

# SDRAWKCAB



*Author's daughter Paty admiring dad's Sdrawkcab.*

## By G. Villa Novoa

**E**xperimenting with new designs is a pleasure in itself for many modelers. That was the motivation which gave birth to the Sdrawkcab but, after flying it for several sessions, I became so excited about it that I felt the need to share it with more friends, and what better way in the world than trying R/C

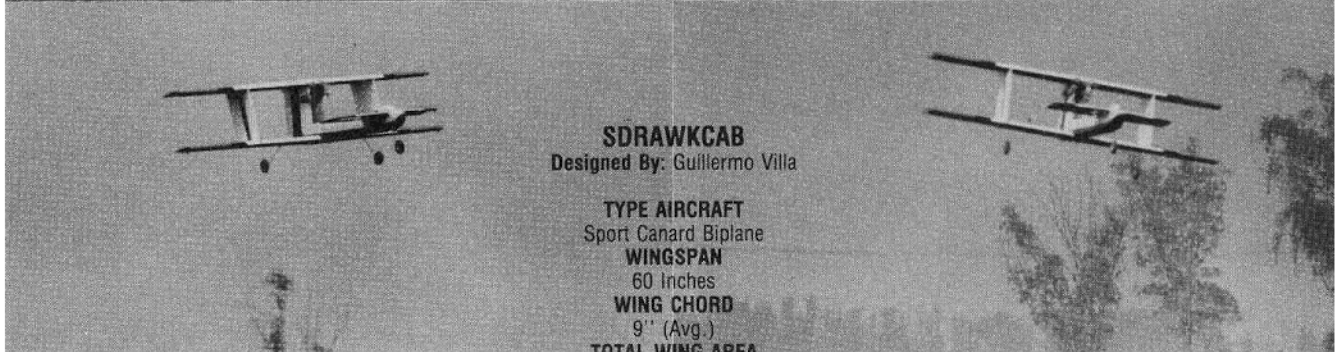
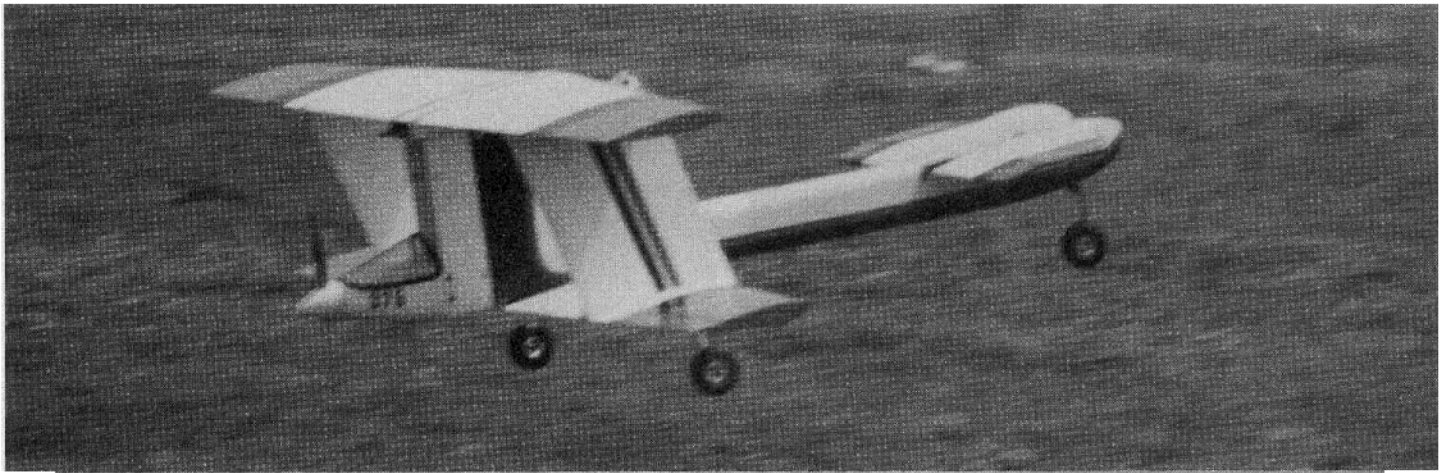
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**An attention grabber and a versatile flier with solid ground handling characteristics. When it moves, comments from spectators are unavoidable. At low speed it is more docile than conventional trainers but at full throttle it is capable of all kinds of stunts and on the ground it out handles any other airplane.**

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Modeler Magazine as the means to do that. Please take note that all tests were carried out in Mexico City at 6000 ft. altitude so its performance at lower altitudes should improve significantly.

