



Chapter Chatter

Todd Robinson, Associate Editor

Certainly the readers of Chapter Chatter have been waiting excitedly for Part 2 of “Dorm Life with Engineering Students.” So, I probably don’t have to explain again the background information for these tales. But, just in case there are some new EMCS members, checking out Chapter Chatter for the first time, I’ll fill them in. “Dorm Life” stories have come from my favorite and most trustworthy source of humorous engineering stories, Steve Jensen (Steve Jensen Consultants, Inc). Steve assures me that his stories have/have not been greatly embellished over time in order to clarify/add humor to the actual/imagined events. When reading Steve’s accounts, one must remember that the state of the art for personal entertainment devices and clocks was vacuum tube table top (so called “5-tube”) radios and synchronous motor driven clocks, respectively. A table model radio of the era (referenced in one of the stories) would typically be capable of AM reception only and include a clock that was capable of turning on the radio at a preset time or as an alarm clock. Steve attended the UCLA Engineering College from the Fall of 1958 until the Summer of 1963. During the years 1960 and 1961, he was a resident of Dykstra Hall, which was the first “coed” (by floor) dormitory on the campus. Sproul Hall, another “coed” dormitory, also figures in one of the three stories, hence the reference to it. The storyline is narrated from Steve’s perspective.

Part 2: Attention Earth

This story also was as a result of my semester with Al Egan and actually was inspired by the success of the previous “special power” adventure. One afternoon, Al returned from a physics class carrying a project that he had built to illustrate the principles of radio frequency (RF) induction heating. This device was a push-pull power oscillator that had two 6BG6 horizontal TV set sweep tubes operating as a power oscillator. This device involved a very large air wound inductor about four inches in diameter and a large air variable capacitor in parallel with the inductor. Al had built a power supply for it and it would tune to any frequency from about 300 – 500 kHz. We were using it to cook hot dogs by placing the hot dog in the center of the air coil and turning on the high voltage power supply. As I recall, there was 500 Volts DC (or so) on the plates of the tubes as well as the inductor. Hence, accidentally touching the coil during the cooking process was an eye opening experience that we quickly learned to avoid. After we tired of cooking hot dogs, a brainstorm related to the special power adventure occurred to me. The idea was to tune the power oscillator to 455 kHz, which was the intermediate frequency (IF) of all of the table model radios of the day. Then using about a 5-turn link coil wound around the existing inductor, and a couple of 0.05 uF series capacitors, we found we could drive RF backwards into our wall outlet.

Since our power was likely shared by many others in the building, we figured we could override everybody’s station of choice that was playing on their radios. The remaining challenge was to achieve amplitude modulation (AM) on what was so far just a high power CW oscillator. Re-enter the plate transformer used for the special power experiment and Al’s power amplifier. We put the plate windings in parallel (there were two originally designed for push-pull audio) for current handling reasons and then connected that parallel combination in series with Al’s high voltage supply for the oscillator. We used a microphone input to Al’s amplifier this time. It was easy to find out when we were on 455 kHz as again, our neighbor had his radio playing as he was doing homework. We simply tuned the capacitor until all of sudden the music stopped from next door. We removed the B+ (high voltage) from the oscillator and the music returned. The neighbor didn’t seem to mind the short interruption. We realized the potential this mode of mass communication had, and we both decided that we couldn’t keep our composure during a “live” broadcast. Other than a couple of microphone tapings, heard again coming back to us through the wall, we didn’t say anything into the microphone. Instead we taped two messages. The first one was:

“Attention Earth...we are in control of your radio. Do not attempt to change the station, as your control is lost. Do not irritate us. This is merely a prelude of things to come.”

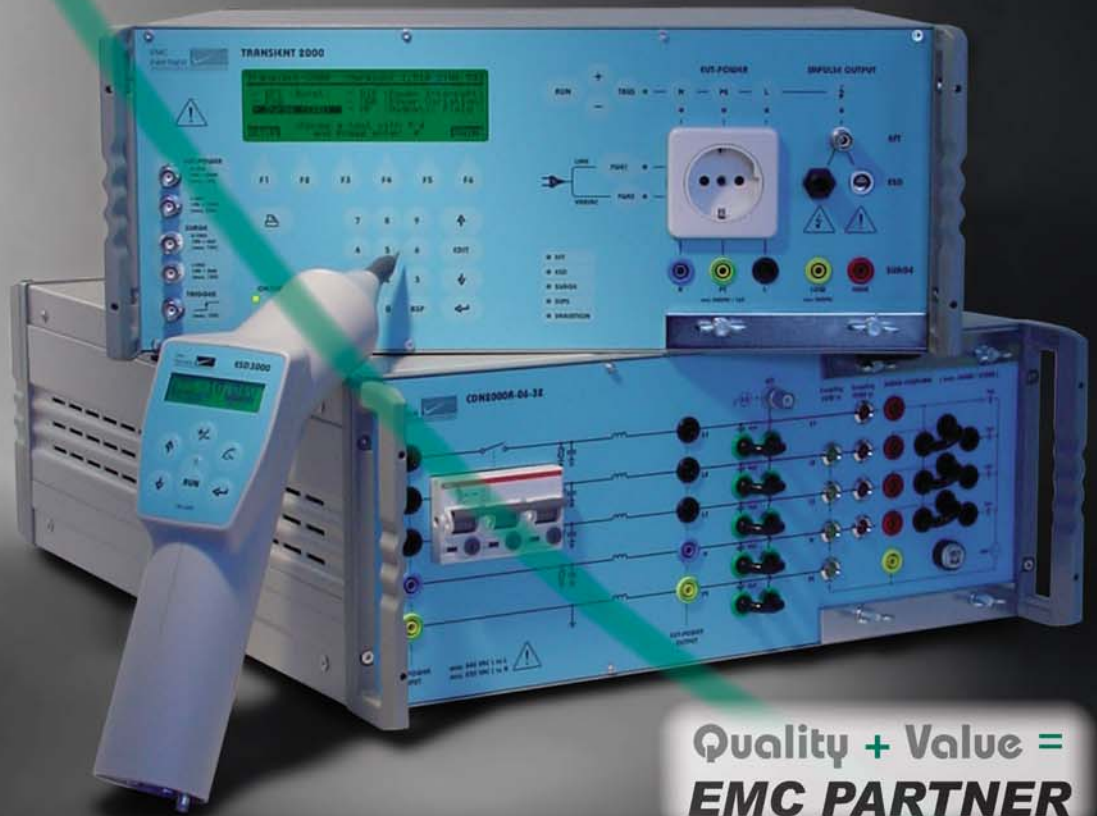
We followed that by about one minute of un-modulated carrier (silence) and then played the following message:

