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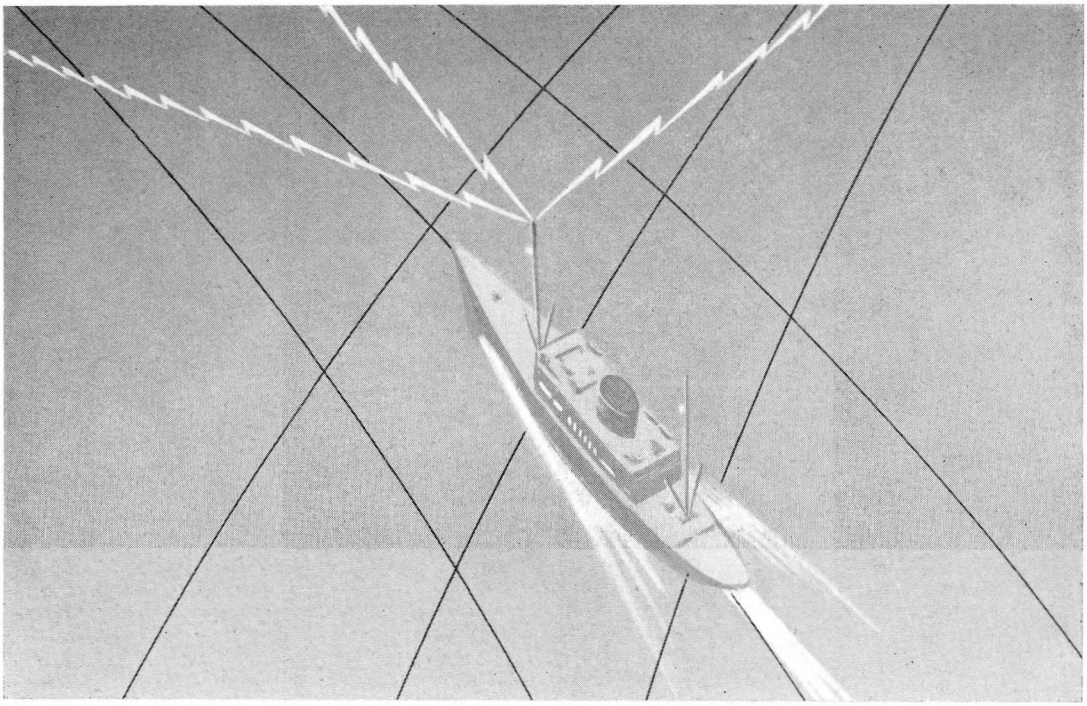

RADIO AIDS

TO MARITIME NAVIGATION AND HYDROGRAPHY

(INTERNATIONAL HYDROGRAPHIC BUREAU SPECIAL PUBLICATION N° 39)

This publication contains the latest theoretical and practical information available regarding radio aids currently used for position-fixing in both maritime navigation and hydrography.

The summary of chapters is as follows :

CHAPTER I. — Spectrum and Propagation of Radio Waves.
1) Frequency Spectrum of Electromagnetic and Radio Waves - 2) Propagation of Radio Waves.

CHAPTER II. — Radio Systems Used in Maritime Navigation.
1) Radio Direction-Finding - 2) Loran - 3) Decca - 4) Consol.

CHAPTER III. — Radio Systems Used in Hydrographic Surveying.
1) Decca in Hydrographic Surveying - 2) Shoran - 3) Electronic Position Indicator (EPI) - 4) Shoran and EPI in Offshore Hydrographic Surveying - 5) Raydist - 6) Lorac - 7) Rana - 8) Computation and Plotting of Hyperbolic Lattices on Survey Plotting Sheets.

CHAPTER IV. — Radar Technique.
1) Radar Technique in Navigation - 2) Use of Marine Radar in Surveying.

CHAPTER V. — Radio Systems in Geodetic Surveying.
1) Outline of Present Situation - 2) Operational Reports.

CHAPTER VI. — Reports on Use of Radio Systems in Hydrography.
1) Decca - 2) Shoran - 3) EPI - 4) Raydist - 5) Lorac - 6) Rana.

The publication has been prepared in the two official languages of the I. H. B. : English and French. The French edition was issued in February 1956 and is already on sale. It consists of VIII + 481 pages, and of 223 figures including 50 full-page illustrations. The English edition will appear towards the middle of 1956.

