

**The Florida West Coast  
Section of the IEEE**

Serving over 2,300 members in Charlotte,  
Citrus, DeSoto, Hardee, Hernando,  
Hillsborough, Lee, Manatee, Pasco, Pinellas,  
Polk, and Sarasota Counties



**THE**

**SUNCOAST**

**SIGNAL**

*THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC.*

**Volume 51 — No. 9**

<http://www.ieee.org/fwcs>

**September 2008**



***Inside this Signal...***

*Page 2*

- \* *Editors Column*
- \* *LightningMaster*
- \* *Nolan Power Group*

*Page 3*

- \* *IEEE.tv*
- \* *Siliconexion*
- \* *Hillsborough Professional Study Day*

*Page 4*

- \* *Signal Processing Meeting A Success*
- \* *The Power of a Thank You*

*Page 5*

- \* *Green Book Seminar*
- \* *USF Student Branch Schedule*

*Page 6*

- \* *NFPA 70E-2008 Seminar*
- \* *Olympic Swimmers Article*

*Page 7*

- \* *Rudy Henning Award*

*Page 8*

- \* *BTC and Solution*

*Page 9*

- \* *Teacher in Service Report*
- \* *Understanding Engineers*

*Page 10*

- \* *Calendar*



***This Month's Meetings***

***September 2nd: EXCOM Meeting  
At TECO Plaza***

*702 N. Franklin Street, Tampa*

*Meeting starts at 5:30PM and ends at 7:30.*

*Register online at <http://time2meet.com/fwcs-excom/index.html>*

*Meeting is open to all FWCS members and guests*



***NFPA 70E, 2004 Standard for  
Electrical Safety in the Workplace***

*When: Friday, September 12-*

*Registration & Breakfast: 7:30AM-8:00AM*

*Training: 8:00AM – 4:00PM. Lunch will be provided.*

*Where: Lakeland Center, Room:*

*701 West Lime Street, Lakeland, FL 33815*

*More on Page 6*



***Grounding of Industrial and Commercial Power Systems  
Standard 142 (The Green Book)***

*FWCS IEEE Color Book Seminar Series*

*Date: September 19, 2008*

*Cost: \$125 IEEE Member / \$155 IEEE Non member*

*Time: 9AM-4PM Includes lunch*

*More on Page 5*



## This Month... (Editor's Column)

### 2008 IEEE EXECUTIVE COMMITTEE FLORIDA WEST COAST SECTION

CHAIR: Jim Anderson 813-425-2467  
[jim.anderson@ieee.org](mailto:jim.anderson@ieee.org)

VICE CHAIR: Serge Beauzile, Progress Energy,  
727-344-4123 or 727-409-1242 [sbeauzil@yahoo.com](mailto:sbeauzil@yahoo.com)

SECRETARY: David Figueroa, [dfigueroa@ieee.org](mailto:dfigueroa@ieee.org)

TREASURER: Dr. Paul Schnitzler (813)-974-5584  
[pauls@eng.usf.edu](mailto:pauls@eng.usf.edu)

SIGNAL EDITOR: Richard A. Sanchez,  
Phone (813)239-3849 [richard.sanchez@ieee.org](mailto:richard.sanchez@ieee.org)

AWARDS & BYLAWS: Richard Beatie, PE, Lightning Master  
(727) 580-3598 [r.beatie@ieee.org](mailto:r.beatie@ieee.org)

EDUCATION: Dr. Rudolf E. Henning and Zhen Tong  
(813) 974-4782 or (727) 328-8777 (Ext: 333)  
[henning@eng.usf.edu](mailto:henning@eng.usf.edu) or [tong@ieee.org](mailto:tong@ieee.org)

MEMBERSHIP: Tom Blair, TECO Energy,  
813-228-4407 [tom\\_blair@ieee.org](mailto:tom_blair@ieee.org)

TEACHER IN-SERVICE: Sean Denny: [Venner20@ieee.org](mailto:Venner20@ieee.org)  
(727)381-7237

PES/IAS CHAPTER: Tom Blair, TECO Energy,  
813-228-4407 [tom\\_blair@ieee.org](mailto:tom_blair@ieee.org)

MTT/AP/ED CHAPTER: Ken A. O' Connor  
[kenoconnor@ieee.org](mailto:kenoconnor@ieee.org)

