



### Valentine's Line

The primary concern of your Executive Committee is service to membership. The Ex. Comm. meeting agenda reflects this by affording each Chapter Chair an opportunity to make a monthly report, discuss new ideas and to advise the Ex. Comm. of areas where help would be appreciated. Each year a budget is set up to fund Chapter activities. The Chapter programs are expected to be more technically specific to Chapter interests. The Ex. Comm., as an entity itself, tries to look at more general programs that would have broader appeal. Last month an Ex. Comm. team completed organization of a program on Power Electronics with SPICE which we hope will afford not only an opportunity to learn some specific engineering skills, but also to earn a continuing engineering education credit, a CEU. Participation in this particular program is limited by the size of the facility our sponsor company has graciously made available for it. We hope to fill it up, but at the same time we would like to see an overflow of registrations because that would indicate that we are offering something that is desirable to membership.

We're working on a new idea for offering programs in the future. We would like you to think about your need for and desire to participate in presentations on current technology and to satisfy any requirements you might have to earn CEUs. We want your input. Please contact your Chapter Chair or anyone on the Ex. Comm. to make your ideas known. Let us know if we are doing something that is of interest to you and more importantly, let us know what programs would be of interest to you and how we might better offer them. Pittsburgh Section is here to serve you.

- Ray Valentine

### IEEE Pittsburgh Section Tutorial on Power Electronics with SPICE

Tom McDermott, Electrotek Concepts, Inc.



The IEEE Pittsburgh Section is sponsoring a 4-session tutorial on power electronics with SPICE simulations to be held in late October and November. A tentative schedule for topics is shown below.

- Oct. 25<sup>th</sup>: Generic Power Converters & Intro to SPICE with Filter Design
- Nov. 1<sup>st</sup>: AC to DC Converters, and AC to AC Converters
- Nov. 8<sup>th</sup>: DC to DC Converters, and DC to AC Converters
- Nov. 15<sup>th</sup>: Power MOSFET and IGBT Models, Magnetic Device Models

Course materials include hard copies of overheads used in class, and SPICE template files. Please visit the course website for more details.

The instructor is Tom McDermott, Electrotek Concepts, Inc. Tom has almost 20 years of experience developing simulation software with Westinghouse, Power Technologies, Ansoft, and Electrotek Concepts. His background in simulations covers power electronics using SPICE, Saber, and EMT. He is a licensed Professional Engineer, and has Ph.D. from Virginia Tech.

Students will need access to the Internet, a 486-class computer (Pentium recommended), and they should be comfortable editing text files. The SPICE exercises will be completed using a free, fully functional version of SPICE 3F5 without schematic capture. The course will focus on modeling basic circuits and devices with simple text files. No time will be spent on schematic capture.

Attendees will earn 1.0 Continuing Education Unit (CEU) if they attend 3 of the 4 sessions and submit a completed set of non-graded exercises. The exercises will consist of 7 SPICE simulations. To complete these, the student must modify the example netlist and produce GIF or PNG format plots. Procedures for submitting the exercises will be covered in the first session.

- Place: Adtranz Facility, West Mifflin
- Date: October 25<sup>th</sup>, November 1<sup>st</sup>, 8<sup>th</sup>, and 15<sup>th</sup> 2000
- Program: 6:30 to 9:30 PM
- Cost: \$50 for IEEE members, \$75 for others
- Website: <http://members.home.net/temcdrm/spice.htm>

Course size is limited to 33 students. To register, please send a check payable to "Pittsburgh Section IEEE" to Tom McDermott, 1800 Jefferson Ridge Dr., Jefferson Hills, PA 15025. Please indicate your IEEE member number on your check.

### IEEE News

All registered members of IEEE should have received their ballots in the mail. Please read the biographies of the candidates, and return your completed ballot following the instructions in the packet.

