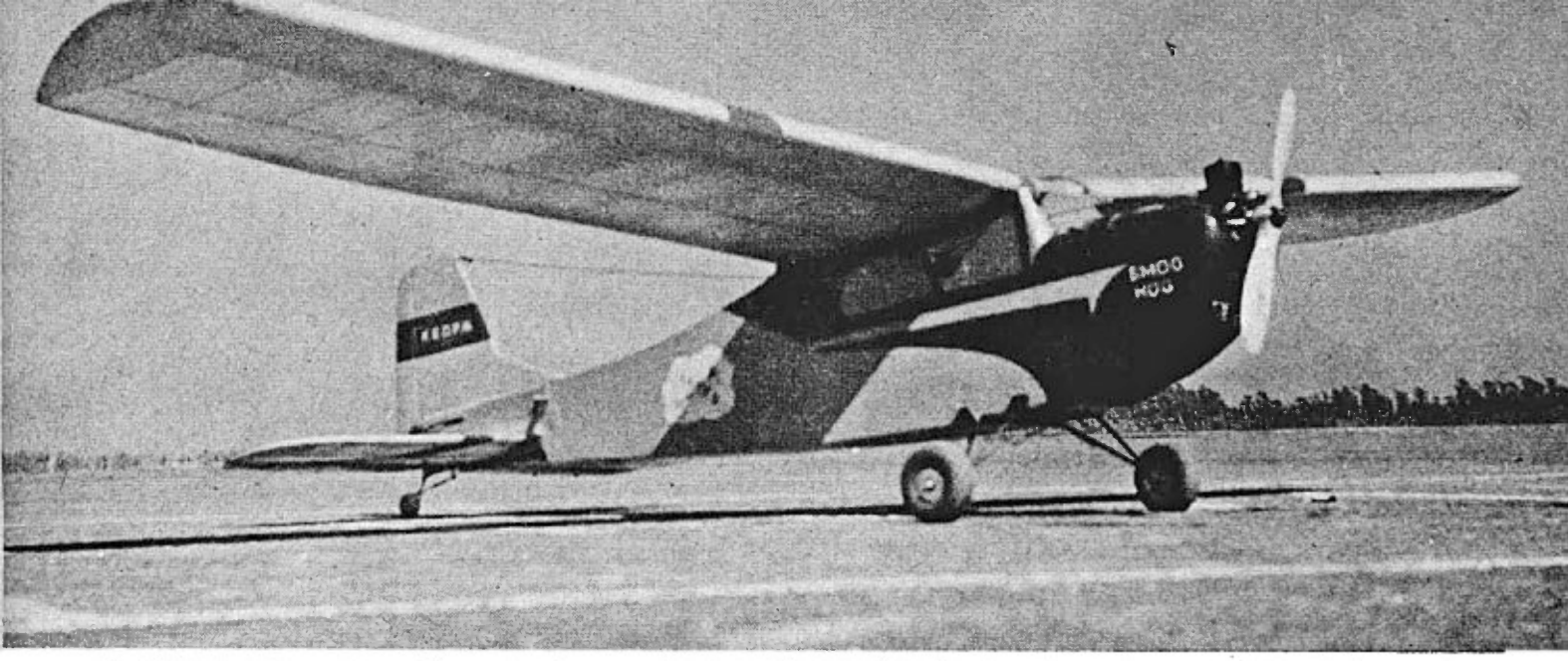


The designer's original airplane—5½ pounds of rugged, functional flying machine. Five-channel control by a CG transistorized receiver.

the Smog Hog

by R. E. BOWEN

► The Smog Hog was the winner of the multi-class in the 1956 Nationals radio control event, and the California State Meet with a high score of 202 points. The design is the result of many months of designing and flight testing by Howard Bonner. The primary objective of the Smog Hog design was ease in building, low maintenance, ability to perform all the maneuvers required and still have a light enough wing loading for doing these maneuvers tighter and quicker without excessive losses of altitude. The airplane is simple enough for the beginner, but still lets the expert add his little changes. As the design stands now, it is a top notch contest performer. Although a C.G. 5-channel receiver and the new Bonner servos were used for the winning flights at the NATS, it has gone through a full stunt pattern (inside and outside loops too) with a single channel Deltron receiver and Bonner's Vari Comps cascaded. This single-channel version won the "Mickey Mouse" Class of a recent LARK'S contest.

The Smog Hog is a fully stuntable radio controlled model with hands-off recovery. This means you can relax when out for week-end pleas- *(Continued on next page)*

Howard Bonner putting the Smog Hog through it's paces. Note that smile of satisfaction. Light wing loading eases abrupt maneuvers.

