THORIZONS®

TSAR Junior

DESIGN AND ARTWORK BY R.TRUMPP

TSAR JUNIOR F3P
ASSEMBLY INSTRUCTION MANUAL

Technical Data-

Wingspan : 33"
Length : 37”
AUW : 160-180g
(Depends upon the setup used)

Setup Recommendations (Not Included)-

Motor : 18-22G 1800-2300KV Outrunner
ESC : 12-16 amp
Servos : 3 X 9gms each
Propeller : 8-9” electric
Battery : 450-600Mah 2-3S Lipo

EPP CONSTRUCTION

RT DESIGN aircraft by Robin Trumpp

KIT ONLY

WWW.TAHORIZONS.COM

WARNING INFORMATION & SAFETY INSTRUCTIONS

Website: www.tahorizons.com Email: tahorizons@gmail.com

Thank you for choosing TA Horizons. Please read the entire manual thoroughly before you begin to assemble this model. If you have any questions, please contact us aforementioned email address.

This R/C airplane is not a toy! Read and understand the entire manual before assembly. If misused, it can cause serious damages to life and property. Fly only in open areas. If you are not an experienced pilot and airplane modeler you must take 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 & methods also to do so. TA Horizons has no control over the final assembly because it specifically depends upon the knowledge and experience of the person involved directly in its handling, or the manner in which the model is assembled, radio gear installed, and electronic parts are used and maintained. Thus, no liability is assumed or accepted for any damages resulting from the use of the assembled model aircraft. By the act of using this user-assembled product, the user accepts all the resulting liabilities. In no event shall TA Horizons' liability exceed the original purchase price of the kit.

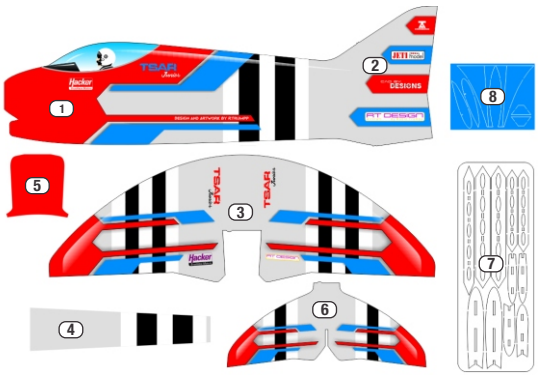
The user is advised to comply with all local laws and regulations. TA Horizons will have no responsibility over the user assembled product and its end use. TA Horizons has the right to change any content on the website, product information brochure, or the manuals, at any point of time without any prior notice.

TA Horizons 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 in assembling of the model. Inspect the components of this kit upon receipt. If you find any parts damaged or missing, please contact TA Horizons immediately. We will not accept the return or replacement of parts on which assembly work has already begun.

Our goal is to bring to you the best in quality and state of the art radio controlled aircrafts. For those who demand the ultimate in precision, or for those who are just a weekend flyers and want to feel good about their flights, our planes are in development from many months and tested to ensure that these aircrafts will give you the best possible performance. We sincerely hope that our products can provide the same thrill to you that we experience in this hobby.

Kit Contents

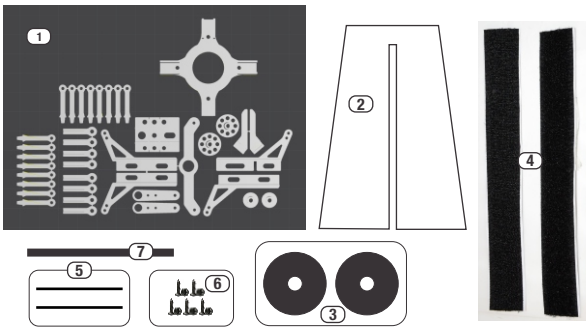
1. EPP Parts



EPP Parts

1. Fuselage
2. Fin & Rudder
3. Wing
4. Horizontal profile section
5. Horizontal nose section
6. Horizontal stabilizer
7. Airbrakes & SFG
8. Wheel pants & gear cover

2. Hardware / Small Parts



Hardware Parts

1. 3D printed kit parts
2. Fuselage assembly jig
3. EPP Wheels X 2
4. 150mm velcro
5. 20mm CF Wheel Shaft X 2
6. Micro screws X 10
7. 60mm CF strip

3. Carbon Rods / Strips / Tubes

Carbon Rods / Strips

1. 3 X 0.5mm Carbon Strips
   L 1000mm X 3

2. Control rods D 1mm
   ELE 505mm L X 1
   RUD 525mm L X 1
   AIL 165mm L X 2

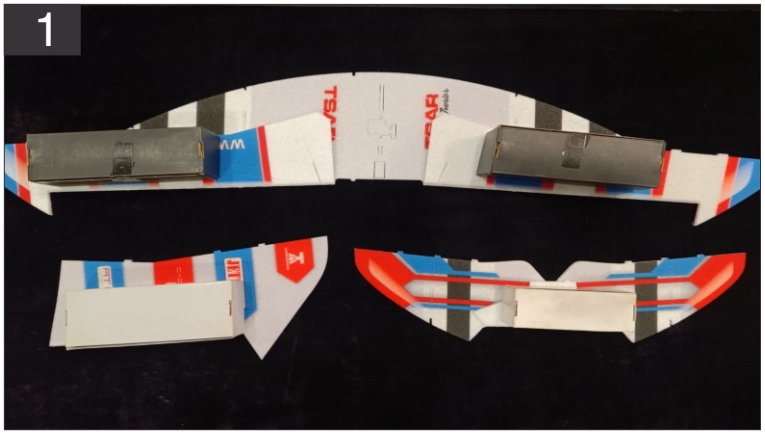
3. Undercarriage Rods
   D 2x2mm L 225mm X 2

4. 1mm Carbon Rods
   L 1000mm X 10

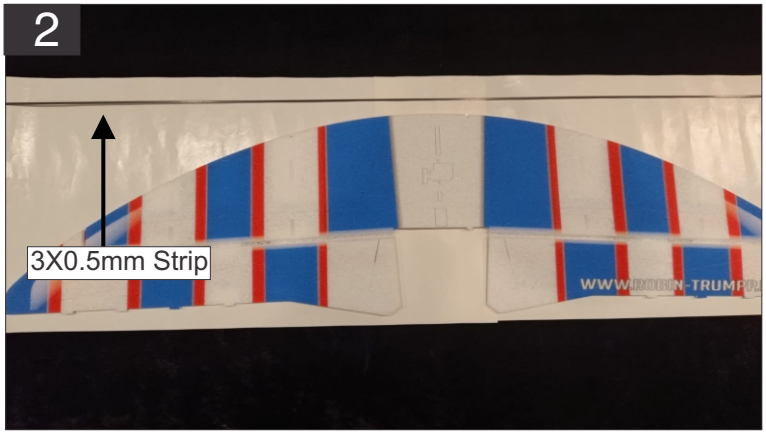
Please Note: After removing kit from shipping box, lay each piece flat on a hard surface, this will allow the airframe to straighten out if lightly bent from shipping. Do not worry since EPP is very pliable and can be bent back if out of shape. Double check that you have all the above pictured items. If any of the airframe or hardware items are missing, contact TA Horizons before starting your build.

TOOLS AND BUILDING MATERIAL REQUIRED

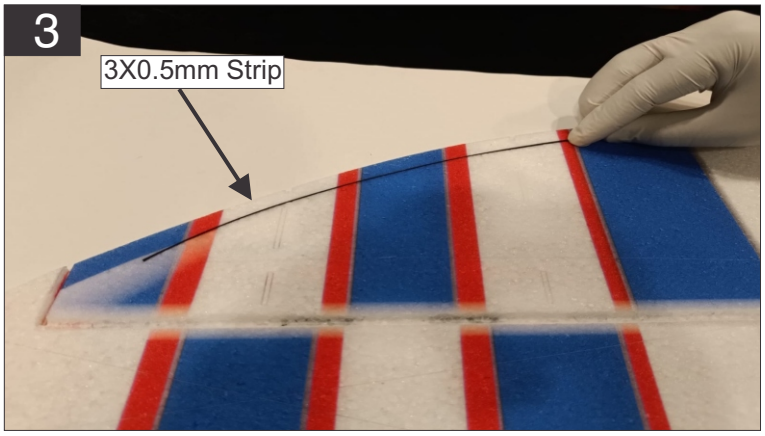
- Heat Gun
- Tape Measure and Ruler
- Black Sewing Thread
- High Viscosity CA
- CA Spray Activator
- Hobby Knife w/new Blade
- Needle Nose Pliers
- Wire Cutters
- Low Temp Hot Glue Gun
- Scissors
- Small Phillips Screw Driver
- Thin CA
- Alenkey



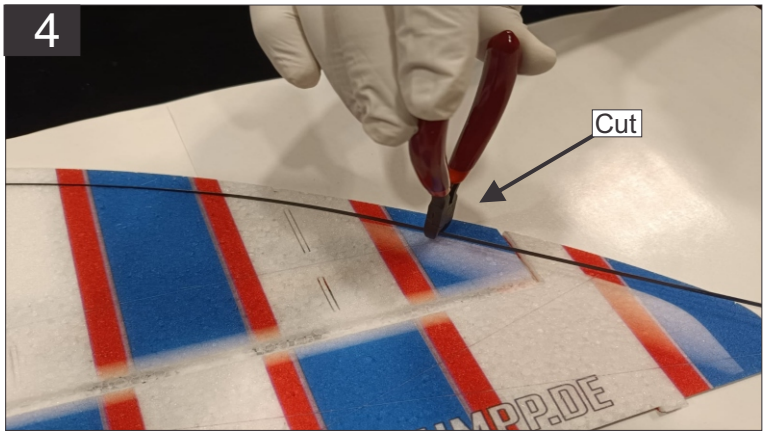
1. (This is mandatory step) locate the hinged items as shown above, Bend them back on to each other as shown and let set for at least 2 hours. This will help to loosen up the movement of the surface.



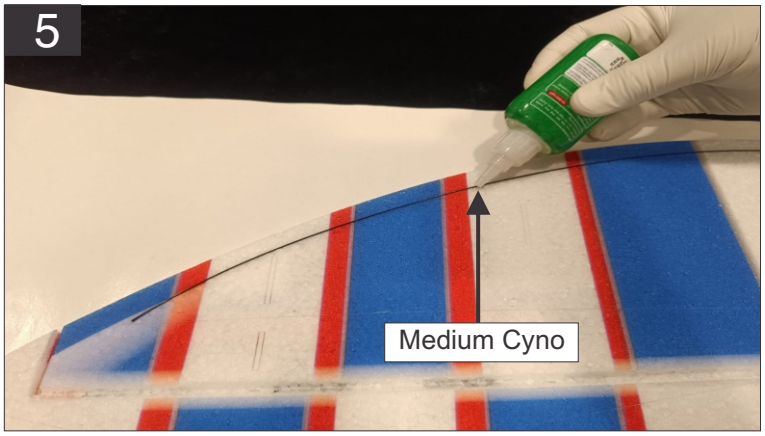
2. Lets start with the wing reinforcement, please note that we are working from the bottom side of the wing. Locate the 3X0.5mm strip as shown in the image above.



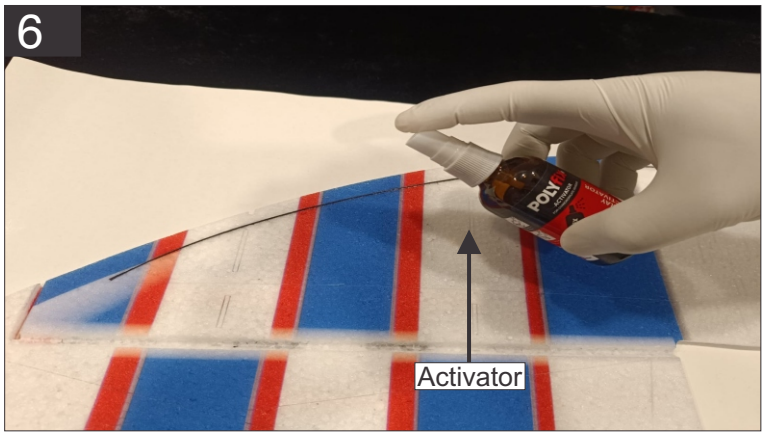
3. Insert the strip vertically into the precut slot, make sure it is completely inserted into the slot.



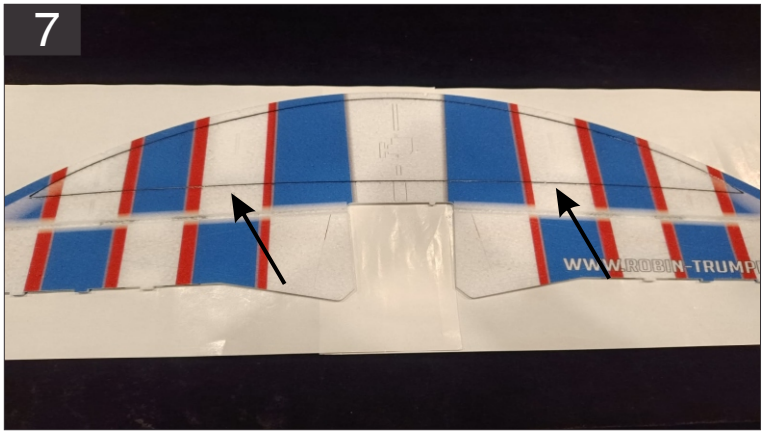
4. Once it reached at the end of Pre-cut slot, use a scissor or wire cutter to cut down the excess strip.



5. Use the Medium Cyno to glue the strip. Wipe out the excess glue if needed using the tissue paper.

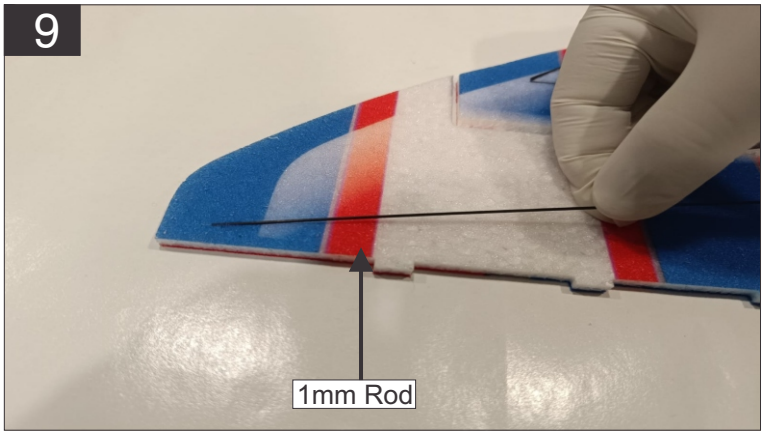


6. Use the spray activator to cure it and fast forward the process.

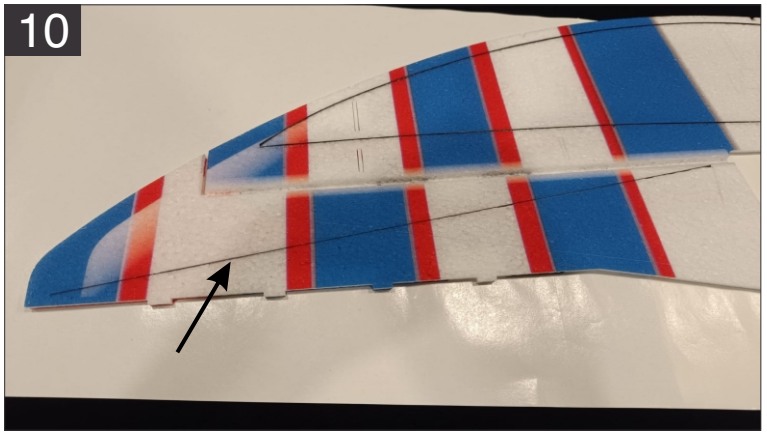


7. Repeat the same process for other strip as well as shown in the picture above.

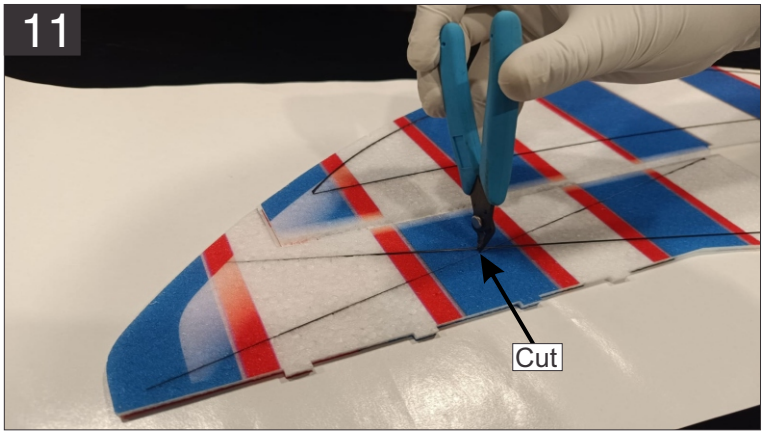
8. Use the 1mm carbon rod to reinforce the ailerons.



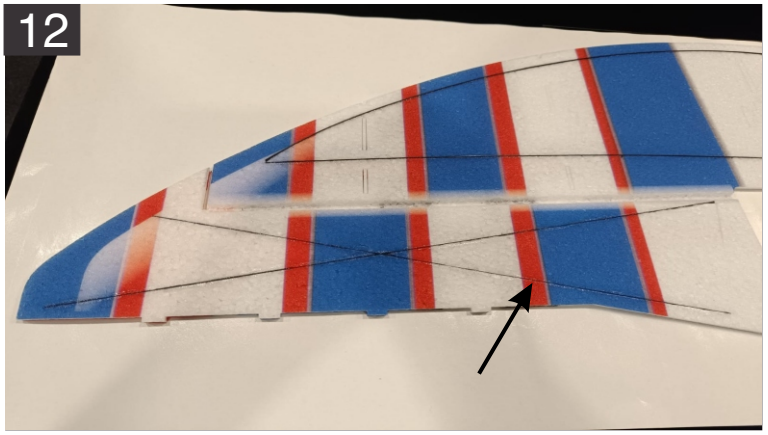
9. Insert one of the two carbon rods that goes in cross shape in the ailerons as shown above.



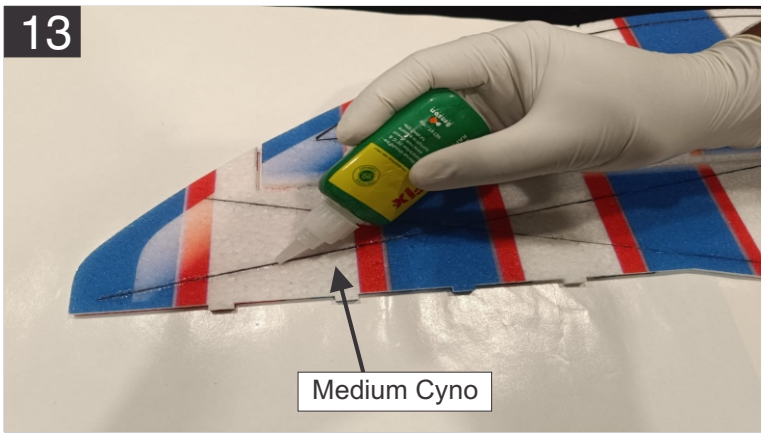
10. Make sure it is completely inserted into the slot.



