



RC-Xplanes EDGE 540T SMS Tabs Instruction Manual



Unpacking Your RC-Xplanes Kit

Please read all of these instructions before proceeding. This can save you time and money by avoiding costly mistakes.

Congratulations on the purchase of your new RC-Xplanes EDGE 540 T. We guarantee that if you follow these instructions and maximum performance power equipment recommendations, you will be rewarded with the best flying 3D foam aircraft available

Inside the box you will find all of the necessary laser cut and pre grooved foam parts and hardware to complete your airframe. Immediately remove from the bags and inventory all parts included. This is what you should find inside.

1 bag of laser cut Depron foam parts including:

1. 1= Fuselage
2. 1= Wing
3. 1= Horizontal Stabilizer
4. 2= Elevators
5. 1= Rudder
6. 2= Ailerons
7. 2= Front 90 degree supports
8. 2= Rear 90 degree supports
9. 2= 45 degree supports
10. 4= servo mounts

1 long parts bag including:

1. 1= 36" x .156 carbon tube
2. 1= 6" x .156 carbon tube
3. 2= 3" x .156 carbon tube
4. 1= 24" x .050 carbon rod
5. 1= 24" x .032 steel wire
6. 1= 2" length heat shrink
7. 1= 2.75" x 3/8" square hardwood motor mount

1 small parts bag including:

1. 15= DuBro Micro hinges
2. 4= DuBro Micro control horns
3. 4= DuBro Micro E-Z links
4. 4= DuBro Micro E-Z connectors

If you ordered the SMS Outrunner motor package you will also find 1 SMS mount parts bag Including:

1. 8= Lexan Fuse Stiffeners
2. 4= 4-40 x 3/8 nuts
3. 4= Nylon 4-40 screws

These instructions are posted on the Construction Page at www.rcxplanes.com in PDF format to allow you to zoom in on any pictures for clarity.

What you will need to complete your RC-Xplanes EDGE 540 T kit

Power Recommendations

Motor Combos:

1. Hacker A20-22L motor, X20 ESC, APC 11x4.7 Slow Fly prop.
2. AXI 2212/26, Phoenix 25 ESC, APC 11 x 4.7 Slow Fly Prop,
3. Himax 2015-5400 or Park 370 5400, 6.6:1 Gearbox, Phoenix 25 ESC, GWS 12 x 6 Slow Fly Prop. For stick mount kits.

Radio

4 or 6 channel transmitter and receiver.
4 Micro servos.

Radio and servo choices are very subjective. We recommend a good 6 channel computer radio and a 6 channel micro receiver for the added ability of some fun mixes.

Adhesives and tools

RC-Xplanes Thin CA
RC-Xplanes Medium CA
RC-Xplanes CA accelerant
RC-Xplanes 5 minute epoxy
3/4" package strapping tape
Hobby knife
Small screwdrivers
Rulers
Fine point Sharpie
Carbon and metal cutting tools

Battery:

1. Thunder Power Gen 2, 1320 mAh 3s1p

STEP 1: Installing the Spars

Your RC-Xplanes kit will have the grooves for the wing and stabilizer carbon tubes already cut. Lay the wing and stabilizer on a flat bench with the grooves facing up. In the long hardware bag, find and install the 36" x 0.156" carbon tube into the wing slot. Find the 6" x 0.156" carbon tube and install into the stabilizer to insure their fit. Run a bead of RC-Xplanes Thin Odorless CA down both sides of the wing and stabilizer spars. While holding the surface flat on the bench and the carbon tube into the groove, spray some RC-Xplanes CA accelerator on the groove and spar in 8-10 inch sections so you can hold the tube into the wing without getting stuck to your plane. The CA will cure almost immediately when the accelerator is applied so make sure the spar is where you want it and nothing else is in contact with the CA.

