

RockIEEE Overlook

Newsletter of

September, 1990



**The Institute of Electrical and Electronics Engineers
Denver Section**

Chairman's Message

by Jack Reesy

Summer is over, vacations have been taken, and of course, everyone is ready to go back to work for IEEE.

The joint PES/IAS Denver Section meeting held in the spring featured the "Walking Machine." The CSU student advisor and the students who took us through the development of the machine and gave a demonstration, have done a great job on the project, displaying innovation and engineering skills at their best.

Three years ago, the fiscal year of the Denver Section was changed to a calendar year. This summer a by-laws change was approved by the Executive Committee conforming the election of officers to the fiscal year. As a result, the Nominating Committee is submitting its slate of nominations in this issue of the Overlook. Nominations from the floor will be accepted at the October meeting, and the new officers elected at that time to take office in January.

The Denver Section sponsored the appointment of the transcontinental telegraph as an IEEE electrical engineering milestone, and our national organization designated it as such. On August 5, 1990, two plaques were dedicated and installed on the obelisk at Ft. Laramie National Historical Site in Wyoming. I had the privilege of acting as M.C. Speakers were **Steve Oxley**, Administrator, Public Service Commission of Wyoming; **Dr. Richard Gowen**, President, South Dakota School of Mines and Technology and Past President of IEEE (1984); **Robert Ammon**, President and CEO of Western Union; **Carleton Bayless**, President of IEEE; and, accepting the plaques, **Gary Candelaria**, Superintendent, Ft. Laramie National Historical Site. Also attending was **Robert Alden**, Vice President of Regional Activities, IEEE, from Ontario, Canada.

John Martin, Region 5 Director, was the individual who proposed and submitted the application for this milestone award. Committee members were **John Martin**, **Charles Wright**, and **Jack Reese** of IEEE, and **Bill Rosol**, Executive Director, Rocky Mountain Electrical League. Our thanks also go to **Phil Schaeffer**, President, Cheyenne Light, Fuel and Power; **Ken Beach**, Professor Emeritus, University of Wyoming; and **John Burns**, Chief, Visitor Service, Ft. Laramie, for their assistance on this project.

Next April, the Region 5 meeting and the Student Paper Contest will be held in Laramie. Help will be needed so call Sadrul Ula at the University of Wyoming, (307) 766-6268, or Don Cottrell at the University of Denver, (303) 871-3752.

Executive Meetings will be held at 7:00 p.m., Diamond Hill Bldg. D.

Executive Board: August 29, 1990, September 26, 1990

Executive Committee: September 12, 1990

The IEEE Denver Section expresses its sincere appreciation to John Tierney at Public Service Company of Colorado for his effort in working with the Denver Section membership database.

Society Chapter Meetings and Information

Joint AP/MTT/GRS

Antennas and Propagation, Microwave Theory and Techniques, Geoscience and Remote Sensing

Thursday, September 20, 1990

National Institute of Standards and Technology
325 Broadway, Boulder, Room 4020
4:00 - 5:00 p.m.

Speaker

Professor David Chang
University of Colorado, Electrical Engineering Dept.
Boulder, Colorado

"Electromagnetic Modeling of Passive Mimic Components and Antennas"

In the design of monolithically integrated microwave and mm-wave circuits, a major factor for causing multiple design iterations often is not because of the statistical variation in the fabrication process, nor limitations in the active device models, albeit they do exist, but more because of the unknown nature of mismatch and parasitic coupling among circuit elements. It is generally known that passive circuit models in commercial CAD software start to become less accurate when the operating frequency increased to beyond 10-15 GHz, and/or when circuit elements are placed in close proximity with each other.

In this talk, a newly developed algorithm call P(pseudo)-mesh for finding the full-wave solution of a microstrip structure of general shape, will be presented. The method is based on solving a mixed integral equation using piecewise linear basis functions for rectangular and triangular cells; however, the approximation is carried out in such a manner that it actually is equivalent to a pseudo wire mesh structure forming by these cells. The scattering matrix of a complex structure can then be extracted from the full-wave solution using "de-embedding arms" which are automatically attached to the microstrip structure as part of the solution process.

