# The Journal of THE ROYAL AERONAUTICAL SOCIETY



CONTENTS

SEPTEMBER 1951

SOME ASPECTS OF MODERN NAVAL AIRCRAFT DESIGN D. L. HOLLIS WILLIAMS, B.Sc., F.R.Ae.S.

AIR TRAVEL—DISCUSSION

THE DERIVATION AND ESTIMATION OF AERODYNAMIC LOADS FOR STRESSING PURPOSES

D. J. LAMBERT, A.F.R.Ae.S., G.I.Mech.E.

NOSE WHEEL STEERING SYSTEMS

H. G. CONWAY, F.R.Ae.S.

**REVIEWS** 

LONDON

ROYAL AERONAUTICAL SOCIETY, 4 HAMILTON PLACE, W.1



we can start and stop almost anything

When it comes to stopping modern high speed aircraft people in the Industry almost automatically think of B.B.A., because MINTEX brake linings are used on practically all British Aircraft. This supremacy, in the most exacting field of all, is the result of years of research and experimental work, the benefits of which are applied to the manufacture of all B.B.A. friction materials. No wonder they say — "When you've got to stop you can rely on MINTEX."

#### BRITISH BELTING AND ASBESTOS LIMITED CLECKHEATON, YORKSHIRE

Spinners, weavers and manufacturers of Asbestos Yarns, Cloths, Tapes, Packings and Jointings. Manufacturers of Machinery Belting for Industry; Manufacturers of MINTEX brake and clutch linings and other friction materials.





### SKYHI HYDRAULIC AIRCRAFT JACKS

are standard equipment in the R.A.F. for the maintenance of their aircraft

also SKYHI equipped are the BRABAZON, the COMET, and the BLACKBURN Gal. 60



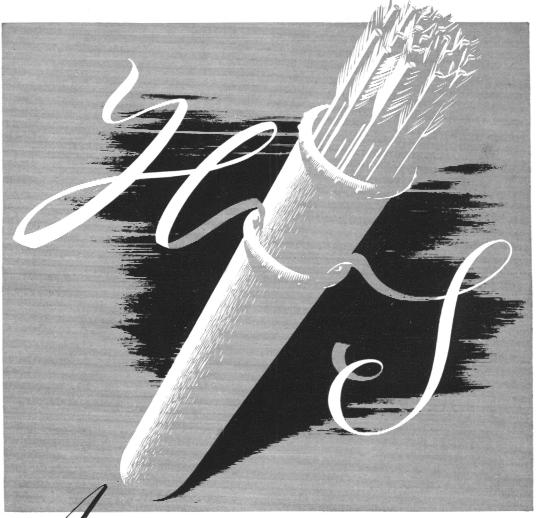
We are exhibiting at the S.B.A.C. EXHIBITION, FARNBOROUGH II-16 SEPTEMBER

Stand No. 124

SKYHI LIMITED, SKYHI WORKS, WORTON ROAD, ISLEWORTH, MIDDLESEX

marco de la comercia de material de la comercia de

HAWKER SIDDELEY GROUP



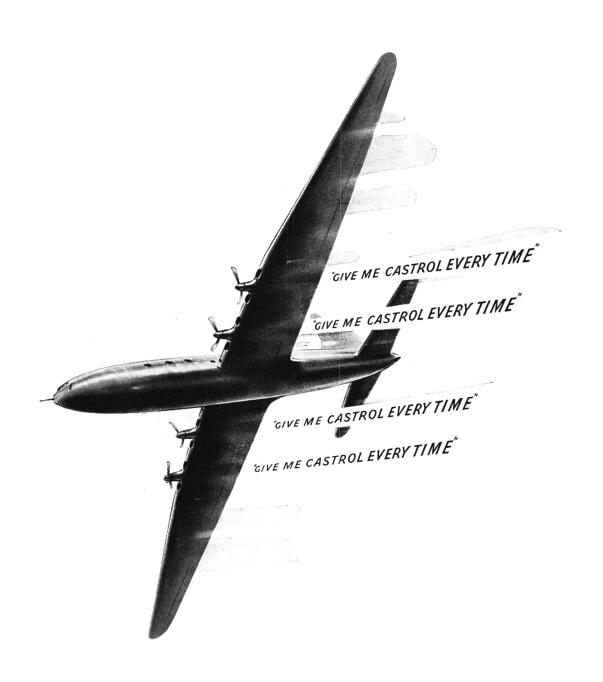
Hfull quiver for freedom's defence

A. V. ROE
A. V. ROE CANADA
ARMSTRONG WHITWORTH AIRCRAFT
GLOSTER AIRCRAFT
HAWKER AIRCRAFT
ARMSTRONG SIDDELEY MOTORS
AIR SERVICE TRAINING
HAWKSLEY CONSTRUCTIONS
HIGH DUTY ALLOYS

For the third time in their history, the principal companies of the Hawker Siddeley Group are again engaged in all-out, large scale production . . . their current aircraft covering every military requirement . . . their entire resources devoted to development of new aircraft and aero engines

18 ST. JAMES'S SQUARE, LONDON, S.W.I. TEL: WHITEHALL 2064

. . . their leadership unchallenged.



