CARF MODELS

Assembly Manual

Edge 540

2.6m

Introduction to the Edge 540

Congratulations on acquiring your new Composite Arf 2.6m Edge 540! Here at Composite Arf we endeavour to bring you the best model aircraft possible, built with modern and innovative techniques. The Edge 540 is constructed using our revolutionary Total Area Vacuum Sandwich (TAVS) technology. All composite components are painted in the mould, allowing a quality finish with the least amount of weight added. Adding paint after construction only adds weight!

This Edge 540 is designed from the ground up, it's not just a modified Extra with a new wing! We used drawings from the full scale Edge to construct the best possible model using CAD design techniques.

All flying surfaces on the Edge 540 are hinged using our unique 4mm hinge pin and phenolic hinge plate system. The surface hinging is pre installed and aligned at the factory. All surfaces are removable, and hinged centrally. The Composite Arf Edge 540 is the first aerobatic plane of our huge catalogue which uses separated ailerons. They are laminated in their own moulds and pin hinged like the elevator or rudder of our conventional kits. The counterbalances emphasize the scale appearance of our Edge and they also decrease the load on the servos.

The fuselage of the Edge 540 is large for a 2.6m model. It's big enough to accommodate just about any boxer twin, even a 150 or 170cc!! We tried this on the prototype, and the power was breathtaking! Clearly a 100-120cc twin will give you the optimum power to weigh ratio, keeping the Edge light will optimize its amazing flight performance for both 3D and IMAC. The large control surfaces on the Composite Arf Edge 540 are big! 45-50deg deflections really bring this Edge to life, making it a freestyle beast! However, dial back the throws and you will be surprised how well this model will flow through an IMAC sequence, rolls are precise, spins are effortless and the snaps are crisp and clean.

The following sections in this manual are designed to make the assembly of your Edge 540 as effortless and trouble free as possible. Every effort has been made to ensure that the performance of this Edge is spectacular, with a little bit of effort from you, we expect this will be an Edge 540 that you are very proud of!

Liability Exclusions

You have acquired a kit, which can be assembled into a fully working R/C model when fitted out with suitable accessories, as described in the instruction manual with the kit. However, as manufacturers, we at Composite-ARF are not in a position to influence the way you build and operate your model, and we have no control over the methods you use to install, operate and maintain the radio control system components. For this reason we are obliged to deny all liability for loss, damage or costs which are incurred due to the incompetent or incorrect application and operation of our products, or which are connected with such operation in any way. Unless otherwise prescribed by binding law, the obligation of the Composite-ARF company to pay compensation is excluded, regardless of the legal argument employed. This applies to personal injury, death, damage to buildings, loss of turnover and business, interruption of business or other direct and indirect consequent damages. In all circumstances our total liability is limited to the amount which you actually paid for this model.

BY OPERATING THIS MODEL YOU ASSUME FULL RESPONSIBILITY FOR YOUR ACTIONS.

It is important to understand that Composite-ARF Co., Ltd, is unable to monitor whether you follow the instructions contained in this instruction manual regarding the construction, operation and maintenance of the aircraft, nor whether you install and use the radio control system correctly. For this reason we at Composite-ARF are unable to guarantee or provide a contractual agreement with any individual or company that the model you have made will function correctly and safely. You, as operator of the model, must rely upon your own expertise and judgement in acquiring and operating this model.

Things that are handy to know

Personal safety:

There are couple of things that are good to keep in mind when you are assembling your Edge 540. Some of them are common sense, but it doesn't hurt to be reminded. While you are working with tools and sharp implements, be aware of others around you and the environment you are working it. Always wear eye protection, and when working with solvents and glues, keep your area ventilated. When cutting or sanding materials, always wear a face mask to avoid inhaling particles. Keep your work environment clean and tidy at all times. A clean workshop will enhance the experience. Protect all parts from scratches and dents. Use rubber matting on your bench, and be careful of components like screws getting between the part you are working on and the bench.

Assembly process:

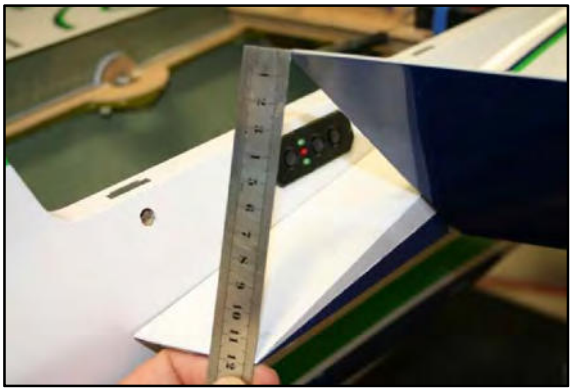
This assembly manual is set out in an order that simplifies the process. Each step is in an order that leads into the next. You may wish to change and do some things in a different order, which is fine provided you keep in mind that some things need to be done before some others. The cowl for instance must be completely assembled and fitted to the fuselage before the engine can be fitted. It's important that the engine position is measured from the completed cowl.

When planning out the installation of your components, always keep the centre of gravity location in mind. The C of G is 140mm from the leading edge of the wing. As the leading edge is straight, where you measure from is up to you, but from the tip is sometimes easiest. If you plan ahead you can avoid having to add weight to your model. It is far easier to remedy a nose heavy model than a tail heavy model. A few grams of lead at the rear is preferable to hundreds of grams in the nose! You will find that it is easiest to fit items that cannot be relocated, like aileron and elevator servos, before you do a preliminary C of G check. Rudder servo(s), RX and ignition batteries etc can generally be relocated to suit your requirements.

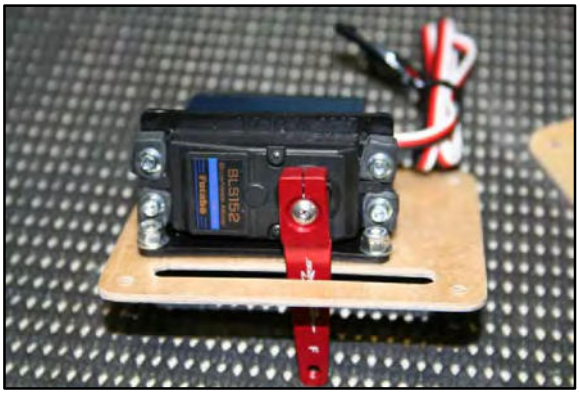
Most of all, enjoy the process of creating your new Composite Arf Edge 540, a job well done is always satisfying!

Servo arms:

The longer the servo arm the more pressure there is on the servo. If you are not into full 3D consider using 1.25” arms, you will still get plenty of surface travel, just not the extreme movement. Extreme surface travel is mostly only handy for post stalled manoeuvres like rolling harriers, very flat spins and the likes. But having extreme throws comes at a price, the possibility of high speed flutter is increased, and servo resolution is compromised for IMAC/sports flying.



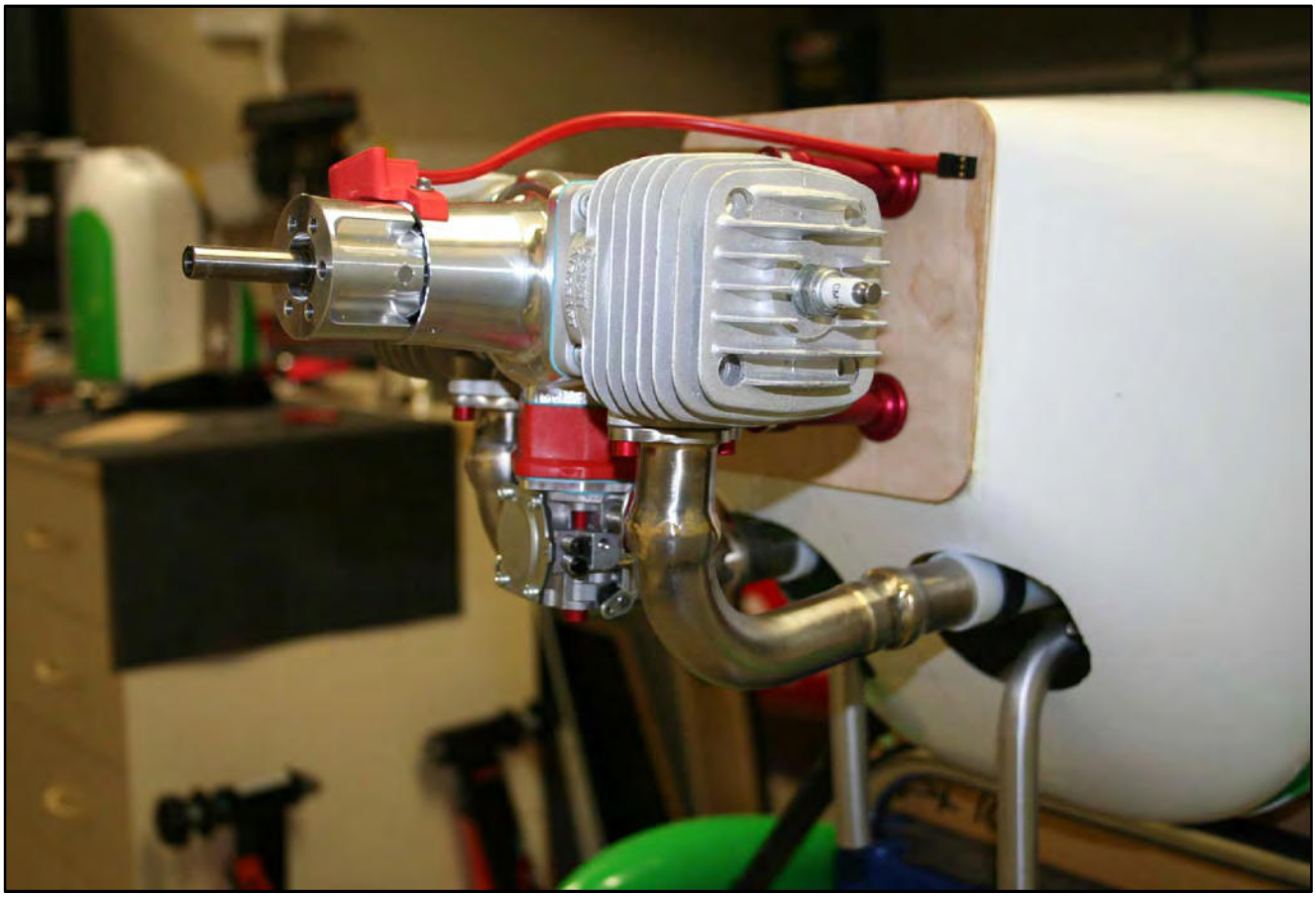
If you are intending to use your Edge for IMAC and some general sports flying the 1.25” are ideal, they also give enough travel for some pretty good 3d work, along with a pretty blistering roll rate. But if 3D is your thing and you want all the travel you can get, then 1.5” arms can be used, but you need to keep in mind that the possibility of high speed flutter is increased, and you should take all possible steps to eliminate this possibility. Using a 30kg servo would be considered a minimum when using 1.5” arms.



Engine Choices:

There is a multitude of engines available for you to use in your Edge 540. As mentioned before a 150cc engine will easily fit in the engine bay. However the airframe is more suited to today’s current crop of 100cc to 120cc engines. We used a DA120 in the process of producing this manual, and we have to say the flight performance is staggering, not sure why you would need a 150!

But if you already have a 150 just sitting in the workshop needing a new home, well, be our guest!



Build Requirements

Additional Components:

- **Engine.**
  100cc-120cc twin cylinder. (DA120 used in this manual)
  Stand off's. 2" plus is required. (SWB 2" to 2 7/16 stand off's were used in this manual)
- **Exhaust**
  We strongly suggest the use of canister mufflers, obviously a lot is dependent on your engine selection, the following types will fit easily to the Edge.
  MTW TD75K (front exit)
  KS86V (front exit)
  Both MTW and KS make adjustable headers to suit their canisters.
- **Fuel**
  32oz (950cc) DuBro fuel tank #690
  Tygon fuel line
  Fuel dot or filler
  Fuel filter
- **Wheels**
  4.5" – 5". DuBro, Kavan or similar
  Tailwheel assembly. J&J traditional or direct drive (or similar)
- **Servo's**
  High quality high torque for all flying surfaces (5-6 required), we recommend;
  JR DS8911, DS6301 or DS6311HV
  Futaba S9157 or BLS152
  Throttle – any good quality servo, but make it a good one. A good constant idle requires a precise servo, such as a JR DS8231.
- **Alloy Servo Arms**
  SWB, Secraft, Hanger 9 or similar. 1.25" - 1.5" for Elevators and aileron. (Phenolic rudder horn supplied)
- **Spinner**
  5" Ultimate style
- **Receiver and Ignition Batteries**
  Owner's choice
  Battery straps

Adhesives:

- **Epoxy**
  Loctite Hysol 9462, recommended. Or 30min epoxy. (If using 30min epoxy you will need micro balloons and (or) milled glass fibre. Hysol 9462 does not require these items)
- **CA Glue**
  Thick and thin types, as well as plastic applicable CA
- **Silicone Adhesive** (Silastic, optional for canopy)

We use Hysol 9642 in all areas where epoxy was required, during the build for this manual.

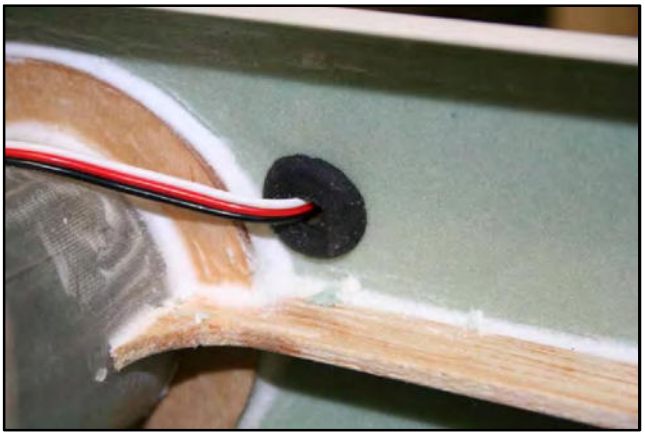
For surface cleaning we recommend old fashioned liquid lighter fluid such as "Ronsonol". Do not use acetone for cleaning the external painted surfaces, damage to the paint could occur. (If in doubt, test on a small area that will not be seen).

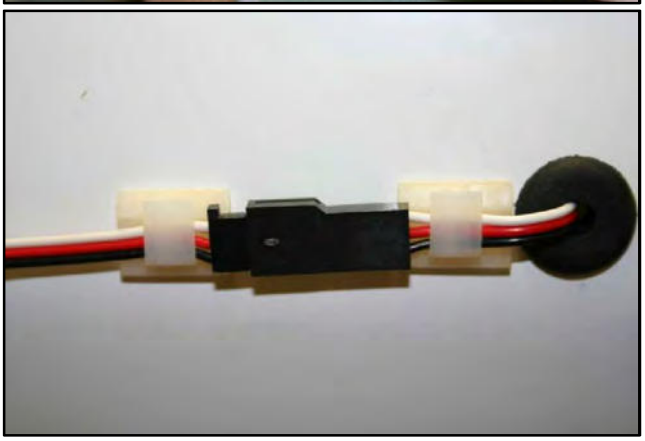
Tools Required

You will not require any specialized tools to build your Edge 540. However some items make the job a little easier, such as a tapered reamer (RC car body reamer), a step drill bit and a centre drill bit. These items make drilling holes in the composite materials less problematic, and very simple. Normal drills , can at times, tear at the material, particularly when making larger holes. The centre dill bit ensures an accurate drill path during the drilling process. These items should be easily obtained from your local hobby store, and or hardware store like “Home Depot” etc. If you can’t obtain these style items, don’t stress, the job can still be done with a little due care.

- **Electric or Battery Drill**
  Pedestal type preferred, hand held
- **Drill Bits**
  Various sizes, metric
- **Sharp Knife**
  X-Acto or similar
- **Measuring**
  Steel rule(s), tape measure, square (ruler), small level
- **Dremel Tool**
  With cutting discs, sanding drums, and various burrs
- **Hand Tools**
  Screw drivers, pliers, ball drivers, hex drivers etc
- **Additional Materials**
  Masking tape, sand paper, marking pen, soft cloth (towels)

Securing fuel line and servo extension leads is made a little easier when you use self adhesive clips and rubber grommets. Most of these items should be readily available from your local hardware store. You may have other methods that you prefer to use to protect your leads and fuel lines, and that is fine, as long as they are secured in position and protected from chaffing where they pass through, or over structural components.





Landing Gear

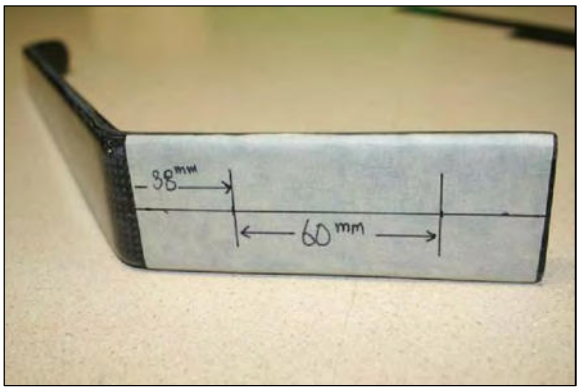
It's easier to fit the landing gear as the first step, you will find it easier to handle the model when it's on its wheels. Drilling the legs is easier if you have a pedestal drill, and a No 3 centring drill bit. However this process can easily be done with a hand drill and a 6.5mm drill bit with due care.

