

MANUFACTURED BY

RC FACTORY



PROXY

A CODY WOJCIK & CHRIS JEWETT DESIGN

MOTOR: 1x 18-30g / 2200-2600kV Outrunner
ESC: 1x 10-20 amp
SERVOS: 4x 5g-11g micro servos
PROP: 1x 5046 triblade
BATTERY: 3s 850mAh-1350mAh



RADIO: 4 channel
WINGSPAN: 44"
LENGTH: 37"
AUW: 250g w/o fpv

SAFETY NOTES

- Before assembling and flying this model, read carefully any instructions and warnings of other manufacturers for all the products you installed or used on your model, especially radio equipment and power source.
- Check thoroughly before every flight that the airplanes' components are in good shape and functioning properly. If you find a fault do not fly the model until you have corrected the problem.
- Radio interference caused by unknown sources can occur at any time without notice. In such a case, your model will be uncontrollable and completely unpredictable. Make sure to perform a range check before every flight. If you detect a control problem or interference during a flight, immediately land the model to prevent a potential accident.
- Youngsters should only be allowed to assemble and fly these models under the instruction and supervision of an experienced adult.
- Do not operate this model in a confined area.
- Do not stand in line with, or in front of a spinning propeller and never touch it with any object.

IMPORTANT: PRIOR TO ANY ASSEMBLY

Please Note: after removing kit from shipping box, lay each piece flat on a hard surface, this will allow the airframe to straighten out if lightly bent from shipping. Do not worry since EPP is very pliable and can be bent back if out of shape.

TWISTED HOBBYS

Website: www.twistedhobbys.com – email: sales@twistedhobbys.com

Thank you for your purchasing a Twisted Hobbys' model. Please read through the entire manual before beginning to build this model. If you have any questions please contact us at the above indicated email address.

WARNING INFORMATION

This R/C Aircraft is not a toy! Read and understand the entire manual before assembly. If misused, it can cause serious bodily harm and property damage. Fly only in open areas, and AMA (*Academy of Model Aeronautics*) approved flying sites. Do not overlook the warnings and instructions enclosed or those provided by other manufactures' products. If you are not an experienced pilot and airplane modeler you must use the help of an experienced pilot or an authorized flight instructor for the building and flying of this model aircraft.

These instructions are suggestions only on how to assemble this model. There are other ways and methods to do so. Twisted Hobbys has no control over the final assembly, the materials and accessories used when assembling this kit, or the manner in which the assembled model, installed radio gear and electronic parts are used and maintained. Thus, no liability is assumed or accepted for any damage resulting from the use of the assembled model aircraft or from this instruction manual including but not limited to direct, indirect, incidental, special, and consequential damages. By the act of using this user-assembled product, the user accepts all resulting liability. In no event shall Twisted Hobbys' liability exceed the original purchase price of the kit.

SHIPPING DAMAGE

Twisted Hobbys checks each plane before shipping to ensure that each kit is in fine condition. We have no bearing on the condition of any component parts damaged by use, modification, or assembly of the model. Inspect the components of this kit upon receipt. If you find any parts damaged or missing, contact Twisted Hobbys immediately. We will not accept the return or replacement of parts on which assembly work has already begun. Twisted Hobbys reserves the right to change this warranty at anytime without notice.

OUR MISSION

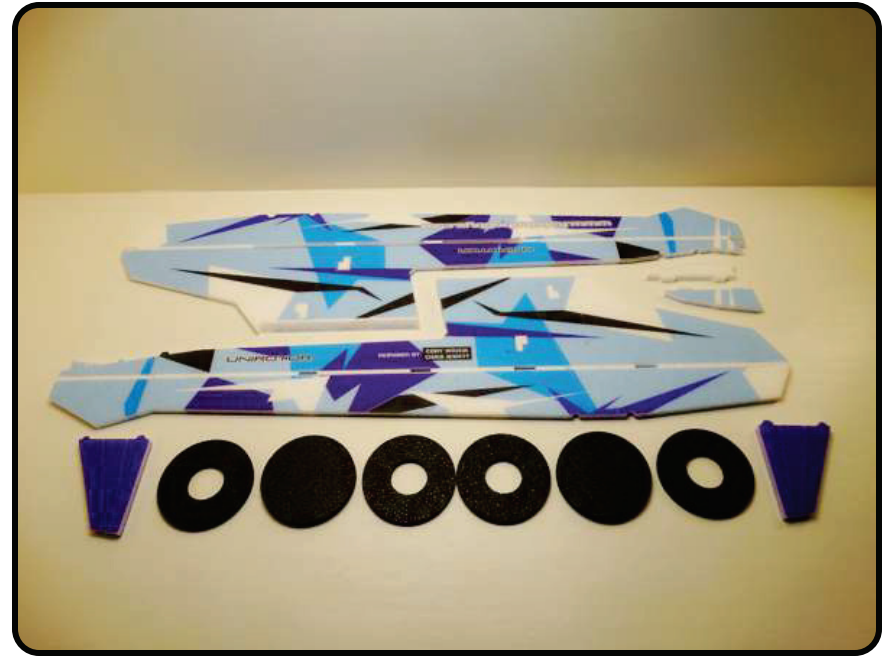
To provide the best products and service to our customers at the lowest prices possible. We take great pride in our company, our commitment to customer service and in the products we sell. Our online store is designed to provide you with a safe and secure environment to browse our product catalog.

Thank you for shopping with Twisted Hobbys!

KIT CONTENTS



Wing Parts

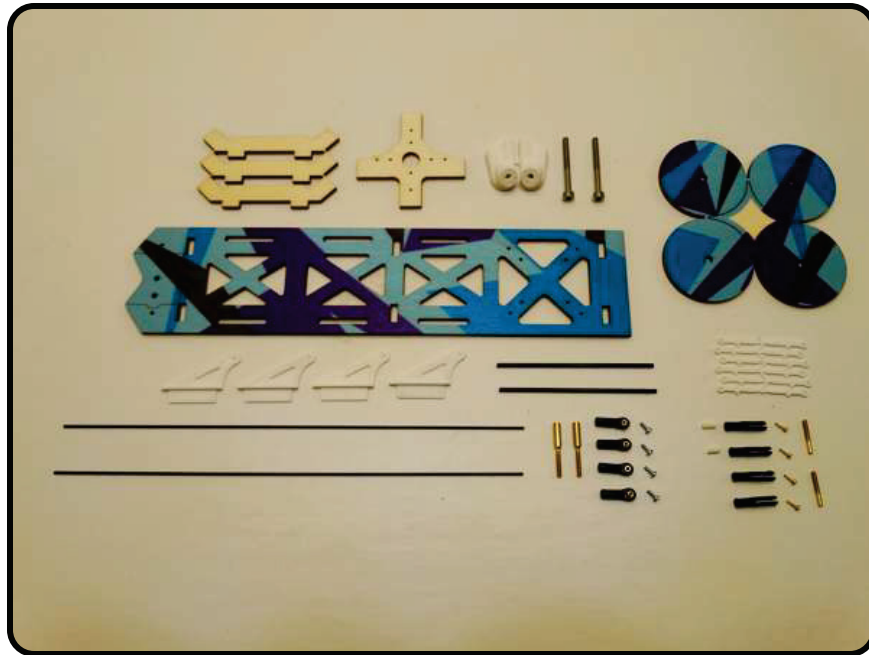


Fuselage Parts

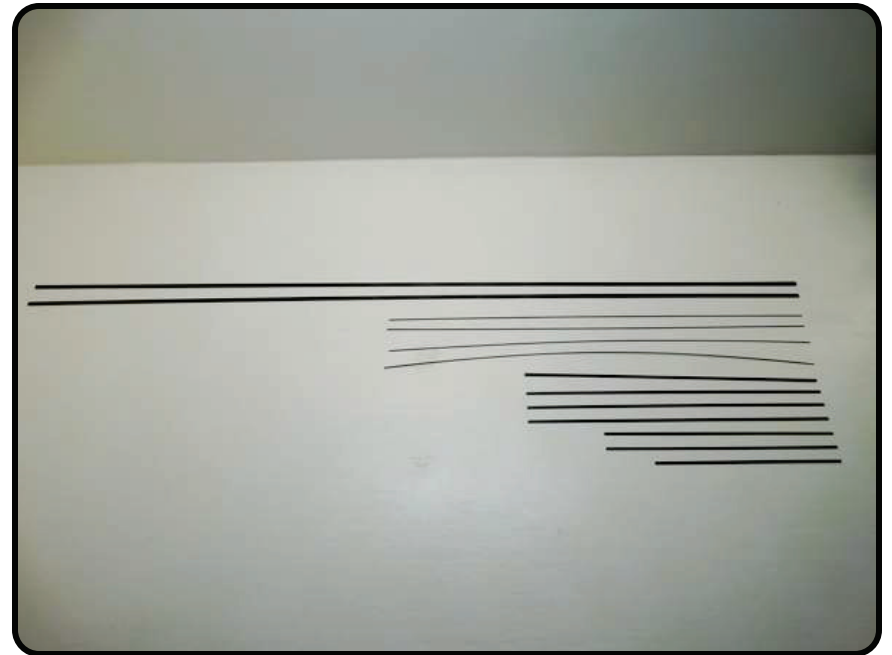
Double check that you have all the above pictured items. Note -
Some kits might have slight deviations from the above pictured items.

DETAILED DESCRIPTIONS OF ITEMS WILL BE CALLED OUT IN THE BUILD STEPS

KIT CONTENTS (cont.)



Hardware and Small Carbon



Carbon Bundle

Double check that you have all the above pictured items. Note -
Some kits might have slight deviations from the above pictured items.

DETAILED DESCRIPTIONS OF ITEMS WILL BE CALLED OUT IN THE BUILD STEPS

TOOL AND ADHESIVES NEEDED



Tools shown and listed are suggestions only. Depending on your building technique you may not need everything indicated – and/or – you may find that other tools available to yourself may be of benefit to your Build.

It is also recommended that you have a flat building surface, one that will accept stick pins and push pins. An Acroscopic Ceiling panel from your local hardware store fits this bill nicely, and will lay flat on your work table. Over size / long push pins are available at your local craft store. These two items are by no means required, but will aid in the building process, and can be used for future projects

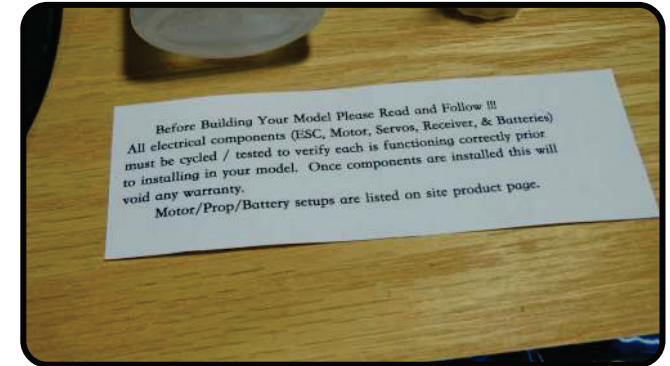
- **Lighter**
- **Small Drill Bits**
- **Tape Measure and Ruler**
- **Black Sewing Thread**
- **Welders or Foam Tac Glue**
- **Hobby Knife w/new Blade**
- **Needle Nose Pliers**
- **Wire Cutters**
- **Low Temp Hot Glue Gun**
- **Course Sand Paper**
- **Scissors**
- **Small Phillips Screw Driver**
- **Thin and Medium CA**
- **CA Applicator Tips**
- **Activator**

THE BUILD

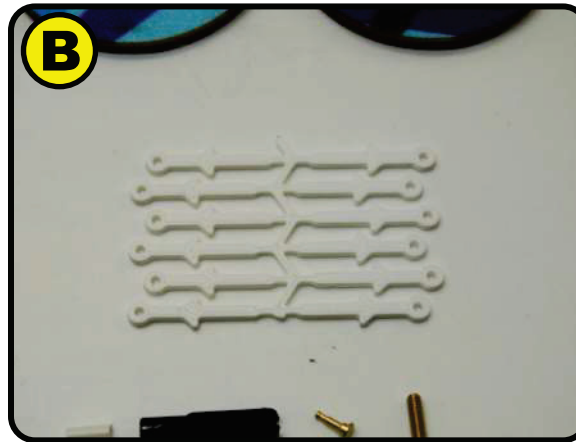
CONSTRUCTION METHODS:

Building surface should be at least 2ft x 4ft and flat. Weights or some small heavy objects will be handy for holding things in place during the time glue is setting.

Welders or FoamTac glue is used for FOAM TO FOAM joints. Thin and Medium CA can be used on the PLASTIC TO FOAM and CARBON TO FOAM joints. **When using the Welders or FoamTac glue for a butt joint, apply a thin film to each surface, allow to sit briefly per mfg instructions, then assemble.** Note that this method will create a nearly instant bond, so locate carefully when bringing the two pieces together. **If alignment is necessary or a slip joint, do not allow the glue to tack up,** simply apply and join immediately, you will have several minutes to locate the two parts before the glue sets up. In most cases the parts being glued can be handled with care in 30 minutes, full cure is approx 24 hours.



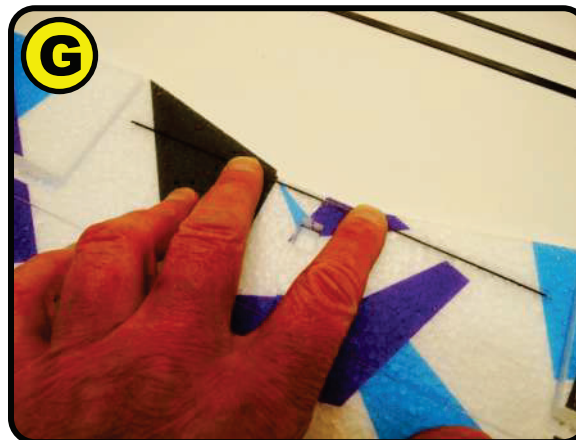
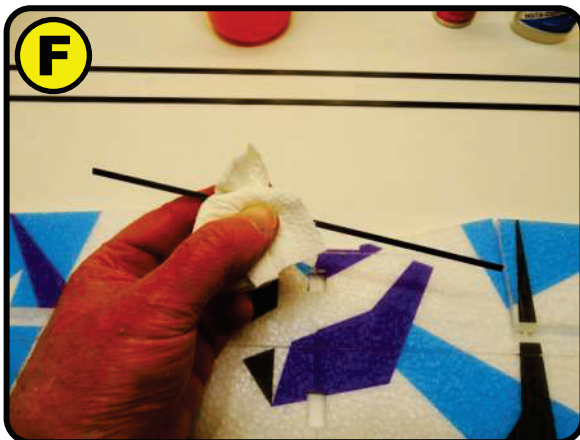
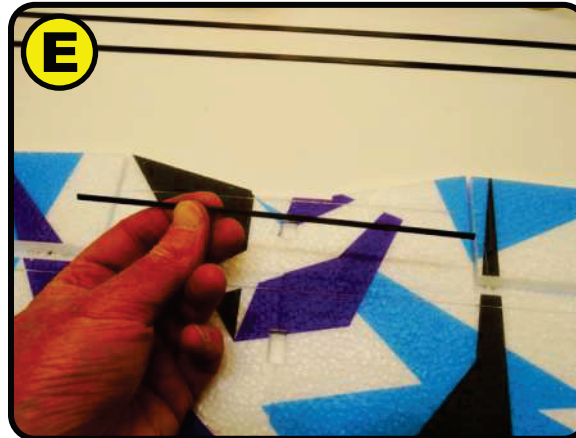
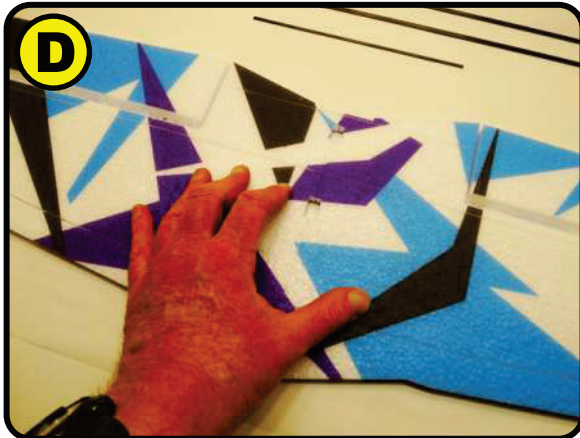
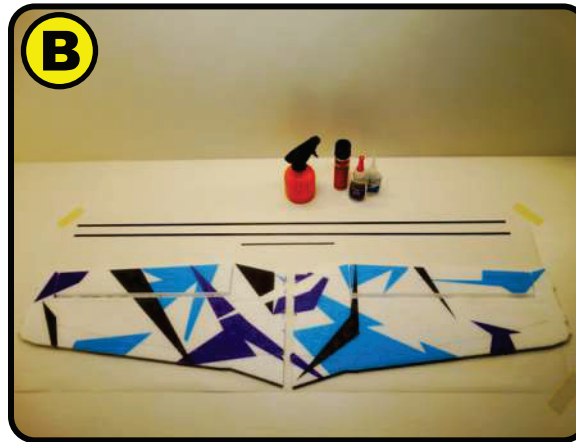
- Locate all the electronics that will be used on this model
- Create a model on your transmitter
- Following your radio mfg. instructions, bind your radio to the power combo components
- Calibrate the ESC.
- Confirm all components work properly.



----- **GETTING STARTED** -----

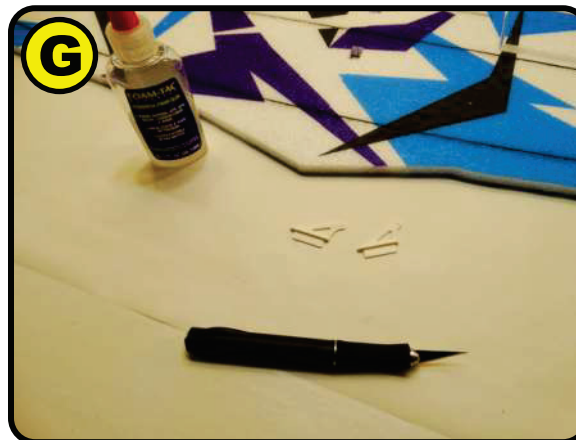
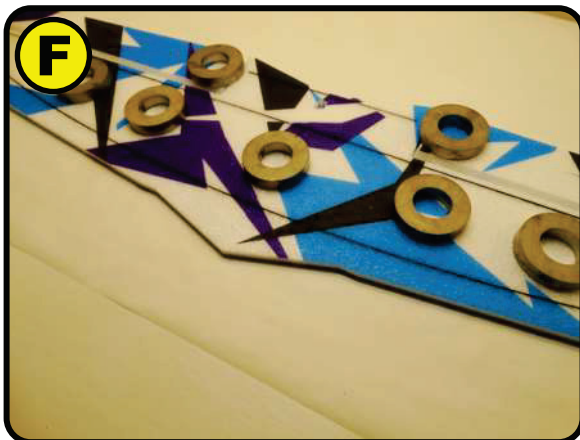
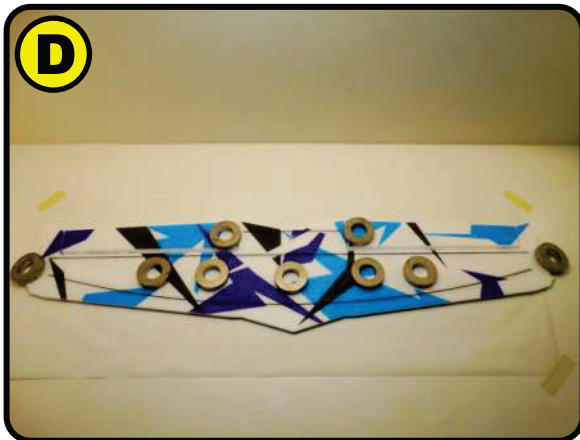
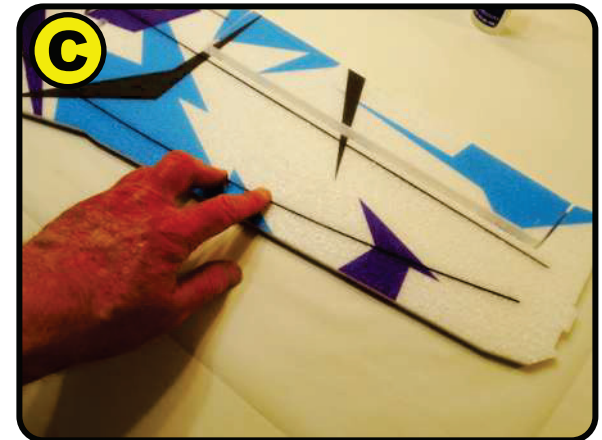
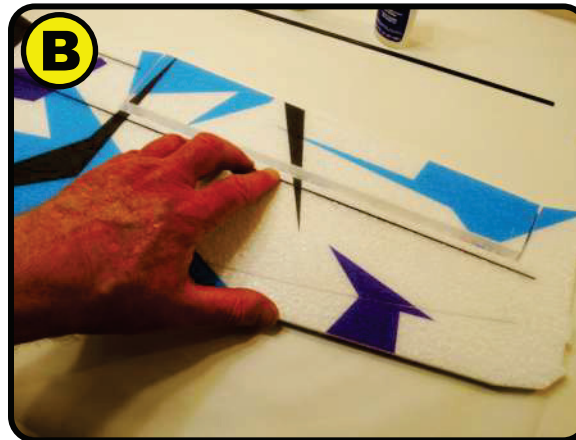
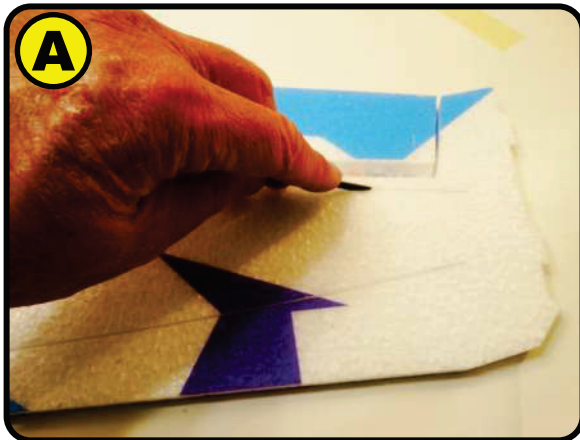
- A** Control Rod Ends
- B** Push Rod Guides
- C** Landing Gear Components
- D** Radio and FPV Tray
- E** Small Parts Organized for Building
- F** Optional Power Combo
- G** Basic FPV Components supplied by Customer

Identify all the components and pieces shown in the pictures. If there are any items missing contact Twisted Hobbys right away. If it looks like some of the small parts are missing, double check the hardware bags and kit box. Note that the items shown in picture G are customer supplied. FPV Camera and Receiver with Gyro.



