



CAD/CAM

NEWSLETTER



May 1985

Information Compiled by the CAD/CAM Technology Advancement Council*

Summary of this Issue

The CAD/CAM Newsletters from January to April 1985 have largely been special reference issues with information on CAD/CAM Centres, Technical Societies and Annual Conferences (January), Journals, Newsletters, Directories and Product Guides (February), Books (March), Films and Video Tapes (April).

This issue returns to the more regular content but focussing to some extent (in order to try and catch up) on recent events and CAD/CAM articles of recent interest. There is an intentional emphasis of information related to the rapidly developing Manufacturing Automation Protocol (MAP), a data communication standard for manufacturing automation.

Sections in this May 1985 Newsletter include:

1. CAD/CAM News Items
2. CAD/CAM Information Available
3. CAD/CAM Courses and Education
4. CAD/CAM Articles of Recent Interest
5. CAD/CAM Conferences, Workshops, Seminars
6. CAD/CAM Abstracts (attached)
7. Recent CAD/CAM Quotes

An interesting comment concerning the CAD/CAM abstracts section may be in order. In recent months, the twenty abstracts selected and printed by permission from INSPEC have been selected from well over two hundred candidate entries, of which close to one hundred are of excellent quality and relevant to the impact of CAD/CAM in Canada. In March 1985 alone, there were 238 candidate abstracts. This means that CAD/CAM projects and developments of significance are being completed and reported at a rate of more than ten per working day. The tempo rises!

1. CAD/CAM News Items

- Canadian Interest Group Formed for MAP

Initial steps were taken towards establishing a Canadian interest group in the Manufacturing Automation Protocol (MAP) when approximately thirty people attended a meeting April 23, cosponsored by the Ontario Centre for

Advanced Manufacturing (OCAM), and the Canadian Standards Association (CSA). Formation of the Canadian interest group would facilitate Canadian involvement in the U.S.A. based activities on MAP, and communication on the importance of this to firms and organizations in Canada.

Attendees at the meeting heard an excellent technical overview of the evolving MAP standard by Dr. D. Morgan, Director of the Communications and Network Laboratory at the Ann Arbor Industrial Technology Institute which is very strongly involved. Many vendors, such as Allen-Bradley, Digital Equipment Corporation, Gould, IBM and others, are working intensely towards participation in the MAP demonstrations scheduled to be held in the General Motors booth at the AUTOFACT Conference and Exhibition, November 4-7, 1985 in Detroit.

According to reports from the Society of Manufacturing Engineers (SME), who are now providing the administrative secretariat for the one year old MAP users group, a recent count places membership at 900 individuals representing 300 companies.

For further information on MAP, please refer to sections two and four of this Newsletter, plus past and future issues.

- Robot Population in Canada

4 According to figures compiled from a telephone survey by the Ontario Ministry of Industry and Trade in the third quarter of 1984 and reported in the February issue of "CAD/CAM & Robotics" February 1985, the number of industrial robots installed in Canada is estimated at 870 and could be as high as 900 to 1,000, up substantially from an estimate of 702 at the end of 1983. Market leaders, according to the survey data, are Unimate, Seiko, Cincinnati Milacron, ASEA, Prab and others with 69 percent of all robots reported as being in the automotive and automotive parts industry sectors. The Robotics Industries Association (RIA) reports industry sales in 1984 of \$50 million, representing a 50% growth rate and bringing the total number of U.S.A. installations to 13,000.

2. "CAD/CAM Information Available"

- "GATEWAY - The MAP Reporter"

Volume 1, number 1 of this publication, designed to keep interested persons up-to-date on the Manufacturing Automation Protocol (MAP), is dated January - February, 1985. This first issue, of twelve pages, advises that MAP version 2.0 documentation has been released in February, and version 2.1 documentation is scheduled for release in April. A tutorial article explains the purpose of MAP and explains the function and purpose for each layer in the seven layer Open System Interconnection (OSI) Reference Model established by the International Standards Organization (ISO). A section is included to describe currently available commercial products which fall within the MAP system plus a

brief description of the MAP Conformance Testing Center being established at a cost of over \$2 million by the Industrial Technology Institute (ITI). A supplement provides information on twenty-seven MAP related and standards committee meetings in the April - November 1985 time frame.

