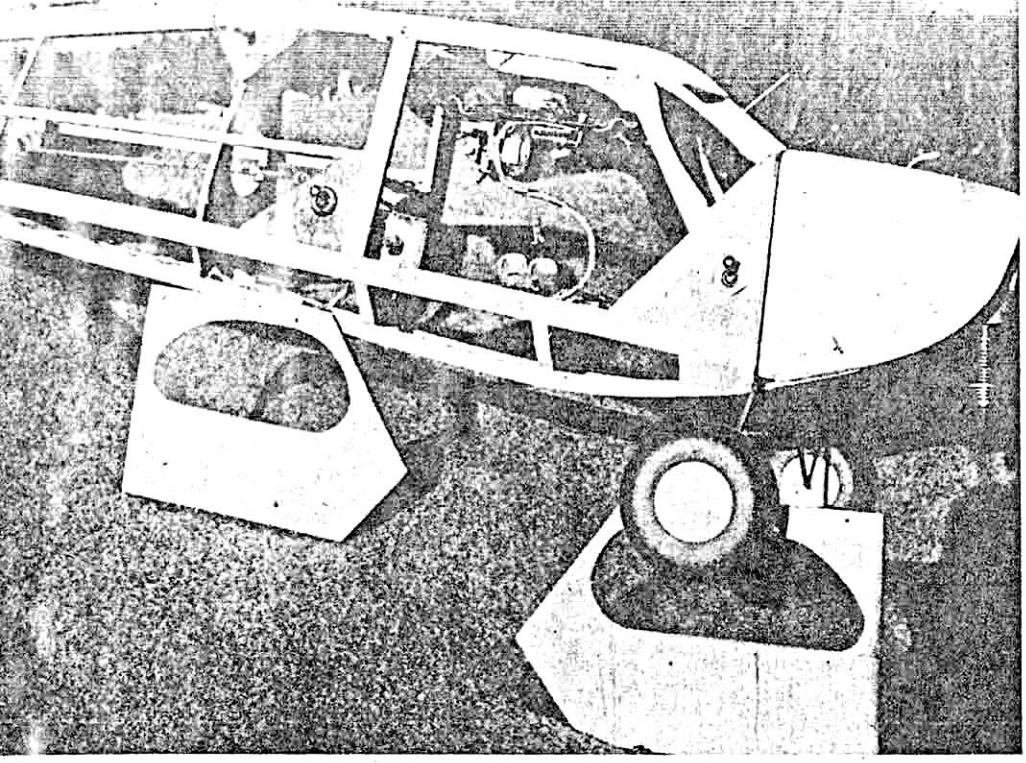
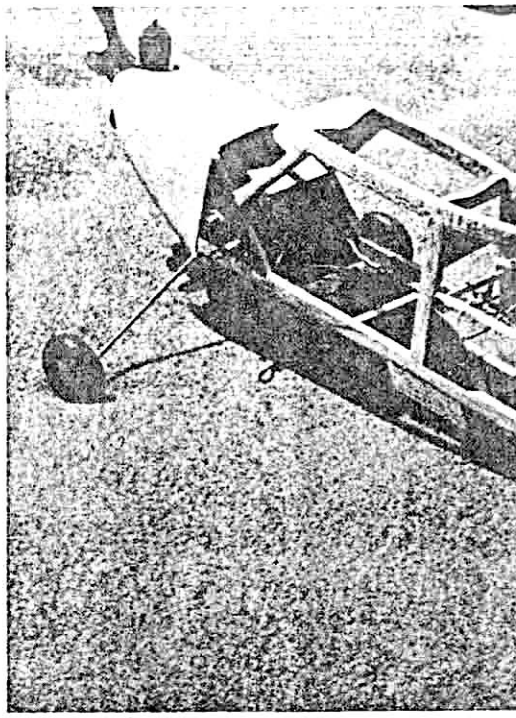


Radio, shown, uses RK-61 tube, spiral wound induction coil; holds frequency in hard landings.



Only two formers used and one of these is mounting

the C.Q.

R. C. JOB extraordinary

by E. J. Brown

Author's model has faired well at tough coast contests.

This picture taken on first test hop. Walker

If any radio job replaces the Rudder Bug, it will be this one. Size and performance good.

