INCLUDING SUPPLEMENTARY PAPERS

THE AERONAUTICAL JOURNAL

OCTOBER 1971

THE ROYAL AERONAUTICAL SOCIETY

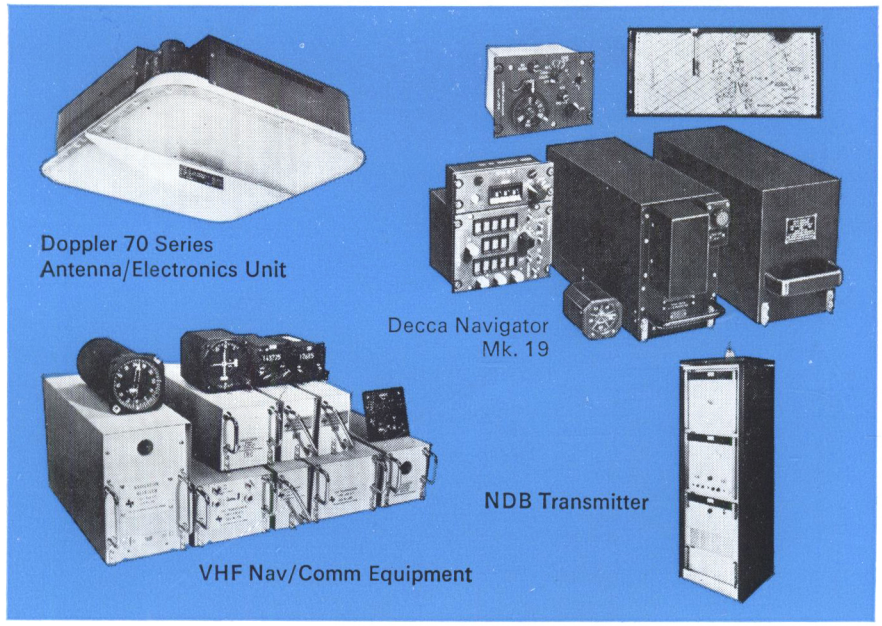
4 HAMILTON PLACE LONDON W1

We spent 25 years developing computerised pictorial display 3-D Area Navigation, now we're making NDB's,

Doppler and Loran C/A, and supplying airborne VOR, ILS and VHF communications equipment, and to judge from the results making a good job of it.

Decca airborne electronics will be found in over 1,000 aircraft: Doppler in Jaguars of the French Air Force, Viggens of the Swedish Air Force and shortly in Lynx helicopters of the Royal Navy and British Army. Decca Navigator is fitted in over 450 aircraft of the Royal Air Force as well as many other military and civil fixed and rotary wing aircraft of many nations. Decca Omnitrac equipment is currently being fitted to the Air Shuttle fleet of Eastern Airlines, Decca Loran is used by the U.S. Coastguard – the list is endless.

The experience gained in 25 years of sophisticated research, development and production is reflected in all Decca Aviation Electronics – and we are still world leaders in computerised pictorial display 3-D Area Navigational systems.



Decca Aviation Electronics

dn The Decca Navigator Company Ltd 9 Albert Embankment London SE1

https://doi.org/10.1017/S000192400004639X Published online by Cambridge University Press

THE AERONAUTICAL JOURNAL

THE ROYAL AERONAUTICAL SOCIETY

Incorporating The Institution of Aeronautical Engineers and The Helicopter Association of Great Britain

Telephone: 01-499 3515 Telegrams: Didaskalos, London, W1

Published Monthly at 4 HAMILTON PLACE, LONDON W1V 0BQ

Subscriptions: **£15.75 per annum, post free**
Single Copies, including back numbers: **£1.50**

VOLUME 75 NUMBER 730 OCTOBER 1971

CONTENTS

Editor: G. R. WRIXON, ARAeS.
Secretary of the Society: A. M. BALLANTYNE, OBE, TD, BSc, PhD, CEng, HonFCASI, FAIAA, FRAeS.
4 HAMILTON PLACE, LONDON, W1V 0BQ. Tel:01-499 3515.

Advertisements Only:
H. E. SOUTHON
Magazine Advertising Ltd, 184 Fleet Street, London, EC4.
Tel: 01-405 6279 & 01-405 3363.

