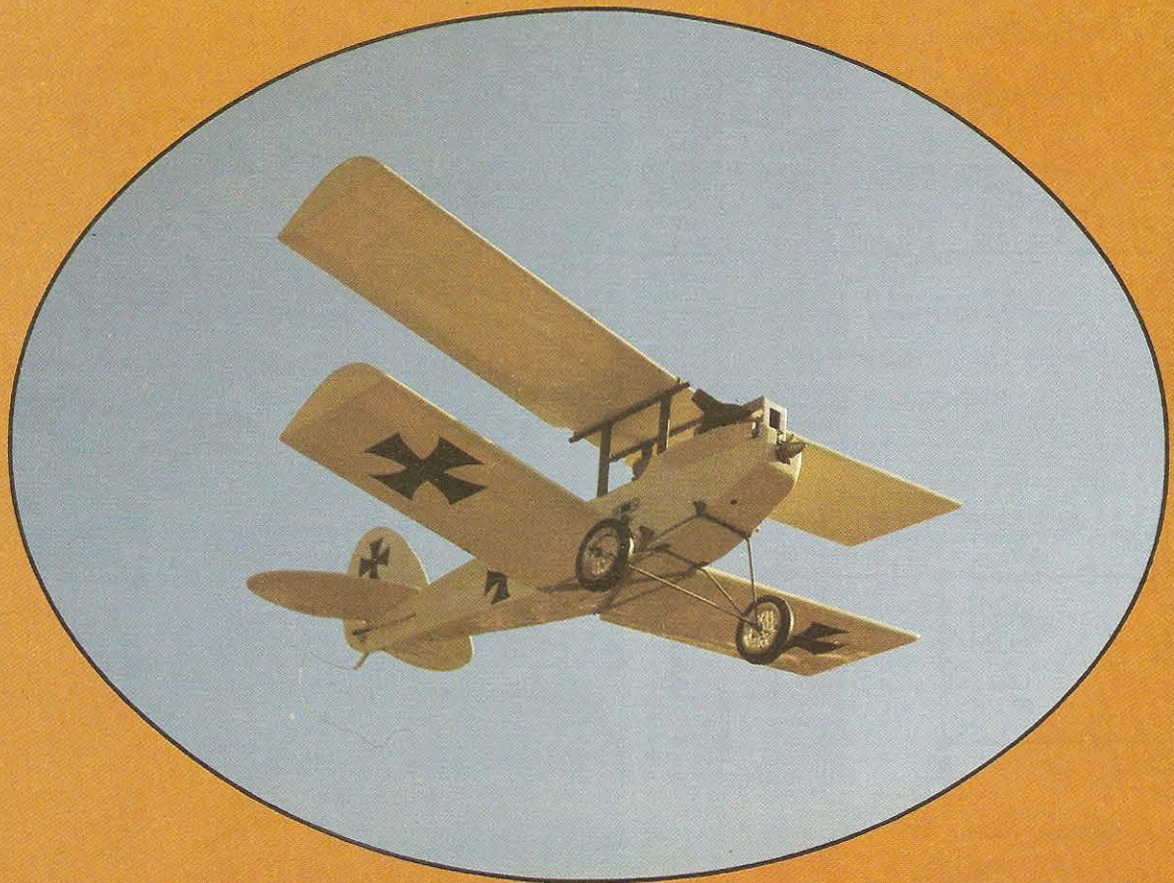




# DOPPELDECKER



**Yes, there is life in Wyoming. From Jackson Hole comes this inexpensive, easy to build little biplane for two or three channels and a .10 size engine.**

**DOPPELDECKER**

Designed By: Fred Reese

**TYPE AIRCRAFT**

Sport Biplane

**WINGSPAN**

Top 32 Inches  
Bottom 28 Inches

**WING CHORD**

6"

**TOTAL WING AREA**

350 Sq. In.

**WING LOCATION**

Biplane

**AIRFOIL**

Flat Bottom

**WING PLANFORM**

Constant Chord

**DIHEDRAL EACH TIP**

Top 1 7/8 Inches  
Bottom 1 5/8 Inches

**O.A. FUSELAGE LENGTH**

27 Inches

**RADIO COMPARTMENT AREA**

(L)6" x (W)2 1/4" x (H)2 1/4"

**STABILIZER SPAN**

11 Inches

**STABILIZER CHORD (incl. elev.)**

5 Inches (Avg.)

**STABILIZER AREA**

55 Sq. In.

**STAB. AIRFOIL SECTION**

Flat

**STABILIZER LOCATION**

Top of Fuselage

**VERTICAL FIN HEIGHT**

4 1/4 Inches

**VERTICAL FIN WIDTH (incl. rudder)**

5 Inches (Avg.)

**REC. ENGINE SIZE**

.09-.10 Cu. In.

