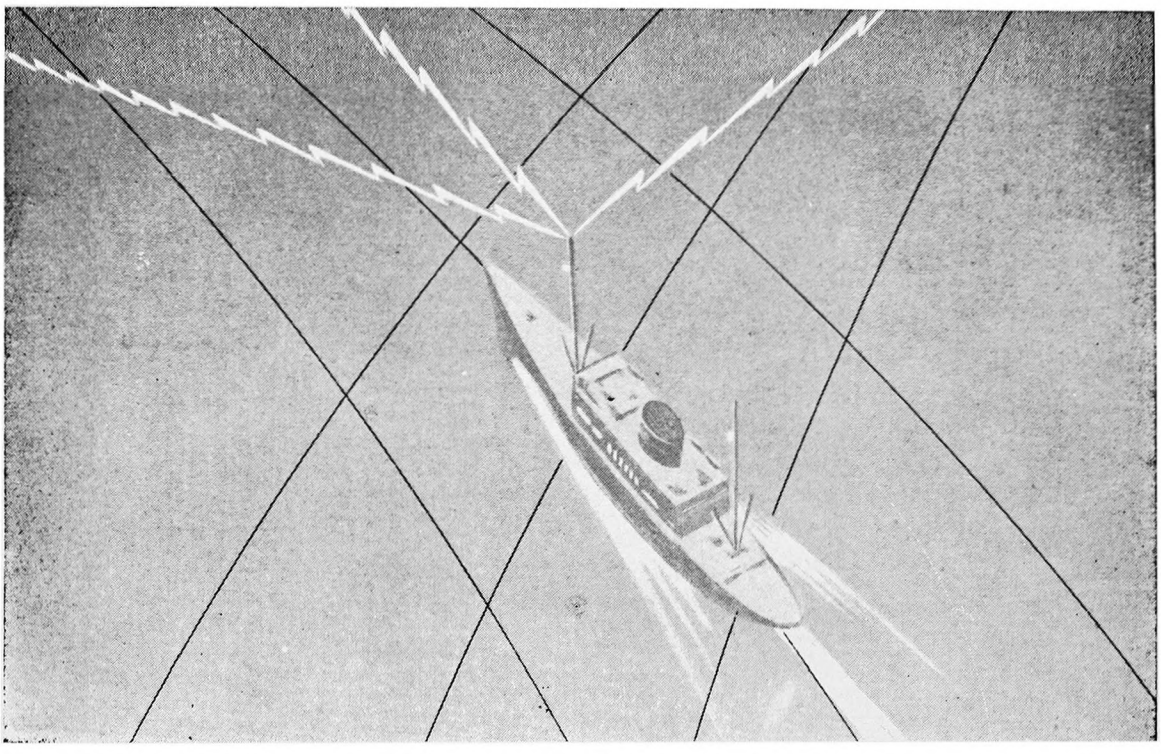
THE INTERNATIONAL HYDROGRAPHIC REVIEW

INTERNATIONAL HYDROGRAPHIC BUREAU
MONACO

Vol. XLIV, No 1
(No 80 OF THE SERIES)

JANUARY 1967



INTERNATIONAL HYDROGRAPHIC BUREAU SPECIAL PUBLICATION 39

2nd edition, 1965

RADIO AIDS

TO MARITIME NAVIGATION AND HYDROGRAPHY

Special Publication No. 39 of the International Hydrographic Bureau entitled **Radio Aids to Maritime Navigation and Hydrography** deals with the principles and gives a general description of radioelectric systems and instruments used in navigation and hydrographic surveying. The 2nd edition, 1965, of this work is a complete revision and recast of the 1st edition issued in 1956, with new additions. It includes the total number of Supplementary Papers which have already been published, and contains the following chapters and sections :

INTRODUCTION.

CHAPTER I. — Spectrum and Propagation of Electromagnetic Waves :

1. Frequency Spectrum of Electromagnetic Waves;
2. Propagation of Electromagnetic Waves.

CHAPTER II. — Radio Systems used in Maritime Navigation :

1. Radio Direction-finding; 2. Loran; 3. Decca; 4. Consol; 5. Radar.

CHAPTER III. — Radio Systems used in Hydrographic Surveying :

1. Decca; 2. Shoran; 3. Electronic Position Indicator (E.P.I.); 4. Shoran and E.P.I. in Offshore Hydrographic Surveying; 5. Raydist; 6. Lorac; 7. Rana; 8. Hi-Fix; 9. Hydrodist; 10. Microwave Position-Fixing System (M. P. F. S.); 11. Derveaux; 12. Toran.

CHAPTER IV. — Computation and Plotting of Hyperbolic Lattices :

1. General; 2. Methods of the Danish Hydrographic Office; 3. Methods of the French Hydrographic Office; 4. Method of the U. S. Naval Oceanographic Office; 5. Method of the Swedish Hydrographic Department; 6. Methods of the Netherlands Hydrographic Office; 7. Methods of the British Naval Hydrographic Office.

