

The JOURNAL of THE INSTITUTE OF NAVIGATION

Volume VII

Number 2

April 1954

Continuous Plotting of Position Lines 111

D. H. SADLER

Navigation on the New Zealand Air Race 120

MEMBERS OF THE R.A.F. TEAM

Jean Rotz and the Marine Chart 136

E. G. R. TAYLOR

Methods of Air and Surface Navigation 144

A COMPARISON OF METHODS

Exploration of the Deep Sea 165

G. E. R. DEACON

The Reduction of Sea and Rain Clutter 175

J. CRONEY

A Racon for Reception by Civil Marine Radars 181

C. RANDALL-COOK

A Beacon for Ship Identification 187

A. L. P. MILWRIGHT

Forum: The Accuracy of Astronomical Observations at Sea 195

Navigation and Oceanography 198

Radar and Compass Bearing 200

Radar and Collision at Sea 202

George Margetts 204

The 'Dyoll' and the Bearing-dial 205

Record 209

Reviews: Maps and their Makers 214

Deep Sea Sailing 215

Atlantic Adventurers 215

The Spirit of St. Louis 216

Correspondence 217

THE INSTITUTE OF NAVIGATION

AT THE ROYAL GEOGRAPHICAL SOCIETY

1 KENSINGTON GORE LONDON SW7

JOHN MURRAY (PUBLISHERS) LTD., 50 ALBEMARLE STREET LONDON W1

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.

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,
1 Kensington Gore, London SW7.

Telephone: Kensington 5021.

The MARCONI RADIOLOCATOR IV

has greater
Power!



Power is vital if radar is to pick out all it should in clear, defined detail. That is why the Radiolocator IV has been given the greatest effective radiated POWER of all British Marine Radar Equipment.

This ensures two navigational essentials:

Better target response at long ranges
Target clarity through short range clutter

Radiolocator IV is now in full production and immediately available, so there is no need to have anything less than the BEST.

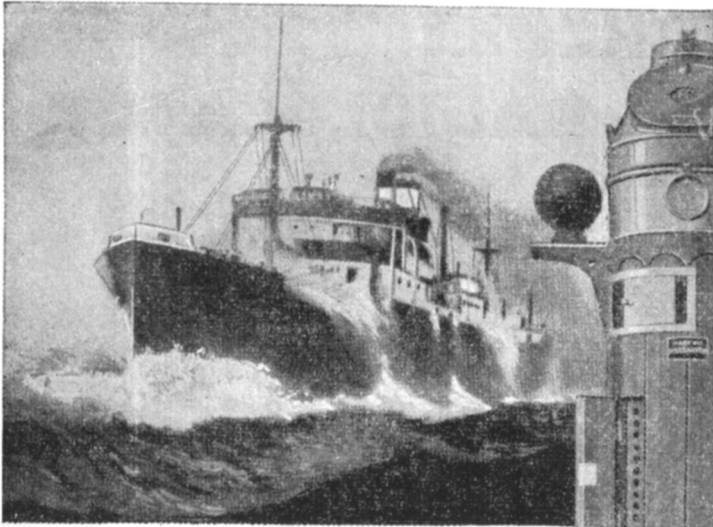
- The first British Marine Radar to have automatic switching of transmitter pulse lengths and receiver bandwidths.
- Automatic self-alignment of scanner and P.P.I.
- Type-tested and approved by Ministry of Transport.
- Rental-maintenance contracts available if desired.

MARCONI Radiolocator IV

with world-wide service in over 200 ports

THE MARCONI INTERNATIONAL MARINE COMMUNICATION CO. LTD.

Marconi House, Strand, London, W.C.2. Tel: TEMple Bar 1577. Grams: Thulium, Estrand, London



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 (N.J.53).*

HEATH & COMPANY

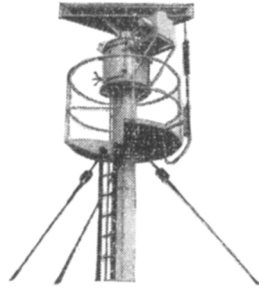
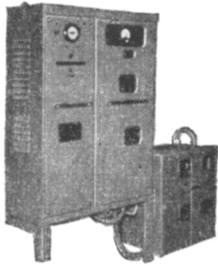
(Incorporated with W. F. Stanley & Co. Ltd.)