----- **THE WING** -----

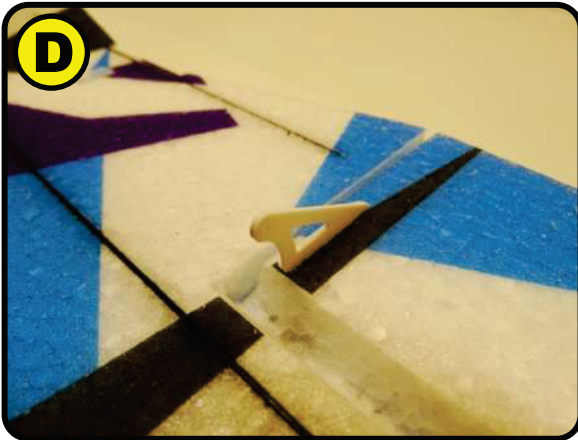
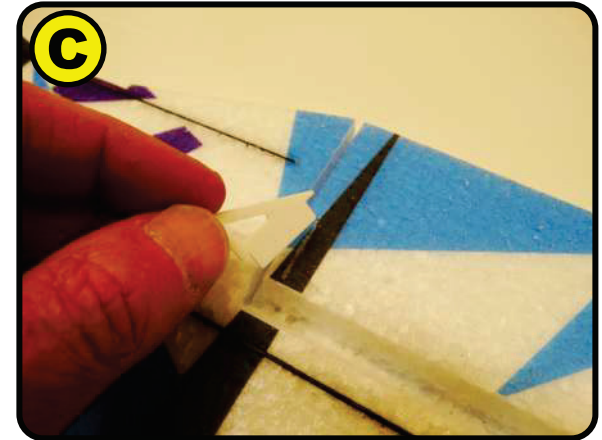
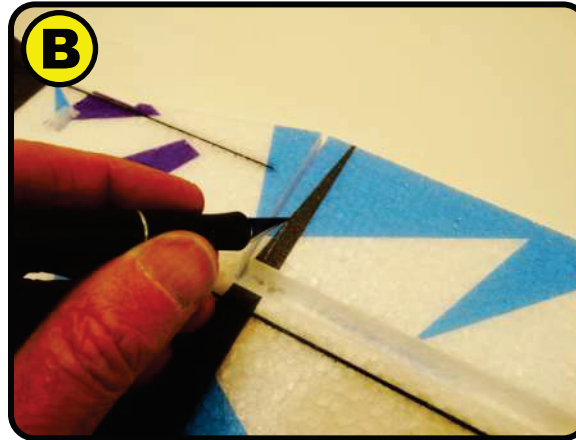
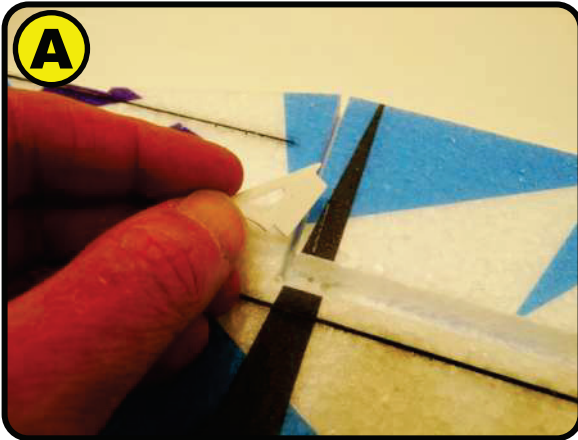
- A** Gently bend all the control surfaces back and let them sit like this for about an hour
- B** Locate the two longest and largest spars, 1x5x950mm, and the smaller one that is .5x3x200mm
- C** Apply a medium layer of FoamTac to the mating edges of the wing halves
- D** Once the glue is tacked up, bring the two pieces together making sure the alignment nubs are locating everything perfectly
- E** Start with the .5x3x200mm spar
- F** Wipe it down with alcohol
- G** Test fit it into the reward slot on the bottom side of the wing and secure with thin CA



----- **THE WING (con't)** -----

Wipe down the two main spars with alcohol before fitting

- A** Test fit the rear main spar so that it is flush with the surface
- B** Install the rear main spar, pushing it flush to the wing surface for the how length
- C** Repeat the process with the forward main spar
- D** Secure the wing and spars flush to the work bench with some weights
- E** Glue all the three of the spars to the wing with some thin CA, don't hit with kick yet
- F** Let the whole assembly sit for a couple minutes to all the CA to soak in, then hit with kicker
- G** Locate two of the four control surface horns. All four are the same, so any two will do



----- **THE WING (con't)** -----

FoamTac or CA can be used to attach the control surface horns

- A** Test fit the horn in to the provided slot
- B** Adjust the length as needed
- C** Retest the fit
- D** Make sure the front of the horn is flush with the edge of the hinge cut
- E** Apply some glue to the base of the control horn
- F** Install into the slot, again making sure that the front edge of the horn is flush with the hinge cut.
- G** Repeat for the other side, paying attention to make sure that the other horn is installed in the same location relative to the hinge cut



----- MAIN FUSELAGE STRUCTURE / Before you Start -----

If you are an experienced builder all the detail may not be necessary, if so skip ahead a couple pages.

Building the Main Fuselage structure for the proXy will be similar to that of the Crack Beaver. There are a couple different ways to do this, method and sequence shown here will ensure that the X cross section of the fuselage will come out nice and square with little effort. Things that will be critical to the success of this step will be to make sure ahead of time that all the slits for the spars are deep enough and clear of nubs so that the spars will lay into the slits nice and flush.

IMPORTANT PART FOR SUCCESS OF THIS STEP TO TEST FIT ALL THE PARTS TOGETHER FIRST AND UNDERSTAND THE SEQUENCE OF EVENTS BEFORE GLUING.

----- THE PROCESS / words -----

- Start by rounding up the two main fuselage pieces
- Remove any scrap from the cut out areas
- Locate the fuselage section that has the LONG slits and SHORT tabs as shown
- Split the tabs in half at the "V" marks
- Locate the landing gear struts. Note that they are keyed unique
- Test fit that the nubs match up perfectly and that the slits for the spars align
- Attach the two pieces with FoamTac, using the "tackup" method
- Hold a little pressure for a minute or two against the joint while the glue sets up
- Repeat for the other side
- Locate the Ele/Rud that is keyed to fit the large one piece fuselage section
- Glue the two together with the "tackup" method, make sure the slits align
- Hold a little pressure for a minute or two against the joint while the glue sets up
- Take one of the two smaller carbon spars and clean it with alcohol
- Fit it into the slit of the Ele/Rud piece that was just attached, make sure it is flush
- Constrain it flat and then CA in place
- Take the other smaller spar and the loose piece of the Ele/Rud
- Clean, test fit, constrain and CA glue the two together
- Get two of the larger spars and the one piece fuselage side
- Clean the spars with alcohol and test fit, make sure that the spar is all the way to the top of the slit and flush
- Also check that the remaining part of the spars at the end of the strut will be approximately the right length to engage the axle hubs
- Do not glue the hubs on yet, they will get attached in a later step
- Constrain, check for flush and CA
- Take top half of fuselage and the remaining two larger carbon spars
- Test fit them into the slits, again make sure that they go all the way to the upper end of the slit
- Make sure they are flush, the constrain it all flat and apply CA
- Test fit the last remaining smaller spar into the slit in the Ele/Rud
- Constrain, check for flush and CA

----- **THE PROCESS / words (con't)** -----

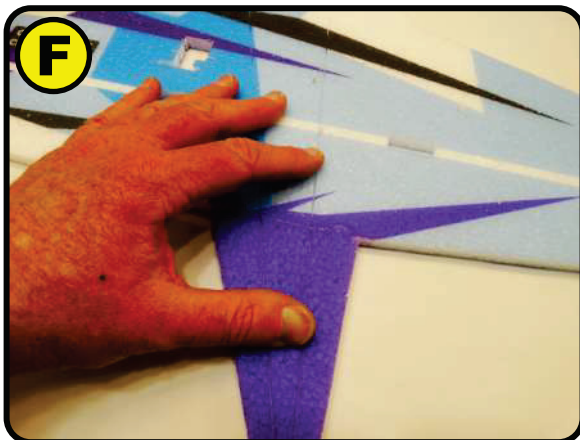
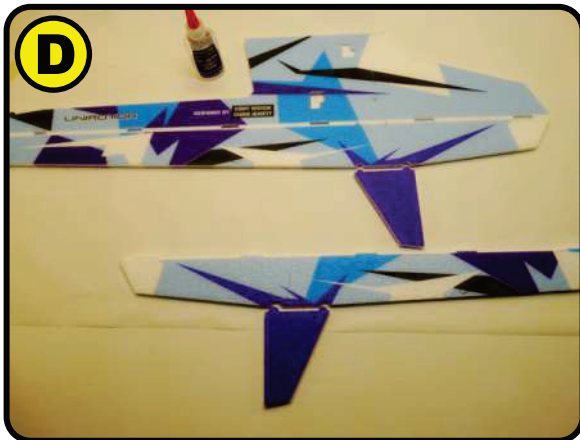
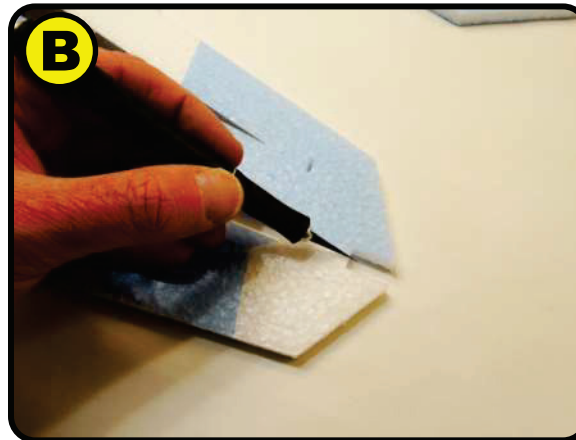
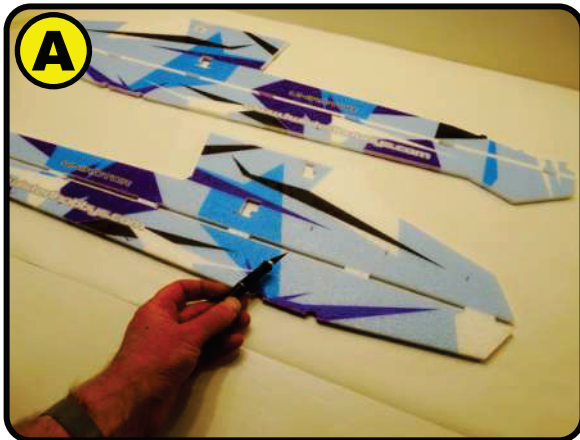
The next several steps will all be done WITHOUT GLUE it is for test fitting only and to understand how the assembly will go together, study the pictures and make sure everything fits together nicely

- Take the top half of the fuselage with the spars sticking out and feed those spar ends thru the cut outs in the fuselage
- Get it pretty close to the tabs, then focus your attention the the rear Ele/Rud spar and feed it thru its associated hole
- Fully engage all the tabs and slots
- Make sure that the bevels on the top of the fuselage are LEVEL, if they are not, you have assembled the pieces incorrectly
- Grab the lower fuselage half and align the tabs at a slight angle to the slots in the fuselage
- Engage the tabs into the slots at the same time as guiding the carbon spars into their respective slits
- Push everything together, making sure that it all fits nice, flush and square
- If any parts are not flush, fully engaged or not square, make the necessary adjustment to get everything fitting properly

This completes the TEST FIT WITH NO GLUE, keep in mind how it all went together and disassembly all the pieces

- Start the reassembly with the main fuselage piece and the top half of the other side of the fuselage
- Apply FoamTac to the larger piece in all the areas where the two items will contact each other including the tab and slot areas
- Keep glue AWAY from the area where the spars cross thru
- Fit the upper fuselage half and the strut spars thru the holes in the large fuselage piece like was done in the test fit up
- Make sure all the foam tabs and slots are fully engaged and that the strut spars and Ele/Rud spar are in their slits and flush
- Make sure the two upper fuselage member are nice and square with each other
- Apply a little pressure to the assembly for a couple minutes to allow the FoamTac to make a good bond
- Next the lower fuselage half will be attached, apply FoamTac to all the mating FOAM surfaces
- DO NOT PUT GLUE THE SPARS AT THIS TIME
- Move the two pieces into position as was done with the fit up
- Make sure the foam tabs and slots are fully engaged
- Double check that the spars are (dry fit) flush with the surface of their slits
- Make sure all the fuselage pieces are 90 degrees to each other along the entire length
- Hold a little pressure on the two pieces for a minute or two so that the FoamTac can make a good bond
- NOW the spars will be secured with CA to their slits
- Make sure that all the fuselage components are still square and that the spars are flush in the slits
- Apply thin CA to all the spars and hit with kicker

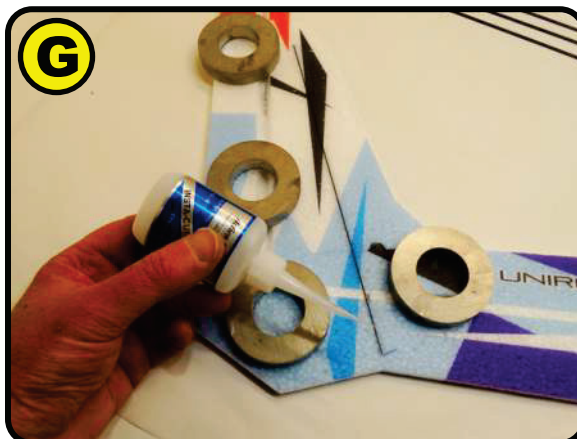
This completes the Main Fuselage Structure



----- MAIN FUSELAGE -----

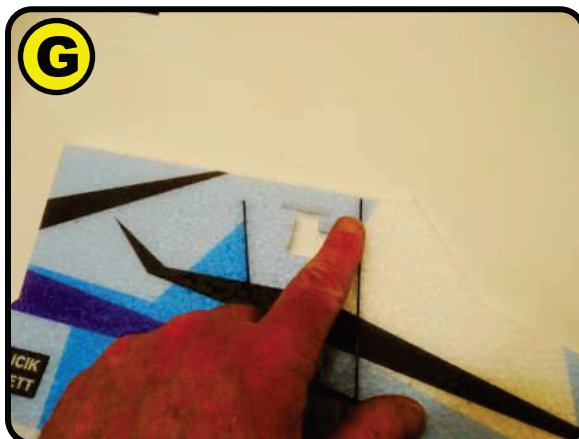
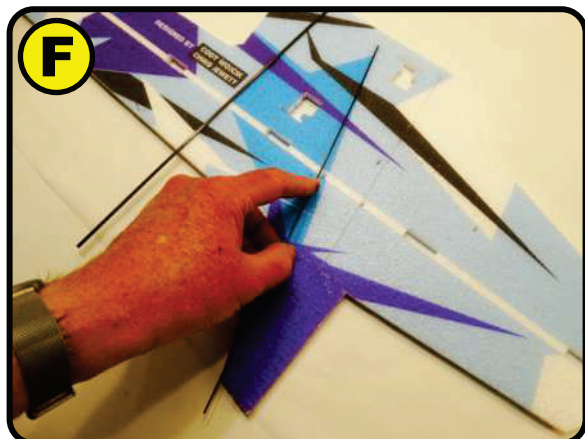
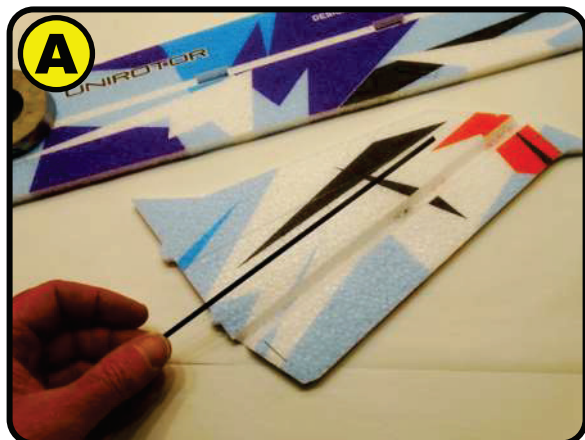
Pictures to follow along with for the previous two pages

- A** Locate the two fuselage halves bottom one shown gets split ...
- B** ... at the center of the tabs
- C** Split all the way, nose to tail
- D** Locate the gear struts and notice how they are keyed to their mate fuselage piece
- E** Use the “tack” up method to attach the gear strut to the fuselage
- F** Assemble and hold pressure for a minute or so
- G** Repeat for the other side



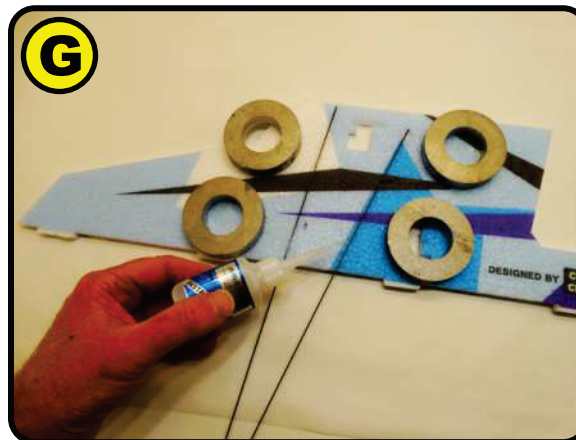
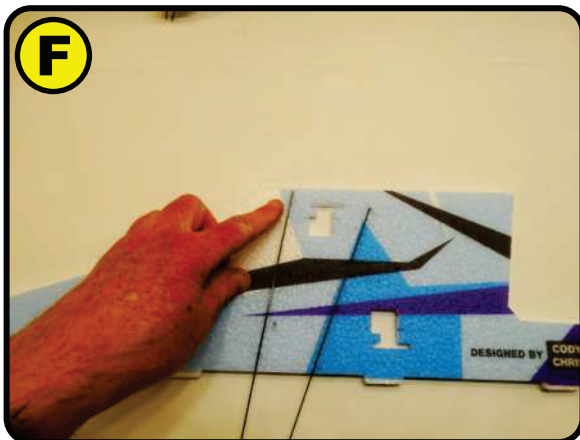
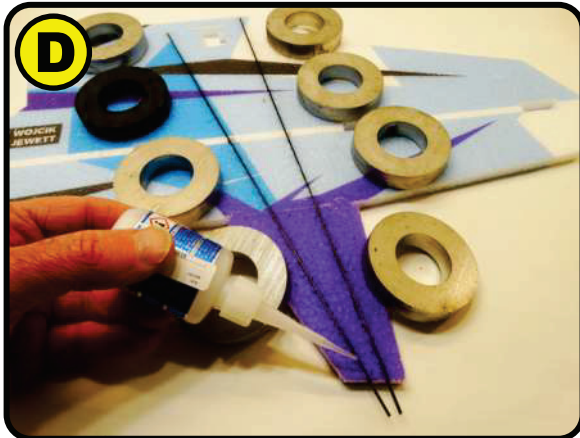
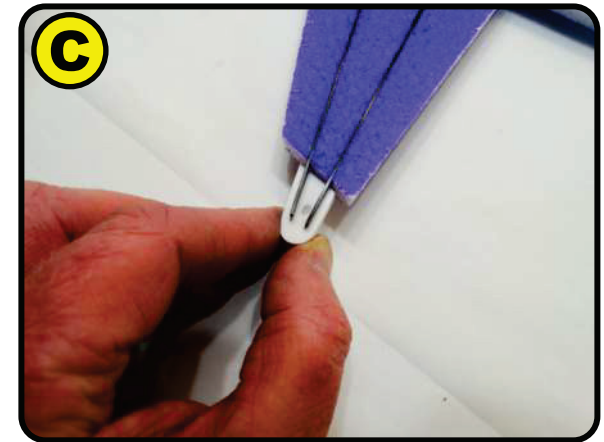
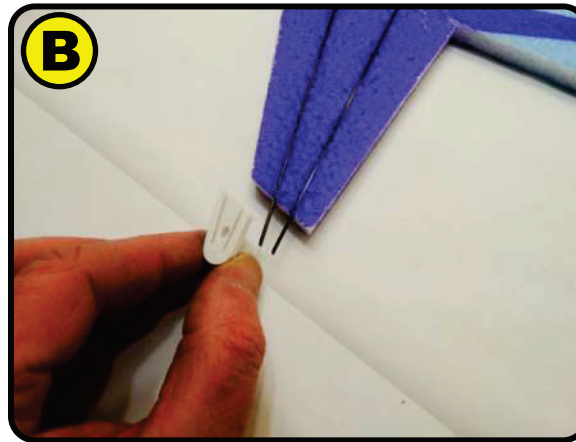
----- MAIN FUSELAGE (con't) -----