FOR FORTY YEARS CASTROL HAS BEEN USED BY THE BRISTOL AFROPLANE CO. LTD.

## ... two contributions to 'pay-load' and safety

#### · FLEXELITE?

The new LIGHT WEIGHT FLEXIBLE FUEL TANK of SYNTHETIC RUBBER and NYLON FABRIC.

#### MAREX'

LIGHT ALLOY
HEAT EXCHANGER'S
COOLERS, INTERCOOLERS
RADIATORS, etc., etc.

Fullest co-operation and advice from our Development Departments

#### MARSTON EXCELSIOR LTD

(A subsidiary company of Imperial Chemical Industries Ltd.)

WOLVERHAMPTON (TEL. FORDHOUSES 2181) AND LEEDS MAR.51a

#### Pitman's — ——Books

#### Bennett's Complete Air Navigator

By Air Vice-Marshal D. C. T. Bennett, C.B., C.B.E., D.S.O., F.R.Ae.S., F.R.Met.S. Fifth Edition 25/- net. "Every good navigator should have this work available for reference."—AEROPLANE.

#### The Performance of Civil Aircraft

By F. B. Baker, M.A., A.F.R.Ae.S. An up-to-date book for civil pilots and aircrews, and of considerable interest to everyone concerned with air transportation. 109 illustrations. 35/- net.

#### Performance of a Piston-Type Aero Engine

By A. W. Morley, Ph.D.(Lond.), M.Sc.(Cantab.), A.C.G.I., etc. A study of the laws governing the performance of a piston-type aero engine, and their detailed application to a particular four-stroke engine. Illustrated. 25/- net.

#### Cutting-Tool Materials

By Eric N. Simons. The materials surveyed include high-speed and carbon tool-steels, modern alloy steels of many kinds, tungsten-carbide and kindred alloys, etc. Separate chapters deal with butt-welded and atomic-hydrogen-welded tools. Illustrated. 21/- net.

PITMAN Parker Street - Kingsway - London

## Third Anglo-American Aeronautical Conference

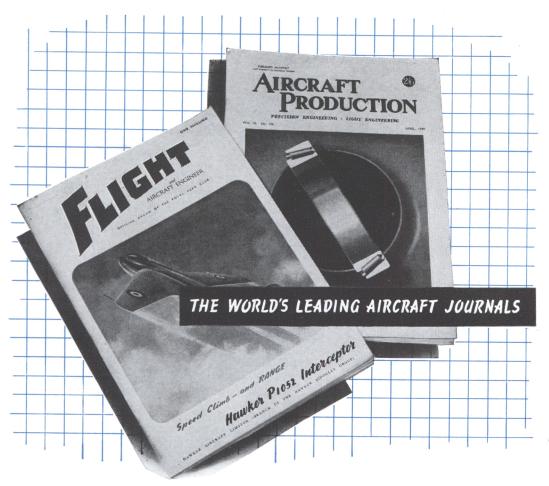
#### Proceedings

A limited number of copies of the complete proceedings, containing the 20 papers, discussions and Authors' replies, and the list of Delegates, will be available later this year, price £5 5s 0d.

Place Your Order Now

The Royal Aeronautical Society
4 HAMILTON PLACE LONDON W 1

Telephone: Grosvenor 3515-19



#### WORLD-WIDE AUTHORITIES

ON EVERY ASPECT OF AVIATION—CIVIL AND MILITARY

FLIGHT Aviation's branches are today so numerous that the specialist who has to keep fully in touch with other people's progress must have up-to-the-minute information on every phase of technical research, development, equipment and operation. He will find it each week in FLIGHT— reliable, critically

annotated and well illustrated news of the world's military, commercial and private aviation activities. Thursdays 1s.

Annual subscription £3 1s.

#### AIRCRAFT PRODUCTION

In aircraft manufacture, as in design, the demands made upon the engineer are severe and often unprecedented. Continuous development of production methods is needed and an intimate knowledge of what is required is Such knowledge can be essential. obtained from the detailed practical

articles published regularly in AIRCRAFT PRODUCTION, the only specialist journal in its field.