CHAPTER V. — Electromagnetic Systems in Geodetic Surveying :

1. General Aspects and Use of Radio Positioning Systems; 2. Aga Geodimeter; 3. Tellurometer; 4. Micro-Dist (Electrotape).

This work, in loose-leaf form, thus permitting subsequent additions, will be on sale at $ 15.00. It includes about 550 pages and 270 figures.

It will continue to be brought up to date in the future by the publication of Supplementary Papers, whose issue will be announced in both the **International Hydrographic Review** and the **International Hydrographic Bulletin.**

SUPPLEMENTARY PAPERS TO SP 39

The 10 Supplementary Papers already published are the following :

PAPER 1 : Tellurometer and Micro-Dist (about 40 pages), price $ 1.00.

PAPER 2 : Raydist, Hydrodist, M. P. F. S. (Microwave Position-fixing System) and Derveaux (about 70 pages) price $ 2.00.

PAPER 3 : Decca in Hydrographic Surveys, Lorac, Rana and Hi-Fix (about 90 pages), price $ 2.50.

PAPER 4 : Decca in Navigation (about 30 pages), price $ 1.00.

PAPER 5 : Loran (about 60 pages), price $ 2.00.

PAPER 6 : AGA Geodimeter (about 25 pages), price $ 0.70.

PAPER 7 : Shoran and EPI (about 45 pages), price $ 1.20.

PAPER 8 : Radio Direction - Finding, Consol, Radar (about 45 pages), price $ 1.20.

PAPER 9 : Introduction, Wave Propagation, Geodetic Use of Radio Positioning Systems (about 35 pages), price $ 1.00.

PAPER 10 : Toran, Computation and Plotting of Hyperbolic Lattices (about 80 pages), price $ 2.50.

A Special Supplementary Paper containing the Preface, the Table of Contents and the General Index was issued (about 15 pages), price : $ 0.50.

Finally, a loose-leaf cover for filing the various Supplementary Papers making up the 2nd edition of the SP 39, is available at the price of $ 1.50.

SUPPLEMENTS TO THE INTERNATIONAL HYDROGRAPHIC REVIEW

The purpose of these Supplements is to complete the basic work that SP 39 represents, by publishing articles, some of which give the practical points of view or the conclusions of the users of electromagnetic instruments and systems, and the others may be technical and scientific notes in connection with the theoretical subjects dealt with in SP 39. Other articles are either outlines of systems, whose development is contemplated or the improvement of those already existing.

The Supplements already published are :

VOLUME 1, October 1960 (about 150 pages), price $ 5.00.
VOLUME 2, October 1961 (about 150 pages), price $ 5.00.
VOLUME 3, November 1962 (about 100 pages), price $ 3.00.
VOLUME 4, December 1963 (about 130 pages), price $ 4.00.
VOLUME 5, April 1964 (108 pages), price $ 3.00.
VOLUME 6, September 1965 (130 pages), price $ 4.00.

Later Volumes will be announced in the **International Hydrographic Review** and the **International Hydrographic Bulletin.**

Conditions of sale of International Hydrographic Bureau publications are as follows :

Orders may be sent either to a bookseller or direct to the International Hydrographic Bureau, Avenue President J.F. Kennedy, Monte-Carlo (Principauté de Monaco). Owing to exchange fluctuations, prices are quoted U.S. dollars. Packing and shipping expenses are extra.

A reduction of 30 % on the list prices is allowed to book-sellers. The same reduction is granted to government offices and to naval or merchant marine officers of States Members of the Bureau, provided the order is sent direct to the Bureau.

Payments to the International Hydrographic Bureau may be made by international money order; by cheque payable in Monaco; by transfer to the International Hydrographic Bureau's account at Barclays Bank Ltd, Chief Foreign Branch, 168 Fenchurch Street, London E. C. 3; or by transfer to the International Hydrographic Bureau's account at Barclays Bank D. C. O., 120 Broadway, New York, N. Y. Postage stamps or cash are not accepted.

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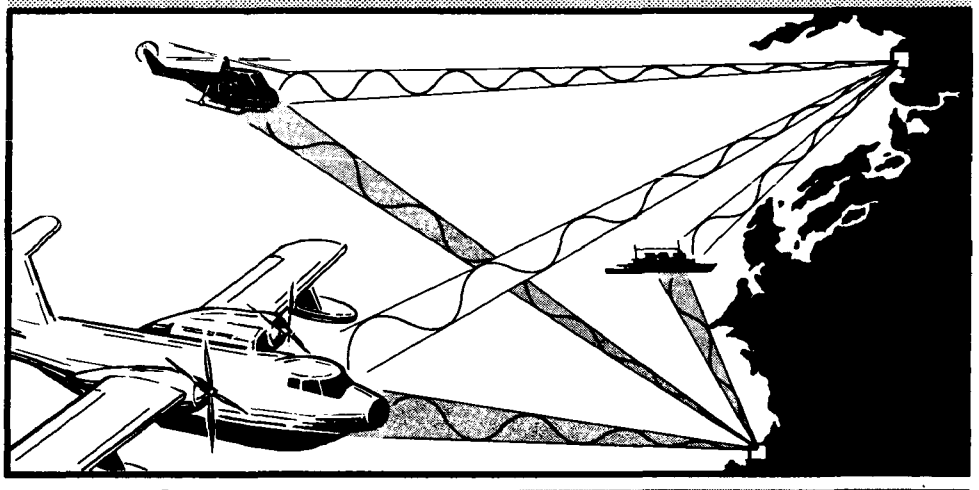