**FUEL TANK SIZE**

2 Oz.

**LANDING GEAR**

Conventional

**REC. NO. OF CHANNELS**

2 Or 3

**CONTROL FUNCTIONS**

Rud., Elev., Throt, (Opt.)

**BASIC MATERIALS USED IN CONSTRUCTION**

Fuselage .....	Balsa, Ply
Wing .....	Balsa, Ply
Empennage .....	Balsa
Wt. Ready To Fly .....	30 Oz.
Wing Loading .....	12 1/2 Oz/Sq. Ft.

**T**here are times when one needs a new airplane quickly, like yesterday, or so it seems. Last spring I was faced with this problem. I needed a knockabout airplane for summer flying from a rough site, but only had a couple of weeks to complete the project. I quickly decided on a small two channel biplane for my trusty Cox TD .09 and thought of the old German word for biplane, "doppeldecker." Doppeldecker or double decker sounded fitting and I looked at all of the old German biplanes from WW I. However, I really didn't want to bother with a scale design so I closed the books and made the simplest biplane I could. Only the dummy engine and crosses give a hint that I actually did look at the books. So much for the design philosophy. The head honchos, Don and Dick at RCM, say we designers are supposed to dazzle you with our footwork. So much for dazzle.

But it does fly. In fact, it flies pretty well --- that is, if you like little "buzz around" biplanes. It will loop and roll and spin and keep you amused for quite a while provided you don't try to fly it through trees or fences.

**CONSTRUCTION**

**Fuselage:**

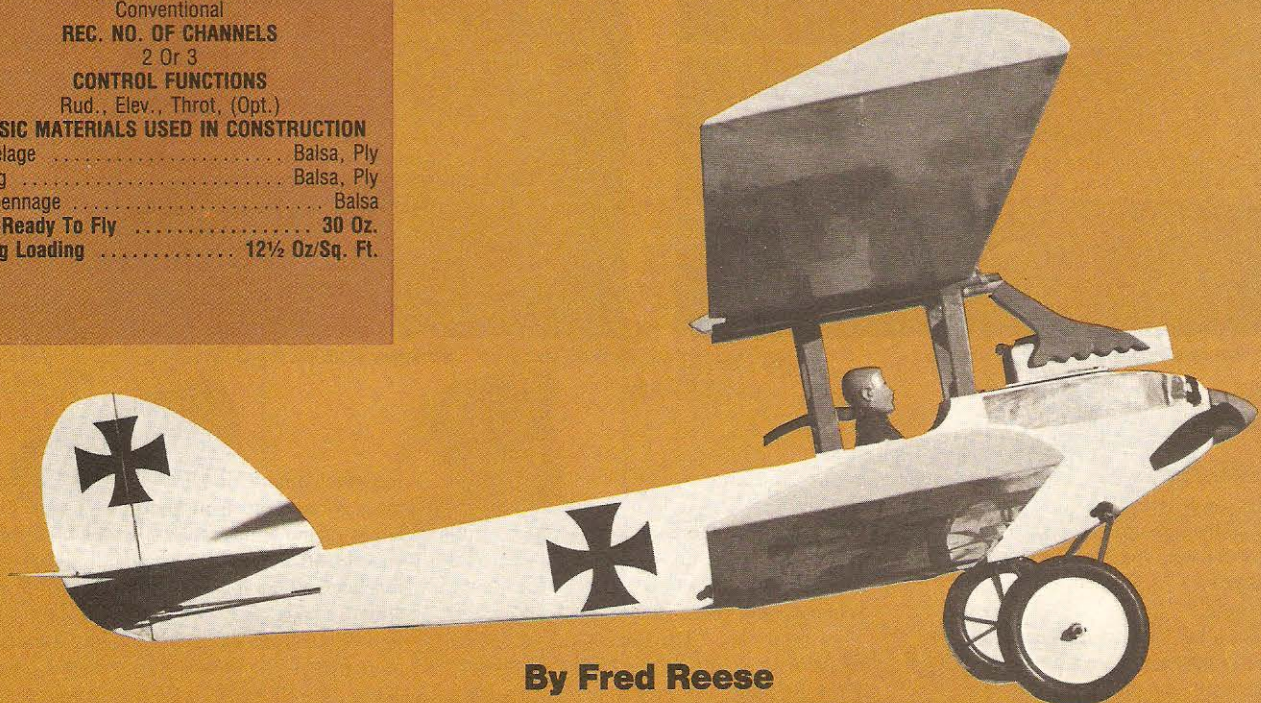
Make the two fuselage sides F-1 from 3/32" medium balsa and add the vertical grain balsa doublers, shown by the dotted lines on the F-1 part drawing. I used Super Jet for all construction except where I specify epoxy. The fuselage top, F-2, fits between the sides and on top of the doublers. Glue bulkhead F-8 and the

