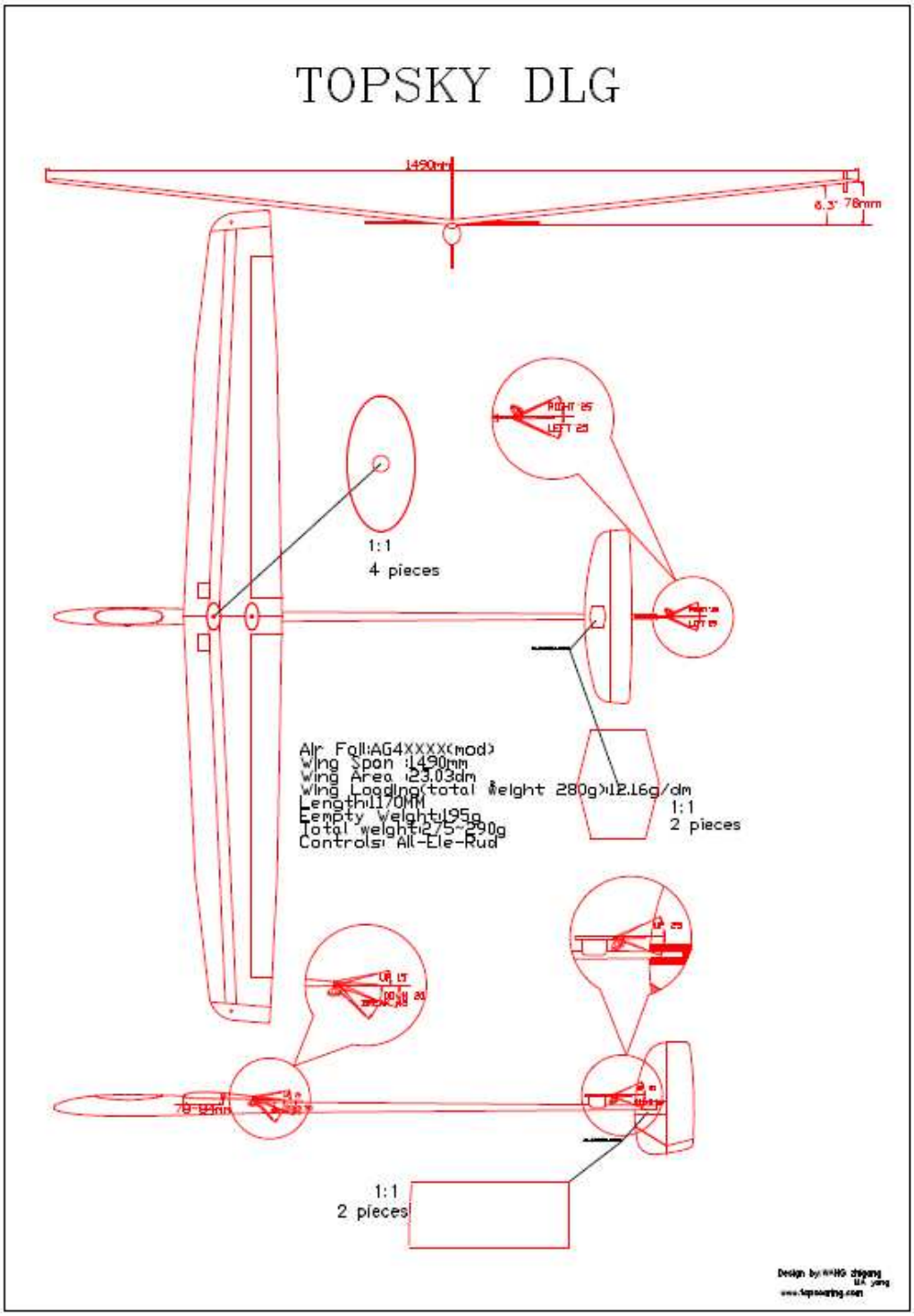
TOPSKY DLG Installation Manual

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Specs:

Airfoil - AG4XXXX
Wingspan - 1490mm
Length - 1180mm
Wing area - 22.84 dm2
Weight - 195g
AUW - 260£-280g
Wing load - 11.38g/dm2£-12.26g/dm2

Recommend RC equipment:

Servo:

Futaba: 3108, 3110, 3114, S3154, JR-SM22, DS285
Diamond: D 4.7, D 60
Hitec: HS45, HS55, HS5055

Battery:

C-4-KAN400 2/3AAA-Double Stick-18AWG Wire-Hitec male

Receiver:

Berg: 4, 7,
Corona: 420II, 620II, 820II,
JR-620
Hitec: 05s, 6s

Wings:	2 x Dymond D60 – 19:95 - Dymond D 60
	2 x Dymond D 4.7 Power - Dymond D 4.7
Elevator:	Hitec HS-55 - Hitec HS-55
Rudder:	Hitec HS-55

Attention: Because after the compound materials cure, there will be ammonia iris on the surface, which affect the bonding strength afterwards. Please polish with sandpaper on all bonding surface.

1. Tail Installation

1.1. Sand the top surface of stabilizer mount. Make sure it's vertical to the side surface.

1.2. Sand the side surface, or you can make streamline as shown in the picture below.

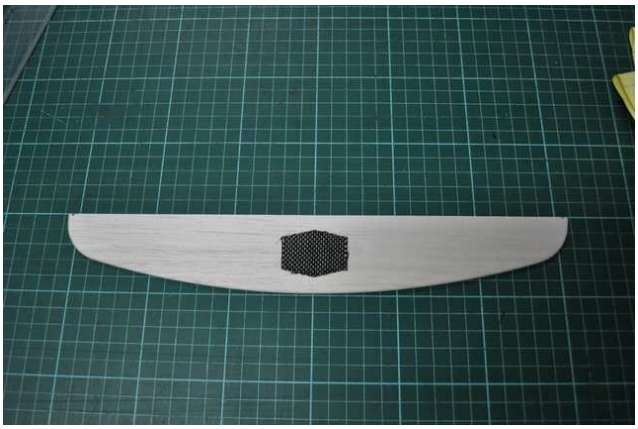
1.3. Cover the tail boom with 300# sandpaper, then sand the groove of the stabilizer mount. Make sure that the groove is parallel to the fuselage, and parallel to the outside surface of the tail boom. And after bonding to the tail boom, the upper side of the mount should be parallel to the central line of the tail boom.

1.4. Polish, cut, or drill the tail as you prefer. We suggest that you may make the rear end of the tail thinner. It should weigh 12g after sanding.

1.5. Cut the elevator. You may decide the size and shape based on your favorite design. Cutting the 2 holes on the balsa is recommended.

1.6. Sand the gap and bevel for the hinge.

1.7. Bond the carbon cloth to the tail. The weight of the tail should be 13g.



1.8. Wait for the glue to harden with heavy weights.

1.9. Make a slot on the front end of the vertical tail. The width is the same as the diameter of the tail boom, and the length is 10mm.

1.10. Slotting the tail boom: Width 2.5mm, length 20mm. Make sure the edge of the two slots are smooth. You may sand it with 300 grit sandpaper.

