



IEEE NEWSLETTER KITCHENER - WATERLOO SECTION



April 1991

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Computers: Wayne Loucks, (519)885-1211 ext 3337
Antennas and Prop., Microwave Theory and Tech.: Len Chow, (519)885-1211 ext 2822
Circuits and Systems, Electron Devices: C.R.Selvakumar, (519)885-1211 ext 3978

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Membership and Transfers: Keith Campbell, (519)884-1710 ext 281
Publications (News Letter): Tom East, (519)746-7809
Awards: Rosalind Hood-Morris, (519)742-1751
Nominations: Bob MacPhie, (519)885-1211 ext 2842

Student Activities Chairs

Conestoga College: Peter Forshaw, (519)748-5220 ext 287
Univ. of Waterloo: Li Deng (519)885-1211 ext 6041
Stream A: George Freeman, (519)885-1211 ext 2876
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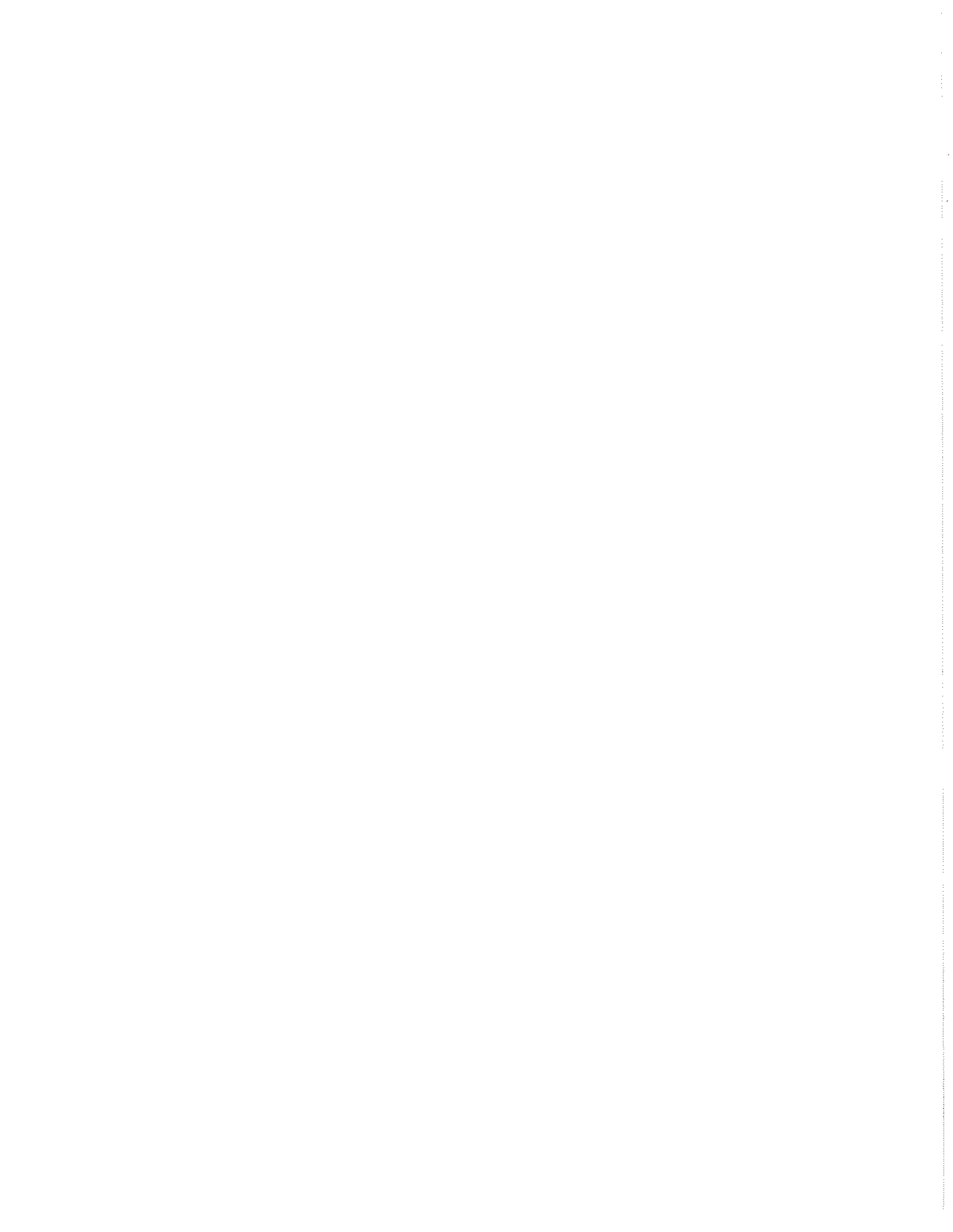
Meetings

