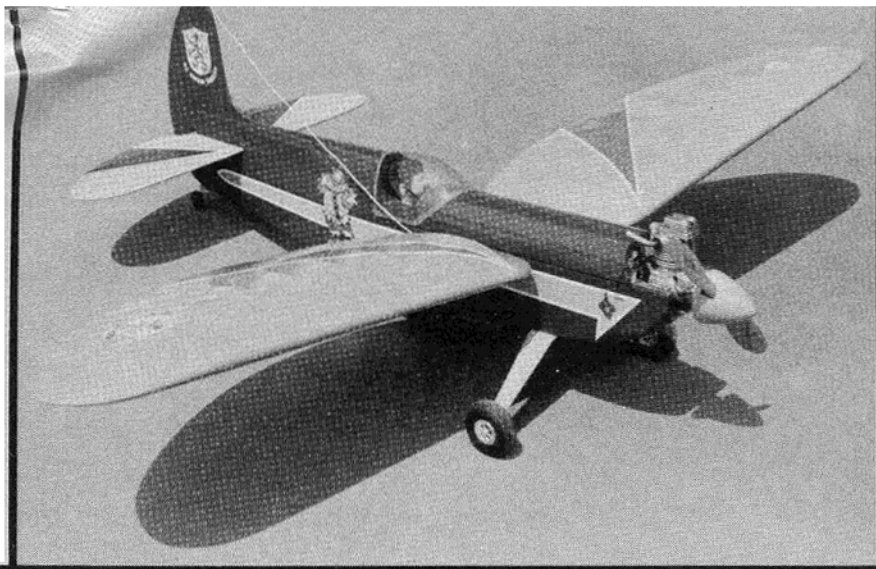




RCM CLOWN

By Dick Tichenor



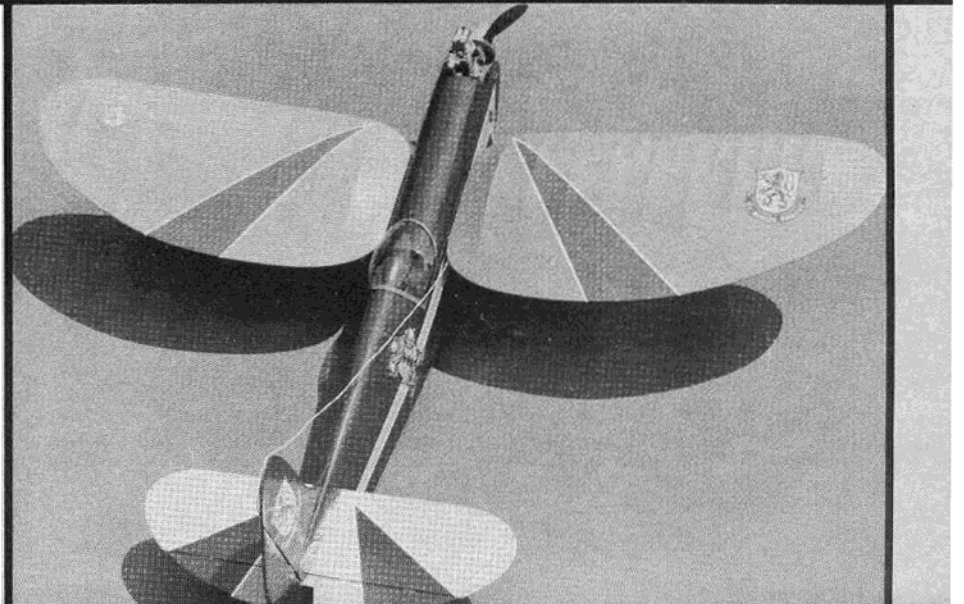


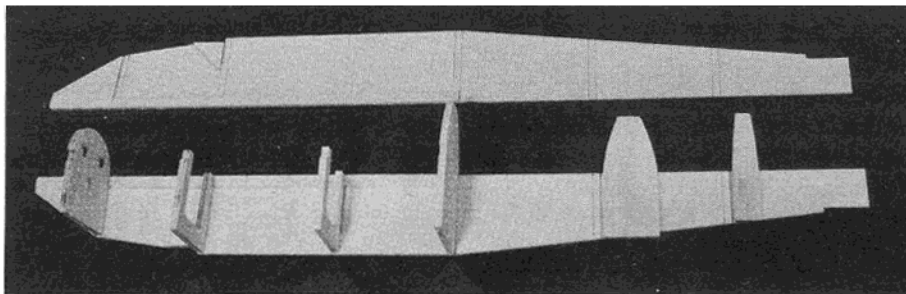
**Build this sport aircraft
with a unique
personality for .21
4-strokers or the .10-.15
2-stroke engines.**