The price per volume in either edition has been set at 8 U.S. Dollars. Conditions of sale are as follows:

Owing to fluctuations of exchange, the price is given in U.S. Dollars. Packing and carriage expenses are extra.

A reduction of 30 % on the price is allowed to Government Offices and Naval and Mercantile Marine Officers of States-Members of the Bureau if the order is sent *direct* to the Bureau and not through a bookseller.

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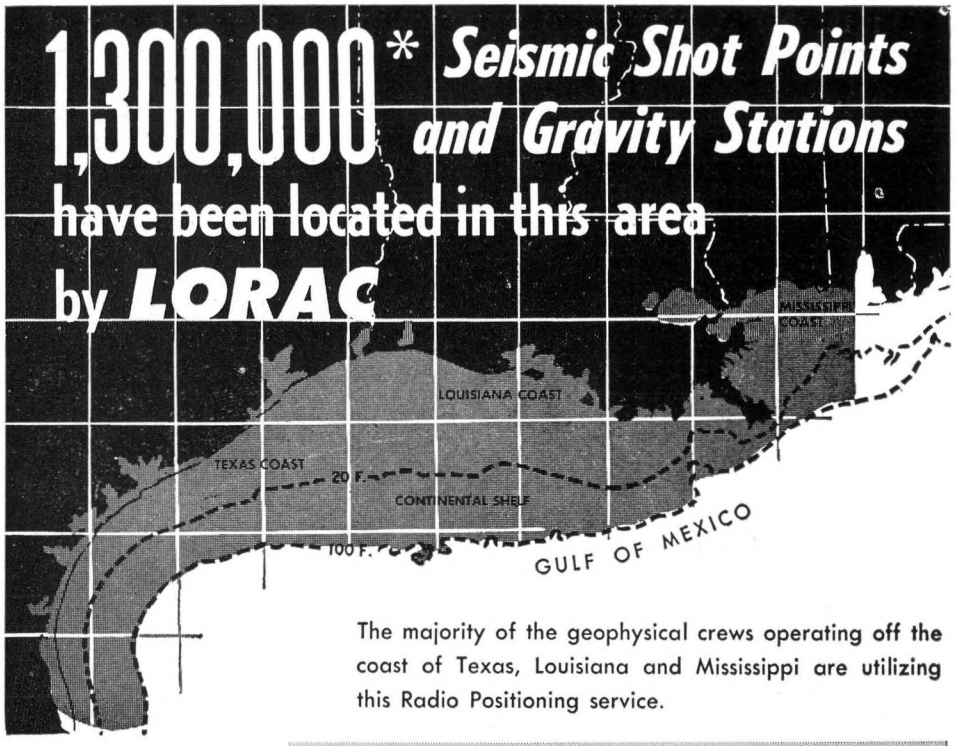

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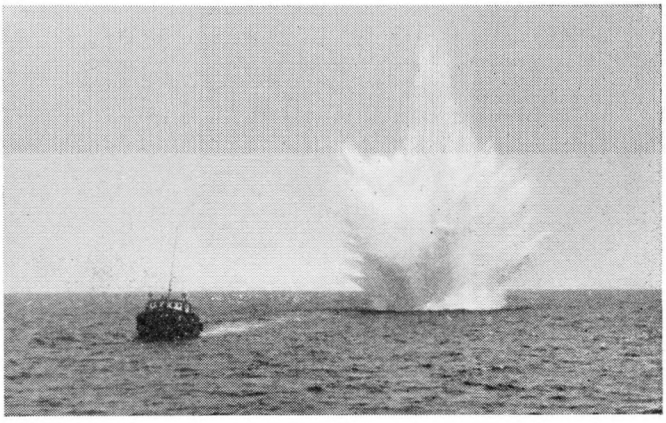