- A** Find the rudder piece shown that is keyed to fit the fuselage on that side
- B** Using the “tack” method attach the two pieces
- C** Locate the shorter spars from the set pictured above (.5x3x250mm)
- D** Wipe it down with alcohol to remove any mfg residue
- E** Test Fit and clean up the slot if needed
- F** Install / Insert
- G** Constrain flat and secure the spar and control surface together with some thin CA and kicker



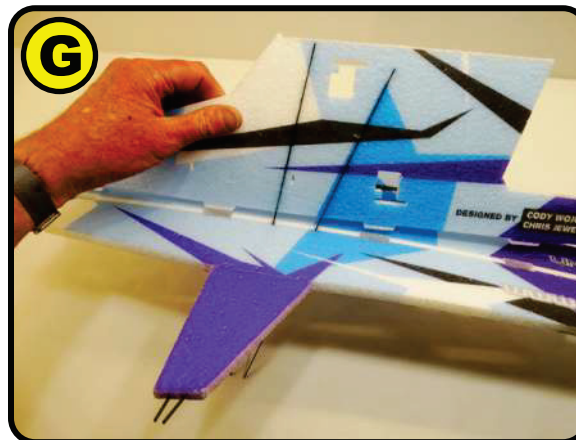
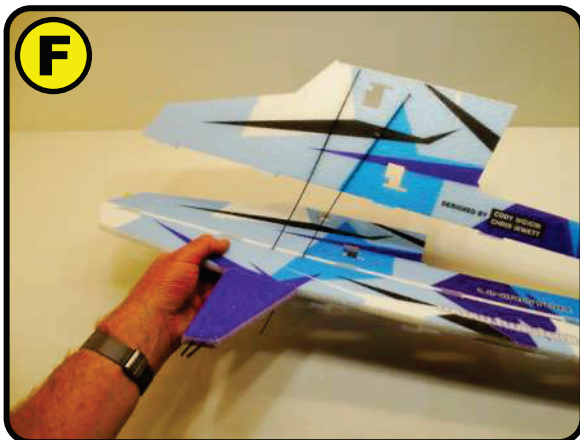
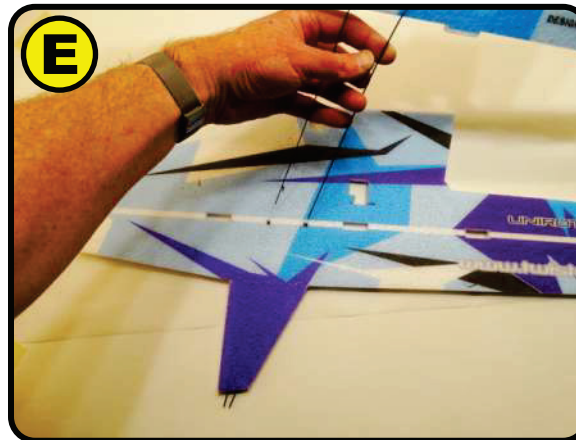
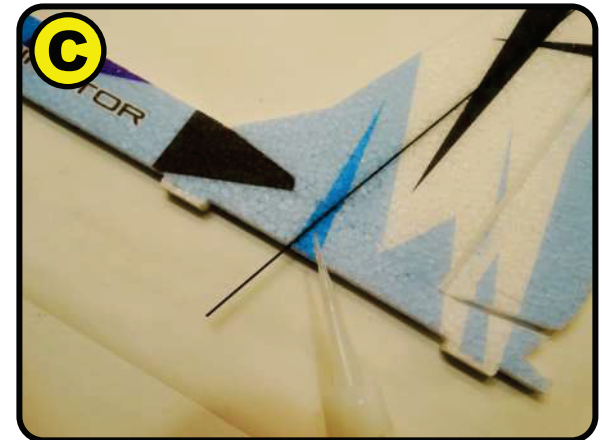
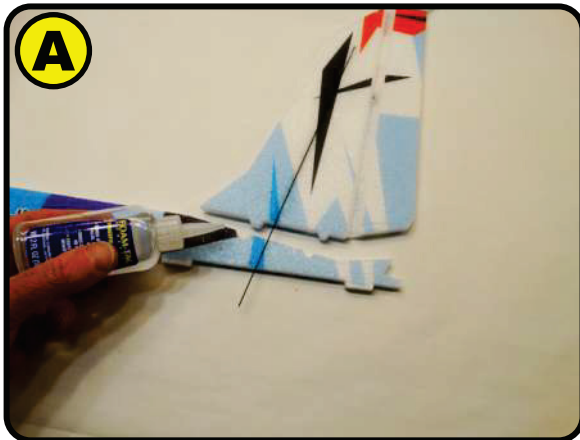
----- MAIN FUSELAGE (con't) -----

- A** Locate the other short spar, prep it and ...
- B** ... test fit it, as was done with the other one
- C** Constrain and combined with CA and kicker
- D** Locate two of the four longer spars (.5x3x332mm long)
- E** Prep them
- F** Test fit them
- G** Make sure they go all the way up to the top of the slot near the wing saddle part of the fuselage



----- MAIN FUSELAGE (con't) -----

- A** Locate the two little white 3D printed axle hubs
- B** Compare the slots in the hub to the exposed spars
- C** The two should match up pretty close, if not double check to make sure the spar is up against the other end of the slot
- D** Constrain Flat and secure with thin CA and kicker
- E** Grab the remaining two spars (.5x3x332mm) and the top half of the other fuselage side
- F** Test fit them, all the way up to the wing saddle like was done with the other side
- G** Constrain flat and secure with thin CA and kicker

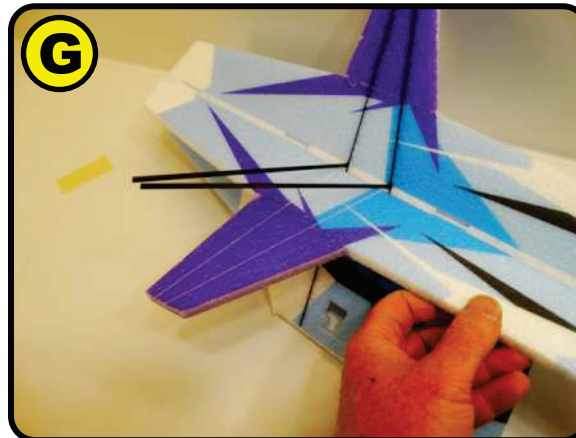
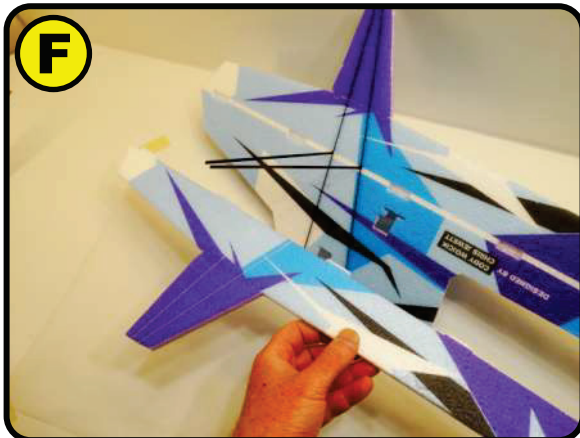
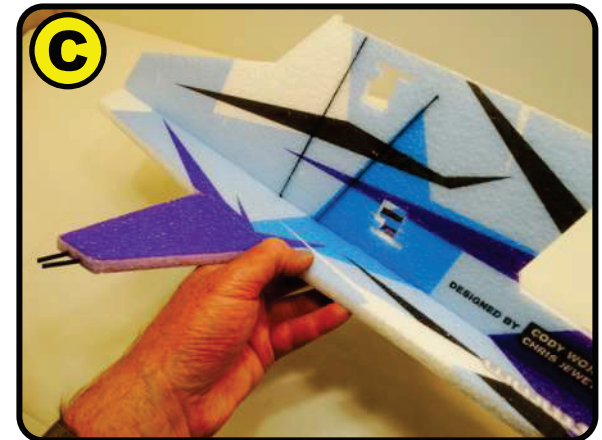
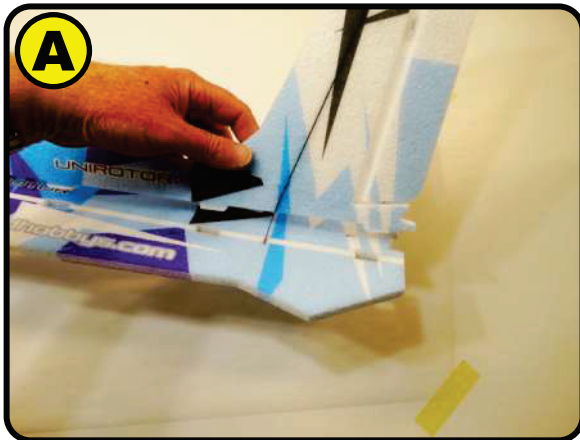


----- **MAIN FUSELAGE (con't)** -----

- A** Use the “tack” method and attach the tail piece shown, only apply the glue on the foam-foam part of the joint
- B** Hold pressure for a minute or so
- C** Secure the carbon-foam part of the joint with thin CA and kicker
- D** Finished parts

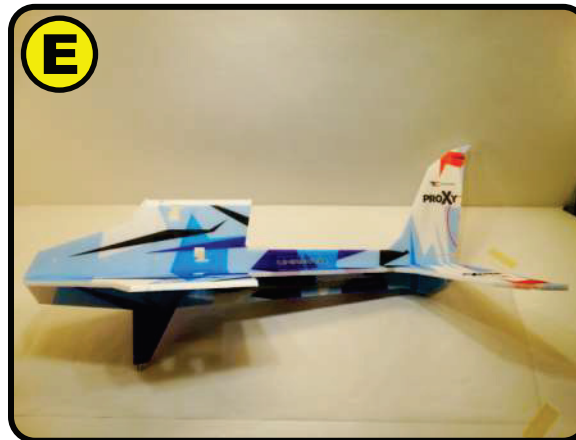
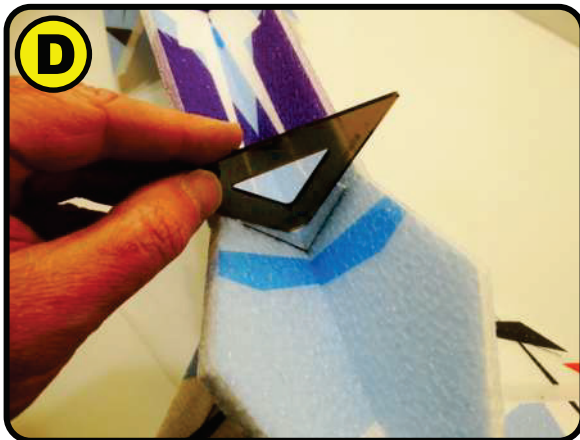
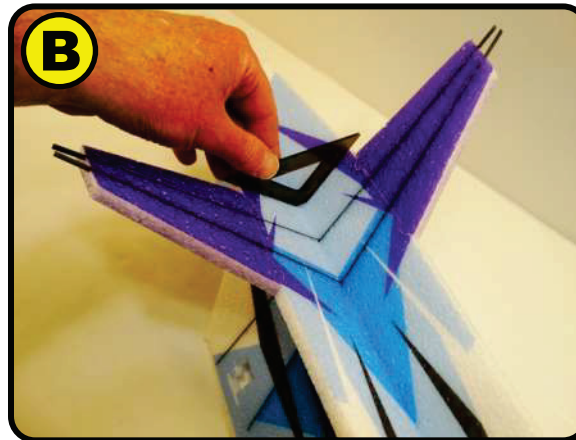
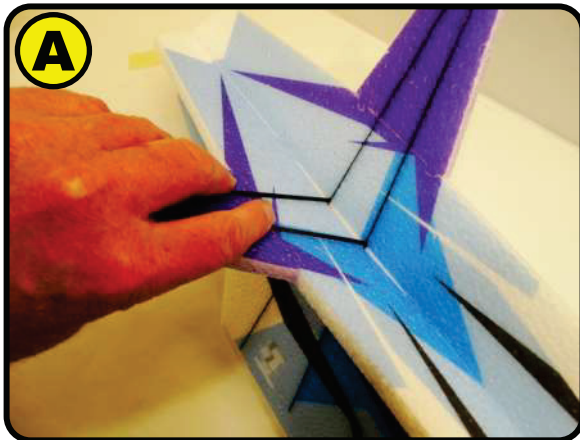
THIS IS WHERE TEST FITTING STARTS - DO NOT USE GLUE UNTIL CALLED FOR

- E** Take the fuselage piece with the spars sticking ut and thread the ends thru the other fuselage part
- F** All the way thru...
- G** and line up the tabs



----- MAIN FUSELAGE (con't) -----

- A** Also feed the extended tail spars thru their respective cut outs
- B** Fully engage the tail tabs
- C** Fully engage the forward tabs
- D** Check that the fuselage saddle area is approximately level/horizontal
- E** Flip the fuselage assembly over so that the extended spars are facing upward
- F** Grab the mating lower fuselage section and start to line up the tabs into their cutouts and the spars into their slots
- G** You will have to fit them up to each other initially at a little bit of an angle, once the tabs and spars are nearly in position, you can square things up

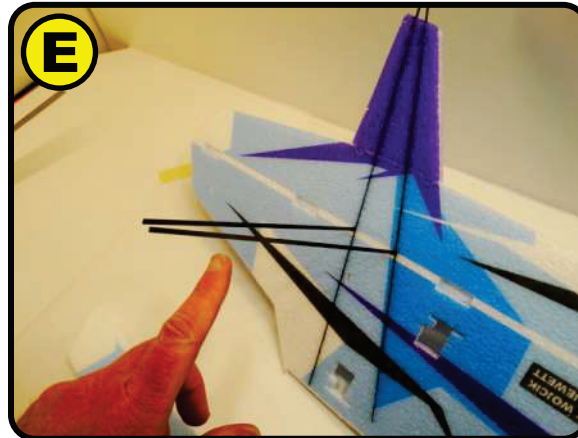


----- **MAIN FUSELAGE (con't)** -----

- A** Fully seat the spars land gear struts into their slots, make sure they are flush
- B** Check to make sure the two fuselage members are square to each other in and around the landing gear strut area
- C** Fully seat the tail spars into their slots, make sure they are flush
- D** Check to make sure the two fuselage members are square to each other in and around the tail section
- E** TEST FIT UP is essentially done, have a look at the whole thing and make sure it all looks nice and square
- F** Take is all apart, remember how it had all been test fit assembled

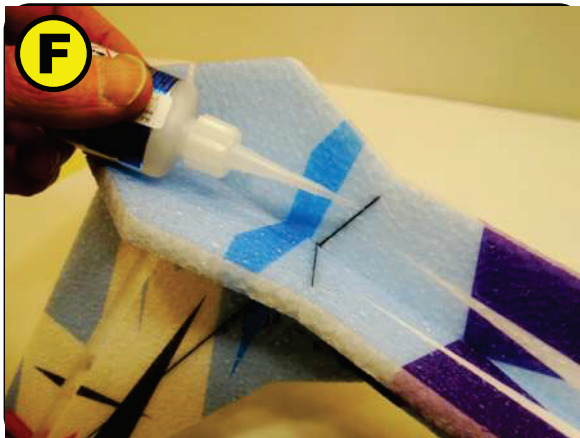
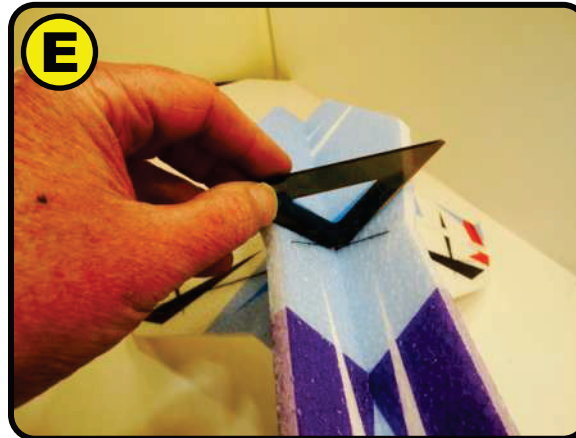
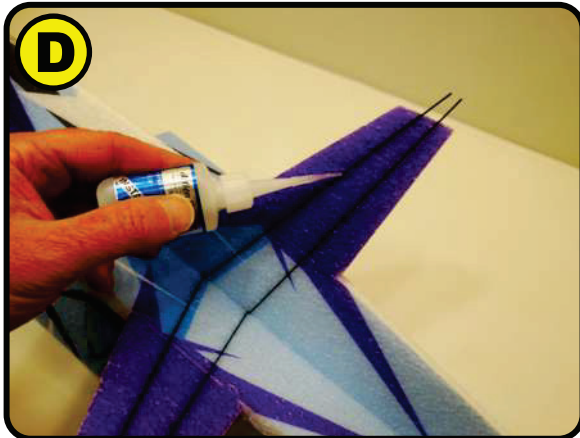
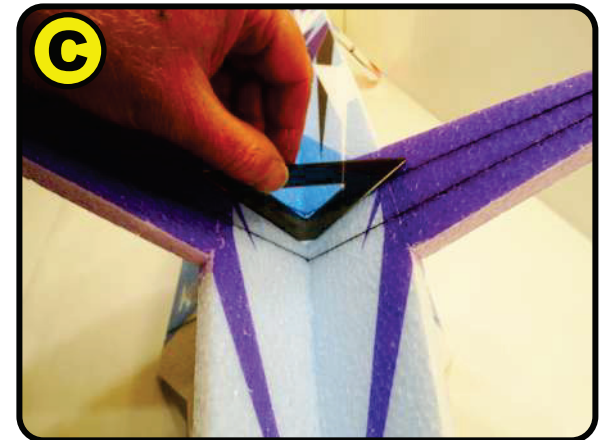
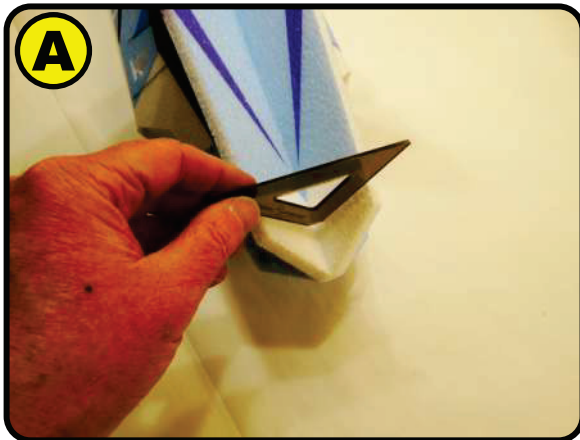
TEST FIT IS DONE - TIME FOR GLUE

