

A practical book for the professional mariner, written by a serving shipmaster, this volume analyses a large number of collisions that have occurred, some well known and others less so, but each proving an important lesson. The accounts are filled with instances where basic principles and practices of seamen have been flouted or ignored, more often than not by seamen who knew, or should have known better, where careers were ruined and lives lost unnecessarily for the lack of thought or learning.

Contents include:

- Restricted visibility
- Forestalling close quarters
- The role of VHF and harbour radio
- Close quarters in clear weather
- In extremis situations
- Fine crossing and overtaking situations
- The hazards of close overtaking
- Meeting in narrow channels
- Collisions at anchor
- Keeping a proper look-out

The Author

Richard A. Cahill, who most recently has been in command of large American flag container-ships, graduated from the U.S. Merchant Marine Academy, Kings Point, in 1943. He has served afloat as a licensed deck officer since that time, being promoted to Master in 1961. A Fellow of the Royal Institute of Navigation, he is a past Member of its Technical Committee and currently a member of Council. He is also a Fellow of the Nautical Institute. He holds a Master's Degree in Business Administration from New York University and has served as a Visiting Professor in Nautical Science at the U.S. Merchant Marine Academy.

Price U.K. £12.00

Other Countries £13.00 or U.S.\$24.00

Available from The Royal Institute of Navigation or direct from Fairplay Publications at the address below.

PLEASE RETURN TO: FAIRPLAY PUBLICATIONS 52/54 Southwark Street, London, SE1 1UJ

Name

Address

Bank Account Midland Bank, 5 Threadneedle St., London EC2R 8BD. Account No. 71026143

PAYMENT SHOULD ACCOMPANY ALL ORDERS PLEASE

Reg. No. 338580

ORDER FORM

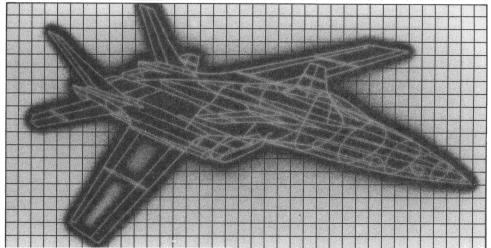
Please send copy(ies) of:

COLLISIONS AND THEIR CAUSES

I enclose cheque

Jnl. of Navigation, 36, 3

(i)



As the future takes shape Ferranti will guide you to it.

Ferranti has been active in military aircraft mission planning since 1975 and in the field of electro-optic cartographic systems for military aircraft for over twenty years. In addition, sophisticated combined map and electronic displays are currently in production for Tornado, F/A-18 and Jaguar while ground-based aids like TACPLAN greatly increase aircraft mission effectiveness.

Ferranti is Europe's most experienced manufacturer of space guidance systems and is supplying inertial systems for guidance and control of Ariane launch vehicles.

For land navigation and attitude reference Ferranti PADS, Position and Azimuth Determining System, for vehicle or helicopter mounting was the first inertial survey system in military service; a commercial version, FILS, is also available.

> Ferranti plc, Navigation Systems Department, Silverknowes, Ferry Road, Edinburgh EH4 4AD Telephone: 031-332 2424 Telex: 727101



THE INTERNATIONAL HYDROGRAPHIC REVIEW

Half-yearly, 160 pages (approx.) 18 × 27 cm. Price 90 French francs* Yearly subscription 160 French francs*

Among the papers of interest in the January 1983 issue are:

- The first decade of GLORIA (A. S. LAUGHTON)
- The role of the sea and the seafarers in early geodesy (I. K. FISCHER)
- On the predictability of currents (G. GODIN)

PUBLISHED BY THE INTERNATIONAL HYDROGRAPHIC BUREAU 7, av. President J. F. Kennedy, B.P. 345 – MC 98000 MONACO

The Bureau also publishes monthly

THE INTERNATIONAL HYDROGRAPHIC BULLETIN

A bilingual journal – English and French – giving news of hydrographic activities worldwide. Lists in detail charts published by Member States of the International Hydrographic Organization, and contains a selective bibliography of recent works in the fields of hydrography, descriptive oceano-graphy, navigation, cartography, etc.

Approx. 30 pages, 21 × 30 cm, 10.50 French francs per copy* Yearly subscription: 105 French francs*

* Postage extra

(iii)

THE JOURNAL OF NAVIGATION

Volume 36

1983

PUBLISHED UNDER THE AUTHORITY OE THE COUNCIL EDITED BY M. W. RICHEY

THE ROYAL INSTITUTE OF NAVIGATION AT THE ROYAL GEOGRAPHICAL SOCIETY 1 KENSINGTON GORE, LONDON SW7 2AT

THE ROYAL INSTITUTE OF NAVIGATION

PATRON

H.R.H. THE PRINCE PHILIP DUKE OF EDINBURGH, KG, KT, OM

OFFICERS AND COUNCIL 1982-83

PRESIDENT Captain B. J. Calvert

VICE-PRESIDENTS Rear-Admiral D. W. Haslam, CB, OBE D. M. Page

> HONORARY TREASURER G. E. Beck

CHAIRMAN OF THE TECHNICAL COMMITTEE Dr J. F. Kemp

CHAIRMAN OF THE MEMBERSHIP AND 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