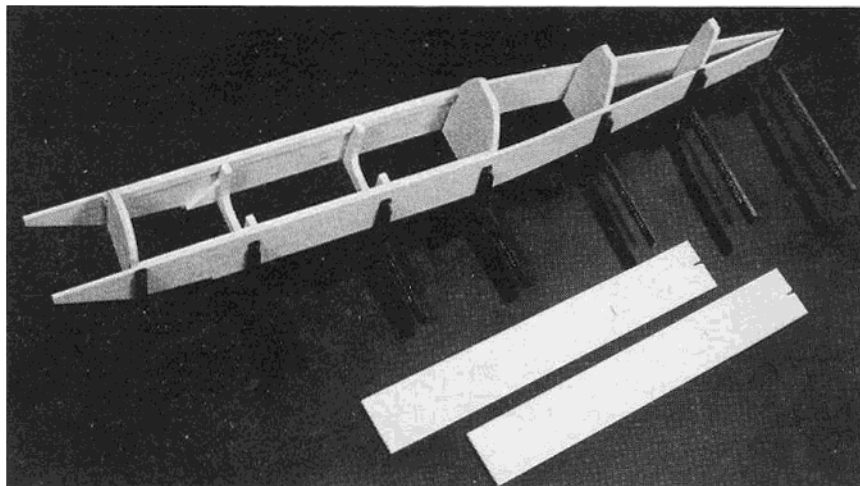
With the availability of the .21 cu. in. 4-stroke engines, came a challenge for an airplane design that is aesthetically desirable while retaining the ease of building and with appropriate flight performance. Then it dawned on us that we already had a flight proven design that had not been published.

First off, let's recognize that from the dozens of kits and ARFs on the market, there are several

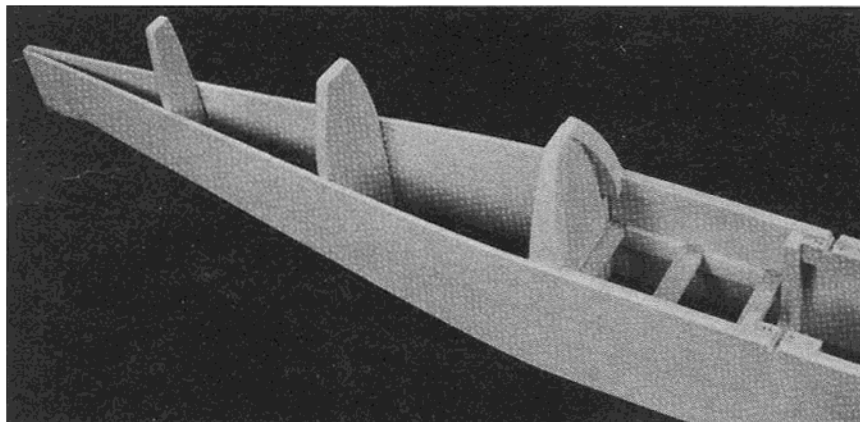




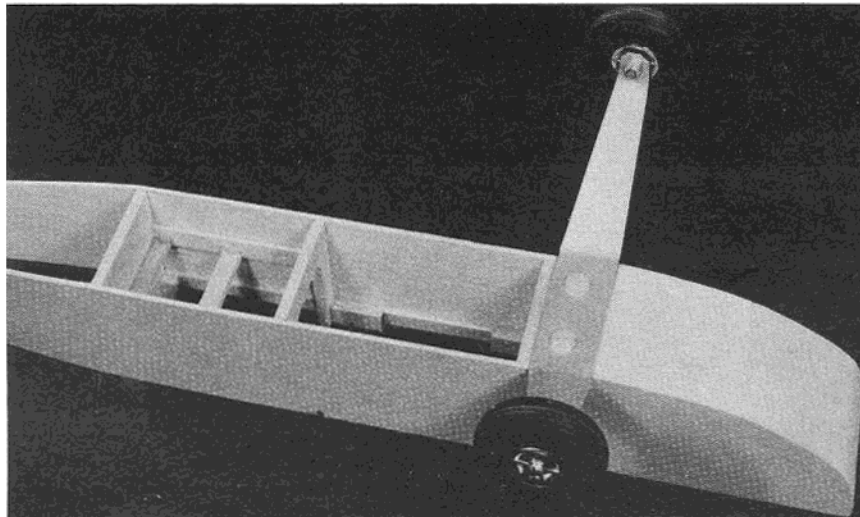
First step in fuselage construction.



