



Instructions for the Funplanes.com Edge 540T

Thank you for purchasing the funplanes.com Edge 540T! We hope you enjoy the kit as much as we enjoyed providing it to you. The Edge will perform most maneuvers you will want to try, and the nice thing about it is if you happen to meet the ground sooner than you had planned, there is a good chance the plane will survive for another flight, although you may want a tube of goop or epoxy close by just to be sure you can fix minor tears if they occur.

If this is the first time you have worked with EPP foam, there are some things you will want to be aware of. The foam is very resilient to many substances, including some glues. The best glues to use on this plane are contact cements and low temp hot glues. Epoxy works well too, it is just heavy, but you can use it where you feel you'd like. Also, while EPP is often referred to as "indestructible", it really isn't quite so completely bullet proof. One of the things to be careful of is ripping the foam. It will rip if pulled hard, so where there will be tearing forces, we will reinforce the foam with strapping tape. This foam is very good to work with once you get use to these qualities.

One other feature of this foam which struck me as odd: it dulls blades like I have never seen before. After a few cuts, you'll see what I mean. The blade will start to pull instead of cut the foam. So, I had a pack of 100 blades that had lasted me almost 10 years when I started making these kits, and I used up almost all of them in very short order. At the Toledo show this year, I came across a booth selling blade sharpeners. I thought "Yeah, right. I'm gonna sharpen a #11 razor blade"! What I saw amazed me. I will never buy another pack of blades again unless I just want a different shape or blade type, and then a 5 pack of blades will last a life time. I am not kidding. I was so impressed I began to stock them on my web site for just this purpose: EPP is a blade dulling son of a gun! Get one of these blade sharpeners and I know you'll be as impressed and happy as I am that I never need to change or buy blades again! Look for the Hobby Blade Sharpeners on my website if you are interested. There are videos there to show you the before and after effects, as well as the process to sharpen them.

So, having said all that, lets have some fun and build an Edge 540T!

Glues and adhesives

- 1- Tube of Goop (there are many types, and which ever is on sale is ok! I have outdoor goop shown, but regular household goop is fine...Outdoor Goop was ½ price at Home Depot....:o)
- 1- Low temperature hot glue gun with low temp glue
- 1- Pack of Low Temp glue sticks
- 1- Can of 3M 76 (not 77!) Hi-Tack Spray Adhesive
- 1- Roll of ¾" strapping tape. You may also want a roll of 2" wide tape as well for the larger reinforcement areas.

Tools

- 1- Exacto knife
- 1- Extra blades or blade sharpener
- 1- Metal ruler or straight edge
- 1- Metal yard or meter stick
- 1- Builders Square
- 1- Fine tip marker or soft pencil
- 1- Glue Brush (or two)

Parts Identification:

Foam Parts:

- ☐ 2 - Fuselage sides
- ☐ 1 - Wing skin
- ☐ 1 - Depron rudder
- ☐ 2 - Depron elevator halves
- ☐ 1 - Depron stabilizer
- ☐ 1 - 6mm EPP Wing spar
- ☐ 1 - 6mm EPP Fuselage rib
- ☐ 1 - 45mm x 45mm x 145 Motor block
- ☐ 2 - 6mm EPP ailerons
- ☐ 10 - Front rib halves
- ☐ 10 - Rear rib halves

Hardware Bag:

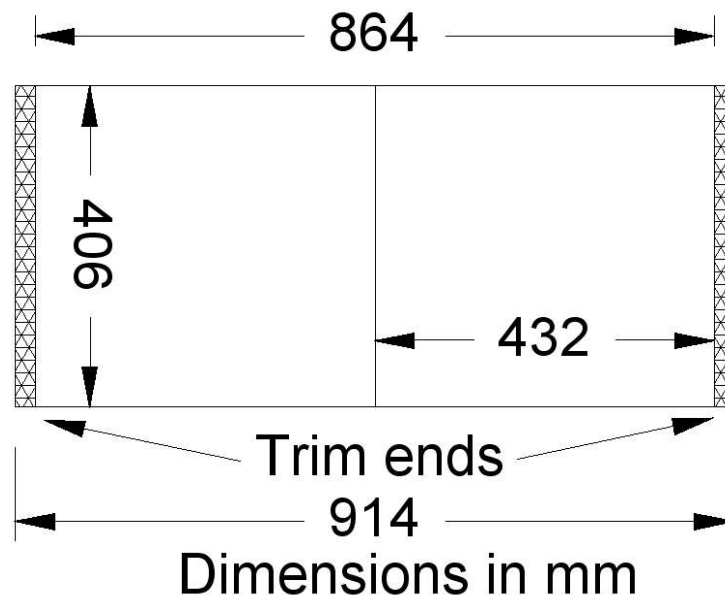
- ☐ 2 - 16" .040 Carbon rod wing spars
- ☐ 1 - 9.5" Carbon tube elevator joiner
- ☐ 2 - Wheels 38mm
- ☐ 1 - 18" .062 Landing gear wire
- ☐ 1 - .039 Pushrod wire 18"
- ☐ 1 - .055 Tail Skid Wire 4"
- ☐ 1 - 3/8 x 3/8 Basswood motor stick 6"
- ☐ 1 - 1/8" x 1.75" x 1.75" lite ply AXI mount
- ☐ 1 - 1/2" x 1.75" triangle LG support brace
- ☐ 8 - 1/64" x .5 x .5 ply control horn supports
- ☐ 1 - Nylon Tie control horn material
- ☐ 1 - 1/8" x 1" x 1.5" LG support bracket
- ☐ 1 - Velcro strips set 8.5"