Subscription rates for six bimonthly GATEWAY newsletter issues, twelve monthly GATEWAY calendars and GATEWAY special issues are \$245 (U.S.) per year.

Contact: GATEWAY
Industrial Technology Institute
P.O. Box 1485
Ann Arbor, Michigan 48106, U.S.A.
Telephone: (313) 763-9273

- "The Application of New Technologies to the Clothing Industry" +

A report on research and development in five European countries prepared and issued by the federal Department of Regional Industrial Expansion. The report opens by asking if new technologies, such as CAD/CAM, robotics and micro-electronics have the potential to radically transform traditional labour intensive industries, such as clothing, into highly automated, capital intensive industries in which developed countries could be competitive with low-wage countries. Judging from the ambitious programs launched by many developed countries within the last three years, and which are described in the report, it would appear that the answer to this question is a resounding "yes".

For example the France Chemise project aims to reduce the manufacturing time for shirt manufacture to seven or eight minutes, compared to the current best achievable time in France of fourteen minutes. The British Clothing Centre (BCC) in Leeds, like others, is performing research on the automated or robot handling of limp fabrics, and has the long term objective of developing a flexible manufacturing system for clothing production.

Copies of the 22 page report, in French/English tumbled binding are available on request.

Contact: R.R. Hanna
Office of Industrial Adjustment (JOIA)
Dept. of Regional Industrial Expansion
235 Queen Street,
Ottawa, Ontario.
K1A 0H5
Telephone: (613) 996-0087

"The CAD Educator"

Published six times per year with a professional format and appearance. Contains articles on CAD training, curriculum development and new equipment of particular interest to those involved in CAD education and training. A sample copy was distributed to members of the "Ontario CAD/CAM Educators" with Newsletter #9, April 1985. Subscription rates for "The CAD Educator" are \$21 (U.S.) or \$27 (Cdn).

Contact: The CAD Educator
P.O. Box 47150
Phoenix, Arizona 85068, U.S.A.

- "Robotics, CAD/CAM Market Place 1985"

A reference publication containing over 6,000 listings on materials, products, organizations, on-line data bases, educational institutions, research laboratories, publishers, manufacturers etc. Listings include over 1,300 books, 500 Canadian and U.S. serials, 300 proceedings and conferences, 180 associations, 400 educational institutions, 700 research institutes and 250 consultants and consulting firms.

Contact: R.R. Bowker Co.
P.O. Box 1807
Ann Arbor, Michigan 48106, U.S.A.
Telephone: (800) 521-8110

- "CAD/CAM Handbook" E. Teicholz, Editor in chief.

McGraw Hill have prepared a CAD/CAM Handbook to which twenty specialists have contributed authoritative sections in the 432 page volume covering both the technical and managerial aspects of CAD/CAM technology. Price \$69.95.

Contact: McGraw-Hill Ryerson Ltd.
330 Progress Avenue
Scarborough, Ontario.
M1P 2Z5
Telephone: (416) 293-1911

- "Review of Low Cost CAD/CAM Systems"

A report is available which reviews and compares 40 turnkey systems and software packages, all micro-based, and reported to sell for less than \$60,000. Report includes drafting systems, 3-D modelers, solid modelers etc. 160 pp., \$95 (U.S.), postpaid in the U.S.A.

Contact: CAE Consultants
41 Travers Ave.
Yonkers, N.Y. 10705, U.S.A.
Telephone: (800) 235-6646 ext.: 532

- "Integrated CAD/CAE/CAM Workstation Trends"

A 220 page report containing extensive market statistics for traditional turnkey CAD/CAM systems and workstations. The report contains comprehensive evaluations of workstation hardware and software, and predicts that the workstation architecture approach will be the dominant approach for CAD and CAE by the 1987-88 time frame.

Apollo is reported to be the workstation market leader with 10,000 nodes installed and 48 percent market share, followed by Sun Microsystems with an estimated 4,000 installed nodes.

