

CAD/CAM

NEWSLETTER

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January 1985

Information Compiled by the CAD/CAM Technology Advancement Council*

1. Reference Issue on Sources of CAD/CAM Information

As in previous years this January issue contains a compilation of sources for CAD/CAM information.

The information in this issue covers:

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

As in previous years it is expected that the February and March issues will provide an index in reference form to:

- E - Regularly Published Journals
- F - CAD/CAM Newsletters
- G - CAD/CAM Directories and Product Guides
- H - Books on CAD/CAM Technology

The information listed has been prepared, as a service to readers, primarily from past issues of the monthly CAD/CAM Newsletter. Where prices for material or fees for conferences are shown they should be treated as a useful guide, but not necessarily current and subject to change without notice. Due to space limitations it is not possible to include all possible entries, but the editor would be pleased to be advised of any major omissions.

In addition to the information contained in this newsletter, a detailed "Reference Guide to CAD/CAM and Robotics Centres" is in preparation and is planned to be available in publication form from the National Research Council about May 1985. The publication will provide an index and guide for managers and technical personnel in industry to the CAD/CAM and Robotics development and information centres in Canada, and to some similar centres in the U.S.A. on a selected basis. The publication will also be useful for the coordination of activities between the various centres in Canada. The Canadian centres, mostly established for regional delivery of information on CAD/CAM technology, including robotics, have both similarities and differences in their abilities and approach. The need for the reference guide is supported by the centres themselves who also are participating in its

preparation. Three coordination meetings, well attended by representatives of the various centres have been held in the past two to three years, and a fourth coordination meeting, to be held about May 1985, is being organized by the CAD/CAM Technology Advancement Council.

It is useful to briefly indicate some of the additions which have appeared during 1984. Please see the listings which follow for details. In their order of appearance in the monthly newsletters, these are:

- The "MAT FORUM" for Manufacturing Advanced Technology (MAT) was established by the Canadian Manufacturers' Association (CMA).
- A special interest group for machine vision was established by the Society of Manufacturing Engineers (SME).
- An agreement was made under which the province of Prince Edward Island will participate in the New Brunswick Manufacturing Technology Centre.
- The Ontario CAD/CAM Educators Group was formed.
- The Standards Council of Canada established a Canadian Advisory Committee to represent Canadian interests in Industrial Automation Standards arising from the International Standards Organization (ISO).
- Carleton University opened a Centre for Advanced Studies in Computer Aided Design and Engineering (CASCADE).
- A Centre for Flexible Manufacturing Research and Development has been established at McMaster University.
- Proposals were invited by the National Research Council and Department of Regional Industrial Expansion for the establishment of a National Manufacturing Technology Information Centre to be operated in the private sector.

A - CAD/CAM Centres in Canada

The following industrially oriented centres are listed in geographic sequence from west to east, followed by some national facilities. Other capability exists and additional centres are being planned in some instances. The centres already listed, or the provincial research council, are often aware of such activity and are a good point of contact in such cases.

- "Alberta Microelectronic Centre"

A non-profit company, established to help Alberta industry learn about, and profit from, new technology. The centre assists companies with feasibility studies on productivity improvement, including CAD/CAM and robotics. Facilities include a Computervision CAD system with eight work stations.

Contact: Alberta Microelectronic Centre
Room 544, Electrical Engineering Building
The University of Alberta
Edmonton, Alberta T6G 2G7
Telephone (403) 432-3914

- Saskatchewan "CAD/CAM Robotics Centre"

The Saskatchewan Research Council (SRC) has made a commitment to Saskatchewan industry to establish the use of CAD/CAM in manufacturing plants in the province. The new service will be a "centre without walls". The centre, managed by Mr. G. Pierce, will focus on the improvement of productivity, technical competence and position of the Saskatchewan industrial sector.

It is expected that within five years thirty design stations at industrial locations will be linked to the centre at SRC and a Control Data computer, owned by the Advanced Technology Training Centre and housed in facilities of the Kelsey Institute of Applied Arts and Sciences.

Contact: Mr. G. Pierce P.Eng.
Saskatchewan Research Council
30 Campus Drive
Saskatoon, Saskatchewan S7N 0X1
Telephone (306) 664-5413

- "Computer Aided Engineering Facility"

The Computer Aided Engineering Facility at the Manitoba Research Council's Industrial Technology Centre in Winnipeg, was officially opened on September 6, 1983. \$2 million had been allocated jointly from federal and provincial funds to enhance the range of services and equipment available in the area of computer aided design and computer aided manufacturing (CAD/CAM).

The facility, in addition to serving Industrial Technology Centre clients, interfaces with Manitoba's major educational institutions to encourage the training of technologists, engineers and designers in the use of computer aided engineering.

Computer aided engineering (CAE) is the application of computer techniques to product design, development, and manufacturing. It includes design techniques such as finite element analysis, product development techniques such as component modelling and testing (CAT), manufacturing techniques such as computer aided drafting, and numerical control of machine tools (CAD/CAM) as well as materials handling, robotics and production planning. Applications of CAE include; Computer Graphics, Part and Plant Design, Information Systems, Manufacturing and Physical Testing.

Equipment at the new Manitoba CAE facility includes a General Electric CALMA computer graphics system, analysis software from the Structural Dynamics Research Corporation (SDRC) and a Zonic field portable data acquisition system all centered around a Digital Equipment Corporation VAX 11/780 computer.

Further information can be obtained from:

Computer Aided Engineering Facility
Industrial Technology Centre
1329 Niakwa Road
Winnipeg, Manitoba R2J 3T4
Telephone (204) 994-6000

- "The Canadian Institute of Metalworking (CIM)"

The Canadian Institute of Metalworking (CIM) was originally located on the campus of McMaster University as a non-profit corporation and has more than eleven years of industrial experience in numerical control machine tool application and several years in CAD. In 1981, the Institute reinforced its capabilities with the acquisition of a CALMA interactive graphics system for computer aided design, drafting and manufacturing.

Developed initially under the sponsorship of the Federal Department of Industry, Trade and Commerce to foster the use of NC and CAD/CAM in Canadian Industry, the CIM has evolved as a leading Canadian authority and provider in CAD/CAM technology, offering services, demonstrations, R&D and educational/training programs for the manufacturing sector and specialized software development for the larger industrial community. The CIM is believed to be unique in its operation as the only financially self-sustaining CAD/CAM resource facility in North America. Sixty companies support the Institute under its corporate membership program.

In February 1984, the CIM moved to a new building and modern high technology facility in the newly-created Ancaster Industrial Park. Plans call for the Centre to operate cooperatively with both McMaster University and Mohawk College, to maintain an outstanding technical competence as a training facility and as a catalyst for industrial development.

Contact: Canadian Institute of Metalworking
1276 Sandhill Drive
P.O. Box 7317
Ancaster, Ontario L9G 3N6
Telephone (416) 648-5011

- McMaster University Flexible Manufacturing Center

As a result of a grant approved under the Federal Government Centres of Specialization Fund, McMaster University announced in

1984 that the \$500,000 granted will be used to establish a "Centre for Flexible Manufacturing Research and Development" at the University.

The planned activities of the centre will be multi-disciplinary, combining Mechanical, Electrical and Computer Engineering and Management expertise. The centre will serve also as a regional resource for the industrial community and will complement other programs sponsored by Federal and Provincial Governments and research councils.

