

Forrest Irving Library  
MAR 7 1935  
University of New Brunswick

# THE INTERNATIONAL HYDROGRAPHIC REVIEW



**INTERNATIONAL HYDROGRAPHIC BUREAU  
MONACO**

Vol. LXII No 1

N° 116 OF THE SERIES

JANUARY 1985





Recently published by the International Hydrographic Organization :

## The 1985 Edition of the **YEARBOOK**

OF THE INTERNATIONAL HYDROGRAPHIC ORGANIZATION  
(PP-05)

containing particulars about Hydrographic Services throughout the world,  
together with details about the scope of their work.  
This invaluable reference work also features particulars about the partici-  
pation of the fifty two maritime nations whose Governments are Members  
of the International Hydrographic Organization.

Price : 55 francs

### **LIST OF IHO PUBLICATIONS**

1985 edition  
English & French versions.  
Free.

### **BP-0004 : INFORMATION CONCERNING RECENT BATHYMETRIC DATA**

List No. 14, bilingual,  
with data on 45 cruises.  
Published Nov. 1984, 40 pp.  
Price : 25 francs.

**This publication is  
available in microform  
from University  
Microfilms  
International.**



Please send information about these titles:

\_\_\_\_\_

Name \_\_\_\_\_

Company/Institution \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_ Zip \_\_\_\_\_

Phone (       ) \_\_\_\_\_

Call toll-free 800-521-3044. In Michigan,  
Alaska and Hawaii call collect 313-761-4700. Or  
mail inquiry to: University Microfilms International,  
300 North Zeeb Road, Ann Arbor, MI 48106.

Some Special Publications of the  
INTERNATIONAL HYDROGRAPHIC ORGANIZATION :

# HYDROGRAPHIC DICTIONARY

(THIRD EDITION)

Special Publication No. 32

A dictionary containing definitions of over 5,600 current technical terms. In its bilingual version has full definitions in both English and French.

Price : 70 francs (English/French)  
45 francs (English only)

NEW ISSUE :

*English-Spanish Supplement to the Hydrographic Dictionary*, 3rd edition 1974 (Translation of only the terms in the Dictionary) — *Suplemento inglés-español al Diccionario Hidrográfico*, 3ª edición 1974 (Traducción de los solos términos del Diccionario).

Price : 70 francs.

## PRECISE POSITIONING SYSTEMS FOR HYDROGRAPHIC SURVEYING

(S.P. 39 - Series 1977)

Similar to the earlier edition of SP 39, but in a radically different format and pertaining to the more recently developed radiolocation systems. Sections are individually bound and of about 20 pages each.

At present on issue are :

Chapter I : Basic Information — Standard Test Procedures.

Chapter II : Radio systems.

1. Hi-Fix/6; 2. Raydist-76; 3. Mini-Ranger; 4. Trisponder; 5. MRD 1; 6. Syledis B;
7. Trident III; 8. Artemis; 9. Argo.

Price : 15.00 francs per section.

\*\*

## RADIO AIDS TO MARITIME NAVIGATION AND HYDROGRAPHY

(S.P. 39 - 2nd Edition, 1965 - reprinted 1969 - superseded 1977)

Contains information concerning the use of radioelectric systems as applied to ordinary navigation as well as to hydrographic surveying.

The following subjects are treated.

1. The spectrum and propagation of electromagnetic waves.
2. Radio systems used in marine navigation : Radio direction-finding, Loran, Decca, Consol, Radar and Omega.
3. Radio systems used in hydrographic surveying : Sea-Fix, Toran.
4. Computation and plotting of hyperbolic lattices : the methods used by various Hydrographic Offices (Denmark, France, U.S.A., Sweden, Netherlands, United Kingdom).
5. Electromagnetic systems in geodetic surveying : General aspects and use of radio positioning systems, Aga geodimeter.

Price : Section 1, 10 francs; the others, 20 francs each whilst stocks last.



THE INTERNATIONAL HYDROGRAPHIC ORGANIZATION  
an intergovernmental organization  
also publishes the

# INTERNATIONAL HYDROGRAPHIC BULLETIN

(PP-03)

A monthly journal published by the International Hydrographic Bureau for the benefit of the world hydrographic community, in a bilingual edition (English and French), 21 × 30 cm in size, with an average of 45 pages per issue, and comprising :

**SECTION I** — News from Hydrographic Offices; Appointments of Hydrographers; New Membership of the IHO; Reports on various international commissions and committees; Training programmes in hydrographic surveying; Recent developments in hydrographic instrumentation; Operational assessments of equipment; Work being undertaken by the Bureau; Work on the General Bathymetric Chart of the Oceans and the International Set of Charts. Also covered are development and research in the field of hydrography, descriptions of new survey vessels and progress in standardization of charts. "From the Chartroom": notes on charts and nautical documents recently added to our world-wide collection.

**SECTION II** — Reports on hydrographic surveys carried out, or planned for the future, by various countries.

**SECTION III** — Listing of new charts and new editions published by Member States, with their reference number, title, limits, scale and date of publication. Charts and new editions in preparation are also listed.

Status catalogue of International Charts in the International Set of Charts, with their International reference number, title, limits, scale, date of publication, and the names of the producer and any printer nations.

Publication and new editions of Sailing Directions, Lists of lights, Tide and Current Tables, Radio Signals, Radio Aids to Navigation, Chart Catalogues.

**SECTION IV** — Lists of selected recent publications and articles concerning hydrography and allied disciplines.

Reviews of some recent publications of particular interest to Hydrographers.

The **International Hydrographic Bulletin** is distributed free to the Hydrographic Office of governments belonging to the International Hydrographic Organization.

It is also available for sale to the public on yearly subscription (price 135 French Francs) or per copy (13.50 French Francs) plus postage.

For updating of national chart catalogues, **Section III** is available separately : yearly subscription 70 F.F.; single issue 7 F.F., plus postage.

---

## Conditions of sale of International Hydrographic Bureau Publications

Prices are quoted in French Francs. IHB invoices will be expressed in French Francs or in US \$ at current exchange rates, as appropriate. Packing and postage or shipping expenses will be added to invoices.

Payments may be made to the International Hydrographic Bureau by bank transfer or by cheque.

No credit can be allowed on unwanted publications unless returned immediately.

