR Matchbox, a reversed servo, or two separate channels for normal setup of the flaps, or one will work backwards. If you are using the popular Spektrum DX7 radio, you will not have a spare channel to program the second flap to move correctly. Here is a trick to allow you to run both flap servos off one channel with just a regular servo y-harness.

109. Install the flap servo into the right wing normally. For the left wing, do this: Cut two scrap plywood blocks as shown, the same width as the existing servo mounts, but about 1" long.

110. Epoxy those blocks into place, level with the existing mounts. Do not epoxy them to the mounts, but only to the wings and to the little corner triangular blocks that hold the servo cover hold-down screws.

111. When the new blocks are thoroughly dry, cut away the old ones. A few strokes of a sharp exacto will do it.

112. Trim the blocks for your servo. Make a cutout for the servo lead.

113. Install the flap servo as shown, along with the linkage and horn. Note that they may not be much structure beneath this new slot to hold the horn, pay extra attention to using lots of Hysol glue when you glue this

horn in.

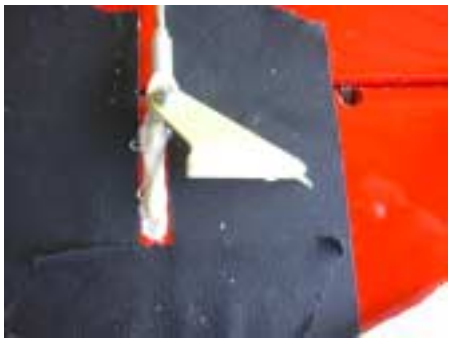
114. Now you have both flap servos facing the same direction and traveling the same way. After the horns are glued in, you can plug both wings into a y-harness and adjust the linkages for matched travel.

115. All of your servos are installed, now it is time to glue in the horns. Follow the same procedures for all seven horns. First use masking tape to tape the control surfaces to keep them from moving.

116. Surround each control horn slot with masking tape, leaving a 1/8" border all around. Do not tape the area in front of the horn, only the two sides and the rear.

117. Fill the slot completely with Hysol. Inject the glue as far in as you can go, it's much better to have excess glue here than too little. This application is another great reason to use the Hysol glue gun and nozzles, it is very difficult to get the glue down inside the slot without a glue gun.

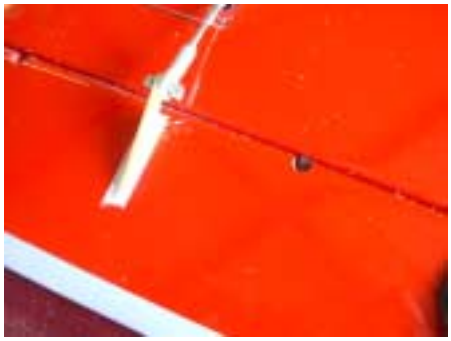
118. Add a bead of glue to each side of the control horn. Be sure to use your nozzle to inject glue into the small holes in the horn, they need to be filled with glue for proper strength of the joint.



119. Insert the control horn into the slot, making sure it is 90' to the surface, and not too deep and not too shallow in the slot.

120. Smooth out the fillet of glue on each side of the horn with a dowel or your finger. If you do not have a nice, complete fillet on both sides of the horn, add more glue until you do.

121. Remove the masking tape, and all the excess glue will go with it, leaving you a nice 1/8" fillet around the horn.



122. Use masking tape to hold the horn and linkage at 90' to the surface while drying.

123. You will need to run four 36" extensions on the right side of the plane, and three on the left. The one extra is for elevator. Prepare the extensions by tying one to your wheel collar and string, then taping the other three extensions, one at a time, to the first extension. The extensions need to be staggered as shown, as only one connector will fit through the holes in the structure at a time.

124. Drop the wheel collar into the hole in the wing root, and then out into the landing gear bay inside the fuselage, through the large upper squarish hole in the rear main former.

125. Pull all the extensions through, leaving only two inches on the outside at the boom end.

126. Plug the elevator servo into the extension in the right side boom. Secure the connection with masking tape.

127. Using the one of the two longer silver bolts, plus a washer, provided in the kit, secure the elevator assembly to the right-hand boom. Tuck the servo cable and connector into the elevator assembly. Do not over tighten this bolt, and be careful with the stab and single boom assembly while it is being assembled, it is easy to damage before it is added to the fuselage and the second boom joined for support.