Let's build the wing!

Size up the wing skin

The Edge wing has a 34" (864mm) span, and the wing skins ship 36" (914mm). So the first thing we'll do is size the wing skin to the correct span.

- ❑ Lay the foam wing skin flat out on your building board and measure to find the center span of the skin. Using a builders square aligned on the long edge closest to you, mark the center line of the wing with a soft pencil or a pen. Note: If you use a ballpoint pen or other ink, the solvents in the glues tend to make the ink show through the foam when you apply them. All you want to do is see the marks while building, so a light pencil mark works fine)
- ❑ From the centerline, measure out 17" (432mm) and make a mark on the foam. Do this for both sides of the wing. Trim off the edge of the foam on both sides so your wing skin is 34" long.
- ❑ Measure the width of the wing skin at the tips and insure they are the same. They should be around 16" (406mm). This is important as we are going to roll the skin over the ribs and the wing skin should trued up so there will not be any warps. If the wing skins are not the same size, true them up at this time.

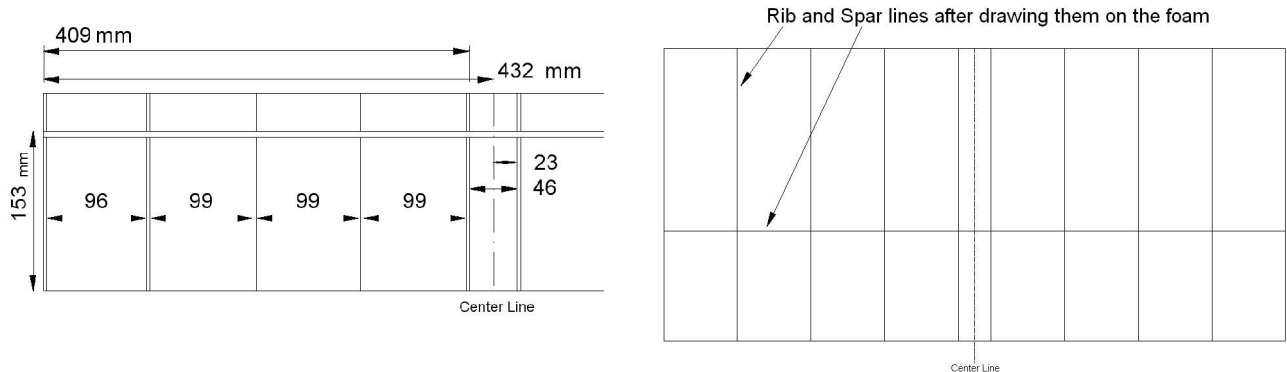


Now that we have a squared and true 34" x 16" wing skin with a centerline on it, let's mark the locations of the spar and ribs...

Mark the rib and spar locations

The ribs and spar locations will follow the diagram below.

