

THE  
AERONAUTICAL JOURNAL  
VOL.—LXVIII

THE ROYAL AERONAUTICAL SOCIETY

# Journal of THE ROYAL AERONAUTICAL SOCIETY

INCORPORATING THE INSTITUTION OF AERONAUTICAL ENGINEERS AND THE HELICOPTER ASSOCIATION OF GREAT BRITAIN

Published Monthly at 4 HAMILTON PLACE, LONDON, W.1  
Telephone: Grosvenor 3515-9    Telegrams: Didaskalos, London, W.1

Subscriptions: £10 10s. 0d. per annum, post free    Single Copies: 17s. 6d.

Advertisements only: J. W. Williams, D.F.C., Magazine Advertising Ltd., 36-38 Whitefriars St., London, E.C.4.    Fleet Street 7539

VOLUME 68

JANUARY 1964

NUMBER 637

## CONTENTS

	Page
Secretary's News Letter	I
Notices	II
<p style="margin-left: 20px;">New Year Honour—New Fellows—Education Evening—Agricultural Aviation Group—Increased Membership Subscriptions—The Parliamentary and Scientific Committee—Test Pilots' Group—Library Facilities—Laurence Hargrave Papers—Convention on Advances in Automatic Control—Seventeenth Louis Bleriot Lecture—Diary—Other Meetings—Fourth I.C.A.S. Congress—Elections—Honour Awarded to a Member—Acknowledgment—Assistance for British Women Engineers to Visit the U.S.A.—Diploma Course in Aerodynamics—Changes of Address or Appointment—Journal Binding—Royal Aeronautical Society Prize—News of Members—Lecture Summaries.</p>	
The Branches	IX
Graduates' and Students' Section	X
Noise from Turbojet Compressors	I
	<i>S. L. Bragg and R. Bridge</i>
Fuel Systems Problems in High Speed Aircraft	II
	<i>W. G. Lydiard</i>
The Development of Military Aviation in Australia	25
	<i>W. H. Garing</i>
Blue Streak Static Firings—A Summary of Progress October 1960 to October 1962	35
	<i>C. R. Hume</i>
The Control of Aircraft Noise Perceived at Ground Level	
Technical Aspects	45
Legal Aspects	49
	<i>E. J. Richards</i>
	<i>H. Caplan</i>
Technical Notes	54
<p style="margin-left: 20px;">The Effect of Mach Number, Incidence and Hole Position on the Static Pressure Measured by a Square Ended Probe—J. F. HAHN. The Velocity Distribution on a Polynomial Mean Line and the Converse—R. P. LLEWELYN. Comment by E. A. BOYD. An Analytical Method for the Design of Two-Dimensional Contractions—W. T. F. LAU. The Speed of Sound and Mach Number Effects—B. S. STRATFORD; V. D. NAYLOR and Reply by S. L. BRAGG and S. F. SMITH.</p>	
The Library	64
<p style="margin-left: 20px;">REVIEWS: The Kinematic Synthesis of Mechanisms—Power Hydraulics—Modern Fuselage Analysis and the Elastic Aircraft—Rarefied Gas Dynamics—Microwave Circuit Theory and Analysis—Methods of Mathematical Analysis and Computation—Wings of Neptune: The Story of Naval Aviation—Instrument Transducers: An Introduction to their Performance and Design—Report of the Second International Agricultural Aviation Congress—Some Problems of the Mechanics of Deformable Media—Applied Thermodynamics for Engineering Technologists—Space Communications—Mécannique Experimentale des Fluides: Dynamique des Fluides Réels, Turbomachines—Jet-Stream Meteorology—Fighter Over Finland—Taschenbuch der Flugkörper, Raketen, Satelliten.</p>	
Additions to the Library	Reports

All communications for publication in the JOURNAL should be addressed to the Editor, JOAN BRADBROOKE, A.R.Ae.S.; all communications on general matters affecting the Society should be addressed to the Secretary, A. M. BALLANTYNE, T.D., B.Sc., Ph.D., F.R.Ae.S., Hon.F.C.A.S.I., F.A.I.A.A.

Reproduction in whole or in part of any of the papers and contributions published in this Journal is not permitted without the written consent of the Royal Aeronautical Society.