COMP/AESS CHAPTER: James S. Lumia (813) 832-3501,  
[jlumia@ieee.org](mailto:jlumia@ieee.org)

EMBS: Engineering in Medicine & Biology: Dr. Ravi Sankar:  
813-974-4769 [sankar@eng.usf.edu](mailto:sankar@eng.usf.edu)

SP/COMM CHAPTER: Hector Martinez, [hmartinez@HNTB.com](mailto:hmartinez@HNTB.com)

WIE: Women in Engineering: Suzette Presas (813) 974-4851  
[spresas@mail.usf.edu](mailto:spresas@mail.usf.edu)

LIFE MEMBER AFFINITY GROUP: TBD

GOLD: Tim Doolittle, [tdoolittle@tmdvault.fastmail.fm](mailto:tdoolittle@tmdvault.fastmail.fm)

PACE: Scott Haynes, Honeywell (727)-539-3358,  
[scott.haynes@ieee.org](mailto:scott.haynes@ieee.org)

Richard Sanchez (813)239-3849 [rsancz@verizon.net](mailto:rsancz@verizon.net)

STUDENT BRANCH CO-ADVISORS:

Dr. Paul Schnitzler, USF PS&A (813)-974-5584  
[pauls@eng.usf.edu](mailto:pauls@eng.usf.edu)

Dr. Chris Ferekides, USF, (813) 974-4818  
[ferekide@eng.usf.edu](mailto:ferekide@eng.usf.edu)

Dr. Srinivas Katkooi, USF, (813)-974-5737  
[katkooi@ieee.org](mailto:katkooi@ieee.org)

STUDENT BRANCH MENTOR: Jim Howard, Lakeland Electric  
(863) 834-6506 [j.howard@ieee.org](mailto:j.howard@ieee.org) (H) (813) 876-1748

STUDENT BRANCHES:

Manuel Bravo IEEE, [mbravo@mail.usf.edu](mailto:mbravo@mail.usf.edu)

Upavan Gupta, IEEECS (813)-974-1348, [ugupta@csee.usf.edu](mailto:ugupta@csee.usf.edu)

CONFERENCES: Jim Beall, [j.beall@ieee.org](mailto:j.beall@ieee.org)

WEB PAGE: <http://www.ieee.org/fwcs>

WEB MASTER: Michelle Chang, [michelle.chang@ieee.org](mailto:michelle.chang@ieee.org)

THE SUNCOAST SIGNAL is published monthly by the Florida West Coast Section (FWCS) of the Institute of Electrical and Electronics Engineers, Inc. (IEEE). THE SUNCOAST SIGNAL is sent each month to members of the IEEE on Florida's West Coast. Annual subscription is included in the IEEE membership dues.

The opinions expressed, as well as the technical accuracy of authors, advertisers or speakers published in this newsletter are those of the individual authors, advertisers, and speakers.

Therefore, no endorsement by the IEEE, its officers, or its members is made or implied.

All material for THE SUNCOAST SIGNAL is due in electronic form by 1<sup>st</sup>

Friday after the 1<sup>st</sup> Tuesday of the month preceding the issue month.

Address all correspondence to:

**Richard A. Sanchez**

**1018 Berry Avenue**

**Tampa, FL 33603**

**Home Phone 813-239-3849**

**E-MAIL: [rsancz@verizon.net](mailto:rsancz@verizon.net)**

**The Signal, Copyright 2008**

Each month I have to find a topic for the Editor's column. This one came to me as I was attending the Signal Processing and Communications Society monthly meeting that is hosted by Hector Martinez. As I looked around the room there were 14 attendees, which is not bad but should be better. The speaker was George Gilhooley who gave an excellent and lively presentation on Vehicle Infrastructure Integration. I have attended a few events like this and I have never been disappointed by the speaker or presentation. The point is that I think members are missing out on what is provided by these events. I realize the time or location may be inconvenient at times but making the effort to attend an event will be worthwhile, even if it's not in your area of expertise. I am fortunate in this regard as I work not far from TECO Hall and the time fits my schedule. Did I mention that there usually is free food at these events? I am going to make it a goal to attend at least one of these a month and I hope to see you there.