Aspects of flexible automation proposed for research in the centre include:

1. Design of Flexible Manufacturing Systems.
2. Computer Simulation and Evaluation of Flexible Manufacturing Cells and Systems.
3. Computer Vision Systems and Applications.
4. Robots Expert Systems and Artificial Intelligence.
5. Hierarchical Real-time Control and Integration of Automated Production Facilities.
6. Physical Modelling and Prototyping of Automated Assembly Systems.
7. Computerized Inspection and Testing.
8. Kinematics and Adaptive Control of Robots.
9. Sensors (tactile, optical, proximity, etc.).
10. Off-line Programming of Robots and Speech Recognition.

Contact: Dr. Hoda A. ElMaraghy
Director, Center for FMS R&D
Dept. of Mechanical Engineering
McMaster University
Hamilton, Ontario L8S 4L7

- "The Ontario Centre for CAD/CAM"

The Ontario Centre for CAD/CAM in Cambridge and the Ontario Centre for Robotics in Peterborough, jointly constitute the Ontario Centre for Advanced Manufacturing (OCAM).

Officially opened in February 1983, the Ontario Centre for CAD/CAM in Cambridge has approximately 30 people and facilities dedicated to creating an awareness of CAD/CAM technology and to assist small and medium sized firms in its application.

It is expected that provincial government funding for the Cambridge and Peterborough centres over five years will total \$36.7 million, less projected revenues amounting to \$6 million from operations on a fee for service basis.

Contact: Ontario CAD/CAM Centre
400 Collier-MacMillan Drive
Cambridge, Ontario N1R 7H7
Telephone (519) 622-3100

- "Ontario Centre for Robotics"

The Ontario Centre for Robotics in Peterborough, Ontario forms the second half of the Ontario Centre for Advanced Manufacturing. The mission of the Robotics Centre is:

- To accelerate the utilization of robotics technology by Ontario industry.
- To promote the growth of supportive robotics industries in Ontario.

The centre is planned to operate through six key thrusts; an outreach program, a training program of workshops and seminars, application demonstration using a variety of robots installed for the purpose, application consulting, innovation and development and information dissemination.

Contact: Ontario Robotics Centre
743 Monaghan Road
Peterborough, Ontario K8J 5K2
Telephone (705) 876-1611

- "The Ontario Centre for Microelectronics"

The Ontario Centre for Microelectronics, in addition to its other capabilities, has an intensive set of CAD tools for the design of integrated circuits and customized silicon chips.

Contact: Ontario Centre for Microelectronics
1150 Morrison Drive, 4th Floor
Ottawa, Ontario K2H 9B8
Telephone (613) 596-6685

- Carleton University "CASCADE" Centre

As a university response to re-structuring and adapting to the changes precipitated by CAD/CAM technology, Carleton University in Ottawa officially opened the Centre for Advanced Studies in Computer Aided Design and Engineering (CASCADE), on October 15, 1984.

The Centre is dedicated to the advancement of Computer Integrated Design and Manufacturing (CIDM) through research and teaching, with a focus on three major areas:

- Civil and Mechanical Engineering - CAD/CAM and Building Sciences
- Electronics - VLSI and printed circuit board design and analysis
- Computer Science for CIDM - Data bases, man-machine interaction, software development tools.

In these areas CASCADE acquires, implements and evaluates world class CIDM software packages and develops in-house expertise in using them. Knitting these programs into integrated and easy-to-use software systems is the main task of researchers in CASCADE. While the CASCADE philosophy is to acquire software wherever possible, in selected critical areas CASCADE will also develop the software needed.

Preceding the October 1984 opening some significant accomplishments were:

- Eight Apollo workstations were ordered with the first being delivered in January 1984.
- A Floating Point Systems FPS-164 Attached Processor was installed as an integrated part of the Apollo Domain local area network.
- During the summer of 1984, approximately 300,000 lines of Fortran, 40,000 lines of C, and 20,000 lines of Pascal code have been ported to the Apollo environment. This includes a state-of-the-art solids modelling program (PADL-2), programming languages (APL/11 and C-Prolog), finite element programs (ASGARD) and circuit simulation systems (SPICE). It also includes EAN, a new electronic mail system from UBC that uses the new CCITT and ISO standards for open systems interconnection. This gives the centre ready access to the world's major research networks (ARPANET, CSNET, UNSENET and CDNNET).

For further information (according to the technical subject area indicated) contact:

(CAD/CAM) - Dr. M. Holtz, Assistant Professor of Civil Engineering
(CAD/CAM) - Dr. J.A. Goldak, Professor of Mechanical and Aeronautical Engineering
(VLSI) - Dr. M.A. Copeland, Professor of Electronics
(QUALITY ASSURANCE) - Dr. E. Menipas, Professor of Industrial Management and Operations Research
c/o CASCADE,
Centre for Advanced Studies in Computer Aided Design and Engineering
Carleton University
Ottawa, Ontario Canada
K1S 5B6

- "Concordia University - Centre for Building Studies"

The Concordia University Centre for Building Studies has expertise in CAD applied to architecture and building design.

Contact: Dr. P. Fazio
Centre for Building Studies
Concordia University
1455 de Maisonneuve Blvd., West
Montreal, Quebec H3G 1M8

- "Concordia University - Computer Aided Engineering"

A booklet is available describing Research and Academic Activities in Computer Aided Engineering (CAE) in the Department of Mechanical Engineering, Concordia University. Activities and publications of approximately 7 professors, 10 research associates and 14 graduate students, primarily in mechanical system analysis (vibration, dynamics) and fluid systems are listed.

Contact: Dr. S. Sankar, Associate Professor
Department of Mechanical Engineering
Sir George Williams Campus
1455 Maisonneuve Blvd. West
Montreal, Quebec H3G 1M8

- New Brunswick Manufacturing Technology Centre

The New Brunswick Manufacturing Technology Centre has been established in 1983 at six institutional locations to provide critical skill training and technical advisory service to industry on CAD/CAM. Contacts are available at UNB, Université de Moncton, The Research and Productivity Centre in Fredericton plus the community colleges of Bathurst, Moncton and Saint John. A seventh location, Edmundston, N.B., is to be equipped during 1985.

Presently, negotiations are under way to establish a Manufacturing Technology Centre in the Province of Prince Edward Island. Upon signing of an agreement between Prince Edward Island and New Brunswick, the "New Brunswick Manufacturing Technology Centre" will thereafter be known as the "Manufacturing Technology Centre".

