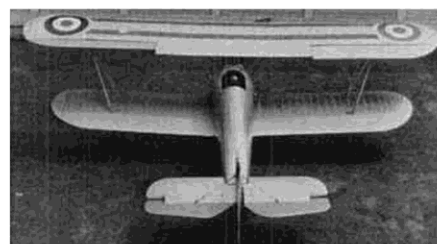


HAWKER FURY MARK II

By DON PRENTICE . . . The Hawker Fury is a quarter-scale replica of the pre-WW-II, Golden Age biplane. Highly detailed scale drawings are also available through *Model Builder*. See Westburg ad, page 79.



• One of the prettiest biplanes designed during the "Golden Years of aviation" was the Hawker Fury. Its silver and chrome finish, large rondels, and red stripes on the fuselage and wing made it a very flashy airplane. It was a sight to stir the soul of most aviation buffs of the day. For those of us who are old enough to remember, the soul is still stirred. The Fury is the ancestor of the Hawker Hurricane which took a major part in WW-II.

Peter Westburg wrote several fine articles on the Fury and provided us with exceptional scale drawings. Anyone contemplating building this model should acquire the Westburg drawings from *Model Builder* (see ad this issue), and send for the back issues containing the Westburg articles (August and September 1976, \$2.00 each). A wealth of detail is provided by Peter and readily augments the plan provided in this issue.

The one-quarter-scale model came

out at about 25 lbs. and was powered with a Quadra. Originally, it had a symmetrical wing. The Quadra was marginal, and in fact, the model flew into a tree, broke branches on its way down, and hit, spinner first, into the ground. The only damage was to the spinner and one ego. The model was re-engined with a Kioritz 2.3 and flew successfully. Later at the STARS rally in Olean, New York, with an untried fiberglass propeller (unfortunately oversized), and with nerves flailing, the model again suffered a setback, but with very little damage.

This time it was decided to build a new set of wings with a Clark Y airfoil, and to put the Fury on a weight reduction program. The model now flies as it should, and is very realistic in flight. To my knowledge there is only one other quarter-scale, flying Fury in the country . . . and it is in Kitchener, Ontario.

This is not a beginner's project, nor is it a project for anyone building their first quarter-scale model. It is a model of an airplane from the Golden Age, a model that will attract the cameras of all who see it. A lot of construction detail is not included, but can readily be accomplished by the modeler who has a background in quarter-scale. The control linkages are not shown, but are left to the builder to design. Every quarter-scaler has his pet method for connecting up the controls to the servos. I'm sure that in addition to reading "BIG Birds," everyone reads Don Godfrey's column, "Giant Steps," and "Big is Beautiful" by Dick Phillips in other magazines. Both have offered many systems for servo connection to the control surfaces.

A step-by-step procedure for the construction of this model is not provided, as it is meant for an experienced modeler. However, certain pertinent details of construction are provided.

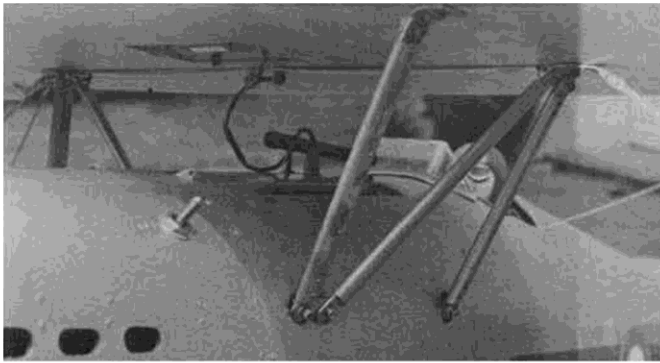
WINGS

Before starting wing construction, obtain two bi-fold plywood doors from the local lumber dealer. Cut one in half and assemble a construction jig as shown on the plan. Attach the two halves to the uncut door separated by the flat center section of the wing. Prop up each end to obtain the necessary dihedral. This jig will permit the assembly of each wing as a single unit.