Orders can be sent either to a bookseller or direct to :

International Hydrographic Bureau, B.P. 345, Avenue Président J.F. Kennedy,  
MC 98000 MONACO, Principality of Monaco.

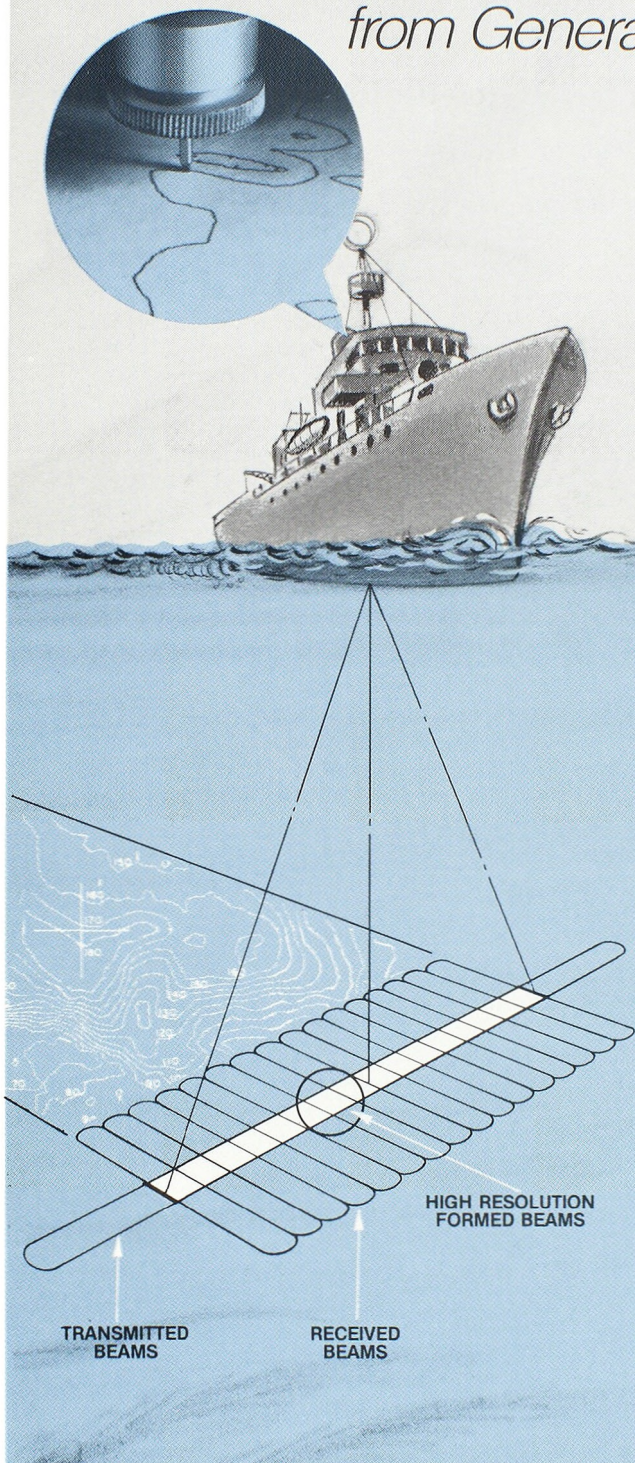
Teleph. : (93) 50.65.87 — Teleg. : BURHYDINT, Monaco

Telex : (France) 479164 MC-INHORG

from General Instrument...

# SEA BEAM

... the only system  
for contour mapping of  
the deep ocean bottom ...  
**IN REAL TIME.**



Sea Beam is a high-resolution bathymetric survey system which processes soundings from 16 formed beams positioned perpendicular to the ship's axis to generate bottom contour charts in real time.

Sea Beam's multiple sonar beams cover a continuous swath of the ocean bottom equal to 80 percent of the depth. Operating depth range is from 150 feet to over 30,000 feet.

General Instrument Corporation is the world's foremost producer of multi-beam bathymetric survey systems. The Sea Beam system has evolved from 15 years of technological growth in system techniques. Multi-beam sonar systems have been produced for the U.S. Navy, the National Oceanic & Atmospheric Administration and oceanographic agencies of other governments.

For further information on Sea Beam, contact Government Systems Division, General Instrument Corporation, Southwest Park, Westwood, MA 02090 (617) 326-7815.

## GENERAL INSTRUMENT



*from General Instrument...*

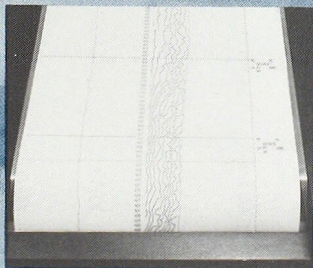
HYDRO CHART

BATHYMETRIC

SWATH

SURVEY

SYSTEM



**REAL TIME, high resolution bottom contour mapping... to depths of 2000 feet!**

Contour charts are generated by means of soundings from 21 contiguous, 5° beams positioned perpendicular to the ship's axis. The multiple-beam pattern covers a swath of the bottom equal to 2.5 times the vertical depth to 800 feet, and a swath equal to the depth to 2000 feet. The system can be adjusted to produce full

bottom contours, or only shoaling contours.

