

## Assembly Guide for the Sport PT 19



### Additional Material

Spars	3/8" X 3/16" X 24" Bass Wood	4
Triangle Stock	1/4" X 1/4" X 36" Triangle Balsa	2
		2
		1
Center wing Sheeting	1/16" X 3" X 36" Sheet Balsa Being added to short kit	1
Aileron Servo Blocks	Being added to Short Kit Cut Parts	
Wing Dowel	3/16" X 1" Hardwood Dowel	1
Cowl Blocks, Wing Trailing Edge Block for Center wing and Lower Fuselage Nose Planking	1/4" X 3" X 36" Balsa Sheet	1
		1

### Hardware Used

Control Horns	Dubro Micro2 Control Horn	4
Push Rod Sets	Dubro Micro 30" Pushrod System (.047)	1
EZ Connectors (Ailerons)	Dubro Mini E/Z Connectors	2

2 1/4" Wheels	Williams Brothers Smooth Pt No 14000	2
1/8" Wheel Collars	Dubro	2
3/4" Tail Wheel Assembly	E-Flite	1
Hinges	E-Flite Park Flier Hinges	1 pkg
Propeller	10 X 7 APC Electric	1

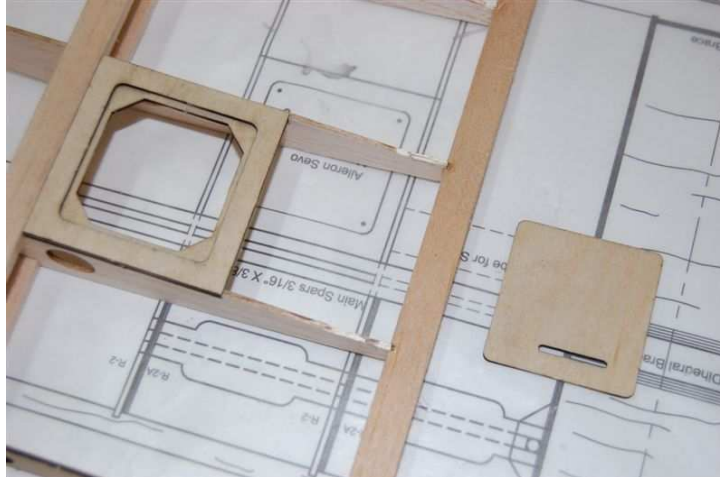
### Power and Radio Used

Motor	E-Flite 450 890kv out-runner	1
Electronic Speed Control	18 AMP Brushless	1
Battery	Common Sense 11.1V-2000mAh 10C LiPo or Common Sense 11.1V-1650mAh 10C LiPo	
Aileron Servos	Hitec HS-55 or equivalent	2
Rudder Servo	Hitec HS-81 or equivalent	1
Elevator Servo	Hitec HS-81 or equivalent	1
Receiver	Berg or Blue Bird 4 Channel	1
Aileron Servo Y Cord		1

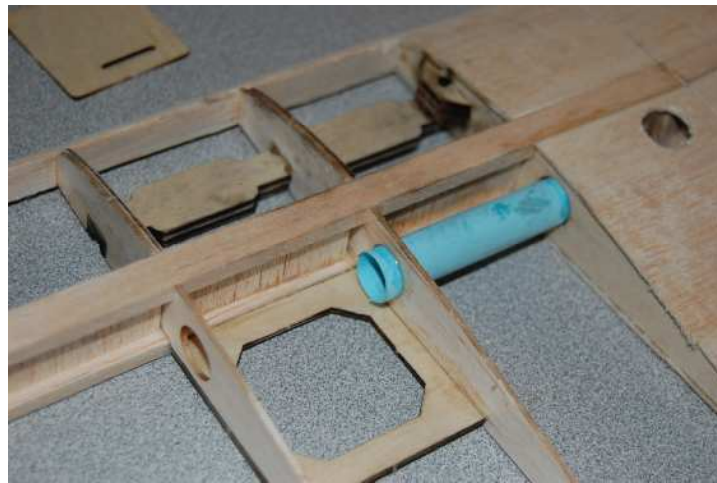
### Wing Construction

Cover plans with wax paper.

1. Pin the lower spar to the plans.
2. Fit R-1, R-2's, R-3's and R-3T over the lower spar and into false trailing edge notches (Note R-3T is slotted to accept the wing tip former)
3. Ensuring ribs are aligned with plans pin them to the building board.
4. Ensuring ribs are perpendicular to the spar and aligned with the plans glue them to the lower spar and notched false trailing edge.
5. Glue the top spar to the ribs.
6. Install notched false leading edge.
7. Install 1/8" leading edge and 1/4" trailing edge
8. Install 1/16" Plywood R-2A's
9. Install 3/32" sheer webbing centered between the upper and lower spar. Grain should be vertical or perpendicular to the spar grain.



10. Install aileron servo mounting plates.

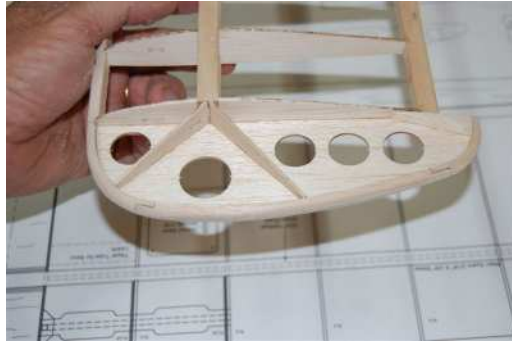


11. Tubes to route aileron servo wires are made up of scrap paper and glued between R-1 and R-2 prior to joining wing halves and planking center section.

