# THE AERONAUTICAL QUARTERLY

A JOURNAL DEVOTED TO AERONAUTICS AND THE ALLIED SCIENCES

Vol XXVIII

February 1977

Part 1

# CONTENTS

Turbomachinery Waves	J H Horlock and H Daneshyar	1
Similarities Between Two-Dimensional and Axisymmetric Vortex Wakes	J E L Simmons	15
The Design of Axisymmetric Ducts for Incompressible Flow	P Laidler and F Walkden	21
The Relationship of the Resistance Curve and $G_c$ to Specimen Configuration	NJI Adams and HG Munro	28
An Experimental and Theoretical Investigation of the Structure of a Trailing Vortex Wake	R G Sampson	39
An Investigation of an Inclined Jet in a Crosswind	P Taylor	51
A New Series of Aerofoil Sections Suitable for Aircraft Propellers	A J Bocci	59
Correspondence: Reference plane method of characteristics		74

## ROYAL AERONAUTICAL SOCIETY 4 HAMILTON PLACE, W1V 0BQ LONDON

#### THE AERONAUTICAL QUARTERLY

#### **Editorial Board**

Professor W A Mair, CBE, MA, FRAeS (*Chairman*) Sir Arnold Hall, MA, FRS, HonFRAeS, HonFAIAA Professor D W Holder, MA, FRS, FRAeS Dr J H Horlock, MA, PhD, FRS, FRAeS Lord Kings Norton, DSc, DIC, PhD, HonFRAeS, FAIAA Sir Morien Morgan, CB, MA, FRS, FRAeS Sir Alfred Pugsley, OBE, DSc, FRS, HonFRAeS Professor S C Redshaw, DSc, PhD, FRAeS, FICE, FIStructE Sir Owen Saunders, FRS, FRAeS Professor W H Wittrick, ScD, PhD, FRAeS

### Editor – Miss E C Pike, MA, FRAeS

#### **Editorial Referees**

The high standard of papers published in The Aeronautical Quarterly is the result of the care and vigilance of many specialist referees. Hardly a paper is published that has not been improved by their suggestions and their contributions to the authors' work is often considerable. The Editorial Board and the Editor are pleased to acknowledge here, and to thank on the authors' behalf, the following specialists who have refereed papers during the past year.

Dr C J N Alty Dr A W Babister Dr A J Barrett Mr E A Boyd Dr L J S Bradbury Dr J R Calvert Prof I C Cheeseman Dr D J Cockrell Prof A R Collar Mr H L Cox Prof L F Crabtree Prof S N Curle Dr D J Dawe Dr L F East Mr D N Foster Prof M B Glauert Dr J M R Graham

Dr J E Green Dr D J Hall Dr M G Hall Prof G J Hancock Dr G Z Harris Prof W S Hemp Dr R D Henshell Dr R Hillier Mr C R Hookham Prof H G Hopkins Mr F G Irving Prof N H Johannesen Dr H P Horton Prof B Lakshminarayana Dr D M A Leggett Prof R I Lewis Dr J Lewkowicz

Prof H Marsh Dr D J Maull Mr G A Miles Dr D F Myring Dr E H Mansfield Prof B G Newman Prof P C Parkes Dr J H Preston Prof J W Railly Mr J Reid Dr R A Sawyer Dr D L Schultz Dr C C L Sells Mr L E G Simmons Dr A Simpson Mr J H B Smith

Prof J L Livesev

Prof D B Spalding Dr D A Spence Dr L C Squire Prof J L Stollery Dr D M Sykes Mr I C Taig Mr R Tetlow Dr A A Townsend Dr M Wadsworth Prof F Walkden Mr E J Watson Dr D S Whitehead Prof J H Whitelaw Mr P J Wingham Mr K G Winter Dr C J Wood Mr D L Woodcock