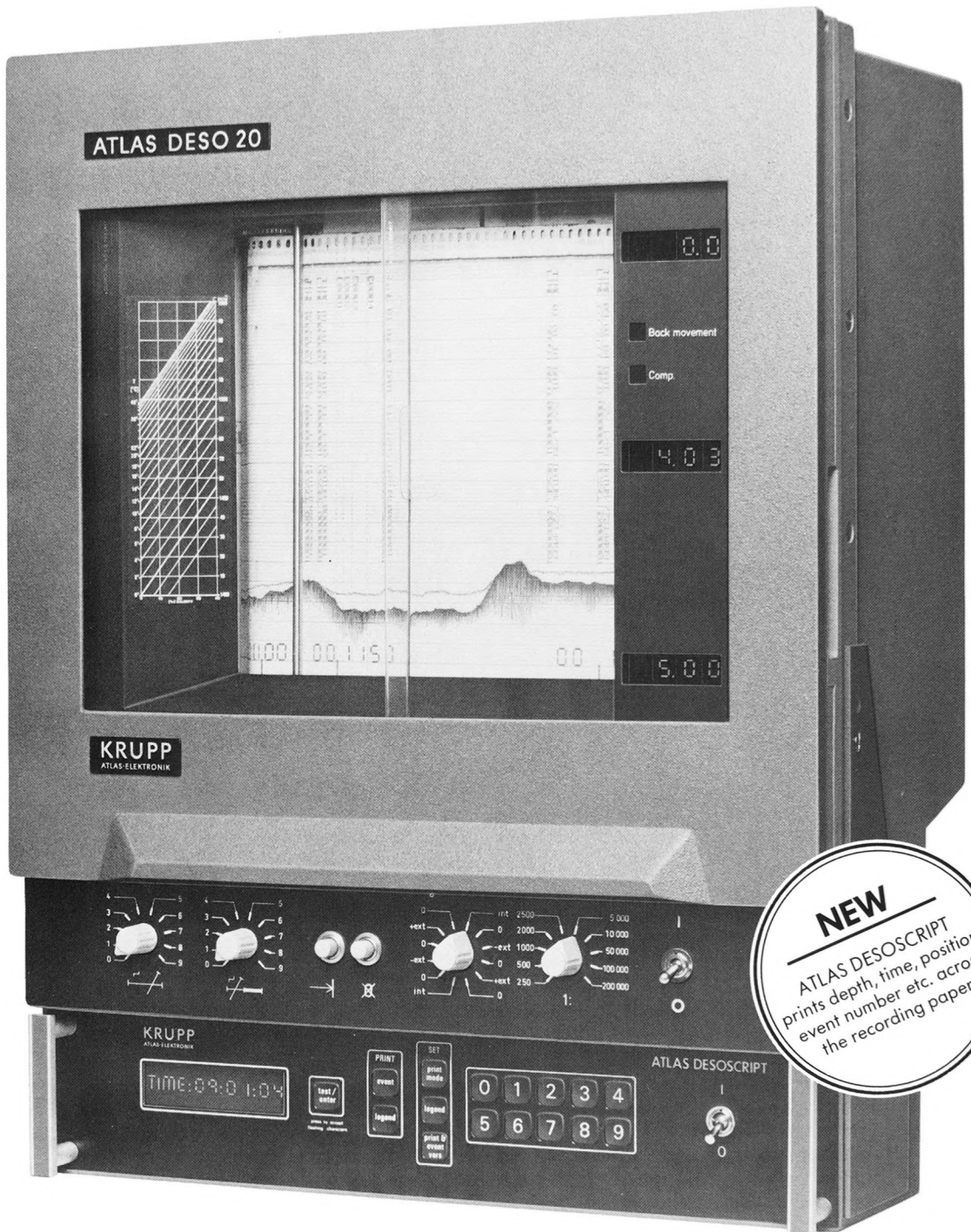
General Instrument Corporation is the world's foremost producer of multi-beam bathymetric swath survey systems. For further information on Hydro Chart, contact Government Systems Division, General Instrument Corporation, Southwest Park, Westwood, MA 02090 (617) 326-7815

General Instrument Corporation  
Government Systems Division  
Southwest Park, Westwood, MA 02090 U.S.A.  
(617) 326-7815 • TWX: 710-348-6575

**GENERAL  
INSTRUMENT**



# Atlas Deso 20



 **KRUPP ATLAS ELEKTRONIK**  
A Sound Decision



# Universal = Special?

ATLAS DESO 20 solves this equation.

If you are a professional survey organisation, the chance is more than 70 percent that you are the satisfied owner of an **ATLAS DESO 20** survey echosounder.

Why? Because it is so universal.

It is accurate and reliable because it **is designed to be the backbone of your survey job.** It is compact and portable, because it should fit on any size of vessel and suit mobile survey operations.

If you are a specialized survey organisation, the chance is also more than 70 percent that **ATLAS DESO 20 solves your special requirements as well.**

Why? Because it is so versatile.

**It can be upgraded** for two-channel digitisation **for automated systems.** You can add the special heave compensator **for high accuracy under rough water conditions.**

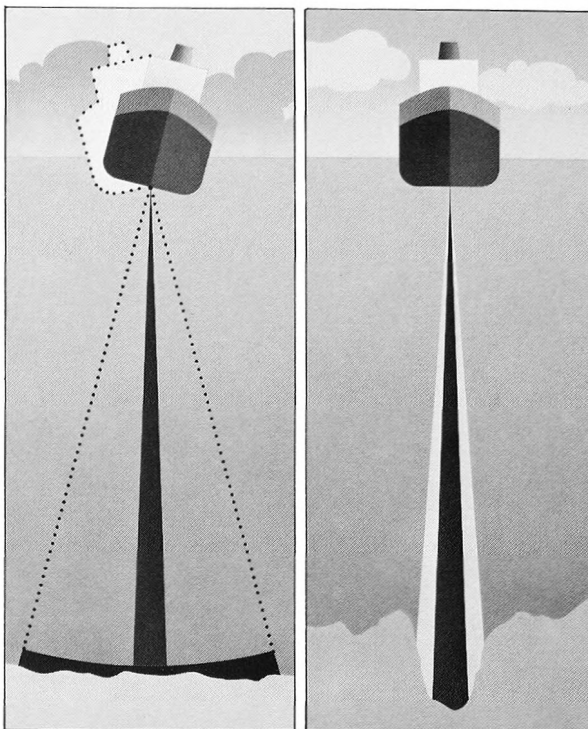
You can add the special offshore power package **for narrow beam precise high-relief bottom presentation** down to 5000 metres depth of water at an extremely low price compared to other echosounding systems **with stabilized transducer.**

Or, you can **add the new special annotator** to use the ATLAS DESO 20 as a datalogger/printer for your survey system.

Didn't you notice that DESO 20 has been improved continuously from year to year?

