

*Editorial*

H. J. Caulfield, Editor

### Reviewing the Book Review

Books are a primary source of information for working scientists and engineers, so presenting helpful reviews of the latest books in optics and closely related fields has been a primary goal of mine as editor of *Optical Engineering*. I have sought out the leaders in the field to do the reviews and their efforts have been evident in some excellent reviews. Nevertheless, I see the need, for the sake of completeness and value of the reviews, to list certain things that I as editor would like to see in many book reviews. The following list is incomplete and in no particular order, but I hope reviewers will find it useful.

(1) Books can be evaluated in terms of their value in achieving well-defined goals. The author usually states his goals in the preface. You may see other purposes for which the book is suited; if so, please indicate them.

(2) Books go on shelves where they collect, almost automatically, dust and authority. The matter of authority is of primary concern if significant errors are enshrined there. You, the reviewer, are one of the last lines of defense against errors which can not only cause confusion and problems but which can be propagated into other books.

(3) The matter of style is important to note. Some otherwise-seminal books are beyond the capability or patience of most readers. Some easily read books are devoid of significance. Somewhere between those extremes are most of the books we review. It is often helpful to the would-be purchaser of the book to know something of the author's style.

(4) Because books are used for ready reference, such matters as organization, references, and index become important. Is the organization clear and logical? Are the references complete, unbiased, and up to date? Is the index present, complete, and usefully organized?

(5) The heart of a technical book is its technical content. In the broad sense, is the chosen subject matter defined well and covered well? Are major aspects omitted? Are irrelevances included? In detail, is the subject matter treated completely and accurately?

(6) Multi-author, multi-subject books are a special problem, because they amount to many independent small books. It is appropriate to comment on each individually, as well as to comment on the overall organization, coherence, and completeness (glaring gaps or duplications) of the book.

(7) Many books have competitors in the field. Comparisons are extremely valuable.

(8) Personal opinions, clearly labeled, are also valuable. If you enjoyed the book or found it tedious, that is good information to those of us who know you and at least a clue to others.

(9) Certain factual information is important as well. A book review should start with this information, in this order: Title of Book, Author(s) or Editor(s), Number of Pages, Number of Line Drawings, Number of black/white and color photographs, a statement that there is or is not a bibliography (references), and there is or is not an index, the ISBN, Publisher's Name and Address, Year of Publication, Paperback Price, and Clothbound (Hard Cover) Price. (Most of this information is on the publisher's data sheet which is tucked inside the front cover of the book.) Then the reviewer's name and address are needed.

I hope these comments will be helpful to reviewers, and, in turn, to our readers. Your comments and suggestions are always welcome and often heeded.

## OPTICAL ENGINEERING EDITORIAL SCHEDULE

MARCH/APRIL 1981

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MAY/JUNE 1981

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JULY/AUGUST 1981

### Application of Optics to Energy Processes

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617/275-9400

Kent Casleton, Guest Editor  
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P. O. Box 880  
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304/599-7573

SEPTEMBER/OCTOBER 1981

### Photo-Optical Instrumentation Engineering

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Bedford, MA 01730  
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NOVEMBER/DECEMBER 1981

### Phase-Conjugate Optics

David Pepper, Guest Editor  
Hughes Research Labs.  
3011 Malibu Canyon Road  
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# Book Reviews

## LASERS: OPERATION, EQUIPMENT, APPLICATION, AND DESIGN

Engineering Staff of Coherent, Inc. vii + 216 pp, 250 illustrations, index, bibliography, glossary of industrial laser terms. ISBN 0-07-011593-1. McGraw-Hill, 1221 Avenue of the Americas, New York NY 10020 (1980) \$21.50.

Reviewed by Shaoul Ezekiel, Massachusetts Institute of Technology, Research Laboratory of Electronics, Cambridge, MA 02139.

The title of this book is *LASERS* in very large letters and below it in much smaller letters are the words *Operation, Equipment, Application, and Design*. The reader very quickly finds that this title is a little misleading. A more appropriate title would be "Industrial CO<sub>2</sub> Laser Systems of Coherent Inc. and Their Application in Materials Processing."

The book is based on a series of seminars presented by the staff of Coherent, Inc., a leading laser manufacturing company in Palo Alto, California, for the purpose of educating prospective users of industrial lasers. In a little over 200 pages the authors, who are all members of the Engineering Staff of Coherent Inc., explain, using laymen's language, the principles of laser

behavior, the CO<sub>2</sub> laser in particular, the manipulation of high power laser beams, and the application of CO<sub>2</sub> lasers in the processing of materials.

