Note: The illustrations show the Yak 55, but these instructions apply to the EPP Yak 55, the EPP McFoamy and the EPP MX2. XL series planes build similar with the exception of the split wing and dual aileron servos. These instructions are written with the assumption that you have purchased a kit, the motor, ESC, servos, etc. (everything needed to complete your new foamy) from WMPF.

Here are some things you are going to need – In addition to the kit & items above, you're going to need a SMOOTH, FLAT work surface about three feet square or bigger (a VERY handy thing is a piece of 3/4" to 2" thick blue or pink foam about the same size.) Also needed are some Foam Tac Glue (medium Foam-Safe CA and kicker works too but not recommended as it will make a brittle joint), some sticky-back velcro, rulers or yard stick, clamps, straight pins, some weights (chunks of steel or lead or cans of soda or Bricks), and a SHARP hobby knife. A pin vice with 1/32" & 1/16" drill bits, a heat gun, a soldering iron & rosin core solder.

**Step 1. Flat Parts** Start by laying out the fuse nose piece, the wing/aileron, the fuse center section and the stab/elevator on wax paper, bottom side up, as shown. Using Foam Tac Glue, glue these pieces together and pin in place (or hold in place with weights) until glue dries - don't forget the wax paper under the glue joints.

With a wooden firewall Kit or XL series Plane you can skip this next step.

**Step 2. Motor Mount** Now we add the motor mount. Don't forget to modify the mount by increasing the slot length per Tailflyers tip ... you will thank yourself later, believe me - I didn't do it on my first one and wish I did! I use a hacksaw blade for this operation shown to the right (a dremel with a cut-off disc works too). Cut the slot 1/4" to 3/8" longer than the slot from the factory mold. (For the McFoamy, shorten the Motor mount by about 1/2") Lightly sand the mount on all four sides to remove the shiny skin, this will make the glue grab hold better. Glue in place on both sides as shown, we will glue the top and bottom to the fuse at a later step.
**Step 3. Bottom fuse.**
With the airframe still bottom side up, test fit the bottom fuse so you understand where all the tabs fit into the horizontal fuse. The nose of the plane should line up together. Notice the gaps left behind the tabs on the bottom fuse; this is where the tabs go for the top fuse. Now apply glue to the bottom edge of the bottom fuse and install in the notch cutouts – hold it firmly in place and brace it square and straight, similar to what is shown, until glue is dry. The front of the fuse and the flat fuse nose should line up.

At this point you need to decide if you are going to use some type of bracing to increase overall rigidity & prevent fuse twisting. I prefer the Carbon Fiber truss bracing as illustrated in the next few steps. If using bracing you should do it now while the build is upside down and still flat.

*(See Trussing Drawing at the end of this guide for truss lengths and location)*

EPP or Depron strips can also be used. Some don't brace the bottom at all. Note - if you do not brace the bottom there will be some twist in the fuse during fast roll rates.

**Step 4. Trussing**
To brace the wing to the fuse, start by cutting off the cotton tips of plastic tube 'Q' tips & bending in the center. From the 39” Carbon Fiber rods, cut 4 pieces 12” long. Put some Foam Tac glue in the tubes and insert the 4 Carbon Fiber rods as shown. *(Heat shrink can also be used instead of the Q tip stems)*

Step 5. Dry fit the carbon fiber into the slots to check fit before applying glue.

Remove all the trussing and place it alongside the plane close to the spot where it will go when glued in.

Step 6, Apply a small drop of glue into the precut slot for each truss mounting spot working from the back of the plane to the front. You can glue them in all at once if you are fast enough with the glue. Check for Square and straightness of the bottom fuse as you do the trussing. Be sure to keep everything “flat, plumb, level & square” as you proceed.
The last photo shows using Depron strips with holes, attached with hot melt for bracing instead of carbon fiber.

**Step 7. Motor Prep.** While the glue is drying, let’s solder plugs, sockets & connector to the motor & ESC leads. One easy fixture is to drill 6 holes in a board about 1/4” – 5/16” deep just big enough to hold the plugs & sockets. (you want the ends to be about 1/8” above the board). Now solder the 3 **MALE PLUGS** to the motor leads using rosin core solder **ONLY.** Now solder the 3 **female sockets** to the three leads on the ESC. Strip the black & red leads of the JST connector approx. 1/4”.

Make sure you slide a piece of heat shrink tube on each red & black lead. Hold the two red leads in place (don’t use fingers), and solder. Repeat for the black leads. Cover joints with the heat shrink tubing & shrink in place. Add heat shrink tubes to the three motor & ESC leads as shown & shrink.

