The JOURNAL of NAVIGATION

/01	L. 31, NO. I JANUARY	1978
	The Navigational Requirements for Ocean Cable Laying Presidential Address by Sir Edward Fennessy	r
	Early Dead Reckoning Navigation C. H. COTTER	20
	Testing a Modern Strike Aircraft Navigation System J. B. V. COLLINS	29
	Aeronautical Chart Servicing W. A. ROSENKRANS	39
	Depth Sounding from the Air by Laser Beam J. E. CLEGG AND M. F. PENNY	52
	Navigation in the English Channel and the Southern North Sea	62
	Collision Avoidance Behaviour and Uncertainty J. R. RIEK	82
	Ship Performance in Rough Weather A. R. J. M. LLOYD	93
	Traffic Models for use in Vessel Traffic Systems M. D. CILETTI	104
	The Estimation of Losses Resulting from Marine Accidents Y. Fujn	117
	Drift Angle and its Consequences in Ship Manoeuvres K. Meurs	126
	Dynamic Simulation: A Tool in Research on Human Behaviour in Navigation	133
	A. LAZET AND H. SCHUFFEL Estimating Speed and Angle of Impact in Collision Cases T. D. HELLESØE	141
	FORUM	
	Single-handed Voyages and the Collision Regulations L. R. Foster, H. G. Hasler, J. D. Sleightholme, A. N. Cockcroft and A. Wepster	149
	A New Navigation Computer M. W. RICHEY	157
	English Channel Traffic Control I. C. VENDRELL	161
	Record	162

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

SCOTTISH ACADEMIC PRESS LTD., 33 MONTGOMERY STREET, EDINBURGH EH7 SIX

https://doi.org/10.1017/S037346330008855 9 Jolished Unline By Cambridge Uniterative Press 4.50)

THE ROYAL INSTITUTE OF NAVIGATION

Patron

H.R.H. THE PRINCE PHILIP DUKE OF EDINBURGH, K.G., K.T., O.M.

OFFICERS AND COUNCIL 1977-8

President Sir Edward Fennessy, C.B.E.

Vice Presidents Captain R. Maybourn S. Ratcliffe

Honorary Treasurer Mrs. Mary Pera

Chairman of the Technical Committee Dr. J. F. Kemp

Chairman of the Membership & Fellowship Committee Rear Admiral D. W. Haslam, O.B.E.

Other Members of Council

Prof. A. N. BlackMiss A. M. FerrarCaptain B. J. CalvertCaptain K. D. JonesGroup Captain D. Clare, D.F.C.,
R.A.F. (ret)Lieut. Commander P. Le Pla, R.N.Captain G. DudleyJ. W. MclvorCaptain R. K. N. Emden, D.S.C., R.N. (ret)

Director M. W. Richey, M.B.E.

The Journal of Navigation

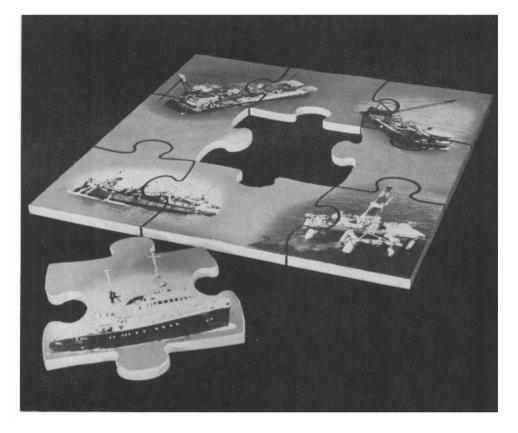
THE Journal is published three times a year by the Institute and is edited by M. W. RICHEY. It contains original papers contributing to the science of navigation, including those presented at meetings of the Institute together with the ensuing discussion. In addition the Journal includes a record of 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 is issued free to all Members of the Institute. It is sold to the public at four pounds fifty per copy or, by subscription, at fourteen pounds twenty-five per annum (including postage) and may be obtained through all booksellers and Scottish Academic Press Ltd., 33 Montgomery Street, Edinburgh EH7 5JX. Back numbers dated two years prior to the current volume may be obtained from William Dawson & Sons, Ltd., (Back Issues Department), Cannon House, Folkestone, Kent.

Enquiries for advertising space should be addressed to The Advertisement Manager (Noel S. O'Doherty) Lewin House, Dorking Road, Tadworth, Surrey KT20 7RT. (*Telephone:* Tadworth 3063).

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).

Volumes of the Journal can be bound for three pounds seventy five including postage. The parts should be sent, together with the appropriate remittance, to Fowler-Wilson Bookbinders, Unit 4, Middlefield Industrial Estate, Sandy,



We're great at putting everything in its proper placeprecisely.

Because positioning is our business. And because we've been doing it for a long time now. For over 30 years, we have been steadily developing and improving electronic positioning aids.

Today, as the Decca Survey Group of companies, we are strategically stationed to provide a comprehensive survey service anywhere on demand. Precisely positioning rigs and platforms in the search for oil and minerals offshore. Undertaking the vital survey work associated with dredging and port and harbour maintenance and development. And surveying the routes for pipes and cables in the seas and oceans of the world.