The P-mesh code has been used to find the S-matrix for structures such as double-stub and bandpass filters, interdigitated capacitors, microstrip serpentine lines with or without taps, closely-spaced power dividers. A new perturbative/iterative algorithm to reduce redundancies while still taking parasitics among circuit elements into account will be discussed briefly. Layout simulation for passive MMIC circuits at the chip level is currently being implemented.

Reservations are **not** required. Please call Katie MacReynolds at 497-3471 if you have any questions.

Reliability Society Front Range Software Quality Committee

Wednesday, September 19, 1990

Guaranty National Insurance
100 Inverness Terrace East
2:00 - 4:00 p.m.
(Directions by phone: 790-8200 x365)

Speaker

John Cornell
Martin Marietta Denver Aerospace
Author of "Structured Rapid Prototyping, an Evolutionary Approach to Software Development"

"Structured Rapid Prototyping"

Reservations are **not** required. Please call Rick Karcich, 673-6223 if you have any questions.

EMC

Electromagnetic Compatibility Rocky Mountain Chapter

Tuesday, October 9, 1990

National Institute of Standards and Technology
325 Broadway, Boulder, Room 1107
(Enter front of main bldg.)
7:00 p.m.

Speaker

Robert F. German
EMC Engineer
Henry Ott Consultants

"Effect of an Image Plane on Printed Circuit Board Radiation"

For more information call:
Mark Lapchak (303) 773-4626 or
Ev Evans (303) 761-9447

Joint PES/IAS Power Engineering/Industry Applications

Thursday, September 20, 1990
Brooklyn's Saloon and Restaurant
2644 W. Colfax, Denver
572-3999

6:00 p.m. Social
7:00 p.m. Dinner (optional @ \$10)
8:00 p.m. Meeting

Speaker

Ron Claussen
Senior Project Manager
United Engineers & Constructors Inc.
Stearns-Roger Division

"New Nuclear Technology"

The United States was once the world's leader in the development of nuclear power. During the 50's, our Naval Nuclear Power Program was the driving force behind the design, construction, and operation of the first generation of power reactors. This program set the stage for the rapid worldwide development of commercial power reactors which took place during the 60's and 70's.

While such development has continued elsewhere in the world, the excessive construction costs, schedule delays, licensing issues, and installation of excess capacity experienced in the U.S. by the mid-70's combined to retard our commercial reactor development program. In 1978, the accident at Three Mile Island directed the focus of growing public sentiment against nuclear technology in general, and towards the nuclear power industry in particular. The resulting cancellation of nearly all commercial nuclear power plant construction in the U.S. during the 80's has crippled our worldwide leadership and eroded domestic confidence in nuclear power as a viable source of power for the future. The 90's are now upon us with ever more serious issues regarding nuclear wastes coming to light. A glance at this history leads one to ask, "Is there a future for nuclear power in the United States?"

This talk will address the status of the nuclear power industry in the U.S. today, various efforts currently underway to restore viability to the industry, and the trends which seem to be developing that can affect the outcome.

Please contact Barbara at Peterson Company, 388-6322, by Monday, September 17, 1990.

IEEE PES/IAS 1990/1991 Tentative Meeting Schedule

October 18, 1990
"Evaluation of Shunt Capacitor Bank Switching Using EMTP"

November 15, 1990
"Adjustable Speed Drives and Harmonics"

December 20, 1990
No Meeting

January 17, 1991
"Advanced Electrical Technologies Designed into the New Denver International Airport"

February 21, 1991
"Sidney Back-To-Back DC Converter Station"

March 21, 1991
"Geomagnetic Induced Currents"

April 18, 1991
IEEE Denver Section All Chapters Meeting
Topic to be announced

May 16, 1991
Tour of New Public Service Co. of Colorado "Gas Insulated Substation" in Downtown Denver

