

INCLUDING  
SUPPLEMENTARY  
PAPERS



# THE AERONAUTICAL JOURNAL

OCTOBER 1970

## NOTICES

THEODORE PAUL WRIGHT, HonFRAeS, 1895-1970

PORTRAIT OF A PIONEER, J. D. NORTH, 1893-1968

**F. F. Crocombe**

THE DEVELOPMENT OF SMALL GAS TURBINES FOR AIRCRAFT AUXILIARY  
POWER

**C. H. Paul**

## CORRESPONDENCE

A COMPARATIVE STUDY OF AIRCRAFT GUST ANALYSIS PROCEDURES

**R. A. Cox**

COLLISION AVOIDANCE SYSTEMS

**G. L. Perry**

DIRECT LIFT CONTROL

**W. J. G. Pinsker**

## TECHNICAL NOTES

The Analysis of Cooling Towers by the Matrix Finite Element Method

**A. S. L. Chan  
and A. Firmin**

Attitude Dynamics of a Gravity Orientated Satellite Under the Influence of  
Solar Radiation Pressure

**R. C. Flanagan  
and V. J. Modi**

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RAPIER

**S. C. Dunn**

PROTECTION OF WORK IN PATENTS AND DESIGNS

**W. E. P. Johnson**

THE ROYAL AERONAUTICAL SOCIETY

4 HAMILTON PLACE LONDON W1

# THE AERONAUTICAL JOURNAL

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OCTOBER 1970

## CONTENTS

	Page
NOTICES	XXV
THEODORE PAUL WRIGHT, HonFRAeS, 1895-1970	XXVIII
<b>F. F. Crocombe</b> PORTRAIT OF A PIONEER, J. D. NORTH, 1893-1968	787
<b>C. H. Paul</b> THE DEVELOPMENT OF SMALL GAS TURBINES FOR AIRCRAFT AUXILIARY POWER	797
CORRESPONDENCE	806
<b>R. A. Cox</b> A COMPARATIVE STUDY OF AIRCRAFT GUST ANALYSIS PROCEDURES	807
<b>G. L. Perry</b> COLLISION AVOIDANCE SYSTEMS	814
<b>W. J. G. Pinsker</b> DIRECT LIFT CONTROL	817
TECHNICAL NOTES	826
<b>A. S. L. Chan and A. Firmin</b> The Analysis of Cooling Towers by the Matrix Finite Element Method	
<b>R. C. Flanagan and V. J. Modi</b> Attitude Dynamics of a Gravity Orientated Satellite Under the Influence of Solar Radiation Pressure	
THE LIBRARY	842

### SUPPLEMENTARY PAPERS

<b>S. C. Dunn</b> RAPIER	847
<b>W. E. P. Johnson</b> PROTECTION OF WORK IN PATENTS AND DESIGNS	853

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OCTOBER 1970

# The peace keepers of the seventies

The Royal Air Force enters the new decade with three of the world's most advanced military aircraft, designed and built by Hawker Siddeley.

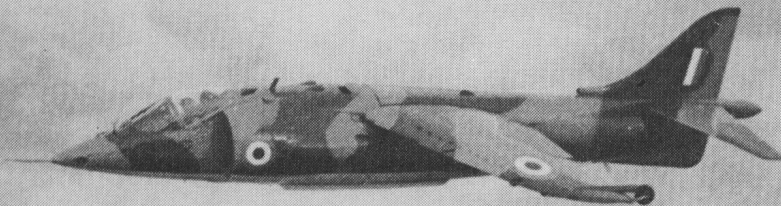
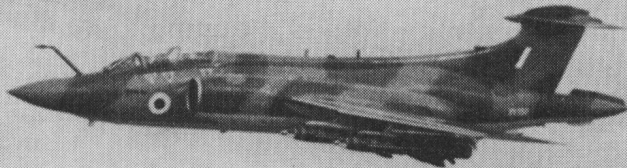
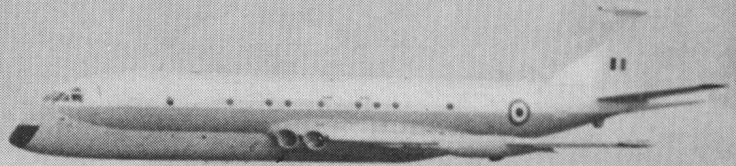
**The Nimrod**, maritime reconnaissance and anti-submarine aircraft. The first four engined pure jet to perform this role.

**The Buccaneer**, specifically designed for high-speed, low-level strike and reconnaissance.

**The Harrier**, the world's first Vertical/Short Take-Off and Landing (V/STOL) tactical close support fighter.

Two of the world's most sophisticated missiles, Martel (television guided) and Red Top (infra-red guided), also demonstrate Hawker Siddeley's leadership in advanced technology.

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

# AIRCRAFT NOISE

An engineer or scientist with knowledge and recent experience of acoustics, including full scale experimental measurements, preferably in connection with aircraft, is required for work on the noise certification of civil aircraft under the newly introduced Air Navigation (Noise Certification) Order, 1970. The task will entail bringing acoustic expertise to a team of aeronautical engineers engaged in the preparation of requirements for showing compliance with civil aircraft noise standards and the testing of aircraft in relation to these standards.

The work will be based at Redhill, but is likely to entail visits in the U.K. and abroad.

Salary is contemplated in the range £2,500 to £3,500 p.a., and the ARB has favourable pension and life assurance schemes and a private flying scheme.

