DON QUIXOTE

Transparency by Jack Rousseau

This scale model (1:3.5) of the Polish homebuilt is not only an attention getter, but extremely docile, with superb flying and ground handling qualities.

By Laddie Mikulasko

There are countless eye appealing full sized aircraft in the world, which modelers build as scale models. For me, one of my favorites is a small Polish homebuilt called "Don Quixote."

The plane was designed by J. Janowski, who wanted to own a plane which was easy to build, easy to fly, and good looking. I think that he succeeded on all counts.

If there is anyone interested in building the full sized aircraft, the address of the builder or plans distributor can be obtained from the EAA in the States, or the EAAC in Canada.

Eight years ago I built two models of Don Quixote, the same size. I had a lot of fun flying them and entering several Canadian scale contests and flying rallies. Eventually I sold them so that I could concentrate on other modeling projects.

As time passed, I could never forget this plane. I knew that sooner or later I would be building another one. Here it is.

I made a new set of drawings and in a short time the model was built. Once again, I'm having fun with it and receiving many nice comments as it is extremely docile with superb flying and ground handling qualities.

The model is exact scale, except for the engine. A 4-stroke, 2-cylinder engine would make it exact. As with any scale model there are some items which you have to make for yourself. None of them are difficult to fabricate. The scale of the model, as shown, is 1:3.5. Dimensions of the full size are:

Wingspan: 7.60 meters (25 ft.)
Length: 4.88 meters (16 ft.)
Height: 1.75 meters (5.75 ft.)

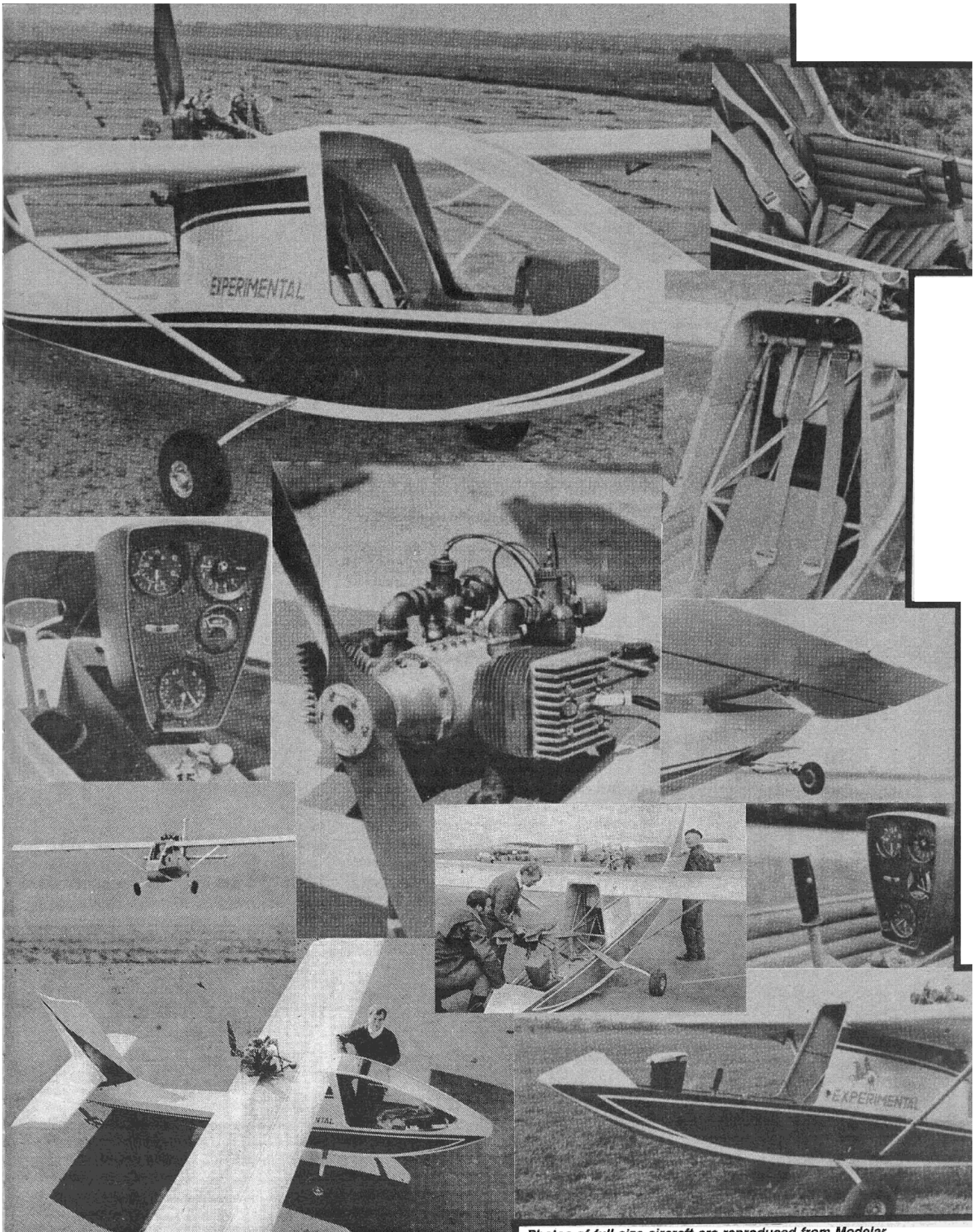
The model was designed to be easy to build for a relative beginner who has built at least one or two models before. To build the model, simply follow the order in which the instructions are written. Most items are identified by number or letter so that the description of the parts is made easier. The whole model is made from balsa, with some plywood and spruce.

To start building the model, cut out as many parts as possible. Drill holes where necessary.

Start by building the wing center section.

Take plywood piece (1) and, with 5-minute epoxy, glue the 3/16" ID brass tubing on its centerline. Glue in balsa fillers (6) on either side, and then enclose the structure with plywood piece (1) to box in the tubing.