NEW ELTHAM - LONDON, S.E.9

Phone : ELTHAM 3836

Cables : "Polaris, Souphone, London"

MARINE RADAR



S.S. "British Sailor" — newest and largest ship of the British Tanker Company's fleet — is equipped with BTH Radar in common with a number of her sister ships.

The performance of BTH Marine Radar has won praise from users in every part of the world. In all types now in production three new features are incorporated — features which contribute still more to the safety and speed of world shipping.

Increased Range

An additional range-scale is now incorporated, providing a maximum range nearly double that previously available.

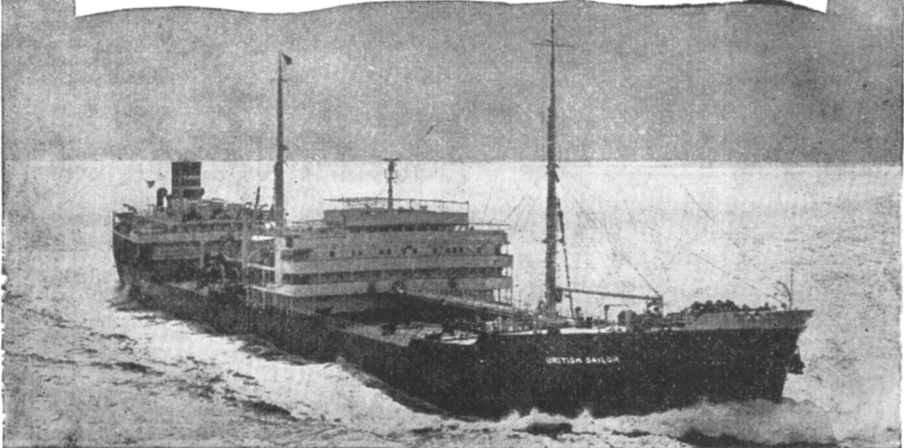
Differentiator Circuit

Minimises "clutter" echoes from snow, rain, or sand particles.

Drift Indicator Device

Allows drift measurements to be made directly with speed and accuracy.

for Britain's Largest Tanker

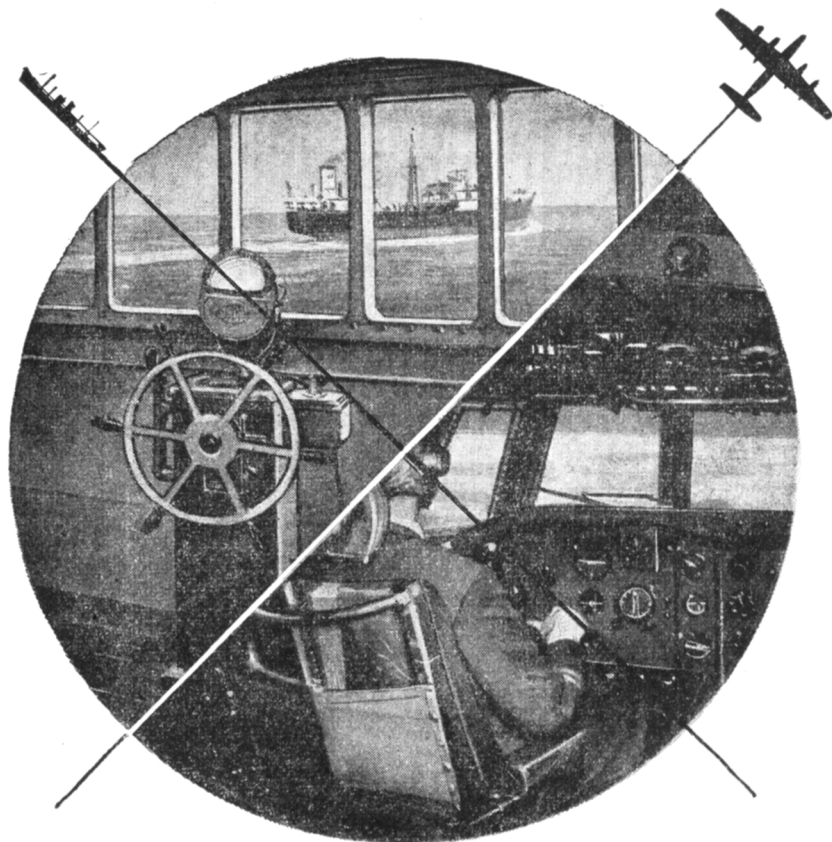


THE BRITISH THOMSON-HOUSTON CO. LTD • RUGBY • ENGLAND

Member of the AEI group of companies

A 4684

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.