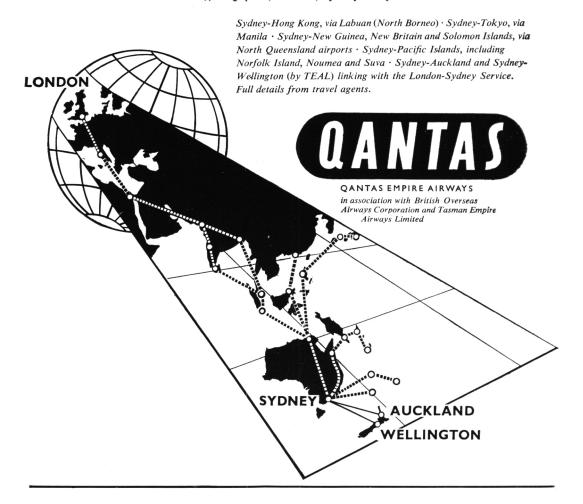
Monthly 2s. 6d. Annual subscription £1 13s.



ILIFFE AND SONS LIMITED, DORSET HOUSE, STAMFORD STREET, LONDON, S.E.1

## Linking England with sixteen Countries... AUSTRALIA'S INTERNATIONAL AIRLINE

In meeting today's requirements of trade and travel by air to the East, Australia, and the Pacific, Qantas provides a valuable international service—qualified by the experience of 30 years. Services covering over 30,000 miles of unduplicated air routes include—London-Sydney via Rome, Cairo, Karachi, Calcutta (alternatively via Bombay and Colombo), Singapore, Darwin, Sydney—in parallel with B.O.A.C.









In almost every Travel Agency in almost every town you



can book (generally at short notice) BEA tickets by 'phone,



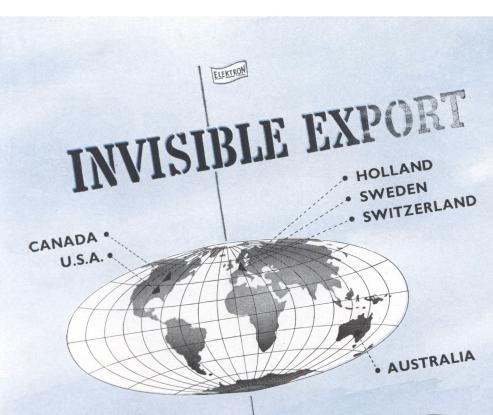
by telegraph, by letter, or by calling round yourself. Travel



Agents charge you no booking fee whatever.



BRITISH EUROPEAN AIRWAYS



Wherever the finest jet engines
are built the soundest light alloys are
in demand. British jet engines
are amongst the finest in the world, and

"Elektron" Magnesium-Zirconium Alloys
have helped decisively to establish
have helped decisively to establish
their supremacy. Today, both are being
their supremacy. Today, both are being
amnufactured under licence abroad.
Thus these British-produced
alloys now play their vital part in the
aero turbine engine industries
of many countries and, incidentally,
help to swell the volume of