May 14: Videoconference: Bell on Supercomputer Design
May 29: Annual General Meeting
June 5: Videoconference: Fiber Optic Applications
June 7-9: Workshop on Charge Coupled Devices
June 19: J.R. Wait on EM Geophysical Exploration
June 20: J.R. Wait on Teaching EM to Undergrads
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The Kitchener-Waterloo Section of the Institute of Electrical and Electronics Engineers serves all members whose mailing address is in Bruce, Grey, Perth, Waterloo or Wellington Counties.



Spring Computer Chapter Meeting

Subject: Videoconference: the 11 rules of supercomputer design
 Speaker: C. Gordon Bell
 Time: Tuesday, May 14 1991, 7.30 pm
 Place: University of Waterloo
 Davis Centre DC 1304

This is the second in a series of meetings based on videotapes of "Distinguished Lecture Series II" purchased by the KW Section. The lecture raises many questions that should be considered during the design of a processor. Dr. Bell describes the goals, process and outcome of the design of Ardent's Titan - a vector multiprocessor architecture, combining high performance computation and graphics for a single user to create a distributed computing environment.

Such machines make it possible to instantly view simulations such as combining molecules, or evaluating how a new airplane wing will interact with the atmosphere.

Kitchener-Waterloo Section IEEE Annual General Meeting Demonstration of BEAM robotics

Time Wednesday, May 29 1991 7.30 p.m.
 Place University of Waterloo,
 Davis Centre room 1302

Spouses are invited to attend the short business meeting and the demonstration afterwards.

1. ANNUAL GENERAL MEETING - K-W-SECTION, IEEE.

The Nominating Committee (chairman Bob MacPhie) has proposed a slate of names to serve on the K-W Section's Executive Committee from July 1, 1991 to June 30, 1992.

The names of the individuals are listed below. Members may nominate other members as alternative candidates under the following conditions: For each nominee

- a) obtain agreement to stand in writing,
- b) obtain supporting signatures of two percent of the voting members.
- c) submit these documents to the Secretary, Bert Knox, 607-265 Westcourt Place by May 24th 1991.

If alternate nominations are received, elections will be held at the Annual General Meeting.

2. DEMONSTRATION OF BEAM ROBOTS BY MARK TILDEN

BEAM (Biology, Electronics, Art and Mechanics) is a new generation of behaviour based robots. They contain a collective series of survivalist behaviours to cope with the real world without using an internal real

world model. Mark has built many such robots including a floor-cleaner, a window-washer, an aggressive ashtray and a solar powered robot ant. He will bring some of these robotic devices and will demonstrate their performance. He will also show videos of other robots.

SLATE PROPOSED BY THE NOMINATING COMMITTEE FOR 1991-1992:

Section Officers:

Chair:	Deborah Stacey
Vice Chair:	Chandra Kudsia
Secretary:	Rosalind Hood-Morris
Treasurer:	John Mowbray

Chapter Chairs:

Acoustics, Speech and Signal Processing:	George Freeman
Computers:	Wayne Loucks
Antennas and Propagation, Microwave Theory and Techniques:	Len Chow
Circuits and Systems, Electron Devices:	C.R. Selvakumar

Committee Chairs:

Education:	Ed Spike
Program Chair:	Ted Swart
Publicity:	unassigned
Membership and Transfers:	Keith Campbell
Publications (Newsletter):	Tom East
Awards:	Rosalind Hood-Morris
Nominations:	Herb Ratz

Student Activities Chairs:

Conestoga College:	Tim Williams
University of Waterloo:	
Stream A:	Li Deng
Stream B:	George Freeman

If you wish you may meet Mark Tilden and members of the outgoing executive over dinner at Mario's, University Plaza II (just east of U of W). Please phone Bert Knox ahead for reservations at 886-6374.

Videoconference: Fiber Optics

Date: Wednesday June 5th
 Time: 6.30-9.30 p.m.
 Place: University of Waterloo,
 Davis Centre 1302
 Chair: Dr. Huang



Topics and
Speakers:

Introduction Technologies for
Fiber optic applications
Tetsuhiko Ikegami,
Nippon Telegraph and Telephone Corp

Fiber to the home and factory
Peter Kaiser
Bell Communications Research

Building blocks for the information age
Michael K. Barnoski
PCO Inc.

