

Advances in Aeronautical Sciences

*Proceedings of
the First International Congress in the
Aeronautical Sciences
Madrid 8-13 September 1958*

Volume 1

Editorial Committee

Chairman : TH. VON KÁRMÁN
A. M. BALLANTYNE R. R. DEXTER
H. BLENK H. L. DRYDEN
 M. ROY

Published by the
SYMPORIUM PUBLICATIONS DIVISION
PERGAMON PRESS
LONDON · NEW YORK · PARIS · LOS ANGELES
1959

CONTENTS

	PAGE
Foreword by TH. VON KÁRMÁN	
Some Significant Developments in Aerodynamics Since 1946 DANIEL AND FLORENCE GUGGENHEIM MEMORIAL LECTURE <i>by TH. VON KÁRMÁN</i>	1
Aerodynamic Design for Supersonic Speeds <i>by ROBERT T. JONES</i>	34
Telecommand and Navigation <i>by W. H. STEPHENS</i>	52
Propulsion Supersonique par Turboréacteurs et par Statoréacteurs <i>by MAURICE ROY</i>	79
Newtonian Flow Theory in Hypersonic Aerodynamics <i>by WALLACE D. HAYES</i>	113
Dynamics of a Dissociating Gas <i>by M. J. LIGHTHILL</i>	120
Experimental Investigation of Hypervelocity Flight <i>by J. LUKASIEWICZ</i>	127
Buckling and Post-Buckling Behaviour of Thermally Loaded Skin Panels <i>by A. VAN DER NEUT</i>	187
Some Contributions to the Heat Conduction and Thermal Stresses Analysis in Aircraft and Missile Structures <i>by LUIGI BROGLIO</i>	213
Représentation d'un Système Thermoélastique Vibrant sans la Direction de la Vibration <i>by R. MAZET</i>	236
Aerodynamic Derivatives for Oscillating Three-Dimensional Wings in Transonic Flow <i>by MÅRTEN T. LANDHAL</i>	255
Mass Transfer Cooling, a Means to Protect High Speed Aircraft <i>by ERNST R. G. ECKERT</i>	276

CONTENTS

	PAGE
Features of Hypersonic Heat Transfer <i>by R. J. MONAGHAN, L. F. CRABTREE and B. A. WOODS</i>	287
Echanges de Chaleur dans les Ecoulements Presentant des Decollements <i>by J. J. BERNARD and R. SIESTRUNCK</i>	314
Wärmeübertragung bei Natürlicher Konvektion, Insbesondere Durch Stoffe in der Nähe Ihres Kritischen Zustandes <i>by ERNST SCHMIDT</i>	333
Movimiento Diabático de un Gas en un Conducto Giratorio <i>by J. M. de SENDAGORTA</i>	343
Progress in Jet Engine Noise Reduction <i>by F. B. GREATREX and D. M. BROWN</i>	364
Noise Research in Canada: Physical and Bio-Acoustic <i>by K. K. NEELY, B. ETKIN and H. S. RIBNER</i>	393
Noise in Air Transport <i>by WILLIAM LITTLEWOOD</i>	442
Quelques Études sur l'Action Produite par les Jets de Réacteurs sur les Structures <i>by H. J. L. LE BOITEUX and P. A. LIENARD</i>	462
Some Considerations of Safety in Automatic Flight Control <i>by A. M. A. MAJENDIE</i>	489
Auswanderungerscheinungen an Schwingenden Kreiseln in Kardanischer Lagerung <i>by K. Magnus</i>	507
Principles of Inertial Guidance <i>by C. S. DRAPER, W. WRIGLEY and R. B. WOODBURY</i>	524
<i>The indexes to both volumes appear at the end of Volume 2</i>	

Advances in Aeronautical Sciences

*Proceedings of
the First International Congress in the
Aeronautical Sciences
Madrid 8-13 September 1958*

Volume 2

Editorial Committee

Chairman : TH. VON KÁRMÁN
A. M. BALLANTYNE R. R. DEXTER
H. BLENK H. L. DRYDEN
M. ROY

Published by the
SYMPOSIUM PUBLICATIONS DIVISION
PERGAMON PRESS
LONDON · NEW YORK · PARIS · LOS ANGELES
1959

CONTENTS

	PAGE
Foreword	vii
Einige Neuere Ergebnisse über Grenzschichtbeeinflussung <i>by H. SCHLICHTING</i>	563
Fundamental Design Problems of Aircraft with Boundary Layer Control for Maintaining Laminar Flow <i>by G. V. LACHMANN</i>	587
Contribution Théoretique et Experimentale à l'Étude du Contrôle de la Couche Limite par Soufflage <i>by P. CARRIERE, E. EICHELBRENNER and PH. POISSON-QUINTON</i>	620
The Use of Boundary-Layer Control to Establish Free Stream-Line Flows <i>by D. G. HURLEY</i>	662
Aeroelastic Problems on Aircraft Construction <i>by H. G. KÜSSNER</i>	709
A Review of some Recent Developments in Hypersonic Flow <i>by ANTONIO FERRI</i>	723
Problems de l'Aile Annulaire Resolus par Analogie Rheoelectrique <i>by L. MALAVARD and G. HACQUES</i>	771
Einige Ergebnisse aus der Theorie des Ringflügels in Inkompressibler Strömung <i>by JOHANNES WEISSINGER</i>	798
A Contribution to the Solution of Mixed Problems of Transonic Aero- dynamics <i>by A. A. DORODNICKY</i>	832
Research on VTOL and STOL Aircraft in the United States <i>by JOHN P. CAMPBELL</i>	845
Safety and Reliability Aspects of VTOL <i>by D. KEITH-LUCAS</i>	893
Mécanique de Vol du Propulseur Volant à Décollage et Atterrissage Vertical <i>by G. EGGLERS and G. ERNST</i>	914

	PAGE
Structures and Materials for Finite Lifetime <i>by N. J. HOFF</i>	928
Problems in Heat-Resisting Materials for High-Speed Flight and Propulsion <i>by POL DUWEZ</i>	961
Heat Resistant Materials: A Survey of Some British Developments <i>by D. A. OLIVER</i>	968
Telecontrol and Telemetry for Pilotless Aircraft <i>by R. A. LESLIE and P. O. GILLARD</i>	990
Transmission of Data by Radio from U.S. Satellites <i>by J. T. MENGEL</i>	1026
Prospects and Limitations of Human Flight Beyond the Atmosphere <i>by JULIAN E. WARD and DAVID G. SIMONS</i>	1033
Disorientation in Flight <i>by G. MELVILL JONES</i>	1046
Les Limites des Possibilités Humaines dans les Concepts Actuels du Vol et de l'Avion <i>by E. EVRARD</i>	1060
Propulsion Methods in Astronautics <i>by W. E. MOECKEL</i>	1078
The Physical Basis of Magnetohydrodynamics <i>by W. B. THOMPSON</i>	1098
A Comparison of Two Approaches to an Electric Propulsion System <i>by VERNON H. BLACKMAN</i>	1111
Index	1125