

Any way, this is true

Most people keep anti-collision watch with a head-up radar presentation. When a true bearing is needed, they shift to north-up, and back again . . . if they remember. With 'Radiolocator' you needn't change the presentation. The electronic bearing indicator is *a/ways* stabilised, so your bearings are true. It's simpler and safer.

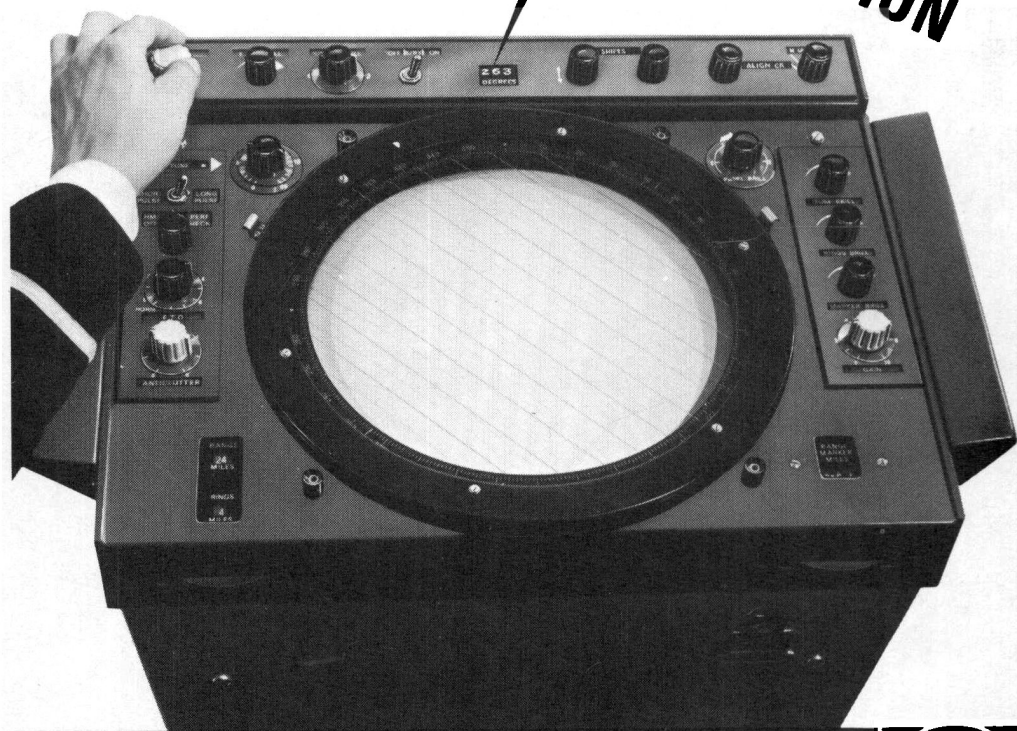
Simplicity is the keynote of the solid-state 'Radiolocators'. All normal radar facilities are standard; and a wide choice of options includes 12- or 16-inch display, True Motion, reflection plotter, dual displays and full or partial inter-switching of dual installations. Dependable, workaday radar. And at the right price.

RADIOLOCATOR

designed throughout for simplicity
and reliability

**263
DEGREES**

**WITH
INTERFERENCE
SUPPRESSION**



Marconi Marine radar

The Marconi International Marine Co. Ltd.

Chelmsford Essex England

Tel (0245) 61701 Telex 99228 · A GEC-Marconi Electronics Company



1972



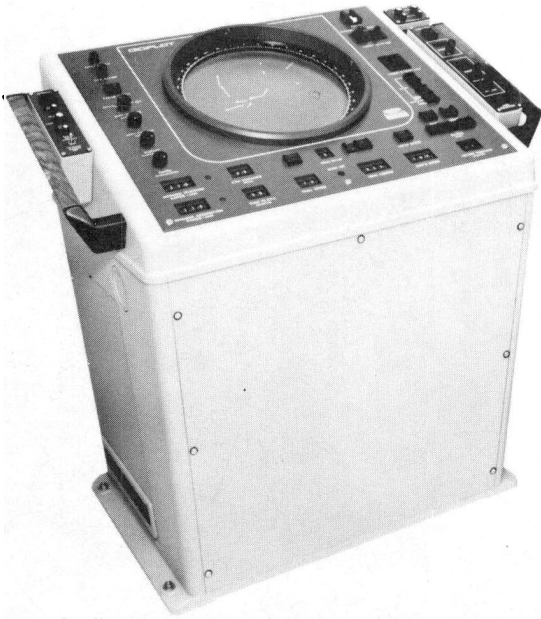
COMMUNICATION
NAVIGATION
RADAR
SOUND AND TV

COLLISION AVOIDANCE with

DIGI PLOT[®]

FULLY AUTOMATIC RADAR PLOTTING AID

COMPARE



More than 275 DIGI PLOTS are at sea totalling over 1000 ship years of experience.