“We now return control of your radio to you. Do not be alarmed; no damage to you or your radio has resulted from this demonstration of our power. Let this be a warning. You may not be as fortunate next time.”

We shut everything down not knowing about the measure of our success. Then we heard a lot of people in the hallway each knocking on their neighbors doors and asking them if they had their radios on. My neighbor came over as well looking a little pale and asked us too. We said no, we didn’t listen to radio, as we were both pretty busy. He left.

The next day, there was a small piece in the “Daily Bruin” (campus newspaper) at the bottom of page one entitled, “Mysterious Radio Signals Heard in Dykstra Hall Last Night Around 9 PM”. The text went on to speculate that it was likely some sort of “prank” initiated by some of the engineering students residing in the dorm. We learned later that our message was heard on all floors. (We were on the 2nd floor that year.) This experiment was a good demonstration of carrier current radio as well as the principles on which a superhetrodyne receiver works. Namely, if you can inject RF directly into the IF amplifier through the power supply, the user has no choice short of turning off the radio but to listen to your signal. (This was the original CS114 test using multiple test samples.)

EMC COMPLIANCE - PRODUCT SAFETY RELIABILITY TESTING



Quality + Value =
EMC PARTNER

Do we have a solution for you!

From the world's first 30 kV battery powered ESD generator to state of the art impulse systems. We have solutions for the following applications:

**AVIONICS & MILITARY
COMPONENT
INSULATION
TELECOMS
CE COMPLIANCE**

Our quality and price will leave you asking
"why didn't we contact them sooner?"

Do it today! — Call or write for a quote.

EMC Partner test instruments and systems distributed
exclusively in North America by HV TECHNOLOGIES

EMC -
PARTNER



HVT
HV TECHNOLOGIES, Inc.

Tel: 703-365-2330 • www.hvtechnologies.com • e-mail: emcsales@hvtechnologies.com

Baltimore-Annapolis

Robert Berkovits, Chapter Chair, reports that on November 9, 2004, the Baltimore - Annapolis Chapter of the EMC Society hosted a joint meeting with the Communications Society. A presentation given by Thomas Jerse, PhD was entitled, "Interference in Communication Systems on Multi-emitter Platforms." Dr. Jerse is an IEEE EMC Society Distinguished Lecturer, Associate Professor of Electrical Engineering at The Citadel and an Associate Technical Fellow of The Boeing Company. The meeting was held at the Northrop Grumman ES Division in Linthicum Heights, Maryland. The total attendance was 27 people. On 13 April 2005, Dr. William G. Duff, IEEE Fellow and EMC Consultant, presented a talk on Ultra Wideband (UWB) Electromagnetic Interference (EMI). The talk was co-hosted by the EMC Society and the Communications Society. There were 33 guests and 16 IEEE members attending the meeting held at the Historic Electronics Museum. Both talks generated high interest and lively discussions.

Beijing

Wen Xun Zhang, Chapter Chair, reports that on August 7, Kai Shao, Principal Engineer, gave an outstanding presentation on, "Progress on Microwave Power Devices Technology." The same evening, Hou Zhong Pan gave an excellent talk entitled, "Full Solid-state Transmitter and Microwave Transistor Power Amplifier for Radar." Both topics were attended by a good turnout of 8 members and 34 guests. The Beijing Chapter also met

on August 8, when Dr. Ling Hsu spoke about "Test Technology for Microwave Pulse Power Transistors." Dr. Hsu's paper was attended by 8 IEEE members and 34 guests. On August 19, the Chapter held a well attended meeting with 7 members and 19 guests. A presentation entitled, "Metamaterials in Antennas and Microwave Engineering," was given by Dr. Yang Hao.