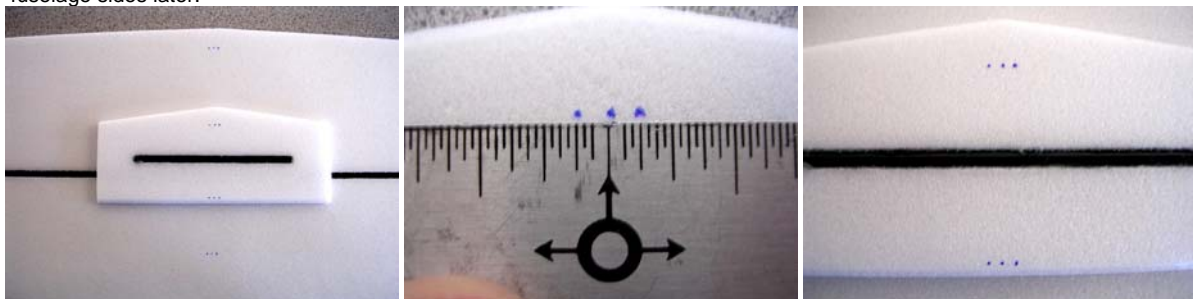
1A:



The main wing spar and stabilizer spar will look like this when installed.

Find the centerline of the wing and stabilizer by measuring from end to end and divide by 2. Do this as close to the leading edge and trailing edge as you possibly can. Now measure out in both directions from center 1/8" and put a small mark at four locations on the spar side of the wing and stabilizer. Two at the leading edge and two at the trailing edge for later reference when installing the wing and stabilizer into the fuse. You should have four reference marks on the wing and four on the stabilizer that will reference the fuselage sides later.

1B:



Step 2: Preparing The Edges and Motor Mount.

Use 220 grit sandpaper on a flat sanding block. This step takes very little time and it is very easy to remove too much material or gall the foam when sanding so use **light** pressure. On all of the edges that are exposed to airflow, sand them into a rounded edge. Place the part on the edge of your bench and sand lengthwise using a different angle on the tool for every pass. The rounded edges will look something like the center picture. For all of the hinged edges of all the control surfaces, sand them into a double beveled configuration by holding the part close to the edge of your bench. Keep the tool at 45 - 50 degrees and move it lengthwise along the leading or hinged edge of the control surface. Use caution not to rush this by using too much pressure or letting the edge of the tool grab the foam. Sand this angle until it is close to the center of the foam thickness and then turn the part over and do the same thing to the other side. Sand this double bevel into the wing, stabilizer and fuselage where the control surfaces mount. The double beveled areas will look similar to the right picture.

2A:



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Find the SMS motor mount parts bag with 8 laser cut Lexan "Ls" and 4, 4-40 x 3/8" Nylon nuts. Sand the 8 Lexan pieces to a frosty white on both sides. Sand the 4 nuts a little on all six sides. Lay the fuselage and the two front 90 degree supports flat on your bench. Take four of the Lexan "Ls" and align them as shown in the left picture over the cutouts in the foam for the mounting nuts. Hold the "Ls" one at a time in place and float a drop or two of thin RC-Xplanes foam safe CA along the edges of the Lexan allowing the CA to travel between the foam and the Lexan. Spray with Accelerant. Repeat for the other three "Ls". Turn the fuselage and 90 degree supports over on your bench. Prepare the four nylon nuts with some wax or Vaseline plugging one end of the threads of the nut without getting any on the sides. Push the nut into the cutout with the plugged end of the nut to the closed end of the cutout. Push the nut all the way to the rear of the cutout and down so the flats are parallel to the foam sides and against the installed Lexan on the bench side. Use two drops of RC-Xplanes Medium CA on each side of each nylon nut and allow to flow down for a few seconds. Align and install the remaining four Lexan "Ls" as you did on the other side. Once cured, use one of the 4 supplied Nylon 4-40 screws to insure that each nut still has clear threads. If not a 4-40 tap can be used at this time to chase any hardened CA from the threads.

2B:

