



CAD/CAM

NEWSLETTER

DEPARTMENT OF REGIONAL
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March 1985

Information Compiled by the CAD/CAM Technology Advancement Council*

1. Reference Issue for Sources of Information

As newsletter readers are aware, the January 1985 issue was organized to provide, as a special issue in reference form, a listing of the many sources available for information on CAD/CAM technology.

The January issue contained information on topics A-D as listed below.

- A - CAD/CAM Centres in Canada
- B - Canadian Organizations, both Regional and National
- C - Major Technical Societies
- D - Conferences for 1985

The issue for February 1985 continued with reference information collected on the following:

- E - Regularly Published Journals
- F - CAD/CAM Newsletters
- G - CAD/CAM Directories and Product Guides

This issue for March 1985 continues with a special listing of books on CAD/CAM. A future issue, possibly April, is planned to continue with a special listing of information in film and videotape form.

The information listed has been extracted primarily from past issues of the monthly CAD/CAM Newsletter. Where prices or fees for material or conferences are shown they should be treated as a useful guide, but not necessarily current and subject to change without notice.

2. CAD/CAM Information Available

- "The Diffusion of Robots into Small and Medium-Sized Enterprises in Japan" - Mineko Sasaki-Smith

A manuscript prepared for the Science Council of Canada and made available on a limited basis to provide information and elicit comment.

According to the thirty-four page study report robots were originally perceived in Japan as a panacea for labour shortages created by high growth, but many firms now see robots as a way of ensuring their survival by increasing productivity. Government measures have been instrumental in

encouraging the spread of robots, primarily through coordination and integration of R&D activities in the private sector rather than in the direct expenditure of funds for R&D. The salient feature of robotics and other flexible manufacturing systems is the competitiveness that is derived from their use. Within the manufacturing sector, which employs 97 percent of industrial robots, 33.5 percent of firms have already introduced robots and 19.5 percent plan to do so within three years. Even some extremely small firms having only one to thirty employees have introduced robots into their operations. The study concludes that the greatest benefit from the diffusion of robots among Japanese firms is that the profits created by their use have become the source of capital for future R&D.

Contact: Science Council of Canada
100 Metcalfe Street
Ottawa, Ontario K1P 5M1

3. Books and Special Collections on CAD/CAM Technology

Conference papers, technical journal papers and magazine articles dealing with CAD/CAM technology are widely available and continue to increase in volume at an exponential rate.

On the other hand, books on CAD/CAM technology may often present information in broader, more organized and more readable form. Only a few years ago, with one or two notable exceptions, information on CAD/CAM and robotics in book form was virtually non-existent. Today many are available.

In addition to the reference source material contained in the January and February issues, the CAD/CAM Newsletter this month presents a special reference tabulation of books and special collections that deal with this technology.

Books and seminars are two widely used mechanisms for technology transfer. In many ways they represent two opposite extremes of the spectrum. Attendance at a CAD/CAM seminar of two or three days duration may easily cost \$1000 including registration, travel and other costs. This approach is short and quick since in a few days the seminar is over. On the other hand, while seminars rate high in influencing their attendees, the actual amount of information communicated may be quite small -- sometimes only a few pages of notes. A single book, at a fraction of the cost, might convey much more information -- but it must be read to be useful and the reader probably needs to be pre-conditioned by some other means to judge its value and applicability.

Additions to the list since the newsletter compilation of March 1984 are identified with an asterisk (*) in the left hand margin. Of the 113 titles listed approximately 58, or 51 percent, are new entries. This testifies not only to the high level of activity in the CAD/CAM field, but also to its growing maturity. To avoid repetition, addresses of the publishers most frequently referred to are given only once at the end of this section.

For convenience in identifying subject content the entries are listed under the following headings.

- General and Collected Entries
- Automation (General)
- CAD/CAM Systems and Graphics
- Design Automation
- Finite Element Method
- Data Bases for CAD/CAM & Manufacturing
- Group Technology
- Networks and Communications (including IGES)
- Numerical Control
- Flexible Manufacturing Systems
- Robotics
- Automated Guided Vehicle Systems
- Sensors and Machine Vision
- Automated Testing

The books listed are those that have come to the editor's attention. Inclusion of any particular book is not intended to represent an endorsement. Suggestions for additional entries, with appropriate information of title, author, publisher, approximate cost, size and contents are welcome.

- General

- "Computer Integrated Manufacturing" - Joseph Harrington
Industrial Press Inc., 200 Madison Ave., New York 10016. 321 pp. 1973.

Possibly the first full book written on CAD/CAM. Written by a senior industry consultant. Available from the Association for Integrated Manufacturing Technology (AIM Tech). \$25 (U.S.) + \$10 postage.

Contact: Assoc. for Integrated Manufacturing Technology (AIM Tech)
Attention: Lisa Schultz
111 E. Wacker Dr., Suite 600
Chicago, Illinois 60601, U.S.A.

- "CAD/CAM - Meeting Today's Productivity Challenge" - K. Taraman, Editor.
Computer and Automated Systems Association of SME, Dearborn, Michigan,
U.S.A. 281 pp. 1980.

Separate chapters by industry specialists on future trends, computer graphics, industrial robots, system integration and industry applications. \$27 (U.S.) SME members, \$32 (U.S.) non-members.

Contact: Publication Sales
Society of Manufacturing Engineers

* - "Computers in Industry - Supplement and Reprint"

Newsletter readers may have already noted the special 70 page report "Computers in Industry" prepared by Maclean Hunter and included recently as a special supplement in many of their regular publications.

This special supplement has been included as a special insert circa May 1984 in the seven publications listed below, which have a combined circulation of 121,300, in addition to the availability of the supplement as a special publication on its own.

- Plant Management & Engineering
- Design Engineering
- Canadian Machinery & Metalworking
- Canadian Controls & Instrumentation
- Modern Purchasing
- Pulp & Paper Journal
- Materials Management & Engineering

Informative and authoritative articles are included which review the use of computers in industry, how to set up a CAD/CAM system, integrating CAD/CAM, manufacturing by computer and others.

Copies of the reprint are available at \$10 each, five for \$25 and \$3 per additional copy, prepaid.

Contact: R.A. Smith
MacLean Hunter Ltd.
Maclean Hunter Building
777 Bay St.
Toronto, Ontario M5W 1A7

* - "A Glossary of Terms for Computer Integrated Manufacturing"
Compiled by T.V. Sobczak, 98 pp, soft cover, 1984.

A new reference guide to over 3000 terms relating to CAD, CAM, NC, MRP, CAPP compiled by exhaustive search through computer-related publications. Covers terms ranging from "absolute system" to "zero-offset". Price \$8.95 (U.S.) for members of SME and its affiliates, \$9.95 (U.S.) to non-members plus \$1.25 per book in each case for postage and handling.

Contact: Publication Sales
Society of Manufacturing Engineers

* - CAD/CAM Reprint Number Three

A reprint of introductory and informative articles covering many aspects of CAD/CAM Technology has been compiled by members of the CAD/CAM Technology Advancement Council and is now available in reprint form on a complimentary basis from the Department of Regional Industrial Expansion.

This reprint number is similar to reprints number one and two, which were publications available from the Department of Industry, Trade and

Commerce in 1977 and 1981 respectively, but reprint number three provides new and more comprehensive coverage. Approximately thirty articles, chosen from many journals and conference publications, are included which cover:

- General introduction to CAD/CAM
- Computer Aided Design and Drafting (CADD)
- Computer Aided Engineering, Group Technology, Computer Aided Process Planning and Database Design
- Numerical Control
- Industrial Robots
- Flexible Manufacturing Systems
- Industry Applications
- Data Transfer and Control Standards

Contact: Office of Industrial Innovation
Department of Regional Industrial Expansion
235 Queen Street
Ottawa, Ontario K1A 0H5

- "What Every Engineer Should Know About Computer Aided Design and Computer Aided Manufacturing" - J.K. Krouse, staff editor of Machine Design.