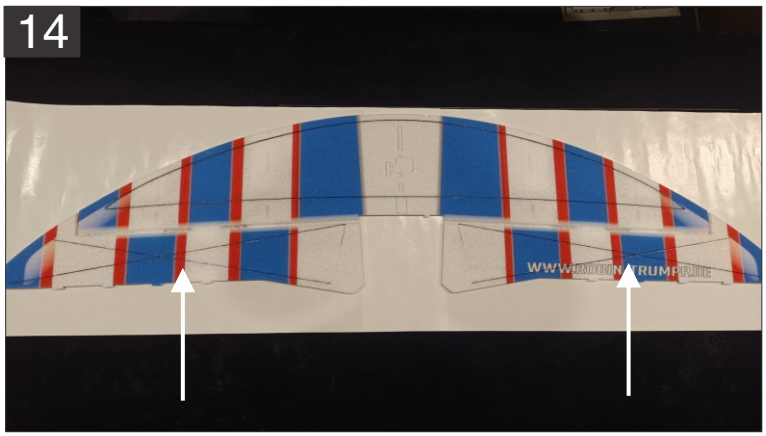
11. Insert the other rod as shown above, once it reached at the intersection of the other inserted rod, use a scissor or wire cutter to cut it.



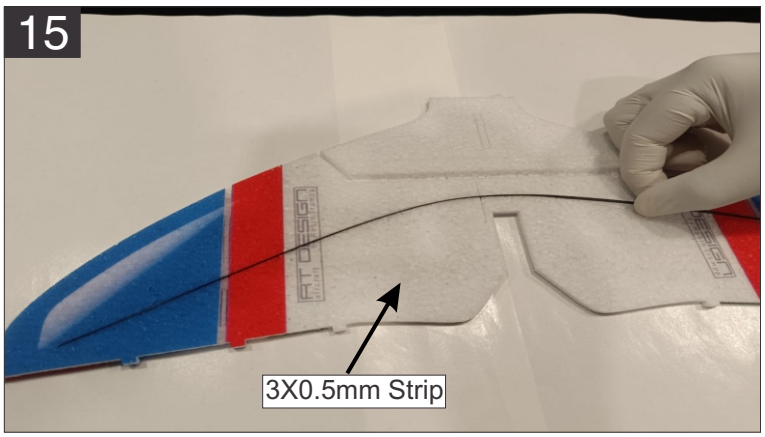
12. Measure and cut the size of other half of the rod, and glue it like shown above.



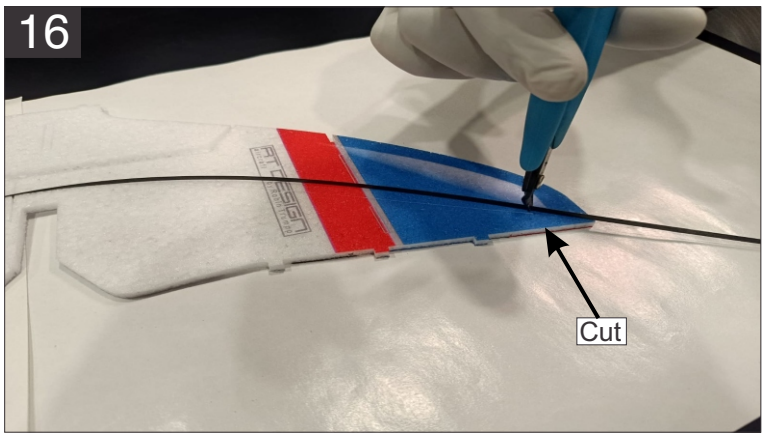
13. Use the Medium cyno to glue it and spray activator to cure.



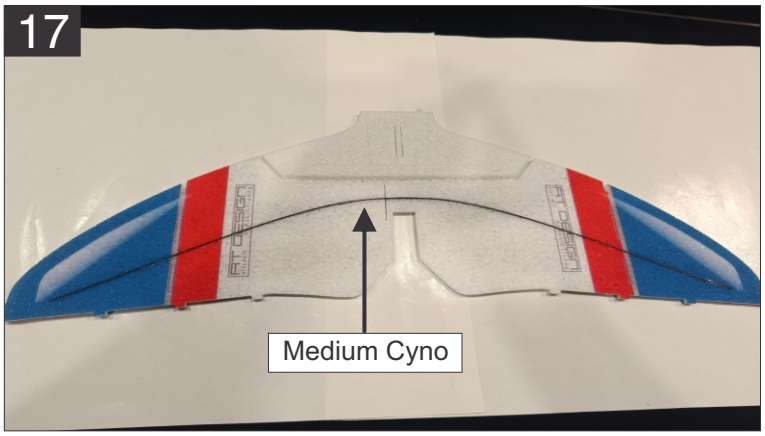
14. Repeat it for the other aileron as well.



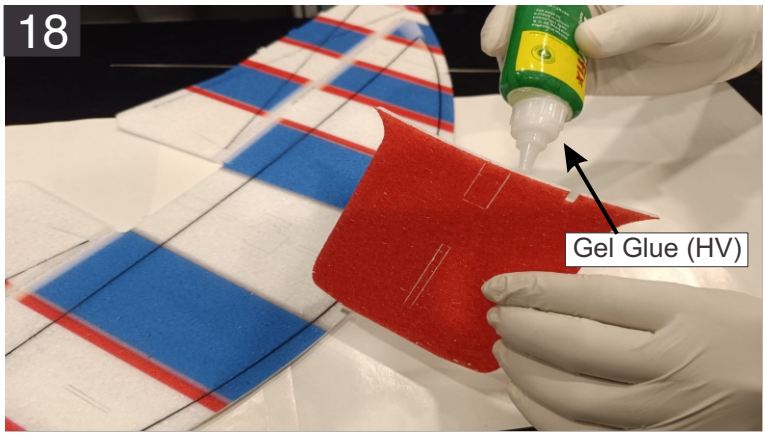
15. Locate the horizontal stabilizer section like shown above, Use the same 3 X 0.5mm strip, that were used to reinforce the wing.



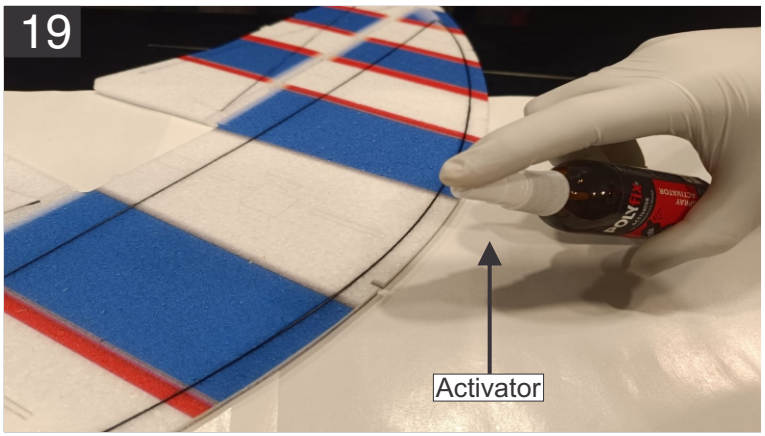
16. Once it reached at the end of Pre-cut slot, use a scissor or wire cutter to cut down the excess strip.



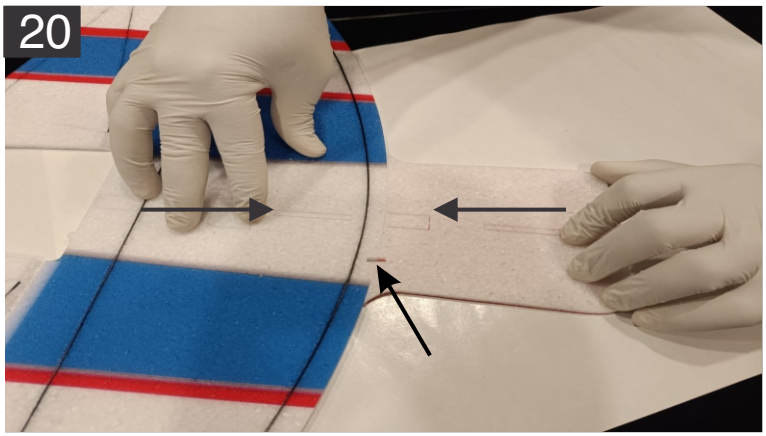
17. Use the Medium cyno to glue it and spray activator to cure.



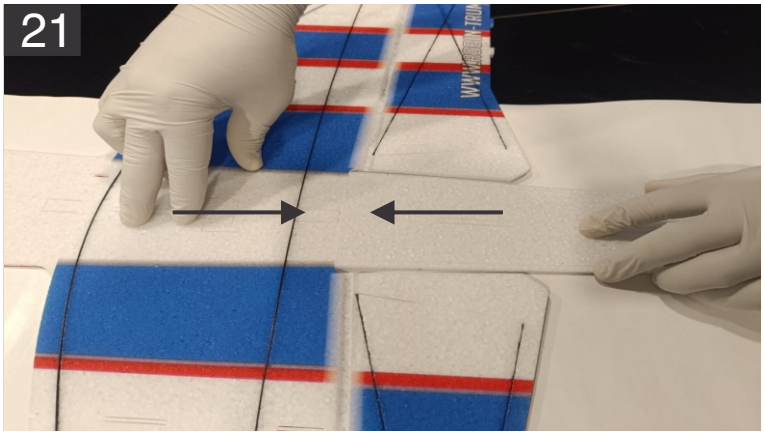
18. Horizontal fuselage nose section is next, Apply a bead of HV CA to the edge of the nose piece that contacts the leading edge of the wing as shown above.



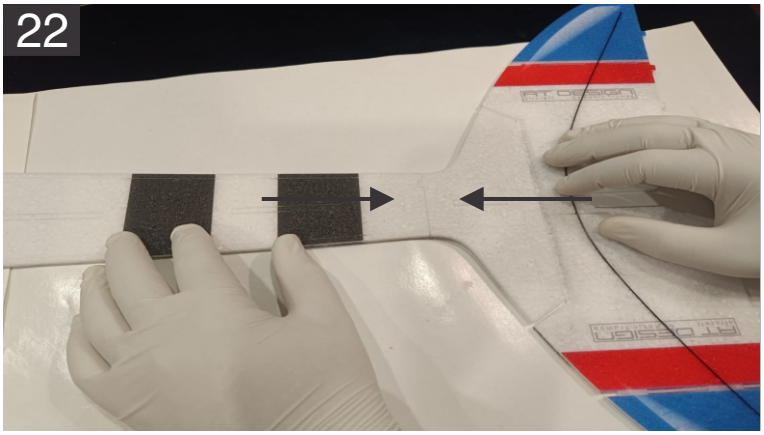
19. Spray activator (kicker) to the mating surface of the wing's leading edge.



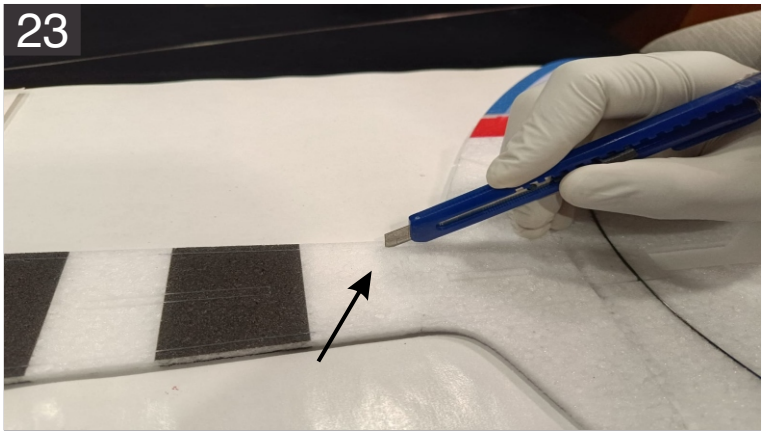
20. Using a straight edge and the indicated cutout as a guide for alignment, bring the two pieces together. Make sure also that both pieces are on the workbench.



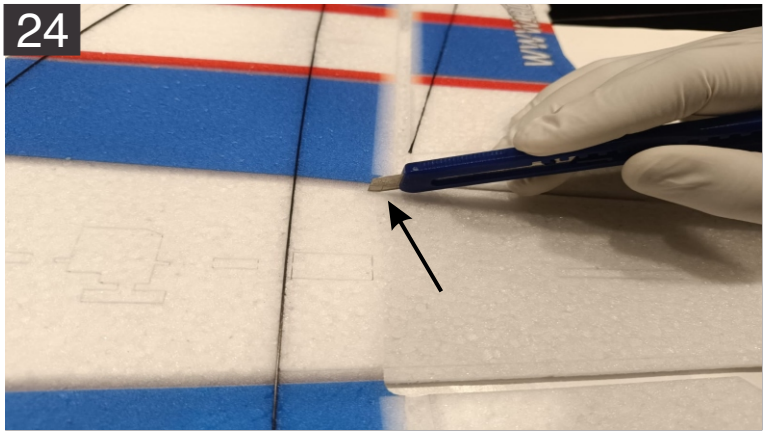
21. Lay down the shown parts on the flat surface with wax paper on it and glue it together. Note that we are working from the bottom side. The bottom side of this part is where the carbon slots are engraved.



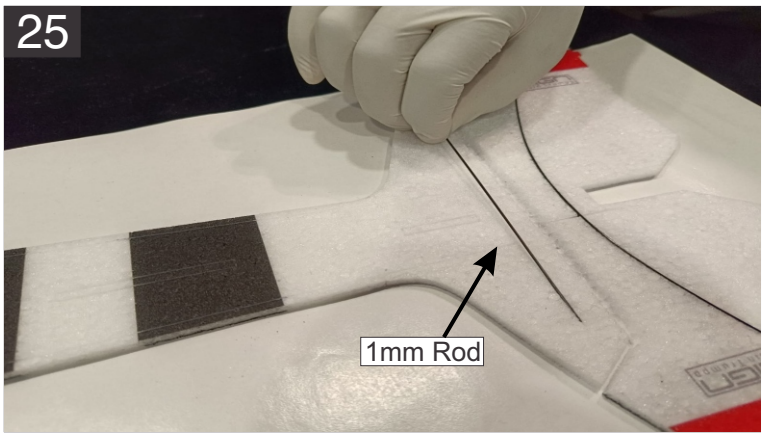
22. Lay down the shown parts on the flat surface with wax paper on it and glue it together.



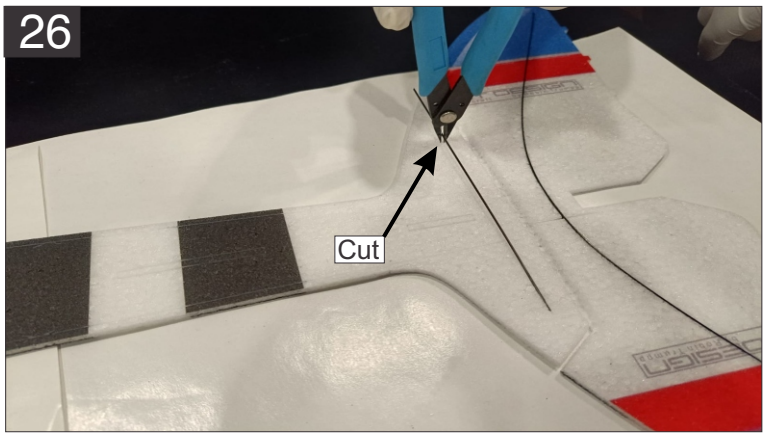
23. Reinforcement of horizontal profile section is next, make sure that the slot in the area where the stabilizer attaches is free of glue.



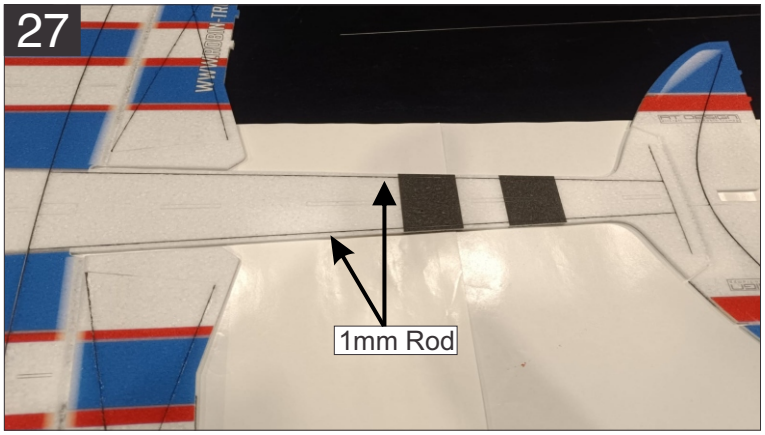
24. Repeat the process where it attach to the wing as well.



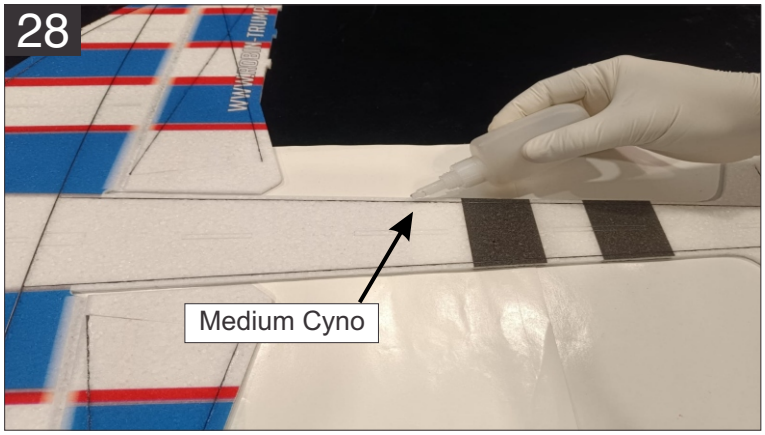
25. Install the 1mm carbon rod to reinforce the tail section as shown above.



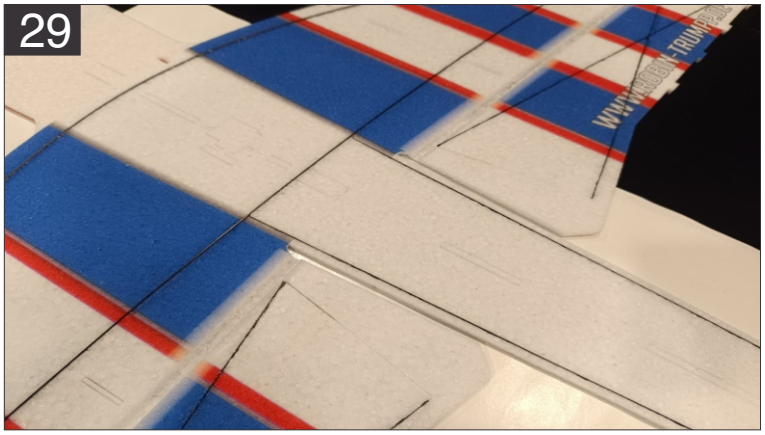
26. Again you need to cut the required length from the supplied 1000mm rod or from any excess remaining rod from the previous steps.