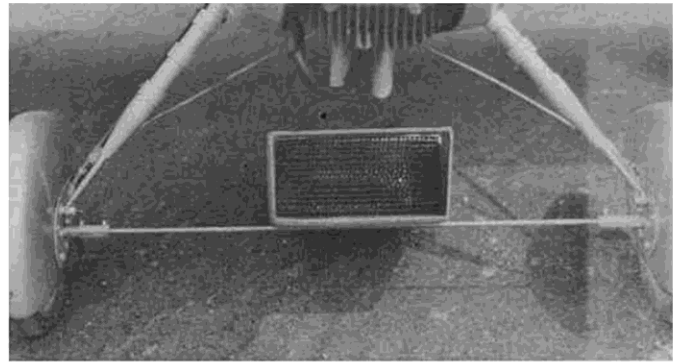
The spars are of sitka spruce. They should be cut to length, and the outermost portion bent as shown. Many small cuts with the saw almost through the spar will ease the bending, and glue will



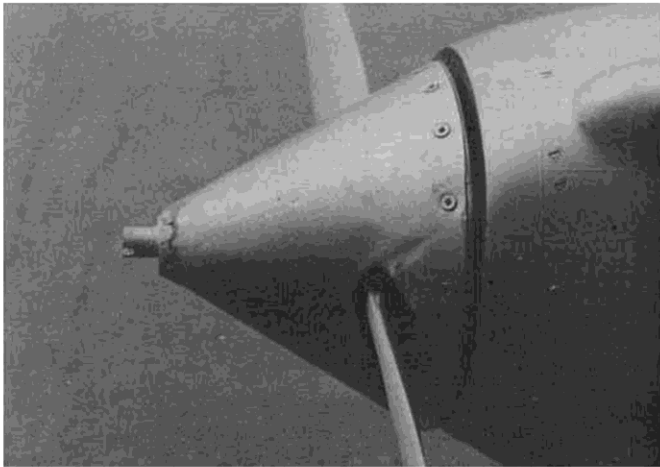
Profile view of the Hawker Fury reveals streamlined fuselage shape, wheel pants (which were not found on the Mark I version), and lightweight tail structure. Quadra powered.



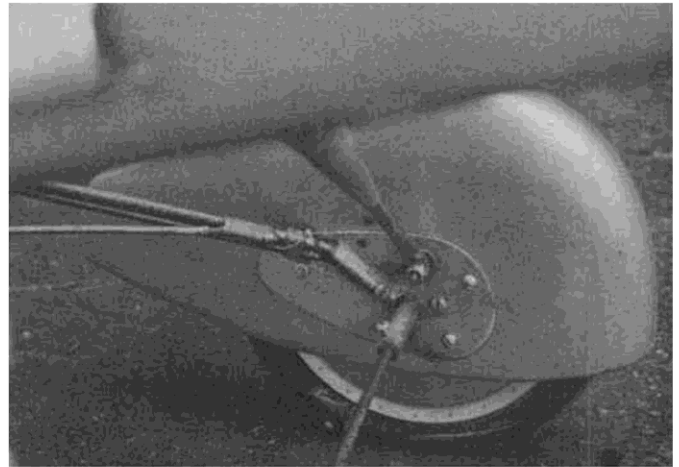
Strut installation, rigging tensioner, on/off radio switch, and servo connector setup in fuselage are visible here.



Radiator core is made from corrugated cardboard sprayed black. Also note undercart fittings required. Radiator mounts to fuse.



No fancy spinner needed for this rig. Author used metal funnel with 3/4-inch ply backplate. Note huck starter fitting.



Undercart fastener details. Round head screws hold wheel pants to mounting plate.

hold the bent shape. Assemble each lower spar to the doublers (joiners) using the jig for correct dihedral. The top spar will be added after the ribs are glued in place.

