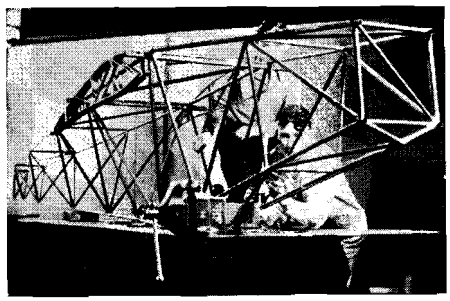
Home CONSTRUCTION

by Jay Buxton



The fuselage takes shape

EDITOR'S NOTE: *Reprints of this article will be included in the pamphlet described on the preceding page.*

The problems of constructing gliders at home are many, varied and seemingly unending and all too frequently end up as the descriptive and derisive term implies "back yard gliders." It is of course recognized that individual experimenting and construction has been the greatest means of developing sailplanes to their present high efficiency. However, the cost of the builders has always been far out of proportion to their value for sport flying. Because one wants a glider is no particular reason for rushing off on a building program, rather it is a very good reason for delaying building until one knows from actual experience the fundamental principles of flight and construction. If a glider club or school is available within even considerable distance, experience has proved it is more economical in the long run to get training this way. Experience in flying is really essential for economy in selection of the type of ship adaptable to one's ability to build or fly. As one learns to fly, his ideas of desirable types or designs become more pronounced.

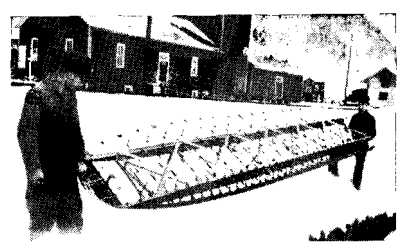
To build a primary glider seems the logical step for the beginner but this is not entirely so. To be sure with the rugged construction of a primary one need not be so idealistic in the selection of material or type of workmanship. On the other hand, this type of ship is soon outgrown and of but scornful use once graduated from. A high performance job is of course highly desirable but is generally in for repairs when used by inexperienced pilots. This line of reason, if any, seems to leave an intermediate type or utility ship as the most desirable and perhaps will prove so. The construction problems are not quite as difficult, the budget required within reason and its use surprising in the hands of a skillful pilot. Last but not least, this type has a wider market and greater resale value should one wish to build a more advanced type.

The old saying of "Jack of all trades and master of none" surely applies to glider building with the wide variety of work involved. Some knowledge of aerodynamics is necessary for a good design and proper functioning of the control system. Considerable engineering ability or experience is essential to obtain a rugged structure without undue weight. Drafting ability is desirable to outline an intelligent construction program and prevent costly mistakes in dimensions and arrangements or location of component parts. If steel tube fuselage construction is used expert welding is necessary. Fittings or any parts of flat metal stock require some knowledge at least of sheet metal working practice. Wood wings and fuselages demand skillful wood working and judgment in glueing and protective paint covering. The fabric covering requires a girl friend or else, to be carefully sewed to prevent local tension or wrinkles.

This assortment of work requires a wide variety of tools and equipment and trying to get along poorly equipped prolongs the struggle and frequently jeopardizes the quality of work. To illustrate the point consider the simple item of bolt holes. In fittings if the holes are not drilled a little undersize and reamed to a snug fit the holes soon become enlarged from the hammering effect allowed by the play of a loose fit. In the control system enlarged holes make sloppy controls and in fittings enlarged holes prevent correct rigging. Reamers are expensive tools easily damaged and of very limited use so one is inclined to false economy. Another apparently minor detail frequently not realized or given much consideration by the hasty home builder is the importance of proper atmospheric conditions for doping fabric. Low temperature or doping out in hot direct sunlight contributes to poor results. A condition of high relative humidity results in blushing and hastens deterioration and cracking. An important consideration is a building large enough for comfortable work and storage of accumulated finished parts. In protracted individual construction wood work and especially glued joints and unpainted steel work will suffer seriously from weathering. Good light is essential for high grade workmanship.

The Civil Aeronautics Authority requires high-grade material be used in all parts of the gliders. There are also certain requirements to be met in the method of construction as well as strength requirements and tests to assure that these have been met practically as well as theoretically.

Finally, unique and revolutionary ideas in design or construction should be avoided, especially with a limited budget and any desire to avoid disappointment.



Hanselman

One wing panel of glider