



Engineering

Books and Journals from
Cambridge University Press

Cambridge publishes a range of high-quality books and journals on the theory and practice of engineering, in communications, information theory, signal processing, networks, RF and microwave, circuits and devices, materials science and polymer research, applied photonics, thermal-fluids, mechanics, aerospace, and chemical engineering.

For further details visit:
cambridge.org/core-engineering

Cambridge
Core



CAMBRIDGE
UNIVERSITY PRESS



Cambridge Core

The new home of
Cambridge Journals
cambridge.org/core

Cambridge Core



CAMBRIDGE
UNIVERSITY PRESS

Submission of Manuscripts

All manuscripts should be submitted online at: <http://www.edmgr.com/aeroj>
Any enquiries should be directed to Wayne J Davis at aerjournal@aerosociety.com.
The current set of instructions for authors are available at: <http://journals.cambridge.org/AER>

Subscriptions

The Aeronautical Journal (ISSN 0001-9240) is published monthly in 12 issues each year.

Non-Members

The subscription price (excluding VAT) to *The Aeronautical Journal* for volume 121 (2017), which includes print and electronic access, is £551 (USA, Canada and Mexico US\$827) and includes delivery by air; single parts are available at £53 (USA, Canada and Mexico US\$79) plus postage. The electronic-only price available to institutional subscribers is £483 (USA, Canada and Mexico US\$725). EU subscribers (outside the UK) who are not registered for VAT should add VAT at their country's rate. VAT registered subscribers should provide their VAT registration number. Orders, which must be accompanied by payment, may be sent to any bookseller or subscription agent or direct to the publishers: Cambridge University Press, UPH, Shaftesbury Road, Cambridge CB2 8BS, or in the USA, Canada, and Mexico to Cambridge University Press, Journals Fulfillment Department, 1 Liberty Plaza, Floor 20, New York, NY 10006, USA. Japanese Prices for institutions are available from Kinokuniya Company Ltd, P.O. Box 55, Chitose, Tokyo, Japan.

RAeS Members

The subscription price for RAeS members is £89 for Hardcopy and online access and £68 for online access only. Individual copies are £7.75. Orders are available from: Membership Department, Royal Aeronautical Society, No.4 Hamilton Place, London, W1J 7BQ, UK. Tel: +44 (0)20 7670 4304 or email: subscriptions@aerosociety.com

RAeS Conference Proceedings

Details, prices and availability of Royal Aeronautical Society Conference Proceedings can be obtained from: RAeS Conference and Events Department, No.4 Hamilton Place, London, W1J 7BQ, UK.
Tel: +44 (0)20 7670 4345, email: conference@aerosociety.com or via www.aerosociety.com/events/catch-up-on-events/conference-proceedings

Advertising

All advertising enquiries should be sent to Simon Levy, simon.levy@aerosociety.com

Internet Access

The Aeronautical Journal is included in the Cambridge Journals Online service and can be found at: <http://journals.cambridge.org/AER>.

The Aeronautical Journal now supports open access publications across its hardcopy and online platforms, and accepts papers to consider for publication under both the 'green' and 'gold' open access options.

Information contained within *The Aeronautical Journal* has been published in good faith and the opinions expressed do not represent those of the Royal Aeronautical Society.

The Royal Aeronautical Society is a registered charity: No 313708

© 2017 Royal Aeronautical Society

All rights reserved. No part of this publication may be reproduced in any form or by any means, electronic, photocopying or otherwise, without permission in writing from Cambridge University Press. Permission to copy (for users in the USA) is available from the Copyright Clearance Center, <http://www.copyright.com>.

This journal issue has been printed on FSC™-certified paper and cover board. FSC is an independent, non-governmental, not-for-profit organization established to promote the responsible management of the world's forests. Please see www.fsc.org for information.

Printed in the UK by Bell & Bain Limited, Glasgow.



ROYAL
AERONAUTICAL
SOCIETY

CONTENTS

Volume 121 Number 1245

November 2017

- F. Yin and A. Gangoli Rao**
Performance analysis of an aero engine with inter-stage turbine burner 1605
- A. Bilal Outirba, B. Patrick Hendrick and C. Kevin Nicolas**
Experimental characterisation of carbon fibre brush seal leakage performance as a function of bristle pack geometrical parameters under dry conditions 1627
- Y. Tondji and R. M. Botez**
Semi-empirical estimation and experimental method for determining inertial properties of the Unmanned Aerial System – UAS-S4 of Hydra Technologies 1648
- C. A. Paulson, A. Sóbester and J. P. Scanlan**
The rapid development of bespoke small unmanned aircraft A Proposed Design Loop 1683
- R. Kalimuthu, R. C. Mehta and E. Rathakrishnan**
Investigation of aerodynamic coefficients at Mach 6 over conical, hemispherical and flat-face spiked body 1711
- T. Streit and C. Hoffrogge**
DLR transonic inverse design code, extensions and modifications to increase versatility and robustness 1733
- Elias Tsoutsanis, Yi-Guang Li, Pericles Pilidis and Mike Newby**
Non-linear model calibration for off-design performance prediction of gas turbines with experimental data 1758

Front Cover: Detail from a Rolls-Royce UltraFan® Power Gearbox (Rolls Royce)

Cambridge Core

For further information about this journal please go to the journal website at:

[cambridge.org/aer](https://doi.org/10.1017/aer)



MIX
Paper from
responsible sources
FSC® C007785

CAMBRIDGE
UNIVERSITY PRESS