I received an e-mail from Susan Sacks, Senior Manager of the IEEE Power and energy Society informing me that I was using an old version of the PES logo! She attached a copy of the new logo and I will be using it in future issues of the Signal. Thanks to Susan for the updated logo.

Thanks to all of this months' contributors. Sean Denny, Jim Anderson, Butch Shadwell and Jeff Basiaga all sent me articles or events to include in this issue.

RS

**LightningMaster**  
Corporation 

**Richard E. Beatie, P.E.**  
**Director Of Engineering**  
**Structural - Bonding/Grounding - Surge**

1351 N. Arcturas Ave. (800) 749-6800 Voice  
Clearwater, FL 33765 (727) 580-3598 Cell  
(727) 499-0138 Fax

www.LightningMaster.com RBeatie@LightningMaster.com

[Web Site](#) [Email Me](#) [Map to Us](#)



**NOLAN POWER GROUP**

---

Power Quality Specialists  
Sales – Service

Batteries / Chargers / UPS  
PM Service / Capacity Testing  
Emergency Call Out

john.todora@nolanpower.com  
Phone: 954-333-3040

---

Authorized EnerSys Representative

## IEEE.tv

**2007-2008 IEEE-USA Online Engineering Video Competition** - IEEE-USA's Online Engineering Video Scholarship Competition awarded three prizes totaling \$6,000 to undergraduate students who created 90-second video clips deemed most effective in reinforcing engineers contributions to the quality of life for an 11-to-13-year-old audience.

**Care Innovations: Responsibility For Being Green** - This program takes a look at the challenge of minimizing the environmental and health impacts of electronics manufacturing. Discussions focus on the responsibility of industry, government, academia, and the general public to foster the development of public policy and the enforcement of laws to safeguard health and the environment.

**Emerging Field of Biomedical Engineering** - This program provides an overview of career possibilities in Biomedical Engineering. In this program professionals discuss the nature of their work.

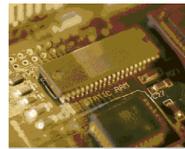
**Energy Innovations: Solar Goes Small** - Cardiff, Wales is the unlikely home of arguably one of the most innovative solar projects in the world. A solar panel manufacturing plant that will be the first facility that makes renewable energy products using only renewable energy is being built in Cardiff.

**Energy Innovations: The Hydrogen House** - The Energy Innovations series profiles fascinating and innovative approaches to meeting our growing energy needs. In this program, Mike Stritzki had a dream. As a tenacious engineer, he was determined to realize it with his own hands. Thus was born the first "hydrogen house" in the United States, designed and built in pastoral Hopewell, New Jersey. An astonishing technical achievement lies in the bucolic setting: a house with all the modern conveniences, but run entirely by the sun.



## Call for Articles!

Have you ever thought about writing an article for publication in a newsletter like the SunCoast Signal? I am always looking for articles written by members of the FWCS. The article can be of any topic that would be of interest to the members of the Section. Don't worry about spelling, grammar or length of the article. That is what Editors are for! If you are interested in sending in something for consideration, get it to me by the first Friday after the EXCOM meeting (it's in the calendar) and in Microsoft Word format and keep it to a page or less. If it's included in the Signal it will be seen by more than 2000 readers in the Section. Send to [rsancz@verizon.net](mailto:rsancz@verizon.net)



**Siliconexion, Inc.**

FPGA Design and Verification Experts

**Siliconexion offers robust, on-time electronic design consulting services by experienced senior level professionals.**

**Applications Include:**

Telecommunications / Data Communications  
Aerospace and Military  
Embedded Computer Systems

**Services Include:**

FPGA / CPLD Design and Verification  
ASIC to FPGA Conversions  
Training for FPGA Design, VHDL, Test Benches  
Digital and Analog Board-level Hardware Design  
Embedded Systems Software Development  
High Speed Signal Integrity Analysis

*Cost Effective sub-system or  
turnkey product development*

Phone: 727 596-1990

E-mail: [info@siliconexion.com](mailto:info@siliconexion.com)

[www.siliconexion.com](http://www.siliconexion.com)