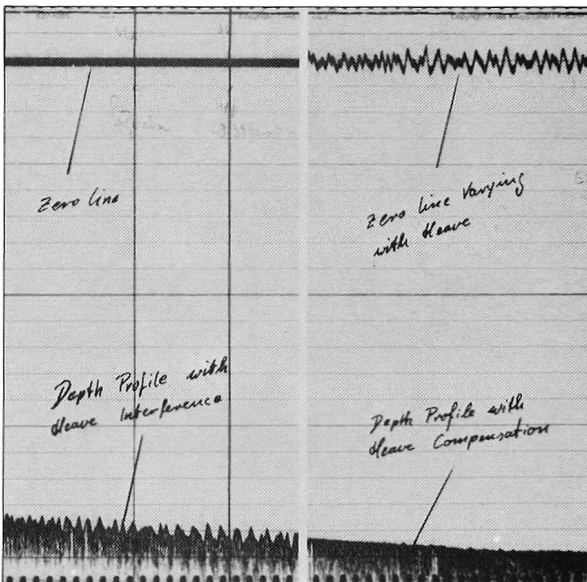
So, before you buy a lot of special equipment, think it over – can the universal ATLAS DESO 20 be upgraded to meet your special requirement? This may be good for your budget, and your service personnel would like the logistical concept.

KRUPP ATLAS ELEKTRONIK GMBH  
P.O.B. 44 85 45 · D-2800 Bremen 44  
Phone 421-457-0 · Telex 2 457 460 ka d



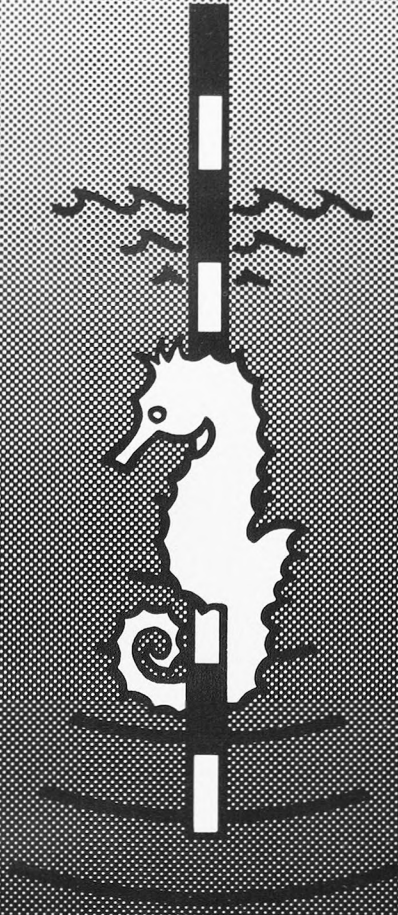
4 KW offshore package with stabilized transducer for deep water and precise high-relief bottom presentation.

ATLAS HECO 10 heave compensator extends the time at sea for accurate surveying.



## KRUPP ATLAS ELEKTRONIK

### A Sound Decision



**representing and serving the world hydrographic  
surveying community with individual and  
corporate members in sixty countries**

## **The Hydrographic Society**

ASTA HOUSE · 156-164 HIGH ROAD · CHADWELL HEATH · ROMFORD  
ESSEX RM6 6LX · ENGLAND · TELEPHONE : 01-599 9991 · TELEX : 665080

NETHERLANDS BRANCH :

RWS - DIR NOORDZEE · POSTBUS 5807 · 2280HV RIJSWIJK (ZH) · TEL : 070 949500 · TELEX : 33782

US BRANCH :

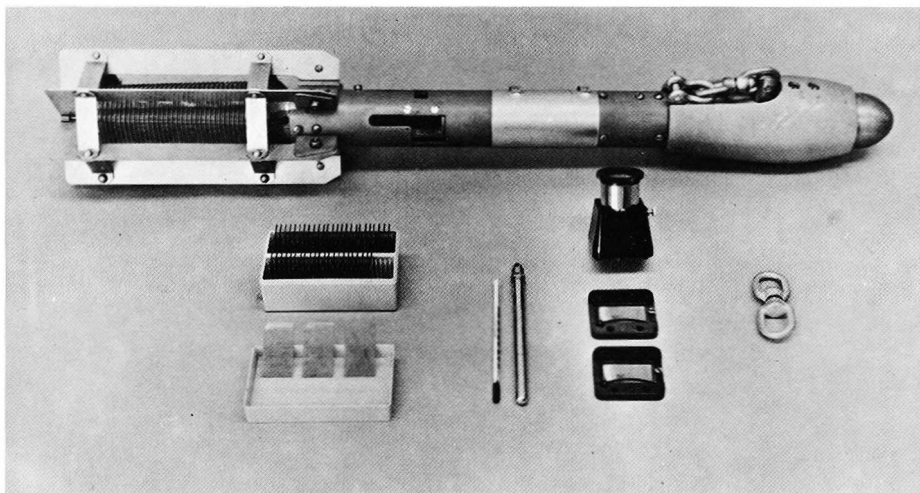
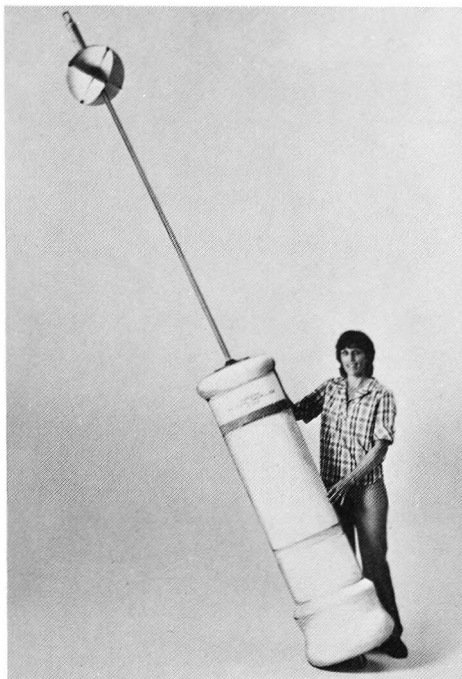
POBOX 732 · ROCKVILLE · MARYLAND 20851 · TEL : 301 443 8232 · TELEX : 248376 OBSW UR



### PORTABLE OCEANOGRAPHIC BUOY FOR INSTRUMENT RETRIEVAL OR STATION MARKING

The KAHLISICO PORTABLE MARINE BUOY is specifically designed to facilitate locating and retrieving deployed instruments, or to be used as a temporary navigation marker. The 3.4 m long buoy has a mast terminating with a darkness-actuated, high-intensity flash-lamp (2-year lifetime), visible from 40 km, by aircraft, or 13 km, by ships. Its omni-directional radar-reflector can be detected from a distance of 5 km. A spare, rechargeable battery (allowing 30 days operation) and a 115 or 220 V battery-charger are furnished.