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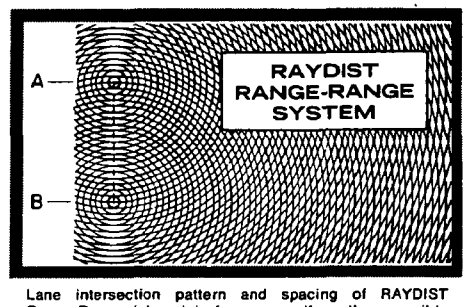

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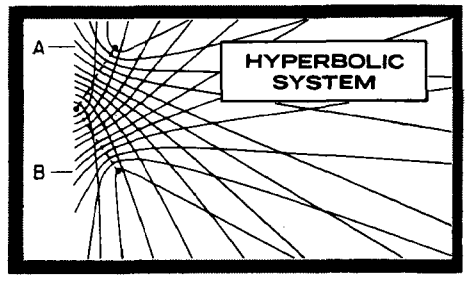

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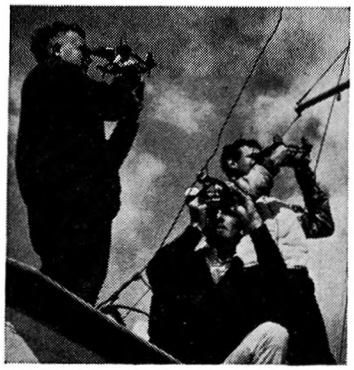
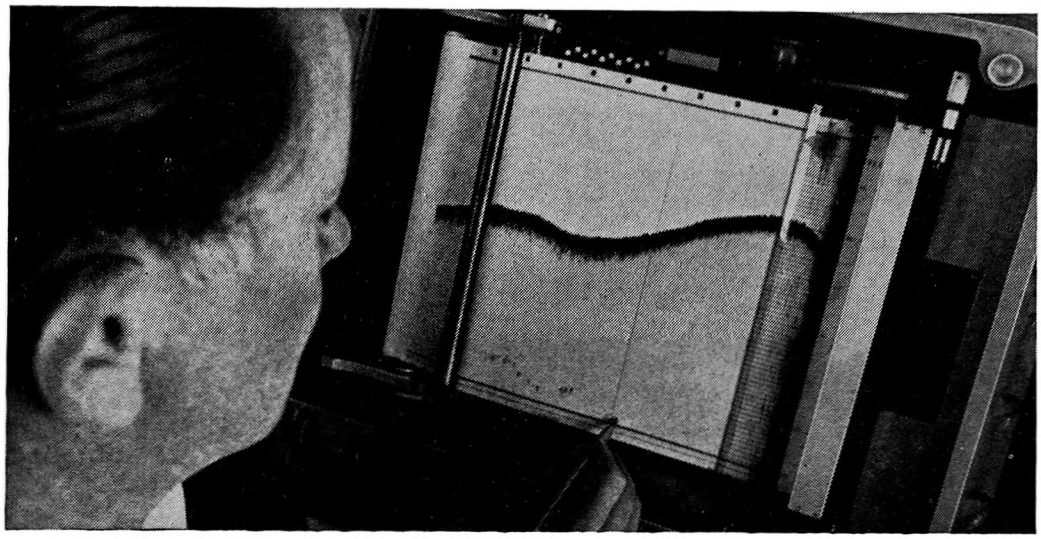


KELVIN HUGHES CONTRACT SURVEYS

Below: An outline of the sea-bed profile reproduced on the Kelvin Hughes MS36 recorder during a survey run.



