



NORTH STAR

By KAVELI SUNDQUIST . . . This interesting .15-powered sport twin was designed by a Finnish merchant marine radio operator. Dick Sarpolous wrote the article, and supplied Kaveli's plans and photos.

• This model was designed and built aboard a Finnish cargo ship travelling all over the world, moving timber, wheat, wood pulp, etc. The designer is the ship's radio operator, an ardent R/Cer named Kaveli Sundquist, and a friend of mine. I think he has come up with a good sport aircraft design here; Model Builder thought so too, so here I am writing an article about a plane I didn't even build.

Discussing the design, Kaveli has sized a twin for two .15 engines; he used the popular OS .15's. Wing span is 50 inches, wing area is just over 400 square inches, and the fuselage length is 37 inches . . . seems just right for two .15s. The design is conventional; a shoulder wing model with tricycle landing gear, two engine nacelles slung under the wing, and a sort of scale appearance enhanced by a Navy-style paint job. Kaveli reports that it is an easy flying model, probably due to the extra thick, full symmetrical airfoil chosen. Engines are as close together as possible, and the vertical tail area is generous, so I would guess single-engine flying not to be critical. The designer says it performs like a pattern ship with the added enjoyment of that twin-engined sound. He has flown it with skis, and living in Finland, I'm sure there is plenty of snow around to suit his sky flying.

Construction is pretty much standard; wing is built-up, including several spars, leading and trailing edge planking, and capstrips. Wing is flat on the top surface, with the dihedral taper in the bottom. Center section is constant chord, with

tapered tips. Ailerons are tip types, not the usual strips. Fuselage features large sized triangle stock in the corners and thick sides, permitting shaping to an elliptical cross-section. The engine nacelles are built-up similar to the fuselage, with considerable shaping required. Although the nacelles use beam mounts, I believe I would simplify things with 1/4-inch plywood firewalls and the use of radial mounts. The engines are enclosed in carved balsa cowls, but molded fiberglass cowls would also work well.

The wing is built upside-down on a flat work surface; all thickness taper is in the bottom surface, for dihedral. The ribs are held level with the building surface by a wood spacer strip under the rear portion of the ribs. After the leading and trailing edge planking is added, the wing can be removed from the bench and turned over for addition of the top planking. The ribs are spaced so the engine nacelles are added between them in the proper location. The ailerons are cut from the finished wing, the ribs cut and a leading edge added to the ailerons so they can be hinged in place. The throttle and aileron linkage should be installed before the center section planking is added to the wing.

The engine nacelles can be assembled and rough shaped before they are added to the wing; the large removable hatches provide access to the engine, fuel tanks, and throttle linkages. The lower wing leading edge planking is removed inside the nacelles to provide room for the fuel tanks. The horizontal

stabilizer is 1/16 balsa sheeting over an 1/8-inch balsa framework. The fin and rudder are simply cut from 1/4-inch sheet balsa.

The 3/16-inch balsa fuselage sides are built up with 1/32 plywood doublers and 3/4-inch balsa triangle stock. When joined with the bulkheads, and the top and bottom are added, there is plenty of built-up wood stock to be shaped to a pleasing elliptical cross-section. With the battery pack located up forward for balance, there is room under the wing for the rudder and elevator servos. The wing is held in place with the usual 1/4-inch dowels and nylon bolts.

Covering and finishing can, of course, be done by the builder's preferred method. Apparently mufflers weren't used on the original model, but the cowlings could be carved out somewhat to provide for them. Interesting four-bladed props are shown in some of the photos; these were made by Kaveli of laminated hard maple, cut and hand-carved to shape. I know if I had hand-carved, four-bladed props like this, I would never fly with them!

Photos of Kaveli's model on the snow show the use of three fairly small skis attached in place of the three wheels, which he reports work well. I also notice he uses a cradle to support the model upside down for easier starting of the two inverted engines, a good idea.

I hope I have described Kaveli's model as he intended it; the North Star looks like a lot of fun to me, so try a twin for a change and enjoy it!