None of the papers or paragraphs must be taken as expressing the opinion of the Council of the Royal Aeronautical Society unless otherwise stated.

# THE ROYAL AERONAUTICAL SOCIETY

## OVERSEAS DIVISIONS

### AUSTRALIA

*President:* L. P. COOMBES, A.F.R.Ae.S.  
*Hon. Secretary:* W. ISBISTER, F.R.Ae.S., Science House, Gloucester & Essex Streets, Sydney, New South Wales.  
*Branches at:* Canberra, Sydney, Melbourne, Adelaide.

### NEW ZEALAND

*President:* B. CORNTHWAITE, A.F.R.Ae.S.  
*Hon. Secretary:* T. T. N. COLERIDGE, A.F.R.Ae.S., The Shell Company of New Zealand Ltd., Box 2091, Wellington.  
*Branches at:* Auckland, Wellington, Palmerston North, Christchurch.

### SOUTHERN AFRICA

*President:* E. P. BEDFORD, A.R.Ae.S.  
*Acting Hon. Secretary:* Mrs. C. G. BEDFORD, P.O. Box 4409, Johannesburg.  
*Branches at:* Durban and Salisbury.

## BRANCHES IN THE UNITED KINGDOM

### BELFAST

*President:* D. KEITH-LUCAS, F.R.Ae.S.  
*Chairman:* E. G. COLLINSON, F.R.Ae.S.  
*Hon. Secretary:* D. SAUNDERS, A.F.R.Ae.S., Short Bros. & Harland Ltd., Castlereagh, Belfast.  
*Tel:* Belfast 59271.

### BIRMINGHAM AND WOLVERHAMPTON

*President:* A. RATCLIFFE.  
*Chairman:* Dr. L. W. J. NEWMAN, A.F.R.Ae.S.  
*Hon. Secretary:* G. O. FRAMPTON, A.F.R.Ae.S., H. M. Hobson Ltd., Fordhouses, Wolverhampton, Staffs. *Tel:* Fordhouses 2381

### BOSCOMBE DOWN

*President:* Air Cdre. J. F. ROULSTON, C.B.E., D.S.O., D.F.C.  
*Chairman:* Dr. D. CAMERON, F.R.Ae.S.  
*Hon. Secretary:* Sqn. Ldr. H. H. HORSHAM, M.B.E., A.R.Ae.S., A. & A.E.E., Boscombe Down, Amesbury, Wilts. *Tel:* Amesbury 3331, Ext. 71.

### BRISTOL

*President:* Dr. W. J. STRANG, F.R.Ae.S.  
*Chairman:* K. B. CHAMBERLAIN, F.R.Ae.S.  
*Hon. Secretary:* W. O. LEE, A.R.Ae.S., British Aircraft Corporation (Filton Division) Filton, Bristol. *Tel:* Bristol 693831, Ext. 90.

### BROUGH

*President:* Capt. E. D. G. LEWIN, C.B., C.B.E., D.S.O., A.F.R.Ae.S.  
*Chairman:* J. T. STAMPER, A.F.R.Ae.S.  
*Hon. Secretary:* A. D. HOWARTH, A.R.Ae.S., c/o Hawker Siddeley Aviation Ltd., Hawker Blackburn Div., Brough, Yorkshire. *Tel:* Brough 67121, Ext. 413.

### CAMBRIDGE

*President:* Professor W. A. MAIR, F.R.Ae.S.  
*Chairman:* R. O. GATES, A.F.R.Ae.S.  
*Hon. Secretary:* E. M. J. SCHAFFTER, A.F.R.Ae.S., Marshall of Cambridge (Engineering) Ltd., Aircraft Division, Airport Works, Cambridge. *Tel:* Cambridge 56291.

### CHESTER

*President:* C. B. V. NEILSON, A.F.R.Ae.S.  
*Chairman:* J. E. HAINES, A.F.R.Ae.S.  
*Hon. Secretary:* G. W. MONNINGTON, Electro-Hydraulics Ltd., Liverpool Road, Warrington, Lancs. *Tel:* Warrington 35241.