12. Shape leading and trailing edge using razor plane and sanding blocks.

### **Wing Tip Construction**

1. Glue wing tip former to R-3T.
2. Glue wing tip braces R-5 through R-8 to the top and bottom of the wing tip former (Note: This will require bevel sanding for proper fit where the braces meet R-3T)
3. Glue a set of T-1, T-2 and T-3 to the top and bottom of each wingtip.
4. Glue T-9 to top and bottom of each wingtip.



5. Shape wing tip using razor plane and sanding blocks.

### **Joining wing Halves**

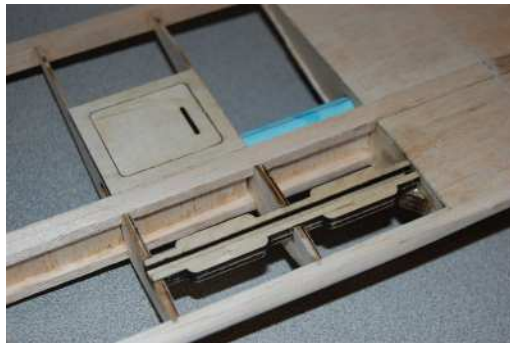
1. Wing halves are joined over the plans using two 1/16" ply doublers for the main spar and one for the trailing edge.
2. Use thirty minute epoxy to assemble doublers to spars.
3. Install front and rear sections of the 1/8" center rib centering to allow for 1/16" center planking.
4. Place scrap balsa on both sides of the center rib to provide material for the wing dowel mounting.
5. Install 1/16" square stock across leading edge, spar and trailing edge for center planking to glue to.
6. Plank center section using 1/16" balsa.
7. Install 3/16" dowel in wing center.

### **Installing Landing Gear blocks**

1. Build up left and right landing gear block assemblies by gluing two L-2 to an L-1 with spacing for 1/8" music wire.
2. Glue up two sets of three L-3 into a stack and attach to R-1



3. Glue the landing gear blocks to the L-3 stack and ribs, using epoxy.



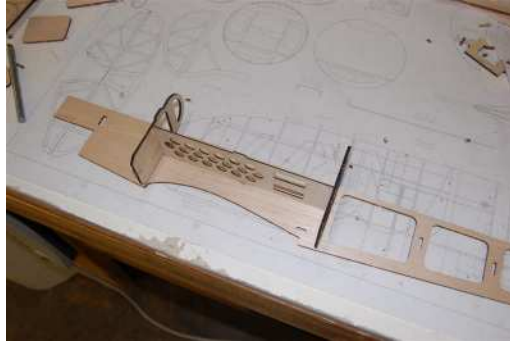
### **Tail Construction**



1. Assemble all components over the plans.
2. Shape using razor plane and sanding blocks.

### **Fuselage Construction**

1. Pinning one fuselage side assembly flat on the building board install F-3, Battery Compartment Floor, Wing Hold down Bracket, and F-4.

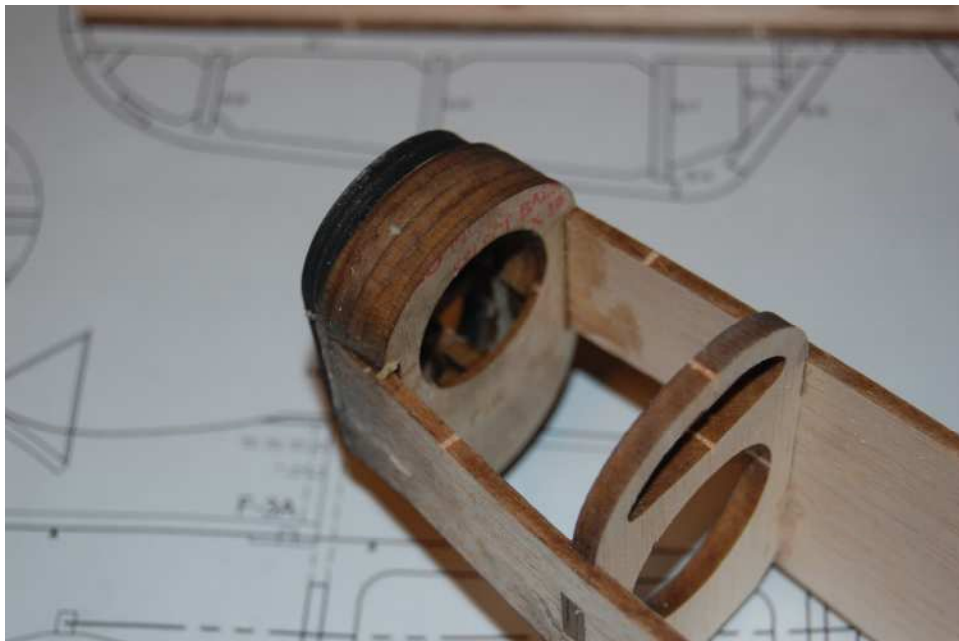


2. Insuring the fuselage is not twisted Install second fuselage side.
3. Remove fuselage from building board.

NOTE: Should you order the short kit from Top Notch Products, Plywood is not provided for a gas firewall.

NOTE: Gas version requires offsetting F-2 by re-cutting the notch on the right side of the fuselage for right engine trust. See plan.

4. Pulling side formers together install F-2
5. Build up the motor mount and nose block by gluing up two F-1s with F-1A through F-1C using epoxy .
6. Install the nose block/motor mount assembly using epoxy.



