A long time favorite, the Curtiss Hawk is presented here as a good looking airplane that is easy to build and fun to fly. Designed for three channel operation, the Hawk will fly on engines in the .19 to .30 power range.

BY BOB RICH

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CURTISS HAWK P-6E

The Curtiss P-6E has been a favorite of most modelers for years and I am no exception. I'm not sure whether it is the overall lines or the squadron markings and the Snow Owl. Whatever it is, it is an airplane that has the "look".

The model was meant to be a good looking airplane that is fun to fly. The fuselage and tail were designed to match the Goldberg Ranger 42 foam wings that were cut to shape. The overall effect is an aesthetically pleasing plane that is easy to build, and best of all, is easy and fun to fly.

The use of the foam wings on this project makes it much easier and quicker to build and it doesn't look like a foam wing plane. The details added on the original model were easy to put on and they add to the overall appearance. There was no real attempt to make the model scale, but all dimensions other than the wing chord are very close to scale. The plans were drawn from the drawings in the September-October 74 issue of National Aeronautics. If you plan to finish the model realistically, the Profile Publications on the Hawks should really turn you on.

CONSTRUCTION NOTES

As this plane is not meant to be a beginners project, it is not necessary to go into great detail on construction methods. The plans and the photos cover most of the items and there is nothing difficult about any part of the model.

Fuselage: All wood sizes are marked on the plans. Construction is sheet sided box type with a 1/16" plywood doubler in the nose section. If you have trouble finding the sheet sizes then build them up from narrower sizes. Zap or Hot Stuff is good for joining sheets if the joint is a good match. Make sure to make one right side and one left side! Glue the 1/4" sheet balsa forward sides to the fuselage sides before joining the sides. Mark the location of the formers and braces on the fuselage sides from the plan, then join the sides making sure the fuselage is kept square.

The hardwood bearers and plywood motor mount plate are used for versatility and strength. Changing to different engines is also very easy. The false formers added to the formers at the cockpit make it easier to glue the cockpit sides on, rather than trying to match the pieces on half the former width. The rear turtledeck is easier if it is made in two pieces rather than trying to bend it from one piece.

Bend the wire cabane struts to shape. Wrap the joints with copper wire and solder. Using heavy carpet thread or dacron, wrap and secure the struts to the 1/4"square hard balsa fuselage cross braces. Coat the wire, thread and balsa cross brace with epoxy for additional strength and security. When the epoxy has set, install the wing struts in the fuselage with epoxy. Re-check to make sure the wings will set level with zero incidence. When you have decided on the engine you are going to install, make a motor mount plate from 1/4" ply to fit the engine. Use Goldberg blind nuts to mount the plate to the bearers and the engine to the plate. Remove the engine and build-up the nose cowling

and carve to shape. After hollowing the removable cowling piece to match the engine, re-mount the engine with down thrust. Cut a hole in the fuselage side to match the engine exhaust port. A Du-Bro muffler worked well and does not detract too much from the looks.

The tail is built up to save weight at the tail. Glue the fin and stabilizer on the fuselage. Be sure to install the elevator before the rudder. When the fin and stab are in place, use 1/16'' sheet, or soft balsa blocks, to continue the turtledeck contour to the tail post.

The wheel pants can be laminated from 1/4'' and 1/8'' sheet balsa to get the proper thickness or made from three pieces of balsa of the proper thickness. They can also be molded from fiberglass or, using the Hobbypoxy ''Easy Does It'' method, whichever way suits your preference. The landing gear struts are built up from 1/4'' balsa sheet then cut to shape. (Don't forget one right and one left.) The top of the landing gear strut does not touch the fuselage. Leave enough clearance for the shock absorbing action of the gear and it won't damage the fuselage on a ''not-so-soft'' landing. The pants and struts are held to the landing gear wires by small sheet brass supports soldered to the landing gear wire and #2 sheet metal screws, screwed into plywood inserts in the pants and struts.