LONDON OFFICE: BATH HOUSE, 82 PICCADILLY, W.I



MAGNESIUM ELEKTRON LIMITED
CLIFTON JUNCTION, MANCHESTER

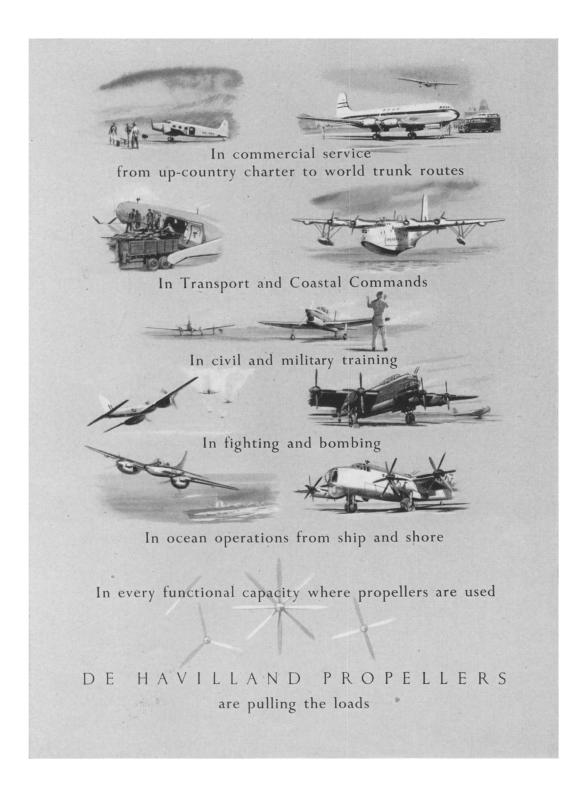


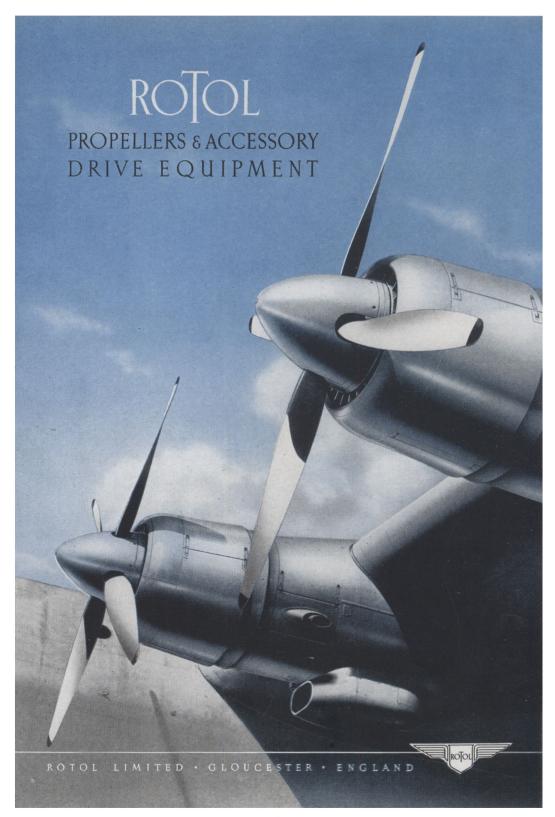
of fuselage in which it is to be used, and the class of traffic it is to serve—so every chair must be tailor made to the operator's requirements. But every Vickers-Armstrongs chair embodies the same principles of comfort, convenience and strength that have led to their adoption in so many of the leading airliners. The Mark 33, illustrated here, is a fully-reclining single-seat chair for long-range luxury travel. It incorporates the well-known B.O.A.C. adjustment principle, and can be fitted with tables and other accessories. The passenger controls the angle of recline by two handles on the front armrest: intermediate positions are locked between



VICKERS-ARMSTRONGS LIMITED · AIRCRAFT DIVISION · WEYBRIDGE · SURREY

fully upright and fully reclined.





### 

#### 1837-1951

#### EXPERIENCE & DEVELOPMENT IN HIGHEST QUALITY STEELS OF ALL GRADES

As manufacturers of Alloy Steels for High Duty, Firth Brown's contribution to industry is world wide, whether it be steels for engineering, shipbuilding, automobile, air-craft, road and rail transport, or for the most minute mechanisms of the precision engineering industries. Firth Brown Steels are used for parts of the De Havilland Vampire Night Fighter.

#### LIST OF PRODUCTS

Forgings-Light and Heavy for special and general engineering.

Forged Steel Drums and Pressure Vessels.

Hardened Steel Rolls.

Carbon and Alloy Steel Bars and Billets.

Tyres and Laminated Springs.

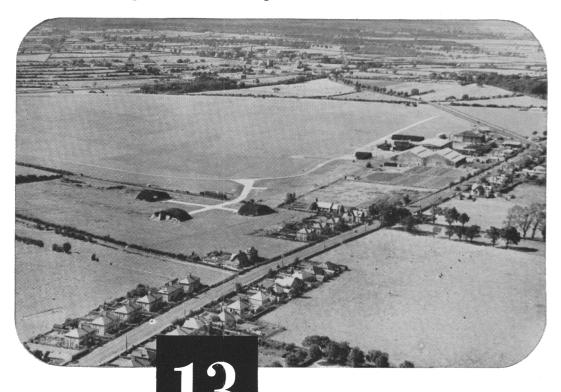
High Speed and Tool and Die Steels.

Steel Castings.

Write for the Firth Brown Buyers' Guide for further particulars.



#### Do you know your airfields?



WINGS
ODAYO

ATURDAY SEPT IS

Give for those who Gave

Recognize this airfield? It's No. 13 in this series of puzzle photographs. You'll find the answer below on the right.  $\bigstar$ 

At twenty-five aerodromes throughout the country, the circling of your plane overhead is the signal for the familiar Shell and BP Aircraft Servicing Vehicle—on duty all the year round—to drive across and meet you as you taxi to a stop. Landing an Auster on a pleasure trip, or a Dakota with thirty passengers, you can always be sure of the same quick, friendly attention from the Shell and BP Aviation Service.

#### Shell and BP Aviation Service

Shell-Mex and B.P. Ltd., Shell-Mex House, Strand, W.C.2. Distributors in the U.K. for the Shell and Anglo-Iranian Oil Groups

\* Kingstown, Carlisle



Large bomb bay carries attack weapons



#### STRIKING DOWN

Double-fold wings are power folded

#### FAIREY GANNET

(FAIREY 17)

ARMSTRONG SIDDELEY DOUBLE MAMBA
TWIN-ENGINED • ANTI-SUBMARINE • CARRIER-OPERATED

CHOSEN FOR SERVICE IN THE ROYAL NAVY

THE FAIREY AVIATION COMPANY LIMITED, HAVES, MIDDLESEX

