The JOURNAL of THE INSTITUTE OF NAVIGATION

| olume | VII | Number 3 | July 1954 |
|-------|----------------------------------|--|-----------|
| Plo | tting to A | void Collision at Sea re Working Party's Report | 219 |
| | ual Judgme E. S. Calve | ents in Motion | 233 |
| | e National G. E. R. Di | Institute of Oceanography | 252 |
| | e London D. Bower | Capetown Record Flights of 1953 | 262 |
| Sar | ndwaves in R. L. Cloe | the North Sea and Persian Gulf | 272 |
| Th | | nents for Marine Pilotage | |
| | I—The Pilot' L. W. AK | | 280 |
| | II—Some Posi | sible Aids | 283 |
| An | chor Drag | ging pey-Schafer | 290 |
| For | | Refraction Measurements at Low Altitudes | 301 |
| | | not Graphical Sight Reduction? | 304 |
| | | ng Sights with the Douglas Protractor | 306 |
| | Radar | and Collision at Sea | 307 |
| Re | views: The | | 308 |
| | | stward Ho with the 'Albatross' | 313 |
| | | nd the World with 'Galathea' | 314 |
| | Han | sen's Improved Ex-Meridian Tables | 315 |
| Co | rresponde | nce The second s | 316 |
| | | | |

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

JOHN MURRAY (PUBLISHERS) LTD., 50 ALBEMARLE STREET LONDON WI

PRICE SEVEN SHILLINGS AND SIXPENCE

THE INSTITUTE OF NAVIGATION

Patron

H.R.H. THE DUKE OF EDINBURGH, K.G.

OFFICERS AND COUNCIL

President

D. H. Sadler, O.B.E.

Vice-Presidents

Air Chief Marshal the Hon. Sir Ralph Cochrane, G.B.E., K.C.B., A.F.C.

Captain F. J. Wylie, R.N. (ret.)

Hon. Treasurer: Francis Chichester

Chairman of the Technical Committee

Wing Commander E. W. Anderson, O.B.E., D.F.C., A.F.C.

Chairman of the Executive Committee: Captain G. C. Saul

Other Members of the Council

Dr. R. d'E. Atkinson

Captain J. D. F. Elvish, O.B.E.

Squadron Leader D. Bower, M.B.E. Gro

Group Captain E. Fennessy, O.B.E.

Commander A. M. Coleman, O.B.E., D.S.C., R.N. (ret.)

A. H. Jessell

Vice-Admiral Sir Archibald Day, K.B.E., C.B., D.S.O. Captain A.M. A. Majendie Dr. G. E. R. Deacon, F.R.S. Captain G. W. Wakeford, M.B.E.

The directors of navigation at the Admiralty, the Air Ministry and the Ministry of Transport and Civil Aviation are invited to attend meetings of the Council as ex-officio members.

Executive Secretary: M. W. Richey. Assistant Secretary: Miss L. M. A. Tower

The Journal of the Institute of Navigation

The Journal is published quarterly by the Institute and is edited by the Executive Secretary. 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 Journal is free to all members of the Institute. It is sold to the public at seven shillings and sixpence per copy or, by subscription, at thirty-one shillings per annum (post free) and may be obtained through all booksellers and John Murray (Publishers) Ltd., 50 Albemarle Street, London W1. American subscriptions through Transatlantic Arts Inc., Hollywood-by-the-Sea, Florida, at \$1.50 per copy or \$6 per annum (post free).

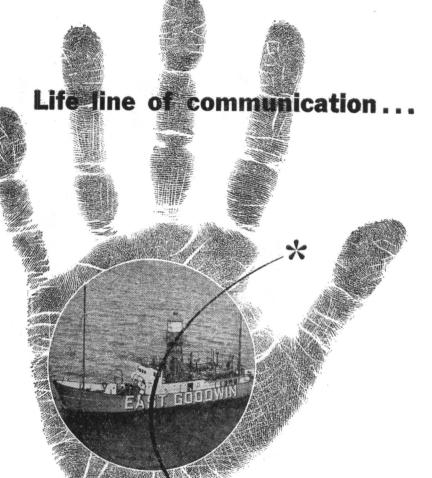
Contributions, which are welcomed from both members and non-members, should be addressed to the Editor.

Enquiries for advertising space should be addressed to the Advertising Manager.

The postal address of the Institute is:

The Institute of Navigation,
at The Royal Geographical Society,
t Kensington Gore, London SW7.

Telephone: Kensington 5021.

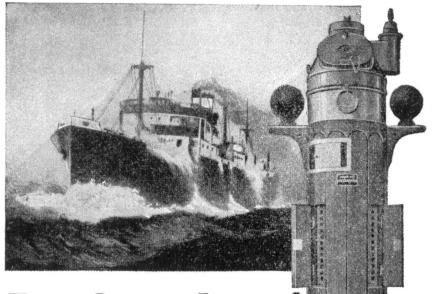


Marconi's fitted the first ship with wireless and by 1907 200 ships and more than 100 shore stations had been equipped. Today practically every vessel that ventures on the high seas carries wireless. All radio approach and marker beacons around the British Isles have been designed and manufactured by Marconi. The mariner is warned of hazards and guided into safe channels by Marconi equipment in nearly every principal shipping lane in the world.