The CQ is the culmination of three years radio control flying experience, plus twelve years in free flight, and is fourth of a series of radio ships by the designer. CQ is the abbreviation for "call of inquiry" used by amateurs when going on the air and calling for another station. It is the hope of the designer that the simple type of construction and excellent flying characteristics, instead of a converted free flight design or made over scale design, will entice some new member into the fine hobby of radio control flying or possibly, the experienced radio flyer will like the ship's ability to do any stunt in the book when powered with a *19* engine. The design also features "split rib" construction of the wing panels.

The use of twin rudders was decided upon to improve rudder effect in turns after power is off. Turns in the glide can be made as small as 100 ft. across for 180 degree change of direction and it is very easy to make full "barrel rolls" either to right or left while under power without undesirable effects of too much rudder control. By reducing engine speed with a controllable restricter, it is quite possible to do all the precision maneuvers of the A.M.A. rules as is borne out by the *CQ's* second place at Long Beach, California in September against larger multi-controlled ships.

Precision rules called for a flight pattern as follows. Take-off, fly 500 ft. to marker; turn right or left 90 degrees then a 270-degree turn and return back directly over transmitter; then "S" turn crosswind; then "figure eight" crosswind; ending with a rectangle around transmitter 200 ft. on two legs and 300 ft. on the long legs. This pattern was compulsory before any other points could be earned for other stunts. Both CQ models, the original single rudder ship and the smaller, improved twin rudder ship, were able to complete the pattern. Radio trouble held the single rudder ship to fifth place.

To start construction, build the basic fuselage crutch of 1/4 x 1/2" material, directly over the top view on the plan. If "Citizen Radio" is planned, build crutch over large crutch drawing and enlarge base of bulkheads accordingly

which in turn are cemented and well braced between the appropriate fuselage formers. Wheels are attached with nuts and bolts in the usual way, heavy scale types being desirable as the weight is needed up front.

We found that complex cowling curves of the Luscombe are best tackled by indenting the *inner* face of each planking strip, before cementing in position. The long fin of the Cessna is cemented to the top of the fuselage and provides a visual stabilizer line-up check. The wing fairing on this same model presents a problem and in this case we have cemented a piece of shaped celluloid to the top of the center section trailing edge. Where the Luscombe center section trailing edge butts up against the fuselage, a 45 degree angled block is inserted, so that the wing can ride up this slope in the event of a sudden shock.

The safest trim for scale designs of this type has proved to be a gentle right turn under power, which tightens up in the glide after the torque stops pulling to the left. Trimming is best achieved by adding or taking off nose weight or by making *small* adjustments to the tailplane incidence. Eliminate all warps by holding effected panels in front of an electric heater for a few seconds —at the same time twisting flat. Remember that scale models lack the stability of pylon designs, so keep that power output low on the initial flights. When you have the trim taped, be sure to key in the wing and stabilizer. And finally, may we remind you that scale models also fly away under good conditions, so fit a tip-up stabilizer D/T if the thermals round your way are really strong.

CQ Radio Control Job

(*Continued from page* 33)

also form battery compartments. Bottom stringers from station six to stabilizer are next cemented in place. A plywood floor of 1/16" stock is added between keel pieces to support batteries. Low battery location results in a very low center of gravity.

Doors are cut from 1/16" plywood and are reinforced around edges with 3/16 x 3/16" strips of balsa. Plywood is used for doors to add to strength of cabin structure, and the extra weight is well compensated for in durability.

Windshield and window glasses are of heavy celluloid which also adds to strength of the structure. The windshield center piece, which is also the mount for the front wing rubber hook, is made from hardwood from a coat hanger. Dashboard can be balsa or plywood. The original and second twin ruddered ship has a 1/16" plywood re-inforcement added to the inside of the top strips over the doors and running full length of the cabin to rear wing tie down dowel. It is just over a half inch wide, and acts as a door jam and reinforcement for the receiver mount hooks.

The compartment behind the engine mount bulkhead contains a Walker pressure tank; enough gas can be put in to last for 15 minutes with an Arden *19*.

The Arden *19* was selected for this ship, even though it can be flown with an Arden *.09*, to permit the ship to do a full stunt pattern, including loops, immelmans, split "S," "chandelles" and "barrel rolls." These stunts all take a lot of power but, for the person new to radio control, stick to *.09* for power until you have mastered pattern flying. The *19* may be used with a good controllable restricter and large wing.