## Hillsborough Professional Study Day

Nancy Marsh invited the Florida West Coast Section of the IEEE to the Hillsborough Professional Study Day on August 12<sup>th</sup>, 2008. This was significant because after 31 years as Hillsborough County's Secondary Supervisor, this was her final Teacher in Service Day. Nancy had helped spread the word about Teacher In Service Program when I was starting out. I owe her a huge debt of gratitude. From IEEE, THANK YOU NANCY! I had the pleasure of meeting her successor, Larry Plank at Robinson High School where the Professional Study Day was held. It was also an honor of running a double session with TISP co-founder and Tampa Electric Engineer Ralph Painter. Ralph instructed thirteen teachers in the first hour on how to make a working model of a nail clipper. It was constructed of foam board, balsa wood, and toothpicks. Ralph mentioned this exercise was developed by John Lutz and that teachers can instruct on Physics laws of forces. I instructed five teachers during the second hour on building Robot Arms. Ralph also mentioned that this exercise has been proven to be the most downloadable from the IEEE Educational Website. The teachers were proud on displaying their creations after constructing in teams. **Sean Denny**

## *Signal Processing Meeting a Success!*



This month's Signal Processing Society Chapter meeting, chaired by Hector Martinez had fourteen attendees to hear the presentation by George Gilhooley of HNTB. The presentation was about Vehicle Infrastructure Integration which is using various communication methods to enable vehicle to vehicle and vehicle to infrastructure applications. These include GPS for enhanced navigation, human interface with the vehicle and Anonymous Probe Data that provides vehicle speed and direction, braking, collision avoidance, in-vehicle signing and other types of information. The primary purposes of these applications are highway safety although commercial applications are allowed. The FCC has licensed the 5.9 GHz frequency with 75 MHz of bandwidth. Standards are IEEE 802.11p and 1609 Family as well as SAE J2735 Message Set. These efforts are supported by the VII Coalition which is made up of various transportation related organizations (AASHTO, IBTTA, ITS America, VII Consortium and local governments). The VII Consortium is composed of the nine largest vehicle manufacturers. The presentation was informative and interesting and touched on current and future developments. George answered the many questions from the attendees and welcomed discussion.



## *The Power of a Thank You!*

So here we find ourselves in the powerful 21st Century and yet still we are looking for ways to motivate and keep our teams together. Hmm, some things never change. I recently had an experience that once again reminded me about the power of something that I already knew but had just once again forgotten about.

I had an upcoming trade show and somehow I got sucked into "booth duty" -- standing for hours on a cement floor trying to interest passer-bys in our product. With just four days left before the big show, I now realized that I had no material to hand out that would describe the product that I'm responsible for. I quickly pulled together a 1-page handout and then I ran smack dab into the company's legal and layout teams. These two groups are never easy to work with nor do they move quickly ("you want it when?"); however, things were even worse because they were involved in a major company marketing material overhaul and had even less time than normal to deal with requests.

I tracked down a technical materials expert; we'll call her Carole, and asked for her help. She started by letting me know that what I wanted to accomplish in such a short time was probably impossible, but she was willing to give it a try. She made edits to the handout herself in order to get it to flow through the legal department easier, set up calls with the legal team and she worked with the layout police. In the end, it was through her efforts that on Friday at 5:00 pm I got a final, approved copy that could be handed out at the show -- an internal company record if ever there was one.

For most engineers, the story would normally stop here. However, I was so impressed with Carole's efforts when I so clearly did not deserve her attention that I sat down over the weekend and wrote a thank you email to her boss. I explained what the situation was, what Carole had done, and why it meant a lot to the company. Here's the amazing part: her boss shot me back a thanks for thanking her note. Then I got a thank you from Carole who had been congratulated by her boss. Finally, I got a thank you note from Carole's VP -- clearly my original email had been forwarded up the chain of command. One simple thank you had accomplished a great deal.

So what's to learn from all of this? Well first off, thank you's still count -- none of us send enough of them and we all really should spend some time each day thanking those who help us to get our work done. Next, when you do send a thank you, be sure to include enough info so that the person who is receiving it can understand the whole story and realize what was done. Finally, when trying to keep an engineering team or department motivated, sometimes the best strategy might be to get folks on the outside to send a note reminding everyone that they really are doing a good job!

**Jim Anderson, FWCS Chair**





## *Grounding of Industrial and Commercial Power Systems Standard 142 (The Green Book)*

FWCS IEEE Color Book Seminar Series

Date: September 19, 2008

Time: 9AM-4PM

Speaker: Elliot Rappaport, P.E.