MARINE BEAGONS AND NAVIGATIONAL AIDS

MARCONI

MARCONI'S WIRELESS TELEGRAPH CO. LTD., CHELMSFORD, ESSEX



FULL SPEED AHEAD!

WITH



NAVIGATIONAL INSTRUMENTS

The "HEZZANITH" Patent MARK VII

PROJECTOR BINNACLE AND COMPASS

By means of a series of optical elements an enlarged erect image of a portion of the card covering an arc of 40° in length is produced on a ground glass screen which is viewed in an adjustable plane mirror.

All stray light is effectively screened, and there is a completely unobstructed view of the card from above, permitting the normal use of an azimuth instrument by day or night.

Send for our special Projector Binnacle Leaflet (NJ.53).

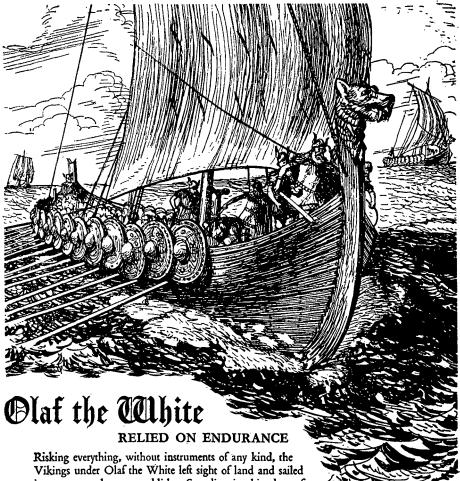
HEATH & COMPANY

(Incorporated with W. F. Stanley & Co. Ltd.)

NEW ELTHAM - LONDON, S.E.9

Phone: ELTHAM 3836

Cables: "Polaris, Souphone, London"



Risking everything, without instruments of any kind, the Vikings under Olaf the White left sight of land and sailed into open sea, later to establish a Scandinavian kingdom of Dublin in the year A.D. 851. Here Olaf ruled for 20 years, making frequent voyages to Scotland and England. This great sailing race, whose "long ships" penetrated to the White Sea, Greenland, North America and South to the Mediterranean, possessed enormous endurance, yet many of their voyages ended in tragedy for want of aids to navigation. Today, science minimises danger and difficulty. BTH Marine Radar, so simple to operate, ensures safe navigation in all weathers.

Write — mentioning this journal
—for descriptive leaflets dealing
with the following———

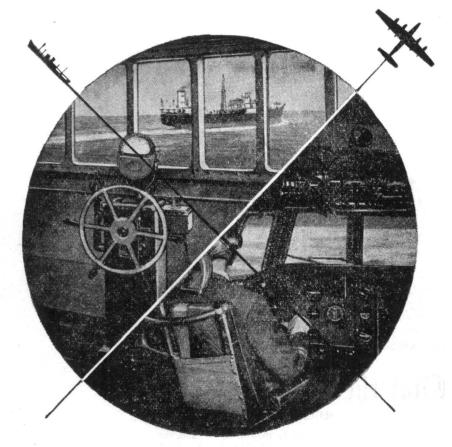
- Adaptability for all types of vessels
- Ease of maintenance
- Range and bearing resolution
- Range performance
- Reliability
- Simplicity of operation

B MARINE RADAR protects the modern mariner

A4638

THE BRITISH THOMSON-HOUSTON COMPANY LIMITED • RUGBY • ENGLAND

Navigation by SPERRY



by Sea - - - or Air

Sperry equipment facilitates accurate navigation along the ocean and air routes of the world, making a notable contribution to efficient operation.

SPERRY Marine and Aeronautical

Compasses and Navigational Equipment

THE SPERRY GYROSCOPE CO LTD. GREAT WEST RD., BRENTFORD, MIDDX.



A Revolutionary Advance in Yacht Compass Design

Clear perspex bowl. Compass card can be read in the vertical position as well as from above. "Circum" single ring magnet gives extreme steadiness in heavy weather. Design allows compass to be mounted on eye level and magnified card image is clearly visible up to ten feet. Two patterns of bracket fitting are available, the pillar pattern "A." for fitting to the coach roof or the bulkhead pattern "B."

(Specify type when ordering). Price 227.0.0

(Specify type when ordering). Price **227.00**"Sestrel" Bearing Sight for use with Sestrel-Moore Compass. **63** 15s.

HENRY BROWNE & SON, LTD.

Sales Dept. & Service Depot:

71 LEADENHALL STREET, LONDON, E.C.3
Telephones: Sales-AVEnue 6060. Service-AVEnue 2156

BARKING, ESSEX

The Use of Radar at Sea

"Undoubtedly as a textbook the work stands alone."—Merchant Navy Journal

"It should find a place in the chart-room bookcase of every radar-fitted vessel and in the private reference library of every navigator."—Journal of the Honourable Company of Master Mariners

"The wording is so clear and simple that it gives the reader confidence." — International Hydrographic Bulletin

"There should be a place for it on the bookshelves of all those who use radar at sea."