Sensation of the radio event at the last Nationals was this great multi-channel winner. Outstanding are light weight, simple construction, terrific stunt ability.

Light weight and simple lines distinguish most really good multi jobs. For aerodynamicists, the wing uses a 2415 airfoil section.

ure flying, or you can wring it out in competition. If you should ever become confused (and who hasn't) or get too excited during a maneuver, returning all controls to neutral will let the airplane recover itself.

The size of the fuselage cabin permits the installation of any receiver on the market today with plenty of room left for batteries, servos or escapements, and your hands. The latest ideas for a practical, easily maintained model have been used, such as a two-wheel knock-off type landing gear, an expandable engine mounting plate that permits quick engine changes in the field, or it will break before damaging the engine and fuselage in a crack-up. Another unusual idea is a visual fuel supply in a crash-proof 4 oz. plastic squeeze bottle (holds Wilhold Glue) that has been modified to function as a "clunk" tank. The tank is mounted outside the fuselage aft of the engine, where it can be easily removed for cleaning, and is held on with rubber bands.

Since construction details are clearly shown on the plans, it is not necessary to go into a detailed construction discussion. However, highlighting a few points will enable the less experienced modeler to duplicate this fine model and it's superb flight characteristics.

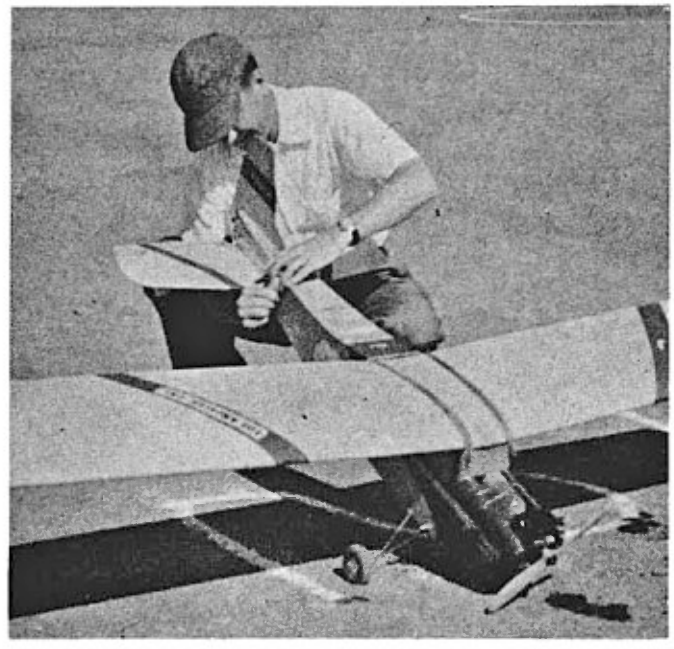
FUSELAGE—The fuselage is the conventional strong box-type with sheet-balsa sides, top, and bottom. Side uprights help prevent the sunken appearance so prevalent on slab sided models. The windshield and side windows are not cut out, but are painted on to increase the strength of the cabin area. The flat windshield helps give some of the drag necessary to get a lower power-on and power-off speed differential. Parallel fuselage sides aid in squaring up the fuselage during the initial stages of fuselage assembly. Careful alinement of the nose blocks is necessary to result in the 0 degree thrust line and the fit of the firewall (F-1).

Before planking the top and bottom aft of F-3, install and line up the push rods (servos) or torque rods (Vari Comps) and make sure they operate freely without any binds. A little time spent now on the torque rods (if escapements are used) will prevent a locked control surface later. Use blind nuts to mount the Vari Comps on a bulkhead 1" ahead of F-3. The escapements should be mounted temporarily to check line-up of the torque rods, then removed, wired and installed when the fuselage is completed.

