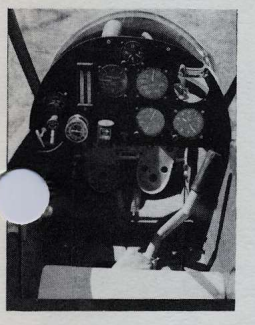
I BUILT MY OWN SAILPLANE BY PETER VAN GRUEN



The Briegleb 12-A sailplane is known among glider enthusiasts as a fast ship ideally suited to cross country competition. With the help of two friends, I built a fir plywood version of the 12-A from a kit supplied by the designers in California.

We did the work in my garage in North Vancouver, laying out the cutting patterns on the plywood in much the same way one would loft a boat. A wooden glider is built in simple jigs just like those used by the boat builder. Cutting presents few problems, but great attention must be paid to taper and smooth finish, both of which have significant effects on performance in the air.

Our sailplane, a single-seater, has a 50-foot wing span and is 22½ feet in length. It weighs more than 600 pounds empty. All the fuselage ribs were cut from ¾″ fir plywood. The skin for wings and fuselage alike is of ⅛″ fir plywood.

Fir plywood is used for everything, in fact, except the laminated lumber wing spars and the poplar plywood ailerons.

Construction began with the building up of the wing spars, starting with five layers of ¾″ fir stock and tapering from the centre to four, three and two. The ribs were then cut out and glued to the spars with an epoxy resin. The thin plywood skins were applied to the ribs in long, scarf-jointed sheets, using a nailing [illegible] which was removed after the glue had set. When the bottom skin was in position on the wings, we installed the steel tubes through which control is communicated from the cockpit to the flaps and ailerons. For finishing we used fiber glass filler in places and covered in the whole ship with aircraft fabric before priming and painting.

While it was still in our garage workshop, we fitted the glider with its instruments and controls—control stick, air speed indicator, altitude indicator, vertical speed indicator, oxygen supply, aircraft clock, compass and other instruments similar to those in a powered aircraft.

Finally, the cockpit was topped with a sleek steel-framed perspex canopy.

Before he can fly it, the do-it-yourself sailplane builder has to weigh his creation to find the centre of gravity. To do this we put scales on the nose tip and the tail, then measured the distances between nose and tail and datum line (the leading edge of the wing). The centre of gravity in relation to the datum line is arrived at by calculations. Small errors can be corrected by adding ballast in nose or tail.

Having established the centre of gravity within the required limits, we test-flew our BG-12A from the old headquarters of the Glider Council of B.C. at Abbotsford. It flew perfectly, and since then has proved itself to be both fast and very safe. It has been flown by myself and other pilots in the British Columbia club (now operating from a new field at Pitt Meadows in the Fraser Valley) at speeds up to 160 miles an hour.

The cross-grain strength of plywood is an important factor in enabling a glider to stand up to such speeds, and in holding the airframe together in the severe turbulence which can be experienced in thermal "lifts" to altitudes as great as 47,000 feet.

When we take our glider south to competitions in the United States, the wings are dismantled for transportation by trailer.

At the field a careful assembly procedure is followed, the pilot satisfying himself that the "ground crew" — sometimes including himself, his wife or a friend—has left no detail unchecked.

The reward for long hours spent in the building, and in ground preparation, is the exhilaration every glider pilot feels in mastering the art of motorless flight.