1.11. Join the tail boom and the vertical tail. Sand or remove small sections until it fits.

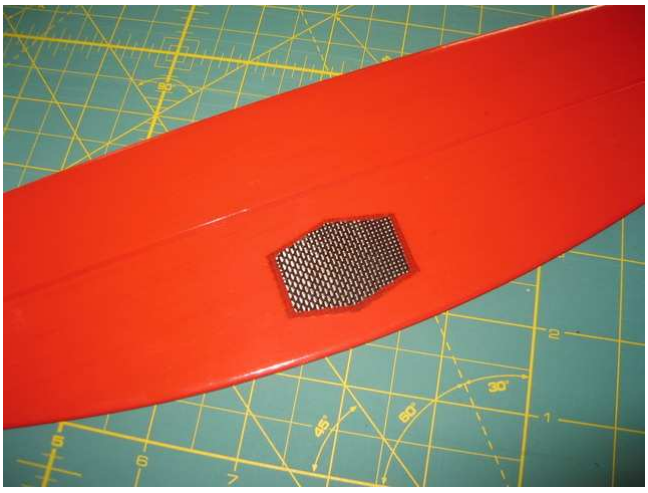
1.12. First cover the tail side with hinge.

1.13. Then, cover the other side. The weight of tail set with films should be 14g.

1.14. Cut the covering of both sides of the vertical tail: 2mm inside the edge of the carbon, cut from the front to the end of the tail boom.

1.15. Bond the tail boom and the vertical tail, with fiberglass and epoxy.

1.16. Cut the covering of the stabilizer: 2mm inside of the carbon.



1.17. Fix the tail on your working board. Check the joint:

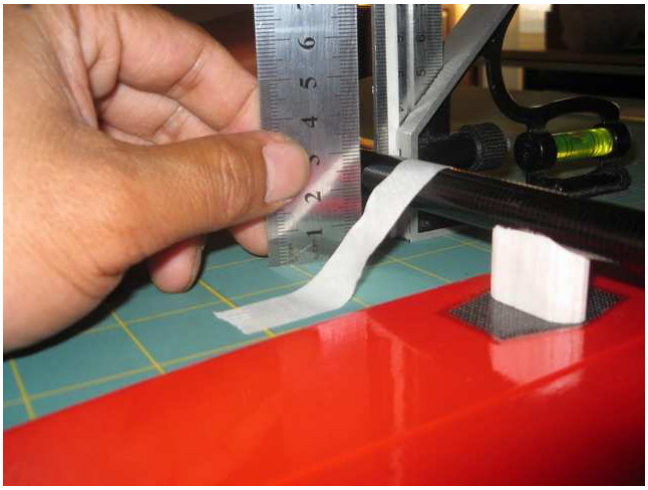
- The stabilizer should be parallel to the center line of the tail boom, or it may have an angle of -1 degree.
- The hinge of the elevator should be vertical to the tail boom.
- The center line of the tail boom should be right in the middle of the stabilizer.

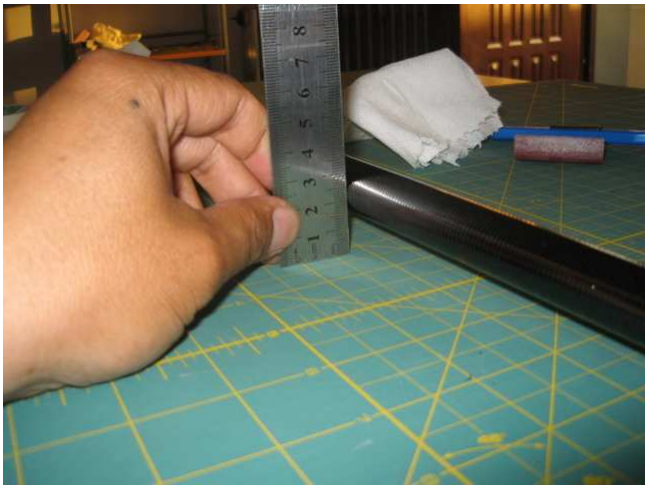
- The vertical tail should be vertical to the stabilizer.
- The vertical tail should be on the same surface as the center line of the fuselage.
- The hinge of the vertical tail should be vertical to the center line of the tail boom.

1.18. Temporarily join the vertical tail and the tail boom with tape. Then bond the tail boom and the vertical tail from both sides using the provided fiberglass and 30min epoxy.

1.19. Lay the fuselage flat on the desk, with the vertical tail up side down.

1.20. Adjust the center line of the tail boom, to make it parallel to the desk surface and also parallel to the scale mark on the working board.

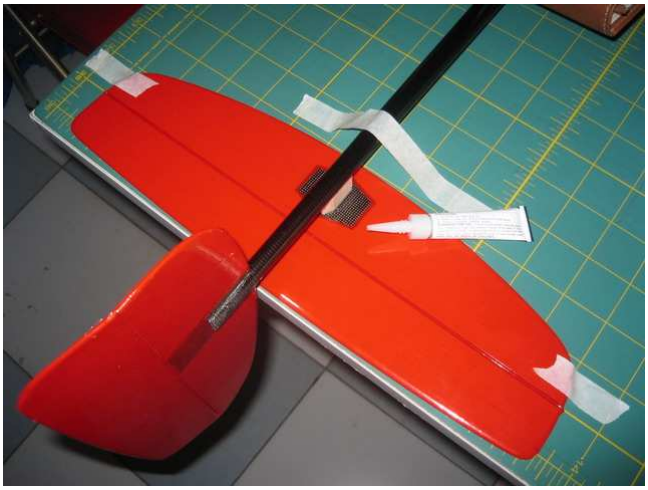




1.21. With a ruler, make the vertical tail be vertical to the desk.

1.22. With the scale mark, adjust the stabilizer and the mount. When the stabilizer is flat on the desk, the hinge of the elevator is vertical to the tail boom.

1.23. Bond the stabilizer mount and the tail boom with fast glue.



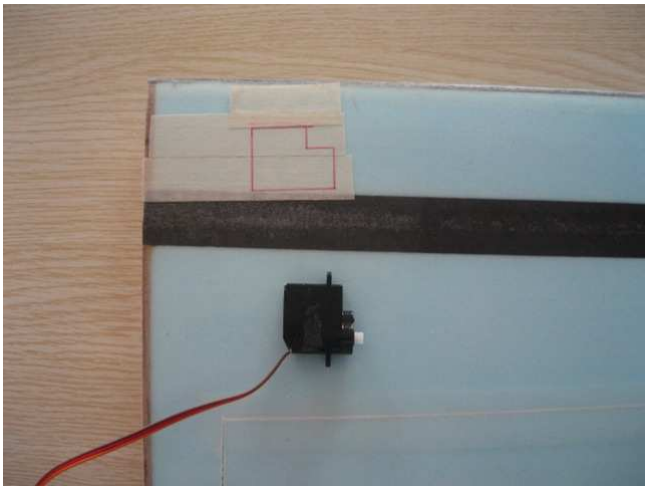
1.24. Cut appropriate size of fiberglass with a paper template.

