

OSTIV COMPETITION FOR DEVELOPMENT OF A SPECIAL FLIGHT INSTRUMENT STALL WARNING FOR SAILPLANES

1. OSTIV announces a competition for developing a simple but useful instrument to provide stall warning for sailplanes.

a) PURPOSE OF COMPETITION

- considering OSTIV's objective to encourage and coordinate internationally the science and technology of soaring and the development and use of the sailplane in pure and applied research and hence to promote safety,

- having observed that the intensity of the natural stall warning of sailplanes and powered sailplanes often has decreased to a point where its effectiveness is doubtful,

- having observed that multiple audio signals (eg. acoustic variometer, speed-to-fly, and radio) mask the aerodynamic noises near stalling flight,

- having observed that—in the case of powered sailplanes—the engine noise and vibration is mostly higher than the intensity of the natural stall warning,

- noting that fatal accidents resulting from "loss of control" (ie. stalling, wing dropping, spinning) show the highest numbers as compared with other causes, and hence that reduction of such accidents should be expected from improving the stall warning,

- having observed a steady tendency towards lower stick forces in sailplane design, in consequence of which the stall warning is an important safeguard against unintentional speed reduction in the low speed area, particularly when the pilot's attention is directed outside of the cockpit, viz. during preparation for landing, or turning in close vicinity of slopes or mountains; and noting that operating experience has shown that many sailplane and powered sailplane wing airfoil characteristics are influenced by rain drops, ice or insect impact, which often leads to a marked, unnoticed and unsuspected stall speed increase so that a suitable warning device appears as a timely contribution of safety.

Therefore, to encourage solution to these concerns, OSTIV announces this competition.

b) SUBJECT OF COMPETITION

Development and construction of an operational, inexpensive artificial stall warning device which meets the outlined specifications and conditions.

c) PRIZES

Three prizes will be given for the three best solutions:

First prize: DM 2500.00

Second prize: DM 1000.00

Third prize: DM 500.00

d) CONDITIONS

1. Specifications—As many of these specifications as possible should be attained, taking into account that the device should be inexpensive. Solutions which do not meet all specs, will be considered.

i. The device must be suitable for sailplanes and powered sailplanes as defined per OSTIV airworthiness standards of JAR-22.

ii. The stall warning must be aural, clear and distinctive, both in straight and turning flight with air brakes, wing flaps and landing gear in any normal position. It must begin at a speed between $1.05V_{s1}$ and $1.1V_{s1}$ *, and must continue until the stall occurs with wing and/or wing leading edge both clean and affected by rain drops, insects or ice. It must not be adversely affected by propeller slipstream.

*According to OSTIVAR, V_{s1} is the stalling speed or the minimum steady speed at which the sailplane is controllable in each particular situation (eg. external configuration, mass C.G. position and load factor) and in addition, different conditions of the wing surface due to rain drops, ice or insect impacts.

iii. If parts of the device are installed in parts of the sailplane that are usually rigged and de-rigged, an indication must be provided when the device is not functioning properly.

iv. The proper functioning of the device itself must not be impaired by rain drops, ice or insect impact.

v. The warning speed settings must be adjustable on the ground with regard to calibration.

2. The competitor(s) must deliver to the OSTIV Secretariat the following:

i. Hardware description.

ii. Detailed description of installation and operation.

iii. Documentation (such as a pilot's test flight report) of a flight test which demonstrates compliance with conditions and requirements.

3. Competitor(s) must deliver to a site, or make available at their site, at OSTIV's selection, hardware for flight test by OSTIV designees for evaluation.

4. The competition is open from 1 February 1987 to 1 December 1988. The claim and hardware must be received by 15 December 1988.

5. Competitor(s) will be notified of entries 1 January 1989.

6. The prize will be awarded by the OSTIV Board, with judging supervised by the Sailplane Development Panel in coordination with the Safety and Training Panel.

7. Prizes will be presented at the OSTIV Congress 1989.