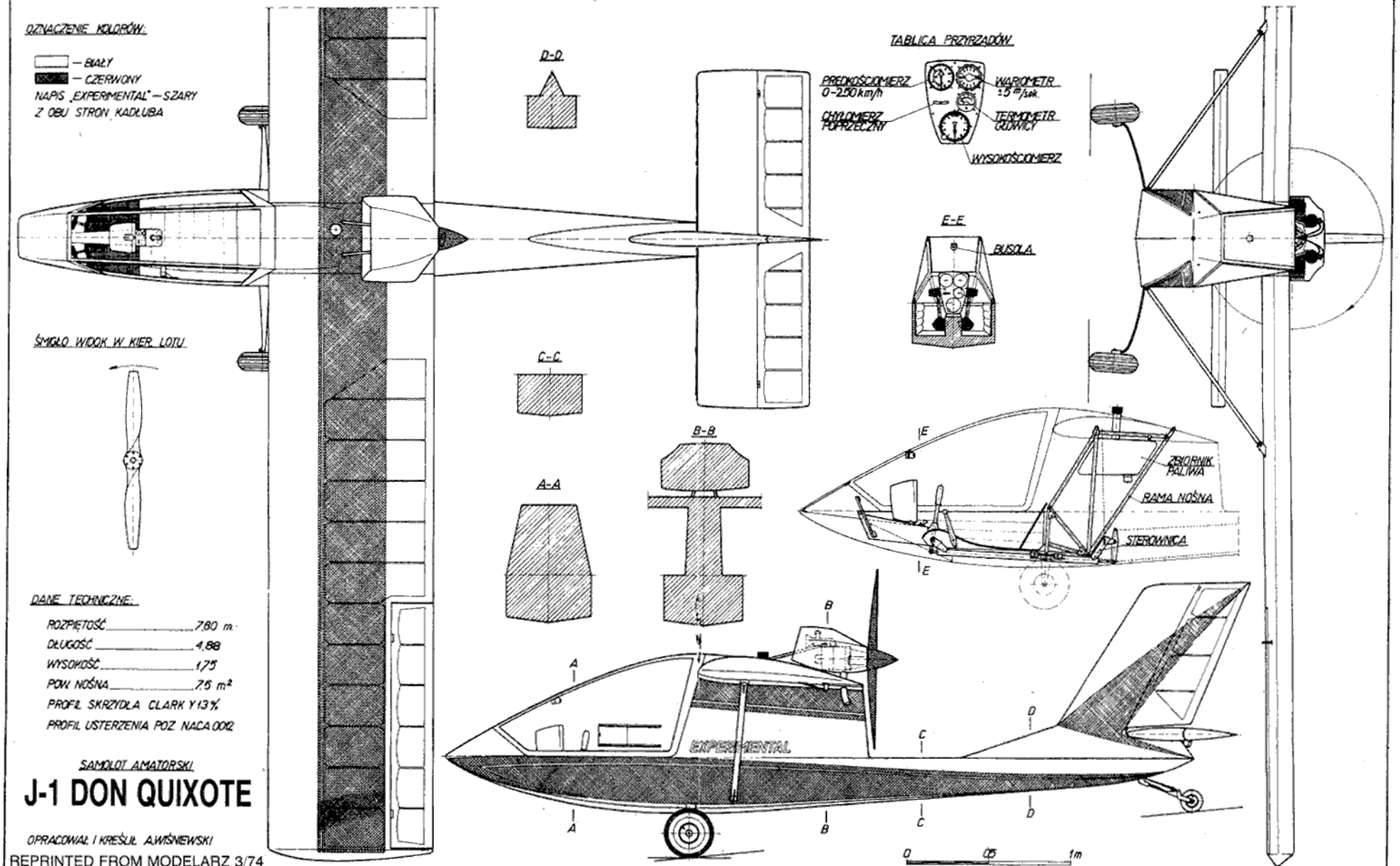
Drill 1/8" holes for the engine



Photos of full size aircraft are reproduced from Modelar and Modelarz.

OZNACZENIE KOLORÓW:

— BIAŁY
— CZERWONY
NnapIS „EXPERIMENTAL" — SZARY
Z OBU STRON KADŁUBA



D-D

C-C

B-B

A-A

TABLICA PRZYRZĄDÓW

PRĘDKOŚCIOMIERZ 0–250 km/h
WARIOMETR ±5 m/sek.
CHYLOMIERZ POPRZECZNY
TERMOMETR GŁOWICY
WYSOKOŚCIOMIERZ

E-E

BUSOLA

ZBIORNIK PALIWA
RAMA NOŚNA
STEROWNICA

EXPERIMENTAL

0 0,5 1m

ŚMIGŁO WIDOK W KIER. LOTU

DANE TECHNICZNE:

ROZPIĘTOŚĆ	7,80 m
DŁUGOŚĆ	4,88
WYSOKOŚĆ	1,75
POW. NOŚNA	7,5 m²

PROFIL SKRZYDŁA CLARK Y 13%
PROFIL USTERZENIA POZ NACA 0012

SAMOLOT AMATORSKI

J-1 DON QUIXOTE

OPRACOWAŁ I KREŚLIŁ A.WIŚNIEWSKI

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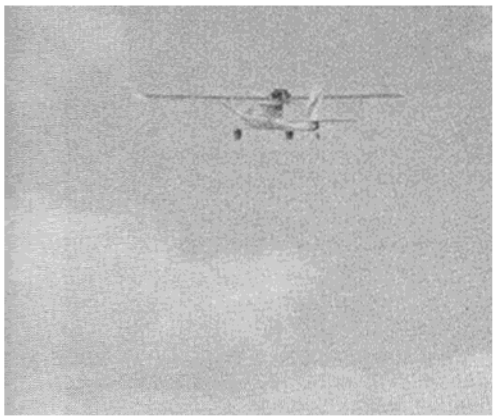
mounting anchor plates and cut out the square holes for the 3/16" wheel collars, which will eventually hold the wings in place.

Drill the angled hole for the nyrod for engine throttle control. Now, glue this entire assembly to the bottom plywood sheet (4), together with ribs (W1) and hardwood block (2).

Epoxy two 8-32 screws into block (2) with their heads flush with the bottom sheeting (4) and tighten with nuts. Glue on the top sheeting (5). Now, put this center section aside.

