THE EPB-1 "FLYING PLANK"

by AL BACKSTRUM

Al Backstrum is 27 years old, and graduated as a B.S. Aero. Eng. from Mississippi State College in January, 1953. He has flown approximately 400 hours in sailplanes and is the holder of U.S. Silver "C" no. 99.

Al is an experienced designer, and helped Fred Obarr with experiments on aileron reduction on sailplanes using the Pratt-Reed and the TG-3.

After service in the U.S. Navy as a flight engineer, he worked for Aero Design and Engineering Company as detail engineer, after which he assisted Hal Cronkhite on the fiberglass styrofoam wing. He is now structures test engineer for Chance Vought Aircraft Co.

The EPB-1 is a sailplane designed in an attempt to determine the minimum size ship which will have a reasonable performance in the air. The minimum acceptable performance was considered to be the same as that of a war-surplus 2-place sailplane.

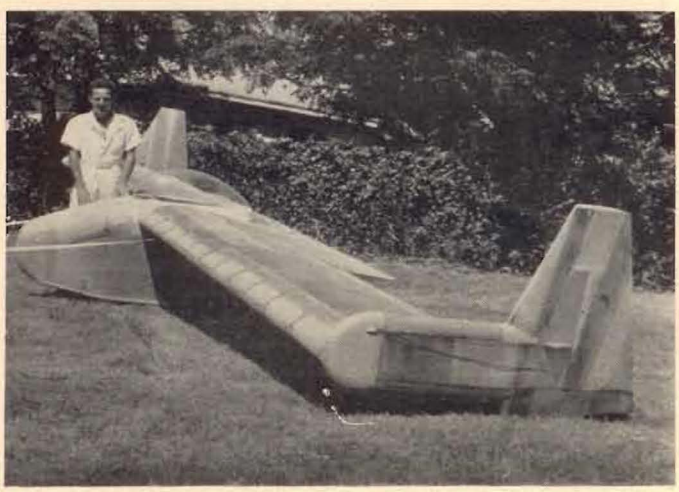
Thinking along these lines was stimulated by Fred Hoinville's articles suggesting the Minimidget class of sailplane, but activity on the project was limited to thinking until the best combination of borrowed ideas was scrambled into what may be called an original design.

Disassembly of such a small ship appeared rather ridiculous, so I first thought of folding wings. I later decided against this because of the complexity of the fittings. Next, a scaled down Fauvel AV36 was considered but was discarded because of the low wing area and small tip chord. Then I decided to exploit the configuration developed by another Frenchman, Arnoux, who, during the period from 1912 to 1925, built and flew successfully several aeroplanes which featured the basic "Flying Plank" layout.[1] These aeroplanes, some of which would look modern today, were characterized by their unswept wings with little or no taper and lack of vertical surfaces. With such a configuration the ship could be trailered sideways like the Fauvel, and a generous amount of wing area could be obtained with a small wing span. Calculations indicated that with a 26 ft. 5 in. span and a 6.6 aspect ratio, the desired performance could be obtained.

One evening early this year I built a very crude profile model of the proposed ship and showed it to some of the members of the local gliding club. Some of them looked for holes in which to hide, while others discussed a strait-jacket for me. However, Phil Easley and Jock Powell thought it would be an excellent experiment which, even if it didn't work, would at least be a spectacular flop.

Phil and Jock wasted no time, and the rate of progress became almost fantastic. In a few short days of spare time work we selected the type of structure we wanted, and did enough design work on it to start construction, having previously enlarged Phil's workshop to cope with the brute.

Left to right: Eric Craik, Phil Easley, Al Backstrum and Jock Powell, smilingly anticipate the first flight.



The designer poses with his completed EPB-1.

We decided that since practically nothing was known about the "Flying Plank" in this country, we would consider this first ship as a flight test machine on which considerable modification could be made if and when required. The structure was designed to be as rugged and as simple as practicable. The wing has a two-spar arrangement, the drag and torsion loads being carried by the skin. The pod is conventional and the tip fins feature standard structure with the the fin spar mounted to the rear spar of the wing. Almost all of the structural details follow standard practice; the wing main spar is a box, ribs are warren truss, leading edge ribs are sawn from plywood, fuselage frames are stick and gusset, fin spars and ribs are solid spruce, and the nose cap is fiberglass.

The control system embodies a set of flappers which act as both aileron and elevator (call them elevons if you are from Northrop, or ailavators if