Laser materials processing has been gaining momentum over the past 15 years or so. Many companies in the U. S. and abroad are exploiting the new possibilities afforded by the laser. This book describes and illustrates numerous applications in the processing of plastics, rubber, cloth, wood, paper, ceramics, glass, metals and so on. Whether the process is drilling, cutting, material removal, engraving, soldering, scribing, welding, or heat treating, the authors provide a brief description of the laser setup in each case, the power requirement, the necessary optics and the conditions under which the work was performed. Each example is illustrated with a photograph of the finished product. Examples include the drilling of aerosol valves, scribing and cutting of glass, perforation of cigarette paper, welding of titanium leads, and heat treating of steel motor shafts. The authors limit themselves to applications that are suited to CO<sub>2</sub> lasers operating at 10.6 microns with a maximum cw power of 775 watts.

In the final chapter, the design of laser systems for such industrial applications is outlined and includes description of the various elements such as delivery systems, focusing heads, beam expanders or contractors, rotating lens assemblies, and the design of coaxial gas jets necessary for many applications. Operating costs of these laser systems as well as the safety aspect are also discussed.

The book can indeed be easily read and understood by the nonspecialist who wants to get a first look at lasers to determine whether lasers can be of any use in his/her line of work—especially if the work is related to materials processing. The book provides quick and simple answers to obvious questions that one might have and the many illustrations covered help to encourage the reader to consider the laser as an industrial tool.

The book is priced at \$21.50 and this would be reasonable were this an objective treatment of the subject. In this case, the book contains so much advertising of Coherent, Inc. products, such as lasers, accessories, systems, warranties, and so on, that I feel one should be able to get this book free or at a nominal charge directly from Coherent, Inc. as part of the company's advertising literature.

## OPTICAL FIBRE COMMUNICATION SYSTEMS

C. P. Sandbank, Ed. 347 pp., illustrated; index; bibliography. ISBN 0-471-27667-7. John Wiley & Sons (1980) \$49.

Reviewed by Joseph C. Palais, Arizona State University, Dept. of Electrical and Computer Engineering, Tempe, AZ 85281.

This is a useful and informative book describing components and system design of optical fiber communications links. Each chapter was written by a different author (or group of authors). The usual lack of cohesion resulting from such an approach did not occur because most of these authors had worked together at Standard Telecommunications Laboratories, Harlow, United Kingdom. The material is oriented specifically towards fiber telephony applications developed there. However, the fundamentals presented can be usefully applied to other applications of optical fiber transmission.

The material is mainly descriptive. It is generally easy to read, except in a few places where difficult concepts are discussed. Examples of this are the descriptions of propagating modes and pulse distortion. In these cases, mathematical derivations are not given. Instead, results of referenced work are described. This approach provides a good review and summary for the reader who is familiar with the original work, but may be difficult for the person studying the subject for the first time. These comments apply to just a few of the covered topics, so that I would still recommend the book to a novice. The omission of derivations and homework problems indicates the book was not intended to be a classroom text.

Chapter 1 is an overview of the entire subject of components and systems for fiber telephony. The second chapter describes the details of propagation in fibers. Step index and graded index fibers are included and multimode and single mode transmissions are considered. The attenuation mechanisms of absorption and scattering are discussed in this chapter and the next one.

In Chapter 3, fiber fabrication techniques are described. These include production of ultra pure glass, the preform, and the thin fiber itself. Both double crucible and glass deposition methods are covered. Cabling of fibers is the subject of Chapter 4. Changes in fiber properties due to cabling, materials used in cable production, and mechanical properties of the resulting cables are topics included.

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Connections and connectors are key elements, particularly in long fiber systems. The problems and solutions occurring in the design of splices and connectors are related in Chapter 5. Chapter 6, on measurement techniques, is very useful. Here we find methods for experimentally determining fiber attenuation, pulse distortion, and refractive index profile.

For telephony, the most common source is the laser diode. This light source is given the most coverage. Chapter 7 briefly describes the physics and structure of the device. Laser diode output characteristics and modulation are more fully described. The emphasis is on operation in the 0.8  $\mu\text{m}$  wavelength region with some mention of future devices operating beyond 1.0  $\mu\text{m}$ .