**Plane appeal, or ability to attract plane lovers attention.** Though you will not hear expressions like, "Boy it is beautiful!" the realistic impression that it gives of flying backwards, causes an inevitable reaction among



**SDRAWKCAB**  
Designed By: Guillermo Villa

**TYPE AIRCRAFT**  
Sport Canard Biplane  
**WINGSPAN**  
60 Inches  
**WING CHORD**  
9" (Avg.)  
**TOTAL WING AREA**  
1080 Sq. In.

**WING LOCATION**  
Biplane  
**AIRFOIL**  
Semi-symmetrical

**WING PLANFORM**  
Swept Back Tapered  
**DIHEDRAL EACH TIP**  
5/8 Inches

**O.A. FUSELAGE LENGTH**  
43 1/2 Inches

**RADIO COMPARTMENT AREA**  
(L)10" x (W)2 3/8" x (H)2 3/8"  
**STABILIZER SPAN**  
24 Inches

**STABILIZER CHORD (incl. elev.)**  
8 1/2" (Avg.)

**STABILIZER AREA**  
204 Square Inches

**STAB AIRFOIL SECTION**  
Flat

**STABILIZER LOCATION**  
Top Front of Fuselage

**VERTICAL FIN HEIGHT (Each)**  
Center 7 1/2"  
Outer 12"

**VERT. FIN WIDTH (incl. rud) (Ea.)**  
Center 10 3/4"  
Outer 8 3/8"

**REC. ENGINE SIZE**  
.61

**FUEL TANK SIZE**  
12-16 Ounces

**LANDING GEAR**  
Tricycle

**REC. NO. OF CHANNELS**  
4

**CONTROL FUNCTIONS**  
Ail., Rud., Elev., Throt.

**BASIC MATERIALS USED IN CONSTRUCTION**  
Fuselage ..... Balsa & Ply  
Wing ..... Balsa & Ply  
Empennage ..... Balsa & Ply  
Wt. Ready To Fly ..... 122 Oz.  
Wing Loading ..... 16.27 Oz./Sq. Ft

spectators who will make comments about it. You will hear a lot of comments around you.

**Name.** From the clear impression it gives of flying backwards, it was easy to christen it, I just wrote down the word backwards, backwards.

**Stall Characteristics.** As theory says should happen with canards, practice demonstrated that this bird is really difficult to stall. You can feed full elevator at idle to get only the stab stalled first with wings still flying and with responsive ailerons. After the stab stalls, the nose goes down reducing the angle of attack and the aircraft gains speed; again in full control with just a few feet of lost altitude.

