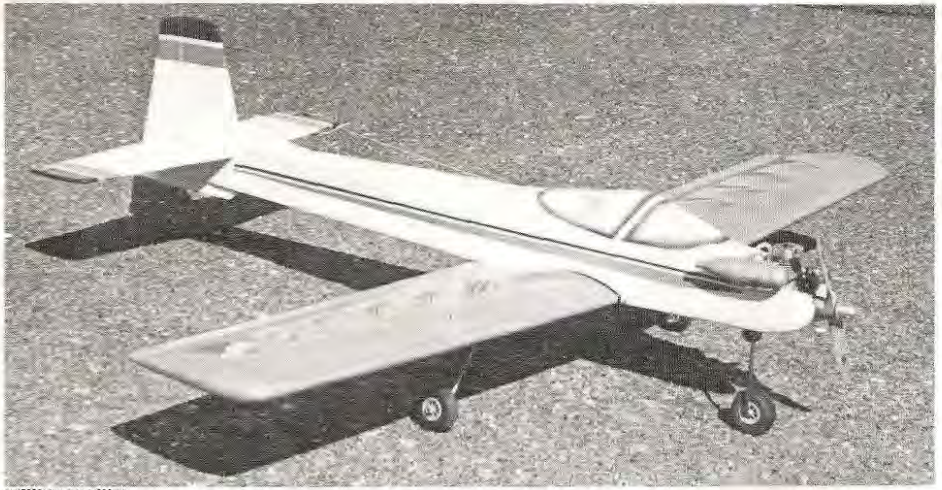


PHOTOGRAPHY: DICK SARPOLUS

PEPPER

By Dick Sarpolus

I find .19 to .25 sized aircraft to be desirable for many reasons; obviously their smaller size makes them easier to transport and lower in cost, while they are still large enough to be capable of flying well under most conditions. Several years ago I designed a shoulder wing model in this size range, the Sportster 20. The design was published in *Model Airplane News*, reprinted in *Lennokki*, the Finnish modeling magazine, and is available as a kit from one of FM's advertisers, the Champion Model Aeroplane Co. It has been one of my favorite models for use in many casual flying sessions as it's so easy to take along quickly and operate from any sort of flying field.

Talking with other modelers about the Sportster design, I found that many consider a shoulder wing model to be a trainer and believe a low wing configuration is necessary for real aerobatic performance. I don't completely agree and have had many shoulder wing models which were extremely capable fliers. Anyway, this design was not intended to be an all-out pattern aircraft, but to be aerobatically capable and still easy to fly. I decided to try a low wing version of the same aircraft to see just what the difference would be, and the Pepper is the result. The overall size—50 inch wingspan, 41 inch length, 400 square inch wing area—and the 16 per cent thick semi-symmetrical airfoil on a slightly tapered planform, is a good arrangement for a sport model.

The bottom of the airfoil is flat from the lower spar to the trailing edge, making it easy to construct flat on a building board. Conventional upper and lower spar, sheeted leading and trailing edge structure results in a strong and light wing. The tail surfaces are simply sheet balsa. The fuselage is box construction, with added triangle stock along the corners to permit rounding. Balsa sides with plywood doublers give strength; or fuselage sides of 1/8 inch light poplar plywood could be used, without doublers. The weight ends up about the same. The rather large canopy area is built up of several balsa parts; it's a little more work but it gets away from a total box fuselage appearance. There is a choice with the engine cowling; it can be faired into a spinner or simply left with the two sides open for less work and easier access to the engine.

Comparing the flight characteristics of the low wing Pepper with the shoulder wing Sportster, I have trouble telling the difference between them in the way they handle when flown wide open. When throttled back, the shoulder wing aircraft may be a little more stable and steady; but the low wing version is still easy to fly. With sufficient control surface travel, they will both do snaps and spins, and when throttled back they're docile The Pepper seems to do better axial rolls, but that may be my imagination. I believe the low wing does require more attention when flying, but it's not intended for a complete beginner anyway. If you're competent with any high wing model and ready for your first low wing, the Pepper would be a good choice. It's docile due to the long moments used and the fairly light wing loading. Nothing really new in the design, just the proper proportions, a basic structure, and styling that I liked.

