THE GYRENE

Automatic control feature of this model will give you more stability. Novel motor mount offers quick and easy servicing.

by **GEORGE KANAKOS**

HERE is a gas model featuring a pendulum-actuated control system for superior safety. With this device the model must at all times assume a normal flight attitude, a condition not too prevalent in some present day designs. Utilizing this control device the author has designed a model of a realistic semi-scale type, even to the hinged cowling such as used on the model cars. The proportions are such that the model is equally well suited for contest or sport flying, the accent being on the latter.

The "heart" of the model is a ball-and-socket joint which allows the pendulum to swing freely in any direction. Any proven universal joint can be used, but the author has dreamed up a very simple and foolproof type. The idea was to use two ping pong balls, one inside the other, for a smoothly acting swivel joint. The control stick is fastened to the inner ball, the other ball being split and cemented around it. Holes in opposite sides of the outer ball allow for the swiveling motion of the control stick. The control stick should be hardwood, preferably ⅛" dowel. The outer ping pong ball is mounted in the roof portion of the fuselage. For a 1" ball, cut ½" holes in opposite sides of the outer ball to allow the proper amount of control stick movement.

A pendulum should now be affixed to a short length of tubing with a set-screw in it. This allows removal or adjustments to be made to the control system. The pendulum used in the original model was made of lead and weighed 5 ounces.

Using ¼" square balsa, the two sides of the fuselage can be cemented together and left to dry on the workbench. The diagonals should be included, as the fuselage sides will be subjected to warping and distortion strains once removed from the workbench. So don't forget those

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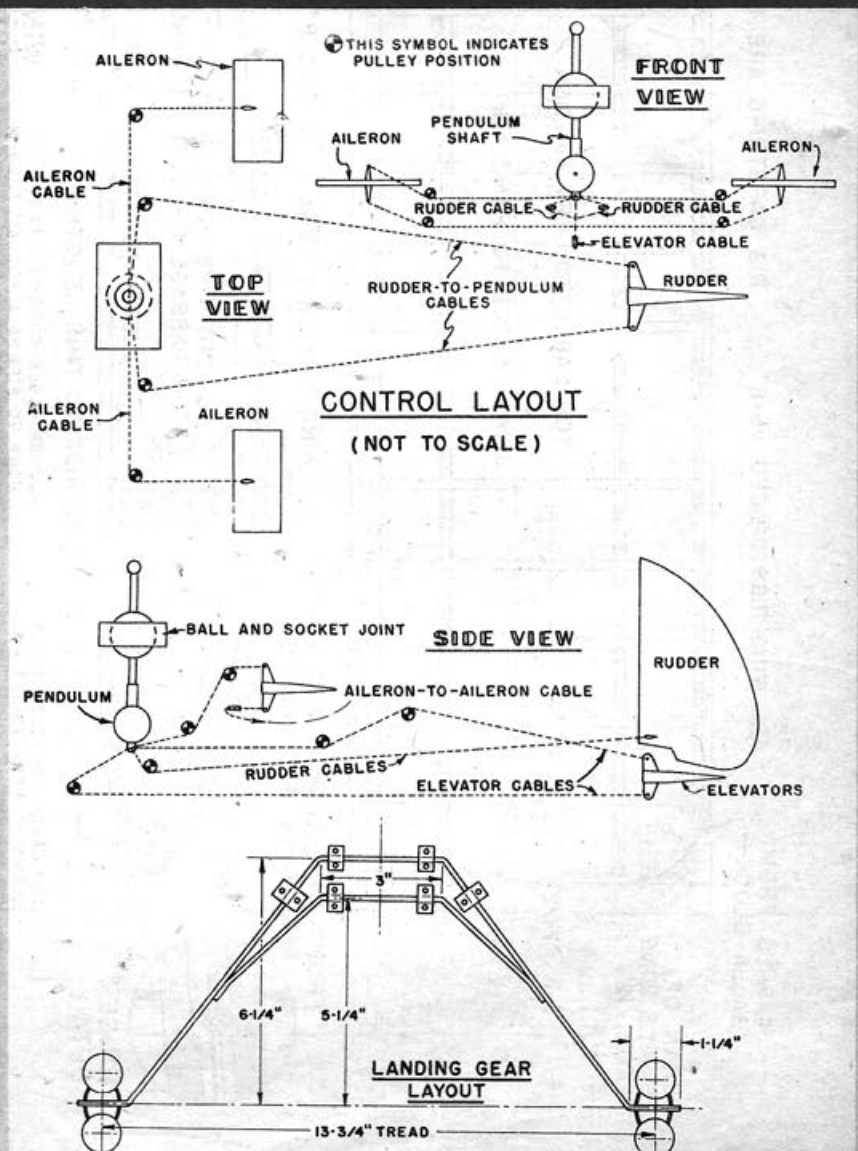

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diagonals. The two sides can be assembled, once the cement has been allowed to dry sufficiently. Care should be exercised so that the fuselage does not warp to either side. If there is any tendency toward warpage it should be corrected with 1/8" square balsa braces cemented in the roof and belly of the fuselage.