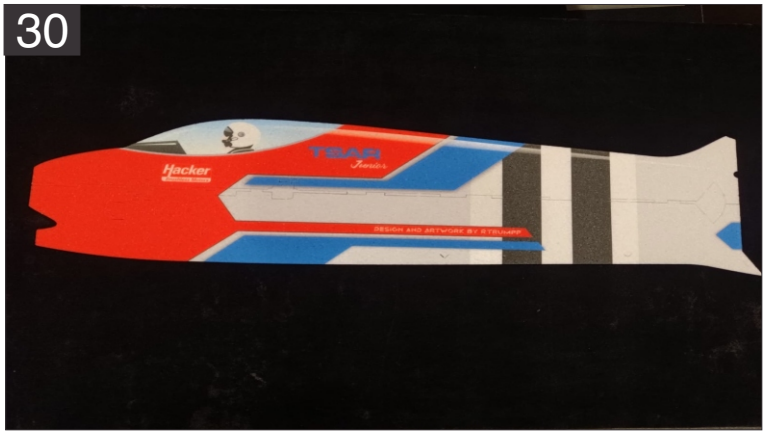
27. The horizontal piece of the fuselage also uses the 1mm carbon fiber rod spanning the entire length from the rear wing spar to the horizontal stab spar, cut the required length and insert the rod into the precut slot like shown above.



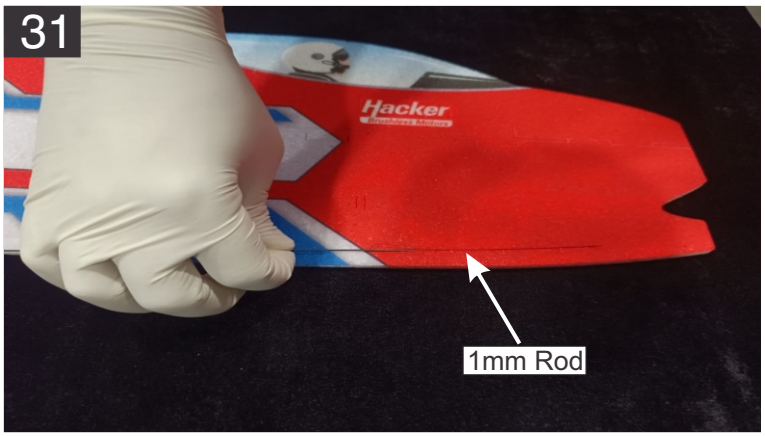
28. Make sure everything is flushed, Use a medium CA to glue it.



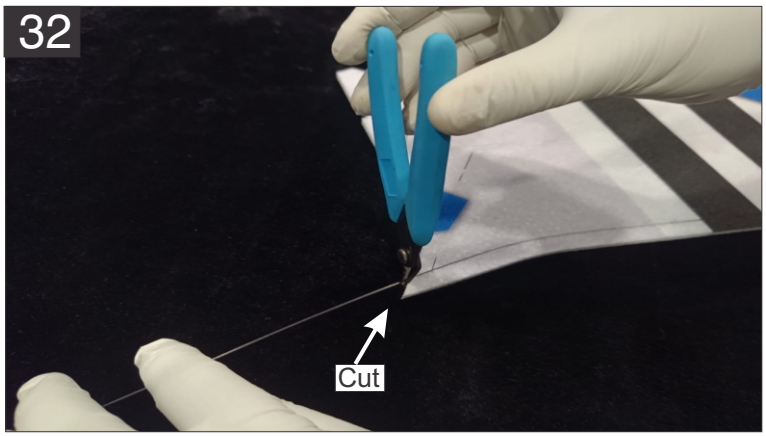
29. Hit with kicker and verify that there is a good solid bond, if there are loose areas simply add a little more CA and kicker.



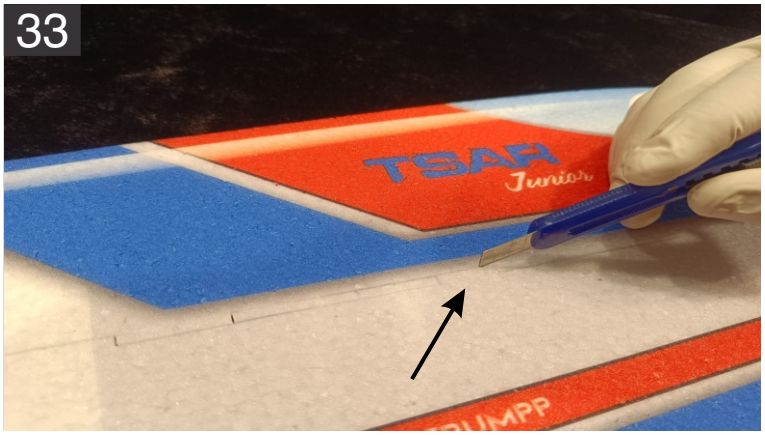
30. Up next is the vertical fuselage section.



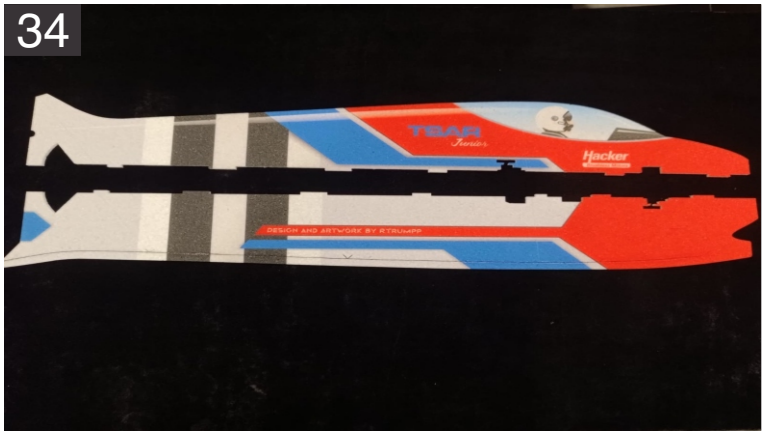
31. Belly of vertical fuselage also uses the 1mm carbon rod for reinforcement, Lay into it's designated slot. Again use the 1mm carbon rod, cut length as advised in the next step.



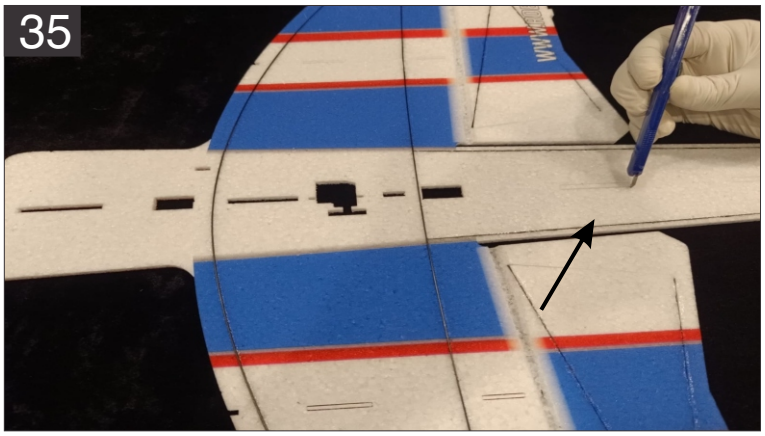
32. Cut the required length and glue the rod into the precut slot like shown above.



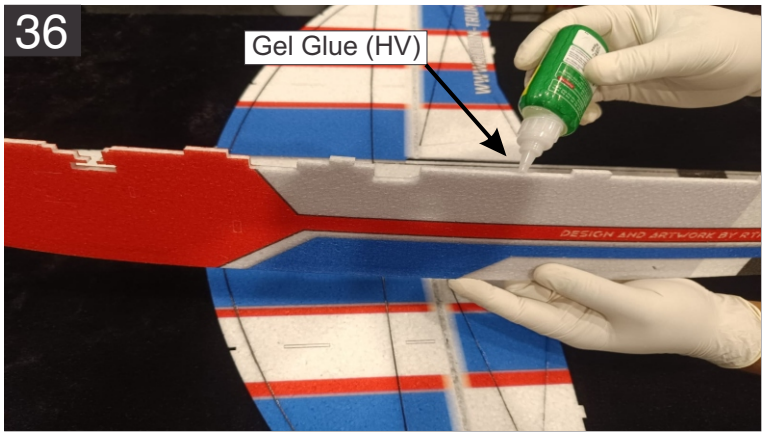
33. We can now began the vertical fuselage installation, use the blade to separate both the parts.



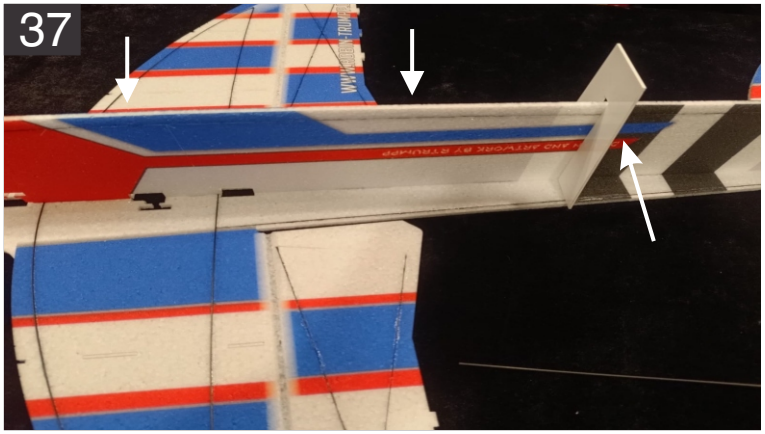
34. Separate both the parts like shown above.



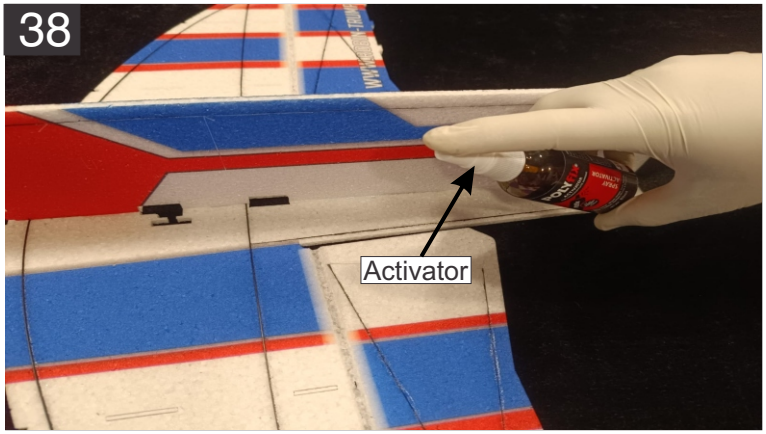
35. Use a blade to take out all the foam out of the assembly slots.



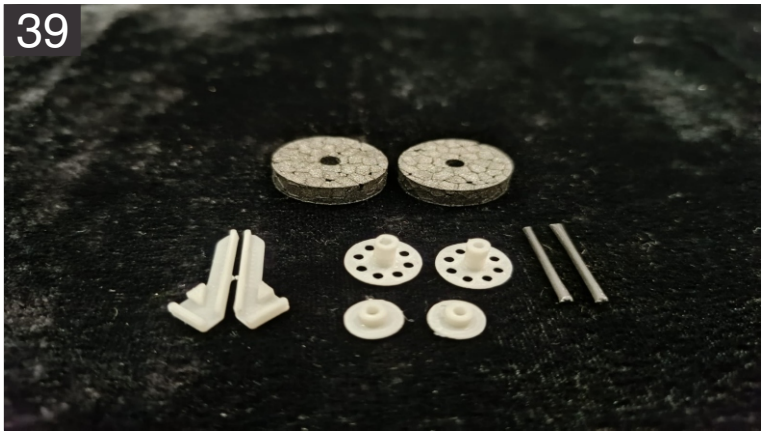
36. Apply a thin layer of HV CA to the mating surfaces of the lower vertical fuselage.



37. Bring the two pieces together, make sure the tabs and slots of the two pieces are fully engaged, flush and square. Use the supplied acrylic jig to make sure of squareness.

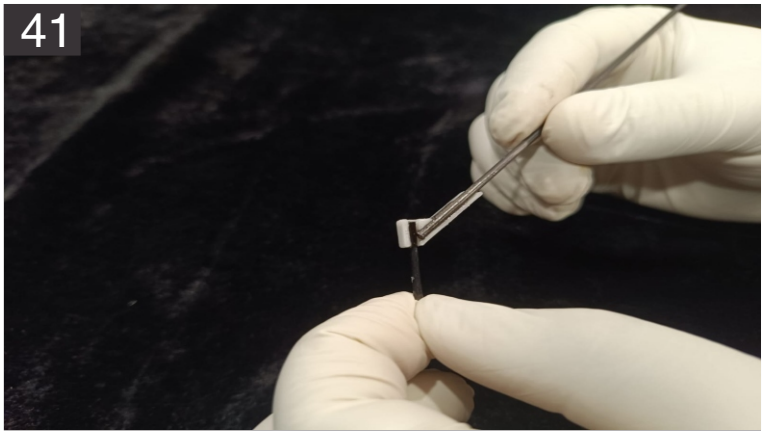


38. You will have a little time to work with and adjust for squareness. Use a spray activator to cure it.

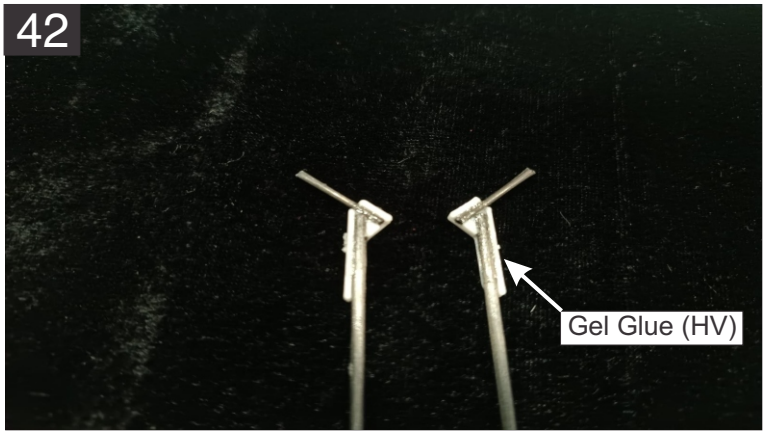


39. Locate the above parts for the undercarriage assembly.

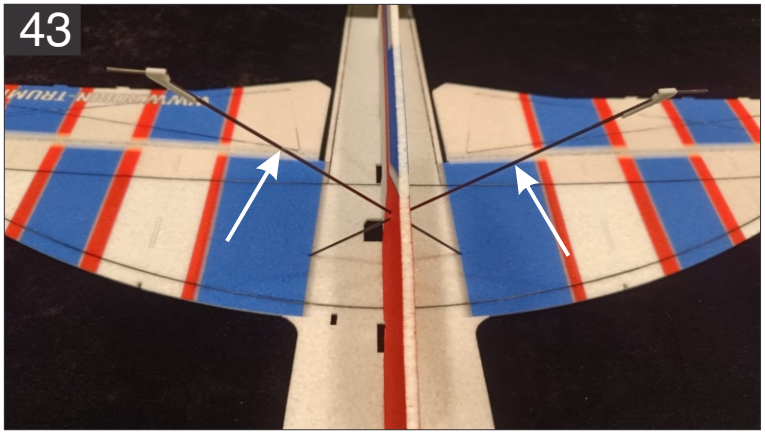
40. Glue the center rim over the supplied black EPP wheels with center hole aligned using HV CA.



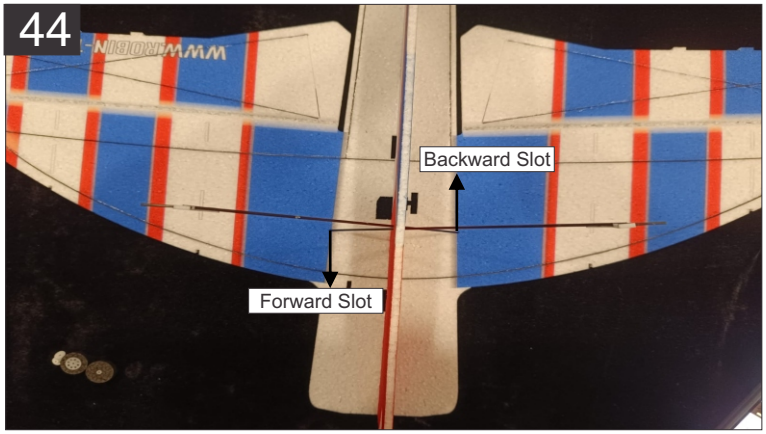
41. Here the supplied 225mm undercarriage and 20mm wheel shaft are glued on the wheel bracket.



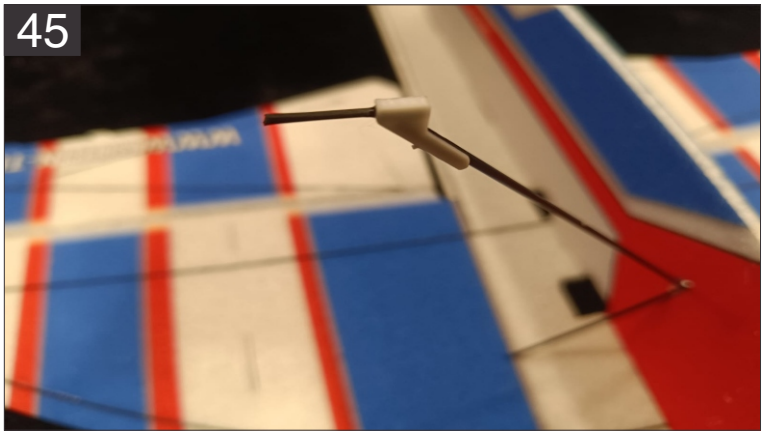
42. Repeat the step for other undercarriage as well.



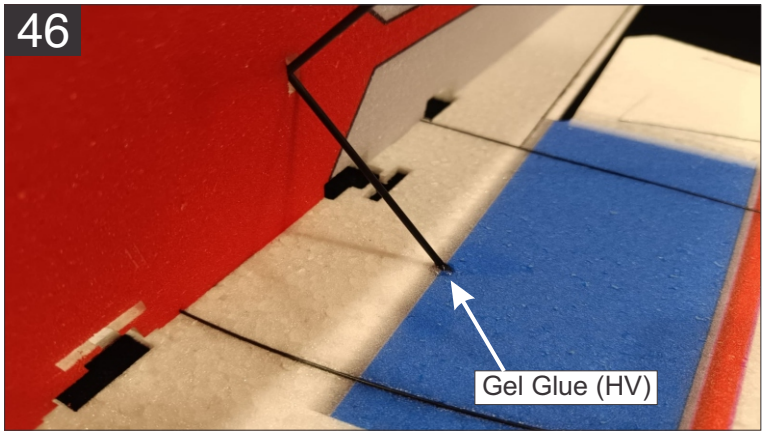
43. Install the undercarriage that we have prepared like shown in the above image.