Second step in fuselage construction.



Several components have been installed. These are easier before bottom sheeting is applied.



Landing gear is fitted and attached with nylon screws in 1/4-20 tapped holes in 1/4" plywood support.

that are suitable for these small 4-strokers. Our efforts are directed toward those who enjoy scratch building and possessing an aircraft that does not look like the mass produced designs.

It is very difficult to come up with an airplane configuration

RCM CLOWN

Designed By:

Dick Tichenor

TYPE AIRCRAFT

Sport

WINGSPAN

46 Inches

WING CHORD

8 1/2" (Avg.)

TOTAL WING AREA

360 Sq. In.

WING LOCATION

Shoulder Wing

AIRFOIL

Clark Y (Modified)

WING PLANFORM

Semi-Elliptical

DIHEDRAL EACH TIP

3 Inch

O.A. FUSELAGE LENGTH

33 Inches

RADIO COMPARTMENT SIZE

(L) 9" x (W) 2 1/4" x (H) 2 1/4"

STABILIZER SPAN

18 Inches

STABILIZER CHORD (incl. elev.)

5" (Avg.)

STABILIZER AREA

90 Sq. In.

STAB. AIRFOIL SECTION

Flat

STABILIZER LOCATION

Mid-Fuselage

VERTICAL FIN HEIGHT

6 Inches

VERTICAL FIN WIDTH (incl. rud.)

5 1/2 Inches

REC. ENGINE SIZE

.21 cu. in. 4-stroke

FUEL TANK SIZE

4 Oz.

LANDING GEAR

Conventional

REC. NO. OF CHANNELS

3

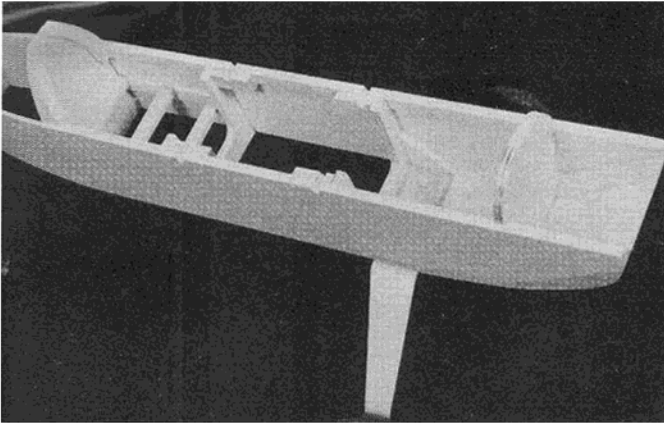
CONTROL FUNCTIONS

Rud., Elev., Throt.

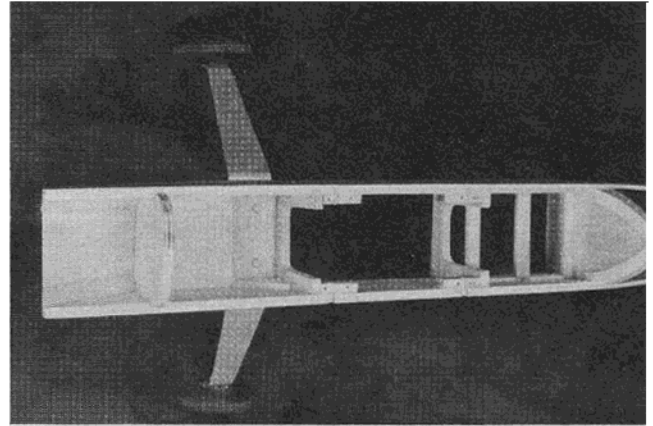
BASIC MATERIALS USED IN CONSTRUCTION

Fuselage	Balsa & Ply
Wing	Balsa & Music Wire
Empennage	Balsa
Wt. Ready To Fly	48 Oz.
Wing Loading	19.2 Oz./Sq. Ft.

