HobbyKing.com Votec 55”, (1397mm), ARF

Due to a lack of instructions with this model, I decided to create this document covering a goodly portion of the build process with this model. Hopefully it will help a few people.

If you haven’t bought this plane yet but decide you wish to after reading these instructions that I took the time to create, please show your appreciation by purchasing this plane through my HK Affiliate link so I get a small credit ☺:
http://www.hobbyking.com/hobbyking/store/uh_viewitem.asp?idproduct=19339&aff=618223

First impression is they’ve done an excellent job with this aircraft. The quality of the fit and finish is exemplary. Well done HobbyKing. (However, my Cowling was malformed from shipping. I managed to straighten it out somewhat and it looks ok now).

Your kit should include the following items;

Main Items:

1. Pre-built and covered Fuselage with motor mount built in
2. Canopy hatch and a Fibreglass Cowl
3. Pre-built and covered Right Wing and Left Wing
4. Pre-built and covered Vertical Stabilizer and Rudder
5. Pre-built and covered Horizontal Stabilizer and Elevators (left and right sides, split elevator)

All pieces come nicely finished in a heat shrink covering and a nicely detailed scheme with a contrasting underside.

Hardware:

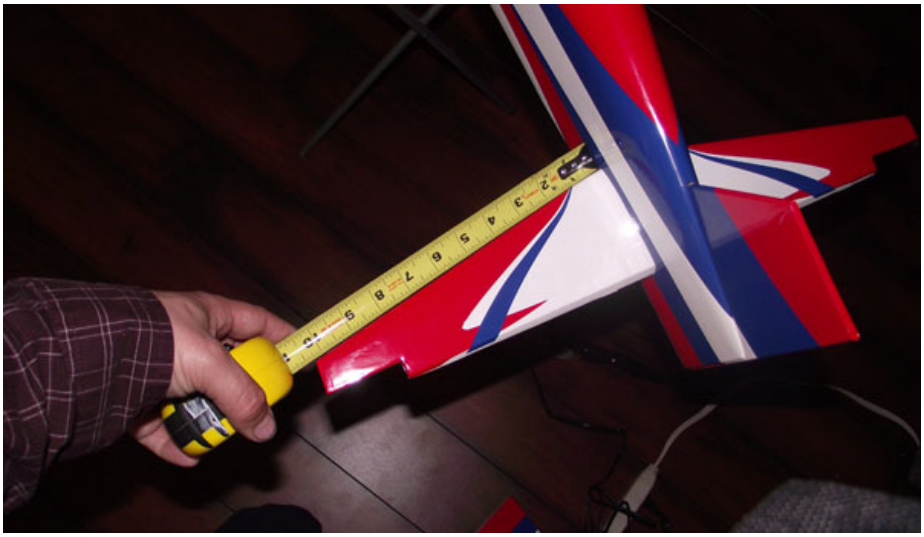
6. Fibreglass Control horns (2 Aileron, 2 Elevator, and 1 Rudder)
7. 10 - Ball-links
8. 5 - 2mm thick push rods, threaded on one end
9. 5 - Threaded Stainless Steel push rod ends
10. 1 - Tail Wheel (1 inch dia.)
11. Pre-bent Tail Wheel landing gear , 1 - aluminium tail wheel bracket and 2 - 2mm Wheel Collar
12. White painted Aluminium Main Landing Gear, Two Red painted Fibreglass Wheel pants
13. 2 - $1^{7/8}$ inch Main Wheels, 3 - 3mm x 15mm black Landing Gear mounting Screws
14. 2 - black 3mm x 35mm and 2 - Stainless Steel 3mm x 35mm screws
15. 2 - 3mm nylon locking nuts and 2 - 3mm Wheel collars
15. 4 - small servo screws for mounting the Cowling
16. 2 - Nylon Wing Bolts
17. 1 - 12mm OD Aluminium Wing Spar
18. 21 - Control Surface CA Hinges
19. 4 - 3mm x 25mm motor mount screws for the blind nuts preinstalled in the firewall.

Time to build!

I started with the tail feathers…

Find and cut out the Horizontal Stabilizer, (H-Stab), opening. A flashlight shining from the other side helps find your cut outs.

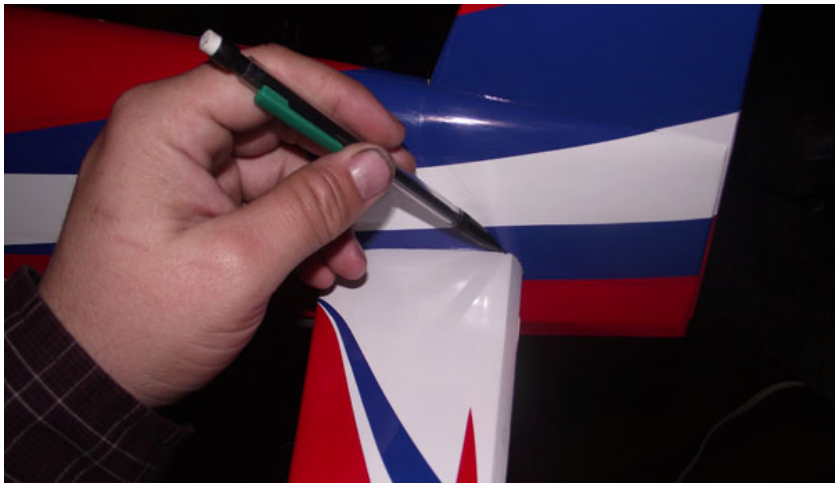
Glue in the Vertical Stabilizer. Cut away any covering film you need to on the V-Stab to get a good wood on wood glue joint inside the V-Stab slot.