The discussion in Chapter 8 centers on silicon photodiodes and avalanche photodiodes and their use in receivers. Noise calculations and response time estimates are covered. System design is the topic of Chapter 9. Optical transmitting, receiving, and regenerating circuits are analyzed.

Short descriptions of applications of optical fiber transmission to areas other than telephony are presented in Chapter 10. Advantages for several industrial and military systems are considered. The last chapter describes the practical aspects of design and installation of a 140 Mbps demonstration system.

I cannot help but point out the use of the spelling "fibre," rather than "fiber," throughout the book. Another Wiley book covering much of the same territory, *Optical Fibers for Transmission*, and also having an English author (John E. Midwinter), uses the spelling "fiber." The book also uses the words "inter-modal dispersion." This should be discouraged. Instead, the more accurate description "multimode distortion" should be used.

Overall, this book is excellent. It contains many clear illustrations and numerous photographs of actual devices and equipment. It is a well-written addition to the introductory literature on optical fiber transmission systems.

## ULTRASONIC IMAGING

Pal Greguss. 224 pages; illustrations; index; bibliography. ISBN 0-240-51039-9. Thomson Litho Ltd., East Kilbride, Scotland (1980).

Reviewed by **Milton Gottlieb**, Electro-Optics, Westinghouse Electric Corp., R&D Center, 1310 Beulah Road, Pittsburgh, PA 15235.

Professor Pal Greguss has been involved in many aspects of acoustic imaging since the early 1950s, and is well known for his pioneering work on recording ultrasonic holograms. We might expect a unique perspective of this complex field from the hands of so imaginative a scientist as Greguss, and that is indeed the case with this new book, subtitled *Seeing by Sound*. While the book is primarily a brief (some 220 pages) review of all the important techniques developed for acoustic imaging, there is an underlying theme addressing possible interpretational approaches to sonic image formation going beyond attempts to produce conventional visual imagery. Greguss touches on means of extracting non-visual information, or images, by appropriately processing the data from the acoustic medium; literally, seeing by sound. This theme is not fully developed at this time, but the author will undoubtedly have more to say on the psychophysics of acoustic imaging in the future.

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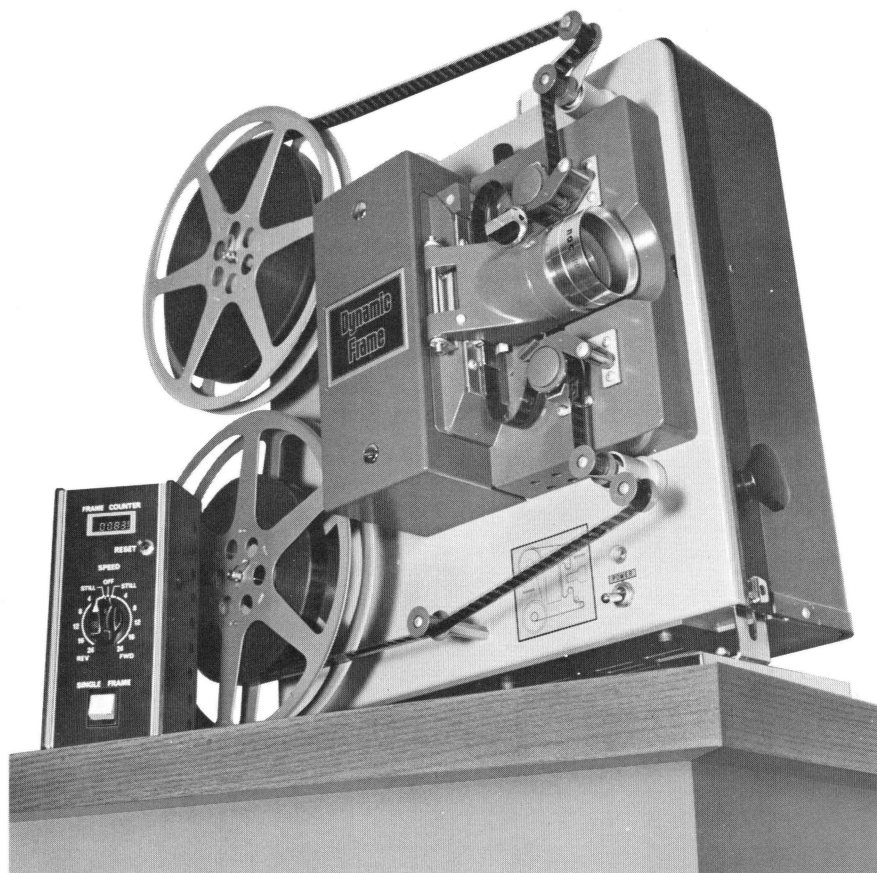
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This conference provides a forum for the presentation of both invited and contributed papers on optical fiber and integrated optics research and technology. The conference will be divided into three topical areas: (1) fibers and cables; (2) connectors, couplers, equipment, systems, and transmission techniques; and (3) integrated optics and active devices. Parallel sessions are planned.