### CHRISTCHURCH

*President:* E. W. J. GRAY, F.R.Ae.S.  
*Chairman:* H. E. VINCENT, A.F.R.Ae.S.  
*Hon. Secretary:* J. F. BRENNAN, A.R.Ae.S., c/o British Aircraft Corporation (Weybridge Division) Bournemouth (Hurn) Airport, Christchurch, Hants. *Tel:* Northbourne 3201.

### COVENTRY

*President:* J. WRIGHT, C.B.E., F.R.Ae.S.  
*Chairman:* C. BAYLY, F.R.Ae.S.  
*Hon. Secretary:* J. G. LUM, A.F.R.Ae.S., Wind Tunnel Dept., Hawker Siddeley Dynamics Ltd., Whitley, Coventry, Warwickshire. *Tel:* Tollbar 3271, Ext. 121.

### DERBY

*President:* Sir DENNING PEARSON, F.R.Ae.S.  
*Chairman:* A. A. RUBBRA, F.R.Ae.S.  
*Hon. Secretary:* J. F. COPLIN, Rolls-Royce Ltd., Dept. 61, Derby. *Tel:* Derby 42424.

### GLASGOW

*President:* Dr. A. W. BABISTER, A.F.R.Ae.S.  
*Chairman:* Wm. H. G. W. FINLAY, A.R.Ae.S.  
*Hon. Secretary:* W. N. ALCOCK, Shenstone, Dumbuck Crescent, Dumbarton.

### GLOUCESTER AND CHELTENHAM

*President:* K. FEARNside, F.R.Ae.S.  
*Chairman:* J. G. RUSSELL, A.F.R.Ae.S.  
*Hon. Secretary:* C. E. HUTT, A.R.Ae.S., c/o S. Smith & Sons (England) Ltd., Bishops Cleeve, Cheltenham, Glos. *Tel:* Cheltenham 54092.

### HALTON

*President:* Air Vice-Marshal J. K. ROTHERHAM, C.B., C.B.E., A.F.R.Ae.S.  
*Chairman:* Sp. Capt. R. C. FORDHAM, C.B.E., A.F.R.Ae.S.  
*Hon. Secretary:* Sqn. Ldr. P. V. AYERST, D.F.C., A.R.Ae.S., Officers' Mess, R.A.F. Halton, Bucks. *Tel:* Wendover 2242, Ext. 110.

### HATFIELD

*President:* Sir GEOFFREY DE HAVILLAND, O.M., C.B.E., A.F.C., Hon. F.R.Ae.S.  
*Chairman:* A. W. TORRY, A.F.R.Ae.S.  
*Hon. Secretary:* G. B. EVANS, A.F.R.Ae.S., Drawing Office, Hawker Siddeley Aviation Ltd., de Havilland Division, Hatfield, Herts. *Tel:* Hatfield 2345, Ext. 274.

### HENLOW

*President:* J. HANSON, F.R.Ae.S.  
*Chairman:* Wg. Cdr. W. S. C. WATKINS, A.F.R.Ae.S.  
*Hon. Secretary:* Sqn. Ldr. A. H. CRAVEN, A.F.R.Ae.S., Officers' Mess, R.A.F. Technical College, Henlow, Beds. *Tel:* Henlow Camp 391, Ext. 261.

### ISLE OF WIGHT

*President:* H. KNOWLER, F.R.Ae.S.  
*Chairman:* R. STANTON-JONES, A.F.R.Ae.S.  
*Hon. Secretary:* R. L. WHEELER, A.F.R.Ae.S., Design Office, Saunders-Roe Ltd., Osborne, Isle of Wight. *Tel:* Cowes 2211.

### LEICESTER

*President:* K. L. C. LEGG, F.R.Ae.S.  
*Chairman:* K. B. AYERS, A.F.R.Ae.S.  
*Hon. Secretary:* D. M. WATERS, A.F.R.Ae.S., 24 Roulstone Crescent, East Leake, Loughborough, Leics.

### LONDON AIRPORT

*President:* Rear Admiral Sir MATTHEW S. SLATTERY, K.B.E., C.B., F.R.Ae.S.  
*Chairman:* R. C. MORGAN, O.B.E., F.R.Ae.S.  
*Hon. Secretary:* N. BROWN, A.R.Ae.S., BOAC H.Q., Technical Publications Department, London (Heathrow) Airport, Middlesex. *Tel:* Skyport 5511, Ext. 2883.