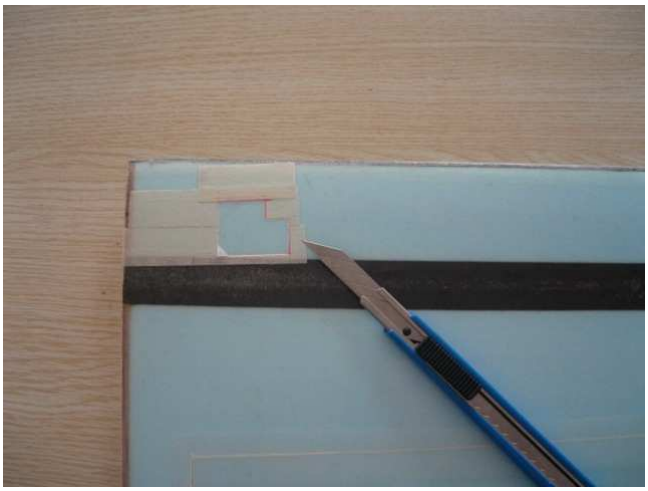
1.25. Apply a thin layer of epoxy on the boom, stabilizer carbon and the mount.

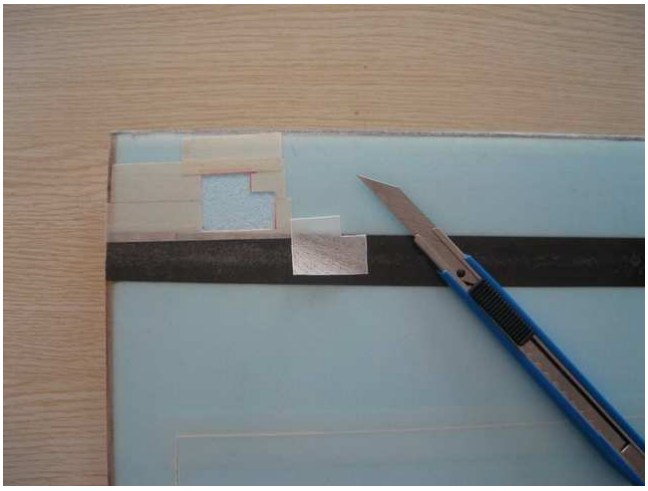
1.26. Join the tail boom and the mount to the bottom of the stabilizer with epoxy and fiberglass. Waiting for it to cure.

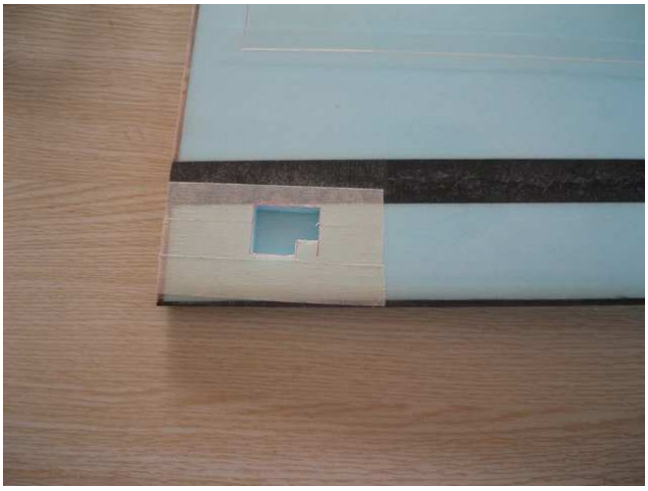
2. Wing installation

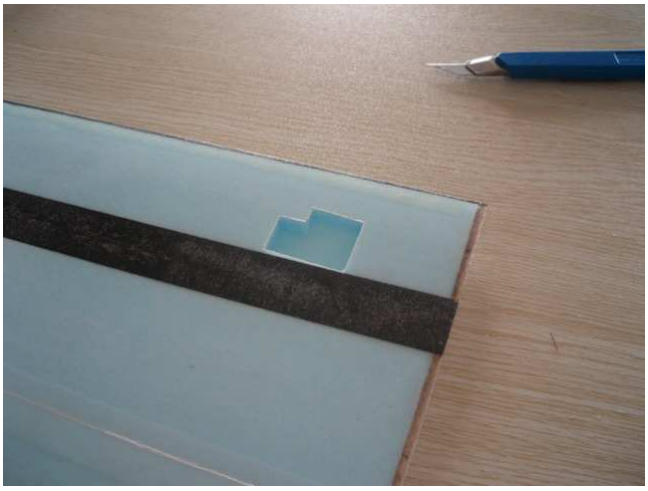
2.1. Cut the servo mount based on your servo size.