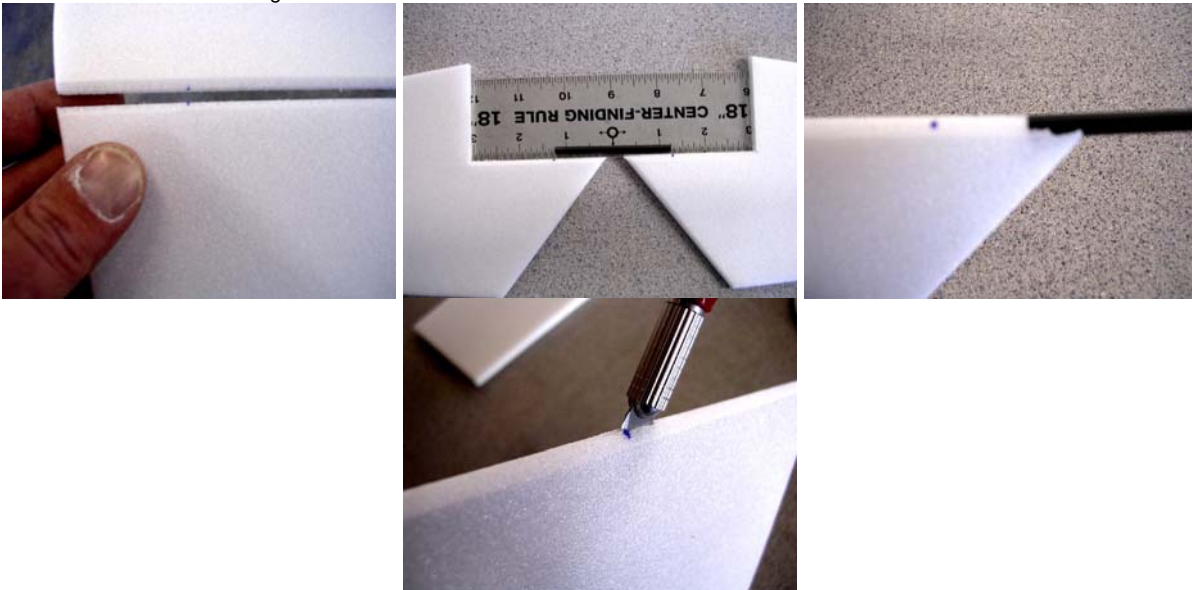


Step 3: Wing and Stabilizer Fitting

Lay the wing and stabilizer flat on your bench with the spars facing up. Match the ailerons to their wing side with the double beveled edge toward the wing and make reference marks for the left and right sides on the bottom surface. Mark each aileron 1.5" from the outside edge on the double beveled edge. Make marks every 5" inward from there so there is four hinge center markings every 5 inches per aileron. Mark the rudder on the double beveled edge at 0.5" down from the counter balance, 0.75" from the bottom edge of the rudder and half way between these two marks for three hinge center marks on the rudder. Align the control surface with the mating surface and transfer the hinge marks.

3A:

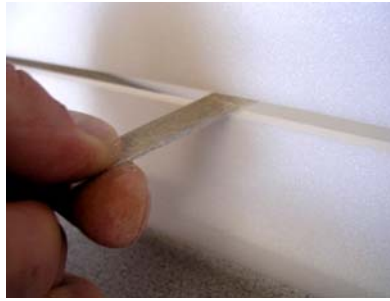
Lay the elevator halves on a flat ruler at 8 1/8" between the counterbalances. Find one of the 3" pieces of 0.156" carbon tubes. Lay it on the ruler in the center of the elevator halves and mark it's end positions on each elevator half. Sharpen one side of the 3" elevator joiner on its inside diameter with a #11 Hobby knife and use it to cut the grooves in each elevator half. Make hinge center marks at 0.5" from the counter balance and 0.5" out from the end of the elevator joiner tube groove. Transfer these hinge marks to the stabilizer. At all of the reference marks you have made, use a sharp #11 blade and make hinge slots that are just a bit longer than the hinge tab is wide. Test fit these surfaces to make certain your hinge slots are all in the correct position. When you are satisfied with this fit, remove the control surfaces and hinges. Set these aside for later installation.



Test fit and adjust if necessary the main wing and rear stabilizer into their fuselage slots. The rule of thumb here is that if the slot is too short the fuselage will bend right or left along its length. If the slot is too narrow the fuselage will try to fold along its length. A word about laser cutting and foam. The CNC laser controls the outside shape very well. As the laser beam goes through the foam it widens by a few thousandths, leaving the beam exit side a slightly different dimension than the entry side. The thicker the foam the more the beam widens. This needs to be corrected on the wing and stabilizer slots. Use the flat jewelers file wrapped in 220 grit sandpaper inserted in the slot and sand the slot on top and bottom at a 90 degree angle in lengthwise direction. Try three or four passes at a time so the slot doesn't get too big. The rear stabilizer should be done at this time as well. Once you are satisfied with the fit put the Fuselage/Wing/Stabilizer assembly into the gluing jig inverted.