Parts Required:

- *Undercarriage Legs*
- *Wheel Pants*
- *Landing Gear Parts Bag*
- *Wheels 4.5 -5" (not supplied)*

Tools Required:

- *Electric Drill (pedestal type preferred)*
- *Drill Bit – 3mm, 6mm and 6.5mm*
- *6mm Hex driver*
- *10mm spanner*
- *Steel rule(s)*
- *Masking tape*
- *Marking pen*
- *Epoxy (30min or Hysol)*



The undercarriage legs for the Composite – ARF Edge 540 are very strong and very light, thanks to the laminated carbon manufacturing process that has been used. The legs are held in place with four - 6mm x 20mm cap head bolts, you will need to mark and drill the four holes required. The carbon legs are both identical and can be used on either side. The T-nuts are already pre fitted to the undercarriage mount plate for you at the factory. Two bolts are used on each leg, and are inserted from the bottom of the fuselage.

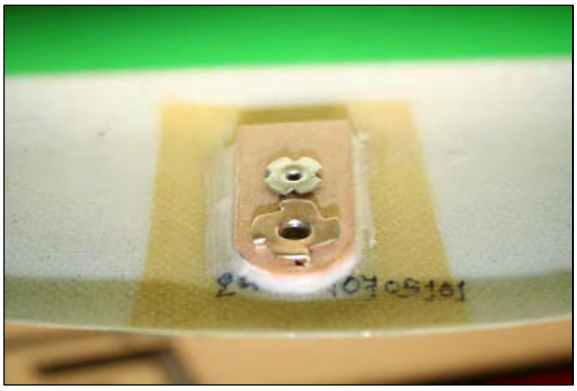
Place some masking tape on the upper surface of both the carbon legs and draw a centre line along the top surface. Place a straight edge on the outer surface of the leg, and measure 38mm from the edge of the straight edge, and make a mark. The mounting holes need to be 60mm apart, so make a further mark 60mm from the 38mm mark.

The mounting bolts used are 6mm, so use a 6.2 - 6.5mm drill bit to make the necessary holes. Using a pedestal drill really makes the job a lot easier, and you will have less chance of drifting off the correct drill path. If you are using a hand held drill, it will be wise to drill a pilot hole first before proceeding to the correct size drill bit. Take your time and drill straight!

On the lower surface of the carbon leg you see a dimple marking for the location of the wheel axle. Drill a 6mm hole for the axle, and a 3mm hole 20mm above the centre of the axle hole, for the wheel pant retention bolt.

Wheel Pants:

The wheel pants are recessed to fit against the carbon undercarriage legs, you will need to epoxy in place the “U” shaped milled plywood pieces to the inside of the wheel pants. Rough up the inner surface of the wheel pant with some sand paper, prior to applying epoxy. This section of the wheel pant is reinforced with Kevlar, and the recessed moulded section is quite prominent and easy to locate. Epoxy the plywood “U’ piece in place and set aside until cured.

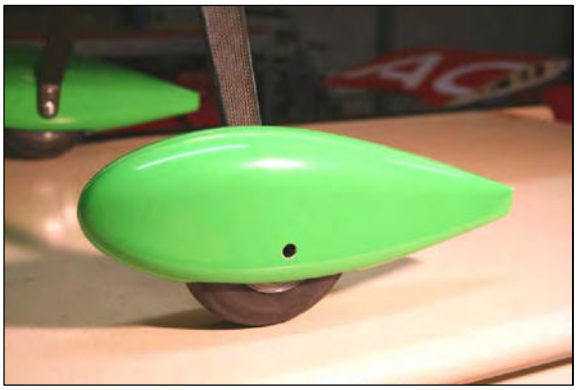


After the epoxy has cured, locate the dimple in the recess at the inside outer surface of the wheel pant. You need to drill at this point a hole large enough to accommodate a 6mm T-nut, a 7.5mm drill bit will do nicely.

You will notice that the 6mm T-nut protrudes well past the surface of the wheel pant. At this point you can elect to cut down the threaded portion of the T-nut, or simply let the T-nut stand proud inside the wheel pant. If you elect to let the T-nut stand proud, don’t forget to fill the space between the T-nut and the ply with epoxy and micro balloons (if using Hysol you will not need micro balloons).

When you have the 6mm T-nut secured in place trial fit the wheel pant to the landing gear leg. At this point you can use the 3mm hole that you drilled earlier as a drill guide to drill the wheel pant. When you have done this insert a 3mm T-nut into place in the wheel pant.

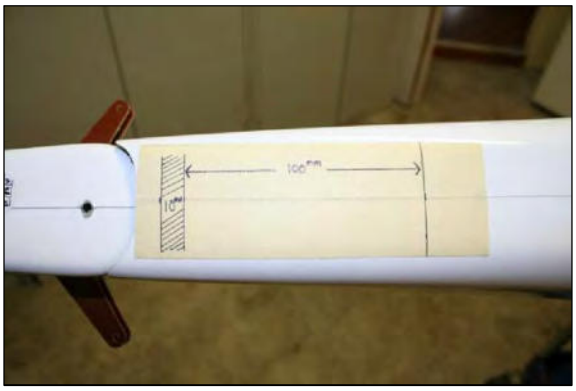
Locate the 6mm x 70mm axle cap head axle bolt, wheel collars, 6mm flat washers and 6mm nylock nuts. The positioning of the wheel collars is shown in the picture opposite. You will now need to drill a hole in the outer surface of the wheel pant big enough for the axle bolt to pass through.



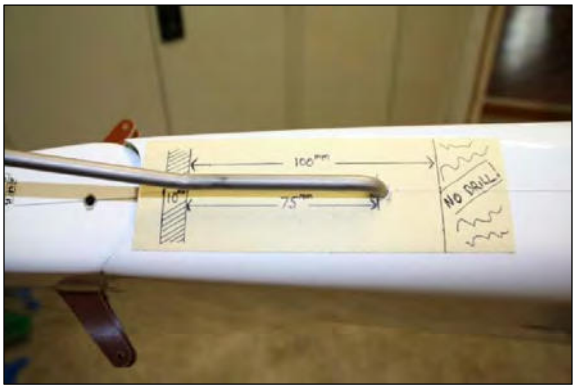
Assemble the wheel and axle onto the landing gear leg, ensuring that the wheel remains able to rotate freely. Please note if you are using Dubro wheel, you will need to drill out the axle hole to 6mm.

Tailwheel Assembly:

When fitting the tailwheel assembly, the choice of wire style, or carbon leaf style, is completely up to your personal preference. You will find there is plenty of area behind the stern post to accommodate almost all types of commercially available tailwheel assemblies. The flat bottom surface of the Composite Arf Edge 540 makes tailwheel assembly mounting very simple. During construction we elected to use a Haig style titanium wire tailwheel assembly from J&J Tailwheels.

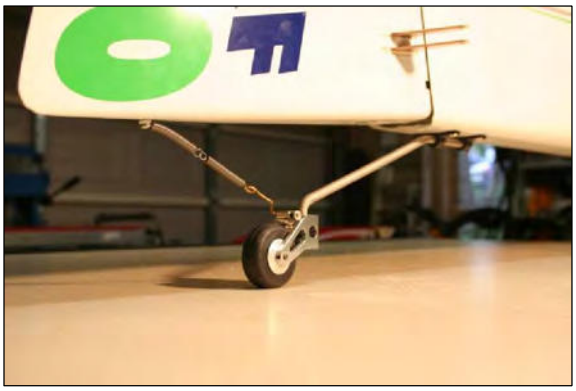


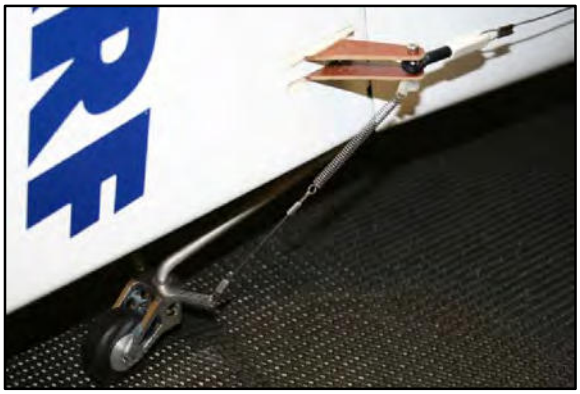
Behind the stern post there is a pre installed ply mounting plate to accommodate the fitment of the tailwheel assembly. First up, you need to place a strip of masking tape along the bottom rear of the fuselage, and then you need to locate the position of the stern post! This is pretty simple using the following procedure. Measure from the end of the fuselage to the surface of the stern post. Mark the beginning of the stern post on the bottom of the fuselage. The stern post is 10mm thick, mark this area clearly on the bottom of the fuselage. The tailwheel mounting plate is approximately 100mm long, and is mounted directly in front of the stern post. Measure 100mm from the rear of the stern post, this is the area you have available to mount your chosen tailwheel assembly.



If you elect to use the J&J tailwheel, simply measure 70mm from the stern post and drill a 6.2mm hole in the centre of the fuselage. You should chamfer the rear edge of this hole sightly to accommodate the bend in the wire. Place the plastic mounting straps evenly along the wire and drill the appropriate size holes for the mounting screws.

If you are using a traditional style tailwheel assembly which requires springs to facilitate steering, consider mounting them to the underside of the ball link retention bolt on the rudder control horn. Simply use a long bolt and add some Dubro #557 horn brackets to attach the springs. Alternatively if you use a direct drive system which attaches directly to the rudder, you will need to apply some epoxy and micro balloons to the mounting area, where the spring retaining bolt is fitted.





Cowl

Parts Required:

- *Cowl Assembly*
- *Fuselage Parts Bag*

Tools Required:

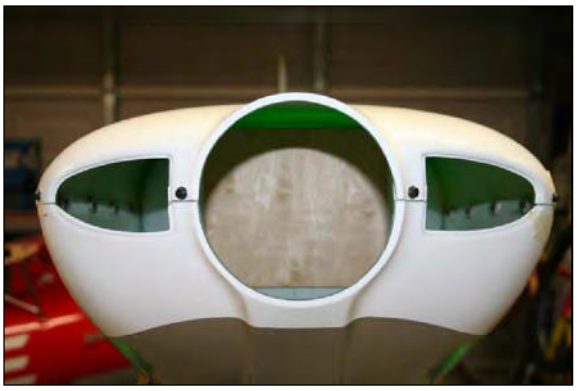
- *Electric Drill*
- *Drill Bit – 3mm*
- *3mm Hex driver*
- *Steel rule(s)*
- *Tape Measure*
- *Masking tape*
- *Marking pen*
- *Epoxy (30min or Hysol)*

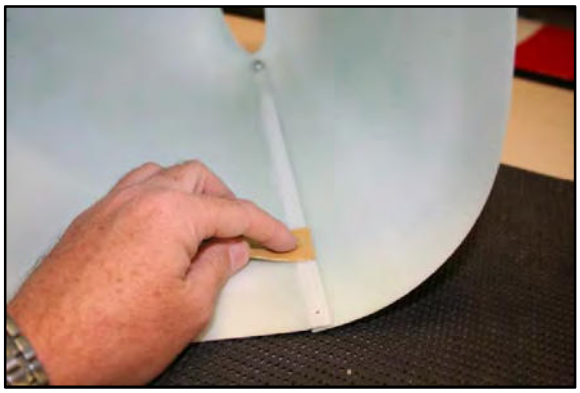
The mounting of the cowl is one area where you should take your time, don't rush this. While it's not difficult, careful marking and alignment will make the outcome far more satisfying. As you can see the cowl is a two piece configuration, which requires you mate both halves of the cowl, and to properly align the cowl as a whole on the fuselage. The cowl assembly is pre cut and trimmed at the Composite Arf factory and should require very little alignment and adjustment to make the perfect fit.

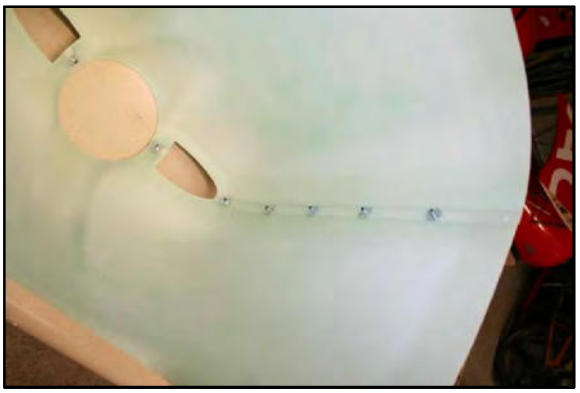
First up you should join both halves of the cowl together. Using masking tape, temporarily join both halves of the cowl. The overlap at the front of the cowl may need some sanding to make the joining of both cowl halves satisfactory (see top picture). Be careful not to remove more material than is absolutely necessary. When you are satisfied with the fit of both halves, mark a line 5mm above the join on the top portion of the cowl. The first hole to drill should be the front bolt closest to the spinner. Make a mark on the cowl at the centre between the spinner and the air inlet hole. Make sure both halves of the cowl align properly, and drill your first hole! Take a breath, stay calm, and do the other side! Well done! We're on our way.

On the side of the cowl, mark your next hole 10mm from the rear edge of the cowl. From that point make a mark 70mm toward the front of the cowl, and then repeat 3 more times. In all, each side of the cowl will have 7 bolts. When you are satisfied with your placement, use a 3mm drill bit to drill the required holes. Insert a 3mm cap head bolt in each hole with a T-nut attached upside down from the inside of the cowl. The first hole 10mm from the rear edge of the cowl does not have a T-nut attached to the inside of the cowl. The bolt in this hole has double duty, being used to mount the cowl assembly to the fuselage. You will need to mix up some epoxy and micro balloons to apply around the edge of each of the T-nuts. Ensure you lightly sand the area that each T-nut sits on first. Remember **NO** T-nut is fitted on the first hole!!!

Set cowl aside and let epoxy cure.







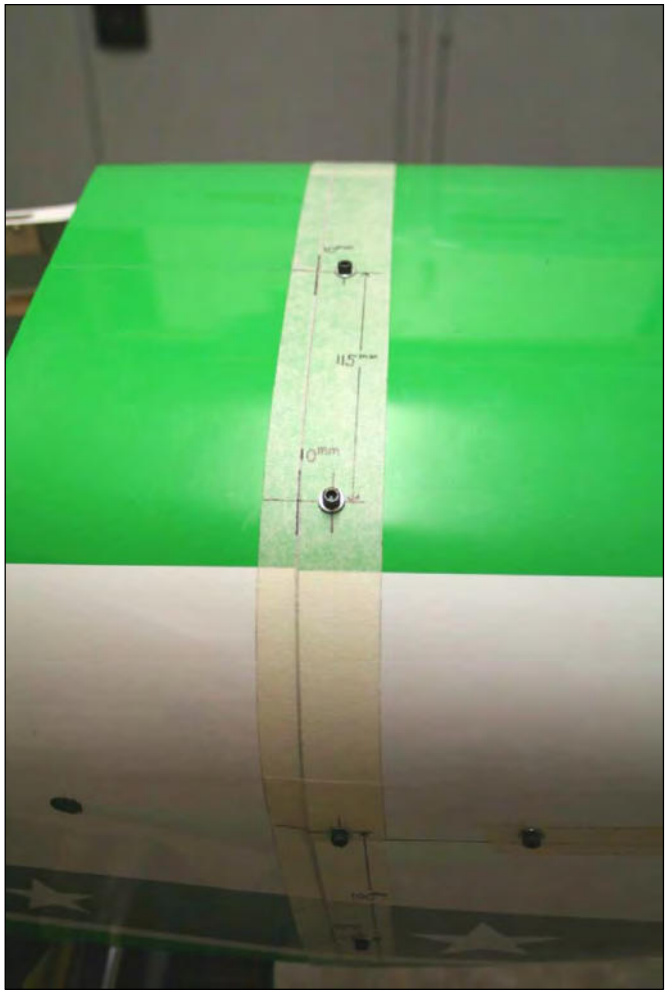
Now that both the top and bottom halves of the cowl are joined, it's time to mount the complete assembly to the fuselage. Align the cowl on the fuselage and check the fit. Now is the time to make any small adjustments if necessary. If all is OK, secure the cowl onto the fuselage with masking tape.

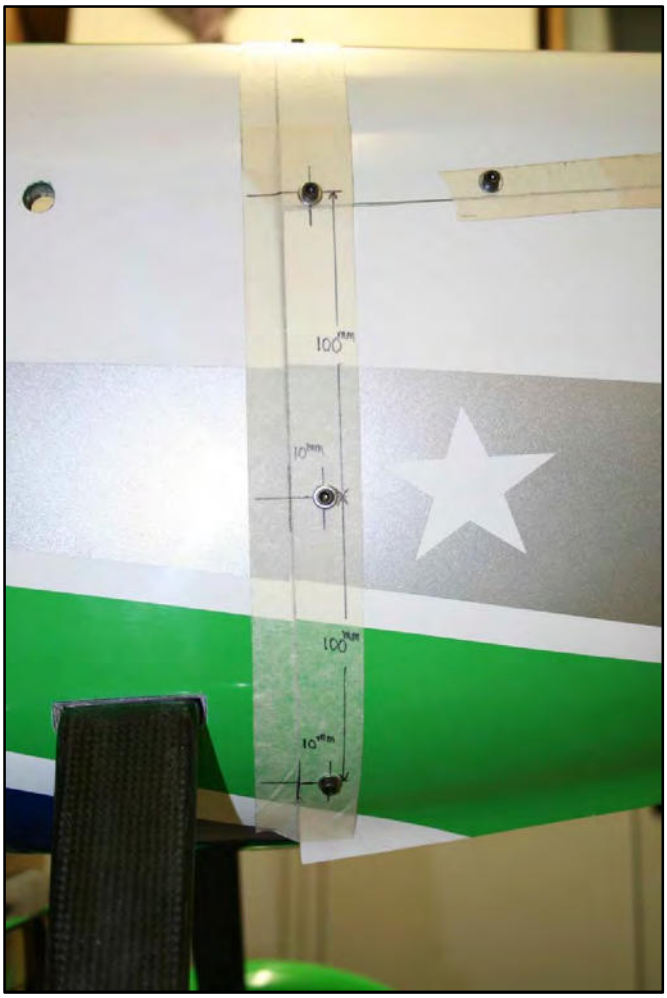
The first bolt to fit is the top bolt. Finding centre here is pretty simple, just use the seam line at the top of the fuselage. Make a mark 10mm from the rear edge of the cowl. All the bolts securing the cowl to the fuselage will be 10mm from the rear edge. From your centre mark measure 115mm, and make a mark. Do this on both sides of the centre line.