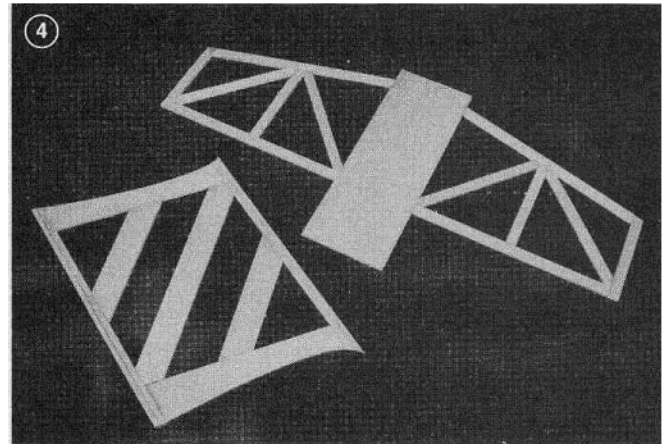
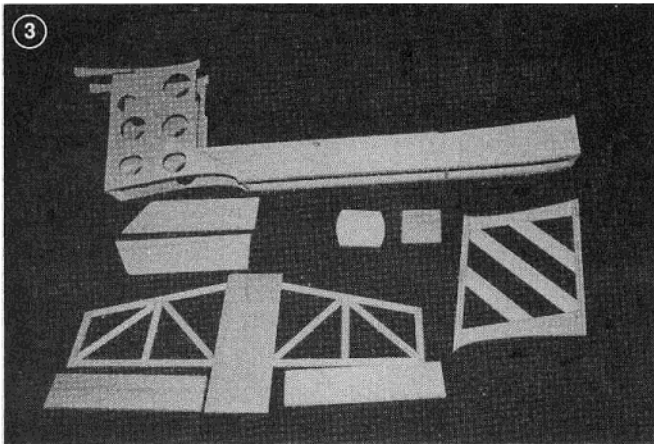
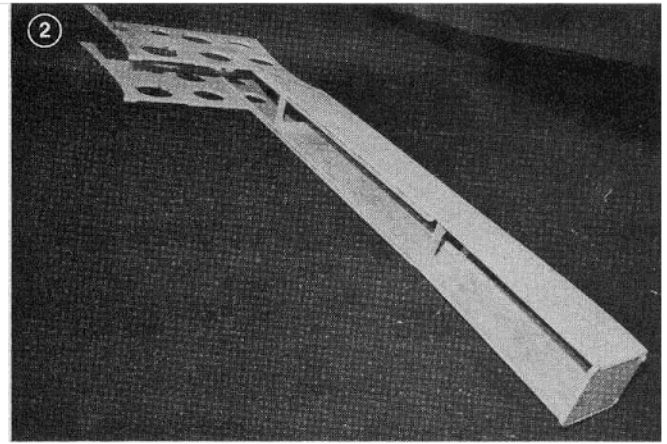
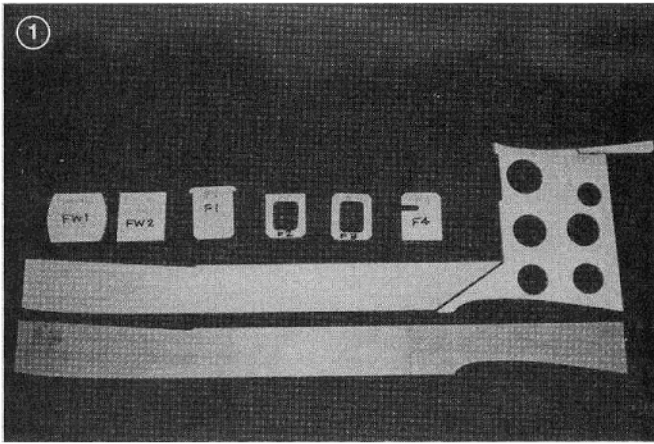
**Speed Range.** This design is so gentle at low speed that without doubt I would recommend it as a trainer, floating slowly around and making approaches is enjoyable, and with a 16 oz. tank you can fly this way for twenty minutes. At full throttle it becomes a nice looking stunt aircraft in the sky. A low inverted pass is something to see, try inside and outside loops, split S's, Cuban eights, rolls, etc. I personally do not like spins, but for the sake of testing the model at sufficient height, I have tried to spin it a few times. I throttled to idle and applied up elevator gradually and when the stab seemed to start stalling I gave full ailerons (rudder was not enough). An impressive combination of spin and spiral dive resulted. Then I released the controls, gave some

elevator, and opened throttle, the aircraft returned to level flight (while my legs shook since I do not like or do not practice this maneuver).