PRINTED BY THE LEWES PRESS LTD, FRIARS WALK, LEWES, SUSSEX, ENGLAND, AND PUBLISHED BY THE ROYAL AERONAUTICAL SOCIETY, 4 HAMILTON PLACE, LONDON, W1V 0BQ, ENGLAND.

Who knows where

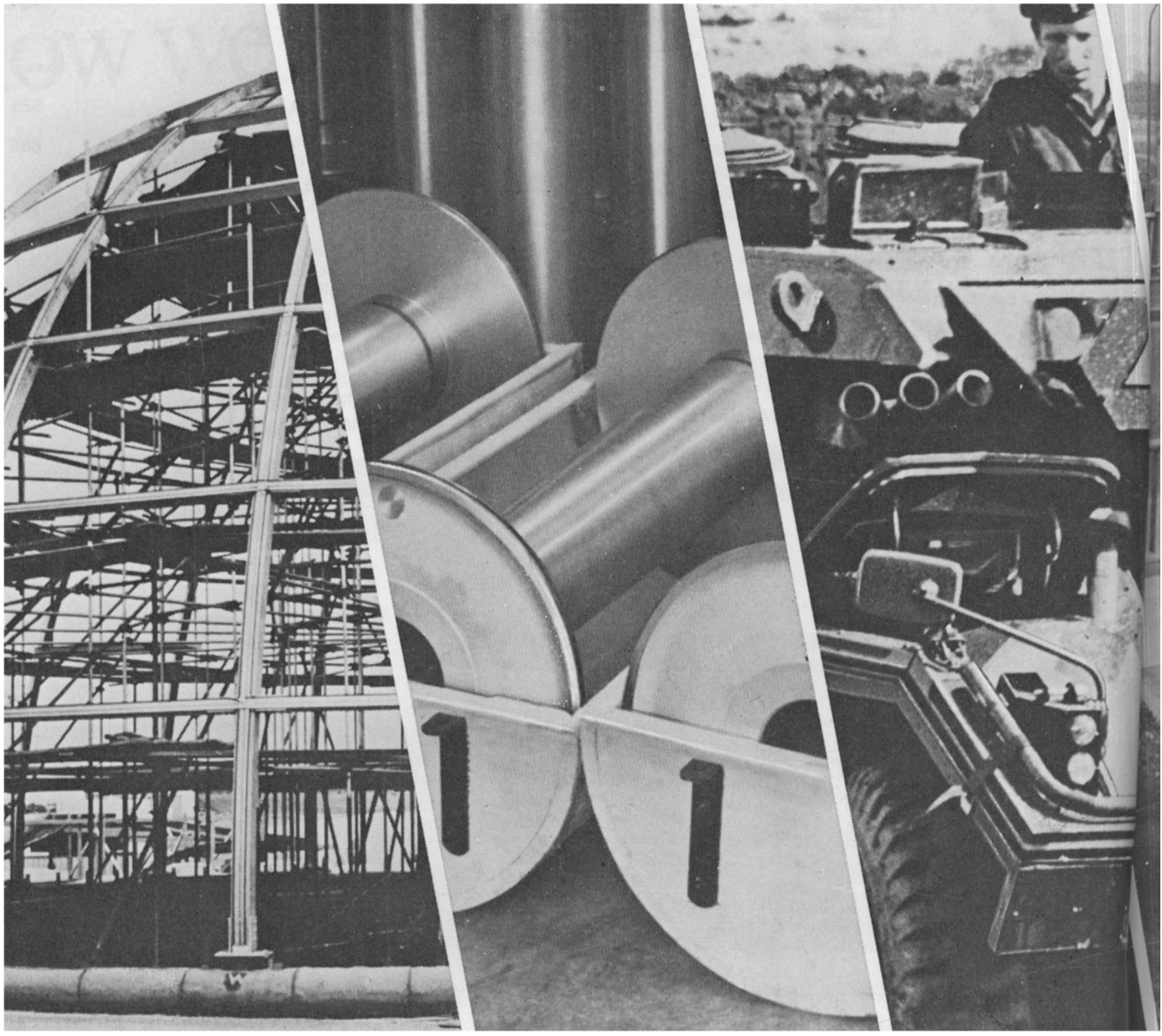
H.D.A. aluminium alloy products turn up in all sorts of applications.

It might be balustrading on a new road bridge. Or a pressure die-casting on an Imperial typewriter. Or extrusions and forgings in textile beams.