The wing tips are made by using a quarter-inch piece of scrap plywood form-shaped to the inside curve of the tip. Attach the form to a larger back-up plyboard, cover the assembly with saran wrap, and lay up the 5/16 balsa laminations with white glue or Hot Stuff.

In assembling the wings, cut the 1/16 by two-inch lower balsa sheet to shape, mark the locations of the ribs on each half, and attach them to the jig. Lay the lower assembled spars in place using scraps of the 1/16 balsa under them to establish their correct height above the job board. Now, using a square, lay the ribs in place followed by the 1/8-inch sub leading edge. The center ribs must be cut to fit between the spars, etc., as the doublers must not be cut. For the top wing, assemble it as if there was no aileron. After assembly, before cap stripping, cut the ribs associated with the aileron and fit the aileron leading edge in place.

The aileron hinges provide for a froese type installation and are installed after the wing is completely framed and cap stripped. The inner nyrod used is from the flexible red type, and the 1/16 welding rod fits it nicely with no play. More detail is shown on the plan. The sewing of the parts is accomplished with

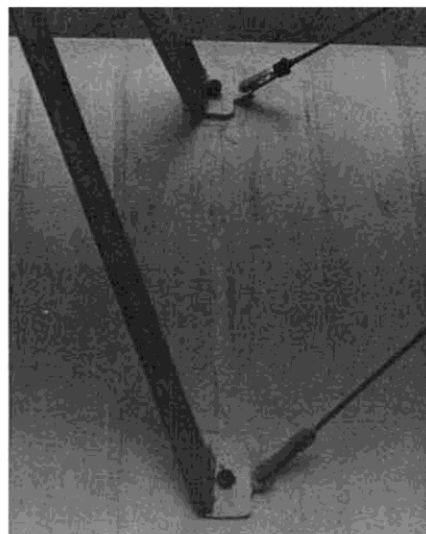
the use of a .060 or smaller drill providing the thread holes. The aileron is held in place with a 1/16 collar. Slots must be cut in the balsa to permit aileron removal and clearance for the collar. The ailerons are balanced using strips of wire solder imbedded in the lower part of the leading edge.

EMPENNAGE

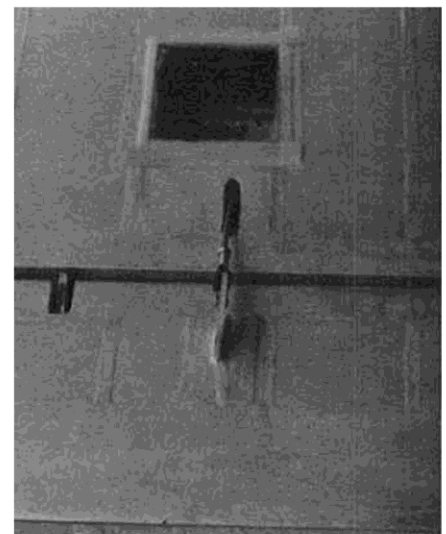
The outer edges of the empennage are laminated in a similar manner as the wing tips. The surfaces use a sandwiched

3/32 sheet core on which are mounted the ribs which start out as rectangular strips of 1/8 x 7/16 balsa and are later sanded to streamline shape.

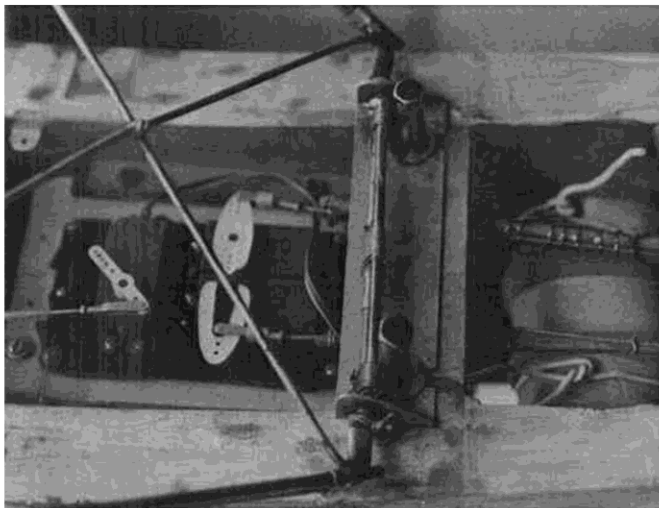
The spars are pine or spruce, and it is a good idea to mount the hinges before assembly begins. Further, if the hinge pins are removed it is possible to use a length of wire through all hinges. This procedure will make it possible to remove the surfaces for covering, painting etc.