Build the wings next. They are simple to build and I only have a few comments to make regarding the construction. Before gluing the top leading edge sheeting down, the piano wire (37) has to be glued in at the proper angle. To do this, first glue plywood web (41) to the top and bottom spar (39) on the side close to the leading edge. Take piano wire (37) and insert it through the first balsa rib

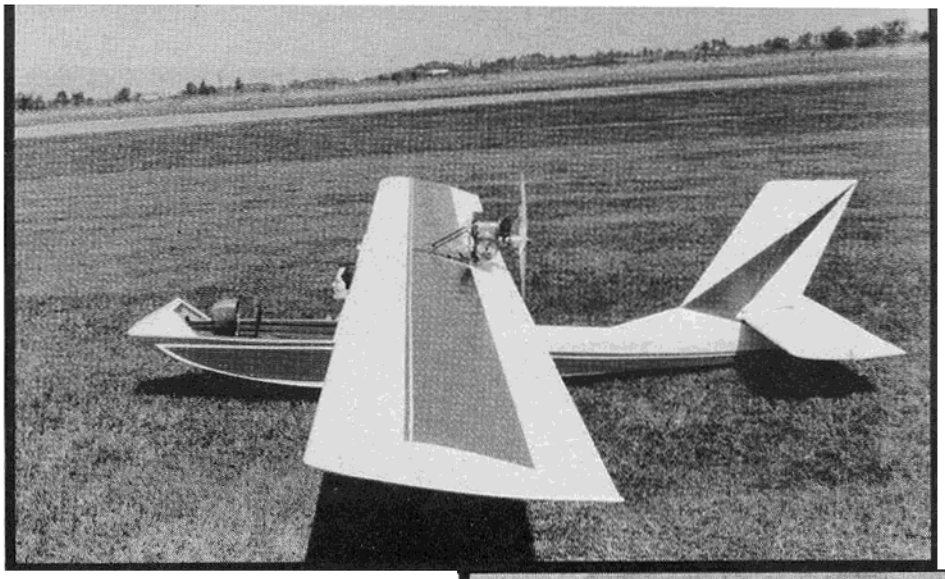


(W3). Do the same thing with the rear piano wire (38), but attach this one to the rear spar (40) with thread and epoxy.

Now, take the wing center section and place it on top of the plan in line with the wing roots. Put some weight on top so that it does not move. Take one wing panel and slide it toward the center section, until the wing root is touching it, with the 3/16" piano wire now sitting in the tubing and the 1/8" wire in the hole in plywood rib (W1). Lift the wing tip and place a 1/4" block under it so that you get the proper dihedral when the wing is finished.

With epoxy, glue the piano wire to the plywood web (41) in the wing and surround it with 1/4" sq. spruce and balsa filler, as shown on the drawing. With epoxy, enclose this assembly with the other plywood web (41).

Install the controls for the ailerons (I used nyrods) and then glue on the top leading edge sheeting.

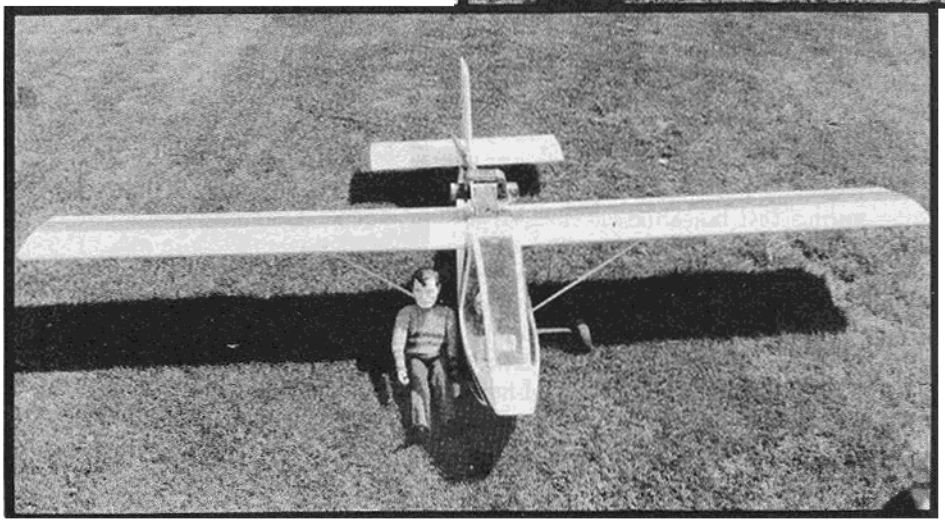


ABOVE: Wing and stab surfaces are removable. RIGHT: Photo showing interior. Notice fuel tank location. No problem drawing the fuel using just muffler pressure. Homemade muffler to simulate opposing twin. BELOW: The pilot is a must to complete the package.

Before you can cover the wings, the wing strut mounting lugs must be installed. Take one lug and solder two 4-40 nuts over the holes. Make a small notch in the bottom leading edge sheeting and insert this lug so that the holes in it line up with the holes in the plywood web (42). Place mounting lugs without the nuts on the other side and, with 4-40 screws, secure them to the plywood web (42).

Next, build the fin.

Glue the trailing edge of the fin together and cut out the leading edge spar (12). Support them over the plan in such a way that the centerline of both is on the same level. Glue in the ribs, sheet one side with 1/16" balsa, and then flip it over and sheet the other side. Glue on the leading edge



cap (13) and tip (14). Glue on the rib (C1) at the bottom. Sand the fin to your satisfaction.

At this point, make the rudder control horn out of 3/32" piano wire, with the control arm silver soldered to it. Slip the brass tubing over the wire and bend the wire at the top to go into the rudder later. Fasten the tubing to the spruce (32) in the trailing edge of the fin. Mount a Du-Bro ball link onto the rudder control arm and the two cables which will be connected to the tail wheel later.

Finally, the fuselage is next.

Cut out the fuselage sides (15) and doublers (16 & 17) with locations of the formers and cross webbing marked. Note that the triangular markings on the drawings are indicating the outline of the fuselage sides (15). The balsa doublers (16) have the grain running vertically.

Lay the left and right fuselage sides flat, side-by-side, and glue the spruce longerons (18) and balsa cross webbing (19) in place. Put weights on top of the fuselage sides at the location of the landing gear hole and place pieces of scrap balsa, to create a jig, as shown on the top view. Take a slow drying glue and smear it on the balsa doubler (16) and plywood doubler (17). Press these down on top of the fuselage sides. Put a few pins through the doublers into the fuselage sides. Now, put weight on top of the doublers, so that they bend until the fuselage side is touching each piece of the balsa jig. Let it sit overnight.