Weighing only 35 kg, Model 204WA150 Oceanographic Buoy is easily handled at sea, or transported in a small truck. Designed to be rugged, yet reasonable priced, this multi-purpose buoy can be outfitted with sensors and their electronics, recorders, etc. to meet your specific needs, due to ample space within its foam-filled, thick-walled, resilient, molded-plastic, buoyancy chamber, which has an integral mooring eye at bottom.



**KAHLISICO BATHYTHERMOGRAPH (BT)** is an efficient and reliable device which graphically records on a gold-plated glass slide both temperature and depth measurements as the BT is towed through the water at speeds up to 15 knots. It may be used to depths of 270 meters (900 ft). As illustrated, the equipment comes complete with all accessories, including a calibrated grid, viewer and thermometer, all packed in a special, compartmented storage case.

Consult us with regard to your needs for other instruments such as Fog Alarm Systems for platforms or coastlines, Tide Gauges, Current Meters, Corers, Dredges, etc.



P. O. Box 947, EL CAJON, California 92022, U.S.A.  
Telex : 697906 Telephone : (619) 444-2158

Our Instruments Are In World-wide Use  
HYDROLOGY - OCEANOGRAPHY - METEOROLOGY

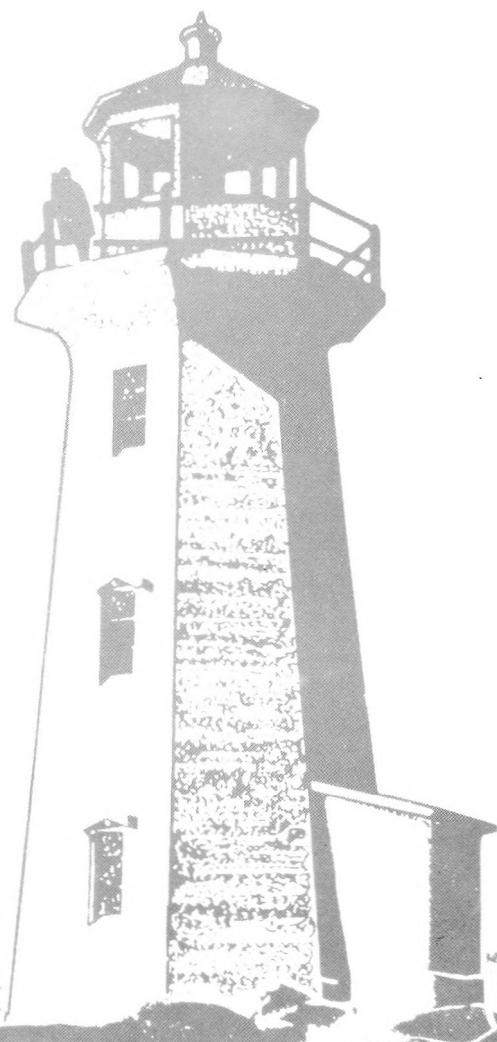


# Lighthouse

JOURNAL OF THE CANADIAN HYDROGRAPHERS' ASSOCIATION

- A journal dedicated to promoting the free exchange of information within the hydrographic community and to advancing the technical and professional ability of hydrographers.
- It includes a variety of articles and topical news on advances in hydrography and historical perspectives.
- Published twice yearly, in April and November, and is free to Association members.
- Subscription rates to non-members is \$3.00 (Cdn) per single issue or \$6.00 (Cdn) yearly.
- For further information regarding membership, article submission and advertising, please address all correspondence to:

The Editor, LIGHTHOUSE  
Canadian Hydrographers Association  
P.O. Box 1006  
Dartmouth, Nova Scotia  
Canada B2Y 4A2  
Phone: (902) 426-3497

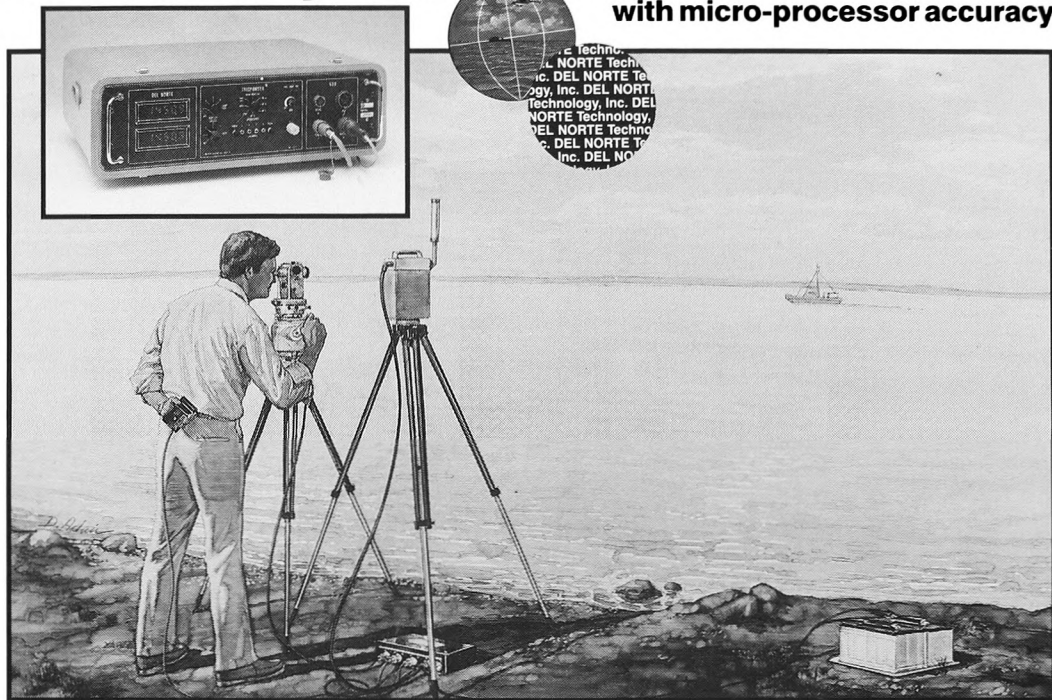




# TRISPONDER<sup>®</sup> SYSTEMS

## Rho/Theta System

Range/Azimuth marine positioning  
with micro-processor accuracy



### Rho/Theta System

Del Norte Technology's Rho/Theta System provides extremely accurate marine positioning using range and azimuth from a single on-shore location. The system is designed for use in difficult-to-navigate areas, such as serpentine rivers and small harbors or where range-range positioning systems are restricted due to cost or operational limitations. The Rho/Theta System is easy to install, easy to operate and very cost effective.

