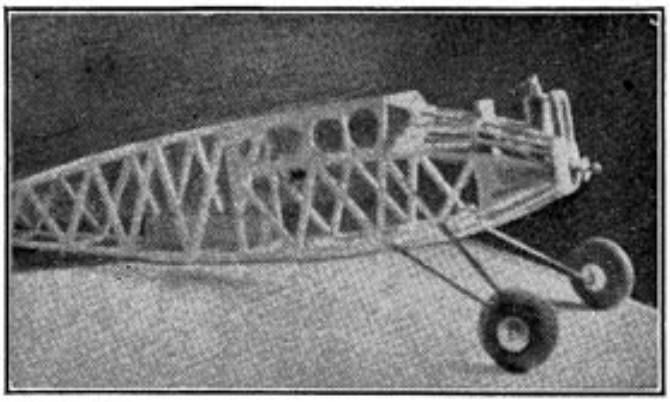
One quick glance at this photo is all you need to tell that "Scrappy" has got "it." For this "skeleton" shot of Ray Heit's petrol buggy clearly shows that the model was designed for Streamlining, Stamina, and Speed—all with capital "S's"!



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A NIFTY FIVE-FOOT SHIP

Once again, Ace Modeler Ray Heit, has designed a gas buggy that's really a honey. This five-footer is not only simple to build, but it also boasts a unique cowling that makes for easy engine accessibility! So get your tools together, look over the bill of materials, and get set to—

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Make a "Scrappy" Gas Job

By Ray Heit

HERE SHE IS, fellows! Just the happy-go-lucky type of model you have always wished for. Yep, *Scrappy* was designed primarily for service, durability, and stability. She has many noteworthy features combined to produce a model capable of great results. And to give you an idea of how efficient a flyer *Scrappy* is, she led us a swell chase and turned in a four minute flight with only a thirty-second motor run at a recent contest.

Scrappy is well stressed and will give you supreme service, even after hard handling. Although designed for any motor of the one-fifth horsepower variety, the model has been flown with less than one-tenth horsepower! However, for best results it is advisable to use the former motor—one fifth horsepower.

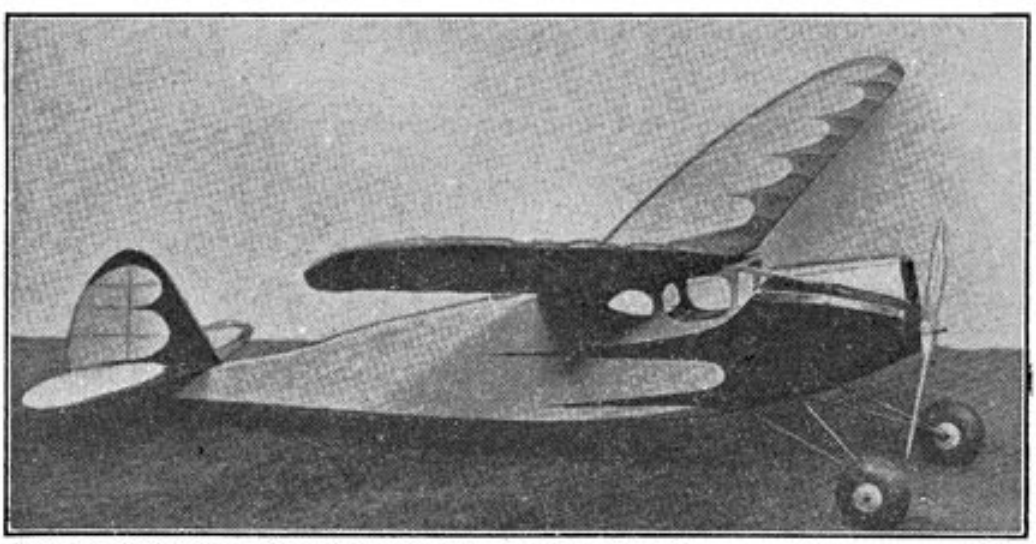
One of the ship's best features is a sleek, unique motor cowling. It permits the power plant to be entirely enclosed. And yet, with a flip of your wrist, the motor is laid bare for examination or operation! One might say it is a "dream cowling" for it aids immensely in streamlining, combines *everything* that could be wished for in a model builder's dream!

To construct this *Scrappy* gas job lay out all parts of the plane, full size, by enlarging from the assembly drawing, making use of all the dimensions as given. (See plans for scale.)

Begin the model by first constructing the fuselage. Build two side frames from one-quarter inch square medium balsa. Use hard balsa for all longerons and braces. Lay out the longerons in a jig composed of wire-head nails alternately spaced at the maximum bends of the longerons. Glue all upright members and brāces in. But do not be stingy with your cement—remember, you want a *strong* model.