Insert the H-Stab through the cut out. Measure both sides, front and back leading edges to center the H-Stab

Temporarily install the wings for the next step. Now would be a good time to ensure they fit ok, I had to enlarge the holes for the small dowelings slightly so the wing didn't get stuck and break the light ply walls of the fuselage. Also work the aluminium tube in and out of the wings as it's quite a tight fit.

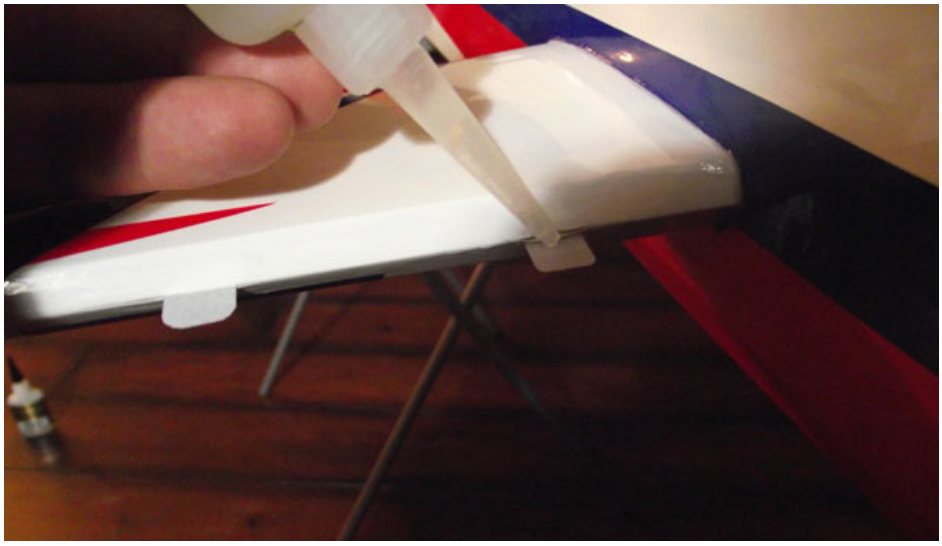
Once the wings are temporarily in place, measure diagonally to the corners of the H-Stab and Main Wing on both sides to ensure it's square to the wing.



Now draw a line on both sides of the fuselage on the H-Stab, both on top and on bottom, we need to mark an area to cut away the film to glue the H-Stab in place.

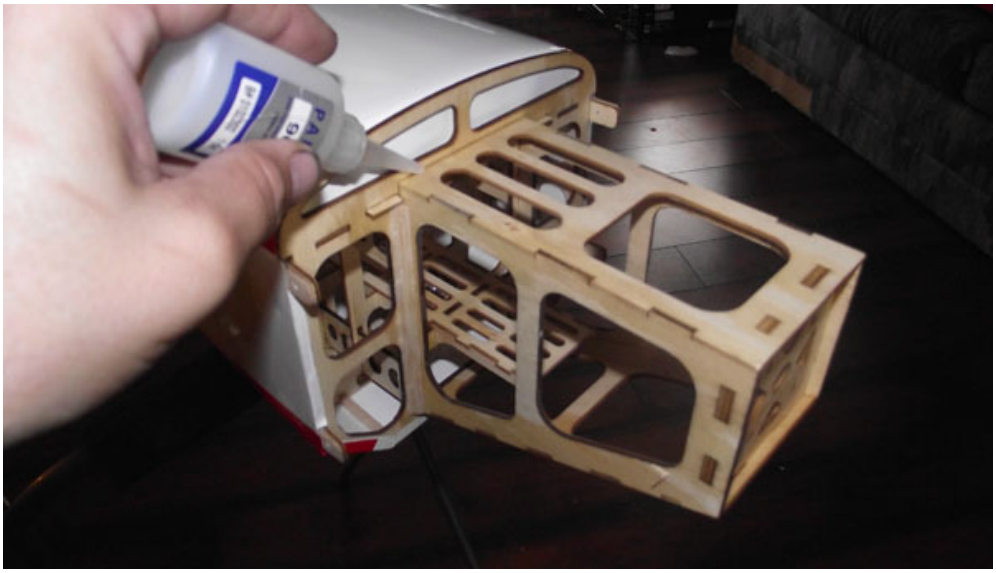
Lines marking the fuselage side both top and bottom of H-Stab.

Cut away the covering film, top and bottom, just inside the lines you marked. Leave about a 1/16th inch covering inside the line and your cut out.