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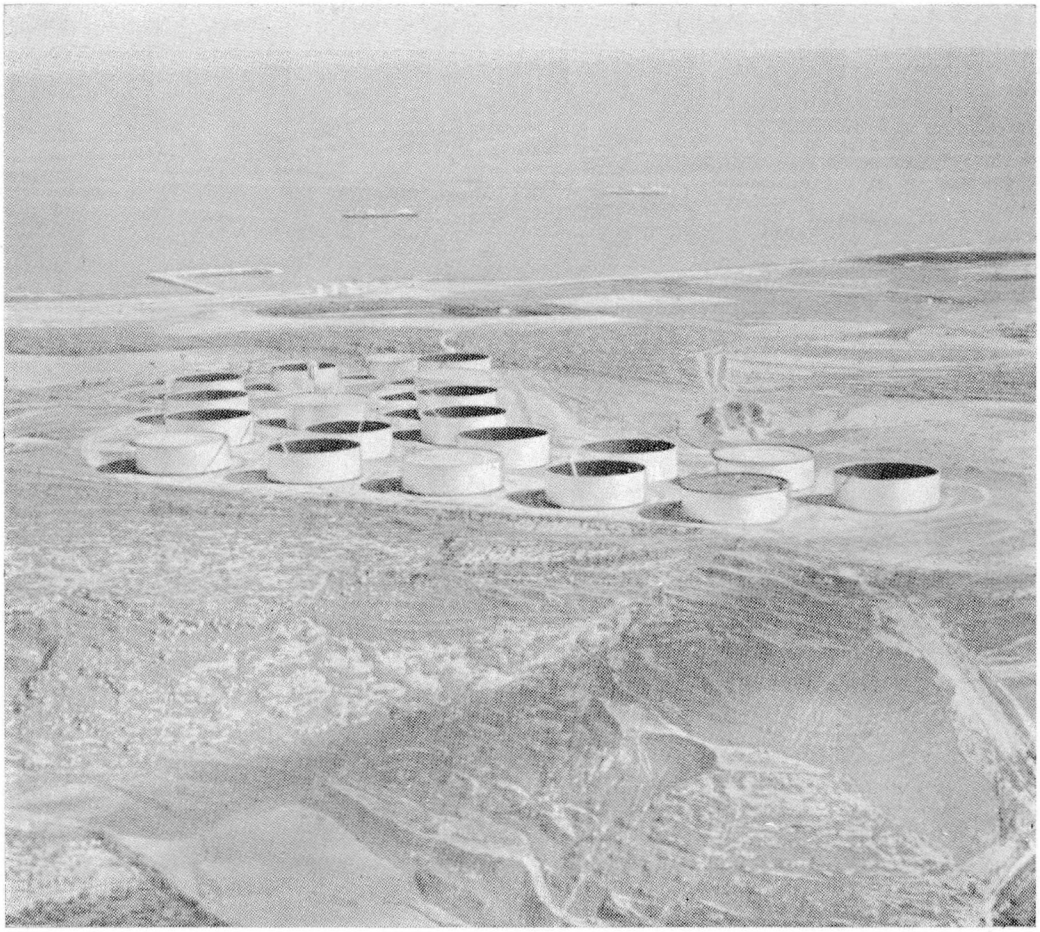

Photograph by Courtesy Trans-Arabian Pipeline Co.

Oil terminal at Sidon, Lebanon

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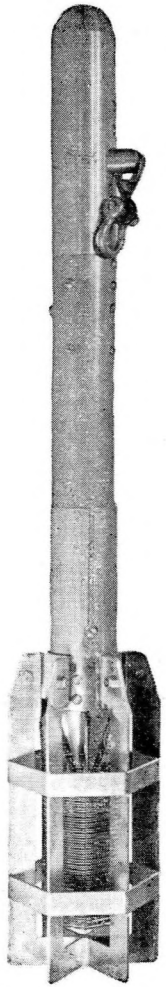

Wallace and Tiernan
Thermarine Recorder

USE THIS WALLACE and TIERNAN

Thermarine Recorder

to measure and record water temperature vs depth.

THERMARINE RECORDER
(Bathythermograph)

	MODEL Nº		
	FA-190011	FA-190021	FA-190031
Depth range *	0 to 200 ft.	0 to 450 ft.	0 to 900 ft.
Accuracy	2 ft.	4.5 ft.	9 ft.
Temperature range *	+ 30° to + 90° F.	+ 30° to + 90° F.	+ 30° to + 90° F.
Accuracy	± 0.1° F.	± 0.1° F.	± 0.1° F.
Maximum allowable depth	225 ft.	562.5 ft.	1125 ft.
Length	31"	31"	31"
Diameter: Nose	2 1/8"	2 1/8"	2 1/8"
— Tail	5"	5"	5"
Weight (pounds)	21 3/4 lb.	21 3/4 lb.	22 lb.
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ACCESSORIES:

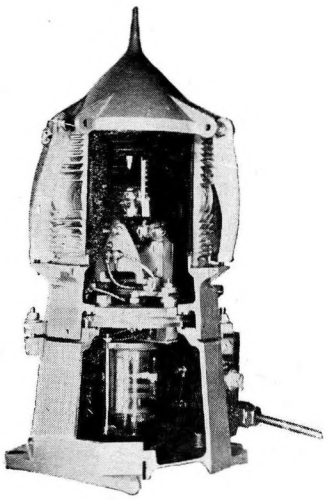
200 smoked glass slides. — Two individually calibrated grids and holders. — Two grid viewers. — Two pts. slide lacquer. — One pt. lacquer thinner. — One slide forceps. — One thermometer. — One nose casting.

* Temperature and depth may be calibrated in °C and meters, if desired.

The accessories listed above are the same for models FA-190011, FA-190021 and FA-190031, with the exception that a deep diving rig is included with model FA-190031.

WALLACE & TIERNAN Incorporated
Belleville 9, New Jersey (U. S. A.)

ELECTRICITY POWERS
THE MODERN AID TO NAVIGATION
For Lighthouse or Buoy



Wallace and Tiernan 200 mm. Lantern cut away to show lamp changer and flasher mechanism

Recognizing the responsibility imposed on marine lights and their accessories, Wallace and Tiernan has, over the years, developed a complete line of modern **electrically powered** aids to navigation meeting all the requirements of unfailing dependability, low initial cost, negligible maintenance and long unattended service periods.

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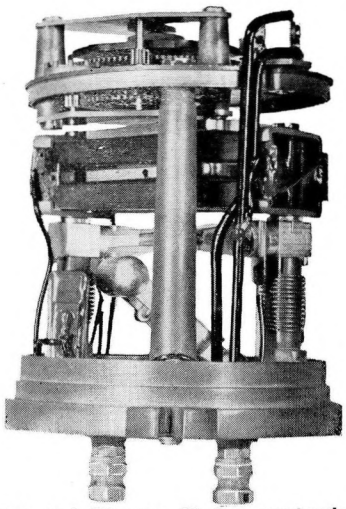

Wallace and Tiernan Flasher mechanism

- Electrically powered operation.
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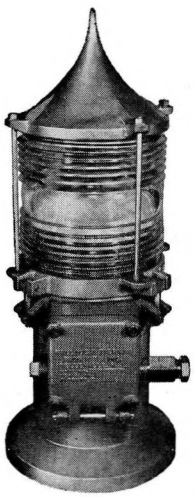
- Automatic lamp changers.
- Corrosion resistant, watertight construction.
- Efficient candlepower output high visibility with low power consumption.
- Low initial cost.
- Continuous, unattended operation for long periods.



Wallace and Tiernan 150 mm. Lantern

Wallace and Tiernan Specialists on aids to navigation will be glad to make recommendations on your problem without obligation—either on new installations or on the conversion of old gas or oil lights to modern electric operation. Such conversions, utilizing existing optics and structures, are both economical and pratical.

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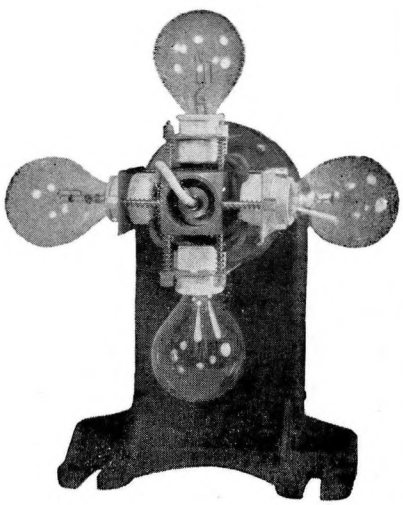
- Fog signals.
- Batteries of all types.



