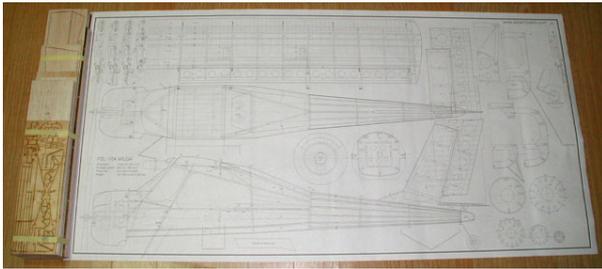


# PZL-104 WILGA INSTRUCTIONS

www.estarmodels.com

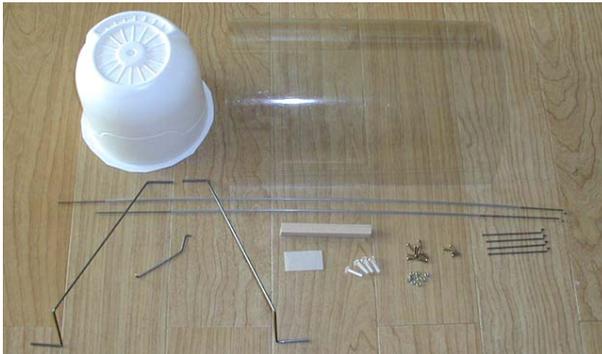
## ● KIT INCLUDES



Full size plan.

### Laser-cut parts.

- 1.5mm(1/16")xL600mm(24") balsa : 2sheets
- 1.5mm(1/16")xL560mm(22.4") balsa : 2sheets
- 1.5mm(1/16")xL500mm(20") balsa : 1sheet
- 1.5mm(1/16")xL480mm(19.2") balsa : 1sheet
- 1.5mm(1/16")xL450mm(18") balsa : 1sheet
- 1.5mm(1/16")xL430mm(17.2") balsa : 1sheet
- 1.5mm(1/16")xL370mm(14.8") balsa : 2sheets
- 1.5mm(1/16")xL330mm(13.2") balsa : 2sheets
- 3.0mm(1/8")xL600mm(24") balsa : 2sheets
- 3.0mm(1/8")xL500mm(20") balsa : 2sheets
- 3.0mm(1/8")xL430mm(17.2") balsa : 2sheets
- 3.0mm(1/8")xL330mm(13.2") balsa : 2sheets
- 5.0mm(3/16") xL600mm(24") balsa : 1sheet
- 5.0mm(3/16") xL330mm(13.2") balsa : 1sheet
- 5.0mm(3/16") xL553mm(22") balsa : 2ea
- 1.8mm(5/64")xL300mm(12") plywood : 1sheet
- 3.0mm(1/8")xL600mm(24") plywood : 3sheets



Vacuum formed Cowl.

Motor mount 10x10x90mm.

- Landing gears(2ea), Silicon tubes(4ea) and Tail gear.
- 2mm bolts and nuts(10sets), 2mm screws(4ea).
- Wingbolts (4ea).
- CA hinge.
- Pushrods(4ea) for Rudder, Elevator, Ailerons and flaps.
- Clear plastic for Windshield 300x300mm(12x12").



Instructions and Stickers.

## ● ITEMS NEEDED TO COMPLETE



480 motor(2.5~3:1 geared) or BL motor (5~6:1 geared, 12~15A : Himax 2025 kv4200 or Feigao 13084-13L kv4462 recommended).



ESC (25A).

GWS slow prop 1047 or APC 10x5E.



Li-Poly 11.1V 1700~2400mAh Battery w/Li-Poly charger.



Mini Receiver(6 channel).



6 submicro Servos (Hitec HS-55 / Futaba S3108 / GWS pico servos, or equivalent) Servo extension cords and Y-harness.

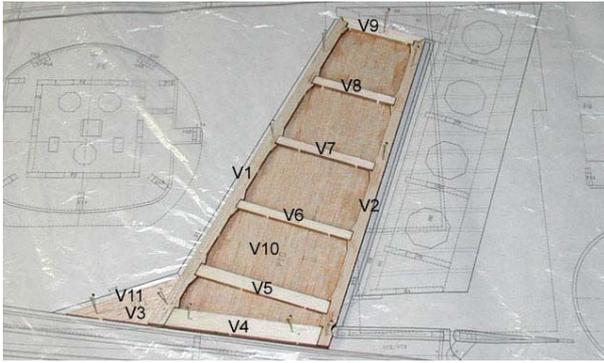


3 rolls of covering film. (Solite/Monokote/Oracover)

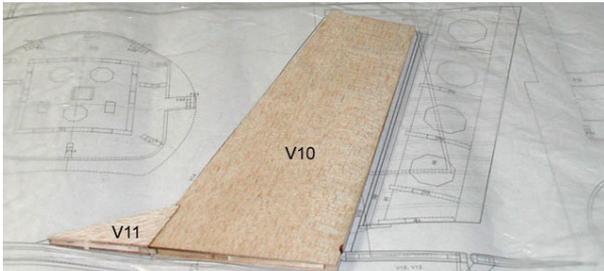


63mm(2.5") Wheels, Wheel Collars (4ea) and Rod adjusters (6ea).