Central New England

John Clarke, Co-Chair, reports that the Central New England Chapter held a meeting on Wednesday, September 28, 2005. The topic presented was, "How to Measure and Check RF Stuff Using eBay and a Test Receiver". The speaker was Lee Hill of SILENT, Amherst, NH. The speaker is currently a member of the IEEE EMC Society Board of Directors (2005-2007) and Chairman of the IEEE EMC Society Distinguished Lecturer Program. Many EMC engineers and technicians have, and are familiar with, using a spectrum analyzer with a tracking generator. Mr. Hill's presentation gave a hands-on demonstration of how to create a very sensitive, low cost measurement system for characterizing the performance of RF devices found in most EMC troubleshooting and test laboratories. Lee used a portable test receiver/spectrum analyzer and tracking generator, together with a dual directional coupler purchased on eBay to demonstrate the usefulness of S11 "return loss" or "reflection loss" measurements. First, the principles of "through" or "insertion loss" measurements were

discussed and demonstrated. Second, the principles of return loss measurements were discussed and demonstrated. A variety of common EMC test/debug laboratory RF devices, such as RF series adapters, attenuators, probes, and antennas were characterized with one or both of the two measurement techniques. The main emphasis of Lee's presentation was a 50 ohm return loss measurement setup with a best case dynamic range of 40 dB. This setup can be used to do nice "sanity checks" of RF equipment without the need for an expensive or delicate vector network analyzer or TDR setup. The characterization is done in the frequency domain that provides insight into the useful frequency range of a particular device. There was a short tutorial on the advantages, disadvantages, and best use of insertion loss and return loss measurements. In attendance were 18 members (12 also EMCS members) and 14 guests. The Central New England Chapter will hold its next meeting on Wednesday, October 26, 2005.

Chicago

On September 20, the Chicago EMC Chapter met to review the 2005 IEEE International Symposium on EMC held the week of August 8 in Chicago. Several members of the EMC 2005 committee were on hand to present their take on the Chicago Symposium. The meeting was lead by Jack Black, the Chicago Chapter Chairman, and also the EMC 2005 Exhibits Chair. Jack highlighted the many new ideas that brought a fresh look to this year's Symposium, including: a



Jack Black (far left) welcomes everyone to the Chicago Chapter meeting on September 20. Note Roger Swanberg is shown on the far right. Roger provided that great photo of the EMC 2005 committee that was erroneously credited to Bob Hofmann on page 61 of the Summer 2005 issue. Thank you Roger for the photo!



Tom Braxton, seated left in tan colored suit, appreciated the accolades he received for his leadership as Chairman of the EMC 2005 Symposium in Chicago.



Melissa Lorensen joins her Boeing Satellite Systems colleagues Hugh Oliveto and Greg Tetterer (from left) at the Los Angeles Chapter Colloquium and Exhibition on "Aerospace EMC."



Fischer Custom Communications was well represented at the Los Angeles Chapter event. Bruce Harlach and Ray Adams joined Allen, Virginia, Joe, and David Fischer to ensure the day was a big success.

keynote speaker to kick off the opening of exhibits, a new product showcase, and an interactive EMC forum. Jack also described how the EMC-opoly game brought a little more fun to the event for the attendees and exhibitors alike. This was also the first time a Symposium committee solicited "non-traditional" corporate sponsorship such as that from United Airlines and FedEx. This type of sponsorship helped defray Symposium costs while the same time providing benefits and convenience to the sponsors/patrons, Symposium attendees, and exhibitors. At this meeting, the winners of the 2005 EMC Symposium Exhibit Booth Awards were announced. The Exhibition Committee voted based on booth aesthetics, general appearance, information, graphics, and booth coverage. Congratulations to the following companies for their impressive showing: ETS-Lindgren - Best Large Booth,

EMScan - Best Medium Booth and FerriShield - Best Small Booth. Jerry Meyerhoff, John Kokklys, and Roy Leventhal spoke about aspects of the Symposium that worked well and those which could be improved upon. Carla Robinson (Technical Committee) commented that the technical program was a great success. Carla and Technical Committee Co-Chair Ray Klouda were the first to work through the challenges of a new process for technical paper submittal. Samir Parikh, Symposium Volunteer Coordinator, spoke about the positive experience he had in working with the committee and in recruiting student peers for participation in the event. Bob Hofmann (Treasurer) reported that not only was the Symposium a success in terms of the technical content and exhibitor satisfaction, but that it also produced a respectable surplus for the benefit of the EMC Society. And finally, Tom Braxton,

the superb Symposium Chair, finished the discussion by reiterating a quote by Daniel Burnham, Chicago's founding architect, "Make no little plans; they have no magic to stir men's blood". This quote provided the vision and fueled the excitement for the EMC 2005 committee members. This quote and Tom's leadership kept the committee volunteers intellectually, physically, and emotionally charged up, and always thinking creatively throughout the four plus years of their collective effort in planning the Symposium.

Los Angeles

The Los Angeles EMC Chapter kick started its September-June technical program with a one day colloquium and exhibition. Titled "Aerospace EMC", the event was held on September 26 at The Crowne Plaza Hotel in Redondo Beach, California.



During the break in the exhibit area, Jeffery Grelich of General Dynamics, Carl Vogelsang of Boeing, and John O'Brien of WEMS Electronics (from left) talked about Jeff's travel from Gilbert, Arizona to attend the Los Angeles Chapter event.



Don Parikh of SDP Engineering, Zbong Chen of ETS-Lindgren, and Dave Bernardin of Cymer, also the San Diego EMC Chapter Vice-chairman, (from left) enjoyed dessert in the exhibit area following lunch at the Los Angeles Chapter event.



Ken Javor of EMC Compliance joined Michelle Hope (left) and Wendy Miller at the FerrisShield display during the Los Angeles Chapter event.



Lunch Sponsors Jerry Page of Northwest EMC and David Fischer of Fischer Custom Communications enjoyed supporting the Los Angeles Chapter's "tabletop show."