Location: Dean's Conference Room

Kopp Engineering Building

University of South Florida

4202 Fowler Avenue

Tampa, Fl

**Space is limited to 35**

Questions: Jeff Basiaga at 813-541-5758 or [jeff.basiaga@stantec.com](mailto:jeff.basiaga@stantec.com)

Cost: \$125 IEEE Member / \$155 IEEE Non member

Includes lunch.

RSVP: <http://time2meet.com/fwcs-green/index.html>

Make checks payable to: IEEE FWCS

Pay at the door or send checks to:

IEEE FWCS Treasurer

30612 Nickerson Loop

Wesley Chapel, Fl 33543

**Your local IEEE PES/IAS chapter is offering this seminar on IEEE 142 Grounding of Industrial and Commercial Power Systems (the Green Book) as part of a series of seminars based on the IEEE Color Books. Please come and benefit yourself and the industry with this excellent class – sellout attendance is key to the continuance of the local color book guest speaker series.**

The IEEE Green Book reviews practices and methods of system grounding in detail. A thorough investigation of grounding problems, and the methods for solving these problems, is presented. In presenting these problems and solutions to electrical engineers worldwide, the IEEE Green Book provides a basic framework for applying fundamental principles to specific work situations and applications.

The IEEE Green Book addresses many different aspects of grounding. The problems of system grounding, which include connection to ground of neutral, of the corner of the delta, or of the midtap of one phase, are covered. The advantages and disadvantages of grounded versus ungrounded systems are discussed. Information is given on how to ground the system, where the system should be grounded, and how to select equipment for the grounding of neutral circuits. Methods for connecting the frames and enclosures of electrical equipment to the ground system are addressed. The fundamentals of making the interconnection between the electrical equipment and ground rods, water pipes, etc. are outlined. Even problems relating to static electricity and lightning, as well as electronic equipment, are covered in the IEEE Green Book.

**Speaker Bio: Elliot Rappaport is a Life Member of the IEEE and is well acquainted with the Green Book having been Chapter 2 (Equipment Grounding) Chair for the last two editions. He was the Working Book Chair for the 2008 edition and past Chair of the Grounding Subcommittee. He has been a member of the NEC Code Panel 5 (Grounding) for more than 25 years. Mr. Rappaport is a graduate of Wayne University in Detroit with a BSEE and an MSEE and is a registered professional engineer in the State of Michigan. He was a Division Electrical Discipline Head for a large A/E company and has had his own electrical engineering consulting company for the past 25 years.**



### *The IEEE USF Student Branch's Tentative Fall 2008 Schedule*

Here are tentative dates for the Student Branch events for this semester. The Picnic appears on this month's calendar. If you have any questions, please direct them to Nathan at the e-mail address at the end of this article.

- Picnic at Riverfront Park -- September 21, 2008
- S-PAC -- November 5, 2008
- Fall 2008 Senior Banquet -- December 5, 2008
- Projected dates are subject to change.

--Submitted by Nathan Quecan, Chair, IEEE USF Student Branch [nquecan@mail.usf.edu](mailto:nquecan@mail.usf.edu)





## *NFPA 70E, 2004 Standard for Electrical Safety in the Workplace*

How does this code apply to you and your workplace? What do you need to do now to become compliant? For the first time in 25 years, OSHA is updating the general industry electrical installation standards found in Subpart S of 29 CFR Part 1910, to include among other requirements, a more specific reference to the NFPA 70E requirements, Effective August 13, 2007.

*“A qualified person shall be trained and knowledgeable of the construction and operation of equipment or a specific work method and be trained to recognize and avoid electrical hazards that might be present with respect to that equipment or work method.”*

*“The employer shall provide the safety related work practices and shall train the employee who shall then implement them.”*

*“Appropriate safety related work practices shall be determined before any person approaches exposed live parts within the Limited Approach Boundary by using both shock hazard analysis and flash hazard analysis.”*

*“...employer shall document the incident energy exposure of the worker.”*

*“When an employee is working within the Flash Protection Boundary he/she shall wear protective clothing....”*  
*OSHA 1910.269(I)(6) Flame resistant (FR) clothing and PPE shall be used by the employee based upon the incident energy exposure associated with the specific task.*

*“Switchboards, panelboards,..., likely to require examination, adjustment, servicing or maintenance while energized shall be field marked to warn qualified persons of potential electric arc flash hazards.”*

**When:** Friday, September 12- Registration & Breakfast: 7:30AM-8:00AM

Training: 8:00AM – 4:00PM. Lunch will be provided.