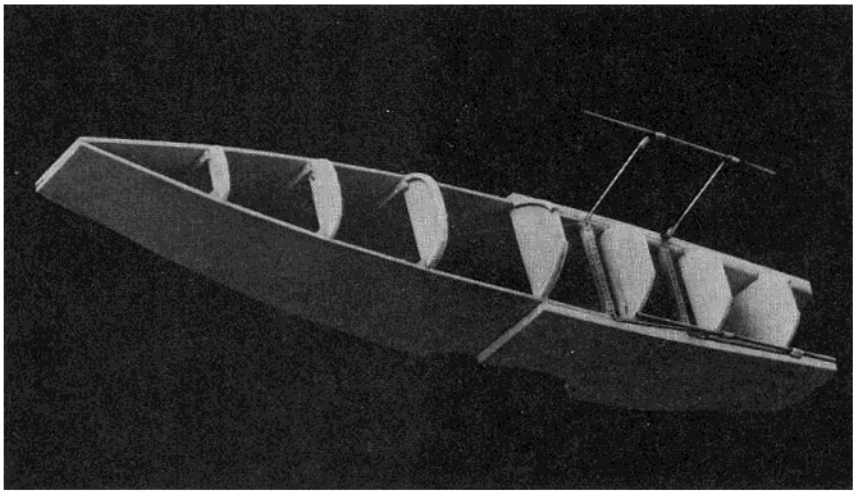
The Care And Feeding Of Goldberg Foam Wings:

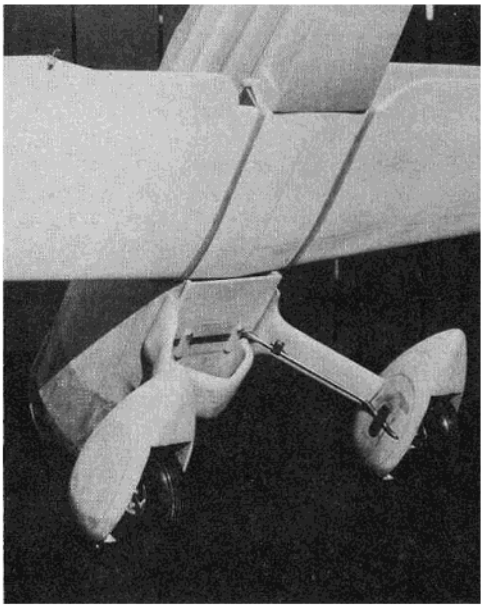
The Ranger 42 Molded foam wings were used for this project for good reason. They are excellent wings, have a good airfoil, are strong, and near the correct shape.

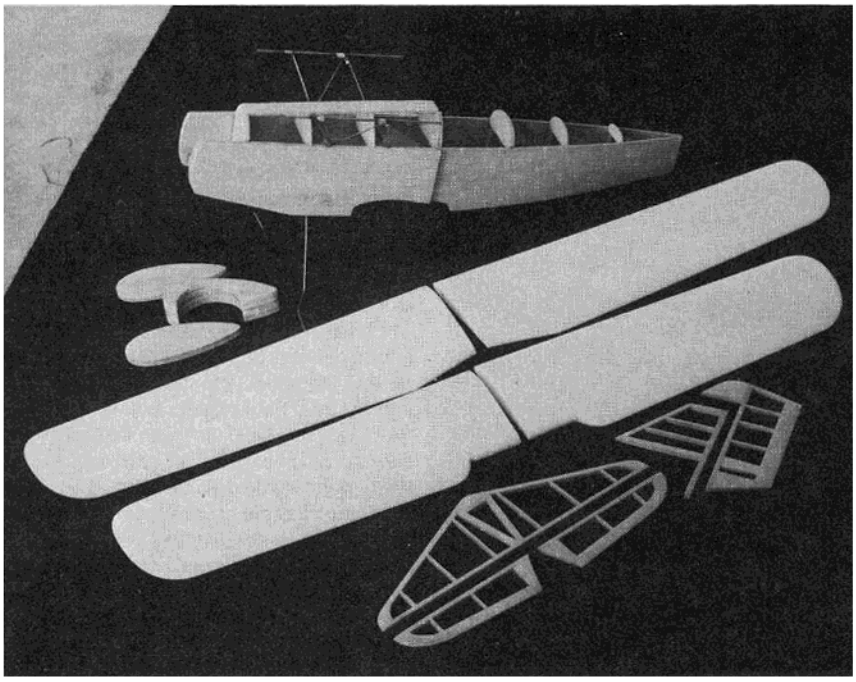
Follow the instructions given in these paragraphs for best results with the wings. If you aren't prepared to follow the instructions to a reasonable degree, don't start the project or, alternately, cut ribs and build the wings out of balsa. If you follow these procedures, I'm sure you will agree that the results justify the effort.