In addition to looking at low wing versus shoulder wing design, it may be interesting to compare the Pepper with my Hammer design, published in the July 1983 issue of FLYING MODELS. Both of these planes are for .19 to .25 power; both have 50 inch winspans, are about 41 inches long, and have a similar wing area. But they fly differently and are intended for different purposes. We have reviewed the Pepper design: looking at the Hammer, you'll see it has a fully symmetrical airfoiled wing, a more highly tapered wing planform, less dihedral, more forward side area in the fuselage, and a higher wing centerline position. These design differences are to make the Hammer a more aerobatically capable aircraft. It's also more work to build. The Pepper would be better suited for a learning pilot's first experience with a low wing aircraft; it would have somewhat more positive stability, land at a slower airspeed and be less likely to snap, and in general be more forgiving for the pilot. This at the expense of some aerobatic performance. There's a choice to be made.

I'll get into the construction work. When starting with the wing, the painful part will be cutting out the ribs. One method is to cut out root and tip rib patterns of plywood, sandwich balsa blanks between them, and sand to shape. I don't like that method and usually just cut them all out one at a time from the plan patterns. There are only nine different ribs and with a good sharp modeling knife it doesn't take long. With the flat-bottom section, the wing panels are built directly over the plans. The bottom spar is pinned in place, ribs positioned, and the top

You won't see the Pepper in this position much (we hope). Purpose of this bottom view reveals the conventional tricycle gear arrangement.

Any .20 sized engine should do a creditable job pulling the Pepper around. Dick used an OS .25 FSR which was really too much power.

The author adds a little "spice" to the 19 - 25 size class with this low-wing update of his popular Sportster design.

spar, trailing edge planking, leading edge, and leading edge planking are all added before removing the wing panel from the building board. Turning the wing panel over, the landing gear blocks and their plywood doublers are added, along with all the bottom planking, capstrips, and wingtip blocks. The two wing halves are joined with epoxy at the proper dihedral angle, and the center section reinforced with fiberglass cloth and epoxy. The strip aileron torque rod linkage is installed and a hole cut into the wing for the aileron servo. Plywood mounts to suit the servo are glued in place.

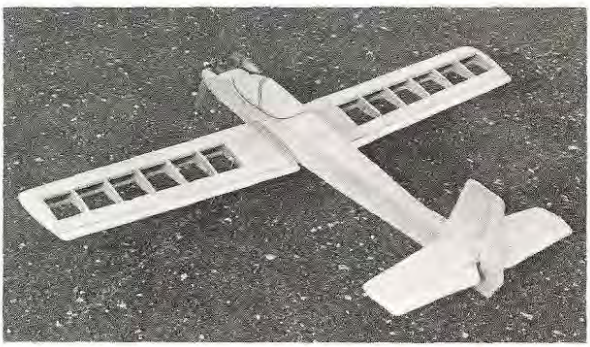
If you prefer, the Pepper may be built using a foam core wing. Cores for this design and other small ships are available from Little Wings, 268 Dell Place, Stanhope, NJ 07874. The cost of the Pepper core is $15.00, which includes a thorough sanding and a precut spar/dihedral brace slot. Send them a S.A.S.E. for a list of their available cores and services.

Before starting the fuselage construction, you might proceed to cut out all the necessary parts; making your own kit first will enable the construction work to go faster. If you are using balsa fuselage sides, the plywood doublers can be contact cemented or epoxied to the sides. The triangle stock and wing saddles are added to the sides; they can then be connected with the firewall and the next two bulkheads. The tail ends are pulled together and the rear two bulkheads glued in place. Before planking the whole fuselage, top and bottom, install the elevator and rudder control nyrods or cut holes in the bulkheads for pushrods.

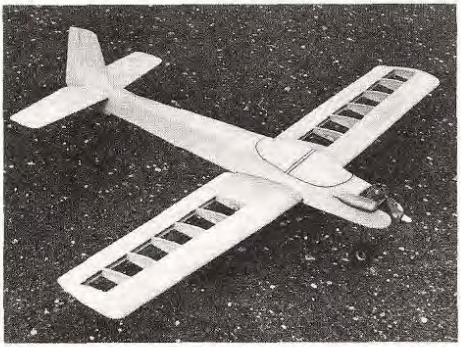
The engine mount is bolted to the firewall, the engine installed and protected from balsa dust, and the cowling built up around the engine. The wing is held on with nylon bolts, for a much neater appearance than rubber bands. The canopy area side pieces should be beveled on their bottom edges, then glued in place. A sanding block is then used to bevel the top edges at the proper angle, and the top blocks are added. With the 3/8 and 1/4 inch top blocks, they can be well rounded to a smooth contour.