### Model 520 DDMU

The heart of the Rho/Theta System is Del Norte's Model 520 Digital Distance Measuring Unit (DDMU). It provides range and azimuth read-out at the mobile station with superior performance and accuracy. The 520 DDMU is fully automatic, both portable and waterproof, and can also operate in a *range-range* mode.

### Azimuth Tracker

A high quality Azimuth Tracker provides the angle measurement in the Rho/Theta System. This self-contained unit is adaptable to all field applications and to standard optical equipment.

### Remote TRANSPONDER

A standard TRANSPONDER Model 217E or 218E Remote is fully capable of transmitting angular measurements and status data, eliminating the need for a separate RF data link. The remote still retains its capability to operate in the *range-range* mode.

Rho/Theta employs a standard TRANSPONDER Master which requires no modification.

### The Complete System

The Rho/Theta System includes the Azimuth Tracker, Switch Box, Foot Switch, Data Transfer Unit and the ranging equipment which completes the system.

### Craftsmanship-Performance-Serviceability

Our standards are rigid; our specifications precise. We provide you with some of the most sophisticated micro-processor based and controllable positioning systems available today.

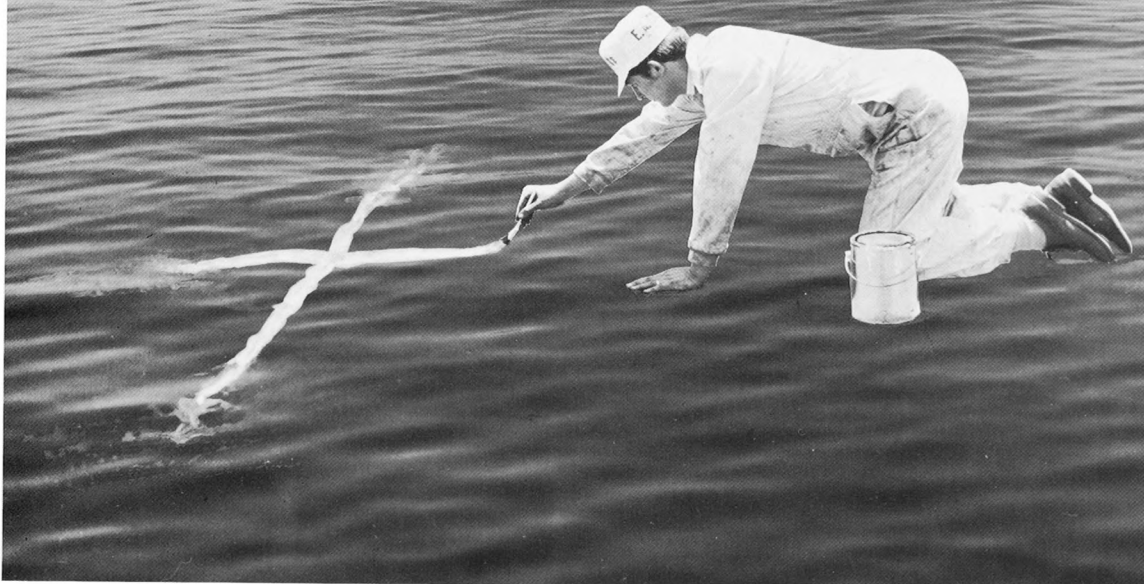


**DEL NORTE Technology, Inc.**

1100 Pamela Drive, P.O. Box 696, Euless, Texas 76039  
817-267-3541 Telex: 75844-3

TRISPONDER<sup>®</sup> is a registered trade mark of Del Norte Technology, Inc.

# How do you mark the spot at sea?



Accurate position measurement is our business. Our modern Raydist DRS-H system can "mark the spot" within a few feet for your offshore work hundreds of miles seaward.

To obtain continuous, repeatable data we use shore stations — just two of them. Our shore station electronic packages are 100 percent solid state for highest reliability; light weight (only 27 pounds) and low power (just 2 amps at 24 volts DC). It takes about two hours to install an operating station, making Raydist by far the most portable radiolocation system available for use beyond line-of-sight.

Do you have unusual or demanding requirements? Raydist has enough built-in flexibility to handle almost any individual need, such as four-party range-range operation, and enough output flexibility to handle our wide selection of control and display accessories; or to interface directly with your computer or digital tape recorder.



WE INVITE YOU to see a complete demonstration of Raydist in operation aboard our research vessel, HAST RAY II.

Raydist is available for sale or lease world-wide. For information regarding Raydist systems and the complete line of Raydist accessories, call or write:

 **TELEDYNE HASTINGS-RAYDIST**

P.O. Box 1275  
Hampton, Virginia 23661 U.S.A.

Telephone: (804) 723-6531  
TWX: (710) 882-0085

Cable Address: TDY HASTHAMP



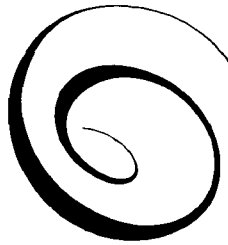
# *FRENCH INSTITUTE OF NAVIGATION*

3, Avenue Octave-Gréard — 75007 PARIS

**Publishes a Technical Review on  
Maritime, Aerial and Spatial Navigation  
entitled :**

# NAVIGATION

which is issued quarterly  
(January, April, July, October)



● **Membership.** — Applications for registration should be addressed to the Secretary-General. Navigation is despatched regularly to Members of the French Institute of Navigation.

● **Annual Dues.**— 1985 :

- Active Members (resident in France)..... 180 F
- Associate Members (resident abroad)..... 220 F

● **Payment.** — Preferably by bank transfer or postal payment to the Association's Postal Order Account : **I.F.N. 1581-32 N Paris.**

● Bank cheques only in French francs, payable in Paris; bank charges for the subscriber.

