



TA HORIZONS RAF-1 ASSEMBLY INSTRUCTION MANUAL

Technical Data-

Wingspan : 26"

Length : 36"

AUW : 180-200g
(Depends upon the setup used)

Setup Recommendations (Not Included)-

Motor : 18-22G 1800-2300KV Outrunner

(T-Motor AM40 1850KV Recommended for Super Light Setup)

ESC : 12-16 amp

Servos : 3Pcs 9gms each

Propeller : 5" 3 Blade electric

Battery : 450-600Mah 3S Lipo

EPP CONSTRUCTION





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 at the 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.

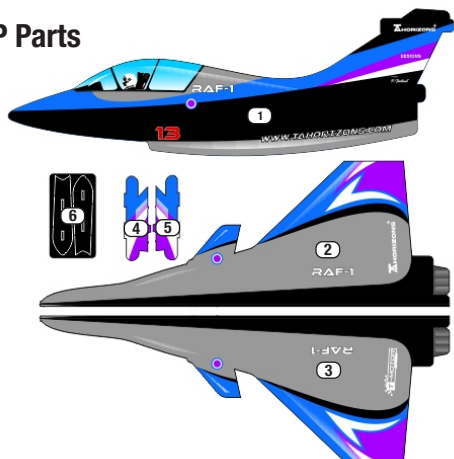
These instructions are suggestions only on how to assemble this model. There are other ways & methods also to do so. TA Horizons has no control over the final assembly because it specifically depends upon the knowledge and experience of the person involved directly in its handling, or the manner in which 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.

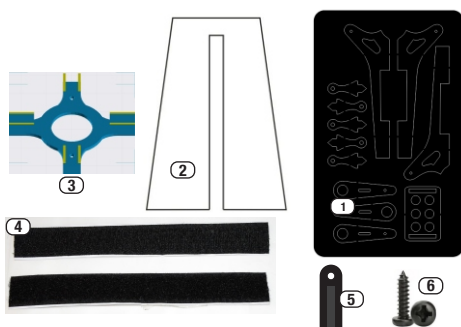
1. EPP Parts



EPP Parts

- ① Fuselage
- ② Right Wing
- ③ Left Wing
- ④ Left Wing Extender
- ⑤ Right Wing Extender
- ⑥ Side Force Generators

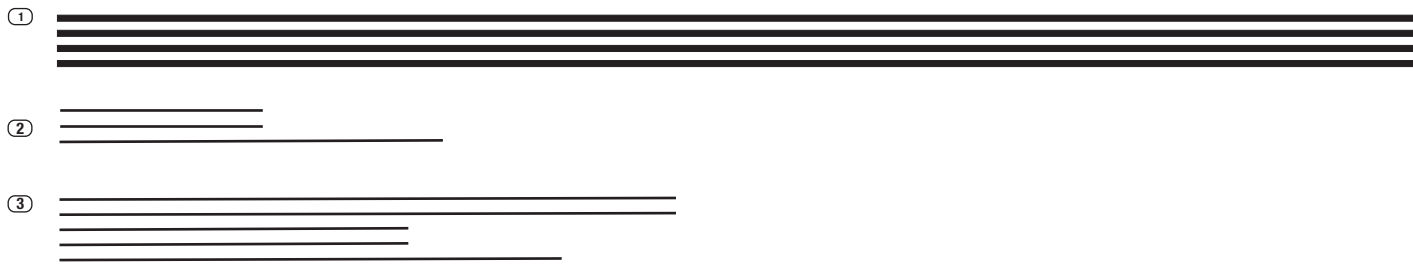
2. Hardware / Small Parts



Hardware Parts

- ① Polycarbonate parts
- ② Fuselage assembly jig
- ③ Motor Mount
- ④ 150mm velcro
- ⑤ Quick links X 8
- ⑥ Selftaping screw X 8

3. Carbon Rods / Strips



Carbon Rods / Strips

- ① 3 X 0.5mm Carbon Stripes
L 1000mm X 4
- ② 1.5mm CF Control rods
Elevons 120mm L X 2
Rudder 210mm L X 1
- ③ 1mm Reinforcement Rods
Wing Truss: 290mm L X 2
180mm L X 2
Vertical Stab Truss: 250mm L X 2

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.

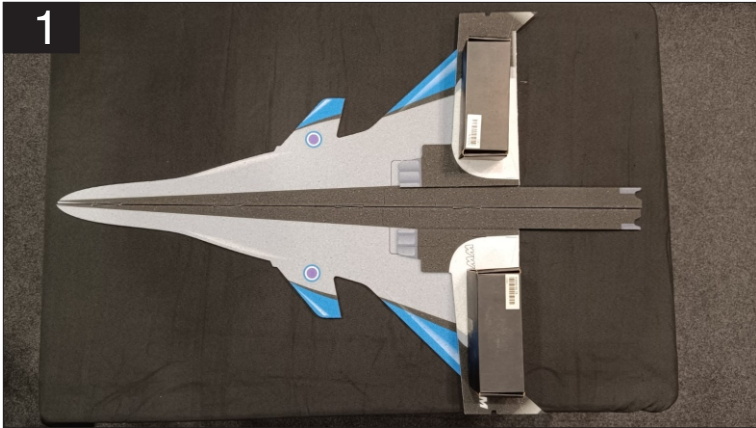
TOOLS AND BUILDING MATERIAL REQUIRED

- 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
 - Allenkey
-

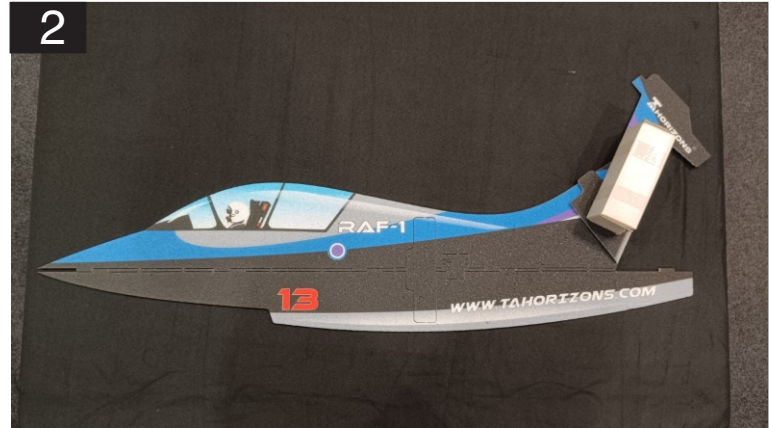


The Build

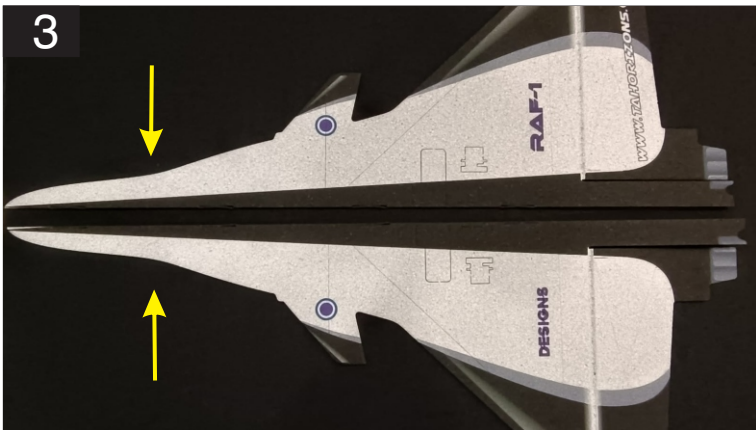
Please Note: Few pictures shown below are of different plane and for reference purpose only.



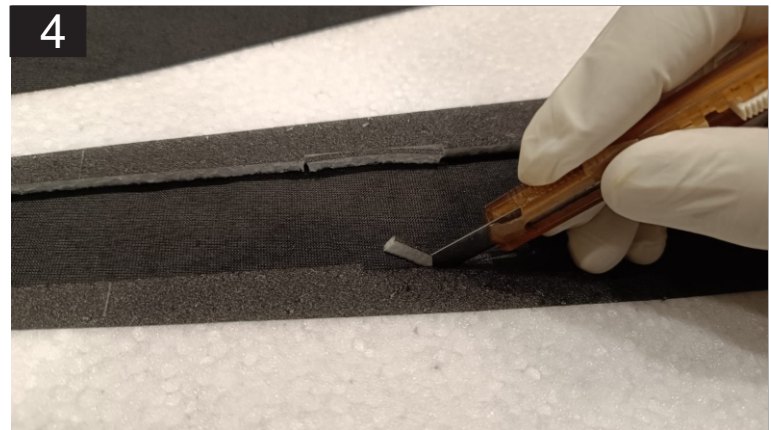
1. **(This is mandatory step)** locate the hinged items as shown above, Bend them back on to each other as shown and let set for at least 2 hours. This will help to loosen up the movement of the surface.



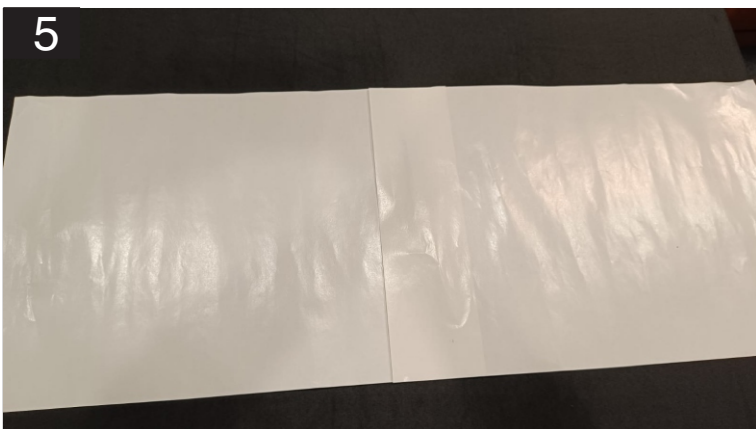
2. Repeat the step for rudder as well, let set for at least 2 hours.



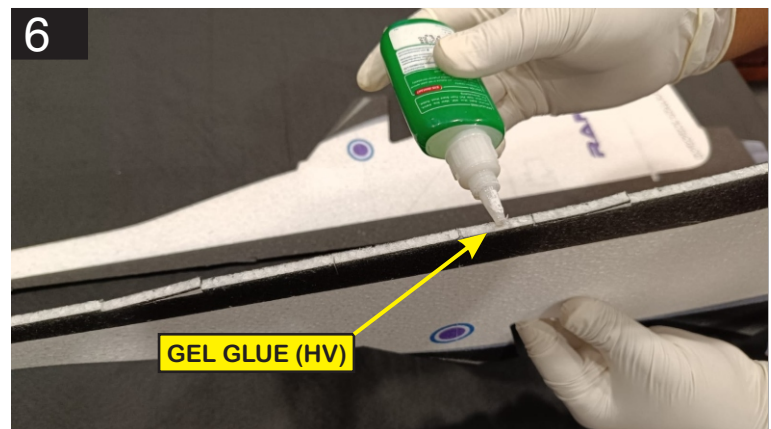
3. Locate the two halves of the wings as shown in the picture above.