- ❑ Measure out from the centerline of the wing skin 23mm and make a mark. Then measure 99 mm from this mark toward the wing tip and make the next mark. Do this for each rib, understanding that the wing tip rib is about 96 mm instead of 99 mm from the previous rib. This isn't really critical. The ribs can be on 100 mm centers.
- ❑ Make the marks all the way across the wing skins where the ribs will go

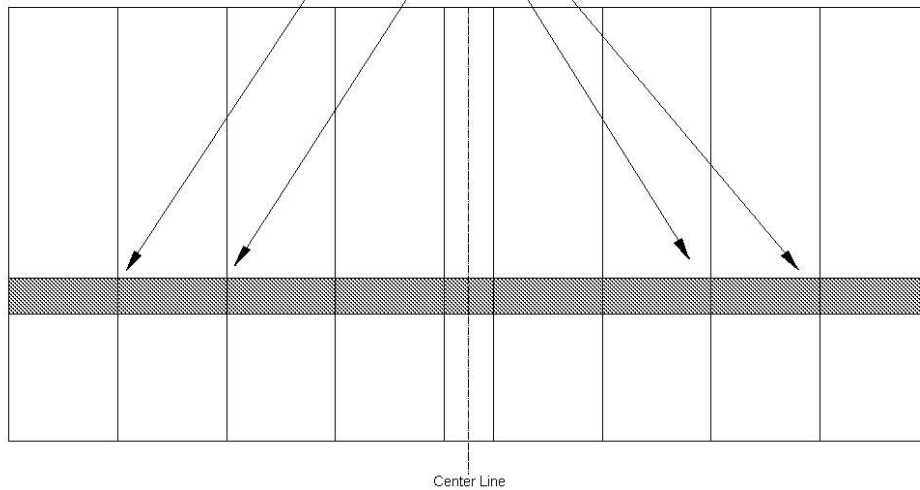


Glue the ribs to the spar

Using the same dimensions we just covered, we'll glue the ribs to the spar, and then the spar to the wing skin

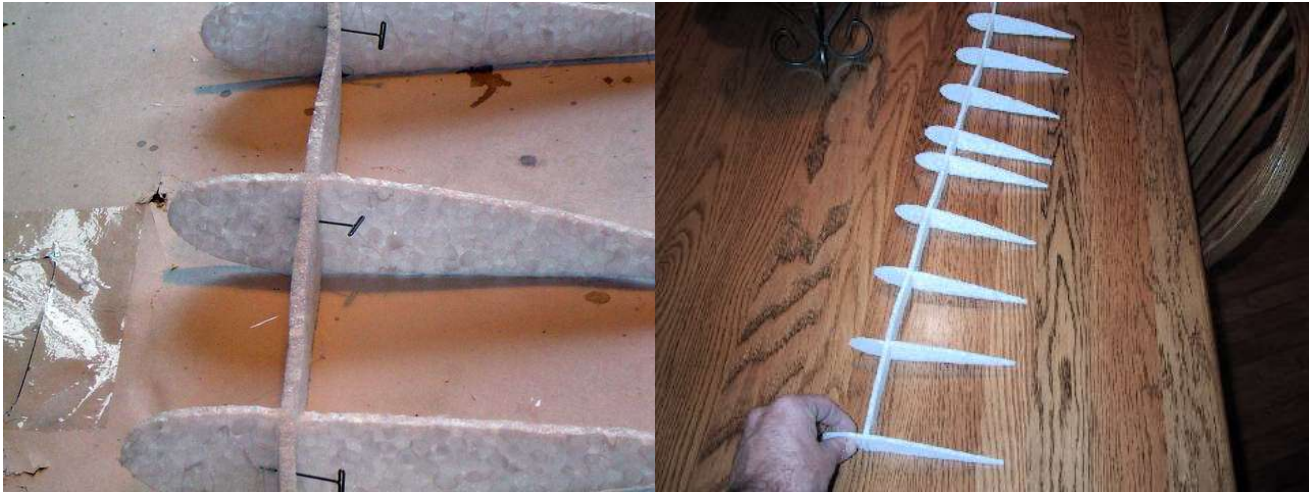
- ❑ Set the spar on the wing skin over the spar line you made and cut the spar to the same length as the wing skin. The spar's Leading Edge is the one to line up with the line you made for the spar. This is where the leading edge of the spar will glue down when we get to that point.
- ❑ Mark the rib positions on the spar where you have made them on the wing skin.

Lay spar flat on the wing skin and mark the rib positions



- Using a small amount of low temp hot glue on the front end of the rear wing ribs, glue them in place over the position lines you made on the spar. Be careful to get them perpendicular to the spar.