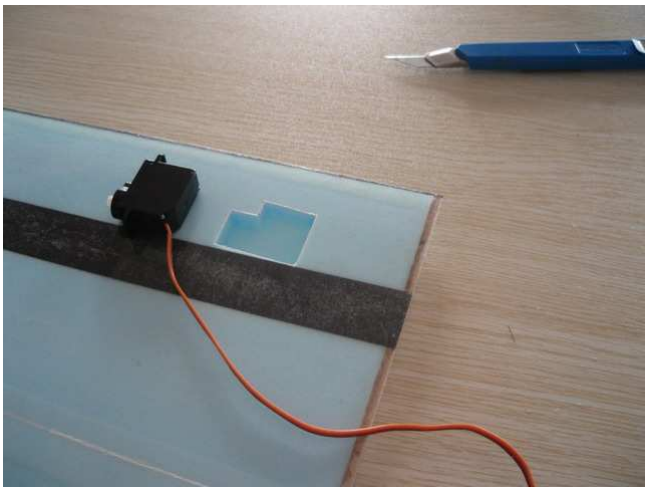


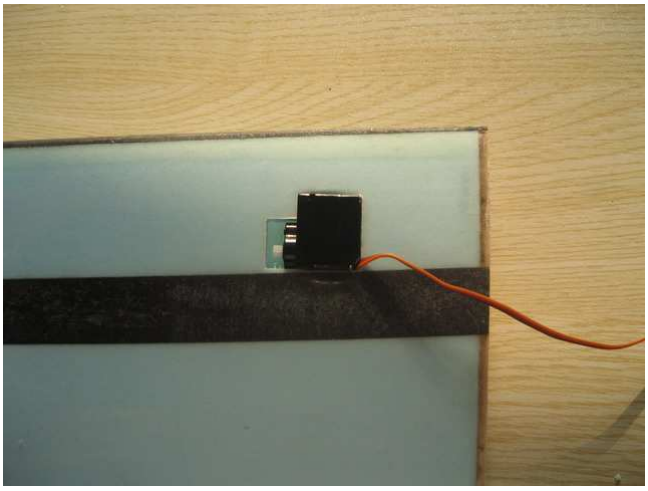




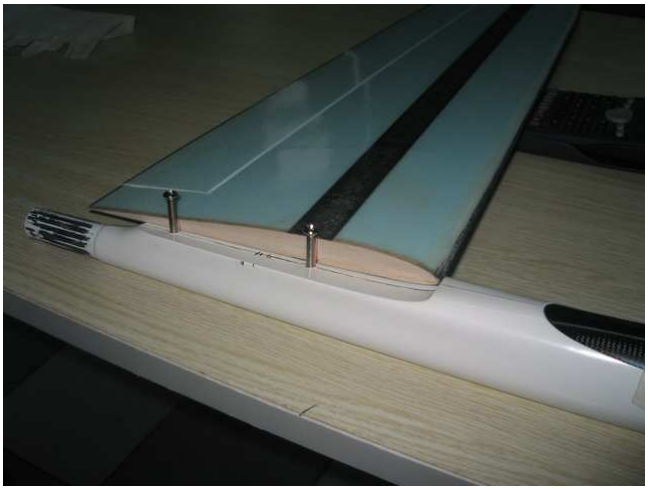


2.2. Trial fit your servo and make adjustments until they fit tight.





2.3. Mark the location of the screw holes, when putting the wing on the fuselage.



2.4. Drill holes for servo cable with file.

2.5. Drill screw holes with file.

2.6. Place wing face down on the desk.

2.7. Put tape on the joint of the wing bottom.

2.8. Prepare the platform for gluing of the wing joint. The wing dihedral angle should be 6.3 degrees.

2.9. Put the wing on the platform, then join with 6min epoxy or fast glue..

2.10. Record the locations of screw holes and servo cable holes.

2.11. Apply fiberglass and epoxy on the joint area, the width is about 6mm.

2.12. Cellophane can be added on the outside of the fiberglass making the surface very smooth after it cures.

2.13. Apply carbon cloth and epoxy on the location of screw holes.

2.14. Cut the 6mm carbon pipe into 3 pieces as 60mm (finger peg), 12mm (front screw sleeve) and 7mm (rear screw sleeve) in length.

2.15. Drill 4mm screw holes. Trim the wing screw holes and make them centered to the screw holes on the fuselage. Then enlarge the holes with 6mm drill.

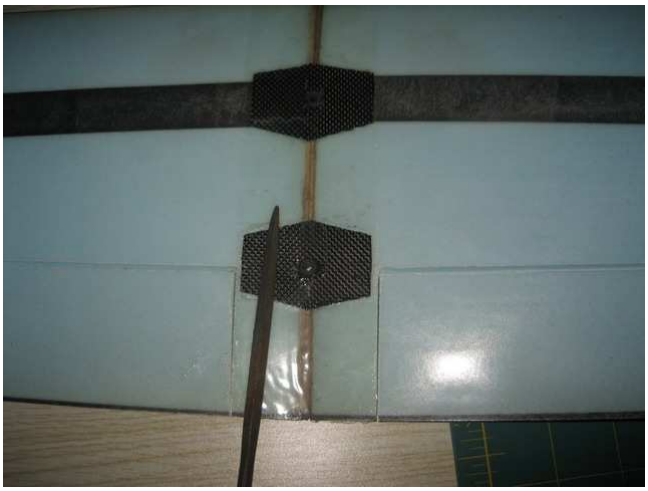
2.16. Insert the 2 short carbon pipes into the wing screw holes, and assemble the wing onto the fuselage.

2.17. Put on the tail boom, and make sure the wing is vertical to the center line of the fuselage. Check the length between the wing tips to the vertical tail. Both sides should be the same. Trim the screw holes if not.

2.18. Cover the screw holes on the fuselage with tape.

2.19. Bond the screw tube on to the wing. And assemble the wing on the fuselage with two screws. Slightly loosen the screws when the epoxy is half cured.

2.20. After the wing's cure, sand the screw tube to make them flush with the wing.



2.21. Locate the finger peg position as you like. We suggest it be on the center line of the carbon wing beam, and 10mm to the outside edge of the wing tip. Drill 6mm holes on the holder location.

2.22. Bond the peg into the wing with epoxy.

3. Fuselage Installation

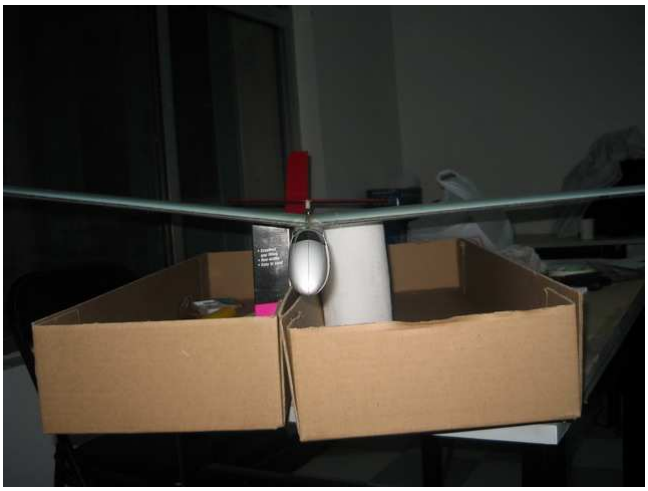
3.1. Sand the rear part of the fuselage if necessary, and the inside of the front part of the tail boom. Make sure they match.

3.2. Drill holes on the rear part of the fuselage, preparing for the linkage of the tail.

3.3. Assemble the wing on the fuselage.

3.4. Bond the fuselage and the tail boom with epoxy.

3.5. Rotate the tail boom; make sure the stabilizer is horizontal.



3.6. Waiting for it to cure.

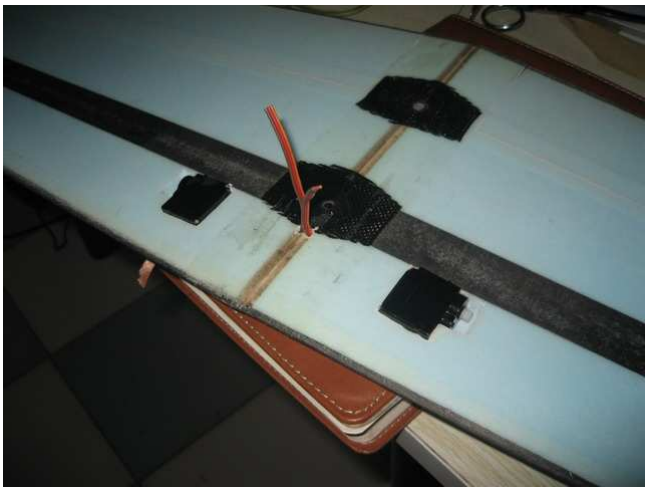
3.7. If the tail boom was cut on the front part, 3k carbon fiber should be added to the front part of the tail boom, and apply epoxy.

4. Aileron Installation

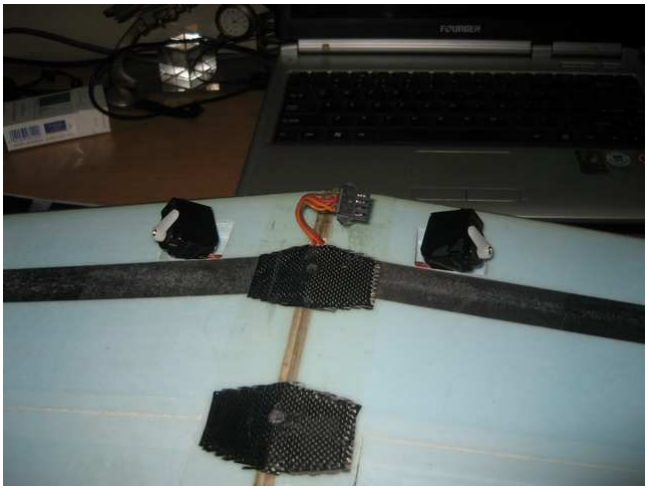
4.1. Connect the electronic devices, power on and test. Center all sticks and trims on the transmitter, and center the aileron servo arm. Turn off the receiver.