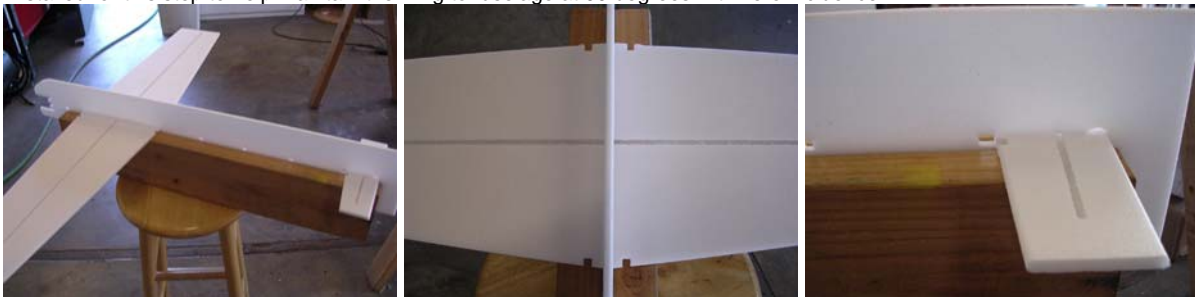
3B:

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3C:

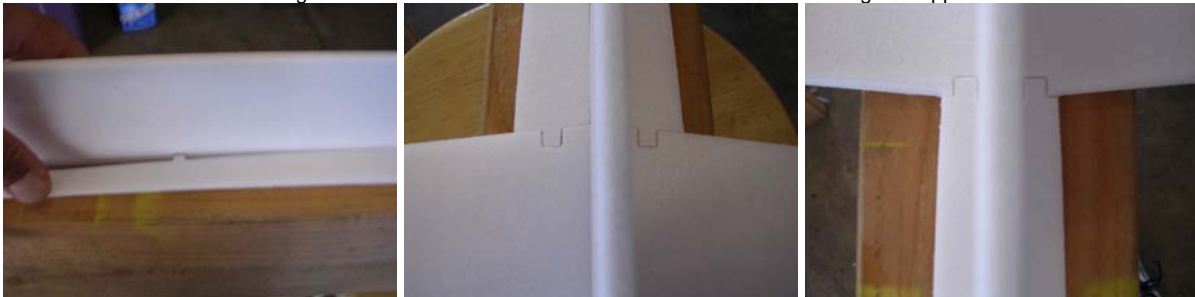
This is my gluing jig and as you can see is not very high tech. It is two lengths of 2X6 board on a surface that will keep them parallel. It doesn't take much. Loosely install the stabilizer and the wing with the spars toward the bottom of the fuselage. The tabs in the wing that are farthest apart will be on the leading edge of the wing. Move the Stabilizer to the rear of its slot. Push the two boards together with the top of the fuselage sandwiched in between them with the wing and stabilizer installed. The plane will be inverted. The marks that reference the fuselage sides, made in Step 1, should be just visible on both sides at the front and rear of the wing. The stabilizer is installed for this step to help maintain the wing to fuselage at 90 degrees with zero incidence.



Step 4: 90 Degree Support System

4A:

Find the two 90 degree rear fuselage supports and the two 90 degree front fuselage supports that you have previously installed the motor mount system into. With the plane inverted in your jig, insert the rear 90 degree support tabs into the wing trailing edge slots and press the support tabs into the fuselage holes. Slide the stabilizer forward engaging the tabs and slots at the leading edge of the stabilizer. Insure that the tabs and slots at the wing and stabilizer are even with the front and rear of the 90 degree supports.



4B:

Install the two front 90 degree supports and your outrunner motor radial mount. You will be using the radial mount to hold the 90 degree supports at the front while they are attached. Insert the front 90 degree support rear tabs into the wing leading edge slots and press the tabs into the fuselage holes. Screw your motors radial mount to the fuselage securely. Screw the radial mount to the 90 degree supports just firmly insuring the supports remain at 90 degrees to the fuselage. Align the rear of the front 90 degree supports to the wing leading edge. Hold the rear 90 degree supports into the fuselage and tack glue them at the fuselage tab positions with CA and accelerant. Repeat this for the front 90 degree supports. Measure from the wing trailing edge tip to the fuselage rear edge on both sides to insure the wing is in square to the fuselage. Run a bead of CA along the wing / fuselage joint and apply accelerant on both sides. Measure from the wing trailing edge to the stabilizer trailing edge on both sides to insure the stabilizer is square to the wing. Apply CA to the stabilizer / fuselage joint on both sides and apply accelerant. Apply CA to all of the 90 degree support joints at the fuselage, wing and stabilizer and apply accelerant.