128. Connect the rudder and elevator extension cables from the right side boom to two of the extensions you installed in the fuselage. Tape the connections.

129. Slide the boom into place. Make sure the two remaining extensions from the fuselage go out through the holes in the boom to where the wing will be, and make sure you do not pinch the airlines for the retract mechanism.

130. Secure the boom using the large black bolts provided, along with the large silver washers. Again, do not over tighten and strip the bolts.

131. Fit the left side boom and secure with two bolts as shown for the right boom.

132. Fit the wings into place. Connect up the extensions for the ailerons and flaps.

133. Tuck the excess cable back into the wing, not the fuselage. If you need to, it will e very easy to remove the wings for transport.

134. Secure the wings into place using the shorter silver bolts provided. Again, be very careful of over tightening and stripping anything.

135. Route all the extension cables through the LG bay. Keep all the servo extensions away from the pneumatic tubes and the landing gear. Run all of the extensions up and away from the pneumatic lines, then run them forward to the nose radio tray area.

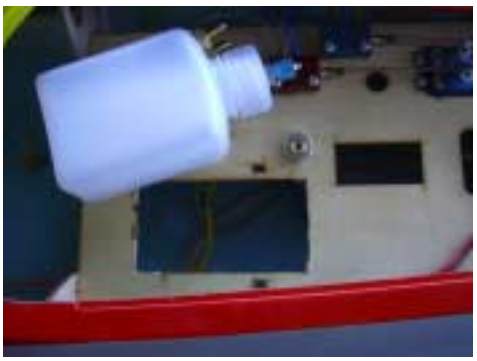
136. Run the entire servo leads through the lower hole in the rear radio tray former.

137. Attach a three-foot length of large Tygon fuel tubing to both tubes on the main fuel tank. Secure with tie wraps or safety wire.

138. Test fit the fuel tank and adjusts the velcro strap installed at the factory. Keep trying until the strap is a nice tight fit when you slide the tank in.

139. Slide the tank into place. Make sure it is square and butted against the former behind it. Use some silicone glue for extra security. Silicone keeps the tank in place, but still leaves it easy to remove in case service is needed.

140. Adjust the size of the hole in the radio tray to fit your UAT or header tank. A sharp Exacto with a new blade will cut the plywood very accurately with a few strokes.



141. Install the UAT using a tie wrap. Note most UAT devices need to be installed at angle. Follow the manufacturer's instructions. Also note that some UATs may project high enough that you will either need to make a hole in the plastic cockpit deck or relocate the UAT, or simply not use the cockpit deck.

142. Cut the tubing coming from the tank. One side goes to your UAT and gets secured with a tie wrap. The other side is the tank vent line and it goes to atmosphere. Make it the approximate length shown, long enough so that you can easily attach an overflow to it to catch excess fuel while fueling and route it back to your fuel jug, but not so long that it might kink or double up in flight and cut off the air to your fuel tank and starve the engine..

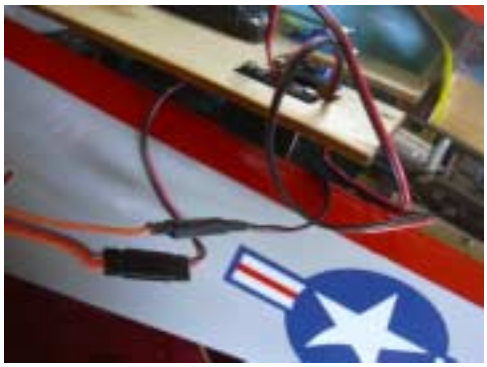
143. Install two high quality switches as shown. Dual switches and battery packs are highly recommended for redundancy.

144. Install your receiver as shown, using a tie wrap.

145. Route all your servo leads up through the slots from the bottom of the fuselage and plug them into the receiver.


146. Install a standard sized servo in the provided cutout in the radio tray for nose gear steering. Wire it into either a spare channel or into your rudder circuit. Install a standard sized servo in the provided cutout in the radio tray for nose gear steering.

147. Connect two extensions for your receiver batteries to your switches, long enough to reach the forward nose compartment. Tape these connections.



148. Run these extensions through the holes in the nose gear formers, up into the extreme nose area.

149. Run the charge leads from your switches through the hole in the rear nose gear former up into the nose gear area so you can get to them for charging.

