VIPER

By Jack Headley

The monoplane fighter was born several times, but the Establishment didn't seem to want it to live. "Too weak," they said; "Wings will break off," they said; "Biplanes for us," they said. And true, some wings did break off. "We told you so," they said.

The biplane reigned supreme, but the monoplane was to come, and designers learned about structures, and new materials were developed and tested. After all, it was the natural thing, who ever saw a biplane bird?

It took a while, but at last, it was there, looking a little gawky with its widespread undercarriage legs, reminiscent of a newborn colt. a little unsteady on its feet. And, just to make sure, the wing had a few struts to make certain it wouldn't break off - - - but it only had one wing.

The monoplane era was about to begin, but the biplane wasn't finished yet. Still to come were the last words in the biplane's long history, begun in the fires of old wars; still to come were the Hawker Furies, and the Gloster Gladiators. But the writing was on the wall. The elements of the fighters of the future were almost all present and, from these cautious beginnings came the Spitfires, M.E. 109's, and Hurricanes, lean and deadly.

But this is still in the future as far as our model is concerned. We distilled features from many early monoplanes for our model, all the forerunners of the World War II fighter to come; fighters long forgotten, such as the Dewoitine 510, the Moraine MS 325, the de Havilland 77, and the Vickers Jockey. Remember those? (You do??)

We borrowed the strong and sturdy undercarriage, designed for the rough grass airfields of yesteryear, and the open cockpit, so that the pilot could feel the wind in his cheeks, and sight his machine guns through a primitive gunsight and the tail skid, which was usually all the braking provided.

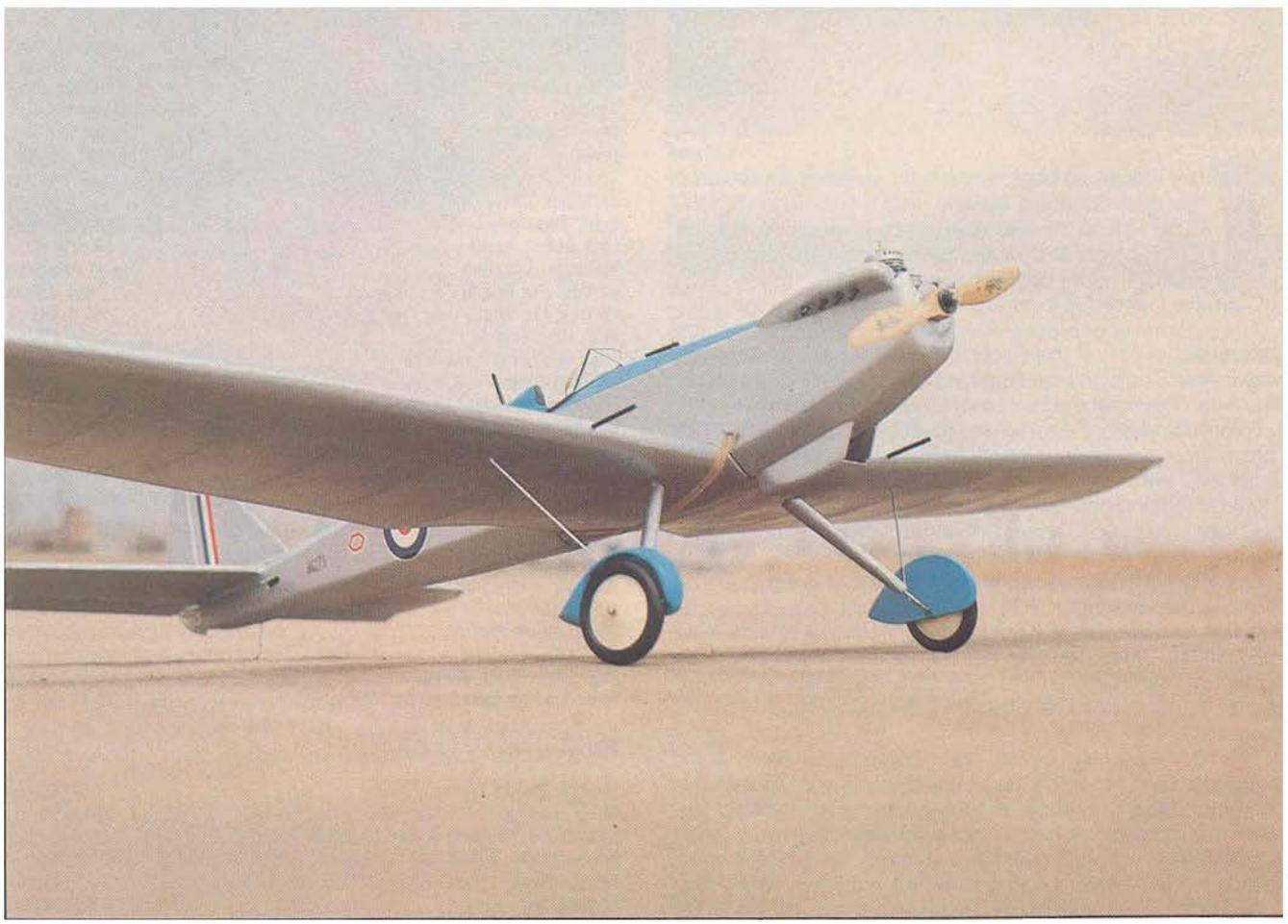
And so we ended up with the "Viper" - - - a semi-semi scale model of an airplane that didn't really exist. So, if you're looking for a little nostalgia, try this. The construction notes follow.

