AN INTERNATIONAL ONE-DESIGN CLASS AND THE OLYMPICS

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In the fall of 1984, at Frankfort, Germany, the CIVV carried out a review of the sailplane classes for the World Gliding Championships. I presented a proposal that one of the classes be a low-cost one-design class sailplane. There was not much interest shown in this proposal, since most of the delegates seemed to be satisfied with the present classes. This resulted in the continuation of the designers' competition, which steadily raises the cost of sailplanes that are needed to be competitive in the World's Championships.

Now that the International Olympic Committee has approved gliding for the Olympics starting in 1992, it is appropriate to propose a one-design class sailplane design contest as a logical way to pick the Olympic sailplane. An FAI/IOC committee has been formed to study the addition of the three air sports to the Olympics, and William S. Ivans was chosen as the gliding representative and Tor Johannessen as the alternate.

In the past, there have been some negative feelings, by some gliding people, about Olympic gliding competition, with some objecting to the international politics that might be involved, and others questioning how the amateur status rules would be interpreted. The World Gliding Championships have shown that they can be successfully carried out in spite of occasional unwanted international politics, and the IOC has taken a much broader outlook on amateurism and it is expected that by 1992 this will not be a problem. There are so many benefits in having soaring in the Olympics, that they far outweigh these objections.

The idea of an Olympic soaring competition had been proposed in the early thirties, being based upon the successful experience with class sailing. Soaring demonstrations were carried out in conjunction with the 1936 Olympics in Berlin, and as a result, it was decided to include soaring in the 1940 Olympics. The FAI chose ISTUS to carry out a contest to pick the most appropriate design for an Olympic sailplane that could readily be built by the countries that competed in soaring. Sailplanes were entered by four (4) countries and after a fly-off, the German "Meise" was chosen as the winner with the Polish "Orlik" finishing second. The "Orlik" had better performance, but its gull wings and rather sophisticated construction, for that time, worked against it. Unfortunately, the start of World War II prevented the 1940 Olympics from being held and soaring was not included in the post war Olympics.

One-design competition, however, has proven to be successful in the U.S.A. with the Schweizer 1-26 sailplane. This is a 40 foot span intermediate sailplane that was put into production in 1954. Regatta type contests started in 1955 and in 1965 the first Annual 1-26 National Championships were held. The site for these championships is moved to a different place each year, so that a good number of the 600 1-26 owners in the U.S. can have a chance to compete. These championships have grown in stature and the winner of this event appears each year alongside the Open, 15-Meter and Standard Class U.S. National Championships in the annual listing of the U.S. Champions.

The basic concept of all pilots in a competition, flying the same type of sailplane, is the ultimate in fair competition and a valid reason why the Olympic sailplane should be a one-design sailplane.

The CIVV and/or OSTIV need to pick a sailplane as the Olympic sailplane, so that they can be available in quantity well before the 1992 Olympics. None of the present three classes of sailplanes that are used in the World Championships would seem to be appropriate. They are the result of a designers' competition and the performance of these types steadily increases due to the competitiveness of the World Championships and the efforts of the sailplane designers. They have resulted in some superb sailplanes with steadily increasing performance. This type of competition is a very appealing and exciting activity, as new records are set and outstanding flights are made. However, this upward spiral of performance, sophistication and costs are beginning to limit the number of pilots that can afford them. Another disadvantage is that the trend is toward heavier and faster racing sailplanes, which are best in strong conditions and more difficult to handle in out landings. As this trend continues, and the cost of these sailplanes escalates, it would appear that we are moving toward the point where there will be need for syndicates, like those that finance the American Cup Sailboats, in order to come up with an improved design for each championship. It's an exciting activity for those involved, but it will gradually limit the competition to a relative few.

It would seem that the Olympic sailplane should be a lower cost, practical sailplane that many can afford to own. Such a sailplane was envisioned when the Standard Class was proposed. It would seem that we can benefit by looking at the reasons behind the original standard class concept of a "low-cost easy to fly, club type sailplane." CIVV and OSTIV set the standards for the Standard Class in 1956, and seven (7) countries entered ten (10) sailplanes in the OSTIV design contest that was held at the time of the 1958 World Championships in Leszno, Poland. An International Jury was set up to evaluate these sailplanes and to pick the sailplane that best met the requirements. The German "K-6" was the winner of the first design contest, and it generally met the concept of the Standard Class. After the judging was completed, the Jury felt that if the aims of the Standard Class were to be achieved, the class would have to be controlled by much stricter requirements. This was not done and over the following years, the original requirements were gradually dropped one-by-one until the class became an open class with the only limitation being the span and the prohibition on the use of flaps. It also became a designers' class with the sailplanes increasing in performance and becoming more sophisticated and more expensive, and which have to be replaced every few years if one wants to stay competitive.

The need for a sailplane designed to the original Standard Class concept still exists. This, plus the need for a one-design sailplane for the Olympics, provides an opportunity to create a new class by combining these two concepts. This would result in an affordable sailplane for Olympic competition. It also would make available a practical sailplane for club flying, badge attempts and recreational soaring that could be a big factor in increasing soaring activity around the world.

It is proposed that a design contest be held to choose the sailplane that best meets a specification set up by a CIVV/OSTIV Committee. This would provide an interesting and challenging activity for all those involved, and give the OSTIV a major project. A very important task would be to develop the factors to be used in the specification so that the Olympic Sailplane Competitions would be a success. I list some factors that I feel should be considered in the specifications.