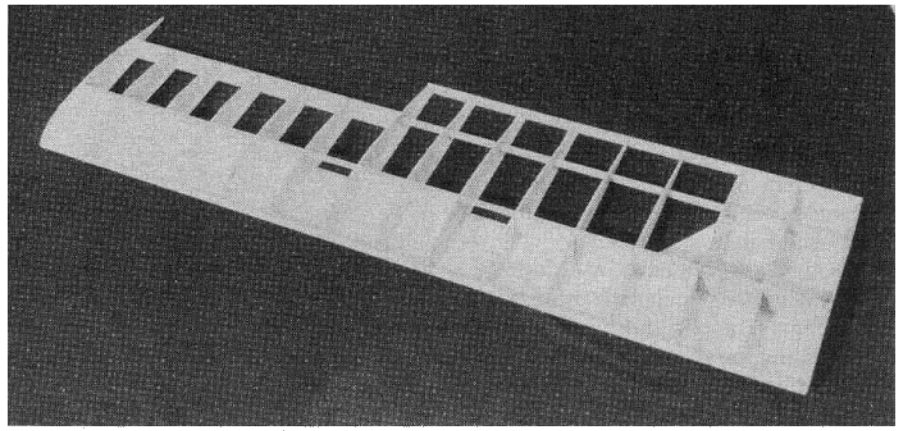
Then, in the fuselage sides, cut out the holes for the landing gear legs and strut brackets. Over the landing gear holes, glue the small plywood doubler (20).

Now the fuselage can be built upside down on top of the plans top view.

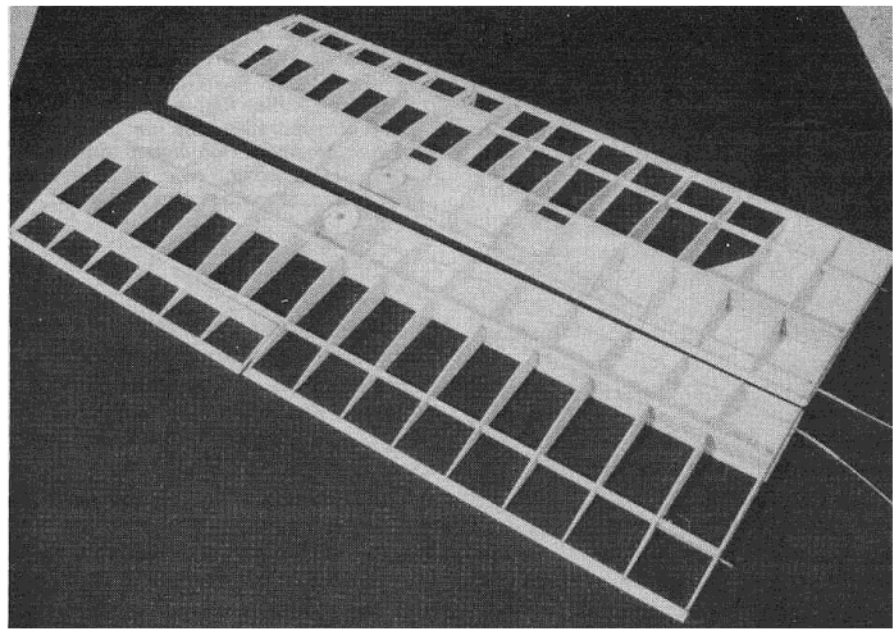
Glue in all of the (F) designated formers, between the fuselage sides, along with the cross braces. Glue in the fuselage center longeron (21). Glue in the hardwood block (22).

Before you sheet the bottom of the fuselage, make the tail wheel assembly. Mine was home-made out of spring steel, brass and soft steel, silver soldered together. You could use a commercial product with the installation modified to suit your needs. Mount this tail wheel assembly to the plywood former (F9). Connect the nyrod to the rudder control horn. Mount the wing strut mounting lugs to the plywood former (F4). Glue in the cockpit floor.

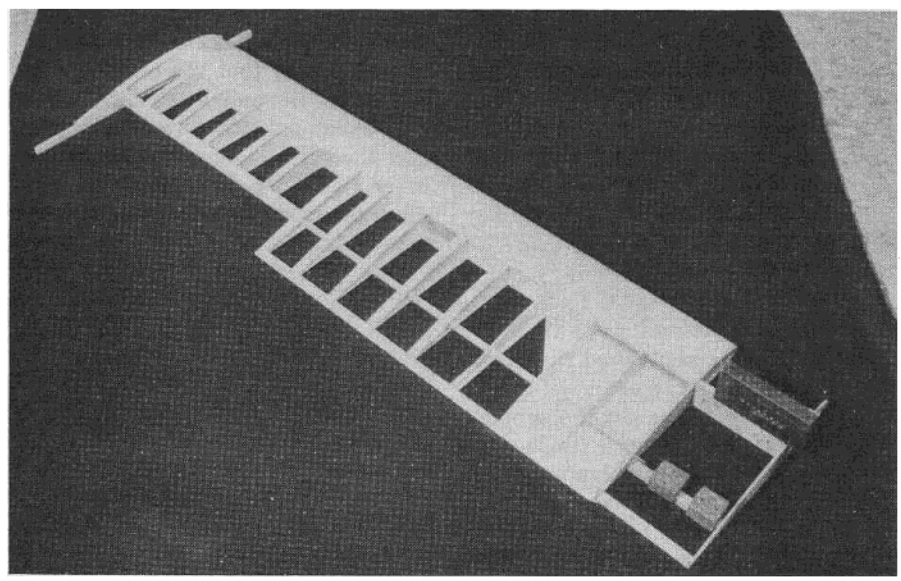
Sheet the bottom of the fuselage and



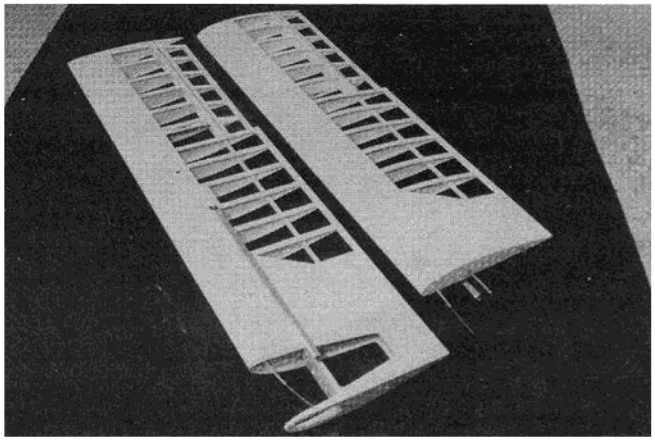
Wing panels can be built flat on bench. Very simple and basic construction.