To increase the number of ballots cast, IEEE will randomly select one ballot per region and that individual will receive a Palm Pilot. A total of 10 Palm Pilots will be awarded. To be eligible, the ballot must be received by 12:00 Noon on November 1<sup>st</sup>, 2000, and it must be properly filled in and signed. For more information, and a list of web pages for the candidates, please visit [www.ieee.org/organizations/corporate/candidates.htm](http://www.ieee.org/organizations/corporate/candidates.htm).



## Signal Processing Society

### Excising AM-FM Interference from Direct Sequence Spread Spectrum Communications

Pat Loughlin, Dept. of Electrical Engineering  
University of Pittsburgh

While direct sequence spread spectrum (DSSS) communication systems are robust to many types of interference, performance can be significantly degraded (e.g. increased bit-error-rate) if the interference is strong enough, particularly for wideband interferences. In these situations, various signal processing methods can be employed to remove, or excise, the jammer prior to despreading the received signal, resulting in enhanced performance. An overview of some of these methods will be briefly discussed. Focus is on the effects of amplitude and frequency modulated (AM-FM) jammers on the performance of DSSS communication systems. It will be shown that such jammers cause significant degradation in performance with increasing AM in systems designed to excise FM jammers (i.e., systems with fixed notch-width excision filters tuned to the instantaneous frequency of the jammer). Results of an adaptive technique that utilizes the instantaneous bandwidth of the jammer, in addition to its instantaneous frequency, to filter wideband AM-FM interference from the DSSS signal will be presented. Simulations demonstrate considerable improvement in system performance for the proposed adaptive technique compared to the fixed notch-width excision filters.

Pat Loughlin joined the faculty at the University of Pittsburgh in 1993, where he is currently an associate professor in the Dept. of Electrical Engineering, with a joint appointment in the Dept. of Bioengineering. His research interests are in the broad area of time-varying systems and nonstationary signal analysis, with particular attention to the development of time-varying spectral analysis and its application to problems in bioengineering, acoustics, communications and machine fault analysis.

Place: Room 424, Benedum Engineering Hall  
Univ. of Pittsburgh, Dept. of Electrical Engineering  
Date: October 16<sup>th</sup>, 2000  
Program: 4:00 to 5:00 PM  
Website: [www.pitt.edu/~nlsj/maps](http://www.pitt.edu/~nlsj/maps) for directions and maps

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## Computer Society

### A Distributed Resource Architecture for Embedded Real-Time Systems

Todd Wade and Jim Schimpf, Tollgrade Communications Inc.

Todd Wade, Engineering Manager, and Jim Schimpf, Senior Software Engineer, will describe a distributed resource architecture that can have application to any industrial system employing networked embedded microprocessors. They have developed a distributed real time operating system to support Tollgrade Communications telephone line test equipment. This system can support an arbitrary number of test nodes allowing all their resources to be shared. The system requires modest processor power and is not tied to any networking scheme. They will detail the benefits of this design, in particular the benefits for built in test and manufacturing support for these systems.

Place: Tollgrade Communications, Inc.  
Date: October 26<sup>th</sup>, 2000  
Program: 7:00 PM Technical Program  
6:00 PM Refreshments and Social Time

Directions to Tollgrade Communications, Inc.

**From PA Turnpike:** Exit the Turnpike at Allegheny Valley (Exit 5). Follow the signs for Cheswick/Springdale/New Kensington (N. on Freeport Road). Turn left at the first traffic light onto Pearl Avenue. At the top of the hill turn left at the Texaco Station onto Nixon Road. Tollgrade is on the right about 1/10 mile.

**From Route 28:** Take Exit 12 (Springdale/Cheswick). Turn right at the stop sign onto Nixon Road. Tollgrade is about 1/10 mile after the next stop sign.

For further information, contact Philip Cox, 412-820-1302.

**Industry Application Society**  
**Advanced Notice for January Meeting**

**K-Factor Distribution Transformer - An Update Report**

Nigel P. McQuinn, Electrical Power Consultant



Distribution transformers loaded with non-linear loads are subjected to harmonic currents that produce increased heat losses and temperature rise. These loading conditions are becoming increasingly important with the widespread use of adjustable speed drives, electronically controlled equipment, and "smart" office loads. Non-linear loading has been contributing to failure of transformers that are not specifically designed to handle such loads, and the situation is being given special attention by certification and standards organizations.