7. Glue in F-5 through F-8
8. Ensuring the fuselage is symmetrical and not twisted bring the two sides together gluing them at the rudder post.
9. Glue in ¼" triangular stock along the lower fuselage sides between the wing mount and the rudder post and between F-2 and F-3. (This triangular stock provides material to sand the lower fuselage sides to a rounded corner)
10. Using 3/32" balsa scrap from short kit, plank the fuselage top between F-2 and F-3.
11. Plank the lower fuselage between F-2 and F-3 with 1/8" Balsa sheet.
12. Plank the lower rear fuselage with 1/16" balsa.
13. Glue in 1/16" X 1/8" balsa or basswood stringers on the turtleback
14. Using razor plane and sanding blocks, shape the bottom edges of the fuselage.
15. Using 1/4" balsa sheet build up top and bottom areas between F-1 and F-2 with balsa blocks. (Do not glue permanent).



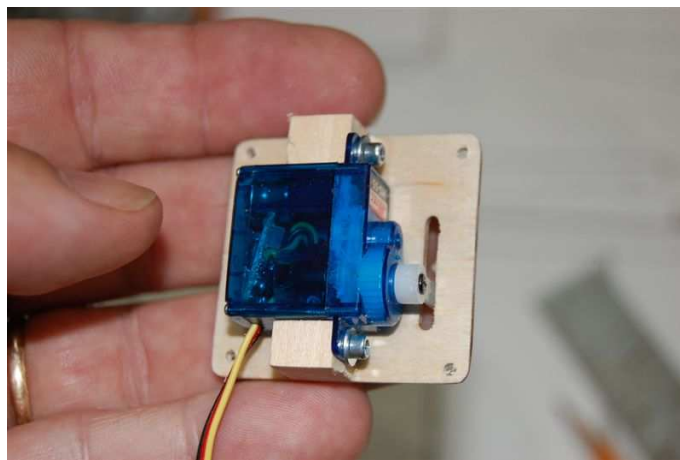
16. Using razor plane and sanding blocks, shape the nose blocks along with the bottom and top hatch blocks. (To expedite the process a power disc and belt sander was used to rough sand the prototype to a rough shape)
17. Hollow out upper and lower blocks to one quarter inch thickness.
18. Using epoxy blue bottom blocks between F-2 and Nose blocks. (This block is critical as it carries motor stress back into the fuselage)

19. Add guide blocks to the bottom of the upper block to align it with the fuselage sides. This motor hatch will be held down with magnets)
20. Install pushrods for rudder and elevator. (Hitec HS-81 servos and Dumas Park Flyer .047 pushrods were used on the prototype)
21. Glue 1/16" X 1/8" balsa stringers to turtleback.

### **Hatch Construction**

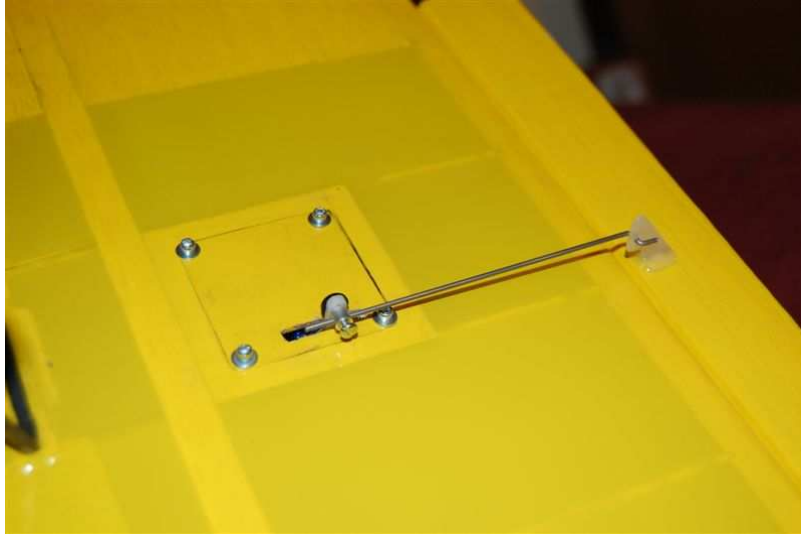
1. On a flat table, glue three F-3A to the Battery Hatch base.
2. Glue four 1/16" X 1/8" stringers into notches in F-3A's.
3. On a flat surface covered with wax paper glue up hatch skin.
4. With the Battery Hatch Base on the edge of a flat table, Starting at the centerline, hold down one side of the hatch skin allowing the excess skin to over hang the table as you glue it.
5. Trim the excess skin off allowing the hatch to rest flat on the table surface.
6. Using the same method glue down the other side of the skin.
7. Add scrap balsa strips to each side of the base of the hatch to align it with the fuselage sides.
8. Cut out cockpit openings.