The 160 page reference defines major CAD/CAM areas and describes the cooperative efforts to develop unified systems. \$22.50 (U.S.)

- "Computer-Aided Engineering 1982"

An overview covering design, analysis, manufacturing, glossary of terms and directory of products and services. \$15 plus 25% for shipping and handling on foreign orders. Order number P50.

Contact: Penton/IPC Education Division
Penton Plaza
1111 Chester Avenue
Cleveland, Ohio 44114, U.S.A.
Telephone: (216) 696-7000

- * - "Systems and Technology for Advanced Manufacturing" - Edited by K. Gardiner, 270 pages, hard cover, 1983

Addresses key questions on the integration of CAD/CAM. Chapters cover Organization for Manufacturing, Design in Electronics, Systems Implementation, Pattern Generation, Laser Applications, Robotics etc. Price \$27 (U.S.) to members of SME and its associations, \$32 (U.S.) for non-members, plus \$1.25 (U.S.) postage and handling per book in each case.

Contact: Publication Sales
Society of Manufacturing Engineers

- "Education for the Wave of Change"

Presents findings of the CAD/CAM Education Workshop, March 30-31, 1983, Ottawa, Ontario, sponsored jointly by the CAD/CAM Technology Advancement

Council and the Canadian Industrial Computer Society. The report summarizes views presented by 31 attendees who discussed common needs, problems and solutions oriented to the university, technical college and industrial in-plant education level. 34 pages (68 pages total in bilingual English/French format). Price \$25.

Contact: The Canadian Industrial Computer Society
12 Kindle Court
Ottawa, Ontario K1J 6E2

- "SME Productivity Equipment Series"

Five separate volumes as discussed below are available from the Society of Manufacturing Engineers in their new productivity equipment series.

1. "CAD/CAM" - 785 pages, soft cover 1983. Provides characteristics and comparisons of CAD/CAM products from over 70 producers. Eight sections cover Computer Aided Design and Drafting Systems; CAD/CAM Systems; Graphics Systems; NC Tape Preparation Systems; Software Packages; CRT's, Workstations and Recording Systems; Plotters and Printers; Digitizers.
2. "Work Holding" - 630 pages, soft cover 1982. Seventeen sections on clamps, chucks, vices, jigs, fixtures and other workholding devices.
3. "Industrial Robots" - 450 pages, soft cover 1983. Describes models from over 60 manufacturers including robots, components and accessories, control systems, vision systems, etc.
4. "Machining Centers" - 333 pages, soft cover 1983. More than 100 models of horizontal, vertical and head changing machines are examined.
5. "Numerical Control" - 411 pages, soft cover 1983. Provides a guide and specifications to products of over 40 manufacturers.

Prices are as follows in U.S. dollars plus \$1.25 (U.S.) per book for postage and handling. Membership number must be provided to obtain the member rate.

	<u>Order Code</u>	<u>Member price</u>	<u>Non-member price</u>
1. CAD/CAM	782	\$ 41.00	\$ 46.00
2. Workholding	695	\$ 37.00	\$ 44.50
3. Industrial Robots	710	\$ 31.00	\$ 36.00
4. Machining Centers	765	\$ 31.00	\$ 36.00
5. Numerical Control	730	\$ 31.00	\$ 36.00
All five volumes	-	\$171.00	\$198.50

Contact: Publication Sales
Society of Manufacturing Engineers

* - "Understanding the Manufacturing Process" - Joseph Harrington, 240 pp., 1984.

Based on Integrated Computer Aided Manufacturing (ICAM) this new text by Dr. J. Harrington presents a thorough study of the structure of manufacturing essential to the implementation of modern industrial technology in an effective and economical manner. Available to AIM Tech members in Canada and overseas \$33 (U.S.) including postage which is a 20% reduction from the regular price.

Contact: Association for Integrated Manufacturing Technology (AIM Tech)
Attention: Lisa Schultz
111 E. Wacker Dr., Suite 600
Chicago, Illinois 60601, U.S.A.

- * - "All About Computer - Aided Design and Manufacture" - J.W. Fellows

Intended for persons with little or no prime knowledge of CAD/CAM but who are responsible for installing CAD/CAM equipment. \$24.50

Contact: John Wiley and Sons Canada Limited

- * - "Design for Assembly Handbook" - G. Boothroyd

Book 1982, Dept. of Mechanical Engineering, University of Massachusetts and Salford University, Industrial Centre Limited.

- * - "Computer-Based Automation" - J.T. Tou (Editor), publication forthcoming.

Provides twenty-nine contributions from research and industrial engineers on significant progress made in the understanding and applications of advanced automation. Areas covered include computer-aided design, robotics, computer vision and image processing, computer-aided manufacturing, and local area networks, databases, and graphics.

Contact: Plenum Publishing Corporation
233 Spring Street
New York, N.Y. 10013, U.S.A.

- * - "Computer Control of Manufacturing Systems" - Yoram Koren, 1983, ISBN 0-07-035341-7.

Contact: McGraw-Hill Book Company

- * - "Understanding Electronic Control of Automation Systems" - N.M. Schmitt, R.F. Farwell, 1983, 280 pp., paperback \$4.99.

Provides an introduction and understanding of electronic control of automation systems for continuous, batch and discrete processes. Includes a section on the importance of automation to protect jobs with chapters on programmable controllers in discrete parts manufacturing, industrial robots and examples of plant automation.

Contact: Radio Shack Stores

- Automation (General)

- "Computers in Manufacturing: Principles and Practises for Managers and Engineers in Metalworking" - A book developed by the staff of American Machinist. Covers computer integrated manufacturing (CIM), design of products and tools, justification procedures, flexible manufacturing systems and case histories in metal cutting, metal forming, assembly, finishing, inspection and robotics, 320 pp. 1983. \$47.50.

Contact: McGraw-Hill Ryerson Limited

- * - "Automated Manufacturing" - Edited by B. Rooks 1983, 452 pp. \$80.75 (U.S.) prepaid.

Proceedings of the 2nd European Automated Manufacturing Conference, Birmingham, England, May 16-19, 1983. Contents include many individual papers by authors from the United Kingdom, Europe and elsewhere covering all aspects of automated manufacturing from individual equipment items such as robots and lasers, up to and including flexible manufacturing systems and assembly automation.

Contact: Elsevier Science Publishing Co. Inc.

- "The Role of Computers in Manufacturing Processes" - by Gideon Halevi. 1980, 502 pages, \$45 (U.S.).

As the use of computers in manufacturing increases, a re-evaluation of the existing manufacturing process is taking place. The author of this book presents a new computer-oriented technology that views the manufacturing process as a single unique system. He calls his approach Hal-technology.

Part I presents an overview of current methods in manufacturing technology.

Part II discusses the generative process planning system and its modules. Part III provides an in-depth discussion of Hal-technology, including practical problems and their solutions.

The author is the director of the CAD/CAM Research and Development Center in Tel Aviv, Israel. He teaches engineering design and CAM at the Technion Israel Institute of Technology, from which institution he received a Doctor of Science degree in Mechanical Engineering in 1973.

Contact: John Wiley and Sons, Inc.
One Wiley Drive
Somerset, NJ 08873, U.S.A.

- * - "Computerized Manufacturing Automation: Employment, Education, and the Workplace" - U.S. Government Printing Office - Publication #052-003-00949-8. Price \$14 (U.S.).

A report prepared by the office of Technology Assessment (OTA) which is an analytical arm of the U.S. Congress to help legislators plan for technological changes.