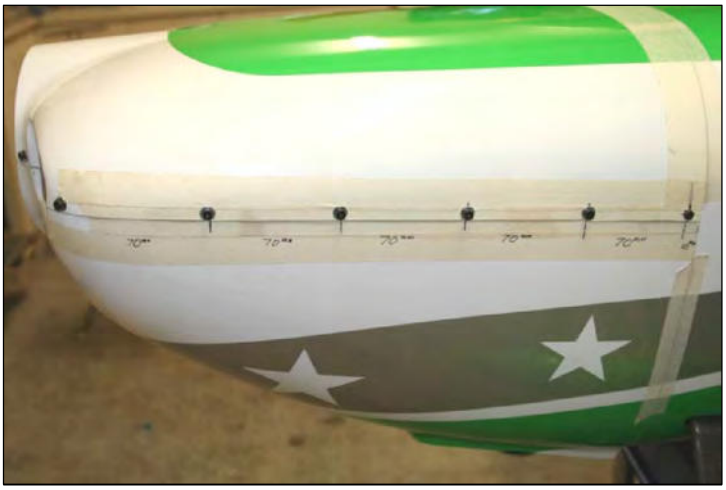
Time to drill your holes with a 3mm drill bit. Don't forget to drill the hole where you have left the T-nut off when joining the two halves. Place a 3mm cap head bolt in each hole with an upside down T-nut attached from inside the fuselage. You can now move further around the cowl underneath the join line.

Measure 100mm from the side bolt and make a mark, then a further mark 100mm below. Drill your holes with a 3mm drill bit, and attach the 3mm cap head bolts with upside down T-nut from inside the fuselage. Repeat this process on the other side of the fuselage. Now it's time to epoxy the T-nuts in place, again don't forget to light sand the area where the T-nuts sit.

That's it, the cowl is done!







Engine Installation

Parts Required:

- *Cowl Assembly*
- *Fuselage Parts Bag*
- *Standoffs. 2" SWB adjustable stand off's*

Tools Required:

- *Electric Drill*
- *Drill Bit – various*
- *Square (rule)*
- *Steel rule(s)*
- *Level*
- *Masking tape*
- *Marking pen*

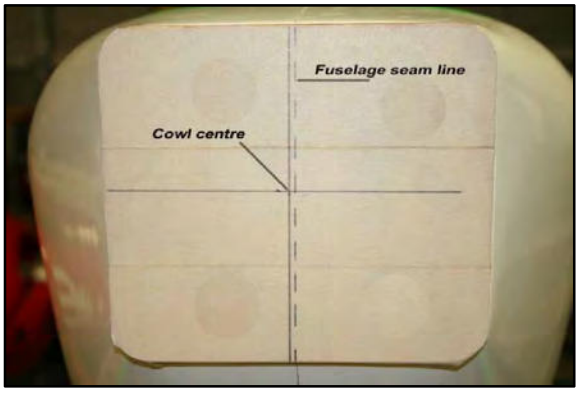
The engine installation requires that the cowl assembly be fitted first. In order to obtain correct engine to cowl alignment, you will need to get some reference marks that can only be obtained when the cowl is complete and fitted. The Edge cowl is shaped to accommodate a 5" spinner, and correct alignment will enhance the appearance when done correctly. First up you need to attach the cowl assembly, and transpose the spinners centre from the cowl to the fuselage firewall. It's not really that difficult, but you may want another set of hands available to assist you.

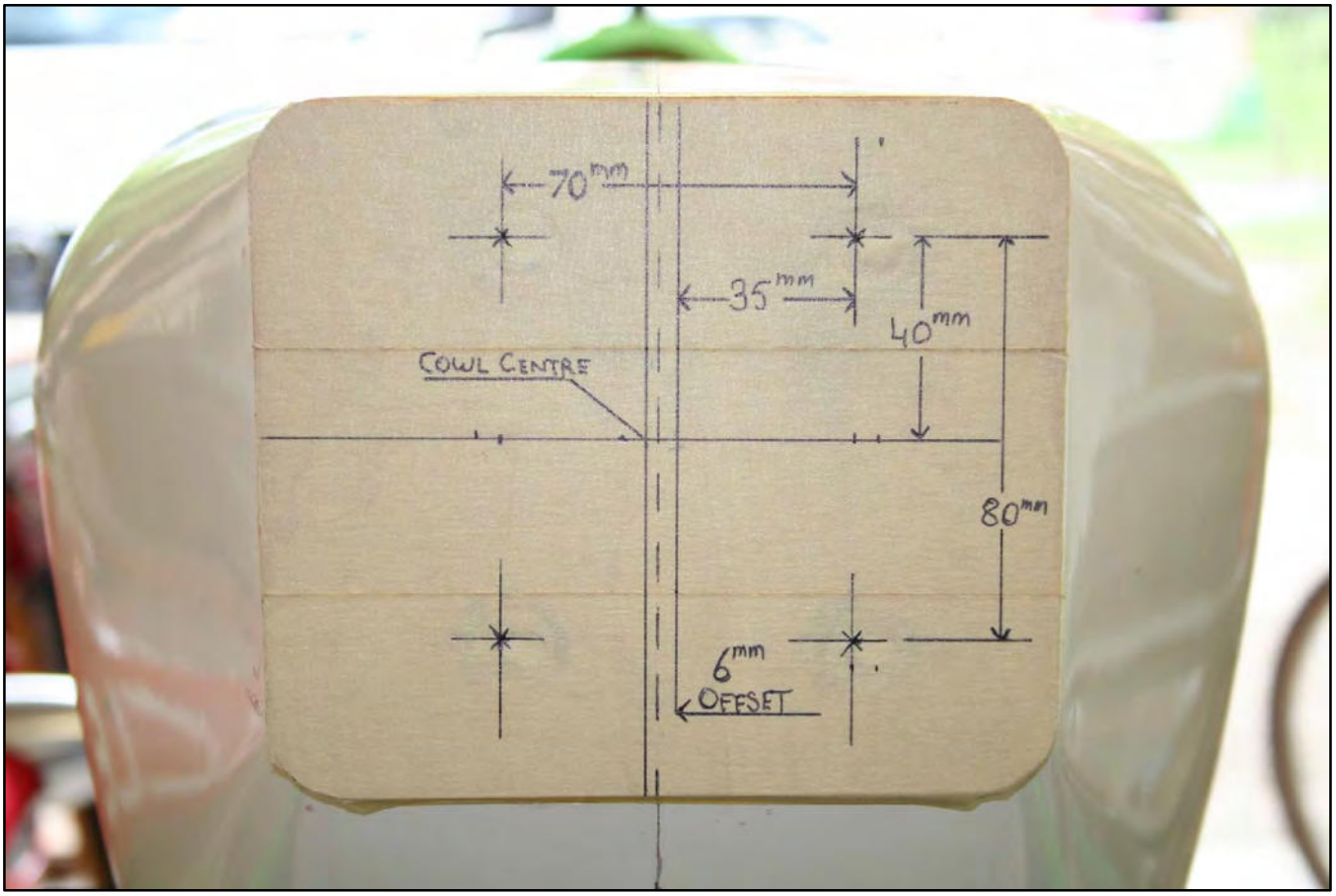
Don't be tempted to just use the bottom portion of the cowl only! While this makes the process look a little simpler, the cowl can change it's over all shape when both halves are joined, resulting in an incorrect spinner to cowl alignment. So, let's get started!

First up you need to mask off the ply firewall on the fuselage, then fit the cowl securely. Next, we are aiming to image the spinner centre from the cowl onto the firewall. To do this we will need a square (ruler) and a small steel rule. Place the small steel rule across the horizontal centre line in the spinner area of the cowl. Using your square set flat against the firewall, find the horizontal line as indicated by the small rule, and make a mark. You have now found the horizontal line for the engine.

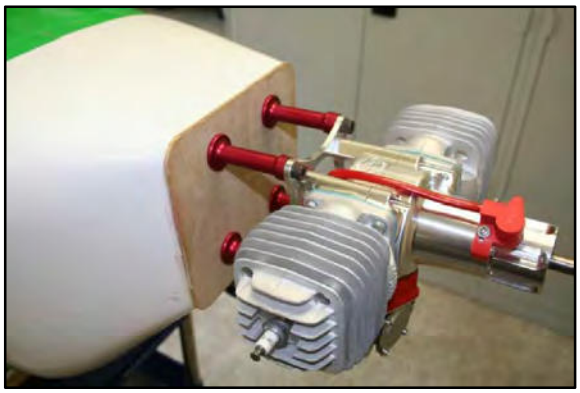
To find the vertical line place the small steel rule edge onto the spinner area of the cowl. Place the square horizontally flat against the fire wall, and move into the spinner centre position, mark this position on the firewall. Now that you have a vertical and horizontal mark, you can now use these marks to draw out the position of the engine. Remove the cowl and get ready to mark out the engine placement. Use the seam line of the fuselage as reference, but you can also place a small level on the wing tube socket in the fuselage make sure everything is level.

While the firewall is set at 0°, the front of the cowl is offset to 2.5°. So you will need to place an offset line from the centre line on the firewall. The offset equates to 6mm.





A DA100/120 has a bolt separation pattern of 70mm across and 80mm from top to bottom. Make your marks as shown in the picture above.

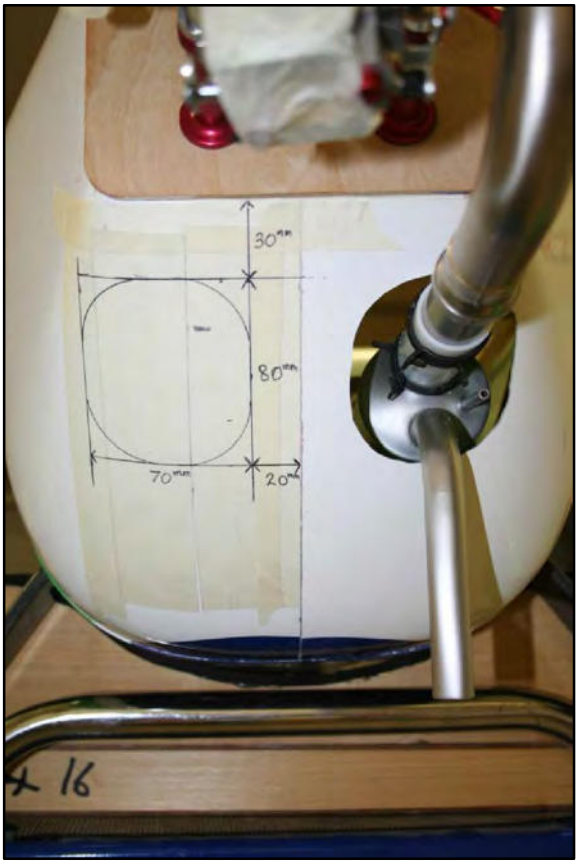


When you are satisfied with your engine position markings, drill your mounting holes. Drill a 3mm pilot hole first, then use a 7mm drill bit to enlarge the hole to suit the 6mm T-nut. Using a 6mm bolt and a washer pull the T-nuts into position.

The engine standoff's need to be 54mm on the RH side and 58mm on the LH side (pilots view), to achieve the correct thrust line. If you are using the SWB standoff's this is easy to achieve using the adjustment washers supplied. Simply use one large adjustment washer per LH stand off, and one medium, per RH standoff.

As the standoffs are over 50mm it is wise to wrap the standoffs in carbon cloth. This will assist in eliminating excess vibration due to the length of the standoffs. You simply layup some carbon cloth with some epoxy and wrap the carbon around the standoffs, as shown in the picture. When cured the standoffs will now be like a unified dome rather than individual standoffs. You will be surprised at how much vibration this will reduce.

Exhaust Installation



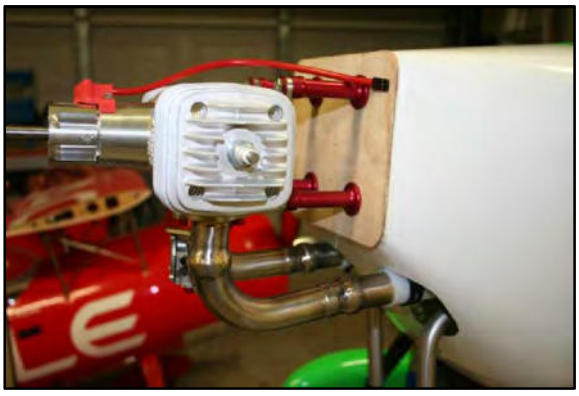
Parts Required:

- *Exhaust System. (KS86V, MTW TD75 etc)*
- *Headers. (KS Comfort Headers, MTW Knuckle headers etc)*
- *Canister Mounts*

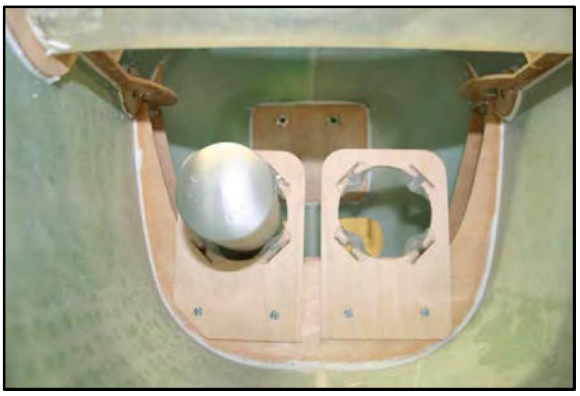
Tools Required:

- *Electric Drill*
- *Drill Bit – various*
- *Dremel tool*
- *Square (rule)*
- *Steel rule(s)*
- *Masking tape*
- *Marking pen*

Mounting a canister exhaust system in the Edge is pretty straight forward. Obviously there is a large selection of canisters on the market to purchase. During assembly we used KS86V front exit canisters. However there is enough room in the fuselage to accommodate most brands and styles of exhausts. Adjustable headers were also used to fine tune the positioning of our canister. Adjustable headers such as those produced by MTW and KS really make the canister installation process much easier. If you wish to use readymade headers you will need a set with a 60mm drop.



Mask off the bottom of the engine dome in preparation for marking out the desired cut out area. Again the area that needs to be cut out will vary dependant on your exhaust selection. It's important with a dual canister installation that you keep the centre seam area intact, try and leave 20mm on either side of the seam uncut.



Use the engine dome centre seam line as a reference for marking out the area that requires cutting out. As you can see from the pictures, we removed an area 80mm x 70mm. This gave us plenty of room to pass the canister through, and allows air to flow in and around the canister. Use your Dremel tool with a suitable cutting burr to cut out the area you have marked out. Don't forget to use safety glasses and a face mask!

To mount your canisters we have supplied two sizes of plywood canister mounts, you will need to select the appropriate size. You can mount the plywood mounts on the rear of the undercarriage mounting plate. Keep in mind when drilling the mounting holes, not to drill into the carbon undercarriage legs! Place the mounts to suit your canisters, there is no need for definitive measurements here, whatever suits your needs! There is plenty of room to move them around to suit.

Tuned pipes can also be fitted if desired. There is plenty of room to pass tuned pipes between the undercarriage mounting plates and the wing tube. However you will need to rethink how and where you will mount the rudder servo(s). The supplied rudder tray will definitely be in the way when installing tuned pipes, you will need to relocate the rudder servo(s) to suit your installation.

Ignition and battery mounting

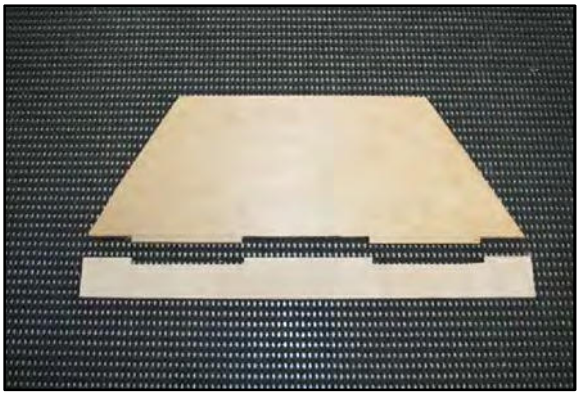
At this point in the assembly process it pays to think about where you wish to place your ignition, ignition battery, kill switch and receiver batteries. If you are using one of the current crop of light weight engines such as the DA120 (2.25kg), you will need to place as much of the on board weight as far forward as possible to obtain the required C of G. Obviously if you are using an engine in the region of 3kg this is less critical.

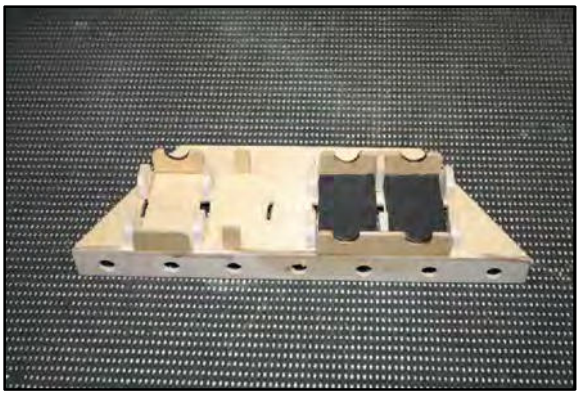
The ignition and ignition battery can always be attached to the engine dome using zip ties, and or Velcro straps. If you choose to mount them this way ensure you use high density foam around these items to protect them from excessive vibration. Do not pull the zip ties down too tight!