forward, straight part of the top, F-2, to one of the fuselage sides. Glue on the other side, pull the tail together and glue. Bend the tail skid wire and laminate it between F-17, F-18, and F-19 (using epoxy), and glue the assembly into the fuselage. Add the bottom, rear 3/32" balsa sheeting. Glue bulkhead F-7 into the fuselage. Glue the firewall, F-5, and the firewall doubler, F-6, together. Bolt the motor mount to the firewall with a 1/16" plywood shim behind left side of motor mount to give the engine 2° right thrust. Epoxy the firewall and the tank floor, F-3, into the fuselage. Add the noseblock, F-4. Glue in the landing gear mount doubler, F-8, and then the 1/16" plywood forward fuselage bottom, F-11. Sand the fuselage for covering and apply a coat of Balsarite to seal the wood and make the covering stick better.

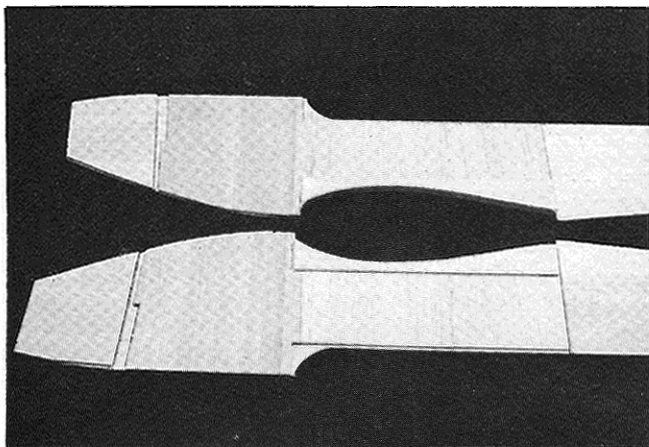
**Wings:**

Construction of the two wings is the same, except the lower wing is one rib shorter on each side. Lay waxpaper over the plan. Glue the 1/8" x 1/2" spar doubler to the spar and pin it down to the plan. Also pin down the 1" trailing edge and glue in the 1/16" bottom sheeting. Glue all of the ribs in place, angling the center rib for the dihedral joint. Add the 1/4" sq. leading edge and the rest of the bottom center 1/16" sheeting.

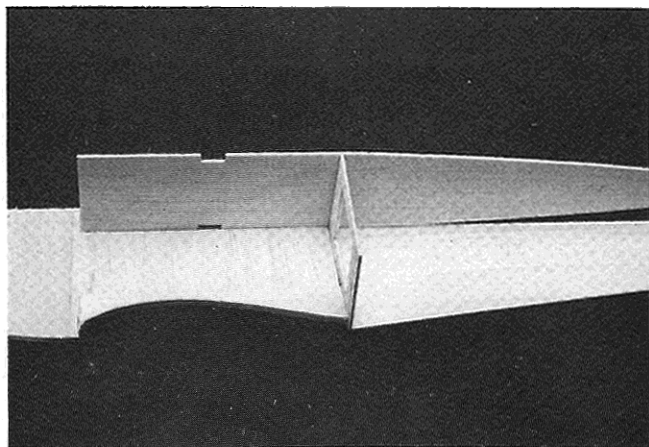
Glue on the wing tips, W-6, using W-5's to get the correct angle. To one side of each wing, glue the plywood spar joiners, W-4, to the wing spar. Add the top 1/16" sheeting to that panel and trim the center. Glue the