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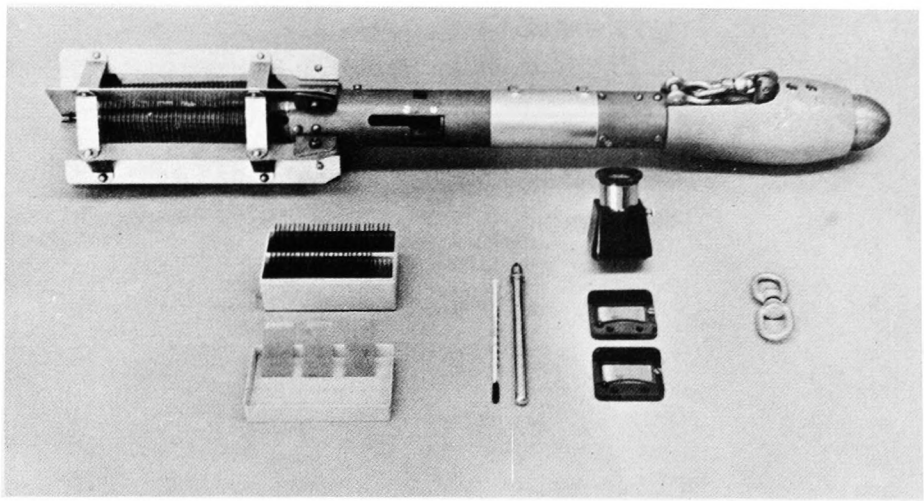
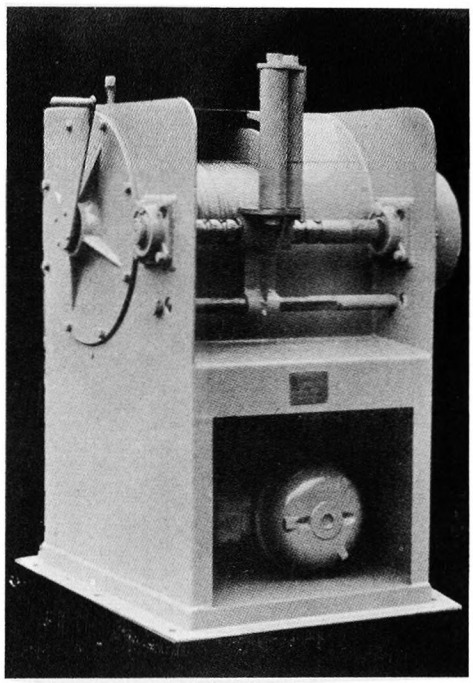


BATHYTHERMOGRAPH (BT)

The illustration shows the improved model BT, complete with its accessories, which comes packed in a strong, shock-proof carrying case. All improvements have been field tested and accepted by the U.S. Navy, as well as other oceanographic research groups. The BT operates at various depths, down to 900 feet (275 meters) and may be towed at ship speeds up to 20 knots. When in service, the BT stylus makes a trace on a glass slide which indicates the measured temperatures and depths during the towing cycle. Sensitivity and accuracy are guaranteed; the device will operate without hysterisis.



OCEANOGRAPHIC WINCHES

Heavy duty oceanographic winches are available for all wire diameters, with large capacity drums, either with electric motor or hydraulic systems, rated at from 1 to 30 HP. The standard 3 HP BT winch may also be used for light oceanographic survey work as the drum holds 1,000 meters of wire. The winches are carefully built for heavy service and minimum maintenance. They are used aboard leading research ships operating in all oceans, including the Antarctic. Additional equipment such as meter wheels, oceanographic wire, current meters, water bottles, bottom samplers, etc. are available in various sizes and types.

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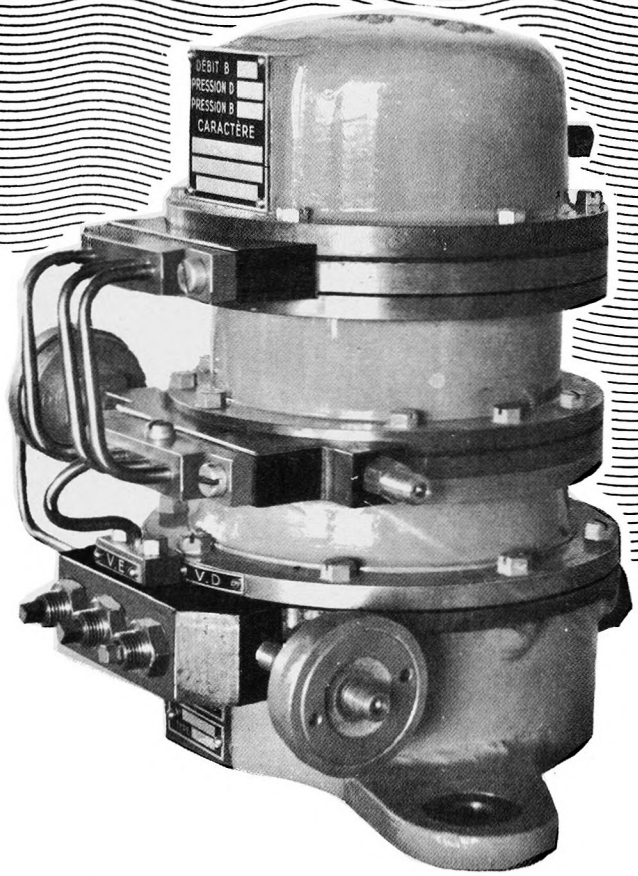
Equipment approved by French official lighthouse authorities.