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



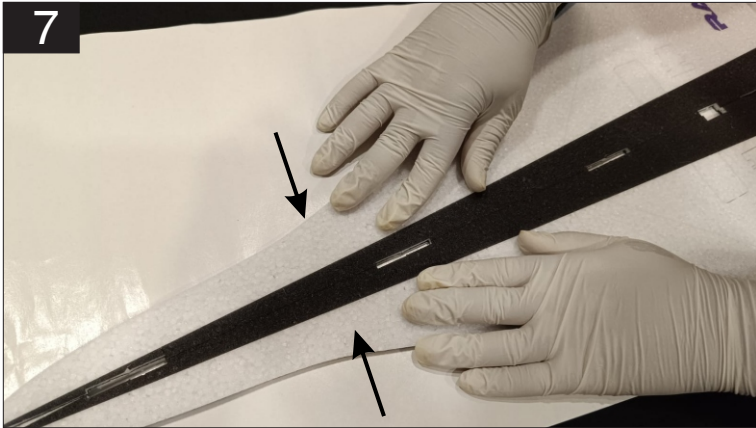
5. Building surface should be at least 2ft X 4ft and flat, use a wax paper over the surface to avoid sticking EPP on it when gluing.



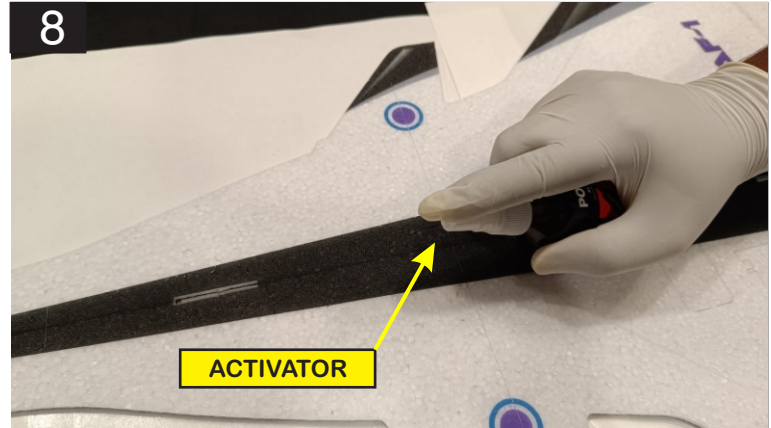
6. Apply a bead of HV CA to the contacting edge of the wing piece as shown above.

The Build

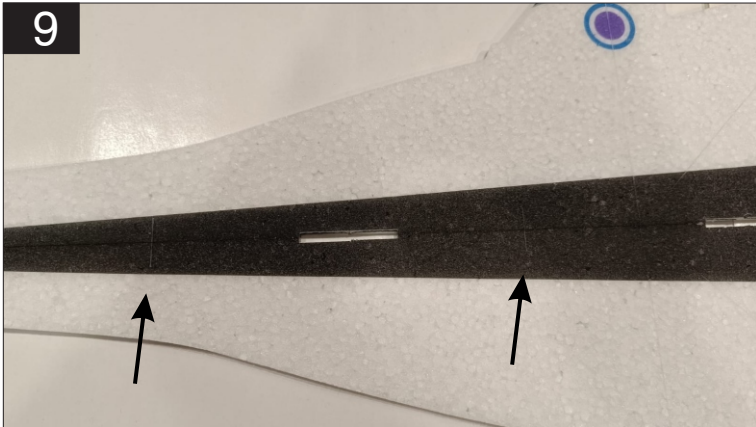
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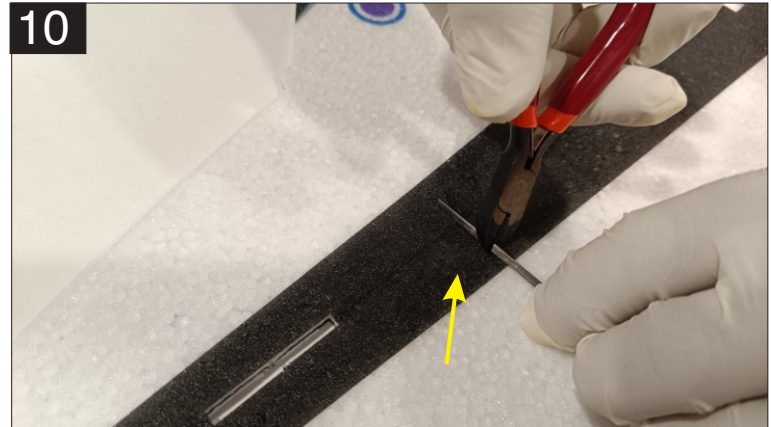
7. Lay down the shown parts on the flat surface with wax paper on it and glue it together. Note that we are working from the bottom side.



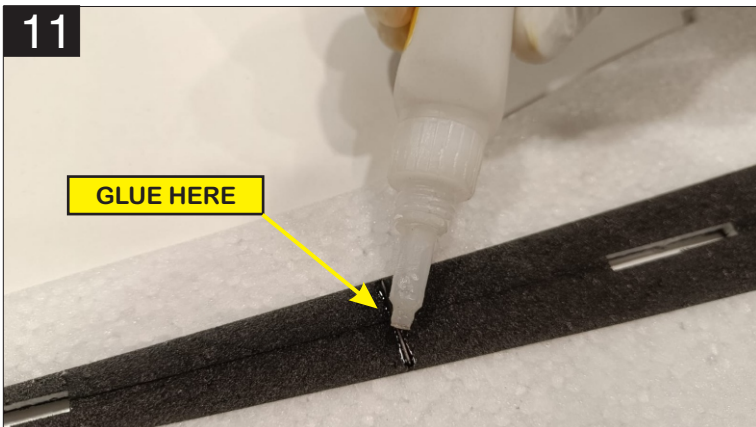
8. Use the spray activator to cure it and fast forward the process.



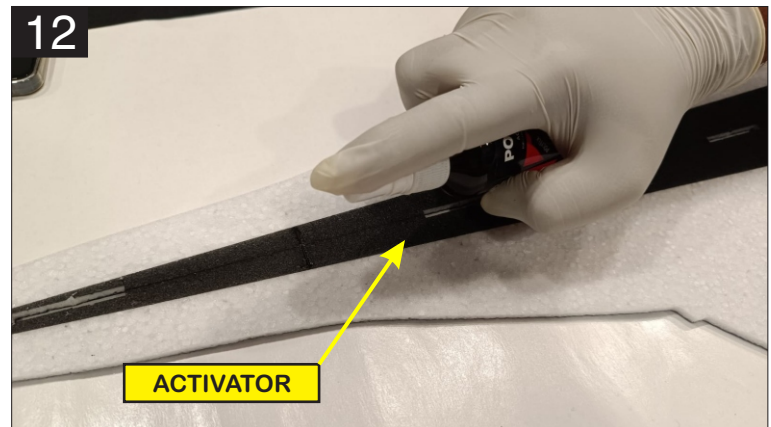
9. Locate the pre-cut slots as shown above. These slots will be used to strengthen the bond between the two halves of the wings by inserting and gluing a 3 X 0.5mm strip inside each slot.



10. Use scissors or a wire cutter to cut the 3 X 0.5mm strip to the same length as the slot.



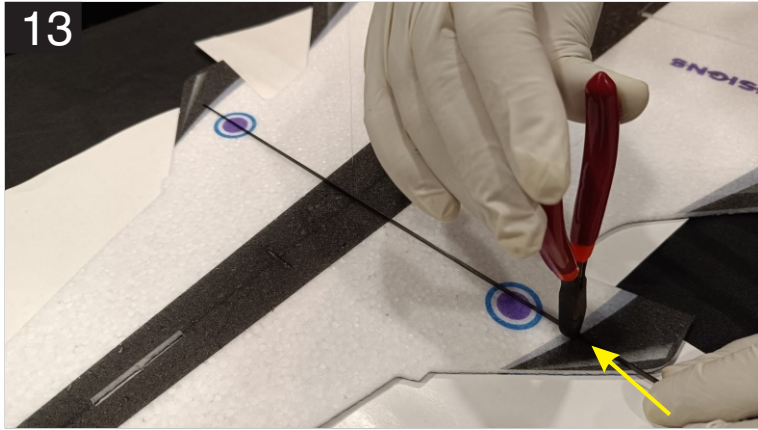
11. Use the Medium or HV Cyno to glue the stripe.



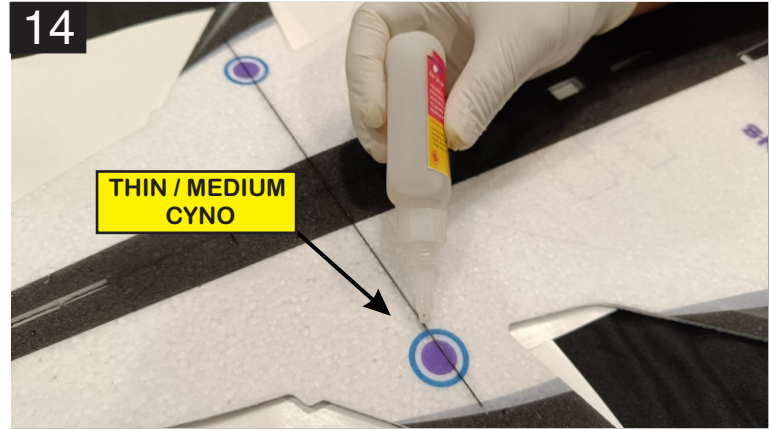
12. Use spray activator to cure it.

The Build

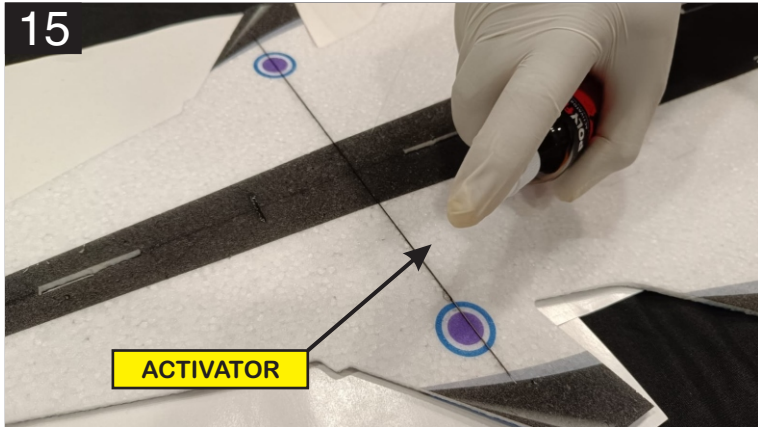
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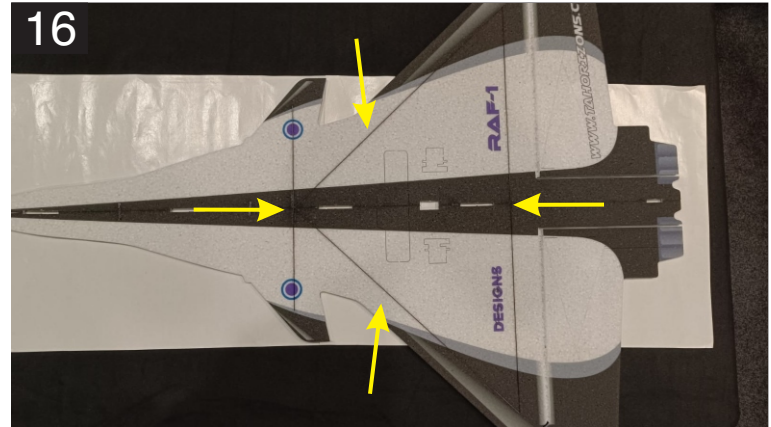
13. Repeat the same process for glueing rest of the carbon stripes, Please note that all stripes that goes and flush into the foam are 3X0.5mm stripes, Insert the stripe vertically into the precut slot, make sure it is completely inserted into the slot, use a scissor or wire cutter to cut down the excess stripe.