Place all wiring, drill holes for switches, meter jack, and hole for the "pot" before covering. Mount escapement and linkage and work out any binds in the system. One of the most important prerequisites of successful radio flying is a good escapement, free enough to operate down to the last winds of the rubber. This ship happened to use Control Research Radio equipment including the escapement, chosen for its small size, light weight, adjustment features, and reliability. Citizens gear with a Bonner Specialty escapement will be just as successful, though slightly heavier.

Both original model and twin rudder job fuselage are nylon covered for durability though silk or heavy *Silkspan* may be used. Nylon is put on wet over a pre-doped fuselage at point of covering contact. Pin nylon in place and, when dry, dope through material to stick to framework. Nylon of proper type and weight can be obtained from a department store or curtain shop, in white or a variety of colors. It is easy to dye or paint. The original ship is white, trimmed in red. Finish the job with Buyterate dope, a glow fuel proof finish.

Escapement linkage is similar to the set up of the *Rudderbug* by Walt Good (May & June 1949 issues, M.A.N.). The twin rudder push rod differs from point of contact at rear link loop from the escapement aft and rudder horn set up. Push rod is made from 1/16 wire, likewise rudder horns and extension pieces which comes up through hole in the stabilizer. This last piece is soldered to the link rod after tail section is covered. With this arrangement, it is possible to remove the tail section without unsoldering any joints.

If elevator use is desired later, install a second link loop at 90-degree angle to the rudder link. Bend rear angle outward and run through slot in fuselage side. Elevator link is then run through this rear link loop. Elevator positions then occur at normal neutrals.

This sounds intolerable, but really is not. To start with, the elevator when of equal size to rudder is only about 50 percent as effective. Only enough elevator for trim effect is used. The ship is adjusted for a little more climb than normal, then "down" elevator position is used for most normally neutral flying. Down elevator at low speed is very effective and will nose ship over but, after full flying speed is reached, will only reduce the climb to a small angle. The effect of "up" control is just the opposite. At take-off elevator is in "up" position till full flying speed is reached, then control is switched to down. At higher speeds "up" elevator is very effective and must be used with caution unless a loop is desired. Limit "up" setting to 1/8" from zero elevator position while "down" can be used as much as 1/4". The use of elevator opens up a whole new field of possibilities but proceed with caution until you are thoroughly familiar with rudder only flying. The author has run out of altitude on more than one occasion while learning to use combination control. Do not try stunts under power at a low altitude unless you like building new airplanes.

A controller box of the type illustrated by the author in the May 1951 issue of M.A.N. is essential to two control flying. For this use, mark two "off" positions as "up" and "down" respectively, to the position of the crank.

The "split-rib" type of wing construction used in the CQ design is new to large gas models of the radio controlled type. The designer has built four such wings for use on radio controlled ships, and has found them much easier to build, lighter in weight, more crash damage resistant and, very important, more economical to build. When covered with silk or nylon, the wing is almost indestructible due to its flexibility. The lack of rib webs between spars, in addition to weight saved, permits large amounts of twist and up and down flexing without damage experienced in solid rib construction. No notches in spars or ribs eliminate weak spots in these members.

The wing is much easier to build than to describe. A complete panel can be built in a few hours. No notching of ribs is necessary and the complete set of upper ribs will take only two sheets of 1/8 x 3" sheet against four sheets for solid type ribs. The cap strip of 1/16 x 3/16" over the contour strip between leading and trailing edge sheets, or on the small wing, between leading edge strip, prevents splitting of the contour strip experienced with rubber models or AA-powered ships when no cap strip was used. Complete weight of wing framework, with all sheet in place, is less than 12 oz. on the large wing. For violent maneuvers and high "G" pullouts from spins, the wingtips can be seen to bend upward and sometimes flutter, but to date, after many hundreds of flights, no failures have been experienced.

To start construction, make a plywood or metal template of rib shown on plan at root end of the wing. Start with a single edge razor blade and cut upper or outer curve of the rib. Drop contour template 1/4" at each end; repeat cut. This is the inside curve of the rib. It leaves a 1/4" wide strip which is the upper