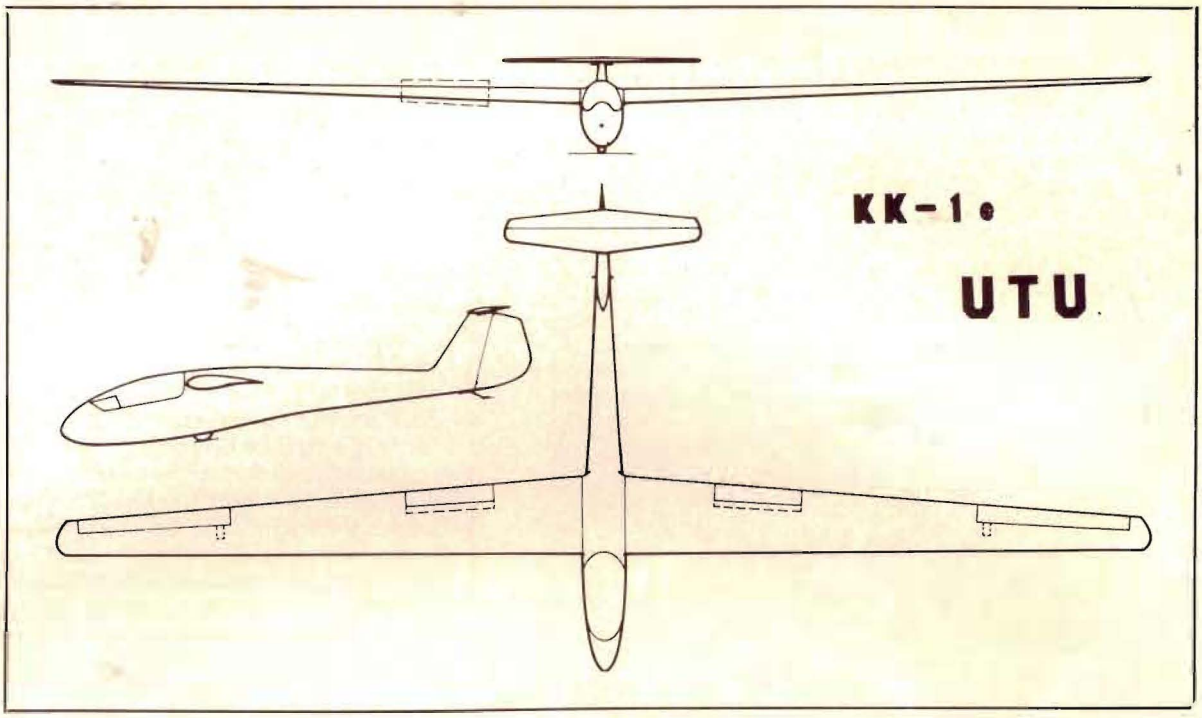

None of the calculation methods used in these tests turned out to be reliable. With the I-spar the full compressive properties of the laminate are attained. The best strength-to-weight ratio is obtained with attention to skin stabilizing. The permitted factor of + 8 gives a rough-air maximum speed of 130 m.p.h. according to O.S.T.I.V. requirements. Greater speeds are very unpleasant in really gusty conditions, and therefore questionable in practice.

During flutter studies complete flutter was – inadvertently – induced in the wings and rear of the fuselage of a prototype lacking mass-balance controls. Flutter began at an estimated airspeed of 250 k.p.h. The only damage that was evident later was a small rend in the rear fuselage shell. To prevent this in the future 100-percent mass balancing of ailerons and rudder were subsequently incorporated. These tests seemed to prove the extreme resistance to flutter of FRP laminates. A wooden airplane would probably have disintegrated in a matter of seconds in similar circumstances.

Glassfiber-polyester laminates have been used throughout the Utu. These can in no way be regarded as new insomuch as they have been used for a quarter of a century, even in industry. Test results of the material already published are very comprehensive. Because of the high ultimate-load factors of sailplanes, and the small amount of yearly use, gliders differ significantly from other airplanes. They do not have the fatigue problems of conventional aircraft and rarely wear out in use. Bearing this in mind it can be stated that FRP laminates are already used successfully for

The Utu wing-root fittings (below left) are of metal, bonded into the fiberglass structure of the wing. The small fitting to the left is of injection-molded nylon, complete with ball-bearing housings. The cockpit (below) is roomy and simply fitted out.