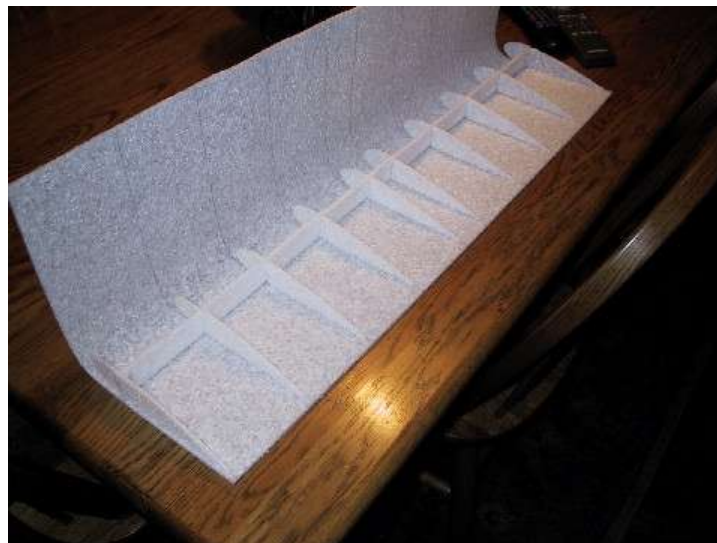
- ❑ Now, using the same method, glue the front rib halves to the leading edge of the spar. Try to only use as much glue as necessary to hold the rib to the spar as excess here doesn't add strength, just weight.



Glue the rib and spar assembly to the wing skin

Now it's time to glue the entire assembly to one edge of the wing skin. We'll use small thin beads of the low temp hot glue for this.

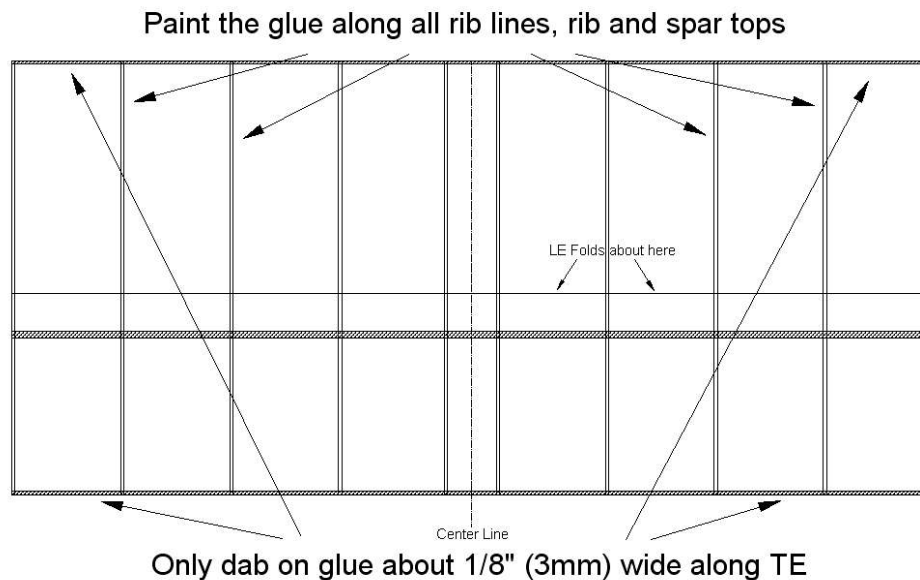
- ❑ Starting at one end of the wing skin, squeeze out a small thin bead of low temp hot glue on the trailing edge side of the line you drew for the spar. (Remember, the spar line was drawn to line up on the leading edge of the spar). Only apply the glue one rib bay at a time so you can position the spar and have it set properly on the wing skin. Hold the spar in place until the glue cools and apply the glue to the next rib bay. Continue until the bottom of the wing spar is completely glued down.
- ❑ Then, glue the bottoms of the ribs to the foam in the same way. Be careful here to not introduce any warps to the wing!



Fold and glue the top of the wing onto the whole assembly

The next step will be to paint the contact glue onto the wing skin and to the tops of the spar and ribs. We will use a spray on glue, 3M 76 Hi Tack glue, sprayed into a cup and brushed onto the parts. Then we'll fold over the wing skin to join the trailing edge together. I strongly suggest reading the entire section here before actually starting the process.

- ❑ Grab a glue/epoxy brush and trim off a bit of the bristles so they are a bit stiffer when you use the brush. Then, walk into your sweethearts kitchen and get a small jar, like a baby food jar, and head back to the shop (grab your favorite beverage while you're there...). We'll use the jar for spraying the glue into. Shake the can of spray glue (I have found the 3m 76 Hi Tack glue works well here) and spray a healthy dose of it into the jar. Using your glue brush, dab glue onto the foam where the rib lines are drawn on the upper section of the wing where it will contact the ribs. Be sure to get under the front of the ribs where they join the skin on the bottom. Dab the glue along the trailing edge on both the top portion and bottom portion of the inside wing skin where they will meet once the wing skin is folded over. **Be careful here:** You only want about 1/8" of glue on both surfaces! If you paint on a wider stripe of glue the trailing edge will flatten out and not look right when pressed together.