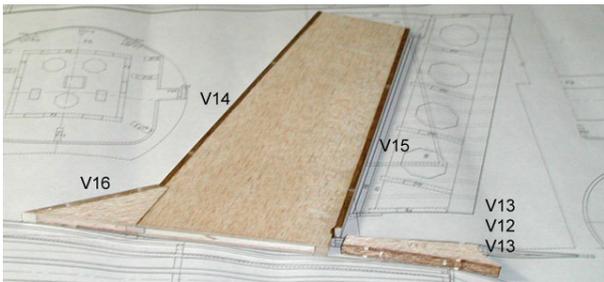
## ● TAIL CONSTRUCTION



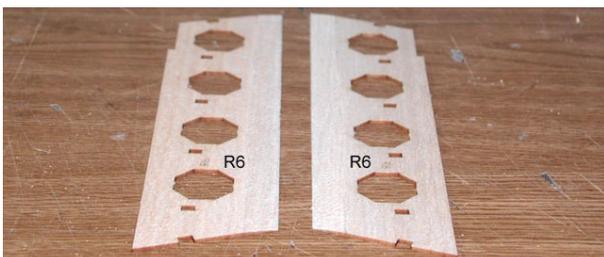
1. Lay the waxed paper or PVC film over the plan. Pin the vertical fin sheets(V10-V11) and frames(V1-V9). Glue them with thin CA.



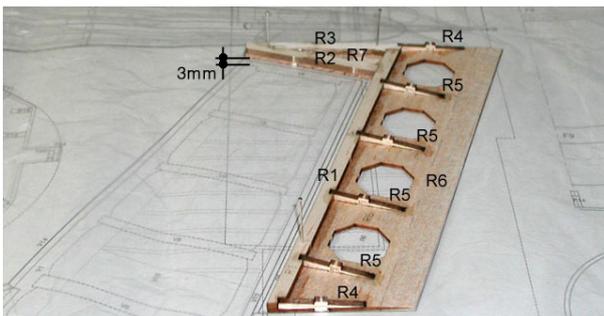
2. Remove pins and glue the sheets(V10, V11) with thick CA.



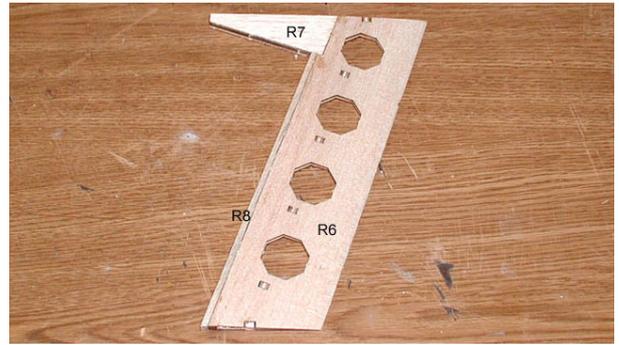
3. Glue the leading and trailing edges(V14-V16) with thick CA. Glue stabilizer bed(V12, V13) together.



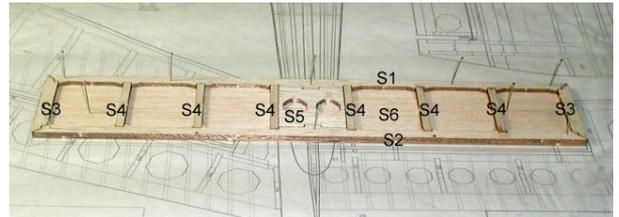
4. Prepare rudder sheets(R6) and sand trailing edges.



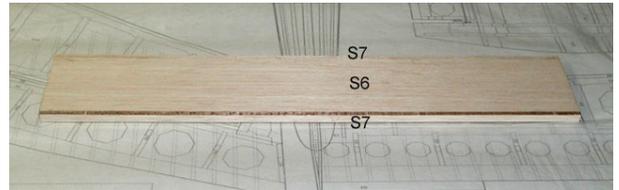
5. Pin the sheet(R6) on the plan and glue frames(R1-R5,R7).



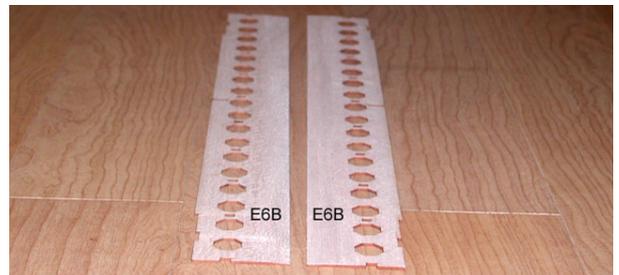
6. Glue the sheets(R6,R7) and leading edge(R8) with thick CA.



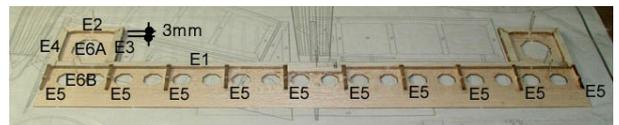
7. Pin the stabilizer sheet(S6) and frames(S1-S5). Glue them with thin CA.