That's all in addition to the work we do as a major supplier to the British and European aircraft industries. We developed the aluminium alloy for construction of the skin and airframe of Concorde.

Then there's the Dome on Blackpool's Golden Mile. The structural members were extruded by us.

We even look after the Army. The gun turrets on many of today's fighting vehicles are fabricated from H.D.A. forgings and extrusions.



Structure of Blackpool Dome in H.D.A. extrusions.

H.D.A. forged flanges and extruded barrel in textile beams.

Fighting vehicle gun turret in H.D.A. extrusions and forging

https://doi.org/10.1017/S000192400004639X Published online by Cambridge University Press

https://doi.org/10.1017/S000192400004639X Published online by Cambridge University Press

Without us things would be a lot simpler.

And a lot less informative.

Smiths Industries provide instruments and systems for 164 aircraft types operated by 434 airlines and air forces in 123 countries. So leave us out and those aircraft would have a lot of holes all over the flight deck. Holes where altimeters and airspeed indicators should be. And vertical speed indicators, director horizons, horizontal situation displays, fuel gauges, engine instruments and all kinds of position and pressure indicators. Not to mention auto-pilots, flight control systems and autoland equipment.

And it doesn't only apply to the flight deck.

Take away Smiths Industries and you create gaps all over the place. On the engines for example. Where we have igniters, tacho-generators, thermocouples, control units, pressure

https://doi.org/10.1017/S000192400004639X Published online by Cambridge University Press

switches and so on.

Apart from aircraft currently in production, we're giving a lot of thought to those that will be around in the future and the equipment they're going to need. Like our electronic head-down displays, which are so new you won't find them on any aircraft anywhere—yet.

So it's easy to see that we make a sizeable contribution to the aviation business.

Maybe without us aircraft would be just as advanced as they are with us.

Maybe.

SMITHS INDUSTRIES LIMITED

Flight Displays and Control Systems:- Bishops Cleeve, Cheltenham, Glos. GL52 4SF
Engine Control and Fuel Management Systems:- Winchester Road, Basingstoke, Hampshire.

https://doi.org/10.1017/S000192400004639X Published online by Cambridge University Press

The Royal Aeronautical Society

FOUNDED 1866 INCORPORATED BY ROYAL CHARTER 1949

Patron: HER MAJESTY THE QUEEN

COUNCIL

President: S. D. DAVIES, CBE, BSc(Eng), CEng, FRAeS

President-Elect: K. G. WILKINSON, BSc, DIC, ACGI, FCGI, CEng, FRAeS

Vice-Presidents:

DR. G. S. HISLOP, PhD, BSc, ARCST, CEng, FRAeS
B. P. LAIGHT, OBE, MSc, CEng, FRAeS
AIR VICE-MARSHAL C. N. S. PRINGLE, CBE, MA, CEng, FRAeS

Past Presidents:

PROFESSOR D. KEITH-LUCAS, HonDSc, MA, CEng, FRAeS
AIR COMMODORE F. R. BANKS, CB, OBE, HonCGIA, CEng, HonFAIAA, HonFRAeS, RAF (retd)
AIR COMMODORE J. R. MORGAN, OBE, BSc(Eng), CEng, FRAeS, RAF (retd).

Members:

C. ABELL, OBE, CEng, FRAeS
CAPTAIN E. C. BEARD, CBE, CEng, FRAeS, RN(retd)
M. J. BRENNAN, BSc, CEng, FRAeS
F. R. J. BRITTEN, CBE, AFRAeS
SIR ROBERT COCKBURN, KBE, CB, MSc, PhD, CEng, HonFRAeS
DR. L. F. CRABTREE, BSc, DIC, PhD, AFAIAA, AFRAeS
I. B. FLEMING, OBE, BE, MSc, CEng, FRAeS *(President, Australian Division)*
K. R. FREEMAN *(Chairman, Graduates' and Students' Section)*
DR. W. F. HILTON, PhD, DSc, CEng, AFAIAA, FRAeS
G. R. JEFFERSON, CBE, BSc(Eng), CEng, FRAeS
PROFESSOR K. L. C. LEGG, DCAe, BSc(Eng), CEng, FRAeS
F. MCKENNA, CEng, AFRAeS *(President, Rhodesia Division)*
J. D. MANN, CEng, AFRAeS *(President, Southern Africa Division)*
G. M. MOSS, DCAe, CEng, AFRAeS (Co-opted)
DR. E. S. MOULT, CBE, BSc, CEng, FRAeS
W. N. NEAT, MA, CEng, FRAeS
L. F. NICHOLSON, CB, MA, CEng, FRAeS
G. K. C. PARDOE, BSc(Eng), DLC, CEng, FRAeS *(Chairman, Astronautics and Guided Flight Section)*
J. T. STAMPER, MA, CEng, FRAeS
A. H. STRATFORD, BSc(Eng), CEng, FRAeS
A. M. THOMPSON, BSc(Eng), GradRAeS
G. T. WANSBROUGH-WHITE, ARAeS
GROUP CAPTAIN G. E. WATT, CBE, AFC, BE, DIC, CEng, FRAeS *(President, New Zealand Division)*
DR. H. F. WINNY, BSc, PhD, CEng, FRAeS *(Chairman, Rotorcraft Section)*
N. H. WOOD, DCAe, CEng, AFRAeS
H. ZEFFERT, CEng, FRAeS