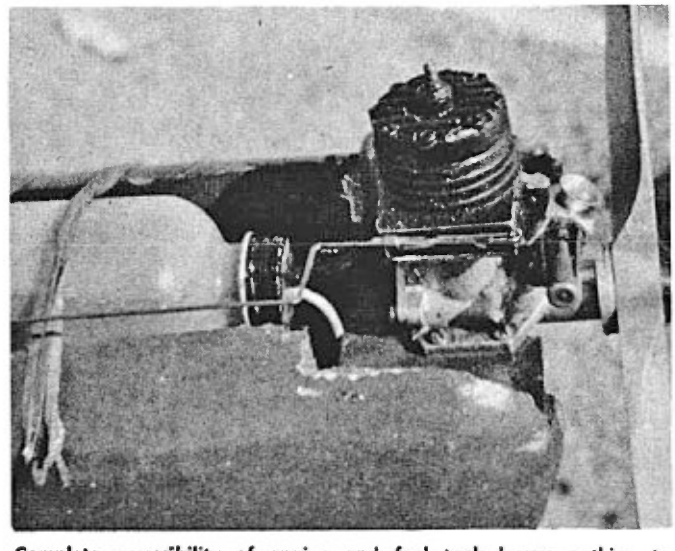
Cover the fuselage with nylon and dope. If additional strength is desired, the fuselage can be fibre-glassed on the lower side back to F-3. Make the fuel tank tray fit snugly over the battery compartment. Be sure to fuel-proof the nose and battery compartment thoroughly. Add steerable tailwheel bracket and cement firmly.

Install batteries required for your receiver in the battery compartment between F-1 and F-2 and pack any spare space left with plastic sponge to prevent vibration and impact damage. Vibration can work a well soldered joint until it breaks. Put a thick pad of plastic foam against F-2 and mount the receiver vertically against it, if any other receiver than the "CG" 5-channel receiver is used. Mounting of the "CG" receiver is shown on the plans. Note that the receiver is mounted high on F-2 to keep the center of gravity high and to provide accessibility. Follow the manufacturer's instructions on installing and wiring your receiver. If servos are being used, mount the rudder and elevator servo on the servo mounting board which is screwed to the servo rails. Wire servos to the receiver as per the wiring diagram supplied with the servos and receiver. Drill any necessary holes for switches and test jacks. Mounting the engine off center as shown on the plans will give straight flight with full throttle.

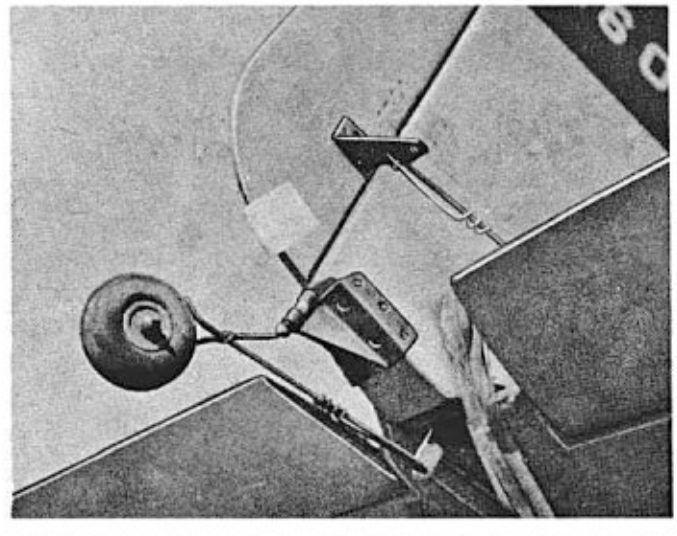
A Bramco thottle is used on the engine and is operated by a Bonner SN escapement that gives two speeds. The escapement is mounted on the (*Continued on page 55*)



Preflight checking before every hop saves airplane and ensures top performance. Knock-off gear is a great repair eliminator, too.



Complete accessibility of engine and fuel tank leaves nothing to be desired. Fuel level visible in squeeze bottle used for a tank.



For ground maneuvers, up-elevator applies a brake to the steerable tail wheel. Details shown on the plans—compare with this photo.

The Smog Hog

(*Continued from page 20*)

right side of the fuselage just behind the receiver box and operates the throttle via a 1/16" wire push rod. The rubber for the engine control is wound by a removable plug on the bottom of the fuselage.

WING—The wing construction is conventional with a few new wrinkles. The absence of heavy plywood dihedral braces may shock some of the old hands. However, there is a good reason. This is a case of when absence makes the wing grow stronger. The addition of plywood braces will cause stresses to center where the plywood ends, and could cause the wing to fold during a pull-out. Center section strength is achieved by scarf splicing the ¼" square spars, leading and trailing edges. The top and bottom pieces of the front and rear spars should be spliced in opposite directions. The leading and trailing edges should also be spliced opposite. This, with the spar webbing and 1/16" sheeting on the top and bottom of the center section, will result in a center section just as strong (or stronger) and lighter than one built with plywood dihedral braces. The reenforcing wires on the leading and trailing edges prevent the hold down rubber bands from cutting into them in the advent of a bad landing.