14. Use the Medium or HV Cyno to glue the stripe.



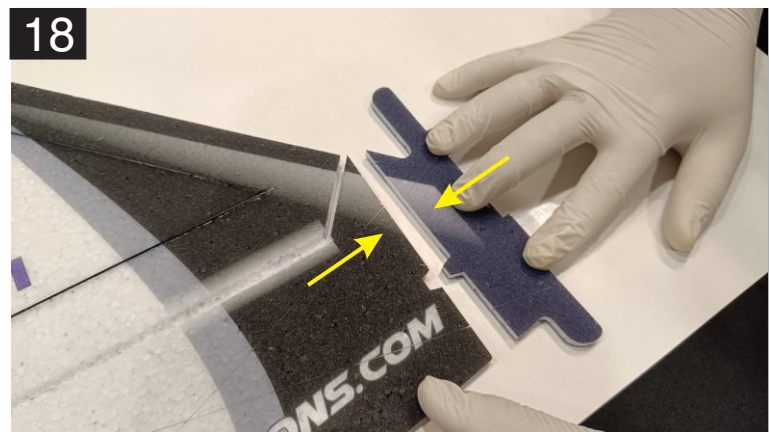
15. Use spray activator to cure it.



16. Repeat the same process for other stripe as well as shown in the picture above.



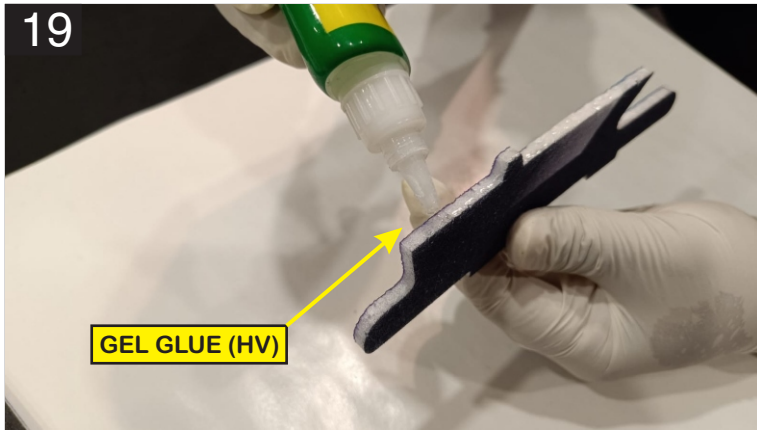
17. Here is another view.



18. Locate these wing extenders that will go on each side of the wings (Elevons).

The Build

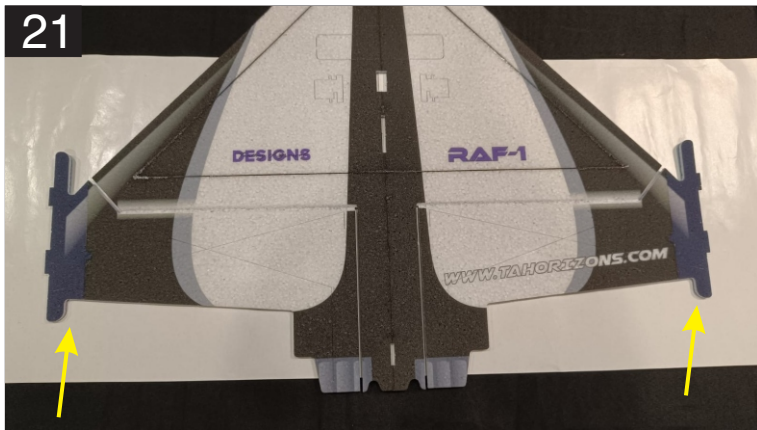
Please Note: Few pictures shown below are of different plane and for reference purpose only.



19. Apply a bead of HV CA to the contacting edge.



20. Use a spray activator (Kicker) on the other surface.



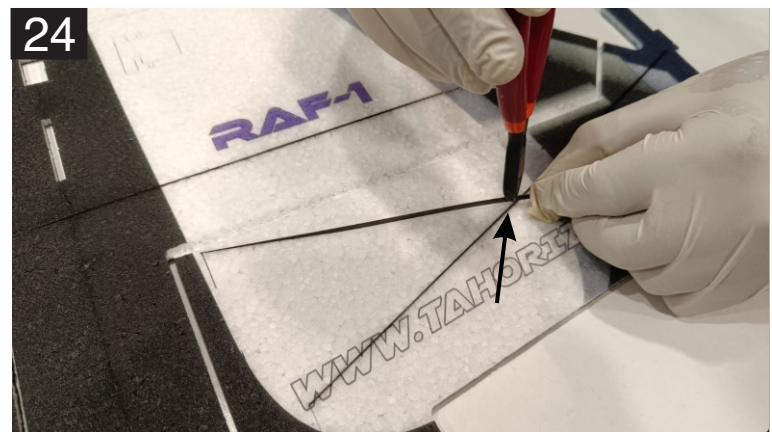
21. Glue both parts together, hold it for a few seconds, repeat the step for other side as well.



22. Use the same 3 X 0.5mm stripe to reinforce the elevons as well. Glue one of the two carbon stripes that goes in cross shape in the elevons as shown above.



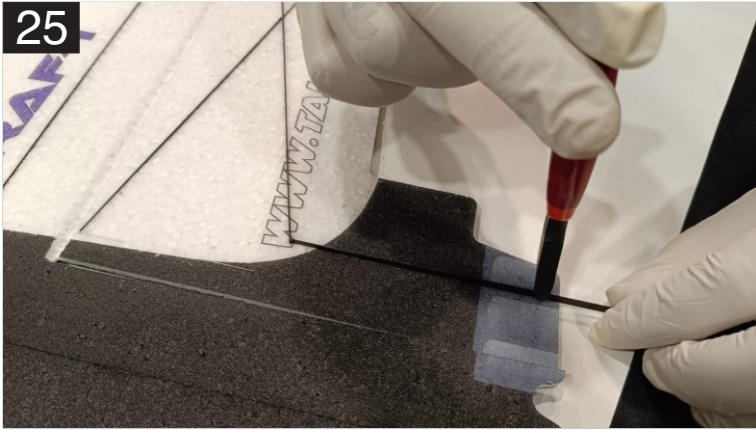
23. Use a scissor or wire cutter to cut down the excess stripe.



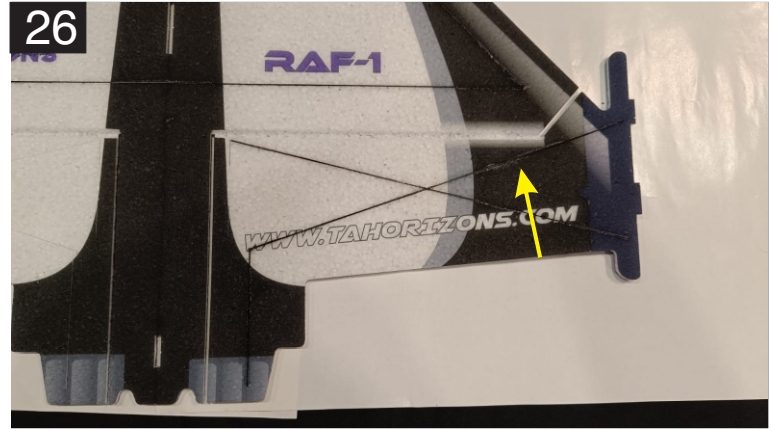
24. Glue the other stripe as shown above, once it reached at the intersection of the other glued stripe, use a scissor or wire cutter to cut it.

The Build

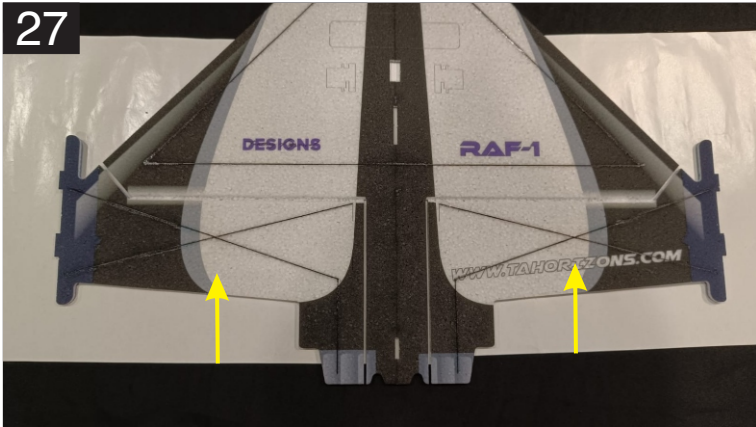
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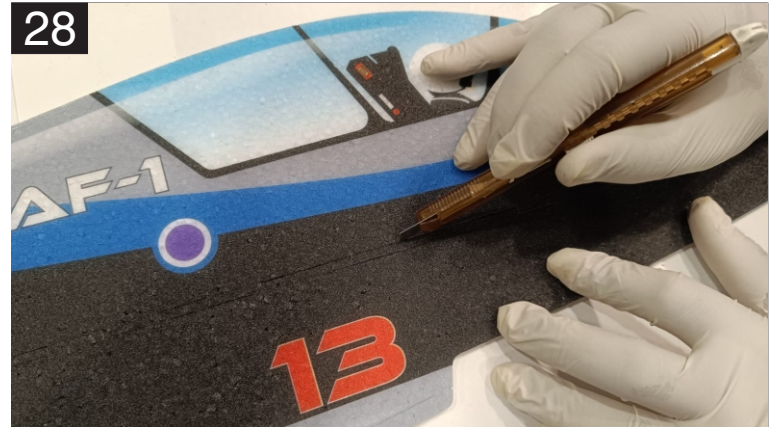
25. Measure and cut the size of the stripe as shown above, this will be used for strengthening the extended elevons.



26. Measure and cut the size of other half of the stripe, and glue it like shown above.



27. Repeat it for the other elevon as well.



28. Up next is the vertical fuselage section, use the knife to separate both the parts.



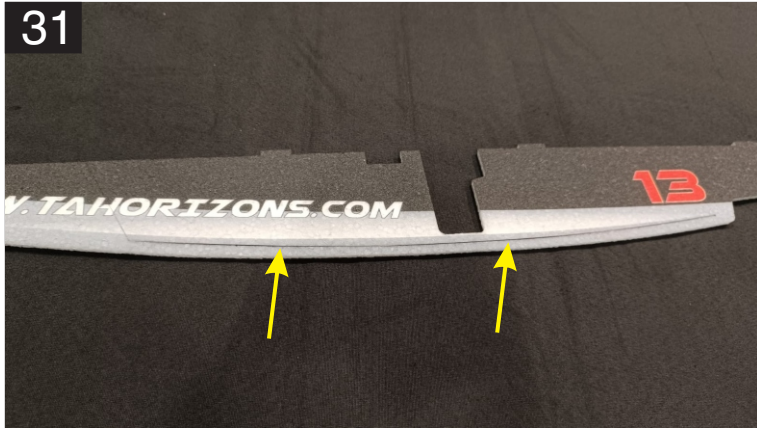
29. Belly of vertical fuselage also uses the 3 X 0.5mm stripe for reinforcement, Lay into it's designated slot, cut length as advised in the next step.