The report predicts that computerized manufacturing automation can

improve manufacturing productivity, product quality and working conditions. However, increased use of computer-based automation in manufacturing will aggravate regional unemployment. It may have an enormous long-term impact on the number and kinds of jobs available for which workers and the current U.S. instructional system may not now be geared to accommodate.

Contact: Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402, U.S.A.

- "Microprocessors for Management: CAD, CAM and Robotics" - Dimitris Y. Chorafas.

Intended primarily for technical managers. Parts 1 and 2 deal with microprocessor technology, device architecture, design, manufacturing and interfacing. Part 3 deals with CAD, CAM and their integration. Robotics, quality control and monitoring are included, 307 pp., 1982, \$25 (U.S.).

Contact: Petrocelli Books
1101 State Road
Princeton, N.J. 08540, U.S.A.

* - Computers in Manufacturing"

A four volume loose leaf series by Auerbach Publishers Inc. Four volume set \$450 (U.S.), individual volumes \$150 (U.S.) each.

Volume 1 - "Manufacturing Resource Planning" - 378 pages, 27 articles in four chapters covering Concerns and Interfaces; Applications and Case Studies; Planning Implementing and Managing; Systems Design.

Volume 2 - "Master Production Scheduling" - 262 pages, 23 articles in 4 chapters with headings as above.

Volume 3 - "Material Requirements Planning" - 324 pages, 23 articles in 4 chapters with headings as above.

Volume 4 - "Execution and Controls" - 288 pages, 23 articles in 4 chapters with headings as above.

For further details consult the publisher, or the review printed in the Journal of Manufacturing Systems (SME), Dec. 1982. Additional volumes are planned or in preparation.

Contact: Auerbach Publishers Inc.
6560 North Park Drive
Pennsauken, New Jersey 08109, U.S.A.
Telephone: (609) 662-2070

- "Automated Manufacturing - The Key to International Competitiveness - and Why the United States is Falling Behind" - J. Baranson.

A 256 page analysis report dated February 1983 by J. Baranson, Developing

World Industry and Technology, Inc. (DEWIT) with emphasis on international comparisons, policy recommendations and country studies covering approximately 31 specific companies in the United States, Japan and Europe. Price \$75 (U.S.) prepaid. (See also this Newsletter page 25.)

Contact: Developing World Industry and Technology, Inc. (DEWIT)
800 18th Street N.W., Suite 606
Washington, D.C. 20006, U.S.A.
Telephone: (202) 429-0177

- "Automation Technology For Management and Productivity Advancements through CAD/CAM and Engineering Data Handling" - Wang, P.C.

Contact: Prentice-Hall Inc.
Englewood Cliffs
N.J., 1983
323 pp., \$24.94 (U.S.) cloth.

- "Automatic Assembly" - G. Boothroyd, C. Poli, L.E. Murch, New York,; U.S.A.; Marcel Dekker (1982), viii + 378 pp. (0 8247 1531 4).

The book has 9 chapters and covers the following aspects of automatic assembly; transfer machines, vibratory bowl feeders; nonvibratory feeders orientation of parts; feed tracks, escapements, parts-placing mechanisms and robots; performance and economics of assembly; design for automatic assembly and machines. The book is aimed both at practising engineers and those studying manufacturing engineering at technical college or university. Some problems are appended, together with a subject index.

- * - "The Encyclopedic Dictionary of Industrial Technology"

A 353 page reference text which reviews industrial materials, manufacturing processes and equipment including metal casting, annealing, heat treating, electronics, robotics, FMS and artificial intelligence. \$34.50 (U.S.).

Contact: Chapman and Hall
733 Third Ave
New York, N.Y. 10017, U.S.A.

- * - "Forces of Production - A Social History of Industrial Automation"
David F. Noble. Pub. Alfred A. Knopf 1984, 408 pp.

Largely a detailed and thorough history of numerical control, the author documents the view that NC became unnecessarily mathematical, complicated and expensive due to the influence of MIT and United States Air Force funding over the concepts of the inventor John T. Parsons. The early work of Canadian inventor E.A. Leaver is cited and it is suggested that Canada lost an opportunity of major economic proportions when resources were not available, circa 1947-49, to follow this through. The allocation of the programming activity for NC machinery to other than shop personnel is viewed in the larger context of a labour-management struggle.

- * - "The Future of Work" - A report of the NDP Caucus Task Force on Work, People, and Technological Change, 25 pp.

Presents results of a six month study on the threats and opportunities presented for Ontario due to technological change. The report stresses the need to improve productivity and competitiveness through many mechanisms, including the adoption of new technology, while coincidentally implementing adjustment mechanisms such as a reduced work week through legislation, employee training and participation with business management in the adaptation to new technology. Report makes 37 recommendations.

Contact: Ontario New Democratic Party Caucus
Room 216, North Wing
Main Legislature Building
Queen's Park, Toronto, Ontario M7A 1A2

- CAD/CAM and Graphics

- "The Guide for the Evaluation and Implementation of CAD/CAM Systems" - S.H. Chasen, J.W. Dow. Second edition 1983, 461 pages, \$250 (U.S.). Presents a sequential guide of steps for the evaluation of CAD graphics equipment, including; preliminary system planning, system evaluation, procurement, installation and support. The book is not a description of the many systems available, but rather is a guide to rules and procedures for their evaluation and selection.

Contact: CAD/CAM Decisions
P.O. Box 76042
Atlanta, Georgia 30328, U.S.A.
Telephone: (404) 255-5271
(404) 973-3108

- "The CAD/CAM Handbook" - C. Machover, R.E. Blouth, Editors
Computervision Corporation, Bedford, Mass. \$20 (U.S.). 306 pp. 1980.

Chapters by Computervision Corporation authors and others describe CAD equipment and its applications in various industries, such as; printed circuit board design, integrated circuit design, cartography and NC machinery.

- "Computer Aided Design" 1980

Describes Geometric Modeling, ICAM project, Stress Analysis, Mechanism Design. \$10 (U.S.) plus 25% for shipping and handling on foreign orders. Order number R51.

Contact: Penton/IPC Education Division
Penton Plaza
1111 Chester Avenue
Cleveland, Ohio 44114 U.S.A.
Telephone: (216) 696-7000

- "Elementary Computer Graphics" - A.A. Mufti.

A textbook authored by Dr. A.A. Mufti, Professor and Director of the

Computer Aided Design Centre at the Technical University of Nova Scotia. The text covers all aspects of programming computers for graphic display for persons in computer science and engineering including those at the senior undergraduate or graduate level. Includes 2-D and 3-D subjects with Fortran programs, discussion of both vector graphics and raster graphics and applications. Price \$19.95 plus \$1.00 postage and handling.

Contact: Reston Publishing Company, Inc.
Attention: Mary Ryan
11480 Sunset Hills Road
Reston, Virginia 22090, U.S.A.
Telephone Toll Free: (800) 336-0338

- "Computer Aided Design Modelling, Systems Engineering, CAD Systems" - editor J. Encarnacao, 1980, 461 pp., paper \$29.00 (U.S.)

Vol. 89 in the lecture notes on computer science. Written by technical experts as lecture notes for an introductory text and to serve as the basis for an advanced course or seminar on the subject. Emphasis is on geometric modelling, surface representation, data base design and representation of graphic data.

Contact: Springer Verlag

- "Introduction to Interactive Computer Graphics" - J.E. Scott. 1981, 352 pp., \$31.95.

An introduction to the applications, economics and technology of interactive computer graphics, covering 2-D and 3-D graphics, monochrome and full colour screens, plotters and other peripherals.

Contact: Wiley Interscience

- * - "Introduction to Computer-Aided Drafting"
David L. Goetsch (Book) - 210 pp, 1983 - \$22.95 (U.S.)