To order a set of accompanying notes (approx \$6.00)
phone Ed Spike on or before June 4th at 885-1211 X
3716.

**June 7-9: IEEE Charge-Coupled Devices
Workshop (1991)**

Sponsored by K-W Section IEEE, Department of
Electrical and Computer Engineering, University of
Waterloo and NSERC.

Place: Valhalla Inn
Kitchener, Ontario
Registration: Prof. S.G. Chamberlain
University of Waterloo
FAX: [519] 746-3077

The purpose of this workshop is the dissemination of
fundamental research material which is already pub-
lished or to be published but non-proprietary, includ-
ing models and design techniques applied to the
advancement of the theory and design of CCD Image
Sensors and GaAs devices.

**June 19: J.R. Wait on EM Geophysical
Exploration**

Presented by K-W Section IEEE

Time: 7.30 pm
Place: University of Waterloo,
Davis Centre 1302
Speaker: James R. Wait (see below)
Subject: Theory and applications of transients
in EM methods of geophysical
exploration.

This presentation will review the speaker's early
efforts to understand the physics and chemistry of
time-dependent fields in geological media. Related
topics: Induced polarization, complex resistivity, EM
cable coupling and well logging.

Join the speaker for dinner if you wish, at Reuben and
Wong's University Plaza II (just east of UW). Phone
Bob MacPhie for reservations at 885-1211 ext 2842.

**June 20: J.R. Wait on Teaching EM to Undergra-
duate Engineers**

presented by Antennas and Propagation, Microwave
Theory and Techniques Chapter, IEEE

Time: 7.30 pm
Place: University of Waterloo,
Davis Centre 1302
Speaker: James R. Wait (see below)
Subject: Tutorial on "the Quasi-static approach in
teaching EM to undergraduate electrical
engineers".

The idea presented in this lecture will be that much of
classical electrostatics can be bypassed in favor of cir-
cuit analogies. Related topics: Potential theory via
current flow in conducting media, transients.

Join the speaker for dinner if you wish at the Univer-
sity Club on the UW campus. Phone Bob MacPhie for
reservations at UW 885-1211 ext 2842.

The speaker: James R. Wait has received B.A.Sc.,
M.A.Sc., and Ph.D. degrees from the University of
Toronto. From 1955 to 1980, he was a member of the
scientific community in Boulder, Colorado. His posi-
tions included: Senior Scientist in NOAA, Professor
Adjoint in E.E. at the University of Colorado, Consul-
tant to the Institute for Telecommunications and Fel-
low of the Cooperative Institute for Research in
Environmental Sciences. In 1980 he became Professor
of Electrical Engineering and of Geosciences at the
University of Arizona in Tucson. Dr. Wait has
received numerous awards for his research in elec-
tromagnetics and electrical geophysics including the
Balth van der Pol Gold Medal presented by URSI in
Helsinki in 1978, IEEE Centennial Medal in 1984,
IEEE Geoscience and Remote Sensing Achievement
Award in 1985, and the IEEE Antennas and Propaga-
tion Distinguished Achievement Award in 1990. He
is a Fellow of the IEEE and is a member of the (U.S.)
National Academy of Engineering. In 1988, Dr. Wait
was appointed a Regents Professor in the University
of Arizona. In 1989, he retired from the University to
become a private consultant.

Videoconference: Computer Simulation

Date: Monday, June 24, 1991
Time: 3:00-6:00 p.m.
Place: University of Waterloo, Davis Centre
Room 1304
Chair: Dr. Wayne Loucks

Topics and Speakers:

Introduction
Simulation and Synthesis
Dr.Meng H. Lean,
Xerox Corp

Numerical Simulation and
Visualization of
Non-linear free surface
Dynamics
Dr.Philip L.-F. Liu
Cornell University

Putting Knowledge to Work
for Intelligent Simulation
Dr.Stephen C. -Y. Lu,
Univ. of Illinois

E-Mail

We would like to save trees and also to reduce the cost of distribution of meeting notices. Our newsletter schedule requires meetings to be scheduled up to 90 days ahead of the event. Some speakers will not commit to an engagement that far ahead. Besides, Society Chapters such as the Computer Chapter may find only a few weeks ahead about a visitor to the area who would give a presentation for the Chapter.