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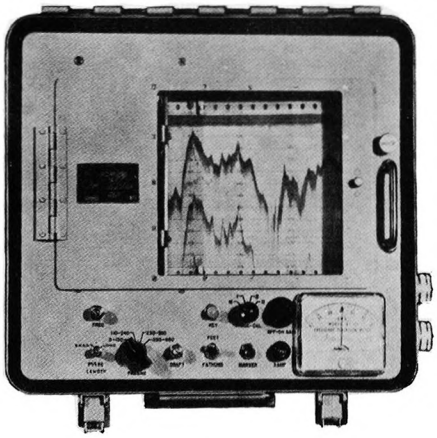
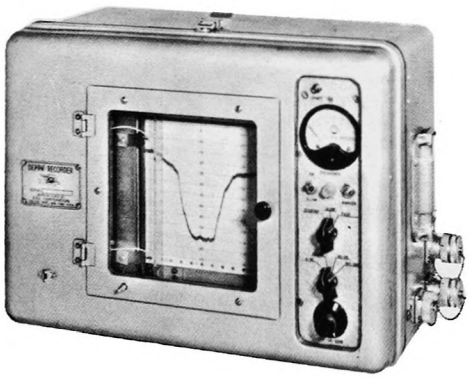
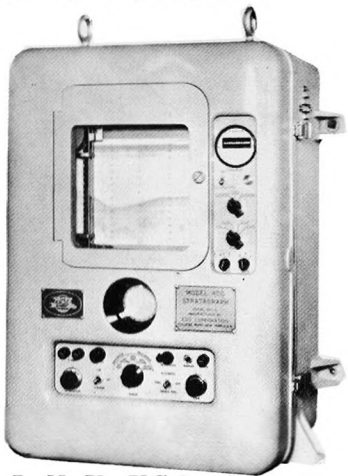


NEW EDO MODEL 9006 TRANSISTORIZED DEPTH RECORDER can be used as «through-the-ice» sounder, as helicopter-towed sounder and for all exacting survey jobs in any water to 460 fathoms, in vessels or 'copters travelling at speeds to 30 knots.



AN/UQN-1E. EDO MODEL 185 DEEP DEPTH SOUNDER, developed originally for U. S. Navy, is now in quantity use by U. S. and other navies as well as commercially. Records accurately to 6,000 fathoms.



AN/BQN-4A. EDO MODEL 578 SURVEY DEPTH RECORDER (formerly Model 555) is versatile unit for measuring depth in relatively shallow waters — to 230 fathoms. Ideal for deep depth penetration and general survey.

EDO MODEL 400 STRATAGRAPH. Unique sonar unit penetrates and records strata formations underlying beds of rivers, lakes, coastal waters. In wide use to determine layers at which drilling foundations can be set.

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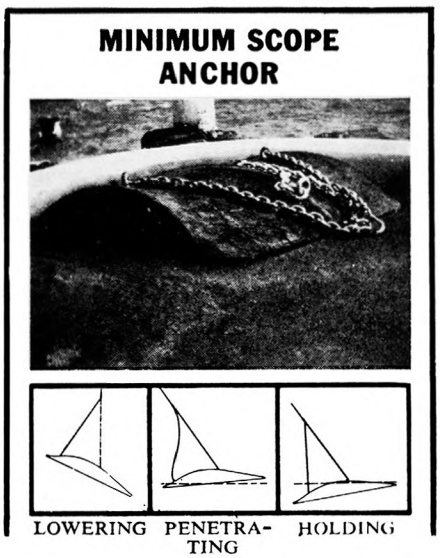
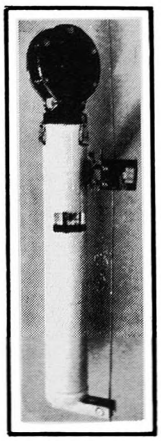


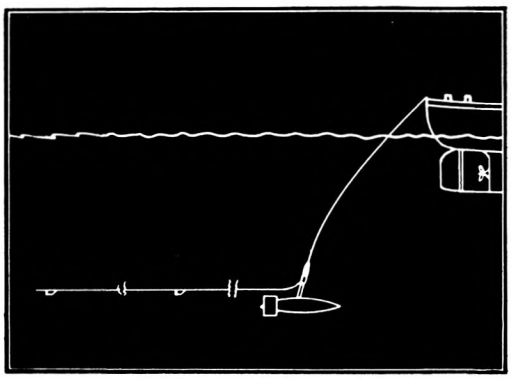
O.R.E. MINIMUM SCOPE ANCHORS

A new, proven design for low cost, minimum scope anchors to moor buoys or other devices at any depth. The anchor with suspension rig is stable during lowering and is designed to dig into soft bottoms, preventing lifting or skipping. Operates with nearly vertical cable angles, reducing the amount of cable needed for permanent mooring. Available in a variety of sizes up to 20 000 lbs (9 000 kg).



O.R.E. BOTTOM PINGER

A proven self-powered, widely used signalling device which is attached to the end of the oceanographic wire and permits accurate location aboard ship regardless of water current structure or wire configuration. It is very useful for lowering instruments to or near the ocean bottom and may be used to position water bottles, bottom sampling equipment, deep-sea cameras, or other equipment we offer. The signal can be received on any 10 or 12 Kc ship sonar system. The pinger has a special casing to withstand pressures at any ocean depth.