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A technical exhibit of materials, components, instruments, and equipment used in the production and application of optical fibers will be held in conjunction with the meeting. It will be located in the Pacific Room, centrally placed at the headquarters hotel. Registrants will have ample opportunity to visit the exhibit area and examine the latest developments in integrated optics and optical fiber communication. The exhibit will certainly be an important part of this IOOC Conference which will not be held in the United States again until 1987.

For further information:  
Exhibits Manager — Mary Dean VanLandingham  
Meetings Manager — Barbara Hicks

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The book is divided into six chapters, falling into four major subject categories. These are the theoretical background, including information theory aspects and physics of acoustic propagation; the techniques of sonic image formation; the methods of displaying images; and an overview of the important areas of applications. The first, theoretical section of the book is unfortunately too brief except for the reader who has already had considerable exposure to the concepts presented, and has a good understanding of such ideas as signal entropy and the phenomena of elastic wave propagation. The mathematical development is only sketched out, and it is left to anyone wishing to see a more complete treatment to follow the references listed at the end of each chapter for additional material.

The largest section of the book is devoted to sonic image formation, and is a comprehensive and thorough review of all the known techniques, including many older and exotic approaches. A concise, but complete, description of the non-sampled methods is given, including sonosensitized plates based on photographic, chemical, electrochemical, luminescent and thermal effects. A great deal of work involving methods of acoustical-to-optical conversion, using Bragg diffraction and deformed surface reflection, is described, as well as the various sampling methods, including laser beam, mechanical, electron beam, electronic, and acoustic lens. All of this is done with a minimum of mathematical complexity, and is an excellent survey for anyone considering working in this field. The section is well illustrated, with many good diagrams of the various systems, as well as photographs showing examples of the images that can be obtained. The reference list is extensive, and this chapter will be an excellent starting point for the newcomer to acoustic imaging.

The author's stated objective of this book, to give the reader the ability to specify the parameters affecting the formation of an acoustic image and the ability to estimate the best mode of display for the visualization of the sound image to accomplish a given task, is extended very well into the chapter on displays. Here, Greguss gives a comprehensive, critical evaluation of the best known methods, such as A, B, and C mode visualizations, to the lesser known, such as the various 3-D modes. In this connection Greguss's own work in acoustic holography has no doubt endowed him with a deep understanding of its difficulties, and he informs the reader of the severe limitations inherent in the holographic process, at least as it is currently carried out. Its potential has never been realized, and perhaps it will be left to a future generation of acoustic holographers to bring it to full fruition.

The final chapter deals with a variety of different applications such as underwater viewing, geophysical exploration, medical diagnosis, and the increasingly important area of non-destructive testing. These are all exciting fields with great opportunities for invention and improvements, and this book is an excellent guide for suggestions of promising avenues of investigation. For example, medical diagnostics have received a great deal of attention in the past, and some excellent results can now be achieved; Greguss has indicated, however, certain vitally important diagnostics which cannot be made because of incomplete understanding of propagation effects of acoustic waves in living tissue. Many other such examples are given.

The book suffers from a few deficiencies detracting from its overall quality; it is hoped these

can be corrected in future printings. For example, there are a number of typographical and style errors, and a few incorrect statements. A few of the illustrations border on the incomprehensible because of inadequate labeling or captions, and should be clarified in the text, or redone. One or two photographs have been printed inverted, and while they can be interpreted, it is an obviously unnecessary annoyance. On the whole, however, the book successfully achieves its purpose, and will be valuable for review, reference, and introduction to ultrasonic imaging.

### APPLIED OPTICS—A Guide to Optical System Design, Vol. 2

Leo Levi. 1128 pp.; illustrations; index; bibliography. ISBN 0-471-05054-7. Wiley-Interscience, 605 Third Ave., New York NY 10016 (1980) \$75.

Reviewed by Robert R. Shannon, Optical Sciences Center, University of Arizona, Tucson, AZ 85721.