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- 4C:** In the area indicated in shade, Install 3/4" strapping tape on both sides of the fuselage. Trim it as shown for a taper from 10" to zero at the stabilizer trailing edge. Use a heat gun or hair drier on low or a covering iron with a cover sock to adhere the tape to the fuse. Do not overheat the foam. It is more resistant to heat than most foam but can be melted.



Step 5: 45 Degree Support System

Find the two long 45 Degree Fuselage Supports that run from the rear stabilizer trailing edge to the motor mount area and prepare them with a 45 degree bevel for the entire thickness of the foam and length of the part on both long edges facing the same surface. You should have two parts that are prepared like the left picture below.

Start by lining up the narrow end of the 45 Degree Support with the stabilizer trailing edge. Use thin, foam safe RC-Xplanes CA to tack glue about 1" of the support at the rear aligned with the stabilizer trailing edge, 1" at the wing trailing edge and 1" at the front end on the fuselage and 90 degree supports. When you are satisfied with the alignment, apply some accelerator to these six points to hold it in place. Now use light pressure to hold the support against the fuselage and 90 degree supports. Run a bead of the RC-Xplanes thin CA along the 45 degree support to fuselage joint and the 45 to 90 degree support joint to the wing trailing edge. When you are satisfied with its placement, use just enough pressure to hold it in place and not distort the fuselage while you apply the accelerator to the portion of the support joints that CA has been applied stopping short of the end of the last CA application by an inch or so. Continue this process to the front of the fuselage. Repeat the process for the other side.

5A:

Trim the overhanging front edge of the 45 degree support even with the profile of the front radius of the front 90 degree fuselage support to finish it off. The right picture below shows what the front should look like after you have trimmed it. You should really be able to notice the rigidity of the triangulated RC-Xplanes fuselage system as compared to any other foamy you have built.



Step 6: Control Surface Hinging.

Some people have used CA to attach the DuBro hinges but I have yet to find a reliable way to get the CA into the hinge slot with the hinge installed and the CA cures too fast to install a coated hinge and properly align everything so I use the epoxy method as outlined here.

Prepare the 15 small DuBro hinges by applying some wax, Vaseline or in this case Blistex, to the barrel portion. Fold the hinge over and do the same thing again. Work the lubricant into the barrel by folding the hinge back and forth a couple of times and set it aside, partially folded on its edge. Do not get the lubricant on any of the hinge that you want adhesive to stick. Repeat this for all of the hinges.

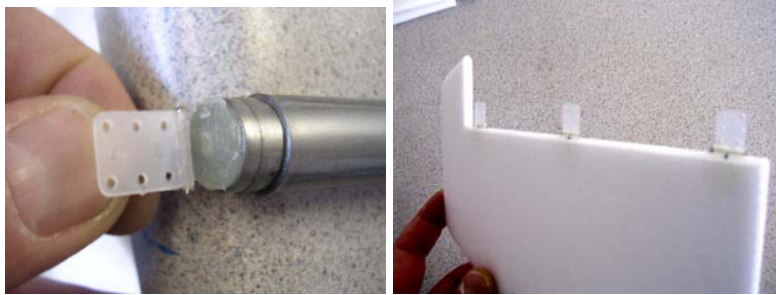
Use RC-Xplanes 5 minute epoxy to mount the hinges into the control surface. This step requires that you move quickly to distribute the epoxy before it sets up. Mix enough epoxy to do 4 hinges at a time. Use a "T" pin or a discarded #11 blade to apply some of the epoxy into the slots in one of the ailerons. Apply a little epoxy to both sides of one of the hinge tabs and slip it into the slot about $\frac{3}{4}$ depth.

6A:

Excess epoxy can be removed from both sides of the hinge with a pocket screwdriver or similar tool. Insert the hinge in to the slot until the barrel is almost touching. Move quickly to get all four hinges into the surface, then sight down the hinge line and align them as close as you can by eye. The hinge will function fine with some alignment offset in the hinges and this works great every time. Set the aileron aside and repeat this for the remaining control surfaces.

By the time you finish installing the last hinges, the first control surface should be ready to install to the plane. They will look similar to this. Use the same techniques of installing 4 hinges or less at a time and install all of the control surfaces and allow them to cure.