Formers and stringers are now added, then the proper bulkheads "filled-in" with 1/4" sheet to allow mounting of the landing gear. Landing gear struts are bent to shape from 1/8" music wire and bolted into place. Use lockwashers here, as well as in the engine mount for durability.

The nose block can be carved next, using a balsa block 3 1/2" x 3 1/2" x 7" Once the desired outside shape has been attained, the interior should be hollowed out to suit the individual. Now split the cowl along the horizontal plane and cement the lower half into place. Cooling openings are left to the fancy of each modeller—a grill can be incorporated if so desired. The tail cone is also shaped from a balsa block, but before it is cemented into place a portion should be hollowed out to provide space for the elevator horn and its movement.

The wing should be made on a flat surface to insure freedom from warps. Lay down a row of cap strips on the plan, once it has been drawn up full size, and pin them down at the proper intervals. Next, the ribs should be slipped into place on the spars and pinned to the plans. As each rib is cemented to its capstrip, the rib should also be cemented to the spars. Once all the ribs are in place, the leading and trailing edges can be cemented on. The assembly should be allowed enough time to dry, later being sanded carefully for a smooth covering job.

The stabilizer is of ordinary construction and, like the wing, may be capstripped for added strength and smoother covering. Once the stock sizes as called for in the plans are assembled, the unit should be sanded. Hinge details are shown on the plans. Extreme care should be exercised that the hinges are smooth-acting, snug and strong, so that they do not wobble of their own accord. Rudder construction is similar to that of the wing. Here again, precaution should be taken to see that the rudder moves smoothly in relation to the fin, yet does not "freeze" in any position.

A Phantom P-30 was used in the original model, mounted in the simple and novel manner shown in the photographs and sketches. A 1/4" aluminum or dural bar was bent into a horseshoe shape (roughly speaking), then each "leg" of the U bent at right angles to form the bearers to which the crankcase lugs are bolted. The usual ignition system applies to this model, and care should be taken to see that soldering is neat and that fairly short lengths of wire are used to keep electrical losses to a minimum. It should be kept in mind that certain joints will take much abuse, so be sure to use plenty of cement on landing gear-to-bulkhead connections and between all the joining edges of fuselage, wing and tail surfaces. In joining all the parts, the wing should be "jigged up" or supported by various means so that the tips assume 4" of dihedral.

The 1/4 x 3/4" hard balsa wing struts can now be cut to fit, and cemented into place. The struts will be strained with each rough landing, so to prevent any embarrassing situations at the flying site make doubly sure the struts are in place *to stay*. In the original model a small metal fitting was made for each end of the strut so that it could be bolted in place, but the average modeller will be satisfied with a good cemented joint.

To obtain access to the interior of the fuselage for adjustments or changing of batteries, either the windshield should be made removable or workable doors be incorporated into the model. If a removable windshield is used, either small hooks and rubber bands or good old fashioned dress snaps can be used to keep the windshield in its proper place.

Ship model rigging cord (No. 100) is used for the control cables, and small brass pulleys employed where needed. Using straightpins, all the control surfaces should be pinned in normal or zero-zero position, and the control cables rigged up. Take up the slack in the control system, but be careful not to tighten the control cables excessively, thus causing the entire system to bind and lock in position. Once the pins are removed the model should be propped up in flying attitude to see that the control surfaces are in their normal positions. To check for correct rigging, pick up the model and put it in a banked position. The pendulum should swing to the side that the model is banked in, and in so doing move the controls into such position to counteract the banking attitude.

The pendulum control makes every control surface respond to its action. That is: when the model is in a dive the pendulum swings forward, giving the elevators an upward movement, returning the model to level flight. Once the control action has been checked the model may be covered. Gas model Silkspan is ideal (be sure to moisten it before using to obtain the best results) for the covering, but no matter what is used checks should be made regularly to see that all surfaces are true and free from warps.

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