This book is a truly massive book. It is subtitled *A Guide to Optical System Design, Vol. II*. The book begins with Chapter 10 as a continuation of the author's previous Volume I work. The book is 1128 pages long, including comprehensive indexes and many data tables and is sufficiently heavy that evening reading in a water-bed is not recommended.

The topics covered range from optical glass to image systems with many stops in between. In summary, this reviewer feels that a massive and well-carried-out task was accomplished by Dr. Levi in constructing this volume. However, the general effect is a bit disappointing. There is too much material, covered in insufficient depth to be of basic use to most workers. In many respects, reading this book can be likened to a dinner in a Chinese restaurant. Many many courses are served, all of them interesting, all of them in small quantity. The net result at the time is a feeling of happiness and contentment, but a few hours later one is hungry for more again. Therefore, this reviewer cannot unqualifiedly recommend this as a purchase for the average engineer. It will likely serve as a reminder of various formulae and information the individual has forgotten rather than as a source book of new information. Since the book is well done, one would hope that Dr. Levi will sometime take a smaller subset of topics and generate a book in depth on the subject.

I will now go in a little bit more detail discussing the various subjects that are covered.

Chapter 10 (the first chapter, of course) is on "Optical Media." The chapter starts with a discussion of the basic structure of glass, and follows with dispersion formulae, transmission, mechanical and thermal properties, in a very few pages. The author does collect in the back of the book a number of tables of interest which summarize properties of materials in the *Optical Society Handbook*, but not as extensive. This chapter, as well as all others, contains many references to pertinent work.

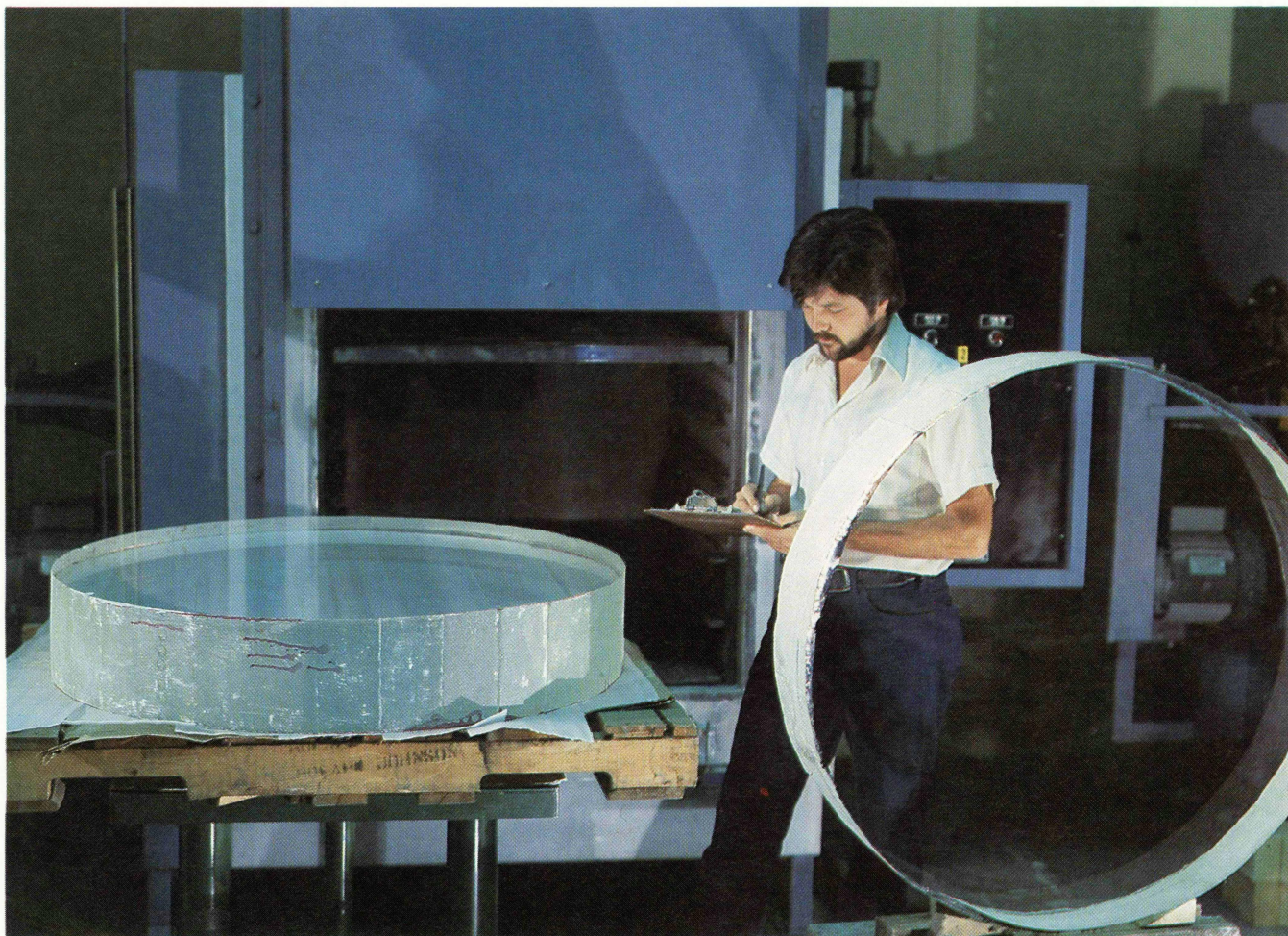
Chapter 11 on "Filters," both thick and thin, is a brief coverage of the properties of the principal types of filter materials. The depth to which the material goes is suitable for an appreciation of the subject but is hardly useful for instruction in the subject and in fact, is not really suited for somebody who has any need to do computation in this area.