After assembling one side of the fuselage, let it dry for a few hours before repeating your operations to produce the other half. After the two halves are finished, assemble them by cementing the two tail-posts together, then work toward the nose by filling in the cross members at their proper positions.

Using Plate 3, which shows the different formers and ribs, trace the formers required for the fuselage onto balsa sheet—including the firewall which is cut from one-quarter inch plywood. Glue the formers in place. But before attaching the stringers, it is advisable to fasten the landing gear wire in place by wrapping the wires to the fuselage with thread. Then coat the thread generously with cement. After the landing gear has been completed, the stringers will fit into the slots provided for them in the formers.



Boy, oh boy! What a beaut! You're dern tootin' she is! Ray, now studying aeronautical engineering, wrapped all of his experience as a modeler builder into his job, too. Yep, everything from a simple, wide tread landing gear to a corking paint job. What's more, "Scrappy's" a cinch to build and a pleasure to fly!

Motor Mount

MAKE the motor mount from one-half inch dural angle material. Rivet the pieces together with three-sixteenth-head rivets. And bolt the motor mount to the firewall. Then make two straps long enough to accommodate the placing of the coil against the firewall. Bolt the coil in

Bill of Materials

(All wood is medium balsa except where otherwise specified)

Six strips ¼" by ¼" by 4' hard balsa for longerons;
One sheet ⅜" by 2" by 18" for formers;
Five strips ⅛" by ¼" by 36" hard balsa for stringers;
One sheet 6" by 6" by ¼" plywood for firewall;
Four sheets 1/16" by 2" by 36" for wing ribs;
Three strips ¼" by ½" by 36" for main spar;
Three strips ¼" by ⅜" by 36" for auxiliary spar;
Three strips ½" by 1/16" by 36" for trailing edge;
Three strips ¼" by ¼" by 36" for leading edge;
One strip 4' by 3/16" by ¼" reed for wing tips;
Six strips ⅛" by ½" by 36" for tail ribs and spars;
Two strips 3/16" by 3/16" by 18" for leading edge;
One strip ⅛" by 2" by 18" for trailing edge;
Four sheets of bamboo paper, six feet of ⅛" landing gear wire, ½ pint of glue, 1½ feet of dural angle, and celluloid for cockpit covering.

place. Finally, make the battery-box as shown on the plan. Cement and pin in place permanently directly under the center of gravity.

Now cut the pattern of the cowling out of aluminum and bend the end over for the hinge. Push the two prongs of the hinge into former "A." It is not advisable, incidentally, to cover the fuselage before placing the motor upon its bearers.

Wing Construction

THE WING is very simple to construct so pay close heed to the following instructions in order to produce an exact replica in the easiest manner:

Cut the ribs out as a whole by having them pinned together during the carving. Sand them as one unit. Slot the ribs carefully for spars, leading and trailing edges. This slot will automatically line up the wing if cut correctly.

Splice the main spar as shown on the plans, but be *sure* to include the necessary five inches of dihedral. Lay one half of the spar down on the plan and glue the ribs for half a wing panel in place. Cement the auxiliary spar in the spot provided for it in the ribs.

Attach the leading and trailing edges, trim the three tip ribs to size, and bend the reed edge around them. To form the other wing panel, lay the other half of the spar down on the plan and proceed with the same operation.

After the two wing halves have been completed, insert your center section ribs—two in number—to the spar and fill in with the leading edge, trailing edge, and auxiliary spar. (To make the model stronger, you might try covering the center section of *Scrappy's* neat wing with sheet balsa.) Glue the gussets for the wing tips in place so that the reed will not warp.

Tail Assembly

BOTH the rudder and stabilizer are constructed in the same manner—so we'll describe the construction in general of both.

Lay the one-eighth by one-half inch spar on the plan. Cut out the trailing edge and tip from one-eighth sheet. Pin the tail units to the plan. Then pin the leading edge in place. Now, it is necessary to raise the leading and trailing edges slightly off the plan in order to place the ribs in their exact center. Raise the leading edge about thirty-five seconds of an inch off the plan and lift the trailing edge approximately three-sixteenths of an inch.

Cut the ribs out as rectangular pieces and cement them between the spar and the leading and trailing edges.

After completing these operations, the tail sections should be left to dry for several hours. After they have set thoroughly, sand the ribs to a symmetrical shape with heavy sandpaper. Finish off with light paper.