# THE JOURNAL OF NAVIGATION

The Journal of Navigation is the publication of the Royal Institute of Navigation. It contains authoritative papers on every aspect of navigation – air, sea and space – and papers of every type – scientific, historical and narrative. It also publishes reviews of important books on navigation and a record of current navigational work.

The Journal is completely international in character and a sizeable proportion of its contributions always come from overseas. Its circulation likewise is wholly international.

Readers of the Journal comprise members of the Royal Institute of Navigation and other subscribers who are for the main part air and sea navigators, scientists and technicians concerned with navigation, and an increasing number of yachtsmen.

The subscription for Volume 38, 1985 is £ 40.00 including postage, single parts £ 15.00 plus postage. Orders through any bookseller or direct to Cambridge University Press, The Edinburgh Building, Shaftesbury Road, Cambridge CB2 2RU, England.

*Recent articles includes :*

**The US Federal Radio-Navigation Plan, D. SCULL; Air Navigation Cost-benefits and Payments, M.A. AMBROSE; The Requirements for Oceanic Navigation in the Air, R. CROXFORD; Global Civil Satellite Navigation Systems : an Airline Operator's View, P. MOORE and D.M. PAGE; World-wide Navigation System for Shipping, J.N.F. LAMEIJER; The Use of Satnav Systems for Precise Time Transfer, J.D.H. PILKINGTON; Granas, a New Satellite-based Navigation System, H. EULER and G. HOEFGEN; Civil Aviation Application of Navstar, L.E. DEGROOT, D.H. MONK and M.Y. McELREATH; The Geostar System, G.K. O'NEILL; An Electronic Chart Display for Fishing Vessels, R. COATES, Keith DYE and K. KNOX; The Evolution of the Arctic Submarine, Alfred S. McLAREN; Sailing Problems Within and Near Traffic Separation Schemes, K.H. KWIK; Hydrographic Survey in the North Sea and English Channel, D.W. HASLAM and F.A. PIELOU; Quantification of Action to Avoid Collision, Wu ZHAO-LIN**

**CAMBRIDGE UNIVERSITY PRESS**



# TRAC IV B

Already in use as the most compact and versatile navigation system yet available, Qubit's TRAC IV B is storming to popularity.

Advanced integrated navigation and positioning capabilities are standard, and a range of specific extension options is offered including powerful interactive post processing and editing, providing final plot production to fair sheet standard.

Easily shipped and installed, TRAC IV B packs the capability for surveying and navigation in a wide variety of applications, and interfaces to most available navigation aids and ship's sensors.

Physically compact and operationally versatile, TRAC IV B will be your choice in fair weather or foul.



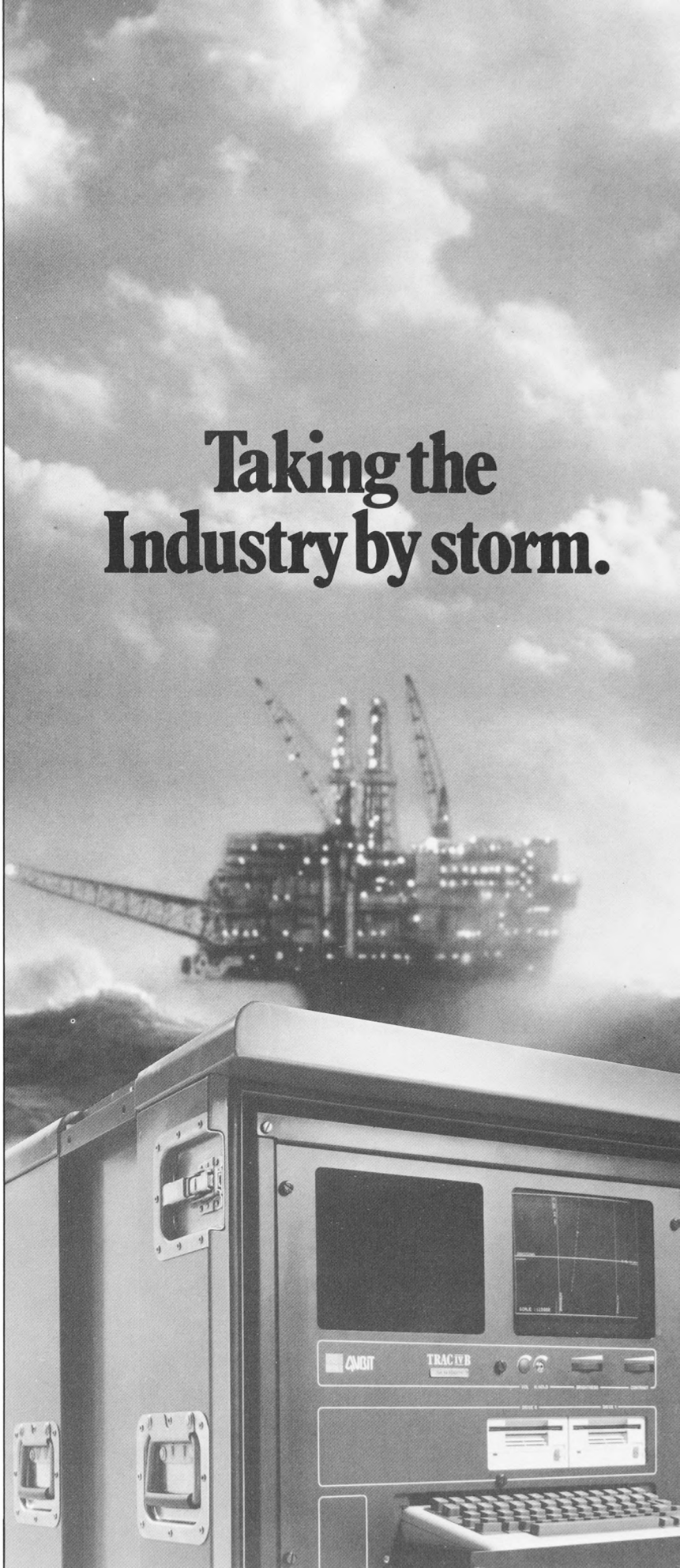
**Qubit UK Limited**

251 Ash Road Aldershot  
Hampshire GU124DD  
England  
Telephone (0252) 331418  
Telex 858593 Qubit G

**Qubit UK Limited**

18 Prowse Street  
West Perth  
Western Australia 6005  
Telephone (09) 3224955  
Telex AA93960

## Taking the Industry by storm.







**INTERNATIONAL HYDROGRAPHIC REVIEW**

## FOREWORD

The *International Hydrographic Review* is published twice a year (January and July) in separate English and French editions.