Basic one-design factors

There should be little argument that the Olympic sailplane should be a one-design class. The basic need is to provide competition sailplanes of identical type, that many can afford and in which they can compete on an equal basis. This type of sailplane would not become obsolete and because of this, there would soon be a much larger fleet of sailplanes. Provisions would have to be made to assure the uniformity of dimensions and profiles of this type of sailplane. Master gauges of the winning design would be made and would be used to make control templates. These templates plus other dimensional information would be sent to the countries interested in building this sailplane. Although any changes in dimension or shape would be prohibited, it would be allowable to: Do smoothing of surfaces — do any sealing — and apply special finishes. No limitation would be placed upon instrumentation or e.g. location except as it might be limited by the governing aeronautical body of the country of origin. The class sailboating people have found that it is desirable to permit such minor "improvements" since they improve the appearance and increase the value as well as the pride of ownership.

The standard class factor

The reason for using the original Standard Class requirements as a guide for the Olympic sailplane is to create a sailplane for the Olympic competition, as well as one that is practical for clubs and individuals around the world. It is proposed that the aim of this sailplane is to make soaring possible a greater percentage of the time by providing a "low-sink" sailplane, with at least a 30 to 1 glide ratio. This would

enable it to soar much more easily in light conditions that are found in many countries around the world. The present three classes at the World Championships are heavy and fast racing sailplanes and are more demanding of the pilot. These factors and their increased costs limit the number of pilots that can be involved in these classes. An Olympic sailplane designed to the Standard Class concept will make it possible for greater numbers to be involved in Olympic competition, as well as in other phases of soaring.

It is expected that by using airfoils optimized for this type of soaring, and with lighter wing loadings, the span could be kept in the 13 to 14 meter range. It would provide an excellent challenge to the designers and constructors, to meet these requirements and still keep the sailplanes small and light but strong. It is expected that the larger potential sales volume would help to make them available at reasonable prices.

Safety

An Olympic design contest would give the opportunity for designing greater safety into this class of sailplane. It obviously should have good stability and handling characteristics, which are possible with today's knowledge; however, other ways of improving the safety should be included.

Keeping the kinetic energy down would enable the sailplane to be landed more easily in small fields, and in the event of a crash, would minimize the damage. This can be accomplished by keeping the weight and wing loading as low as possible and incorporating crash resistant structure. Pilot protection in the case of a crash can also be improved, by the use of energy absorbing structure in front of the pilot, so that the inertia loads can be reduced and around the pilot to protect him from injury. New material and design concepts can make possible greater energy-absorbtion structure, which would increase survivability in severe accidents.

Good interior cockpit design that minimizes the chance of striking objects, improved padding and seat cushion design, better pilot restraint apparatus and turn over bars, will also help to improve safety.

Material and structural design

The sailplanes should be designed so that they can be made of various types of aircraft material. Although they will be principally evaluated for their aerodynamic design, flight performance and handling characteristics, their adaptability to being built in alternate material should be a factor.

Once the winning "aerodynamic shell" has been chosen, the drawings, external shapes, and loading requirements, will be made available to FAI member nations that are interested in building the Olympic sailplane. They could duplicate the original design using the same material, or develop their own structural design in whatever material that they desire. The sailplane so constructed would have to meet the government requirements of that country. This would encourage the development of new types of structures that are: Lighter and more efficient — easier to repair — crash resistant — and, it is hoped, will result in a lower cost sailplane.

It is felt that this feature will "further the state of the art" of sailplane design and construction, and provide an opportunity for continuing the development of the structure of the Olympic sailplane.

Ballast

It is proposed that no disposable ballast be used in the Olympic sailplane, since it is a bother to use and it increases the cost and complication of the sailplane.

Instead, it is proposed that all sailplanes fly at the same weight (and wing loading) by having provisions for ballast that is not removable in flight. Convenient ballast containers would be located in the fuselage near the center of gravity of the loaded sailplane. Necessary weight would be added before a flight so that all the sailplanes in that competition would be flying at the same weight.

Homebuilding

In the U.S. the homebuilding of aircraft has become an important part of aviation, since homebuilding provides a way of substantially reducing the cost. It would seem that this method has much to offer soaring enthusiasts in other countries.

For those that hesitate to tackle building a sailplane from scratch, a sailplane kit may be more interesting to them. In the 1-26 project, about one third of the 700 1-26's built, were constructed from kits which provides all of the material, eliminates the most difficult jobs, and speeds up the completion.

The ability of an entry to be adaptable to homebuilding or construction from the kit, should be one of the factors in the contest. This would enable the builder to get the satisfaction of flying something that he has built himself. Kits could also be used as an educational tool for teaching aircraft construction and maintenance and to provide useable sailplanes for flight programs.

Summary

No doubt, there will be proposals to take what would seem to be the easy way, and choose an existing design for the Olympic sailplane. This would be very short sighted and would eliminate a chance to encourage new designs and new concepts for lower-priced and safer sailplanes. It would raise the question of how you could choose an existing sailplane on a fair basis. The opportunity to have a stimulating design contest that would further the "Art and Science" of sailplane design would also be lost.

With the first Olympic sailplane competition scheduled for 1992, there is ample time for a design contest and for a number of sources to be turning out Olympic sailplanes in good numbers. Such an Olympic sailplane would encourage gliding around the world and enable more countries to be involved in international competition. The design contest would be an interesting and challenging competition for the designers and Akafliegs around the world, and give the CIVV and OSTIV a lot more visibility.

The "Standard Class" features would provide a sailplane that is suitable for other purposes, and yet be an ideal Olympic sailplane. It could be used for other than Olympic competition and could be flown without ballast to get the benefit of lighter structural weight.

There would also be "fall out" from this contest. Although only one sailplane would be the winner, the other designs entered would no doubt have many new features that would help to further the art of sailplane design, and some, no doubt, would be put into production as a class in their own country.

It is hoped that this paper will help to advance the idea of a contest to pick a new one-design sailplane for the Olympics.