150. Check all your wiring and plumbing beneath the radio tray, then secure the tray with the provided two screws. Note how the airlines go around the side of the tray and over to the bottom. Be extra careful about pinching or kinking airlines.

151. Install a horn with two Du-bro MICRO EZ Connectors onto your nose gear steering servo. The MICRO type connectors for park flyers have a smaller hole and screw and hold better on the steering wires than the standard ones do. EZ connectors provide less trouble in this application than clevises and the regular pull-pull fittings setup, there is less chance of them getting hung up.

152. Lower the gear. Pull the steering wires taut, while sighting through the nose gear opening in the fuse to keep the nose gear straight, and tighten the EZ connectors. You only need the steering wires free of slack, not tight. If they are overly tight, they may keep the gear from locking down.

153. Cut off the excess wire, but leave a little for adjustment if needed later.

154. Connect two high quality batteries to the extensions you added before. Wrap the batteries in foam and stuff them in the extreme nose of the aircraft. Do not secure them permanently yet, wait until all the turbine equipment is installed, as you may need to move them for balance before finally securing them.

155. Make up a piece of quality 1/4" plywood, 6 5/8" x 3". This will be turned into your turbine mounting plates.

156. Test fit the plate between the engine bearers at the rear of the fuselage.

157. Drill pilot holes and install the plate with three screws on each side. Be careful when you drill not to go through to the bottom of the fuselage.

158. Measure the distance between the mounting holes on your turbine mounting bracket. Make allowances for the mounting screws.

159. Subtract the measurement of your engine from step 158 from the width of the plate. Divide this by two. Measure that dimension in from each side of the plate and make a line there. In this case, we measured 4" between the holes in the turbine bracket, subtracted it from 6 5/8", leaving 2 5/8", and divided 2 5/8" by two to get 1 13/16", and made a line at 1 13/16" in from each side.

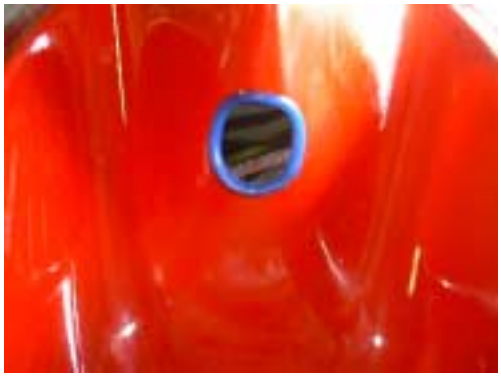
160. Remove the plywood plate. Cut on the lines you made and re-mount the plates with one screw on each side.

161. Trial fit your turbine on your mounting plates.

162. Make a mark on the fuselage in front of your starter motor.

163. Drill a hole where the mark is. The hole needs to be large enough to accomodate any connectors on any leads coming from your turbine. About one inch in diameter will do for the Multiplex connectors used on most engines.

164. Take a scrap piece of airline tubing about four inches long. Cut a notch out of it with a sharp razor, and fit it around the edges of the hole you made, and CA it into place. This will serve as a grommet to keep the sharp edges of the fiberglass hole from cutting your wiring and tubing.



165. Test fit your turbine again, check carefully for centering, and drill pilot holes for mounting screws. Do not mount the turbine yet.

166. Remove the plates. Put a fuelproof finish on them in case of fuel spills.

167. Remount the plates with all six screws and tighten firmly.

168. Put all your turbine wire leads and tubes through the hole you made into the wheel well area and mount the turbine with four screws.

169. Test fit the fiberglass turbine cover and marks a hole for the glow plug if needed.

170. Cut a hole for the glow plug and glow plug boot.

171. Mount the fiberglass engine cover with four screws.

172. Make up a 3/16" plywood plate for the engine accessories. This should measure 8 1/8" by 4", to fit across the fore-and-aft rails factory installed in the fuselage in the area in front of the main fuel tank, but behind the main radio tray.

173. Make up a quarter inch by quarter inch hardwood or plywood beam that fits right between the rails, approximately 7 5/8". This will simply be a place you can screw the engine accessory plate down to.

174. Test fit the beam between the fuselage rails. When satisfied, epoxy into place flush with the tops of the rails.

175. Test fit the engine accessory plate into the fuselage.

176. Arrange your ECU, solenoids, and propane tank on the plate. This installation will vary according to your engine, but things to consider are that you need to be able to get to the GSU port on your ECU, that you may have connectors coming out of either side of the ECU that need room, and that your propane tank may be too tall to fit in this area and may need to be relocated.