- **COMPUTATIONAL ABILITY**
Most powerful micro-programmed computer designed specially for marine application. Not a limited performance microprocessor on a "chip".
- **REQUIRED TRAINING**
Uses familiar radar vector display and controls. *No computer code inputs required.*
- **TRACKING PERFORMANCE**
Target response and accuracy not affected by range scale, bearing or number of targets.
- **TARGET ACQUISITION**
Manual or FULLY automatic with NO guard ring operational limitations.
- **RELIABILITY**
Closed cooling system eliminates salt air corrosion. 100% production thermal and vibration tested to fully meet RTCM specifications. Every unit is factory operated for 200 hours at 140° F (60° C).
- **EQUIPMENT WARRANTY**
No Cost service for two years after acceptance including all parts, labor and worldwide travel *without* any port or mileage restrictions.



SYSTEMS DESIGNED FOR SAILORS

IOTRON CORPORATION, 5 Alfred Circle, Bedford, Mass., 01730 USA Telephone (617) 275-0340 Cable: Iotron Boston Telex: 92-3426

THE INTERNATIONAL HYDROGRAPHIC REVIEW

Half-yearly, 160 pages (approx.) 18 × 27 cm. Price 65 French francs

Among the papers of interest in the January 1980 issue are:

- Hydrography and navigation
(L. OUDET)
- Definition of the seabed in navigation routes through mud areas
(R. KIRBY, W. R. PARKER, & W. H. A. VAN OOSTRUM)
- WRELADS: The Australian laser depth sounding system
(M. CALDER)
- Processing of tidal records at Hout Bay Harbour
(C. L. MERRY)

PUBLISHED BY THE
INTERNATIONAL HYDROGRAPHIC BUREAU
B.P. 345 - MC - MONACO

The Bureau also publishes monthly

THE INTERNATIONAL HYDROGRAPHIC BULLETIN

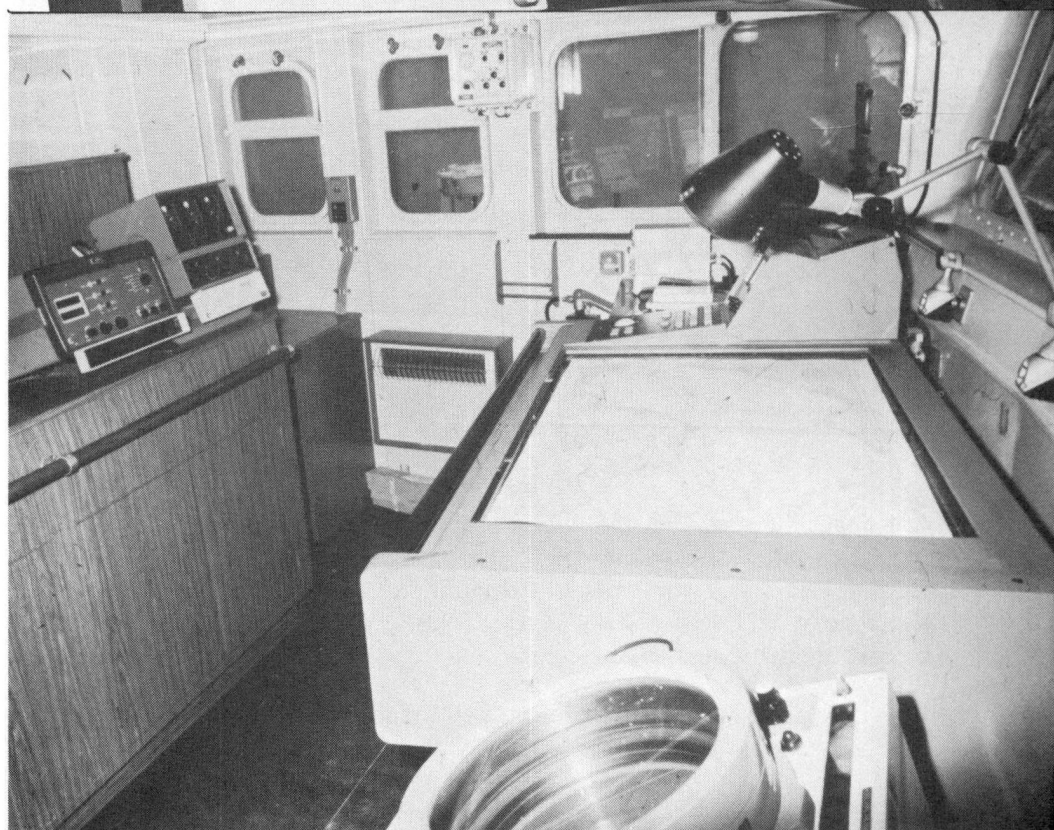
A bilingual journal - English and French - giving news of hydrographic activities worldwide. Lists in detail charts published by Member States of the International Hydrographic Organization, and contains a selective bibliography of recent works in the fields of hydrography, descriptive oceanography,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

