

30's SPORTSTER

By TOM HOULE . . . For relaxed R/C fun, nothing can beat a small, rudder-only, glow-powered parasol. Just be sure that the tempting small field near your home is a safe distance from the regular R/C airport!

• The 30's Sportster had its beginning in my collection of AERO ERA plans, as a 14 inch span stick-and-tissue rubber powered design. The darn thing flew so well that I began to consider enlarging it for Ace pulse flying. Two years later (these things take time) I did enlarge the plans to 28 inch span. The nose arm was shortened and the fin was reworked slightly, but other than that, it is the same configuration as its rubber powered little brother.

Mine literally flew off the board, the only adjustments required were to add just a bit of nose weight and unwarp a wing panel that had taken a set due to overzealous doping and shrinking. Incidentally, the Sportster

will do very nicely as a free flight. Just don't get carried away and install a brand new TD.020. She'll do quite well with an anemic .020.

For those of you who like detailed how-to-do-it commentary, read on. For those of you who have built 'em'all and don't need the commentary, proceed directly to the plans and start hacking.

I started with the fin and stabilizer because those are the two items I least like to make. Cut the stabilizer and fixed elevators from medium 3/32 sheet and butt glue together on a flat surface. Do likewise with the 2-piece fin. Cut out the rudder and hinge with Robart or thread hinges, ensuring that the fin can freely flap

back and forth on its own weight. The fin must be free. Magnetic actuators typically have low output torque.

Set these aside and start the fuselage by cutting out and assembling all bulkheads. While these are drying, you can cut out the sides from medium 1/16 sheet and install the 1/16 nose doublers . . . one right and one left. I personally like to run the doubler grain vertically, at 90° to the side grain, but take your choice here. You should also glue in the 1/16 x 1/4 upper side reinforcement strips at this time, butting them to the doublers.

After the bulkheads are dry, install the bulkheads in the cockpit area, ensuring that the fuselage is square. Next, bend the landing gear from 3/32 music wire and sew it to the 1/8 ply landing gear bulkhead. It's a good idea to coat the sewn wire with epoxy . . . just in case. Epoxy this bulkhead in place and wrap the fuselage with rubber bands to retain the bulkhead while the epoxy cures.

The 1/8 ply firewall with blind 2-56 nuts can be installed next, again using plenty of epoxy. In fact, I make it a habit to coat both sides of the firewall to prevent fuel soaking into the plywood. Install the firewall with 0° and downthrust, unless you must install a super-hot engine. In which case, add a couple of degrees of down and right thrust.



The 28 inch span Sportster looks very much like its 14 inch span, rubber powered descendant. It's also just about as easy to build.

Pull the two sides together at the back end and install all other bulkheads. Bend the wing cabane struts from 1/16 music wire. Note that there is a 1/16 difference in height between the aft and forward strut sets, providing about 1° of positive wing incidence. Bind the struts to the 1/8 ply cross pieces and epoxy them into the fuselage, bracing with 1/8 balsa gussets.

Use 1/8 birch dowel or 1/16 music wire for the wing supports, and bind these to the struts, ensuring that the cabane struts are parallel as viewed from the side. If they are not parallel, you've messed up your incidence angle. You experts out there may want to reduce the incidence angle, allowing a more aft center of gravity and faster flying. However, you never get something for nothing, as the ship will be highly sensitive and may do funny things in the air... snap rolling for example.

There is some latitude in that the wing can be slid fore and aft about a 1/4 inch to reduce stall tendencies. More on this later.

This is the time to install the actuator and .045 music wire torque rod. Make sure that there are no binds in the system. As stated earlier, the actuator puts out so little torque that any binds will simply cause the steering system to hang up... always, it seems, with full right or left rudder... never neutral. The torque wire should ride in nylon or teflon 1/16 I.D. tubing. Do not use brass or aluminum tube, as it will generate electrical noise that can glitch the receiver. In short, before you button up the fuselage, make sure that the actuator and torque wire assembly run smoothly. Extend the torque wire approximately 4 inches beyond the fuselage tail post. It will be bent up later.

When you are satisfied that all is well inside the fuselage, install the 3/32 sq. stringers and sheet the bottom of the fuselage, cross-grain fashion, with 1/16 sheet. Also install the 1/32 top decking from the "rear hole" forward. Give everything a good sanding and set the fuselage aside.

Start the wing assembly by shaping a 30 inch strip of 1/8 x 1/2 balsa into a tapered configuration and notch and cut to length per the plans. The carved center section portion of the trailing edge is cut from a piece of 1/8 sheet stock, medium to hard.

Pin the three trailing edge pieces to the plan and cut all ribs from 1/16 sheet. Also, at this point, cut out the eight 1/16 ply dihedral braces and set aside. The spars are 1/4 x 1/8 (fwd.) and 3/16 x 3/32 (aft). These should be pinned to the plan after

checking the rib notch locations. Install all ribs and the 3/16 sq. leading edge. The ply gussets should be glued in now, but only to the outer panels.