4.2. Solder an aileron servo extension cable to the 4 pin connector provided in the accessories bag.

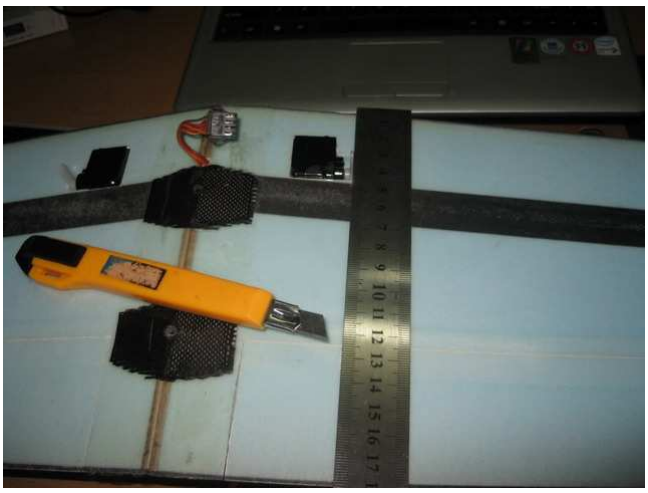
4.3. Pass the Servo cables through the hole and glue the aileron servos into the installation holes with epoxy.



4.4. Solder the aileron connector.



4.5. Make holes on the ailerons, insert the aileron horns, and adjust to appropriate position.

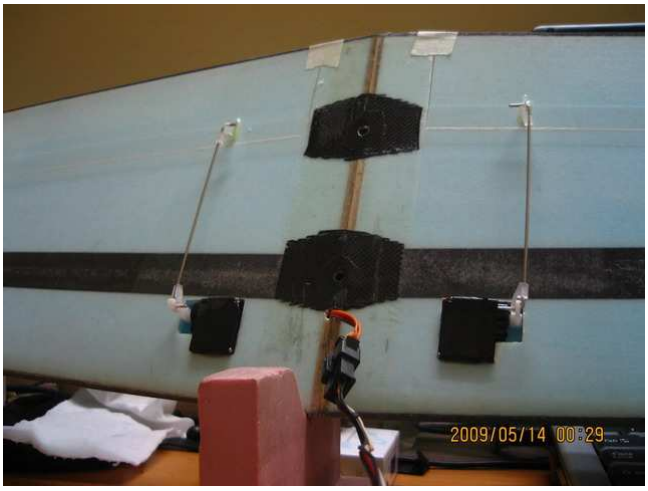


4.6. Measure the length of the link rod and z-bend the supplied steel wire into the same length.

4.7. Install the aileron link rod.

4.8. Test the aileron servos by powering on the receiver. Then power off the receiver. Adjust the arms to center the ailerons.

4.9. Bond the servos and arms with epoxy. Waiting for the wing to cure.

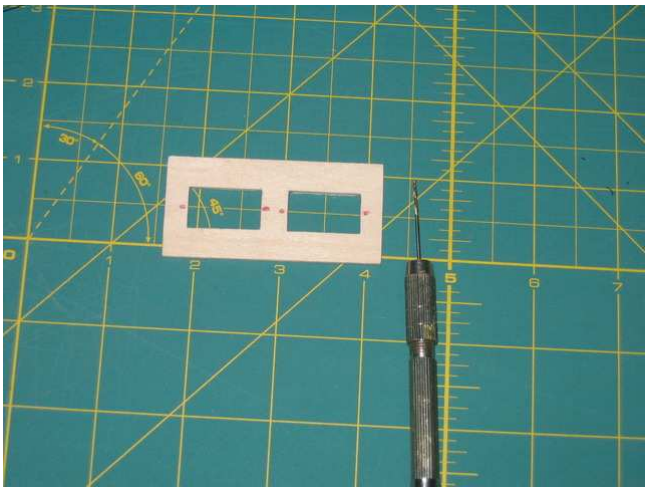


5. Fuselage device installation

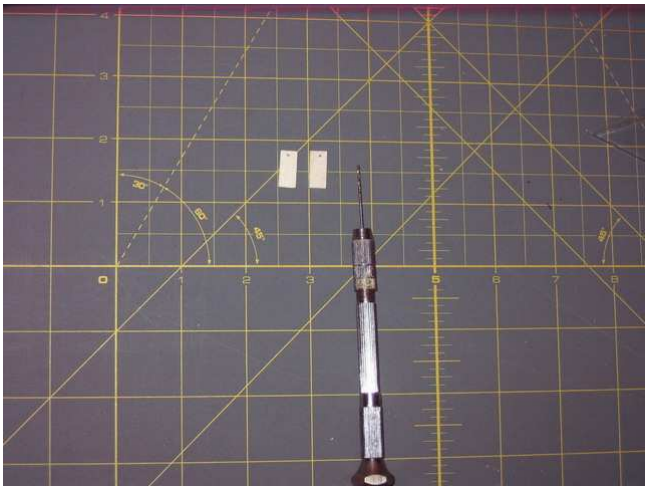
5.1. Put in batteries and receiver. Install the servos as forward as possible without affecting the battery

and receiver assembly.

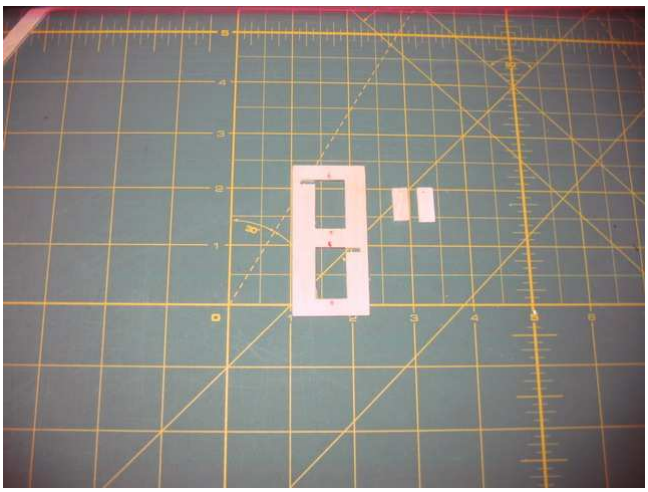
5.2. Adjust the servo mount based on the size of the servos.



