

facilitated, and more confidence in the operation of the aircraft can be engendered.

DETAILS—DETAILS

Never use a single strand hard wire when a cable will do the job. One has more chance to detect a break in a cable and replace it (ask the designer to improve this detail so the cable won't fray again).

What will happen if any particular part fails to function or breaks? What else would be affected? Should it be made to be redundant. Will this trouble occur as the result of some other failure overloading it? Is it going to give warning before it fails to operate so that it will be detected by an inspection? Is an undetectable insidious failure possible? If it is subject to wear (e.g. nose skid) will it present another kind of hazard on failure (e.g. possibly ensnarl a towline, hence make it impossible to release)? Can mud or ice jam it? Can a relatively unskilled person detect, fix, replace this item? Is it sensitive to water, snow, ice, sand, salt (from ocean beaches), dust, shock loads, corrosion, lightning, high or low temperatures, fatigue, sunlight, road chemicals, oils? Is it appetizing to cattle, rodents, insects, fung? Can it be fixed by easily procured items i.e. it is not made of obsolete equipment or parts or of exotic materials; is it reasonable in cost? Does it require much service?

TOOLING

Here is where great horizons beckon, for the basic genetics of the sailplane are concerned. The many factors of cost, time, construction skill, materials, performance, repair, replacement, insurance costs and overall philosophy meet in and are resolved by the tooling. For the usual wing concept of spars and ribs one requires numerous jigs of sometimes doubtful accuracy, spar tables, meticulous care to assemble these parts in harmony with fittings and with other structures. Great effort is required to get smooth contours for adequate performance.

Each of the many rib jigs seem "easy" to build for there are no new concepts to worry one. They require inexpensive materials and tools purchasable at any well stocked hardware store. Considerable progress toward simplifying this kind of structure has been made and, with some aesthetic performance losses, pretty good results are obtained. But major progress sometimes shows

itself in the ability to get consistently superior products by using larger and more imaginative tools. What speaks against this? Costs are not too different, for big molds have the potential of eliminating conventional ribs, spars, their detailed jigs and complicated alignment problems which, in the aggregate, may cost more in time and money (and performance) than the big molds. If gliders are factory formed (like automobiles) this is indeed progress as long as the tooling is in existence, for replacements are part of the overall picture. It need not be factory built, however, for if a home builder has the ability to make big tools the same savings are made. If more than one craft is so built the costs go down. It is mostly a matter of confidence, for if the big tool does not work, if the new idea does not pan out, then the loss may be more severe. Or if the project is not carried through it might be harder to hide or to explain away a big tool even though the cost of similarly abandoned conventional spar and rib jigs may be comparable. Pioneering always requires courage; almost anyone can be conventional. It will surely come to pass that the breed of sailplanes will evolve into simpler, better structures, probably cheaper and more durable than those of the last decade because more designers will abandon today's conventions. Even the next generation of sailplanes is being formed by tools that make those now common look as archaic as an arrowhead chipper.

CONCLUSION

The many laws of nature require the greatest respect (among these is the "survival of the fittest"). These laws are appreciated by him who designs a sailplane. He slowly gains that confidence required to envision and to develop by courageous re-examination, discard and discrimination, a complete machine that when properly flown will accomplish truly magnificent feats. He will have learned from those who pioneered, whose records and championships are the guideposts of progress in this still infant endeavor; he will have learned from those who failed and from those who fell.

And nature's laws include more than aerodynamics: performance, stability, and control. They are more than shearing, twisting, tension, compression and bending forces. They include deep understanding of one's

fellow man, of his varying abilities, of his limitations, his need to earn a living and have something left for soaring.

One sees that the sailplane is an instrument which, if well done, is not only beautiful because it is shaped naturally and responds in an orderly way to nature's forces, but it creates a very special kind of beauty in flight: it reveals the exciting joy of life to those who fly and understand why it is good.

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PHOTO CONTEST WINNERS ANNOUNCED

Fred Hefty of Santa Monica, California, won first prize of \$100 in SSA's contest for photos of sailplanes in flight. His photo of a 1-26 sailplane taken at Tehachapi appears as the frontispiece on page 2 in this issue of *Soaring*. Second prize of \$50 was won by R. L. Moore of Richland, Washington, for his shot of two 1-23H's peeling away in formation. It will appear as the frontispiece in next month's issue of *Soaring*. George Uveges of Los Angeles submitted several excellent shots of a BG-12B sailplane; one of these was used on the cover of last month's issue of *Soaring* and placed third, winning \$25, and another tied for fourth, winning \$5. The four other photos in fourth place which won \$5 each are one of the Prue Standard by Leslie Benis, a 2-22C by R. L. Moore, a LO-150 by Henry M. Dittmer, and a 1-23H-15 submitted by Wolf Mix. The 1-23H-15 appears on the cover of this issue of *Soaring*, and Henry Dittmer's shot appeared, severely cropped, on page 5 of the September issue.

A total of 113 photographs were submitted by twenty entrants and the judges experienced difficulty in selecting the eight to be awarded prizes. Nine others that the judges felt deserved honorable mention were one by Alex Aldott, two by Dita Aldott, two by R. L. Moore, and one each by Ross A. Taylor, K. G. Coleman, Henry Dittmer and Charles M. Fiedler.

Some of the photos submitted for the contest have been used in the 1962 soaring calendar and numerous others will add interest to coming issues of *Soaring*. Many thanks to the anonymous SSA member who contributed the prize money so SSA would not want for good photos of sailplanes in flight.