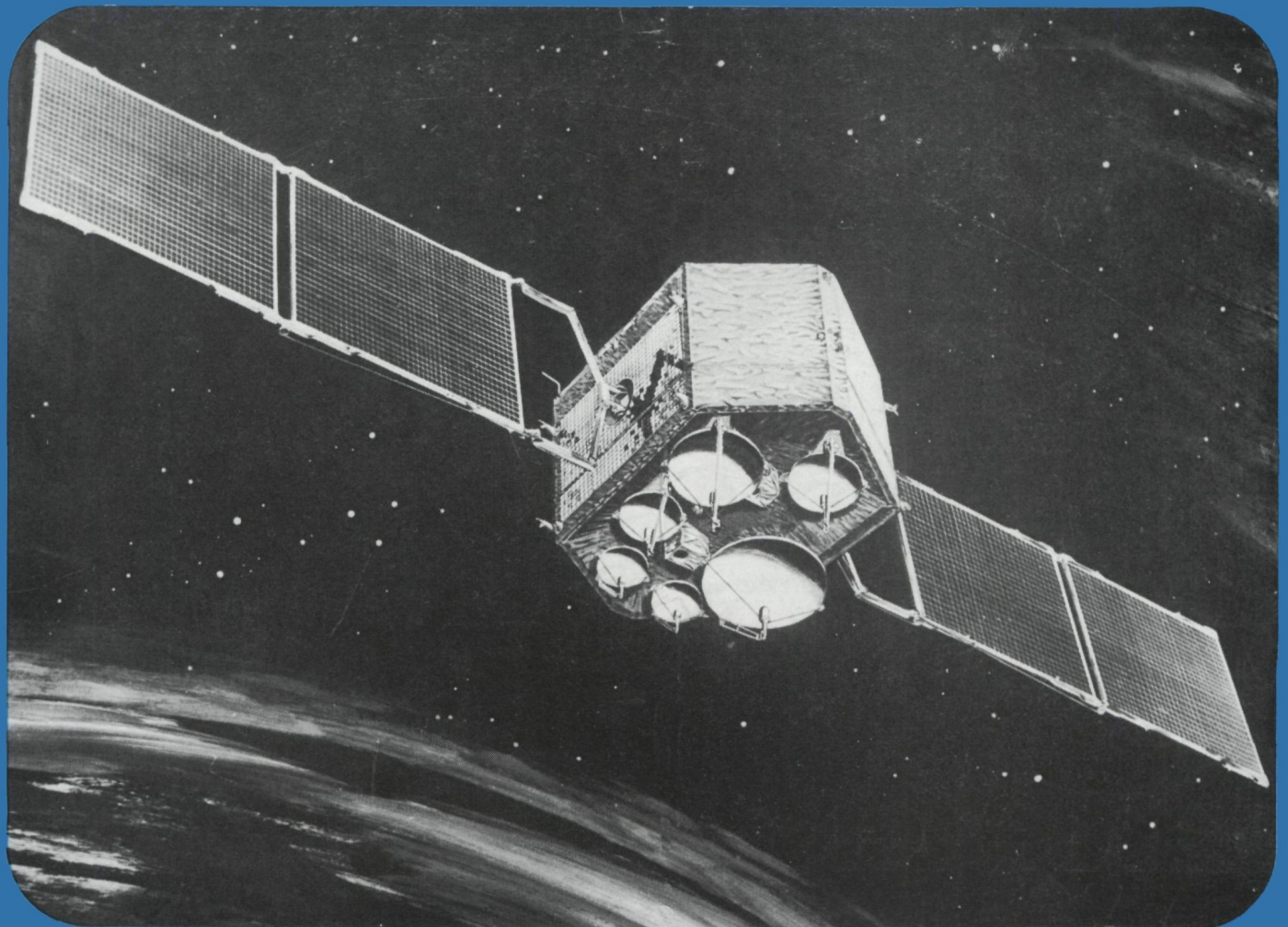




AUGUST 1980

# THE *aeronautical* JOURNAL



VOLUME 84

No. 835

AUGUST 1980



# MULTI MISSION

## **Battlefield Lynx**

Britains world beating advanced technology helicopter. Fast, agile, all weather, twin engined.

## **Battlefield Lynx**

able to put men and equipment right on the spot, wherever, whatever

## **Battlefield Lynx**

the complete troubleshooter, in full production to meet orders from armed forces throughout the world.

# Battlefield LYNX

# Westland<sup>®</sup>

WESTLAND HELICOPTERS YEOVIL ENGLAND

VOLUME 84  
NUMBER 835  
AUGUST 1980

# THE **aeronautical** JOURNAL

*Incorporating The Institution of Aeronautical Engineers and  
The Helicopter Association of Great Britain*  
*Published Monthly*

Editor: Jay Wolff, Assoc. Member  
RAeS.

Assistant Editor:  
Carol Evans.

Secretary of the Society:  
E. M. J. Schaffter, MA, CEng,  
FRAeS.

4 Hamilton Place, London  
W1V 0BQ. Tel: 01 499 3515.  
Telegrams: Didaskalos, London, W1.

Advertisements:

J. G. Heller,  
Cheiron Media Ltd,  
43a Dulwich Village,  
London SE21 7BN.  
Tel: 01-299 1711/2

Reproduction of any of the papers  
published in this journal is not  
permitted without the written  
consent of the Editor.

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

Printed by  
Lewes Press Ltd,  
Lewes, Sussex, England.

Subscriptions: £48.00 per annum,  
post free.

Single copies, including back  
numbers: £4.00.

US subscription: \$100 per annum.  
Single copies, including back  
numbers: \$8.25.