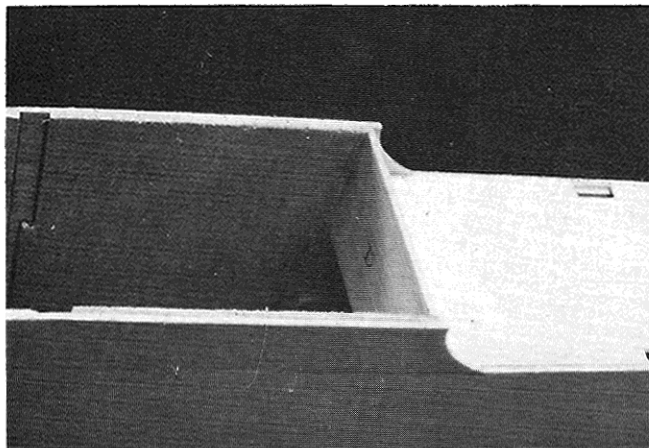
**By Fred Reese**



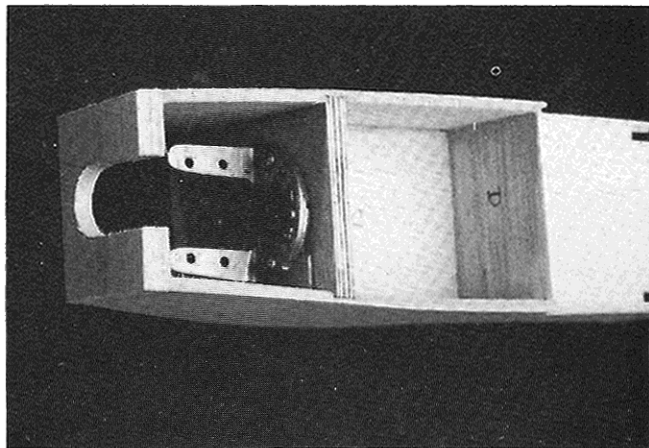
Make the left and right hand fuselage sides with the balsa doublers.



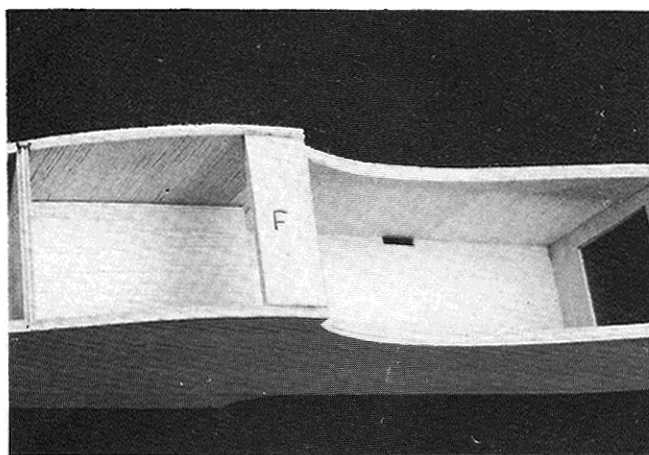
Glue bulkhead F-8 to the right hand side F-1. Glue the top, F-2, to F-1 and the bulkhead.



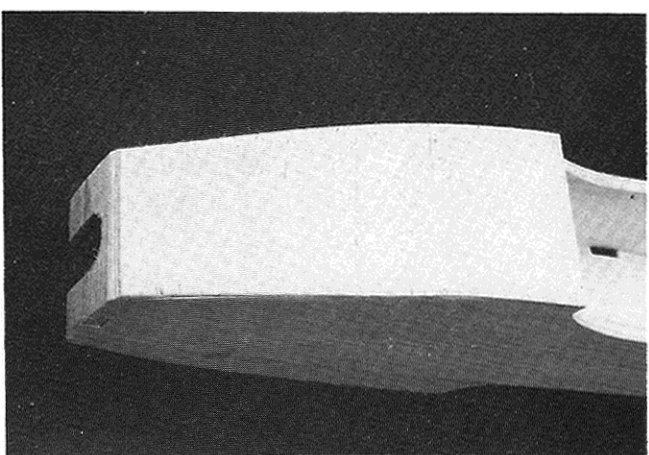
Glue in bulkhead F-7 (marked as D in photo).