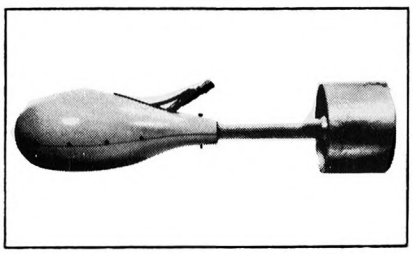


O.R.E. GEOMAGNETIC ELECTROKINETOGRAPH (GEK)

The GEK reliably measures surface water current velocities while being towed at speeds up to 12 knots. This system has been proven to provide accurate recording of water velocities down to 0.1 knot. The GEK includes a calibrated recorder with geomagnetic compensation features, highly stable electrodes with cable and a depressor.

O.R.E. TOWED TRANSDUCER VEHICLE

This enclosure of fiberglass construction is hydrodynamically designed for " quiet listening ". Transducers placed in the vehicle receive signals without interference from the ship's sound or motion, thereby permitting rapid and noise-free operation with increased sensitivity. It may be towed at speeds up to 20 knots at any depth, carrying a payload of 100 lbs (45 kg). Faired (low-drag) cable for rapid and noise free towing is available.



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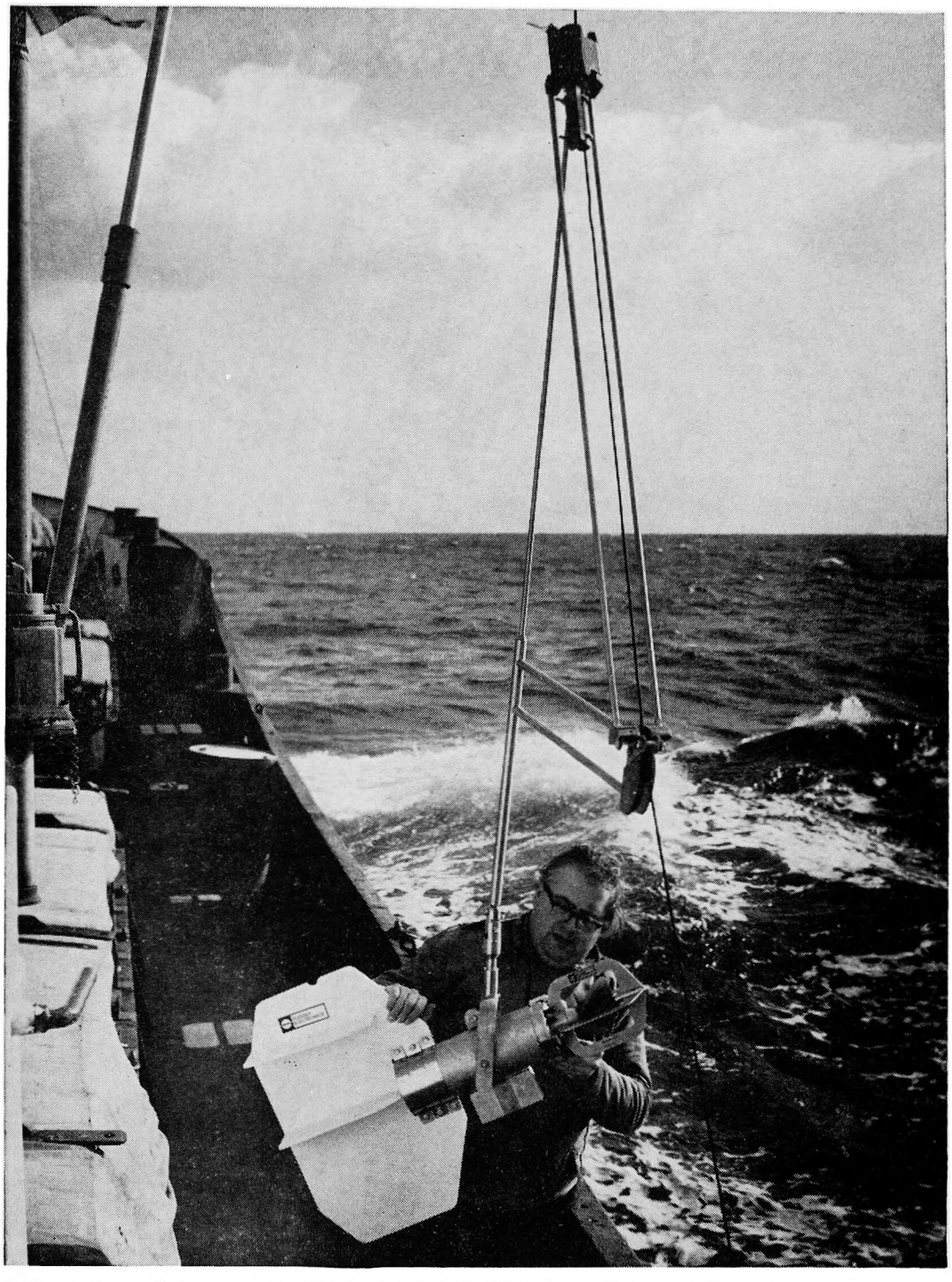


A Plessey Recording Current Meter being inspected prior to launching—part of an ocean buoy system being laid for oceanographic and meteorological exploration and research.