Mr. McQuinn will discuss the philosophy behind the newly published Standard C57.110 and the comparative calculation method for the K-Factor and the new Fhl Factor. The process and difficulties of performing qualification tests, instrumentation and test facility needs will also be discussed. Examples of design features that can give rise to premature winding and shield failures will be presented on recent forensic failures.

Place: George Westinghouse Science & Technology Center  
Churchill, Beulah Rd, Exit 13 off Parkway East (Route 376)  
Date: January 16<sup>th</sup>, 2001  
Program: 7:00 PM Technical Program  
6:00 PM Coffee, sodas and fellowship

More detailed information will be available in the January Bulletin.

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**VOLUNTEERS NEEDED FOR THE FUTURE CITY COMPETITION**

The Engineer's Society of Western Pa. (ESWP) in conjunction with the Carnegie Science Center will present the 2<sup>nd</sup> Annual Future City Competition in the Pittsburgh area. The Future City Competition asks middle school students to create -- first on computer and then in large, three-dimensional models -- their visions of the city of tomorrow. The Pittsburgh Regional Competition will be held at the Carnegie Science Center, on Saturday, January 20, 2001. The Future City Competition is a national program sponsored by the engineering community to promote technological literacy and engineering to middle school students. The Future City Competition in the Pittsburgh Region is planned to include school districts from Allegheny and the immediate surrounding counties. Students can experience a fun way to learn about engineering and cities of the future.

Each volunteer engineer mentor works with seventh- and eighth-graders, helping to guide the youngsters through the rigors of building a functioning city. Engineers generally have to devote up to 10 hours per month to the project over the period from October to January. Mentors will work with a team of 3 students and a teacher in developing a city of the future on the SimCity computer program. They will also help as the team builds a section of the city, and consult with them as they prepare a presentation for the regional competition in January.

Volunteers are also needed as judges for the regional competition. As a judge, you will be part of a four-member panel who will evaluate the team's verbal presentation and the models of the cities. The judging will take place during the competition at the Carnegie Science Center on Saturday, January 20, 2001.

**Engineer Volunteer Information**

Name: _____	Company: _____
Engineering Discipline: _____	Professional Society: _____
Mailing Address: _____	Work telephone: _____
_____	Home telephone: _____
_____	Fax: _____
_____	Email: _____

Interest (mentor, judge, volunteer): \_\_\_\_\_

**For information contact:**

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Email completed form to: [schwarcw@westinghouse.com](mailto:schwarcw@westinghouse.com) or FAX to (412) 374-3451

## 2000-2001 Pittsburgh Section IEEE Program Calendar

Group/Society	September	October	November	December	January	February	March	April	May
ExecCom Ray Valentine (724) 733-5083	21 Point Park	19 WVU	16 Point Park	21 Point Park	18 Point Park	15 Point Park	15 Point Park	19 Point Park	17 Point Park
Section Mtngs Ray Valentine (724) 733-5083	16 Fall Picnic	25 SPICE Tutorial	1, 8, & 15 SPICE Tutorial			National Engineers Week		History Dinner	
Upper Mon Biswajit Das (304) 293-6371									
Industry Applications Harry Hagerty (412) 487-8235	19 Fuse Protect. Medium Volt. Power Sys.				16 K-Factor Distribution Transformer				
Magnetics Miklos Gyimesi (412) 268-2308									
Computer Gerry Kumnik (412) 393-8223		26 Distributed Architecture							
Communication Sujata Banerjee (412) 624-9470									
Power Eng. Gregory Reed (724) 772-2158									
Membership Jim Karn (412) 732-9000									
Signal Processing Pat Loughlin (412) 624-9685		16 Excising Interference							
PACE Dennis Steward									

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