Presents an introduction to computers, programming in BASIC and an overview of computer aided drafting.

Contact: Prentice-Hall
Englewood Cliffs, N.J., U.S.A.

- "Computer Aided Design and Manufacture" - 2nd Edition by C.B. Besant, 232 pages, soft cover 1983.

Designed to present the fundamentals of practical CAD and CAM systems to practising engineers and draftsmen. Sections include, The Digital Computer as a Design Aid, Interactive CAD Systems, A Computer Aided Design System; the Software, Operation of the GLADS Drafting Systems, Computer Aided Manufacture and more. Price SME members \$49.95 (U.S.), non-members \$54.95 (U.S.) plus \$1.25 (U.S.) for postage and handling in each case.

Contact: Publication Sales
Society of Manufacturing Engineers

- * - "Computer Aided Design: Fundamentals and System Architectures"
J.L. Encarnacao and E.G. Schlechtendahl (book) 1983, 346 pp., cloth \$29.50 (U.S.).

The authors from institutes and centres in Darmstadt and Karlsruhe present a thorough introduction to CAD, covering history, basic components, system architectures, drafting and data base aspects, economics and ergonomics.

Contact: Springer-Verlag New York Inc.

- * - "Solid Modeling - A State-of-the-Art Report" - R.H. Johnson.
Published Feb. 1984 by CAD/CAM Alert.

The report is a guide to developing, selecting, installing and implementing a solid model system and includes a description of 21 commercially available solid modeling systems from leading vendors. Pre-publication price \$495 (U.S.) and \$595 (U.S.) later.

Contact: Management Roundtable, Inc.
P.O. Box 404
Newton, MA. 02161, U.S.A.

- * - "Computer Graphics Programming, GKS - The Graphics Standard"
G. Enderle, K. Kansy, G. Pfaff (book) 1984, 542 pp., cloth \$39.00 (U.S.).

The Graphics Kernel System (GKS), identified as the first international standard describing the functions of computer graphics, is explained in an informal description using examples and figures by three authors from Germany and designers of the standard. The book presents an overview of the concepts, history of the design and example applications in both Pascal and Fortran.

Contact: Springer-Verlag

- * - "CAD/CAM: Computer Aided Design and Manufacturing"
E.W. Zimmers, Jr., book, 1984, 489 pages. Prentice-Hall.

- * - "Computer-Aided Design, Engineering and Drafting"

A newly announced 225 page quarterly, loose leaf, updated reference book which details the capabilities, limitations and practical applications of computer-aided design, engineering and drafting tools. Includes solid modeling, finite element analysis, computer-aided drafting and graphical simulation. Quarterly supplements provide new articles featuring recent developments in CAD tools and applications. Introductory price \$78 (U.S.)

Contact: Auerbach Publishers
6560 North Park Drive
Pennsauken, N.J. 08109, U.S.A.
Telephone: (800) 257-8162

- * - "Geometry of Spatial Forms" - P.C. Gasson, 561 pp., 1983, \$28.95.

A comprehensive treatment of analytic, descriptive, projective, transformational, topological and structural geometry and other topics of computational geometry related to space vision for computer aided design.

Contact: John Wiley & Sons Canada Limited

- * - "GKS Primer" - Lucia McKay, book, paperback 1984, 109 pp., \$9.95 (U.S.)

A description of the Graphic Kernel System (GKS) and details of its program applications. Includes chapters on GKS procedures, syntax for graphics development and an extensive list of subroutines.

Contact: Nova Graphics International Corporation
1015 Bee Cave Woods
Austin, Texas 78746, U.S.A.
Telephone: (512) 327-9300

- Design Automation

- * - "Handbook of Design Automation" S. Sapiro, R.J. Smith II. First Edition, 1984, 184 pages, CAE Systems, Inc.,

A recent issue of the ACM SIGDA design newsletter (June 1984) presents a review of the above book, reported to cover the full spectrum of Computer Aided Engineering (CAE). Devoted to design automation of integrated circuits, the book covers design methodologies and constraints (Structural Design, Gate Array, Standard Cell and Full Custom). Design verification tools, including high-level, gate level and circuit level simulation packages are discussed plus sections on Engineering Work Stations (EWS).

Contact: CAE Systems, Inc.
1333 Bordeaux Drive
Sunnyvale, California 94089, U.S.A.

- "Structural Design by Computer" - E. Whitman Wright

The author is a lecturer at Carleton University, Ottawa and consultant in civil and structural engineering, 411 pp., 1976. Van Nostrand Reinhold Co. Ltd.

Contact: W. Wright & Associates Consultants Inc.
57 Sunnyside Avenue
Ottawa, Ontario K1S 0P9

- Computer-Aided Architectural Design" - (Publisher unknown). New York, 1977. Available in paperback edition. Reported to give a comprehensive overview of the subject, and with an excellent bibliography.

- Finite Element Method

- "Finite Elements: An Introduction for Engineers" - R.K. Livesley, Cambridge University Press, 1983, 199 pp., soft cover.

This textbook introduces the finite element method as an important general technique in engineering mathematics. It is written for students who have already completed a general course in vector calculus, matrix algebra and partial differential equations. The treatment introduced in the book will provide a secure foundation for more specialized work. Each chapter introduces worked examples many of which contain important applications and generalizations of the ideas in the main body of the text. The book is principally aimed at engineering students encountering the technique for the first time.

- "Finite Elements: An Introduction" - E.B. Becker, G.F. Carey, J.T. Oden
Vol. 1, 256 pp., 1981, \$27.95 (U.S.).

A mathematically oriented text book intended for undergraduate students in engineering and science to provide familiarity with the finite element method, now widely available in CAD systems in addition to its earlier application as a computational technique for problems in fluid mechanics, heat transfer and electromagnetic theory. Five volumes are planned in the series.

Contact: Prentice-Hall
1870 Birchmount Road
Scarborough, Ontario M1P 2J7
Telephone: (416) 293-3621

- "The Finite Element Method" - O.C. Zienkiewicz, 3rd ed., McGraw-Hill, 1977.

Reported to be one of the best known texts on finite element analysis with a wide coverage of relevant material.

- Data Bases for CAD/CAM and Manufacturing

- * - "Data Bases in CAD/CAM" - F.M. Lillehagen, E.A. Warman

A set of tutorial notes rewritten and structured by popular demand to provide a basis for information for system users and builders. Price £30 or \$50.00 (U.S.) plus postage and packing.

Contact: CAD CAM Publications Limited
170 Park Road
Peterborough, England PE1 2VF

- * - "A Commented and Indexed Bibliography on Data Structures and Data Management in CAD/CAM: 1970 to mid-1983"
Dr. F.B. Vernadat - NRC Report ERB-956

Abstract - The report is a bibliography on data structuring and data management in CAD/CAM, including computer graphics and factory automation. The information structures considered concern data files, data structures, data management systems, and database management systems. Part I of the report gives a general introduction to CAD/CAM

and factory automation, and to data structuring and data management in order to define the vocabulary used and the keywords associated with each reference listed.

Part II is a bibliographic study issued from the analysis of the list of references. Topics dealt with include a history of the evolution of data structuring and data management in CAD/CAM, engineering information, database justification and requirements in CAD/CAM, data modelling methodologies, data models, integrity management, user interactions, systems architecture evolution, and current trends. The concept of Engineering Information Systems (EIS) for CAD/CAM is introduced in the conclusion to Part II. Part III contains the list of references in alphabetical order. Each entry has associated with it a list of keywords relevant to the title of this report. Part IV is composed of two indexes: a keyword index and an author index. The list of references contains 909 entries and the number of keywords is over 180.