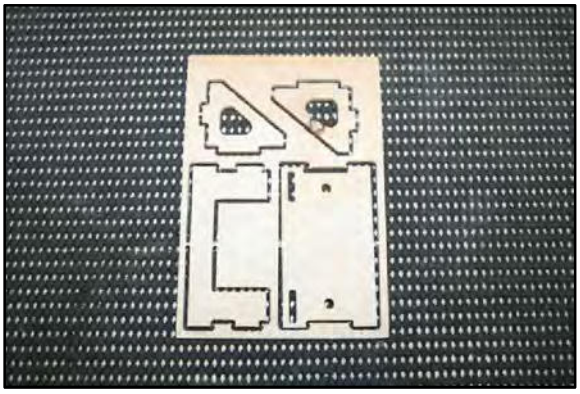
One option is to place all of the batteries on a tray mounted behind the firewall. This is a pretty simple process which will require some 3mm ply to make the tray. The ply tray needs to be shaped to fit behind the firewall inside the engine dome. The tray is shaped like a blunt pyramid, and measures 17cm at the front, 28cm at the rear and is 10cm deep. These measurements may vary slightly from model to model, so make a cardboard template first, then, you can make any adjustments necessary before you start cutting ply.

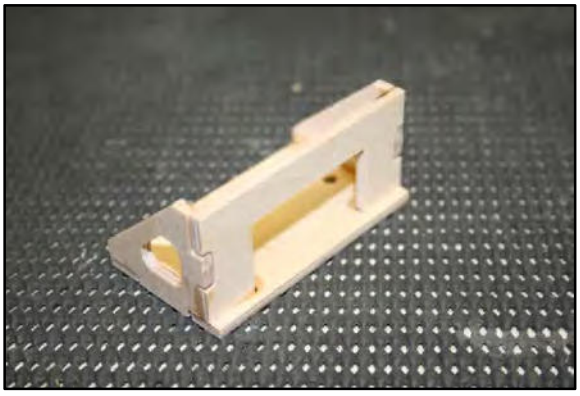
How you place the items on the tray is dependent on the equipment you choose. As you can see from the pictures, we had no trouble fitting everything we needed on the tray. One other advantage of the tray is, you can mount the throttle servo underneath it. When mounting the tray inside the engine dome, keep in mind the throttle servo position. If positioned correctly you will have a nice straight path for your throttle push rod. We have provided a plywood throttle servo mount in the hardware pack for you.

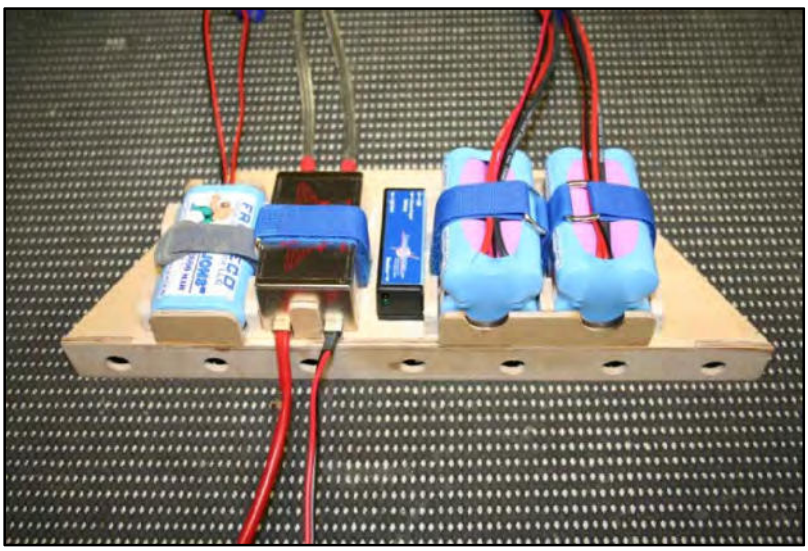
For the DA120, the throttle servo arm needed to be positioned approximately 50mm from the LH front inner corner of the engine dome. However please take some measurements to verify the position that suite your requirements.

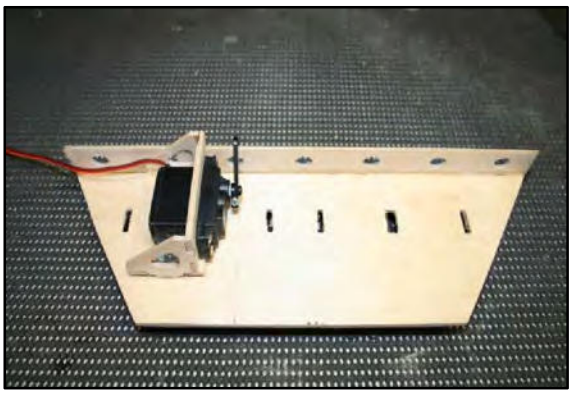




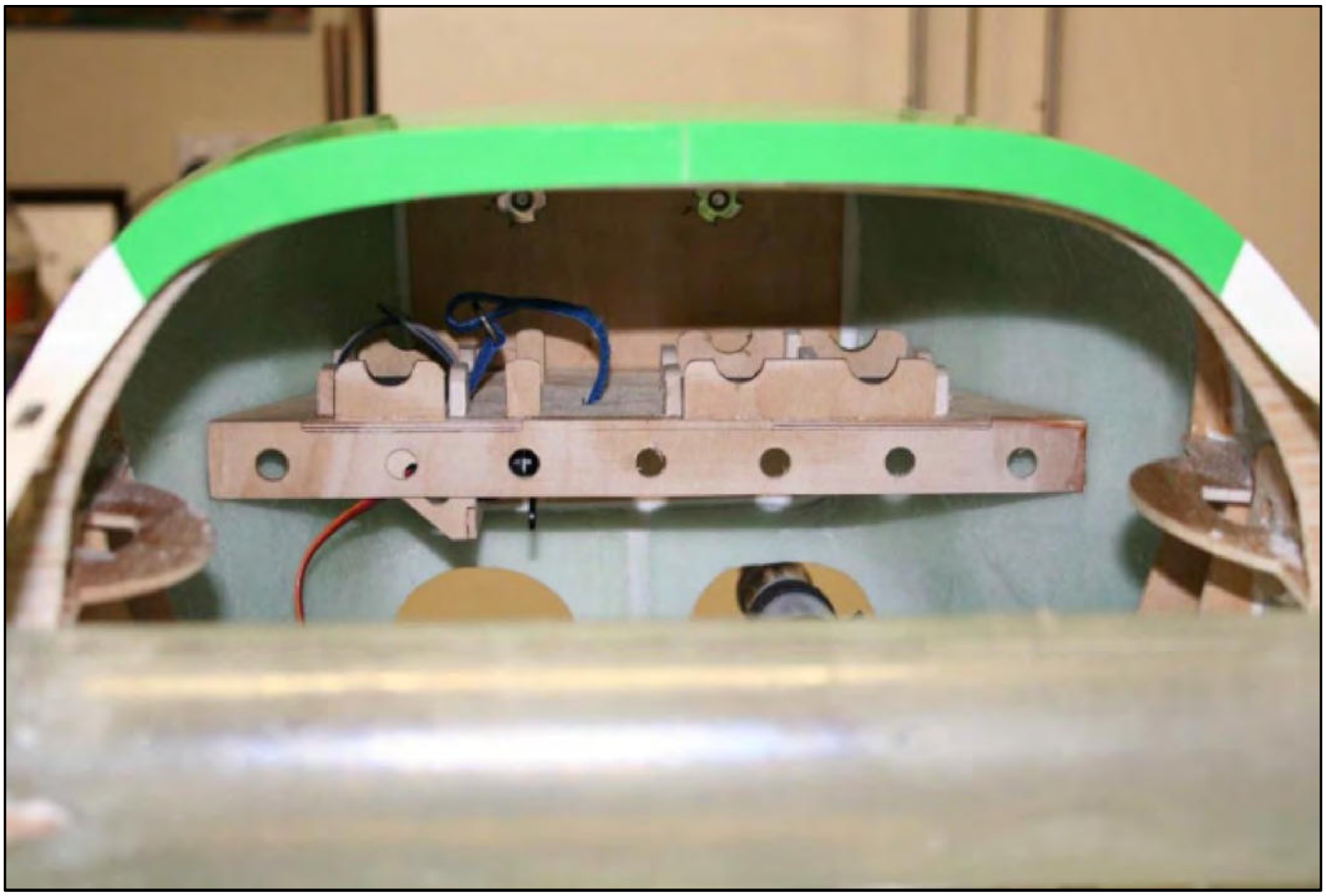


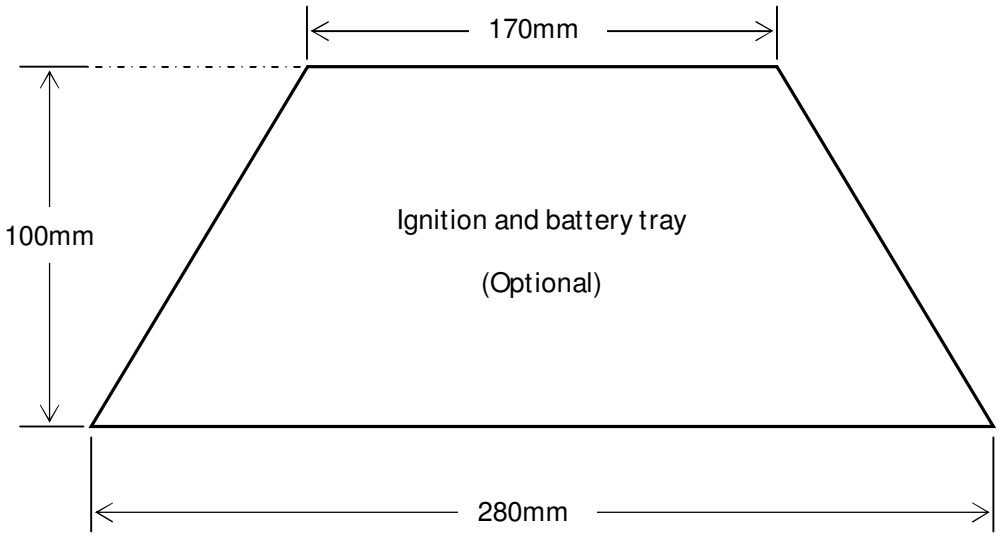






Once you have your ignition/battery tray assembled and trimmed to fit neatly inside the engine dome, tack it in place with CA and kicker.
Make sure you are satisfied with the position of everything, and that the throttle servo is correctly placed.
When you are fully satisfied, epoxy in place (don't forget to lightly sand the area first.





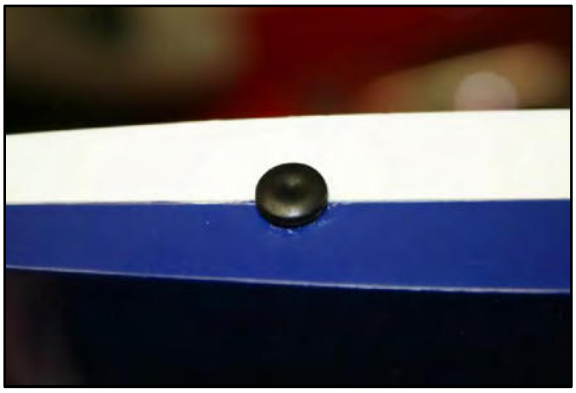
Horizontal Stabilisers and Rudder

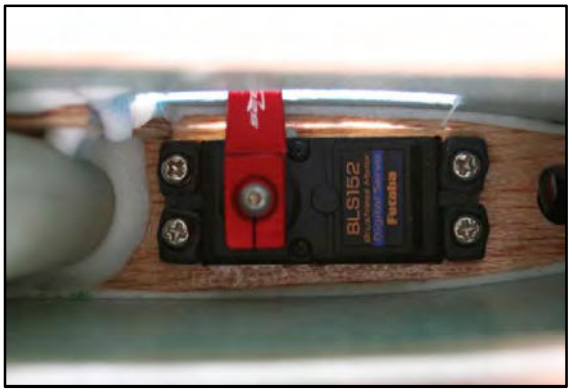
Parts Required:

- *Stabs, elevators and rudder*
- *Stab parts bag*
- *Elevator servo*
- *Alloy Servo Arm (SWB, Secraft, Hanger 9 etc) 1.25”-1.5”*

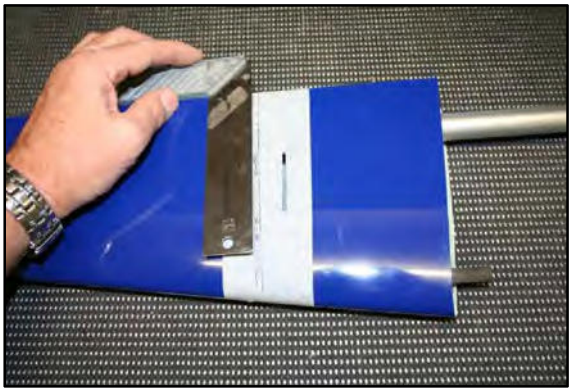
Tools Required:

- *Dremel tool*
- *X-Acto hobby knife*
- *Square (rule)*
- *Steel rule(s)*
- *Masking tape*
- *Marking pen*
- *Philips head screw driver*

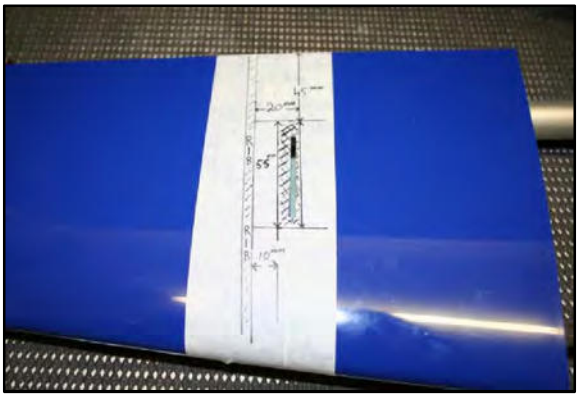




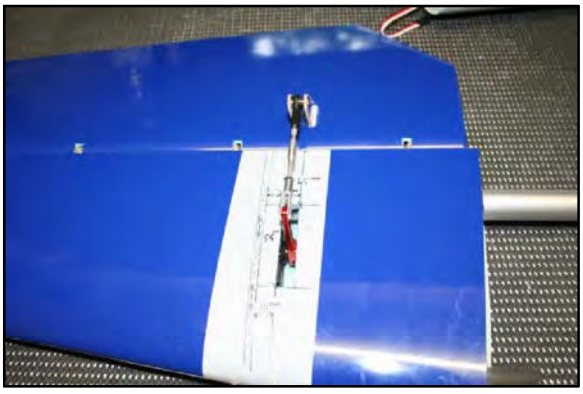
The horizontal stabilisers are pretty much completed for you at the factory. The dual elevator control horns are pre fitted, and the stab tube is already set up and ready to go! You will need to trim the 4mm brass hinge tube to the correct length, and install your choice of servo.



Fitting the hinge tube is quite simple, just mark and trim the brass tube to the required length. You can use tape to prevent the tube from shifting position. Or you can use a small 4mm plastic plug like those used in home reticulation systems. A 4mm sealing plug is ideal, just remove the barb end with an X-Acto knife then push the plug snugly into place. You will need to trim a little extra from the brass hinge tube to accommodate the 4mm insert plug.



In the parts bag supplied you will find 2.9mm x 13mm pan head sheet metal screw to mount your servos. It’s important that you **do not** use the mounting screws supplied with your servo. The mounting rib that is pre installed in the stabiliser has the mounting holes pre drilled for you and the standard servo mount screws are unsuitable. Some brands of servos use mounting eyelets that are too small for the 2.9mm screws. You will need to change these if necessary. Use JR standard servo eyelets.



A servo arm exit slot has been pre milled at the factory. This is only a preliminary slot, you will need to enlarge the area required to suit your servo and servo arm. This process is quite straight forward, but make sure you measure twice and cut once! Mask off the area around the pre milled servo arm exit slot. Locate the servo mounting rib and mark this on the stab. It’s easy to locate, using a small steel rule to measure the distance from the rib to the slot, you will be able to see the rule through the exit slot. The mounting rib is fitted 90° to the trailing edge. Use a square to mark your lines.

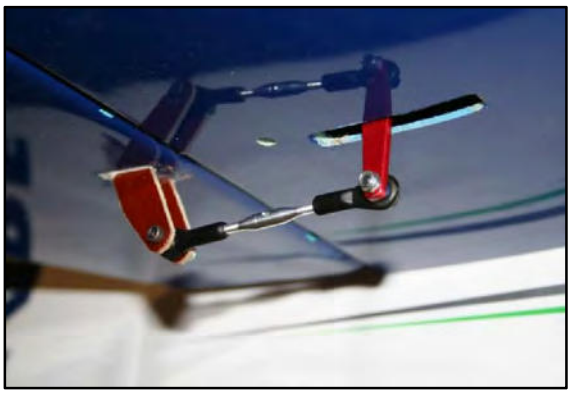
The area marked out in the picture refers to a standard size servo, as all servo and servo arms vary in size. Please take the time to

measure your servo and servo arm to make sure the measurements suit your needs. If not make the necessary adjustments.

Cut out the marked out area using your Dremel tool with a cut off wheel or burr. You can also use a sharp X-Acto hobby knife. Take your time if using a Dremel!

Mount your servo using the 2.9mm sheet metal screws provided. The output shaft of the servo goes toward the stab tube. Pass the servo lead through the pre drilled hole in the rib before dropping the servo in place. You will need to assemble the components that make up the push rod. It may be necessary to trim the 3mm threaded rod and brass tube. The brass tube slides over the threaded rod to add strength. The brass tube should not be loose, a snug fit is required.

Alternatively you may want to use an aftermarket turnbuckle, such as those provided by SWB, Secraft or Hanger 9. A turnbuckle length of 50mm (2") is required. A suitable ball link may also be used in place of the alloy clevis.