Contact: Enterprise Information Systems, Inc.
P.O. Box 1154
Greenwich, Connecticut 06836, U.S.A.
Telephone: (203) 629-3512

- "Production and Use of Industrial Robots"

A United Nations New York 1985 report prepared by the Economic Commission for Europe. 131 pp. + annexes. The report contains numerous tables and figures accompanied with discussion, definitions and description to present a composite picture of the industrial robotics scene. Robot populations are tabulated from available sources by country, application, type, function (parts handling, tool handling or assembly), by industry sector, date, as a ratio to the number of metalworking industry employees and other factors. While most data is for European countries, data for the U.S.A. and Japan are included in many instances. A section on the development and use of industrial robots in the USSR plus a description of a plan for multilateral mutual collaboration for technological cooperation and production by countries in eastern Europe is included. Publication ECE/ENG. AUT/15, U.N. Publication Sales No. E 84.II.E.33.

- Impacts of Robotic and Flexible Manufacturing Technologies on Manufacturing Costs and Employment - S.M. Miller.

A Carnegie-Mellon University Robotics Institute Technical report summarizing the work of a Ph.D. thesis of May 1983. Based on an industrial survey concerning the extent to which robotic manipulators may be retrofitted into existing production facilities estimates are made for the percentage of production worker jobs that may be lost, for the change in unit production costs and for the possibility that apparent direct decreases in production labour requirements might be offset by a demand increase stimulated by price reductions. The percentage of production workers in specified occupations that might be replaced by level 1

(non-sensory) robots is the order of 10% and for level 11 (sensor-based) robots is 30%. However, industry projections for the number of robots likely to be installed in the U.S.A. by 1990 appear much lower, with a total generally in the range of 100,000 and primarily concentrated in large firms. A further analysis is included to structure and estimate the possible effects of additional factors such as worker attrition, impact of demand/price flexibility, productivity improvement leading to greater output, custom and low volume batch manufacture in the metalworking industries, possible plant closings and production concentration and other factors. A flexible manufacturing scenario is recommended for further study, rather than robotics per se. Report No. CMU-R1-TR-84-23.

Contact: The Robotics Institute
Carnegie-Mellon University
Pittsburgh, Pennsylvania 15213, U.S.A.

- "IEEE Standards Available"

In view of the accelerating interest in the Manufacturing Automation Protocol (MAP) and the associated IEEE standards such as IEEE 802.3, IEEE 802.4 and IEEE 802.5 readers may wish to note that IEEE and IEEE/ANSI standards are available from the Canadian Region Office which is stocking a complete range of standards. This means they can be obtained from the Toronto office without the added delays of customs clearance, payment in U.S. dollars etc. Delivery by courier and payment by credit card can be arranged. Normal purchase prices are 1.33 times the U.S. price plus \$2.00 (Cdn) for handling. Publications of interest would include:

- ANSI/IEEE 802.2 - 1985. Logical Link Control. Draft International Standard. Price \$19.95 (U.S.).

- ANSI/IEEE 802.3 - 1985. Carrier Sense Multiple Access with Collision Detection (CSMA/CD). Draft International Standard. Price \$21.95 (U.S.).

- ANSI/IEEE 802.4 - 1985. Token-Passing Bus Access Method and Physical Layer Specifications. Draft International Standard. Price \$25.95 (U.S.).

- ANSI/IEEE 802.5 - 1985. Token Ring Access Method and Physical Layer Specifications. ISO Draft Proposal. Price \$19.95 (U.S.).

Contact: IEEE
Canadian Region 7 Office
7061 Yonge St.
Thornhill, Ontario
L3T 2A6
Telephone: (416) 881-1930

3. CAD/CAM Courses and Education

- Vanier College CAD/CAM Institute

The Vanier College CAD/CAM Institute located in downtown Montreal, in addition to meeting the needs of regular daytime and evening students attending college level courses using CAD, is providing a number of courses on a regular basis for business and industry. Facilities at the Institute include ten black and white workstations based on the Apollo DN 300 and ten colour workstations using the DN 550 Apollo computer. All twenty are linked to form a local area network. Electrostatic and colour plotters are also available. The courses for business and industry include:

- A thirty-five hour (non credit) course on General, AEC and Mechanical Applications available to attendees as an intensive one-week course, or one day per week for five weeks.
- Computer Aided Drafting - a fifteen week college credit course (available at three levels) spread over fifteen weeks.
- Management Seminars - Two day seminars for managers and engineers in industry on CAD/CAM productivity improvements, realistic expectations, pitfalls to avoid, real and hidden costs etc.