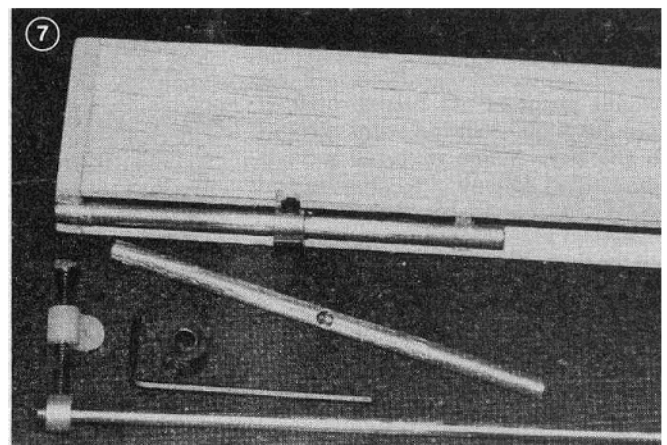
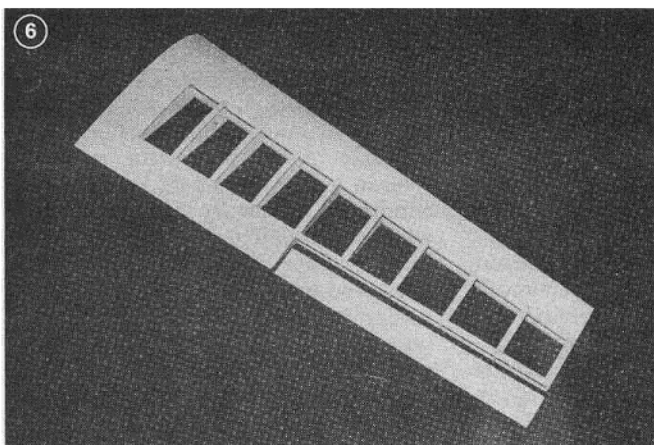
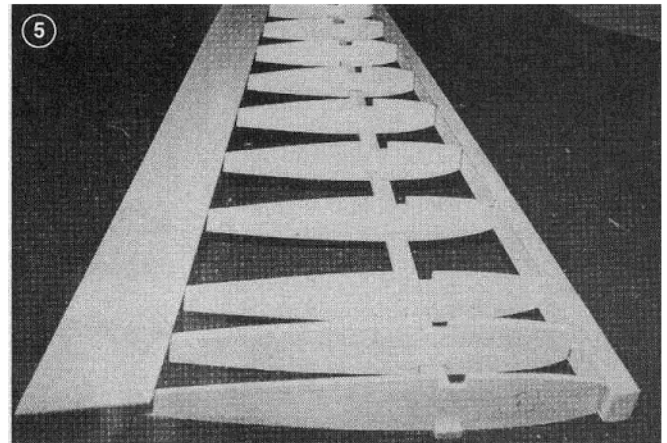
**Ground Handling.** It is so stable on the ground that I can compare it only with an R/C buggy and, with the location of the engine, you will never break a propeller again, even if you go off of the runway, make a hard landing, or like to practice touch and goes.