CONSTRUCTION

Fuselage: The fuselage is built with the use of the "inside out" technique, and begins with cutting out the two fuselage sides from 3/32" sheet. Mark on each of these sheets the position of all the frames and cross members, not forgetting to make one side left and the other side right. Cement the 3/16" square longerons at the top and bottom edges of these sheets, then install all the cross pieces. The 3/16" sheet doublers in the nose and wing area are attached next, then the sides are left to dry for a while.

But don't stop work — this is the ideal time to cut out the fuselage bulkheads and the 3/16" plywood firewall, to which the engine mount can be attached. When the sides have dried completely and all the frames are available, assemble the basic fuselage. Cement the sides together at the aft end, then install the remaining 3/16" square cross pieces, except those in the tank region - - - these are glued in place after the tank has been installed. Locate the tank securely with scrap pieces of balsa and make sure that all the fuel lines run smoothly and are well sealed.

The minor formers can now be added (all cut from 3/32" sheet), followed by the top and bottom fuselage sheeting. When



The Viper - - - A semi-scale model of an airplane that never existed for dedicated sport fliers who don't like scale. For .10 to .15 engines and three channels.

dry, the cockpit shape can be cut out and, if the wing is available, the wing cut-out can be trimmed to its final contours. Sand the fuselage all over, removing the corners from the fuselage sheeting, and then contour the nose former. Make the dummy cylinder blocks from soft balsa and also the headrest; sand to shape and glue into place. The dummy exhaust pipes and the radio mast are attached after the fuselage is completed and covered. The radiator, an essential item on all aircraft of this vintage, is made from two side plates of 1/8" sheet, and a 1/4" sheet bottom. A small piece of window screen wedged inside the radiator adds a further touch of realism.

Wings: Begin by cutting out all the wing ribs from hard 1/16" sheet. The main spars are next; these should also be cut from pretty hard strips. Add the doublers at the center section, then pin the bottom set down onto the plans (which naturally you've already covered with plastic sheet).

Glue all the wing ribs, except W1, into place making sure that the ribs are aligned correctly. A strip of 1/4" square balsa pinned to the plans near the trailing edge makes a satisfactory prop for the back of the ribs at this stage.

Cement the top main spars into place, followed by the 1/8" x 5/8" leading edge strip and the upper 1/16" sheet trailing edge piece. Add the lower trailing edge sheeting when all the above has dried.

The two wing halves can be put aside for a while now since the wing joiner/undercarriage mount is to be made next. Cut the wing joiner from 1/8" plywood, then bend up the main undercarriage wire. Using J-bolts, attach this wire to the plywood, remove and glue the wings together with the aid of this plywood piece. Don't be mean with the glue at this stage; this joint is pretty important. Rebolt the wire undercarriage legs back into place and epoxy the J-bolt nuts into place.