5.3. Using plywood; cut two pieces of 7x15mm squares. Drill 1mm holes on them.

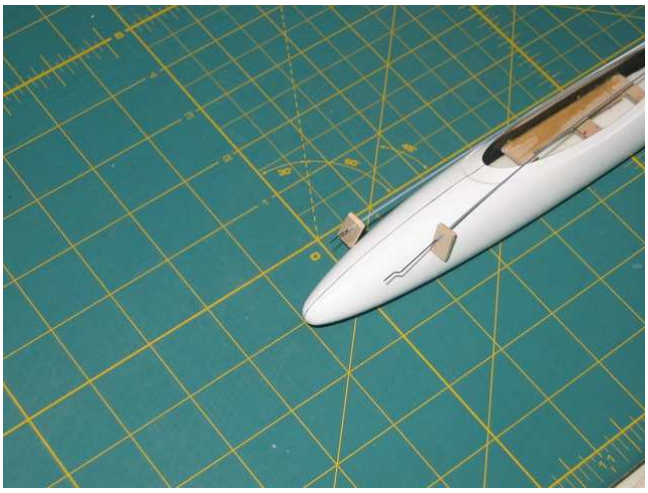


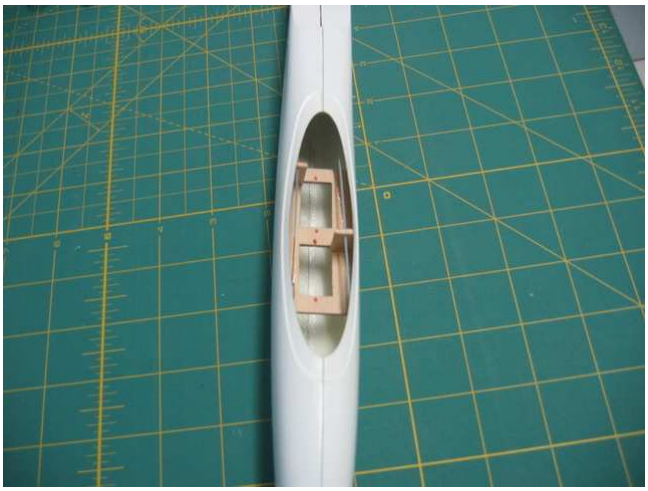
5.4. Cut slots on the servo mount.



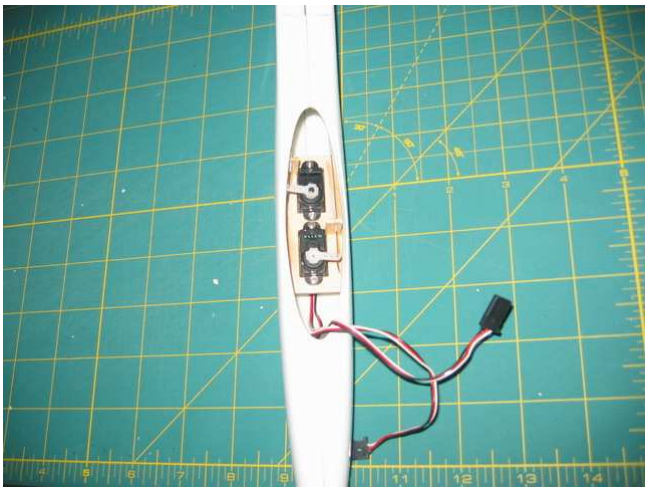
5.5. Install the servo mount and wood squares. Bond the servo mount onto the fuselage.

5.6. Install the rod tube.





5.7. Install servos.

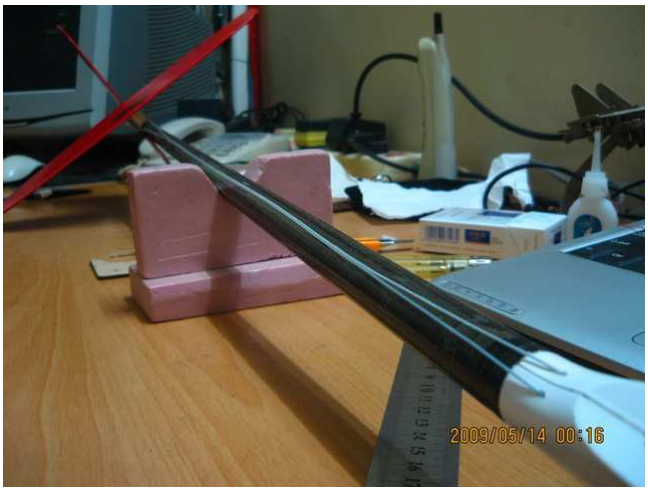


5.8. Install the servo Y-extension cable you created earlier.

5.9. Install receiver and batteries. Run the antenna out of the fuselage through the front part, and fix it on the tail boom with tape.

6. Install devices on the tail.

6.1. Run the tube from the fuselage to the tail through the tail boom. Fix it with tape.

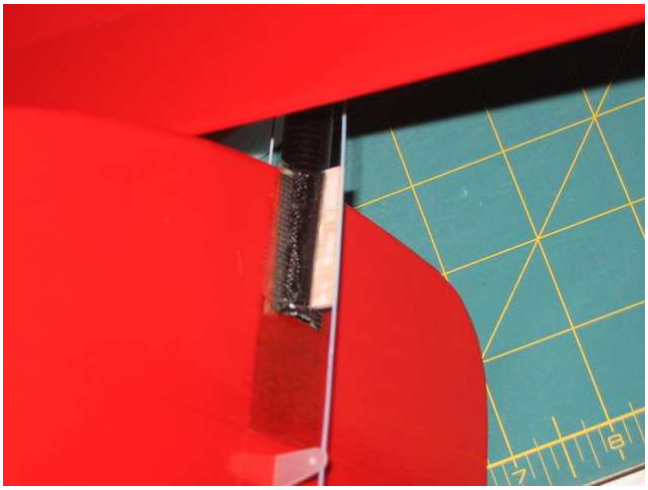


6.2. Insert 0.5mm steel wire into the tube. Make sure the wire can move smoothly. Sand the wire with 300# sandpaper if not.

6.3. Cut slots on rudder and elevator, put in the horn without glue, then adjust them into appropriate position.

6.4. Cut a piece of balsa wood. Put it at the end of the rudder rod tube. Trim the shape of the wood, and make sure the rod doesn't get pressure.

6.5. Fix the tube onto the tail boom with fiberglass and epoxy.



6.6. Make a Z bend on the wire with pliers.

6.7. Reinstall the horns with wires connected.

6.8. Power on the receiver, center the servo and then glue the horns on the control surface with fast glue.

7. Finish

8. Checking

8.1. Check the center of gravity: Install batteries, receiver and fuselage cover. Make sure the COG is 75-80mm behind the leading edge at the middle of the wing. Changing weight on the nose or tail to adjust the COG. The best COG position should be decided during flight.

8.2. Control surface testing: Make sure all devices are installed firmly and the position is accurate.

The Topsky Build Thread

http://www.rcgroups.com/forums/showthread.php?t=1121424

So after many questions, here it is, the first real review of Top Soaring's Topsky! The builder Wzg asked me to find someone to post a build thread and test fly his Topsky on here so I hooked up my friend Marcus, and ten days later, the big box arrived!

First impressions are really good! The packaging is great, it was double boxed, stuffed with tons of foam, and even had wood lined around the outside box to prevent the ever so gentle shipping companies we're all too familiar with from crushing it during the overseas transit. Out of the box there was zero damage and all the parts were present. Upon opening the box you'll find the all the usual bits and pieces and a very complete hardware kit, with control horns, pushrods and housings, carbon rod, lots of carbon and glass, pre-cut servo tray, even the wing plug is included! The manual is also very nice too, with step by step picture instructions.