Glue firewall F-5, and firewall doubler F-6 together and bolt on the motor mount. Epoxy the firewall and tank floor, F-3, into the fuselage. Add the noseblock, F-4.



Glue in the landing doubler, F-8.



Attach the 1/16" plywood bottom front, F-11.

two wing panels together, blocking up each tip of the lower wing 1/8" and the top wing 1/8". Add the remaining top 1/16" sheeting and notch the trailing edge for the rubberbands.

#### Tail Group:

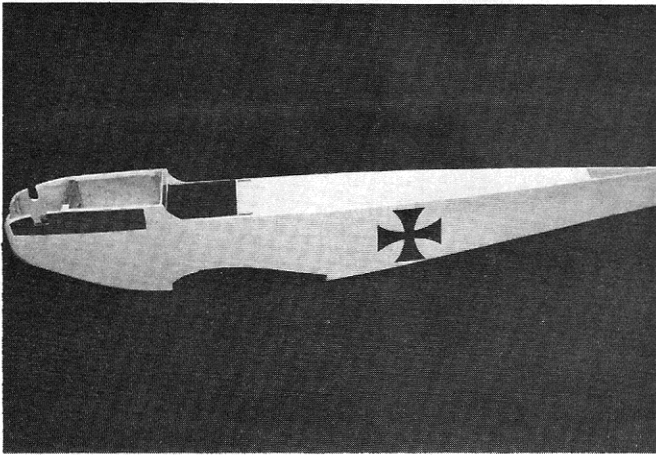
Cut out all of the tail surfaces from 1/8" medium-light sheet. Epoxy the 3/16" dowel to connect the elevator halves. Brush on a

coat of Balsarite.

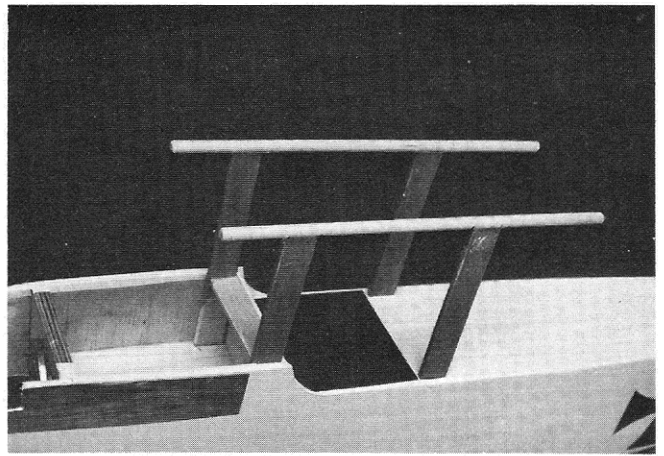
#### Finishing:

Cover all of the parts with a plastic film covering. I used the cream colored Econokote. A good source for color schemes and other details is the Kenneth Munson series, "The Pocket Encyclopedia of World Aircraft in Color, Fighters 1914-19" and "Bombers 1914-19," from

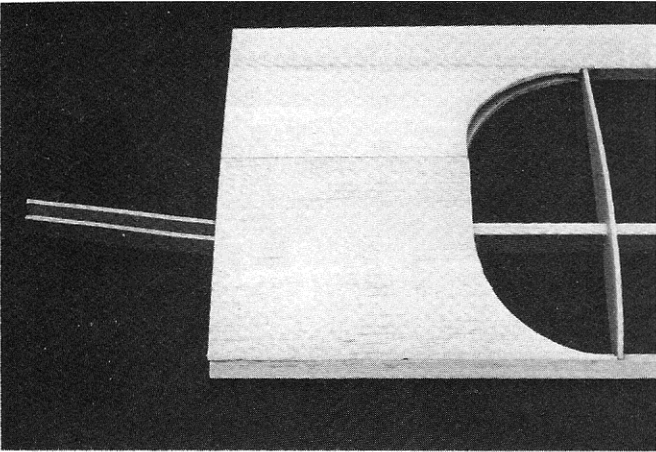
the MacMillan Company. Cut out the trim from MonoKote trim sheets and seal the edges of the trim with Hot Stuff. Glue the cabane struts, F-20 and F-21, into the fuselage. Glue in F-12 between the front struts. Epoxy the 3/16" dowels onto the tops of the struts using Goldberg nylon tape to reinforce the joints. Glue in the other 3/16" dowels through the fuselage for the