Contact: Editorial Office
Division of Electrical Engineering
National Research Council of Canada
Ottawa, Ontario K1A 0R8

- Group Technology

- "Group Technology in the Engineering Industry"

Group Technology is an important element of CAD/CAM systems in both the strategic planning and operational sense. This handbook, based on implementation in a large number of British factories, has been compiled by the I.Mech.E. (U.K.) as a guide to management at all levels. Available in the Western hemisphere from the Society of Automotive Engineers (SAE) Publication MEP 86. 282 pp. Casebound 1979. Price \$30 (U.S.) including handling if prepaid.

Contact: Society of Automotive Engineers
Department 723
400 Commonwealth Drive
Warrendale, Pa. 15096, U.S.A.
Telephone: (412) 776-4841

- "Group Technology at Work"

A further addition to the SME Manufacturing Update Series is devoted to information on group technology entitled: "Group Technology at Work". The 254 page hardcover book contains papers and articles from leading sources on how to successfully introduce group technology systems. Information is provided on the use of group technology in process planning, scheduling, manufacturing cells, manufacturing resource planning (MRP), etc. \$27 (U.S.) to SME members, \$32 (U.S.) to non-members.

Contact: Publication Sales Department
Society of Manufacturing Engineers (SME)

- Networks and Communications

- "Local Network Handbook" - G.R. David (Ed.), New York, U.S.A., McGraw-Hill (1982), iv + 256 pp. (0 07 606831 5).

Some articles in this book describe local network techniques, technologies, applications and choices. Others cover more general equipment or software with local networking applications. The capabilities of minicomputers and microcomputers are discussed, since these serve as network nodes. Comparisons of local networking with other techniques are also included. 32 articles are divided among six sections, headed technology, software, equipment, implementation, applications and selection.

- "Local Computer Network Technologies" - C. Tropper, London, England, Academic Press (1981), xi + 144 pp. (0 12 700850 0).

The reasons behind the interest in local computer networks - technical as well as economic - are explained. An attempted definition of a local network is provided. Following this introductory chapter, the book divides naturally into two sections - Chapter 2 being devoted to ring networks and Chapter 3 to bus networks. Each chapter is structured along the same lines beginning with a description of the protocols followed by a discussion of the performance models of the protocols. The performance of the protocols are then compared (to the extent that this is possible), and finally, the assumptions and weaknesses of the models themselves are described. Both chapters include descriptions of many existing or planned networks and their protocols (87 ref.).

* - "IGES, Building Blocks and Alternatives"

A state-of-the-art report on CAD/CAM standards entitled "IGES, Building Blocks and Alternatives" is available from Management Roundtable, Inc., who also publish the regular monthly newsletter "CAD/CAM Alert". IGES is an acronym for the Initial Graphics Exchange Specification which defines a standard system for communicating design data information between different makes and models of CAD/CAM graphic systems. Report price \$290 (U.S.). Includes a copy of IGES Document version 2.

The report contains four major sections:

- An overview and technical briefing drawn from ANSI standard documents and other sources.
- Discussion of implementations, enhancements, problems and solutions drawn from case studies of major users.
- Formats for data exchange in IGES, and comparison to other systems.
- Description of the IGES offerings of major CAD/CAM system suppliers.

Contact: Carole Williams
Report Coordinator
Management Roundtable, Inc.
822 Boylston Street
Chestnut Hill, Massachusetts 02167, U.S.A.
Telephone: (617) 232-8080

- Numerical Control

- "Principles of Numerical Control" - (book), 3rd Edition - J.J. Childs, 302 pp.

Covers Computer Numerical Control (CNC) systems, EIA standards, plus new technical areas such as robotics, graphics and group technology. Includes examples of APT and Compact II parts programming. Available at \$25.45 (U.S.) including postage and handling.

Contact: COMMLINE
241 Holbrook Drive
Wheeling, Il. 60090 ,U.S.A.

- "Computer Numerical Control" - (book), J.A. Pusztai, M. Sava.

A new book authored by two engineers, both of Humber College, Toronto. Covers both manual and computer assisted programming (in APT and COMPACT II). Includes fixturing, set-up, tooling, etc. plus programming features of the most recent systems and a detailed account of specific product oriented canned cycles. Shows direct applications to most modern CNC controls such as those from Fanuc, Siemens and General Numerics. 278 pp. Price approximately \$32.45 plus \$2.50 for shipping and handling.

Contact: Reston Publishing Company (Prentice-Hall Inc.)
1085 Bellamy Rd. North
Suite 210
Scarborough, Ontario M1H 3C7
Telephone: (416) 438-2272

- "Sculptured Surfaces in Engineering and Medicine" - J.P. Duncan, S.G. Mair, 392 pages, Cambridge University Press, hard cover.

This book describes a comprehensive, flexible, computer-aided method called POLYHEDRAL NC which can facilitate the mapping and reproduction of complex and convoluted surfaces. Both authors are at the University of British Columbia. The system is reported to have proven itself in many medical and engineering applications, with the modeling of limbs and faces as well as engineering structures. The book describes the theory and the method for readers who may be designers and engineers in the manufacturing industries or prosthetists, orthopedic and dental surgeons. Price \$79.50 (U.S.) in U.S.A. or \$99.40 in Canada.

Contact: Customer Service
Cambridge University Press
510 North Avenue
New Rochelle, N.Y. 10801, U.S.A.
Telephone: (914) 235-0300

or

The Bookstore
University of British Columbia
2075 Wesbrook Mall
Vancouver, B.C. V6T 1Z2
Telephone: (604) 228-4741

* - "Numerical Control Lathe Language Study"

An evaluation study of the technical characteristics of 15 different NC lathe languages determined from the programming and preparation of ten test parts. Characteristics of each language are described, programming time for the test parts etc. The systems evaluated are; Cinturn 11, QUICK-PATH, Genesis, GETURN, Ingersoll Lathe Program, COMPACT 11, TOOLPATH, APT for Lathes, GTL/T, APTURN, VNC, UNIAPT, UCCAPT, PROMT and WESTURN.

The study does not include milling machine, machining center or punch press work. Price \$70 (U.S.) plus \$2 (U.S.) postage.

Contact: Association for Integrated Manufacturing Technology (AIM Tech)
Attention Lisa Schultz
111 East Wacker Drive, Suite 600
Chicago, Illinois 60601, U.S.A.

- Flexible Manufacturing Systems

* - "The FMS Report"

A comprehensive report on Flexible Manufacturing Systems (FMS) prepared by the U.K. consulting firm, Ingersoll Engineers and published by IFS (Publications) Ltd., England. Contents include: What is FMS; Why Consider FMS; FMS Pitfalls and Problems; How Will FMS Affect People and a survey of 40 major FMS systems in the U.S., Japan and Europe. A forward by the U.K. Minister of Information Technology makes reference to the U.K. Flexible Manufacturing Systems Scheme whereby companies can obtain grants of up to 33 1/3% for capital and development costs, or up to 50% for consultancy studies, related to FMS installations. An extensive bibliography is included. 179 pages. Soft bound. Approximately \$88 (U.S.).

Contact: IFS (Publications) Ltd.
35 - 39 High Street
Kempston, Bedford, England, MK42 7BT
Telephone: (0234) 853605, Telex 825 489

* - "The Design and Operation of Flexible Manufacturing Systems" - P. Ranky, Trent Polytechnic, Nottingham, U.K. 1983, 362 pp. \$48.00 (U.S.).

A book for persons working on FMS at universities and technical colleges as well as those responsible for installation and operation in industry. Covers all aspects of the complex subject with emphasis on systems design, interfacing and software considerations plus management, economic and human considerations.

Contact: Elsevier Science Publishing

- * - "FMS at Work" - John Hartley (book) 1984, 300 pages \$39.50 (U.S.)

