

HELISOAR HP-10 KIT SAILPLANE

By STEVE DUPONT



The Helisoar HP-10 showing the forward area and deflected flaps.

It appears timely to report on the Helisoar Aircraft, Inc., HP-10 project.

In 1961 I considered several sailplanes for this project and chose Dick Schreder's HP-10, partly because of its simplicity, particularly of the wing, and partly because of the outstanding performance demonstrated by Dick in the HP-10 in the U.S. Nationals in 1961, where HP-10 held first place for four meet days and won the Stroukoff award for best goal-and-return flight. Dick's article in the February, 1961, *Soaring* had pointed out that little additional performance was to be gained in aspect ratios above 20 to 1. A look at a tapered wing indicates the complexity of building it. The possibilities of applying modern manufacturing methods in the honeycomb concept used in HP-10 were attractive.

Since early in 1961 when the Type Certificate application was filed, there have been over 653 drawings made of parts and assemblies, the sailplane has been tooled and a complete manual for the homebuilder, including 241 special drawings, has been prepared, and our consultants, DeVore Engineering Service in New York, have run a stress analysis of virtually every

part. These data have nearly all been submitted to FAA under the T.C. application and a substantial portion of the work approved. In most areas the safety margins are well above the required strength. We do not state if or when a type certificate will be obtained, but the work is progressing in an orderly fashion.

HP-10 customers are advised of the findings of the analysis and if changes are indicated, the customers are notified and the necessary materials made available. Meanwhile, kits are sold for Amateur Built Experimental Certification under CAM-1.

Fabrication of kit parts is to aircraft standards of quality by aircraft people under subcontract. All material is bought under affidavit and inspection has been run by an FAA-approved aircraft inspection department as carefully as if a type certificate had been granted.

All parts are manufactured to tools, and areas such as welding, critical bend radii, press forming of bulkheads and ribs, stretching and rolling of fuselage skins, heat molding Royalite leading edge, rolling canopy bows and the like are done, with the kit-builder left to trim to size and burr, set the parts up on

simple wooden fixtures to our instructions, drill and rivet together. All material is included down to the last washer and rivet from which to build the sailplane, except instrumentation. Alclad duraluminum alloy sheet is used. It is also possible to purchase fuselage and wing in partly completed form, still in compliance with the Amateur Built Certificate as a home-built kit.

The simplified wing is indicative of the refinement for straightforward assembly, with its eight preformed honeycomb skins, its six ribs, and simple assembly procedure. It is based on the 65 (sub 3) 618 laminar airfoil. An airline captain without previous sheet metal experience built his basic HP-10 wing in 167 hours including the wooden holding fixture.

In January, performance tests were run against George Moffat's world record-holding Schreder designed and built HP-8 and at 60 mph the unsmoothed Helisoar HP-10 prototype in rough prime finish, performed at an honest 35-to-1 at 60 mph based on known performance of HP-8, which in the light of the many 40-to-1 claims being made on every side for the retractable gear "super" sailplanes, shows up pretty well for a 48-foot span and 20-to-1 aspect ratio.

As to ease of flight, it stalls at below 40 mph indicated with 45° flaps, and 46 indicated with no flap, and is, like the other Schreder designs, thermalled at 50 mph and up with 6 to 12° of flap. Its -8° flap is used for high speed running, and with 75° down, the 32-foot span flaps will bring it down as steep an approach as could be asked for.

Quick-removable instrument panel and windshield are featured for fast maintenance of equipment at contests, and we are pleased with the results of our program to simplify rigging. With no wild claims, the ship can be rigged and derigged by two or three people in a perfectly reasonable time, and has been completely rigged and derigged from trailer and back by one person with the help of trestles.

While cost of HP-10 may appear higher than most true kits, the owners of kits have congratulated us on our complete kit and manual. There is nothing to go shopping for, its all there.

While we make no promises, the usual program of improvements is planned with the policy of making