Over 70 people attended, with strong representation from Northrop Grumman, Boeing, and various other aerospace firms in the area. There were five presentations, each ranging from 60-90 minutes. Speakers included Ray Adams and Bruce Harlacher of Fischer Custom Communications, Zhong Chen of ETS-Lindgren, Ken Javor of EMC Compliance, and Steve Jensen of Steve Jensen Consultants. Topics addressed Conducted and Radiated Emis-

sions, EMP Testing, BCI and Impulse Excitation, Radiated and Conducted Susceptibility, as well as Effective Test Planning and Performance. Steve started the technical program with a discussion of "Conducted Emissions (CE101/CE102)." He provided filter design tips, troubleshooting, and test tips. Bruce then spoke on "EMP Tests (CS116 and RS105)" as well as "Impulse Excitation, BCI (CS115)" and addressed test setup, design

tips, and troubleshooting. After a short break in the exhibit area, Zhong spoke on "Radiated Susceptibility (RS103)", including providing an introduction to E-field probes, their limitations, proper usage and key assumptions. Lunch and time in the exhibit area then provided a welcome break to let the technical material "sink in". Revitalized after lunch, Ray covered "Effective EMC Test Planning and Performance" and reviewed common mis-



Toni Gurga of Credence Technologies was first in line for the reception buffet following the "Aerospace EMC" Colloquium and Exhibition.



While the technical program was in session, exhibitors caught up on industry news, including Robert Tozier of CKC Labs (left), and Martin Jabn of Advanced Test Equipment.



The speakers at the Los Angeles Chapter event included (from left) Zhong Chen of ETS-Lindgren, Ken Javor of EMC Compliance, Steve Jensen of Steve Jensen Consultants, Ray Adams and Bruce Harlacher of Fischer Custom Communications.

takes and how to avoid them thru proper test planning and test engineering. He followed this with a presentation on "Conducted Susceptibility (CS101)." He reviewed the use of conducted susceptibility test data and spice modeling to troubleshoot/resolve problems, proper test setup, and design. After a short break in the exhibit area, Ken, our "Military EMC Test Standards Guru," then addressed "Radiated Emissions (RE101, RE102)." Coming all the way from Huntsville, Alabama, he reviewed test rationale, limit tailoring, proper conduct of the test and troubleshooting. He then ended the day with a review of "Bulk Current Injection (CS114)." Topics presented included test rationale, test setup, and equivalence to radiated susceptibility. The history he provided on the development of these standards was especially interesting. This event was also well supported by 18 exhibitors of EMC products and services. The tabletop show provided considerable interest to the attendees and amongst exhibitors as it had been awhile since a "tabletop show" was last held in the Los Angeles area. The LA EMC Chapter is

grateful for the financial support provided by all the exhibitors, and in particular, the Lunch Sponsors, Fischer Custom Communications and Northwest EMC, as well as the Reception Sponsors, AR Worldwide and Rohde & Schwarz. Incidentally, the Los Angeles Chapter has a NEW website: www.ewh.ieee.org/r6/lac/emc/ Check it out and feel free to attend a meeting if you are new to EMC, are a visitor in the area, or simply want to see what's new with the Los Angeles EMC Chapter!

Oregon-SW Washington

For the past several months, the Oregon-SW Washington has been very busy planning for the 2006 IEEE International Symposium on Electromagnetic Compatibility to be held in Portland, Oregon over August 14-18, 2006. Numerous committee and subcommittee meetings were held over the summer to plan the technical program, show amenities, social activities and promotional efforts. In honor of the 200th Anniversary of the Lewis and Clark trek across North America, the theme of EMC 2006 is "Explor-

ing EMC Frontiers." In Chicago, the EMC 2006 committee manned a fun, Oregon-themed booth, encouraging everyone to "join the Corps of EMC Discovery at EMC 2006 in Portland." Please see the end of Chapter Chatter for the fun photos taken from the EMC 2006 booth in Chicago. The EMC 2006 committee is working hard to provide a technical program that will be uniquely balanced, providing cutting edge EMC theory and many practical "how-to" sessions. (Please see the article that resulted from this discussion on page 66 of this Newsletter.) They are also working hard to attract attendees with the multitude of unique site seeing opportunities located in and around Portland. Overall, the EMC 2006 committee members want to make this an event to remember! William Moyer, Chapter Vice-Chair, reports that the fall meeting sequence for Oregon-SW Washington was kicked off in September with a bang – somewhat literally. The featured speaker was Dr. Christopher Holloway, with the National Institute of Standards and Technology (NIST). Previously Dr. Holloway worked

Low-Profile Gaskets

125LP45 & 125LP60

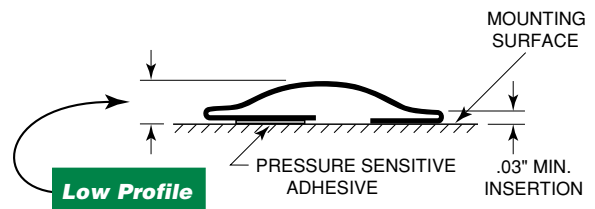
"Smooth to the Touch"

- Low closing force
- Bi-directional
- Gap range - .030" - .100"
- Adhesive mounting
- Beryllium copper
- 100db attenuation
- 360° No-snag
- Durable



Visit our web site for a **FREE SAMPLE** plus expanded technical information!

www.tech-etch.com



Tech-Etch

Tech-Etch, Inc., 45 Aldrin Road, Plymouth, MA 02360 • TEL 508-747-0300 • FAX 508-746-9639

ISO 9001:2000
REGISTERED



Chris Holloway during his presentation to the Oregon and SW Washington Chapter.