### **Wing Final Assembly**



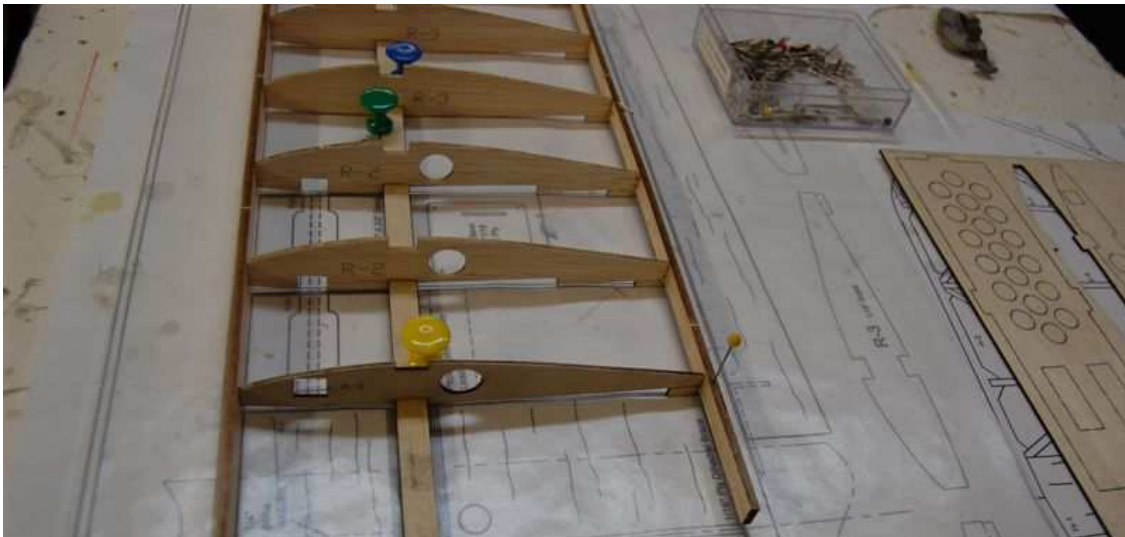
1. Using scrap hardwood blocks mount Hitec HS-55 or equivalent servos to the aileron mount plates.



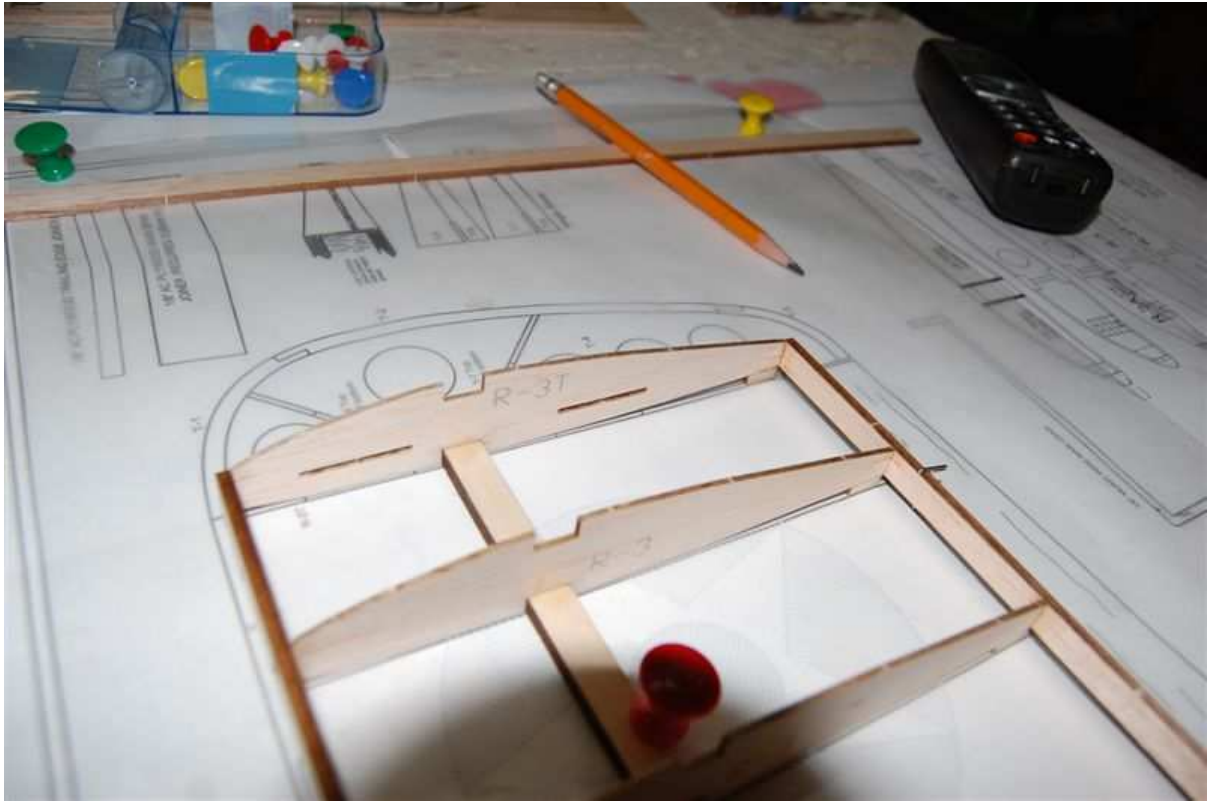


2. Using listed hardware build up aileron linkage.
3. Bend landing gear from 1/8" music wire to match patterns.
4. Install landing gear using servo mount screws and straps cut from scrap brass or plastic.