Department of Commerce and Development

Mr. W.C. McGregor, Director, Manufacturing Services Division
Mr. B. Teece, Manager, Manufacturing Technology Centres and Software Development
Mr. Otis Phinney, Industry Services Officer, CAD/CAM
P.O. Box 600
Fredericton, New Brunswick E3B 5H1
Telephone (506) 453-2790

New Brunswick Research and Productivity Council

Mr. Neville Coelho, CAD/CAM Centre Manager
P.O. Box 6000
Fredericton, New Brunswick E3B 5H1
Telephone (506) 455-8994

The University of New Brunswick

Dr. D.J. Bonham, Chairman, Mechanical Engineering
Ms. Evelyn Richards, Project Director
P.O. Box 4400
Fredericton, New Brunswick E3B 5A3
Telephone (506) 453-4513

Université de Moncton

Mr. Jean Rene Longval, CAD/CAM Centre Manager
Engineering Department
Moncton, New Brunswick E1A 3E9
Telephone (506) 858-4309
(506) 858-4562

N.B.C.C., Campus de Bathurst

Ms. Jocelyne Vienneau, CAD/CAM Centre Manager
725 College
C.P. 1
Bathurst, New Brunswick E2A 3Z2
Telephone (506) 548-4591

N.B.C.C., Moncton Campus

Mr. John Hanusiak, CAD/CAM Centre Manager
1234 Mountain Road
P.O. Box 2100, Station "A"
Moncton, New Brunswick E1C 8H9
Telephone (506) 384-4473
(506) 384-4306

N.B.C.C., Saint John Campus

Mr. Syd Brittain, CAD/CAM Centre Manager
Grandview Avenue
P.O. Box 2270, Station "C"
Saint John, New Brunswick E2L 3V1
Telephone (506) 696-1860
(506) 696-5452

- "Computer Aided Design Centre" - Nova Scotia

A computer aided design centre was announced and established in 1983 at the Technical University of Nova Scotia. The centre, established with assistance from the provincial Department of Development and Control Data Canada, also shares the computer aided manufacturing resources at the Nova Scotia Institute of Technology. The centre offers courses in CAD/CAM Technology on an ongoing basis, has commenced publication of the "Nova Scotia CAD/CAM Centre" Newsletter and in 1984 established a "collegium" with strong representation from industry as an advisory and liaison body.

Contact: Dr. A.A. Mufti
Director
Computer Aided Design Centre
Technical University of Nova Scotia
P.O. Box 1000
Halifax, Nova Scotia B3J 2X4
Telephone (902) 429-8300, ext. 350

- Prince Edward Island

New Brunswick and Prince Edward Island have combined forces to take the best advantage of computer technology and to conserve valuable resources. The two Maritime provinces signed an agreement May 7, 1984 which will enable Prince Edward Island to participate in the New Brunswick Manufacturing Technology Centre.

Under the agreement, Prince Edward Island opts into an existing pact covering the transfer of technology through computer software packages between the New Brunswick centre and McDonnell Douglas Automation Co., an aerospace firm located in St. Louis, Missouri.

Under the agreement the resources of the New Brunswick centre will also be available in Prince Edward Island. In addition to access to the technology transfer network, the island province will participate in projects involving the demonstration of McDonnell Douglas' software systems, and on-the-job training for university and community college graduates.

Contact: New Brunswick Centre (as above)

- The National Manufacturing Technology Information Centre

Announcement was made in April 1984 that the Federal Government will allocate funds for the establishment of a National Manufacturing Technology Information Centre.

The Centre, which will be operated by the private sector, will serve as a national focal point for disseminating information to companies, industry associations, universities and provincial agencies on the development and utilization of advanced manufacturing technologies. The Centre will also provide facilities for workshops, seminars and cooperative projects to be undertaken by industry to enhance the diffusion of the new technologies into the workplace.

The fundamental objective of the Centre will be to improve the productivity of Canadian industry by assisting in the planning for, and implementation of, Advanced Manufacturing and CAD/CAM technologies.

This will be achieved by:

- i) providing information and advice to Canadian industry on Advanced Manufacturing and CAD/CAM technologies;
- ii) coordinating multi-firm technology development projects at the request of industry (however, the Centre would not undertake intramural R&D)
- iii) coordinating activities and sharing information between the various regional centres; and
- iv) providing a national and international perspective to Canadian industry, community colleges, universities and other centres on developments in the Advanced Manufacturing and CAD/CAM field.

It is expected that the Centre will generate revenues from funding contributions by companies sponsoring projects, through the sale of reports, documentation, project results and software packages and through paid corporate memberships in the Centre. However, a number of the activities of the Centre, such as the coordination and information sharing functions and those activities directed toward keeping up-to-date on international developments are not expected to produce revenues.

Proposals for establishment of the centre have been received and evaluated such that an announcement regarding start-up can be expected early in 1985.

- Canada Institute for Scientific and Technical Information

Readers of the CAD/CAM Newsletter are aware that in many instances photocopies of the articles and papers referenced in the abstracts section of the newsletter can be obtained at nominal cost by ordering them from the Canada Institute for Scientific and Technical Information (CISTI), which is part of NRC, and one of the largest technical libraries in North America. For mail requests, the CISTI address, as regularly given in this newsletter, is Canada Institute for Scientific and Technical Information (CISTI), National Research Council, Building M-55, Montreal Road, Ottawa, K1A 0R2. Telephone (613) 993-1585, Telex 053-3115.

Alternatively, online ordering of scientific and technical documents will be easier, faster and less expensive with a new electronic mailbox facility released by CISTI in 1984, cutting almost a week off delivery time.

The mailbox facility, of interest to librarians, scientific and technical researchers, business people, and anyone else with a need for scientific and technical information, is a streamlined

version of CAN/DOC, the order feature of CISTI's CAN/OLE online bibliographic retrieval system. CAN/OLE gives anyone in Canada with a telecommunications computer terminal and a CAN/OLE account instant access to millions of bibliographic references stored on the National Research Council Computer in Ottawa. CAN/OLE allows searchers to order any of these documents from any CAN/DOC supplier by a simple command at the terminal. The original CAN/DOC routed orders through CISTI. The new CAN/DOC allows users to choose suppliers, and route their order directly to the supplier's mailbox, thereby saving up to a week in turnaround time.

Another feature of the upgraded CAN/DOC is a new file, called DOC, especially created to allow ordering of any document from any source other than a CAN/OLE database. The file is available at the rate of \$20 per connect hour, a considerable saving compared to the standard CAN/OLE rate, which starts at \$40. DOC prompts the user for the appropriate descriptive information.

CAN/DOC suppliers are:

CISTI
Geological Survey of Canada
National Library of Canada
Environment Canada
Transport Canada
University of Guelph
Alberta Oil Sands Information Centre
Micromedia Limited
Atomic Energy of Canada Limited
Canada Centre for Mineral and Energy Technology

B - Canadian Regional and National Organizations

The following organizations, listed in alphabetical order, draw strength from their membership to whom they provide services, but with less emphasis on physical facilities than the centres described in Section A above.

- "CAD/CAM Association CAO/FAO"

The CAD/CAM Association (L'Association CAO/FAO) is an association formed in 1981 of individuals, companies and educational institutions with common interests in the application of computer technology to design, drafting, documentation, manufacturing, architecture, analysis, mapping, and research and development.

The objectives of the association are:

- to strengthen the awareness and to promote the application and implementation of CAD/CAM.
- to provide a forum for discussion, education and exchange of ideas.
- to act as an information centre.
- to sponsor meetings, seminars, expositions and publications.
- to further the common interests of its members with other associations and government.

Regular meetings are held in the Montreal area and four grades of membership are available; Regular members (\$50), Student members (\$10), Educational Institutional Memberships (\$100) and Corporate Memberships (\$250). For information concerning membership, contact L. Boucher, Director of Membership, telephone (514) 636-4540.