Officers:

Hon. Treasurer: C. F. HUGHESDON, AFC, ARAeS
Solicitor: L. A. WINGFIELD, MC, DFC *(Hon Companion)*
Secretary: A. M. BALLANTYNE, OBE, TD, PhD, BSc, CEng, HonFCASI, FAIAA, FRAeS

Note: The President of each Division and the Chairman of each Section of the Society is a Member of the Council.

https://doi.org/10.1017/S000192400004639X Published online by Cambridge University Press

Ferranti put fixed wing stability aboard rotary wing aircraft.

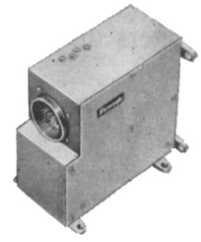
The Ferranti Stability Augmentation System makes all the difference to helicopter flying. By successfully counteracting the inherent instability of the helicopter it greatly lessens the workload of the pilot and increases the comfort of passengers. With the Ferranti System installed, you can operate efficiently even in bad weather conditions.

The Ferranti Stability Augmentation System is a simple, lightweight unit capable of being retro-fitted into most types of helicopter. It can be a valuable asset in military flying and is also well suited to executive aircraft such as the Agusta Bell 'Jet Ranger', for which it now has full ARB approval.

Write for details to Ferranti Limited, Instrumentation Division—Avionics, South Hill Park, Easthampstead, Bracknell, Berkshire, England, RG12 1RA Tel: 0344 4202

FERRANTI

Helicopter Stability Augmentation System



The Ferranti Lightweight Autostabiliser is built under licence from the Autonetics Division of North American Aviation Inc. and is based on the Autonetics S.A.S. (Stability Augmentation System).

https://doi.org/10.1017/S000192400004639X Published online by Cambridge University Press

Three world-beaters ought to be enough for anyone– except us.

These three aircraft show what's good about Hawker Siddeley Aviation. And show how we cater for many different types of aircraft users today. For tomorrow's needs we're already building the right answer.

The Trident 3B airliner With seating capacity for up to 180 passengers, the Trident 3B is tailor-made for today's medium and short-haul airline routes. Now in service with BEA, it will carry many thousands of British holiday-makers and businessmen all over Europe.

The HS 748 feeder-liner Built for the airline operator whose needs demand a versatile turbo-prop. 250 have been sold; 200 of them exported to 32 countries throughout the world. Able to carry up to 62 passengers comfortably, or five tons of freight, or any combination of the two, the HS 748 has flown 1 million operational hours and made a total of 1 million landings.

The HS 125 Executive Jet This is the business jet that's done a great deal to prove to the world that good business jets don't necessarily have to come from the United States. 250 have already been sold – with over half going to companies in the USA. It can seat up to 10 people in air conditioned comfort. And can improve executive efficiency all round.

The A300B – the European Airbus This is the wide-bodies jet liner we're building in conjunction with three other leading European aircraft manufacturers. Suitable for the high-density medium/short haul needs of the 1980's, the Airbus will be entering service in 1974. And will be able to carry as many as 300 passengers up to 1,800 miles in quiet, comfortable economy.

HAWKER SIDDELEY AVIATION

Kingston upon Thames, England

Hawker Siddeley Group supplies mechanical, electrical and aerospace equipment with world-wide sales and service.

https://doi.org/10.1017/S000192400004639X Published online by Cambridge University Press