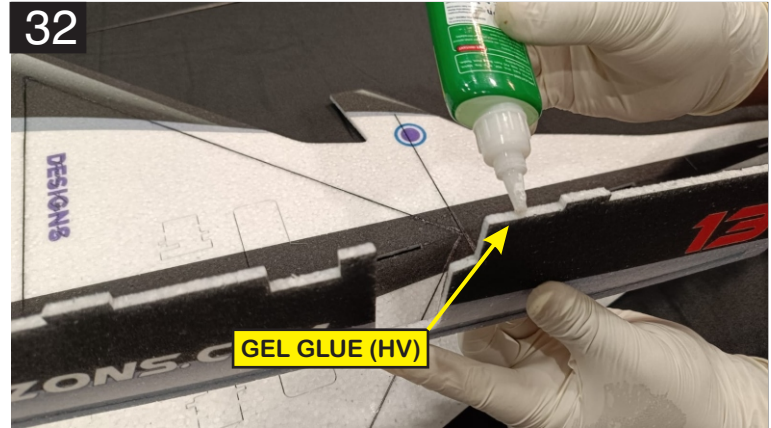
30. Once it reached at the end of Pre-cut slot, use a scissor or wire cutter to cut down the excess stripe.

The Build

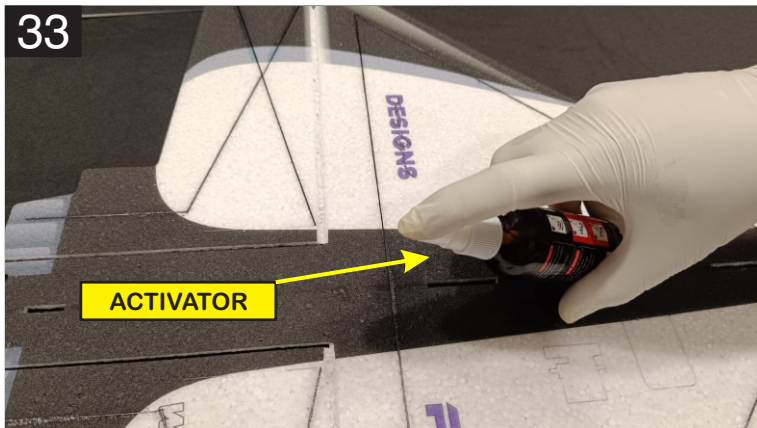
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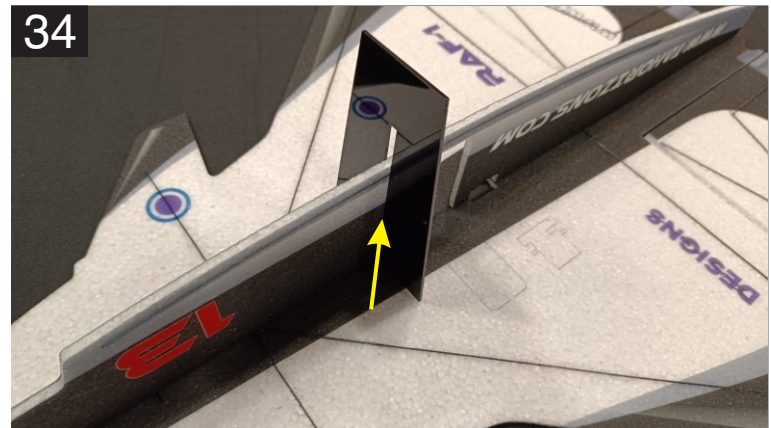
31. Use thin or medium cyano to glue this stripe. use spray activator to cure it.



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



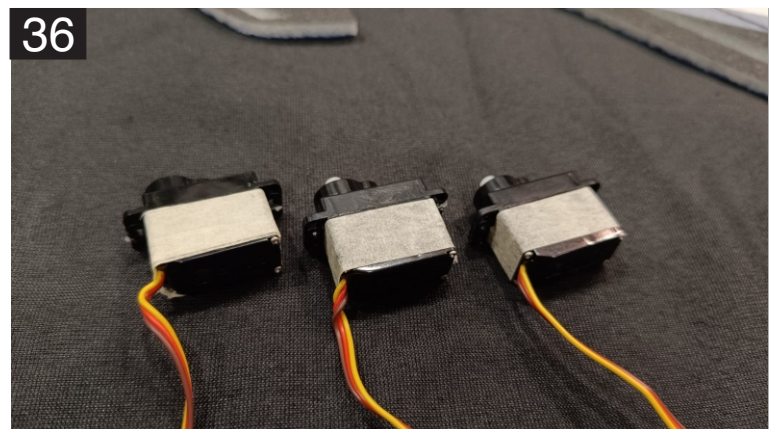
33. Use spray activator on the other mating surface.



34. 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 for this task.



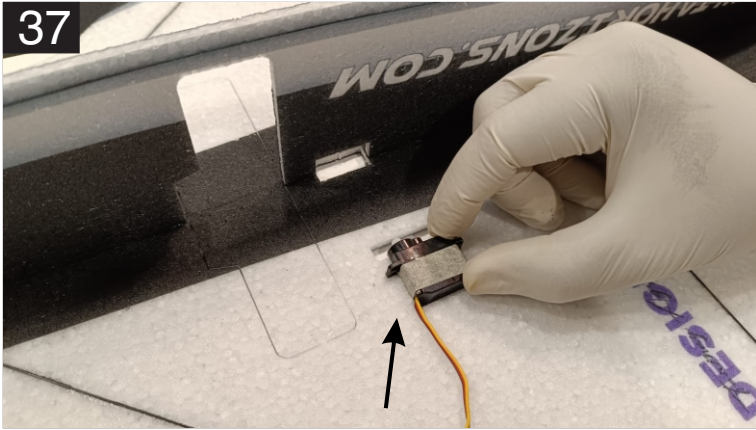
35. Take out the excess foam from the wing servo slots using the sharp knife.



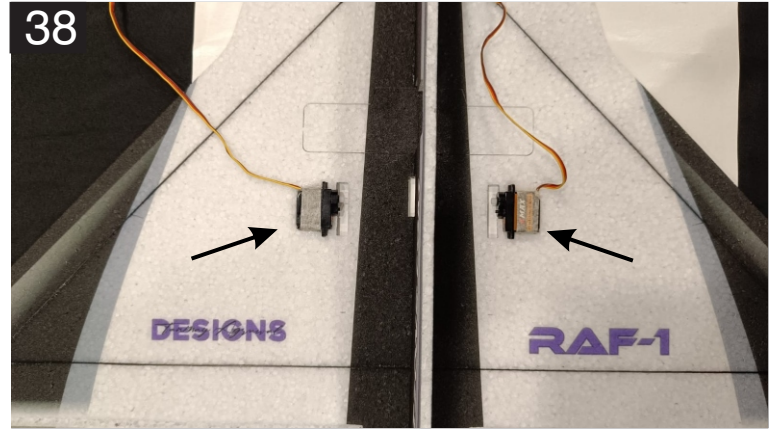
36. It's a good idea to wrap the servos with the paper tape to keep the servos safe from the glue used for sticking them in the later steps.

The Build

Please Note: Few pictures shown below are of different plane and for reference purpose only.



37. Glue the elevon servos in place, make sure to glue the area with the paper tape on it.



38. Repeat the step for other side as well.



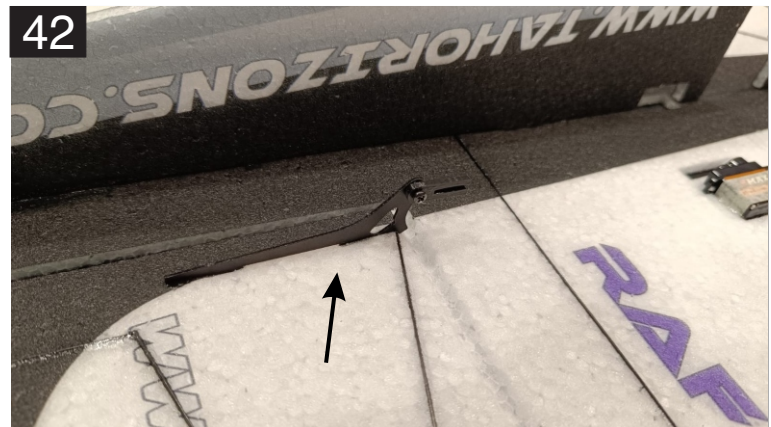
39. Install the extenders over the stock plastic servo arms using the small screw. Wrap with thread for more strength if desired.



40. Repeat the step for all 3 servo arms.



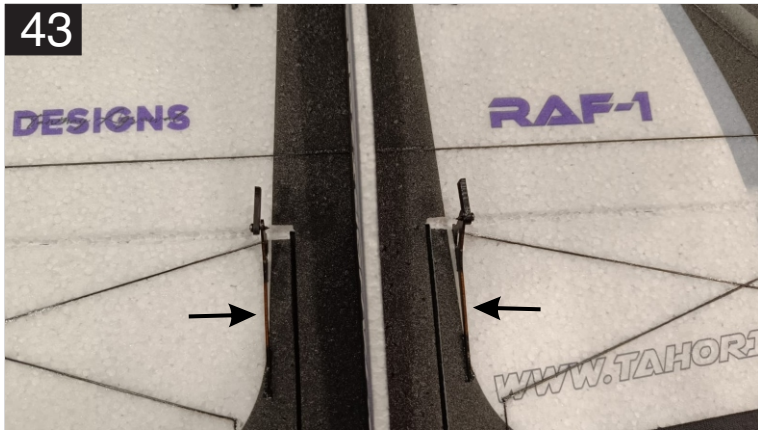
41. Screw all quick links to the pre laser hole in all arms and horns, do not tighten them too much, make sure they can rotate freely.



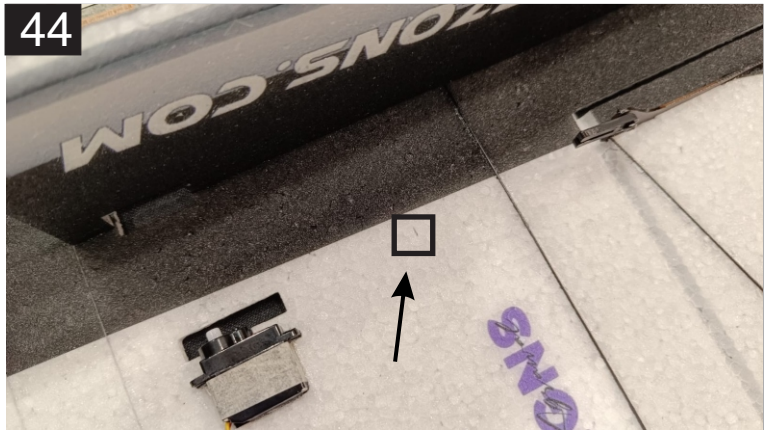
42. Glue the elevon horns shown in the image in the precut control horn slots using HV CA. Make sure it sits right to the bottom of EPP surface. Keep in mind that we are working on the bottom part of the wing.