### LUTON

*President:* G. R. JEFFERSON, A.F.R.Ae.S.  
*Chairman:* S. B. OLIVER, A.R.Ae.S.  
*Hon. Secretary:* L. A. WILLOTT, A.F.R.Ae.S., British Aircraft Corporation (Luton Division) The Airport, Luton, Beds. *Tel:* Luton 6060.

### MANCHESTER

*President:* C. E. FIELDING, O.B.E., F.R.Ae.S.  
*Chairman:* M. J. BRENNAN, A.F.R.Ae.S.  
*Hon. Secretary:* J. A. E. WATERFALL, 56 Manor Avenue, Ashton-on-Mersey, Cheshire. *Tel:* Failsworth 2020.

### MERTHYR AND TREForest

*President:* E. J. BUSH.  
*Chairman:* J. INGRAM.  
*Hon. Secretary:* Dr. G. O. FORESTER, Chief of Research, Teddington Aircraft Controls Ltd., Cefn Coed, Merthyr Tydfil, South Wales. *Tel:* Merthyr Tydfil 3261.

### PRESTON

*President:* F. W. PAGE, C.B.E., F.R.Ae.S.  
*Chairman:* F. D. CROWE, A.F.R.Ae.S.  
*Hon. Secretary:* J. T. FROUD, A.F.R.Ae.S., Project Research Office, British Aircraft Corporation (Preston Division) Warton Aerodrome, Preston, Lancs. *Tel:* Freckleton 531.

### PRESTWICK

*President:* C. D. WALDRON.  
*Chairman:* R. HOSIE, A.R.Ae.S.  
*Hon. Secretary:* G. RAE, Design Office, Scottish Aviation Ltd., Prestwick Airport, Ayrshire. *Tel:* Prestwick 79888.

### READING

*President:* E. N. MOBBS.  
*Chairman:* J. T. APPLEBY, A.F.R.Ae.S.  
*Hon. Secretary:* E. W. C. ANGELL, A.R.Ae.S., M. L. Aviation Co. Ltd., White Waltham, Maidenhead, Berks. *Tel:* Littlewick Green 248.

### SOUTHAMPTON

*President:* Professor E. J. RICHARDS, O.B.E., F.R.Ae.S.  
*Chairman:* F. C. KIRKPATRICK, A.R.Ae.S.  
*Hon. Secretary:* Dr. B. L. CLARKSON, A.F.R.Ae.S., The Department of Aeronautics and Astronautics, University of Southampton, Southampton. *Tel:* Southampton 56331.

### SOUTHEND

*President:* F. A. LAKER, A.R.Ae.S.  
*Chairman:* K. A. COLE.  
*Hon. Secretary:* T. R. C. BERRETT, A.R.Ae.S., Aviation Traders (Eng.) Ltd., Southend Airport, Essex. *Tel:* Southend 48561.

### SWINDON

*President:* S. R. HUGHES, A.F.R.Ae.S.  
*Chairman:* W. A. C. KENDALL, A.F.R.Ae.S.  
*Hon. Secretary:* D. RIGG, A.R.Ae.S., Vickers-Armstrongs (Engineers) Ltd., South Marston, Swindon, Wilts. *Tel:* Stratton St. Margaret 3241.

### WEYBRIDGE

*President:* Sir GEORGE EDWARDS, C.B.E., Hon. F.R.Ae.S.  
*Chairman:* J. HEAP, A.F.R.Ae.S.  
*Hon. Secretary:* A. M. DOBSON, A.F.R.Ae.S., British Aircraft Corporation (Weybridge Division) Weybridge, Surrey. *Tel:* Weybridge 45555.

### Y-OVIL

*President:* E. C. WHEELDON.  
*Chairman:* R. HAFNER, F.R.Ae.S. and Dr. E. W. STILL, F.R.Ae.S.  
*Hon. Secretary:* L. A. LANSDOWN, A.F.R.Ae.S., Westland Aircraft Ltd., Yeovil, Somerset. *Tel:* Yeovil 1100.

JANUARY 1964