The Association publishes an information journal "CAD/CAM Communications CAO/FAO" for members which is also available on a reduced fee basis to persons outside the membership area. Short papers and articles of interest are invited for the journal. Submissions may be addressed to Giuliana Marussi, Editor, CAD/CAM Communications, 3130 Daguerre, Longueuil, Quebec, J4L 3A4.

In addition to its regular monthly meetings, the association has begun sponsorship of a major CAD/CAM conference and exhibition normally in November of each year.

Contact: CAD/CAM Association CAO/FAO
P.O. Box 992, Desjardins Postal Station
Montreal, Quebec H5B 1C1

- The CAD/CAM Technology Advancement Council

The CAD/CAM Technology Advancement Council was established by the Department of Industry, Trade and Commerce in 1978 with members from industry, educational institutions and government. Objectives of the council include increasing the awareness, in industry and elsewhere, of the importance of this technology, and dissemination of information to encourage and assist CAD/CAM development and application in Canadian industry. The council, composed of fourteen invited members from industry and educational institutions plus four from government, normally meets four times per year.

In addition to its regular monthly CAD/CAM Newsletter, the council in 1980 issued its major report "Strategy for Survival" and in 1983 the supplementary report "Closing the Gap".

Copies of the newsletter, council reports and other information are available on application.

Contact: Secretariat
CAD/CAM Technology Advancement Council
Office of Industrial Innovation 5C
Dept. of Regional Industrial Expansion
235 Queen Street
Ottawa, Ontario K1A 0H5
Telephone (613) 995-3741

- Canadian Advisory Committee for ISO/TC 184

Recognizing the great need for standards in the area of industrial automation, it is not surprising that the structure necessary to achieve this is being established, and initial steps being taken, on a relatively rapid time scale.

The inaugural meeting of the ISO (International Standards Organization) Technical Committee on Industrial Automation Standards was held in Paris on December 5-8, 1983. There were 51 delegates in attendance from 9 countries representing most of the major industrial and research organizations in this field.

Accordingly, the Standards Council of Canada has established a Canadian Advisory Committee, known officially by the abbreviation CAC/ISO/TC 184, for the purpose of;

- a) Following the work of ISO/TC 184 and its sub-committees and working group, including receiving and studying documents and contributions from all other member bodies.
- b) Formulating Canadian opinion recommending Canadian policies to the Canadian National Committee on ISO (CNC/ISO).
- c) Casting Canadian ballots on Draft Proposals and Draft International Standards.

For further information, persons interested to participate in CAC/ISO/TC 184 should contact:

W.J. Baigrie, P.Eng., Assistant Manager
Technical Services Division
International Standardization Branch
Standards Council of Canada
2000 Argentia, Suite 2-401
Mississauga, Ontario L5N 1V8
Telephone (416) 826-8110

- "Canadian Association for Production and Inventory Control"

The Canadian Association operates as region eight of the American Production and Inventory Control Society (APICS) as an association of professional practitioners involved in production and inventory control management.

Contact: A. Fortin
Canadian Association for Production and Inventory
Control
P.O. Box 107
Kanata, Ontario K2K 1X3
Telephone (613) 592-2122

- "Canadian Industrial Computer Society (CICS)"

The Canadian Industrial Computer Society (CICS) is an outgrowth of the previous NRC Associate Committee on Automatic Control. The society issues a regular newsletter to members and sponsors the Canadian Conference on Industrial Computer Systems every two years, with specialized workshops in the intervening years.

The 1982 Canadian Conference on Industrial Computer Systems was held May 3-5 at McMaster University in Hamilton with approximately 90 technical papers presented and 250 persons attending. Copies of the proceedings are available.

The 1984 Canadian Conference on Industrial Computer Systems was held May 22-24 at the University of Ottawa. A special report "Education for the Wave of Change" resulting from the March 1983 workshop on the educational impact of CAD/CAM Technology is available in French and English for \$25.

Information concerning membership in the Canadian Industrial Computer Society is available from the following address.

Contact: Canadian Industrial Computer Society
12 Kindle Court
Ottawa, Ontario K1J 6E2
Telephone (613) 993-2834

- Canadian Manufacturers' Association "MAT FORUM"

The Canadian Manufacturers' Association (CMA) in 1984 began the introduction of an important new initiative to meet Canadian needs for more and better information on developments in technology, systems, human resource training and management approaches. The MANUFACTURING ADVANCED TECHNOLOGY (MAT) FORUM has been planned by leading representatives of industry, government and higher education to communicate an awareness of new technology and its potential applications.

It is expected that the MAT FORUM will greatly benefit all manufacturers, regardless of size or product, by exposing them to the latest technological advances and affording them a format for an exchange of ideas with industry leaders and technological innovators. While primarily oriented to manufacturers, the MAT FORUM will also be of considerable interest to any others who are servicing this sector.

The CMA's MANUFACTURING ADVANCED TECHNOLOGY FORUM is being launched specifically to:

- communicate information on new innovations and developments in technology and systems
- provide an opportunity to exchange ideas with industry leaders
- place participants in contact with experts in a variety of fields
- generate new ideas and approaches
- help participants to gain employee acceptance of new products, processes and equipment
- help participants measure the performance of new technological applications

The MAT FORUM will be primarily oriented to senior management plant engineers, plant managers, consultants, and other organizations engaged in activities related to manufacturing.

The MAT FORUM is open to any manufacturing company, or to representatives of any other private or public body interested in advanced technology, whether a CMA member or not. All CMA principal members will routinely receive information regarding the Forum's activities.

There will be no charge for CMA members. For non-CMA members the cost will be \$35.00 per year.

For additional information:

Contact: Marvin Zalman
Consultant - Industrial Performance
Canadian Manufacturers' Association
One Yonge Street
Toronto, Ontario M5E 1J9
Telephone (416) 363-7261

- CASA/SME Chapter

The first chapter in Canada of the Computer and Automated Systems Association (CASA) of the Society of Manufacturing Engineers (SME) has been formed in Toronto. CASA/SME is an educational and scientific association founded in 1975 for computer and automation systems professionals and will reach 10,000 members in 1985.

Membership of the SME is now approximately 75,000. The CASA division of SME was created to provide comprehensive and integrated coverage of computers and automation in the advancement of manufacturing. The "Ontario" chapter holds regular meetings and site visits in the vicinity of Toronto.

For further information contact:

Alfred Haupt, Program Chairman
CASA/SME Chapter 286
c/o Ontario Ministry of Industry & Trade
Hearst Block, Room 718
900 Bay Street
Toronto, Ontario M7A 2E1
Telephone (416) 965-0410

or Heinz Rusche, Chairman
CASA/SME Chapter 286
c/o Engel Canada Limited
545 Elmira Road
Guelph, Ontario N1K 1C2
Telephone (519) 836-0220

- "National Computer Graphics Association (NCGA)"

The Toronto chapter of the NCGA holds regular monthly meetings and may be reached at the address indicated below for information concerning their membership and program activities.

Contact: NCGA
Attn: Mr. R. Mackay
961 Eglinton Avenue East
Suite 200
Toronto, Ontario M4G 4B5
Telephone (416) 424-4758

- "Ontario CAD/CAM Educators Group"

The Ontario CAD/CAM Educators Group is a committee dedicated to the dissemination of information in regards to CAD/CAM education.