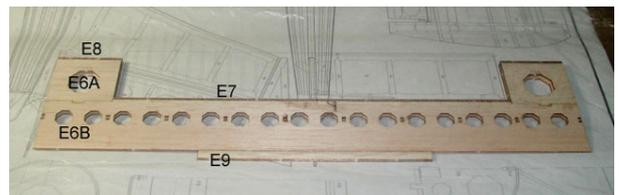
8. Glue the sheet(S6), leading and trailing edges(S7) with thick CA.



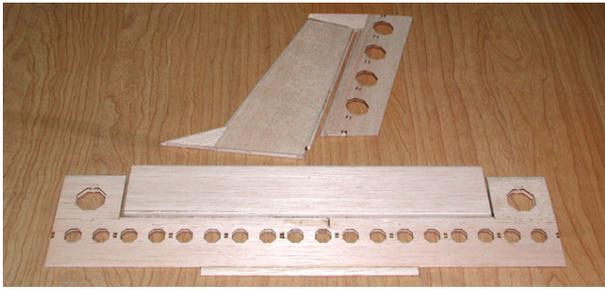
9. Prepare elevator sheets(E6B) and sand trailing edges.



10. Pin the sheets(E6A, E6B) on the plan and glue frames (E1-E5).

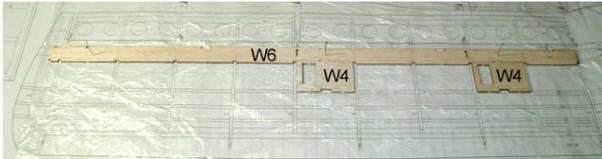


11. Glue the sheets(E6A, E6B), leading edge(E7, E8) and trim tab(E9) with thick CA.

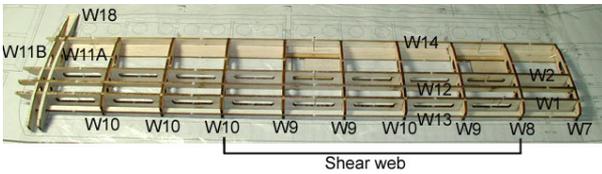


12. carefully sand all surfaces.

## ● WING CONSTRUCTION



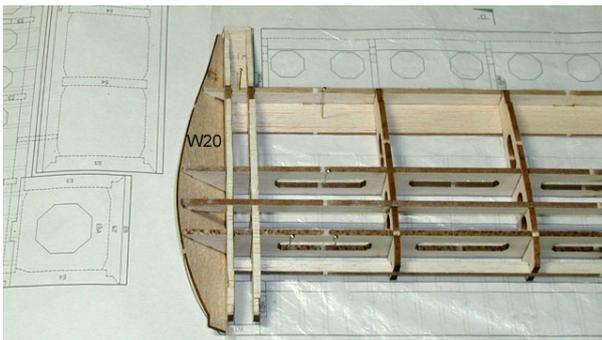
1. Pin the parts(W4, W6) and glue together with thin CA.



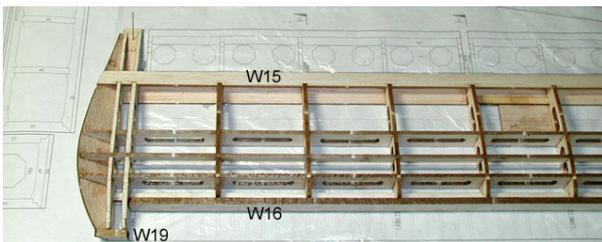
2. Assemble ribs(W7-W11B), main spars(W1, W2), sub leading edge(W13), sub spar(W12), trailing edge(W14) and wingtip part(W18) on the plan. And then glue together with thin CA. Glue Shear webs to the main spars.



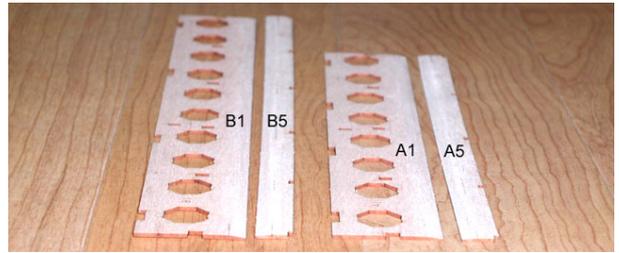
3. Glue plywood servo trays(W5) with thin CA.



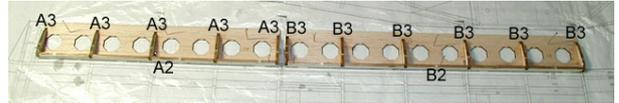
4. Glue wingtip (W20) with thin CA.



