

Fly this unique twin-engined
fire fighter off land
or water.

by Steve Gray



If this airplane doesn't excite you, you have no soul! It looks best in the water, but bolt-on gear allows land operation too.

- The Canadair CL-215 model is a twin engine, scale, amphibious aircraft that's easy to build, unique in appearance, and stable in flight. The model was originally designed around a couple of O.S. Max 20s, which were just sitting idle in one corner of the workshop. Some quick figuring resulted in a scale of $1/15$ original size and produced a model with a wingspan of just over 6'. The model was only intended to be built as a sport standoff scale aircraft, but the lines and proportions of the full-size plane lent themselves well to modeling, and none of the proportions had to be adjusted to insure good flight characteristics. The result is a good flying sport scale model with exact scale outlines and airfoils.

The CL-215 aircraft, made by the Canadair Aircraft Company in Montreal, is all-Canadian designed and built. It was developed to incorporate the most desirable features to make it the most effective fire-fighting aircraft in the world, with secondary capabilities to spray insecticide, search and rescue, transport cargo to remote areas, and do survey work.

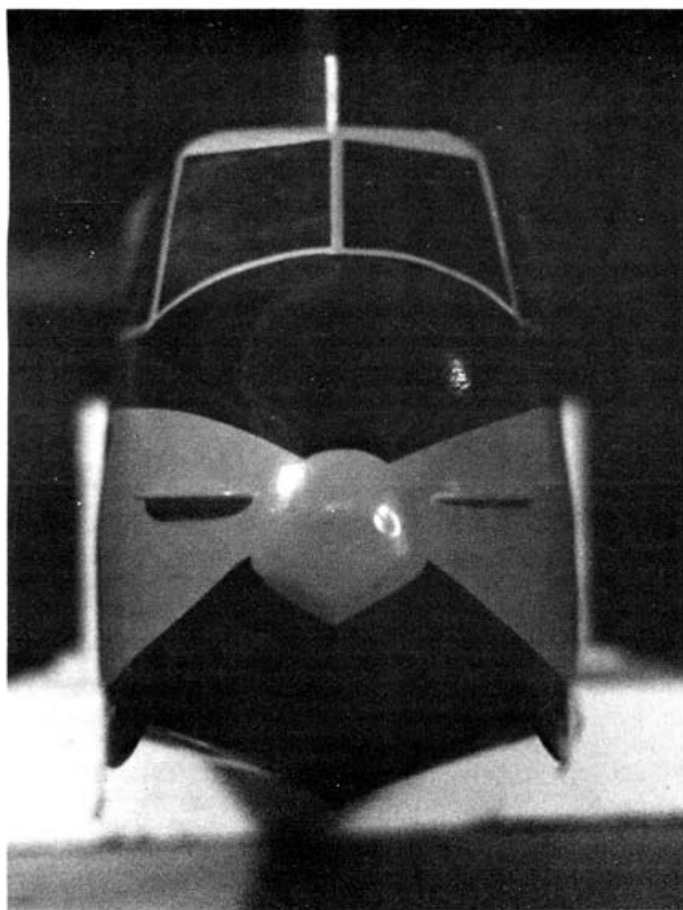
In its waterbombing configuration, the CL-215 is designed to scoop up six tons of water from a lake or river as it taxis along the surface. It then flies over the forest fire and dumps its entire load over an area of 350' x 40' in less than one second; this circuit is repeated as often as necessary to control the fire. During fire-fighting operations, several instances have been recorded of more than 100 drops being made by one CL-215 in a single day. Most of the CL-215s are in use in Canada, but several have been sold to France, Greece and Spain. Each year these aircraft save many times their cost in valuable natural resources and lives.

The full-size CL-215 is powered by two Pratt and Whitney R-2800-CA13 2100 HP radial engines, driving three-blade hydromatic constant-speed propellers. The aircraft is of conventional aluminum alloy construction, with special attention being paid to protecting the structure from corrosion. The landing gear is retractable and hydraulically operated, with the main gear