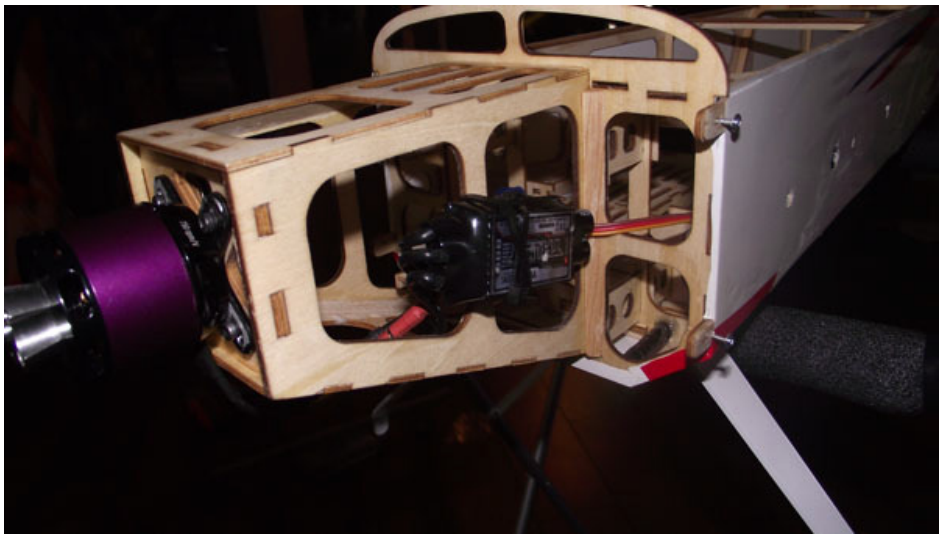
Glue the H-Stab in place ensuring to line up your marks with the fuselage side once again. Now, using thin CA glue, glue your CA hinges into your H-Stab and V-Stab. Slide the Elevators and Rudder onto the CA hinges and use thin CA glue to glue hinges to the control surfaces. Make sure all control surfaces move freely on the hinges. (Note: I glued in an extra CA hinge lower on the rudder, just for security of mind).

Looking pretty so far! Time to move to the front…

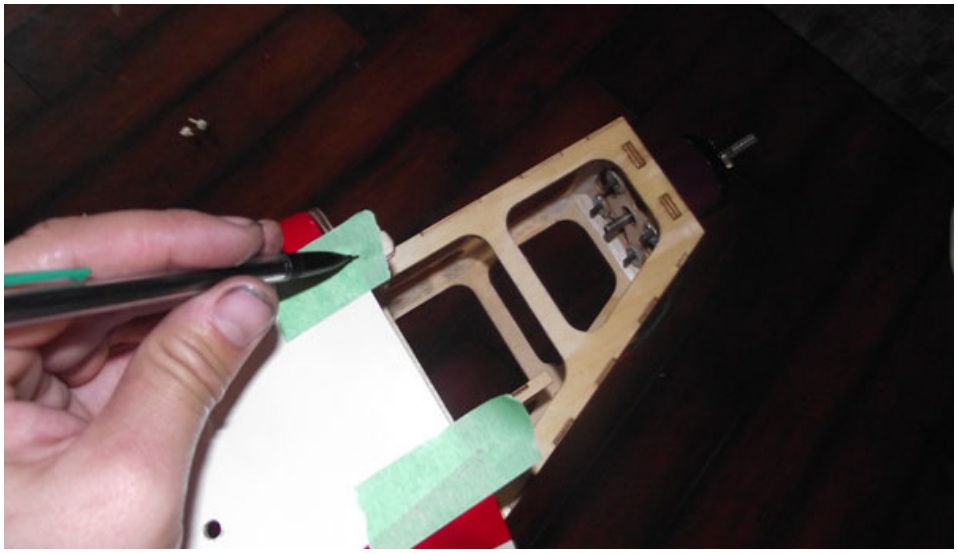


I've read too many horror stories about too little glue being used on the built in motor mounts on many of these HK planes, so take a little extra time and use thin CA and/or epoxy to all the main joint areas. Unlike the above, make sure the Canopy hatch is not in place while your gluing, just saying. ;-)

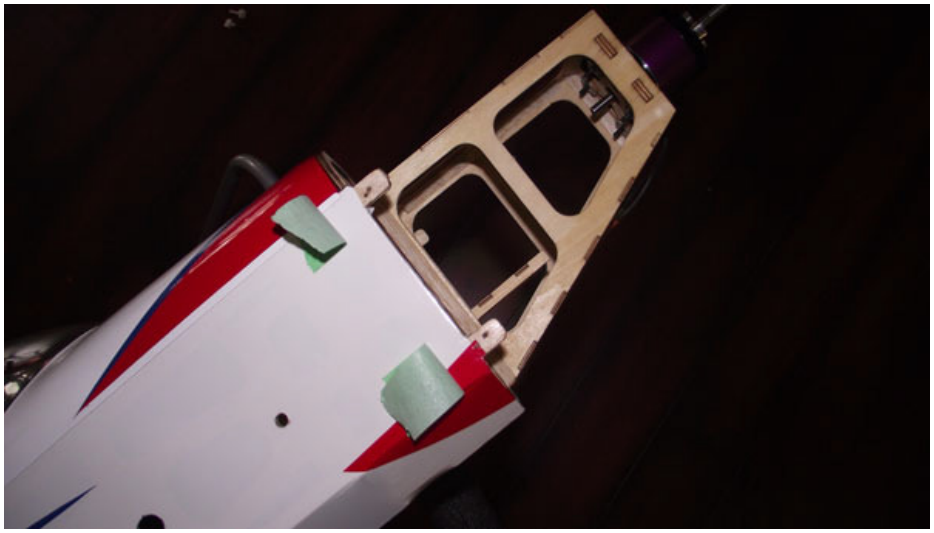
Mount your motor. I installed a Hacker A40-10S 750kv motor and it ended up being a PERFECT fit! These motors cost a little more but it's well worth the quality, reliability and peace of mind. I had to modify my X mount slightly by drilling new holes closer to the motor in order use the preinstalled hidden nuts.