The Build

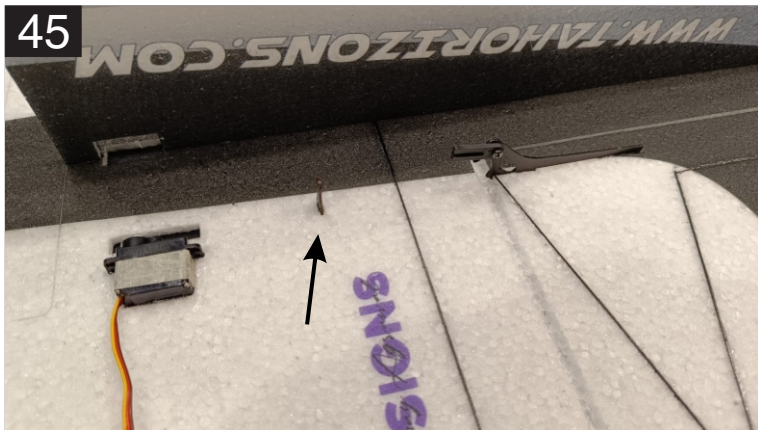
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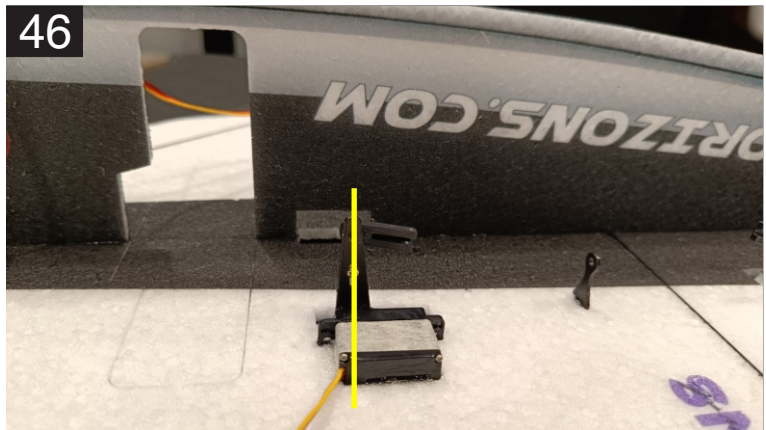
43. Repeat the step for other side as well.



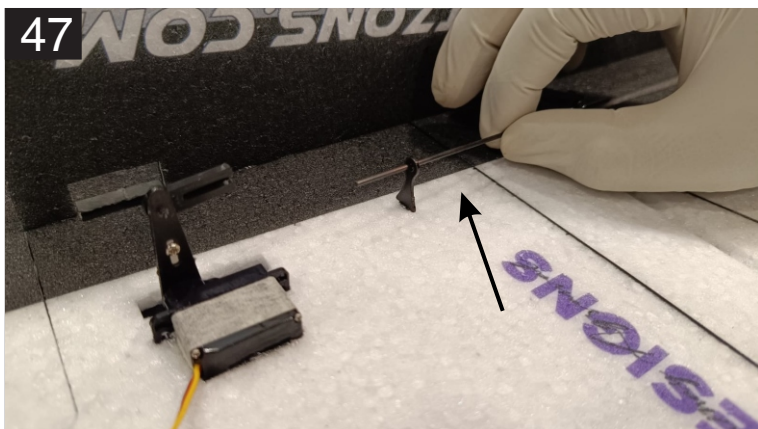
44. Locate the small slot as shown above; this will be used for gluing the pushrod guide.



45. Before proceeding to the elevons linkage setup, glue one piece of the pushrod guide into the pre-cut slot as shown above.



46. Install the servo arm in place, make sure you have the servo arm centered for the next steps.



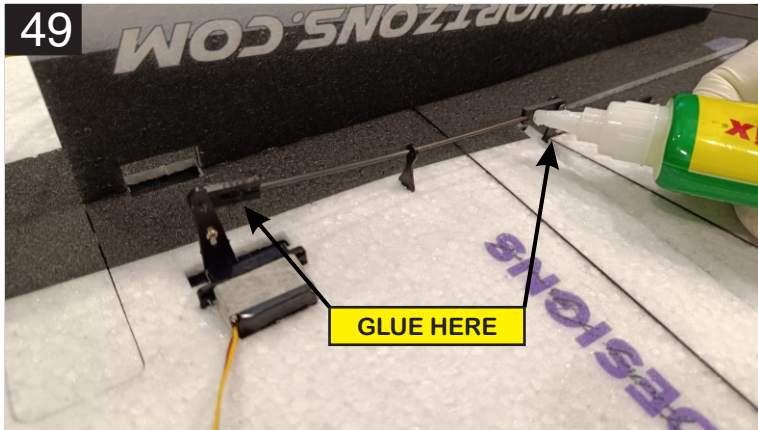
47. Notice how the elevon control rod (120mm) is slid in the pre glued pushrod guide.



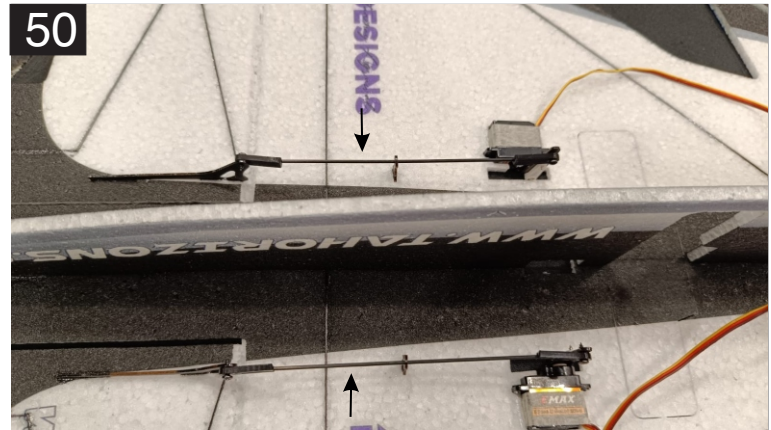
48. With the servo arm and control surface centered, dry fit the control rod as shown above.

The Build

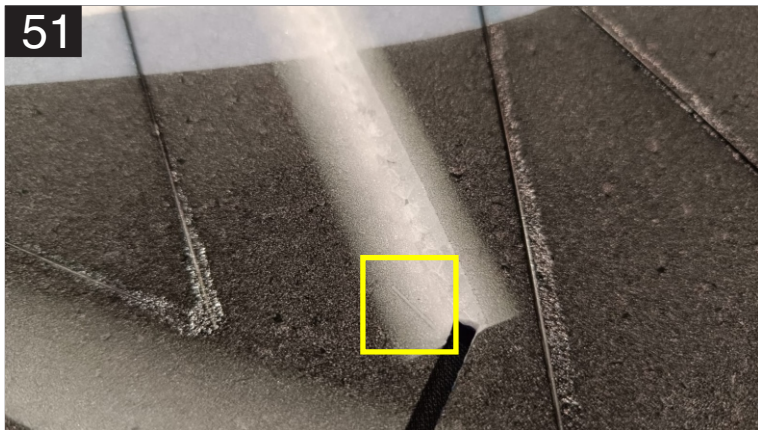
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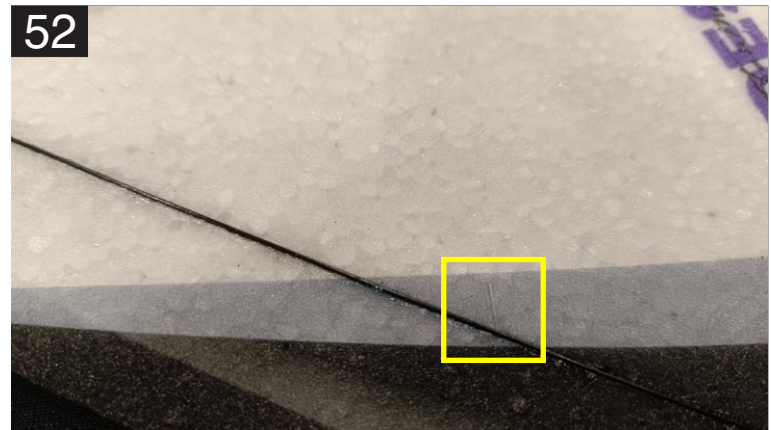
49. Once satisfied, glue both ends of the rod to the quick links using the HV CA as shown above.



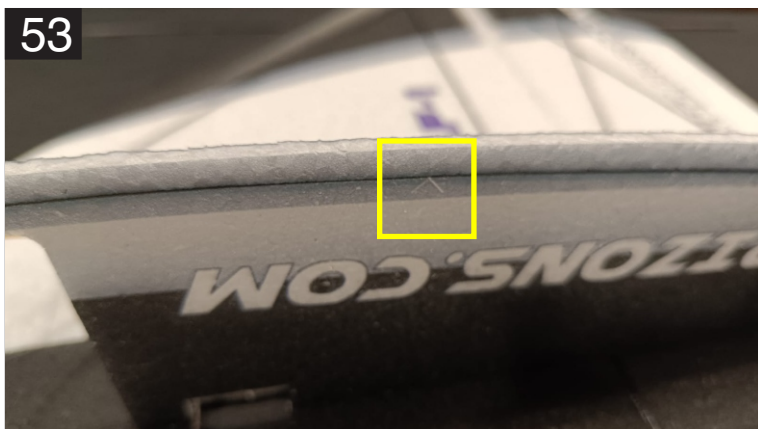
50. Repeat the same process for the other side as well.



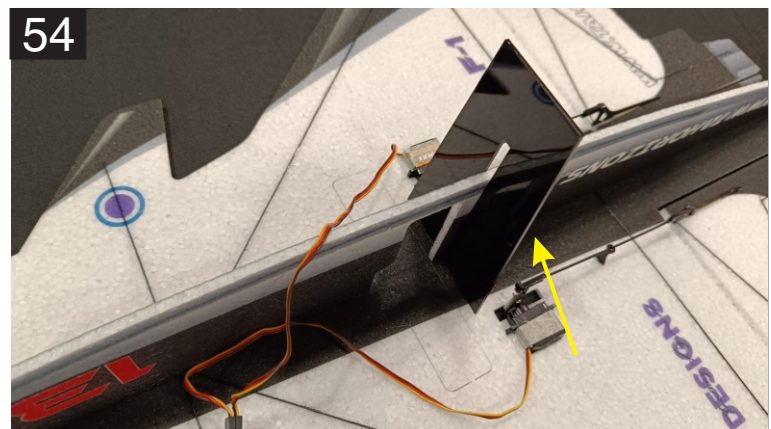
51. Up Next is the fuselage trussing. Locate the pre cut small slots on the wings and vertical fuselage section.