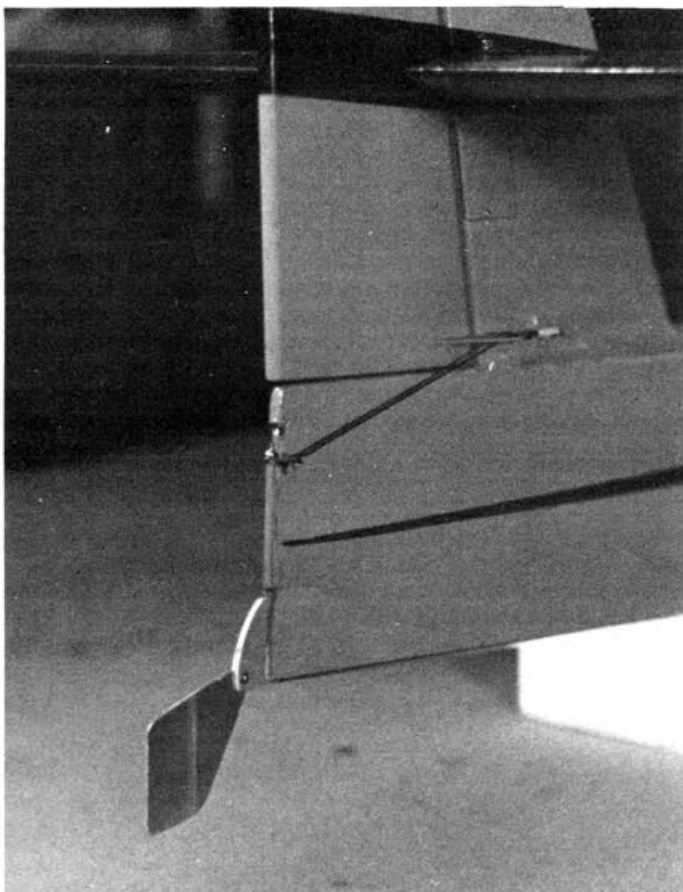
CANADAIR CL 215



CANADAIR CL-215
TYPE: Radio Control Sport Scale
WINGSPAN: 76 inches
WING AREA: 791 square inches
LENGTH: 55 inches
ENGINE: two .20
RADIO: 5-channel



Head-on shot shows spray deflectors on chines and nose.



Water rudder linkage is direct and simple. Note pivoting blade.

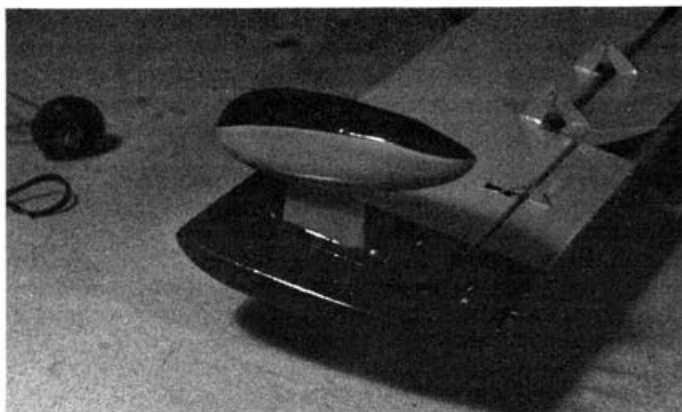
CANADAIR CL215

folding up to the sides of the fuselage and the casting nosewheel folding rearward into the hull. The tip floats are fixed.

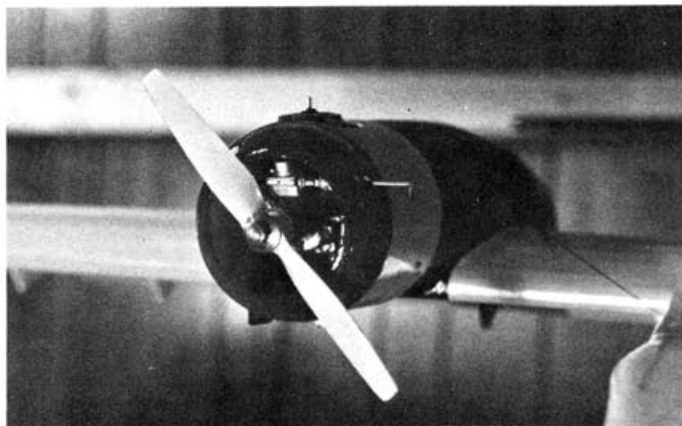
This model is highly recommended to anyone wishing to try a twin for the first time; it is fairly simple and quick to build, and is extremely stable in the air due in part to its large vertical fin. Another feature of the model is the thick, flat-bottomed airfoil that makes for good slow-flying characteristics and slow smooth landings. Two of these models were built in spare time in the space of eight weeks, which attests to the claims of quick building time and ease of construction (the prototype model crashed on its sixth flight due to a radio failure and a duplicate was quickly built to replace it). The model's outlines were not altered from the original's and all surface areas have proven to be perfectly adequate.

CONSTRUCTION. The model is constructed primarily of balsa, and most building methods employed are simple and orthodox. I will, however, discuss some aspects of construction so as to clarify the grey areas beforehand. Remember to use waterproof glues throughout if you will be flying off water.

The fuselage is constructed by cutting out all the formers, the two fuselage sides, the cabin floor, and the forward keel. Contact cement F-8 and F-9 together, and score the fuselage sides vertically from the wing saddle to the bottom of the hull right at the step. This will allow the fuselage sides to be cracked when they are pulled together at the tail. Glue F-6, F-7, and F-8/9 between the fuselage sides with epoxy. At the same time, glue and clamp the tail together (be sure the sides crack along the score). Fill the score with epoxy or glue, make sure everything is square, and set the assembly aside to dry. Epoxy F-2, F-4, and F-5 to the cabin floor, again making sure that they are all square, and set



Tip floats bolt on wing, are removable for repair or storage.