Published monthly by  
The Royal Aeronautical Society,  
4 Hamilton Place,  
London W1V 0BQ, England.

Second class postage paid at  
New York, NY.

US Mailing Agent: Expeditors of  
the Printed Word Ltd,  
527 Madison Ave, Suite 1217,  
New York, NY 10022.

ISSN: 0001-9240

## contents

### SYMPOSIUM ON 'IS FLIGHT SIMULATION OF ACADEMIC INTEREST?'

- A. Q. Chapleo**  
SOME UNIVERSITY EXPERIENCES OF AIRCRAFT SIMULATOR  
RESEARCH 223
- R. B. Stammers**  
BEHAVIOURAL EVALUATIONS OF SIMULATORS: ACADEMIC  
AND PRACTICAL ISSUES 227
- P. J. Willis**  
A MODULAR LOW-COST RASTER-SCAN COLOUR VISUAL SYSTEM 230
- O. H. Gerlach**  
SIMULATION RESEARCH: ROLE OF UNIVERSITY, GOVERNMENT  
AND INDUSTRY IN THE NETHERLANDS 233
- R. J. Golding**  
FLIGHT SIMULATION AT CRANFIELD INSTITUTE OF TECHNOLOGY 236
- R. A. Prasad, S. L. A. Saoullis and L. Tsitsilonis**  
THE ROLE OF SIMULATION IN AUTOMATIC FLIGHT CONTROL  
SYSTEMS RESEARCH 238

### CORRESPONDENCE 243

- T. F. Howell**  
STATUS OF EUROPEAN TELECOMMUNICATION SATELLITE  
DEVELOPMENT 244

### TECHNICAL NOTE

- S. R. Mohan and J. L. Stollery**  
A study of the temperatures achievable by expansion of high  
pressure gas 253

- Library, Reviews, Additions and Reports** 256

Cover Picture:  
The cover shows the European  
Space Agency's Orbital Test  
Satellite, OTS, launched on 11th  
May 1978 and built for ESA by  
a European consortium led by  
British Aerospace. In this issue  
Dr. Howell of ESA reviews the  
status of the European effort  
in telecommunication satellite  
systems.

# The Royal Aeronautical Society

FOUNDED 1866

INCORPORATED BY ROYAL CHARTER 1949

*Patron: HER MAJESTY THE QUEEN*

## COUNCIL

*President:* P. A. HEARNE, MSc, DLC, CEng, FRAeS

*President-Elect:* J. T. STAMPER, MA(Cantab), FEng, FRAeS

*Vice-Presidents:*

CAPTAIN E. M. BROWN, CBE, DSC, AFC, MA, FRAeS, RN(Ret'd)  
PROFESSOR M. G. FARLEY, CEng, FIMechE, FBIM, FIProdE, FRAeS  
J. W. FOZARD, DCAe, BSc(Hons), CEng, FIMechE, FRAeS

*Past Presidents:*

HANDEL DAVIES, CB, MSc, CEng, FAIAA, FRAeS  
PROFESSOR L. F. CRABTREE, BSc, DIC, PhD, CEng, AFAIAA, FRAeS

*Members:*

C. ABELL, OBE, CEng, HonFSLAET, HonFRAeS  
A. J. ADCOCK, BSc(Eng), AMRAeS  
M. W. ANDERSON, MA(Cantab), CEng, MICE, MSAE, AFAIAA, FRAeS  
F. AUSTIN, FRAeS (*President—Australia Division*)  
R. G. AUSTIN, MSc, CEng, MAIAA, FRAeS (*Chairman, Rotorcraft Section*)  
AIR CDRE F. R. BANKS, CB, OBE, HonCGIA, CEng, HonFAIAA, HonFRAeS,  
RAF (Ret'd)  
A. E. M. BARTON, DFC, CEng, MRAeS  
A. L. BLACKMAN, OBE, MA, FRAeS  
M. J. BRENNAN, BSc, CEng, FIMechE, FRAeS  
F. A. BRITAIN, AMRAeS (*President—New Zealand Division*)  
DR P. H. CALDER, OBE, BSc, ACGI, PhD, CEng, MRAeS  
R. J. FRITZ, CEng, FRAeS (*President—Southern Africa Division*)  
N. FALCONER, MRAeS  
DR W. F. HILTON, PhD, DSc, CEng, AFAIAA, FIERE, FRAeS  
DR G. S. HISLOP, CBE, HonDSc, PhD, BSc, ARCST, FEng, FIMechE, FRSA, FRSE,  
FRAeS  
A. S. HUGHES, CEng, MRAeS (*Chairman—Branches Committee*)  
T. H. KERR, BSc, FRAeS  
D. KNIGHT, BSc(Eng) (*Chairman—Graduates' and Students' Section*)  
B. P. LAIGHT, OBE, MSc, CEng, MIMechE, FRAeS  
F. J. LOW, MRAeS  
COLMAN MYERS, MRAeS (*President—Zimbabwe Division*)  
G. K. C. PARDOE, BSc(Eng), DLC, CEng, FBIS, FRAeS  
AIR MARSHAL SIR CHARLES PRINGLE, KBE, MA, FEng, FRAeS, FBIM,  
RAF(Ret'd)  
D. J. RICHER, MSc, BSc  
A. C. SOUTHGATE, BSc, DCAe, CEng, FRAeS (*Chairman—Astronautics &  
Guided Flight Section*)  
G. T. WANSBROUGH-WHITE, AMRAeS

*Officers:*

Hon. Treasurer: C. F. HUGHESDON, AFC, FRAeS  
Solicitor: C. L. BYWATERS, Associate RAeS  
Secretary: E. M. J. SCHAFFTER, MA, CEng, FRAeS