The Group has members from colleges, high schools, universities, industry and service groups. A database of information from all members is being formed so that members can pull from this source to answer questions they may have regarding CAD/CAM hardware or software.

A bi-monthly newsletter will be distributed to members. The \$15/year fee will cover the cost of literature and mail. The newsletter will have feature articles, a question and answer box, and a section on general comments in regards to software/hardware problems, etc.

The Group will also host a CAD/CAM Educators Conference annually. The theme for the 1984 conference, held at Humber College in June, was "small computers for CAD/CAM".

For membership application forms or further information,

Contact: Elizabeth Bond, P.Eng.
Secretary, Ontario CAD/CAM Educators Group
Sheridan College
P.O. Box 7500
Brampton, Ontario L6V 1G6

- "Ottawa-Carleton CAD/CAM Society"

The Ottawa-Carleton CAD/CAM Society holds informal meetings at approximately two months intervals. Meetings typically take the form of a one-half morning technical presentation and review of systems implementation at the site of a major industrial user such as Mitel, Computing Devices of Canada, and Bell-Northern Research, or an educational centre such as Carleton University, University of Ottawa or Algonquin College.

Contact: Dr. V. Thomson
Analysis/Control Systems, Bldg. M-2
Division of Mechanical Engineering
National Research Council of Canada
Montreal Road
Ottawa, Ontario K1A 0R6
Telephone (613) 993-2321

- Robotics Program in Ontario

The Central Ontario Chapter of Robotics International of SME holds regular monthly meetings in Toronto and vicinity.

Contact: Robotics International of SME
Central Ontario Chapter
c/o 6535 Millcreek Drive, Unit 62
Mississauga, Ontario L5N 2M2
Telephone (416) 821-3222

- "The Western Foundation for Advanced Industrial Technology"

The Western Foundation for Advanced Industrial Technology was formed to promote the application of Computer Aided Design/Manufacturing and Robotics (CAD/CAM) technologies. It is a society of Western Canadian manufacturing companies and other technology based organizations who have common objectives. Further information and membership application details are available from:

The Western Foundation for Advanced Industrial Technology
B.C. Research Building
3650 Wesbrook Mall
Vancouver, B.C. V6S 2L2

C - Major Technical Societies

- "The Society of Manufacturing Engineers (SME)"

The Society of Manufacturing Engineers (SME) has over 77,000 members in 65 countries and maintains a very active technical program. Their organizational structure includes two special divisions, the Computer and Automated Systems Association of SME (CASA/SME) and Robotics International (RI/SME), each of which has special publications and activities in its field.

Aided by 25 Technical Councils, the SME Technical Activities staff organize approximately 120 clinics per year which are held in many cities in addition to sponsorship of major conferences such as AUTOFACT, Robots 8, 9 etc., and others. More than 500 technical papers and reports are published yearly by the SME. The SME has a full time permanent staff of 240 persons and approximately one million pieces of mail are issued each month.

The following three regular publications have a combined circulation of more than 115,000.

"Manufacturing Technology" - the principal SME monthly publication

"CAD/CAM Technology - published 4 times per year by CASA/SME

"Robotics Today" - published 6 times per year by RI/SME in cooperation with the Robotic Industries Association (RIA)

In 1984 the SME announced, in addition to the CASA/SME divisions above, the establishment of a new special interest group for persons interested in machine vision. It is intended that the new technological interest group will be chartered as a full-fledged SME Association when 2,000 members are enrolled. The group will provide members with special services such as a new quarterly Vision Newsletter, conference notices etc., in addition to full SME membership benefits and a subscription to Manufacturing Engineering.

For existing members of SME or its divisions membership in the vision group will be an additional \$10 (U.S.). For new members membership in the vision group is \$45 (U.S.) annually plus a one time initiation fee of \$15 (U.S.).

Contact: Society of Manufacturing Engineers
P.O. Box 930
One SME Drive
Dearborn, Michigan, U.S.A. 48128
Telephone (313) 271-1500

- "SME Computerized Automation & Robotics Information Centre
(CARIC)"

The Society of Manufacturing Engineers (SME) began operation in 1982 of a Computerized Automation and Robotics Information Centre (CARIC) at its world headquarters in Dearborn, Michigan to gather and disseminate technical data and other information on automation and robotics as they apply toward increasing productivity and improving product quality in manufacturing.

Functioning as part of the SME library, it is intended that inquiries, under the guidance of librarian Paulette Groen, will be researched within 48 hours in most instances. The CARIC facilities may be accessed by visitors to SME headquarters during normal office hours or reached by telephone.

Contact: Computerized Automation & Robotics Information Centre
(CARIC)
Society of Manufacturing Engineers
One SME Drive, P.O. Box 930
Dearborn, Michigan, U.S.A. 48128
Telephone (313) 271-5340

- "Robotic Industries Association (RIA)"

The Robotic Industries Association (RIA), formerly known as the Robot Institute of America, while not a technical society is included in this listing for clarification purposes. The RIA, founded in 1974 is the trade association serving North America. From its headquarters in the SME Building, Dearborn, Michigan, the RIA sponsors the largest robot exhibition in the world and conducts industry-related programs for over 200 member companies. The Robots 9 Exposition will be held June 3-6, 1985, in Cobo Hall, Detroit, Michigan. The Association has a number of publications available to both members and non-members as described in the RIA Publications Catalog which is available on request.

Membership in the RIA is open to organizations involved in the manufacture, distribution, usage, and research of robot equipment.

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

- "Association for Integrated Manufacturing Technology"

Formerly known as the Numerical Control Society, the newly named Association for Integrated Manufacturing Technology (AIM-TECH), maintains activities on many aspects of CAD/CAM as well as numerical control. Canadian chapters maintain local activities in Montreal, Central Ontario and British Columbia.

Contact: Association for Integrated Manufacturing Technology
111 E. Wacker Drive, #600
Chicago, Illinois, U.S.A. 60601
Telephone (312) 644-6610

- "The IEEE Computer Society"

The IEEE Computer Society with more than 50,000 members, is part of the 200,000 member Institute of Electrical and Electronic Engineers.

Contact: IEEE Computer Society
10662 Los Vacqueros Circle
Los Alamitos, CA, U.S.A. 90720
Telephone (714) 821-8380

- "The Association for Computing Machinery (ACM)"

The activities of the Association for Computing Machinery (ACM) in the CAD/CAM field stem primarily from its annual major conference on computer graphics (SIGGRAPH), its special interest group on design automation (SIGDA) and its extensive publication activity for which the "ACM Publications Catalog 1984" is available.

Contact: Association for Computing Machinery (ACM)
11 West 42 Street
New York, N.Y., U.S.A. 10036
Telephone (212) 869-7440

- "National Computer Graphics Association (NCGA)"

The National Computer Graphics Association (NCGA) sponsors an annual conference and other activities. For example, Computer Graphics West 85 will be held in Los Angeles, June 25-27 and the World Computer Graphics 85, co-sponsored by the World Computer Graphics Association, in New York, July 10-12, 1985.

Contact: NCGA
8401 Arlington Blvd
Fairfax, Virginia, U.S.A. 22031
Telephone (703) 698-9600

- "Society of Automotive Engineers (SAE)"

As indicated in earlier issues of the CAD/CAM Newsletter, the Society of Automotive Engineers (SAE) has a number of CAD/CAM publications available particularly in the area of robotics.