**Where:** Lakeland Center, Room:

701 West Lime Street, Lakeland, FL 33815

**How:** Call 800-881-2698, Cost: \$150.00, \$125 for IEEE members, an NFPA 70E book will be provided (\$50.00 value). Make reservations early, space is limited to 50 students. 8 PDH hours will be awarded.



## *Olympic Swimmers Use Hydrodynamic Analysis*



U.S. swimming champion Michael Phelps has made history in Beijing by becoming the first 11-time gold medalist in the Olympics. He is now the unquestioned greatest short-distance swimmer ever. But could there be more to his story than meets the eye?

A professor of fluids mechanics at Rensselaer Polytechnic Institute in Troy, N.Y., has been working with USA Swimming, the group that fields the American team at the Olympics, on improving event times by analyzing the hydrodynamics of its competitors in the pool.

Professor Timothy Wei, head of Rensselaer's Department of Mechanical, Aerospace, and Nuclear Engineering, has developed cutting-edge hardware and software that analyzes a swimmer's movement through the water. He used it to consult with USA Swimming's coaches to break down the techniques of the athletes under their supervision. Wei's experimental flow measurement technology uses sophisticated mathematics with stop-motion video technology to identify key vortices, pinpoint the movement of the water, and compute how much energy the swimmer exerts. It could be responsible for giving the U.S. team members the extra precision they need to perfect their strokes, according to one of the participants in the process.



## *Dr. Rudolph Henning Receives the 2008 Microwave Career Award*

This year's recipient is Rudolf E. Henning whose citation reads "*For a career of leadership, meritorious achievement, creativity, and outstanding contributions in the field of microwave theory and techniques.*" He is currently Professor Emeritus at the University of South Florida.



Rudolf E. Henning (Rudy Henning) received the BSEE degree in 1943, the MSEE Degree in 1947 and the Eng. Sc.D. in 1954, all from Columbia University. Starting with his service as a communications engineer in World War II Rudolf Henning's life has been dedicated to the greater understanding of microwave theory and techniques and helping those around him to aspire to great careers for themselves. His initial interest in microwaves and electromagnetics began toward the end of his senior year at Columbia University when an electrical engineering professor was performing research on high power magnetrons as a pulsed power source for radars.

Henning's early technical achievements were in the field of microwave metrology, with four patents awarded in the 1950's and numerous papers and technical reports. He was involved in the early automation of microwave measurements for antenna and circuit measurements. This work included the broadest bandwidth automated reflectometer measurement equipment of its kind. These and later contributions in microwave measurement technology led in part to his elevation to IEEE Fellow in 1965 and receiving the ARFTG Automated Measurements Career Award in 1986. He worked at Sperry Microwave Electronics Division from 1958 to 1970, becoming Chief Engineer. His large group of technical professionals earned an international reputation. From 1970 to the present he has been with the University of South Florida where he rose to the highest professorial position, Distinguished Professor. He held during his more than 35 years at the USF positions of Department Chair and Acting Dean. He was instrumental in building the USF Center for Wireless and Microwave Information Systems (WAMI) and helped launch the IEEE WAMICON conference held annually in Florida.

Combining his involvement in R& D with active in IEEE led to his chairing the 1965 National Symposium on Microwave Theory and Techniques. From 1966 to 1971 Rudolf was a member of the MTT Society Adcom and President of the MTT Society in 1968. He served as Chairman of the 1979 IMS in Orlando and co-chairman of the 1995 IMS in Orlando. He is currently serving as an advisor for Ute planning of the 2014 IMS.

Dr. Henning recently received a Presidential Award for Excellence in Science, Mathematics and Engineering administered by the National Science Foundation. Dr. Henning founded the "YES We Care- program to inspire young minority students to aspire to careers in engineering and the sciences in the Tampa Bay, Florida region. Fostering this program for more than two decades which includes family participation in a twenty five week program, he is in the process of expanding it to include in addition to traditional minorities other students with interest and capabilities in Science, Technology, Engineering and Mathematics.