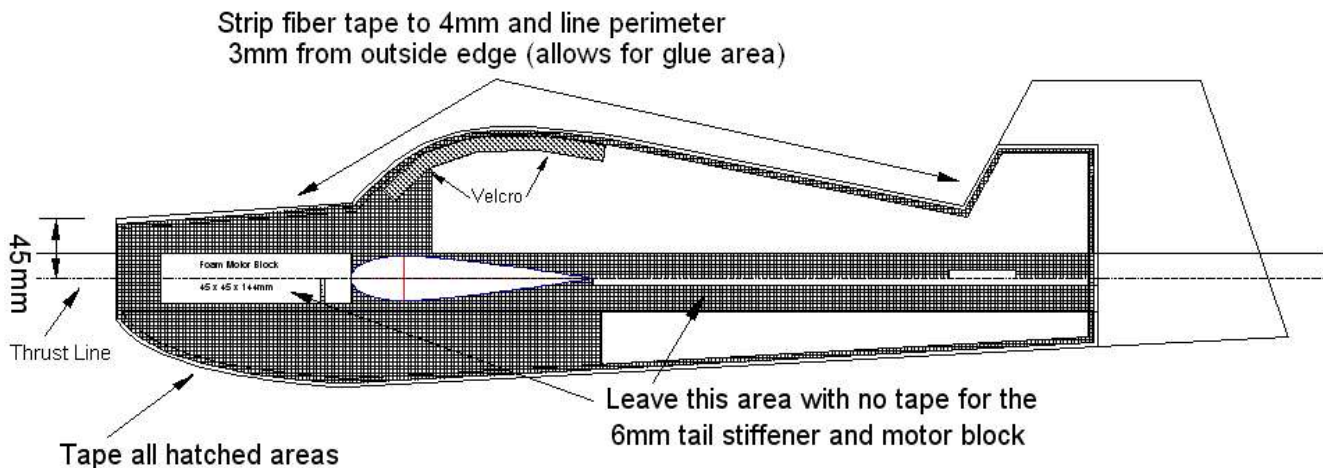


- ❑ Once you have the glue brushed on, it's time to fold the wing skin over and join the trailing edges. **This is to be done CAREFULLY!** As you can imagine, contact cement is not very forgiving. Carefully roll the wing skin over the ribs, being cautious not to introduce a warp.
- ❑ Once the trailing edge is sealed, you are finished with the wing for a while. Now it's time to move on to the Fuselage. Grab another diet soda, and we'll get started!

Let's build the fuselage!

The fuselage is easy to build but requires making sure the parts are aligned properly. The first thing we'll do is draw reference lines on the fuse sides. Then we will tape reinforcements into the insides of the sides and cut out the stab and wing holes. Next we'll join the fin at the rear, glue in the tail stiffener and motor block, cut the holes for the landing gear wire, and glue the top and bottom together. Let's get started...

- ❑ Using the measurements on the building diagram, make a mark:
 - 45mm down from the corner on the inside nose of the right fuse side for the centerline
 - Make the corresponding mark on the tail at 51mm from the bottom corner of the fin. Connect the marks with a line forming the centerline of the fuselage.
 - Mark the position of the Stab and wing on the centerline using the measurements on the diagram.
- ❑ Using 3/4" fiber tape, tape both inside fuse halves in all the areas shown in the diagram below. Strip the fiber tape to 4mm to line the perimeter of the fuselage. This helps keep the foam from ripping in the event of a hard landing. Be sure to leave the area where the tail stiffener and the motor block goes uncovered as the glue does not stick to the tape and it will peel off when you glue on the parts. Use a rubber wall paper seaming roller to press the tape firmly onto the foam. It will make the foam curl a bit toward the inside and this is alright. You do not need any extra spray adhesive as the tape sticks well to the foam. You may want to use 2" bi-directional packing tape for the larger areas.



❑

- ❑ Using the completed wing as a template, line up the center of the wing leading edge and trailing edge on the right fuselage center line 178mm from the nose and trace around the wing's airfoil with a soft pencil.