We have the most experienced personnel. The most comprehensively fitted vessels. And the most advanced electronic equipment—including acoustic and satellite positioning aids.

Whenever you need precise positioning services, you need us. The Decca Survey Group. In positioning, we're *precisely* the people who matter.



DECCA SURVEY LIMITED KINGSTON ROAD LEATHERHEAD SURREY ENGLAND TELEPHONE LEATHERHEAD 76971 TELEX 928437

DECCA for the greater efficiency and safety of ships at sea

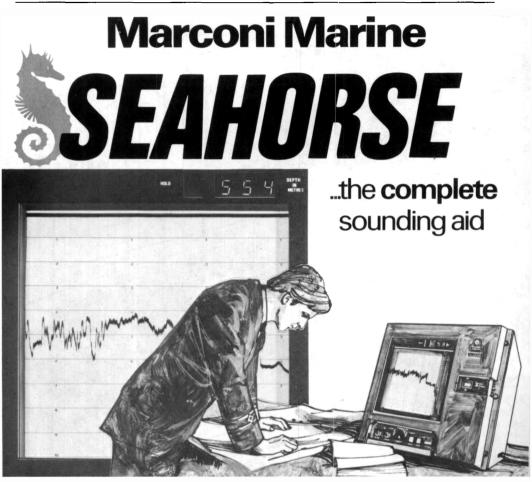
THE DECCA NAVIGATOR COMPANY LIMITED. DECCA RADAR LIMITED. LONDON

State State State

ŹŊ







Marconi Marine's new Seahorse echosounder brings together in one unit *all* the sounding aids required by a navigating officer – a highly accurate chart recorder, a clear digital depth indicator, and a shoaling depth alarm. If required it will also operate large, easy-to-read remote displays on the bridge or in cargo control rooms, with either digital or analogue readouts.

Probably the largest chart display in any navigational echosounder provides excellent resolution at all depths from 0 to 1000 metres. Two ranges – 0 to 100 and 0 to 1000 metres – can be selected manually or automatically. The recorder can be switchec off when not required, leaving the digital readout for continuous monitoring. The depth alarm can be pre-set at any depth down to 999 metres. Audio and visual alerts are activated when the depth shoals below the pre-set level.

High reliability and ease of maintenance are outstanding features of this new echosounder. Seahorse is designed to comply with IMCO (Solas 74) regulations for echosounding, the DTI Marine Echosounder Performance Specification 1972, and all known national requirements.

Marconi Marine navigation

The Marconi International Marine Co. Ltd. Chelmsford Essex England Tel (0245) 61701 Telex 99228 A GEC-Marconi Electronics Company

https://doi.org/10.1017/S0373463300038558 Published online by Cambridge University Press





COMMUNICATION NAVIGATION RADAR SOUND AND TV

BOOKS OF INTEREST ON SHIPPING THE ELEMENTS OF NAVIGATION AND NAUTICAL ASTRONOMY By Charles H. Cotter £16.00 Per post £16.86 THE OIL RIG MOORINGS HANDBOOK By Captain J. Vendrell £3.40 Per post £3.63 **BROWN'S NAUTICAL ALMANAC 1978** £7.20 Per post £8.06 AN INTRODUCTION TO CHARTS AND THEIR USE By M. Chriss and G. R. Hayes £4.20 Per post £4.56 **COMPASS-WISE** or GETTING TO KNOW YOUR COMPASS By J. Klinkert, F.R.I.N. £5.60 Per post £5.92 BROWN, SON & FERGUSON, LTD., 52 DARNLEY STREET, GLASGOW, G4I 2SG

THE INTERNATIONAL HYDROGRAPHIC REVIEW

Half-yearly, 160 pages (approx), 18×27 cm. Price 50 French francs.*

Among the papers of navigational interest in the number of January 1978 are :

- The impact of automation on hydrographic organisations (K. G. BURROWS, M. CALDER)
- Developments in digitising and voice recognition to meet the requirements of hydrography and cartography (J. TOLSON)
- Sound velocity corrections for the North Sea surveyor (R. T. BAILEY)
- The background to IALA buoyage system "A" (J. E. BURY)

PUBLISHED BY THE

INTERNATIONAL HYDROGRAPHIC BUREAU

Avenue Président J. F. Kennedy, Monte-Carlo, Monaco

The Bureau also publishes monthly

THE INTERNATIONAL HYDROGRAPHIC BULLETIN

A bi-lingual journal — English and French — giving news of hydrographic activities worldwide. Lists in detail all new charts published by Member States of the International Hydrographic Organization, and contains an extensive monthly bibliography on Oceanography, Navigation, etc.

> Approx. 30 pages, 21×30 cm, 6 francs per copy*. Yearly subscription : 60 francs.

*30% reductions for naval & merchant marine officers of IHO Member States ordering direct from the Bureau.

