

Preface

The 12th Congress of the International Council of the Aeronautical Sciences (ICAS), of which this volume is the proceedings, is being held in the beautiful facilities of the Hotel Bayerischer Hof, Munich, Federal Republic of Germany, from October 12-17, 1980. The host society for the congress is the Deutsche Gesellschaft für Luft- und Raumfahrt, DGLR, under the presidency of Professor Dr.-Ing. Gerhard Brüning.

The opening session, commencing at 9:30 a.m. on Monday, October 13, 1980, will feature welcoming speeches by representatives of the Federal Republic of Germany, the Free State of Bavaria, the City of Munich, the DGLR and the ICAS. Following the opening ceremonies, the Daniel and Florence Guggenheim Memorial Lecture on "How to Improve the Performance of Transport Aircraft by Variation of Wing Aspect-Ratio and Twist" will be given by Professor Dr.-Ing. Erich Truckenbrodt of the Technical University of Munich.

A total of 93 papers and lectures are scheduled for delivery in the five days of the congress, with a break for industrial visits on Wednesday afternoon. This is a significantly greater number of papers than in past congresses and shows again the growing importance of ICAS as an international forum for the aeronautical sciences.

An important ICAS objective is to focus attention on those specific problems which have seemed, from time to time, to provide barriers to aeronautical progress. A review of the program of past congresses reveals quite clearly how, over the last twenty years, ICAS has arranged its programs to highlight critical problem areas and has drawn on the world's outstanding experts to lecture and discuss them in a fundamental and scientific manner.

The program for the 12th Congress continues this tradition. Beginning on the afternoon of the first day, parallel sessions are offered in Civil Aircraft Configurations, Basic Aerodynamics and Structural Testing. The Civil Aircraft Configurations session emphasizes fuel-efficient aircraft, the development of which presents aeronautical engineers with one of their greatest challenges. Basic Aerodynamics, always strongly represented at ICAS congresses, features some aspects of laminar separation as well as an excursion into numerical methods for the problems of supersonic flow. Perhaps the most intriguing aspect of the Structural Testing session is the emphasis on non-destructive testing methods.

Aerodynamics is covered in seven sessions during the course of the conference. These sessions vary from Basic Aerodynamics on the one hand

to the practical problems presented by Transonic Flight to High-Lift Research and finally to Wind Tunnel Techniques on the other.

Materials and structure papers occupy seven sessions with a general lecture on Thursday morning on Fracture Mechanics and Fatigue by C.J. Peel and P.J.E. Forsyth of the Royal Aircraft Establishment. Fatigue and the associated questions of Durability and Damage Tolerance are again highlighted in the Munich program as they have been in ICAS programs of the recent past.

A session on Flight Simulation on Tuesday afternoon provides interesting insights from five countries on how simulators may be used in design and development.

The rapid development and application of active controls is impressively portrayed by five papers on Thursday afternoon and a general lecture on Friday morning given by H.A. Rediess from NASA Headquarters. For the first time in an ICAS congress there is a Wednesday morning session on Military Aircraft Configurations.

Propulsion Airframe Integration, one of the continuing and absolutely crucial questions of aircraft design, is covered by five papers on Thursday afternoon as is Aircraft Operations in two sessions on Friday. Sessions on Computer Aided Design and Systems round out the program.

In addition to the Guggenheim Lecture on the opening morning, there are three general lectures on The Next Generation of Commercial Aircraft, The Analysis of Fatigue Failures and Impact of Advanced Control Concepts on Aircraft Design. These lectures are deemed to be of sufficiently wide interest and importance that plenary sessions are arranged so that all members of the congress can attend. The remaining specialist lectures are offered, as in the past, in parallel simultaneous sessions.

On behalf of the Council of ICAS, I offer its sincere thanks to the authors of the papers and to the lecturers, without whose efforts no congress would be successful. To Professor Dr.-Ing. Brüning and Professor Dr.-Ing. Laschka, Co-Chairmen of the Organizing Committee and the members of the committee, ICAS tenders its sincere thanks, not only for the warm invitation to hold the 12th Congress in Munich, but for the great effort that has been put into its organization. Very special thanks are offered to all the many people who will attend to the multitudes of arrangements and services which go into the smooth running of a congress of this nature.

To Professor Josef Singer and the members of the ICAS Program Committee, the thanks of the Council are tendered for the excellence of

the program that has been developed by the committee. It is desired to acknowledge particularly the dedication of Professor Singer in chairing the Program Committee for both the 11th and 12th Congresses.

Finally, it is an extreme honor and pleasure to extend cordial thanks and appreciation to Professor Dr.-Ing. Rolf W. Staufenbiel, Executive Secretary of ICAS, and the Deutsche Gesellschaft für Luft- und Raumfahrt e.V., which provides the ICAS Secretariat, for their strong leadership and support for all aspects of the work of ICAS. Mrs. Helga Will of DGLR has earned our warmest gratitude for the outstanding service she has rendered on behalf of ICAS.

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