Chapter 12 on "Optics of the Atmosphere"



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is a good brief discussion of the characteristics of atmospheric propagation and imaging through the atmosphere. Unfortunately, many of the key formulae are presented without sufficient discussion as to the significance of the formulae, the size of the quantities, and so forth. Much of the information of interest has to be found by referring to the references. Considerably more information is contained in the chapter on "Atmospheric Optics" in the *Handbook of Military Infrared Technology*.

Chapter 13 on "Integrated and Fiber Optics" is a brief review of the fundamentals of the subject. Most of the material on the fibers is, in fact, quite old and the chapter does not appear to be up to date.

A comment is in order about the dated nature of the book. Most of the references in the book date from 1975 or earlier with very few references of more recent vintage. This is quite acceptable in areas such as optical glass, which is a relatively mature subject, but does not yield an up-to-date picture in the areas of integrated optics and electro-optics, which are quite fast-moving fields.

Chapter 14 on "Stress Optics" discusses elasto, electro, and magneto optical effects in various materials. Most formulae are presented as facts, but occasionally a derivation is given. This chapter appears to be useful but it would have been helpful if the author had added a few numerical examples to serve as a guide to the importance of various terms in the formulae.

Chapter 15 is a quite good chapter on "Vision" with very extensive referencing. The author presents many graphs of interest covering several topics in vision in a rather summary manner. This chapter is recommended for reading by those who would just like to get some feeling for the eye as an optical instrument. Like all the chapters, it contains most of the general pertinent material but does not go into sufficient depth to allow the reader to judge, in many cases, the importance of the various effects.

Chapter 16 and 17 deal with photoelectric and photographic detectors. These chapters form sort of a subtextbook within the basic book covering the subject of detectors. Most topics of interest are covered. The detail is sufficient that the reader can gain appreciation of the topic but not necessarily its importance relative to various properties of detectors.

The final chapters, 18 and 19, on "Imaging Systems and Coherent Optics," are those that appear to be closest to the author's specialty. The author discussed in reasonable detail the subject of linear system analysis, introduction of noise, bandwidth, etc., into imaging systems. Most of the pertinent formulae seem to be present but reference to other texts will be necessary to properly apply the formulae. The author does go through, in an Appendix to Chapter 18, a complete analysis of an imaging system. This is recommended to the reader.

The coherent optical chapter covers a brief discussion of holography, spatial filtering, and

includes the concepts of partially coherent imagery. While the chapter is reasonably complete, it again lacks the depth that would be desired for a user.

Finally, the book ends with a large number of tables which range from manufacturers' information to a very useful summary of tables of materials, as mentioned before.

In terms of production, the book is very well done and the style of writing is quite clear. The author did not check in detail for errors in formulae or typographical errors but there did not seem to be any outstanding collection of such errors. This indicates that the author has done very careful editing.