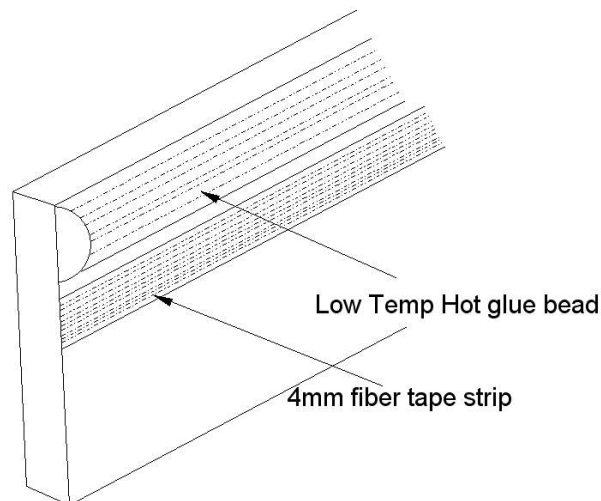
Using a sharp Exacto blade, trim out the wing airfoil shape on the right fuselage side. Then, cut the 5mm stab slot above the fuse stiffener 61mm from the tail end as shown on the plan sheet.

- ❑ Using the right fuse side as a template, cut out the wing and stab slots on the left fuse side.
- ❑ Using contact cement or goop, glue the fuse tail stiffener onto the right fuse side. Goop the firewall in place and position the motor block on the fuse side and glue in place with goop. Apply the glue to the rear inside edge of the fin at the very tail edge and glue the tail together at the fin. It helps to have some longer flat sticks to hold the edge together as the glue sets.
- ❑ Apply glue to the inside areas of the left fuse side and glue the fuse sides together. Make sure at this point that the fuse sides are lined up at the nose to insure the fuse is straight and not curved like a banana! Let the glue set and have another diet soda.

Joining the fuselage and mounting the stab and wing

Now that the sides are joined in the middle, it's time to glue the top and bottom edges together, install the landing gear and put the wing and stab in place. If you follow the instructions below, you can put the fuse together without using any long edge clamps. The advantage is that the fuse can be built faster and the edges will not have flat spots around the edge where the 4mm strip is. The key is putting glue on the inside edge close to the corners that will meet on the fuse sides.

- ❑ Slide the stab into the slot you cut in the tail. Using a string, measure from the corners of the stab to the center of the fuselage to insure the alignment is correct and even. Use a small amount of 5 minute epoxy and glue the stab in place.
- ❑ Using low temp hot glue and starting at the top of the fin, squeeze glue about 4" along the inside edge of the right side. Line up the corner edges of the fuse sides and press the fuse sides together on this edge. The way I have found to think about this is that you are trying to glue just the corner edges together. If you think this way, you will likely not glue 1/4" of material together as you go. The diagram below illustrates the concept.



- ❑ Repeat this procedure, 4" or so at a time until you join the fuse together up to the end of the fuse stiffener.
- ❑ Plan now on how you will mount your motor. If you are using a GWS motor mount, you will want to cut a 3/8" channel in the motor block to install the stick assembly. If you are installing the AXI "Outrunner" style motor, install the plywood plate on the motor block. Join the top nose section together this same

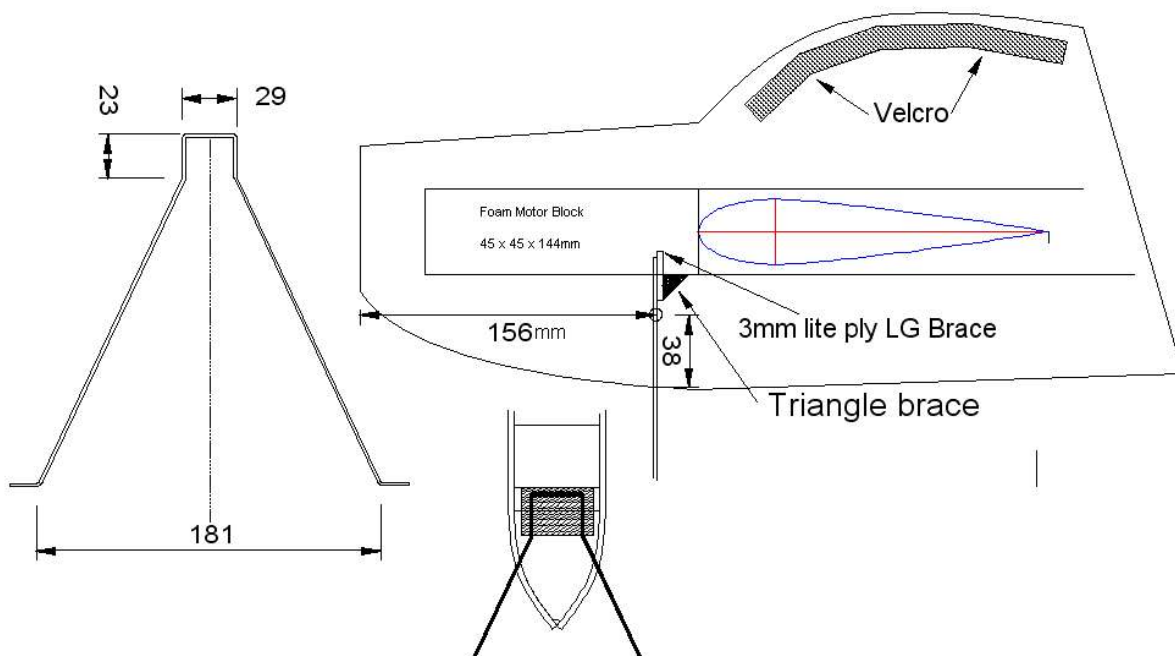
way, stopping at the front of the canopy area. Do the same for the bottom of the fuselage but stop at the leading edge of the wing so you can install the landing gear wire later.