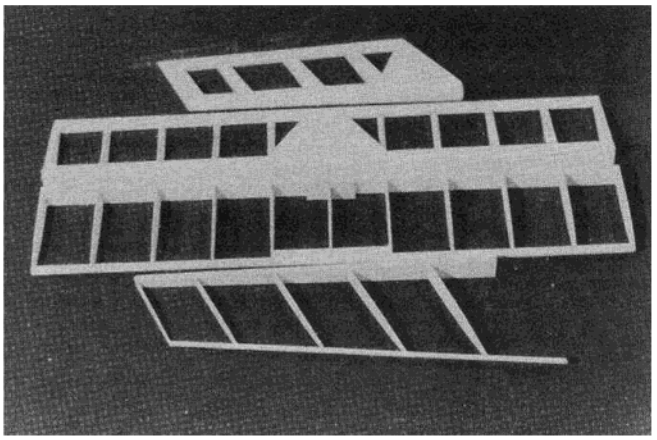
Aileron control linkage installed prior to top sheeting being glued on.



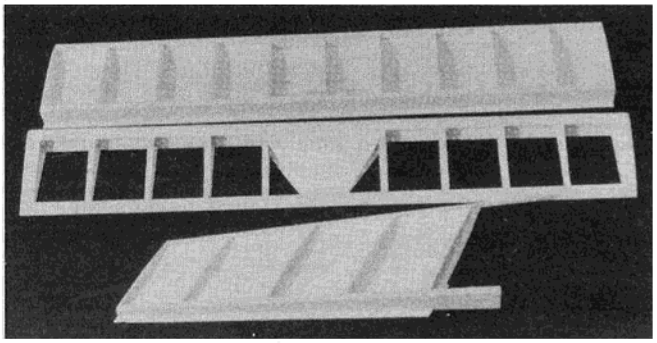
Setting up the correct dihedral on the center section. Glue the 3/16" piano wire securely into the wing. Note tip is blocked to proper angle.



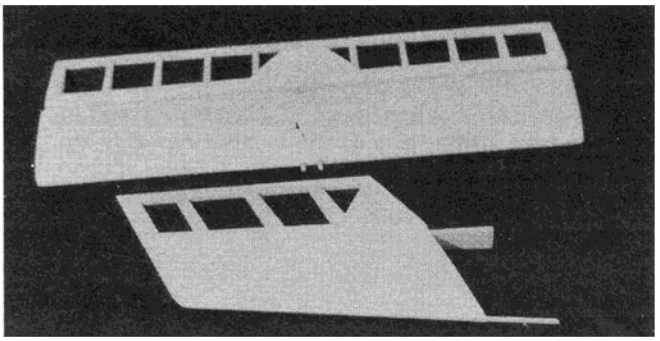
Wing panels completed along with center section. Ready to cover.



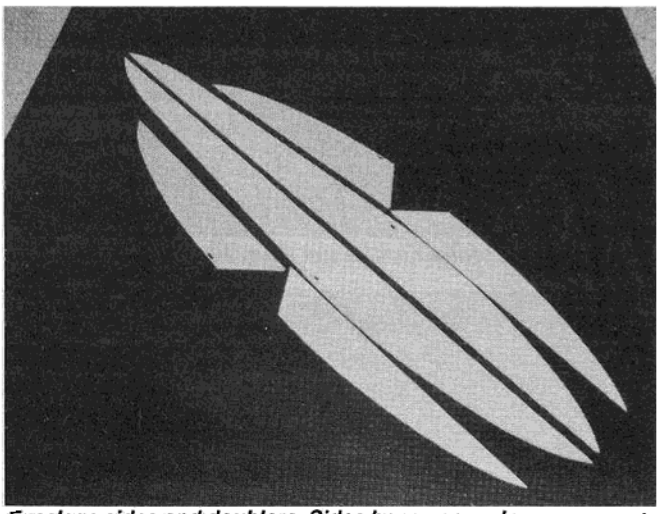
Basic tail group framed up.



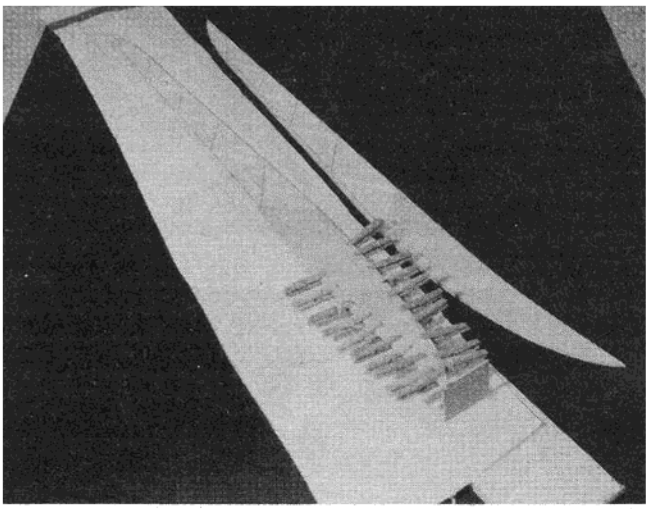
Stab and fin partially sheeted. Rudder and elevator has open structure.



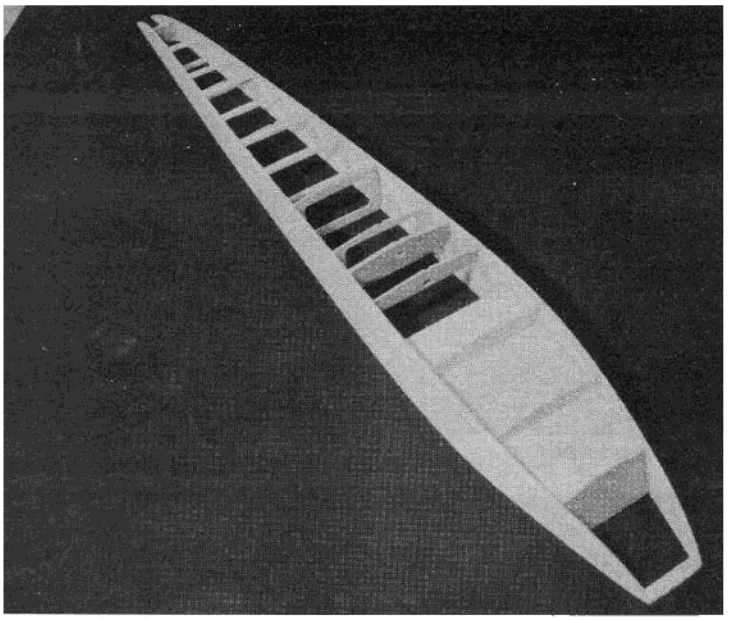
Completed tail group.