Now as stated earlier, this book is really not recommended for the student trying to learn what's going on in the field, nor is it recommended to someone who has to carry through in detail in any area of optics. Just who is it intended for? The author says it's meant to serve the dual purpose for self-study by the graduate engineer and serving as a handbook to the experienced practitioner. In fact, the book probably meets the self-study handbook criterion, but the user is advised if he really wishes to do much with what he finds in the handbook, he had either be knowledgeable in the field or be prepared to refer to some of the references.

As a final note I must say I did enjoy reading the book that was done to prepare this review. I doubt if the book will become a text because of its extremely high price. I do not think it would serve as a good library reference but probably would serve as a fair-to-good desk reference for the practicing engineer. The \$75 price tag is such that a person would probably do better to buy two or three books in a \$25 or \$30 range which cover, in reasonable depth, the particular topics in which he is interested.

#### PHYSICS AND CHEMISTRY OF LIQUID CRYSTAL DEVICES. IBM Research Symposia Series.

Proceedings of the Symposium on the Physics & Chemistry of Liquid Crystal Devices, held at IBM Research Labs, San Jose, California, Feb. 7-8, 1979. Gerald J. Sprokel, Ed. xi + 348 pp. ISBN 0-306-40440-0. Plenum Press, 227 West 17th St., New York 10011 (1980). \$42.

Reviewed by David H. Davies, Vice President, Kylex, Inc., an Affiliate of Exxon Enterprises, Inc., 420 Bernardo Ave., Mt. View, CA 94043.

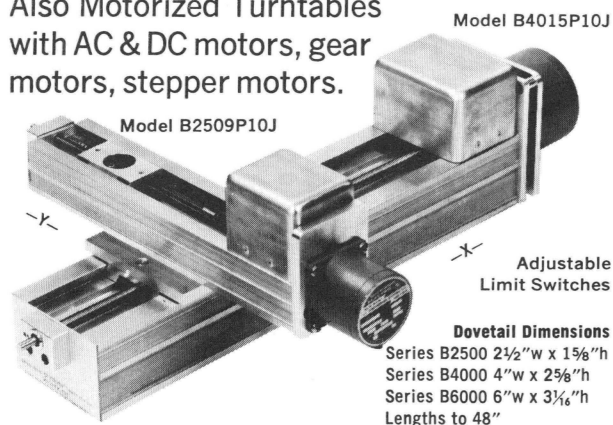
Liquid crystal displays have been undergoing explosive commercial growth in the last few years. This has been fueled by the ease of interface to ICs, by the low power, and by their physical compactness. Principal areas of commercial growth have been in consumer applications, especially timekeeping and calculators.

Less obvious to the people outside the field but perhaps of deeper significance for the long term is a parallel growth in the R&D sector devoted principally to extending the range of the devices, understanding the details of device operation, and incorporating such features as color, analog formats, etc. The fruits of the R&D will be evident in the coming decade where it is anticipated that much wider usage in industrial and business equipment will develop.

As is the case in many fast-developing fields, the review texts generally lag the actual work by several years. This book, a compilation of papers presented at an IBM symposium in 1979, helps bridge that gap by making available in widely

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distributed form summaries of current research areas. It is particularly valuable since it focuses on the fundamentals behind device application, rather than on the basic physics for its own sake or on specific device embodiments per se. The majority of the authors are well-known contributors from the major industrial laboratories, and as a result the text does provide an excellent, reasonably up-to-date snapshot of where the liquid crystal display community is headed both from a practical and a theoretical device point of view.

The topics covered range from in-depth discussions on liquid crystal device physics with particular emphasis on surface aspects, through certain specific display formats now in development, including projection devices, analog LCDs, meter type systems, and finally, covers the chemical materials area including some synthesis, analysis, and thermodynamics of liquid crystal mixtures.

A unique aspect that adds greatly to the value of the book from the general reader's point of view is that it is multidisciplinary, covering physics, electrical engineering, and chemistry. It's rare to find a text that brings the differing professions together to review all aspects of a new technology, and IBM and Dr. Sprokel are to be complimented for this approach.

Two minor weaknesses are the relative lack of Japanese contributors compared to the level of activity in Japan, although European activity

is fairly well represented, and the somewhat less than comprehensive index.

Overall, this book is most valuable and will be useful to practitioners in the display field, both users and developers. In addition, it will be useful for technologists in other related fields such as optics and electronics to gain a rapid and stimulating cross-fertilization from this dynamic area of research and development.