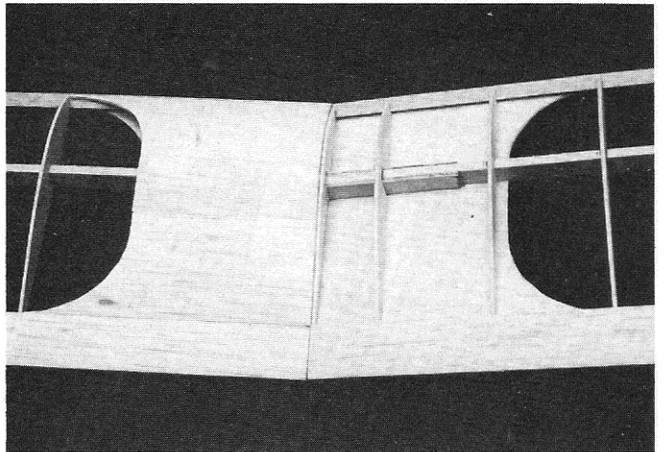
Apply a coat of Balsarite to all surfaces to be covered with iron-on film, then cover before further assembly. Add trim cut from MonoKote trim sheets.



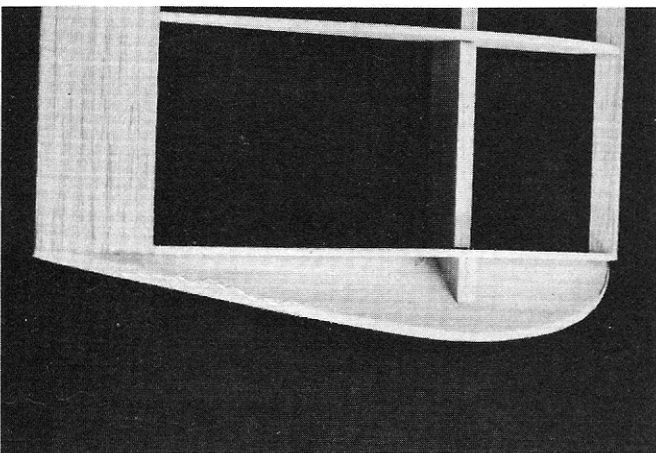
Epoxy the cabane struts, F-20 and F-21, into the fuselage, then epoxy the 3/16" dowels onto the tops of the struts using Goldberg nylon tape to reinforce.



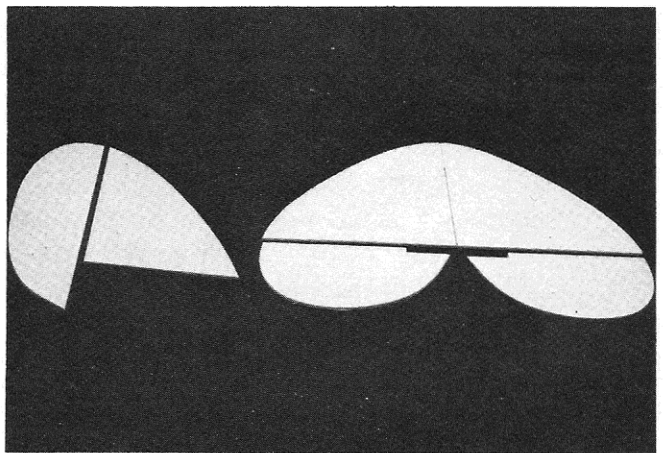
Glue the two spar joiners, W-4, to the wing spar and add the top 1/16" sheeting.



Build the other wing panel except for the top sheeting and epoxy the wing panels together.



Glue on the angle guides, W-5, and the wing tips, W-6.



Tail surfaces are made of 1/8 sheet.

bottom wing and the landing gear.