5. Glue leading edge(W16, W19) and trailing upper sheet(W15).



6. Prepare aileron and flap parts(A1, A5, B1, B5) and sand trailing edges.



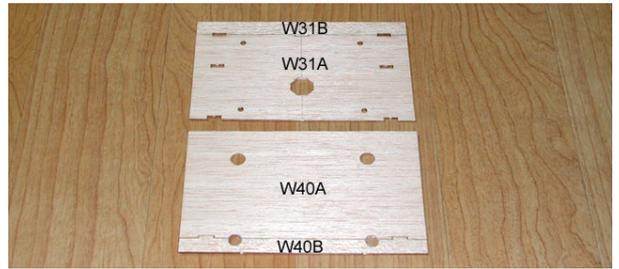
7. Assemble sub leading edge(A2, B2) and ribs(A3, B3) and then, glue them.



8. Glue leading edge(A4, B4) and trailing upper sheet(A5, B5).



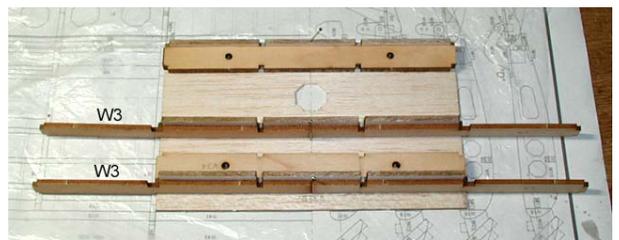
9. Assemble the other side wing.



10. Glue lower sheets(W31A, W31B) together. Glue upper sheets(W40A, W40B) together.



11. Pin the lower sheet(W31A, W31B) and temporary assemble spars, trailing edge(W32, W33, W39) and balsa(below) and plywood(above) wingbolt mounts(W34's, W35's).



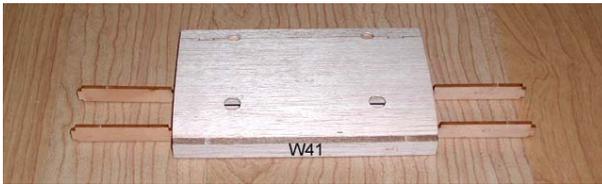
12. Temporary install wing joiners(W3).



13. Assemble ribs(W36), spar(W37), sub leading edge(W38) and then, glue them.



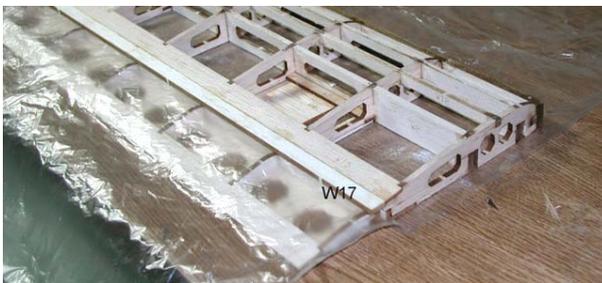
14. Glue the upper sheet(W40A, W40B) with thick CA.



15. Sand and glue leading edge (W41) with thick CA.



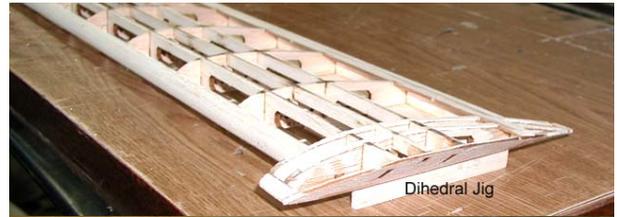
16. Glue the slat parts together (W21-W22, W43A-W43B) with thick CA.



17. Glue trailing edge(W17) with thick CA. Refer to the wing section on the drawing and use cardboard to make a gap.



18. Glue center trailing edge(W42) with thick CA. **Apply thick CA glue at each joints for reinforcing.** And then, carefully sand surfaces.

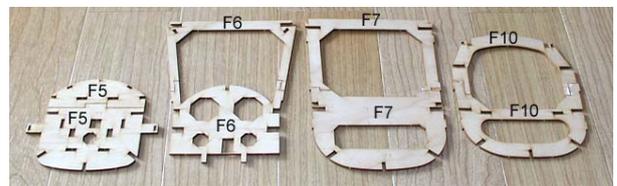


19. Glue right and left wings together. Use dihedral jig for dihedral setting..

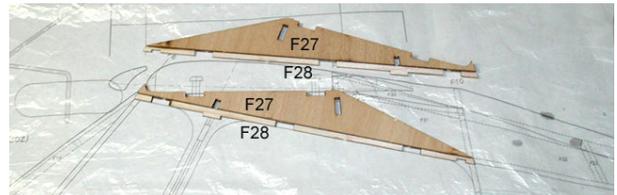


20. Wings are ready to cover.

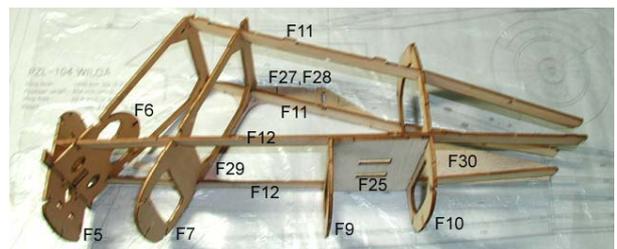
## ● FUSELAGE CONSTRUCTION



1. Glue Bulkheads(F5, F6, F7, F8) together



2. Glue the parts(F27, F28) together



3. Lay right side parts(F27, F28, F29, F30) on the plan and temporary assemble right longerons(F11, F12), bulkheads(F5, F6, F7, F9, F10) and servo bed(F25). And then, install left longerons(F11, F12).