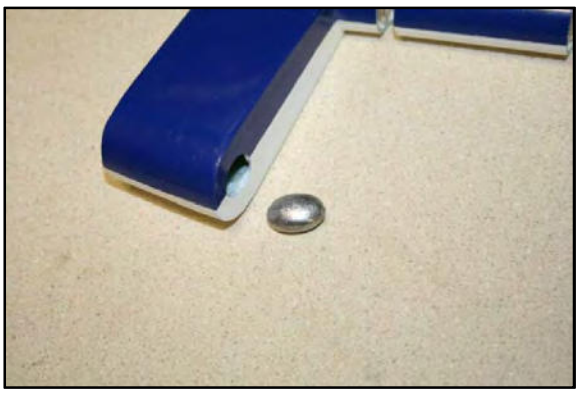


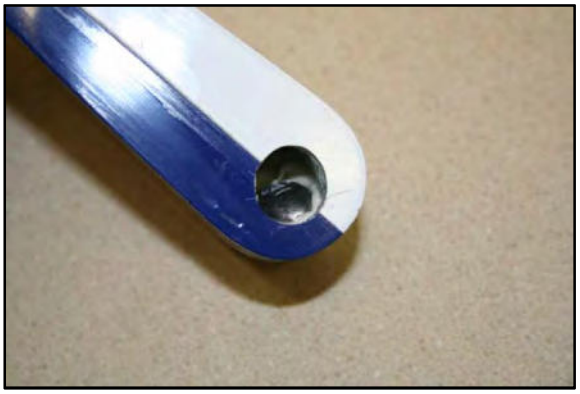
This Section is mandatory, not an option!

It is important to semi balance the elevator to assist in preventing flutter. You will need to epoxy 15 grams of lead into the elevators balance tab. This is a simple procedure and will not detract from the performance of your model.

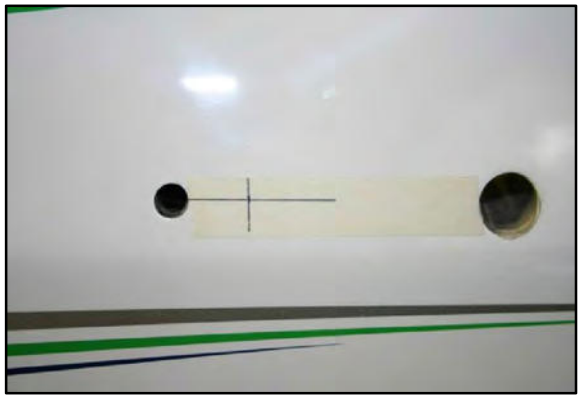
Make a hole in the inner edge at the front of the elevator balance tab, large enough to accommodate the 15grams of lead. A RC car body reamer makes this job pretty simple. Fishing sinkers make ideal weights, and come in some various sizes and shapes.

Apply some epoxy through the hole to the area where the lead will sit. Push the 15gram lead piece into place and let the epoxy set. Make sure you have enough epoxy on and around the weight, so it won't break loose!





The stab tube is already complete and ready for you to use, no more needs to be done other than fit the tube to the stabs. The retention bolts have been pre fitted for you, and only requires you to fit the stabs to the fuselage. The stab tube may already be marked with L and R, to help you distinguish the correct orientation. If not, don't stress, it can only go one of two ways!

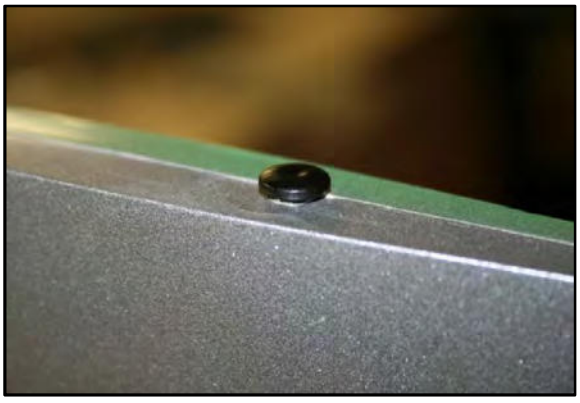


Before you attach the stabs to the fuselage you will need to make the exit for the elevator servo leads. Essentially the elevator servo lead can exit pretty much anywhere between the stab tube and anti rotation dowel. But it does need to be in line with both of these holes. A good location is 20mm aft of the rotation dowel location.

The servo lead needs to be protected in some way from the harshness of the fibreglass fuselage. The edges of the fibreglass will quickly wear through the protective coating of the unprotected extension lead. Rubber grommets are readily available from most good hardware stores. Select a grommet that is large enough to allow the lead ends to squeeze through. About 15-20mm will do fine. You don't want it too big, so as the lead falls back through.

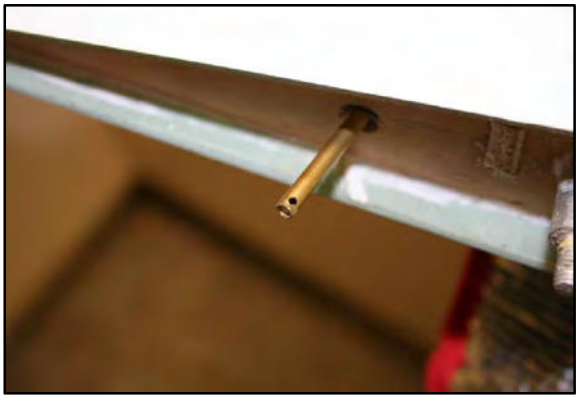
Making a hole large enough for a grommet to fit is a simple job with a RC car body reamer! Simply push into your marked position and start turning. The reamer will remove the material quite efficiently without tearing. If you choose to use a drill bit, please be very careful, often the drill bit can bite and tear at the fibreglass. Pass your lead through the grommet and insert the grommet into the fuselage. You may want to use a clip to secure the extension lead to the side of the fuselage as shown.

Rudder:



Fitting the rudder is very simple. The majority of the work has been done for you. Basically all you need to do is trim the brass hinge tube. As before with the elevators you can use tape to keep the tube in location, or use the 4mm plastic plug as explained at the start of this section.

Ailerons



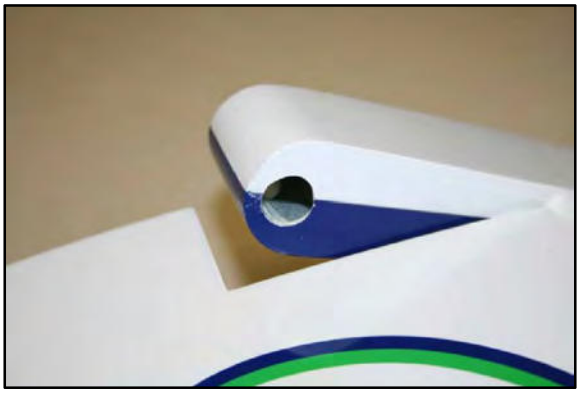
The ailerons on the Composite Arf Edge 540 differ from what has been up to now, normal for Composite Arf models, the ailerons are centre hinged! The ailerons now use a hinge tube just like the rudder and elevators. The ailerons are huge, and require 2 brass hinge tubes, to cover the length of the aileron.

The 2 brass tubes can be left as 2 separate pieces, or you may elect to join the 2 pieces with a piece of 1/8th brass tube. The 1/8th tube is a snug fit in the 4mm tube and soldering should not be necessary. Leaving the tubes separated will not create any problems, it's your choice!

To secure the brass hinge tube at the wing root, it is very easy to drill a 1.5mm hole at the end of the tube and insert an R clip, which in turn is secured with a small servo screw. At the wing tip, you can again use tape, or the 4mm plastic plug as used in the elevators and rudder.

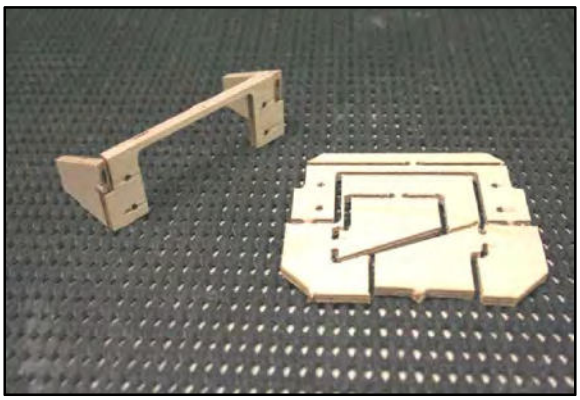
This section is mandatory, not an option!

It is important to semi balance the aileron to assist in preventing flutter. You will need to epoxy 20 grams of lead into the elevators balance tab. This is a simple procedure and will not detract from the performance of your model. Use the same procedure used when assembling the elevators. However there is an increase in the weight to 20 grams!

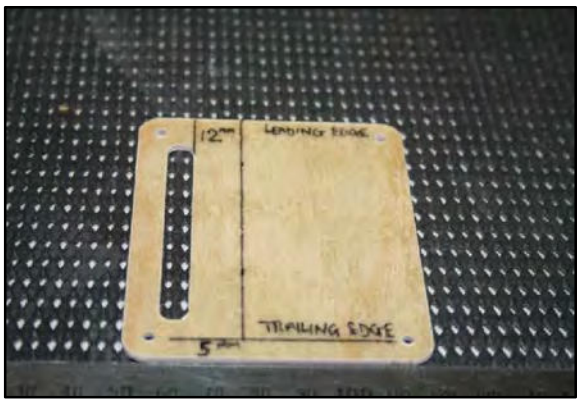


Servo Hatches:

The aileron servos need to be attached to the hatch covers on the bottom of the wing. Plywood mounts are provided for this purpose. Once assembled these mounts will need to be epoxied onto the servo hatch. Assemble the mounts and for now, just CA them.



You will need to mark out the placement for the servo mounts on the hatch covers. Be careful that you have the hatch cover in the correct orientation. The servo hatch sits on a plywood retainer built into the wing. This small ledge is about 5mm wide. You will need to mark this area on the servo hatch as shown. The servo mount is mounted slightly off centre in an effort to get the servo output shaft as close to the centre of the servo arm slot as possible. The servo needs to be installed with the output shaft toward the leading edge of the wing.



Place the servo mount so as your servo arm fits nicely between the edges of the cut out. When satisfied with its position epoxy in place, making sure you epoxy the inside corners of the of the

servo mount. Don't forget to give the surface of the hatch a light sand before applying the epoxy. Set aside and allow epoxy to set.

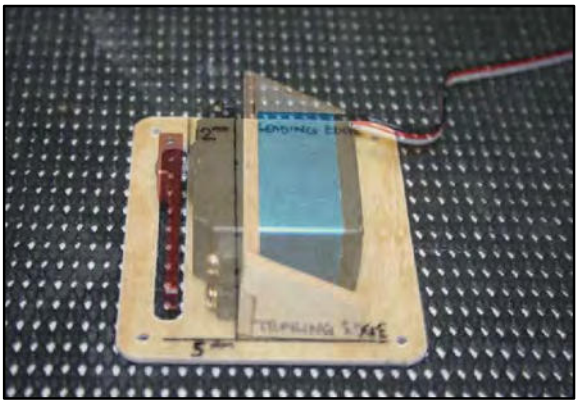
Now your servo hatches are complete, and you can now fit them to the wing. Sit the hatch in place and hold them there with some masking tape while your pre drill the holes for the hatch retaining screws Use a small drill bit (1.5-2mm) to drill the holes for the hatch cover retention screws. Use the 2.9mmx15mm sheet metal screws provided.

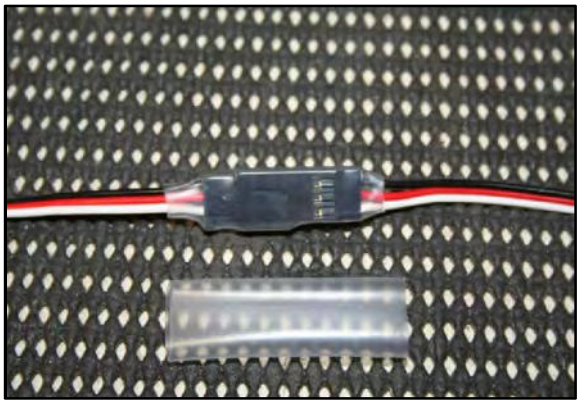
A 200mm extension lead will be required to have the servo lead exit the wing root. As this lead will be permanent, it would be wise to use a safety clip or some heat shrink to prevent the leads from separating. This is good practice for all extension leads that will remain permanently attached.

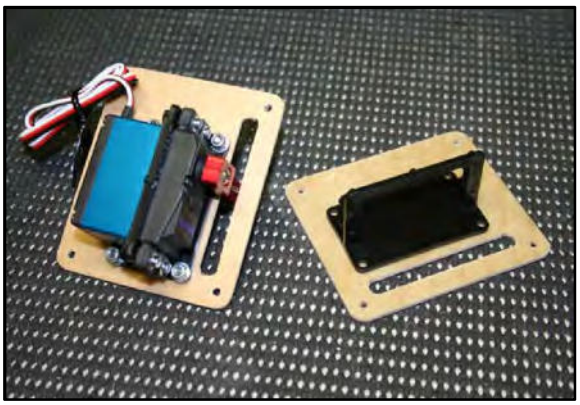
(As an alternative to the plywood servo mount, you could also use a JR single servo side mount (#07-04). These items are pretty cheap and can be attached with some 3mm screws and nylock nuts. Most hobby stores will keep these items. The same measuring process as with the ply mounts applies. Work toward keeping the servo output shaft as close as possible to the centre of the hatch slot.)

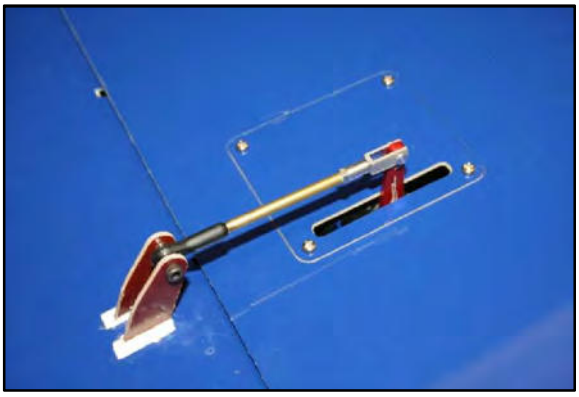
Assemble the push rod from the components in the parts bag. If necessary trim to length. The servo arm should exit the hatch at 90° to the hatch. Ensure that both the aileron servos are aligned like this. The push rods for both sides should be the same length. If you wish to use after market turnbuckles a 60mm or 2.5" item is required. Alternatively a ball link can be used in place of the alloy clevis.

Attach the servo hatch to the wing using the 15mm screws provided. The aileron control horns are pre fitted at the factory and ready to use. These double horns provide excellent strength and the 3mm ball link provided will fit nicely between the horns. When you have adjusted the push rod to the correct length, fit the push rod between the servo and control horn. Carefully move the aileron through its full travel to ensure there is no binding.









Canopy

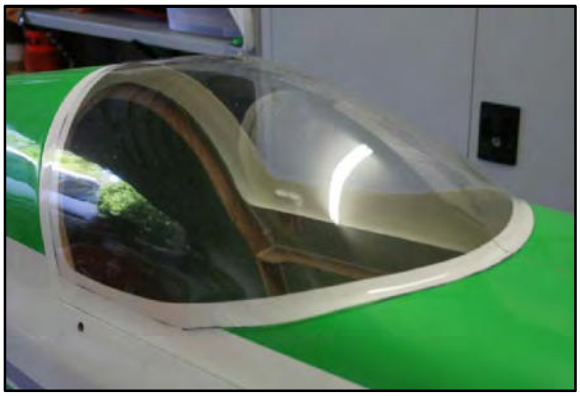
Parts Required:

- *Canopy*

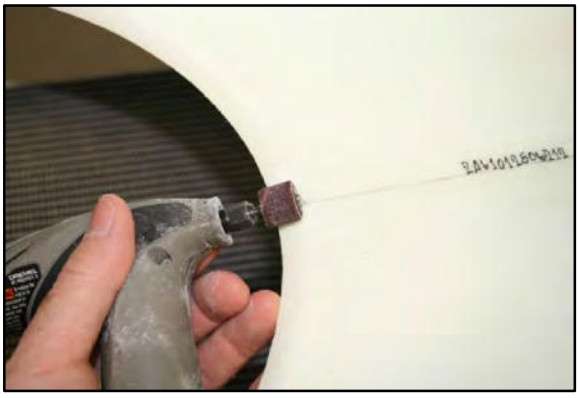
Tools Required:

- *Masking Tape*
- *Marking pen*
- *Scissors*
- *Canopy Adhesive*
  Clear Silicon (Silastic)
- *Syringe 30ml*

Fitting the canopy is one of the areas that people seem to dislike! Really it's not that difficult, and the Edge canopy is quite small, and fits in place beautifully. Fixing the canopy to the canopy frame can be accomplished with a good quality silicone sealant. That's right the same stuff plumbers use!



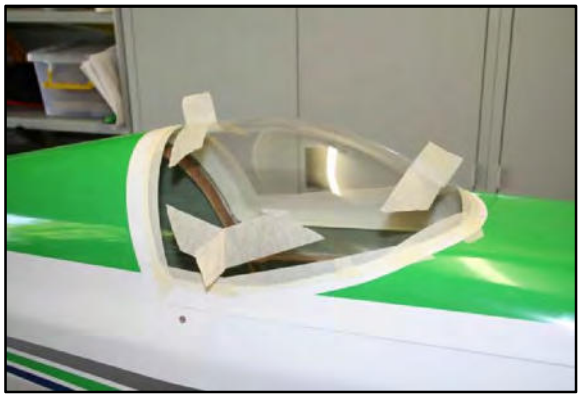
You may opt to use an epoxy, a plastic CA, or specialized canopy adhesive. But be careful, CA can run, as well as fog the canopy. Be really careful with any kind of CA kicker, discolouration and fogging can occur. Epoxy can also be used, but it can be pretty messy, however it is pretty affective. Canopy adhesive needs a long time to cure, and is particularly runny.
Silicon works particularly well in this area, and provides a clear strong bond. It is also easy to clean up and if you ever need to replace the canopy, removing the old one is pretty straight forward.