52. Locate the pre cut slots like shown above.



53. Locate the pre cut slots like shown above.



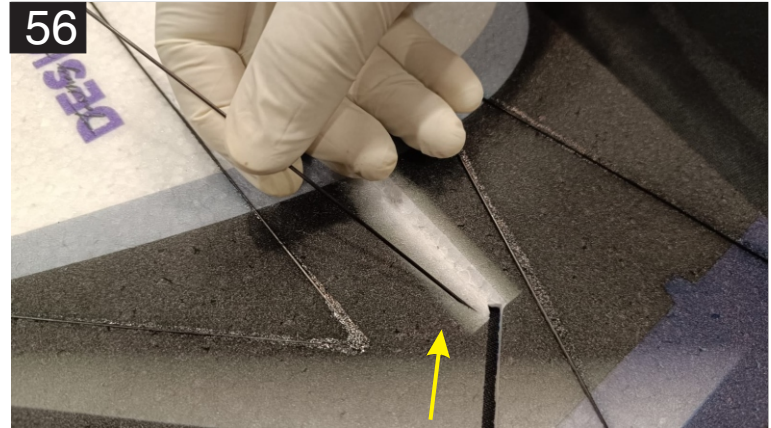
54. Before proceeding with the trussing use the assembly jig to keep the vertical fuselage section straight throughout the process.

The Build

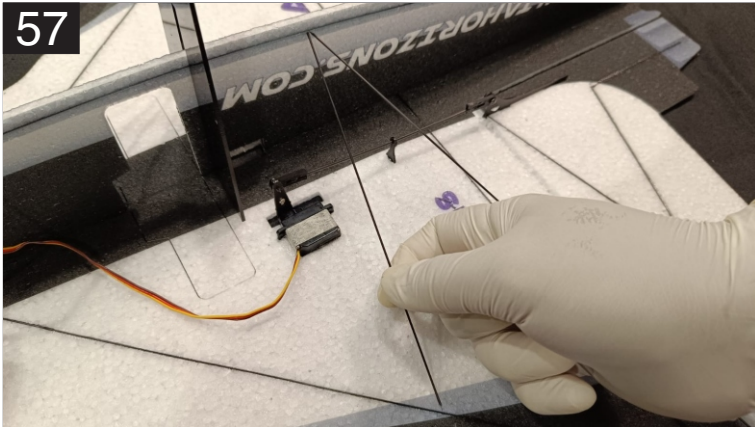
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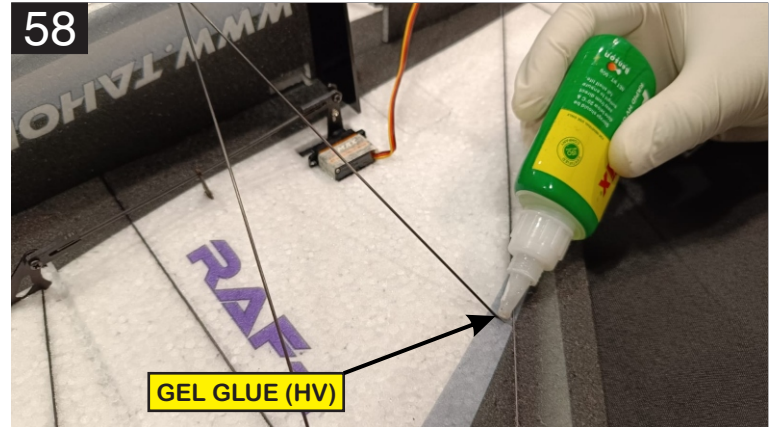
55. The two rods (each side) used for trussing are 290mm and 180mm in length. Begin by inserting the 290mm rod into the pre-cut slot that runs from the center of the vertical fuselage to the back of the wings near the hinge line, as shown in the next step.



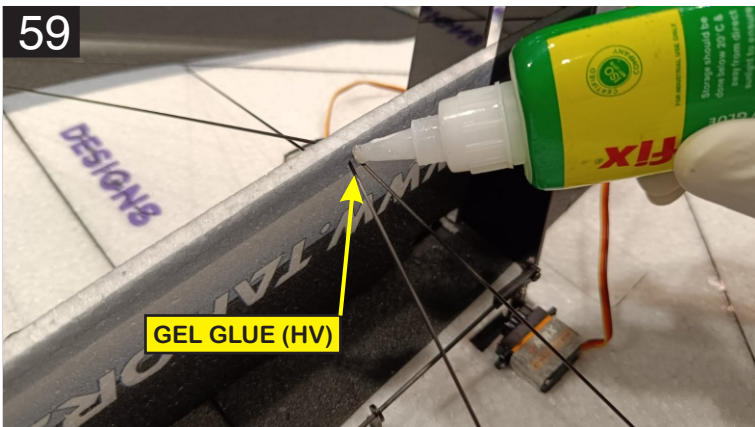
56. Make sure the rod is completely flushed into the slot as shown above.



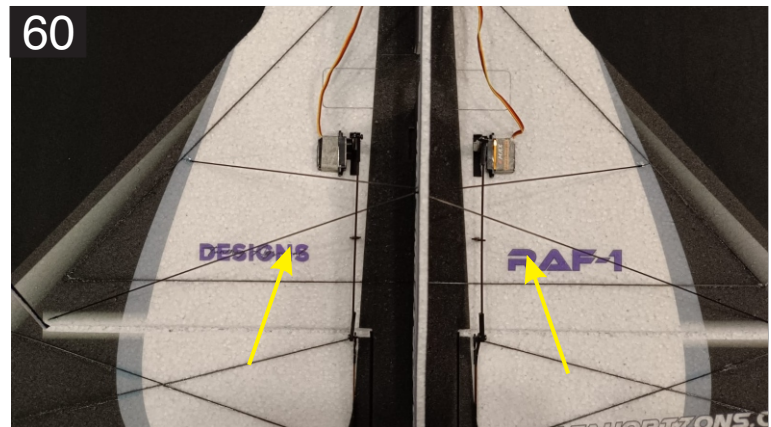
57. Install the other 180mm rod into the pre-cut slot that runs from the center of the vertical fuselage to the center of the wings, as shown above.



58. Once satisfied glue the rods in place, make sure of the squareness throughout the process.



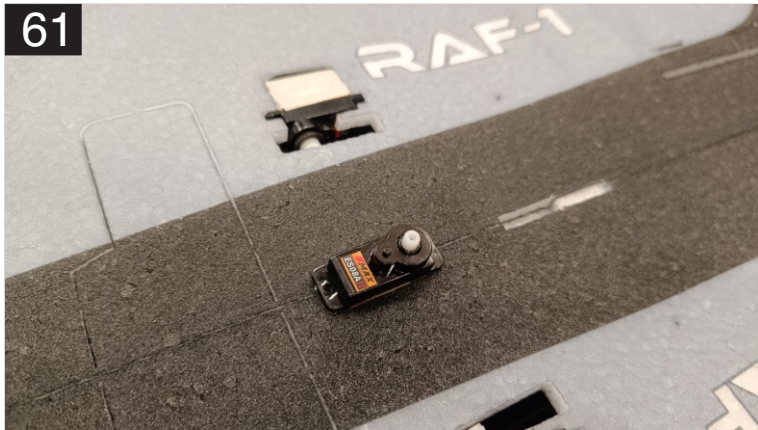
59. Once satisfied glue the rods in place, make sure of the squareness throughout the process.



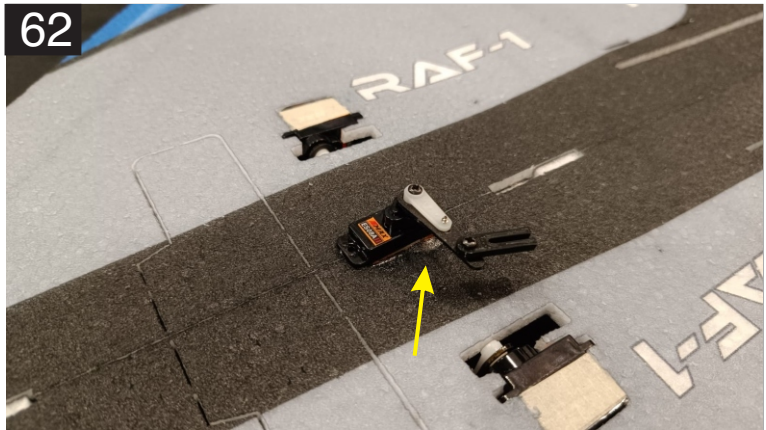
60. Repeat the step for other side as well.

The Build

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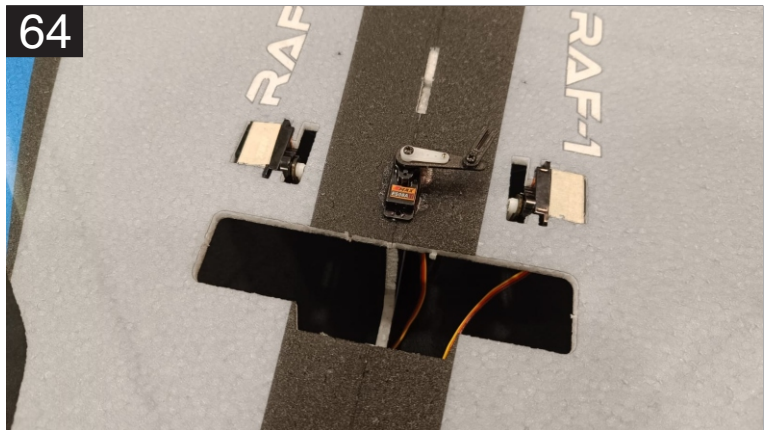
61. Before moving to the upper half of the fuselage, make sure you have glued the rudder servo in the designated slot.



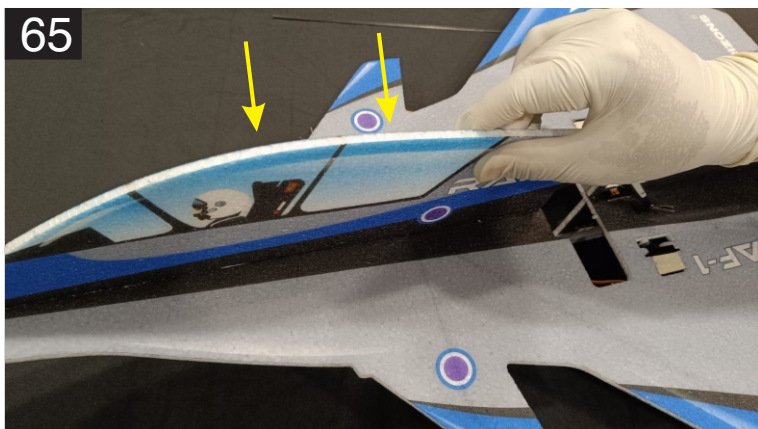
62. Install the servo arm with the servo arm centered.



63. Cut out the excess foam for the motor mount using the sharp knife.



64. Take out the excess foam from the motor mount slot using the sharp knife.



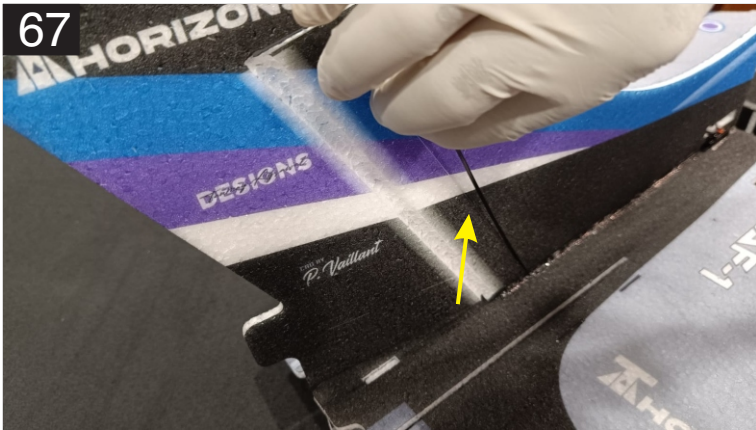
65. Use the same process as gluing the bottom of the fuselage to glue the top of the fuselage into place.