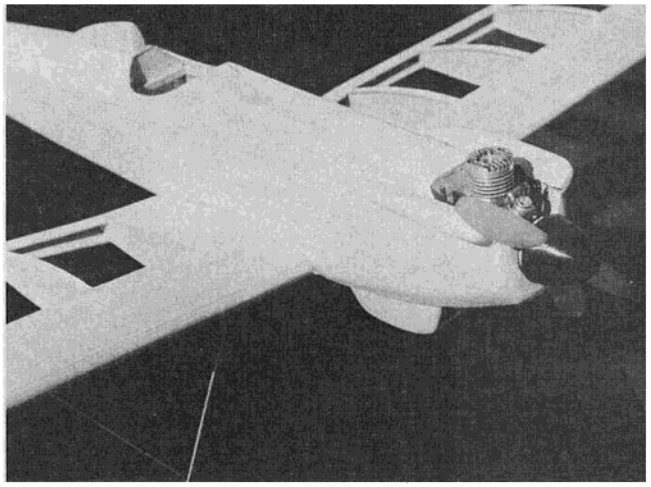
The remaining W1 ribs can now be installed, followed by the leading edge sheeting (on the upper side only) and all the center section sheets. Now make the outer gear struts from 1/16" wire; bolt them to their 1/8" ply plates and solder the bottom ends of the struts together. The lower leading edge sheeting can now be cemented into place; the true leading edge and the wing tips following.

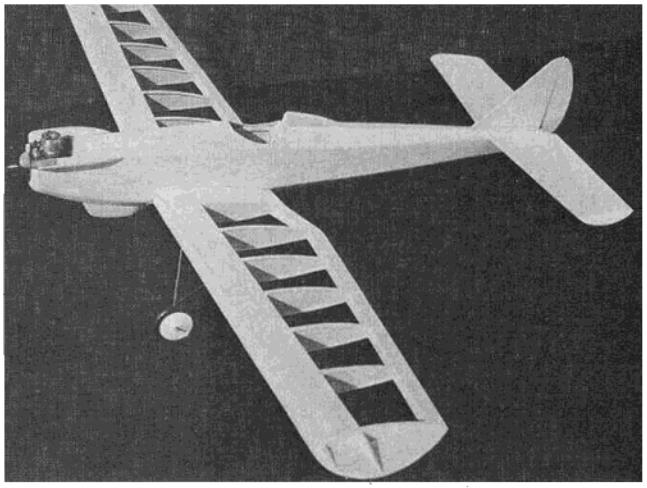
This completes the wing construction. A few moments with the sanding block will prepare the wings for covering.

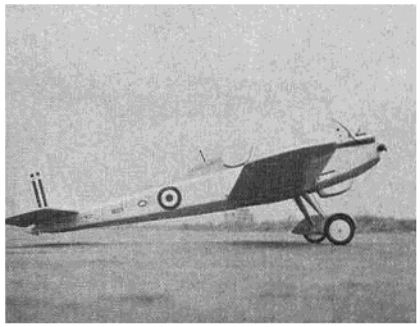
The wheel spats can be made and installed next, if required, together with the balsa fairings around the main U/C legs.

Stabilizer: Trace out the outline of the stabilizer onto a sheet of good quality 1/16" sheet, then mark on this the locations of all the internal cross members. Cut the sheet to the traced outline, and then make an additional piece for the upper surface. Glue the leading and trailing edge strips (1/4" x 1/8"), and the 1/8" square cross braces onto the marked sheet. After this has dried, attach the upper sheeting. Make the stab tips from 1/4" sheet and glue into place. When this assembly is completely dry, sand the leading and trailing edges to a semi-circular section and round off the tips.