Contact: Society of Automotive Engineers (SAE)
Department 721
400 Commonwealth Drive
Warrendale, PA, U.S.A. 15096
Telephone (412) 776-4841

- "Canadian Society for Mechanical Engineering (CSME)"

A constituent society of the Engineering Institute of Canada (EIC). Technical sessions on CAD/CAM are frequently included as part of the Annual General Meeting.

Contact: Engineering Institute of Canada
700 EIC Building
2050 Mansfield Street
Montreal, Quebec H3A 1Z2

- "Canadian Society for Civil Engineering (CSCE)"

A constituent society of the Engineering Institute of Canada (see above).

- "Canadian Society for Electrical Engineering (CSEE)"

A constituent society of the Engineering Institute of Canada (see above).

- "User's Groups of the CAD System Vendors"

CAD and related systems developments are regularly presented in a conference like format at user group meetings held under the aegis of CAD system vendors and may be available to attendees on payment of a conference registration fee. For example, the Computervision Users' Group, which has East, mid West and West coast divisions in the U.S.A., may be reached by contacting: Sharon Boyle, telephone (617) 275-1800 in Bedford, Massachusetts.

- "World Computer Graphics Association"

Contact: World Computer Graphics Association
2033 M Street N.W., Suite 399
Washington, D.C., U.S.A. 20036
Telephone (202) 775-9556

D - Major Conferences for 1985

There are many technical society meetings and conferences held on an annual basis. The following lists some of the largest and best known. 1985 dates are given where known. In any cases where a 1984 date is given it can be assumed that the conference is held on an approximately annual basis and the previous conference organizers may be contacted for new information regarding the 1985 equivalent as soon as it is available.

The Society of Manufacturing Engineers sponsors well over one hundred conferences, seminars and exhibitions annually. Only the largest are listed below. For others, please contact the Society at the address given, or its publications for details.

- "1985 Spring ACM Design Automation Workshop"
January 21-22, 1985 Santa Barbara, Ca.

The Spring Design Automation Workshop has been organized under the auspices of the ACM Special Interest Group on Design Automation, in cooperation with the IEEE Design Automation Technical Comm. and CANDE to facilitate discussion of current research topics and of practical experiences in utilizing advanced CAD codes. This year's workshop will concentrate on the process impact on VLSI design, device modeling and simulation.

To encourage a free interchange of ideas, no proceedings will be published nor will recording of discussion be permitted. Attendance will be limited to approximately 50 people. For ACM, SIGDA of IEEE members, the workshop registration fee is \$100.00 if received prior to December 1, 1984; thereafter the fee will be \$130.00. Non-members will be charged an additional \$20.00.

Contact: Dr. T. Young
ACM Workshop Chairman
c/o ZyMos
P.O. Box 62379
Sunnyvale, CA., U.S.A. 94088
Telephone (408) 730-8800, ext. 345.

- "CSC 85, ACM Thirteenth Annual Computer Science Conference"
March 12-14, 1985 New Orleans, Louisiana, U.S.A.

Contact: Terry Walker
Computer Science Dept.
University of South Western Louisiana
P.O. Box 44330
Lafayette, Louisiana, U.S.A. 70504
Telephone (318) 231-6339

- "FMS '85"
March 11-13, 1985 Dallas, Texas

A conference and exposition for potential users of Flexible Manufacturing Systems (FMS), sponsored by the SME and the Computer and Automated Systems Association (CASA/SME) which will examine both new and proven systems. Focus will be on FMS for mid-volume, mid-variety batch production and the factory of the future. Projected attendance is 1,000 persons.

Contact: Exposition Dept.
Society of Manufacturing Engineers
One SME Drive, P.O. Box 930
Dearborn, Michigan, U.S.A. 48121
Telephone (313) 271-1500, ext. 334

- "CAM-I's 3rd Annual Geometric Modeling Seminar"
March 19-20, 1985 Opryland Hotel, Nashville, Tennessee

A conference for current users, potential users and developers as a forum for the discussion of user requirements, benchmarking of current systems and communication with vendors. Fee \$575 (U.S.) for CAM-I members if exceeding the member allowance, and \$675 (U.S.) for non-members.

Contact: CAM-I, Inc.
Conference Services
611 Ryan Plaza Drive, Suite 1107
Arlington, Texas, U.S.A. 76011
Telephone (817) 860-1654

- "1985 IEEE International Conference on Robotics and Automation"
March 25-28, 1985 St. Louis, Missouri

Contact: K.S. Fu
Electrical Engineering Dept.
Purdue University
West Lafayette, Indiana, U.S.A. 47907
Telephone (317) 494-3433

- "Vision 85"
March 25-28, 1985 Cobo Hall, Detroit, Michigan

Call for papers closed July 2, 1984 for the fourth annual Applied Machine Vision Conference sponsored by the SME. More than 5000 are expected to attend the 1985 conference and exposition of vision equipment and systems.

Contact: Technical Activities Dept.
Society of Manufacturing Engineers
One SME Drive, P.O. Box 930
Dearborn, Michigan, U.S.A. 48121
Telephone (313) 271-1500, ext. 371

- "NCGA's Computer Graphics '85"
April 14-18, 1985 Dallas Convention Centre, Dallas, Texas

The National Computer Graphics Association (NCGA) will hold its sixth annual conference and exposition with both tutorial and technical sessions under the general theme "Education and Learning".

Contact: National Computer Graphics Association (NCGA)
Suite 601, 8401 Arlington Blvd.,
Fairfax, VA, U.S.A. 22031
Telephone (703) 698-9600

- "SME 1985 International Conference and Machine Tool Show"
May 6-9, 1985 Cobo Hall, Detroit, Michigan

A continuation of the regular SME conference and exhibition series which drew attendance of 18,277 in Cleveland, May 1984 and over 29,000 to Detroit in 1983. Exhibits will focus on demonstrations of advanced machine tools, computer-run manufacturing systems plus related manufacturing technologies and services.

Contact: SME (as above)

- "Advanced Manufacturing Summit '85"
May 14-17, 1985 Birmingham, England

Contact: IFS (Conferences) Limited, U.K.
35-39 High Street
Kempton, Bedford, M.K. 427 B.T. U.K.
Telephone (0234) 853-605
Telex: 825489

- "CICC 85, Custom Integrated Circuits Conference"
May 20-22, 1985 Portland, Oregon

This annual IEEE Conference brings together designers, producers and users of custom integrated circuits to discuss recent developments and future directions. It has a high component of CAD because of the essential nature of design automation in integrated circuits.

Contact: Aris K. Silzars
Tektronix, Inc.,
P.O. Box 500 MS 13-800
Beaverton, Oregon, U.S.A.
Telephone (503) 627-6980

- "Graphics Interface '85"
May 27-31, 1985 Montreal, P.Q.

Graphics Interface '85 is the eleventh Canadian Conference devoted to computer graphics and interaction techniques, and is the oldest regularly scheduled computer graphics conference in North America. Now an annual conference, exhibition and film festival, Graphics Interface has established a reputation for high-quality technical program. The call for papers has been issued with a closing date for program. The call for papers has been issued with a closing date for abstracts of October 31, 1984 indicating the intent of the conference to describe research results and applications experience relating to the following areas of computer graphics.