The motor comes with a prop mount, but WMPF furnishes a better one. Mount the WMPF prop mount to the motor shaft – big end out – using either the Allen or phillips head screws.
**Step 8 & 9 Servos.** Now we are going to prepare to install the 9 gram aileron servo – it needs to be glued in place prior to gluing on the upper fuse.

First, turn the fuse/wing assembly right side up and support it with wood blocks, soup or soda cans – whatever.

I like to plug all 3 servos into a receiver, power up and “CENTER” them first.

Assemble the servo arms as shown with the 9 gram servo having the double arm.

You’re going to need the WMPF wooden control horn set next.

**Step 9.** Time to prepare the 9 gram aileron servo for installation. (You did “center” the servo and mount the arm shown, right?) Carefully remove the “Aileron Differential Horn” (ADH) from the WMPF control horn set. (The ADH is necessary to assure equal movement (up & down) of the ailerons). With a 1/16” dia. Drill, enlarge the SECOND hole from each end of the servo control arm. Enlarge the second hole from each end of the ADH and the middle hole of the 5 on each end of the ADH. Now, mount the Du-Bro mini connectors to the ADH as shown.

Using the mounting screws that came with the servo, mount the ADH assembly to the plastic servo arm. Note the relationship of the ADH to the servo lead wires. Install the finished servo in the fuse opening just behind the motor mount with the servo lead exiting out on the side below the “X” & lead wires FORWARD. Glue servo securely in place with Foam Tac Glue. You only need to place a couple drops of glue under the screw tabs when gluing in the servos. A little glue goes a long way. This will save weight as well as make the servo easier to remove if needed.
Step 10. Installing the control horns.

Apply a bead of Foam Tac glue over the slot and insert the control horn into it – pull it out & insert it again a time or two to make sure the glue is well distributed on both sides. Be sure the pointy end is lined up with the hinge line. It should look like the picture on the right. Now do the other aileron the same way.

Step 11. Rudder control horn.

Glue in the Rudder control horn to the proper side of the Rudder. It should be glued in on the left side or hinged side of the rudder.

Elevator Control horn.

Glue I the elevator Horn in the precut slot on the right side of the airframe.

Step 12. Top Fuse

Ok, time to add the top fuse & rudder to the lower fuse & wing assembly. With the lower assembly blocked up “plumb, level & square”, test fit the top fuse into the horizontal fuse. The nose of the plane should all line up together. The sharp edges of the lower fuse and the lower portion of the rudder should be lined up also. Now apply glue to the bottom edge of the top fuse and install in the notch cutouts – hold it firmly in place and brace it square and straight, similar to what is shown, until glue is dry.

Step 13. When the glue has thoroughly dried, the bottom fuse & lower portion of the rudder has to be “hinged”. First. Pin or clamp in place using some scrap foam, balsa wood, etc. as shown.

For illustrative purposes, I have used some scraps and something other than Foam Tac glue (which is clear) to clearly show how
this is done. With everything in place, apply a small STRAIGHT bead of Foam Tac over the sharp edges of the two parts. With some type of squeegee (I use a used up gift card), quickly smear/spread the Foam Tac over the entire length of the joint. Let dry thoroughly before removing the supporting scrap piece. (Note: zig-zag for illustration only)

Step 14.

**Wood Firewall:**

- **Standard Series:** Round firewall. Glue firewall to front of plane and glue foam wedge pieces behind firewall to fuse as well as the back of the firewall.

- **XL Series:** Center Wood firewall on front of plane in slots, work glue in behind mount between the foam and the wood. Glue on foam wedge shaped pieces behind the firewall to the foam as well as the wooden firewall.

- **Stick Mount:** Loosen the 2 set screws & remove the firewall motor mount from the motor. Plug the 3 motor leads into the three ESC leads and install the motor into the motor mount. Secure with the screw & nut provided.

Attach the ESC and receiver with sticky backed Velcro as shown. Cut a small hole thru the fuse just behind the aileron servo and feed the JST battery connector thru to opposite side.

For Receivers with long antenna, wrap antenna around a large soda straw and tack glue both ends with hot melt, then glue straw to lower fuse with hot melt.
**Step 15. Control Rods** The two shorter 1.5mm CF rods are for aileron control rods & the two longer 1.5mm CF rods are for the rudder & elevator control rods. While glue dries, we’ll make up ONE end of each. From one 2” piece of heat shrink tube, cut 8 pieces about 1/8” long. Cut two others in half. Position a ‘Z’ bend wire & 2 pieces of heat shrink on a CF rod & shrink the tube as shown. The ‘Z’ should be about 1/4” from end of CF rod. Apply a small bead of glue on each side of wire & slide a 1” piece of heat shrink over everything and shrink. Do one end of all 4 rods.