We are planning a test mailing. Please help out by participating: send your E-mail address and comments to: KWIEEE@EandCE.UWaterloo.CA

Edison Medal: Nominations invited

The IEEE Edison Medal was established by our predecessor society, the AIEE, in 1904. It is presented for "a career of meritorious achievements in electrical science of electrical engineering of the electrical arts". The award consists of a gold medal, small gold replica, certificate and \$10,000 US. IEEE members are strongly encouraged to submit candidates for consideration for this prestigious award and thereby support the Institute's program of recognition for outstanding technical achievement. Nominations must be received at IEEE headquarters no later than July 1st 1991. Nomination forms and information may be obtained by contacting: Maureen Quinn, IEEE Awards Boards Administrator, 345 E 47th St., New York, NY 10017. Tel (212) 705-7882; Fax (212)223-2911.

Short Technical Courses: Topics

Short courses of 10 to 24 hours duration have been well attended in the past. It is planned to organise new ones, and now is your opportunity to ask for ones

that you want.

Please fill in the form below and mail to:
Mr. Edward Spike,
E & CE Department,
University of Waterloo,
Waterloo, Ontario. N2L 3G1

or E-mail: SPIKE@watserv1.UWaterloo.CA

Topics	Duration	Suggested speakers
1.		
2.		
3.		
4.		

How to become a Senior Member

First check that you meet the requirements: You must be an engineer, scientist, educator, technical executive or originator in an IEEE designated field who has (a) at least ten years active professional practice, with five years of significant performance and (b) accomplishments in engineering, publications, management, education or professional contributions. If you do, then phone or leave a message with our Membership Chair, Keith Campbell (see below). He will send you a kit: you will find that besides sending in a resume, you have to find three Senior Members or Fellows who will act as referees on your behalf. (Better make it four in case one of them forgets to do the necessary). Contact Keith Campbell, NCR: Phone 884-1710 x 281. E-mail Keith.Campbell@WATNCR

Student Papers Night 1991

There was a good turn-out for the annual Student Papers Night on March 18th, at Golf's Steak House. Kitchener. After an excellent smorgasborg dinner, we all settled down for the contest.

Master of Ceremonies Ed Spike introduced the judges: George Freeman, Peter Forshaw, John Mowbray and Ted Swart.

The contest by Conestoga College students for the McKenzie Award was won by Doug Vandevine, Raidine Malone and Dave Netzke for their presentation on "Dual Frequency Diversity System". They described equipment which they had attached to two audio radio links to select automatically the link which had the better signal to noise ratio.

Second prize went to Greg Curry, Richard Rankin, Nick Balint and Dick Slattery for their paper on "Design of a 32 bit Microprocessor". Their task consisted of assembling integrating and programming major components generously donated by suppliers into a fast capable machine.

The George Dufault Award for teams from the University of Waterloo went to James Goel for a presentation on "Computer Simulation using VHDL". He used VLSI Hardware Design Logic for designing Application Specific Integrated Circuits, and achieved a 4 week turnaround instead of the usual 8-10 weeks from customer specification to production.

Second prize was awarded to Naraij Manjikian for his description of "A Command-Driven Operating System for the Waterloo Multibus-based Multiprocessor". This consisted of a number of processors computing in parallel while sharing a common memory.

The winning teams are sending written versions of their presentations to the Central Canada Council for the area wide contest.

Prizes ranged from \$75 to \$200. Financial support for the prizes and for the dinners were provided by Conestoga College, NCR Canada and Raytheon Canada.

Congratulations to all the contestants, and to Ed Spike and the judges for a very enjoyable event.

Spring training for the Central Canada Council

The Central Canada Council of the IEEE encompasses all sections in Ontario except Ottawa. They held a Spring training session on April 6th and 7th in Toronto. This section was represented by our Chair, Deborah Stacey. Ed Spike was also there as the Region 7 (IEEE Canada) Student Activities Council chair, and Tom East was there to receive the 1990 Central Canada Council Merit Award at the banquet.

Upcoming Conferences in Canada

May 9-10 1991 IEEE Pacific Rim Conference on Communications, Computers and Signal Processing: Victoria BC

May 14-17 ICASSP 91 - 1991 IEEE International Conference on Acoustics, Speech and Signal Processing: Toronto Ont

May 26-29 1991 21st International Symposium on Multiple-Valued Logic: Victoria BC

May 16-30 1991 18th International Symposium on Computer Architecture: Toronto Ont

May 29-30 IEEE WESCANEX 91: 1991 IEEE Conference on Computer, Power and Communication Systems in Rural Environment: Regina Sask

June 3-7 1991 IEEE Pulp and Paper Industry Conference: Montreal Que

June 17-20 1991 IEEE Digital Cross-connect Systems Workshop IV: Banff Alta

June 24-28 1991 North American Radio Science Meeting and International IEEE/AP-S Symposium: London Ont

June 25-27 1991 IEEE 21st International Symposium on Fault-Tolerant Computing: Montreal Que

Sept 9-11 1991 Petroleum and Chemical Industry Technical Conference: Toronto Ont

Canadian for President ? Why not !