Application forms may be obtained from:

**The Secretary,  
Air Registration Board,  
Brabazon House,  
Redhill, SURREY.  
Telephone: Redhill 65966**

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# A Message to Members from the President

One of the first tasks which fell to my lot on accepting the responsibilities of President of the Society, was to take action to correct the adverse balance of the Society for the year ended the 31st December 1969. A general meeting of Voters of the Society was held at No. 4 Hamilton Place on the 8th July 1970 to discuss the situation and to consider and vote on two resolutions to enable subscription rates to be increased. These resolutions were passed at the General Meeting but, as any amendment to annual subscriptions agreed by a General Meeting must be approved by a postal ballot, all voting members of the Society were required to vote individually on the second resolution approved at the General Meeting. A report of that General Meeting was sent out on the 20th July 1970 together with an appropriate Ballot Paper which voters were required to complete and return to No. 4 Hamilton Place by the 24th September 1970.

The votes recorded as a result of this Postal Ballot were as follows:—

FOR the Council's proposed revised scales	2543
AGAINST the Council's proposed revised scales	872

As a result of this Postal Ballot the proposed new scales of subscription will be adopted with effect from the 1st January 1971. Details of the new rates will be sent to all members in due course.

The purpose of this message is to thank members of the Society most sincerely for supporting the Council's proposals so convincingly and thus ensuring that the Society will be financially viable in the years immediately ahead. I would like to hope that even those who could not support the proposals will still continue to support the Society—albeit at a higher rate of subscription.

Finally, I would like to take this opportunity of assuring members that the closest watch will be kept upon expenditure and that everything possible will be done to ensure that the increases now approved will be the last for some years.

Air Cdre. J. R. Morgan  
President

## NOTICES

### Associate Fellowship Examination, 1970

The following candidates were successful in the examinations.

#### United Kingdom Candidates

ALABASTER, A. J. Economics and Management.  
ANTHONY, T. D. J. Theory of Structures A. Theory of Structures B. Thermodynamics and Theory of Machines.  
BRIDGELAND, J. W. Theory of Structures A. Theory of Structures B. Theory of Structures C.  
CAULFIELD, A. J. Aerodynamics A.  
DICK, D. J. Theory of Structures A. Theory of Structures B. Theory of Structures C.  
HAYWOOD, D. S. Thermodynamics and Theory of Machines. General Design, Piston and Turbine Engines. Piston and Turbine Engines.  
JEFFREY, J. E. Aerodynamics A. Aerodynamics B. Meteorology.  
MCCARTHY, R. F. J. Economics and Management. Production. Aircraft Manufacture.  
MORGAN, P. H. Aerodynamics A.  
PRITCHARD, D. Theory of Structures A. Aircraft Design and Development A. Aircraft Design and Development B.  
SULLY, J. F. Air Transport. Operational Air Transport.

#### Candidates Abroad

ARUNACHALAM, S. Aerodynamics A.  
BROWN, F. A. Theory of Machines.  
CHAKRABORTY, S. K. Theory of Machines (allowed). General Design, Piston and Turbine Engines. Piston and Turbine Engines. Economics and Management.  
COWAN, D. M. Theory of Structures A. Theory of Structures B. Theory of Structures C.  
DARSHANE, R. A. Aerodynamics A. Aerodynamics B. Theory of Structures A.  
GARNETT, B. Aircraft Design and Development A. Aircraft Design and Development B. Air Transport.  
KINGSTON, D. S. Theory of Structures A. Theory of Structures B.  
LUCAS, M. Theory of Structures A. Thermodynamics and Theory of Machines. General Design, Piston and Turbine Engines.  
MANI, L. M. Aircraft Design and Development B. Thermodynamics and Theory of Machines. General Design, Piston and Turbine Engines.  
MENON, E. S. S. Aerodynamics A. Theory of Structures A. Thermodynamics and Theory of Machines.  
NILAKANTAN, G. R. Aerodynamics A. Aerodynamics B.

Theory of Structures A.

PHIEM, Vo Van. Aerodynamics A. Aerodynamics B.  
ROBINSON, C. R. A. C. Thermodynamics and Theory of Machines.  
SOOBARAH, J. Meteorology.  
SUBAWICKRAMA, S. W. Theory of Machines. Theory of Structures A. Thermodynamics and Theory of Machines. General Design, Piston and Turbine Engines.  
THAM, K. K. Theory of Structures A. Thermodynamics and Theory of Machines. General Design, Piston and Turbine Engines.  
VIJAYAVITTAL, C. S. Aerodynamics A. Theory of Structures A.

#### Baden Powell Prize

This prize is awarded to a candidate achieving a consistently high overall standard in the Part II examination. It is not awarded every year.

The Prize has this year been awarded to R. F. J. McCarthy.

### Conference on Atmospheric Turbulence to be held at the Royal Aeronautical Society from 18th - 21st May 1971

#### Preliminary Announcement

In conjunction with the American Institute of Aeronautics and Astronautics and the Canadian Aeronautics and Space Institute, the Society is organising an international conference on Atmospheric Turbulence to be held in May 1971. There will be six sessions devoted to the following topics:

1. Knowledge of the Atmosphere based on Scientific Observation.
2. The Nature and Physics of the Environmental Wind Field (including Turbulence)—Theory.
3. The Nature and Physics of the Environmental Wind Field—Operational Aspects and Experience.
4. Aircraft Control and Stability (including V/STOL).
5. Human Factors.
6. Structural Loads and Design.

Each session will begin with a review paper by an expert and continue with a number of shorter papers on more specialised aspects. It is hoped that full details of the programme will be available early in 1971.

Anyone interested in attending the conference is asked to write to the Secretary, Royal Aeronautical Society, 4 Hamilton Place, London, W1V 0BQ. There will be a registration fee of £15 for members of the RAeS, CASI and AIAA and £20 for non-members. This fee will include the cost of a complete set of papers.