Presents a guide to Flexible Manufacturing Systems in easy steps from single CNC machines to the largest systems in operation. Describes how systems may be built up in stages with hardware, software and staff training at each step. The book is recommended as an introduction and companion volume to the more detailed book by Ranky (see above). Covers casting, forging, sheet metal and assembly FMS systems as well as those for machining.

Contact: Elsevier Science Publishing

- * - "Flexible Manufacturing Systems" - J.R. Holland (editor)

A new 300 page addition to SME's Manufacturing Update Series is available with the title "Flexible Manufacturing Systems". This new book explores the key elements that make up an FMS system. A collection of articles formed into 12 chapters such as Factory Communications, Data Base Requirements, Sensors, Distributed Numerical Control, Economic Justification and Payback. Price \$34.00 (U.S.) to members of SME and its associations, \$39.00 (U.S.) to non-members.

Contact: Publication Sales
Society of Manufacturing Engineers (SME)

- * - "Flexible Manufacturing Systems"

A 420 page technical text for business owners, managers and engineers published by the Society of Manufacturing Engineers. Covers robotics, databases, sensors, numerical controls, and programmable controllers plus market implications, payback, simulation systems, engineering and social impacts. Price \$39 (U.S.), (34 (U.S.) to SME members) plus \$1.25 (U.S.) for mailing.

Contact: Robotics International of SME
One SME Drive
Dearborn, Michigan 48121, U.S.A.

- * - "Flexible Manufacturing Systems Handbook"

A 392 page handbook in four main sections which describe FMS systems and their implementation. An FMS system is defined as a "computer-controlled configuration of semi-independent work stations and a material handling system designed to efficiently manufacture more than one part number at low to medium volumes". The four handbook sections include an executive

summary, description of the technology, Buyer/User's Guide and appendices with case studies and glossary of FMS terms. Price \$64 plus \$2 for shipping and handling.

Contact: Business Books
Box 734
Lindsay, Ontario K9V 4J9

- * - "Flexible Manufacturing Systems 2" - Edited by K. Rathmill, Cranfield Institute 1983, 700 pp., \$86.50 (U.S.).

Proceedings of the 2nd International Conference on Flexible Manufacturing Systems, held in London, U.K., Oct. 1983. Proceedings of the 1st International Conference on Flexible Manufacturing Systems held at Brighton, U.K., Oct. 1982 are also available. (520 pages, \$85 (U.S.))

Contact: Elsevier Science Publishing

- * - "Flexible Assembly Systems" - A.E. (Tony) Owen, 244 pp., \$42.50 (U.S.).

The author, with a company in Bletchley, U.K., draws on his twenty eight years of manufacturing experience to present an overview of the implications, problems, solutions and benefits associated with flexible assembly systems. Topics include robot safety, material control, workplace design and the role of Flexible Assembly Systems (FASs) in the factory of the future.

Contact: Plenum Publishing Corporation
233 Spring Street
New York, N.Y. 10013, U.S.A.

- Robotics

- "Robotics in Practice - The Management and Applications of Industrial Robots" by J.F. Engelberger, 291 pp. Published 1980 by Amacom, a division of American Management Associations.

The first half of the book is devoted to a description of robot construction, design, application management, economics, and sociological impact. The second half describes robot applications in die casting, welding, investment casting, forging, press work, spray painting, plastic molding, machine tool loading and others. The author, Joseph F. Engelberger, is president of Unimation Inc. and a long time developer of industrial robots. The descriptions and photographs describe work and applications by other companies in addition to his own. Price approximately \$50.00

Contact: Prentice-Hall
1870 Birchmount Road
Scarborough, Ontario M1P 2J7
Telephone: (416) 293-3621

- "Robots in Industry"

A sixth volume on applications for the electronics industry has been added to the previous five reports published by the SEAI Institute in Georgia and available from Technical Insights. Volume six deals with fundamentals of robots, machine vision, robot operations in clean room environments, printed circuit board assembly and inspection, wire harness fabrication by robot and other topics. Price \$125 (U.S.).

Contact: Technical Insights
P.O. Box 1304
Fort Lee, New Jersey 07024, U.S.A.

- "Industrial Robots from A to Z - A Practical Guide to Successful Robot Applications" - Home study course of 16 modules, self-contained in two looseleaf binders.

To develop this course, material from a three day robotics seminar conducted by W.R. Tanner was recorded, transcribed, edited and then combined with material from "Industrial Robots: A Summary and Forecast for Manufacturing Managers" developed by the Tech Tran Corporation of Naperville, Illinois. Contains over 100 photos, charts, tables and specification data on 68 robots produced by 33 different manufacturers. The course is designed to permit completion in 40-45 sparetime hours. Price \$195 (U.S.) plus \$4.95 (U.S.) for handling and shipping. Fifteen day free trial permitted before invoicing.

Contact: Marketing Services
Robotics International of SME
One SME Drive, Box 930
Dearborn, Michigan 48121, U.S.A.

- "Industrial Robots, Applications" - 2nd Edition. Edited by W. Tanner, 484 pages, hardbound 1981.

Provides detailed examinations of successful applications in Material Handling, Machining, Casting, Pressworking, Welding, Finishing, Inspection and Assembly Operations. Price SME members \$34 (U.S.), non-members \$39 (U.S.) plus \$1.25 (U.S.) for postage and handling in each case.

Contact: Publication Sales
Society of Manufacturing Engineers

- "A Glossary of Terms for Robotics" - Prepared in 1981 by the National Bureau of Standards for the Air Force Materials Manufacturing Division. NTIS order number PB 82 - 251216. Paper copy price \$10.50 (U.S.) in U.S.A., Canada and Mexico.

Contact: National Technical Information Service (NTIS)
5285 Port Royal Road
Springfield, Va. 22161, U.S.A.
Telephone: (703) 487-4650

- "Robotics: Applications and Social Implications" - R.U. Ayres, S.M. Miller, 1983, 339 pp., Ballinger Publishing Company (Harper and Row).

The authors, from Carnegie-Mellon University, present an in-depth examination of robotics applications taken in context with computer aided manufacturing and flexible computerized manufacturing systems (FCMS). The work is supported throughout by an extensive listing of reference sources in the technical, economic and social domains.

- "Brains, Behavior and Robotics" - J.S. Albus, 400 pp., 1982.

Presents a contemporary scientific understanding of the physiology and functioning of the human brain with the view that the best robot control systems will follow a similar approach. Examines the current state-of-the-art of robotics, difficulties to be overcome and potential applications. Author is a noted researcher in robotics with the National Science Foundation in Washington. \$26.95.

Contact: McGraw-Hill Ryerson Limited

- "Robotics and the Factory of the Future"

A collection of approximately sixteen papers advising on what to expect from robots being designed today to be a part of the factories of the future. Papers include: Robotics at Chrysler, Multiple Robots in Manufacturing Cells, CAD/CAM, Robotics in the Factory of the Future and others. Paperbound. Publication No. P117. Price SAE members \$20 (U.S.), non-members \$25 (U.S.) including handling if prepaid.

Contact: Society of Automotive Engineers
Dept. 723
400 Commonwealth Drive
Warrendale, Pa. 15096, U.S.A.
Telephone: (412) 776-4841

- "Robotic and Automated Manufacturing" - Richard C. Dorf (Univ. of California) 208 pp., \$24.95 (U.S.) ISBN 0-8359-6686-0.

A full examination of the mechanical design of robots, their industrial applications and manufacturing, and their impact on workers and the workplace. Also includes information on robots of the future.

Contact: Reston Publishing Company (Prentice-Hall Inc.)
1085 Bellamy Rd. North, Suite 210
Scarborough, Ontario M1H 3C7
Telephone: (416) 438-2272

- "Robots at Work" - J. Hartley, 1983, 192 pages.