## Meetings

### Stanford University School of Medicine/ SPIE conference

**Digital Radiography, Sep. 14-17, 1981, Stanford University, Palo Alto, CA.** Presented by Advanced Imaging Techniques Laboratory, Department of Radiology, Stanford University School of Medicine and SPIE. Conference will provide a forum for the discussion of the application of digital data acquisition, storage, and processing techniques to radiographic imaging in the disciplines of engineering, physics, computer science, and medicine. In addition to digital x-ray imaging, relevant digital imaging methods applied to ultrasound or nuclear medicine will be considered. **Call for papers.** Abstracts of technical and scientific

papers are being solicited on topics related to digital x-ray imaging, including 1) digital imaging systems (e.g., digital fluoroscopy, scanned radiography), 2) detectors, 3) x-ray sources, 4) image reconstruction and processing, 5) image storage, transmission, and retrieval, 6) medical applications of digital radiography—chest and abdominal imaging, intravenous arteriography, intravenous pyelography, 7) display systems for digital imaging, 8) applications of VLSI technology to digital imaging, 9) comparison of digital systems with conventional x-ray imaging components, 10) integration of digital imaging systems into hospital radiology departments, 11) economic analysis and impact of digital imaging systems. **Abstracts due April 20, 1981.** Send abstracts to SPIE Technical Program Committee, Digital Radiography, P.O. Box 10, Bellingham WA 98227. 206/676-3290.

### International Motorcon '81

**Motor and Motor Control Technology Conference and Exhibition, June 10-13, Chicago.** International conference will cover subjects such as pulse width modulation, phase control, stepping motors; also special application areas ranging from intelligent drives to submersible pumps for oil rigs. **Abstracts due March 1, 1981.** Send abstracts and 200 word summary to Motorcon '81, Jim Guild, 2909 Ocean Drive, Oxnard CA 93030. 805/985-1595.

## SPIE Call for Papers: A Conference on Digital Radiography

**September 14-17, 1981  
Stanford University**

Cosponsored by the Society of Photo-Optical Instrumentation Engineers and the Stanford University School of Medicine, Department of Radiology, Advanced Imaging Techniques Laboratory.

Conference Chairman: William R. Brody, M.D., Ph.D., Department of Radiology, Stanford University.

**Program Committee:** Edwin Alderman, M.D., Stanford University; Robert Alvarez, Ph.D., Stanford University; Thomas F. Budinger, M.D., Ph.D., University of California, Berkeley; M. Paul Capp, M.D., Ph.D., University of Arizona; Dieter Enzmann, M.D., Stanford University; W. Dennis Foley, M.D., Medical College of Wisconsin, Milwaukee; Joseph W. Goodman, Ph.D., Stanford University; Albert Macovski, Ph.D., Stanford University; Charles A. Mistretta, Ph.D., University of Wisconsin, Madison; William K. Pratt, Ph.D., Compression Laboratories, Inc.; Robert Wagner, Ph.D., Bureau of Radiological Health; Harry Miller, Stanford University.

The application of digital data acquisition, storage and processing techniques to radiographic imaging will be the major technologic

advance for medical imaging in the '80s. This digital radiography conference will bring together the diverse disciplines in engineering, physics, computer science, and medicine to present work in progress and to provide a forum for interchange of ideas.

Scientific sessions will promote communication of the most recent developments in digital radiography, including device technology, system implementation, and clinical results. Plenary sessions will stimulate a dialogue between physician and scientist to help couple clinical needs to the application of new technology.

Tutorials on digital imaging principles and medical applications will provide background understanding in this new field. The principal thrust of the meeting will be digital x-ray imaging; however, relevant digital imaging methods applied to ultrasound or nuclear medicine will be considered.

Abstracts of scientific papers are being solicited on topics related to digital x-ray imaging, including:

- Digital imaging systems (e.g., digital fluoroscopy, scanned radiography)
- Detectors
- X-ray sources
- Image reconstruction and processing
- Image storage, transmission, and retrieval
- Medical applications of digital radiography (chest and abdominal imagery, intravenous arteriography, pyelography)
- Display systems for digital imaging
- Applications of VLSI technology to digital imaging
- Comparison of digital systems with conventional x-ray imaging components
- Integration of digital imaging systems into hospital radiology departments
- Economic analysis and impact of digital imaging systems

Deadline for receipt of abstracts is April 20, 1981; manuscripts are due by July 20, 1981. For further details and author's application, write to SPIE, P.O. Box 10, Bellingham, Washington 98227 U.S.A.; or call 206/676-3290.