Chris Holloway getting into the swing of his presentation in Oregon with just enough equations to be interesting.

as a staff scientist with Electromagnetic Applications, Inc. in Lakewood, CO, where he worked on theoretical analysis and finite-difference time-domain modeling of various EM problems. From fall 1992 to 1994 he was with the National Center for Atmospheric Research (NCAR) in Boulder, CO, where his duties included wave propagation modeling, signal processing studies, and radar systems design. From 1994 to 2000 he was with the Institute for Telecommunication Sciences (ITS) at the US Department of Commerce in Boulder, CO, where he was involved in wave propagation studies. Since 2000 he has been with NIST in Boulder, where he works on the frontiers of electromagnetic theory. He is also on the Graduate Faculty of the University of Colorado in Boulder. Chris gave two remarkable presentations of considerable interest to his audience. The first and most technical presentation, “A Discussion on Double Negative

Materials, Transition Boundary Conditions, Controllable Surfaces, and the Design of a New Class of Metamaterials,” reported on his ongoing research into the exciting new realm of metamaterials. A little something for the Uber-Geeks among us, where Chris explained briefly under what circumstances one can make use of quite small scattering elements within a non-conductive matrix to create programmable and real-time adjustable “smart materials” with quite-remarkable electromagnetic properties: specifically negative permittivity and permeability. The proper combination of which result in real physical media where an EM wave’s energy propagates in opposition to its phase, which can be used to create substantially smaller-sized electrically-resonant structures, useful for miniaturizing antennas and microwave resonators, and for controllable, electrically-switchable, frequency-selective totally-reflecting or transparent surfaces. Wild stuff! The second pre-

sentation, complete with numerous video clips of intentionally-collapsing buildings, was on “The Propagation and Detection of Signals Before, During, and After a Building Implosion,” a topic of considerable immediate relevance in our post 9-11 world. The NIST research Chris described is aimed at identifying how signals in cell phone and emergency communication bands can and do propagate from transmitters buried in collapsed buildings, and what can enhance and what can hinder wireless communications links for trapped emergency workers and firefighters. Information about future Oregon-SW Washington Chapter meetings can be found at the following web site: <http://www.worldaccess-net.Coloradoradom/~emc/>

Seattle

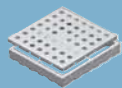
The Seattle EMC Chapter welcomed members back from the summer break



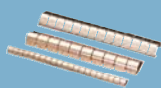
Chapter Chair Derick Skouby (right) thanks Chris Holloway for coming to Portland and providing a tantalizing glimpse at some of the more exotic EM research currently in progress.



Leo Smale (left) and Bill Hall of Lionheart Northwest enjoy pizza prior to the start of the September Seattle EMC Chapter meeting.



Board Level Shields



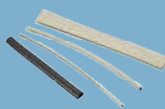
Fingerstock



Fabric-Over-Foam



Form-In-Place



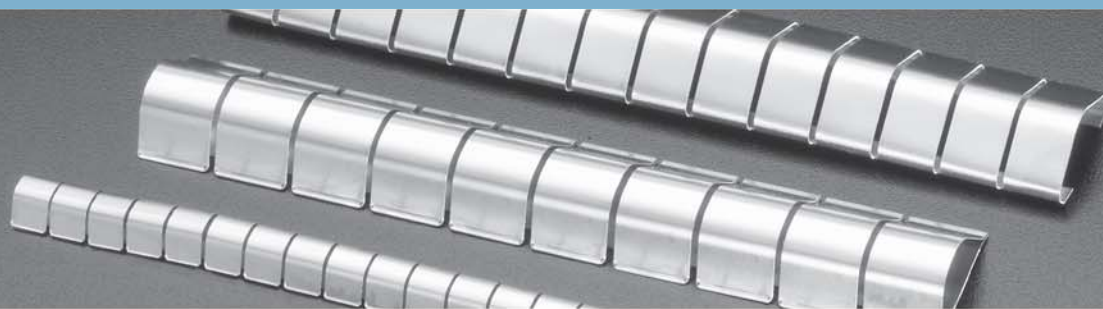
Conductive Elastomers



Microwave Absorbers



Wire Mesh



YOU ABSORB OUR EXPERTISE; WE DEFLECT YOUR EMI.