I zip-tied my ESC to the side of the motor mount. This keeps it nicely in the airflow from the Cowling inlets. I'm using a Turnigy Trust 70A ESC.



Take some tape and place it over the cowling mounting tabs, mark the tape where you want to drill for the mounting screws.



Now peel back the tape, but leave it in place.

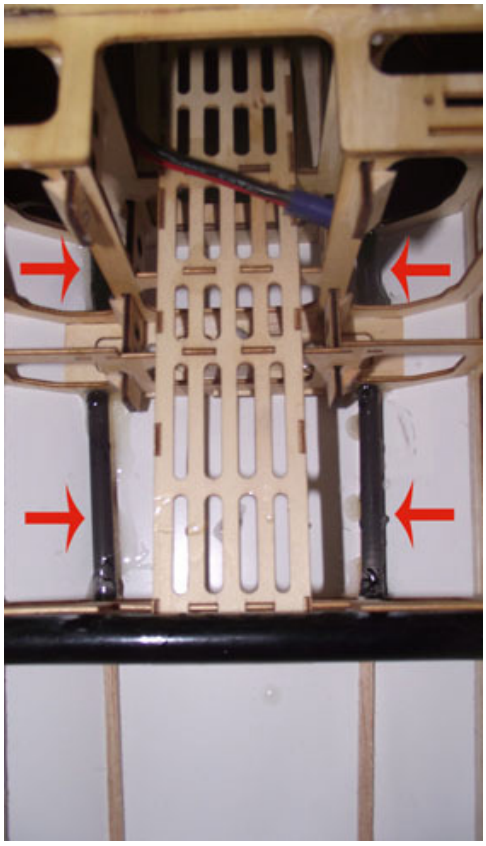
Slide the Cowling on overlapping the bottom part of the fuselage and bring the top to meet the canopy hatch. Adjust until it's centered on the motor as seen here. Once in place and it's looking good where it meets the fuselage, tape the cowling in place.

Now roll forward the tape you peeled back onto the cowling to re-align the mounting screw drill guide marks.

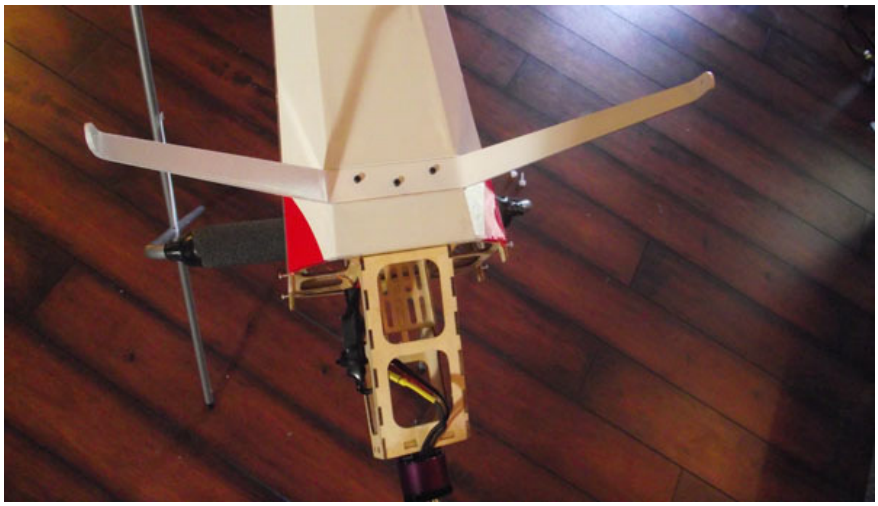
Now pre-drill the holes for the Cowling mounting screws.

Sit back and smile at your nicely mounted cowling. ☺

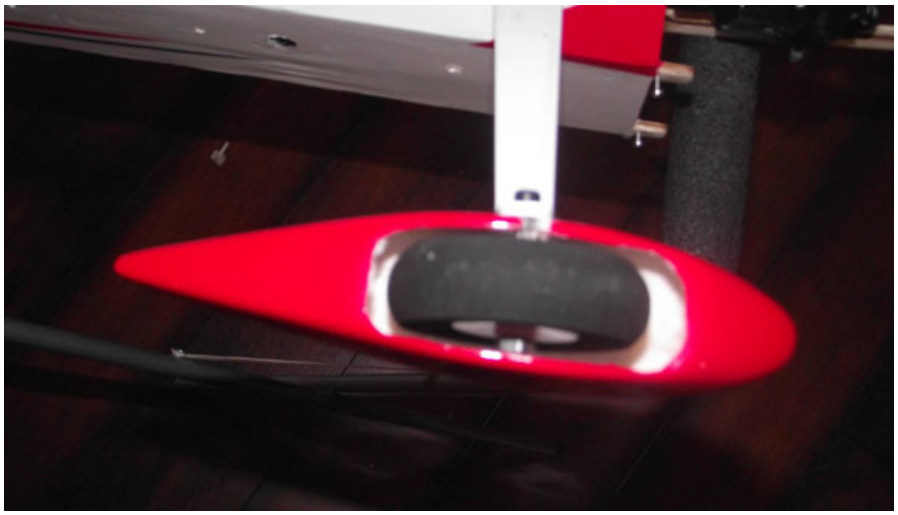
Just the right clearance. I'm using an APC 15x8E Propeller. I've ordered a nice Aluminium Spinner as I really don't care for the bland red spinner included. Looks good in the pic here, but it's really off color and dull.