The elevator is made from 3/16" sheet and the two halves are joined by a strip of 3/16" dowel. Be sure to make this joint quite strong. Sand the elevator round at the leading edge and taper it off to al-



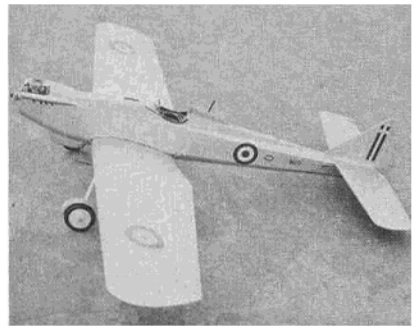




VIPER
Designed By: Jack Headley

TYPE AIRCRAFT
Semi-Scale Sport
WINGSPAN
48 Inches
WING CHORD
7" (Avg.)
TOTAL WING AREA
336 Square Inches
WING LOCATION
Low Wing
AIRFOIL
Symmetrical
WING PLANFORM
Double Tapered T.E.
DIHEDRAL, EACH TIP
2¼ Inches
O.A. FUSELAGE LENGTH
31½ Inches
RADIO COMPARTMENT AREA
(L) 7" X (W) 2½" X (H) 2½"
STABILIZER SPAN
20 Inches
STABILIZER CHORD (incl. elev.)
4½" (Avg.)
STABILIZER AREA
90 Square Inches
STAB AIRFOIL SECTION
Flat
STABILIZER LOCATION
Top of Fuselage
VERTICAL FIN HEIGHT
6½ Inches
VERTICAL FIN WIDTH (incl. rudder)
5" (Avg.)
REC. ENGINE SIZE
.10 to .15 Cu. In.
FUEL TANK SIZE
2 Ounce
LANDING GEAR
Conventional
REC. NO. OF CHANNELS
3
CONTROL FUNCTIONS
Rud., Elev., & Throt.
BASIC MATERIALS USED IN CONSTRUCTION

Fuselage	Balsa & Ply
Wing	Balsa & Ply
Empennage	N/A
Wt. Ready-To-Fly	40 Oz.
Wing Loading	17 Oz/Sq. Ft.



most a point at the trailing edge. The plans illustrate a typical section through both the stab and the elevator.

Fix these items together with your favorite brand of hinges, then cement to the fuselage.

Fin and Rudder: These items are easily made from soft 3/16" sheet and only require sanding to the correct profile, after which they can be hinged together. If you're interested in saving a little tail weight, the fin can be built-up in a manner similar to the stabilizer, using 1/16" sheeting and 1/8" strips. Test the fin so that it doesn't interfere with the elevator action before finally cementing it into place. The triangular gussets, added next, strengthen the whole assembly.

Radio Installation: A three channel radio was installed in the original to control engine, elevator, and rudder. There's plenty of room in the cavity above the wing to locate all the necessary equipment, and it's a good plan to make a trial installation of all the radio gear before the fuselage top sheeting is in place. In this way, all the control runs can be checked out before it's too late. The servos should be mounted upside down for ease of adjusting the control throws and trims. Make certain everything is operating freely and in the correct sense (remember this particularly when the fuselage is inverted).

The 1/16" plywood cockpit floor makes an ideal location for the On/Off switch and, as a further touch of authenticity, run the antenna wire up the "radio mast", then aft to the top of the fin.

Covering: I wanted, on the prototype, to produce a dull silver finish typical of the mid-1930's color schemes, so the model was covered first in medium weight silkspan and the silver was sprayed on. Decals were then added as you see in the illustrations. The only problem with a tissue finish is, of course, that it's not very durable (if you're flying site is brush covered as mine is).

So, I would suggest that a plastic film finish on the wings would be a little more practical. The fuselage and tail unit can still be initially covered with tissue and then doped, if required.

Many other pre-WW II color schemes can be used, and a few moments spent looking through "Profile" publications should produce a few different ideas.

FLYING

A few checks should be made before presenting yourself on the runway, such as, are the controls really hooked up correctly? Stand behind the model and, with the engine running, switch everything on. Make a simulated right turn, followed by a dive, then throttle back the engine and speed it up quickly to check the engine response. Fix everything now that needs work; re-check the wing rubber bands and it's time for the first flight. This should only be a shakedown flight. Test out the sensitivity of the controls and the trims; then bring it back and make the required adjustments. After that's done, it's all up to you from here on - - - so, good luck and happy flying. □

From RCModeler Mar. 1978