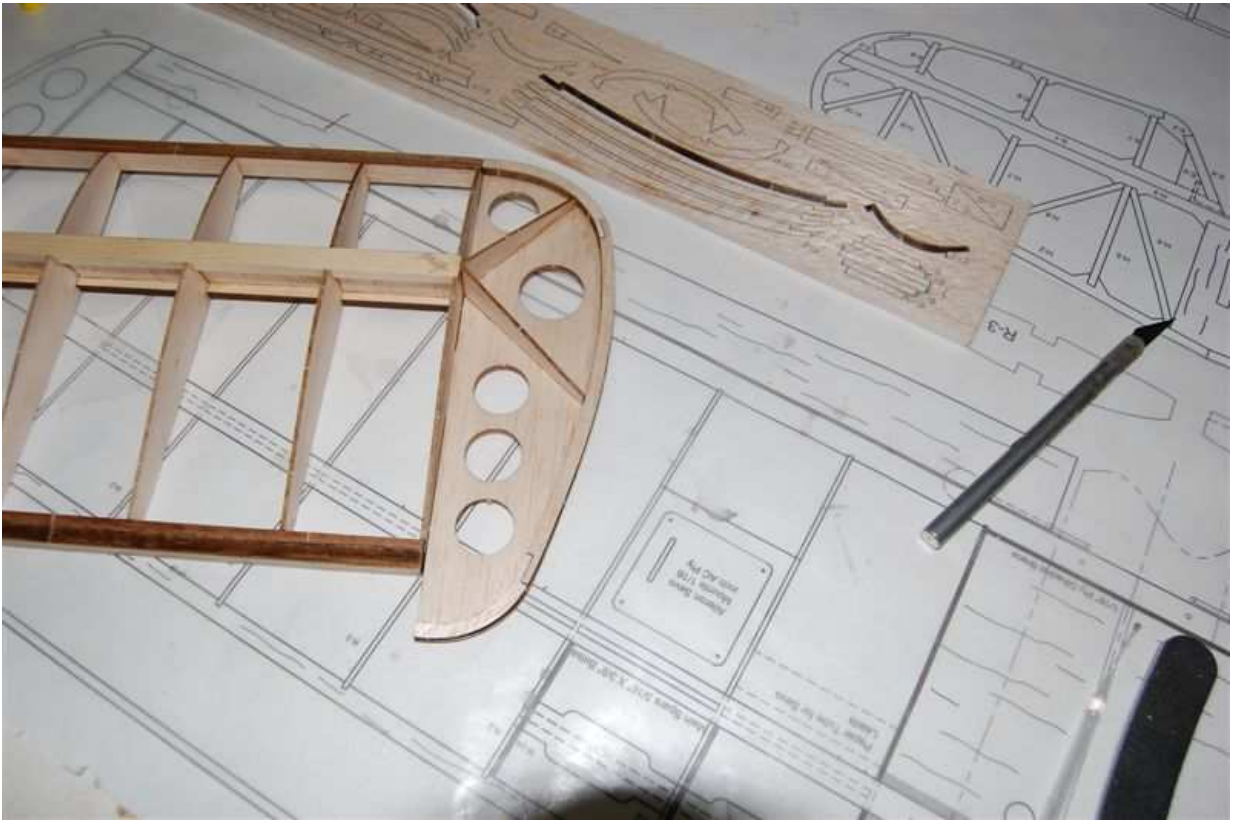
OK YOU HAVE REACHED THE POINT I STOPPED WORKING ON THIS  
THE REST IS PHOTOS I ADDED DUE TO THE AMA PUBLISHING THIS  
**EXTRA WING CONSTRUCTION PHOTOS**



If you are new to this, Make sure you build a left and right wing panel

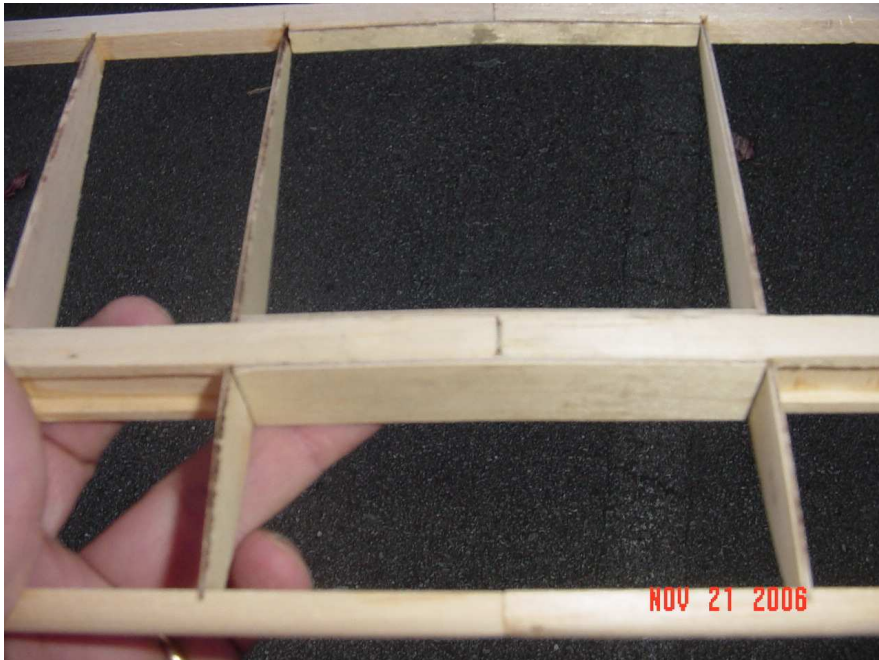
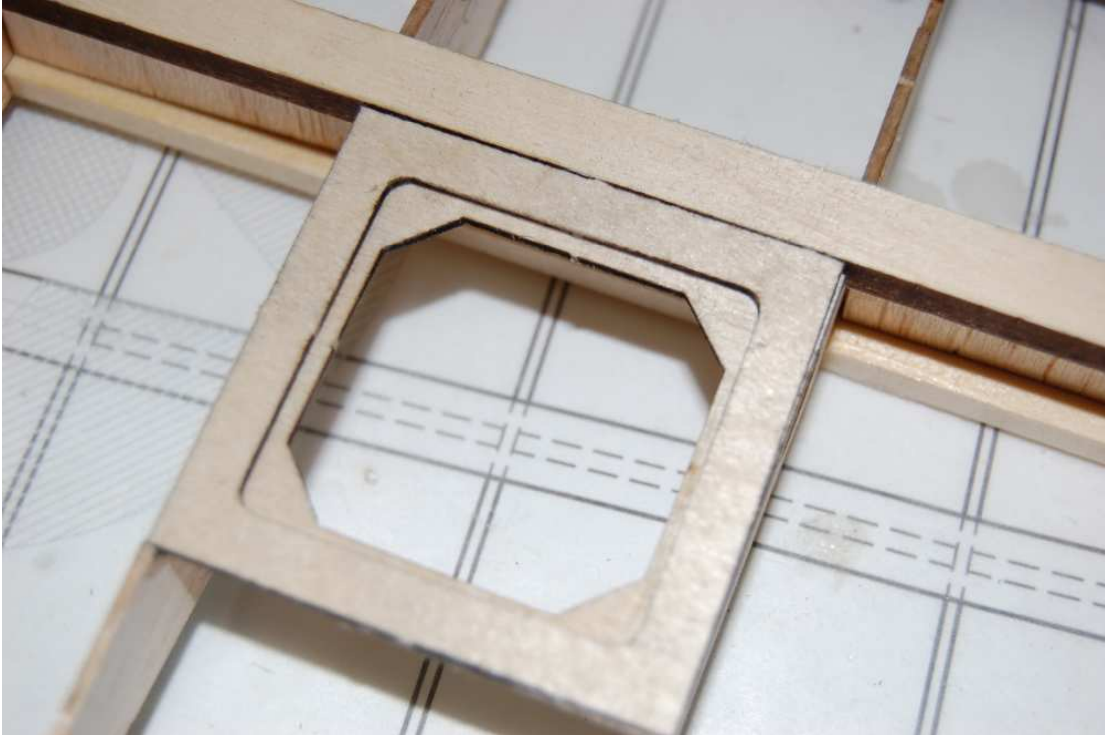