Upright engine stays out of spray, is almost completely cowled.

this subassembly aside to dry. When all is ready, epoxy the subassembly, F-1, and F-3 into place. Fill in the rear $\frac{1}{8}$ " x $\frac{1}{4}$ " balsa keel, the nosewheel bearing tube, and the fuselage wing saddle doublers. Allow this to dry and then add the $\frac{3}{8}$ " top block. When this is dry, plank the nose, add the nose blocks and shape them, add the balsa window panels, and sheet the bottom of the fuselage. Leave the top rear of the fuselage open until later.

The stabilizer is simply constructed by gluing the leading the trailing edges to the $\frac{1}{16}$ " balsa bottom skin. Add the ribs, the top skin and tips, and you're finished. The elevators are built in the same way. The rudder and fin are built in two opposite halves, joined, and then covered with $\frac{1}{16}$ " balsa. The stab can now be glued to the fin. Next, install the pushrods, and glue the fin and elevator assembly to the fuselage. Finally, cover the fuselage top with $\frac{1}{16}$ " balsa.

The wing shown on the plans is built from balsa, but there is no reason a foam wing would not serve as well. Flaps are also optional and may be deleted as the model does not need them—the original model did not have them and would still land slowly in short distances. However, if you want to come in steep and land on a dime, try them; they add a whole new dimension to the flight characteristics of the model. The wing is built flat on the plans in one piece. Begin by marking the rib positions just outside the outline of the wing plan and cover the planform with $\frac{1}{16}$ " balsa. Onto this wing bottom skin, glue the bottom spar, leading edge, aileron and flap leading edges and hinge supports, ribs and half ribs, and nacelle crutches. Install all pushrods for the ailerons, flaps and throttles, tip float mounts, and wing bolt support block. Add the spar webbing and the top spars. Sheet the top of the wing with $\frac{1}{16}$ " balsa and construct the nacelles. These are begun by installing the fuel tanks and pushrods. Next, glue on the formers and firewalls, and do your plumbing and engine mount installation. With the wing still on the plan, plank the top of the nacelles with $\frac{3}{32}$ " balsa. Remove the wing from the table and carefully cut out all the control surfaces. Add the

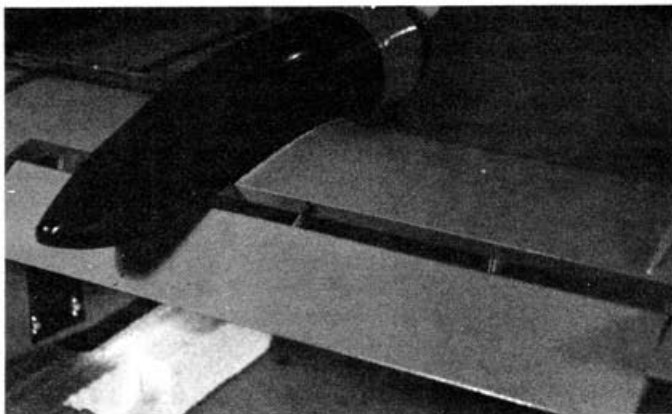
tip blocks and nacelle blocks, finish planking the bottom of the nacelles, and cut out the servo opening in the wing bottom. Now sand and shape for a few hours and you've got yourself a wing.

The flap hinges are simply made with $\frac{1}{16}$ " laminated plywood, and are installed in slots you cut in the underside of the wing and flaps. When installing the flaps, pin them in place on the wing in the up position, glue the hinges in place with slow-drying epoxy, and align the hinges before the epoxy dries by inserting a long piece of wire through all four hinge points on each flap. When these are dry, remove the wire and separate the flaps from the wing. Install the $\frac{1}{16}$ " plywood horn in the flap leading edge and you're done. The wing can now be fitted to the fuselage, the wing fairing can be carved and installed on the fuselage, and the wing hold-down blocks can be aligned and glued in. W-1, the $\frac{1}{4}$ " spacer, and the wing dowels can also be installed at this time. Engine cowls can be made from fiberglass or suitably sized plastic bottles.