THE *Sestrel*
SERVICE COMPASS

For Engineers', Surveyors', and Military use. Recommended to Yachtsmen for taking bearings. Overall diameter 2½".



Price
 complete with
 leather sling case
£11.13.6

Full Particulars from
HENRY BROWNE & SON, LTD.
 71 LEADENHALL STREET, LONDON, E.C.3
 Telephones: Sales AVE 6060 Service AVE 2156
 Head Office: BARKING, ESSEX

Hutchinson's

Published Recently

**MAPS AND
 THEIR MAKERS**

AN INTRODUCTION TO THE HISTORY OF CARTOGRAPHY

G. R. Crone

"No more reliable or more readable short history of maps has yet been published in any language."

7 maps

NEW STATESMAN AND NATION

**PORTS
 AND HARBOURS**

F. W. Morgan

"The book is an excellent general introduction to the subject."

12 maps

THE ECONOMIST

Each volume 8s. 6d. net.

**University
 Library**

**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	Yachts and Motor Boats
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 :

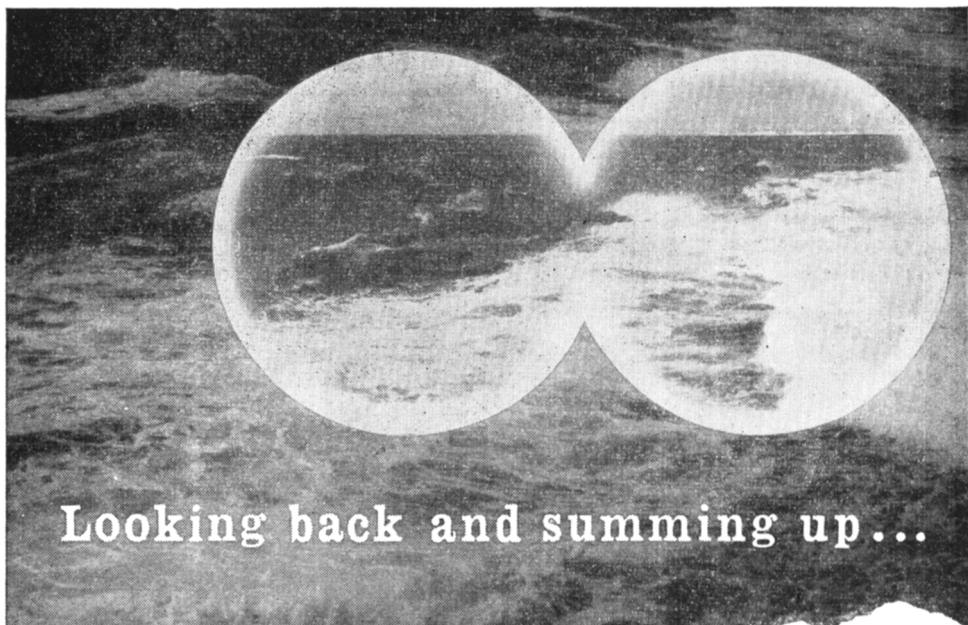
THE NAVIGATORS AND GENERAL

INSURANCE COMPANY LIMITED

15/16 CULLUM STREET, LIME STREET, LONDON, E.C.3

Telephone: MANsion 2121

Telegrams: Avigatinsu Fen London



Looking back and summing up...

Think of navigational radar only a year ago. Suppose for example you were plotting the course of an approaching ship in January, 1953: you had either to transfer your own and her position to a chart; or try to do the job on the face of the tube — which was unsatisfactory in many ways besides parallax.

The Deccaplot put an end to all that in April.

Or take the matter of radar display on the open bridge — either on a small vessel without wheelhouse or on a ship which required an additional display in the open. There simply was not a display to be had that would stand the weather.

The Decca Type 4207 waterproof display supplied the answer to that one in May.

Or — to become a trifle more technical — take the selection of pulse length.