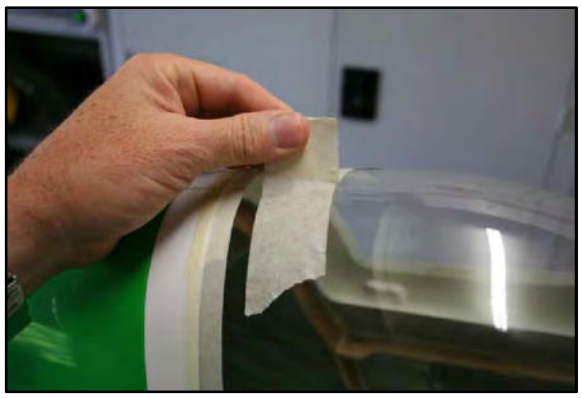
The clear canopy needs to be trimmed first. Start by removing the excess material, so you can fit it over the canopy frame for marking. The canopy can be cut with sharp scissors (If you are in a cold climate you may need to warm the canopy before you cut. Test a waste area first). Attach the canopy frame to the fuselage and place the canopy over it. Move the canopy into a settled position and mark the cut lines. Leave about 10mm over lap. Take your time here, and make sure you are happy with the positioning and marking.

After you have trimmed the canopy you will need to prepare the canopy frame before you start the final fit. You need to make sure that you sand off any high spots on the canopy frame where the canopy will sit. Occasionally during the moulding process some excess resin can form high spots. Also there is a fibreglass band that runs along the middle of the canopy frame. The edges of this band need to be smoothed. This can mostly be done by hand with some sandpaper, but if you use a Dremel be careful not to remove too much material. Lightly sand all the area where the canopy will sit, then wipe clean.

It's important that you fit the canopy while the canopy frame is attached to the fuselage, this will keep the frame properly aligned and not twisted. Masking tape is used to hold the canopy in position prior to gluing. It may pay to have another pair of hands available to assist you here. Perhaps you can bribe your best buddy with a beer, or two (after their assistance)!



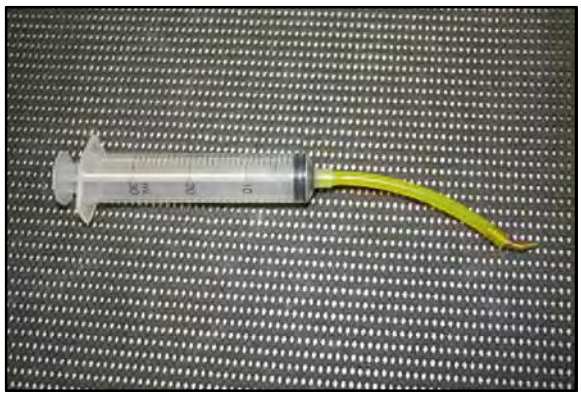
When you have trimmed the canopy and prepared the canopy frame, attach the frame to the fuselage and secure in position with the mounting bolts. Make up some grip handles from masking tape and attach to the canopy. Use as many as you see fit, but usually 4 will do the job. Carefully place the canopy inside the fuselage through the opening in the canopy frame.



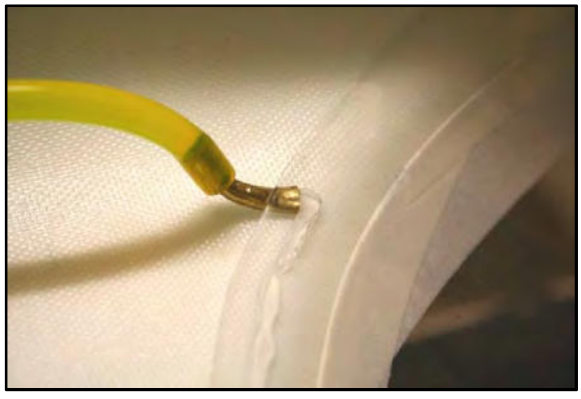
Lift the canopy into position with the masking tape handles you pre-fitted. Once you have the canopy settled in position start to tape it onto the canopy frame. It's easier to start with the top of the canopy first, then the front and sides. Tape all the way around the canopy edges. Use your finger nail to push the tape snugly against the edge of the canopy frame. It doesn't hurt to run a few overlapping layers of tape to secure the canopy.

Remove the canopy frame from the fuselage. As you undo the mounting bolts take note to see if the frame is distorted. Now is the time to fix this if it is distorted. Place a towel or something similar on the work bench so you can work on the canopy without marking it.

A syringe is one of the easiest ways of applying the silicon between the canopy and frame. A 30ml syringe has more volume than required, but its physical size makes it easier to handle, it's great for guys with big hands! Attach about 100-150mm of fuel tube to the syringe, with a small piece of brass or alloy tube. You should have some off cuts left from the elevator hinge pins. Bend a gentle radius in the brass tube and carefully flatten the end a little, so it can slide between the canopy and frame. You will only need to half fill the syringe with silicon, and it is a little easier to manipulate the plunger if the syringe is not completely full.

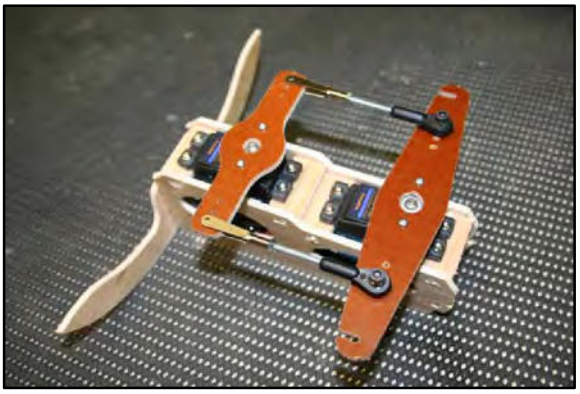


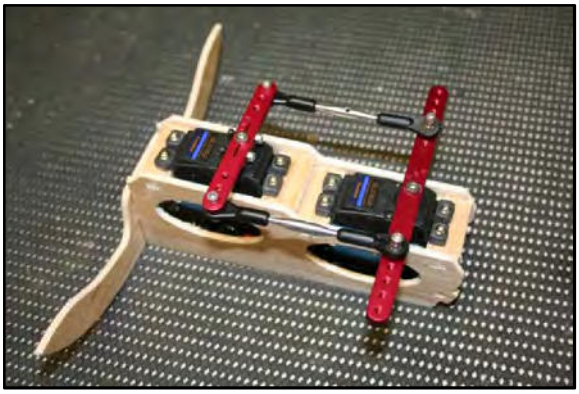
Insert the brass tube between the canopy and frame, and start to squeeze the silicone between the two. As you squeeze the silicone into position carefully keep moving the brass tube along the canopy until you have gone all the way around. Gently run your fingers around the inside of the canopy to settle the silicone. If any of the masking tape has lifted away from position, gently press it back into place. If a little of the silicone has oozed between the tape and the canopy, don't worry, it will easily clean off, either with a gentle rub, or with a little mineral turpentine.



Reattach the canopy to the fuselage and bolt into position. Leave it in position until the silicone cures. After several hours (4-5) the silicone should be touch dry and you can start to remove the masking tape. Leaving the canopy overnight is also a good option if you are unsure. When you remove the tape, simply rub away any silicone that has come above the tape. Mineral Turpentine with a soft cloth can make it easier. Jobs done!

Rudder Servo(s)





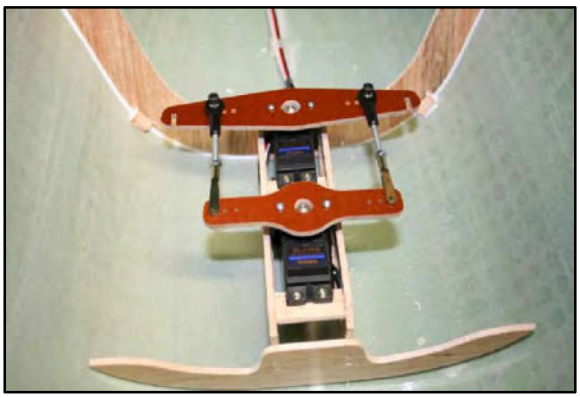
Parts Required:

- *Rudder tray components*
- *Rudder parts bag*
- *Phenolic servo arms*
- *Rudder Servo(s)*
  JR DS8911, DS6301 or DS6311HV
  Futaba S9157 or BLS152
- *Alloy servo discs*
- *Alloy Servo Arms (optional)*
  SWB 4.5" Full arm, plus 3" Full arm (front servo)
  SWB or Secraft turnbuckles 50mm (2")

Tools Required:

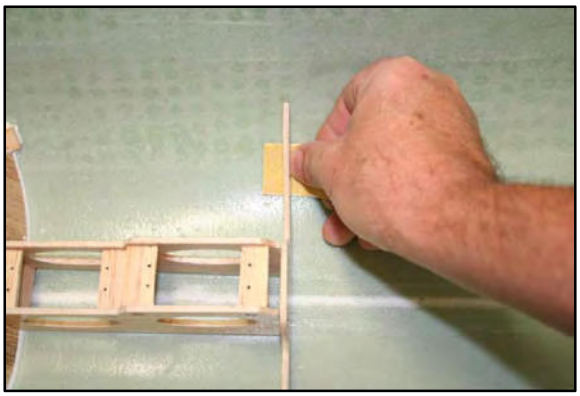
- *Steel rule(s)*
- *Marking pen*
- *Philips head screw driver*

The rudder tray provided is suitable for 2 servos. You may elect to use 1 x 30kg plus servo. The servo tray is designed to fit into the fuselage former at the beginning of the turtle deck. Before you proceed, you should assemble the model, and do a preliminary C of G check to make sure that you will meet the C of G requirements. If the model is tail heavy now is the opportunity to move the rudder tray further forward in the fuselage. If you do need to move the rudder tray forward, you will need to make 2 new ply formers to attach to the existing rudder tray.



The supplied phenolic arms are required to be mounted onto alloy servo discs. **DO NOT USE THE STD NYLON SERVO DISCS!** The standard discs provided with the servos may strip under heavy loads resulting in control surface flutter. Screws are provided in the hardware pack to attach the phenolic arms to the alloy discs.

As an option you can elect to use alloy arms. The alloy arms need to be 4.5" for the rear servo and 3" for the front servo. (You may also wish to use turnbuckles and ball links to connect the 2 servos). Straight arms are preferable, as the pull/pull cables are to be installed straight and not crossed. Crossing the cable will result in the cables hitting the rear most former.



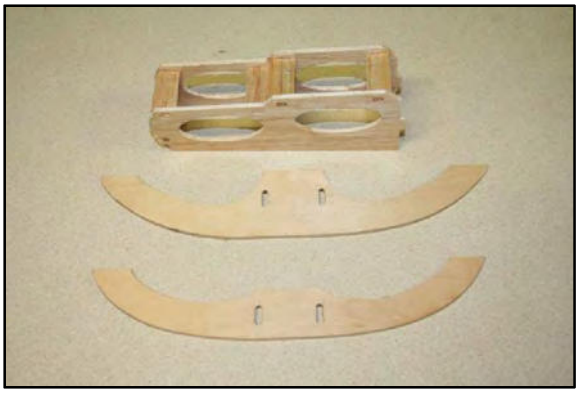
Assemble the rudder tray from the wooden components. Glue 4 pieces of scrap ply under the servo mounting screw location. If you have elected to mount the servos in the standard (rear) location you can fit the former to the tray at this time. Lightly sand the area in the fuselage where the tray will be attached. Before you epoxy the tray in place make sure that it is centred in the fuselage. You can use CA and kicker in a couple of spots to hold in position while the epoxy cures.

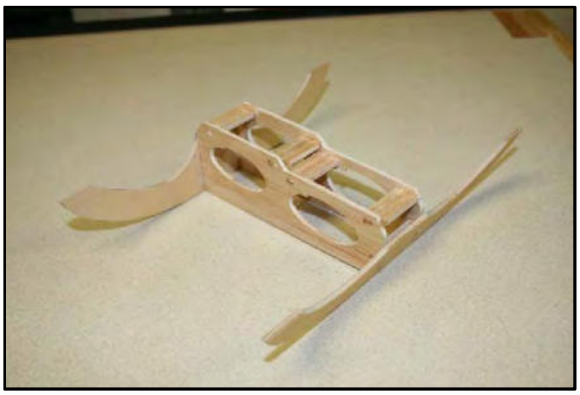
If you need to move the rudder tray forward to obtain the correct C of G, you will need to make 2 new mounting formers to use on the existing tray. Use 3mm ply for this.

Use some card to make the shapes for the new formers. You can use the supplied former to aid with the basic shape. The basic shape of the standard former is pretty close but need to be stretched a little. A scroll saw makes the job of cutting out the ply very simple.

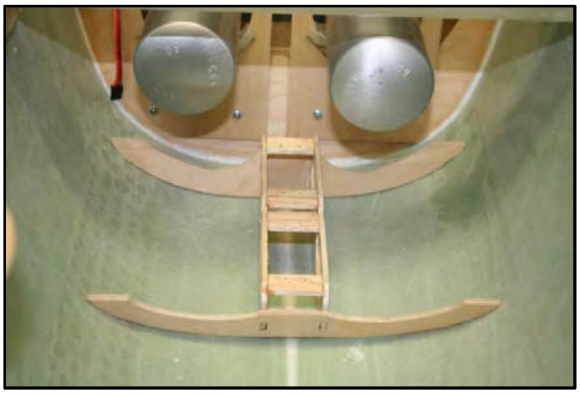
When selecting the new position for the tray, keep in mind the location of the canisters, you do not want to subject the servos to too much direct heat from the exhaust. Also keep in mind the landing gear plate. If you ever break it and need to remove it, having both the landing gear plate and rudder tray too close can hamper the operation. Some separation is desirable, around 40-50mm is ample.

When you are satisfied with the servo tray location, use some CA and kicker in a few spots to hold the tray in position while you apply epoxy and while the epoxy cures.



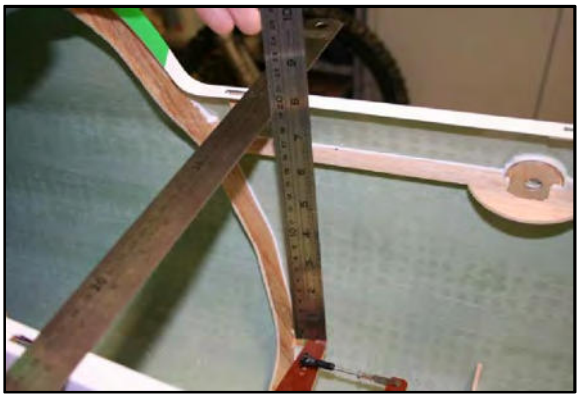


After the epoxy has fully cured, place your servo(s) back into the tray, and screw into position. Fit your chosen servo arms and linkages, and rout the servo leads to you desired position. Everything is now ready for the pull/pull cables to be measured up and fitted. As mentioned before we used straight cables rather than crossed. Crossing the cables will move the cable exit slots in the fuselage rearward and the cables will foul on the rear fuselage former.



Pull/Pull Cables:

This is one area where the term “Measure twice, cut once” really comes into play. While the job of fitting the pull/pull cables is not difficult, being sure of your measurements is important. While we have supplied measurements for the cable slots, you should still make your own measurements to verify that the positioning is correct. Small changes to the assembly process and changes of equipment can alter the outcome, so “Measure twice, cut once”!!

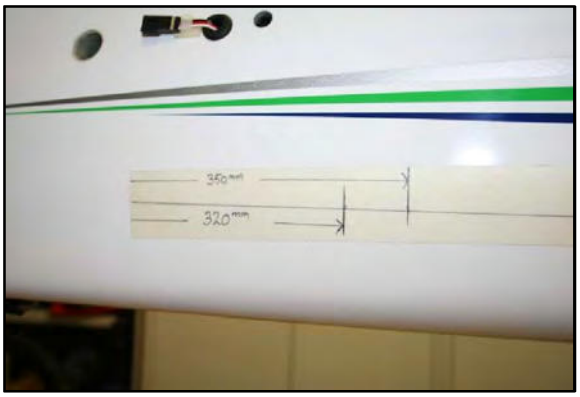


The first line we need to establish is the horizontal line, essentially the plane the pull/pull cable will lay on. This process is quite simple and will only require a few measurements. The process is the same regardless of whether the rudder tray is in the rear or forward position.

You need to establish where the pull/pull cable meets the servo arm. Use a straight edge on the canopy seat, measure to the top of the servo arm. If you are using alloy arms, measure to the centre of the ball link, this will be a few millimetres higher. Now that you have a measurement, you need to transfer that to the outside of the fuselage.

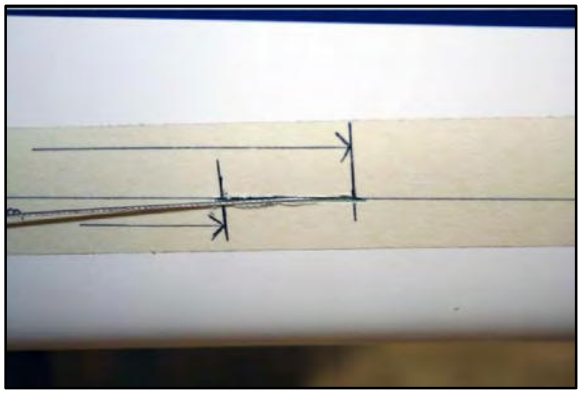
Place some masking tape on the fuselage roughly where your mark will be. With the straightedge on the canopy seat mark a line using the measurement you just established. Now that you have the servo arm position marked on the outside of the fuselage, you can use a string line to mark the horizontal cable line.