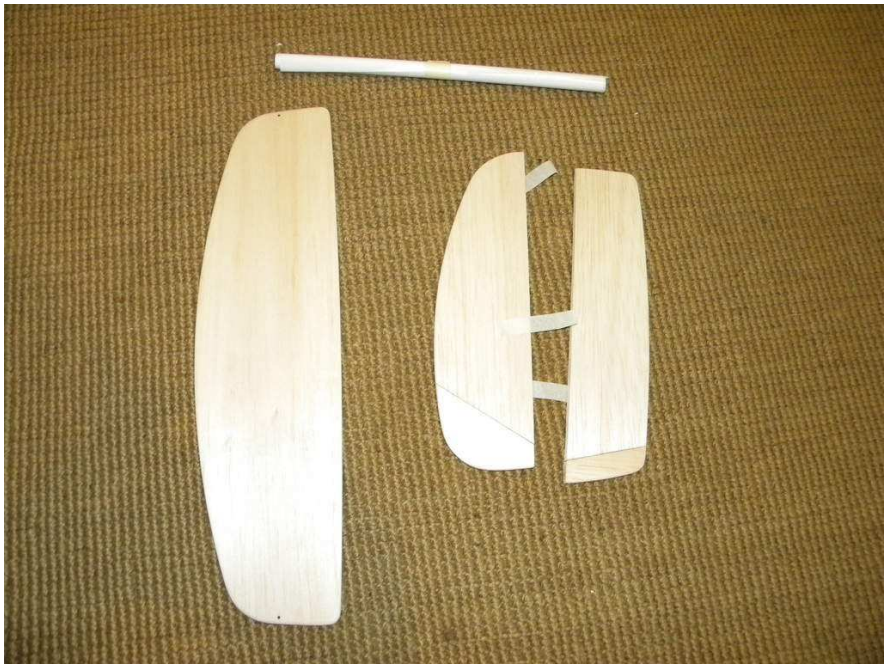
The first thing I noticed out of the box was the wing, its beautiful! The glass work is impeccable, and both the LE and TE are armored with a strip of carbon making them very strong. The carbon on the tips is also extremely clean and verrrryyy tough, we're gunna be hard pressed to get a peg through it! The pod is also very nice, with very graciously sized carbon strips and a very slick carbon hatch. The tails are competition grade balsa along with the stab mount. So let's start building!

The kit as seen upon arrival!

Very complete hardware kit, control horns, pushrods and housings, heat shrink, wing plug, pre-cut servo tray, and lots of carbon and glass to play with!

The pod, very clean and NOT like the Longshot as many people compare it to.

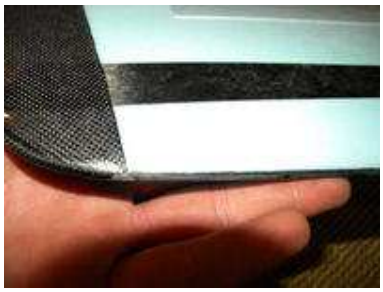
The tail feathers



The wings!

Carbon armored TE and tips

Carbon armored LE



Inside view of the pod, nice carbon supports

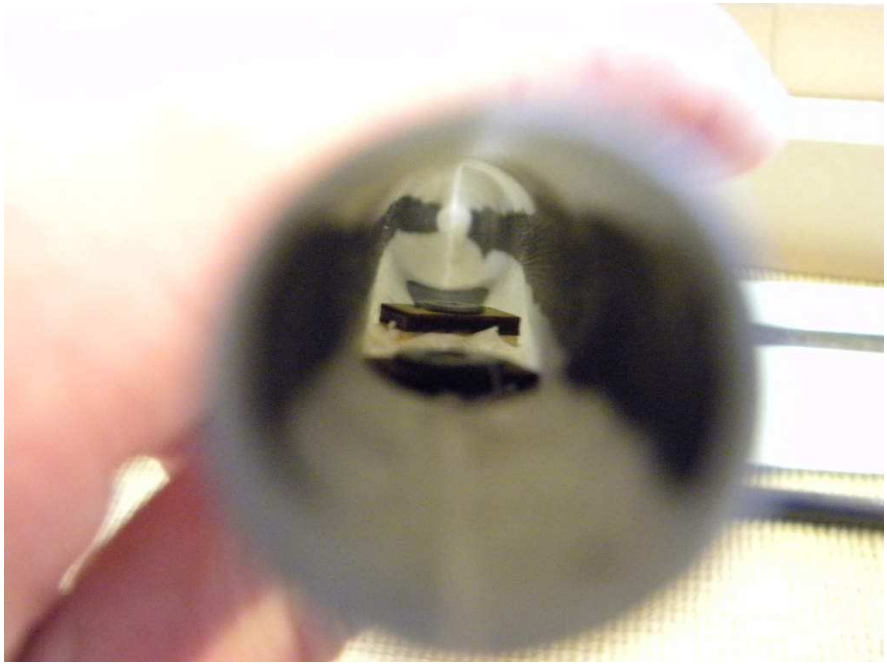
Tightly woven boom, very strong

All the carbon and glass!!

Like a mirror!!

Detailed photo of the hardware kit.

Views inside the pod, the wing bolt threads in the pod have carbon blocks with blind-nuts, verrryy tough!



So we started the build with the boom and pod. The stub of the pod was sanded down and the boom cut 10mm at a time until there was a snug fit. Then with some 5 min epoxy and micro-balloons, she was set in place.

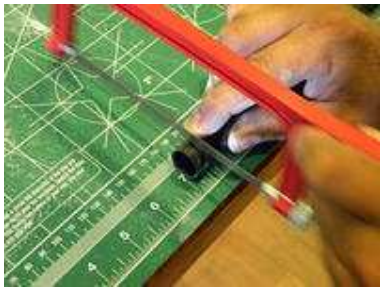
After that cured, it was time to mess with the servos and electronics in the pod. For rudder and elevator, Marcus decided on using some E-flite S-75's. The Rx is an AR6100e and the rx battery is a 220mah. In order to fit the S-75's, the holes in the tray had to be widened, they are pre-cut for about a D-60 sized servo.

After everything was test fitted, Marcus marked in the pod where the tray would set, roughed up the inside of the pod, and glued it in with some medium CA. Once in place, the servo wires were trimmed up to the proper length. A switch jack is also in the works, but not installed yet. Even still, there is plenty of room to remove everything if needed.

At the end, we drilled out the holes for the pushrods where they will exit at the end of the pod to go down the boom. The best way to do this was to drill a pilot hole with a tiny bit, and then file it into an oval using a rat tail file.

Sand the stub

Trimming the boom



Nice snug fit

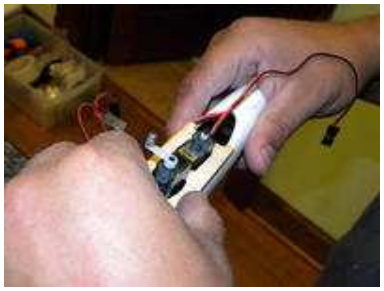
Mixing the splooge!