Approx. 30 pages, 21 × 30 cm, 8.50 French francs per copy*
Yearly subscription: 85 French francs*

* *Postage extra in all cases*

DECCA

for the greater efficiency
and safety of ships at sea



THE DECCA NAVIGATOR COMPANY LIMITED. DECCA RADAR LIMITED. LONDON

(iv)



(v)

'NAVIGATION'

NAVIGATION (Paris), the quarterly Journal of the French Institute of Navigation, is available to Members of the Institute at the preferential subscription rate of £7.00. The October 1979 issue contains the following papers.

I LES NOUVEAUTES TECHNIQUES

- 1 Nouveau D.M.E. de précision par M. SCHILLINGER (Thomson-LMT)
- 2 L'instrumentation électronique dans l'aviation civile par F. MUSZYSKI (Compagnie Nationale Air France)
- 3 La gyrométrie optique et la relativité par P. SCHNERB
- 4 Logiciel et équipement d'avionique par R. BOUDAREL (CIMSA)

II LA CHRONIQUE DU NAVIGANT

- 1 Les collisions maritimes – Etudes statistiques (2^e partie) (IRT)
- 2 Automatisation de l'information de position dans le chenalage par M. HAMER
- 3 Des Ephémérides aux Epétides par M. EYRIES
- 4 Traitement, départ et visualisation de l'information météorologique par M. HOLLER (Thomson CSF)
- 5 Comparaison de différents schémas du trafic en Manche par T. DEGRE & X. LEFEVRE (Sté Orion)
- 6 Les problèmes de navigation des aéroglisseurs amphibies – Les solutions actuelles par C. V. CERBELAUD

III INFORMATIONS

- 1 Compte-rendu d'une visite au Salon de l'Aéronautique et de l'Espace (Le Bourget 8–17 juin 1979)
- 2 Premières impressions du Congrès International des Instituts de Navigation (Brighton 10–14 septembre 1979)
- 3 Démonstration à la mer sur l'omega différentiel (Marseille 20 juin 1979)
- 4 Extraits du Journal Officiel du 25/6/79 – C.R. d'une réponse du Ministre des Transports
- 5 Le nouveau moyen de transport hydroptère 'Sea Jet'

IV CHRONIQUE DES LIVRES & REVUES

'NAVIGATION (USA)'

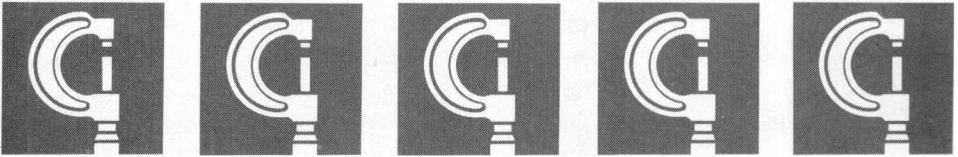
Navigation, the quarterly Journal of the American Institute of Navigation, is available to Members of the Institute at a reduced subscription of £5.00 a year. Volume 26, No. 1 (Spring 1979) contains the following papers.

Compression of Ephemerides by Discrete Chebyshev Approximations <i>A. Deprit, H. Pickard and W. Poplarchek</i>	1
Navstar Field Test Results <i>D. W. Henderson and J. A. Strada</i>	12
Navigation, the Government and Industry: an Ancient Partnership <i>Hans Mark</i>	25
Application of Electronic Positioning and Navigation to Ground Combat <i>W. Hicks</i>	31
The Role of Navigation Satellites in Oil Exploration <i>J. G. Morgan</i>	37
Driru II Standard High Accuracy Inertial Reference Unit for Spacecraft through the 1980's <i>J. W. Ritter and R. B. Irvine</i>	44
A Completely Programmable Method of Celestial Navigation <i>C. T. Daub</i>	59
The use of Transit for Time Distribution <i>R. E. Cashion, W. J. Klepczynski and K. Putkovich</i>	63
A New Method for Plotting the Position Line: The Golem Solution <i>E. Gradsztajn</i>	
The Institute's Professional Forum <i>G. Gebel, H. D. Black and R. Huenemann</i>	
The Institute's Professional File	

Accuracy is one thing.