Make sure to pay attention to all bulkheads, the numbers should be facing forward.

Pins and glues are not required in this step.



4. Install bulkhead(F8), left side parts(F27, F28, F29, F30) and lower longerons(F13, F14).

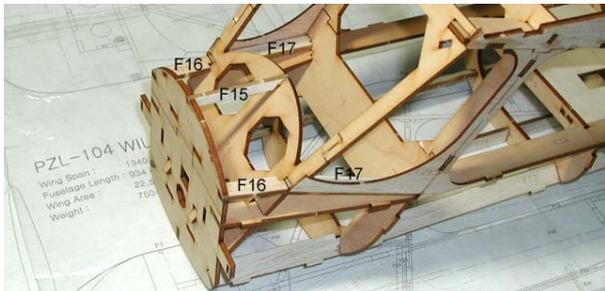
Pins and glues are not required in this step.



5. Install the part(F21) and bulkhead(F43). Pins and glues are not required in this step.



10. Install panels for pushrod exit(F49-F51). **Apply thick CA glue at each joints for reinforcing.** Insert and glue plastic pipes for elevator and rudder pushrods.



6. Install turtle deck frames(F15-F17). Pins and glues are not required in this step.



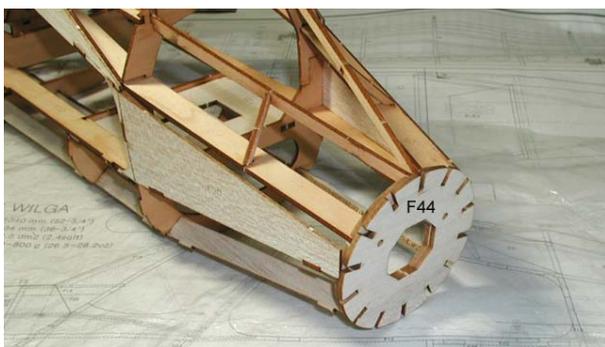
11. Glue plywood servo rails(F26).



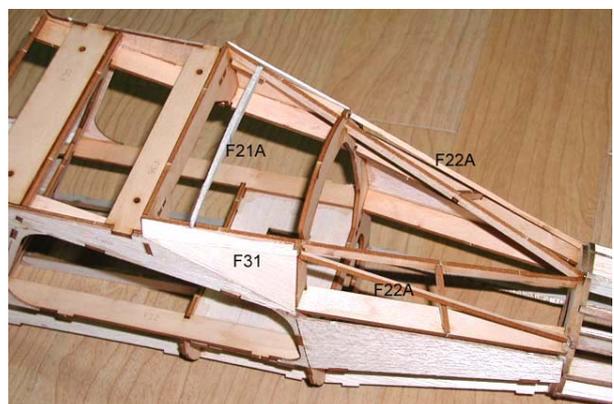
7. Install rear cockpit frames(F20, F22). Now glue all the parts together with thin CA. And then, **Apply thick CA glue at each joints for reinforcing.**



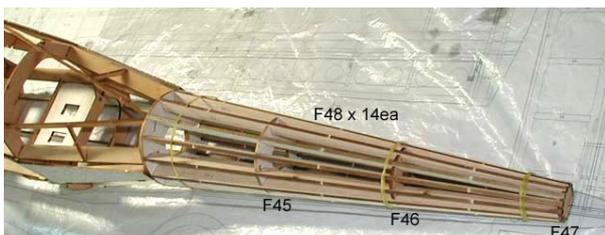
12. Glue plywood wing mounts(F35, F36).



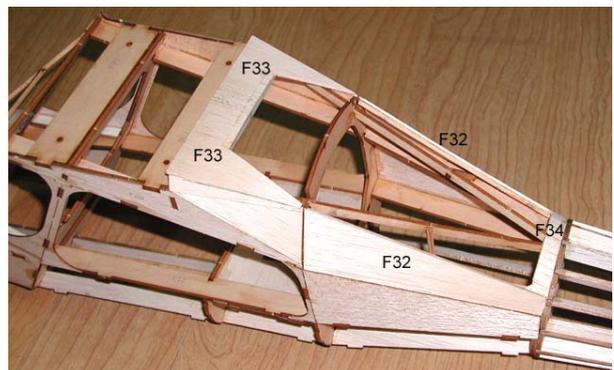
8. Glue the bulkhead(F44).



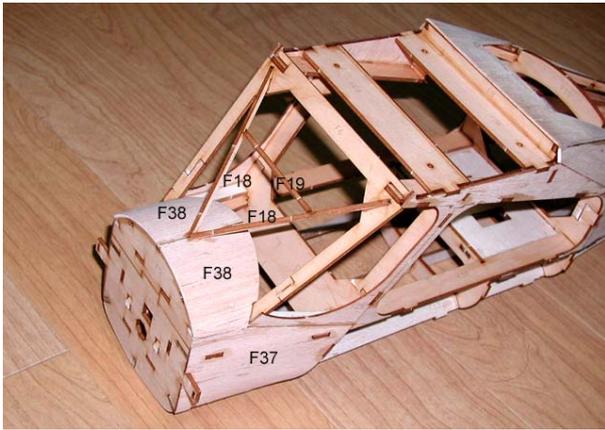
13. Glue rear window frames(F21A, F22A).