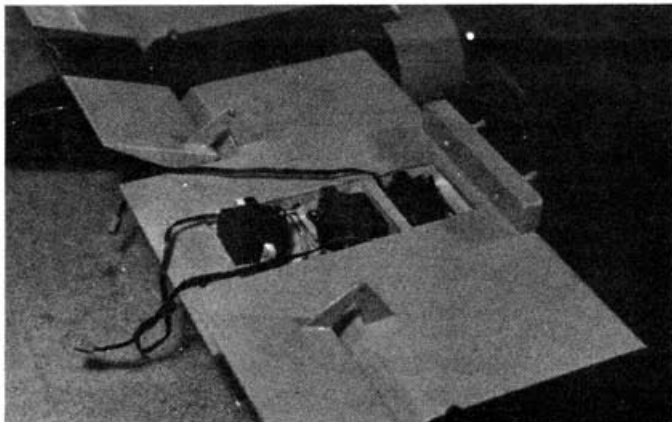
Bend the wire landing gear, and bind and solder the pieces together as shown on the plan. Install the $\frac{1}{4}$ " square spruce beam in the fuselage, together with the brass tube and rubber bungees. The beam must be installed at the bottom of the slot cut in the fuselage sides so that the brass tube is free to ride up and down in the slot, being restrained only by the rubber bands. This, or some other type of shock-absorbing landing gear, is necessary to protect the model from damage on hard landings. The nose gear is simply installed by pushing it up through the bearing tube and securing it with a removable nylon steering horn. It is advised that you file a flat on the nose gear strut so that the horn remains aligned.

FINISHING. The model was given a coat of clear dope, covered with silkspan, and then given several more coats of clear and a couple of coats of color. All markings were then painted on and a final coat of clear was sprayed over everything. Other finishes, of course, may be used as you prefer, but remember to keep it light and watertight.

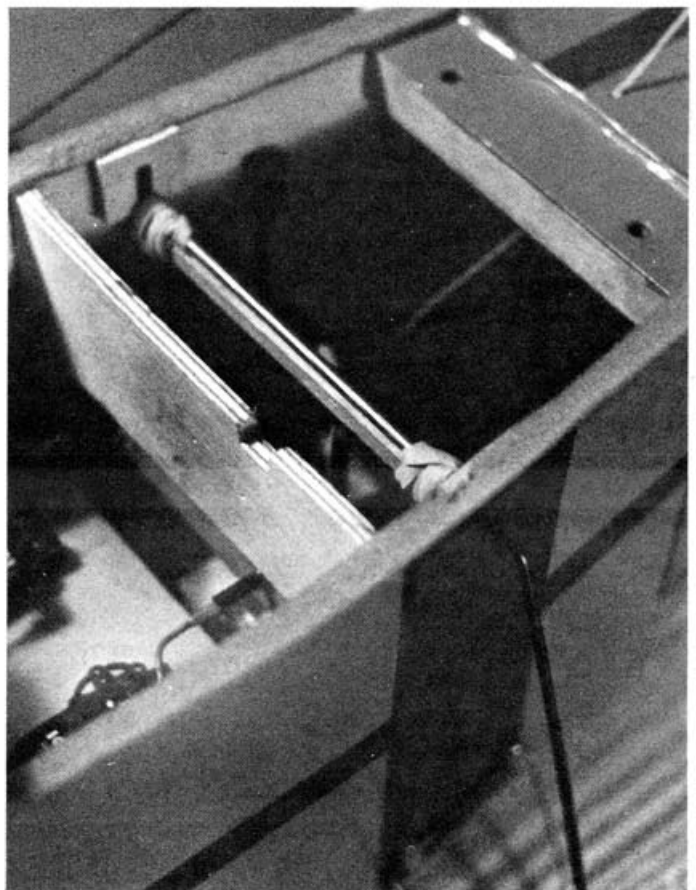
(Continued on page 100)



Flap pushrod is located just outboard of engine nacelles.



Aileron, flap, and throttle servos are mounted in wing root.



Main gear upper brace is shock mounted with rubber bands.

CANADAIR CL-215

(Continued from page 27)

TRIMMING AND FLYING. All control surfaces should be set up to have $\frac{3}{4}$ " throw in either direction—except the rudder, which should have maximum throw. This allows ample compensation for yaw should one engine fail in flight. The flaps should be set so that maximum downward deflection is about 30°. With these throws and the center of gravity located properly, the model should fly very smoothly, and although not aerobatic, it will roll and loop. The prototype model is powered by two O.S. Max 20 engines with tatone manifolds, which can easily be hidden by the cowlings. These engines provide ample power for realistic flying off land or water,

but the climb is not rocket-like, so ease the plane gently into the air. I would recommend you step up to 25s, though, if the weight is much over 9 lb. Single-engine performance is marginal but safe enough, due in part to the large fin and rudder. In any case, land as soon as possible if one engine goes out, gliding in with the other engine at an idle. The model exhibits no bad tendencies once trimmed, however, and is a real joy to fly. It is especially fun to fly off water and seems to be even more at home on the lake than it is on the land. If you do intend to fly off water, be sure to install a water rudder or individual throttles to facilitate taxiing. Two engines seldom run in sync through their entire speed range and steering can be a problem. Have fun and good flying! ■