

BOOK REVIEWS

MANUALE DEL RADARISTA

(Radar Operation Manual)

by Gino MONTEFINALE

Instructions on radar technique, equipment, circuits, applications and use. 8vo, xii + 476 pp., 258 figs. & misc. ill., with an English-Italian glossary of radar terms. Ulrico Hoepli, Corso Matteoti, 12, Milan, 1958.

Radar was one of the revelations of World War II, and the most ardent partisans of its application to navigation in general and to merchant navigation in particular were the same men who made such brilliant use of it during military operations. It is common knowledge that the International Meeting on Radio Aids to Marine Navigation (IMRAMN), held at London in 1946, was responsible for an intensive examination of the entire problem of marine radar, including technical specifications based on prototypes previously tested, its use in coastal navigation and in narrow waters, and for the prevention of collisions in fog. Opinions upholding the marine possibilities of radar were subsequently confirmed at meetings of IMRAMN held in the United States of America in 1947. The extraordinary development of radar in the merchant marines of all flags dates back to this period, although no national or international commitment prescribes that it be installed on vessels of any particular class, such as in the case of the radio direction-finder.

In spite of the recommendation of the International Conference for the Safety of Life at Sea (1948) to the contracting governments that personnel assigned to the operation of shipborne radar should be adequately trained, most maritime nations have been slow in complying with this requirement. Only in recent years has this important question been given prominence and headed the agenda of various international congresses (Hamburg, Paris, Genoa, and London), as a result of several collisions attributed to an inadequate knowledge of radar operation on the part of shipmasters.

It must nevertheless be admitted that, notwithstanding the delay of numerous government agencies in implementing a training programme (even today radar is absent from the curriculum of navigation schools), there has been no lack of textbooks by competent authorities in the leading maritime countries intended for master mariners who required a closer acquaintance with radar, whether as watch officers or as commanding officers on ocean liners. An idea as to the large number of works that have appeared on this subject may be had upon referring to the carefully reproduced entries in the bibliography of the International Hydrographic Review. These bibliographical lists contain both manuals of a popular nature for the use of navigators, since the master mariner's knowledge of electronics is necessarily restricted, and works on radar of definite technical and scientific value.

Colonel Gino Montefinale, a Naval Ordnance engineer and a former captain in the Italian Navy, was a pioneer and publicizer in regard to radio systems in his country's navy and merchant marine, when his book *Il Radar ed il suo impiego in Navigazione* (Radar and its use in Navigation) appeared late in 1948. The second edition was published in 1951 (8vo, xv + 344 pp., 172 figs. & diagr., Ulrico Hoepli, Milan). Colonel Montefinale was the first in Italy, and certainly one of the first in the world, to attempt to bring this difficult, complex subject within range of the user's, and especially the seafaring user's, understanding; he also realized its possible usefulness to other groups whom this new instrument more or less directly concerned: shipowners, hydrographers, ship inspectors, radiomen, radar fitters, and others.

Meanwhile, ships were increasingly fitted with radar equipment (at present believed to be 20000 in number), and improved methods were developed for the navigational use of radar and for avoiding collision. Techniques were radically improved in the design of marine radar and shipborne installations: among these, scanners, the size and power of discrimination of PPI screens, circuits, component parts and assembly technique, the safety and normal operational controls deserve special mention. To facilitate evaluation of the ship's track and speed in fog for collision avoidance, plotting methods were perfected by speeding up the process through reflection systems. Leading manufacturers of marine radar have made the new true motion radar devices commercially available, and these have proved to be valuable accessories to the main radar set; i.e. junior radar and millimetric-wave radar (ship-shape radar), which directly supply ship outlines at short range.

All these different developments amply justify the revision of Colonel Montefinale's previous book. A new volume is now presented by the Milanese publishing house of Ulrico Hoepli under the title of *Manuale del Radarista*. As the author points out in the preface, the new manual has only a remote connection with the former work, in that it is purely informative in character: it is an absolutely new treatise on radar, in which the theory has been thoroughly dealt with as necessary, and which has otherwise been revised on the basis of the technical progress accomplished during the past six years. The book is intended for the *radar operator*, by which term the author does not refer to a particular class of qualified personnel, but to any person entitled to handle radar to the extent defined in the book: master mariners, air navigators, port and airport radar assistants, meteorologists, hydrographers, and other types of technicians and users. Since the manual is not restricted to marine radar, but generally covers radar for commercial aircraft, port and airport radar, meteorological radar, and radar for determining high altitudes or radio-astronomical radar, each user will find something to his advantage in the book.

Moreover, the author has given special attention to preparatory radar instruction in navigation schools, and to the training of bridge officers and masters with no previous instruction in electronics.

The work consists of the following chapters: 1. Preliminary concepts; 2. Principle of radar; 3. Radar components; 4. The oscilloscope indicator; 5. Various types of radar; 6. Radar constituents; 7. Radar electronic tubes; 8. Navigational radar; 9. Commercial technical development of radar; 10. Technique of radar impulses and circuits; 11. Other radar applications.

Illustrations have been increased from 172 to 258 as compared with the 1951 edition, an indication as to the volume's present development. Bearing in mind

that radar techniques were initially developed in Great Britain and the United States, and that instructions and diagrams accompanying sets are ordinarily in English, the author has supplied a number of references to Anglo-American techniques in the various chapters, and has combined them in the latter part of the book with appropriate navigational terms in a comprehensive English-Italian glossary.

Whereas the relatively limited and as yet indefinite radar standards in commercial aviation have been included in the descriptive material, the more complex standards regarding the use of equipment on merchant vessels are given in appendices. This is due to the temporary and constantly changing character of the concepts described, which at present should merely be regarded as the prevailing tendencies in marine research circles, pending a decision by authorized international conferences, and especially by the Conference for the Safety of Life at Sea, as to the adoption of final regulations.