---Seafarer

"Whatever happens the book will remain a milestone on the road of radar in its relation to shipping."—Hansa (Hamburg)

"An excellent handbook for the navigator."

—Navigation (Paris)

"One of the very finest books on the subject yet to appear."—Navigation (Los Angeles)

Royal 8vo.

270 рр.

30s.

Published for

THE INSTITUTE OF NAVIGATION

by

HOLLIS & CARTER 25 Ashley Place, London, S.W.I

DIFFERENT SHIPS— DIFFERENT LONG SPLICES

- but only one 'Navigators Insurance'

The obvious and appropriate Company for the insurance of the property and liabilities of all professional and amateur NAVIGATORS.

Founded in 1921 under the chairmanship of the late Admiral Sir John Franklin Parry, K.C.B., The Navigators and General specialise in the Insurance requirements of all who are or were connected with the sea. We have added interest in their insurance problems in that the majority of our executive staff served, at one time, in the Royal Navy or Royal Merchant Navy. We offer impeccable security and are renowned for prompt and generous settlement of claims.

Classes of business transacted include:

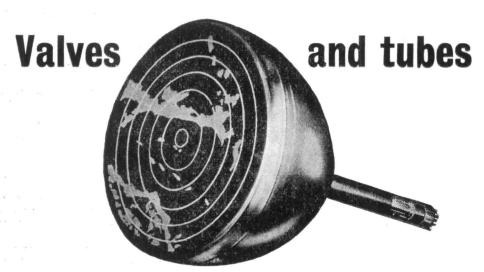
Fire, Accident, Marine
Personal Effects (Ashore, Afloat and Airborne)
Pilot's Public Liability
Navigator's Indemnity (Sea and Air)
Aircraft (Hull and Cargo)

Consult your Broker or write for particulars:

THE NAVIGATORS AND GENERAL

INSURANCE COMPANY LIMITED

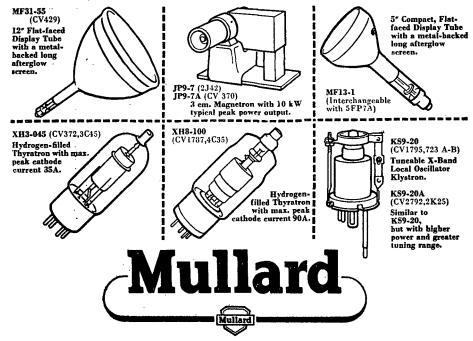
15/16 CULLUM STREET, LIME STREET, LONDON, E.C.3
Telephone: MANsion 2121
Telegrams: Avigatinsu Fen London



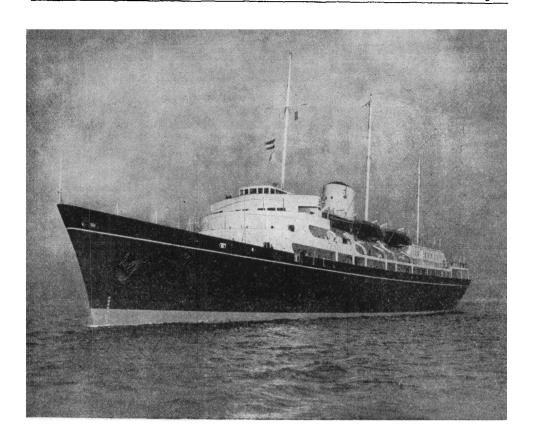
FOR NAVIGATIONAL RADAR

Valves and display tubes specially designed by Mullard for navigational radar are produced with the advantage of vast experience in the manufacture of valves and tubes for television and the many branches of electronics.

All types whose alternative numbers are American are directly interchangeable with their American counterparts and are tested to the same standards. Full technical information, including characteristic curves on the whole series will be gladly forwarded on receipt of your request.



MULLARD LTD - COMMUNICATIONS AND INDUSTRIAL VALVE DEPARTMENT
CENTURY HOUSE _____SHAFTESBURY AVENUE _____LONDON W.C.2
MVT 151 REV.



Her Majesty's Yacht

BRITANNIA

is equipped with



DECCA RADAR LIMITED . LONDON . ENGLAND

D.R.349



Sailing tomorrow! Must get those charts up-to-date

(Kelvin Hughes Chart Correcting Service can correct full outfits speedily)



'Better get the Compass adjusted too'

(Kelvin Hughes craftsmen carry out this responsible work with meticulous care)



'Must get this Sextant repaired before we sail'
(Kelvin Hughes skilled instrument makers repair all marine instruments)

'Get hold of Kelvin Hughes. Their service is first-class'



KELVIN HUGHES

THE TWO GREATEST NAMES IN NAVIGATION

KELVIN & HUGHES (MARINE) LIMITED

99 FENCHURCH STREET

LONDON E.C.3
KHM 45.