In addition to being a IEEE Fellow for whom the citation read "*For contributions to Microwave Instruments and Measurement Techniques, Dr. Henning received in 1996 the MTT Society Distinguished Service Award.*" He also received recognition as the 1984 IEEE Region 3 Outstanding Student Branch Counselor and in 1984 the IEEE Centennial Medal. In 1992 he received an IEEE United States Activities Board Citation of Honor. He has served for many years on the IMS Technical Program Committee and MTT Society Technical Committee 16 (Microwave Systems) and Committee 20 (Wireless Communications).



## ***Brain Teaser Challenge Solution - June 2008 Butch Shadwell***

Last month I discussed the high cost of gasoline and the impact on holiday travel. I decided it would be useful to talk about ways to get a better value for your gasoline dollar. So I asked this question. "Most cars have two or three pedals on the floor. This month I am asking you to tell me which one is the cause of the most loss of fuel economy."

First we must accept the constraints that the vehicle will be operated safely and within the requirements of traffic laws. No energy saving strategy may violate this axiom.

So, an automobile is a machine designed to convert chemical potential energy into kinetic energy. As you depress the gas pedal, the machine proceeds to do this function at various rates (different rates of acceleration, or overcoming friction and air resistance) and with varying efficiency. In general as you do this, the efficiency of energy conversion into useful momentum is always significantly higher than zero, even if you accelerate too quickly, which is wasteful. You continually get movement of the car down the road in exchange for your fuel dollar. As you press the brake pedal, the braking system converts the vehicles valuable kinetic energy (momentum) into waste heat, which is dissipated into the atmosphere and the road. These petro-dollars are actually burned as 100% heat pollution. It is not an exaggeration to imagine your fuel dollars being burned by your brake pedal. No value for these dollars. So it is clear that the thrifty driver will drive in a fashion that uses the gas pedal judiciously (don't push it down too far), but the main one to avoid is the brake pedal (except when you are stopped). Don't follow so closely to the car in front of you, so that you can avoid having to apply the brake as their speed varies. As soon as the traffic light turns yellow, take your foot off of the gas pedal. There is no reason to keep pumping dollars into the cars momentum when it will all be wasted by the brake pedal as you stop for the red light.

I would really enjoy discussing the effects on fuel economy of using the clutch pedal, but this column is getting too long. Maybe next time.

## ***Brain Teaser Challenge – July 2008***

We bought a new 61" HDTV last Christmas. It is the DLP type, though it has some interesting innovations. Instead of the usual projector lamp and color wheel for the light source, this set uses three high output LEDs (red, green, and blue). No color wheel and motor and no projector lamp to replace. Incase you are not familiar with DLP TVs, DLP stands for digital light processing. It is based on the use of a MEMS (micro electro mechanical system) device with 2,073,600 tiny mirrors that can be electro-statically moved. The mirrors are adjusted 360 times per second successively displaying the red, green, or blue components of the image, so that we get up to 120 complete display frames per second. The amount of red, green or blue light that is added to an individual pixel (picture element) by its respective mirror, is controlled by how long the mirror allows that color light to project to the screen. Each mirror pulse width modulates the light to control how much red is blended with how much green and blue. Your eye integrates these pulsing light sources into 10,000 levels of brightness for each of the three color components.

Let's say that my high output LEDs have a forward voltage drop of 4 volts at 25 degrees C at the junction and the forward voltage drops 3mV per degree C. Then I supply forward current to one of these LEDs through a 100 ohm resistor and a 10VDC source. So tell me the current through the LED when the junction gets up to 100 degrees C? I know this is a simple one, but I have been struggling with writers block. Good luck.

***Reply to Butch Shadwell at [b.shadwell@ieee.org](mailto:b.shadwell@ieee.org) (email), 904-223-4510 (fax), 904-223-4465 (v), 3308 Queen Palm Dr., Jacksonville, FL 32250-2328. (<http://www.shadtechserv.com>) The names of correct respondents may be mentioned in the solution column.***



## *Teacher in Service Report*

Hope you had a good summer vacation. We are gearing back up in August for a great 2008-2009 school year. I need your input what topics and when representatives from the IEEE can help your school district for the upcoming year. Ralph Painter and I are committed to helping Hillsborough County on August 12th and Pinellas County on August 15th.