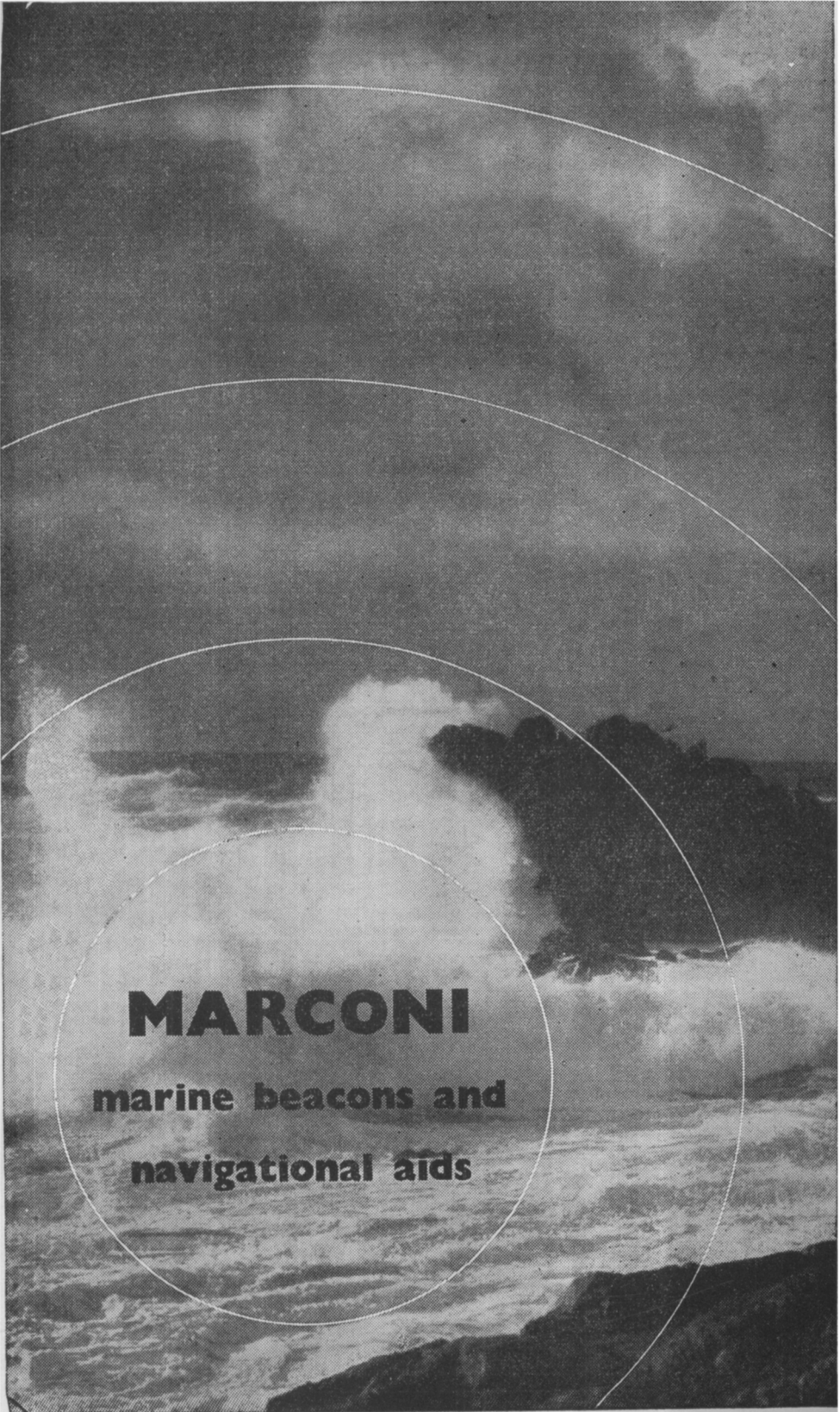
Everyone knew perfectly well that you needed a long pulse (1.0 microsecond) for good painting of poor targets or those at extreme range; and a short pulse (0.1 microsecond) for discrimination. But even the best informed authorities considered that such a combination in one set was not commercially practicable.

Well, in September the Decca 45 appeared with just that ten to one pulse length ratio (h.r.p.), which in combination with a number of other advances in design carried the usefulness of radar as a navigational aid a very long stride forward.

In themselves not a bad year's work . . . Add a new storm warning radar; a new range of instruments for microwave laboratories; an entirely new type of radar landing aid for aircraft; and you have some idea of what we are talking about when we say . . .