CONTENTS

THE PROVINCE OF THE INSTITUTE. M. W. RICHEY	I
HUMAN ASPECTS OF INTEGRATED NAVIGATION IN THE AIR. V.D.	
Норкіл	21
AIRCRAFT SEPARATION ASSURANCE: SYSTEMS DESIGN. P. BROOKER	28
THE ROLE OF ADVANCED NAVIGATION IN FUTURE AIR TRAFFIC	
MANAGEMENT, R. C. RAWLINGS	37
POSSIBLE IMPROVEMENTS IN METEOROLOGY FOR AIRCRAFT NAVI-	37
GATION. M. BISIAUX, M. E. COX, D. A. FORRESTER AND J. T. STOREY	54
SELF-ADAPTIVE FILTERS FOR THE INTEGRATION OF NAVIGATION	31
DATA. J. P. Abbott and C. R. Gent	64
THE IMPACT OF FILTERING ON SEA AND AIR OPERATIONS. M. G. PEAR-	- 1
SON	74
THE 'MANAV' INTEGRATED NAVIGATION SYSTEM. I. C. MILLAR AND	74
R. F. HANSFORD	81
THE ADMIRALTY CHART – VI – HYDROGRAPHIC DEPARTMENT: CHART-	•••
ING FOR MODERN NEEDS. D. W. HASLAM; RECENT SURVEYS. R. DE	
F. BROWNE; CHANGES IN ADMIRALTY CHART SPECIFICATION.	
G. A. MAGEE; THE USE AND MISUSE OF CHARTS. R. O. MORRIS; THE	
ENGLISH CHANNEL PASSAGE PLANNING GUIDE. H. R. W. HALLI-	
WELL; ADMIRALTY SAILING DIRECTIONS. J. S. N. PRYOR	93
THE WORK OF THE INTERNATIONAL HYDROGRAPHIC ORGANISATION.	
G. S. RITCHIE	116
THE STILL UNDISCOVERED ORIGIN OF PORTOLAN CHARTS. H. C.	
FREIESLEBEN	124
THE ESTIMATION OF THE MEAN SIZE OF SHIP DOMAINS, W. G. P. LAMB	130
ROTATIONS IN NAVIGATION. E. W. Anderson	137
A NEW CONCEPT FOR VERTICAL SEPARATION (Forum). A. BLOM-BAKKE	157
NAVIGATION SAFETY IN EUROPEAN WATERS. Aline De Bièvre	169
DESIGNING A NORTH SEA SHIPPING ROUTE. J. A. VAN RIET, R. TRESFON,	. ,
R. A. W. Pollen and A. P. Valstar	183
THE CHANNEL NAVIGATION INFORMATION SERVICE, R. K. EMDEN	195
THE PREDICTION OF SAFETY MARGINS AT SEA. J. HAGART	211
MEASUREMENTS USED IN EXPERIMENTS TO EVALUATE THE PERFORM-	
ANCE OF WATCH OFFICERS. J. F. COOK AND C. M. CRAWSHAW	220
A RETURN TO THE SUMNER LINE? D. H. SADLER	231
A BRIEF HISTORICAL SURVEY OF BRITISH NAVIGATIONAL MANUALS.	-] -
C. H. Cotter	237
A BRIEF HISTORY OF SAILING DIRECTIONS. C. H. COTTER	249
A THEORETICAL FRAMEWORK FOR ANALYSIS OF LATERAL POSITION	12
ERRORS IN VOR JET-ROUTE SYSTEMS, D. A. Hsu	262
ON THE USE OF HEIGHT RULES IN OFF-ROUTE AIRSPACE, R. L. FORD	269
COMPUTER MODEL OF A COLLISION-AVOIDANCE SYSTEM FOR AIR	
TRAFFIC CONTROL. S. Morleigh	288
SOME ASPECTS OF MILITARY NAVIGATION: THE ARMY AIR CORPS.	
R. Eccles. THE USE OF INERTIAL TECHNIQUES. A. E. Elias and G. B.	
HAMILTON	302
THE CALCULATION OF LOXODROMIC DISTANCES (Forum). A. SPOSITO	315
THE ANDERSON THEOREM (Forum). E. W. ANDERSON	318
MANOEUVRING TIMES, DOMAINS AND ARENAS (Forum). B. A. COLLEY,	-
R. G. CURTIS AND C. T. STOCKEL	324
AN INQUIRY INTO SIMULATOR TRAINING (Forum). G. M. VEENMAN AND	
W. Verhage	328