You will need a couple of meters of string with a loop at one end. Attach the loop to the rudder horn using the 3mm bolts provided. Centre the string loop between the control horns, then position the other end of the string over the servo mark. Tension the string so there is no sag, then hold in place with some masking tape. You have just established your horizontal cable line. Place some masking tape on the fuselage about 300mm from the rudder control horn. Using the string line as a reference, use a rule to mark a horizontal line. You need to cut a slot about 30mm long. Make 2 marks on your horizontal line 320mm and 350mm from the rear edge of the fuselage.



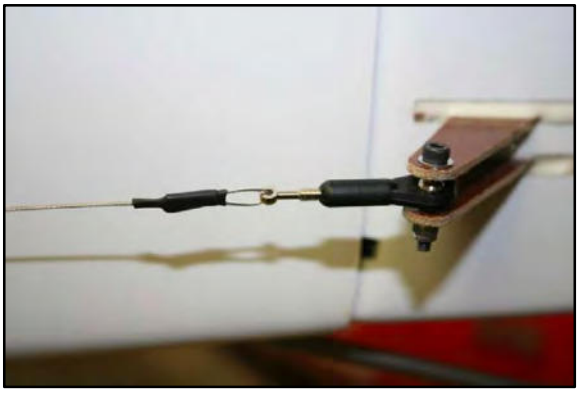
You can double check the exit measurement by running the string along the bottom of the fuselage. Flip the model upside down, and directly underneath the servo draw the servo arm measurements onto so masking tape. Remember this measurement is dependent on which servo arms you use.

When you are satisfied that the cable exit slot is positioned correctly, make a cut with your Dremel and cut off wheel. The cut off wheel will cut the fuselage material with ease, so keep the tool steady.

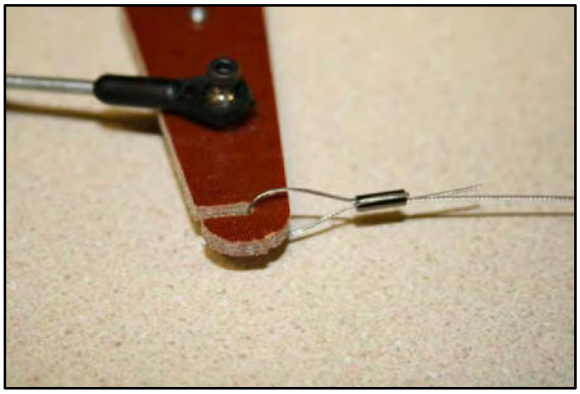


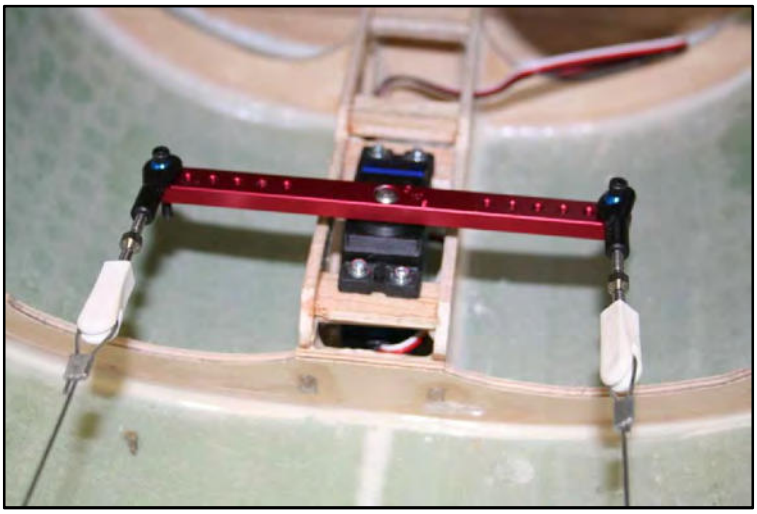
You should now make up your pull/pull cables. Start by doing one end only. Divide the cable supplied into two equal lengths. Fit the threaded cable eyelets into a ball link, and feed through the cable. The crimps supplied are spacious enough to pass the cable through three times. By looping the cable around for a third pass through the crimp, you minimize the chances of the cable slipping and pulling through the crimp. Once you have completed the crimp you may like to cover it with some heat shrink. You can now pass the cable through the exit slot and fit the ball link to the rudder control horn.

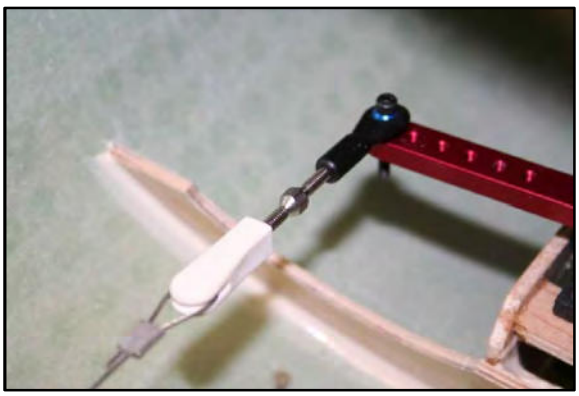
If you are using the phenolic servo arm provided in the hardware pack, you can simply loop the cable through the slot in the arm and crimp. If you elect to use an alloy arm, you can repeat the same process as you have already completed at the rudder end. Another item worth using is a SWB wire tensioner, these items make keeping the cables in tension very simple.



Whichever type of arm you use the process to tension up the cables is pretty similar. It's important that you temporarily plug in your rudder servo(s) to your receiver and centre them up using your sub trim. The final fitting of the cables is a little easier if the servo(s) are powered up and centred. Using some masking tape, hold the rudder in place by taping the boost tab at the fin. At this point you want to take care that you don't move the transmitter rudder stick. Now that everything is in place and held in position, pull the cables taught and crimp. Don't forget to leave room for tensioning adjustment at the ball link. You do not want everything wound right up and no thread left to fine tune the cable tension.







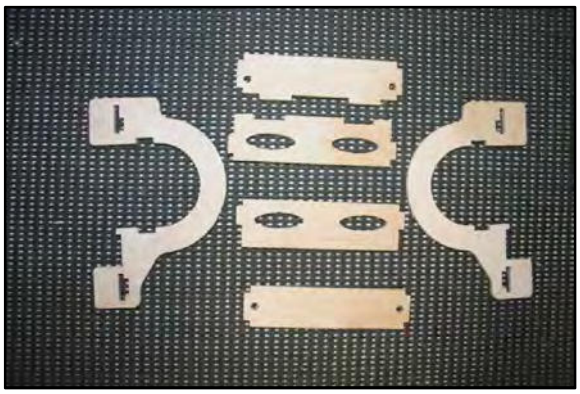
Fuel Tank and Tray

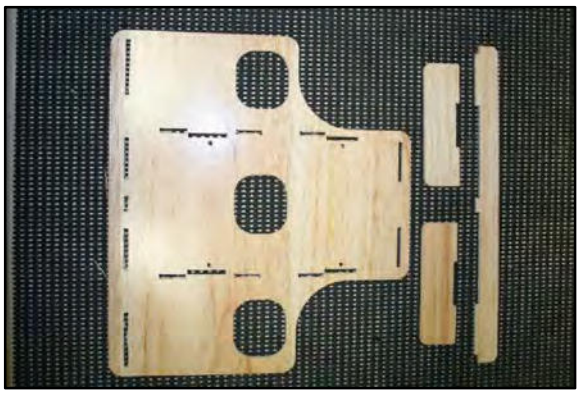
Parts Required:

- *Wooden Tank Tray Components*
- *Plywood Tank Tray Saddle Components*
- *Tank Tray parts bag*
- *Fuel Tank – DuBro 32oz*
- *Tygon Fuel Line*

Tools Required:

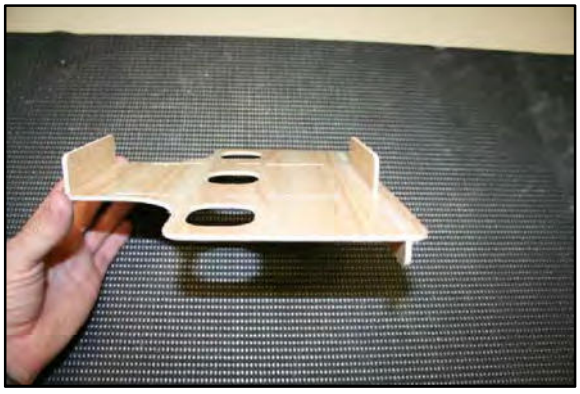
- *Steel rule(s)*
- *Marking pen*
- *Ball Driver(s)*





Fitting the fuel tank tray should be one of the last things you do when assembling the Edge 540. Although the tank tray is designed to be removable, to give you better access to the front of the model. It can still be a little awkward working around the tank tray saddle, which is permanently fixed in position on the wing tube socket. So with this in mind sort out your equipment fit out in advance of getting to this stage.

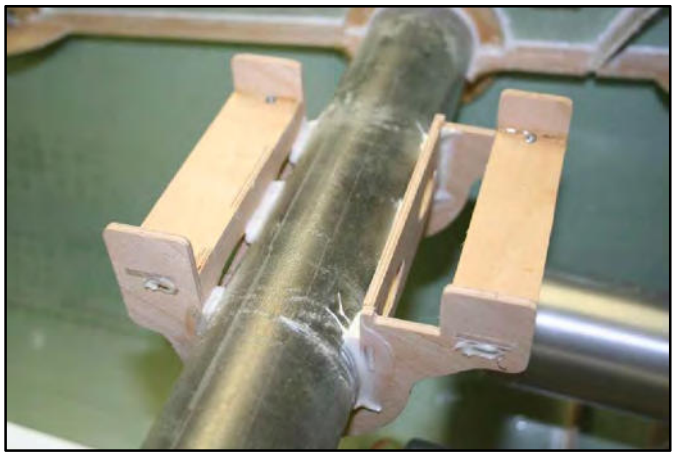
Firstly, assemble the tank tray saddle to make sure all the components fit as they should. There are four 3mm T-nuts in the parts bag that need to be inserted in the pre drilled holes on the saddles top plates. Ensure you fit these T-nuts underneath the top plates and before you permanently glue the assembly. Tack the saddle together with some CA and trial fit on the wing tube socket. It's a good idea to have the wing tube in place before you do this.

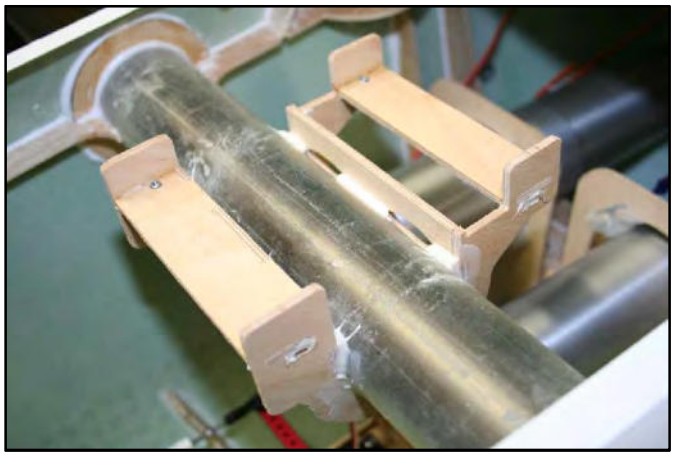


The tank tray is a milled balsa composite structure, and is extremely light. Trial fit all the tank tray components together. Some filing of the slots may be required. When you are satisfied with the fit, run some CA along the joints and let cure. Trial fit the tray onto the saddle, and make any adjustments necessary to ensure a good fit. **Remember do not glue the tray to the saddle!**

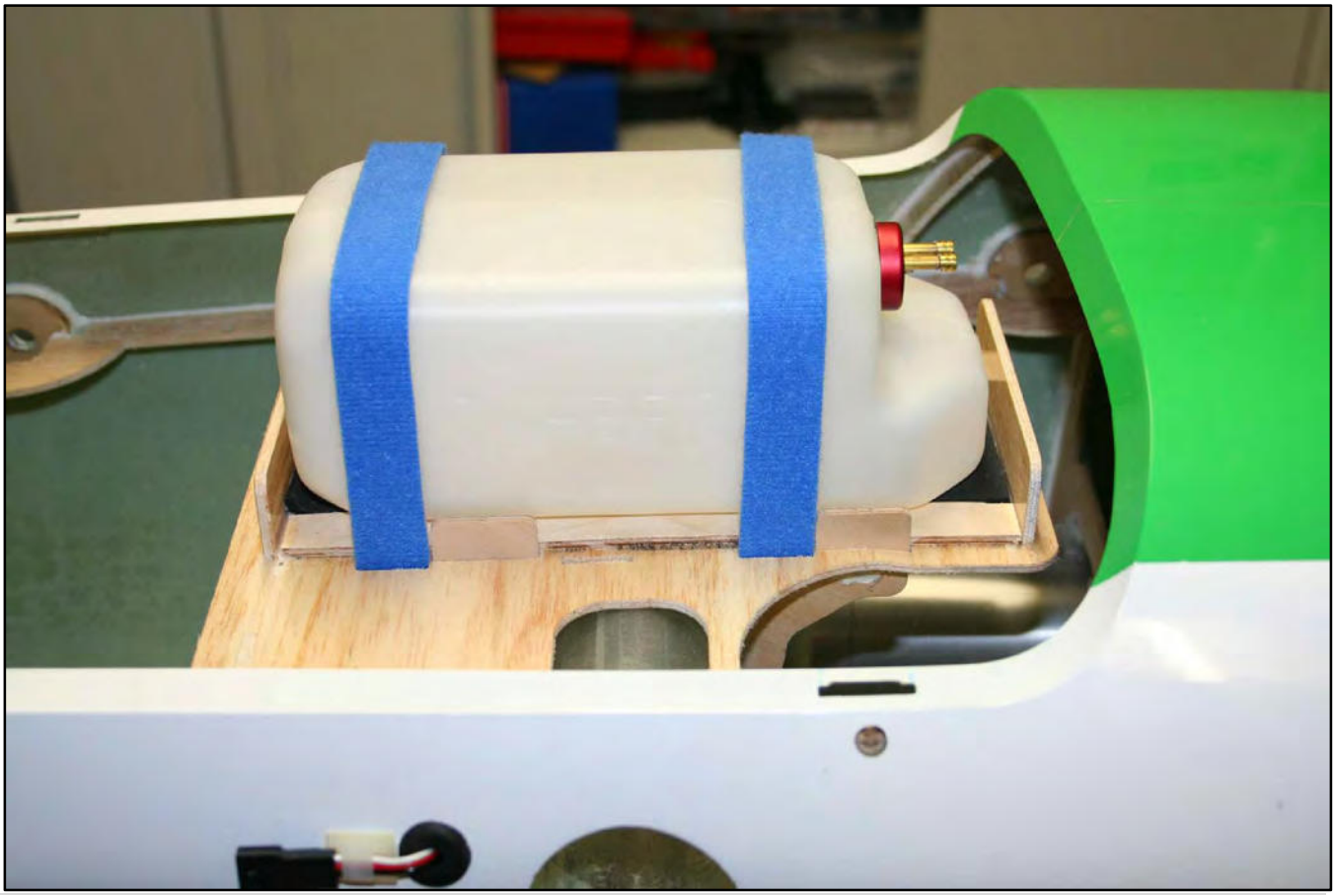
There are two 200mm x 15mm ply strips in the wooden parts bag that need to be attached to the tank tray to provide some strength and a hard base for the attachment bolts to screw down on. Glue the ply strips beside the inner edges of the saddle mounting slots, running the length of the tank. The mounting bolt holes will need to be drilled in the ply, this can be done after they are glued in place.

With the wing tube in position trial fit the tank tray and saddle. It's important that you position the tray so as the top of fuel tank does not hit the canopy frame. There is not a lot of room to spare, so take your time obtaining the correct angle. You will also need to lightly sand the wing tube socket where the saddle will be glued. Also make sure you have the saddle in the correct orientation. When you are satisfied with the position use some CA and kicker to tack the saddle to the wing tube socket. Apply some epoxy to the saddle and wing tube socket, and allow to cure.

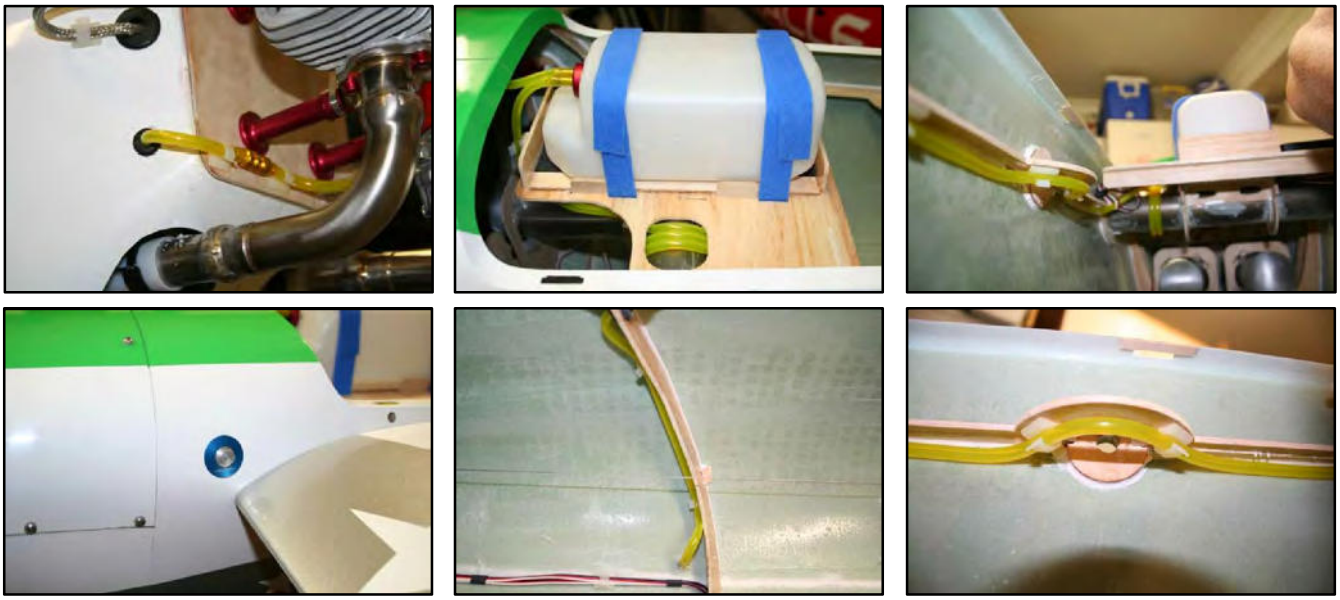




It's good practice to place some thin foam between the fuel tank and the tray. Ensure that any foam you use doesn't lift the tank too high as the tank may then hit the canopy frame. Fit the tank tray to the saddle using the 3mm cap head bolts. Secure the tank in place with the Velcro strap supplied.