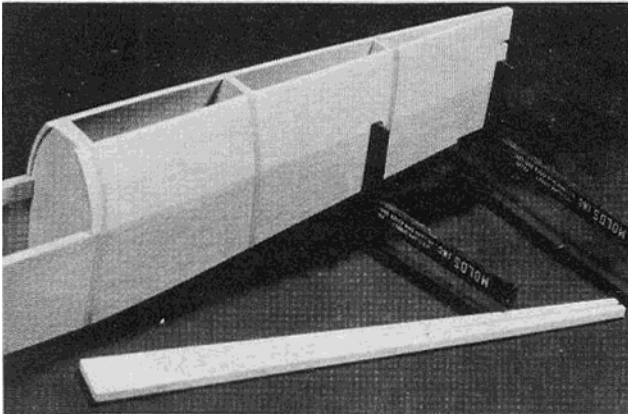
that hasn't been done before and our Clown is no exception. This is actually a rehash of an original Brown Jr. powered free-flight model that I designed and built in 1938. The original created lots of funny remarks from my flying buddies back in those days and



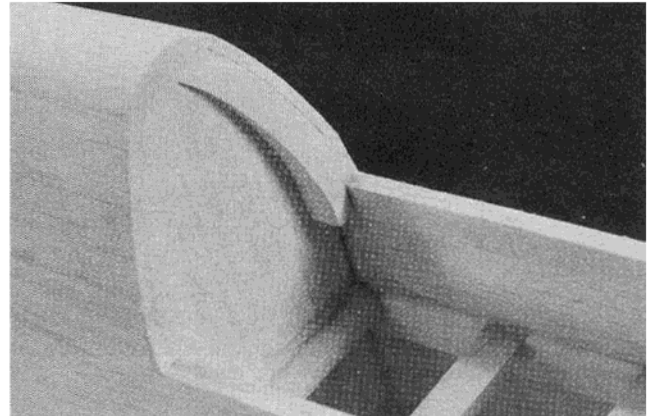
A view of details inside the forward fuselage.



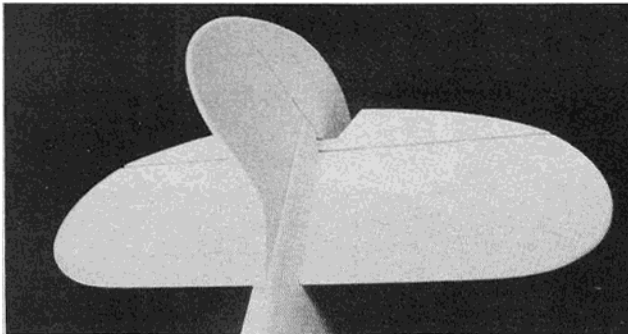
This is a good time to apply polyester resin to the interior of the first two sections for fuelproofing.



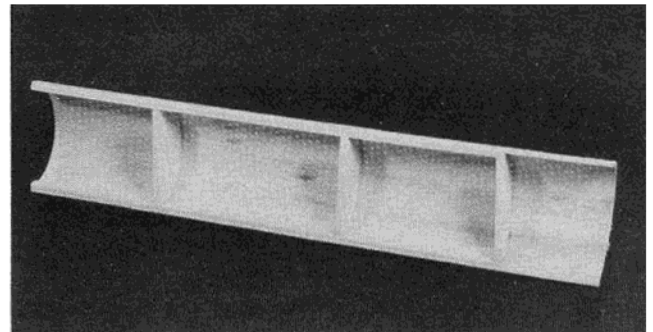
The 3/32" upper rear side panels are held in place with rubber bands and secured with Zap CA. The 1/4" top cap is ready to install. Note slot for vertical stab in top cap.



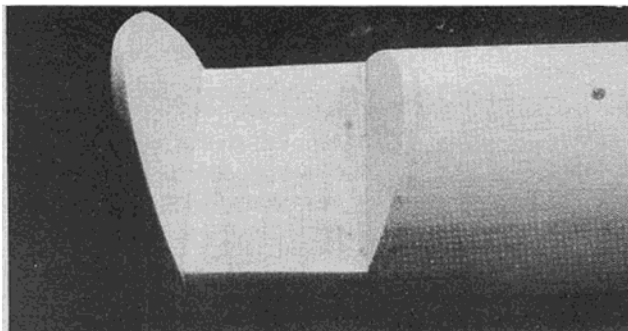
Top cap has been shaped. Slant shown is to facilitate installing and removal of forward cowl.



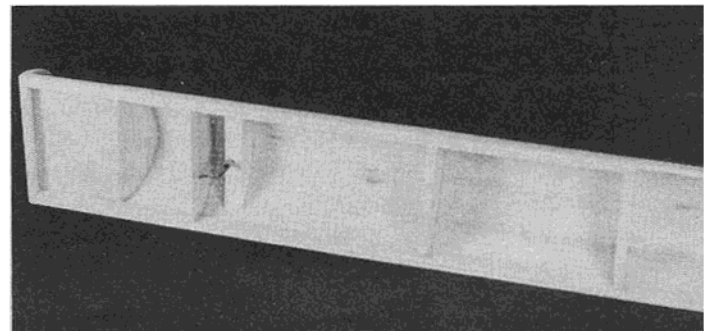
The tail surfaces are made of soft 3/16" sheet balsa. Trial fit is shown — install after covering. Keep 'em light.