All members will soon be asked to cast ballots for the post of President-elect of the entire IEEE. Whoever wins has an important job to do for three years and then automatically becomes President, which is even more important.

Of the five declared candidates, two are Canadian - Wally Read who is now treasurer of the IEEE and has run before, and Bob Alden who was recently Director of IEEE Canada. If you feel that it is time for a Canadian to win, don't be afraid of splitting the Canadian vote. IEEE elections use the system of approval voting (which I explained in previous newsletters). You can vote for both Wally and Bob, and both your votes will count. If all Canadian members think a Canadian should become President, and all vote for both, then Read would get 15000 Canadian votes and many others, and Alden would get 15000 Canadian votes and many others, and one of them might well win.

Let's send a Canadian to the top.

Total Quality according to Baldrige

The videoconference called "Total Quality: the Malcolm Baldrige Award approach to Quality Management" turned out to be about revolutionising the operation of entire companies. US companies are eligible to send in a description of their recent improvement in quality, and each year one receives the award, described as the "Nobel Prize" of quality, from the President of the United States.

Malcolm Baldrige was a popular US Secretary of Commerce who stressed the importance of Quality in

Manufacturing. (He was also a keen rodeo competitor and was killed in a rodeo accident). Ed Fuchs of AT&T Bell Labs outlined the rules, and Edward Finein of Xerox and Wm. Smith Jr. of Motorola described how their companies won. The thrust of Xerox was competitive benchmarking - targeting to do better than the competition in product performance and reliability, servicing and documentation. Motorola's target was "six sigma", which turns out to mean only 3.4 total defects per unit in one million opportunities. This applies not only to manufacturing tolerances, but to all activities: for example, only three errors in one million entries in accounting, and only three wrong items in one million line items in purchase orders.

The president of one company asked for an estimate of the net cost of this change in their operations. The answer was minus several hundred million dollars - a large net gain!

New journal on Superconductivity

IEEE has started the "IEEE transactions on applied superconductivity". The journal will publish technical papers on the science and technology of superconductors and their applications. Both electronics and power applications will be covered.

The annual subscription rate is only \$10 US if you are a member of any of the 10 sponsoring societies: Communications; Components, hybrids and manufacturing technology; Dielectrics and electrical insulation; Electron devices; Instrumentation and measurement; Magnetics; Microwave theory and techniques; Power electronics; Power engineering; and Ultrasonics, ferroelectrics and frequency control. Otherwise it is \$80 US.

Meetings - 1 by Tom East

There are many kinds of meetings, and the rules vary accordingly. If a meeting is run as a democratic process, then rules such as Roberts' Rules of Order apply. (A copy of these rules should be available in any good library). The AGM and executive meetings of this Section are run that way: motions are proposed and seconded, then discussed and put to the vote of those present: the majority wins. However, companies and many University Departments are not democracies (though I once worked in a University department which was run that way). Some of the kinds of meetings are:

Announcement: The management wants to give out information to everyone at the same time. This is an alternative to a memo: it has more impact, and can give the boss immediate feedback, but it costs more person-hours.

Briefing: The boss and others tell a person or team what they will have to do on a trip or a project; another chance for questions and to avoid misunderstandings. You'd better not forget important instructions received in front of witnesses!

De-briefing: The traveller tells everyone who needs to know, what happened and what was found out. People can ask questions while the answers are fresh in the traveller's memory, but there should be a trip report as well.

Periodic meetings: (Weekly, monthly etc) One of my former bosses used to send his secretary round to collect items for the agenda, and if there were not enough to make it worth while, he cancelled that month's meeting.

Presentation: (Also known as "show and tell", or "dog and pony show"). An art in itself.

Decision meeting: This is the main type of meeting featured in the John Kleese movie "Meetings, bloody meetings". The purpose is to give the boss enough input to make decisions. It also lets the people who are to be impacted by the decisions make their suggestions and objections, and feel that they are a part of the decision-making process. These people can even let the boss know that if he or she makes a certain decision, there will be unhappy employees (or ex-employees).

In the next article, I will suggest some rules for the chair, recorder and participants.