9. Temporary assemble rear fuselage bulkheads(F45, F46, F47) and longerons(F48). After sight check down the fuselage to insure against twist, then apply thin CA.



14. Glue rear cockpit panels(F32, F33, F34)



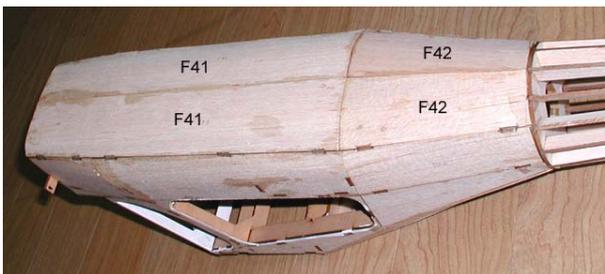
15. Glue fore cockpit frames(F18, F19), turtle decks(F38) and fore side panels(F37).



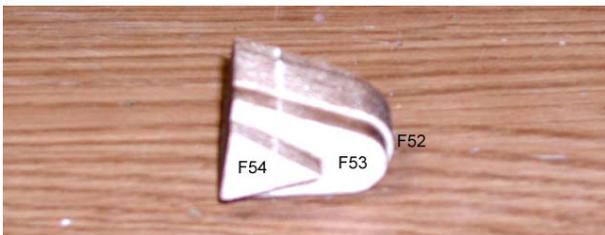
16. Glue landing gear mounts(F23).



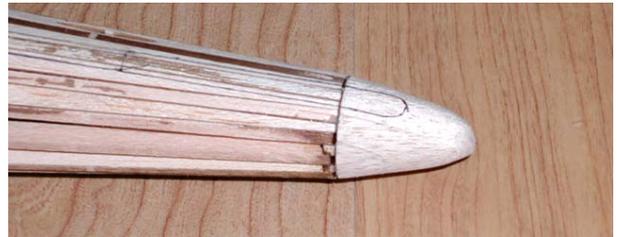
17. Glue fuselage side panels(F39, F40).



18. Glue fuselage lower panels(F41, F42).



19. Glue tail cone parts together.



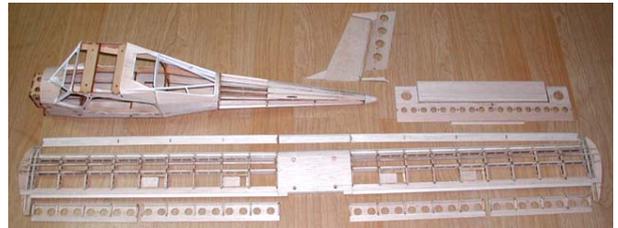
20. Temporarily glue and sand tail cone



21. Carefully sand fuselage surfaces.



22. Paint cockpit area. Install tail gear and glue tail cone.



23. All the airframes are ready to cover.

## ● COVERING AND EQUIPMENT INSTALLATION



1. Cover Wilga with your trim choice.



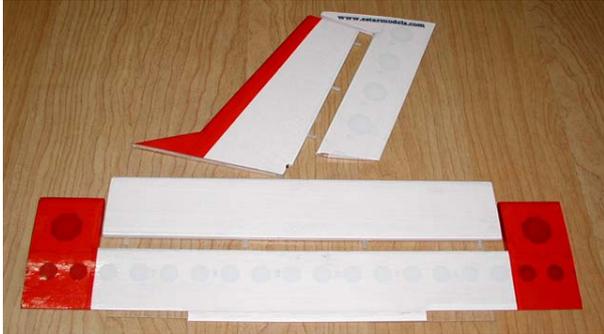
2. Insert and glue plywood slat supports(W23).



3. Glue slats.



4. Cut CA hinges as shown above.



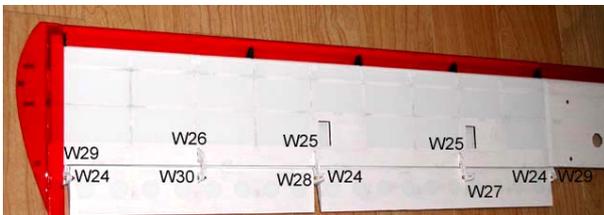
5. Make hinge slots and pre-install hinges. (Do not glue hinges in this step.)



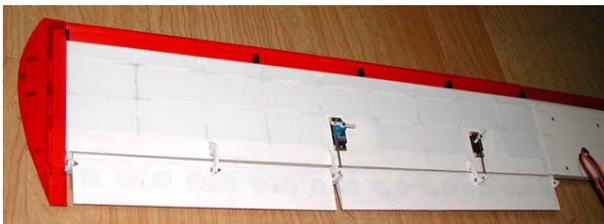
6. Glue stabilizer and vertical fin to the fuselage with thick CA. (Horizontal tail must be paralleled with wing and vertical fin must be at right angle to horizontal tail. Wings must be installed temporarily to align them.)