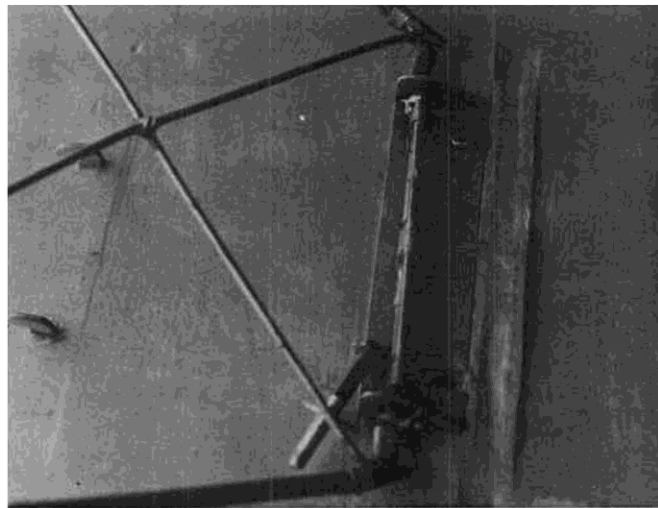
Close-up view of landing wire fittings. Alternate method of attaching struts to fittings shown.



Aileron pushrod assembly. Hinges have been changed per the plans. Bellcrank inspection made easy by removable panel.



Underside of fuselage opening. Note rear undercart strut attachment and bolt spacers used when wing is not in place. Note servo arm strengthening. Note pushrod vibration dampening.



Shown here are the wing hold down bolts and rear undercart strut fitting. The lower rear wing spar is shown rather than being cut off as per the plan. This allows it to hold undercart fitting in place.

Two methods of surface control are shown: cable and pushrod. For the large models, and for realism, cables should be used which tie into plywood bellcranks just behind bulkhead six. To provide for cable adjustment, cut the 1/16 wire of a Du-Bro Kwik-Link about a half-inch back from the thread, flatten it out with a few hammer blows, and drill a small hole through it to accommodate the cable. Use a lock nut and rubber tube on the adjusted Kwik-Link!

Two stabilizer braces are mounted under the stab and are made of Sullivan streamline tubing.

FUSELAGE

The basic framework of the fuselage is made from 5/16 pine or spruce with balsa cross-braces etc. The formers are Sig Lite Ply and balsa, and slide onto the basic framework holding the whole assembly in a rigid structure.

The firewall is half-inch plywood, and after seeing the Byron Pitts fly with a 1/8 firewall, it is felt that a quarter-inch plywood firewall is adequate. (One might also consider making the basic framework of quarter-inch square spruce). The firewall is fiberglassed on the inside to ensure that it will stay in place.

The metal mounting parts for the cabane struts and undercart are installed on their plywood parts before assembling the parts to the structure.

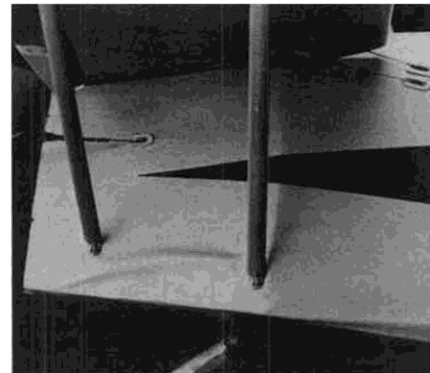
The 1/8 balsa skin is covered with a half-ounce fiberglass cloth to add strength to the forward part of the fuselage.