First assembly of forward top cowl. Note angle of front former to match firewall.



Aft end of top cowl. Edges of rear former are beveled to fit canopy.



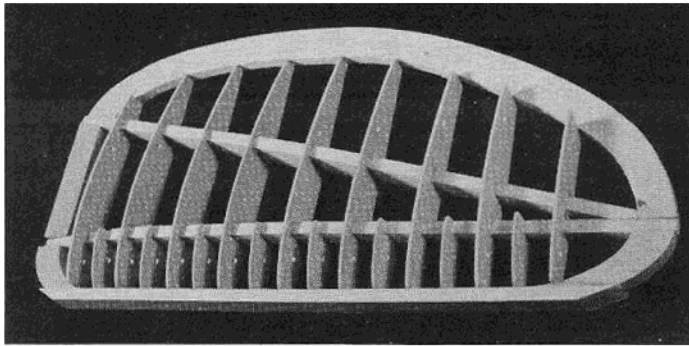
Bottom view of top cowl showing location of hatch latch which is secured after covering.

the Clown follows in the same tradition.

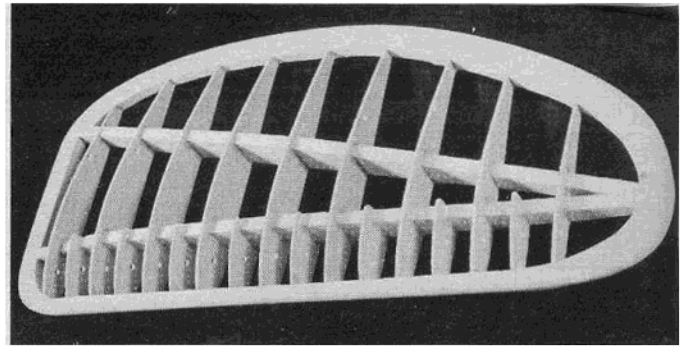
A three control approach is used with the Clown in the

interest of simplicity yet the maneuverability is limited only by the pilot's imagination. An Airtronics XL Series six channel

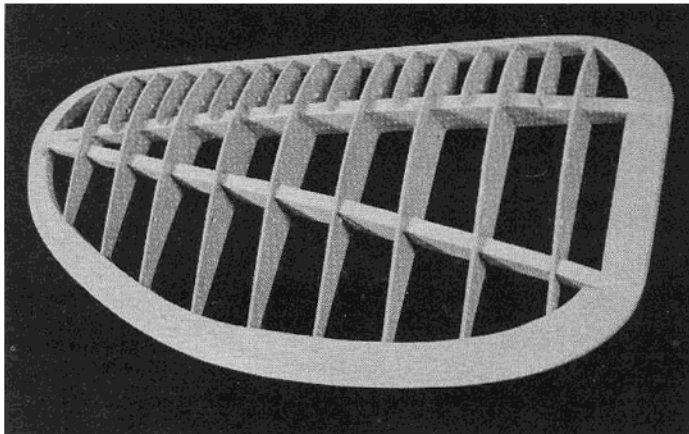
radio with three 94401 micro servos was used. The size of the micro servos allows generous space in the fuselage for moving



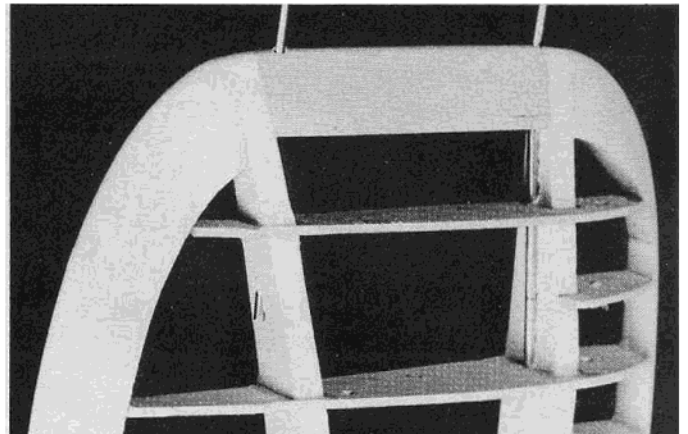
The original wing was made by using identical ribs which were trimmed to final shape after assembly. Builder's choice.