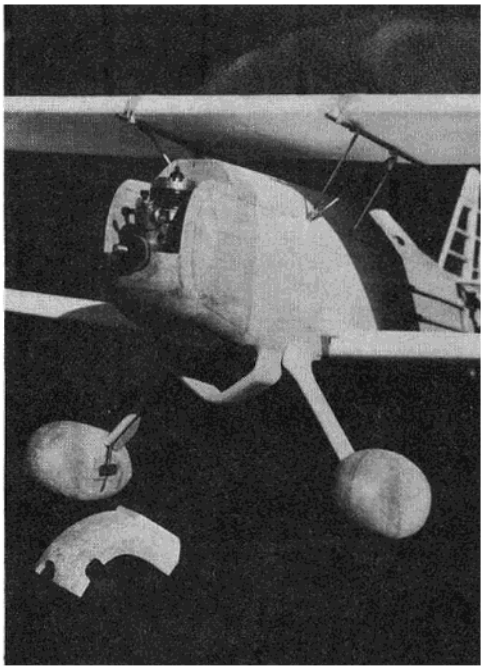
The Goldberg foam wings are available from hobby shops (they may have to order them for you) or if they can't supply you they can be ordered directly from Carl Goldberg Models, Inc. The designation for the wing is RC1W and the cost is $5.50 per wing (2 required).

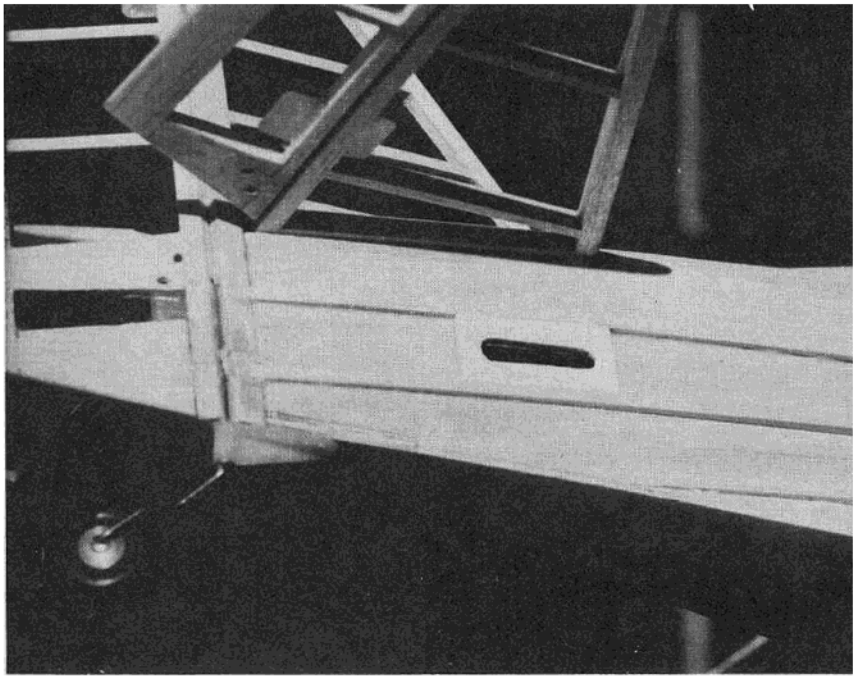
Top Wing: With a razor saw, or equivalent, cut the wing in half at the center marks indicated on the wing. Trace the tip and center section pattern from the plans and lightly mark it on the top of each half. With a razor blade, or X-Acto knife cut the foam roughly to shape. Carefully finish shaping the tip and center section with a good grade of 250 grit, or finer, sandpaper. Make sure the sandpaper stays clean so it doesn't dent or scratch the foam. If your sandpaper causes scratching of the foam, go to a finer grade. Carefully sand the center cut of the two halves to give the proper dihedral angle as shown on the plans. Join the wing halves using one of the fast epoxies. Maintain the proper dihedral angle while the epoxy sets. Reinforce the wing center section, top and bottom, with silk, silron, or your wifes or