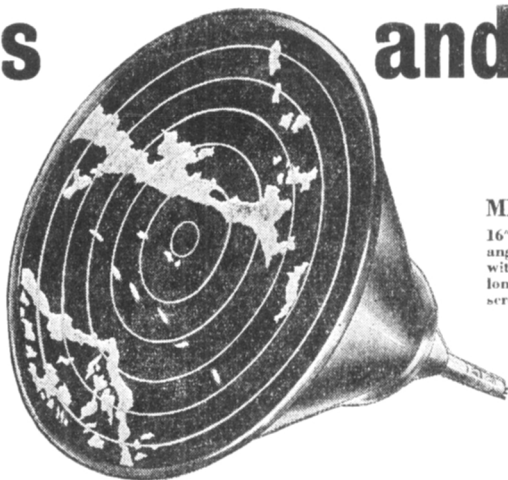
DECCA Radar

shows the way ahead



MARCONI
marine beacons and
navigational aids

Valves and tubes



MF41-15
16" Flat-faced, Wide-angle Display Tube with a metal-backed long afterglow screen.

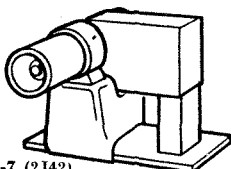
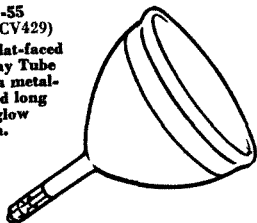
FOR NAVIGATIONAL RADAR

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.

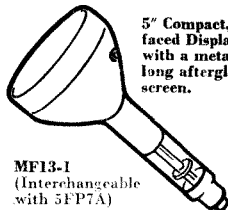
This special radar series has recently been extended by the addition of two new valves, the KS9-20A Klystron and XH3-045 Thyatron. All types whose alternative numbers are American are directly interchangeable with their American counterparts and are tested to the same standards. Full technical information, including characteristic curves on the whole series will be gladly forwarded on receipt of your request.

MF31-55
(CV429)

12" Flat-faced Display Tube with a metal-backed long afterglow screen.



JP9-7 (2J42)
JP9-7A (CV 370)
3 cm. Magnetron with 10 kW typical peak power output.

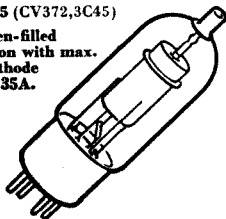


MF13-1
(Interchangeable with 5FP7A)

5" Compact, Flat-faced Display Tube with a metal-backed long afterglow screen.

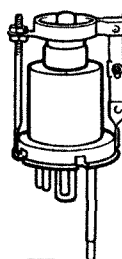
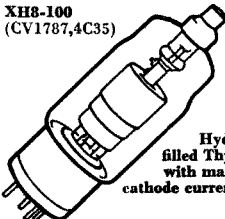
XH3-045 (CV372,3C45)

Hydrogen-filled Thyatron with max. peak cathode current 35A.



XH8-100 (CV1787,4C35)

Hydrogen-filled Thyatron with max. peak cathode current 90A.



KS9-20 (CV1795,732A-B)
Tuneable X-Band Local Oscillator Klystron.

KS9-20A (CV2792,2K25)

Similar to KS9-20, but with higher power and greater tuning range.

Mullard



MULLARD LTD · COMMUNICATIONS AND INDUSTRIAL VALVE DEPARTMENT
CENTURY HOUSE ———— SHAFTESBURY AVENUE ———— LONDON W.C.2

MVT 151A

The Elements of Navigation

By C. H. COTTER, M.I.N., F.R.A.S., M.B.A.A., M.S.N.R.

A very thorough treatment of the principles of navigation, in six parts, covering Mathematics, the Sailings, Coastal Navigation, General Astronomy, Nautical Astronomy and Instruments. A knowledge of elementary algebra and geometry is assumed, but trigonometry is explained from the start. A generous measure of examples and worked solutions is given throughout the text and exercises are given at the end of most chapters. For naval cadets and all students of sea navigation.

40/- net.

SIR ISAAC PITMAN & SONS LTD.

Parker Street, Kingsway, London, W.C.2.

**OF PROVEN
RELIABILITY**

Brown — SUBSIG

**COMPASS
EQUIPMENT** **ECHO SOUNDING
EQUIPMENT**

TYPE A2 BINNACLE

SUBSIG INDICATOR

SUBSIG RECORDER

Brown Gyro Compass Equipment, known throughout the world and installed by many of the foremost shipping companies, offers the most reliable method of safe navigation—and the most economical.

