

P r e f a c e

The 13th Congress of the International Council of the Aeronautical Sciences (ICAS), of which this volume is the Proceedings, is being conducted jointly with the AIAA Aircraft Systems and Technology Conference during the period August 22-27, 1982. The joint meeting is being held in the facilities of the Red Lion Inn at the Seattle-Tacoma Airport in the State of Washington, U.S.A. The host society for the Congress is the American Institute of Aeronautics and Astronautics under the presidencies of Joseph G. Gavin, Jr. (1981) and Michael I. Yarymovych (1982).

The opening session, commencing at 9:30 AM on Monday, August 23, 1982, will feature welcoming addresses by representatives of the AIAA and ICAS. Following the opening ceremonies, the Daniel and Florence Guggenheim Memorial Lecture will be given by George B. Merrick of the U.S.A. The title of his lecture is "Space Transportation Systems".

A total of nearly 170 papers and lectures are scheduled for delivery during four days of parallel sessions. The fifth and final day of the Congress (ending August 27) is set aside for an all-day technical field trip to Boeing facilities in the Seattle area, including a briefing and tour of the Everett plant where the 747 and 767 airplanes are assembled; a tour of the test flight facilities for the 757 and 767 aircraft; and a tour of the various research laboratories and activities of the development center. The number of papers at the 13th Congress is significantly greater than in past Congresses, showing 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 programs of past Congresses reveals quite clearly how, over more than two decades, ICAS has arranged its programs to highlight critical aeronautical 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 13th Congress continues this tradition. Beginning on the afternoon of the first day, parallel sessions are offered on such varied topics as Fighter Systems of the Future, Aeroelasticity, Crew Station Design, Propulsion Systems, Laminar Flow, Computational Aerodynamics, Metal Structures and Power Plant Materials, Control Systems, Inlets and Nozzles and Unsteady Aerodynamics. This pattern of parallel sessions on a rich variety of topics, ranging from fundamental research to design, is continued throughout the Congress.

Aerodynamics, always strongly represented at ICAS Congresses, is covered in fourteen sessions during the course of the Congress. These sessions range from Computational Aerodynamics, strongly represented by three sessions, to Unsteady Aerodynamics, Laminar Flow, High Lift Aerodynamics, Low Reynolds Number Aerodynamics, Aerodynamic Drag, Vortex Flows, Windtunnel Techniques, Experimental Methods in Aerodynamics, and finally to Aerodynamic Design, also covered by three sessions.

Materials and structures papers occupy seven sessions. Composite Structures are strongly represented by three sessions. Fracture Mechanics, Damage Tolerance and Fatigue, Structural Dynamics and Aeroelasticity are each covered by strong sessions.

The topic of propulsion occupies five sessions of the Congress. These sessions emphasize Inlets and Nozzles, Propulsion Simulation and Systems.

The 13th Congress contains more papers than previous Congresses in the areas of aircraft and engine technology and design. This is partly a reflection of the joint sponsorship of the meeting with the AIAA. However, it is also a reflection of the desire and intent of the ICAS Council to present programs which will have maximum interest and benefit to the international aeronautical community. As the premier international society concerned with the aeronautical sciences and engineering, it is the intent of ICAS to provide a format on aeronautical topics which range from basic research, on the one hand, to design and operations, on the other. In the 13th Congress, the field of design is strongly represented by sessions on Control Systems, Unique Commuter Aircraft Designs, Rotorcraft/Component Design, Subsystem Technology, Computer Aided Design, Rotor and Blade Design, Future Transport Technology and Canard Configurations. Three of the general lectures are concerned with design. The Daniel and Florence Guggenheim Memorial Lecture, given by George B. Merrick of the U.S.A. on Monday morning, August 23rd, is on Space Transportation Systems. The Wright Brothers Lectureship in Aeronautics, given by John E. Steiner of the U.S.A. on Tuesday morning, August 24th, is on How Decisions are Made: Major Considerations for Aircraft Programs. The ICAS-von-Kármán-Lecture, given by Bernard O. Heath of the U.K. on Wednesday morning, August 25th, is on Engineering Aspects of International Collaboration on TORNADO. Finally, a General Lecture given on Thursday morning, August 26th, will be on Tomorrow's Transport Aircraft.

Other Sessions on Advanced Technologies for General Aviation, Flight Management and Landing Aids, Fuel Efficient Transports, Maintenance Detection in Sea-Based Aircraft, Flight Mechanics, and Manufacturing/Maintenance round out the program. As a special treat, the Congress will hear a History Lecture as the final event on Thursday afternoon, August 26th, on A History of U.S.A./Italy Mutual Exchange in the Field of Aeronautics. The lecturer is Maria Fede Caproni-Armani of the Museo Aeronautico Caproni Di Taliedo, Rome, Italy.

On behalf of the Council of ICAS, I offer its sincere thanks to the authors of the papers and to the lecturers. To Professor Dr.-Ing. Boris Laschka and the members of the International Program Committee the thanks of the Council are tendered for the excellence of the program that has been developed by the Committee. The Council is most grateful to the AIAA and its Presidents for the warm invitation to hold the 13th Congress in Seattle, Washington. To Mr. Kenneth F. Holtby, the Congress General Chairman, and Mr. Theodore C. Nark, the Administrative Chairman, ICAS tenders its sincere thanks for their magnificent effort in preparation for the Congress. Very special thanks are offered to all of the many people who will attend to the multitudes of arrangements and services which go into the smooth running of a Congress of this magnitude.

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

April 22, 1982

Raymond L. Bisplinghoff
President, ICAS