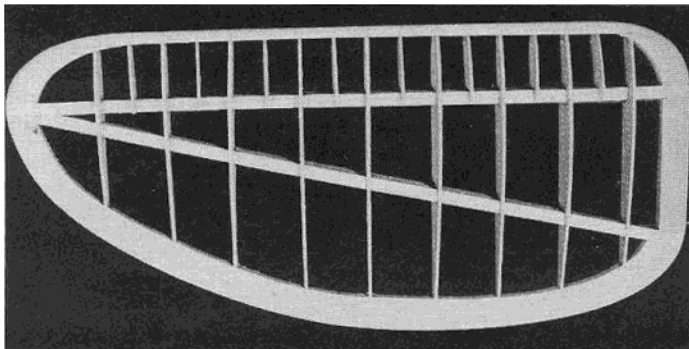
Wing panel after trimming and sanding.



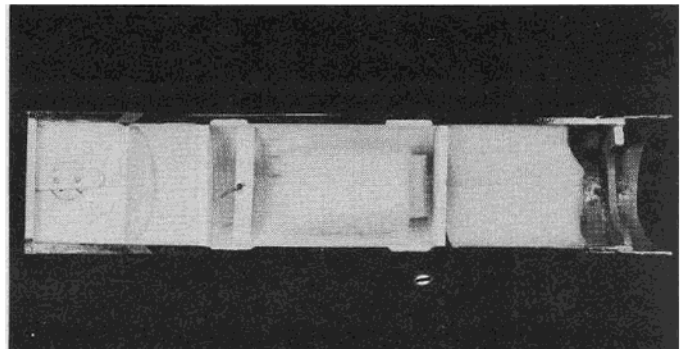
View of wing panel from inboard trailing edge.



Wing joining wires were installed with generous application of thick CA. Epoxy is also acceptable.



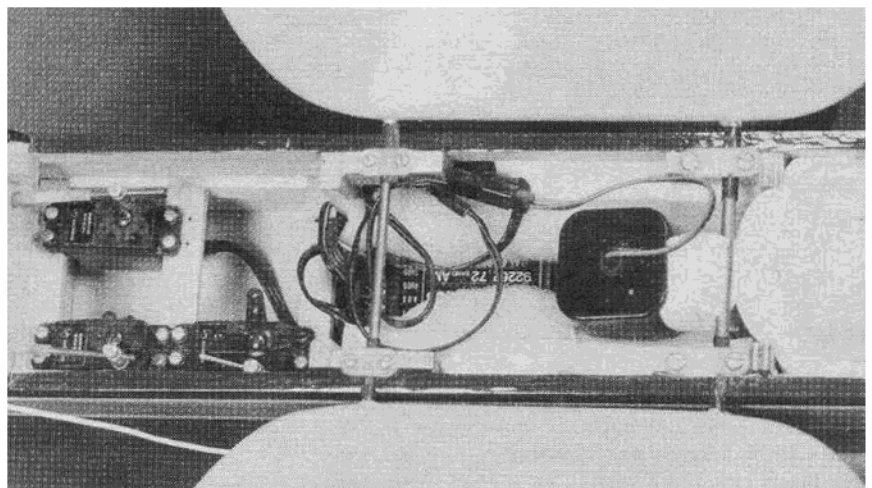
Wing panel with joining wires installed and ready for covering.



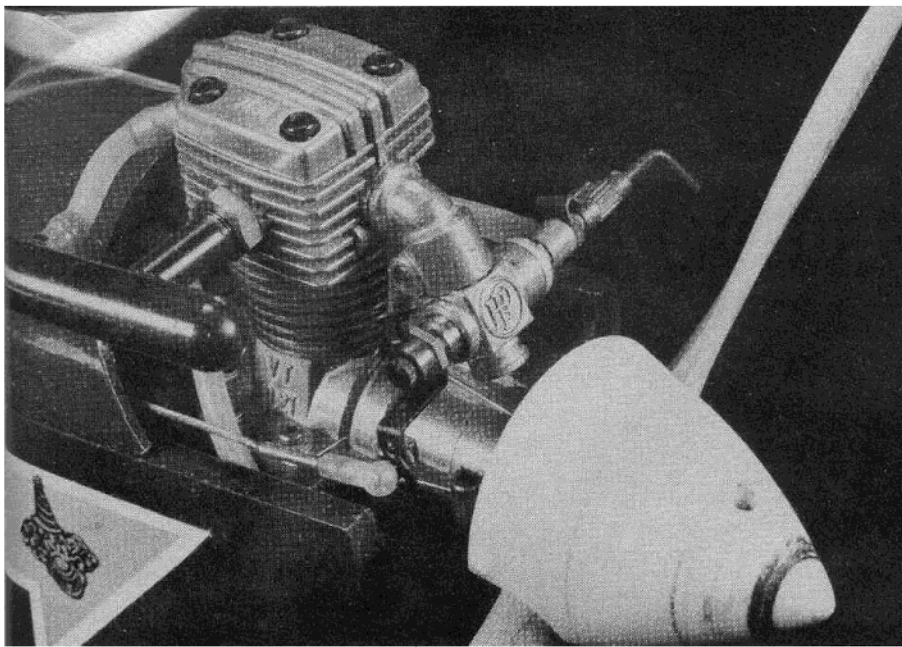
Bottom view of top cowl after covering.

