

Introducing the Tern

by W. T. Miller

TYPE The Tern is a high-performance, Open Class sailplane designed specifically for amateur construction. The prototype was completed in 1180 hours. Materials and primary instruments cost less than \$650. It takes two men ten minutes to assemble it for flight.

WING Cantilever, shoulder-high wing of two-piece construction. All-wood, two-spar structure covered with a 1/16 inch birch plywood skin. Wooden torsion-box ailerons. Dive brakes which extend from the bottom surface of the wing. F. X. Wortmann 61-series airfoil section, 19 percent thick at the root tapering to 16 percent thick at the tip. Chord 40 inches at root tapering to 22 inches at the tip.

FUSELAGE Modified monocoque structure with spruce longerons and stiffeners and a 1/16-inch birch plywood stressed skin. The fuselage has flat sides which are constructed on a table. The top and bottom surfaces are rounded. The compound-curved nose forward of the instrument panel is formed of foam plastic and fiberglass.

TAIL UNIT Cantilever spruce and birch plywood torsion-box construction. The horizontal tail plane attaches to the fuselage and locks the elevator horn in place with one bolt. Horizontal tail plane areas 14.5 sq. ft. Vertical tail area 11.25 sq. ft. All tail surface hinge lines have special tow-drag contouring.



Flight testing started in September 1965 and continued through October at which time the Tern was stored for the winter. The first few flights showed the design to be very stable about all axes. Stalls were gentle with slight buffeting two mph before the stall occurred. Roll rates are high. The high-aspect-ratio vertical tail has produced excellent yaw control at all speeds and bank angles. Although insufficient test data is available to verify the computed performance polar it is felt that the Tern has attained the performance specifications.

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SPECIFICATIONS OF THE TERN

Wing span	50.8 feet
Wing area	130 sq.ft.
Aspect ratio	19.8
Length	21.3 feet
Empty weight (fully equipped)	470 lbs.
Maximum flying weight	700 lbs.
Maximum wing loading	5.4 lbs./sq.ft.
Maximum rough air speed	90 mph
Maximum L/D (calculated)	34 @ 58 mph
Minimum sink (calculated)	2.1 fps @ 47 mph