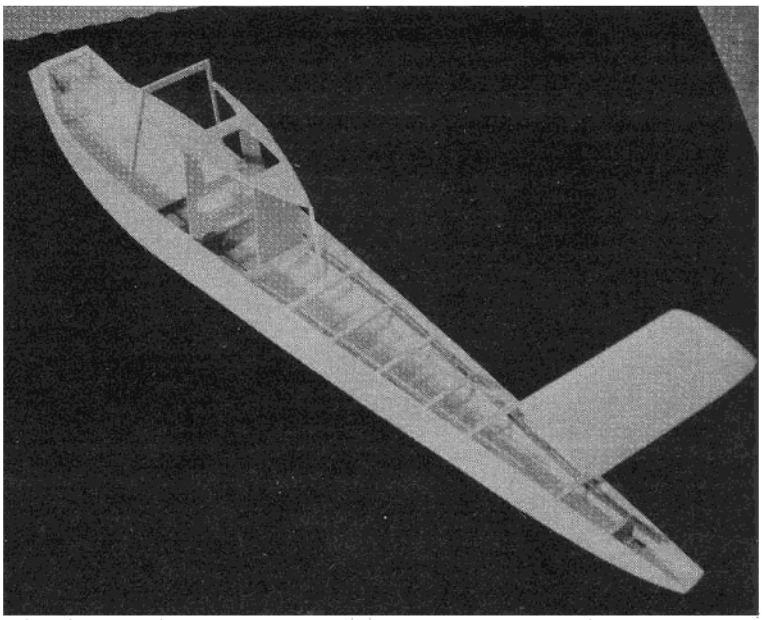
Fuselage sides and doublers. Sides have spruce longerons and balsa cross-webbing.



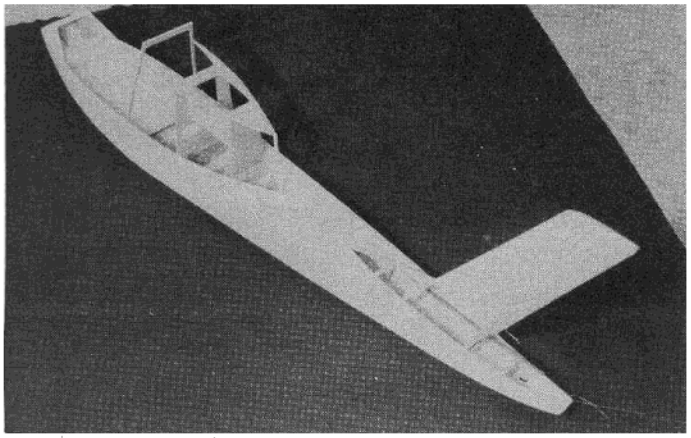
Balsa and ply doublers being glued to sides. Sides are bowed to confirm to top view before glue sets up.



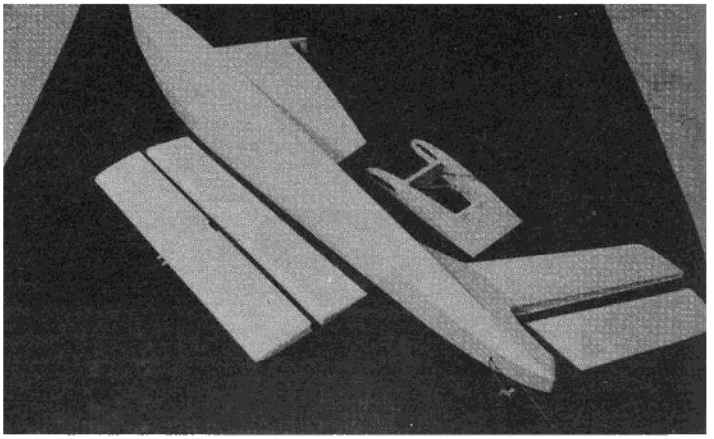
Fuselage sides are joined being careful to make sure they are symmetrical.



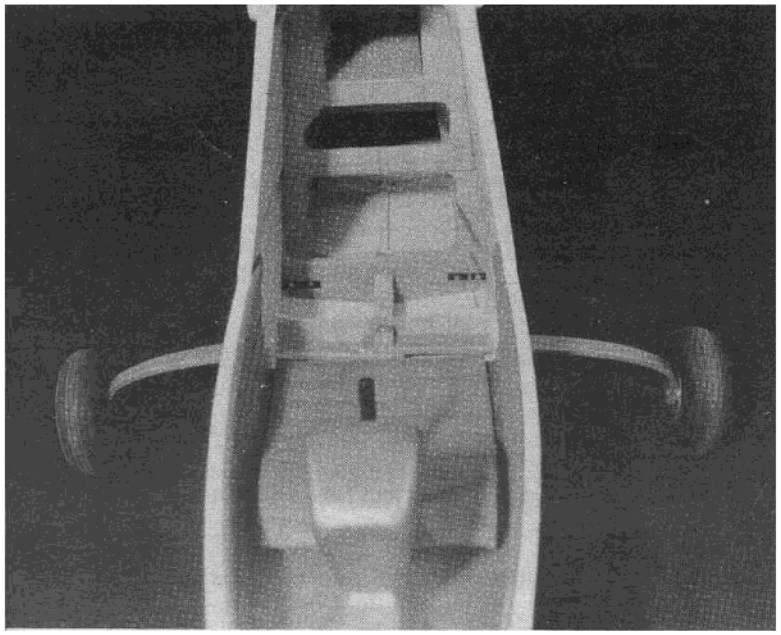
Wing mount and fin being attached. Note nyrods secured to the crosspieces



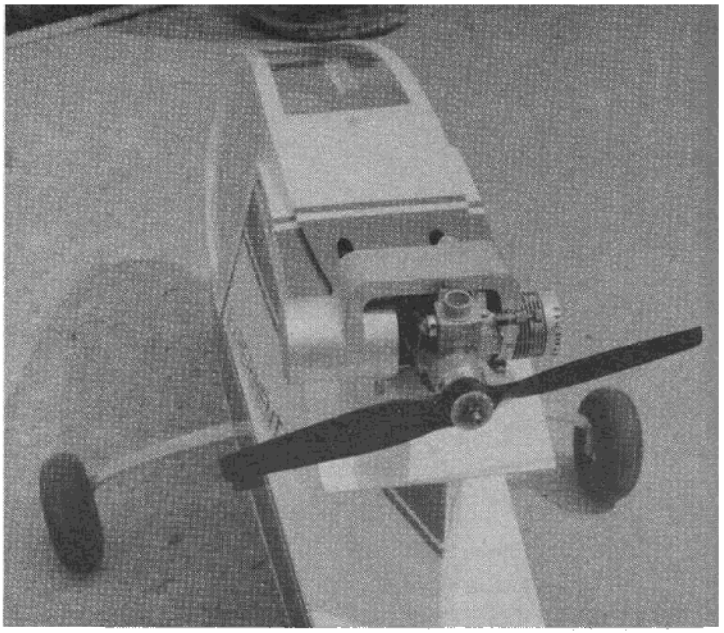
Top sheeting added to fuselage.