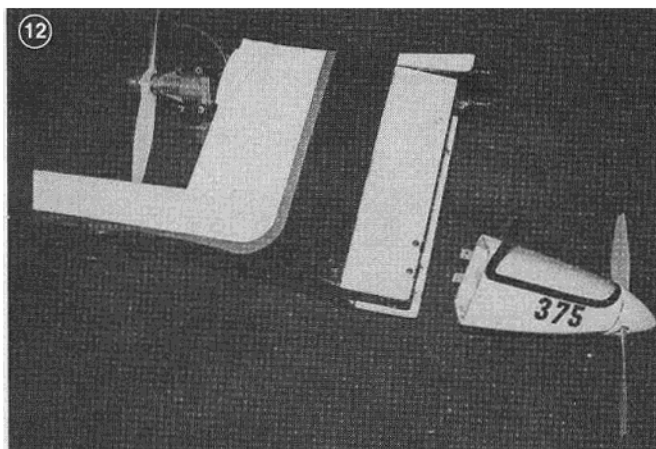
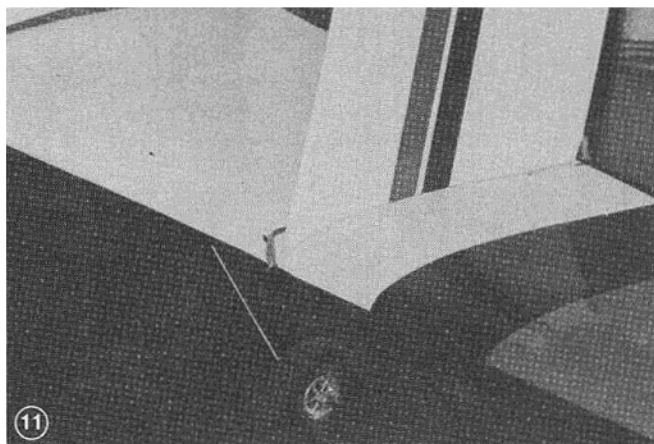
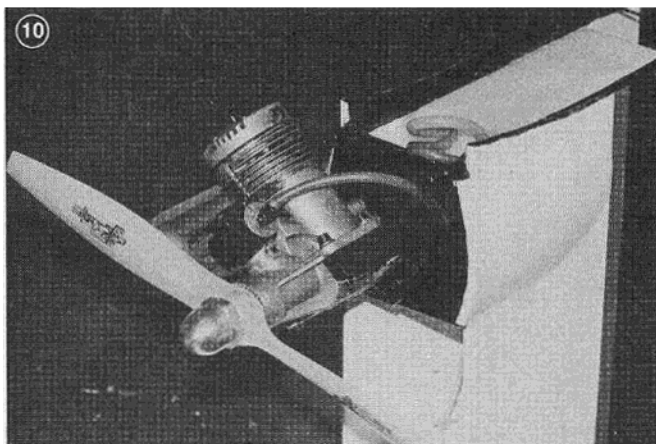
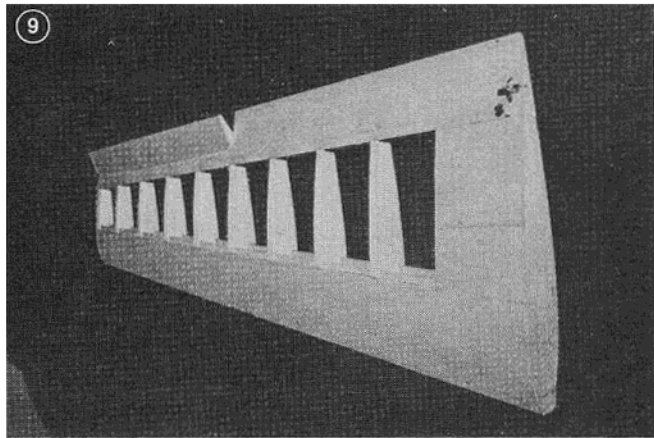
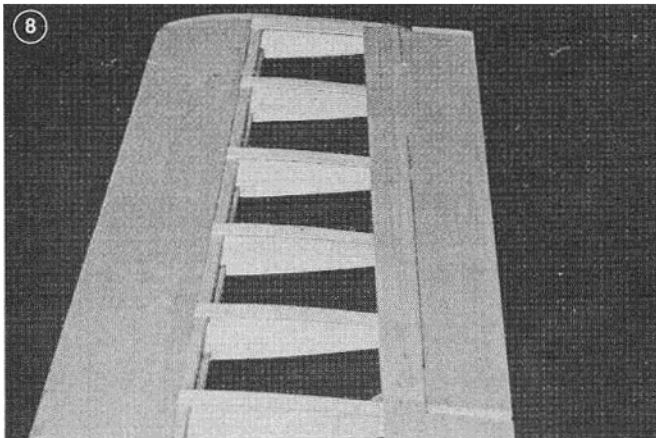
**Practical access to engine and radio.** The radio system is so accessible that you will save time in the field for flying and not solving puzzles when you have to make an adjustment. You can inspect the fuel tank and lines without having to disassemble anything and can even remove the engine in five minutes.

