

The JOURNAL of NAVIGATION

VOL. 39 NO. 2

MAY

1986

The Protected Volume of Airspace Generated by an Airborne Collision Avoidance System	139
R. L. FORD	
Navigation Aspects of JTIDS	159
G. L. WRAY AND C. P. SHEPPARD	
An Automatic Collision Avoidance and Guidance System for Marine Vehicles in Confined Waters	180
M. J. DOVE, R. S. BURNS AND C. T. STOCKEL	
Radar Simulator Studies of Crossing Encounters in Fog	191
ROBERT G. CURTIS	
Collision Rate as a Danger Criterion for Marine Traffic	203
K. H. KWIK	
Routing and the Environment	213
A. N. COCKCROFT	
The Future of Conventional Aids to Navigation	225
SIR MILES WINGATE	
Laser Airborne Depth Sounding in Australia	248
M. F. PENNY, R. H. ABBOT, D. M. PHILLIPS, B. BILLARD, D. REES, D. W. FAULKNER, D. G. CARTWRIGHT, B. WOODCOCK, G. J. PERRY, P. J. WILSEN AND J. RICHARDS	
The Backstaff and the Determination of Latitude at Sea in the Seventeenth Century	259
GERALD FORTY	
Coordinate Systems: How to get your Position Very Precise and Completely Wrong	269
PROFESSOR V. ASHKENAZI	
Vehicle Navigation Using the Adaptive Compass	279
M. R. FOSTER	
Digital Colour Map Units for Land Navigation	286
D. HALLIWELL	
Forum	291
Record	302
Review	305

THE ROYAL INSTITUTE OF NAVIGATION
CAMBRIDGE UNIVERSITY PRESS

THE ROYAL INSTITUTE OF NAVIGATION

Patron

HRH THE PRINCE PHILIP DUKE OF EDINBURGH, KG, KT, OM

OFFICERS AND COUNCIL 1985-6

President

J. E. D. Williams

Vice Presidents

Sir John Charnley, CB

J. H. Beattie

Treasurer

G. A. B. King, CBE

Chairman of the Technical Committee

M. G. Pearson

Chairman of the Membership & Fellowship Committee

Commander A. E. Fanning, MBE, DSC, RN

Other Members of Council

W. F. Blanchard

Wing Commander D. W. Broughton,

MBE, RAF

C. St. J. H. Daniel

Lieutenant Commander A. G. Dyer,

MBE, RN

Captain J. D. Eames

E. A. Green

P. F. C. Griffiths

Air Commodore D. F. H. Grocott, CBE,

AFC, RAF

D. W. Newson

Rear Admiral A. F. R. Weir, CB

Director Rear Admiral R. M. Burgoyne, CB

THE JOURNAL OF NAVIGATION

The *Journal* is published three times a year by Cambridge University Press and is edited by M. W. Richey. It contains original papers contributing to the science of navigation, including those presented at the meetings of the Institute together with the ensuing discussion. In addition the *Journal* includes a record of current navigational work, reviews of important books, and other matters of concern to those interested in navigation. The views expressed in the *Journal* are not necessarily those of the Institute, or of any organization or department to which the authors may belong. Crown Copyright may be reserved.

The *Journal* (ISSN 0020-3009) is issued free to all Members of the Institute. The subscription price to non-members for Volume 39, 1986, is £43 (USA and Canada US \$98.00) post free; single parts are available at £16 (USA and Canada US \$36) plus postage. Orders, which must be accompanied by payment, may be sent to any bookseller or subscription agent or direct to the publishers, Cambridge University Press, The Edinburgh Building, Shaftesbury Road, Cambridge CB2 2RU, or in the USA and Canada to Cambridge University Press, 32 East 57th Street, New York, NY 10022. Back volumes are also available from the publishers at £27 each.

Enquiries for advertising space should be addressed to Cambridge University Press at the address given above.

The postal address of the Institute is The Royal Institute of Navigation, at The Royal Geographical Society, 1 Kensington Gore, London SW7 2AT (Telephone: 01-589 5021).