- G** Apply glue as shown to all mating surfaces



----- MAIN FUSELAGE (con't) -----

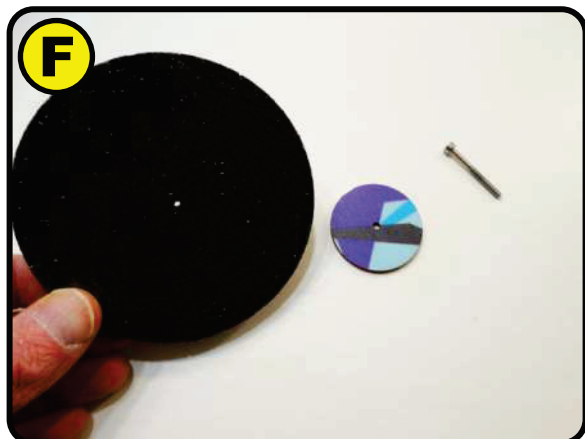
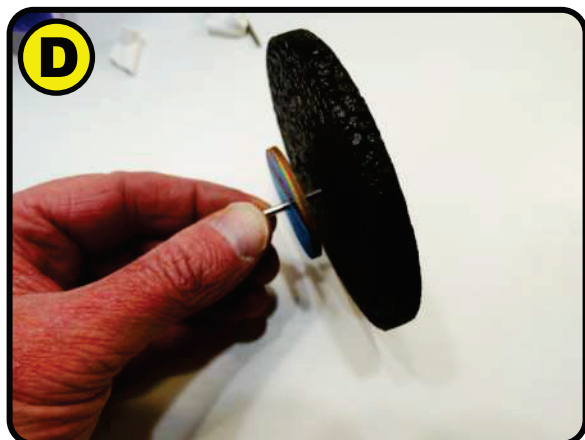
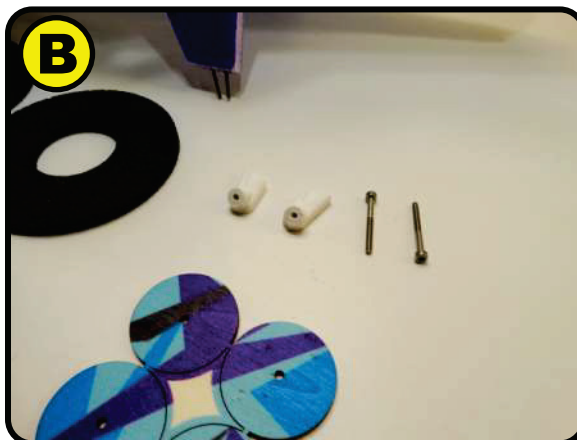
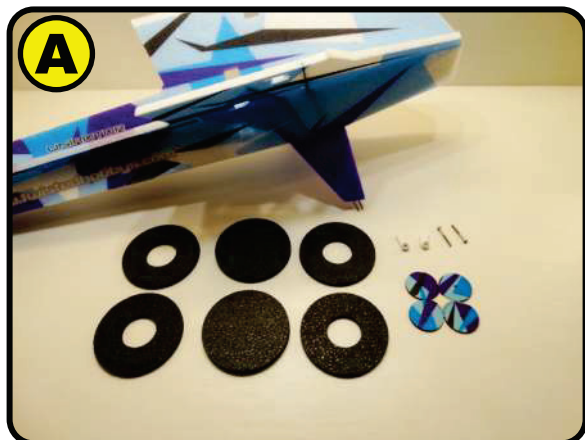
- A** Feed the spars thru the forward section
- B** Feed the spars thru the tail section
- C** Check for squareness and that all the joints are firm against each other
- D** Apply glue to lower fuselage sections
- E** Keep the two long extended spars free of glue at this time
- F** Keep the single extended tail spare free of glue as well
- G** Press all the FoamTac joints together firmly for a minute or two until they hold their own position



----- **MAIN FUSELAGE (con't)** -----

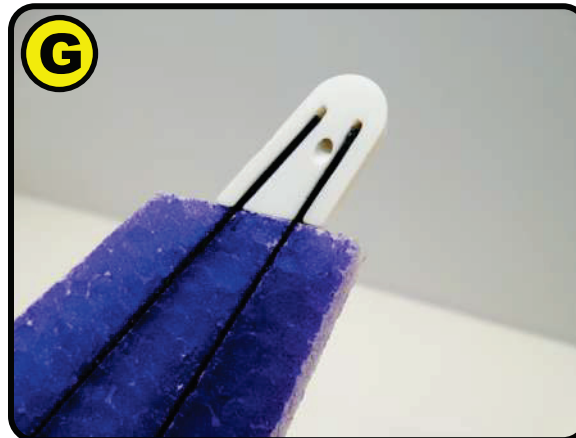
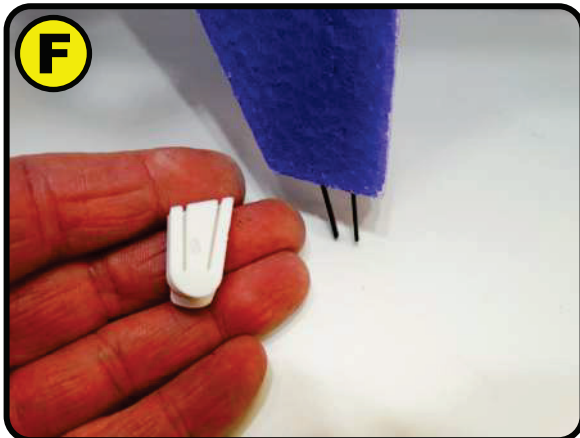
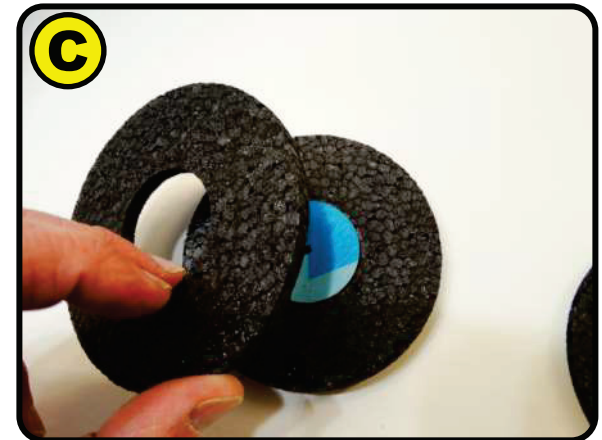
- A** Check that the fuselage is square all along the length nose to...
- B** ... tail
- C** From the underside, specifically check that all the spars for the landing gear struts are flush
- D** When satisfied, secure the one that have not been glued yet with some thin CA
- E** Repeat step C for the area of the tail section where the spars comes thru
- F** Repeat step D for the tail
- G** Do one last double check with your builder square to make sure everything is nice and square and set aside for now to let the glue cure up.

MAIN FUSELAGE STRUCTURE IS NOW COMPLETE



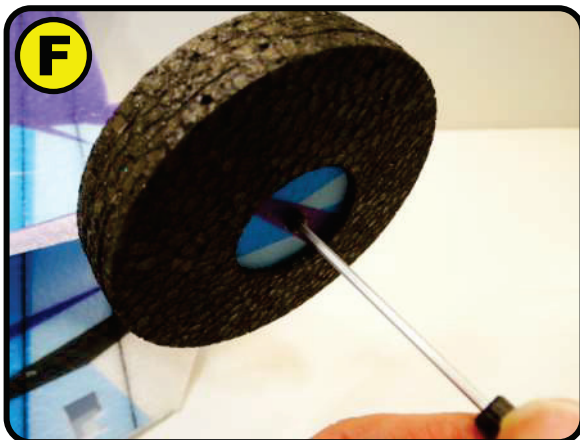
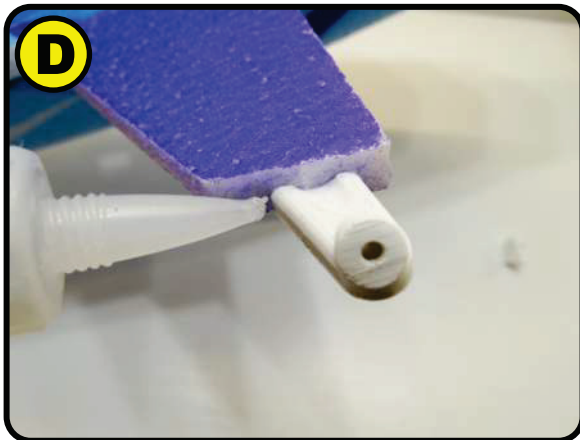
----- WHEEL / AXLES/ HUBS -----

- A** Gather up all the round wheel donuts
- B** Locate the two 3D printed axle hubs, the socket head cap screws and the wood hub caps
- C** Separate the hubs from their wooden tree
- D** Take one of the hub caps, one of the cap screw and a solid wheel piece
- E** Fit them together, using the cap screw as a locator to position the hub cap at the center of the foam wheel piece. Secure with CA or FoamTac
- F** Flip the tire piece over...
- G** ... and repeat for the other side



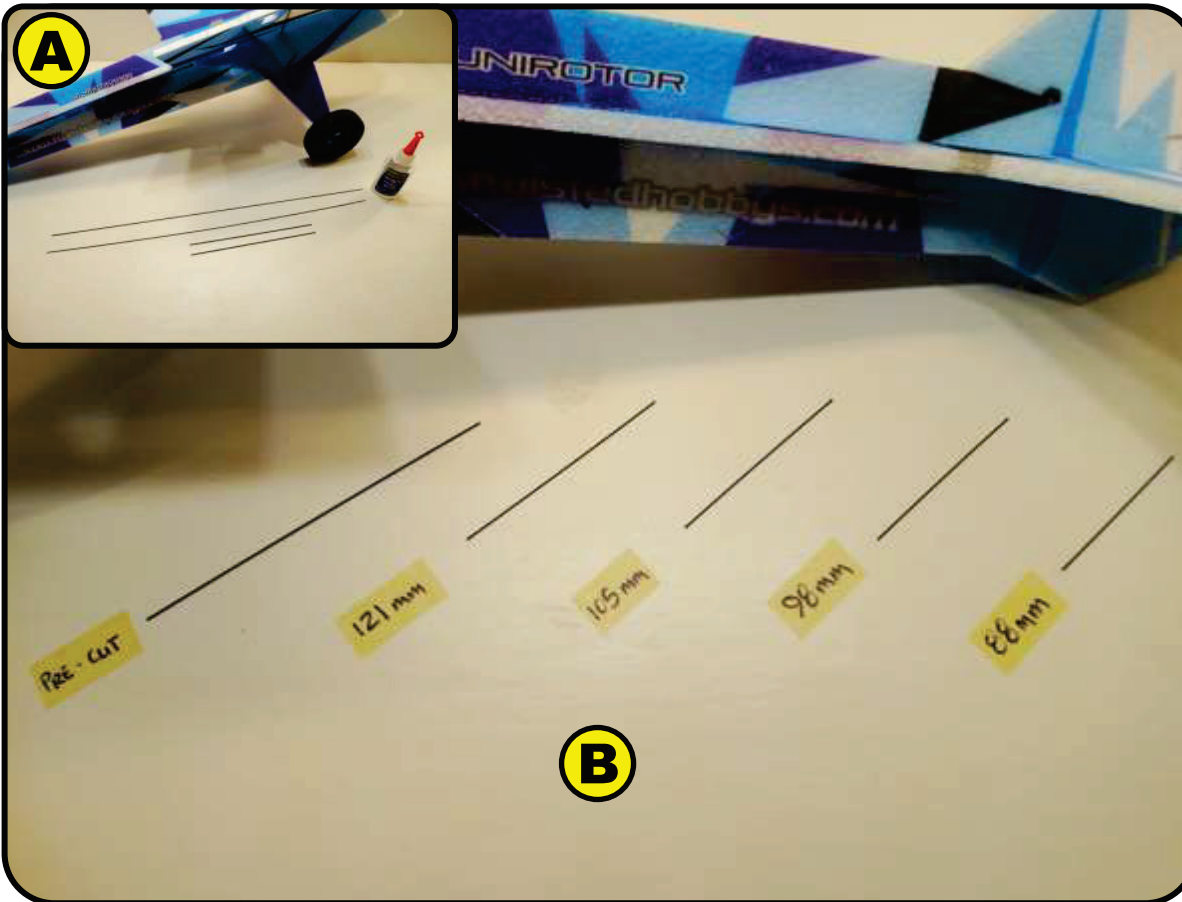
----- WHEEL / AXLES/ HUBS -----

- A** Gather up all two of the donuts with holes in the center as pictured
- B** Apply some FoamTac to one side
- C** Join together with the piece that has the wood hub cap all ready attached to it, center the hole around the hub cap. When joining together slightly twist the two pieces to distribute the glue
- D** Repeat for the other wheel
- E** Once both wheels are built, put them under some heavy weights, and leave them there overnight, this will minimize the edges from curling up
- F** Locate the 3D printed axle hubs
- G** ... and test fit them both on to the exposed ends of the spars as shown, the spars may need to be shortened slightly for a nice flush fit



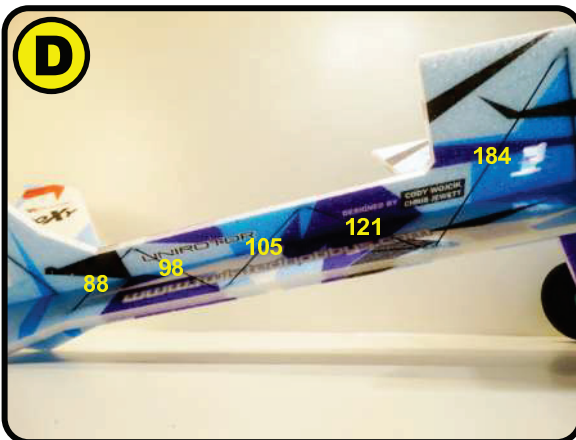
----- WHEEL / AXLES/ HUBS -----

- A** For best strength and longevity, use FoamTac for attaching the axle hubs
- B** Put some glue in the grooves
- C** Coat the spars
- D** Join the two pieces as shown and add a fillet of glue all around the base of where the two pieces meet. Make sure the spars are flush and that the axle hub is firm against the bottom edge of the landing gear strut
- E** Repeat for the other side. Let this assembly dry at least overnight before attempting to attach the wheels
- F** Insert a cap screw thru the wheel and thread into the axle hub. Note that it may be a little tight, so work the screw in gently by going in and out a little at a time.
- G** ... and repeat for the other side



----- TRUSSING -----

- A** Gather up two of the four long skinny round carbon rods (1x500mm) and the two thicker ones from the hardware kit that are approx. 1.2x184mm long
- B** Cut one of the 500mm long pieces into one each of: 121/105/98/88 mm long pieces
- C** Locate the slit cuts in the fuselage pieces that are angled to accept the ends of the rods just cut, fill each of the slots on one side with FoamTac
- D** Install the trussing as show, starting with the longest (thick one) that goes from the wing saddle down to the fuselage, from there they zig-zag towards the rear of the fuselage in decreasing size.
- E** Make sure the fuselage is true, and repeat the process for the other side





----- TAIL PUSH RODS AND SERVOS / Before you Start -----

If you are an experienced builder all the detail may not be necessary, if so skip ahead a couple pages.

Following is the process for the installation of the equipment tray, the dry fitting (no glue) of the servos, and the building (and installation) of the tail control rods. Read ahead a couple steps along the way if the assembly process is not clear on the current step.

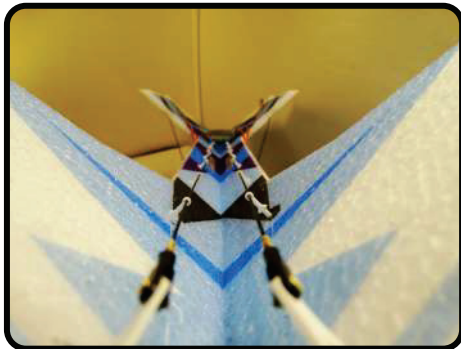
CAUTION SHOULD BE USED WHEN BUILDING THE CONTROL RODS.

IT IS CRITICAL

FOR THESE STEPS THAT THE SERVOS AND CONTROL SURFACES BE CENTERED. IF YOU DO NOT HAVE THINGS CENTERED YOUR CONTROL RODS WILL END UP THE WRONG LENGTH!

----- THE PROCESS / words -----

- Start by locating the three wood cross braces, the equipment tray and your four servos
- Separate the wood pieces from each other
- Test fit them into the slots of the equipment tray
- Wiggle the three wood cross braces into their respective holes in the fuselage
- Fit the equipment tray onto the cross braces
- Use thin CA to attach the wood pieces in the tab areas
- Underneath on the foam side the tabs should be flush adjust if needed then CA
- Push the four servos into their cut out, pay attention the the orientation. Horns for the ailerons will face outward, and horns for the tail will face inward
- Do not glue the servos yet, but situate them so that the ailerons servos are flush with the inner fuselage wall and the tails servos should be flush with the external fuselage wall
- Locate the two remaining control surface horns and test fit them into their pre-cut slots
- The fore/aft location should be such that the hole in the horn is directly above the hinge line.
- The slot in the foam should already be cut to locate this as needed, but it does not hurt to double check
- Once happy with the fit remove the horns, put some FoamTac in the slot, some FoamTac on the tab of the horn and install
- Repeat this for the other side
- Locate all the control rod guides and cut them free from each other
- Install them into their tiny holes on the "top-inside" of the fuselage, **DO NOT GLUE THEM YET**
- Locate two clevis and two ball link sets of hardware, and the two remaining long thin rods
- The clevis end will install on the control surface side of the push rod, and the ball link end will attach to the servo horn
- Locate the two tiny white spacers and finger install them into the back of one of the ball link ends
- Once you have it started by hand, hold the ball link with some small pliers and gently tap the white spacer in a little further
- When completely seated there should be just a little white of the spacer showing
- Test fit one end of the push rod into the center of the white spacer that was just installed. You may need to dress up the end of the carbon rod a little so that it fits cleanly into the center of the spacer
- Once happy with the fit, use some thin CA to secure the pieces together
- Repeat for the other control rod
- Next from the nose of the aircraft, thread the control rod thru the push rod guides such that when completely threaded thru, the ball link should be near the area of the servo control horn
- The ball link will attach to the **BOTTOM** of the servo horn. You will need to manipulate the servo out of it's pocket a little to be able to reach the tiny screw that threads into the base of the ball part of the link. Use a little bit of thread locker on the screw to keep it from backing out
- Repeat this process with the other control rod and servo
- Locate two of the clevis links and two of the small threaded rod ends
- Thread the clevis on the threaded rod end for approx half of the available threaded length. Do this for both pieces.

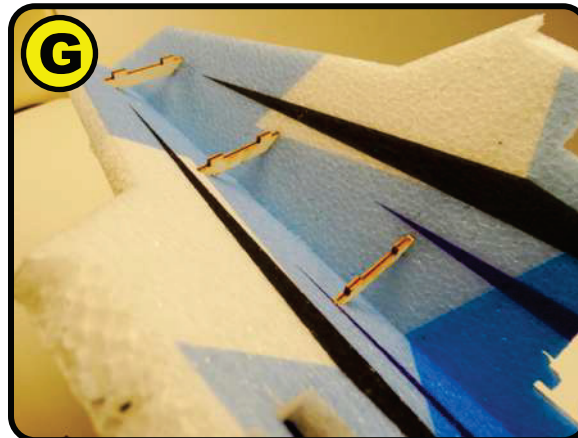
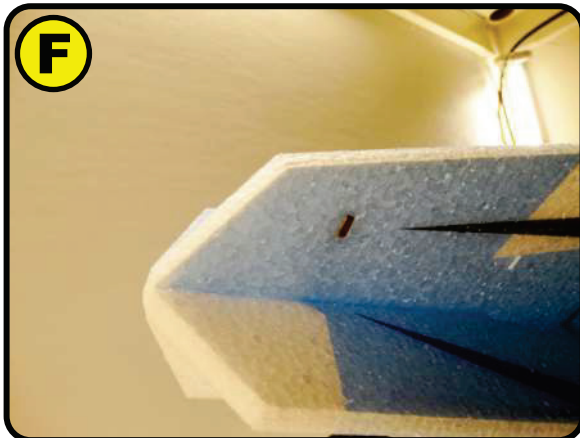
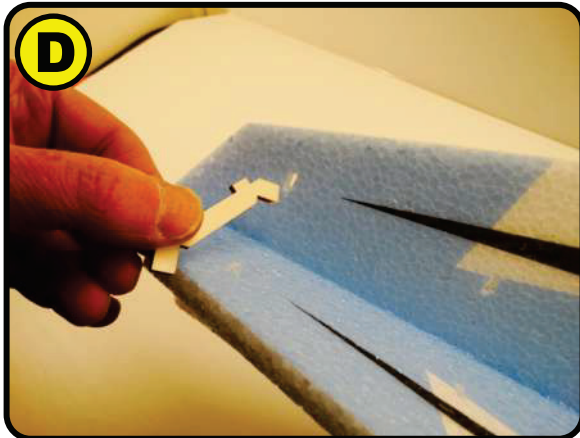
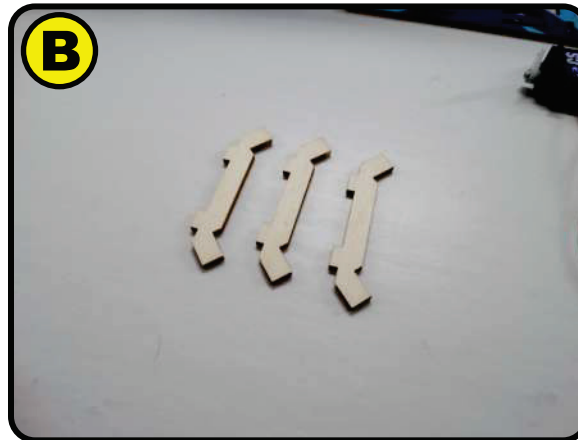
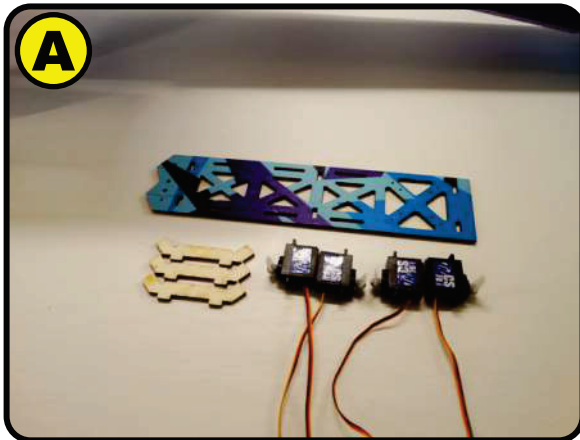


----- **COMPLETING THE PUSH ROD LENGTHS AND ENDS** -----

**MAKE SURE THAT WHEN CALLED FOR THAT THE
SERVOS ARE ELECTRONICALLY CENTERED AND
THE CONTROL SURFACES ARE "LOCKED" IN
THEIR NEUTRAL POSITIONS**