Contact: Christopher Ericksson
Coordinator, Business & Industry
CAD/CAM Institute
Vanier College
425 de Maisonneuve Blvd., West
Montreal, P.Q.
H3A 3G5

- Durham College Provides CAD/CAM Training for Engineers

Durham College has been involved in training unemployed engineers in Computer Aided Design over a three-year period. Approximately 300 have been trained to date in CAD/CAM techniques.

The program is sponsored by the Canada Employment and Immigration Commission with funds provided by the Federal Government.

Duration of the program is for eight weeks based on 30 hours per week of instruction. It relies heavily on hands-on training which constitutes two-thirds of the course. The concentration of training is during the evening hours.

Students work in pairs at each workstation, and are encouraged to use their background of engineering knowledge in developing design applications.

Durham College has two Computervision CAD/CAM systems with a total of 13 workstations using the most advanced software packages available. The systems are capable of advanced surfacing design and solid modelling using a 32-bit Analytical Processing Unit.

The program features five weeks of introductory CAD/CAM instruction and the remaining three weeks are devoted to a project related to the engineering discipline of each student. Although this is not a comprehensive program covering all aspects of CAD/CAM, students receive more than adequate coverage of CAD/CAM techniques to provide entry into this new and expanding job market. Topics covered for the first five weeks include 3-D Modelling, Detailing, Macro Language Programming, Basic System Procedures, and Data Extract for Bill of Materials. For the remainder of the eight-week course the training is specialized for the respective areas of Numerical Control, Mechanical, Piping, Electronics and Structural Steel.

Persons interested in this program should contact their local Canada Employment and Immigration Office or obtain further information as follows.

Contact: Technology Division
Durham College of Applied Arts and Technology
P.O. Box 385
Oshawa, Ontario
L1H 7L7
Telephone: (416) 576-0210 ext.: 264

- CAD/CAM Educators Conference and other Coordination Meetings

As explained in their recent newsletters, the Ontario CAD/CAM Educators will be holding their 1985 CAD/CAM Educators Conference under the auspices of the 4th Canadian CAD/CAM and Robotics Conference, June 18-20, in Toronto. A special meeting room has been allocated during the day for Monday, June 17 preceding the conference and on Thursday afternoon, June 20 as part of the conference program.

In addition, the annual university CAD/CAM coordination meeting and conference was organized recently by Prof. Sankar of Concordia University, and held at École Polytechnique, May 1985.

The CAD/CAM Technology Advancement Council is planning a coordination meeting for CAD/CAM centres whose services are primarily directed directly to industry. This meeting, to be held in Montreal, June 11-12, will be the fourth meeting in recent years for this series. Previous coordination meetings for this group have been held in Winnipeg, Vancouver and Fredericton.

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- (1) Programmable controller applications:
 - (a) Process control,
 - (b) Instrumentation, data acquisition,
 - (c) Machine tool control,
 - (d) Robot control,
 - (e) Material handling,
 - (f) Power systems.
- (2) Language, programming and documentation.
- (3) Network, data communications.
- (4) System design, installation and commissioning.
- (5) Man/machine integration; interface, maintenance and training.
- (6) Diagnostics and problem correction.

One page abstracts should be sent by those interested to the following person.

Contact: Dr. Gordon Chen
1985 Conference Chairman
Niagara College
Welland, Ontario
L3B 5S2
Telephone: (416) 735-2211

6. CAD/CAM Abstracts

(See section attached.)

7. Recent CAD/CAM Quotes

- "By the year 2000 - fewer than 15 years off - most of the major manufacturers of goods - still manufacturing goods - will have replaced all their machinery. All of it. That's the rate of change we are going through."

Manufacturing Engineering - January 1985 in a summary of remarks by Alex Maier, Vice President, Technical Staff Group, General Motors, U.S.A.

- "The real issue we face in the electrical industry is not WHETHER we should automate, but HOW. --- Ironically none of these are technology issues. They are management issues. The biggest obstacle to automation is not organized labor - but unorganized management."

Comline March-April 1985 in a summary of remarks by Chester A. Sadlow, Executive Vice President of Advanced Production Technology, Westinghouse Electric Corporation, U.S.A.

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