Make sure each aileron end is aligned with the wing end and that there is clearance between the control surface counterbalances and the stabilizer ends for each elevator half and the rudder.



In this step you will test fit the elevator joiner to the elevators and prepare some waxed paper spacers and tape to hold everything aligned while the adhesive is hardened.

Hang both elevator halves at 90 degrees to the stabilizer exposing the grooves for the joiner tube. Slip the tube through the hole in the fuselage and lay it into the grooves in each elevator half. Rotate the elevators up and align with the stabilizer. Prepare some folded waxed paper spacers to fit snugly between the elevator joiner tube and the stabilizer. Also prepare two pieces of tape to tape the elevators to the stabilizer. Remove the waxed paper and hang the elevators down and remove the carbon joiner tube.

6C:

Use 150 or 200 grit sandpaper and sand the elevator joiner tube with lengthwise scuffs for the adhesive to grip. With the Elevators hanging down at 90 degrees to the stabilizer, run a bead of medium CA in the joiner grooves. Slip the joiner tube through the fuselage hole and into both joiner grooves. Begin rotating both elevator halves up into place while slipping the pre-prepared waxed paper into place. Continue rotating the elevator halves up and align with the stabilizer. Make sure the waxed paper is lightly pushing the joiner tube into the bottom of the joiner tube grooves. Tape the elevators to the stabilizer and insure the joiner tube is perpendicular to the stabilizer trailing edge. Remove any excess CA with a paper towel. Apply CA accelerant and allow to fully cure for 4 – 5 minutes before disturbing.

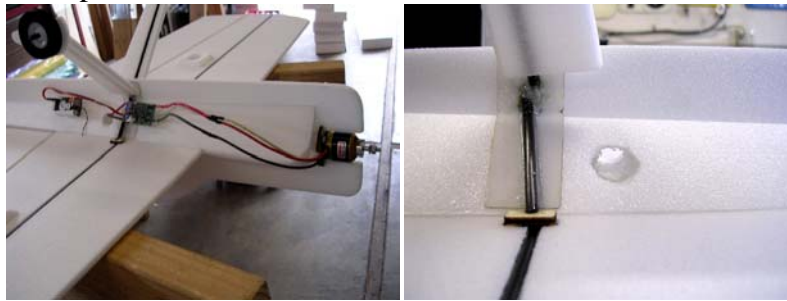


Step 7: Motor & Radio Gear Installation

Connect your motor and speed control. Mount the motor using the four nylon screws supplied. Mark the location of the Speed Control. Apply a piece of self adhesive Velcro to the controller and fuselage where it will live. Attach the receiver just in front of the wing trailing edge with the servo connector pins facing rearward. All of the following measurements are for a four HiTec HS55 setup. If you decide on a different setup, you are on your own as to their placement. Make a hole at 1 inch behind the wing spar through both 45 degree supports and the fuselage large enough to pass the Dean's battery connector through. Make a small rectangle cutout in the fuselage just behind the receiver pins for the right wing and elevator servo connectors to pass through.

7A:

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Find the four servo mounts as shown in the bottom of the left photo below. These servo mounts are generic and some adjustment to the inside area will be needed to achieve a good fit with your servos. Cut or sand 45 degree angles around all five edges of two mounts making one for the left side and one for the right side wing as shown as the two outer mounts in the upper portion of the left photo.

- 7B:** The remaining two mounts for the tail servos will require some additional modification as follows. Mark and cut off 0.25" from the top edge where the servo control horn attaches. On this edge the 45 degree angle will be cut on the backside opposite of the 4 front side edges. These back cut edges will match the 45 degree support when installed on the fuselage. Leave the bottom edge un beveled as it will be modified when its final location is determined. Mark the areas that need to be modified for servo fitment by tracing around your servo and cutting this area out with a sharp hobby knife. Make a 45 degree cut out on both sides of the servo horn travel area. Mark and notch the area for the servo wire to exit.