**Flying.** If the C.G. has been placed where indicated on the plans, and you already know how to fly, the only recommendation I can think of is to generously feed elevator when taking off; it will take about 100 ft. at full throttle. After breaking ground, release a little elevator and it will climb nicely. Now fly it in accordance with your confidence and ability. Landing approaches can be made at low speed with the nose a little up or moderately fast and straight with the nose leveled or slightly down. After you become familiar with the Sdrawkcab, you can move the C.G. a little at a time, but never do it more than 1/2" forward or 3/4" aft, as it will

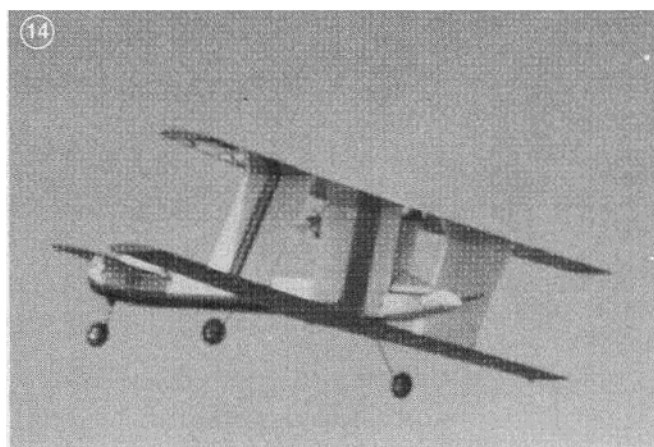
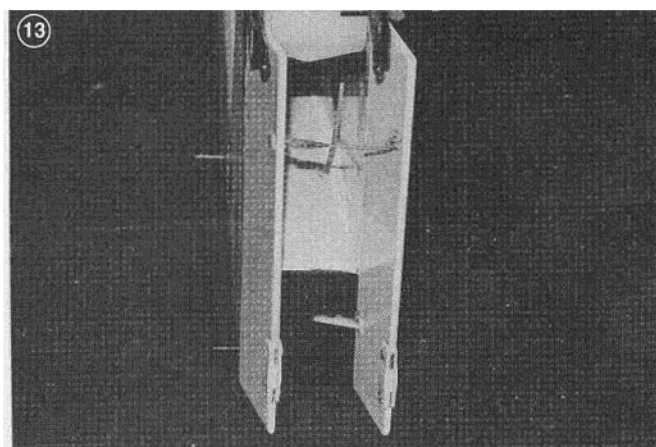


**(1) Parts required to start fuselage.**  
**(2) First step in fuselage assembly.**  
**(3) Basic fuselage with rudders, wing strut, horizontal stabilizer and elevators.**  
**(4) Closer view of wing strut and stabilizer construction.**  
**(5) First stage of wing assembly.**  
**(6) Wing sheeted and capstripped.**  
**(7) Details for aileron controls.**





(8) Aileron installed.  
(9) Aileron controls have been installed.  
(10) Engine and fuel tank installation.  
(11) Wing struts are held in place with rubber bands.  
(12) Optional rear pod with windmill propeller is hinged to rudders.  
(13) Rudder controls and pod attachments are shown.  
(14) And off she goes (or comes?).



become very sensitive.

### **CONSTRUCTION**

Though this is not a project for a modeler's first plane, its construction does not differ from traditional balsa models. Relevant comments are given here to help construction: We used four different types of glue, epoxy (5-Minute and 30-minute types) for plywood and hardwood joints, gap filling cyanoacrylate (Super Jet type) for fast tacking balsa parts, and aliphatic resin (Wilhold type) to glue balsa to balsa when left overnight for drying.

#### **Fuselage:**

Cut the fuselage sides from 3/16" balsa; also cut the 1/32" plywood doublers and the 3/16" plywood upper wing supports; note that the rear part of this support is cut separately to avoid wasting wood. Cut out the lightening holes in these supports.

Using 30 minute epoxy, glue the balsa sides to the upper wing supports and then the 1/32" plywood doublers. Be sure to make one left and one right side. Using cyanoacrylate, glue the 1/4" traingle stock. Now cut the formers and locate correct position for the nose landing gear bracket in F-1; drill holes and secure with blind nuts. The rest of fuselage construction is like any other model plane. Start gluing the formers at 90° with the sides of the fuselage (F-1 with nose gear bracket installed). Glue the top and bottom balsa sheeting in place. Add the nose block, the firewall and backplate. The tank floor will be glued after covering.