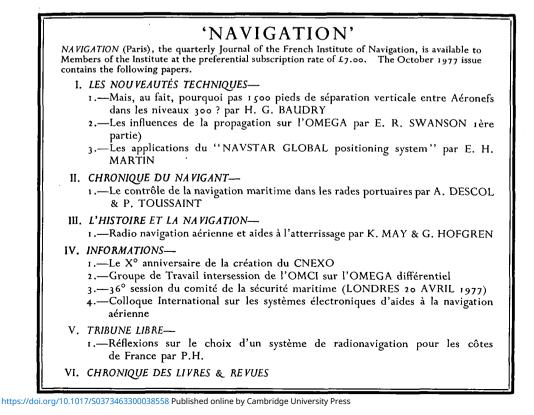


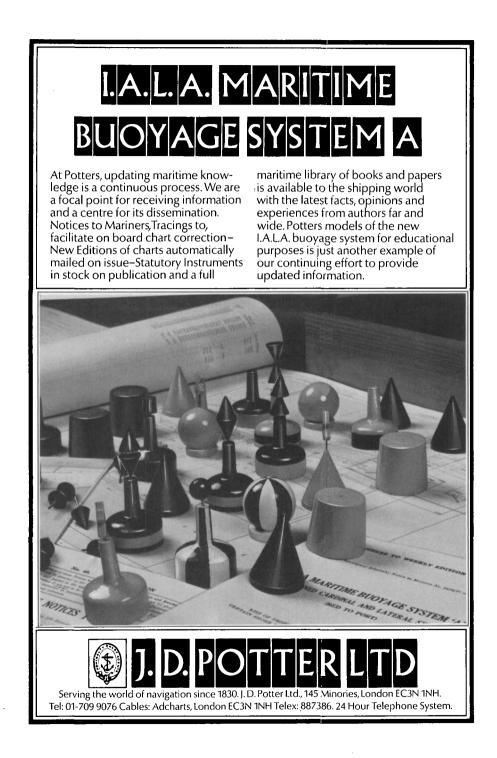
Congratulations to Timothy Severin and the crew of *Brendan* on their historic crossing of the Atlantic. They used HOMER DF.

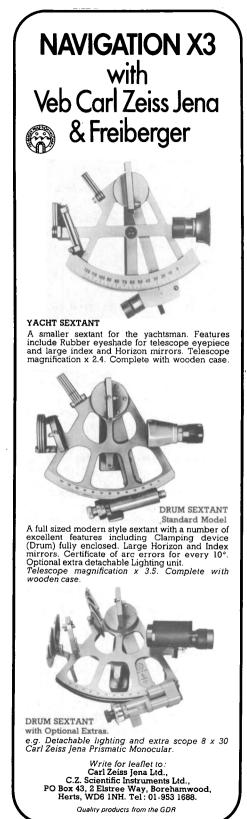
BROOKES&GATEHOUSE LTD

Pioneers and world leaders in electronic instrumentation for yachts Bath Road, Lymington, Hants. Tel: (0590) 74252. Telex 477724 and a branch in the USA. **BROOKES & GATEHOUSE INC**

154 East Boston Post Road, Mamaroneck, New York 10543







https://doi



Institute Notices

COVENANTS

THE Institute is not liable to income tax, and the Inland Revenue authorities will refund to the Institute any income tax that has already been paid on annual contributions, provided they are paid under a seven-year covenant. By agreeing to subscribe in this way Members can give great help to the Institute, at very little trouble and no expense to themselves. The Council therefore hopes that as many Members as possible will undertake to covenant. (Only Members who pay income tax at the full British rate are eligible to pay in this way.)

INTERNATIONAL NAVIGATION CONGRESS 1979

The Royal Institute of Navigation in association with the Member Institutes of the International Association of Institutes of Navigation is organizing an International Navigation Congress to be held at the University of Sussex, near Brighton, from 10-15 September 1979. The theme of the conference is Man and Navigation, a title intended to cover the whole relationship between navigation and society. Navigation is understood to mean navigation by sea and air and in space. Some 40 papers will be presented and it is intended to hold an exhibition concurrently with the Congress on the history of navigation.

MARITIME AND AERONAUTICAL SATELLITE COMMUNICATION AND NAVIGATION

The Electronics Division of the Institution of Electrical Engineers in association with the Institute of Electrical and Electronics Engineers Communications Society, the Institute of Mathematics and its Applications, the Institution of Electronic and Radio Engineers, the Nautical Institute, the Royal Aeronautical Society and the Royal Institute of Navigation is organizing an international conference to provide a forum for reviewing the rapidly-evolving state of development of satellite communication and navigation systems for ships and aircraft. The conference will be held from 7–10 March 1978 at the Institution of Electrical Engineers, Savoy Place, London WC2R OBL, from whom details may be obtained.

SYMPOSIUM ON MARINE TRAFFIC SERVICES

A four-day symposium, of which the Institute is one of the sponsors, organized by the Liverpool Polytechnic is to be held in Liverpool from 3-6 April 1978. In the light of conclusions drawn after the 1976 conference in the Hague, the meeting will examine a whole range of marine traffic problems with particular reference to estuaries and port approaches including collision, communications and training. Further details may be obtained from The Secretariat, Symposium on Marine Traffic Service, c/o Maritime Studies, Liverpool Polytechnic, Byrom Street, Liverpool L3 3AF.