IEEE PES/IAS 1990/1991 Tentative Seminar Schedule

Friday, February 8, 1991
8:00 a.m. - 12:00 noon
"Analysis of System Harmonics Due to Adjustable Speed Motor Drives"

Friday, April 5, 1991
8:00 a.m. - 12:00 noon
"Fundamentals of Relay Protection"

CS/ITS

Computer/Information Theory Society

Do you have an interest in the Computer/Information Theory Society activities? The society needs some good ideas and people to make them happen. There are many possible ways to participate. We could use recommendations for speakers and meeting optics. Would you be interested in arranging a meeting or other activity for the coming year, serving as a society officer, or participating on an officer nominating committee? If you have suggestions or can offer assistance, please call Rory Laiho at 924-7534.

Preliminary Announcement UTC Telecommunications Workshop

Mariott Hotel, Fort Collins, Colorado
Mid October, 1991
"Fiber Optics and LANS"

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is open to the
public.
For additional
information
contact:
Mike Schmitz
(303) 229-
5269.

1991 Slate of Officers

The following officers have been proposed by the
nominating committee for the IEEE Denver Section for
1991.

Chairman	Gary Petersen
Sr. Vice Chairman	H. Paul Meisel
Vice Chairman, Members Services	Don Cottrell
Vice Chairman, Student Activities	Doyle Ellerbruch
Secretary	John Barnick
Treasurer	Lew Beck, Jr.

Elections will take place at the next IEEE Denver
Seciton meeting scheduled for October 10th.

IEEE 1991 International EMC Symposium August 13-15, 1991

Call for Papers

The IEEE EMC Society seeks original, unpublished papers and proposals on potential sessions, workshops, and tutorials on all aspects of EMC.

Suggested Technical Areas

Featuring Practical Applications and Benefits to Environment and Technology	(1) EM Environment	(10) System EMC	(18) New EMC Technologies
	(2) Emissions	(11) EMC Design	(19) Spectrum Management
	(3) Immunity	(12) Measurements	(20) Nonsinusoidal Waves
	(4) International EMC	(13) Instrumentation	(21) Radiation Hazards
	(5) Automotive EMC	(14) Test Facilities	(22) Product Safety
	(6) Military Applications	(15) Cables & Connectors	(23) Education/Student Activ.
	(7) EMP/Lightning	(16) Filters	(24) Standards/Regulations
	(8) ESD	(17) Shielding	(25) EMC Management
	(9) EMC Analysis	(17) Power Supplies	

Paper Formats

* Six-page paper, 20 minute presentation * Short (up to two-page) paper, 10 minute presentation

A page in the Proceedings allows approximately 1200 words, including formulas, figures and tables. Short papers on recent or late-breaking developments are encouraged.

Author's Schedule

Synopsis (3 copies)	Oct. 15, 1990	Dec. 1, 1990
Notification of Accept.	Dec. 15, 1990	Jan. 15, 1991
Camera-Ready Copy	Feb. 15, 1991	Feb. 30, 1991

Prospective authors should submit two copies of a 500- to 750-word synopsis with up to five illustrations, clearly explaining the contribution, its originality and relevance to EMC. Please indicate the desired paper format and technical area (by number or several numbers, if applicable) on the first page of the Synopsis. For anonymity during review, please identify the author(s) only on the cover sheet. Paper acceptance will be based on the following criteria: importance of topic, technical sophistication and depth, readability and clarity, presentation and discussion of results, novelty/originality. Promotional and commercial presentations are not acceptable. Prospective session organizers submit the session title and a 1000-word Synopsis containing the session objectives and tentative topics for consideration. Upon acceptance, authors will receive an author's kit. All papers must be orally presented in the Symposium by authors or their designated presenters. Synopses and all communications should be directed to:

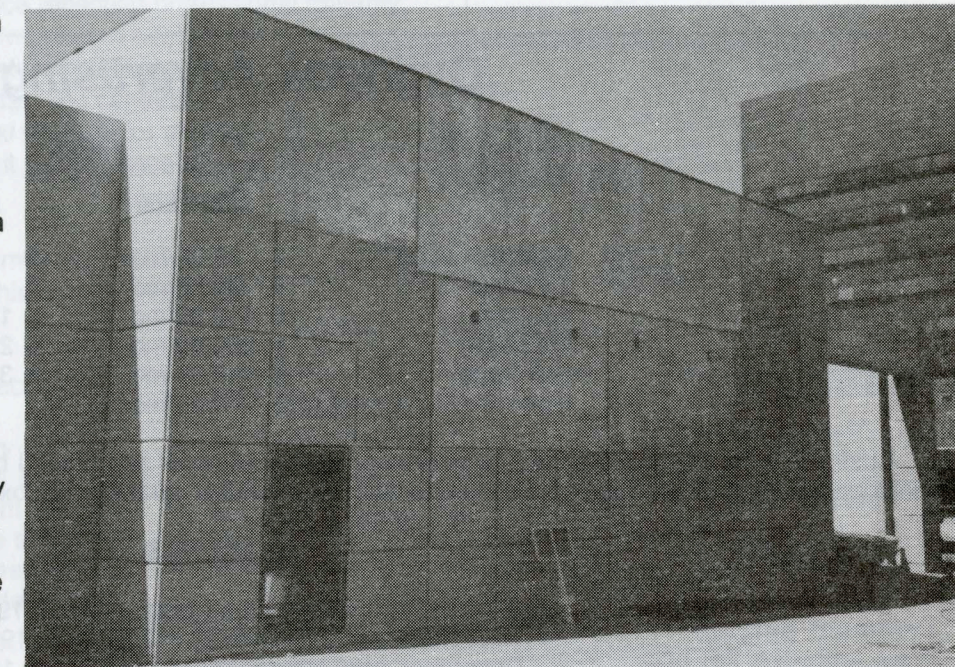
IEEE 1991 International Symposium on EMC
P.O. Box 609
Lincroft NJ 07738

Elati Substation

by John Richards

The Public Service company of Colorado crews at 13th and Elati are currently constructing the foundations and walls of a new substation. This substation will house a state-of-the-art facility including a 230,000 volt sulfur hexafluoride (SF₆) compact gas insulated substation (GIS). The SF₆ portion of the substation will be housed in a GIS building 72 feet by 66 feet and 40 feet high. It will enclose four 230,000 volt breakers used to protect three transformers and two high pressure oil filled underground transmission lines. The entire substation will be surrounded by architectural wall. This will be the first SF₆ substation for Public Service and the first in the region. The substation is scheduled for completion by the end of 1990. It will primarily serve the downtown loads through the underground networks. This substation is being built on a plot of land 125 feet by 275 feet; including approximately 40 feet of landscaping in front. A conventional open-air insulated substation would have required a plot 266 feet by 275 feet, and would have required that the alley be vacated.

oride compact substation have been received and are being stored off site, awaiting completion of the GIS building. The metal clad switchgear is being stored in the partially completed building which is on the North end of the substation. (See photo).



Elati Substation

Partially Completed Building, North End of Substation

Inside the substation will be room for three 50 MVA, 230,000 to 13,800 volt transformers and three lineups of 13,800 volt metal clad switchgear. Initially, two transformers and one switchgear lineup will be installed. The first transformer and the sulfur hexaflu-

Ray LaPanse, P.E. has worked for Public Service for nine years in various capacities in Electrical Engineering and is the Substation Engineer on this project.

MICHAEL J. FOLEY



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If you could spare three hours a week for this challenging, but very satisfying volunteer work, please contact our director, Barbara Hays, at 388-6594. The studio is located at 305 Milwaukee.