See these and other PLESSEY INSTRUMENTS at the 9th INTERNATIONAL HYDROGRAPHIC CONFERENCE MONTE-CARLO—April 18 to May 3 1967.

PLESSEY Electronics

Marine Systems Division, Ilford, Essex, England. Tel: Ilford 3040. Telex: 23166

PE(M)3

Plessey Marine Systems Division

–a complete service in oceanographic instrumentation systems

The Marine Systems Division of Plessey Electronics has for many years undertaken diverse marine projects for defence, scientific and commercial applications. The experience gained in these projects, together with a continuous research programme in underwater acoustics, gives the Division a unique understanding of the specialised requirements of underwater systems. A self-contained comprehensive research, engineering, manufacturing and installation facility has been built up and is available to all users of oceanographic systems.

From a single transducer to a complex system incorporating the latest data handling and processing techniques, the Division's unique capability will meet the requirements of any marine project from systems development to final installation, and after if required. Three instruments developed by Plessey which will be on display at the 9th International Hydrographic Conference in Monte-Carlo are :—

Recording current meter — the most versatile and accurate instrument of its type. Completely self contained, it has a capacity of 55,000 measurements and an in-sea cycle of 80 days.
Direct reading current meter — developed for rapid, spot readings of current speed and direction. 'Sub-unit' type of construction enables this equipment to meet a wide variety of requirements.
Sound velocity meter — accurate to 1 part in 10,000. It provides rapid, direct readings in ft/sec or m/sec on a standard counter. A single transducer is used, so relative motion up to 25 knots does not impair accuracy.

Plessey-Sippican

the only system that lets you make a Bathythermograph plot at 30 knots

First system to use expendable probes

Plessey-Sippican Expendable BT system consists of three units, the probe, the launcher and the recorder. It enables plots to be made of the temperature distribution down to 1,500 feet (460m.). The record is produced as a permanent paper-trace.

The system uses a small probe containing a thermistor (the temperature sensor) which is connected to two spools of wire. When the probe is released from the launcher, wire from the two spools is unreeled, which allows the probe to fall vertically at a predetermined rate unaffected by the forward speed of the ship, which may be up to 30 knots.

After 85 seconds the probe reaches 1,500 ft. during which time the plot will have been automatically recorded. Temperature/depth is determined by the known rate of descent of the probe.

The Plessey-Sippican system has advantages over the usual "reel-back" type of Bathythermograph —

Time—non-expendable systems require the ship to slow down.

Exposure to danger—in tactical situations any reduction in speed may make the ship vulnerable—not so with Plessey-Sippican.

Easy to operate—the probe and spools are contained in an easy-to-load canister. Proficiency in operation can be achieved in a few minutes.

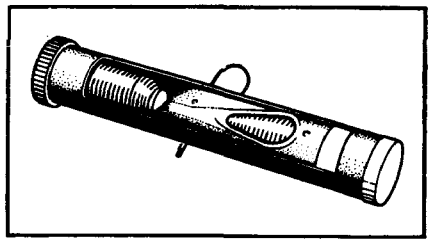
PLESSEY Electronics

EXPENDABLE BATHYTHERMOGRAPH PROBE MO300T-4

measures ocean temperatures down to 1,500 ft. : precalibrated unit : suits all types of ship.

SPECIFICATION

Temperature Range:	28° to 95°F ±0.27°F —2° to 35°C ±0.15°C
Depth Range:	0 to 1,500 feet @ 0 to 30 knots (0 to 460 metres @ 0 to 30 knots)
Sinking Time:	Approximately 1 minute to 1,500 ft.
Probe Size:	2¾ in. dia. x 14 in. long (6.9 cm dia. x 35.5 cm long)
Weight:	2¼ lbs. (1.2 kg.)
Shipping Container:	12 units to a carton
Size:	14¼ in. x 11¾ in. x 17¼ in. (36.2 cm x 28.6 cm x 43.8 cm)
Weight:	38 lbs. (17.2 kg.)

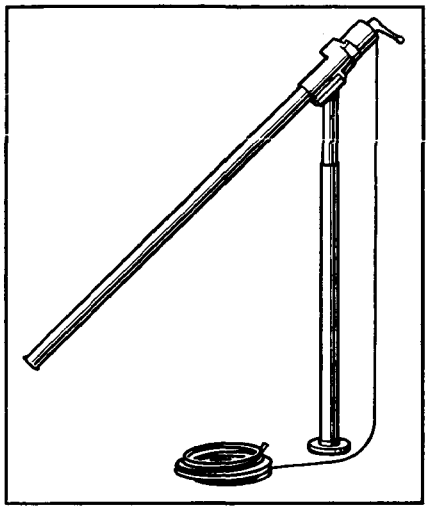


PROBE LAUNCHER MO302

gravity device consisting of discharge tube and loading breech : portable : easily installed : 100 ft. cable for connection to recorder.