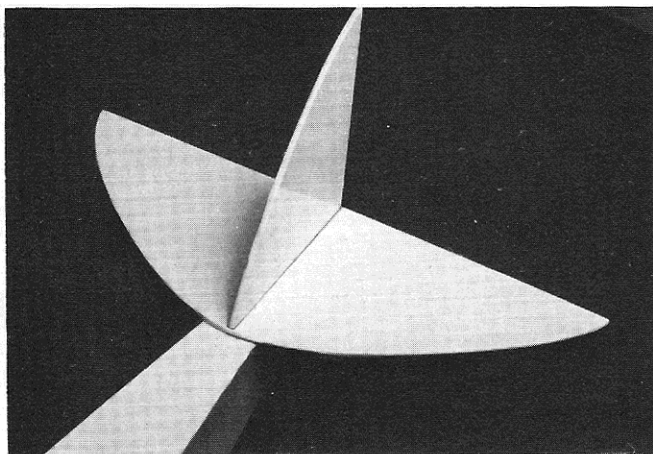
Cut away the covering on the stabilizer so it can be glued to the fuselage, and cut away a 1/8" wide strip on the top for the rudder. Glue the stabilizer to the fuselage, and the rudder to the stabilizer. Hinge the elevator to the stabilizer. Notch the rudder to clear the elevator dowel, then hinge the rudder.

Make the landing gear from 3/32" piano

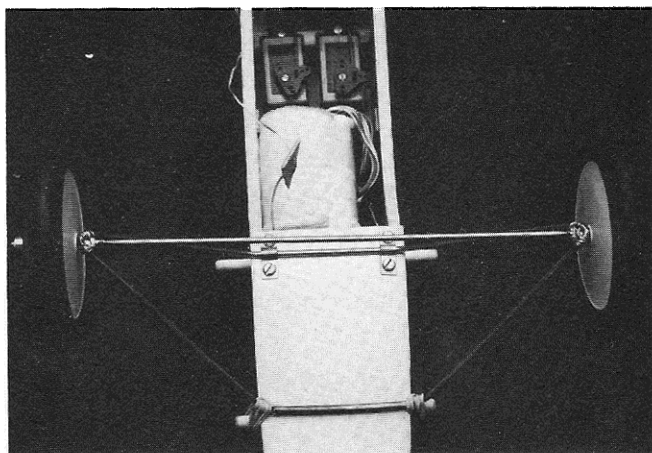
wire. Bind the joints with copper wire and solder. Attach the landing gear to the fuselage with two metal landing gear clips and #4 x 1/2" SM screws in the rear. The front of the landing gear is held to the fuselage with a rubberband around the forward dowel to absorb the landing shocks. Install the radio as shown. There should be room for three servos in the location shown

in the plan, but check your servos for width. If you plan to use three servos and they are wider than mine, you will have to make the fuselage wider.

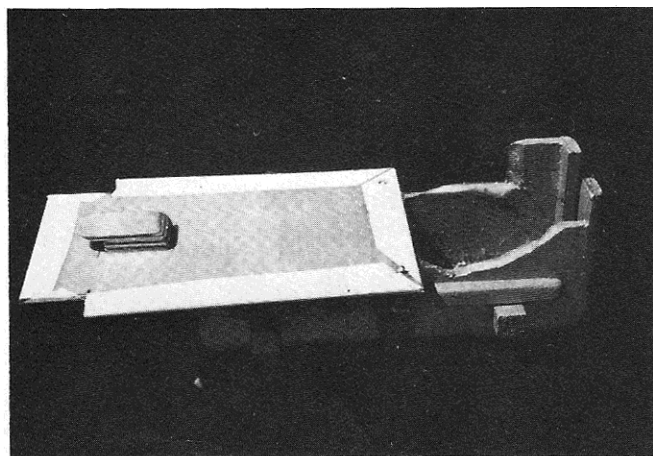
Seal the engine and tank area with epoxy and brush on a coat of fuel proofer in the radio area. Install the engine and the fuel tank. Fit the tank compartment cover and epoxy on the rear catch, F-15 and F-16. This



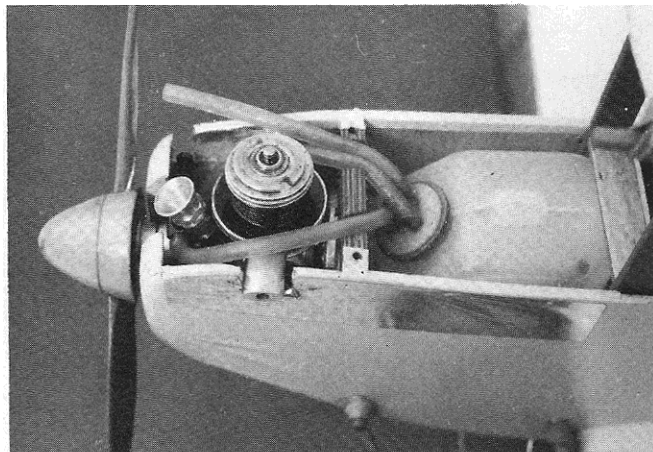
*Cut away the covering on the stab for the fin and where the fuselage is to be glued, then glue the stab to the fuselage. Glue the fin in place.*