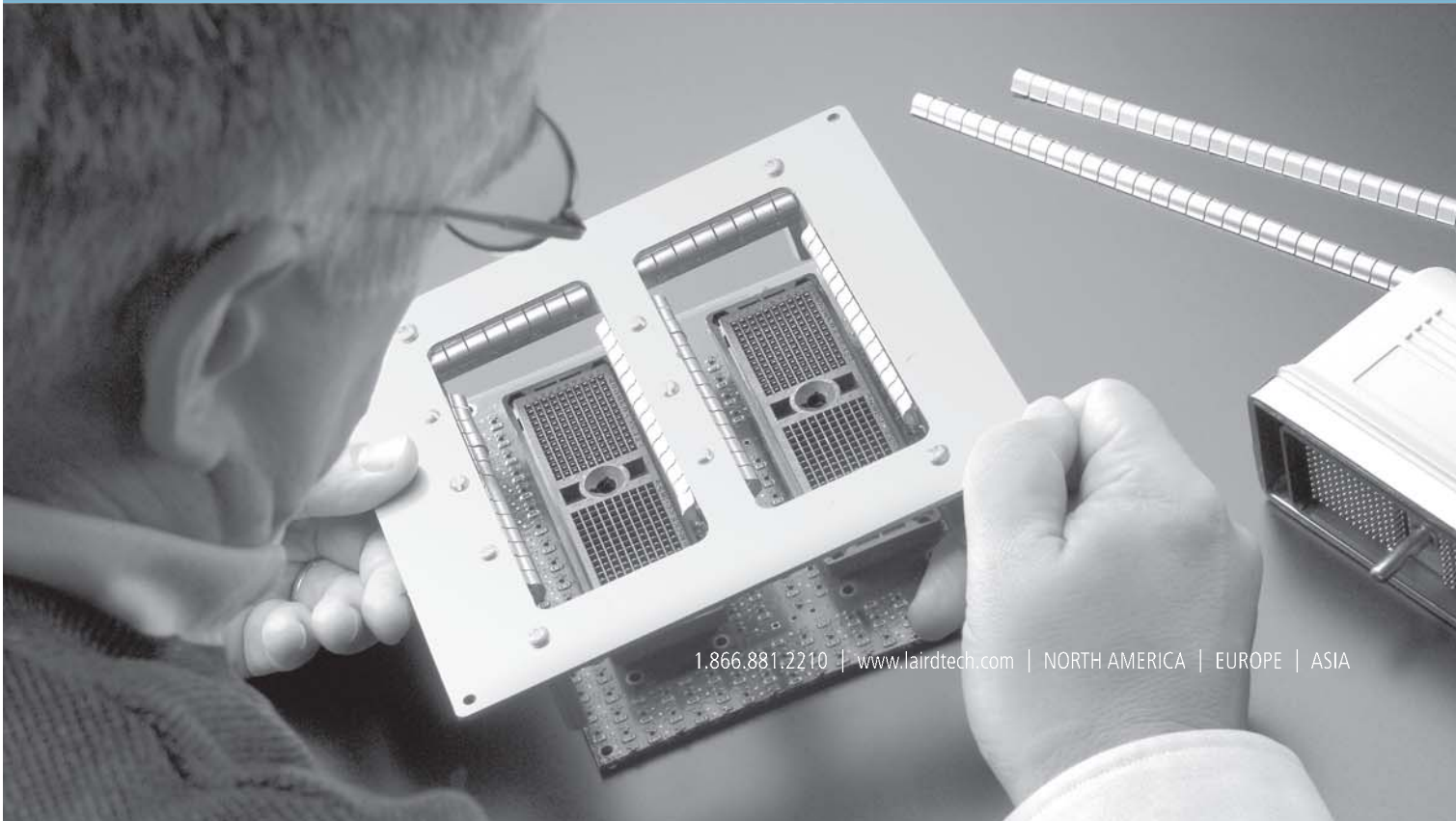


LET
NOTHING
INTERFERE.™

You're an engineer. You like challenges—even counteracting EMI. But who likes getting frustrated in the process? Which is why Laird Technologies offers the industry's most knowledgeable technical experts. Our professionals work with you through all project phases to identify early on where interference can affect your design. They then determine the most efficient, cost-effective way to solve EMI problems. Even if custom fabrication is the answer, they make it happen.

From the moment you pick up the phone through final delivery, you can expect swift response to any need. And, you can be assured of success because our experts draw from the industry's broadest line of high-quality products, including the recently added board level shielding solutions of BMI.

To bring our expertise into your design and deflect delays call 1.866.881.2210 or visit www.lairdtech.com.





Joel LaChance of Microsoft attended the September joint Chapter meeting of the EMC/MTT/AP Societies.



PHOTOS BY PAT ANDRÉ

Speaker Chris Holloway of NIST points out an important concept during his presentation in Seattle.

with a presentation on September 20 by Chris Holloway of NIST in Boulder, Colorado. This was a joint meeting with the Seattle IEEE Electromagnetic Compatibility (EMC) Microwave Theory and Techniques (MTT) and Antennas and Propagation (AP) Societies. Dr. Holloway presented a “double-header” in speaking on “A Discussion on Double Negative Materials, Transition Boundary Conditions, Controllable Surfaces, and Design of a New Class of Metamaterials” AND “Propagation and Detection of Signals Before, During, and After a Building Implosion.” This latter presentation was especially rousing! Dr. Holloway explained how, in recent years, there has been a great deal of attention directed towards metamaterials (i.e., engineered or man-made materials). In the context of electromagnetics, examples of these are artificial dielectrics, photonic bandgap structures, and fre-

quency-selective surfaces. More specifically and recently there have been studies on the properties and potential applications of double negative (DNG) materials. DNG materials are a class of metamaterials, also known as negative-index materials, backward media (BW), or left-handed materials, for which the effective permeability and effective permittivity are simultaneously negative. This class of metamaterials has a wide range of potential applications in electromagnetics (EM) and electromagnetic compatibility (EMC) including: (1) shielding materials, (2) low-reflection materials, (3) substrate materials, (4) antenna applications, (5) electronic switches, and (6) the so-called perfect lens. He showed that the effective permeability and permittivity of composite medium consisting of insulating magneto-dielectric spherical particles embedded in a background can be simultaneously negative for wavelengths

where the spherical inclusions are resonant to form a DNG material. The theoretical results presented showed that composite media having much simpler structure than those recently reported in the literature can exhibit negative permeability and permittivity over significant bandwidths. Metamaterials are commonly engineered by arranging a set of scatterers embedded throughout a region of space in a specific pattern so as to achieve some desirable bulk behavior of the material. This concept can be extended by judiciously placing scatterers in a two-dimensional pattern at a surface or interface. This surface version of a metamaterial has been given the name metafilm. More specifically, a metafilm is a surface distribution of electrically small scatterers characterized by electric and magnetic polarizability densities. He presented generalized sheet transition conditions (GSTCs) for the average



The spacious meeting room provided by Arrow Electronics was much appreciated by attendees at the Seattle Chapter meeting in Bellevue.