A practical guide for engineers and managers by an author who assesses the international scene from his base in Japan. Chapters cover introduction to robots, cost effectiveness and application areas such as spot welding, handling, arc welding, spraying and assembling. \$39 (U.S.).

Contact: Elsevier Science Publishing Co. Inc.

- "IFS Publications"

- "Robot Vision" - A selection of 28 papers by leading specialists, 356 pp., hardbound, \$56 (U.S.).
- "The FMS Report" - Prepared by IFS publications in close cooperation with Ingersoll Engineers. Available in French and German as well as English, 179 pp., softbound, \$88 (U.S.).
- "Automated Guided Vehicles" - Covers theoretical and practical aspects of system design plus data tables based on 500 installations, 290 pp., hardbound, \$39.50 (U.S.).
- "Robots at Work" - A practical guide and in-depth assessment for production engineers and managers, 200 pp., hardbound, \$50 (U.S.).
- "Decade of Robotics" - Contains articles especially commissioned by The Industrial Robot Journal following one decade of service, 168 pp., softbound, \$35 (U.S.).

Contact: IFS (Publications) Ltd.
35-39 High Street
Kempston, Bedford, England, MK42 7BT
Telephone: (0234) 853605, Telex 825489

- "Developments in Robotics 1983" - Edited by B. Rooks

A collection of papers in book form to highlight some of the most recent advances in robot technology. Chapter 1 - Robot Applications, Chapter 2 - Robot Design and Commercial Systems, Chapter 3 -Sensing/Sensors, Chapter 4 - Drives/Control and Simulation, 1983, 272 pp., \$59.50 (U.S.) in U.S.A. and Canada.

Contact: Elsevier Science Publishing Co. Inc.

* - "An Introduction to Robot Technology" - M. Chirouze
208 pages, 1984.

Provides an introduction to robots for electronic engineers, mechanical engineers and technical managers. Chapters cover: 1 -Robotics: An Introduction; 2 -Robots in Use; 3 -Representation of a Robot; 4 -Degrees of Freedom of a Robot; 5 -Basic Principles of Control; 6 -Control Based on the Geometrical Mode; 7 -Control Based on the Kinematic Mode; 8 -Actuator Servocontrol; 9 -Robot Actuators; 10 -Internal Sensors; 11 -External Sensors; 12 -Computer Control; 13 -Robot Training and Trajectory Generation; 14 -Robot Performance and Standards; 15 -Robots in Use; Appendices. \$41.95 plus \$2.50 shipping and handling.

Contact: McGraw-Hill Ryerson Limited

* - "Industrial Robotics Handbook" - D. Hunt
352 pages, hard cover, 1983

Studies critical applications and procedures for selection, computer programming, systems integration, safety, economic justification and other factors. Price \$29.50 (U.S.) to members of SME and its associations, \$32.50 (U.S.) for non-members.

Contact: Publication Sales
Society of Manufacturing Engineers

* - "RIA Publications Catalog"

The Robotics Industries Association has available on request a publications catalog listing approximately a dozen publications available from them in the field of robotics, including the following representative items. The first price indicated in each case is the non-member price, with the member price following:

- "RIA Robotics Glossary" - 1983, 80 pages, softcover. A comprehensive authoritative listing and definition of over 500 terms commonly used. \$8 (U.S.)/\$6 (U.S.) to RIA members.
- "Industrial Robots" - 1983, 416 pages, softcover. A complete product guide featuring detailed specifications from over 60 robot manufacturers. \$36 (U.S.)/\$30 (U.S.) to RIA members.
- "A Manager's Guide to Industrial Robots" - K. Sasnjara. 1982, 186 pages, softcover. Provides a clear explanation of the technology and a checklist for identifying potential automation candidates. \$8.95 (U.S.)/\$6.75 (U.S.) to RIA members.
- "Automated Guided Vehicle Systems" - T. Muller, 1982, 290 pages, hardbound. An authoritative work describing vehicle types, control systems, applications, planning and a summary of installations in Europe \$39 (U.S.)/ \$31.50 (U.S.) to RIA members.
- "Robot Vision" - Edited by Alan Pugh, 1983, 356 pages, hardbound. A collection of technical papers providing state-of-the-art reports on machine vision throughout the world. \$47 (U.S.)/\$37.50 (U.S.) to RIA members.

Contact: Robotic Industries Association
P.O. Box 1366
Dearborn, Michigan 48121, U.S.A.
Telephone: (313) 271-7800

* - "Robots in Manufacturing - Key to International Competitiveness" - J. Baranson (book), 152 pages, 1983, \$32.50 (U.S.)

A world review of industrial robotics and their impact on industrial competitiveness presenting first hand on-site knowledge by an economist associated with the World Bank. Discusses why the U.S. is falling behind other nations, what can be done to stem the decline, presents studies of national environments in the U.S.A., Japan, Europe and company profiles of robot suppliers around the world.

Editorial note - This book is by the same author, and appears to be similar, at least in part, to the 256 page report listed on page 9.

Contact: Lomond Publications, Inc.
Mt. Airy, Maryland 21771, U.S.A.
Telephone (301) 829-1496

- * - "Robotics Age: In the Beginning"
C.T. Helmers, ed., book 1983, 241 pp. Paper \$16.95 (U.S.).

A book compiled from articles that have appeared in robotics Age. Three sections cover Power and Control, Interactions (Senses, Vision and Voice) and Applications and Development.

Contact: Hayden Book Co.
50 Essex Street
Rochelle Park, New Jersey 07662, U.S.A.

- * - "Robotics Research" edited by Michael Brady and Richard Paul.

Contains fifty-three contributions in book form from the first international symposium to describe current research in one of the fastest moving fields of artificial intelligence. 1000 pages, 600 illustrations. Price \$65.00 (U.S.).

Contact: The MIT Press
28 Carleton Street
Cambridge, Mass. 02142, U.S.A.

- * - "Industrial Robots and Robotics" 396 pages. A comprehensive introduction to the field, considered to be well suited for a basic elective course in colleges \$28.95 (U.S.)/\$25.95 (U.S.).

Contact: Robotic Industries Association
P.O. Box 1366
Dearborn, Michigan 48121, U.S.A.
Telephone: (313) 271-7800

- * - Tutorial: Robotics C.S.G. Lee, R.C. Gonzales, K.S. Fu

IEEE Computer Society Press, 1983, 730 pages. Members \$24 (U.S.), non-members \$39 (U.S.) plus \$5 (U.S.) for shipping and handling.

A tutorial text summarizing fundamentals and theory of robotics. Nine chapters cover robot arm kinematics, dynamics, control, trajectory planning, sensors, robot vision, robot control languages and machine intelligence.

Contact: IEEE Computer Society Order Department
P.O. Box 80452
Worldway Postal Center
Los Angeles, CA. 90080, U.S.A.

- * - "Robot Technology, Volume 1: Modelling and Control" - P. Coiffet, Prentice-Hall, Inc., Englewood Cliffs, N.J., 07632; 1983, 160 pages, \$44 (in U.S.A.).

The first of a series of seven on robot technology. The subject volume deals with robot modeling and dynamic control, primarily as articulated kinematic mechanical systems.

- * - "Robots: Planning and Implementation" - C. Morgan, 1984, 1955 pp. \$38.00 (U.S.).

A broad perspective on the use of robots in manufacturing with an examination of robot types, applications, safety, personnel factors and financing.