The tail skid which is shown as 1/8 wire should be a size larger and contains one loop for springing. The tail skid is steerable using cables to the bellcrank used for the rudder. Springs are installed on these cables to reduce the load on the bellcrank during taxiing, etc.

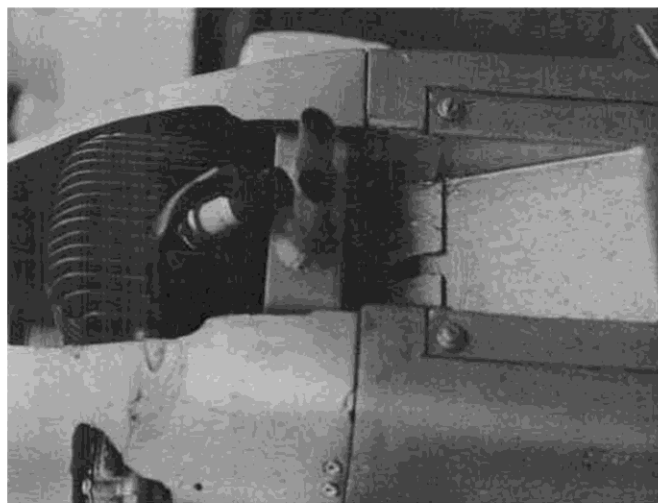
The cowling is made of fiberglass using a foam plug to establish the shape. A block of foam is cut to the length of the cowl less one quarter-inch. Next, cut one-eighth plywood forms, one the shape and size of the firewall, and the other a circle 5-3/4 inches in diameter. These are glued to the front and rear of the foam in their correct location to each other. The foam is now cut, sawed, and sanded to the shape of the finished cowl, but slightly smaller in size. A handle is glued to the rear plywood former to make it easier to handle the foam plug. Saran wrap is now draped over the plug, and resin and fiberglass

are now formed around the plug to bring it up to the required size. A lot of sanding, etc., will be required to finish the cowl and should be completed before removing the foam plug. The plug drops out easily and an adequate cowling is produced.

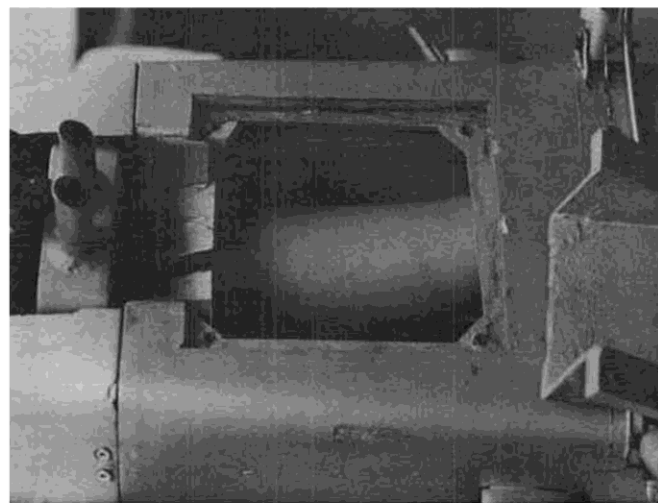
The spinner is made using a six inch steel funnel. Cut the ring off the large end and back the spinner with a three-quarter-inch disk turned to fit inside the spinner. The spinner is attached to the



Stabilizer struts and cable controls. Note brass tube for changing lower cable direction.



Fuel tank access door and cooling channel.



Access door removed. Note stabilizing 7/32 wire.

disk with flat head screws. The front of the funnel is cut away to accommodate the mechanical "Huck" starter fitting.

