ELSEVIER

Infrared Physics and Technology 37 (1996) 281–282

INFRARED PHYSICS & TECHNOLOGY

Book Review

Principles of Infrared Technology (a practical guide to the state of the art)

Principles of Infrared Technology (a practical guide to the state of the art), ed. John Lester Miller, Chapman and Hall, May 1994, ISBN 0442 012101, £52.00, 578 pages.

This is an unusual book on Infrared Technology, and the subtitle – "a practical guide to the state of the art" – should be taken seriously. As the author's preface notes, it is not a book which develops subjects from first principles (which makes the title a little odd!), it attempts to "function as a compilation of the state of the art, and provide background information for the reader to separate the practical from the chimerical". A very wide church of readers is addressed – engineers "catching up", engineers new to the field, managers, students, administrators and technicians. This sounds like a marketing department's dream – but does it succeed?

If a book is to present the "state of the art" it must above all be up to date, for the state of the art is by definition transient. Unlike some recent volumes on the infrared in this case the claim is reasonably justified. Published in May 1994, most chapters have many references in the early 90's and a few into 1993, and the (commendably extensive) reference lists at the end of each chapter contain very little make-weight, outdated material. It is a little more difficult to judge the extent to which the many summaries of commercial information are "state of the art", as they are less clearly dated, but certainly there is much recent information.

The opening two chapter section on "management" will come as a surprise to many readers. It attempts to draw together some of the marketing and management issues relevant to infrared and electro-optic technologies. Whilst perhaps it may act as a thought provoking reminder of the importance of these issues if you really need to know about them a real book on technology management would be more appropriate than these fifty or so pages, which are rather full of "motherhood" statements.

Part two covers component technologies, and in particular infrared telescopes, focal plane arrays, cryocooling systems, and image processing and mechanisms, occupying some 260 pages. Each chapter ends with an appendix offering a brief summary of the performance of a range of commercial items relevant to its subject. Data provided includes not only the critical technical parameters (although no attempt has been made to standardise the way parameters are presented so intercomparisons are difficult) but also information on delivery, approximate price, qualification levels and production rates. These appendices are certainly a unique and valuable aspect of the book. The body of each chapter seeks to set out the relevant technical background. As previously noted there are few formulae – and the choice of those presented seems odd at times. Regrettably these chapters are not free from technical error, and (especially in the aspects of the detectors chapter relating to the physics of the detection process) one sometime feels the author may be writing outside the area in which he is entirely at home. An example which particularly "grated" on this reviewer was the opening sentence on the pyroelectric detection mechanism: "Pyroelectrics produce a change in magnetic effects when energy (watts) is absorbed....". These errors aside the chapters do take a useful and different approach to that of most texts. There is a concentration on values of parameters actually achievable in production items, rather than physical

SSDI 1350-4495(95)00131-X

limits and "one off" laboratory results, which will indeed help the reader separate the "practical from the chimerical".

Part three addresses systems, again covering a wide range, for deployment on a wide variety of platforms in a wide range of applications. Again each chapter has the useful appendix summarising the properties of some commercial systems and again there is a unique concentration on real-life systems and achievable performance. Sadly, there is a fair scattering of errors (a "bang bang" control system whose position as a function of time reverses direction of movement whilst its velocity always has the same sign for example!).

The book closes with appendices on nomenclature, a glossary of abbreviations and acronyms and a bibliography. These are very useful indeed for the new comer, but once again there are errors – Eutectic totally incorrect, the wavelength of a He–Ne laser wrong, sloppy definitions of the Airy disk and Bremmstrahlung amongst others.

Style is very much a matter of personal preference, and a technical book does not need to be a great literary master piece. However it does need precision in its use of language, and should avoid unnecessary verbiage which carries little information. There are rather too many examples of sloppy, inaccurate use of words like the confusion of energy and power in the quote on pyroelectric detectors given earlier, self contradiction in successive sentences ("devices....consist of linear arrays. Only recently have two dimensional arrays appeared"), inaccurate chemical formulae (the element To is new to me) etc. I am not sure that the rather frequent, vague, unquantified and unreferenced statements such as x is "generally lower" than y are really much help in an engineering context. Occasionally words are so misused as to render a sentence meaningless ("DC coupling does the corollary....").

Overall this is a valiant attempt to write a genuinely rather different book on infrared technology. For the reasonably experienced reader, who will not be caught out by the substantial scattering of errors, it will be a useful view. For the new comer I cannot recommend it, partly because of those errors, partly because it does not really provide the "principles" mentioned in its title, and some vital aspects such as atmospheric transmission are barely mentioned. The manager or administrator addressed in the preface is unlikely to get much beyond chapter two!

Buy this book for its *subtitle* "a practical guide to the state of the art", but look elsewhere for the "principles of infrared technology". If you do buy it – and it certainly has its uses – be careful of the occasional error, and try not to be too irritated by a rather careless and at times rather verbose presentation. Can we please have a second edition from which these careless slips and verbiage are removed? – it will then be a truly commendable and novel book on IR technology.