Optional Modification: This plane is built very light, 1/8th light ply with 3/16th square balsa stringers. It's been noted this isn't strong enough in the landing gear area if you're landing on rough or grassy surfaces. I beefed it up with some carbon fibre rod. Another fellow online used hardwood rails.
Use your discretion here.

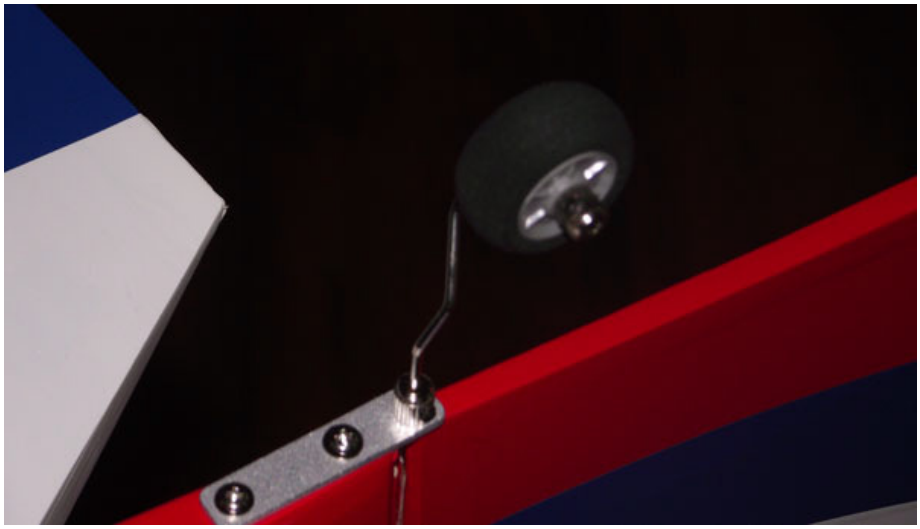


Install the landing gear with the supplied 3mm x 15mm Allen head screws.

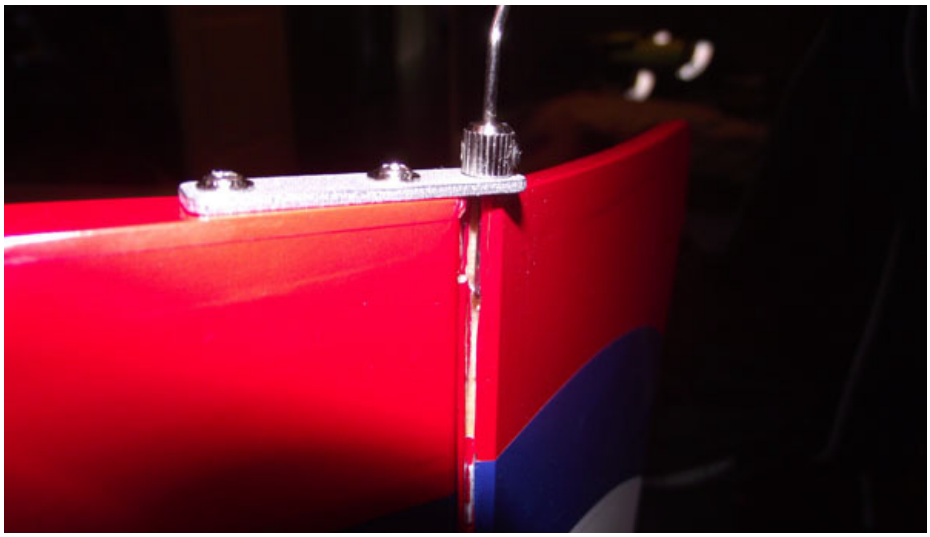


Install the Wheel Pants and Wheels using the 3mm x 35mm screws, the 3mm locking nuts and 3mm wheel collars. (I went with bigger 2.5inch Wheels, so I had to cut out my wheel pants a bit and use different mounting hardware).

