

ACRO SPORTSTER 40

By PETER NEUER . . . "Super-smooth; would be great for fun-flies and pre-novice and novice pattern, thanks in part to the longer-than-average tail moment. So says Assist. Editor John Elliot after flying this sharp looking sport/pattern model of basic balsa and plywood construction.

• Have you ever thought about designing that perfect single-purpose airplane, you know, the perfect trainer or the smoothest pattern ship, or perhaps a really good looking scale job that took off and landed with ease.

How about one plane that has all those planes rolled into one? Too good to be true, well that's what I thought until I flew my latest creation, the "Acro Sportster 40". This ship has been flown by lots of people who fly a lot better than I, and they all loved it, in fact, I had a hard time getting my transmitter back in some cases. Well, if you want a real fun flyer with good looks, easy ground handling, and great aerobatic ability, then wait no longer, get a set of plans and starts chopping balsa.

The construction is straight forward

tern, peel off the backing of the shelf paper and press the pattern onto the wood. The shelf paper will peel off without leaving any adhesive residue.

Use the plans as a guide to mark the 1/8 x 4 x 36 inch fuselage sides. This is to show where the 1/4 sq. balsa longerons and uprights will be glued onto the sheets. Use a ball point pen, don't press hard. Be sure to make one LEFT and one RIGHT. Choose two sheets that are the same hardness, if possible. Use firm to hard sticks for the longerons.

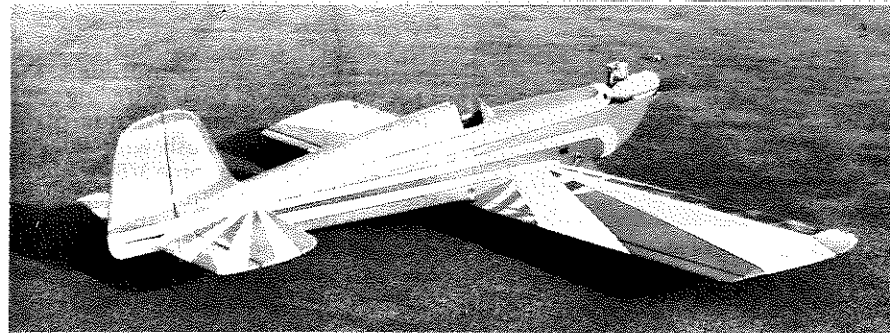
After you have glued the longerons and uprights onto the sides, glue F-13 also. Take the 3/16 birch ply firewall and mark a vertical and horizontal line indicating the engine center thrust line. Using a Kraft engine mount or similar,

sure that it is vertical and at a right angle to the fuselage center line. Glue the one-inch trailing edge stock behind the firewall to reinforce it. Position F-3 into place, and using a triangle for alignment, put the 3/16 x 1/4 balsa upright in front of F-3 as indicated on the plans.

Before fitting the left fuselage side onto the right, bevel the ends of the longerons as shown on the plans at the rear of the fuselage (see top view). Trial fit F-3 between FD-1 and F-13, check to see that the fuselage sides are parallel, and once you are satisfied that everything is in alignment, go ahead and glue the left fuselage half to the right.

Cut the 3/8 x 1/2 balsa stick that goes between the two sides at the back of F-13, right under the dowel hole, pin and glue. Cut the two 1/4 sq. cross braces that are against F-4 and F-5 pin and glue. Now pull the rear fuselage ends together. Check carefully their alignment and glue. Put the rest of the top and bottom cross braces in and glue. Fit and glue LG-1 in place between the fuselage doublers with epoxy glue, use hard 1/4 inch balsa as shown on plans. I use a Hallco B 106-4 landing gear, it's 12.8 inches wide. Drill four mounting holes as shown. I put the nut on the outside of the landing gear and use flat washers on the inside against the wood to keep the heads from pulling through. File off any part of the screws that sticks through.

Drill the lock nuts that are provided or punch them out. I use 5/32 axle shafts (Dubro #247) and Dubro 2-inch Low Bounce wheels. This method allows me to use the flange nut that is on the steel axle to hold the wheels pants on, or you can drill two small holes through the



and should be no problem for anyone except an absolute beginner. I think that it's a real time saver when scratch building to start by cutting out all the parts shown on the plans, thereby making yourself a kit.