Nancy Marsh introduced me to her successor, Larry Plank, [Larry.Plank@sdhc.k12.fl.us](mailto:Larry.Plank@sdhc.k12.fl.us) to the position of Hillsborough Science Supervisor. Please download "PSDAugust12Registration.pdf" to register for the Hillsborough Professional Study Day and return to Larry if you plan to present. Ralph and I will take care of this for the presentation. They are calling this a "Celebration of Science." The location is at Robinson Senior High School, 6311 S. Lois Ave. Tampa, FL, 33616, between 8AM to 3:30PM. On behalf of the Florida West Coast Section of the IEEE, we thank Nancy for 31 years of service to Hillsborough County Schools. I sent Larry a TISP welcome packet and look forward to working with him.

Blythe Lodermeier has arranged for Ralph and I to present the Rotational Equilibrium presentation at the Pinellas Professional Study Day on Friday August 15 at Clearwater High.

Donna Friis, [friisd@cdm.com](mailto:friisd@cdm.com) referred me to George Bartuska, [gebart@mpinet.net](mailto:gebart@mpinet.net), who is a Consultant for the Technology Resources Group, Inc. who could help in the Winter Park area.

Yvonne Pelham, [y.pelham@ieee.org](mailto:y.pelham@ieee.org), Educational Outreach Manager of IEEE Educational Activities, requests that you download the attached survey. She wrote: "*From your efforts through the years, the Teacher In-Service Program has really been a success. Thank you for your willingness and contributions to informing and working with your local school systems and teachers. Over 77 presentations impacting nearly 1800 teachers have been reported. If you have conducted additional presentations, please let us know. From the feedback surveys that have been summarized, we know that over 90% of the teachers agree that the presentations have increased their level of technological literacy, and over 92% said that they would use the concepts presented in their classroom instruction*

*We would like to do a follow-up assessment with teachers to get their feedback on the effectiveness of the program and the activities that were used in the classroom. We revised the feedback survey to capture contact information, so that IEEE Research would be able to conduct the assessment. We would ask that you use the suggested attached form for your upcoming presentations. Please forward the completed surveys to me and we will take care of tabulating the results. We would also send a summary back to you as well*

*Thanks again for your commitment to making a difference by educating students and teachers at the pre-university level. Demonstrating to them how engineers and the engineering profession positively impacts society helps us raise the public's awareness of what we're all about and will ultimately help us recruit and retain future engineers. "*

I am also representing the IEEE with Serge Beauzil for the new Engineering Banquet proposed for February 20, 2009. More details will follow. We want the Pasco, Pinellas, and Hillsborough counties submitting nominations in late November for Outstanding High School Teachers which we call the Lignell Awards. I will provide the updated forms later this fall. We prefer the nominations before the Christmas break.

Thank you.  
*Sean Denny*



## *Understanding Engineers*

The graduate with a science degree asks, "Why does it work?"

The Graduate with an engineering degree asks, "How does it work?"

The Graduate with an accounting degree asks, "How much will it cost?"

The Graduate with an arts degree asks, "Do you want fries with that?"



September 2008 Calendar of Events (For more information see P. 1) *inside this Signal...*

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
31	1 <i>Labor Day</i>	2 <i>EXCOM Meeting @ TECO Hall Page 1</i>	3	4	5	6
7	8	9	10	11	12 <i>NFPA 70E-2008 Seminar Page 6</i>	13
14	15	16	17	18	19 <i>Grounding Seminar (Green Book) Page 5</i>	20
21 <i>USF Student Picnic Page 5</i>	22	23	24	25	26	27
28	29	30	1	2	3	4

Institute of Electrical and Electronics Engineers, Inc.  
 Florida West Coast Section  
 3133 W. Paris  
 Tampa, Florida 33614



*Florida West Coast Section, Tampa*

NON PROFIT  
 ORG  
 U.S. POSTAGE  
 PAID  
 TAMPA, FL.  
 PERMIT  
 No. 1197

**DATE SENSITIVE MATERIAL. DO NOT DELAY**

Change of address? IEEE Web Contact Update <http://www.ieee.org/membership/coa.html>  
 Or send address changes including your name, IEEE Member number and all pertinent information to:  
 IEEE, 445 Hoes Lane, P.O. Box 1331, Piscataway, NJ 08855-1331 or call (800) 678-4333  
 Or fax your address changes to (732) 562-5445