

The JOURNAL of NAVIGATION

VOL. 36, NO. 2

MAY

1983

Navigational Safety in European Waters	169
ALINE DE BIÈVRE	
Designing a North Sea Shipping Route	183
J. A. VAN RIET, R. TRESFON, R. A. W. POLLEN AND A. P. VALSTAR	
The Channel Navigation Information Service	195
R. K. N. EMDEN	
The Prediction of Safety Margins at Sea	211
J. HAGART	
Measurements used in Experiments to Evaluate the Performance of Watch Officers	220
J. F. COOK AND C. M. CRAWSHAW	
A Return to the Sumner Line?	231
D. H. SADLER	
A Brief Historical Survey of British Navigational Manuals	237
CHARLES H. COTTER	
A Brief History of Sailing Directions	249
CHARLES H. COTTER	
A Theoretical Framework for Analysis of Lateral Position Errors in VOR Jet-Route Systems	262
D. A. HSU	
On the Use of Height Rules in Off-route Airspace	269
R. L. FORD	
Computer Model of a Collision-Avoidance System for Air Traffic Control	288
SIDNEY MORLEIGH	
Some Aspects of Military Navigation	302
R. ECCLES, A. E. ELIAS AND G. B. HAMILTON	

FORUM

The Calculation of Loxodromic Distances	315
ANTONINO SPOSITO	
The Anderson Theorem	318
E. W. ANDERSON	
Manoeuvring Times, Domains and Arenas	324
B. A. COLLEY, R. G. CURTIS AND C. T. STOCKEL	
An Inquiry into Simulator Training	328
G. M. VEENMAN AND W. VERHAGE	
Reviews	334

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 1982-3

President

Captain B. J. Calvert

Vice Presidents

Rear-Admiral D. W. Haslam, CB, OBE

D. M. Page

Treasurer

G. E. Beck

Chairman of the Technical Committee

Dr J. F. Kemp

Chairman of the Membership & Fellowship Committee

M. G. Pearson

Other Members of Council

J. H. Beattie

Wing Commander D. W. Broughton, MBE, RAF

Captain R. A. Cahill

Wing Commander E. E. Eatwell, RAF

Commander A. E. Fanning, MBE, DSC, RN (ret)

Captain L. W. Fifield

Lieutenant Commander H. D. Howse, MBE,

DSC, RN

Commander J. Paton, RN (ret)

Commander P. Le Pla, RN

Commander M. R. H. Llewellyn, RD, RNR (ret)

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 36, 1983, is £35 (USA and Canada US \$89.00) post free; single parts are available at £14 (USA and Canada US \$35) 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, N.Y. 10022. Back volumes are also available from the Publishers at £27 each.

Enquiries for advertising space should be addressed to Cambridge University Press.

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).