Time to apply

And on she goes

Trimming out the tray to fir the S-75's

Test fitting



Marking inside the pod

Shorten the wires

Glue it in place

Starting the pushrod exit holes

Filing them out with the rat tail

Time for the wing! The wing root is pre-beveled for a 6" dihedral, so that saved A LOT of time normally spent sanding in the angle. Also, this wing uses balsa at the root and carbon sleeves down where the wing bolts go in, so no hard points are needed, also saving time.

Marcus decided to use HS-45's for the ailerons, so first thing to do was make a template. Using some thin cardboard from a servo box, we made a template to match the outline of the 45's. Following the directions, the servos were to be placed in front of the carbon spar. Then also using another plane of mine for reference, we decided to place the horns on the ailerons in 30mm from where they're cut out of the wing. Marking 30mm in, I used a square against the hinge line and placed the servo template on the wing.

After taking some careful measurements of the template on the wing so that servos would be even, it was time to cut! Exacto made quick work of the glass, and then the foam left over was dug out with a scratch awl. And the fit? Like a glove! The 45's fell perfectly into place. Then I used a hole-saw made out of brass tubing to make a wiring channel.

Next it was time to mark the bolt holes through the wing. The best way I've found to do this with the balsa root wings is to line the wing up on the pod, mark the holes with a pencil, and then use a rat tail file to file out a channel through the root. This eliminates the "is it square?" guess work when drilling the wings after they've been joined. Plus, this creates a pilot hole so that all is needed is to enlarge the holes to fit the bolts. Also the wire channel was marked and filed out. After the balsa was filed, Marcus took an Exacto and added a few pin holes in it to give the epoxy in the root a better bite. Then it was time to tape off the roots and sand the skin so the wing-root glass would have good bite.

Once all the ground work was done, it was time to join the halves. Since this wing relies heavily on the strength of the glass and carbon patches to hold the halves together, only a small amount of 5 minute epoxy and micro-balloon mix was used to join the halves. The epoxy was set in and the dihedral was set

at 6". Time to cure!

Marking the location of the servos square to the hinge line

Template laid, time to cut!

Digging the foam

Brass hole saw making the wire channels

Like a glove!!

Mark the bolt holes locations

Filing out the bolt holes

Sanding the roots

Making the pin holes for the epoxy to bite better

Glued up and the clock is running!

Check the dihedral, 6"

Epoxy cured

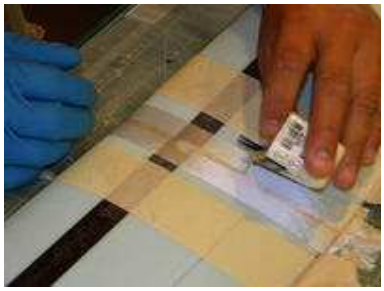
Wings continued! So now time for the glass, Marcus had a large strip of glass and prefers the one strip method, so we cut a 40mm wide (20mm on each root) and 14.5" long strip. I just bought a new tool/toy for this that one of my buddies Brian showed me, the fabric cutting wheel. WOW this makes cutting glass a little too easy! I can't wait to use it on every build haha! Anyways, back to the build the glass provided in the kit is more than enough to cover the root in 2 pieces, so if you have no glass laying around, the kit has all you need.

After cutting it, it was time to 3M77 her and lay her down. After it was on, time to set it for good. We debated on whether we should CA the glass or epoxy it down, I voted for the CA because it is strong, and very fast, but Marcus, being a religious Paul Naton follower had more faith in epoxy. That being said, 60 min finishing epoxy was used. The epoxy was poured on generously and worked into the glass weave via Marcus. Once that was worked into the glass really good, the excess was blotted out with some paper towel. Once this is cured, the carbon reinforcing patches will go on over the bolt holes over top the glass. So since this process takes fffooooorrrrreeeeeevvvvvveeeeeerrrr (stupid finishing resin) I guess this is it for now! We'll be back soon with the carbon patches and wing joining to the fuse. Not bad progress for 2 days work!

The glass and my new favorite tool!

3M77 and then its onto the wing

Time for the eternity paste!



Work it into the glass

Blot out the excess

Time to wait until eternity for it to cure!

Finally back to it!

Ok folks, I know its been over a week since I posted some good build photos, but to say that the last week has been one of the worst/most hellish weeks I've ever had would be a severe understatement. So enough about that, on to the build!

The wing glass took forever to cure, and by forever, I mean like after 4 days of drying, even though the resin mixed in the cup was rock hard and completely cured, the epoxy on glass was still tacky! Stupid finishing resin, I'll never use it on another wing root! The glass was hard though, so onward we went. Next step was to put the carbon reinforcing patches over the wing bolt locations. I don't really think they are very necessary just in case you're worried about weight. The reason why I say this is because I have a Long Shot 3 and the entire wing root is held together by just 4 diamond patches of carbon fiber over the bolt holes. I've launched the hell out of it and flown it since May and I haven't had it fail me yet. Anyway, we installed them because the instructions called for it, and this time we used thin foam safe CA to wet them out. Needless to say, they dried much faster.

For the patches, I took the big piece of carbon cloth and measured out a strip 40mm wide. Then I took the strip and cut 30mm pieces out of it, so I had four 40mm x 30mm pieces. Then I took the patches and cut the four corners at approximately 10 degree angle to get the diamond shape. After they were cut out,

a little 3M77 and on they went.

A good thing to do when installing the patches: put on only one side at a time. Why? This way you don't lose the location of the wing bolt holes you filed out previously. Install both patches on one side, then take a tiny drill bit and drill through the wing completely through the pilot holes. Then, flip the wing over and apply the patches to the other side and run the drill bit back through the holes you just made on the opposite side. When you do the bottom side, take good note of where the wire-exit hole is in relation to the front bolt hole, once again to keep you from losing it and drilling a hole in the wrong spot on the wing.

Once they were in place and all cured (much faster than 4 days!!!) it was time to drill the holes out bigger and put in the carbon sleeves into the wing for the hard points. The holes were drilled, and the supplied carbon rod was cut to length per the instructions. Be sure to sand the rod good before cutting it, that way the glue will have good bite when they are glued into place. The sleeves were glued in with thin foam safe CA.

Then we hit our first road block... the supplied wing bolts did not fit the threaded holes in the pod. So it was off to the hardware store and on to our next stopping point. Hopefully this one won't be as long as this last one!

Cutting the patches. My favorite tool again!

Patches ready to go!

Lay them approximately centered over the bolt holes

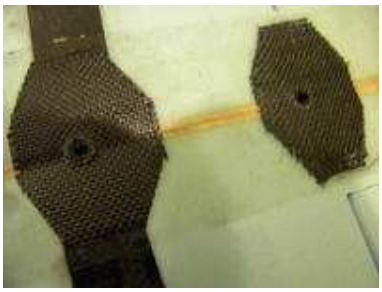
Wet them out with thin CA

Drill the holes so you don't lose them on the other side

Then apply to the other side

Cut the carbon sleeves to length

Then install!



Finished!!