Covering

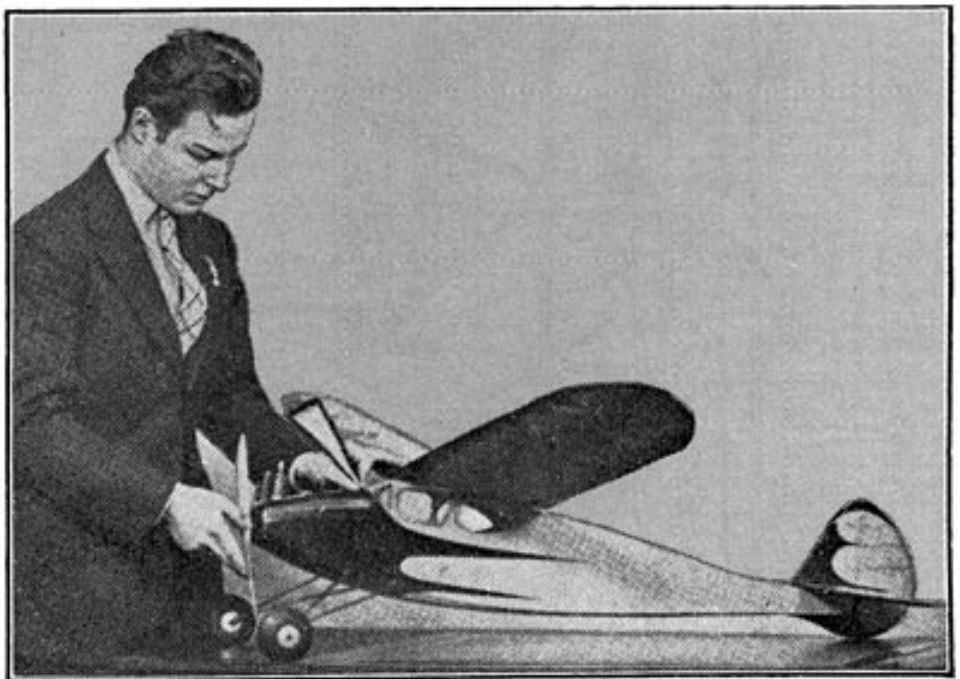
EITHER SILK or bamboo paper may be used for covering. However, bamboo paper will produce a much lighter model and is therefore preferable. If you have not had any previous experience with either of these two materials, it is advisable to start your covering with the rudder and stabilizer. The tail surfaces are fairly simple to cover because of their flat surfaces.

Dope is usually a bit too thin for attaching the covering, but a half-and-half mixture of heavy cement and dope is easy to work with and it holds the covering in place admirably. Spray the entire plane with at least two coats of water. After it has dried thoroughly, apply two coats of dope.

There is one precaution, however, that you should observe in the wing covering, and that is—glue the covering material to each under part of the wing *thoroughly*. This will produce the under camber of the rib in its required form and will make for much better flying qualities in your finished model.

Any color scheme may be used and the number of coats is up to the builder. However, we'd suggest that you use bright red and yellow. For then, if your model gets caught in a thermal, you'll be able to see these two colors much easier when *Scrappy* flies into the distance. Not only that, but red and yellow are two colors that will make this sleek little gas job even *more* attractive. Yep, we'd suggest that you use 'em by all means. It's only a hint, but it's also a worthwhile suggestion.

(Continued on page 49)



Here's Mr. Heit in pusson, fellows! That wedge-shaped thingamajig Ray's holding with his left hand is a convenient, hinged cowling top that will enable you to get to your motor for adjustments in no time at all. To make your model just as swell as this one, just follow the plans carefully. Now hop to it!

(Continued from page 45)

Test Flying

DO NOT attempt to fly the plane before balancing it with the motor and ignition equipment installed. Glide the model from about a four foot height. If *Scrappy* shows a tendency to stall, you can adjust this condition by shifting the position of the battery box slightly forward. And if the model glides too steeply, move the battery box toward the rear until the best results are obtained.

When *Scrappy* is ready for her first power flight, give the ignition a final check-up. Have your motor running smoothly, and set the timer or gas supply for about 15 or 20 seconds.

With the engine's throttle set at about the half way mark, release the ship and run alongside of it. Correct any turning tendencies by a slight touch on the wing tip. And after the model gains flying speed, *Scrappy* will do the rest under her own power. Yep, even at this reduced power, *Scrappy* will show you the peppiest little bit of flying your eyes have ever witnessed outside of the local flying field.

And, above all things, *don't forget that timer!* Because if you lose the ship on her first flight, we don't want to have to say: "We told you so!"

1/8 x 1/4

1/8 x 1/4

1/4 x 7/8

1/16 x 1/2

1/8 SHT.

1/4 REED TIPS

1/16 SHT.

21 REED

1/8 x 1/4

1/8 x 1/2

1/8 SHT.

GLUE TAIL IN PLACE

LOWER MEMBERS (DOTTED)

1/4 x 1/4

1/8 x 1/2

1/8 SHT.

STAB HERE

COWL

ALUMINUM COWL

FIREWALL

1/8 SHT.

1/4 SHT.

1/4 x 1/8 STRINGERS

1/8 MUSIC WIRE

3 1/2 WHEELS

1/4 PLY

1/8 SHT.

1/4 x 1/4

SPLICE SPAR

"SCRAPPY"

by Ray Hait

MODEL BUILDER magazine