**Step 16. Tail Servos** Plug the two 5 gram servos into a receiver and “center” them. Install a single arm on each one as shown. Carefully enlarge the end hole of each arm to 1/16”, and install a servo connector in each.

**Step 16.1** With a punch or sharpened tube, make a hole about 1/2” behind the spar for the rudder & elevator servo leads. Make a similar hole thru the upper fuse for the elevator servo lead. Thread elevator servo thru hole in fuse and both servo leads down thru hole in wing. Glue servos in place as shown and allow glue to dry thoroughly.

**Step 16.2** Now we complete and install the control rods. Enlarge the uppermost hole on all 4 control horns with a 1/32” drill. Starting with the ailerons first, (with the servo centered and the aileron even with the horizontal fuse), insert ‘Z’ bend into hole, and cut CF rod about 3/8” from servo connector with side cutter or Dremel abrasive cut-off wheel. Remove from control horn. Repeat for other side.
**Step 16.3** Now, assemble the straight 1/32” wire to the control rods, opposite the ‘Z’ bend, as you did in step 15, leaving about 3/4” wire exposed from end of CF rod. Re-install ‘Z’ bend into control horn and insert straight wire into servo connector – tighten screw snugly, just to hold in place – final adjustment will be made later.

**Step 16.4** The elevator & rudder control rods are done the same way, EXCEPT, after cutting CF rod to length, you must install the three rod guides with the short one closest to the ‘Z’ bend end. Now, remove and install the straight wire to both rods the same as you did in step 19.

**Step 16.5** Install the elevator & rudder control rods with the ‘Z’ bends in the control horns & the straight wire ends into the servo connectors. With the elevator level & the rudder straight, snug up the servo connector screws.

**Step 16.6** On one side, space out the control rod guides evenly, then make a small slit in the foam for each one. (Slots already done) Squeeze some glue into each slit & insert the guides. Before the glue has a chance to set, wiggle the guides as req’d so they are in line & do not cause a drag on the control rod. Repeat for other side. NOTE – for the rudder, the guides go into the vertical fuse.

**Step 17.** We be almost done! Plug the servo leads into their proper location on your receiver, then “dress up” the servo & ESC wires. One way is to stuff them into a piece of large heat shrink tube (DO NOT SHRINK!) or similar and tack glue that to the fuse. Install the prop onto the prop saver with the WMPF rubber ring.
Step 18. For the McFoamy and the MX2, (if you want them) glue the “winglets” to the leading edge of the wing as shown. They need to be parallel with the upper fuse. Be sure to check the location to make sure they avoid the CF bracing on the bottom side of the wing.

Step 19. To fly properly, your foamy must be balanced correctly. The balance points are as follows.

Please See Chart on the last page for CG locations.

Make up something similar to the picture to support your plane. Now place your battery on the top of the horizontal Fuse & move it forward or rearward until your foamy hangs level. Place a piece of sticky backed Velcro longer than your battery, on the lower fuse, directly below the battery. The longer piece allows you to use different size/weight batteries and still be in balance. It also allows you to experiment flying a little nose or tail heavy.

Step 20. Turn on your transmitter, set all trims to zero and pull the throttle stick all the way down. Plug your battery into the ESC battery connector. Loosen the servo connector (s) and adjust the control surfaces to straight and level if necessary – re-tighten all servo connector screws. Advance the throttle a bit – the motor should start turning. If it runs backward, switch ANY TWO motor to ESC wires.

Note: if you are using a Futaba transmitter you might have to reverse the throttle channel in your transmitter.

If the motor does not start, unplug the battery (remove the prop for safety) advance the throttle all the way forward, re-plug in the battery wait a 2 seconds, pull the throttle back to zero. This calibrates the ESC to the transmitter. If you wait longer than 5 seconds to close the throttle the esc will go into programming mode. If this happens do not move the stick on the transmitter but rather unplug the battery and start over. If motor now starts, un plug the plane’s battery, put the prop back on and check for proper rotation. If it runs backward, switch ANY TWO motor to ESC wires. Once the throttle is working correctly, check all other controls for proper directions – reverse if necessary.

One last check to MAKE SURE everything is in proper working order – GO FLY THAT FOAMY!