3T is slotted for the tip.





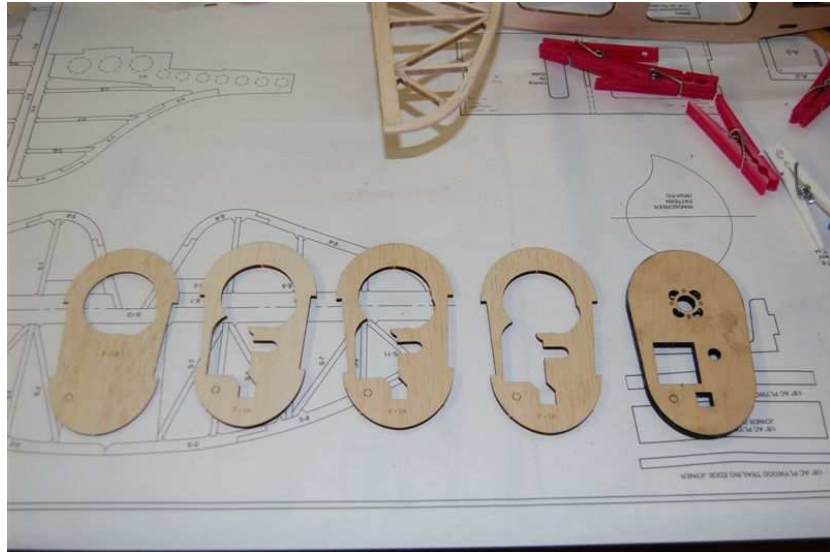
Vertical Grain Shear Webs are a major factor in the wings strength. If you get the short kit these are included



Plywood wing spar doublers are added then the wing center ribs were added. This is not the normal way things are done but it worked for me.

## EXTRA PHOTOS ON SHAPING THE NOSE AND MOTOR HATCH

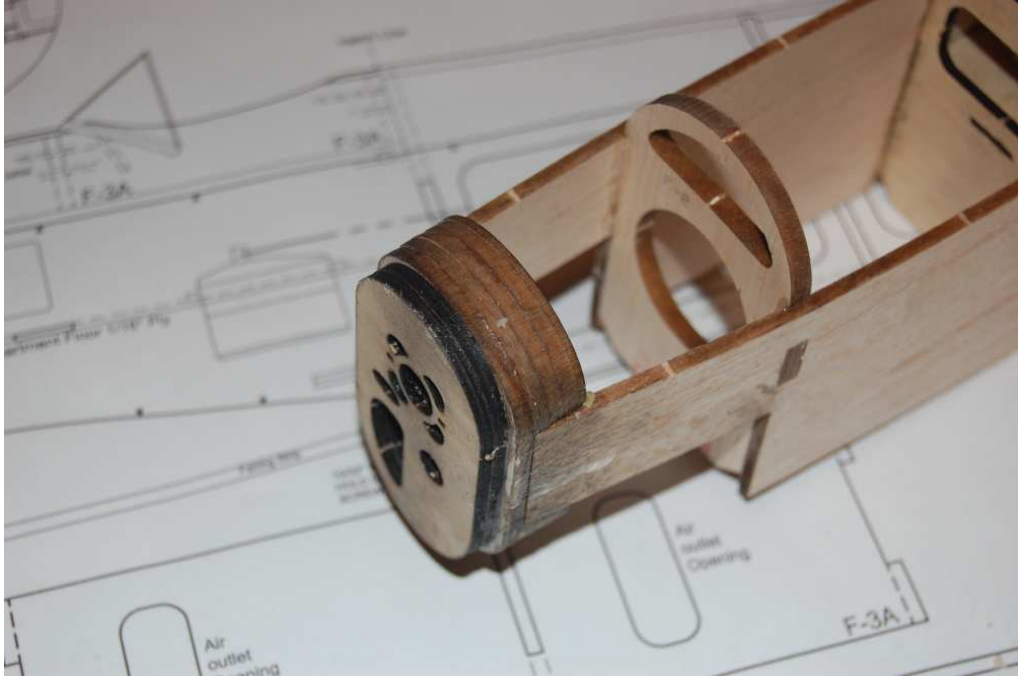
NOTE: IT is important the nose block is glued up in order as it becomes the cooling ducts to force the incoming air thru the motor block.