- Now slide the wing into the wing slot you cut earlier. Center the wing using the same string measuring method as you did for the stab. Measure the distance from the tail fin to the wing tips to insure the wing is straight and glue it in place. You can use a bead of Low temp hot melt glue to secure the wing, or small amounts of 5 minute Epoxy. Glue the entire seam on the inside around the wing saddle.

Adding the landing gear

Adding the landing gear is simple and quick. Just be sure to follow the process in the order listed below so it all fits properly. Bend the landing gear to shape using the template attached to the end of the instructions. The triangle stock is glued to the bottom of the ply brace plate, and the plate is slid into the slot you cut into the motor mount block. The landing gear is bent and slid through holes through the fuselage and then pressed into the slot next to the plate. When all fits correctly, slide the ply plate out and goop everything back into the slot.

- Bend the landing gear to the shape shown below.



- Measure out the distances shown in the diagram and make a hole for the landing gear to go through on both sides of the fuse.
- Use a small amount of 5 minute epoxy and glue the triangle support brace to the plywood plate along the bottom back side of the brace as shown.
- Slide the plywood plate into the slot you cut in the motor block.
- Thread one side of the landing gear wire through the holes in the fuselage and pull the gear through until the wire is in position as shown.
- Mix up a hardy batch of 5 minute epoxy (or you could use goop) and smear it on the plywood landing gear plate front and back. Push it into the slot in the motor mount, then push the landing gear wire into

the slot in front of the plywood plate. The pressure of the foam should hold the wire in place while the epoxy sets. Make sure the gear is centered and even.

- ❑ When the glue is finished setting, close the remaining sides of the fuselage up to the nose as you did before using low temp hot glue.

Attaching the tail control surfaces

Now we'll finish the major part of the construction by attaching the control surfaces... We'll do this by attaching the elevators to the joiner tube, then making fiber tape hinges and applying them to the foam. We'll attach the elevator to the stab and then the rudder to the fin.