I use a spray adhesive on the back of each pattern, then stick it to a piece of shelf paper. After cutting out the pat-

tern, place the mount on the firewall and drill the mounting holes; use 4-40 allen head bolts, they're slightly undersize and will enable you to adjust the mount.

Pull the blind nuts into place, then remove the mount and put the firewall aside until you have glued the side doublers FD-1 and FD-2 in place. Now use a triangle to align the firewall, make

landing gear and use blind nuts and screws to hold them on. If you use the first method, it is advisable to put the wheel and axle assembly into the wheel pant before putting the sides on.

Install F-6 to F-9; put a mark at the top center of each former as an alignment reference. Fit F-10 at the bottom between the longerons; see that there is 1/8 inch that drops down to meet the 3/16 x 1/4 bottom stringers. Fit F1-A at the fuselage front between doublers FD-1 and FD-2; use your engine on its mount to check alignment. Glue F-1 to F1-A. Glue the 3/8" x 1-1/2" trailing edge stock behind F1-A, cut the bottom of the trailing edge stock flush with sides of FD-1 and FD-2. Take some 3/8 inch balsa sheet and bevel it with a sanding block to match the back of F1-A, then glue into place and cut the sheeting to match the fuselage bottom. Take another piece of 3/8 inch sheet and file a notch to clear the landing gear, drill some reliefs part way through to clear the landing gear nuts, glue the block and sand to shape. Fill in the top edges of the engine cowl between F1-A and F-2 with 1/4 sq. sticks and use scrap wood to blend in cowl area.

Soak F-11 in water so that it will bend easily, then glue to the tops of formers F-6 to F-9. After it dries, bevel the edges to match the contours of the former sides. See drawing FC. Glue F4A and F6A into place, wet FC-1 and also FC-2, then bend and glue to F5A and F6A. Before going further on the fuselage it is required that you put together the stabilizer and rudder assemblies. Draw a center reference line where the rudder will go on top of the stabilizer; be sure to use a triangle to check it. This will also help to align the stabilizer on top of the fuselage, so it will be on straight. After gluing the stabilizer to the fuselage, place the vertical fin on top, align and glue it in place.

Use the side view on the plans to make a pattern for the turtle deck sheeting allowing some extra as it curves in toward the top, then glue the bottom

edge to the top edge of the fuselage sides, then bend to F-11 and glue. Fit and glue the 3/16 stringers on top of F-2 to F-4. Cut three pieces of 1/8 sheet soft grade preferred, dampen with household ammonia in water, and fit on top of the cowl formers. When dry, glue in place. See drawings FA and FB. Drill the holes for the 1/4 inch dowels, fit and glue. Glue the 1/8 inch ply tailwheel platform in place. Drill a 3/32 hole in the 1/4 inch ply rudder insert for the tailwheel wire. Trial fit and then remove until plane is painted.

Cut the windshield from acetate plastic, using the pattern on the plans. I use a polyester resin to hold the acetate on. Fillet the bond with micro balloons.

The wheels pants are a cinch. They're strong because of the 1/8 plywood backing, and if you use the single bolt method of attachment, you'll have no trouble with them breaking off; they will just swivel if they make a hard contact. Use the sandwich construction shown on the plans and lots of sanding to get those pretty contours.

TIME TO BUILD THE WINGS

Note that both wing panels are the same; they're built on the same set of drawings. The main spars are 3/8 sq. spruce, however you may substitute 3/8 x 1/2 balsa if you wish, however, if you choose balsa, I suggest that you use 1/8 vertical grain shear webs in between the first four wing ribs. Start construction by pinning down the trailing edge sheet over the plans. Spot glue a piece of 1/4 sq. balsa to the bottom side of the bottom 3/8-square spruce spar. Now gradually bevel the 1/4 sq. on the bottom until it supports the spar at the correct angle to join the notch in the ribs when they are glued to the trailing edge. After the panel is lifted from the plan, pop the beveled 1/4 square shim loose and reuse it for building the second wing panel. Glue the wing rib closest to the wing tip in first; use a triangle to be sure that it is vertical. Check to see that the top edge of the rib is even with the top edge of the spar. Install all the ribs in

the same manner except that when you get to W-2 note, that the top of the rib will be 1/8-inch from the spar edge to accommodate the 1/8 sheeting. Sheet the wing on top and bottom, then cut out the area behind the top main spar for the aileron servo. Both the right and left wings are built the same (fully symmetrical). After completion of both wings, put a slight bevel on the center rib W-2 to accommodate the 1/2-inch (per panel) dihedral, then glue the two wing halves together, using 5-minute epoxy. Take a two-inch wide strip of 6 oz. fiberglass cloth and resin it around the wing center as a reinforcement. Sand the edges flat.