Repeatability is another.



Decca Survey positioning systems give you the best of both worlds

Offshore, time is money. Imprecise knowledge of your position relative to a known datum can be a costly business.

Decca Survey positioning systems will make two invaluable contributions to the cost-effectiveness of your project. They will tell you precisely where you are offshore. And they will enable you to return rapidly, time and time again, to a given location.


Trisponder is the system which is widely used for positional control in such projects as port and harbour development, dredging operations, and ships' speed and manoeuvring trials. A portable microwave system giving ranges up to 80km with an optimum accuracy of ± 3 metres, Trisponder is available in Standard and Multi-Channel versions (the latter for use in confined waterways such as fjords or deltaic regions) and in a Short-Range version for river applications. All versions offer the option of time-sharing for multi-user operation. A derivative of the system, known as Decca Flagman, is used for high-accuracy track-guidance of aircraft in agricultural, search-and-rescue, and aerial survey applications.

Hi-Fix/6 is extensively used in hydrographic surveying by naval and civil authorities, as well as the offshore hydrocarbon industries throughout the world. This highly-flexible medium-range phase-comparison system provides precise position control to an accuracy of within a few metres. A chain

consists of a prime transmitting station and from two to five secondary stations, all designed for unattended operation. The ruggedly-packaged Hi-Fix/6 receiver incorporates monitor and alarm facilities, enabling equipment faults to be rapidly localised to a single replaceable printed circuit board, readily accessible behind the hinged front panel.

Sat-Fix JMR satellite receivers, which are available in various versions for geodetic and marine survey operations, combine one-man portability with precision. The receivers record, on tape cassettes, data from orbiting satellites. These data are processed by a digital computer or microprocessor to give accurate position in three dimensions anywhere in the world. The Sat-Fix JMR-1A represents a significant advance in ultimate accuracy, offering a rapid convergence of data to sub-metre levels in point positioning. The Sat-Fix JMR-3 has a built-in microprocessor for on-site position determination; the Sat-Fix JMR-4 may be used interchangeably on land or sea without modification or program change.

Decca Survey positioning systems may be integrated with the Company's data-handling systems to provide a complete survey package. For full details contact the Sales Department at the address below.

 **DECCA SURVEY GROUP**
precision survey systems

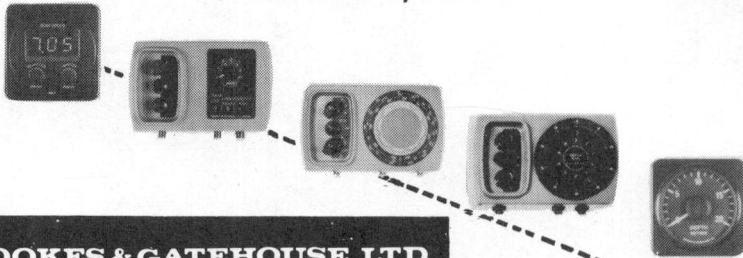
DECCA SURVEY LIMITED KINGSTON ROAD LEATHERHEAD SURREY KT22 7ND TELEPHONE: LEATHERHEAD 76971 TELEX: 928437

(vii)

BROOKES & GATEHOUSE

welcome the yachts competing in
the Cape to Punta del Este race

Yachts sailing from the Cape to
Punta del Este and on to Europe
and fitted with Brookes &
Gatehouse navigational
instruments will find a Service
wherever they sail.



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 U.S.A.

BROOKES & GATEHOUSE INC

154 East Boston Post Road, Mamaroneck, New York 10543

AUTUMN TITLES— OUR FOUR MOST FOREMOST

ELEMENTARY BEAM THEORY AND THE SHIP GIRDER

The technology of loading and discharging ships for students, deck officers, and marine superintendents.

By G W White Extra Master BA

£4.95

MARINE STATISTICS THEORY AND PRACTICE

For sea-going officers, managers and researchers.

E M Goodwin Msc PhD MRIN MIS,

J F Kemp PhD Extra Master FRIN

£12.50

PARALLEL INDEXING TECHNIQUES

Answering a real need in navigation training.

Capt I Smith and Capt R A Mulroney

£1.95

TWENTY SINGING SEAMEN

Prize winning short stories of the inherent drama of life at sea — and its funny side too.