NAVSTAR GPS FOR NAVIGATION: PRINCIPLES AND PRESENT STATUS.	
G. E. COOK; GPS FOR AVIATION. S. RATCLIFFE; GPS FOR MARINE	
NAVIGATION. R. MAYBOURN	341
INTEGRATED NAVIGATION SYSTEMS FOR AIRCRAFT, R. F. STOKES AND	
S. G. Smith	359
NEW DISPLAY SYSTEMS FOR THE NEXT GENERATION OF AIRCRAFT.	
M. Bernard	379
SOURCES OF LATITUDE ERROR IN ENGLISH SIXTEENTH CENTURY	
NAVIGATION. G. M. Forty	388
COLLISION THREAT PARAMETERS FOR A NEW RADAR DISPLAY AND	
PLOT TECHNIQUE. A. S. LENART	404
COLLISION AVOIDANCE FROM THE SHORE. T. DEGRÉ AND X. LEFÈVRE .	411
QUANTITATIVE MEASUREMENTS OF NAVIGATIONAL SAFETY. E. M.	
GOODWIN, W. G. P. LAMB AND J. F. KEMP	418
MARINE TRAFFIC BEHAVIOUR IN RESTRICTED WATERS. T. G. COLDWELL	430
TRAFFIC CONTROL IN SEPARATION SCHEMES. W. FILIPOWICZ	445
DEFINING THE CLOSE-QUARTERS SITUATION AT SEA. H. HILGER	454
THE EFFECTIVENESS OF SHIP ROUTING OFF NORTH WEST EUROPE.	
A. N. COCKCROFT	462
NAUTICAL CHART STANDARDIZATION. D. NEWSON	468
SHIP-BASED WEATHER ROUTING USING DYNAMICAL METEOROLOGY.	
R. MOTTE	480
IN A FLAT SPIN (Forum). J. E. D. WILLIAMS	496
'WHAT COURSE SHOULD YOU STEER?' (Forum). L. R. MUIR	500
USE OF INSHORE TRAFFIC ZONES (Record). A.N.C	505

THE ROYAL INSTITUTE OF NAVIGATION

THE OBJECT of the Institute is to unite in one body those who are concerned with or who are interested in the science and art of navigation. Membership is not restricted to those who hold professional qualifications, but is open to others who wish to further the aims of the Institute.

By coordinating the knowledge and achievements of marine and air navigators, scientists and those associated with the development and production of navigational equipment, the work of the Institute is directed towards raising the standard of navigation. In the field of education it is the aim of the Institute to bring practical navigators into contact with teachers and research workers to increase a common appreciation of the issues involved. It is an object of the Institute to encourage research in equipment and methods; through its publications it gives a wide circulation to original work on navigation so that new developments and suggestions can be appreciated by those most directly concerned with them.

The activities of the Institute include the holding of monthly meetings to discuss specific problems, the publication of a Journal and of other works concerned with different aspects of navigation, and such other activities as the Council may deem necessary to promote knowledge in navigation and its associated sciences.

The Journal of Navigation is issued free to all Members and contains a full account of the Institute's proceedings. It prints the papers which are presented at meetings, together with their ensuing discussion, and other original papers contributing to the science of navigation. It also contains a record of current navigational work, reviews of important books, and general papers of interest to navigators and those with similar interests.

The work of the Institute is coordinated with that of similar societies abroad, whose proceedings are available to members.

Membership. There are five classes of membership of the Institute:

(1) HONORARY MEMBERS, who shall be distinguished persons upon whom the Council may see fit to confer an honorary distinction.

(2) FELLOWS, who shall be members, of at least three years' standing who, in the opinion of the Council, have made a contribution of value to navigation.

(3) MEMBERS, who shall be persons over twenty-one years of age who can satisfy the Council of their interest in navigation.

(4) STUDENT MEMBERS, who shall be persons under twenty-five years of age studying with a view to making navigation, or an allied interest, their career.

(5) CORPORATE MEMBERS, who shall be companies, universities, navigation schools, government departments and other organizations, here and abroad, who are directly or indirectly interested in the science of navigation. Corporate Members are entitled to send representative to all Institute meetings and to receive six copies of the *Journal*, and other publications. They are encouraged to take an active part in the Institute's work. Applications should be sent by letter addressed to the Director.

Subscriptions. Annual subscriptions to the Institute are payable in advance as follows:

Members and Fellows		•	•		£21.00
Student Members .					£7.00
Corporate Members					£140.00

The Institute's financial year begins on 1 July. Members in any category who are elected after 1 January in any year are only due for one half of their subscription until 1 July, when the full subscription for the next year becomes due.

CAMBRIDGE UNIVERSITY PRESS The Pitt Building, Trumpington Street, Cambridge CB2 1RP 32 East 57th Street, New York, N.Y. 10022

Printed in Great Britain at the University Press Cambridge