The ailerons are made from 1 inch trailing edge stock. Draw a line lengthwise on the 1/4 inch side as a hinge reference line, use a large type of pinned hinges. The aileron hardware is made from 3/32 music wire and you must use a Klett AB-4 type hinge as it acts as a support over the wire so that the rubber bands will not rub.

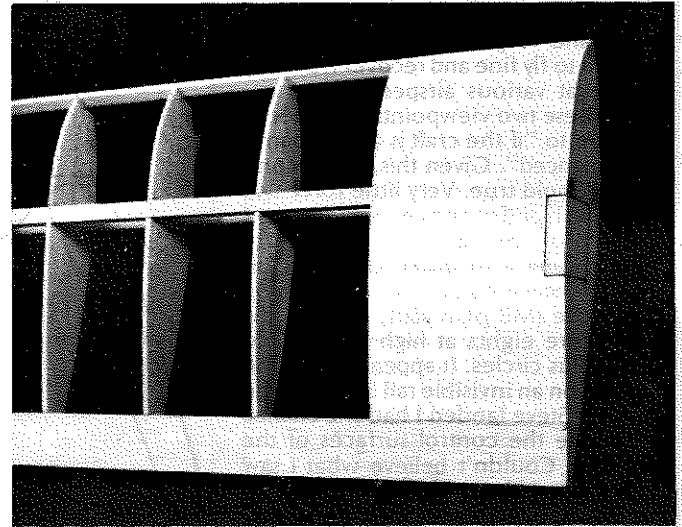
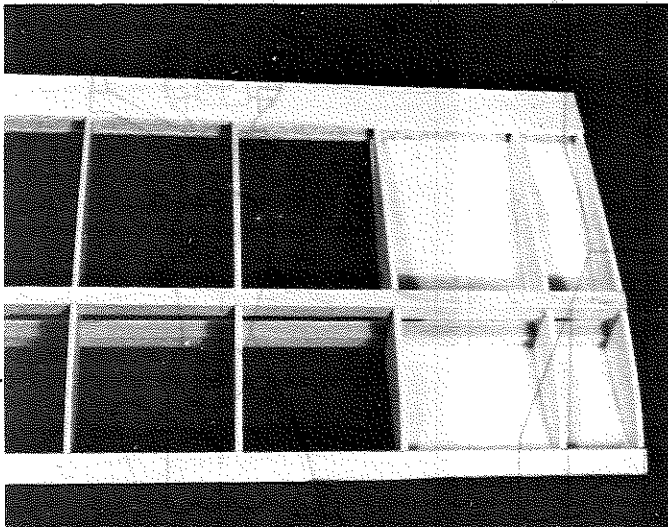
For best results use a fabric covering on the wings, or Super Monokote if preferred.

Use a Sullivan R-10 fuel tank. It's round and will fit easily. The plane flies great on any .40 to .50 size engine, but it will perform quite well on a good .30, provided that the weight is kept low.

Install the servos under the cockpit area. The receiver and the battery should go on top of the front portion of the wing, you can use the battery to adjust the balance point. Use a flexible throttle pushrod; nylon or braided steel cable works fine. The control surface throws are as follows: Ailerons 3/8 inch up and down, rudder 1-1/4 inch left and right, and the elevator 5/8 inch up and down.

Use what ever prop the engine manufacturer suggests.

Well, I hope that some time I will have a chance to see someone else having a ball with their Acro Sportster. As for me, I am tired of typing, so I think I'll go fly mine. Happy landings.



Three root ribs are 1/8-inch smaller to accommodate 1/8 sheeted center section. After completing each panel, bevel-sand roots for 1/2-inch dihedral, join with glass cloth and resin reinforcing, then cut out section for aileron servo.