- Graphics in Office Automation
- CAD/CAM
- Computer-Aided Building Design
- Computer Animation
- Videotex
- Cartography
- Graphics and the Arts
- Graphics in Education
- Image Processing
- Interaction Techniques
- Image Synthesis
- Geometric Modelling
- Graphics and Robotics
- Industrial Graphics
- Graphics and Operation Research
- Medical Computer Graphics

This conference is being held in association with the Canadian Man-Computer Communications Society, the Computer Graphics Society, the Montreal chapter of IEEE Computer Society, the Montreal chapter of the Canadian Information Society and other professional societies.

Contact: Dr. D. Thalmann
Graphics Interface '85
Département d'Informatique et Recherche
Opérationnelle
Université de Montréal
C.P. 6128, Succ. A.
Montréal, P.Q.
Canada H3C 3J7

- "Robots 9"
June 2-6, 1985 Cobo Hall, Detroit, Michigan

This major conference is sponsored annually by Robotics International of SME. Over 20 sessions with more than 80 speakers and 2,000 attendees are expected for the conference section, plus some 200 exhibitors and 20,000 attendees for the exhibits portion.

Contact: Argenia C. Ford
Technical Activities Dept.
Society of Manufacturing Engineers
One SME Drive, P.O. Box 930
Dearborn, Michigan, U.S.A. 48121
Telephone (313) 271-1500, ext. 355

- "Human Factors in Manufacturing Conference"
June 11-13, 1985 Stuttgart, West Germany

Contact: IFS (Conferences) Limited U.K.
35-39 High Street
Kempston, Bedford MK 427 B.T. U.K.
Telephone (0234) 853-605
Telex: 825489

- "Prolamat 85, Sixth Annual Conference on Software for Discrete Manufacturing"
June 11-13, 1985 Paris, France

Contact: AFCET
156 Blvd Pereire
75017 Paris, France
Telephone 33 (1) 766-24-19
Telex EURTEL 290 163 code 235

- "4th Canadian CAD/CAM and Robotics Conference and Exhibition"
June 18-20, 1985 International Convention Center, Toronto.

The above conference will be held in 1985 as indicated. The call for papers, which closed Dec. 15, 1984, indicates the following subject areas. This conference and exhibition, now entering its fourth year, is widely recognized as the largest annual CAD/CAM and Robotics conference in Canada, typically attracting several hundred conference attendees and several thousand attendees to the exhibits section.

Future Software Developments	Computer Aided Scheduling
Future Hardware Developments	Training for CAD/CAM and Robotics
Computer Integrated Manufacturing	Computer Aided Learning
Robotic Research	Robotics for Hostile Environments
Computer Aided Design (CAD)	Robotics for Welding
Computer Aided Engineering	Robot Vision Systems
Design Simulation	Robotics for Material Handling
Design Analysis	Robotics for Assembly
Computer Aided Drafting	NC/CNC/DNC
Computer Aided Manufacturing (CAM)	Justification of New Equipment
Computer Aided Inspection	Flexible Manufacturing Systems

Contact: Canadian CAD/CAM and Robotics
c/o Canadian Institute of Metalworking
1276 Sandhill Drive
P.O. Box 7317
Ancaster, Ontario L9G 3N6
Telephone: (416) 648-5011

- "ACM IEEE 22nd Design Automation Conference"
June 23-26, 1985 Las Vegas, Nevada

An annual conference devoted to all aspects of the use of computers as aid in the design process from conceptual design through to manufacture. The conference emphasis is traditionally concerned primarily with integrated circuit and printed circuit board design but includes also mechanical CAD, solid modelling and robotics.

Contact: Hillel Ofek
Silvar - Lisco
1080 Marsh Road,
Menlo Park, California, U.S.A. 94025
Telephone (415) 324-0700

- "Computer Graphics 85 West"
June 25-27, 1985 Los Angeles, California

Contact: National Computer Graphics Association
8401 Arlington Blvd
Fairfax, Virginia, U.S.A. 22031
Telephone (703) 698-9600

- "World Computer Graphics 85"
July 10-12, 1985 New York, N.Y., U.S.A.

Contact: World Computer Graphics Association
2033 M St. N.W., Suite 399
Washington, D.C., U.S.A. 20036
Telephone (202) 775-9556

- "ACM SIGGRAPH"
July 22-26, 1985 San Francisco

The twelfth Annual Conference on Computer Graphics and Interactive Techniques sponsored by the Special Interest Group on Computer Graphics (SIGGRAPH) of the Association for Computing Machinery, will be held as above. This major event in some years has attracted up to 17,000 members of the computer, graphics and artist community as attendees.

Contact: Bob Heilman
Ramtek, Inc.
2211 Lawson Lane
Santa Clara, California, U.S.A. 95050

- "ASME 85, International Computers in Engineering Conference and Exhibition"
August 4-8, 1985 Boston, Massachusetts

An annual conference and exhibition sponsored by the American Society of Mechanical Engineers.

Contact: Steve Rhode
Power Systems Research Dept.
General Motors Research Laboratories
Warren, Michigan, U.S.A. 48090-9055
Telephone (313) 575-3004

- "COMPINT '85 - Computer Aided Technologies"
September 9-12, 1985 Palais des Congrès, Montréal, Québec

Sponsored by the IEEE, (Montreal Section), IEEE Computer Society and the Association for Computing Machinery, the call for papers has indicated that the conference includes the following areas of interest:

- Robotics
- Computer Aided Manufacturing
- Computer Aided Design
- Computer Aided Industrial Operations
- Advanced Software for Industrial Systems
- Man Machine Interfaces
- Computer Assisted Education
- Computer Communications
- Computer Graphics
- Computer Aided Decision Making

Contact: Stephen G. Leahey
COMPINT '85
P.O. Box 577
Desjardins Postal Station
Montreal, Quebec, Canada
H5B 1B7
Telephone (514) 870-2969

- "'85 International Conference on Advanced Robotics", ('85 ICAR)
September 9-10, 1985 Tokyo, Japan

First announcement and call for papers has been issued and closed December 31, 1984 for the above conference to be followed by the '85 International Industrial Robot Exhibition

in Tokyo, September 12-16, 1985. Suggested topics for papers include:

1. Overviews on Advanced Robotics
2. Robots for the Unstructured Environment
3. Intelligent Manipulation and Locomotion
4. Sensory Systems
5. Mechanics of Manipulator (arms, wrists, hands etc.)
6. Mechanics of Locomotive Robots

For enquiries related to the symposium, contact:

Mr. A. Yasutake
Organizing Secretary, '85 ICAR
Japan Industrial Robot Association
Kikai Shinko Kaikan Bldg
3-5-8, Shiba-Koen, Minato-ku
Tokyo, 105 Japan

- "15th International Symposium in Industrial Robots" (15th ISIR)
September 11-13, 1985 Tokyo, Japan

First announcement and call for papers have been issued and closed December 31, 1984. Approximately 100 outstanding presentations of papers on research, development, application and socio-economic evaluation of industrial robots are expected. An exhibition of industrial robots will be held concurrently with the conference as mentioned above. A study tour of robot manufacturers, users, and research laboratories in Japan is planned following the conference.