PHOTO BY MARK CHASE

Dr. Holloway (left) appreciated the speaker gift of famed Pacific Northwest wine offered by Seattle EMC Chapter Chair Pat André following the September meeting.

electromagnetic fields across a metafilm where it is shown that the coefficients in the GSTC are related to the electric and magnetic polarizability densities of the scatterers on the interface. The transmission and reflection properties of a metafilm were presented where it was shown that the transmission and reflection coefficients are found to be functions of the electric and magnetic polarizability densities. It was shown that the reflection and transmission coefficients can be controlled by changing the electric and magnetic polarizabilities in order to develop a "smart" or controllable surface. Finally, he introduced a metafilm composed of spherical magneto-dielectric particles for achieving a controllable surface. In prefacing the second presentation, Dr. Holloway noted that the National Institute of Standards and Technology (NIST) is involved with a project related to homeland security. In this project they are investigating communications problems for first-responders (firefighters and police) in disaster situations (i.e., collapsed buildings). They are also investigating various schemes for locating firefighters and

civilians who may have portable radios or cell phones and are trapped in voids in the collapsed building. Part of this work utilizes buildings that are scheduled to be imploded. They place RF transmitters in various locations in the building. The transmitters will transmit at frequencies near public safety and cell phone bands (approximately 50 MHz, 150 MHz, 250 MHz, 400 MHz, 900 MHz, and 2 GHz). Once the transmitters are in the building, the building will be imploded. They measure the received signals, before, during, and after the building is imploded. Once the building is down, they investigate various location schemes, which involve searching with directional antennas and connecting instruments to some of the metal debris located on the perimeter of the collapsed building. NIST has just recently finished three such set of experiments, one in a 13 story apartment complex in New Orleans, a second one at the Veterans Stadium in Philadelphia, and a third one at the Convention Center in Washington, DC. In his presentation, Dr. Holloway summarized the experiments in New Orleans, Philadelphia, and Washington DC. It

was a multi-media presentation, complete with photos, videos, and TV News clips of the building implosion. He also showed primary results of the data they collected and discussed some of the interesting propagation effects they observed. It was quite the presentation with a big "Wow!" factor that everyone attending appreciated. Dr. Holloway is a Senior Member of the IEEE and is presently serving as a Distinguished Lecturer for the IEEE Electromagnetic Compatibility Society. The Seattle EMC Chapter heartily recommends his presentations to other Chapters.

SE Michigan

On July 26, ETS-Lindgren, Rohde & Schwarz, the University of Michigan at Dearborn, and the Southeastern Michigan (SEM) Chapter of the IEEE Electromagnetic Compatibility (EMC) Society sponsored a free workshop entitled "Practical Automotive EMC Test and Design." Held on campus at the Fairlane Center, Dr. Shridhar, Chair of the Electrical and Computer Engineering Department at the University of Michi-


**Global Source
 for EMI/RFI Shielding Solutions**
 ISO 9001:2000 Quality System Certified

PRODUCT FEATURES:	SERVICE FEATURES:
> DURABILITY	> SELECTION
> QUALITY	> VALUE
> EFFECTIVE	> DELIVERY
> PERFORMANCE	> RESPONSIVE
> STRENGTH	

OMEGA SHIELDING PRODUCTS, INC.
 9 Emery Avenue, Randolph, New Jersey 07869
 Phone: (800) 828-5784 (973) 366-0080
 Fax: (973) 366-8232
 E-mail: sales@omegashielding.com
www.omegashielding.com

 
 Accepted

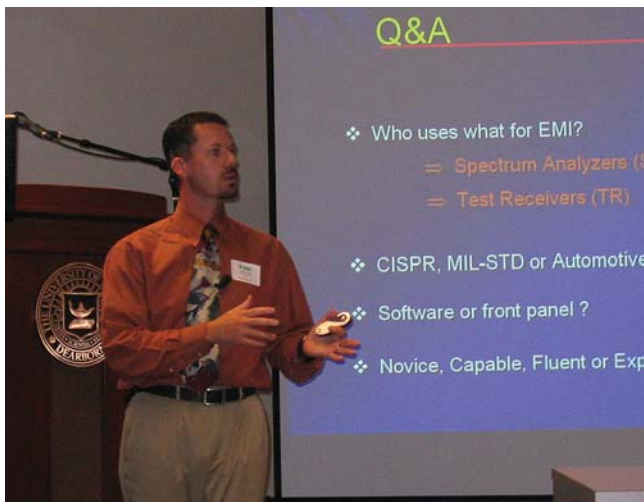
gan at Dearborn, who graciously cosponsored the event, warmly welcomed participants. Dr. Vince Rodriguez from ETS-Lindgren gave technical assistance and understanding to the assembled engineers on how to handle the 600V/m field requirements associated with the “Radar Frequency Pulse Test for Automotive Components.” Dr. Rodriguez used computer graphics to help explain the polarity of the field reflected by a conductive surface associated with the test. Dr. Rodriguez also warned us of the need for probes with special substrates that will not fry in a 600V/m field. James Young of Rohde & Schwarz spoke on “How to Improve the Accuracy of EMC Measurements in the Automotive Environment.” Mr. Young went into some of the finer points of finding the narrowband frequency that is causing trouble. Mark Steffka, with the EMC Engineering Group of General Motors (GM) Powertrain, and an adjunct faculty member with the University of Michigan at Dearborn spoke on “Automotive EMC Design, Troubleshooting, and Test Techniques: A Practical Approach.” Mark Steffka heated up the room with an oxidizing arcing demonstration explaining from whence broad-