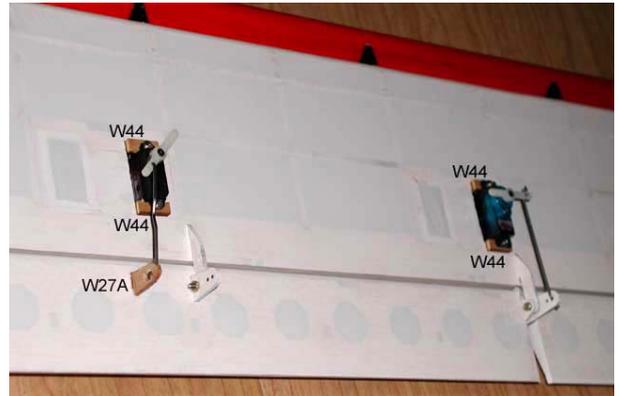
7. Prepare aileron and flap hinges and horns(W24-W30).



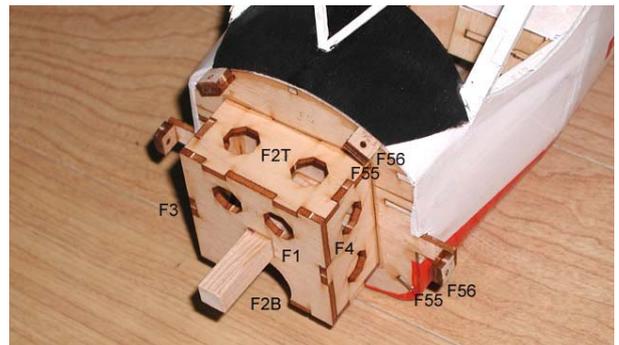
8. Insert hinges and horns. Glue them after throwing check.



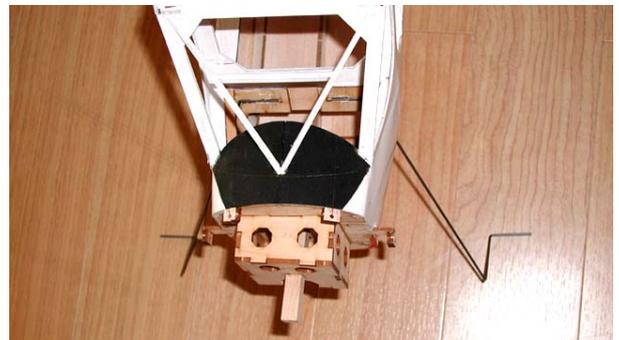
9. Install aileron and flap servos and connect pushrods.



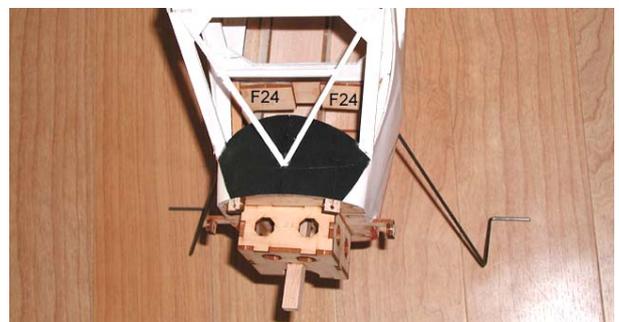
10. If required, glue optional plywood servo beds(W44). You may use a servo reverser when you connect flap servos with Y-harness, if not, install optional flap horn(W27A).



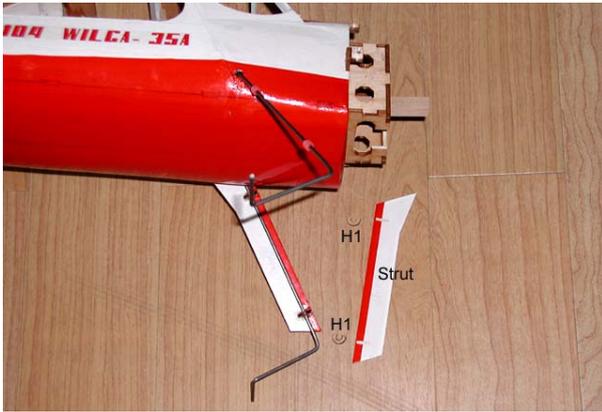
11. Assemble plywood motor mount box(F2-F4) and cowl mounts(F55, F56). Make sure to pay attention to bulkhead F1 the numbers should be facing forward.



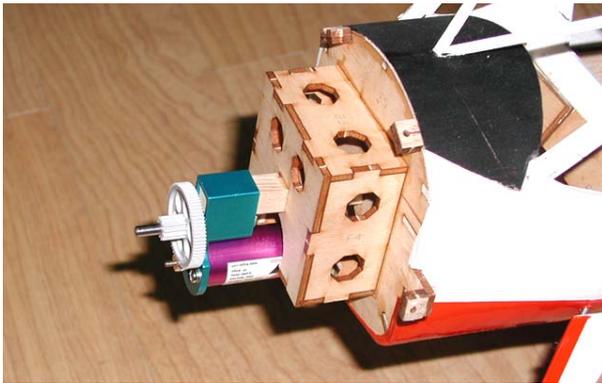
12. Insert landing gear.