the battery pack and receiver to obtain the proper balance. Don't worry about the output power of Airtronics micro servos, the 180 mph Formula I racers are using them on all controls with total reliability.

Our Clown was originally flown with a Fuji .099 2-stroke sleeve bearing engine from Hobby Shack. It was a lot of fun and really flew great. It had a lot of flying time and was getting a little ragged so a new fuselage and set of tail surfaces were built for the 4-strokers. The HP .21 was installed and we were well pleased with the additional power



Cowl removed to show equipment installation in fuselage.



HP .21 4-stroke engine installation.

and better wind penetration as the weight had been increased about 5 ounces.

Early in 1985 O.S. announced their plans to produce a .21 cu. in. 4-stroke engine. We were fortunate to obtain one of the first shipments to the USA. Designated O.S. FS-20, the engine is a miniature version of its larger brothers with all of the desirable design and performance features we have come to expect from O.S. Having flown the FS-20 in a 66 oz. biplane and now in the 48 oz. Clown, I must say that it lives up to the O.S. reputation and I am extremely happy with the little jewel.

One very important step before starting to build the fuselage is to obtain the engine and engine mount that you intend to use. Compare the length of the assembled engine and mount with the plans while placing the back face of the mount to the forward side of the front bulkhead. Mark the propeller clearance desired and reshape (with a pencil) the fuselage nose accordingly.

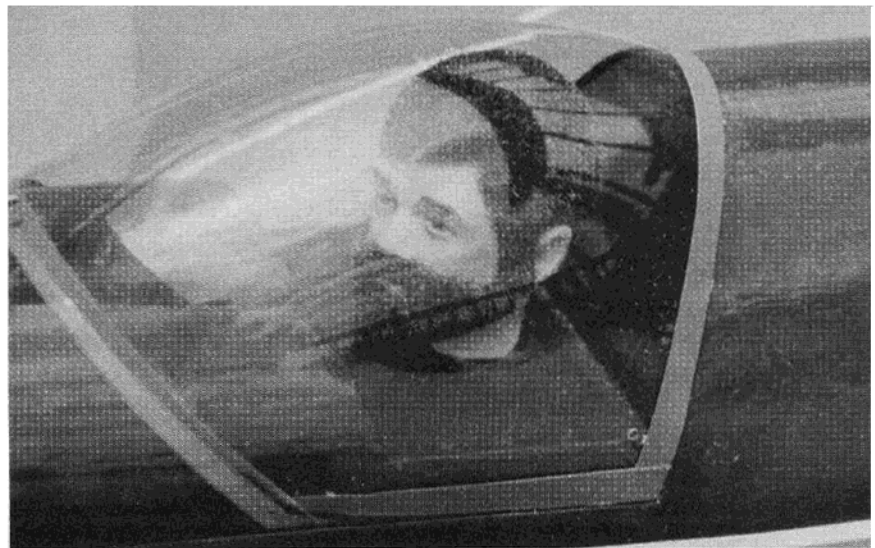
We feel that with the amount of details shown on the plans and in the photos, step by step instructions are not necessary so we will only hit the high points.