girlfriends nylon stockings and epoxy. Spread epoxy on the wing section and covering, working it through the weave and smoothing it with your finger or a hard rubber squeegee. Using Hobbypoxy Formula I, it is possible to do this in one operation. If using a faster setting epoxy, do one area, mix more epoxy and go on to the next section. When the epoxy starts to set don't try to go farther, but simply discard it and mix more. Keep it as smooth as you can — the squeegee helps in this operation. Feather the edges of the covering onto the bare foam with a small overlap of epoxy. If care is used very little sanding is necessary. It's easy and doesn't take long. Clean your finger or squeegee with dope thinner, but don't get thinner on the foam wing or you can buy a new wing and start over.

When the epoxy has thoroughly set, carefully sand the whole wing until it feels smooth, a little like velvet. Using Testors Countour Putty for Plastic Models, fill all dents, dings, and large holes in the foam beading and sand smooth. The more you fill at this stage the better your finished wing will look. When you are satisfied that your wing is smooth enough you are ready to cover.

I prefer to cover the wings with silk, but silron, silray, or any other covering can be used. I like the silk because the edges can be sanded and feathered to a smooth lap. I think that medium or heavy silkspan can be used successfully, although I have never tried it.

Fill a container or jar (4 to 6 oz.) about half full of Titebond, or any aliphatic resin glue, but do **not** use white glue. Add just enough water to make the mixture like heavy cream, so it can be brushed easily. If you get it too thin, add more glue. Cover the bottom of the wing first. Cut a piece of the covering material larger than the wing half.

Using the glue mixture, and a 1/2-1'' brush (or whatever suits you), cover the wing with the silk. It is almost like covering balsa with silk and dope, but it does require a little more smoothing because it doesn't dry quite as fast as dope. It will tend to wrinkle at first. Keep smoothing out any wrinkles with the brush, but don't pull too tight as it is possible to induce a warp. Don't be skimpy with the glue mixture, that is what seals the foam and fills the weave of the covering. Cover the other half of the wing, overlapping the center joint 1/4'' to 1/2''.

When the covering is dry, trim off the edges of the covering, leaving about 1/4'' border. With the glue mixture, seal the border over the top of the wing. When this is dry, lightly sand the edges of the covering. Try to feather the edges so they don't show when the top covering is applied.

Cover the top of the wing in the same manner. When the wing is dry, lightly sand with fine sandpaper. Give the wing two more coats of the glue mixture, then sand lightly between coats.

Follow the same procedure for the bottom wing.

Using this method, the strength and durability of the foam wing is greatly increased at a relatively small increase in weight. One of the other advantages is that colored dopes may be used with no damage to the foam.

Install the eight 1/16'' ply ''N-strut'' fasteners at the locations marked on on the wing plan. Be sure they are on the bottom of the top wing and the top of the bottom wing.