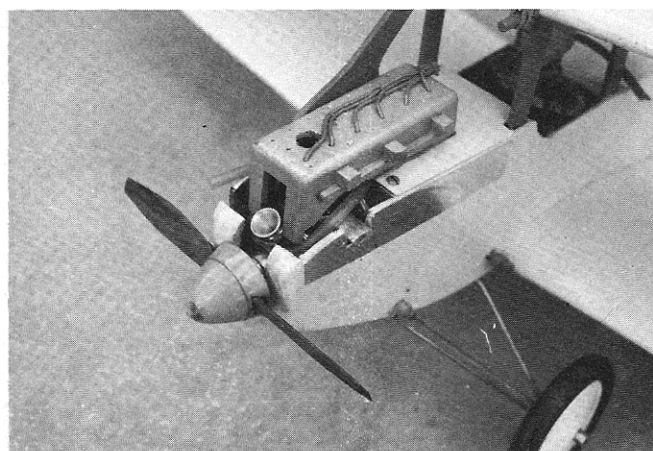
*This photo shows landing gear and radio installation.*



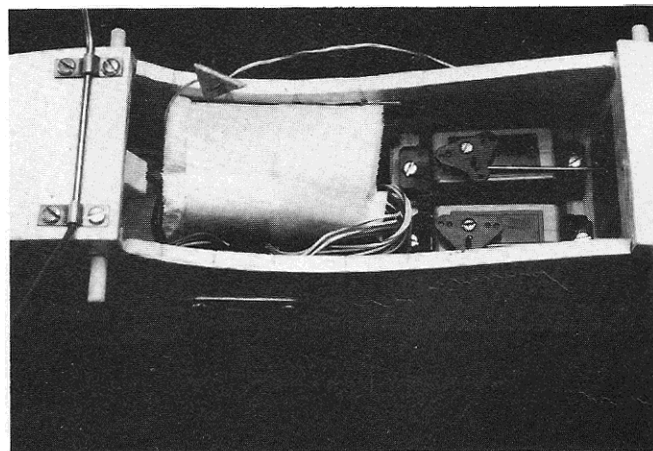
*On dummy engine, both ends are open for engine air cooling. To retain hatch, glue rear catch, F-15 and F-16 which hooks under F-12. Front of cover held down with two #4 x 1/2" SM screws.*



*Install the engine and fuel tank and muffler.*



*Cox TD .09 is almost completely hidden under the dummy engine. Only the venturi and the pipe from the Cox muffler are visible. The Williams Brothers Vintage wheels, pilot and spinner really dress up the model.*



*Mount the servos on 3/8" sq. pine cross rails and wrap the receiver and battery in soft foam.*

catch holds the rear of the cover down to the crosspiece F-12. The front of the cover is held down with two #4 x 1/2" SM screws into the firewall.

#### **Dummy Engine:**

The dummy engine is just a 1/8" balsa box open at each end that hides the real engine. The Cox TD muffler fits neatly under the dummy engine and exits with a

little pipe straight out the side. The dummy engine is dressed up with carburetors made from scrap balsa. Engine bolts are drops of epoxy and the spark plugs are 1/4" lengths of 1/16" dowels stuck into 2-56 hex nuts. The spark plug wires are fine radio hook-up wire glued in place. Paint the engine sliver and the exhaust stack brown. Cut away two 1/8" wide strips from the covering on the

tank cover and glue the dummy engine to the cover. Access to the glow plug is through a hole in the top of the dummy engine. Use a third fuel line to the tank to fill it without having to remove the cover and dummy engine.

#### **Flying:**

Use a 7/3 or 7/4 prop, whichever one your

engine can turn easily without overheating. If the 7/4 is too much prop for your engine and you cannot find a 7/3, trim the prop down to 6½”.

The Doppeldecker is a very docile and stable flyer. It is not difficult to fly and is a fun intermediate design especially for schoolyard type flying. □

**Editing By H.E  
RCModeler  
May 1981.**