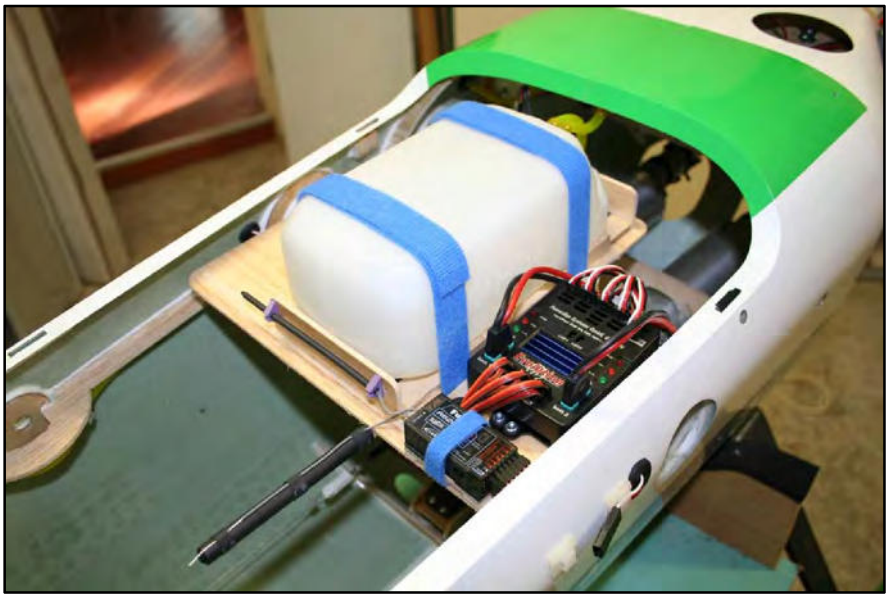


Run your fuel line to the engine taking care to ensure that it doesn't rub against the fibreglass or plywood structures. Where you run the fuel line is partially dependant on which engine you choose, and exhaust system fitted. Please view the pictures below for where the fuel and vent lines were run during our build. All of our fuel lines were held in place with self adhesive clips and where the line passed through the fuselage rubber grommets were used.



RX components

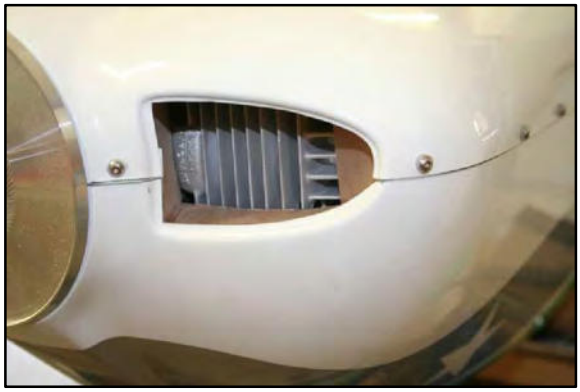
There is plenty of room on the tank tray for most if not all of you RX components. How you arrange this area we will leave up to you. Given the wide variation of equipment available and the personal preferences of the end user, covering all possible scenarios would be difficult.

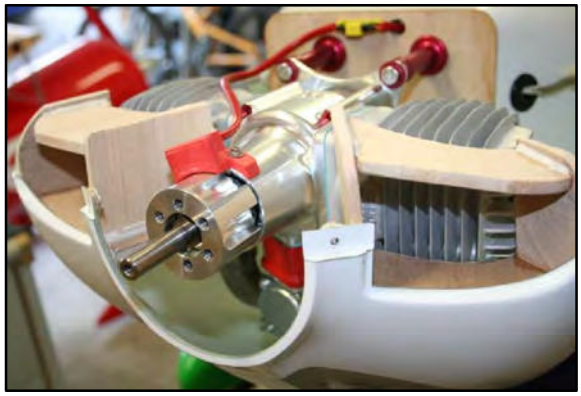


As an example all of the batteries on the model used to compile this manual were positioned up front, and only the receiver and PowerBox were fitted to the tank tray.

Clearly you can fit your RX batteries to the tank tray if you so desire. It is advisable to use the onboard components of the model to aid in achieving the desired C of G. Obviously you may elect to use ballast to obtain the correct C of G, but keep in mind a light model will perform better than a heavy model. Our suggestion is to work toward the lightest overall flying package and avoid adding ballast where possible.

Engine cooling and vents





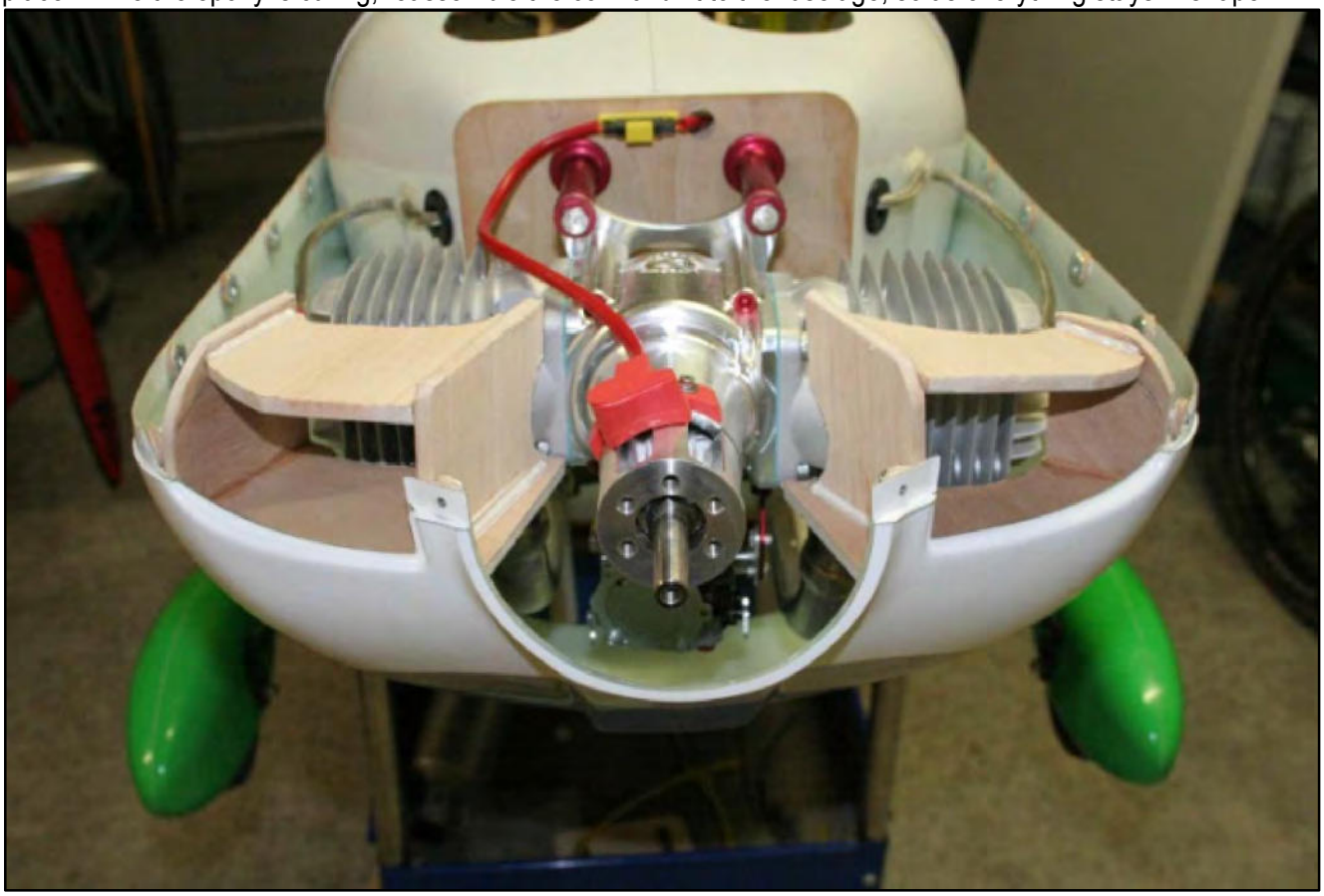
It is important to keep your engine cool, regardless of the engine manufacturer. Keeping your engine cool is good practice, your engine will like love for it! Another area you must also consider is the fuselage. If you are running canisters or tuned pipes this is a **must!**

We will show you how we ducted the air to the DA120 that we used. Clearly with so many engine choices, it would be impossible to cover all variations. But the principle is the same, and the following is a good guideline for you to follow.

Remember, what we are trying to achieve, is to channel all the incoming air from the two openings at the front of the cowl directly onto the cylinder fins, before it can disburse or be forced to other areas of the cowl. It's important that your ducting components are close to, but not touching your engine. About 2mm is sufficient.

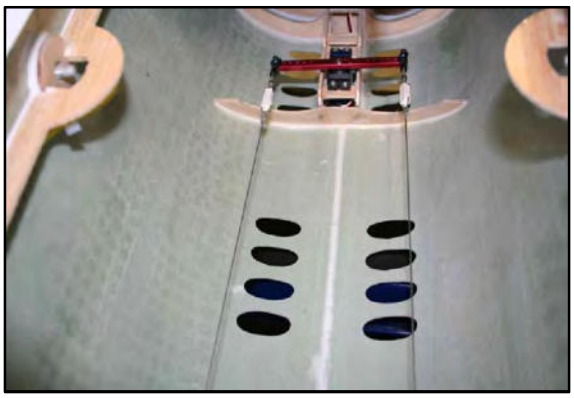
We manufactured our ducting components from 4mm balsa and 0.5mm ply. The balsa is easily shaped to your requirements and is also very light. The ply is added as the top layer when most of the shaping is done to add strength and a tough surface. Use some card to get the basic shape you require, and then trace the shape onto the balsa. The thin ply can be easily cut with scissors and the final shape trimmed with a sanding block. We used medium CA to glue the ply to the balsa.

Tack your components in place with some CA and kicker. Make sure you trial fit as you go. It is also a good idea to bolt the upper part of the cowl in place from time to time just in case some of the components are getting fowled or the lower cowl is getting slightly pulled out of shape. When you are satisfied with the fit epoxy the components in place. While the epoxy is curing, reassemble the cowl and fit to the fuselage, so as everything stays in shape.



To ventilate the fuselage you will need to cut some cooling slots. The fuselage material is easy to cut out, using your Dremel. Finishing with a sanding drum will keep the process simple and tidy. Where you place the slots is again dependent on the final fit out and components used. But as you can see from the picture there is ample room for a sufficient number of ventilation slots.

Keep in mind that you should not cut through the seam line or the fibreglass reinforcement band. Keep your vent slots about 25mm from the seam line. Use the seam line as a reference to keep your vent slots nice and straight. The shape of the slots is not that important, but making them oval, and just large enough to accommodate the Dremel sanding drum makes the process easy.



C of G and Control Throws

The centre of gravity position of the Edge 540 is 140mm from the leading edge of the wing. As the wing has a straight leading edge, it is irrelevant where on the leading edge you measure from, but at the tip is probably the easiest. Picking the completed model up at the tips will not harm the airframe, but due care should be taken in the method you use. Do not use any pointed implements to hold the model up, you may penetrate or damage the fuselage or wing structure. It's quite simple to have someone give you a hand, and using your fingers carefully lift the model at the C of G points you have measured.

Control throws:

This is another area, where your personal preferences are going to determine what you actually need. We have listed below what we believe is a good starting point. From there on you can fine tune your Edge to suit your requirements.

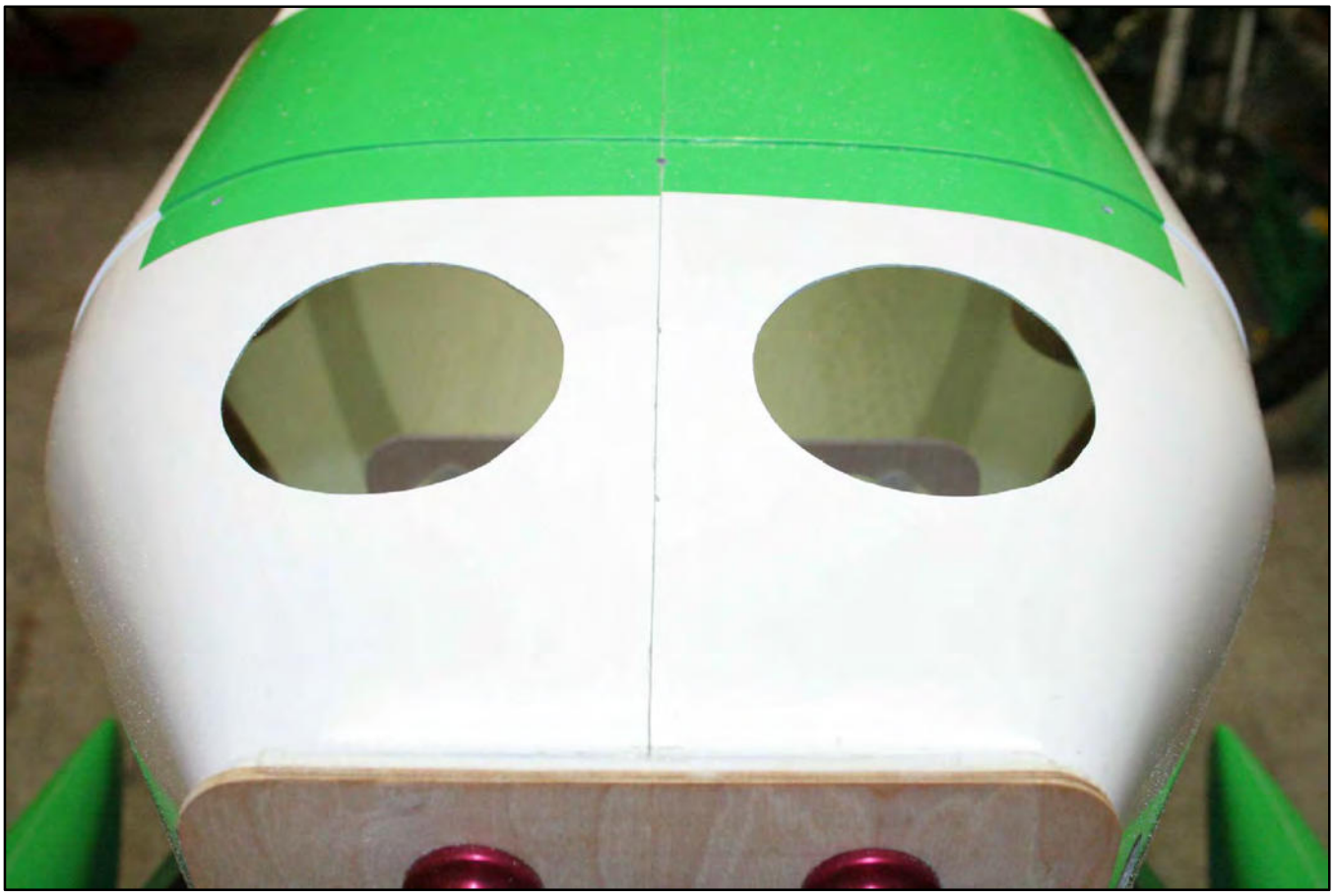
	Low Rate	Low Rate Expo	High Rate	High Rate Expo
Aileron	55mm	30%	95mm	35%
Elevator	35mm	30%	60mm	35%
Rudder	45mm	30%	60mm	35%

Mixing:

The Edge requires very little mixing to keep it tracking nicely. There are lots of things that will influence the amount of mixing that may be required. But as an indication, the only mix we required during our test flight was 5% opposite aileron for knife edge flight, no elevator mixing was required.

Easy Access (Conditional option)

This is an option that can only be done if you have elected to glue in place the battery/ignition tray as previously described earlier in the manual. If you are not using this tray cutting access is not an option! Having the tray glued in place significantly increases the rigidity of the engine dome. Cutting the access holes and canister holes can compromise the strength of the engine dome. You can have either access holes or canister holes, not both, unless you glue the battery/ignition tray in place.



To aid in access to behind the engine dome, you can cut some access holes into the top of the dome. Please do not cut the seam line or the reinforcing join fibreglass band. Stay around 25mm either side of the seam line. The size of the access holes hole should be no greater than 80mm.

We hope you have enjoyed assembling your Composite Arf Edge 540 and you have many years of happy flying with it. We have strived to cover as many area's as possible to ensure the assembly process flowed as smoothly as possible. If you have found yourself in difficulty and need some assistance, your sales rep is only an email away. Please contact your rep and they will endeavour to assist you, and get you back on track. Alternatively you can contact us via the emails below. We also welcome your feedback, please contact us if you would like to see something added or altered. We are always looking to improve our products and the information we supply.

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Edge 540-2.6m manual V1 (April 2011)