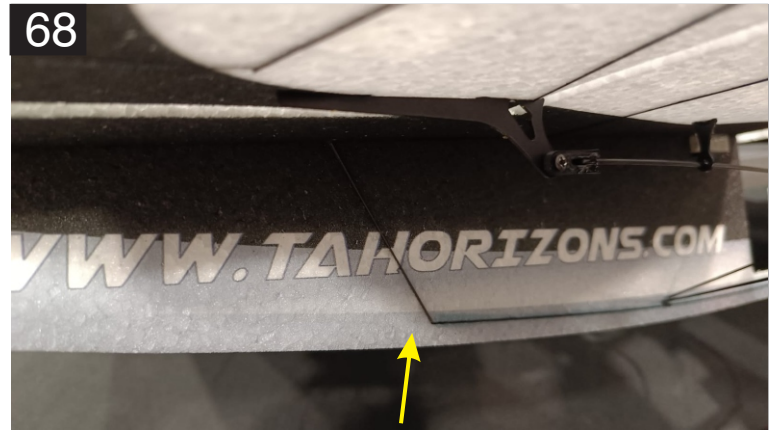
66. Engage all the tab and slots. Press firmly along the length of the fuselage to make sure all areas are fully seated. Check that the top piece is square and straight. Tweak if necessary to make it true.

The Build

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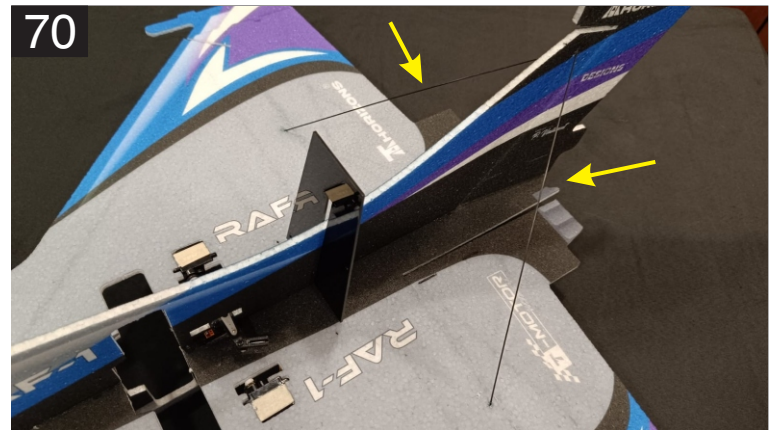
67. Use the 3 X 0.5mm Stripe, slid it into the pre grooved cut into the fin from top to right at the bottom, this will be used to strengthening the upper half of the fuselage.



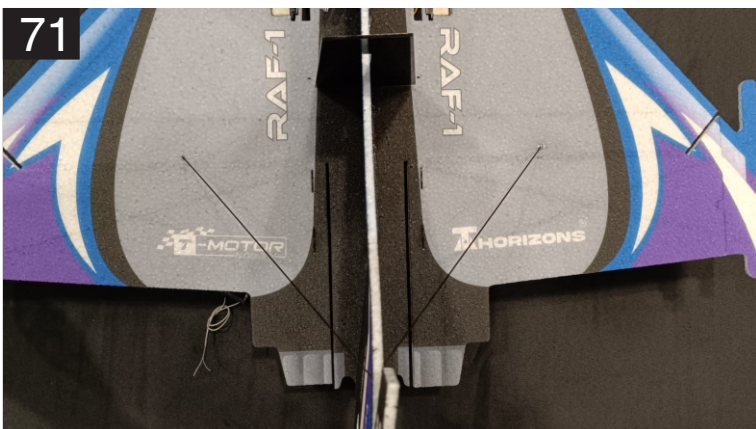
68. Notice how the stripe is slid from top to right at the bottom, Use the HV/Medium CA to glue it.



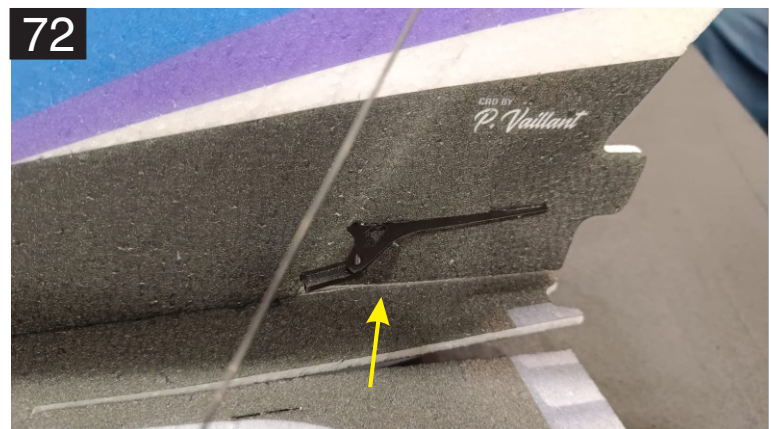
69. Cut the excess stripe if needed.



70. Shown above are the 250mm X 2 carbon rod that will go on each side of the fuselage. It will be used to strengthen the vertical stab.



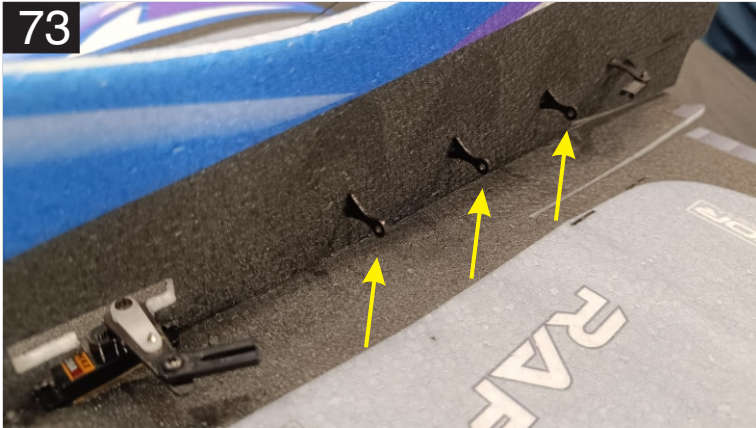
71. Here is another view.



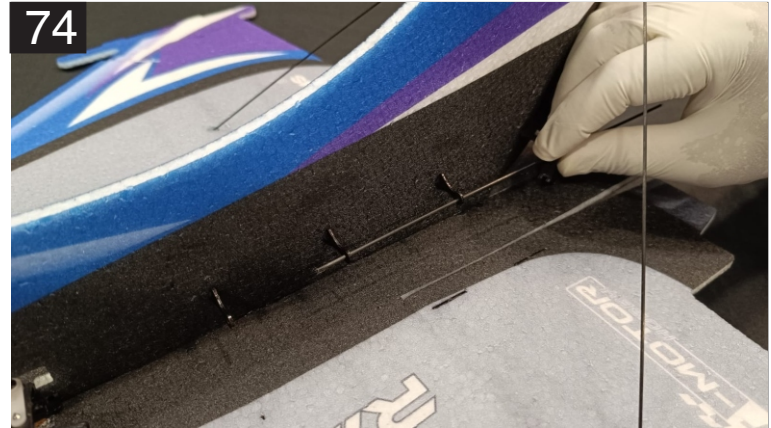
72. Install the rudder horn in place.

The Build

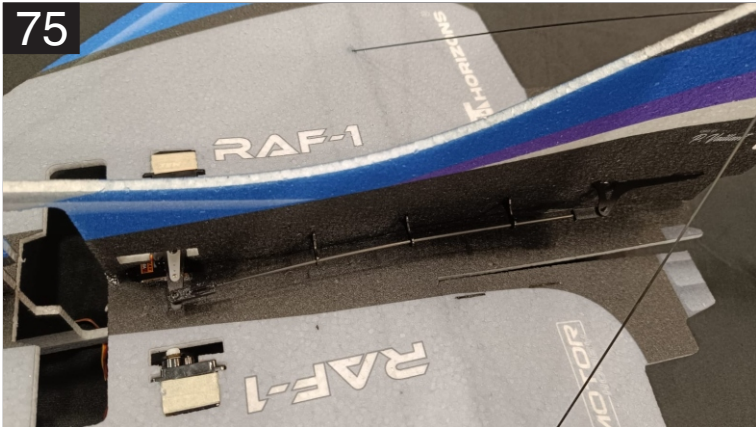
Please Note: Few pictures shown below are of different plane and for reference purpose only.



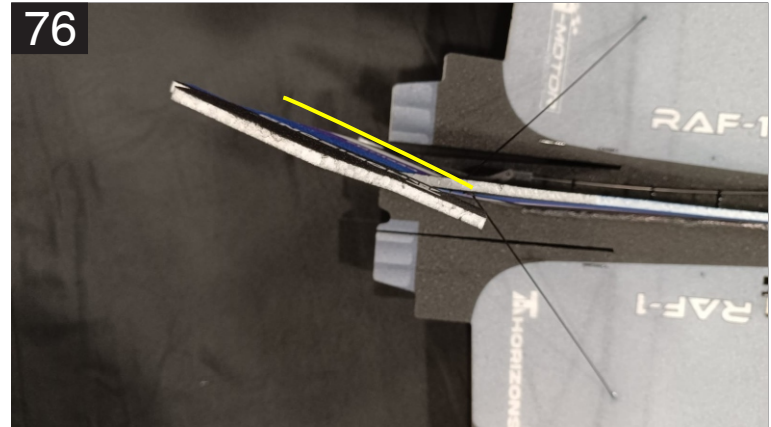
73. Before moving to rudder linkage setup, glue 3 pcs pushrod guide into the pre cut slots.



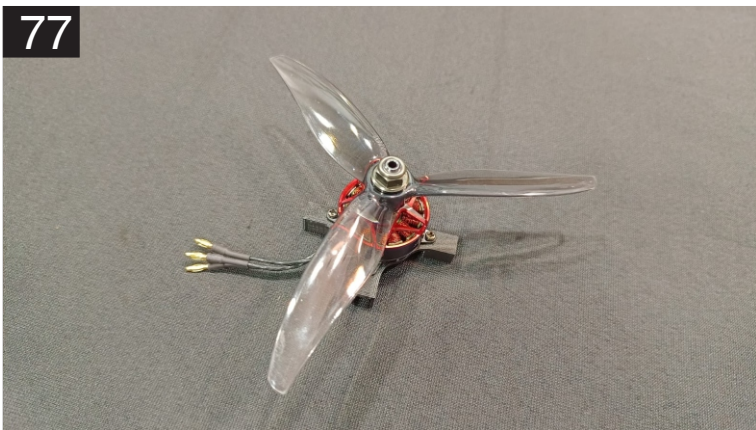
74. Notice how the rudder rod (210mm) is slid in the pre glued pushrod guides.