The fuselage is basically of simple box construction with a bit of extra care required when

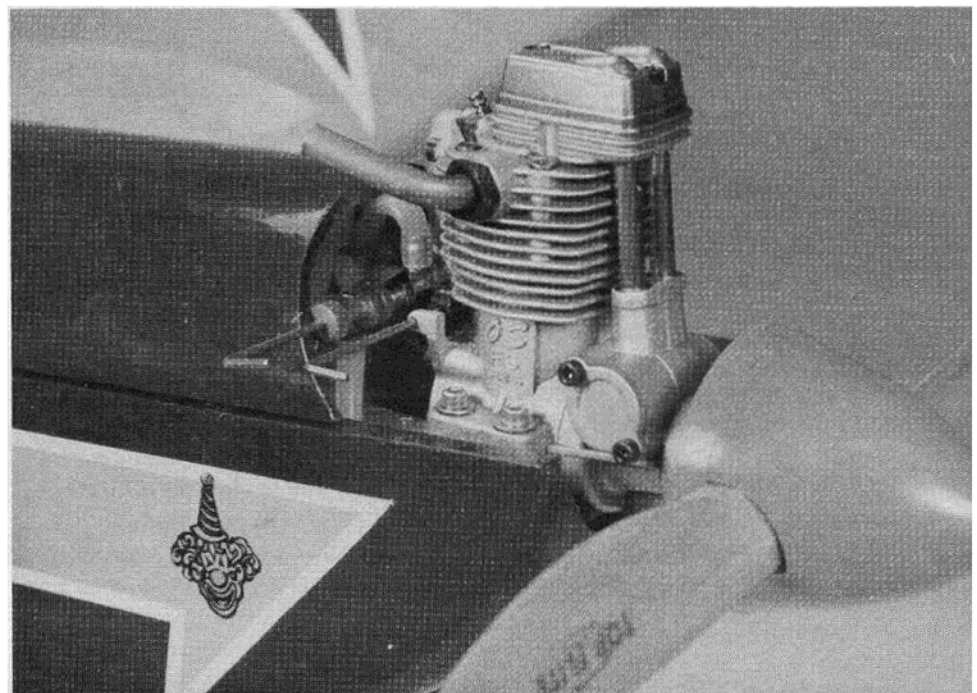
installing the front bulkhead. You will note the built-in cant for a right and down thrust line.

With the side panels and bulkheads assembled, it is much easier to install the servo mounting rails prior to applying the bottom sheeting. This is also a convenient time to make your pushrod installation provisions.

Some of us prefer to make provisions for the various installations during the earlier stages of construction when accessibility is more convenient. Things such as servo mounting, pushrods, fuel tanks and tubing, are more quickly installed on final assembly when they have been previously fitted. There are many approaches to model building so



ABOVE: A G.I. Joe head makes a hairy pilot. BELOW: O.S. FS-20 installation.



everyone can use their own favorite methods.

The forward top of the fuselage, including cockpit and canopy, is removable in one piece allowing access to the internal components by a half turn of the hatch latch. A piece of soft 3/32" x 4" x 14" sheet balsa was soaked in water, and formed around a cardboard tube to make the top hatch. It was held in place with masking tape until dry and then the formers and stiffeners were assembled. The hatch latch installation should be delayed until after the wing has been fitted to the fuselage.

The tail surfaces are made of 3/16" soft sheet balsa. This model provided an opportunity to try the new Carl Goldberg Models' pin point hinges which turned out to be an excellent choice. The ease of installing a round shaft plus the hinge action of a leaf type hinge, results in the best of both worlds. With the hinges temporarily installed (not glued), sand the surfaces smooth and even. Ours ended up about 5/32" thick. Final hinge installation and assembly to fuselage is performed after covering.

The two wing panels are built flat over the plans. First, cut out two sets of parts. You will note that in the original wing, a stack of the largest rib and a stack of nose ribs were made, assembled to fit, then trimmed and sanded to final shape and size. Our plans show individual rib patterns so it is a matter of builders' choice.

The music wire wing joiners as shown have worked very well, however, if you are a hot dogger, you might want to increase the size of the front wire to 3/16" diameter. The spar areas around the wire joiners were first well-saturated with thin CA and then heavily coated with gap filling CA around the wires. If you feel safer with using epoxy in these areas, do so.

Super MonoKote was used for covering the Clown. When covering the top surfaces of the wing panels, be sure to allow

enough excess around the edges so you can stretch it over the compound curved shape. The rest of the covering exercise is simple routine stuff.

On final assembly (after covering), the tail surfaces were inserted in their previously fitted slots, alignment checked, and lines were drawn along the edges of the fuselage. The covering was removed from the tail surfaces, 1/32" inboard of the lines. The tail surfaces were then reinstalled and secured with CA. Then the elevator and rudder hinges were secured with white glue.

Instructions for making and installing the hatch latch are detailed on the plans, just follow the step by step drawings.

Suggestions on flying the Clown are a bit difficult to make. On this, and the earlier versions, it has only been a matter of crank up the engine and go for it. Maybe it has been a matter of good guesses and dumb luck but it has worked like a good thing for us. Enjoy.

**From
RCModeler
Nov. 1 1985**