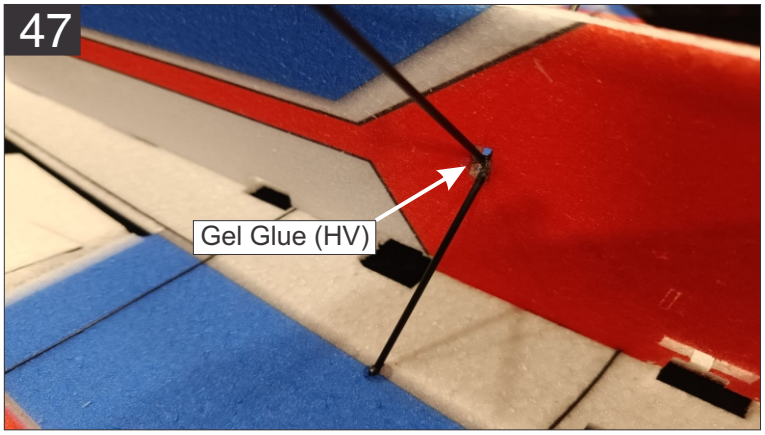
44. Both wings are having different positioning of UC slots with 2mm difference.



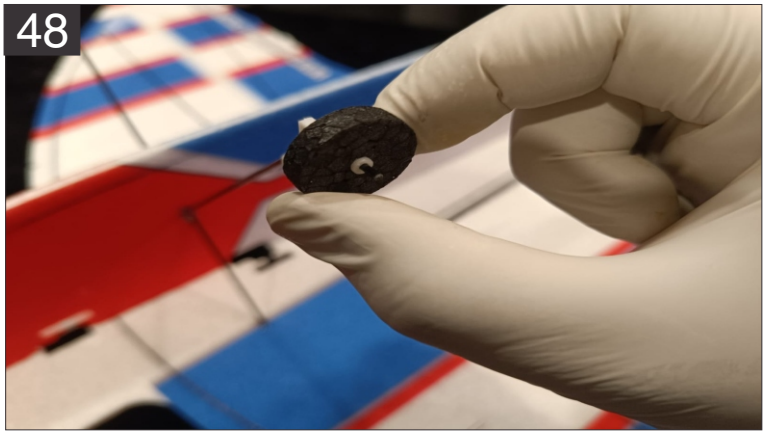
45. Make sure you have used the right orientation of the gear while installing them.



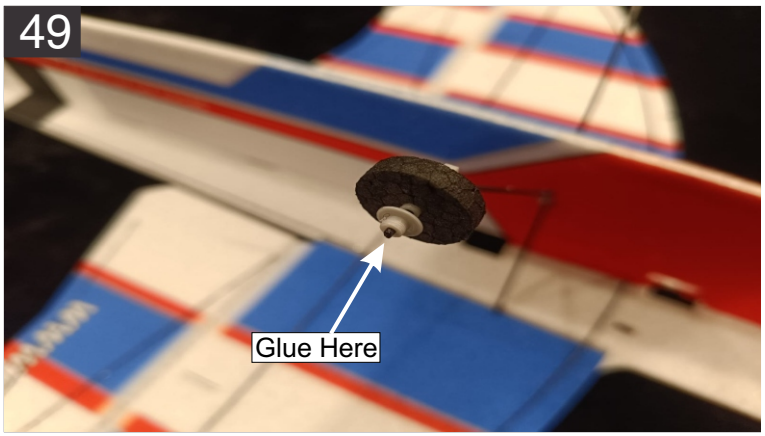
46. Put a drop of HV CA over the joints and spray everything together.



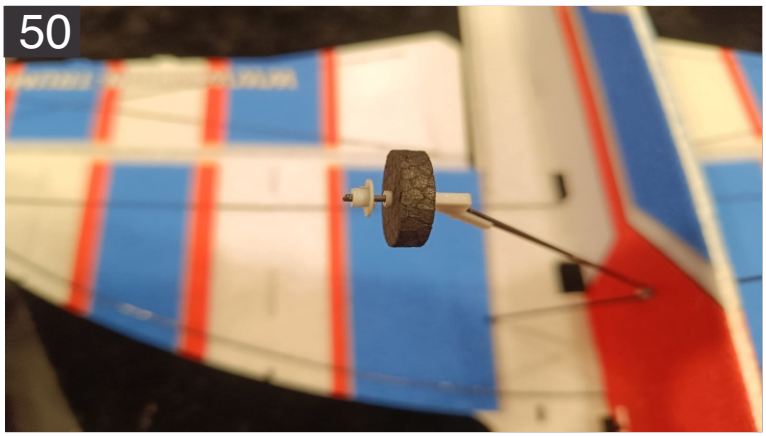
47. Put a drop of HV CA over the joints and spray everything together.



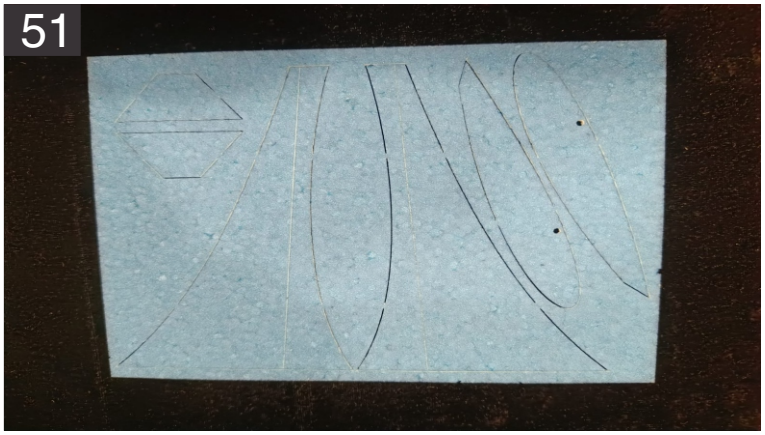
48. Install the wheel over the shaft, make sure it is spinning freely.



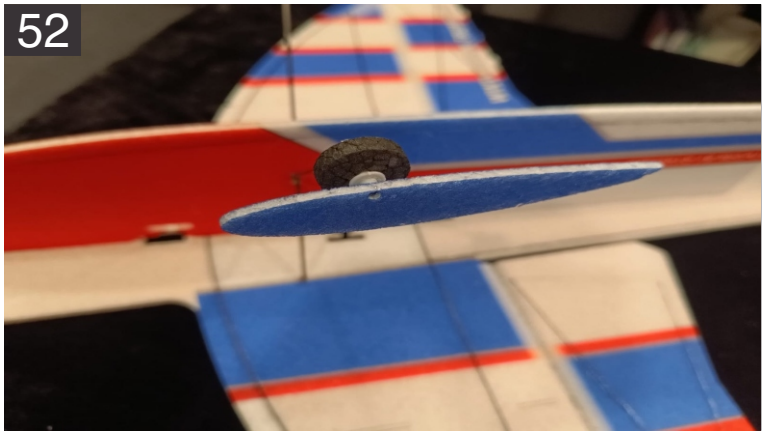
49. Slide in the wheel stopper. Put a small drop of HV CA over the shaft and wheel stopper joint.



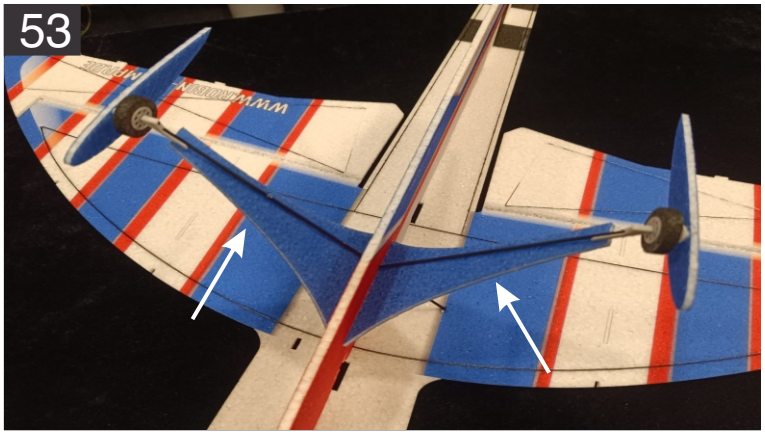
50. Here is another view.



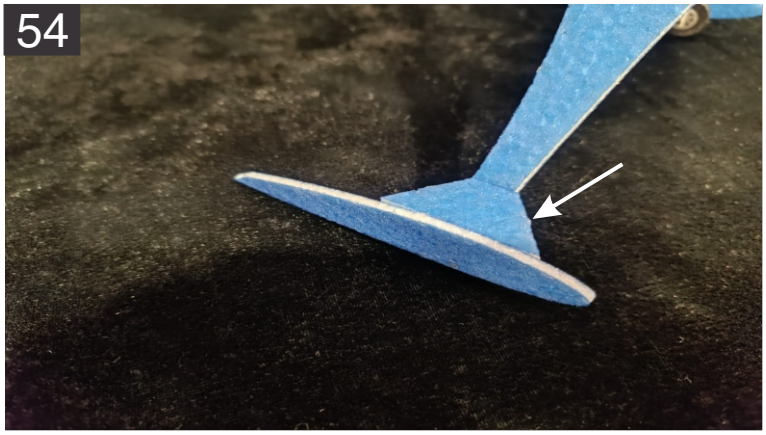
51. Locate the above EPP parts.



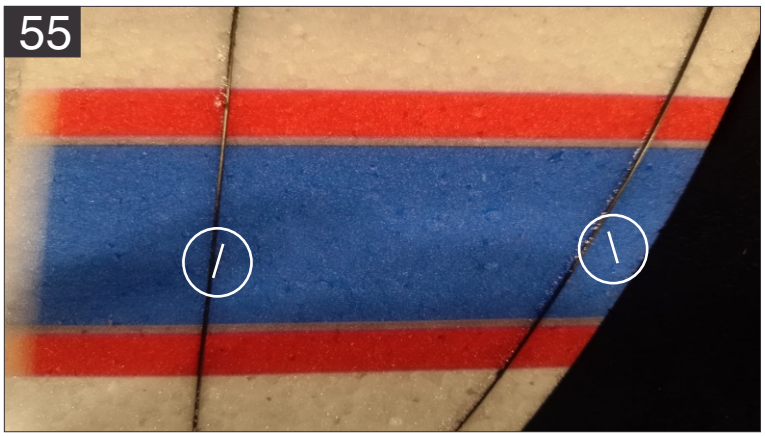
52. Glue the wheel pants on wheel stopper using the HV CA.



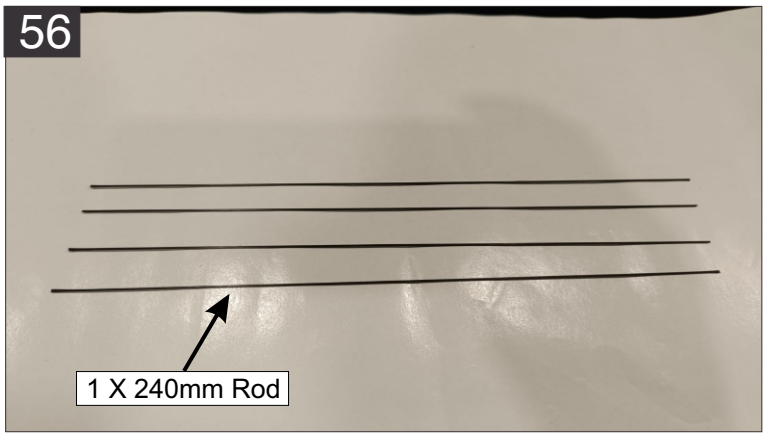
53. Locate the landing gear cover, glue it over the CF Undercarriage, gear cover has the carbon engraved line which should be matched with the Undercarriage rod for the correct orientation of the gear cover. use the above image for the reference.



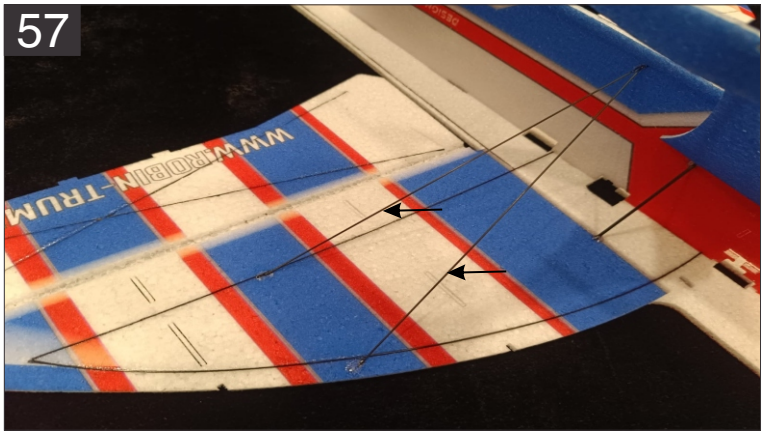
54. Glue the shown small piece which connects the wheel pant with the landing gear cover.



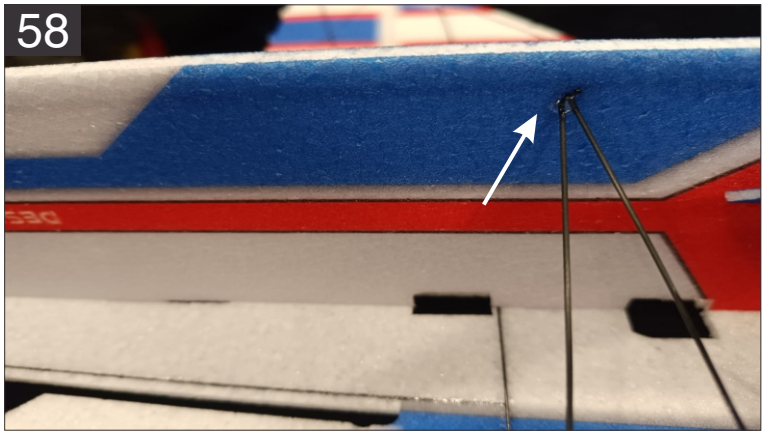
55. Locate the pre cut small slits on the wing tips, 2 slits on both the ends, to insert the rods into.



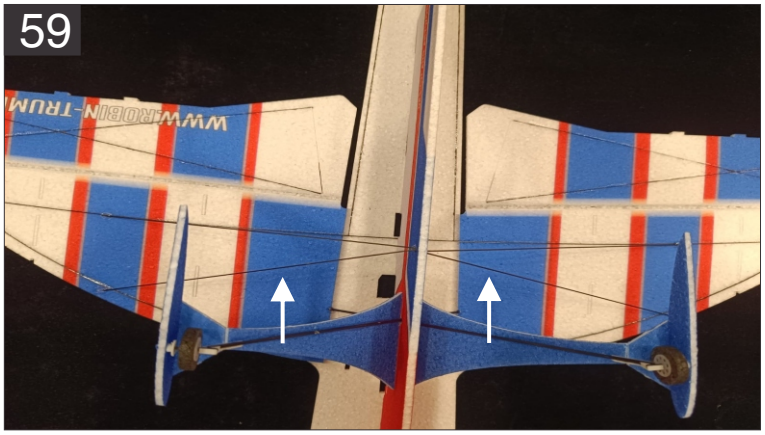
56. Again, all the wing and fuselage trussing is done using the 1mm rod, Cut length of 240mm X 4 from the supplied 1000mm rods for the next process.



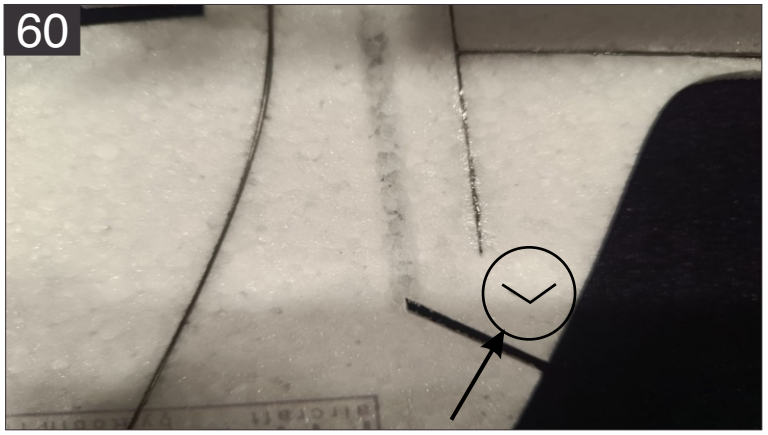
57. Do not use any glue until the step that calls for it. The object will be for the rods to be installed as shown above. Start by making sure the wing is flat.



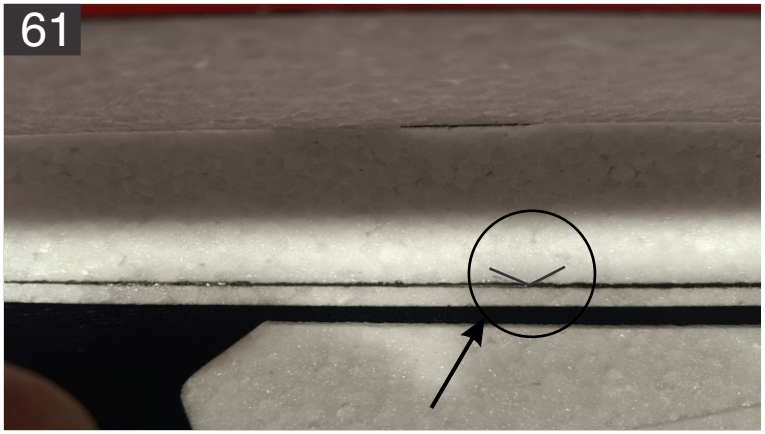
58. The last ends of the two pieces should engage into the slots just behind the undercarriage.



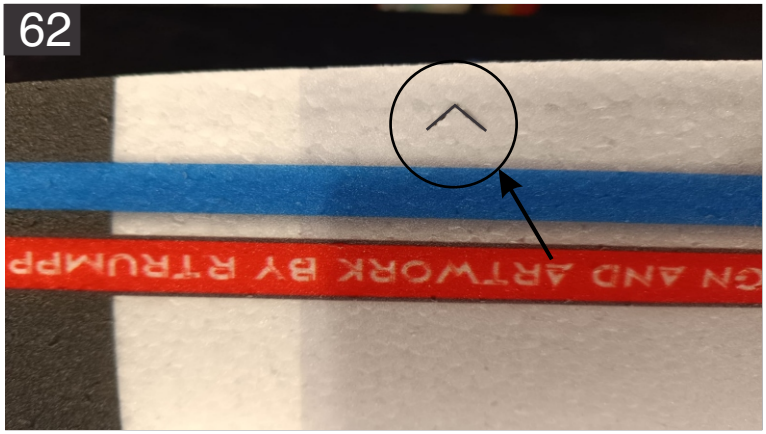
59. Position the carbon rods for the other wing and then at each of the points where the carbon and foam meet, put a drop or two of medium/HV CA and set with kicker.