Suggested topics for papers included:

1. Robotics Overviews
2. Human and Social Aspects
3. Economics
4. Technology (grippers, sensors, languages etc.)
5. Application
6. Implementation (reliability, installation, maintenance)

For enquiries related to the symposium contact:

Mr. Y. Komori
Organizing Secretary, 15th ISIR
Japan Industrial Robot Association
Kikai Shinko Kaikan Bldg
3-5-8, Shiba-Koen, Minato-ku
Tokyo, 105 Japan

- "ICCD 85, International Conference on Computer Design"
October 7-10, 1985 Port Chester, New York

An interdisciplinary conference embracing VLSI Technology, Circuit and Computer Design, Computer-Aided-Design, and Computer Architecture.

Contact: ICCD 85
P.O. Box 639
Silver Spring, MD., U.S.A. 20901
Telephone (301) 589-8142
Telex: 7108 250 437 IEEE COMPSO

- "CAM-I Annual Meeting and Technical Conference"
October 15-18, 1985 San Diego, California

The annual technical conference of Computer Aided Manufacturing-International, Inc., is open to non-members as well as members and normally contains many state-of-the-art papers from invited speakers as well as reports on CAM-I activities.

Contact: CAM-I, Computer Aided Manufacturing-International, Inc.
Suite 1107, 611 Ryan Plaza Drive
Arlington, Texas, U.S.A. 76011
Telephone (817) 860-1654

- "AUTOFACT '85"
November 4-7, 1985 Detroit, Michigan

The AUTOFACT Conference and Exposition sponsored annually by the Computer and Automated Systems Association of the Society of Manufacturing Engineers (CASA/SME) is a major event drawing large numbers of attendees and exhibitors, exceeding 22,000 in some years.

Contact: Society of Manufacturing Engineers
One SME Drive, P.O. Box 930
Dearborn, Michigan, U.S.A. 48121
Telephone (313) 271-1500

- "Sensors '85 - Sensors for Untended Manufacturing"
November 4-7, 1985 The Westin Hotel, Detroit, Michigan

This conference and exhibition will be held concurrently with AUTOFACT '85 as above as a conference devoted solely to sensors technology addressing both user application interests and research topics. Call for papers invites abstracts in English of 100 words or less prior to March 8, 1985 on topics such as robotic sensors (vision, tactile, force etc.), machine

tool sensors (adaptive control, tool monitoring, machine diagnostics) and dimensional inspection.

Contact: Carol Piercey/Paul Borawski
Technical Activities Dept.
Society of Manufacturing Engineers
One SME Drive, P.O. Box 930
Dearborn, Michigan, U.S.A. 48121
Telephone (313) 271-1500, ext. 371

- "CAD/CAM and Robotics Conference"
Fall 1985 Montreal, Quebec

Following the successful conference and exhibition held at the Palais des Congrès, Montreal, November 27-29, 1984 the CAD/CAM Association plans to hold a similar event at approximately the same time each year.

Contact: CAD/CAM Association CAO/FAO
P.O. Box 992, Succ. Desjardins
Montreal, Quebec H5B 1C1
Telephone (514) 879-9037

2. Other Conferences and Courses

- "6th Annual DCLASS Conference"
March 4-5, 1985 Brigham Young University, Provo, Utah

The 6th Annual Conference for non-users of DCLASS, a Group Technology system for process planning developed at Brigham Young University will be held in March 1985. Registration fee \$175 (U.S.) prior to Feb. 18, and \$195 (U.S.) thereafter, space permitting. Approximately twenty speakers are planned for the two day event. Approximately 170 DCLASS systems, licensed by Brigham Young University, are installed at various sites in the U.S.A.

Contact: Dell K. Allen, Director
CAM Software Laboratory
Conference Centre
Brigham Young University
Provo, Utah, U.S.A. 84602

- Short Courses on CAD/CAM for Industry

The CAD/CAM Centre at the University of Victoria has scheduled four different intensive courses on CAD/CAM for industry, each of five days duration:

- Fundamentals of CAD/CAM for Engineers G.W. Vickers and S. Bedi, March 4-8, 1985
- A workshop on Computer-Aided Programming of Numerically Controlled Machine Tools D. Dark: Perry-Dark, March 11-15, 1985

- Introduction to the Design, Operation and Application of Industrial Robots W.F. Higgs, B.H. Iyer and W. Ramsbottom, Robotic Systems International, April 15-19, 1985
- Computer-Aided Manufacture: Concepts and Algorithms J.P. Duncan, May 6-10, 1985

Contact: Tom Lietaer
University Extension Conference Office
University of Victoria
P.O. Box 1700
Victoria, B.C. V8W 2Y2
Telephone (604) 721-8475
Telex: 049-7222

- "How to Implement and Apply Group Technology"
March 12-14, 1985 Amfac Hotel, Dallas, Texas

A short course sponsored by the CASA/SME division on the role, benefits and use of Group Technology. Fee \$425 (U.S.) SME and affiliates, \$495 (U.S.) for non-members.

Contact: Maria Kisell
Special Programs Division, CASA/SME
One SME Drive, P.O. Box 930
Dearborn, Michigan, U.S.A. 48121
Telephone (313) 271-1500

- "Computer Aided Manufacture"
April 11-12, 1985 Queen's University, Kingston, Ontario

A mini-conference sponsored by CSME, EIC, CSIE, NRC and Queen's University.

Contact: Dr. W. Montasser, P.Eng.
Chairman, Conference Organizing Committee
c/o Alcan International Limited
Kingston Laboratories
P.O. Box 8400
Kingston, Ontario K7L 4Z4
Telephone (613) 549-4500

- "Information Control Problems in Manufacturing Technology"
April 22-25, 1986 Yerevan, U.S.S.R.

First announcement and call for papers has been issued for the Fifth IFAC/IFIP/IMACS/IFORS Symposium on Information Control Problems in Manufacturing Systems. Five copies of abstracts of 300-400 words in English or Russian should be submitted prior to April 1, 1985.

Contact: Organizing Committee
Fifth Symposium ICPMT
National Committee of the USSR on Automatic Control
65, Profsoyuznaya Str.
Moscow, 117342, U.S.S.R.

3. This newsletter may be reproduced in whole or in part. Reprinting in other Canadian publications is encouraged. Acknowledgement to the CAD/CAM Technology Advancement Council would be appreciated.

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CAD/CAM Technology Advancement Council,
Office of Industrial Innovation, 5th Floor Centre,
Department of Regional Industrial Expansion,
235 Queen Street,
Ottawa, Ontario K1A 0H5

** Newsletter Editor,
J. Scrimgeour,
Bldg. M-16,
National Research Council of Canada,
Ottawa, Ontario K1A 0R6

Please note that requests for additions, deletions or changes to the newsletter distribution list should normally be directed to the secretariat.

RECALL

CAD/CAM Reprint Available

A reprint of introductory and information 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 three 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 introductions 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.

Readers who wish to obtain this publication for tutorial, instructional or reference purposes should complete and return the following form.

Please send me "Selected Articles on Advanced Manufacturing Technologies - Reprint #3.

NAME: _____

ADDRESS: _____

MAILING LABEL NO: _____