The leading and trailing edges are unique in that they were designed to be cut on a table saw and thereby saving the cost of pre-shaped parts. The plans give the angles and sizes to cut the stock to. Only the leading edge will require final shaping after leading edge sheeting is in place. The wing ribs, being all the same, are mass produced by first cutting blanks of sheet balsa, then stack and shape to final outline. The solid balsa tip is left solid for durability and also it helps to keep the weight high up where it should be. If desired, a conventional shaped trailing edge can be used by notching the trailing edge at each rib station and changing the rib trailing edges to fit. However, you may get the pucker that is so prevalent in most wings where the ribs meet the trailing edge in a but or slotted joint. Building the wing shorter, as indicated by the dashed tip outlines, will increase the flying speed of the model a bit but won't change the flight characteristics noticeably. Cover the wing with nylon for durability and strength. Check for warps before covering, because it is next to impossible to remove them once the wing is covered. Remember, covering will hide a lot of things, but not a crooked wing.

STABILIZER AND ELEVATOR.—Simplicity and ruggedness are the keynotes in the stab construction. Basically, it is a flat ⅜" thick stab with spars added to the top and bottom for strength. The ribs are formed simply by adding rectangular pieces from the spars to the leading and trailing edges on both the top and bottom. These are sanded to a triangular shape when dry. The finished product is a strong symmetrical stabilizer section. The top of the stab should be built complete and allowed to dry before removing from the plan to finish the other side. Sand to the shape indicated on the plans, cover with nylon and dope. The conventional slab-type elevators are connected together by a music-wire connector which has a brass control horn soldered to it. Lace the elevator to the stab with heavy thread at the points shown on the plans. Follow a figure "8" pattern.

FIN AND RUDDER.—There is nothing unusual about the fin and rudder construction. Sand to shape after gluing dorsal fin in place. Glue fillet blocks in place after shaping and make sure there is no off-set in the fin. Add control horn to rudder and lace to fin in figure "8" stitch.

FINAL ASSEMBLY.—Install radio receiver, servos and batteries according to the manufacturer's instructions. Solder all connections well, using rosin core solder and plenty of heat. (A cold iron will require that the iron be left on the joint longer, thereby heating up the components.) To get a good solder joint, clean all areas to be soldered. A cold solder joint is a weak joint, and may come loose under vibration. If a pair of needle-nose pliers are used between the soldered joint and the part to be soldered, the excess heat will be pulled off before it can damage anything.

After equipment is installed and operating, aline the wing and tail on the fuselage and strap it down with rubber bands. Put model on the floor and block up the tail until the stabilizer is parallel to the floor. Measure the distance from the center of the wing leading edge and trailing edge to the floor. The center of the leading edge should be 7/16" higher than the trailing edge. Shim leading edge or trailing edge as necessary. After checking this important measurement, check for proper location of the center of gravity.

FLIGHT TESTING.—Before leaving for the flying field, be sure your name, address, and phone number is inside and also outside in some obvious place. Don't forget, the fuselage is the most valuable component. Wings can be left up in a tree with the fuselage going all the way to the ground.

Bonner's method of flight testing is a very practical and safe way to make the first flight on any R/C model with engine control. There is no test gliding, which is impractical for any model of this size anyway, unless you are long legged and have a good set of lungs. This model has a respectable glide speed and would require a healthy shove to get flying speed.

Check the radio operation with the engine running and the model suspended off the ground by two rubber loops, one near each wing tip held by a couple helpers. This will approximate the vibration that will occur in flight. Check all controls. If all's well, you are ready for the first flight. Put only enough fuel in the tank for about 30 seconds engine run. Do not fill the tank completely, because a full tank coupled with a flyaway can result in a lost model. The first flight should be an ROG with the engine running at about ¾ speed. This way, low speed will keep the model on the ground or stop it completely. Radio On. Head model into the wind and release. If you lose control during the take-off run (the model doesn't appear to be going to take-off), drop engine into low speed and taxi model back. Increase incidence of the wing and try it again. It should take-off with this ¾ power.

After the model is airborne, get altitude, don't try any maneuvers on this first flight but just concentrate on any adjustments that will be needed to give a straight smooth flight.

When the model is flying just the way you want it, fill the tank, start the engine and peak it out, *switch the radio ON*, taxi down wind and swing around into the wind. Pulse for high speed and you are in the air with one of the sweetest flying R/C models in the air today. You can go through a complete stunt pattern, shoot touch-and-go landings, then make a low speed engine approach, land and taxi back to your tool kit. You will enjoy the ground handling characteristics of this model as well as the maneuvers it will perform in the air. Remember, it will take practice to perform all maneuvers perfectly, but that is what it takes to win contests. See you in the winner's circle.