----- **THE PROCESS / words (con't)** -----

- Center the servos
- Constrain the control surfaces to neutral
- Attach a clevis to one of the control surface horns, make sure the little brass pin gets snapped in all the way. It may be necessary to clean the hole out in the control surface horn if the brass pin does not pass thru. If it does need to be enlarged, the tip of a hobby knife or 1mm drill (.039in) can be used, just be careful to not make the hole oversize, this will cause slop in the linkage
- Align the raw push rod end and the brass part of the clevis assembly, you should notice that there is some extra length on the rod. Double check that everything is still centered and neutral
- Cut the control rod with a small pair of snips right at the place where the threads start (see photo)
- Dress up the end of the rod to make it nice and smooth, remove the constraints from the control surface, flex the control surface so that you can install the end of the rod into the open end of threaded brass piece.
- Return the control surface to neutral by pushing/pulling the control rod a little in or out to get the control surface to neutral. Make sure the servo is still centered as well
- Once you like the location, secure with thin CA. For added security you and also make small crimp in the fitting to "squeeze" in onto the rod, just do this carefully so that the rod is not completely crushed inside the fitting
- Repeat the process for the other control rod
- Eyeball down the length of the control rod to align all the push rod guides. They should also be installed all the way in until they bottom out on the little flanged area. Once you are happy with their positions and alignment, secure them to the fuselage by applying a drop of CA at the base where it pokes into the foam. Be careful here to not let any CA get into the area where the rods are sliding thru the guides

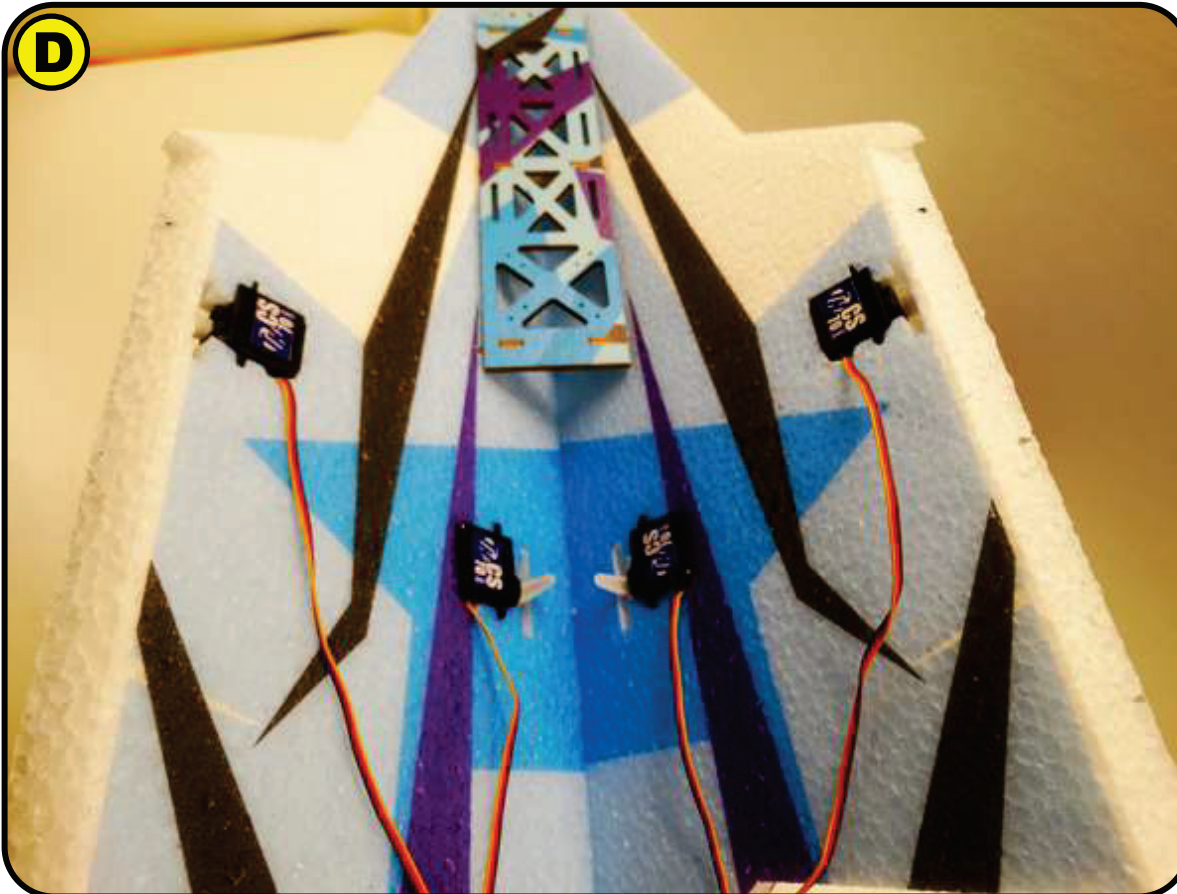


----- **RADIO BAY** -----

** NOTE **

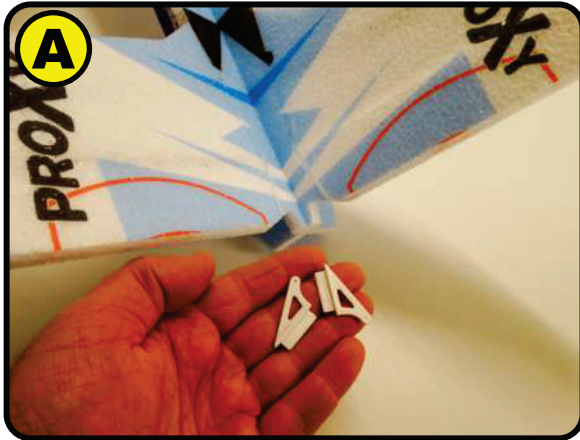
THE FOLLOW SEVERAL PAGES ARE THE PICTURES AND DESCRIPTIONS THAT GO WITH ALL THE VERBIAGE FROM THE PREVIOUS TWO PAGES

- A** Gather up the wood pieces shown and servos that will be used
- B** Start by sanding the cross members smooth
- C** Test fit the tray and cross members together, do not glue at this time.
- D** Insert the front cross member into the forward most pair of slots
- E** Angle it into the holes on both sides of the fuselage
- F** Tabs should be flush with the far side of the fuselage, do not glue at this time
- G** Repeat for the remaining two cross members



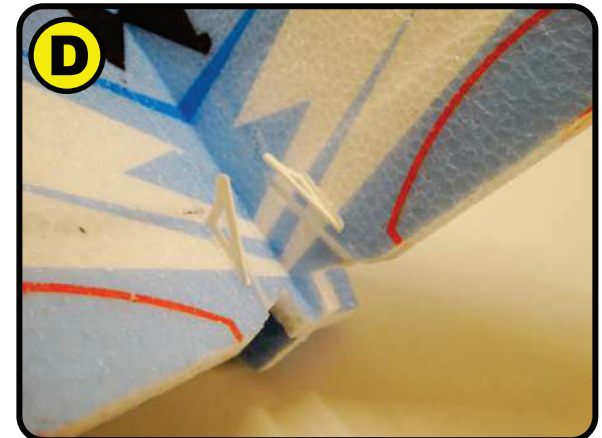
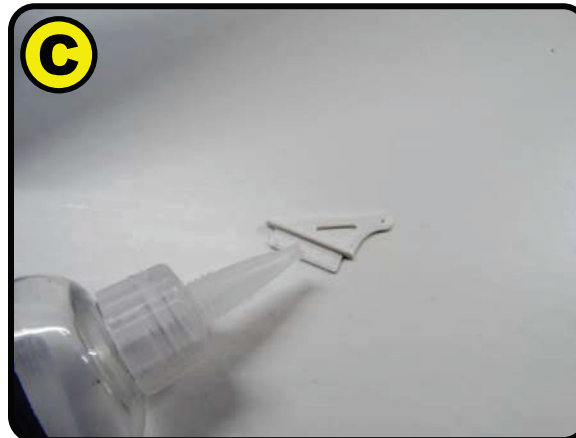
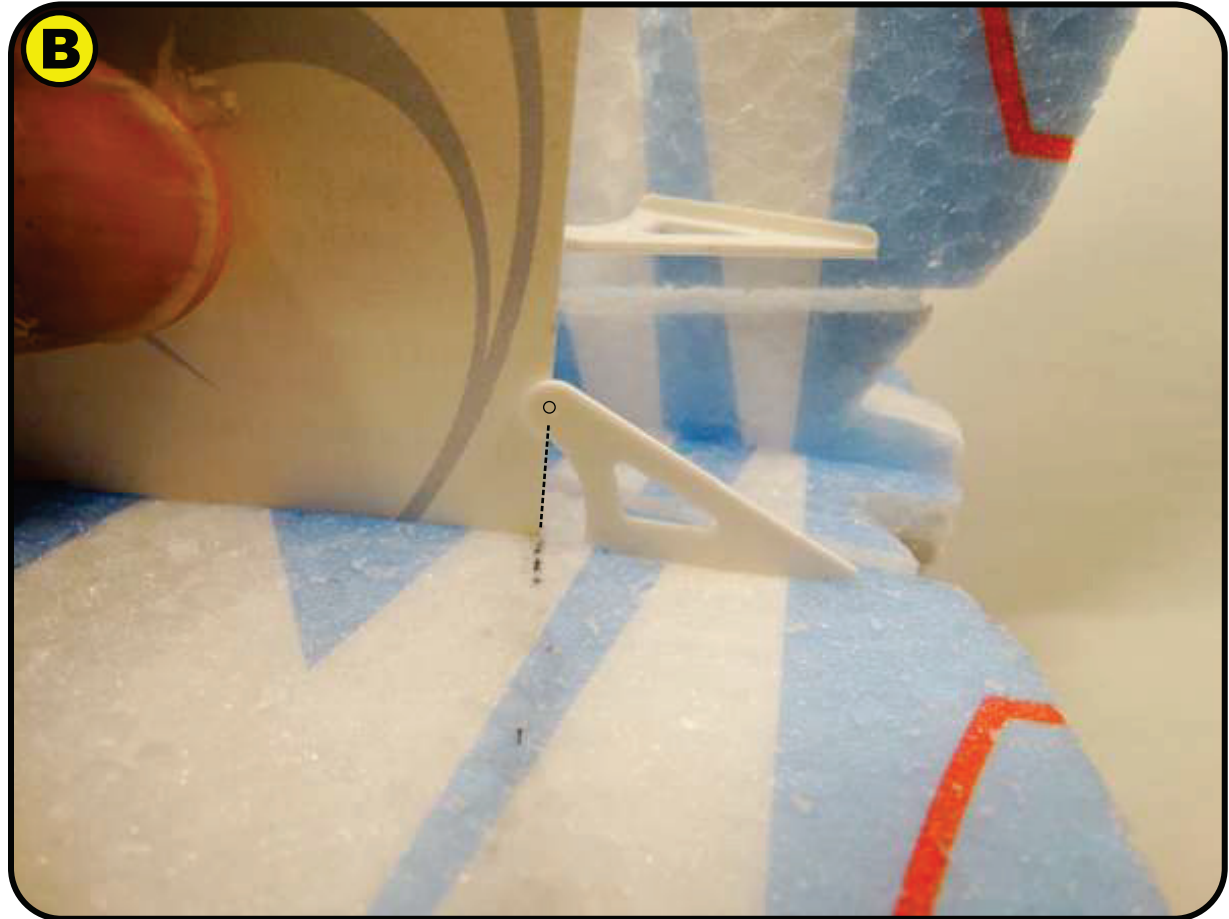
----- **RADIO BAY (con't)** -----

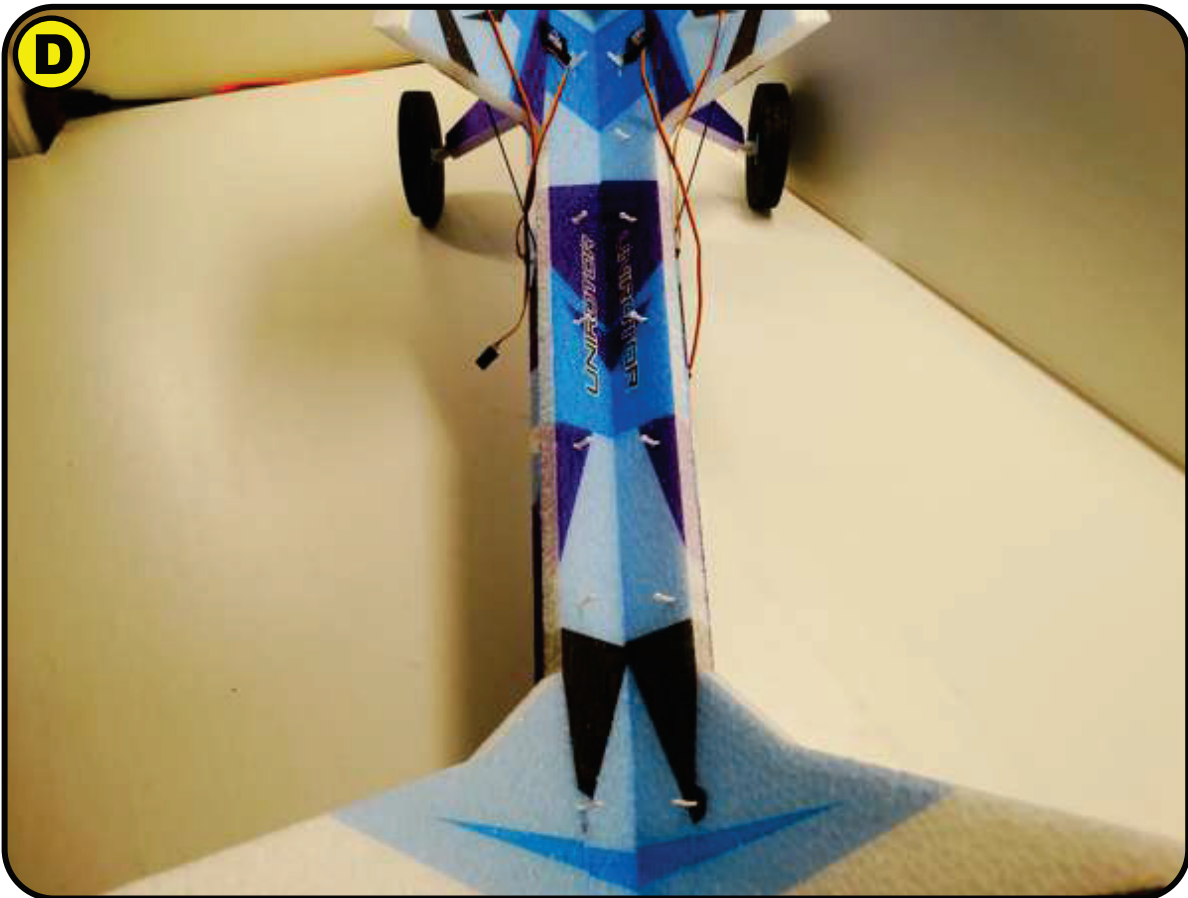
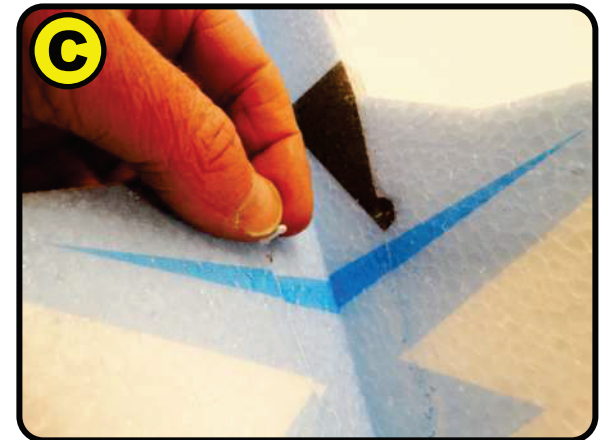
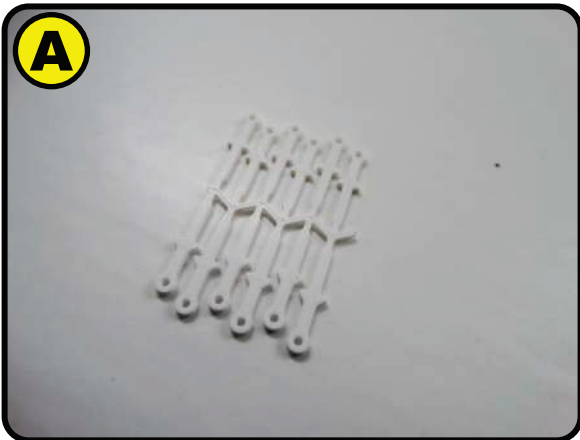
- A** Fit the main tray piece to the cross members, make sure all the tabs are fully engaged
- B** Secure the main tray and cross members together with a drop of thin CA in the tabbed areas
- C** Secure the tray to the fuselage with thin CA where the tabs stick thru the foam. NOTE - you can leave these tabs “unglued” if you want a “removable” radio tray. It fits tight enough into the fuselage that glue is not necessary.
- D** Install the four servos as shown. Aileron servos near the wing saddle will be flush to the **INSIDE**, and their arms will face outward. Tail servos down in the “V” will be flush to the **OUTSIDE** and their arms are facing inward. **DO NOT GLUE THE SERVOS IN AT THIS TIME.**



----- **TAIL HORNS** -----

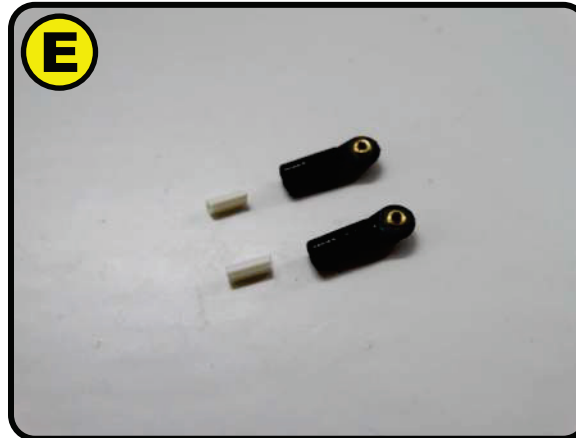
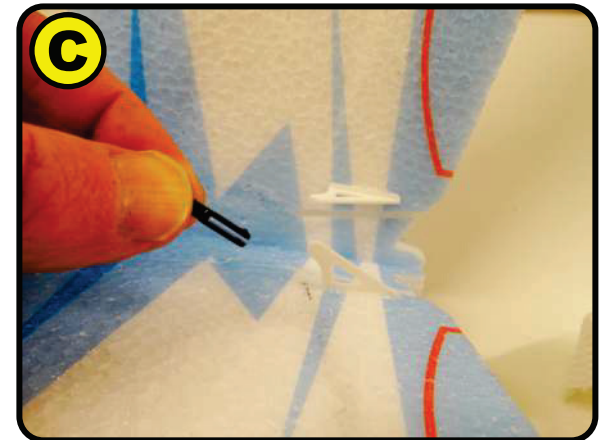
- A** Locate the remaining two control horns. Note - All four control horns are exactly the same, so it does not matter which ones you use.
- B** Test fit them into the slots as shown, making sure that the hole in the horn is directly over the hinge line at the neutral position
- C** When you are happy with the fit, remove the horn and apply some glue to both sides of the tab
- D** Re-Install into the slot, making sure that the hole in the horn is still positioned correctly in relation to the hinge line as mentioned in the previous step. Repeat for the other tail control surface.