band signals emanate. He used an MFJ-269B antenna analyzer to explain how to interfere with narrowband signals such as unwanted noisy FM stations listened to by other members of your family. It was a very informative presentation followed by a nice reception where the over 130 attendees could informally visit with the speakers. We look forward to more workshops sponsored by this group!

Singapore

Yan Seow Chiang, Chapter Secretary, reports that on August 2, the Singapore IEEE EMC Chapter and the MTT Chapter jointly organized a one day workshop on Mesoscale and Microscale Integration for Emerging Microwave Applications. This one-day workshop provided an excellent forum for interaction and sharing of ideas on the latest trends, technologies and breakthrough concepts in emerging microwave applications. For the first time in Singapore, this workshop infused the Distinguished Microwave Lecture with presentations from technology leaders. Key topics addressed included, but were not limited to, smart antennas in multi-mode networks, mixed-signal in wireless applications, EMC modeling, EMC simulation,

MEMS device with fabrication technologies, Metamaterials/advanced composite materials, and multiphysics-multiscale modeling techniques. Professor Lionel Davis, IEEE Distinguished Microwave Lecture, from UMIST, UK gave a presentation on “Modern Circulators and Isolators for Wireless, Automotive and MM-Wave Applications.” Mr. Richard Gruenwald, of EPCOS Singapore, presented “Advanced Passive Integration for Wireless Applications.” Dr. Li Er Ping, IHPC, discussed the “Advanced Modeling and Simulation and Grid Computation for Electromagnetic and Microwave Applications.” Dr. Albert Lu from SIMTech Singapore presented “Mesoscale Integration using Composite Materials.” Dr. Ooi Ban Leong from National University of Singapore, talked about “Characterization and Design of Planar UWB Antenna.” Dr. Popov Alexander Pavlovich from NUS presented “Towards Fully Integrated RF Front End.” Dr. Guo Yong Xin from the Institute of Infocomm Research presented on the “State of Art and Challenges Ahead - Radio-over-Fibre Techniques for Broadband Wireless Communication Systems.” Finally, Dr. Uppili Sridhar, Director from Maxim Integrated Products Singapore, talked about “Film Bulk Acoustic Wave RF Resonators and Filters”. EMC



James Young of Rohde & Schwarz gave a presentation on improving the accuracy of EMC measurements to the SE Michigan Chapter as part of a half-day seminar on “Practical Automotive EMC Test and Design.” The seminar on July 26 started with a warm welcome from Dr. M. Sbridbar, Professor and Chair, Electrical and Computer Engineering Department, University of Michigan - Dearborn (UMD).



Mark Steffka of General Motors, as well as adjunct professor of the University of Michigan - Dearborn, gave a presentation on automotive EMC design, troubleshooting, and test techniques at the SE Michigan Chapter seminar held on campus at UMD's Fairlane Center. He included a great demonstration to show the practicality of his material and was ably assisted by Candice Suriano of Suriano Solutions.

Super Power Radiant Arrow™



New AT2526 Radiant Arrow is designed for high field testing from 26 MHz - 250 MHz.

The Model AT2526 joins AR's family of "bent element" Radiant Arrows. Like its "brothers", the AT2526 is about 60% smaller than standard log periodic antennas. Each of the sleek Radiant Arrows is patented and can be calibrated for emissions testing. Designed for high fields from 26 MHz - 250 MHz, the AT2526 Radiant Arrow is suitable for high-field testing. It can take 15k watts of input power to generate high V/m fields.

The AR Radiant Arrow Model AT5080 operates at 80 MHz to 5 GHz and accepts 5k watts input power. Model AT5026 addresses the need for more lower-end frequency response with a range of 26 MHz to 5 GHz.

The new antenna positioner, the AP5010, is built on casters for easy movement in a shielded room or in open site testing. The design also allows the test engineer to position the antenna for either vertical or horizontal polarization as well as permitting the antenna to be tilted at 30 degrees.



AR Worldwide Competitive Edge products supply a multitude of unique RF solutions to companies around the world. Our limitless support network reaches the far corners of the globe. And our antennas are backed by the best comprehensive warranty in the business.

To learn more, visit www.ar-worldwide.com
or call us at 215.723.8181.

ISO 9001:2000
Certified

Copyright© 2005 AR Worldwide. The orange stripe on AR Worldwide products is Reg. U.S. Pat. & Tm. Off.

Quality = Value

ar worldwide • rf/microwave instrumentation

USA 215-723-8181 or 800-933-8181 for an applications engineer.

In Europe, call EMV - Munich: 89-614-1710 • London: 01908-566556 • Paris: 33-1-47-91-75-30 • Amsterdam: 31-172-423-000

ar
worldwide