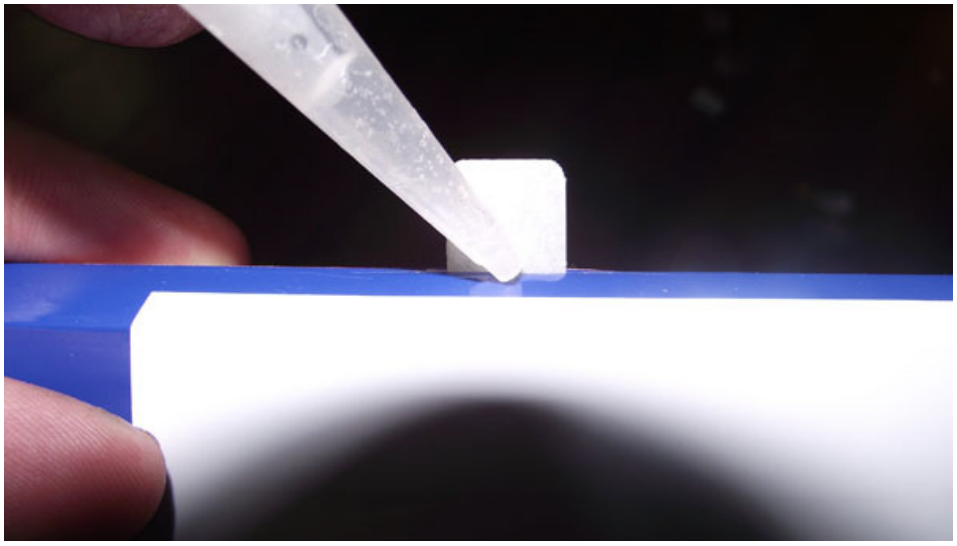
Landing gear installed. Always keep your wheels down, landing on your canopy never works!



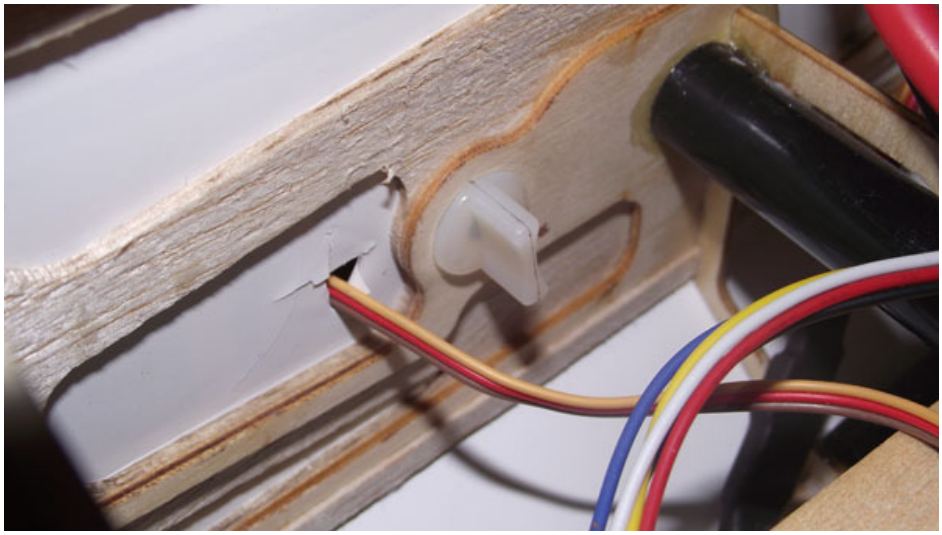
Install the tail wheel.



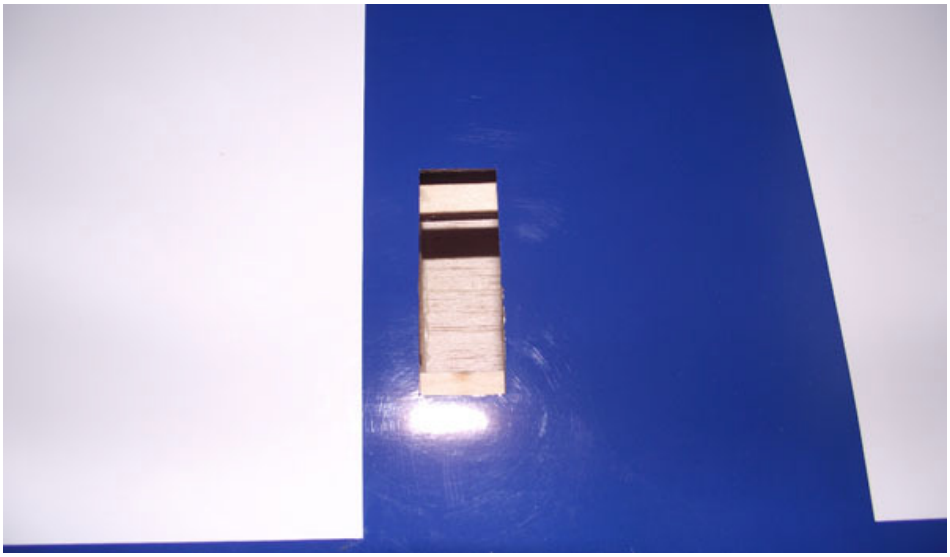
Drill a hole in the front edge of the rudder, approx. 1 inch up from the bottom to accept the top 90° bend on the tail wheel landing gear wire. Then slide the landing gear wire through the tail wheel bracket. Insert the 90° bend into the hole you drilled and then screw the bracket to the fuselage. Set the collar so there's no play and it takes the weight of the landings against the bracket instead of the rudder. Use some glue to secure the wire in the rudder.