Fuselage, wing center section and tail group completed.



Interior view shows landing gear mount also part of cockpit detailing.



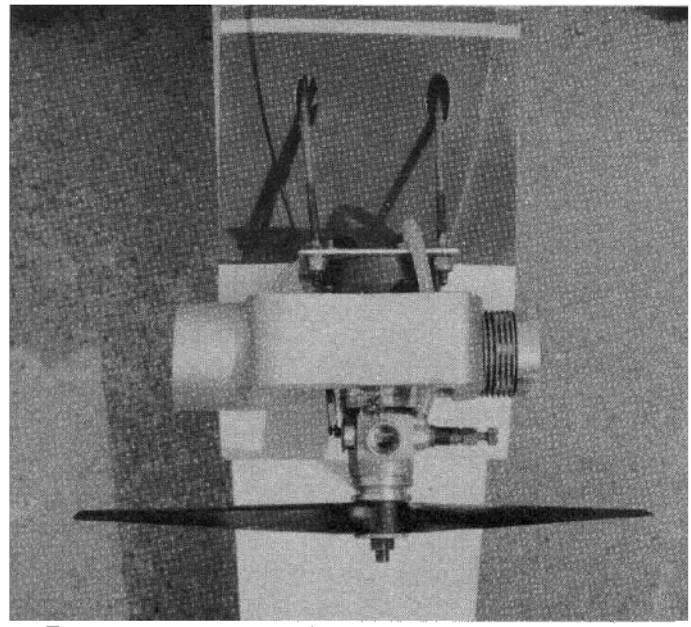
Rear view of designer's custom muffler. Note O.S. .40 front housing has been rotated 90° to make engine run clockwise.

turn the fuselage right side up. Secure the nyrods for the rudder and elevator controls to the top balsa cross braces so that they won't flex. Glue pylon formers (P2 & P3) to the fuselage formers (F5 & F6) and install the plywood base (P4) on top. Glue on the cockpit outline former (P1) to the base

DON QUIXOTE
Designed By:
Laddie Mikulasko
TYPE AIRCRAFT
Scale Polish Homebuilt
WINGSPAN
84¾ Inches
WING CHORD
11¼"
TOTAL WING AREA
953 Sq. In.
WING LOCATION
High Wing
AIRFOIL
Flat Bottom
WING PLANFORM
Constant Chord
DIHEDRAL EACH TIP
1/4 Inch
O.A. FUSELAGE LENGTH
51 Inches
RADIO COMPARTMENT SIZE
(L) 6" X (W) 5" X (H) 4"
STABILIZER SPAN
23 Inches
STABILIZER CHORD (incl. elev.)
7½"
STABILIZER AREA
170 Sq. In.
STAB AIRFOIL SECTION
Symmetrical
STABILIZER LOCATION
Top Of Fuselage
VERTICAL FIN HEIGHT
10 Inches
VERTICAL FIN WIDTH (incl. rud.)
7" (Avg.)
REC. ENGINE SIZE
.40-.60 Cu. In.
FUEL TANK SIZE
12 Oz.
LANDING GEAR
Conventional
REC. NO. OF CHANNELS
4
CONTROL FUNCTIONS
Rud., Elev., Ail., Throt.
BASIC MATERIALS USED IN CONSTRUCTION
Fuselage ..... Balsa, Ply & Spruce
Wing ..... Balsa, Ply & Spruce
Empennage ..... Balsa, & Ply
Wt. Ready To Fly ..... 152 Oz.
Wing Loading ..... 23 Oz./Sq. Ft.

and fuselage side, then the trailing edge (23) can be installed at the rear of the pylon. Glue in triangular stock between the base (P4) and pylon formers (P2 & P3). Glue in the fuel tank floor.

At the nose, on top of the fuselage, glue in former (N1) and the two balsa sides (24) and top sheeting (25). At the



Top view of custom muffler. Designer made from steel plate and silver soldered.

rear of the fuselage, glue on the fin's balsa support (26) and the leading edge of the fin fairing (27). Take the finished fin and glue it to this support, and to the cross brace, as shown on the plan.

Cut out the fuselage top sheeting (7) with the outline of pylon and fin fairing already cut out. Glue this sheeting to the fuselage. Sheet the pylon sides (9) and the fin fairings (10). Glue the plywood (28) for the stabilizer support in place and then the stabilizer saddles (29). Enclose the rear with the plywood piece (30).

Sand the whole fuselage.

Next, the center section of the wing has to be glued to the fuselage pylon.

Plug the two wing halves into the center section and apply glue to the top of the pylon (P4). Place the wing's center section on top and line it up so that the wing tips are the same distance from the rearmost point of the fuselage. On top of the wing center section, glue side sheeting (31) and plywood top sheeting (32).

To make the canopy frame, take 1/16" balsa strips and laminate them together around cardboard templates, to create an exact outline of the cockpit frame. Position the plywood canopy frame (C2) against the fuselage pylon former (P1) and, at the front, line up (C1) with (N1). Hold them in place with masking tape, while you glue in the balsa cockpit frames. Finish the inside of the cockpit frame before you glue the clear plastic windshield to it. Use acetate plastic, .020 to .030 thick. For the outside cockpit frame, I used white ABS plastic. I found that cyanoacrylate works very well.

Now build the stabilizer, elevator and rudder.

If you want to have the stabilizer removable, two 1/8" dowels have to be glued into the plywood insert (47) in the stabilizer spar (48), as shown on the drawing. The aluminum hold-down bracket (36) is going to be screwed into this plywood and fuselage plywood tail piece (30) after the model is painted.