Drill holes for the motor mount and fuel lines. Note that the engine is set at 45° in order for the muffler to clear the top wing. Epoxy the upper wing dowels. Sand the fuselage to shape and prepare for covering.

#### **Rudders:**

Two rudders are necessary and are linked to move simultaneously. Two small horn brackets on the rudders are coupled with a rod which has a "Z" bend on one side and a Kwik-Link on the other for obtaining parallel movement. Use arrow shafts or dowels for pushrods. As shown on the plan, the pushrod exit for the rudders is through former #4. Take this into account to position control horn. Three hinges in each rudder are necessary.

#### **Stabilizer/Elevator:**

The stab frame is built of 3/16" balsa over the plan (kitchen wrap covered). Once the glue is set, apply 3/32" balsa sheeting with epoxy. The elevators are cut from 3/8" balsa and are joined mechanically by means of a control horn.

#### **Strut Fins:**

These fins are 3/16" balsa and spruce frames built over the plan. The wire hooks are epoxied in after covering.

#### **Wings:**

The wings are built over the plan upside down for proper dihedral. Cut four sets of ribs and two sets of plywood plates. Epoxy the plates to the corresponding ribs as shown on plan. Drill holes in the set of ribs for the lower wing as marked on plan, to allow for the aileron torque rods.

Though the plan shows half of the upper wing and half of the lower wing only, it is used to build both wings since they are basically the same. Pin down the upper spar over the plan. Glue the ribs W1, W7 and W11 with the flat (unsanded) side downwards; make sure they are 90° to the building board. Remember that the wings are being built upside down. Glue the remaining ribs, lower spar, leading edge and the lower trailing edge sheeting in place. Note that the L.E. sheeting is 2" for the upper wing and 2½" for the lower wing. Glue the lower center section sheeting and capstrips in place. When dry, remove the wing panels and sand excess wood from ribs W1, W7, and W11. Add the upper sheeting, capstrips, and center section sheeting.

Sand the center ribs of both halves and epoxy them together aligning them flat over the building board while upside down for proper dihedral. Glue the tips in place. Ailerons are necessary only in the lower wing.

#### **Dummy Rear Nose:**

Plans do not show this dummy nose, since it is not necessary to add it unless you want to reinforce the backwards moving appearance. In that case just build a hollow light balsa nose from 3/32" balsa sheet; shape to your preference and attach it to the rudders by means of hinges which are necessary to allow for free movement of the rudders. In this way the dummy nose almost does not move when the rudders are used.

#### **General:**

Before finishing, check all surfaces for true alignment. It is very important to be sure that the incidence angles shown are respected. The fins are set in place with rubberbands attached to the wire hooks. Now drill the holes in the fuselage for the dowels, install them and you are ready for the radio and engine installation.

No special recommendation for the radio installation is given except for the location of servos. The battery and receiver should be located within the fuselage, so as to avoid excess ballast when balancing to the indicated C.G.

Remember to mount the engine at 45° for proper clearance of the muffler. Super MonoKote, Fabrikote or a similar finishing material is recommended for its lightness, strength and simplicity.

#### **Final Recommendations:**

The C.G. should be located respected as shown on the plan for the first flights. Some tolerance has been observed which may better suit your flight style but move it in steps of no more than 1/4" and by no means go aft more than 3/4". You will notice it is critical to move the C.G. aft.

Moving surfaces should be adjusted as follows: ailerons 3/8" up and down, rudders 3/8" to 1/2" to each side, and elevators 1/2" up and down. The main landing gear should have ample throw; as much as double the conventional throw because of its large turning radius.

While the plane is on the ground, check that the main landing gear is adjusted to give 0° to minus 1° incidence to wing. Setting with positive incidence may make it bounce on landings.

A lot of fun will be the reward for building the Sdrawkcab. Enjoy it. □

**From  
RCModeler  
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