The firewall and the lower fuselage behind the firewall is cut away to permit cooling air to escape. This area also contains a cooling hatch to permit entry into the front of the fuselage.

UNDERCART

The model uses a spring-loaded undercart. This is essential as there is no way a springing action can be accomplished due to the axle which extends to both wheels. Detail of the shock is included on the plan. The tube is half-inch electrical conduit, and the necessary parts have been turned on a lathe. One might consider the use of the spring-loaded hydraulic rubbers used on the hatch of the small hatch-back cars. They must be available from auto wreckers. Fortunately, at the Toledo Swap Shop, snubbers (just the right size) were available last year, and I am sure the quarter-scalers who saw the potential of these snubbers purchased a quantity of them at 50 cents each.

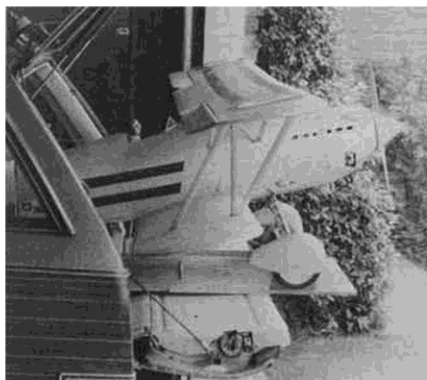
The fittings at each end of the axle are silver soldered to the axle plates. Do not solder the axle directly to the plate as the temper in the axle will disappear. The 7/32-inch rear undercart strut is silver soldered to the plate, and at the upper end it is held by a sheet steel or hard aluminum fitting held in place by the aluminum wing bolts. A stabilizing 7/32 wire is attached to the rear of each shock strut by sliding into a brass tube wired and soldered to the strut. The gear works fine, and when oil damped, provides an excellent undercart.

CABANE STRUTS

The struts are made using Sullivan streamlined tubing and inserting lengths of hard aluminum in each end. Before sliding in the aluminum, thicken some five-minute epoxy, and jam it in first. After the epoxy completely hardens and firmly anchors the aluminum strips, add 1/16 aluminum rivets as shown. The true length of the rear strut is 6-1/2 inches hole-to-hole. The N cross-strut is seven inches hole-to-hole. The length of the front strut is adjusted after installing the upper wing and propping it up to the correct incidence.

WING STRUTS

The wing struts are made the same way as the cabane struts. Their lengths are established after the cabane struts are installed and both wings are in place. Prior to establishing the strut length, install the strut wing fittings using 6-32 socket head bolts which fit into the blind nuts anchored into the wing. After the struts are finished, it is best to leave the



The finished product . . . stuffed into the rear end of a wagon for fun.

struts attached to the strut wing fittings and remove the complete N strut assembly as a unit.

RIGGING

The rigging technique used is the "Don Godfrey Method." Obtain 3/32 nylon woven cord from a sail maker. You can buy it by the foot or by the spool. This cord has little stretch and is very strong. It can also be screwed into Kwik-Links if it is first stiffened with Hot Stuff. Fit a Kwik-Link on one end of a piece of the cord, attach the cord to one of the rigging fittings. Attach a Kwik-Link to its opposite fitting and cut the cord to the length required, shortening it about 3/16 of an inch to ensure it is tight when installed. The plan shows a rigging tensioner which is mounted across the rear cabane struts. Tightening this tensioner tightens up the landing wires and also pulls the flying wires tight.

RADIATOR

The radiator is a box-like structure held in place by sliding it into two L-shaped brackets at the rear and securing it using two screws at the front. The radiator core is simulated using half-inch strips from a corrugated box laid on top of one another and painted black.

FLYING

The model, like most quarter-scale models, cannot be "horsed" off the ground. It flies on its wings rather than on power. Loops and stall turns are pretty, but one must be cautious in attempting a roll. On landing, as the wheels and skid touch on three-point, add a little power to make the elevator effective in reducing the possibility of nose-over.

Happy Landings! ●