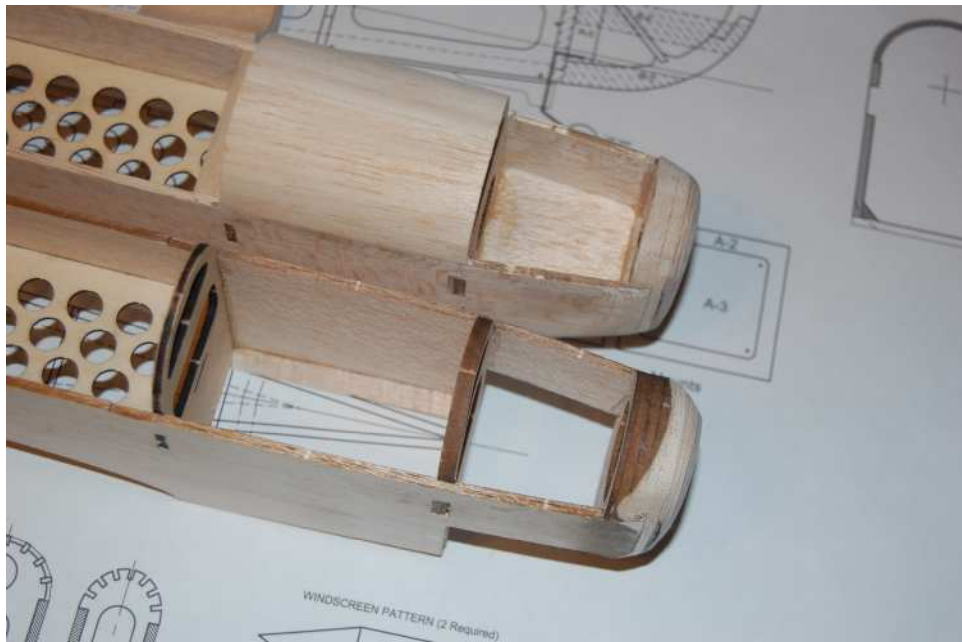
The photo above is not of the PT-19 but a Gee Bee that was designed from it.

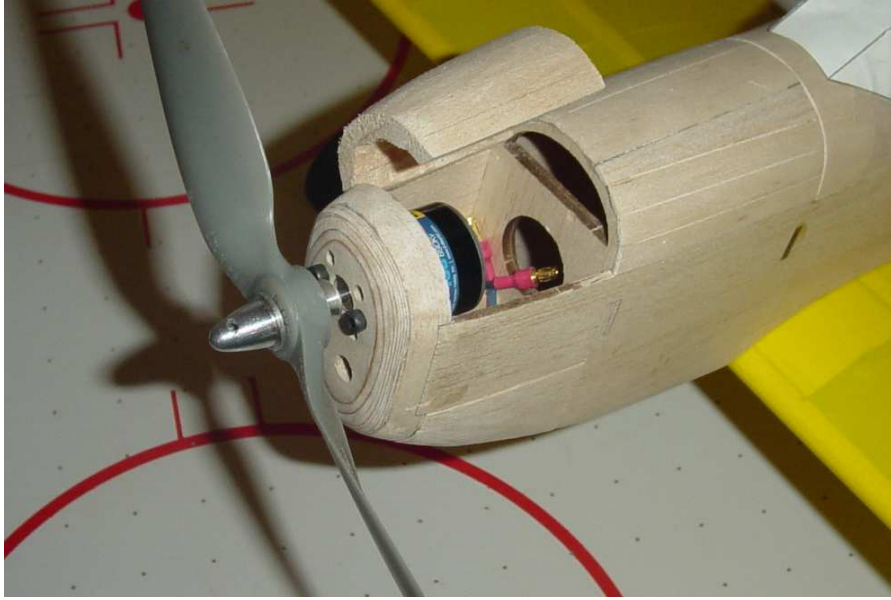
This photo shows the reasoning behind the layup of parts. It is arranged to allow the scale inlets to force air around the motor.

While the top hatch is held on by magnets the lower blocks need to be glued in firmly as they carry the stresses of the motor mounted to the front piece into the main fuselage. I used epoxy.



When you start to sand the nose blocks down do not be afraid to use a disc or orbital sander for the initial roughing out. I used 40 grit paper to get it close. By the way. I did it this way with blocks so there would be no reason to make a separate cowl piece.





Although this is the first prototype it shows the basics for mounting the motor and its hatch. Use Button head allen screws to secure the motor.