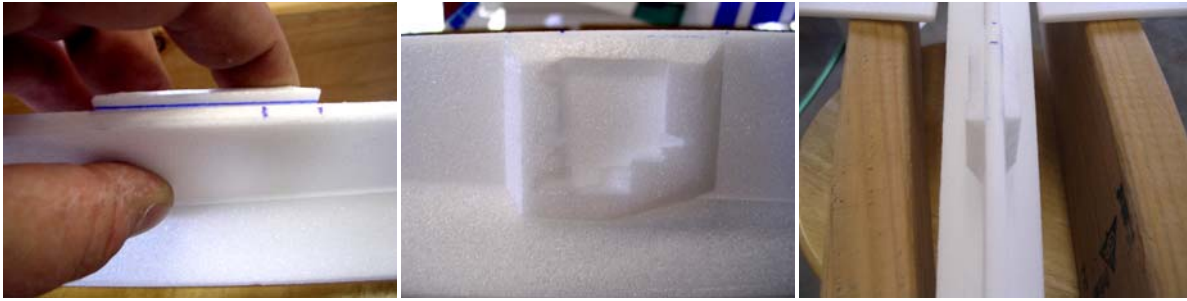


- 7C:** On each wing, locate a point at 6.5" from the 45 degree support / wing joint and 1 3/8" from the wing trailing edge and mark it there. Use two rulers at 90 degrees to each other to simplify the location of this point. Make another mark at 7.5" from the 45 degree support / wing joint and 1 3/8" from the wing trailing edge. Connect these two points with a line. From the 6.5" x 1.3/8" point. Make a 1" line extending away from the wing trailing edge at 90 degrees to the line you made at 1 3/8" along the trailing edge. This will be your visual reference when installing the servo mounts to the wing and represent the servos position. The last picture shows the installed right wing servo mount. Run a bead of medium RC-Xplanes CA around the surface of the servo mount that will mate to the wing. Hold the servo mount over your reference marks with the fuselage edge just touching the wing and the rest off the wing while you align the marks with the inside area of the servo mount. When you have it where you want it, Press the mount in place. Apply RC-Xplanes CA accelerant to the inside and outside of the mount. Repeat this procedure for the left wing servo mount.



- 7D:** Locate the wing trailing edge point on the very bottom of the fuselage by using a square or wide ruler end from the wing bottom surface. Now make a mark rearward from there at 8 3/8" on the bottom of the fuselage. Dry install the servo mount by lining this mark up with the forward edge of the servo cutout. Insure the back cut 45 degree at the top of the servo mount is flush against the 45 degree fuselage support. Make a mark on the bottom of the fuselage at the leading edge of the servo mount itself. You may notice that the servo mount hangs below the fuselage lower edge. Mark the backside of the mount in line with the fuselage bottom edge. Cut the servo mount at this point as necessary and cut or sand the 45 degree angle into the bottom edge of the servo mount outer face. Run a bead of medium CA around the surfaces that contact the fuselage and 45 degree support. Line up your marks and the back cut 45 degree angle and press the servo mount in place. Apply CA accelerant to the mount. Repeat this for the other side directly opposite this mount.

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Prepare four servos as shown. Start with a fresh model memory in your radio if possible. Zero all trims and sub trims. Center all of your servos with your radio for each channel and mark the servos for that channel. Use the long double-sided arms with the largest holes if you are using HiTec HS55s. Test each one of the arms on each servo to get the best 90 degree orientation without trims on each servo. Mark the horn arms for their location and cut off the unnecessary opposing arms. Install the EZ connectors to the farthest holes from center. Press the plastic retainers on the posts with the rounded side toward the arm. Install the horns to your centered servos as they were marked. **MAKE SURE THE SERVO HORN SCREWS ARE TIGHT.**

7E:

Use a dab of clear silicone inside the center of each servo mount. Make sure the servos are centered and the horn screws are tight. Press the appropriate servo into its mount. If needed, tape or clamp the tail control servos in place while the silicone cures. Gravity should hold the aileron servos in place

Find the 0.032" wire and make two, pieces with 90 degree bends on one end at 2" in length from the bend to the end for the aileron control rods. Loosely install the rods in the wing servos with the bent end facing the fuselage. Mark a point just inside the rod on the aileron for the control horn center position. The Elevator control horn center location will be just behind the right elevator joiner tube and 0.75" out from the fuselage. The Rudder control horn mounts on the left side at 1 3/8" from the bottom edge of the rudder.