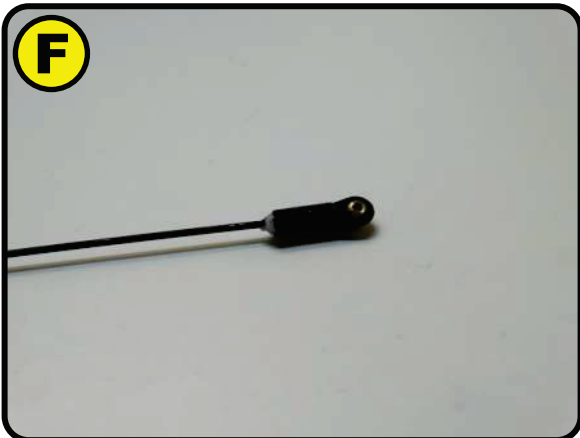
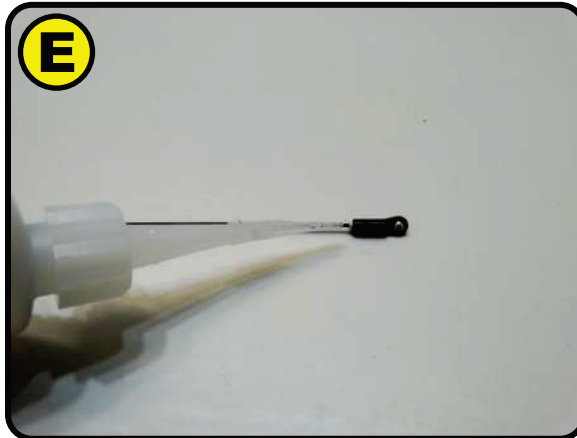
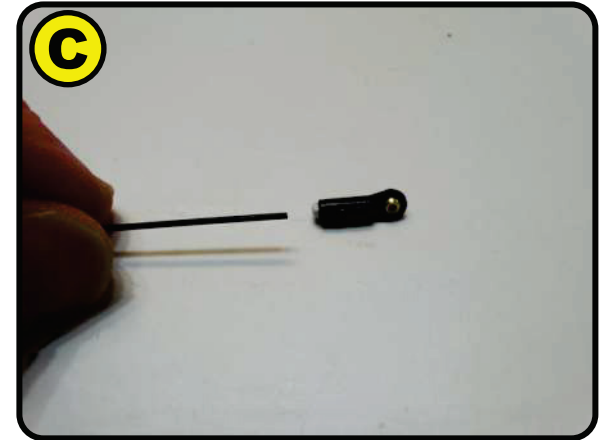
----- **PUSH ROD GUIDES** -----

- A** Locate the tree of push rod guides
- B** Break them all apart. Note - they are all the same length and size.
- C** Stick one each into the pre-cut holes along the length of the fuselage boom. Note that they will be located on the TOP - INSIDE of the fuselage boom
- D** All guides installed. NO GLUE AT THIS TIME



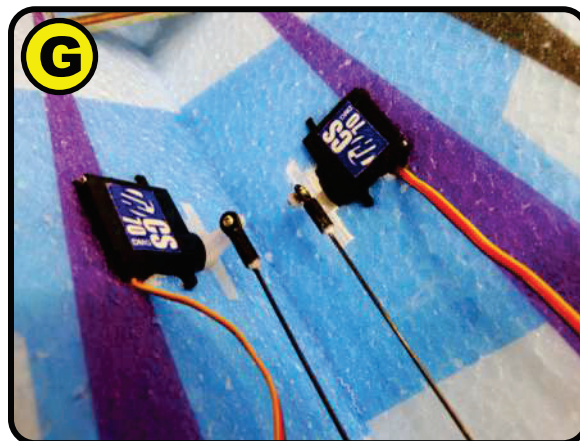
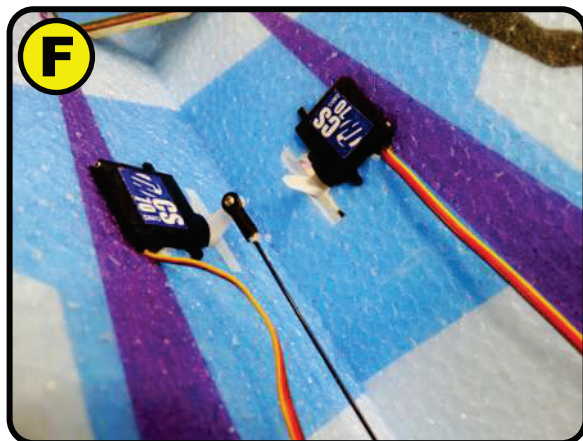
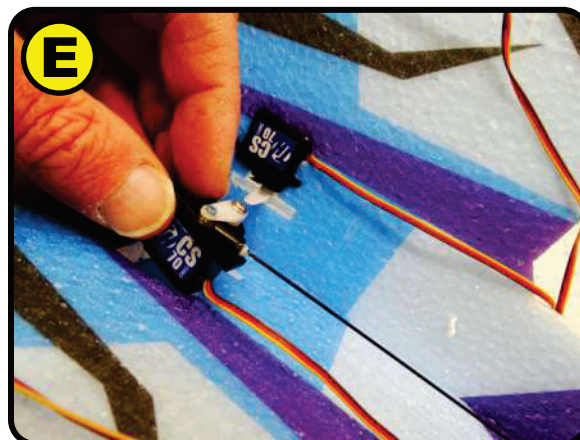
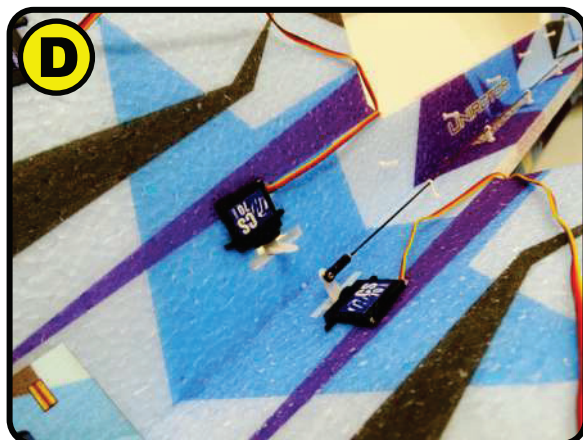
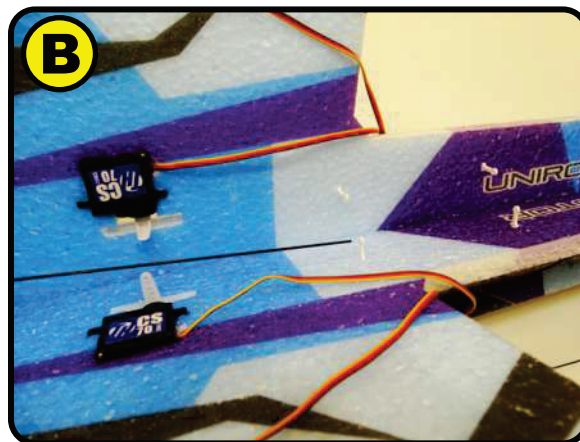
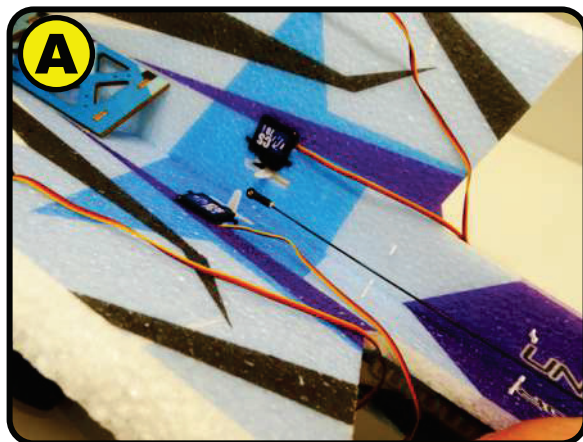
----- TAIL CONTROL RODS -----
PART I

- A** Gather up two clevises, two ball links, two small brass pins, two of the smaller threaded brass rod ends, two tiny screws for the ball links and two small white spacer tubes as all shown in the picture
- B** Locate the two remaining .5x500mm rods
- C** Note that this build will use the clevis links on the control surface side of the control rod, and....
- D** the ball link end will be used on the servo side of the control rod
- E** Grab two ball links and the white spacers
- F** Start the spacer into the end of the ball link
- G** Hold the assembly gently with a pair of needle nose or small pliers. Ball link pliers are shown, if you have a



----- **TAIL CONTROL RODS** -----
PART I (con't)

- A** Gently tap the spacer into the open end of the Ball Link
- B** Note that there will be approx 1.5mm of exposed length of the white spacer as shown
- C** Test fit the control rod into the spacer, dress up the end a little if needed so that the rod will slide into the spacer
- D** Slide it all the way in...
- E** ... and secure with some thin CA
- F** Let the CA sit for a minute then hit with kicker
- G** Repeat for the other control rod

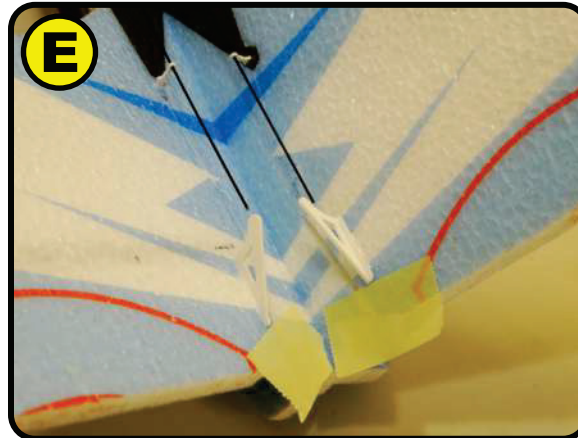
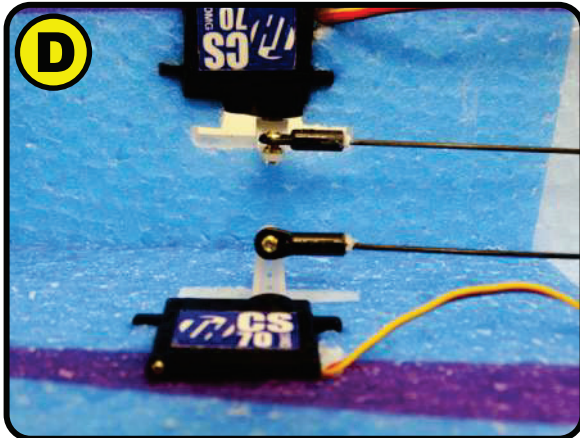


----- TAIL CONTROL RODS -----
PART I (con't)

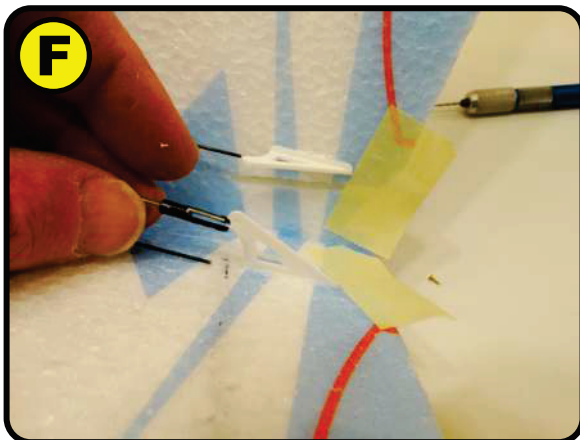
- A** As mentioned earlier, the ball link end will attach to the servo arm
- B** Feed the free end of the control rod thru the guides starting with the ones closest to the servos
- C** Slide the rod all the way thru all the guides
- D** The ball link should line up pretty straight with the UNDER side of the servo control horn
- E** Manipulate the servo so that you can attach the ball link to the horn with it's mating tiny screw. Use a dab of thread locker
- F** Put the servo back into it's slot with the body of the servo being flush with the OUTSIDE fuselage surface
- G** Repeat for the other control rod

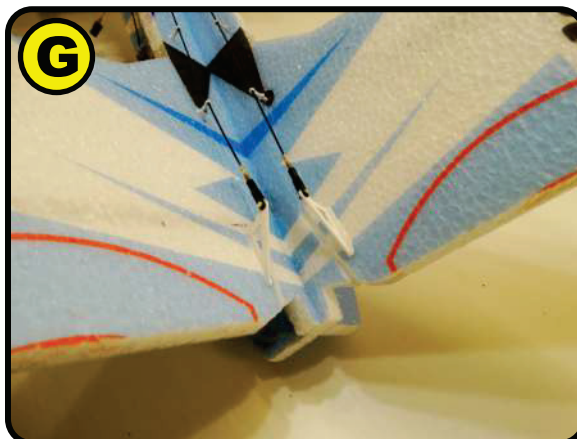
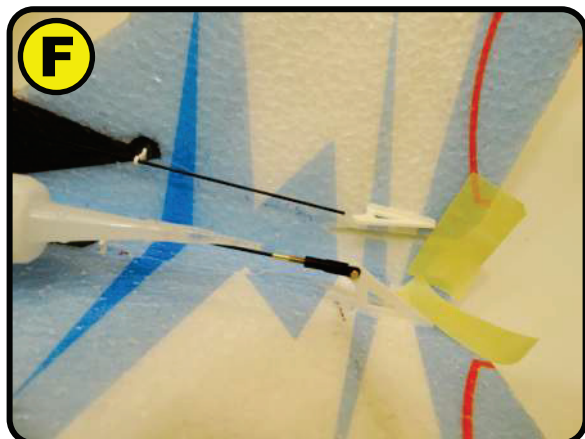
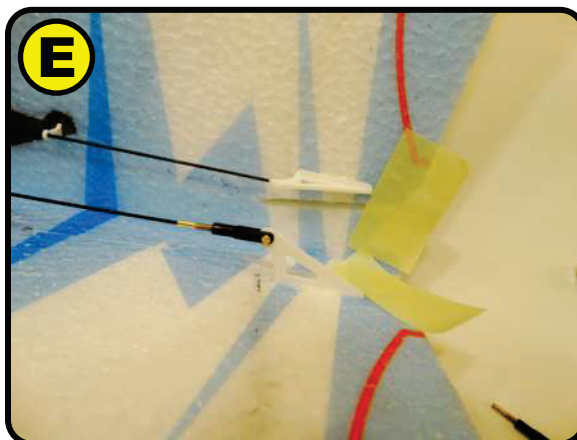
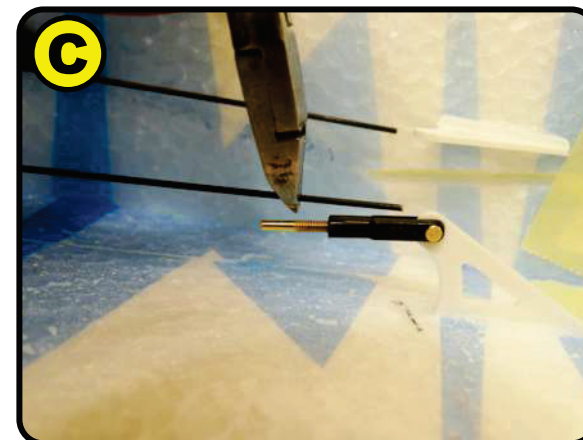
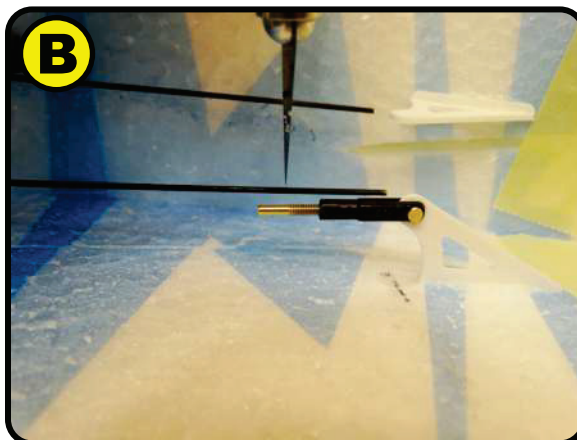
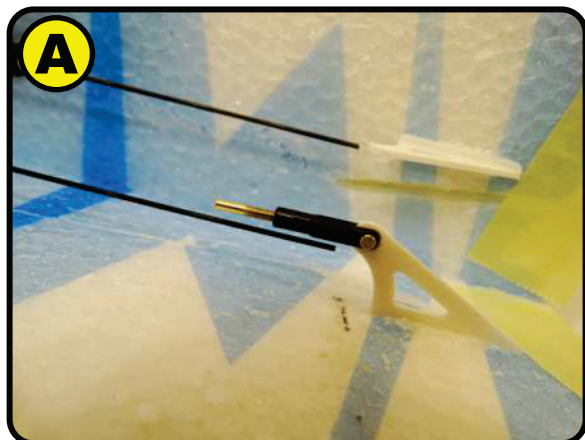


----- TAIL CONTROL RODS -----
PART II



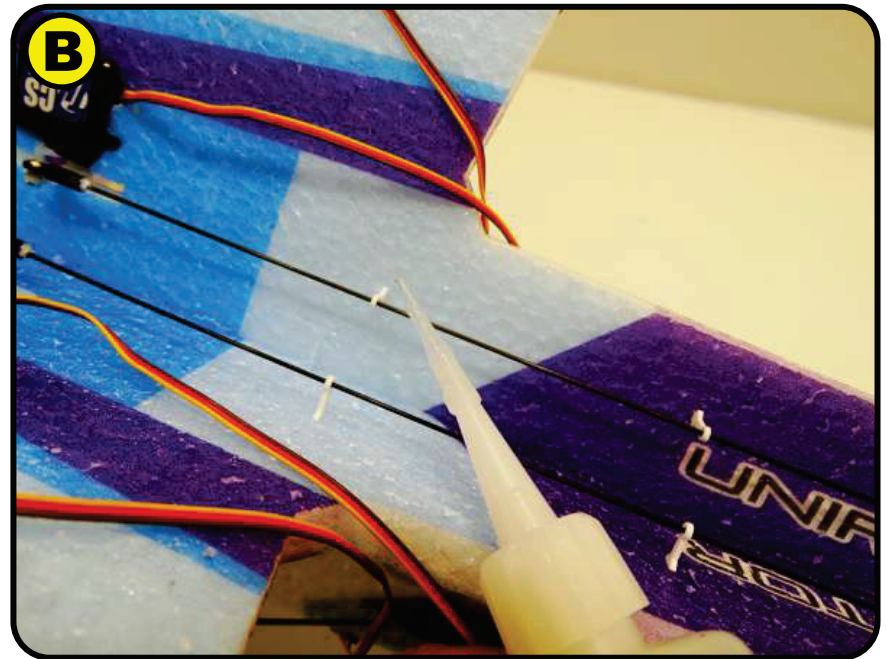
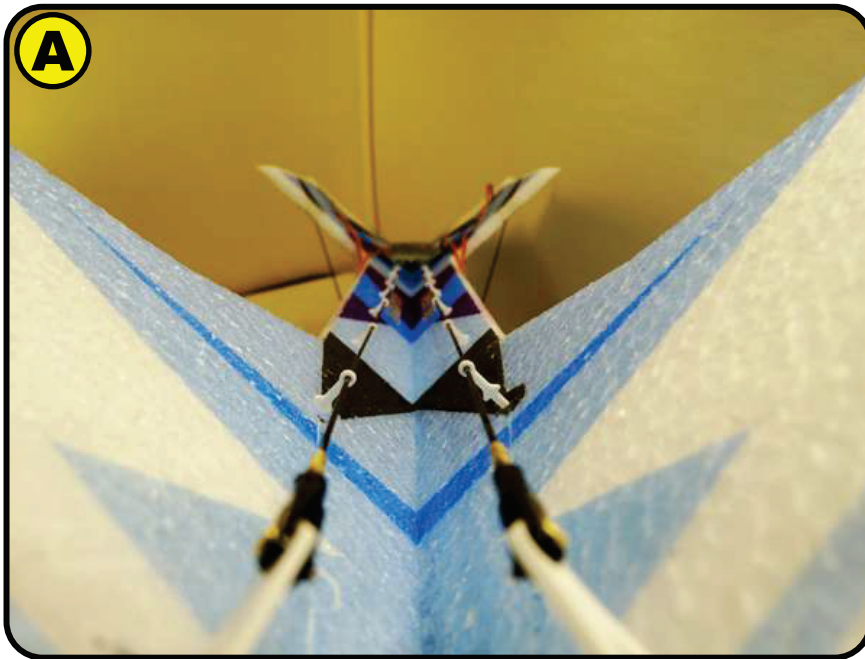
- A** Grab the small thread brass fitting and the clevis as shown
- B** Thread the brass part in approx as far as shown. This will give you a little adjustment in both directions if needed in the future
- C** Repeat for the other clevis
- D** ELECTRONICALLY CENTER THE TWO TAIL SERVOS
- E** LOCK THE CONTROL SURFACES IN THEIR NEUTRAL POSITION
- F** Grab one of the clevis assemblies just made...
- G** ... and attach it to the control surface horn with one of the little brass pins. The hole in the horn may need to be cleaned out a little. Make sure the brass pin fully engages the clevis, and snaps into it's fully seated position





----- **TAIL CONTROL RODS** -----
PART II (con't)

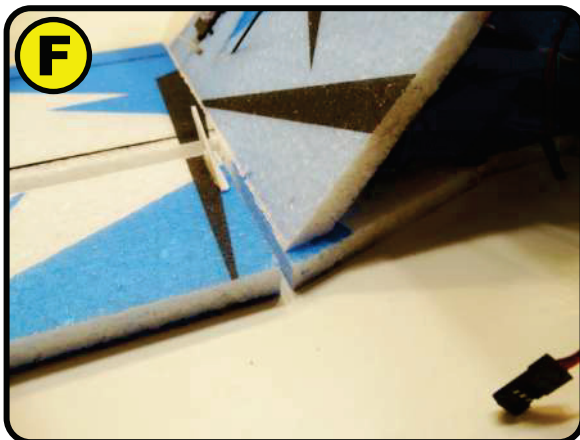
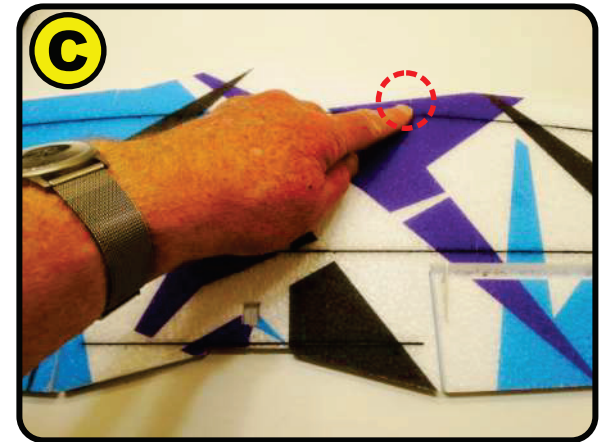
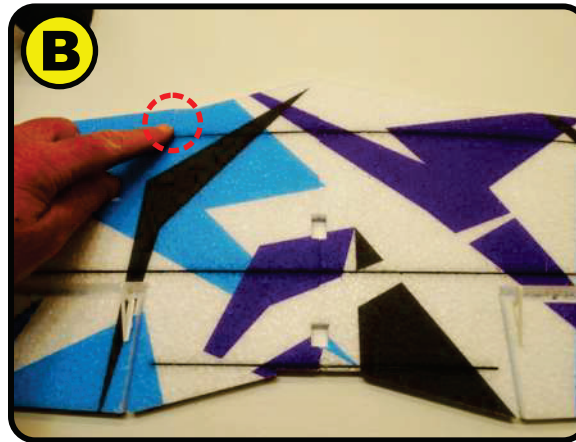
- A** With the servo and control surface both in centered/neutral positions, there should be a little extra control rod length.
- B** You will want to shorten the control rod to a position that is just shy of where the threaded part starts
- C** Clip to length with a pair of cutter and dress up the end where it got crushed from the cutters
- D** Deflect the control surface away from it's neutral position so that the end of the rod can be slid into the brass fitting
- E** Retrun the control surface to neutral, if needed shorten up the rod a little more
- F** With everything neutral, CA together
- G** Repeat for the other side