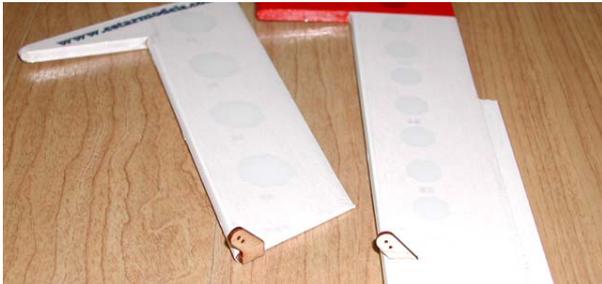
13. Glue landing gear retainer(F24).



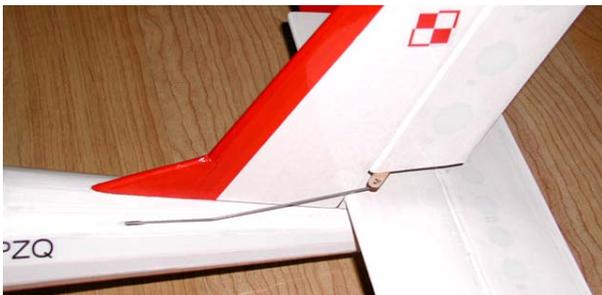
14. Assemble dummy landing gear with silicon tubes, holders(H1) and landing gear struts.



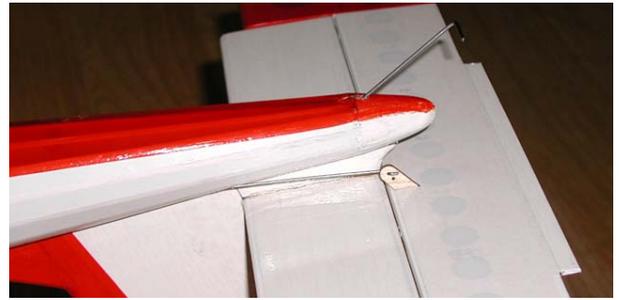
15. Install motor and gearbox.



16. Install and glue elevator and rudder plywood horns. Apply thin CA to the horns for reinforcing.



17. Insert rudder pushrod to the horn and then glue hinges with small amount of thin CA.



18. Insert elevator pushrod to the horn and then glue hinges with small amount of thin CA.



19. Install elevator and rudder servos.



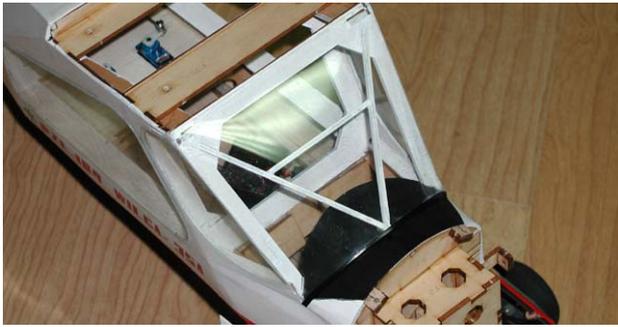
20. Install wheels to the landing gear.



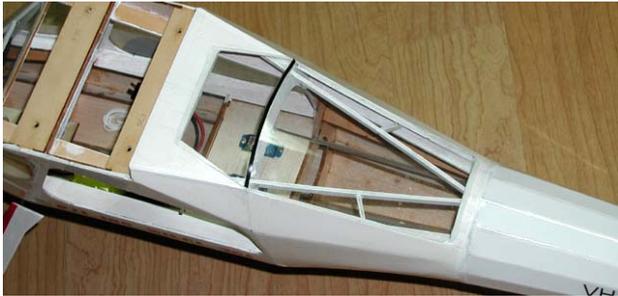
21. Install tail wheel.



22. Glue battery tray(BT).



23. Cut clear plastic fore windshield, fold and glue.(refer to template on the drawing).



24. Cut clear plastic rear windshield and glue.



25. Cut clear plastic right side windshield and glue.



26. Cut clear plastic left side windshield, attach with clear tape. (This window should be a hatch for battery and your maintenance.)



27. Tapping with 4mm tap to fit wingbolts.



28. Paint and assemble cowl with 2mm screws and fix propeller.



29. Assemble wing and fix with wingbolts.



30. Congratulations! Enjoy flying.

### Control Throws

The following control throws are recommended starting points. After you are familiar with this plane, you may increase, or decrease.

- Ailerons : 17mm(2/3") up, 12mm(1/2") down.
- Elevator : 25mm(1") up and down.
- Rudder : 25mm(1") right and left.
- Flaps : takeoff-20degrees, landing-45degrees
- Flap-Elevator mix : 4mm(5/32") down for full flap.

### Caution

Balancing is very important to fly this model. Balance weight should be installed in the nose. (Refer to the drawing for the CG location.)