Original articles are welcomed on hydrography, oceanography, cartography, photogrammetry, geodesy, navigation and allied subjects, radio aids, automation, new instruments, equipment and hydrographic vessels, as well as on the history and organization of hydrographic offices.

The latest date for receipt of manuscripts is :

- 1 August for the January issue,
- 1 February for the July issue,

but earlier submission greatly facilitates the work of preparing translations.

Articles should be addressed to : The Directing Committee, International Hydrographic Bureau, B.P. 345, MC 98000 MONACO (Principality of Monaco).

Up to 50 reprints per article can be supplied free to the author(s). They must be ordered prior to publication, and may be in either language or a proportion in each. Further copies ordered are charged at cost price, plus postage.

**The Directing Committee does not hold itself responsible for statements or opinions expressed by contributors to the Review.**

### Notes for contributors

Papers should be as concise as possible for maximum reader value, and an abstract of up to 150 words is desirable. Uncommon expressions or constructions should be avoided since a large proportion of readers are necessarily reading the Review in a language that is not their mother tongue.

Any permission needed to incorporate material published elsewhere is the responsibility of authors, and it will be assumed that such permission has been obtained.

Texts should be submitted in English or French (or both), though by special arrangement articles in Spanish, Italian or German could be accepted for translation in the Bureau.

Two copies of the article are required, typed in double spacing with adequate margins and on one side of the paper only. Authors should check manuscripts very carefully as no responsibility can be taken for errors of fact or presentation.

Bibliographic references should be listed at the end of the article in the standard Harvard form. Footnotes should be kept to a minimum, and metric measures used throughout.

Illustrations, already numbered and titled, should be supplied ready for reproduction by the offset method and for reduction to 12.5 × 21 cm, the effective size of a Review page. Positive or negative transparencies (repromats) are preferred. Photographs should be black and white glossy prints and be limited to those necessary for an understanding of the text.

As the Review is a two-language publication a minimum of wording should be shown on the illustrations themselves, explanations being confined to the legend beneath.

Printer's proofs are corrected in the Bureau and are not normally sent to authors.

PP-01

# THE INTERNATIONAL HYDROGRAPHIC REVIEW

Vol. LXII



No. 1

(No. 116 OF THE SERIES)

PUBLISHED BY

THE

**INTERNATIONAL HYDROGRAPHIC BUREAU**

B. P. 345 - 7, avenue Président J. F. Kennedy

M C 98000 MONACO

PRINCIPALITY



**JANUARY 1985**

IMPRIMERIE LOUIS-JEAN  
GAP



# INTERNATIONAL HYDROGRAPHIC ORGANIZATION

---

## MEMBERS OF THE IHO

---

ARGENTINA	NETHERLANDS
AUSTRALIA	NEW ZEALAND
BELGIUM	NIGERIA
BRAZIL	NORWAY
CANADA	PAKISTAN
CHILE	PERU
CHINA	PHILIPPINES
CUBA	POLAND
DENMARK	PORTUGAL
DOMINICAN REPUBLIC	REPUBLIC OF KOREA
ECUADOR	REPUBLIC OF SOUTH AFRICA
EGYPT,	SINGAPORE
ARAB REPUBLIC OF	SPAIN
FIJI	SRI LANKA
FINLAND	SWEDEN
FRANCE	SYRIAN ARAB REPUBLIC
GERMANY,	THAILAND
FEDERAL REPUBLIC OF	TRINIDAD AND TOBAGO
GREECE	TURKEY
GUATEMALA	UNION OF SOVIET
ICELAND	SOCIALIST REPUBLICS
INDIA	UNITED KINGDOM OF GREAT
INDONESIA	BRITAIN AND NORTHERN
IRAN	IRELAND
ITALY	UNITED STATES OF AMERICA
JAPAN	URUGUAY
MALAYSIA	VENEZUELA
MONACO	YUGOSLAVIA
	ZAIRE

---

## INTERNATIONAL HYDROGRAPHIC BUREAU

---

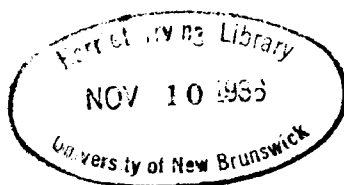
### DIRECTING COMMITTEE

*President* : Rear Admiral F.L. FRASER, AVSM, FIS, Indian Navy (Ret.)

*Directors* : Vice Admiral O.A.A. AFFONSO, Brazilian Navy (Ret.)  
Captain J.E. AYRES, U.S. Navy (Ret.)

Price 110.00 French Francs. For conditions of sale see *List of Publications 1985*.

© Copyright, Monaco, 1st quarter 1985



## TABLE OF CONTENTS

---

— <b>Why a Hydrographic Office ?</b> (D.W. HASLAM) .....	7
— <b>Present state of hydrographic surveying of the North Sea and English Channel</b> (D.W. HASLAM & F.A. PIELOU) .....	17
— <b>The “Mitra”, a new survey vessel for the North Sea</b> (F.A. van DONGEN) .....	31
— <b>The use of robots in hydrography</b> (A.J. KERR & D.F. DINN) .....	41
— <b>Spread spectrum concept applied in new accurate medium-long range radiopositioning system</b> (G. NARD) .....	53
— <b>Recent developments in high-accuracy microwave positioning systems</b> (I.C. TEUNON) .....	73
— <b>Loran-C latitude-longitude conversion at sea : Programming considerations</b> (J.R. McCULLOUGH, B.J. IRWIN & R.M. BOWLES) .....	83
— <b>The legal liability of the chartmaker</b> (P.M. TROOP) .....	115
— <b>Nautical charts with “Dense geographical graticule”</b> (Deutsches Hydrographisches Institut) .....	123
— <b>Tidal prediction and modern time scales</b> (D.E. CARTWRIGHT) .....	127
— <b>Hydrographic and geologic concerns of implementing article 76</b> (A.J. KERR & M.J. KEEN) .....	139
— <b>Fifty years ago</b> .....	149