AT LAST! A Basic Free Flight Pressure Jet You Can Build . . . BLOW BUG

Here's one modeler's answer to the coming age of all-jet flight

By ROY L. CLOUGH, JR.

■ This turbine jet model is somewhat unique in that it belongs to the pressure jet category rather than to the ducted fan class with which most model turbine jet experiments have been made. Instead of an axial flow fan mounted within a tube to accelerate a flow of air, this model uses a centrifugal impeller to pump its fuselage full of pressure to supply a nozzle with air for reactive propulsion.

We chose this configuration for two reasons; first because of its extreme simplicity, second because we wished to introduce something newer in the line of turbine jet models: while quite a bit has been done with ducted fans, this is the first pressure jet job we know of.

While theory gives the ducted fan an edge, on paper, practical considerations tend to favor the pressure jet. It does not require round sections, take-apart fuselages, tricky constructions or difficult starting or servicing procedures. It is also easier to mount the intake in a position which minimizes sucking up débris. (If you have never nosed over a turbine jet model in a snowbank or gravel pit, you have no idea how horrible life can get.)

Blow Bug is, therefore, a simple straightforward basic model with accent on serviceability and a performance margin that insures good results to those who have never built this sort of thing before.

Begin construction with the fuselage. As with any sheet balsa job, careful attention to wood grades will pay big dividends in performance. Use a light, yet strong grade of balsa. To insure a good fit at the hatch, build up the center part of the fuselage first, cementing the bulkhead and the crosspiece upon which the front of the wing rests to the sides to give a starting place. The bottom section of the fuselage is partly covered with 1/16" or 3/32" plywood for the engine bed, and this is braced at the corners with 3/16" sq. bearers. Study the plan and note how the sliding hatch goes in place. This is a very simple deal, but a snug fit is essential to minimize air leakage, and to hold the hatch in place when the motor is running.

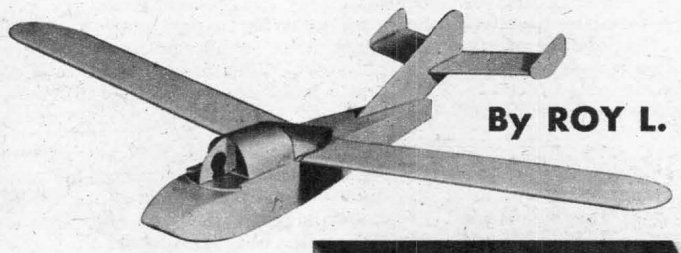
Sheet up the top and bottom of the fuselage, except at the wing station, then bend the front inward as shown and cover this portion. Wetting the wood may help the bending job, but we didn't find it necessary on the original. Be sure the inside diameter of the tail nozzle is ¾" sq. This dimension is quite important for good performance.

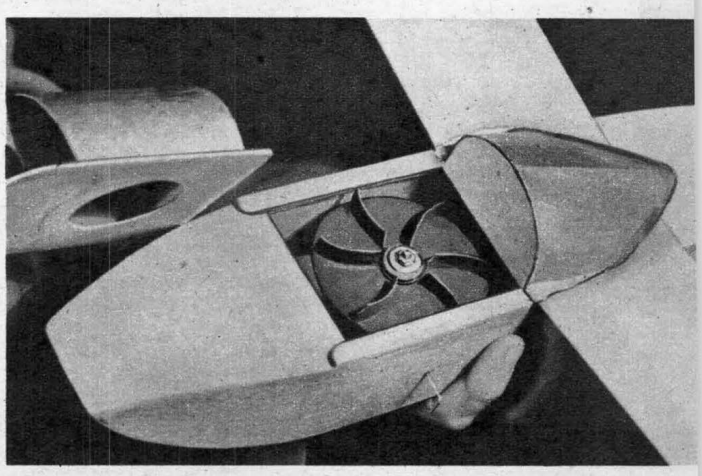
The wing is a simple glider-type sheet balsa affair which is cemented into the fuselage. Any small openings which show as a result of dihedral angle should be cement-skinned over. Fair in the turtle-back with stiff paper and fit the hatch and scoop arrangement to the model at this point. Allow the cement to set for a few hours and then fuel-proof the inside of the model by pouring clear Sta through it and sloshing it around. Do not omit this step because otherwise an untreated inside will pick up a surprising amount of weight from oil absorption, enough to change the flight trim to tail-heavy after a couple dozen flights.

Make up the tail surfaces and attach, noting that the front of the stabilizer is not cemented in place yet. No offsets are required since the gyroscopic action of the blower tends to bank the model to the right as it climbs—provided all surfaces are true.

Next mount the engine, taking care to align the shaft centered with the blower diaphragm opening (that 1 5/8" hole in the hatch). Mount the tank at one side with the filler at the front for easy fueling with the blower in place. (The original model used an Infant Torp tank with a Wen-Mac engine giving a good run, but not too long.)

Don't let construction of the blower, or centrifugal impeller which is the heart of the system worry you. Just cut a disk of .025 stock and solder the blades in place using a good flux. Be sure to do a good soldering job, since a blade coming off could wreck the model. With a good job the blower is safe at any speed a small engine can spin it. We have used a number of such blowers, many of them turning much faster than this





About any .045 cubic inch displacement engine can be used in this model whose "dry" weight is about 5.5 oz. Don't let the blower scare you off. It's not difficult to build, although you should take special care with the soldering operation. The author found starting to be quite simple. You spin the blower with a finger from back of model to front. The lighter you make the model the better its performance, but the more fragile it gets.

Blow Bug

one, with never a failure.

The plan shows a six bucket blower. This is about the top load for an .049 engine, which is the smallest which should be used in this ship. However, experimenters may wish to try three, four or five-bladed blowers, which will save a little weight and allow the engine to wind up a bit faster. The engine, incidentally, should be well run-in; a jet model is a poor place to break in a tight motor. The needle-valve extension is needed because the carburetion changes when the hatch is slid in place, and to simplify starting.

Complete flying details are available on the full-size plans.