The tail surfaces are cut from 3/16 sheet balsa, sanded to shape, and glued in place. In my original model, the battery pack was located under the fuel tank and the servos at the rear of the fuselage opening. With an OS .25 and an OS muffler, the plane balanced perfectly with no added weight.

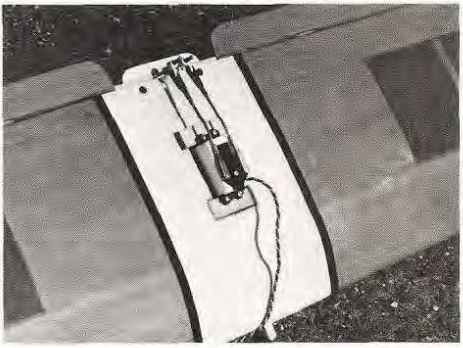
The radio gear used in the prototype was my reliable Royal Super Sport 6 with RS-4 servos. These servos are quite small and the whole radio installation fits easily. Sullivan Gold-N-Rods were used to the elevator and



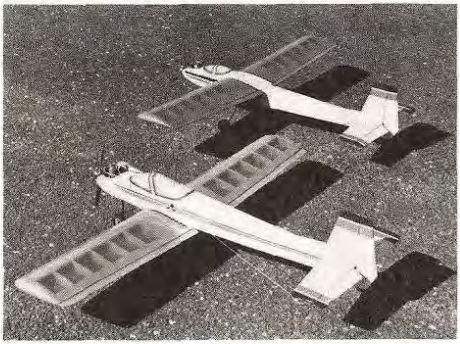
Ready to finish. For low wing loadings, it might be better to paint the fuselage and cover the wing with one of the mylars. Note the rather high aspect ratio of the wing and the long tail moment.



The Pepper's construction is very easy, utilizing a lot of sheet material for sides and surfaces (**above**). Canopy area may be the hardest part. The Pepper with high wing sister ship, the Sportster (**below**). Similar performance.



Medium size servos fit easily in the wing (**above**) and aileron hook-up is conventional torque link arrangement. Dick (l) and Nick Nicholson (r) compare notes on Pepper's "spicy" performance (**below**).



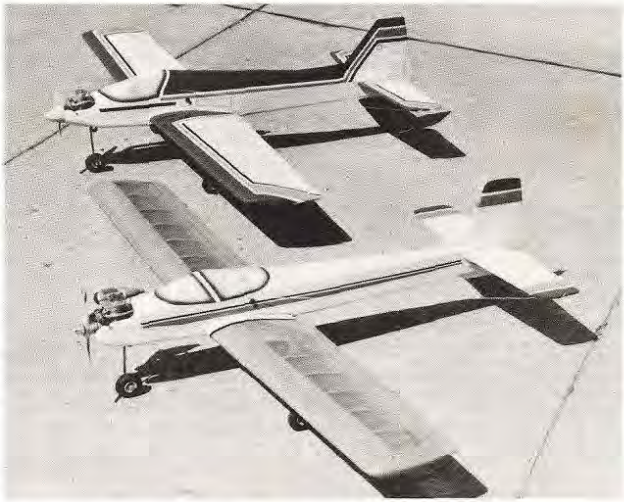
rudder, flexible cable for the throttle, and light music wire for the nose gear steering. The RS-4 servos are fast and the Royal radio has performed perfectly.

Light weight helps any airplane's performance, particularly these smaller models. I used transparent MonoKote™ on the wings; I have always liked the appearance of the transparent coverings. The fuselage and tail surfaces were finished with Sig's butyrate dope.

My Pepper was done in the same color scheme as my original Sportster. Now the problem is deciding which one to fly. I really prefer the Pepper, but will take the Sportster for rough, small field flying—it's easier to hand launch the shoulder wing model. I have been flying my Sportster for several years with a K&B/Veco .19, which provides plenty of power. In the Pepper, I installed an OS .25 schnuerle, and it's more power than the aircraft needs. It jumps off the ground and is a very fast flier; too fast for relaxed fun flying. Of course, it can be throttled back, but a .25 is certainly the largest engine that I would recommend for this model.

Late news

A kit for the Pepper is planned by one of FM's advertisers. Write to Champion Model Aeroplane Company Inc., PO. Box 891, Woodbridge, NJ 07095, for information on their Pepper and other kits.



Shown with the Pepper (foreground) is the Hammer, another of Dick's designs. The Pepper fills an intermediate role, aerobatic and docile, without the all-out pattern performance of the Hammer.