After the wings are dry, set the dihedral angle by blocking up each wing 1-1/4 inches. Ensure that the center section is pinned flat to the bench. Use plenty of glue when attaching the dihedral braces to the center section.

When the dihedral braces have set-up, add the wing tips and give the whole assembly a good sanding. Lightweight yellow tissue was used on my 30's Sportster attached with thinned-out white glue and then water-shrunk. Three to four coats of thinned butyrate dope should provide adequate fuel-proofing. Any more than this may cause wing warping.

Cover the fuselage turtle deck with the same tissue, shrink, and dope. Add the paper headrest and you're ready to install the rudder wire. Bend the rudder actuating wire as shown on the plans (1/32 music wire) and attach to the rudder with a 2-56 nut, screw, and washers. Then bend the torque wire up to slip inside the rudder wire. The torque wire should have a snug fitting plastic sleeve slipped over it. Remember, no metal-to-metal contact.

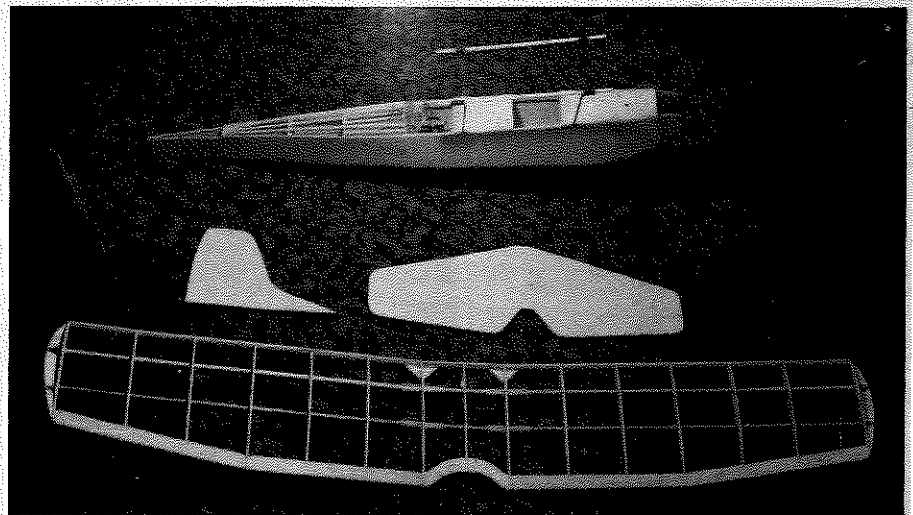
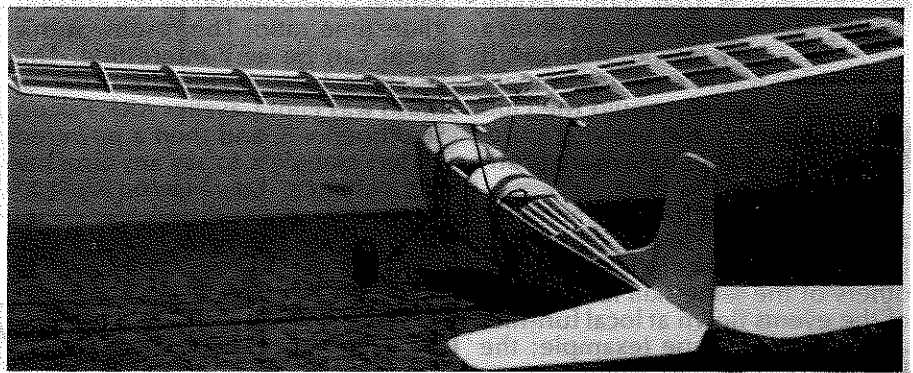
Now fire up your receiver/actuator to make sure all is well. About 5/16 travel to each side of neutral is right. You can increase or decrease this travel by raising or lowering the rudder wire.

I applied two coats of Hobby epoxy paint to my fuselage, fin, and stabilizer. Cub Yellow, natch, and added a Zip-A-Tone red stripe down the side.

My receiver antenna was strung out and attached on the top of the fin. Perhaps you can find a neater way. The receiver on-off switch was simply stuffed into the forward cockpit hole along with the receiver. The battery should be placed as far forward as possible to maintain the C.G. Wrap both the receiver and the battery with foam prior to installing.

Balance as shown on the plans, shifting the wing fore and aft to obtain the C.G. shown. Flying trim is optimal when your 30's Sportster will maintain a shallow climb with neutral rudder. It should fly in a reasonably straight line with no turn tendency. If it wants to turn left with neutral rudder, shim in right thrust with washers behind the left side of the engine. Climb can be improved by shimming up the leading edge of the wing in 1/32 increments.

Have a ball with your 30's Sportster. You too can discover the fun and low cost of school yard flying. ●



Come on, Pop, take a few hours off of that pattern or scale bird, stick one of these together, and introduce your offspring to the fun of controlled flight!