----- TAIL ROD GUIDES -----

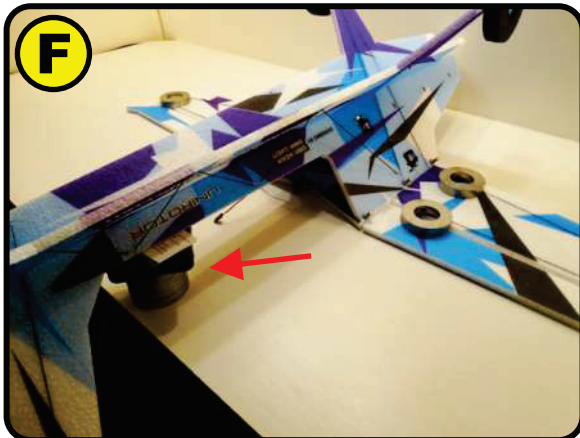
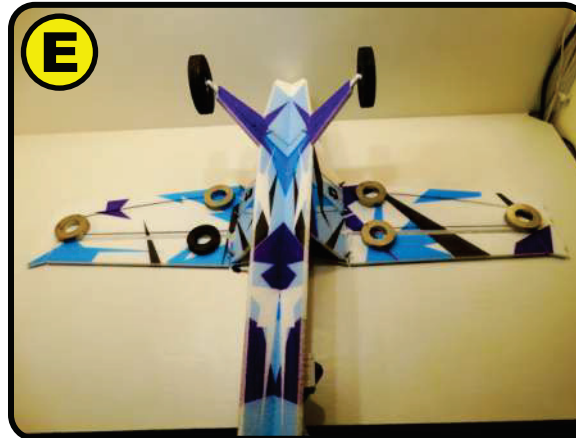
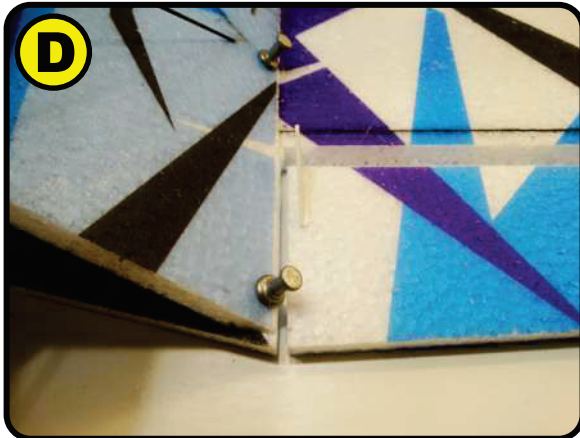
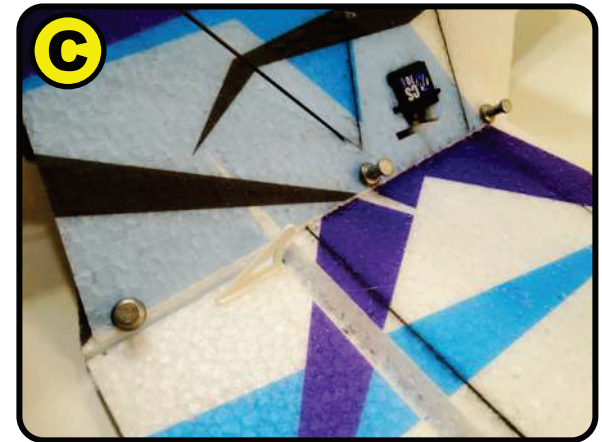
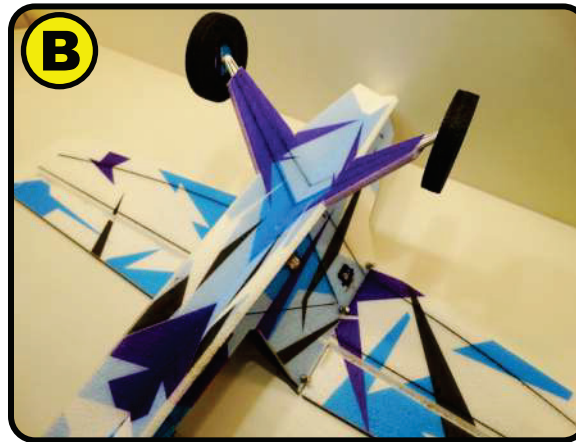


- A** Eyeball down the length of the fuselage to make sure that all the rod guides are straight and true and that all the guides themselves are fully seated to their full depth.
- B** CA the bases of the guides to the surrounding foam, but careful to avoid getting CA anywhere near the rod where it feeds thru the rod guide
- C** If you have a servo tester you can double check the centering and that there is no binding. If not this can be done when a receiver is installed



----- ATTACHING WING -----

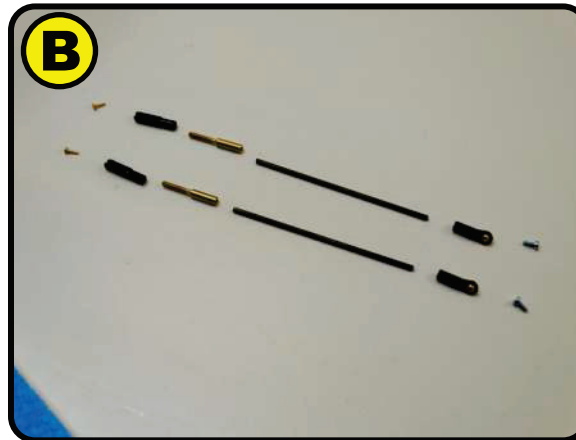
- A** Attaching the wing is next, read thru the steps on this and the next page to fully understand the process before putting glue to foam
- B** There are reference marks (cuts) near the leading edge directly parallel with the inboard end of the ailerons reliefs
- C** These two marks will be used as guides when lining up the saddle area of the fuselage with the wing
- D** Lay the wing on your work bench, bottom side facing UP and test fit the fuselage
- E** The wing should be all the way forward until it is against the notch in the fuselage saddle...
- F** ... and the front outside edge of the saddle will line up with the reference mark at the rear part of the saddle will match up exactly to the aileron relief cut
- G** When you are happy with how everything is lining up with the edges and reference mark, apply a nice bead of FoamTac to the saddle areas



----- **ATTACHING WING** -----
(con't)

- A** Wet glue method will be used to allow for minor adjustments as needed
- B** Flip the fuselage over and line it up with the forward notch and reference marks as when test fit
- C** Long push pins can be used to hold the two pieces in their exact position
- D** Make sure the edges line up perfectly
- E** Put some weights on the wings to keep everything nice and flat
- F** Brace up the tail as shown to keep the boom parallel
- G** Take some measurements from each wing tip to a common point on the tail to check for squareness of the wing to the fuselage. Anything less than 3/16" is fine.

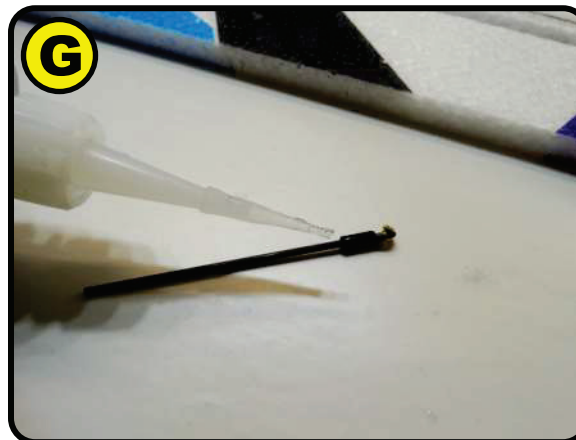
LET THIS DRY OVERNIGHT BEFORE HANDLING AGAIN

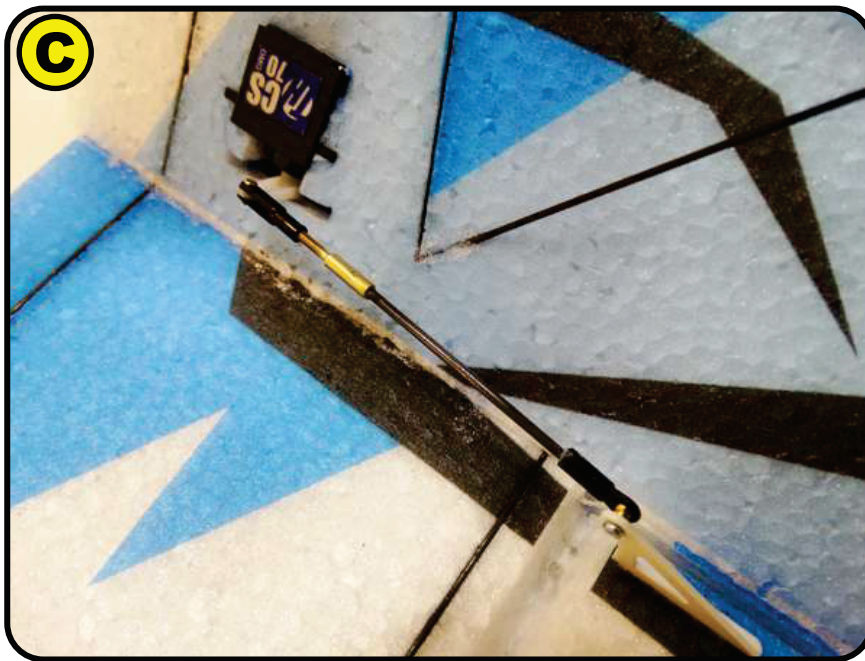
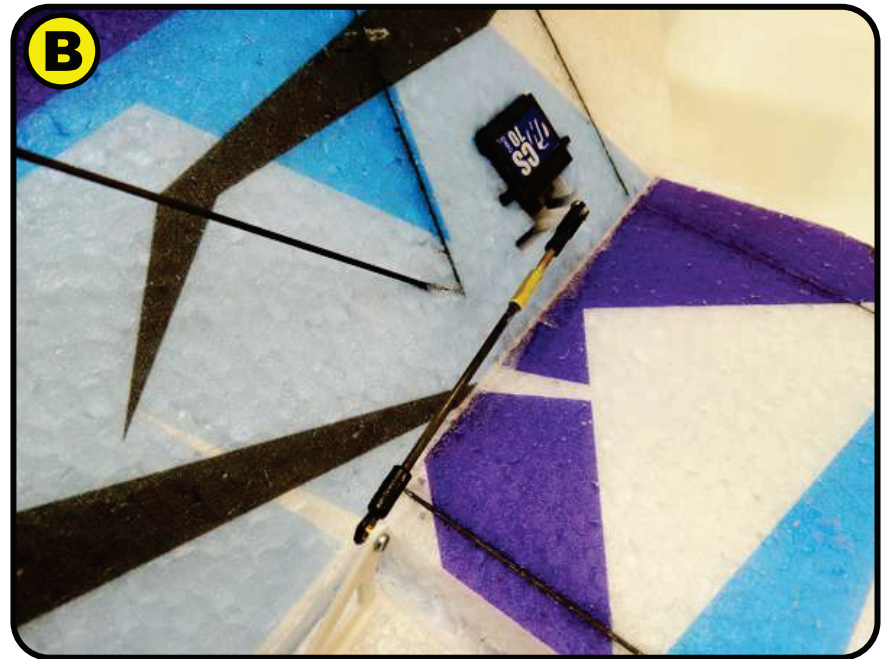
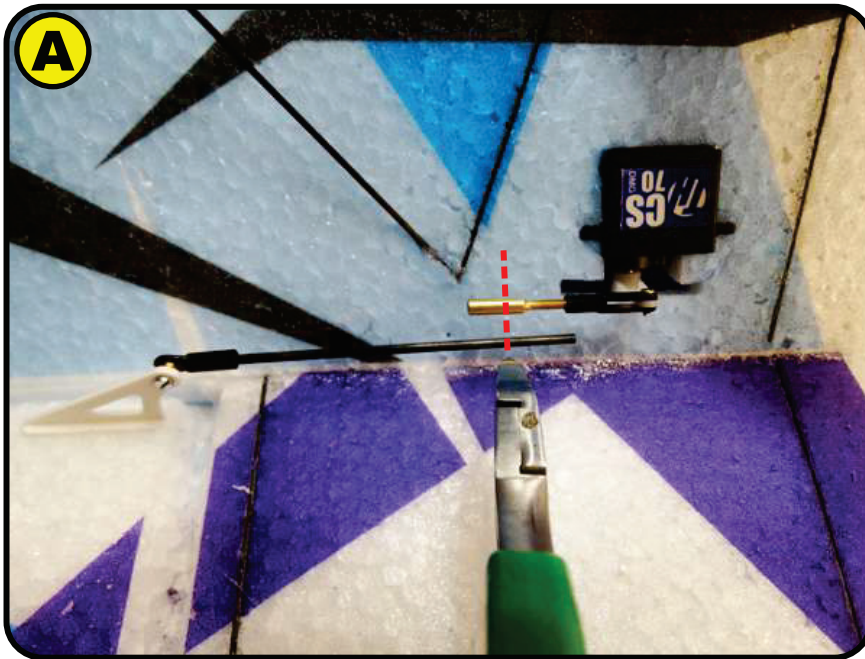


----- AILERON CONTROL RODS -----



- A** Gather up the two 1.8x65mm rods from the hardware packet along with two larger brass ends two ball link with screws and two clevises with pins
- B** Detail view of the items need for this step
- C** The clevis end and brass part will be the two screwed together
- D** Thread the brass part in approx as far as shown
- E** Repeat for the other clevis, then set these two aside for now
- F** Grab one of the ball links and test fit it onto one end of the rod. Note that you may have to dress up the end of the rod a little for a nice smooth fit
- G** Once happy with the fit, slide the rod all the way in and secure with thin CA, make sure to keep glue out of the area around the ball pivot

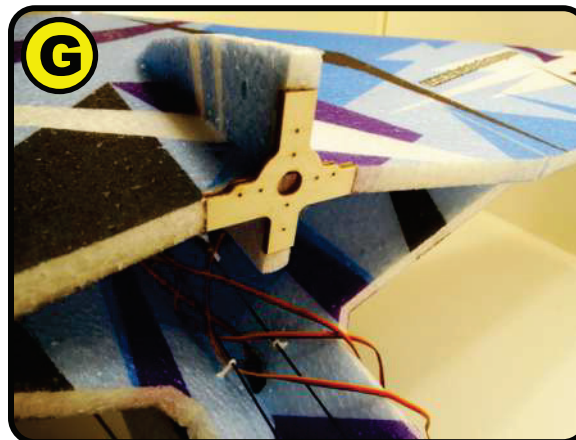
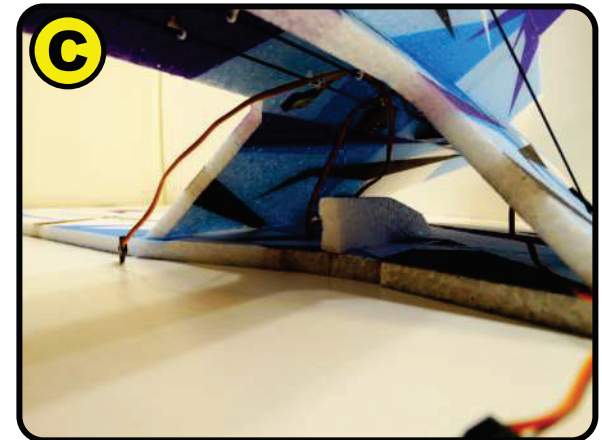




----- **AILERON CONTROL RODS (con't)** -----

- A** Attach the ball link end to the aileron control horn, use a little thread locker on the screw. Make sure the aileron is in it's neutral position and that the servo is electronically center. Attach the clevis and pin to the outer most hole of the servo control arm. Next trim the rod approx where shown with the red dashed line
- B** Dress up the end of the rod as needed after cutting so that it will slide into the brass fitting. Double check that both the aileron and servo are centered and secure the rod and brass fitting together with some thin CA. Be careful that glue does not run into any unwanted areas
- C** Repeat for the other side

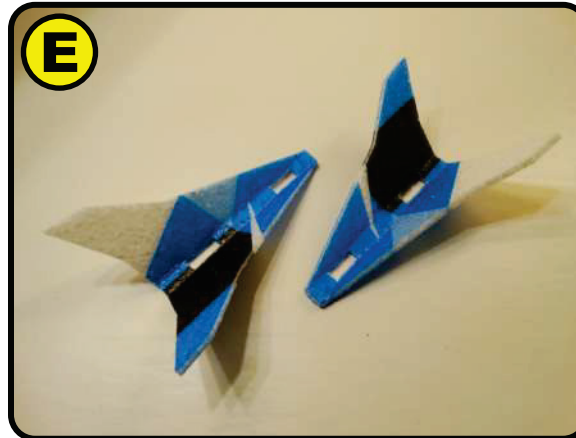
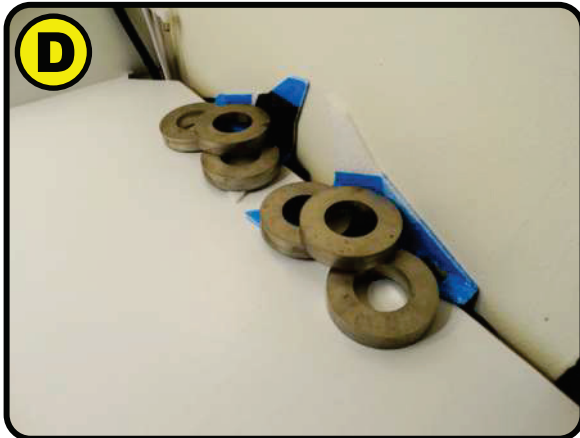
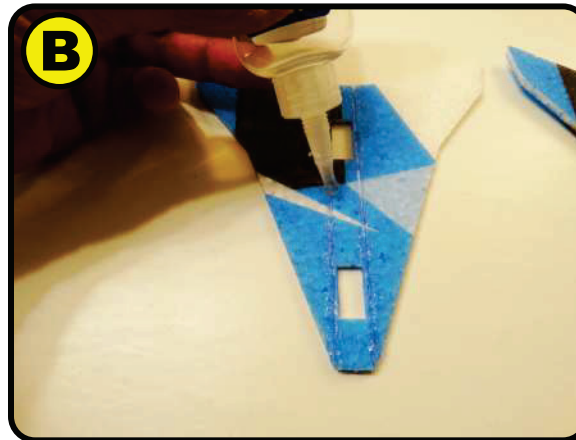
Note - In this build the ball link was put on the control surface side. It could be the other way around, but with it on the control surface side it will work a little smoother



----- **MOTOR MOUNT** -----

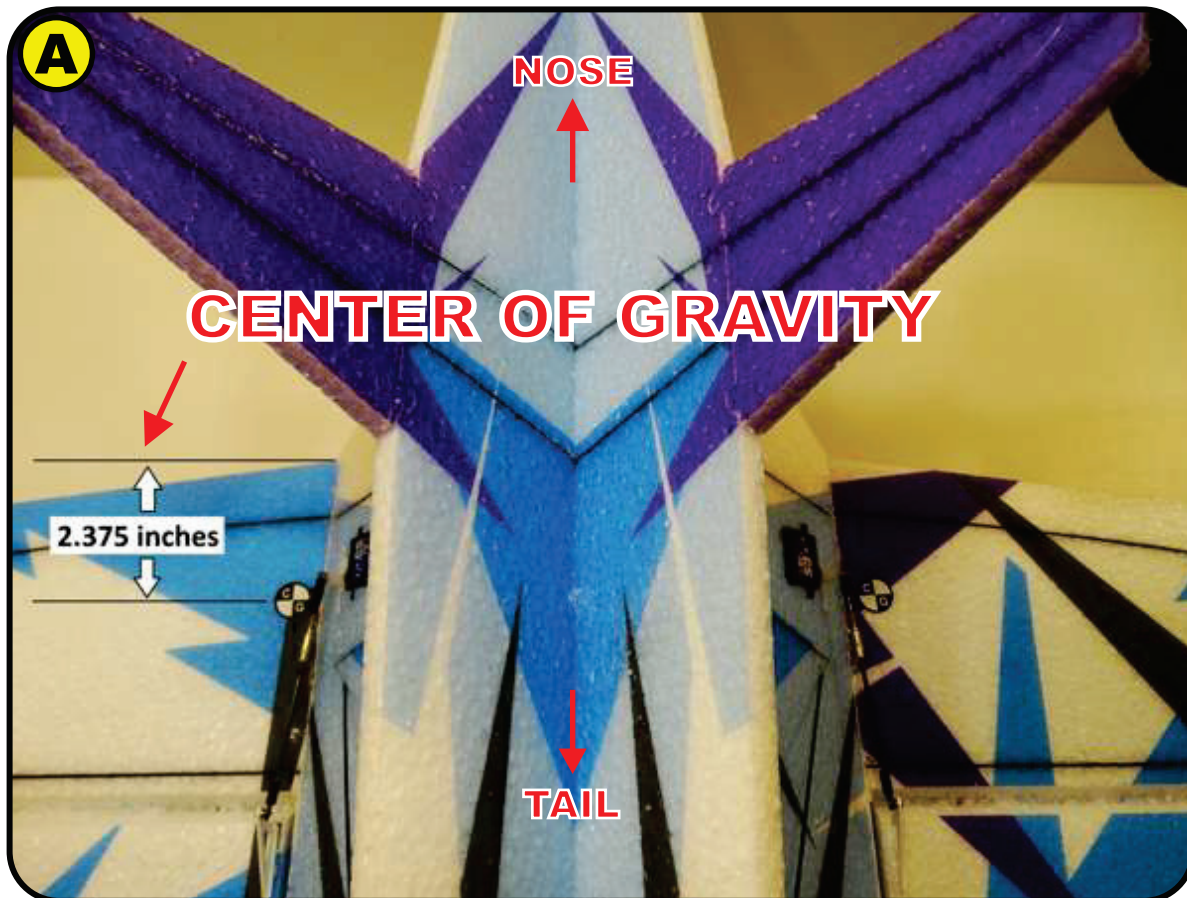
- A** Gather up the pieces shown
- B** Apply some FoamTac to the all white underside piece...
- C** ... and position as shown into it's respective slots
- D** Apply some FoamTac to the upper color printed part...
- E** ... and position as shown into it's respective slots on the top side of the wing
- F** Apply some FoamTac to one side of the motor mount...
- G** ... and position as shown