SPECIFICATION

Launcher:	
Size:	80 in. x 7 in. dia. max. (203.2 cm x 17.8 cm dia. max.)
Weight:	39 lbs. (17.7 kg.)
Materials:	Bronze and Stainless Steel
Stanchion Mount:	
Size:	3 in. dia. x 55 in. H. closed, 75 in. open (7.6 cm dia. x 139.7 cm H closed, 190.5 cm open)
Weight:	42 lbs. (19.1 kg.)
Standard Cable:	100 ft. with terminal lugs to attach to the recorder
Shipping:	
Size:	86 in. x 12¼ in. x 9½ in. (218.4 cm x 31.1 cm x 24.1 cm)
Weight:	142 lbs. (64.4 kg.) (Launcher, Mount, Cable)

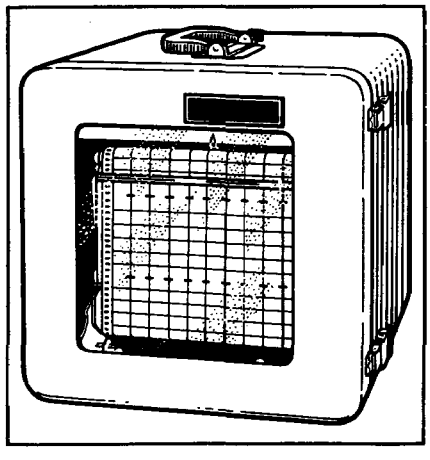


RECORDER MO301

strip type programmed to convert readings into direct temperature/depth plots : continuous profile on 6″ paper chart : recorder actuated by release of probe : weather-proof : 240 plots from a single roll of paper : charts and calibration in °C and metres or °F and feet.

SPECIFICATION

Power Requirement:	110 volts, 60 CPS ±5% 110 volts, 50 CPS on special order
Temperature Range:	28° to 95°F —2° to 35°C
Chart Paper:	English : 28° to 96°F by 0 to 1,500 ft. Metric : —2° to +35°C by 0 to 460 m.
Cycle Time:	90 seconds
Size:	12¾ in. W x 13⅞ in. L x 13¼ in. H. (32.4 cm W x 35.3 cm L x 33.7 cm H)
Weight:	36 lbs. (16.3 kg.)
Shipping:	
Size:	16 in. W x 20½ in. L x 18 in. H. (40.6 cm W x 52.1 cm L x 45.7 cm H)
Weight:	57 lbs. (25.9 kg.)



See PLESSEY-SIPPICAN XBT SYSTEM at the 9th INTERNATIONAL HYDROGRAPHIC CONFERENCE, MONTE-CARLO — April 18th to May 3rd, 1967.

Plessey Marine Systems Division

The Plessey Company Limited, Ilford, Essex, England. Tel: Ilford 3040 Ext. 5149 Telex: 23166

PE(M)5

THE

INTERNATIONAL HYDROGRAPHIC REVIEW

FOREWORD

The International Hydrographic Review is published in January and July of each year in both English and French editions. The Bureau welcomes articles on hydrographic, topographic and photogrammetric surveying, radio aids, navigation and allied subjects, new instruments and equipment, new hydrographic ships and boats as well as articles on the history and organization of hydrographic offices.

An honorarium of 15 gold francs (about 5 U.S. dollars) per printed page of 600 words will be paid for all original articles accepted, including tables and diagrams but excluding photographs. In addition the Bureau will, upon request, supply each author free of charge with a total of 50 reprints of his article in one of the two official languages of the Bureau (or with 25 in English and 25 in French).

Articles should be in English or French, typewritten, double spaced, and if possible in duplicate. However, in order to achieve a well-balanced distribution of subject matter in the various issues of the Review the Directing Committee reserves the right to print articles in an appropriate issue.

Deadline notice

January issue will close 1 August
July issue on 1 February

Articles should be addressed to :

The President of the Directing Committee,
INTERNATIONAL HYDROGRAPHIC BUREAU,
Avenue Président J.F. Kennedy
MONTE-CARLO,
(Principality of Monaco).

The Directing Committee are not responsible for statements made or opinions expressed in articles or papers published in this Review when written by authors who are not members of the Directing Committee or of the staff of the International Hydrographic Bureau.

Information concerning advertisements in the Review will be supplied on request.

Price : 5.00 U.S. Dollars. For conditions of sale see *List of Publications and prices.*

THE INTERNATIONAL HYDROGRAPHIC REVIEW

Vol. XLIV N° 1

(N° 80 OF THE SERIES)

PUBLISHED BY

THE

INTERNATIONAL HYDROGRAPHIC BUREAU

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TABLE OF CONTENTS JAN 67