Overlook Advertising

Ad Size	Rate	
	One Time	Multiple
Business Card	\$ 25.00/mo.	\$ 20.00/mo.
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1/4 page	\$ 150.00/mo.	\$ 130.00/mo.
1/2 page	\$ 250.00/mo.	\$ 225.00/mo.
Full Page	\$ 400.00/mo.	\$ 360.00/mo.
Insert 8-1/2 x 11	\$ 200.00/mo.	

Business card ads must be actual business cards. All other ads should be provided in camera-ready format or additional set-up charges may apply. Inserts must be provided (quantity approx. 3800) and delivered to the printer.

Deadlines

October 1990 Newsletter - September 3, 1990
 November 1990 Newsletter - October 5, 1990
 December 1990 Newsletter - November 5, 1990
 January 1991 Newsletter - December 5, 1990
 February 1991 Newsletter - January 7, 1991
 March 1991 Newsletter - February 4, 1991
 April 1991 Newsletter - March 6, 1991
 May 1991 Newsletter - April 5, 1991

Please make checks payable to Denver Section IEEE. Send business card or ad copy and check to:
Anita Wanberg, dba Trade Services, P.O. Box 4056, Englewood CO 80155-4056, (303) 220-8042.

Schedule of Conferences and Meetings

September 11-12, 1990	Boulder	Symposium in Optical Fiber Meas.	Douglas Franzen	(303) 497-3346
April 12-14, 1991	Laramie	Region 5 Conference	Sadrul Ula	(307) 766-6268
April 28 - May 2, 1991	Boulder	PES Substation Com. Mtg.	George Flaig	(303) 452-6111
June 23 - 27, 1991	Denver	International Communications Conf.	Russ Johnson	(303) 796-9100
May 11 - 13, 1992	Denver	Vehicular Technology Conf. (VTC '92)	Don Cottrell	(303) 871-3752
September, 1995	Denver	Petroleum & Chemical (PCIC)	John Nelson	(303) 431-7895
July, 1996	Denver	PES Summer Meeting	John Barnick	(303) 969-0391
May 1997	Denver	MTT	Hussain Haddad	(303) 460-2114
			John Dunn	(303) 449-1055
			Claude Weil	(303) 497-5305

Proposed Conferences and Meetings

IAS 1994 - 1995
 ACM/IEEE Design Automation 1994
 PES Joint Power Generation 1994
 PES Summer Meeting 1995
 MTT 1997
 Transmission & Distribution 1997
 ITC 1997-2000

Senior Grade -- Go For It !!!

by Don Lindahl, Membership Chairman

If you have been a member of IEEE for ten (10) years or more, you may be eligible for advancement to senior member grade. We are currently compiling a list of eligible members and will be sending you an application form. The senior member grade is the highest professional grade for which application may be made and requires experience reflecting professional maturity. For advancement to the grade of senior member, a candidate needs to be an engineer, scientist, educator, technical executive or originator in IEEE designated fields. The candidate needs to have been active in professional practice for at least ten (10) years and have shown significant performance over a period of at least five (50) years.

Many employers consider senior member and fellow grades as recognition of professional achievement and a serious consideration in salary evaluation.

All newly elected senior members receive an attractive, personalized certificate. It is signed by the IEEE President and is very suitable for framing and displaying at home or in the office. A letter of recognition from the IEEE President to your boss will also be sent, if desired. There are no application fees or additional dues for a senior member grade.

Again, we strongly encourage you to take advantage of this opportunity to further your career and receive the recognition to which you are entitled. As I mentioned, we will be sending an application soon to those members who qualify for this honor, and we are prepared to assist wherever possible with your application. If you have any questions concerning your eligibility, please contact Don Lindahl at 770-7907 during working hours.

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Help Just a "Free" Toll Call Away

Remind members, and tell potential mem-

bers about IEEE's 800 number. Anyone in the U.S. or Canada can use it for the following: ordering an IEEE product; changing or correcting a name and/or address; applying for membership; obtaining information about his or her membership; and for information about training courses or seminars on standards.