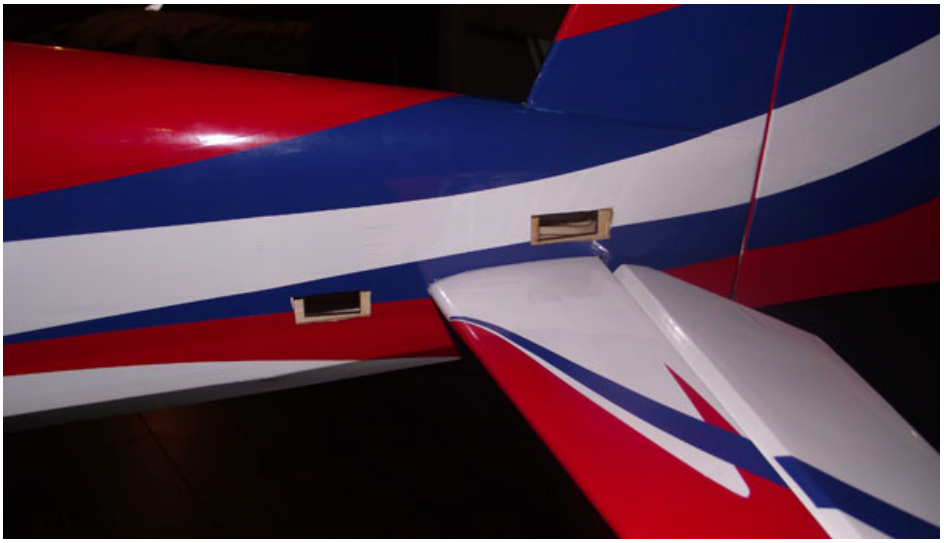
Glue the CA hinges into the wings using thin CA glue. Then slide the Ailerons onto the glued hinges and glue them into the Ailerons.



Install the wings. Secure them in place with the Nylon Wing Bolts. These bolts and the wings can be easily removed for travel to and from the flying field.



Find and cut the covering film away from the Aileron servo mounts.



Find and cut the covering film away from servo mounts for the left elevator and rudder.

On the opposite side, find and cut the covering film away from right elevator servo mount.

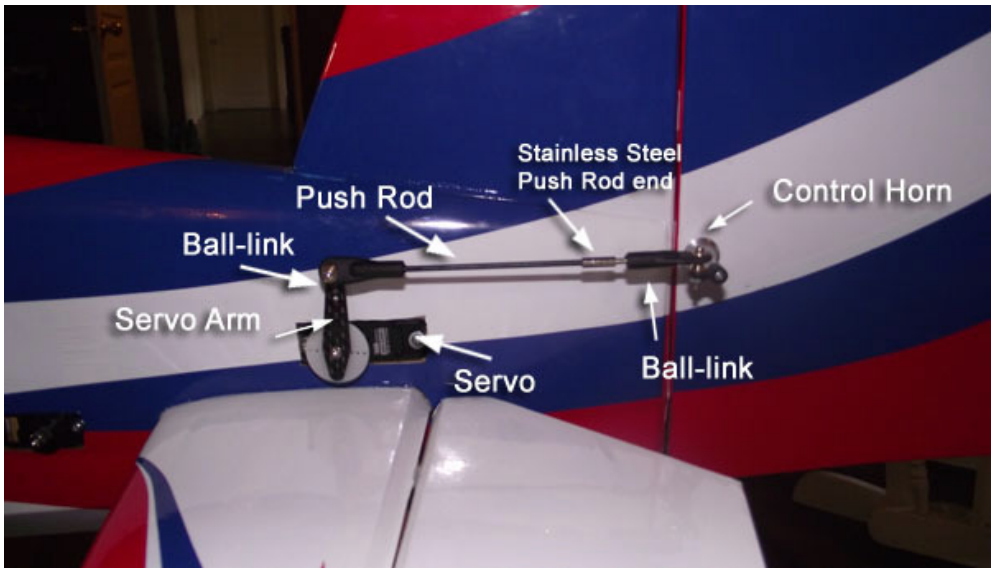
I'm not going to go into much detail about installing all of your electronics because everybody likes it different. I will however walk you through installing your push rods. For the split elevator I tried an inline servo reversing circuit but it proved to be unreliable. Instead I took apart one of the servos and reversed it's polarity which I learned from this video on YouTube.com:

How to REVERSE a Servo
http://www.youtube.com/watch?v=EK_FdRTenl0

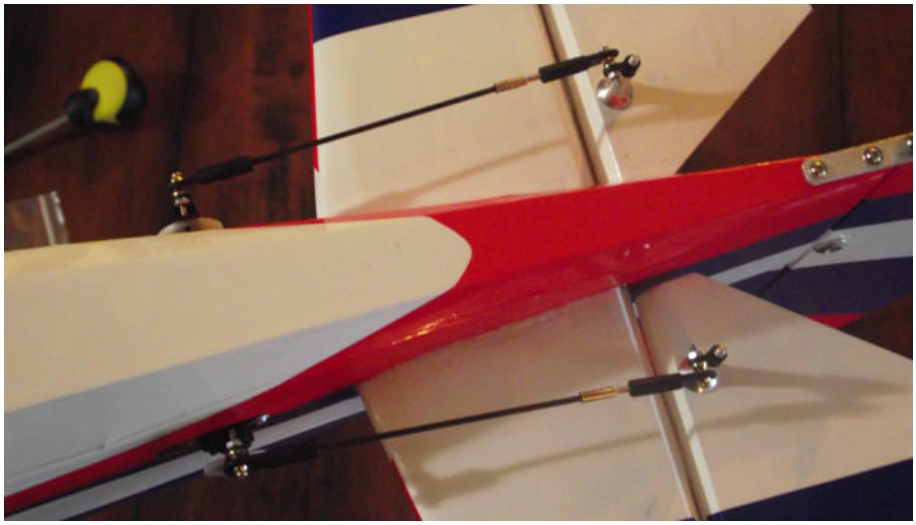
At this point install your Radio gear and power it up to help with servo installation.