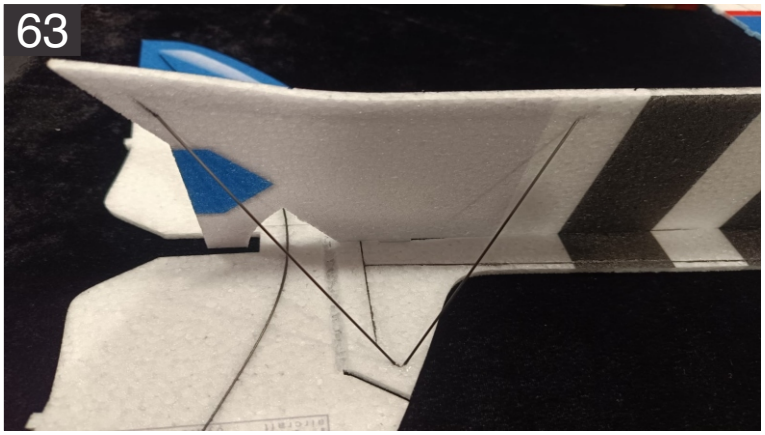
60. Up Next is the fuselage trussing. Locate the pre cut small slots all over the tail, horizontal and vertical profile sections.



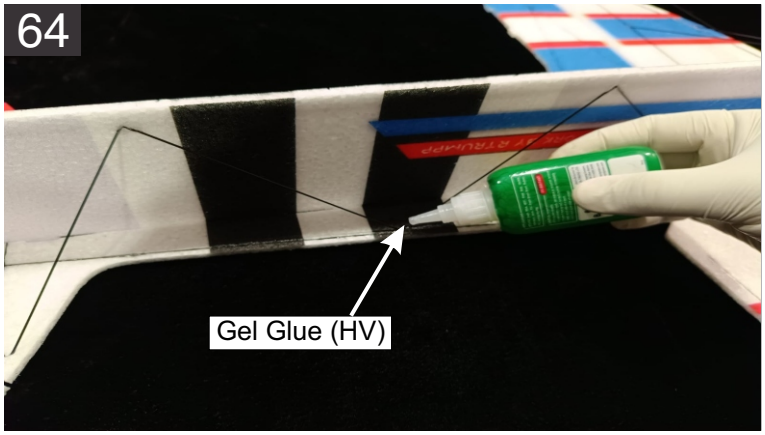
61. Up Next is the fuselage trussing. Locate the pre cut small slots all over the tail, horizontal and vertical profile sections.



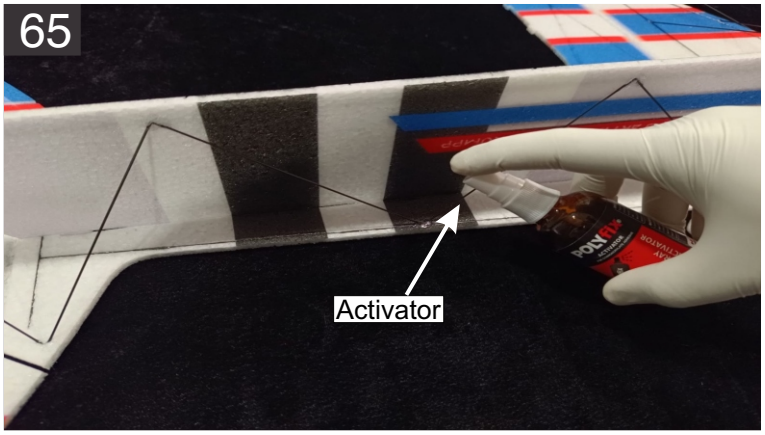
62. Up Next is the fuselage trussing. Locate the pre cut small slots all over the tail, horizontal and vertical profile sections.



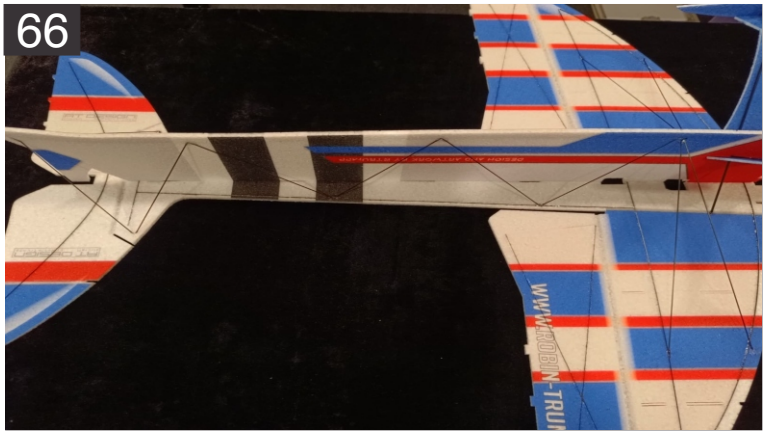
63. Start by cutting the supplied 1000mm 1mm rods into sizes by measuring it from one slot to another. Start installing them from the back as shown in the above image, take the reference from picture no. 68 coming up later.



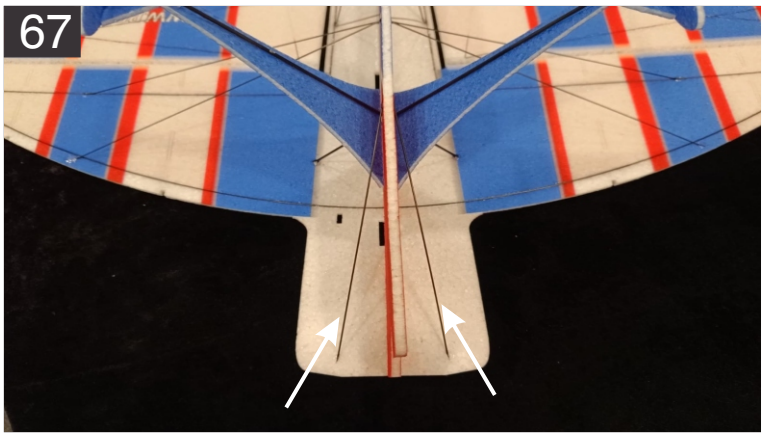
64. Carbon rod needs to sit couple of mm into the pre cut slot in the foam before gluing, Just put a small drop of HV Cyno to glue it.



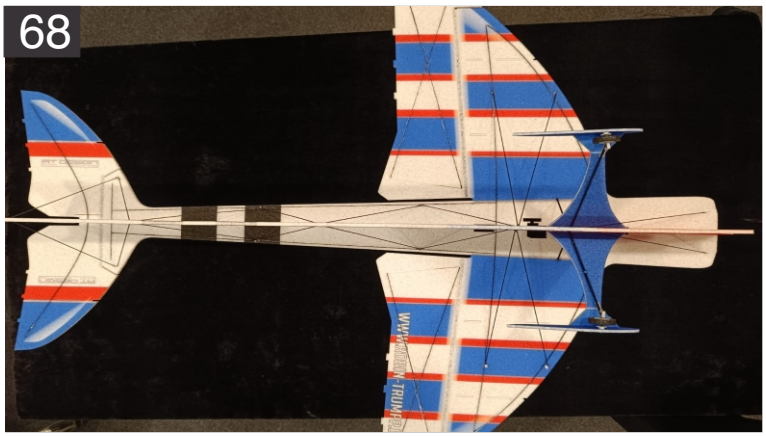
65. Use a spray activator to cure it.



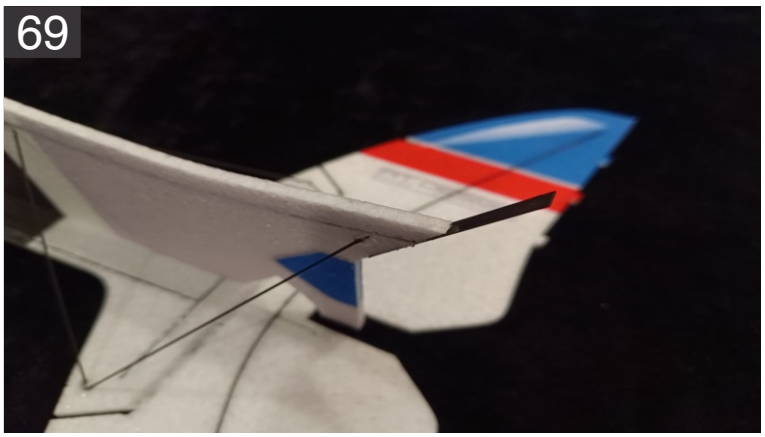
66. Here is a complete fuselage trussing of one side.



67. Along with the fuselage truss, here are the mount reinforcement rods glued in place.

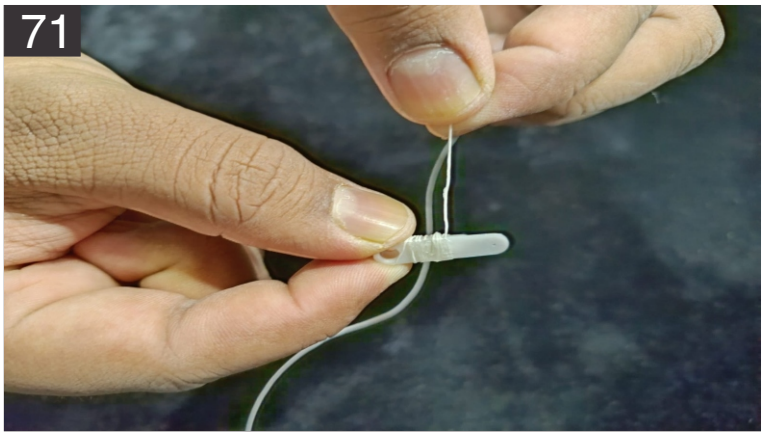


68. Please refer above image for the reference, repeat the process for the other side as well, make sure the vertical half remains square throughout the process.



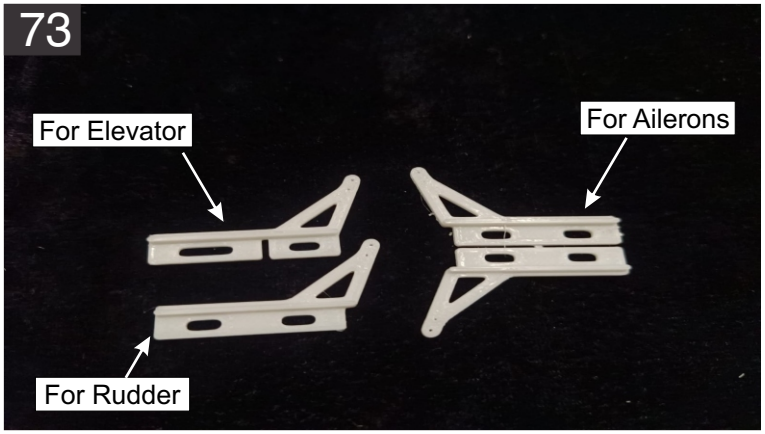
69. Locate the 60mm flat carbon strip and glue it on rear bottom part of the fuselage shown in the above image.

70. Locate the above 3 pcs servo arm extenders.



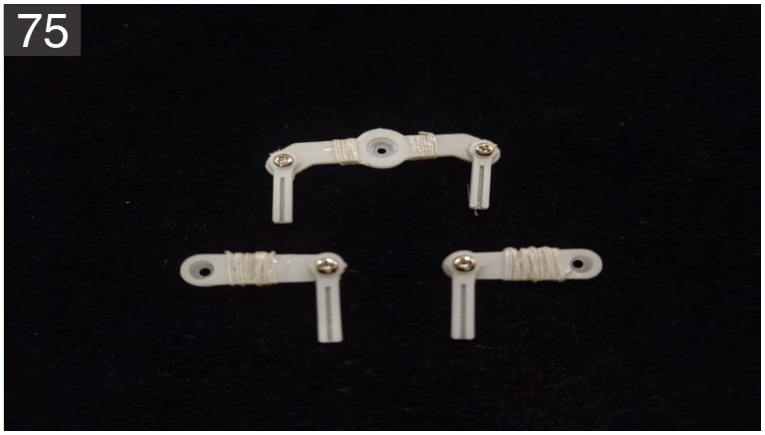
71. Install the extenders over the stock plastic servo arms using the thread and cyno.

72. Here are all servo arm extenders are installed over the stock servo arms.

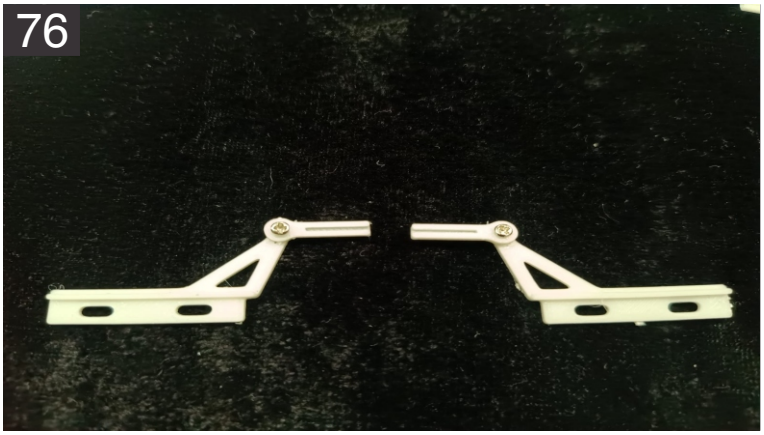


73. Locate the control horns, for elevator control horn you will notice a small square shaped cutout on the underside. This is meant to be placed around the spar of the elevator that was installed earlier. Control horns for ailerons are weld together.

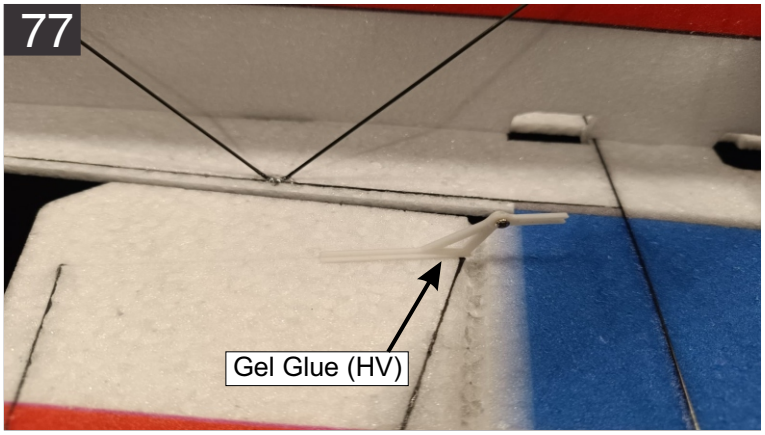
74. Locate these control links as shown above.



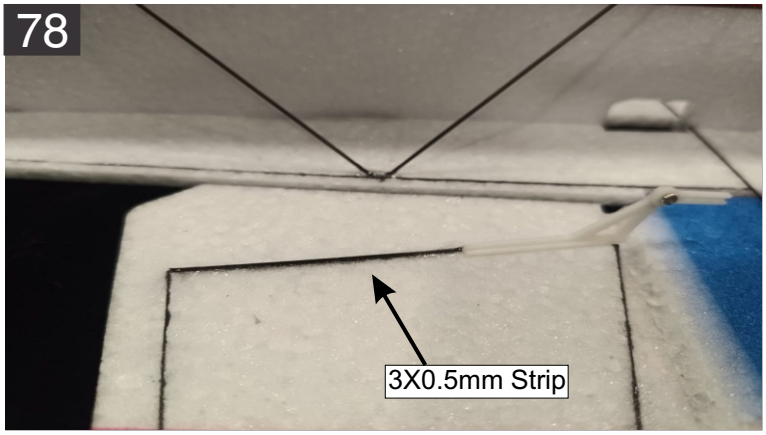
75. Screw these control links over servo arms as shown above.



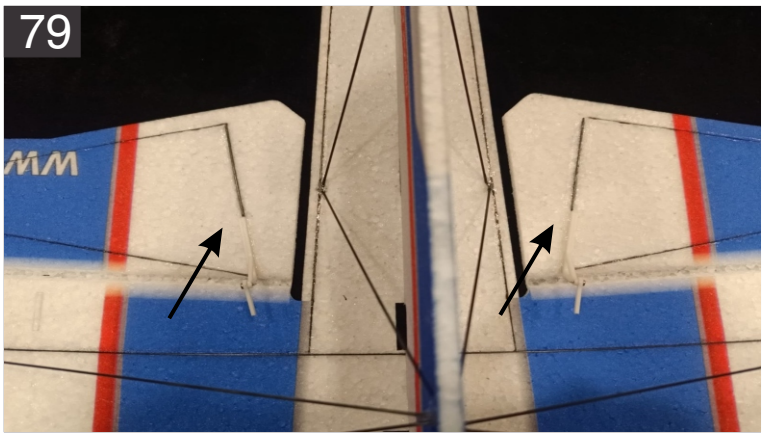
76. Screw the another set control links over all the control horns as shown above, make sure of the link direction before screwing.



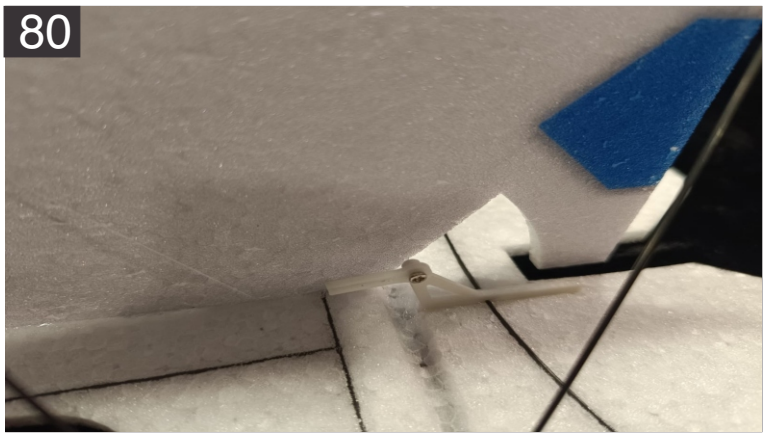
77. Glue the aileron control horn in place, note that we are working from the bottom side.



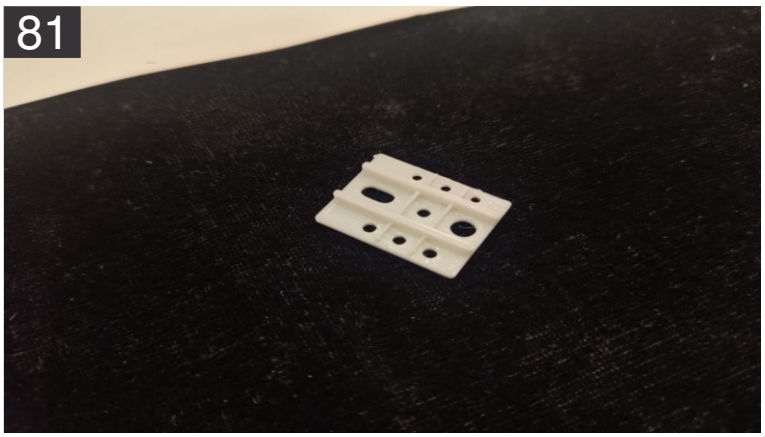
78. Cut down the length and glue the 3X0.5mm strip into the precut slot for aileron horn reinforcement.