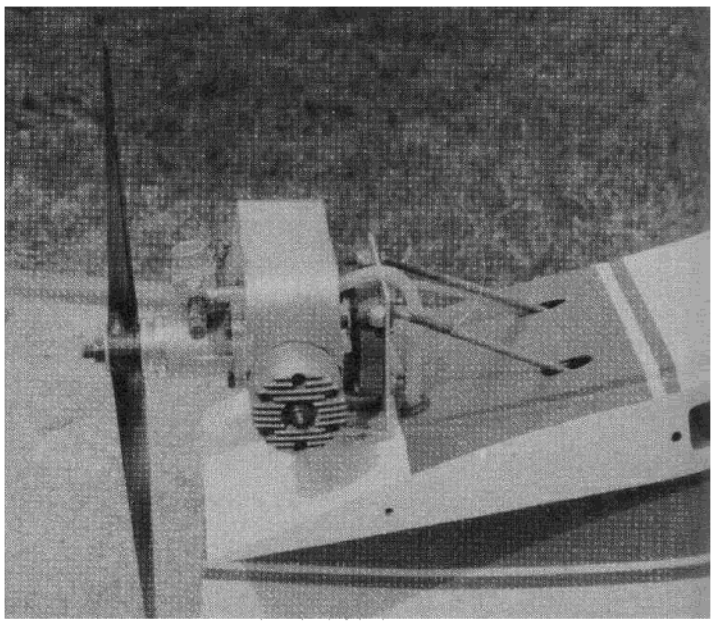
Make two wing struts. Mine are made using K & S streamlined aluminum tubing, cut to length. At each end eyes are inserted into the tubing. They are made from a steel strip bent around brass tubing with hardwood filler between. Epoxy these eyes into the tubing at the appropriate length. Then drill the tubing and end plugs right through, with a 1/16" drill, and insert a cross-pin of 1/16" aluminum tubing, mushroomed at both ends so that the end plugs containing the eyes cannot be pulled out of the strut tubing.

Cover and paint the model with your favorite materials.

The prototype aircraft was painted white with bright red trim and "Experimental" lettered in black. It did not have identification markings at the time that I received the 3-views from Poland.

Make the landing gear.

Take 1/4" duraluminum and cut out the shape. Bend in a vise to the shape shown on the drawing. Now drill the



This side view shows off engine mounting. The thrust line can easily be changed with set-up.

holes for the wheel axles and for bolting it to hardwood block (22). Install it on the model.

Because the cockpit is so large and so visible, you should take the trouble to finish it as well. Upholstery was made this way: Take thin cardboard and transfer the shape of the cockpit sides onto it. Cut it out. With contact cement, glue on 1/8" soft foam. Then place bright red leatherette material on top, folding it behind and gluing it to the cardboard back. With a soft pencil, mark the lines for stitching. Sew right through the cardboard on a suitable machine. Do the same thing for the seat cushion. Now, contact cement the finished cushions inside the cockpit. The console can be made out of balsa and covered with the same leatherette material.

Instrument panel, rudder pedals and control stick add authenticity. A pilot is, of course, a must.

Install your radio equipment.

The drawing does not show detailed installation since every modeler has different radio equipment. My model has the elevator and rudder servos behind the pilot's backrest. The aileron servo is lying sideways in the upper portion of the wing center section. The throttle servo is mounted to the side of the pylon sheeting (9) at such an angle as to permit the nyrod to pass from the engine pod, down the motor mount support (49), through the predrilled hole in the center spar directly to the servo. The receiver is sitting beside the elevator servo with the antenna going back inside the fuselage and coming out at the rear opening for the elevator pushrod. The battery is sitting in the extreme nose of the fuselage, in front of former (F1).

The last thing to finish up the model is to make up the engine mount. For scale appearance, I made mine this way:

Two braces (49) were made from welding rod, cut to length and threaded for their last 3/4" with an 8-32 die, then bent at the threaded end, as shown on the drawing. On the other end, silver solder brackets (50). Two 4-40 nuts are soldered over the holes in the brackets. Now insert the finished braces through the holes in the top sheeting of the wing center section and line them up with the holes in the center spar. With 4-40 screws and washers, fasten them to the spar. Get a piece of soft 1/16" aluminum plate and cut out the engine mounting frame (35). Drill the holes for the braces and engine bearers. Bend on the dotted line shown and mount the engine bearer blocks. The size of these blocks will depend on your engine. An alternative would be a backplate with a commercial engine mount bolted to it.

Mounting the engine can be done next. Here, I would like to expand on the ways to do it. If you are using an engine which cannot be reversed, you will have to use a pusher propeller. With the engine sitting sideways, the exhaust will be pointing upwards. In all three models I never had any problem with this arrangement. Every time I went to start the engine, I made sure that it could be turned by hand freely with no fuel locking the piston. You should do the same thing.

If you have an engine with a removable front housing, loosen the four screws and rotate the whole housing 90 degrees counterclockwise. This will make the carburetor sit 90 degrees to the left of the cylinder head, looking from the propeller side. Now, the engine is going to run backwards (clockwise), and you can use a normal "tractor" propeller bolted onto the shaft backwards. I like this arrangement for another reason. With the engine mounted sideways, the carburetor is sitting vertically for easier adjustment. You can use the regular muffler. Don't worry about its exit facing into the direction of flight. (See RCM March '82 Force One.) Since I wanted a scale appearance, instead of mounting a dummy cylinder, I made a muffler to resemble the opposite cylinder. I used .020 steel plate, formed and silver soldered.

Install the fuel tank. The pickup is about the middle of the tank, at the bottom. The fuel and pressure lines come up through the holes in the top sheeting (32), one to the carb and the other to the muffler pressure fitting. With the pressure line connected, there should be no problem with fuel draw. Of course, if your engine has a fuel pump, it will be that much better.

Assemble the model. The wings are held in place with wheel collars in the center spar and with the struts. Tighten the set screws in the wheel collars so that the wing cannot come out. Check all of the controls. The elevator should have 1" up and down. Rudder should be at least 1" right and left. Ailerons should be 3/8" up and down.

Fill the fuel tank. Check the Center of Gravity against the drawing. More likely, the model will be tail heavy. Glue the ballast into the nose securely to balance the model. As with any model, it is important to have the C.G. in the location as shown on the drawing.

Check the angle at which the engine is sitting against the drawing. On the first flight, run the engine richer than normal.

From RCModeler Feb. 1985

Now, to the flying.

The model has no bad habits. It is a straightforward, gentle flying aircraft. If, while flying, you notice that the model's nose is rising when power is decreased, you will need to increase the negative angle of thrust. To do that, simply loosen the two nuts (A) on the engine struts and tighten back with the nuts (B) so that the propeller end of the crankshaft is raised slightly. Use nylon filled locking nuts. Change the angle in small increments until the model flies level at all power settings.

From this point on you will enjoy flying this unusual Polish homebuilt, named after a Spanish nut who rode around the countryside on horseback, knocking down windmills. □