Reviews

Radar Technology Encyclopedia. By D. K. Barton and S. A. Leonov, editors. xii + 511 pages, 28 × 21 cm, Artech House Inc., £69. ISBN: 0-89006-893-3.

David Barton is a well-known American radar textbook author and engineer. Dr Sergey Leonov, a senior space programme radar designer, formerly headed a research laboratory in the Moscow Aerospace Institute. They and their fellow contributors deserve congratulation for marshalling so much practical information within a well-bound book of manageable size. No waste space, no waffle. The numerous competently translated Russian contributions widen the coverage and bring fresh insights.

Entry lengths well match topic importance. The reader with basic radar knowledge will generally find in each article a concise but clear and accurate overview. Formal IEEE or other definitions, standard notations, equations, tables and line diagrams abound. Usually there will be quite sufficient to refresh the memory of a half-forgotten device or technique, or illuminate an unfamiliar term in one's reading, particularly if the cross-references to related entries are followed up. For more, at least one, usually several, detailed textbook references are always cited, mostly post-1980. The Western and Russian bibliographies, around 400 titles each, are conveniently sorted under three dozen subject-heads.

Defence applications are to the fore, although few West European military equipments feature among the many described. Electronic warfare problems such as jamming, ELINT and ECCM are fully treated. The extensive index of abbreviations and acronyms reminds us these mean electronic intelligence and counter-counter measures. Primary and secondary aviation radars are included, as are passive reflectors. Civil marine is poorly represented; nothing on ARPA or VTS, or target enhancers, racon, search and rescue transponders and their omnidirectional antennas.

The encyclopaedia is strong on components, explaining use and instancing performance. Comparative tables of operating features help understanding of the circumstances favouring, say, a particular transmitter modulator. System and mathematical techniques are covered: scanning methods, pulse compression, holographic filters, transforms, ambiguity functions and much else. There are formulae and tables for sea and precipitation clutter and the radar cross sections of many sorts of target. Continuous wave as well as pulse radars are well represented, as are laser rangefinders, spaceborne and bistatic systems. Even Loran and GPS come in, under 'Radar, multilateration' – not the only entries to hide their lights under bushels. It would have been easier to find some articles if the index of 450 main subjects had been extended to all 5000 entries.

Perhaps inevitably in such a work, a few entries miss the point; for example, the chief merit of cascode amplifiers – absence of reverse coupling – is overlooked. Tighter editing would also have reduced overlaps between certain entries. Helpfully, some of radar's rich heritage of colloquialisms are included; magic tee (waveguide bridge) and main bang for the transmitter pulse. Apart from some muddy half-tone illustrations, the 700 or so line diagrams and the letterpress are admirably clear. The many equation subscripts always remain legible and misprints are few.

The publisher addresses the encyclopaedia to researchers and engineers in radar and

related disciplines. It can also be recommended to technical journalists, administrators and students needing more depth than a technical dictionary and more breadth than any single textbook.

J. N. Briggs

Collisions and Their Causes (*Second Edition*). By Richard A. Cahill. 261 pages, 22 × 28 cm. ISBN 0-9630018-7-6. Nautical Books, 1122 Colorado, Suite 1508, Austin, TX 78701, USA. 1997. Hard cover $59.95. E-Mail: racahill@ix.netcom.com.

Captain Cahill's book *Collisions and Their Causes* was first published in 1983 and quickly became a standard reference work in the maritime field. It has been invaluable reading for navigators, Admiralty lawyers and all those who have an interest in the problem of collision avoidance at sea.

In this new edition, Captain Cahill has added 43 new cases and two new chapters dealing with automatic radar plotting aids (ARPA) and collisions with tows respectively. His updating reflects the dramatic changes which have taken place in the way ships are navigated over the past 14 years. The increasing use of satellite systems for position fixing and of ARPA for collision avoidance are notable examples. The use of VHF radio for collision avoidance purposes is a more controversial development which is discussed fully and wisely by the author.

The book follows a clear and logical sequence with 19 chapters on such topics as Restricted Visibility, Forestalling Close Quarters, The Role of VHF and Harbour Radio, The Use and Misuse of ARPA, Starboard Bow Reciprocal Meeting, Crossing/Meeting, Special Circumstances, Converging/Overtaking/Crossing, Meeting in Narrow Channels, Collisions with Tows, and Keeping a Proper Lookout. Captain Cahill discusses each topic with the accumulated wisdom of four decades at sea with the US Merchant Marine, over half being in command. He illuminates each chapter with a careful analysis of relevant collision cases from the recent past and he quotes important judgements. However, his own comments go beyond official Admiralty Court findings and allocation of blame to bring out the lessons which he feels are to be learned.

Captain Cahill has done wonders in collecting accounts of collisions involving over 140 ships, and in presenting them so that their causes are identified and conclusions can be drawn. The book is of a size to fit on most bookshelves and Captain Cahill is publishing it himself at a very moderate price.

Inevitably, such a presentation raises additional questions which are beyond the scope of the book to answer. There are often causes behind causes. Captain Cahill rightly emphasises the vital importance of an efficient lookout at all times. It is, as he says, 'a rare collision when failure to keep a proper lookout plays no part'. But, if a deficient lookout is a cause of collision, one needs to look beyond this to the cause of the deficient lookout. Captain Cahill discusses the procedural problems at some length but there are others – such as fatigue or alcoholism – which he does not mention, probably because evidence for these factors is hard to come by.

Looking to the future, the pace of change at sea shows no sign of abating. Radar target enhancers to supplement the use of radar reflectors are being developed to assist in the detection of small craft and, for some time, the International Maritime Organisation (IMO) has been considering the introduction of ship radio-transponders for, amongst other things, collision avoidance. There might well be a need for a third edition of *Collisions and Their Causes* in fifteen years time.

Captain Cahill has produced an important book which should be compulsory reading for every offshore sailor, whether professional or amateur. It is also highly recommended to anyone with an interest in safety at sea. If the lessons which he highlights so persuasively are heeded, the sea will become a safer place.

John Kemp