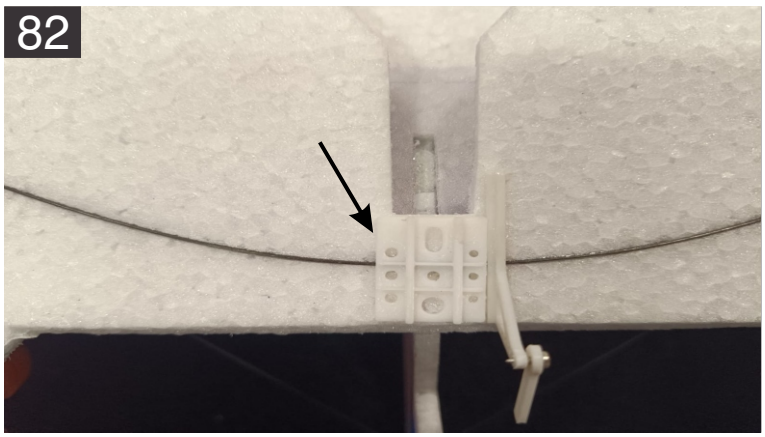
79. Repeat the step for other side as well.



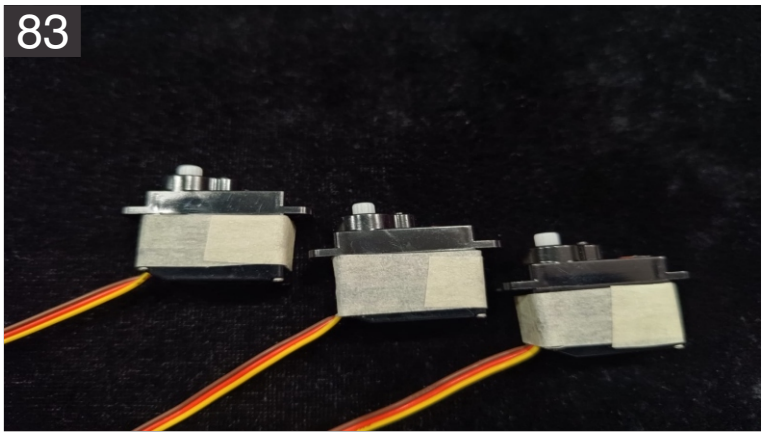
80. Glue the elevator horn shown in the image in the precut control horn slot using HV CA. Make sure it sits right to the bottom of EPP surface.



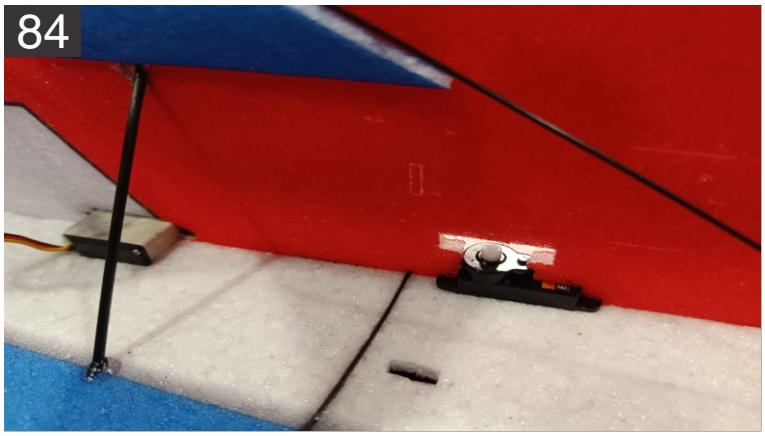
81. Locate the above elevator reinforcement plate as shown in the above image.



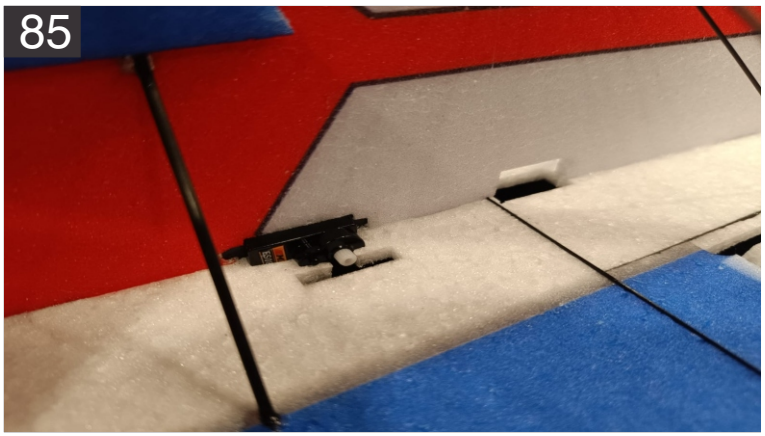
82. Glue it in the center of the elevator right next to the elevator control horn.



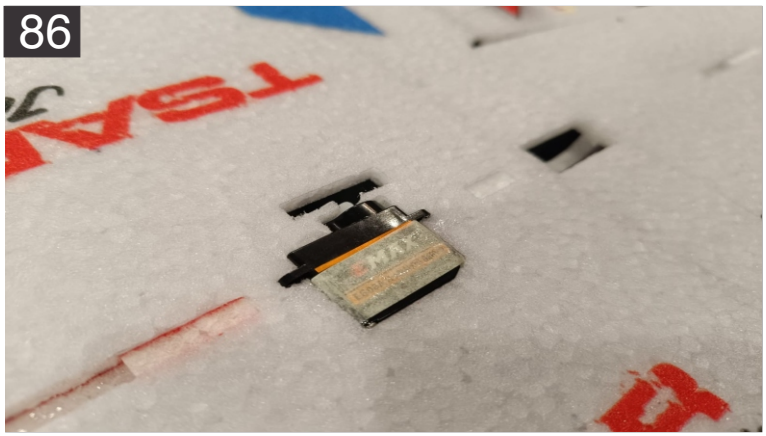
83. It's a good idea to wrap the servos with the paper tape to keep the servos safe from the glue used for sticking them in the later steps.



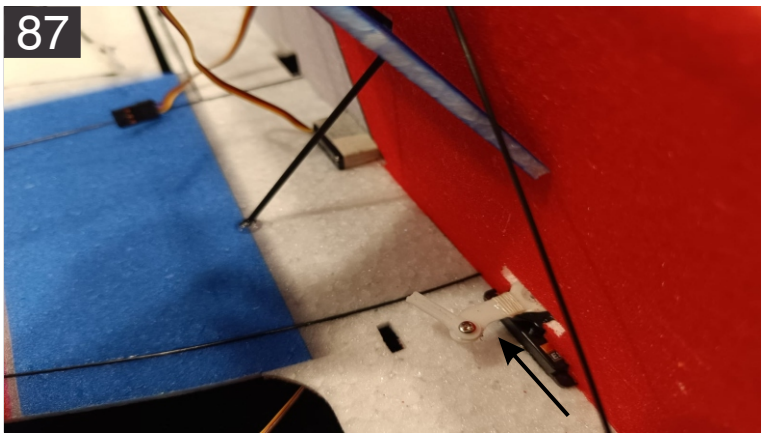
84. Time to install the servos, put the aileron servo in place and glue it. Again make sure that we are working from the bottom side.



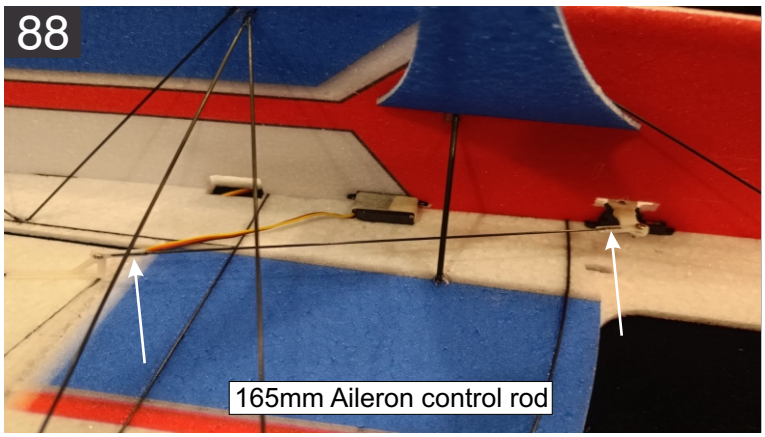
85. Put the elevator servo in place and glue it. Again make sure that we are working from the bottom side.



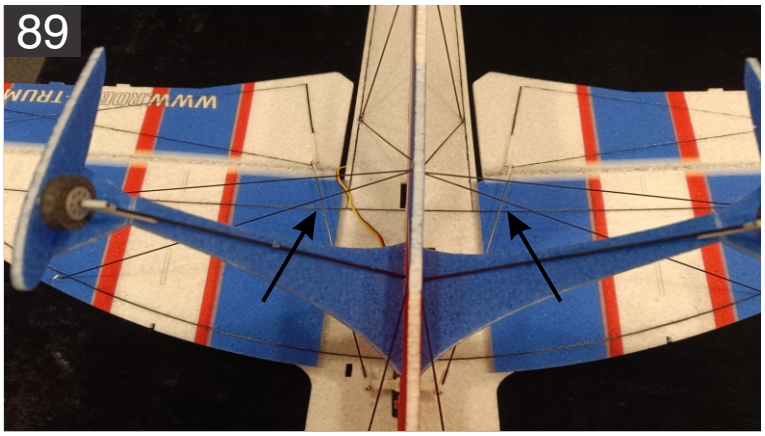
86. Make sure the elevator servo is flush with the foam and not coming out from the top side as shown above.



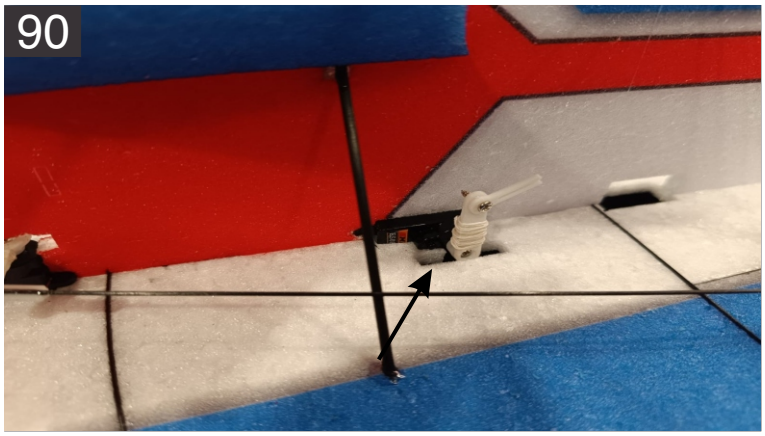
87. With the aileron servo centered, Install the dual servo arm over it, check the orientation shown in the above image.



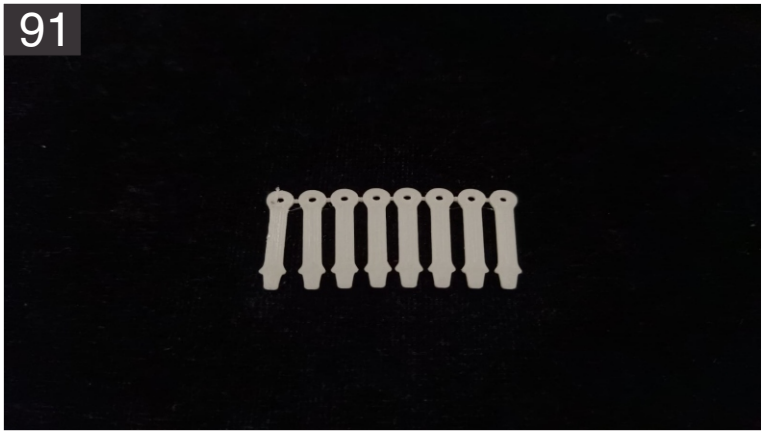
88. Locate the 165mm aileron control rod, as the rod is already pre-cut in the desired size, glue both end of the rod into the quick links as shown above using thin CA, make sure you have servo arm and aileron centered.



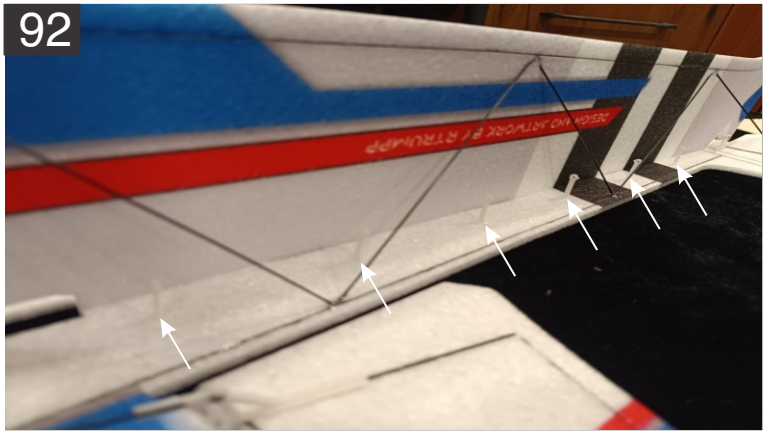
89. Repeat the process for other side. Above is the finished linkage setup with aileron centered and rod well fitted and glued in both the quick links.



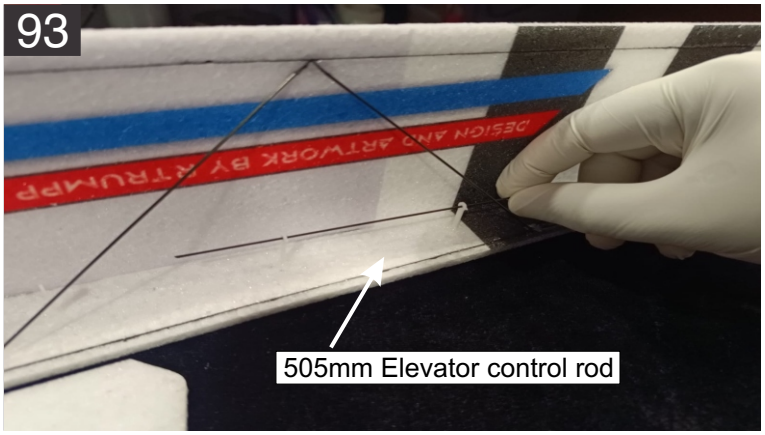
90. Elevator linkage, Make sure you have the servo centered before moving further with the setup, check the orientation shown in the above image, again keep in mind that we are working from the bottom side.



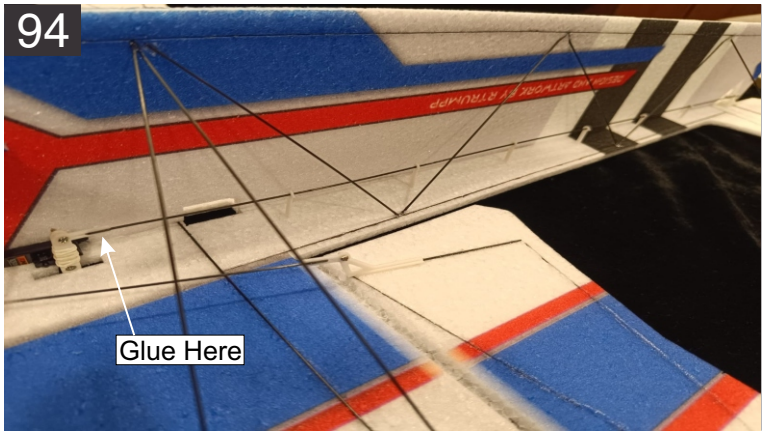
91. Locate the pushrod guides shown in the above image for the next step.



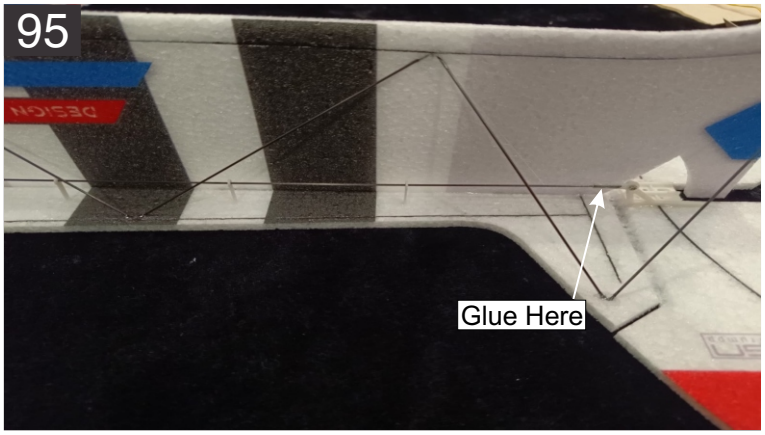
92. Before moving to elevator linkage setup, glue 6pcs pushrod guides into the pre cut slots, like shown above.



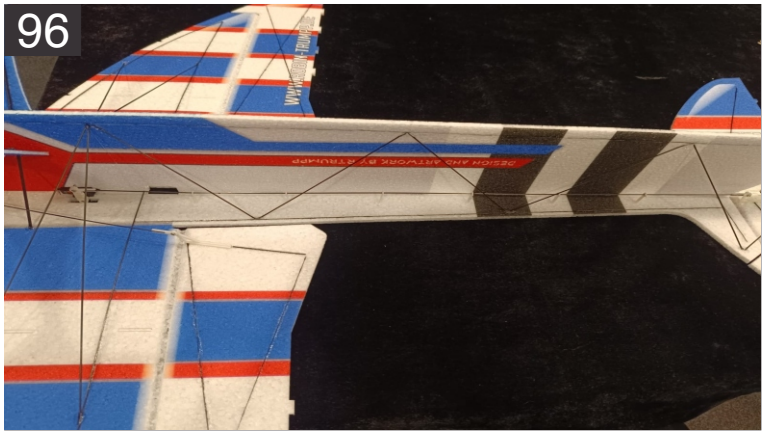
93. Slid in the dedicated pre cut 505mm elevator control rod through the push rod guides like shown in the above image.



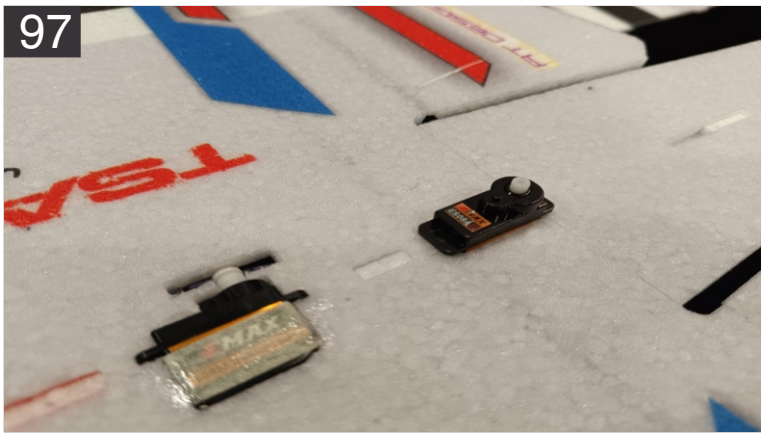
94. As all the control rods are pre-cut to the desired length, no trimming is required during the assembly, glue the Elevator control rod on the one side, using thin CA or optionally HV CA.