Subsig Echo Sounding Equipment is available in both recorder and indicator models. For complete confidence in the navigation of inshore waters more and more owners are fitting SUBSIG.

S. G. BROWN LTD.

SHAKESPEARE STREET, WATFORD, HERTS

Telephone:
WATFORD 7241

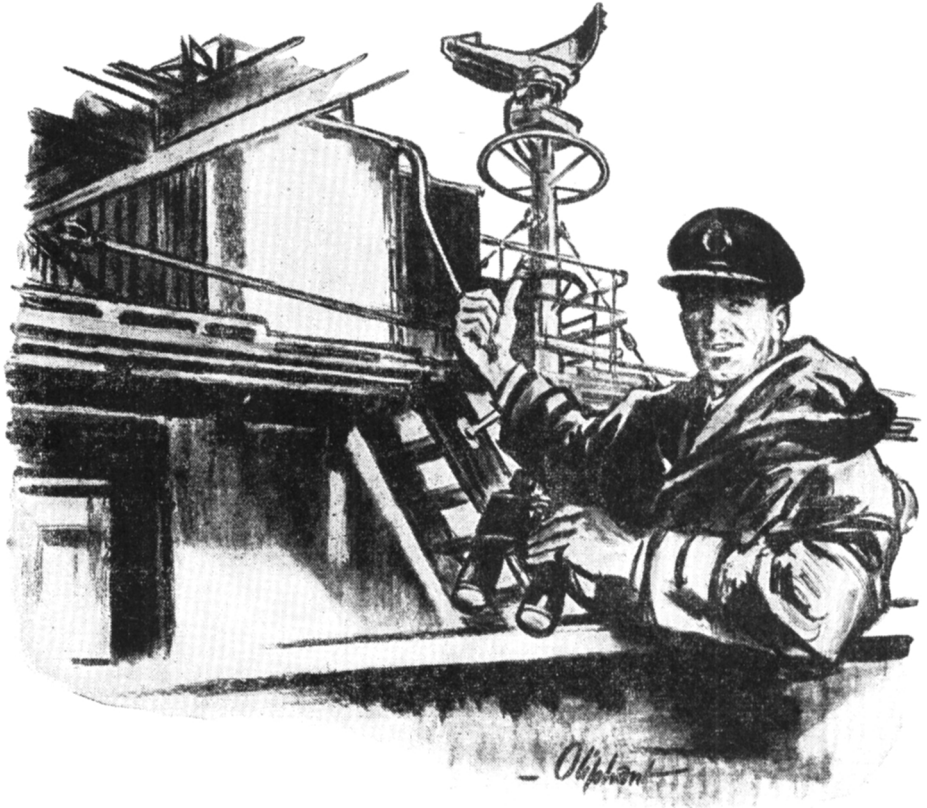
Telegrams:
SIDBROWNIX, WATFORD

**THE SUBMARINE SIGNAL CO.
(LONDON) LTD.**

SHAKESPEARE STREET, WATFORD, HERTS

Telephone:
WATFORD 7241

Telegrams:
SUBMARINOS, WATFORD



The NEW RADAR with a 50 MILE searcher scale

Maintaining leadership in development of scientific aids to navigation Kelvin Hughes introduce the new Type 2c Marine Radar, which provides higher standards in all-round performance than ever before.

OUTSTANDING FEATURES

Range *The well-known technical advantages of Kelvin Hughes Tilted Parabolic Cylinder Scanner are combined with more powerful transmission technique. The scale range is extended so that suitable targets within a 50 miles radius can be displayed on the 12" diameter P.P.I. screen.*

Definition *The high definition associated with Kelvin Hughes radar display is outstanding on all ranges. Bearing discrimination of 1.3° is achieved with Type 2c.*

Reliability *Least possible number of expendable components, low working voltage of units, and high safety factor in all insulation, ensure maximum trouble free working hours.*

Economy *The new high standards of all-round radar performance achieved with Kelvin Hughes Type 2c equipment are offered with no increase in current prices.*



KELVIN HUGHES
THE TWO GREATEST NAMES IN NAVIGATION
TYPE 2C RADAR

KELVIN & HUGHES (MARINE) LIMITED, 99 FENCHURCH ST., LONDON, E.C.3