Wallace and Tiernan Lamp changer, for electrifying large optics

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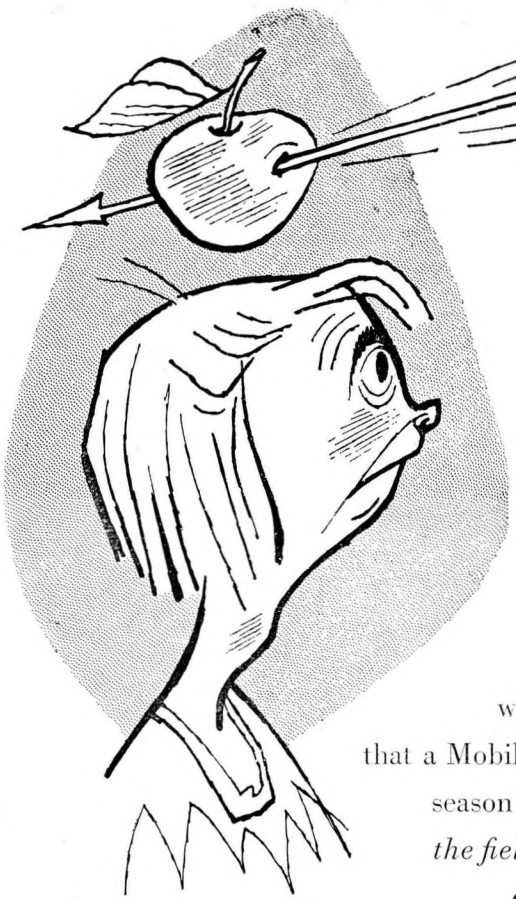

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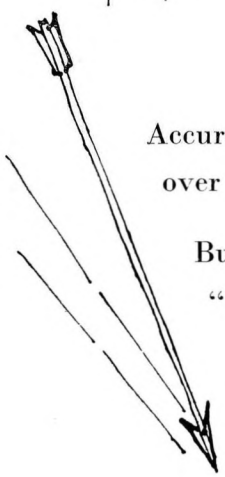

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FOREWORD

The International Hydrographic Review is dependent for its value and interest on original contributions from its readers, as well as on the re-publication, in English and French, of appropriate articles which have already appeared in other publications.

Articles on any branch of hydrographic surveying, navigation and allied subjects, such as radio and other aids to navigation, new instruments, hints to hydrographic surveyors, etc., as well as articles dealing with the history and organization of hydrographic offices with descriptions of surveying ships and boats and their equipment, are of great interest to all Hydrographic Offices.

The Directing Committee of the International Hydrographic Bureau will carefully consider all articles received for publication. Free reprints in English and/or French of original articles will be supplied to their authors on request made when sending manuscript.

Articles should be typewritten if possible in duplicate and adressed to

The Secretary-General

INTERNATIONAL HYDROGRAPHIC BUREAU
Quai des Etats-Unis,
MONTE-CARLO.
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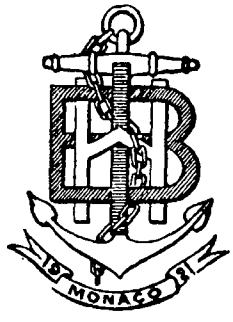
and should reach the Bureau not later than 31st January or 31st July for the May and November numbers respectively.

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.

THE INTERNATIONAL HYDROGRAPHIC REVIEW

Vol. XXXIII



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ERRATUM

International Hydrographic Review

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NOTE ON THE GIVRY CORRECTION

Page 99, line 6 and 13 should read: $\frac{\sin \varphi_m}{2} . \lambda$

$$\frac{\sin \varphi_1}{2} . \lambda$$

Page 100, line 7 should read:

... between the second and third order ...

line 11 from bottom should read:
... the same as above and: p is $\varphi_2 - \varphi_1$ ...

line 4 from bottom should read:

$$+ \frac{\sin^2 \varphi_1 . \cos \varphi_1}{2} . p . \lambda . \varepsilon^2$$

Page 101, line 7 should read:

$$\text{for } K_m : \left(\frac{\sin \varphi_1}{2} . + \frac{2\text{-}3 \sin^2 \varphi_1}{12 \cos \varphi_1} . p . \lambda\right) - \frac{\sin\left(\varphi_1 + \frac{p}{2}\right)}{2} . \lambda = \ldots$$

line 8 from bottom should read:
... to 30° K_m has ...

second line from bottom should read:

$$\ldots \frac{\sin \varphi_1}{2} . \lambda \text{ as from } \frac{\sin \varphi_m}{2} . \lambda \ldots$$

Frontispiece. Admiralty Chart 1826. A graded strip pinned, through the 75-ft. scanner height mark, on to the D.R. position shows that only the mountain tops in Cumberland would be above the radar horizon at this range.