Let these parts completely dry before attaching the motor



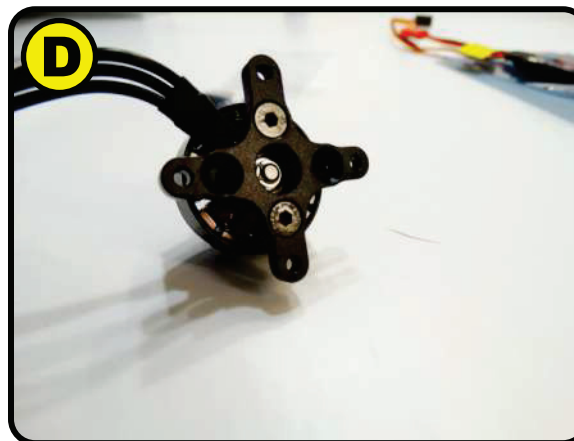
----- WINGLETS -----

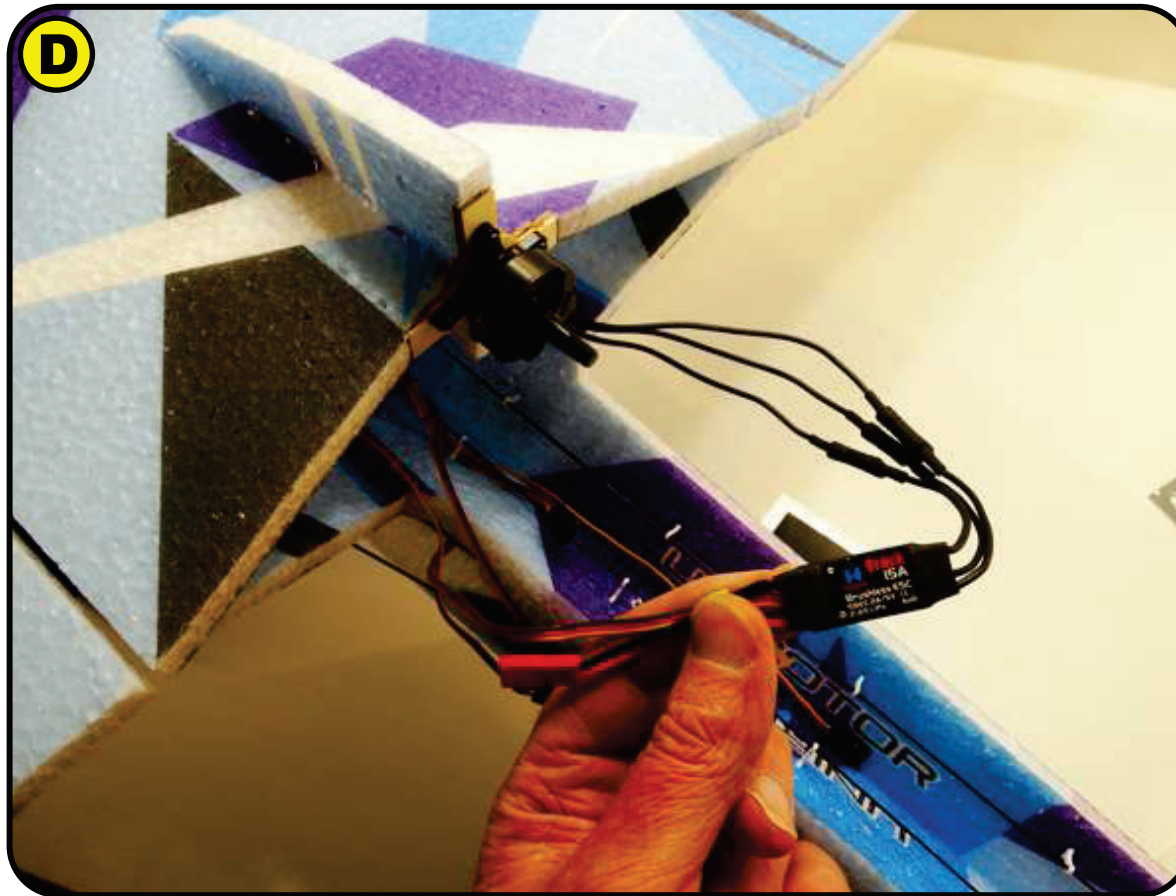
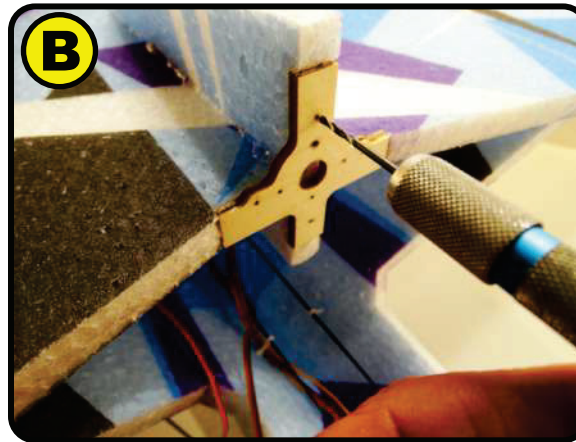
- A** Gather up the two winglet pieces
- B** Apply some FoamTac into the two BEVELED cut areas
- C** Position the winglet as shown up against a vertical surface and secure so that the glue can dry and hold the winglet in this position
- D** Repeat for the other winglet
- E** Let the glue completely dry before handling. They should hold their shape very nicely
- F** Test fit on to the end of the wing, you may need to clean out the slots in the winglet where they are puckered a little from being bent up at 45 degrees
- G** Once you are happy with the fit, secure to the end of the wing with some FoamTac and use some push pins to hold in place until dry. Repeat for the other side



----- **ELECTRONICS** -----
MOTOR

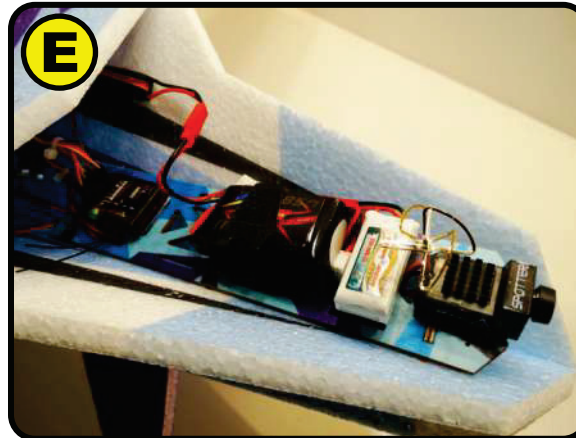
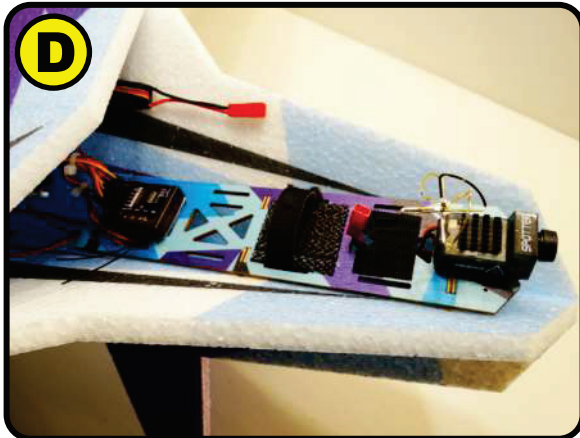
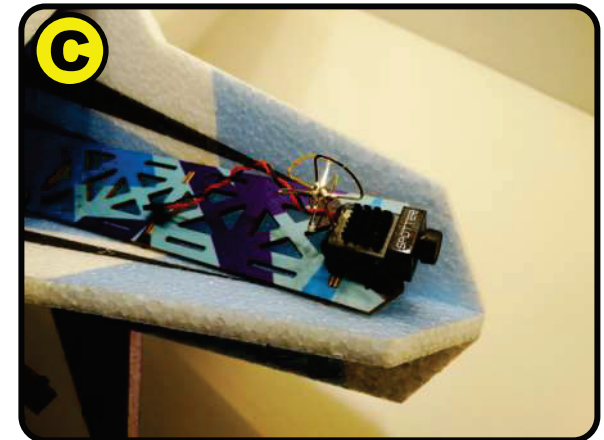
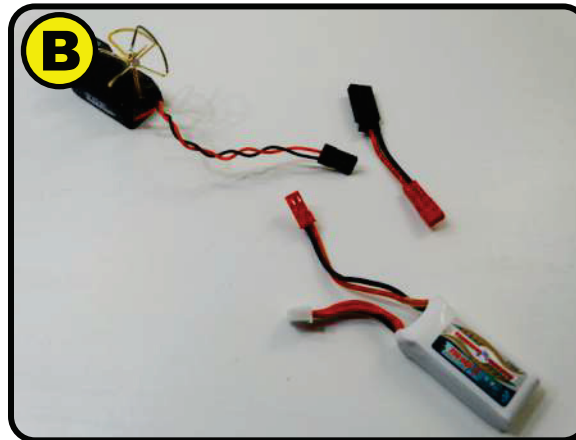
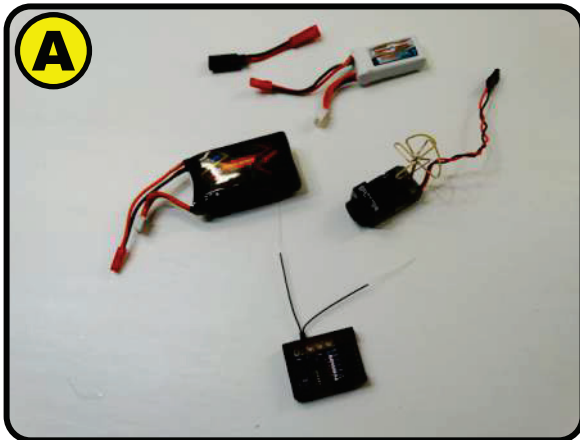
- A** Start by locating the Center of Gravity point for this airframe. Doing this right now will help you in determining where and how to locate all of the onboard electronics
- B** Gather up the motor and mounting hardware
- C** Attach the X mount to the back side of the motor. Use thread locker
- D** If you are using the Twisted Hobbys' motor and universal X mount, you will attach the mount with two screws to the holes that match up to the motor





----- **ELECTRONICS (con't)** -----
MOTOR

- A** The motor will mount to the wood firewall as shown, with the motor wires pointing down, either to the left or right side
- B** If you are using the Twisted Hobbys' motor, enlarge the holes in the wood mount with a 1/16" diameter drill, this will keep the wood from splitting. If you are using another motor and mounting hardware, you may or may not need to size the holes.
- C** Attach the motor
- D** Connect the ESC to the motor wires, it does not matter right now how the wires are connected, but you may need to switch two of them around if the motor spins in the wrong direction once all the electronics are installed



----- **ELECTRONICS** -----
RX & FPV

There are many, many different options available for setting this airframe up with receivers, flight controllers, FPV cameras and HD recording potential. What is shown here is just one possible solution. This gear is simple and easy to setup and will have you flying FPV without a bunch of programing or wiring.

- A** Admiral RX with Stability and Twisted Hobbys' Spotter CAM/VTX
- B** Spotter CAM/VTX will use a dedicated battery for cleanest signal
- C** Spotter Mounted in the nose
- D** Admiral RX mounting position
- E** Flight Pack Battery position
- F** Tuck the wires away for clean setup
- G** Ready to go... !



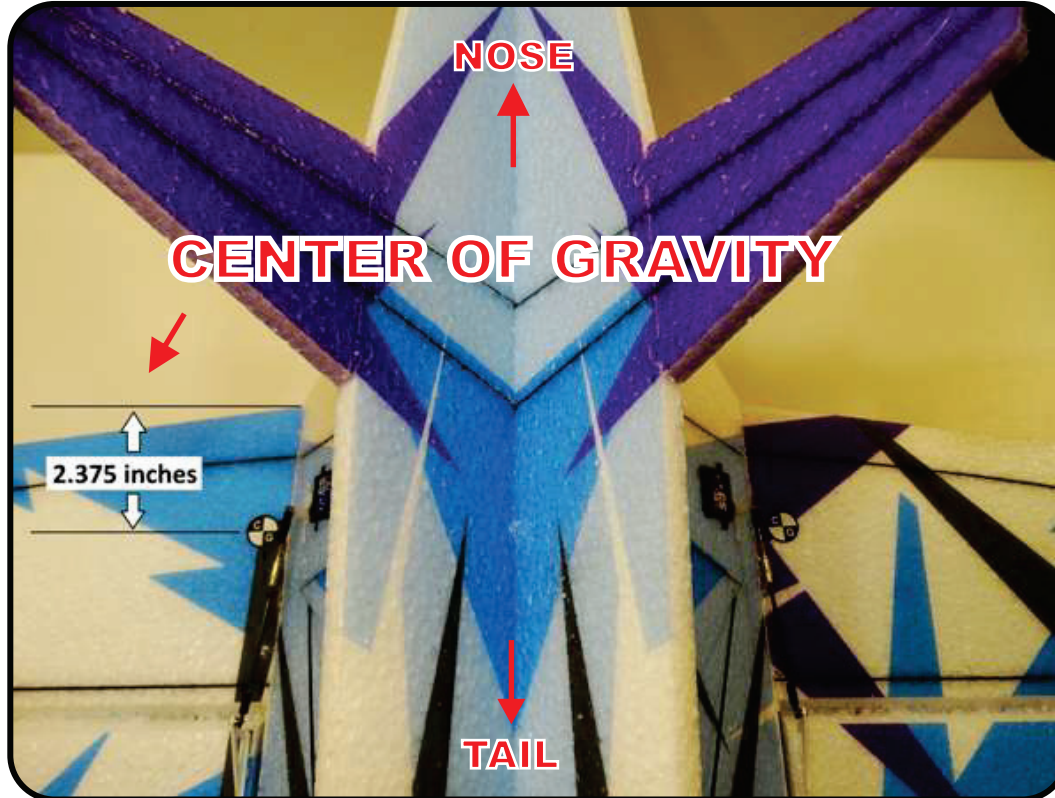
Find yourself a park that is out of the way and full of spaced out trees or other obstacles, strap on the goggles and go..!!

This completes the build, it's design and construction should give you many hours of flying enjoyment. This airplane will serve you well, whether you are new to FPV flying or are a seasoned veteran.

Please visit www.TwistedHobbys.com for other accessories and aircraft.

There are several online resources and forums for this model as well. It is suggested that you visit the RC Groups Thread for this model for additional information, it is a great resource for questions and insight to this aircraft.

CENTER OF GRAVITY AND CONTROL THROWS



C.G. - 2.375" from LE of wing

Locate all the electronics to achieve indicated CG point. Use Velcro for initial flights for battery mounting and experiment with it's position until you have determined the best spot for your flying style.

Control Throws

Ailerons: +/- 20 deg

Rudder: +/- 30 deg

Elevator: +/- 30 deg

Expo to suit

Control Throws should be adjusted to flying style and adjusted to work with a flight control board if being used. For extreme flying control throws could be increased, just be mindful that you don't get any mechanical binding.



PRE-FLIGHT & TESTING

PREFLIGHT CHECKS

Motor: Should run smoothly at all stick positions, and transition smoothly from low to high RPM. If the motor is turning backwards, reverse two of the three wires between the motor and ESC. Check that the screws holding the motor to the airframe are tight and secure.

Flight Controls: Set all to neutral or level positions with sticks in the neutral positions. Ensure that all controls and linkages move freely. Double check that all hinged areas are free from rips or tears. Verify proper control surface directions. Right Roll is – right aileron up, left aileron down, Left Roll is left aileron up and right aileron down.

Batteries: Should be fully charged prior to each flight. Watch transmitter battery level and follow manufactures recommendations. Motor battery should not be drained any further than recommended by the manufacture, use a timer to prevent an over discharged condition.

Radio: All trims should be set to neutral and throttle in the low position. Check that rate switches and mixes are set properly.

Range Check: With and without the motor running per radio manufactures instructions. If there is insufficient range or significant reduction with the motor running, resolve and re-test before flying.

PREFLIGHT CHECKS

The first flights should be done with the CG at the recommended position, and reduced control rates until comfortable with your handling of the aircraft. As your experience with the aircraft grows experiment with different CG points and control rates. After all flights, check the aircraft over for damage and/or other items that may adversely affect flight performance.

This FPV Plane is a high performance aircraft and will provide hours of entertainment, including the occasional crash. If, as the result of a crash, the foam tears, simply glue with Welders, FoamTac or CA. Many pilots prefer Welders or FoamTac because they remain flexible after drying. CA however, is more suited for the “quick” repair.

This aircraft can be flown indoors or outdoors. It is however designed specifically for outdoor FPV proximity flying and will be right at home in the local park with some obstacles to fly between and around

STORAGE

This EPP plane should be stored resting it's landing gear. Storing in other fashions that put stress on the airframe could cause the airframe to distort. Storage in a hot car could also cause damage.

Be safe and enjoy, thank you again for purchasing a Twisted Hobbys' Product!

TIPS AND TRICKS

A good building surface is a “drop ceiling” panel from a local hardware store on a nice flat board

Use parchment paper between the areas being glued and your work surface

Heavy flat objects (like books, batteries, etc.) could be used to hold everything flat

When resetting your radio, start with all the ATV's or throw volumes at 100%.

Make sure you have set the direction of the servos correctly before attempting to trim for zero position.

If possible try the servo horns in different locations to determine which position will require the least amount of sub trim.

Installing the servo horns in their final location and attaching quick links to the servos may make servo installation much easier later.

On the Orange Rx, the negative pin is the one closest to the flat side of the circuit board.

Keep a good supply of sharp knife blades handy when building a foamie airplane.

Use low temp hot glue for gluing electronics, this will allow for easy removal later if necessary. The low temp hot glue can be “released” by painting” the glue bead with an alcohol soaked cotton swab a couple times.

A business card with the corners clipped off can be used as a small square.

Allowing the Welders glue to set for five minutes before assembly will shorten the tack up time, just be sure if doing it this way that you get the parts into position quickly, as the glue will start to bond on contact. Any joints that you feel are going to require adjustment, it is best to assembly the pieces while the glue is wet. The Green (high tack) masking tape works the best when used to clamp things together on an EPP foam airplane.

When gluing the rudder to the fuselage, stick pins could be used to hold in position if wanting to handle the airframe before it is completely dry

A rotary tool with a cutting wheel could be used to produce grooves in fiber glass parts instead of coarse sand paper. Use a hatch pattern. This creates more bonding area for the glue.

NOTES AND S/U SHEET

Setup Sheet

Transmitter -

Receiver -

Model

Weight - g

oz

CG Point - mm from wing leading edge

timer - min

Travels and Exponential

	low rate	high / 3D
right aileron up -	<input type="text"/>	<input type="text"/>
right aileron down -	<input type="text"/>	<input type="text"/>
left aileron up -	<input type="text"/>	<input type="text"/>
left aileron down -	<input type="text"/>	<input type="text"/>
aileron expo -	<input type="text"/>	<input type="text"/>
rudder right -	<input type="text"/>	<input type="text"/>
rudder left -	<input type="text"/>	<input type="text"/>
rudder expo -	<input type="text"/>	<input type="text"/>
elevator up -	<input type="text"/>	<input type="text"/>
elevator down -	<input type="text"/>	<input type="text"/>
elevator expo -	<input type="text"/>	<input type="text"/>

Electronic Components

Aileron Servo -

Rudder Servo -

Elevator Servo -

Battery -

motor -

ESC -

Propeller -