Contact: Springer-Verlag (as above)

- * - Robotics Applications Forecast Report"

This 103 page, comprehensive overview available from the National Technical Information Service (NTIS) provides a perspective on robotics activity in terms of the state-of-the-art, organizations involved, funding sources, and a 5 to 10-year forecast. The report is a thorough, basic robotics reference, containing chapters on: manipulator arm configurations, actuators, mobility, end effectors, control, sensor-controlled robots, robot vision, robot programming, kinematics and dynamics, commercially available robots and components, and future directions. Statistical data is presented in 17 tables; 14 drawings illustrate mechanical construction and functions. Designated publication PB83-217547/TBT, the cost is \$13 (U.S.).

Contact: NTIS
5285 Port Royal Road
Springfield, VA 22161, U.S.A.
Telephone: (703) 487-4600

Note: NTIS reports are also frequently available in Canada from CISTI, The Canada Institute for Scientific and Technical Information whose address is given in the abstracts section of the CAD/CAM Newsletter.

- * - "Robots and Telechirs" - M.W. Thring, 298 pp., 1983, \$63.50.

Covers both the engineering approach and social aspects of robotic automation. Topics include the theory and practise of mechanical arms, hands and legs. The use of robotics in industry and telechirs in mines, underwater and other dangerous applications such as explosives handling are included.

Contact: John Wiley and Sons Canada Limited

- * - "An Introduction to Robot Technology" - P. Coiffet and M. Chirouze, 208 pp., 1984.

A comprehensive review in book form covering stepping motors, computer control of robots, robot training, trajectory generation, robot performance, applications and other factors. Special appendices cover matrix calculations, coordinate sets, principles of hydraulic flow, d.c. motors and dynamic models. \$43.95

Contact: Professional Books Division
Attention: Carol Remy
McGraw-Hill Ryerson Limited
330 Progress Avenue
Scarborough, Ontario M1P 9Z9

- * - "The World Yearbook of Robotics Research and Development" - I. Aleksander Ed.

A major reference book scheduled for publication in 1984 covering information on over 450 establishments worldwide.

Contact: Kogan Page Ltd.
120 Pentonville Road
London, England N1 9JN

- Automated Guided Vehicle Systems

- "Automated Guided Vehicle Systems"

A 111 page report published by Technical Insights in cooperation with the SEAI Institute in Georgia. Automated Guided Vehicle Systems (AGVS) are now being used in production line functions and flexible manufacturing systems as well as automated warehousing. Twenty-five manufacturers are listed with addresses and telephone numbers in the U.S.A. Price \$85 (U.S.).

Contact: Technical Insights
P.O. Box 1304
Fort Lee, New Jersey 07024, U.S.A.

- * - "Automated Guided Vehicle Systems", - Edited by H. Warnecke, Stuttgart, FRG. 1983, 346 pp. \$75 (U.S.).

Proceedings of the 2nd International Conference on Automated Guided Vehicle Systems (AGVS) and 16th IPA Conference held in Stuttgart, F.R.G., June 7-9, 1983. Contains 26 papers by specialists in the U.K., U.S.A., West Germany, Switzerland, Italy and France.

Contact: Elsevier Science Publishing

- * - "Automated Guided Vehicles" - T. Müller, 1983, 290 pp. \$34.50 (U.S.).

A detailed comparison of existing transport systems focussing on vehicle types and floor installations, load transfer, interfaces and control systems.

Contact: Springer-Verlag

- Sensors and Machine Vision

- "Model-Based Computer Vision" - Rodney Allen Brooks

Documenting important advances in computer vision, this clearly written, illustrated book describes ACRONYM, a computer vision system for interpreting aerial photographs and for robot vision. Brooks provides an organized description of the system's design as well as an overview of several important aspects of the model-based vision problem. ISBN 8357-1526-4-SAC, 130 pp., \$34.95 (U.S.).

Contact: U.M.I. Research Press
300 N. Zeeb Rd.
Ann Arbor, Mi. 48106, U.S.A.

* - "Robot Vision" - Edited by Alan Pugh, University of Hull, U.K. (book)
1983, 356 pp., cloth \$47.50 (U.S.).

A state-of-the-art collection covering topics such as Second Generation Robotics, Computer Vision in Industry, Processing of Binary Images, Recognition Systems, Adaptive Visual Servo Control of Robots, Vision Systems for Weld Guidance, Developments in Assembly Systems, applications (including the G.M. Canada application for sorting castings) and descriptions of commercial systems.

Contact: Springer-Verlag

* - "Machine Vision"

A 396 page softcover publication in the SME Productivity Equipment Series presenting an up-to-the-minute collection of the operating characteristics of currently available models of manufacturing equipment. Five separate sections cover General Systems, Robotics Systems, Special Systems, Components and Accessories and Optical Inspection. SME members \$41 (U.S.), non-members \$44 (U.S.) plus \$1.25 (U.S.) for postage and handling in each case.

Contact: Publication Sales
Society of Manufacturing Engineers

or P.O. Box 2457
Walkerville Station
Windsor, Ontario N8Y 4S2

* - "A Vision - Based Robot System Using a Multiprocessing Controller" -
S. Elgazzar, D. Green, D. O'Hara, National Research Council, Ottawa,
Report No. ERB-971.

This report describes the implementation of a sensor-based robot using a binary vision system. The vision system locates and recognizes regular shaped blocks which are then inserted into matching sockets. The vision algorithms and the control software implementation on a multiprocessor system are described. This system of parallel processors permits the concurrent execution of vision analysis and robot motion control tasks.

The procedure for vision calibration and the sequence of VAL commands used to drive the PUMA 560 arm are also described.

Contact: Editorial Office
Division of Electrical Engineering
National Research Council of Canada
Ottawa, Ontario K1A 0R8

- * - "Computer Vision and Sensor-Based Robots" - Edited by G. Dodd and L. Rossol, 364 pp., \$49.50 (U.S.).

Editors are with the General Motors Research Laboratories, Warren, Michigan and the book is a volume in the General Motors Symposia Series.

Contact: Plenum Publishing Corporation
233 Spring Street
New York, N.Y. 10013, U.S.A.

- * - "Automated Visual Inspection" - B. Batchelor, D. Hill, H. Hodgson, 1985, 400 pp., \$59 (U.S.).

A collection of original papers and practical case studies by UK researchers and practitioners. Automated visual inspection includes blemish detection, complex patterned-surface examination, measurement of tools and components, counting, grading, sizing, recognition for robot control and other applications.

Contact: Elsevier Science Publishing Co.

- Automated Testing

- "Computer Controlled Testing and Instrumentation" - An introduction to the IEC-625:IEEE-488 Bus by Martin Colloms.

Provides up-to-date information on the General Purpose Interface bus. Coverage includes: structure, cabling, hardware, software; controller requirements; peripherals; problems and programming hangups; equipment manufacturers, recommended units and symbols. 151 pp. (1983). 0-27406-9, \$37.50.

Contact: John Wiley and Sons Canada Limited

- "Automatic Test Equipment: Hardware, Software, and Management" - Edited by Fred Liguori, Naval Air Engineering Center, 1974, 264 pages. A Book of Selected Reprints. IEEE Press.

Contents: Introduction, Planning, Preparing and Staffing for ATE, Test System Concepts and Design. Test Design Philosophy and Techniques, Test Languages and Program Preparation, Software Tools and Techniques, Configuration Control and Management, Bibliography, Author Index. A total of 28 reprinted papers.

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Plus \$2.00 billing charge if not prepaid.

Contact: IEEE Service Center
445 Hoes Lane
Piscataway, NJ 08854, U.S.A.

* - "ATE: Automatic Test Equipment"

(Book) A.C. Stover, 288 pages, McGraw-Hill Ryerson Limited, 1984. A comprehensive guide book to the principles, techniques and applications of automatic test equipment including hardware, software, IEEE-488 standard bus, etc. \$45.50 plus \$2.50 shipping and handling.

Contact: McGraw-Hill Ryerson

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