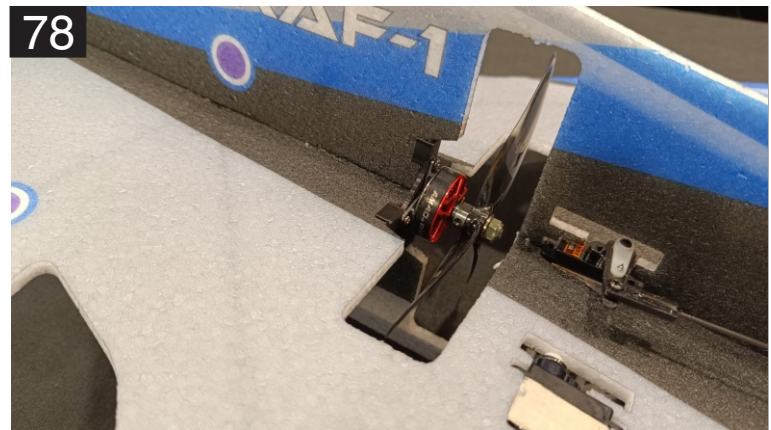
75. Above is the finished linkage setup with rudder centered and rod well fitted and glued in both the quick links with all the guides in place.



76. Program the end points of the rudder so that it won't touch the elevons.



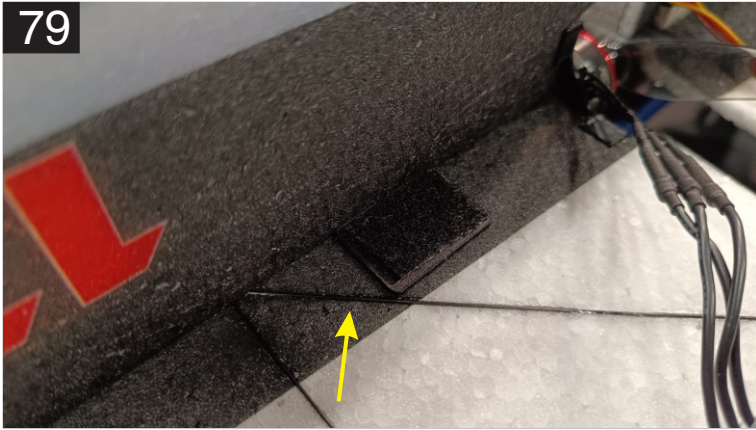
77. Before gluing the motor mount, it is important to first screw the motor onto the mount.



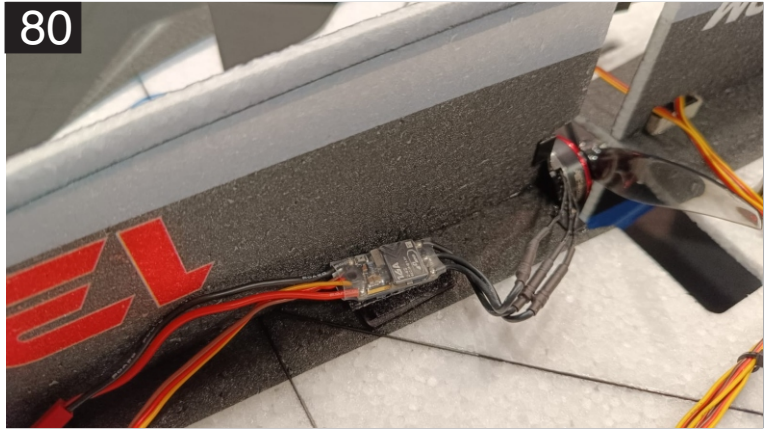
78. Shown above is the motor mount glued, making sure everything is flush and lined up correctly.

The Build

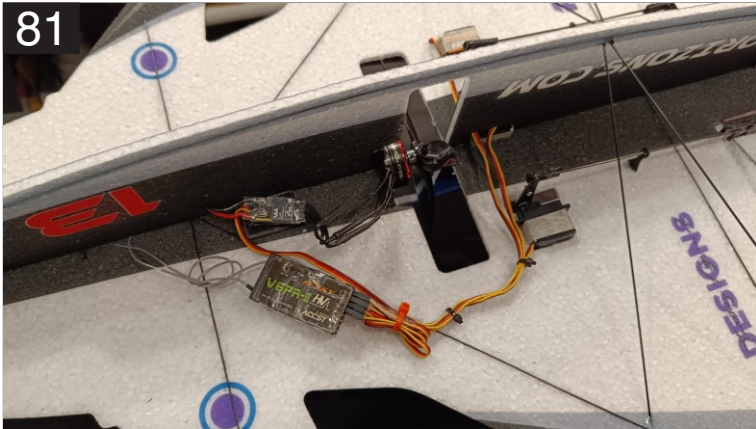
Please Note: Few pictures shown below are of different plane and for reference purpose only.



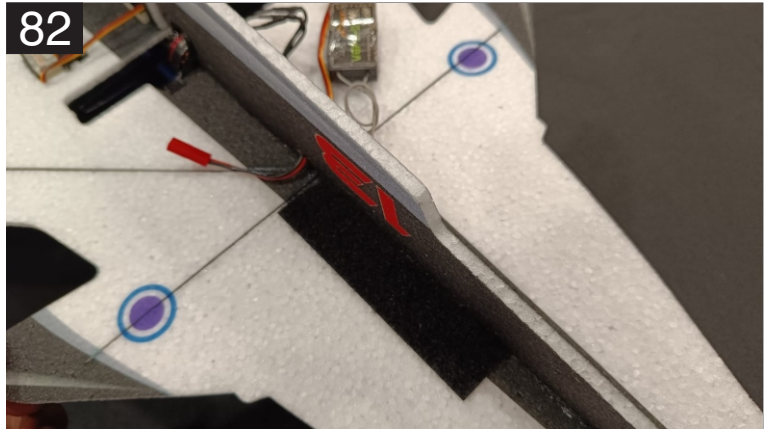
79. Notice above the plate glued onto the bottom side of the wings. This can be used to mount the electronic speed controller.



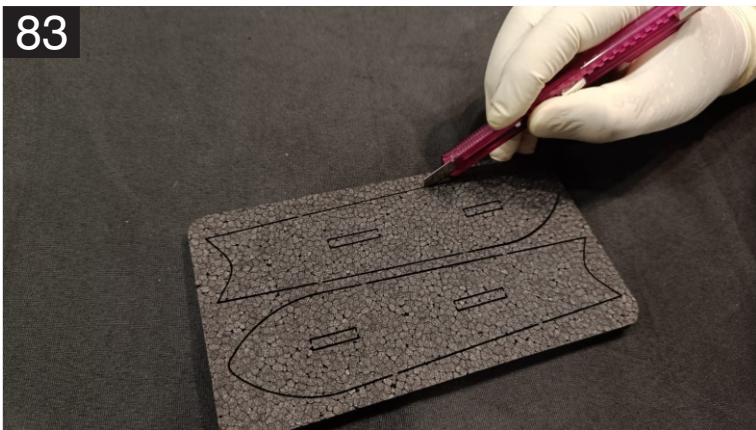
80. Use the supplied self adhesive velcro to mount the ESC over the tray.



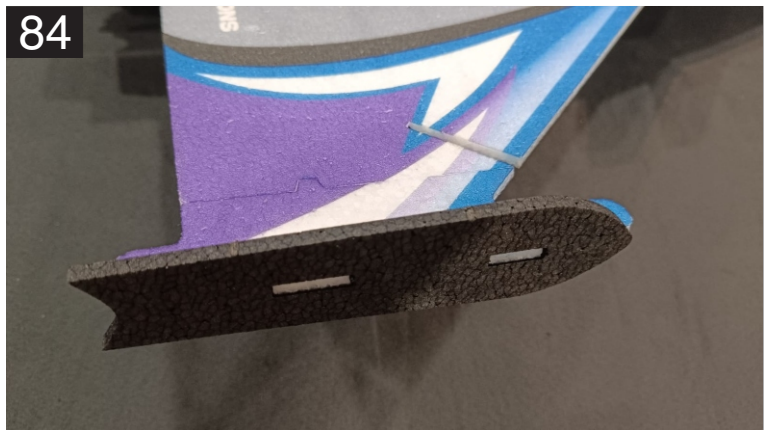
81. Route all the servo cables through the desired side of the wing like shown above, So that it will be safe from the rotating prop.



82. The long piece of velcro along with the strapping velcro mounted, above is the location of the battery for this setup.

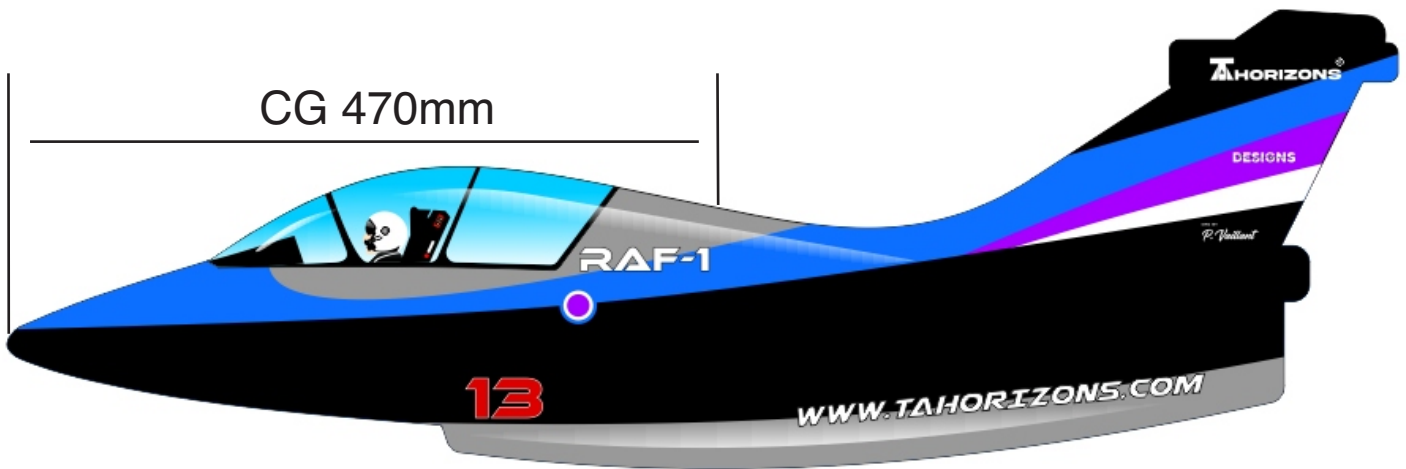


83. If desired, locate these side force generators that will be glued into the counterbalances of the Elevons.



84. Use HV cyno to glue these SFG's in place.

CENTER OF GRAVITY



Initial CG is located 470mm from the nose of the aircraft.

CONTROL THROWS

Extreme & 3D:

Elevons - approx +/- 45 deg
Rudder - approx +/- 20 deg
Expo to suit

Beginner & Sport:

Elevons - approx +/- 20 deg
Rudder - approx +/- 20 deg
Expo to suit

In order to achieve the control throws as described for "Extreme & 3D", 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. The motive of this project is to spread the outcome of my love for teaching and share my knowledge and experience with every enthusiast out there.

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

Happy Landings,
Tanmay Agrawal
TA Horizons