Install the Rudder Servo, Control Horn, and Push Rod. Without instructions I wasn't sure on how to install the included rudder control horn as it looks like a 2 piece "pull pull" horn, just not sure, so I opted to go with some heavy duty control horns I had in stock for all control surfaces.

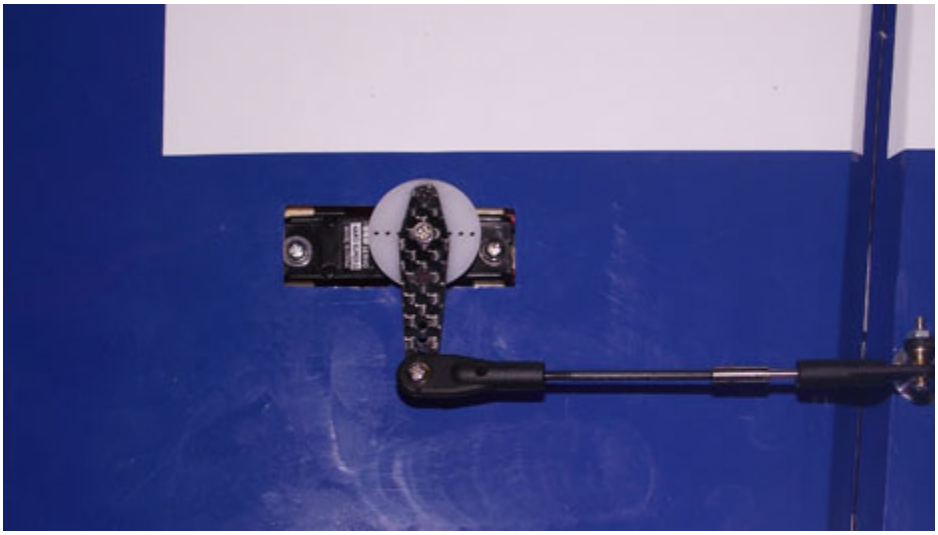
Here's a break down on how I installed the control rods to get the proper length:



1. Install the control horn.
2. Install the servo and servo arm. Do not secure the servo arm to the servo just yet.
3. Attach a ball-link to the control horn and thread in the Stainless Steel Push Rod end. Only thread it on half way, you want to leave room to play to adjust the length later.
4. Attach a ball-link to the servo arm and thread the push rod into it. Again, only thread it onto half the threads to allow adjustment either direction.
5. With the servo at neutral position and the control surface centered, hold the push rod up to the push rod end. Mark the push rod about 1/8th inch back from where the threads start on the push rod end.
6. Remove the push rod and push rod end. I just left the servo arm and ball-link on the push rod for the next step. Leave the other ball-link on the control horn.
7. Cut the push rod where you marked it then solder it into the push rod end.
8. Thread the push rod end into the ball-link on the control horn to approx. the same half way point.
9. With the servo live and in neutral position, adjust the push rod length by threading it in or out of the ball-links until the control surface is centered again. For the Elevators, you'll have to measure the trailing edge height so each are centered the same and in line with each other.



Install the Elevator Push Rods the same way.



Ditto for the Aileron Push Rods. Once all push rods are in place you are ready to check control surface throws. Set up servo travel adjustments, and make sure none of the servos are binding. As far as proper control surface throws, there's no instructions so use what your comfortable with.

Once all your controls are working, moving the correct directions and all that good stuff, check your plane over…chances are some of the covering has expanded in the heat of your home.

Go over any wrinkled or loose areas with a covering iron or heat gun to re-shrink the covering film.

A good Center of Gravity seems to be in the range of 90mm to110mm from the leading edge of the Wing Root where it meets the fuselage. On my plane it was right around the front edge of the white bar marking on the wing bottom.

Ready to Fly!!!!

Definitely a pretty plane!

I really hope these instructions have helped you out. At the time of creating this document I had yet to maiden my Votec, but here's my set-up:

Motor: Hacker A40-10S
ESC: Turnigy Trust 70A with BEC, (I disabled the BEC and used a stand-alone Turnigy Selectable 5/6 volt SBEC)
Propeller: Genuine APC 15x8E (I will be trying others as well to see what's a best fit for this plane).
Radio: JR 9503 converted to use FrSky Transmitter Module and a FrSky 7 Channel Receiver
Battery: Zippy 3000mAh 4S 40C
Servos: Wings and Rudder - MG GWS Naro 19g, 3.6kg/cm High Torque
Elevator: 2 - HobbyKing 939MG 12.5g, 2.5kg/cm High Torque

If you have any questions I'm on RCGroups.com forums, username "teknokraze". Or you may email me at perry.wolf74@gmail.com

Kindest Regards,
Perry Wolf.

If you haven't bought this plane yet but decide you wish to after reading these instructions that I took the time to create, please show your appreciation by purchasing this plane through my HK Affiliate link so I get a small credit ☺:
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Happy Flying!!