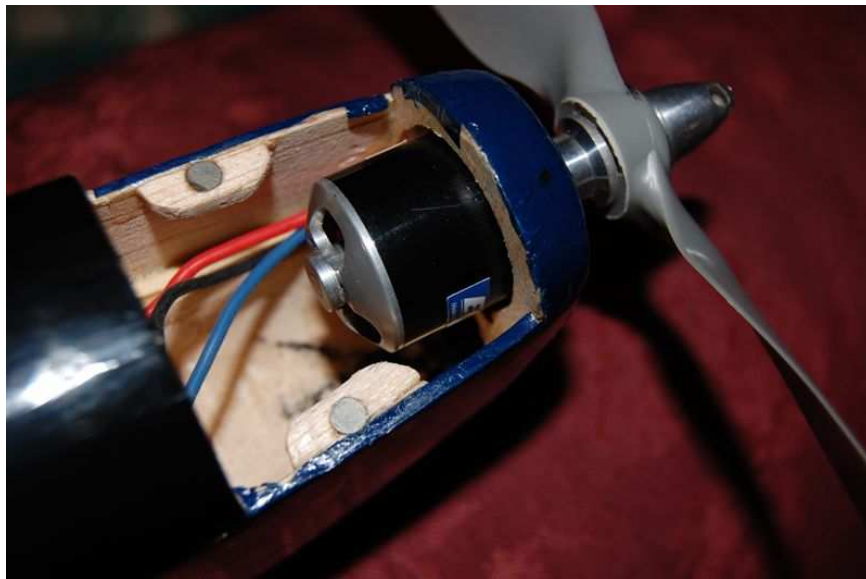


Also the Gee Bee but it shows how much you can sand away.





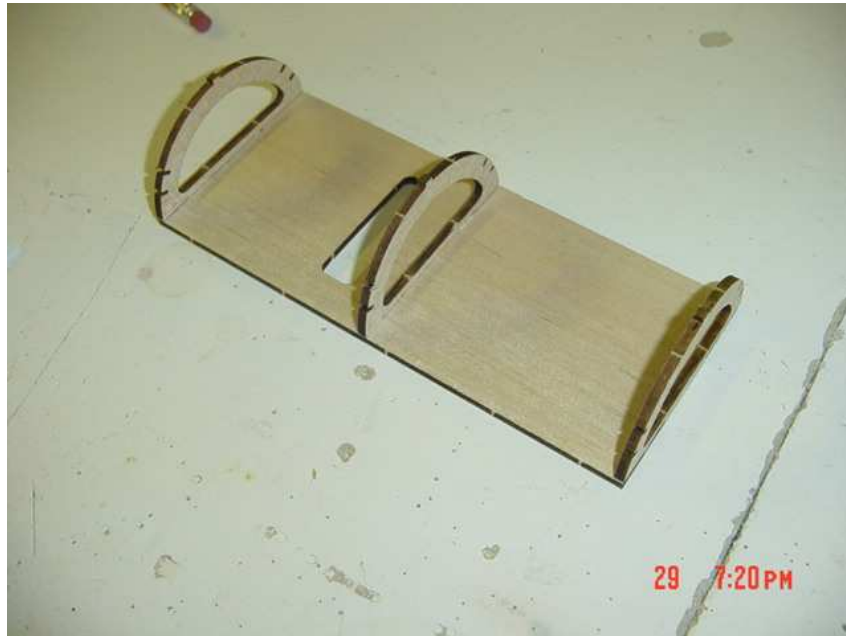
The blocks for the upper hatch and lower cowl are not included in the short kit. I used half inch balsa to glue them up. Use Epoxy on the lower block for strength



Screws holding the motor in place come thru the plywood nose plate. The nose hatch is held down with magnets from Radio Shack.

**EXTRA PHOTOS OF THE HATCH CONSTRUCTION.**

THESE PHOTOS ARE OF THE HATCH ON A GEE BEE MODEL-D BUT USE THE SAME TECHNIQUE.



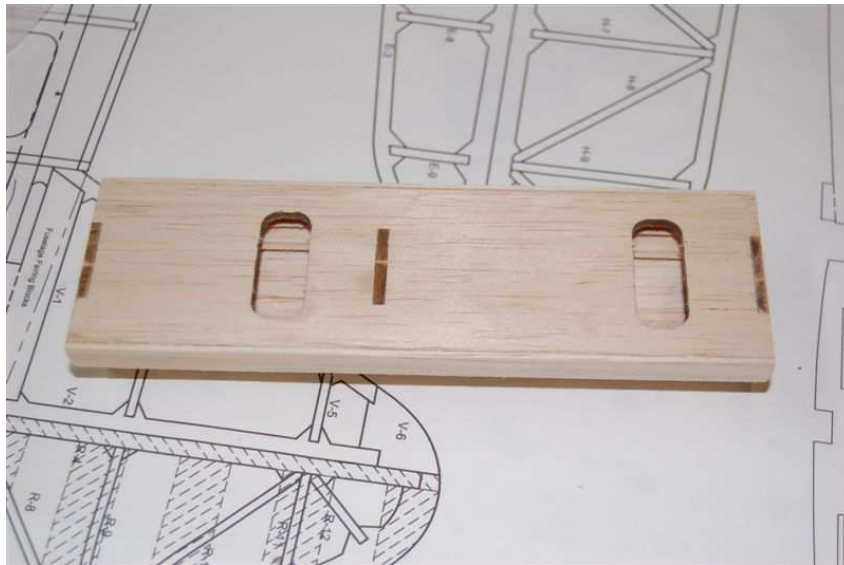
Build up the base



Add the stringers to keep the sides from sagging when you cut out the two openings for the cockpits. NOTE: This is not the PT-19



Do not cut out the hatches until the skin is glued to the frames. Do this final gluing on a flat tabletop doing one side at a time. Place the hatch on the edge of the table and glue the skin to the frames on the side that is overhanging the table. Trim the excess and turn the hatch to do the other side.



These cooling holes on the PT 19 hatch are to allow the cooling air out of the airframe



Do not depend on the hatch magnets to be enough to hold the battery in place while flying (Ask me how I know) I use the forward magnet mount to anchor the end of the battery and a swing around plywood plate to hold mine in place.