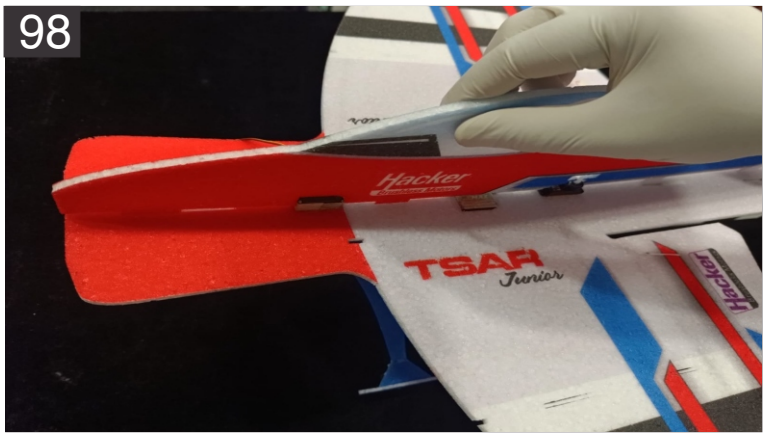
95. Glue the other end of control rod as well with the servo arm and elevator centered.



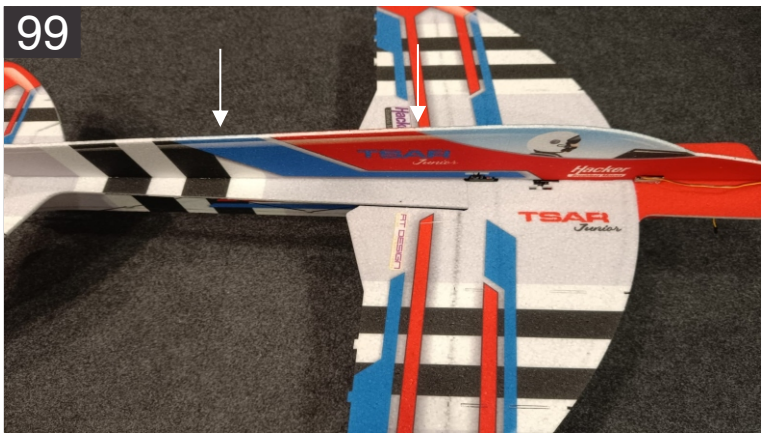
96. Above is the finished linkage setup with elevator centered and rod well fitted and glued in both the quick links with all the guides in place.



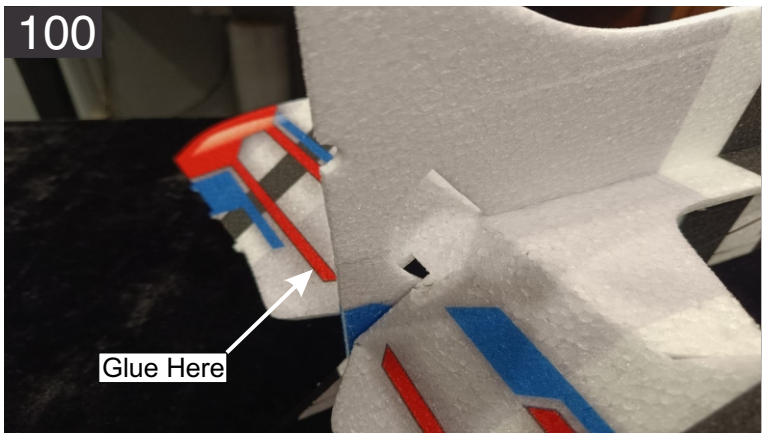
97. Glue the rudder servo in place, now we are working from the top side.



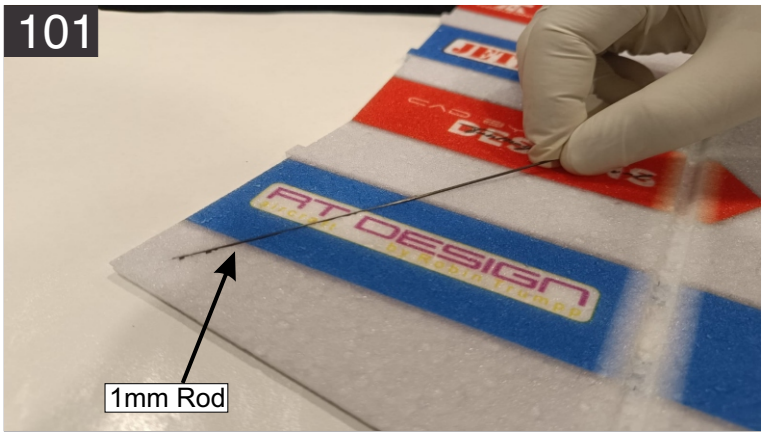
98. Dry fit the top part of the fuselage, trim any slots if needed.



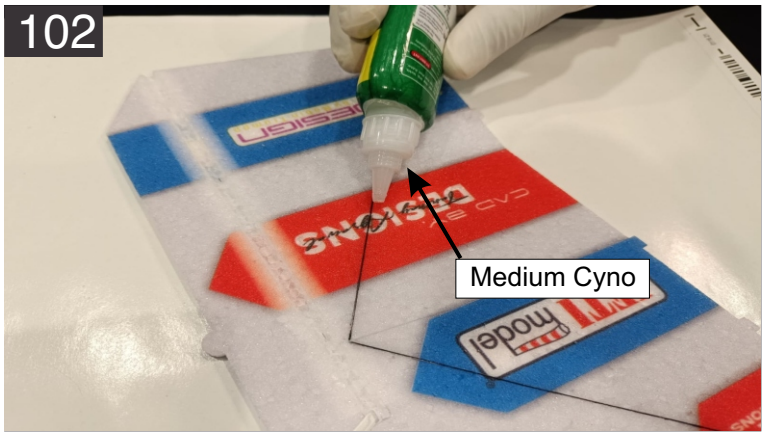
99. Once the aileron and elevator linkages are set up, use the same process as gluing the bottom of the fuse to glue the top of the fuselage into place. Engage all the tab and slots. Press firmly along the length of the fuselage to make sure all areas are fully seated.



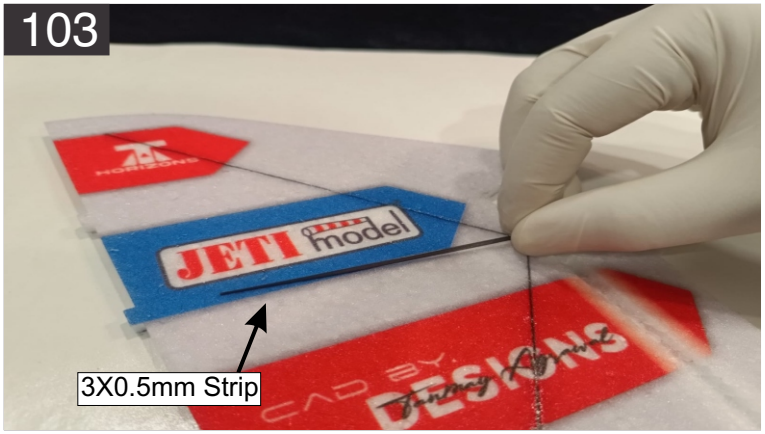
100. Note that there is a small area behind the elevator that should mate up as well.



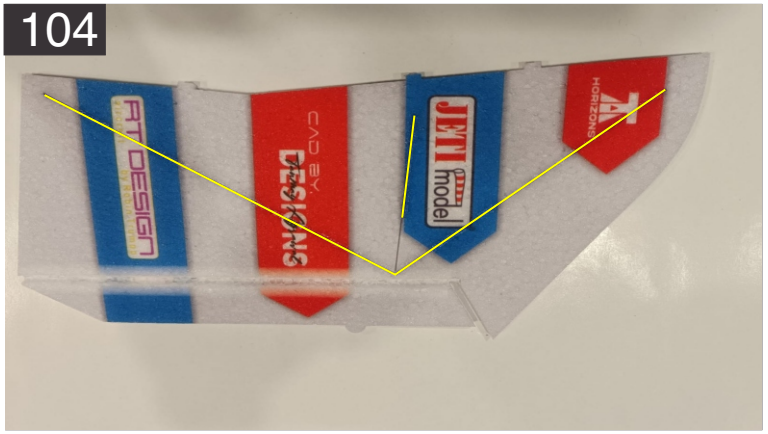
101. Next up is the rudder, cut the required length and glue the 1mm rod into the pre cut grooves as shown in the above image.



102. Glue with medium CA and set with Kicker. Don't forget to use the butter paper underneath when gluing with medium CA.

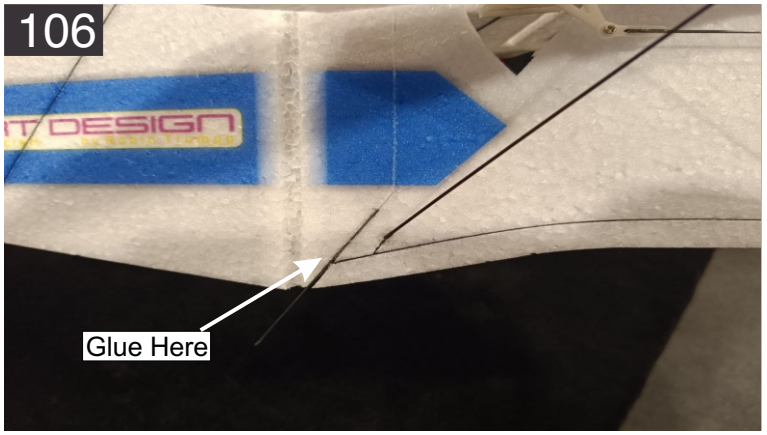


103. Cut length and glue the 3X0.5mm stripe in the slot just behind rudder control horn, take reference from the next picture.

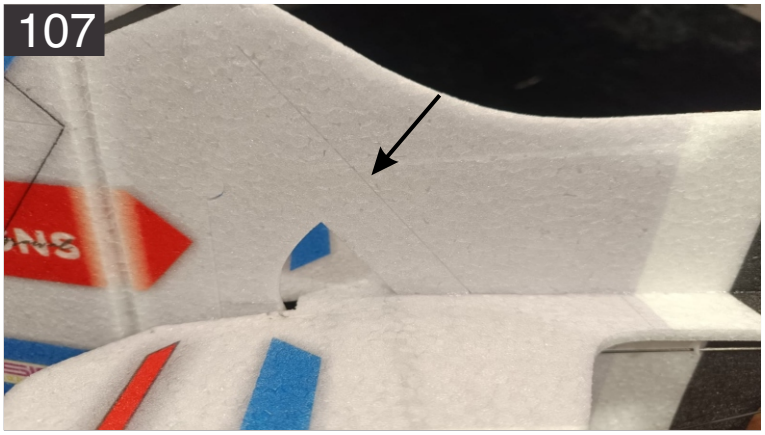


104. Shown above is the reinforced rudder ready for glueing.

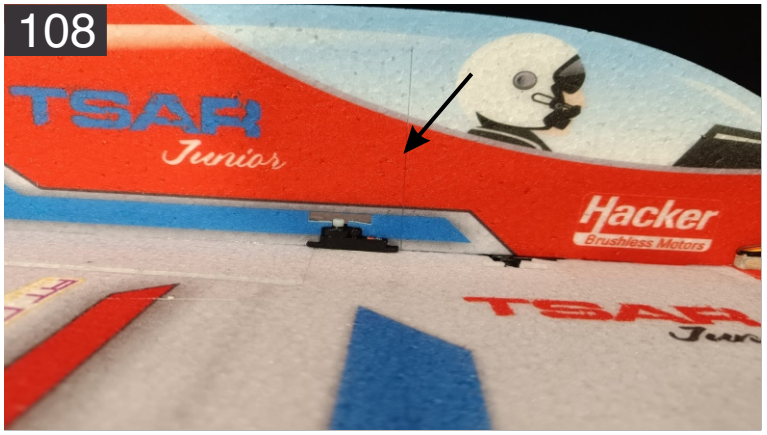
105. Glue the rudder using the HV CA shown in the above image.



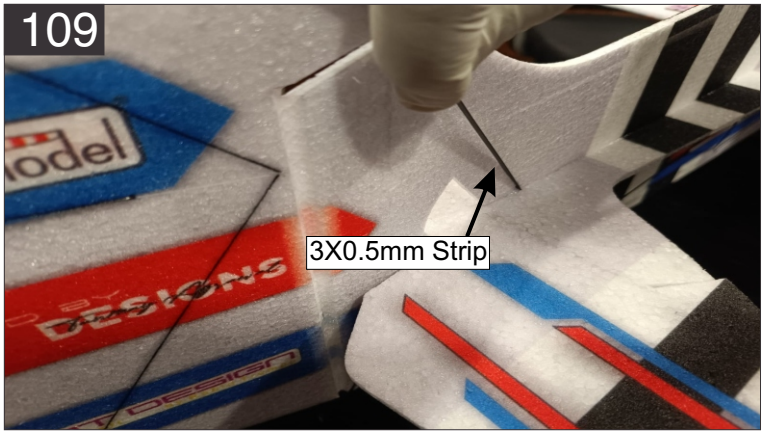
106. Now with the rudder installed glue the rear part to the flat carbon rod that we glued earlier.



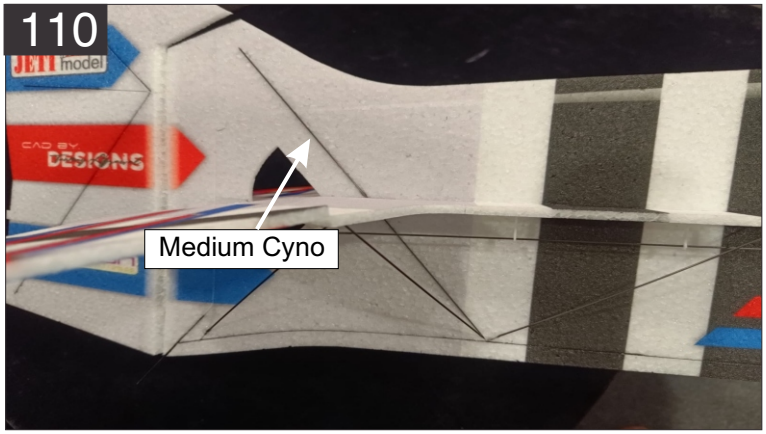
107. Reinforcement of vertical fuselage will be done using the 3X0.5mm flat strips, locate this pre-cut slot located in the vertical fuselage section.



108. Locate this another pre-cut slot located in the vertical fuselage section.



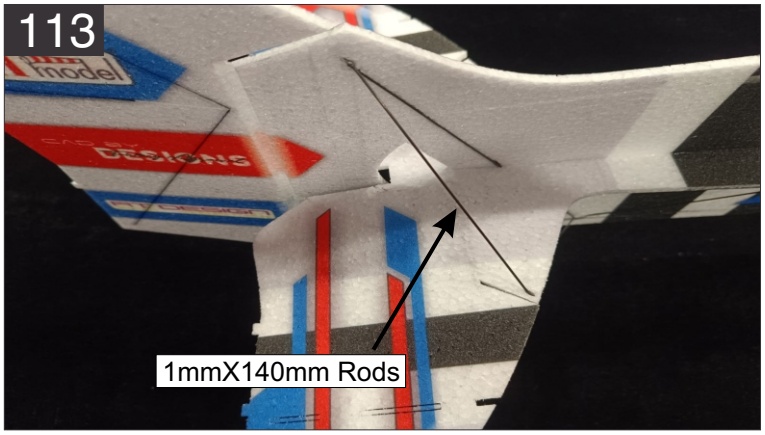
109. Measure and cut length of the strip and slide it into the slot as shown. Note it may be necessary to clean a little glue out of the slot where the fuselage pieces meet up.



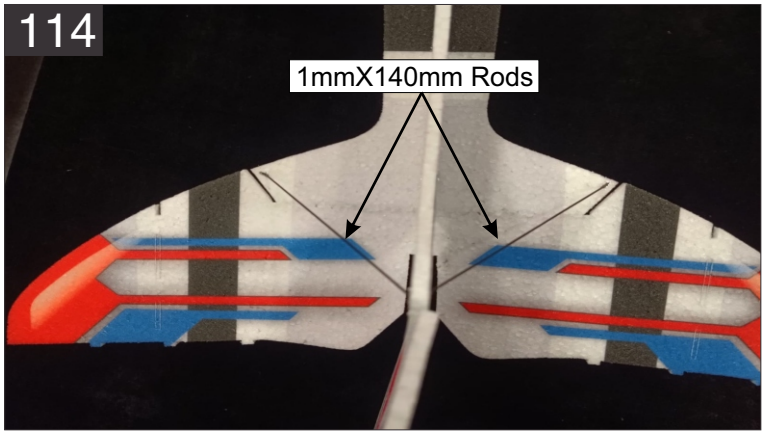
110. Use a medium cyno and activator to glue it.

111. Install the another strip as shown above as was just done with the rear piece.

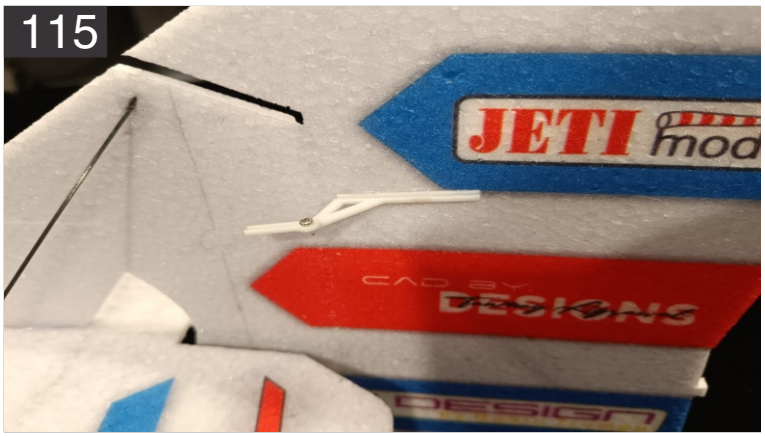
112. Here is another view.