CURTISS HAWK P-6E
Designed By: Bob Rich

TYPE AIRCRAFT
Stand Off Scale Biplane
WINGSPAN
Top 41½'' — Bottom 35''
WING CHORD
5¾'' (Average)
TOTAL WING AREA
419 Square Inches
WING LOCATION
Biplane
AIRFOIL
Flat Bottom
WING PLANFORM
Double Taper
DIHEDRAL, EACH TIP
Top 1¼'' — Bottom 1¾''
O.A. FUSELAGE LENGTH
29 Inches
RADIO COMPARTMENT AREA
(L) 10½'' X (W) 2¾'' X (H) 2¾''
STABILIZER SPAN
14 Inches
STABILIZER CHORD (incl. elev.)
4 Inches (Average)
STABILIZER AREA
52.5 Square Inches
STAB AIRFOIL SECTION
Flat
STABILIZER LOCATION
Top Of Fuselage
VERTICAL FIN HEIGHT
4½ Inches
VERTICAL FIN WIDTH (incl. rudder)
5 Inches (Average)
REC. ENGINE SIZE
.19 — .30 Cu. In.
FUEL TANK SIZE
6 Ounce
LANDING GEAR
Conventional
REC. NO. OF CHANNELS
3
CONTROL FUNCTIONS
Rudder, Elevator and Throttle
BASIC MATERIALS USED IN CONSTRUCTION

Fuselage	Balsa and Ply
Wing	Foam
Empennage	Balsa
Weight Ready-To-Fly	59 Ounces
Wing Loading	20.3 Oz/Sq. Ft.

Using epoxy, set them at the angle that matches the slope of the 1/16'' ply ''N-struts''.

The wings are now completed and ready for painting.

The fuselage and tail were covered with light silk and five coats of thinned dope to fill the weave. MonoKote could be used if you desire.

The original model was finished with Aerogloss dope. Wide DJ Multistripe was used for the trim and markings. The Snow Owl was cut from white Wide Multistripe and marked with a black ballpoint pen. Wide DJ Multistripe is an excellent trim material and if you aren't familiar with it, give it a try. Remember to peel off the **top** protective film before marking on it or putting other trim over it.

The exhaust stacks are cut from aluminum tubing and epoxied into holes drilled to accept them. The gun trough is sanded into the side and a small piece of 1/16'' aluminum tubing simulates the gun barrel. The gunsight is hardwood dowel epoxied in place. The pilot is a 1½'' Williams Bros. unit with balsa glue on the bottom to raise him to the proper height.

The Kraft three channel brick fits easily with lots of room to spare. The battery fits in the nose under the six ounce tank, with room left over. The switch and charging jack are mounted in the cockpit and are easy to reach. Shift the radio installation to obtain the proper balance.

Allied Hobbies Scuff Guard was used on the front of the wheel pants and bottom of the engine cowl to protect them in the event of a nose-over.

Flying: An OS .30 was used on the original model and this was more than enough power. A good .19 would give enough power and fly the model quite realistically. Re-check the balance point to make very sure the plane balances as close as possible to the point marked on the plan. Make sure the engine has the proper downthrust. Put a little toe-in in the landing gear for easier ground handling. For the fist flights remove the wheel pants and struts, since there is no sense in getting them dinged up while checking out the plane. After you are completely sure that the engine and the radio are working properly, try a little taxiing to get the feel of the ground handling characteristics. When your hands and knees stop shaking enough for you to have a little control, line the plane up on the runway and gently increase the throttle, making rudder corrections as necessary to keep it lined up. When flying speed is reached it should fly itself off, requiring very little up elevator.

Fly it around to get the feel, then, at a good altitude, slack off on the throttle and set up a glide. See how it acts at low speed, nose high. Do this high enough so that if any surprises happen you can give throttle and fly out of the difficulty. It's much better that way than when you are a few feet off the ground and the corrections come too late or too low. The original model had no bad traits and no surprises, except it flew much easier than I had hoped. It was a real pleasure to fly and it sure looks good.

Do not fly the model with the engine cowling in place. There is no way to properly cool the engine and it doesn't look bad without the cowling anyway.

You'll enjoy your sport scale Curtiss Hawk P-6E. □

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