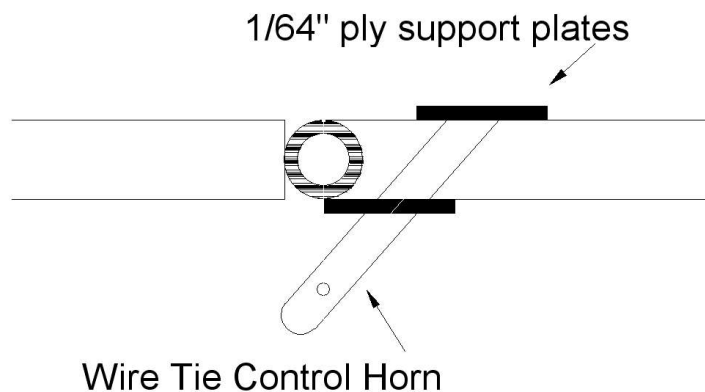
- ❑ Lay out the elevator halves on your workbench over some waxed paper. Measure the stab span and cut the joiner tube about 2mm longer than the elevator. This will leave some clearance for the hinging motion. Mix a small amount of 5 minute epoxy and glue ONE side of the elevator to the tube and let it set.
- ❑ Refer to the diagram on the plan sheet and below for reference to the following procedure. Trim off four 1.5 inch (38mm) piece of .75 (19mm) fiber strapping tape from a roll and cut each of them into 2 halves. Take one pair of the tape strips and place the sticky sides together overlapping them .25 inches (6mm). You should now have a 1.25 inch (32mm) strip that has the sticky side facing in opposite directions on each end. Place the joined center of this strip on the trailing edge of the stab about .5 inches in from the tip and fold the sticky side down against the stab. Lay the next strip down on the opposite side of the stab just over one hinge width and press into place. Repeat this for the third hinge. Do this for all 4 of the hinge groups on the stab.
- ❑ With your sharp #11 Exacto blade, make a hole in the fuse for the elevator joiner tube to go through.
- ❑ Fold the hinges on both sides of the stab to their respective positions as if to attach the elevator. Slide the joiner tube through the fuse at the rear of the stab and line up the edge of the elevator to clear the stab by 1 mm. Press the elevator against the stabilizer's trailing edge with the tips level with the stab and press the hinges into place on the elevator that is glued to the carbon tube. You should now have one elevator half in place and joined to the stab. Make sure the hinges you applied on the side that does not yet have an elevator are folded in the proper position to apply to the elevator once it is glued into place in the next step.
- ❑ Mix up a small batch of 5 minute epoxy and glue the other elevator half to the carbon tube. An easy way to hold the elevator into position is to clamp the elevator in place by using a couple of pieces of scrap ply or Popsicle sticks clamped across the top and bottom of the stab and elevator at the tips, holding the parts together and flat while the epoxy sets. Once the epoxy has set, fold the hinges down an onto the foam to finish the hinging process for the elevators.
- ❑ Using the same hinging method you used for the stab, hinge the rudder onto the fin and fuselage tail. Use 3 sets of hinge points on the fin: top, middle and bottom.
- ❑ Take this time now to bend the tail skid and glue into place. Use the diagram below.
- ❑ Trim the ailerons to length and attach them to the wing in the same way as you did the tail surfaces. Use 3 to 4 hinging points on each aileron.



Installing the radio and motor and attaching the control links

First we'll install the servos into the tail section, then the aileron servo(s). Finally we'll install the rest of the gear and we'll be closer to flying!

- ❑ Place the servos for the elevator and rudder underneath the stab so that they are centered front to back on the stabilizer where it joins the fuselage. Move the servos down toward the bottom of the fuselage 6mm from the stab to accommodate the fuselage stiffener and outline the servo bottom as it is flat against the fuse side. Cut out a tight outline of the servo and trial fit each one onto the fuse. The servo should be flat against the bottom of the fuselage stiffener when it is mounted, as this is what we will be gluing the servo to.
- ❑ Attach the servo extensions to the servo lead and wrap a bit of tape around the junction to make sure they don't get pulled apart by accident. Slip the servo extension lead into the servo hole. Apply some tape around the servo to protect it from the low temp hot glue. Apply some of the low temp hot glue to the top side of the servo that will be flat against the stab. Lean the servo slightly away from the stab to avoid the glue smearing on the bottom of the stab, and slide it into the servo cut out, pressing it firmly into position. Do this for both the rudder and the stab servos.
- ❑ Now we'll apply the control horn reinforcements to all of the control surfaces using the following method. Cut two pieces of the 1/64" ply strip supplied about 10mm long each for each control surface (2 for the elevator, 2 for the rudder, etc). Mix a small bit of epoxy and glue the ply plates to both sides of each control surface where you want the control point to be. Offset them slightly as in the diagram



below.

- ❑ Cut the smooth non-ribbed tip off of the supplied tie wrap material and discard. Cut off about .6 inch of the tie wrap. Using an exacto blade, make a small slit into the ply plates so the tie wrap material can pass through as shown above. It may help to make the holes for the push rod now in the control horn before gluing into place. Epoxy the control horn into place for all surfaces. Put the remaining servos into the plane.

Setting it up to fly

This is the fun part!

If you have dual rates, set your rates to move the controls 30% and 45%. Of course, your settings are as individual as your color scheme, so set them however you feel comfortable. The Edge will perform most any maneuver you want it to perform, but it won't do it for you! The beauty of this plane is that you can try stunts that would normally make your butt pucker with out the fear that one mistake will completely demolish the plane!

Balance the plane at about 3.5" back from the Leading Edge for the first flight and move the CG back an 1/8" inch at a time as you experiment with 3D flight.

Sending your pictures to www.funplanes.com

Please consider sending us a picture of your completed plane! We'd like to post all of the pictures we get on our website. You can send pictures to pictures@funplanes.com

Again, we'd like to thank you for purchasing a funplanes.com kit and wish you many hours of flying enjoyment!