177. Cut a hole in the plate to accommodate the propane tank.

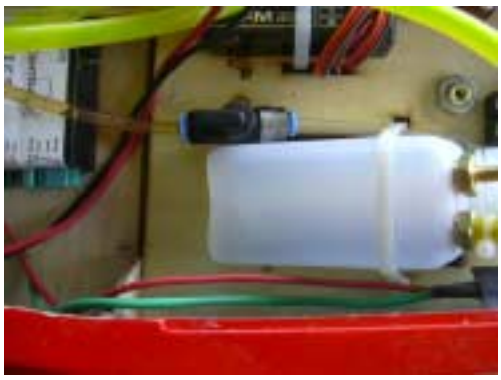
178. Secure the fuel and gas solenoids with tie wraps as shown. Stuff any excess wiring under the tie wraps for neatness.

179. Drill two pilot holes through the engine accessory plate and into the bar you installed and secure the engine accessory plate with two screws.

180. Secure the fuel pump up forward as shown. You want the pump away from the receiver and ECU to prevent any possible electronic interference.

181. Connect the input side of the fuel pump to the UAT

182. Run the output side of the fuel pump to your manual shutoff valve and then to the fuel solenoid.



183. Run the fuel pump-wiring plug through the hole in the bulkhead and plug it into the ECU.

184. Lower the landing gear for better access, then stand the plane on its nose. Put a pad on the floor to keep from scratching the nose. Many of the following steps are easier to perform with the plane standing on the nose. Find the temperature sensor plug. Install an extension on it if need be to make it long enough to reach the ECU. Do the same for the RPM sensor for the turbine.

185. Drop these leads down through the hole shown in the bulkhead until they emerge in the forward fuselage near the ECU. Use a wheel collar on a string if needed.

186. Plug the RPM sensor and Temperature sensor into the ECU. Neaten up any excess wiring.


187. You may need to extend the wiring for your starter and glow to reach your ECU. Use quality wire and quality soldering work.

188. Drop these leads down through the hole shown and plug them into the ECU.

189. Connect the propane line from the engine to the propane solenoid, through the hole in the bulkhead shown.

190. Connect the fuel line for the engine to the fuel solenoid, going through the hole in the bulkhead as shown.

191. Use tie wraps to neaten up and secure all wiring and tubing in the wheel wells. Nothing should be flopping around. Be careful not to squeeze any of the pneumatic lines. Separate and layer the servo leads, pneumatic lines, turbine electronic lines, and fuel lines, for neatness and easier service, and to keep any potential electronic interference at a minimum.

192. Install a piece of tubing and a plug on the fill line of your UAT.

193. Connect the ECU to the receiver as shown.

194. Plug in your ECU battery and stuff it in the nose. Do not secure it yet. You need to move the ECU and radio battery packs to achieve final balance. When balance is properly achieved, the batteries can be mounted into place with silicone glue or heavy duty Velcro. Make them very secure.

195. Congratulations, you have completed construction on your Velox. See the Pilots Notes for balance and control throws.

**196. Technical data:**

**197. Weight with the super bee and two 1800max RC NiCads and full UAT is 18.5 Lbs.**

**198. CG is in the 10mm carbon fiber forward spar it's nice and safety for the first flight. There is room to move it back if you like more aerobatic performance, but make changes gradually. Balance with full UAT and landing gear up. The main tanks, is slight forward of the CG, balance with the main tanks empty. You may find a click or two of trim needed as the fuel runs off during flight.**

**199. Control Trows**

**These are good place to start. Feel free to ad more trow for more aerobatic capability after the first flight.**

**Aileron:**
**20mm up and down**
**Elevator:**
**25mm up and down**
**Rudders:**
**20mm right and left**
**Flaps:**
**35 mm down**

**Some things to be aware of...**
**You may want an up-elevator mix with flap application, as the nose pitches down. You may also want some additional up-elevator throw available with full flaps, as you may not have enough elevator to flare with full flaps. A "landing" mix will reduce the pilot workload. These settings, flap-to-elevator, will change if you move the CG back. You can also increase the rudder throw, but be sure the rudders do not contact the elevator at full throw.**

**Credits:**

**Written by Curtis Mattikow**
**Test Pilot: Dino DiGeorgio**
**Photos first fly: Petter Hall**
**Maiden at Floyd Bennett Field**