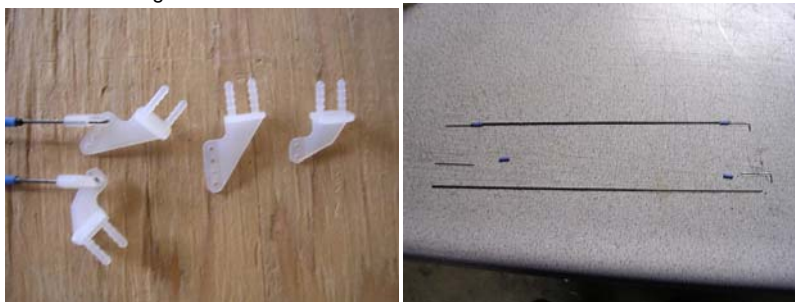


Before Installing the surface control horns, you will need to modify all four of them to look like the one at the far right of the left picture below using a pair of diagonal cutters.

Once modified, the control horns will allow for full control surface movement and can be mounted at the locations marked in step 7E. The marks are the centerline of the control horn. Place the control horn on the surface with the center aligned with the mark and the holes aligned with the hinge centerline. Press them lightly to make two dents where the posts will go. Push a "T" pin through the surface at these dents. Apply some Medium CA to the posts and the bottom surface of the horn base. Push the control horn posts into the surface holes until the base contacts the surface and apply CA accelerant.

7F:

Find the 24" x 0.050" carbon rod, the remaining 0.032" wire and the 2" section of heat shrink tubing. Make two more 90 degree wires that are 1" long from the bend. Make two straight 1" long wires. Cut four 0.25" sections of the heat shrink. Make one 0.050" carbon rod 9.5" long and one 7.75" long. It is very important to sand the wire and the carbon rod for a good CA bond. Sand one end of each carbon rod and the straight portions of all four wires. Slip a 0.25" piece of shrink tube over the sanded end of the carbon rod at 1/32" from the end and insert the sanded end of the 90 degree bent wire into the heat shrink tube sticking out 1/32" past the other end of the shrink tube. Shrink the tube in this position. Apply a drop of thin CA to the wire at the carbon rod side and allow it to flow through the inside of the heat shrink tube toward the 90 degree end. When you see the CA coming through the heat shrink, set aside for 2-3 minutes then apply accelerant. Repeat this for the other carbon rod. Insert the 90 degree bend into the lowest hole of the control surface horn and align the rod to the centered servo arm E-Z connector. Mark this end at 0.5" from the E-Z connector and cut it off there on both control rods. Sand this end of the carbon rod and repeat the attachment procedure above for the two straight 0.032" wire ends.



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Attach all of the control rods to their servos and control horns. Clean up the wiring by taping it down with small sections of clear tape. Push a "T" pin through the wing close to the antenna wire receiver exit and run the antenna through the hole to the top of the wing. Route it down the fuselage and tape in a few places. Install some self adhesive Velcro to the bottom of the 45 degree supports in front of the wing spar and its mating Velcro to your battery. Install your APC 11 x 4.7 prop. The CG point should be at the wing spar to 1" behind the spar. Forward CG allows for smooth precision patterns and rearward CG allows for easier 3D and hovering. Depending on your flying style, you should try to achieve the farthest forward CG that still allows for easy 3D flight. Turn on your radio and plug in your battery. Make sure that all inputs move the surfaces in the correct direction. Set all of the surfaces centered with no trim or sub trim in your radio setup. Following is a good place to start from. Set the high rates to get the maximum available throw for each surface without bind and apply your favorite exponential to these. Make your low rates 50% of the high rates with your favorite exponential for them. For a Hacker A20-22L or AXI 2212/26 set your ESC for High timing advance, Disabled brake, Soft cutoff, 9 V cutoff voltage, Auto throttle sensing, and Normal over amp sensitivity.

7G:



One very important part of flying your new RC-Xplanes Edge 540 T is a good preflight inspection before you throw it in the air with the prop screaming.

Always do a radio and range check, this includes making sure that all of the surfaces do what you want with the input you give. Little can be done if the plane is in the air and rolls right with left roll input or goes down with up elevator.

Make sure your computer radio mixes do what you expect when activated.

Make sure all of your control hardware, Motor and prop, Battery etc. is firmly attached.

The Most Important rule?

Have a blast and show your buddies what an RC-Xplanes Edge 540 T will do with you at the sticks.

By constructing this model, you agree to use the model in a responsible manor and at your own risk and that you are solely responsible for any damages that may occur as a result of its use or misuse. You further indemnify and hold faultless RC-Xplanes and its officers, distributors, retailers and assignees in the case of any such damages and legal action that may result from its use or misuse.