The number -- 1-800-678-IEEE (4333) -- has been on line for a year. The quantity of phone calls received has grown from roughly 8,000 calls per month over the first eight months to 12,000 calls per month. The calls are primarily for product assistance (almost 50%) and for help with memberships (over 25%). In general, everyone seems to be pleased with this relatively new line of access to IEEE.

Centennial Subsection Chairman's Message by Sadrul Ula

The Centennial Subsection will be hosting the 1991 IEEE Region 5 Annual Conference in Laramie, Wyoming in April of 1991. We still need volunteers to help with organizing transportation, getting industry support, and we need people to judge the Student Paper Contest and the Student Design Contest.

Please get involved in our Subsection activities by writing a note or calling me: Sadrul Ula, EE Department, Box 3295, University of Wyoming, Laramie WY 82071-3295, (307) 766-6268 or (307) 766-2240.

The Institute of Electrical and Electronics Engineers - Denver Section

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755-1720

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Executive Committee (Includes Executive Board)

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Educational Activities - **Pankaj K. Sen**, EE & CS Dept., Univ. of CO Denver, 556-2872, 556-2685
Conferences - **John Tary**, Tri-State Generation and Transmission Association, 452-6111
Awards - **Michael J. Foley**, Forensic Engineering Inc., 730-7707
Student Fund - **John Richards**, Public Service of CO, 329-1177

Professional Activities - **Darrell Sabatka**, Public Service of CO, 329-1547
Nominations - **Keith Henderson**, Electric Power Testing, Inc., 428-1655
Membership - **Don E. Lindahl**, Siemens Energy & Automation, 770-7907
Pre-College Student Activities - **Dan Michaels**, Ball Aerospace, 939-5139

Executive Committee (Ex-Officio Members)

Subsection Chairmen

Black Hills - **R.D. McNeill**, Electrical Engineering Dept., South Dakota School of Mines & Technology, Rapid City, SD, 57701, (605) 394-2452
Centennial - **Sadrul Ula**, Electrical Engineering Dept., University of Wyoming, Laramie WY 82071, (307) 766-6268

Society Chapter Chairmen

Aerospace and Electronics - **Henry Rackley**, Ball Aerospace, 690-1600
Electromagnetic Compatibility - **Mark Lapchak**, Honeywell TID, 773-4626
Engineering in Medicine and Biology - **Darrell Jones**, University of Colorado Health Sciences Center, 270-8552, **Jochen Edrich**, University of Colorado Denver, 759-4002
Joint Antenna and Propagation/Microwave Theory and Techniques/Geoscience and Remote Sensing - **Katie MacReynolds**, National Institute of Standards & Technology, 492-5487
Joint Computer/Information Theory - **Rory Laiho**, IBM, 924-7534
Joint Communications/Vehicular Technology - **Ken Shugg**, Martin Marietta Information and Communications Systems, 977-2443

Joint Electromagnetic Compatibility/Instrumentation Measurement - **Richard Groves**, Colorado School of Mines, 273-3677
Joint Power Engineering/Industry Applications - **Fred Jones**, R.W. Beck & Associates, 299-5266
Laser & Electro Optics Society - **Arun K. Majumdar**, University of Colorado Denver, 556-2715
Power Engineering - **Kenneth McBryde**, Colorado Ute Electric Association, 249-4501
Reliability - **Juan Hernandez**, National Systems (719) 590-8880 x410

Senior Past Chairman - **Michael J. Foley**, Forensic Engineering Inc., 730-7707

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The Month at a Glance

August 29, 1990
Executive Board Meeting

September 3, 1990
RockIEEE Overlook Deadline

September 11-12
Optical Fiber Meas. Symposium

September 12, 1990
Executive Committee Meeting

September 19, 1990
Software Quality Committee Meeting

September 20, 1990
PES/IAS Meeting
AP/MTT/GRS Meeting

September 26, 1990
Executive Board Meeting

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