£3.95

*All are available from your bookseller, or direct (enclosing 75p each p&p)
from the publisher — ask for our professional leaflet too.*

STANFORD MARITIME

12-14 Long Acre, London WC2E 9LP 01-836 7863

BOOKS OF INTEREST FOR ALL WHO GO TO SEA

DOWNSTAIRS IN THE ROYAL NAVY

By Lt. Comm. W. B. HARVEY

£3.50

Per post £3.75

WORKED EXAMPLES IN RADAR PLOTTING

By I. W. BAGSHAW B.Sc. Master Mariner M.N.I.

£5.00

Per post £5.69

MAGNETIC COMPASS DEVIATION AND CORRECTION

By W. DENNE Revised by Capt. A. N. COCKCROFT

£6.60

Per post £7.30

HARBORD'S GLOSSARY OF NAVIGATION

Revised by C. W. T. LAYTON

£6.60

Per post £7.30

BROWN'S NAUTICAL ALMANAC, 1980

£10.50

Per post £11.65

BUSINESS AND LAW FOR THE SHIPMASTER

By F. N. HOPKINS M.R. Inst. Nav. (Extra Master)

£12.00

Per post £13.15

MERCHANT SHIP CONSTRUCTION

By H. J. PURSEY (Extra Master)

£8.00

Per post £9.10

MERCHANT SHIP STABILITY

By H. J. PURSEY (Extra Master)

£8.40

Per post £9.10

LIQUIFIED PETROLEUM GAS TANKER PRACTICE

By Capt. T. W. V. WOOLCOTT

£10.80

Per post £11.50

STOWAGE: THE PROPERTIES AND STOWAGE OF CARGOES

By Capt. R. E. THOMAS Revised by Capt. O. O. THOMAS (Master Mariner)

£14.00

Per post £15.15

BROWN, SON & FERGUSON, LTD

52 Darnley Street, Glasgow, G41 2SG

Magnavox Satnav Reliability Proven.

We've been talking about the inherent reliability of the Magnavox MX1102 Satellite Navigators for quite some time. But now, we've got some hard numbers that are worth a thousand words.

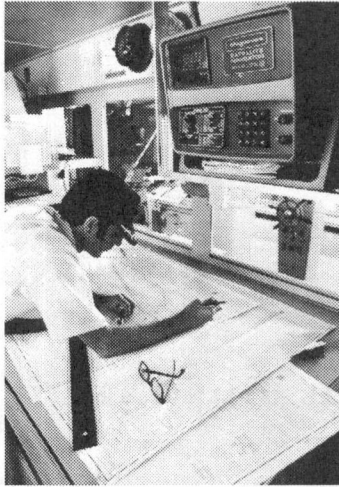
Over 6,442,690 Hours In Service.

All the planning, designing and engineering in the world cannot tell you exactly how a piece of electronic hardware will perform on the job. Neither can the most exhaustive lab testing. But more than six million hours of in-service performance data have demonstrated the reliability we designed into the MX1102 at the outset. Our "claims" of reliability are now substantiated.

Over 23,500 Hours Mean Time Between Failures.*

Incredible but true. The MX1102 has set records for reliability that other manufacturers can't touch. Because our MTBF has been established aboard ships at sea, you can have confidence that your MX 1102 will operate reliably for years. No amount of electronic wizardry or wishful thinking could replace "in-the-field" performance. And that's precisely where the MX 1102 has shown its true colors.

*Documentation available upon request.



New 24-Month Warranty.

Claims of reliability, even when substantiated with hard facts, can appear empty unless a manufacturer is willing to "put its money where its mouth is." And that's exactly what we've done. We've boldly doubled the warranty on MX1102-NV, and MX1112 Satellite Navigators — now 24 months from date of installation or 30 months from the date of shipment, whichever occurs first, including parts and labor at any of our 27 service depots throughout the world.

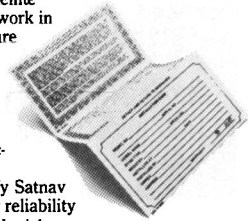
Technology That Keeps On Working.

Reliability translates into hard cash when you're managing a fleet. And when a proven product comes along that's backed up by

the most extensive satellite navigation service network in the world, the results are impressive. That's why there are more Magnavox Satnav systems currently in operation than from all other manufacturers combined!

So before you specify Satnav for your ships, look for reliability that's been proven on the job.

That's reliability you can bank on. Magnavox Government and Industrial Electronics Co., 2829 Maricopa St., Torrance, Calif. 90503, (213) 328-0770, Telex: 696101, Cable: MAGNAMAR.



**More Magnavox Satnav
systems are currently in operation
than from all other manufacturers combined.**

Magnavox
Magnavox Government and Industrial Electronics Company

(X)

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 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	£17.00
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.

Printed in Great Britain at the University Press, Cambridge