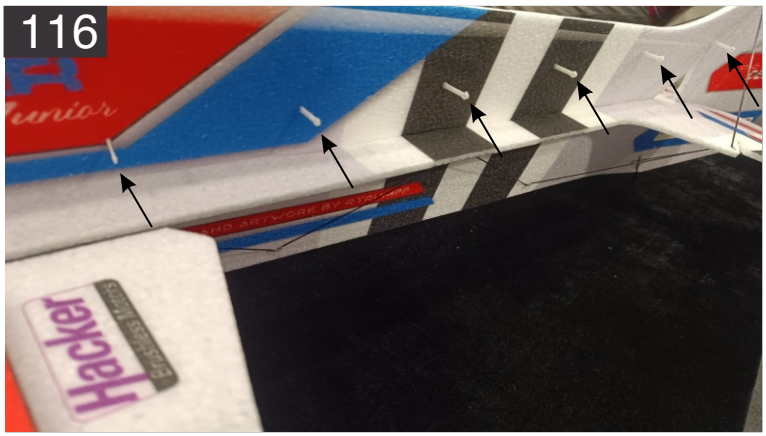
113. Cut down 2 X 140mm rods from the 1mm rod, the 2 carbon rod will go on each side of the fuselage. It will be used to strengthen the horizontal stab and vertical stab.



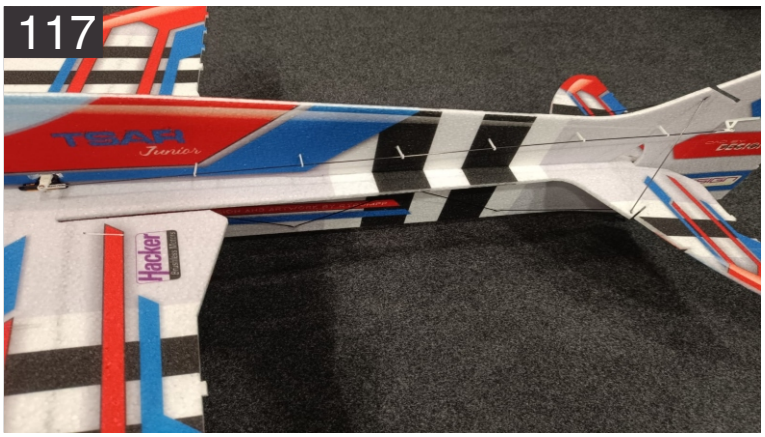
114. Here is an another view.



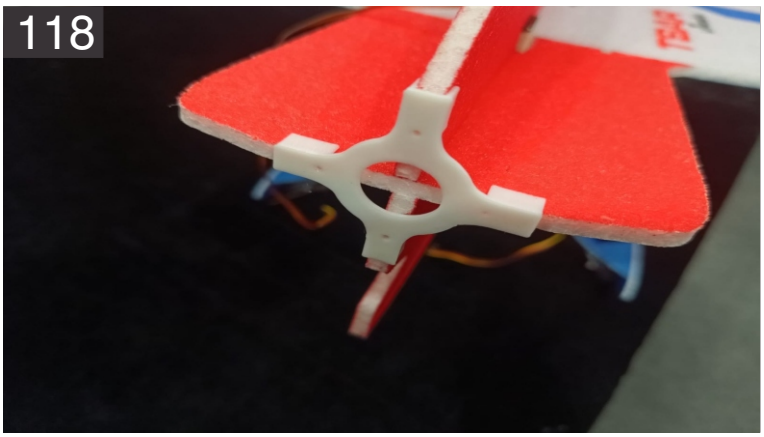
115. Glue the rudder horn shown in the image in the precut control horn slot using HV CA. Make sure it sits right to the bottom of EPP surface.



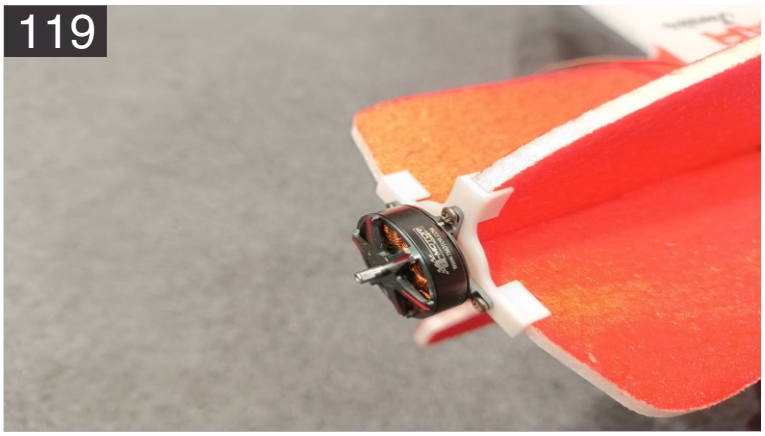
116. Before moving to rudder linkage setup, glue 6 pcs pushrod guides into the pre cut slots, like shown above.



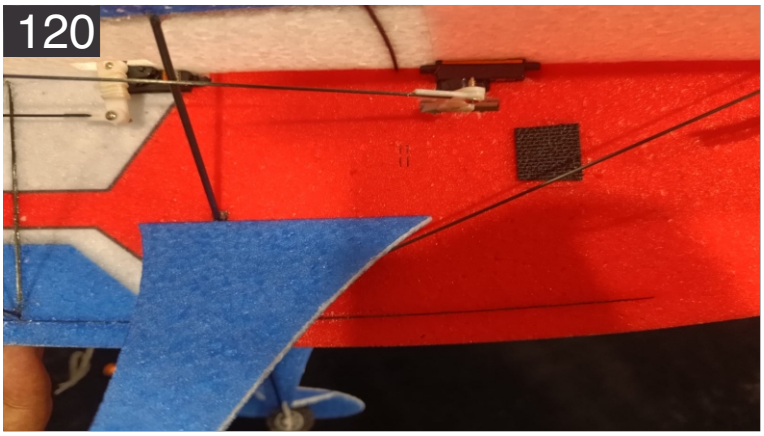
117. Above is the finished linkage setup with rudder centered and rod well fitted and glued in both the quick links with all the guides in place. Use the same process like we did in previous linkage setups



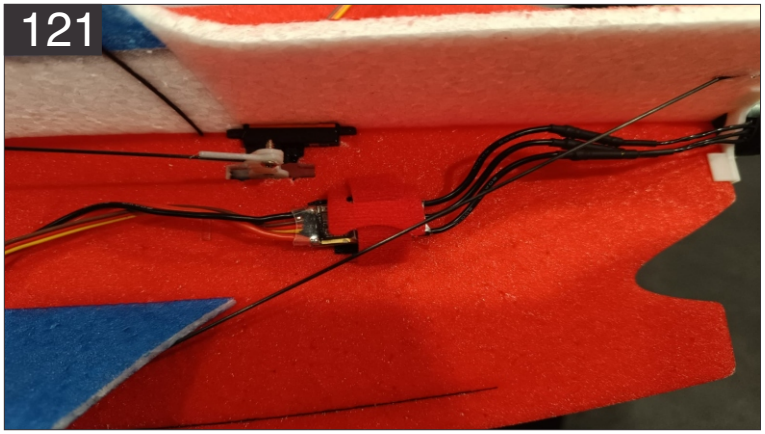
118. Shown above is the motor mount glued, making sure everything is flush and lined up correctly. After that Install the motor on it.



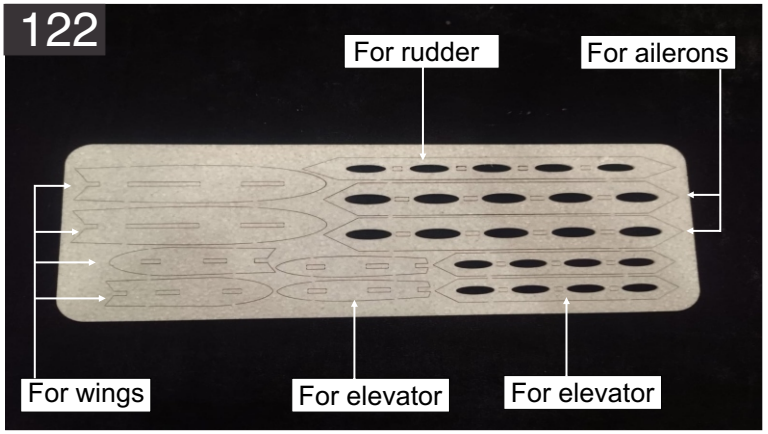
119. Enlarge the pre cut holes over the mount according to need and install the motor on it.



120. Notice above the self adhesive velcro glued onto the side of the fuselage. This can be used to mount the electronic speed controller.

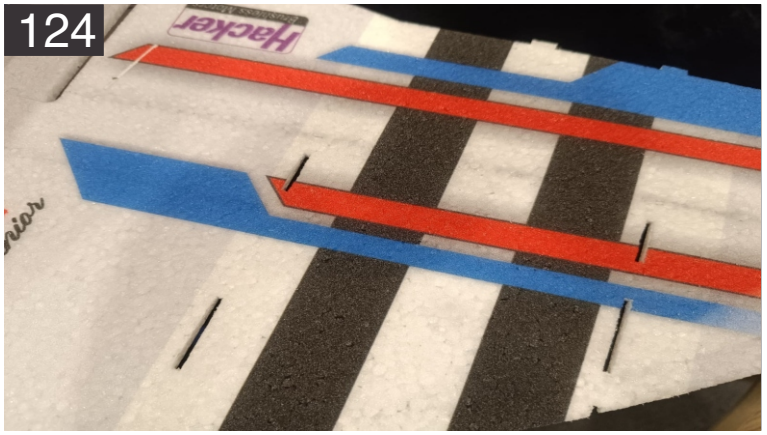


121. Notice how the esc is fixed using the self adhesive velcro, you can use the hook & loop velcro as well to secure it.



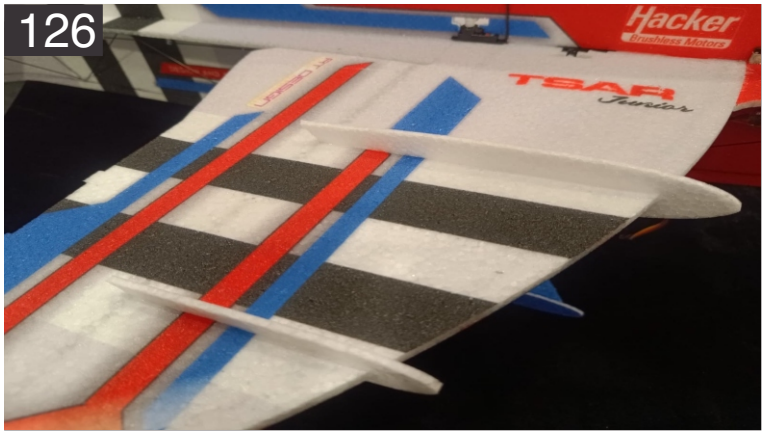
122. Locate the EPP sheet accommodating all the side force generators and speed brakes.

123. Take out the parts from the sheet and clean out the slots, like shown above.

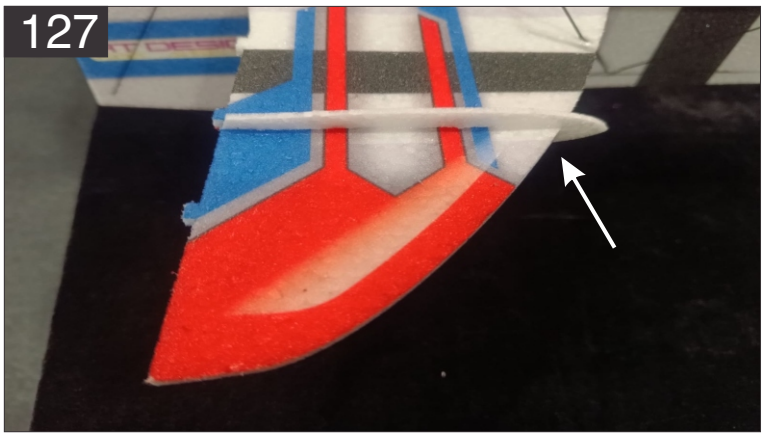


124. Clean out the slots from the wings and other surface as well as shown above.

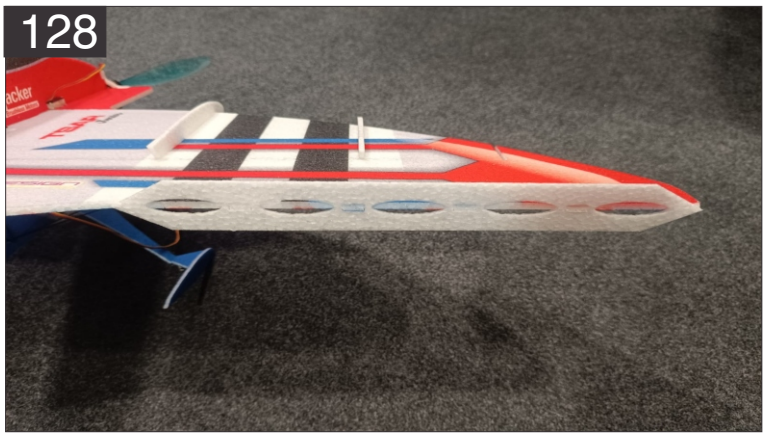
125. Make a clean cut from the center of the slots for gluing as shown above.



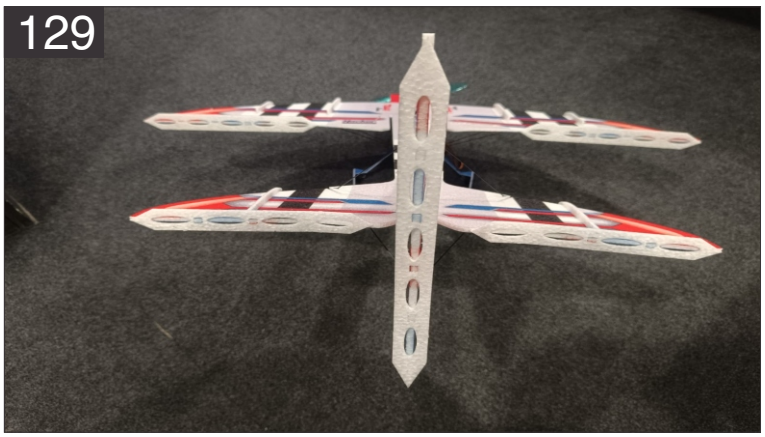
126. Test fit it into the slots on the wings. Sometimes a little trimming is needed. Once happy with the fit use either medium CA or HV CA to attach the piece.



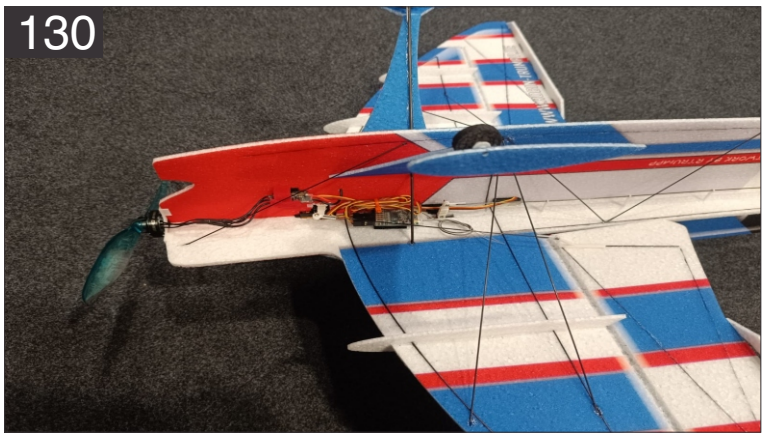
127. Test fit it into the slots on the elevators. Sometimes a little trimming is needed. Once happy with the fit use either thin CA or HV CA to attach the piece.



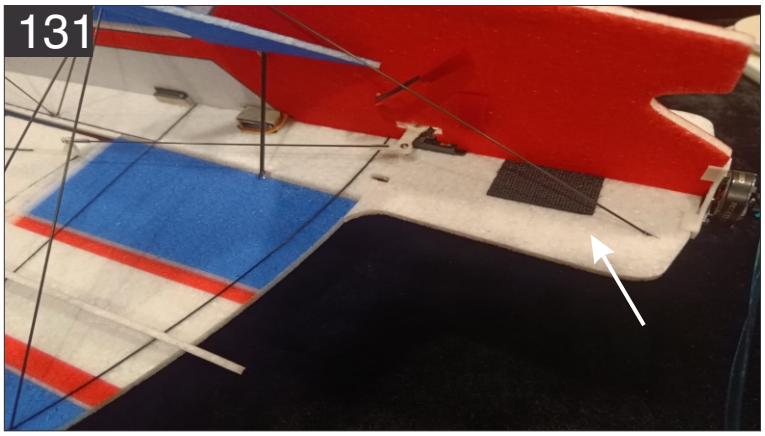
128. If desired, Glue the optional speed brakes to the dedicated tabs on the ailerons, take reference from picture no. 122 to check which part goes where.



129. Repeat the same process for the elevator and rudder as well.

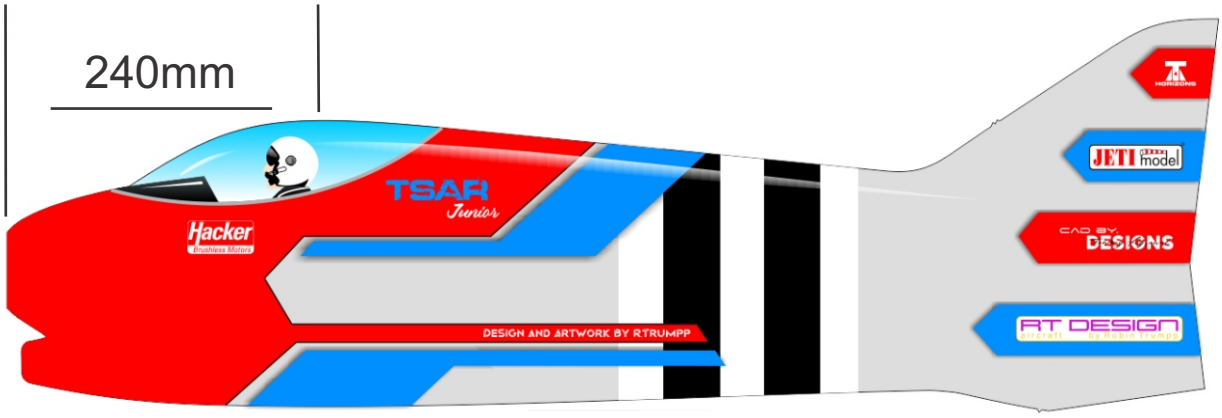


130. Here is the complete picture of receiver setup. Set up your radio as per the suggestions given a little later in this manual, check all the control directions and motor rotation.



131. The long piece of velcro is mounted, above is the location of the battery for this setup.

CENTER OF GRAVITY



Initial CG is located 240mm from the nose of the aircraft (Not from the motor)

CONTROL THROWS

Control Throws

Ailerons - approx +/- 45 deg
Rudder - approx +/- 45 deg
Elevator - approx +/- 45 deg

Expo to suit

In order to achieve the control throws as described, it is imperative that the control surface, linkages, rod ends, etc, all move freely over the entire range, including range end points.
Failure to do so will result in damage to either the servos or mechanical components

Thank You..

Thank you for your purchase at TA Horizons. We sincerely hope that our products can provide the same thrill to you that we experience in this hobby.

Please feel free to contact us regarding any type of question about this kit.

-Team TA Horizons