

## PROVEN BENEFITS

SILENT workshops are created and taught by field-tested experts who have solved electrical noise problems for some of the world's leading companies. Our instructors combine their formal university EMC education with practical know-how from real world consulting to offer a uniquely valuable training experience.

Knowledge gained through the SILENT workshops helps participants:

- Expedite new product designs to market
- Reduce product development costs
- Solve noise problems by applying straightforward troubleshooting techniques
- Develop cost effective & manufacturable solutions
- Master advanced concepts to enable future learning and career advancement

It's no wonder that 99% of our students say they would recommend SILENT to a friend or colleague or come back for refresher courses themselves.

A few organizations that have selected **SILENT EMC classes:**

Oxford University  
Freescale Semiconductor  
General Motors University  
Garmin  
Underwriters Laboratories

*"Our employees work in an atmosphere where they are encouraged to ask questions, no matter how silly they might seem, and this class was no exception. The course was excellent. The sessions were refreshing because Lee encouraged questions and spent whatever time was required to answer them."*

**E. E. LANDSMAN, SC.D.**  
CONSULTING ENGINEER, FOUNDER  
AMERICAN POWER CONVERSION

2011 Spring Engineering  
Workshops Co-Sponsor



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**SILENT**

10 Northern Boulevard, Suite 1  
Amherst, NH 03031

*Learn from the pros.*

*Practical training in electrical noise  
reduction for better job performance*

May 2-9, 2011

Enroll now by mail, phone, fax or online  
(603) 578-1842 x 201  
[www.silent-solutions.com](http://www.silent-solutions.com)

## SPRING ENGINEERING WORKSHOPS

MAY 2-9, 2011

**ELECTRONIC PRODUCT DESIGN &  
RETROFIT FOR EMC**

**CIRCUIT TO CIRCUIT  
INTERFERENCE LAB**

**PRINTED CIRCUIT BOARD DESIGN  
FOR EMC**

**MECHANICAL DESIGN FOR EMC**



**MASTERING THE SPECTRUM  
ANALYZER FOR ELECTRICAL NOISE  
MEASUREMENTS**

**SILENT**

Solutions for your noisy world.

LOCATION:

Radisson Hotel & Conference Center  
10 Independence Drive  
Chelmsford, MA 01824

[www.silent-solutions.com](http://www.silent-solutions.com)

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## SILENT COURSES

### Circuit to Circuit Interference Lab May 2, 2011

Apply noise reduction concepts as you learn to anticipate and solve electrical noise problems in this one-day, hands-on class. Each group of two or three participants will receive a noise 'tool box' to build noise source and victim circuits. Taught by Randal Vaughn.

### Electronic Product Design & Retrofit May 3 & 4, 2011

Discover how to successfully recognize, solve and avoid common EMI problems, including radiated and conducted emissions, electrostatic discharge (ESD) and radiated and conducted immunity. Demonstrations using working hardware illustrate concepts such as radiated emissions, common-mode current and crosstalk in connectors, cables and IC packages. *Each participant in this two-day class will receive a "homework assignment" to be completed prior to the start of class.* Taught by Lee Hill.

### Printed Circuit Board Design for EMC May 3 & 5, 2011

### Mechanical Design for EMC May 3 & 6, 2011

Attend the first day of the two-day Electronic Product Design & Retrofit class to learn about the physical principles of electrical noise, and then receive a full day of targeted instruction just for mechanical engineers or printed circuit board designers. Taught by Lee Hill.

- **PCB Design Topics:** PCB decoupling at low and high frequencies, PCB stackup, grounding, return currents, ground loops and illustrations of "good" and "bad" PCB designs.
- **Mechanical Design Topics:** Grounding and shielding of PCBs, enclosures, shielded/unshielded cable assemblies, resonant enclosures and slots, heat sinks, and unintentional antennas, and the proper use and placement of fasteners and conductive gaskets.

### **NEW** Mastering the Spectrum Analyzer for Electrical Noise Measurements May 9, 2011

The only class of its kind offered in the U.S., *Mastering the Spectrum Analyzer* will train you in the techniques that SILENT has distilled over fifty years of combined troubleshooting experience. Significant instructional time is devoted to making specific EMC measurements including conducted, radiated, near-field, and conducted RF power. Content emphasizes instrument settings, pitfalls, and tips rather than "button-pushing to run a test". Course attendees are encouraged to bring a spectrum analyzer or test receiver to class, and four different machines including the Rohde & Schwarz ESPI-3, ESL-3, Agilent E7405, and HP 8591EM will be available for class exercises. The hands-on practice also provides an excellent opportunity for attendees considering purchasing a new or used spectrum analyzer or test receiver. Those who bring a unit to class will receive individualized instruction to create "saved set-ups" customized for their workplace. Taught by Lee Hill.

## SILENT INSTRUCTORS

### LEE HILL, Founding Partner of SILENT

Lee received his M.S.E.E. from the University of Missouri-Rolla. He has over twenty years of experience in the EMC design and retrofit of complex electronic systems. In addition to his work as a course instructor, Lee provides SILENT's clients with EMC design reviews, on-site hardware troubleshooting and expert witness services. He is also a regular EMC course instructor for the University of Oxford, and General Motors University. Lee consults and teaches worldwide, and has presented classes in Taiwan, Singapore, Mexico, Norway, Canada, South Korea, France and United Kingdom. He is a past member (2004-07) of the IEEE EMC Society Board of Directors, and is a past Chair of the Society's Distinguished Lecturer Program. Lee will be an instructor at the 2011 IEEE EMC Society Global University. He holds a patent for the control of electrical noise in portable electronics.



### RANDAL VAUGHN, Partner at SILENT

Randal received his B.S. in physics from Louisiana State University and advanced training in EMC from the University of Missouri-Rolla. He has 26 years of RF design and EMC experience. Randal has created a variety of high performance industrial and military radio system and circuit designs. He has also developed RF & EMC troubleshooting solutions for many product types, including high speed digital controllers, cellular base stations and high frequency/high power RF transmitters. Randal provides SILENT's clients with EMC design reviews, on-site hardware troubleshooting and course instruction.



For a complete description download our newest EMC course catalog at [www.silent-solutions.com/pdfs/SilentEMCcoursecatalog.pdf](http://www.silent-solutions.com/pdfs/SilentEMCcoursecatalog.pdf).

#### All courses are ideal for:

- Experienced circuit and system design engineers
- EMC engineers
- Engineers with time-to-market design projects
- Engineers interested in electrical noise issues in sensors, cables and amplifiers
- Novices in EMI problem solving

## REGISTER TODAY!

Radisson Hotel & Conference Center,  
10 Independence Drive, Chelmsford, MA 01824

Date	Course	Per Attendee	Register Me
May 2	<b>Circuit to Circuit</b>	\$795	<input type="checkbox"/>
May 3 & 4	<b>Design &amp; Retrofit</b>	\$995	<input type="checkbox"/>
	Add <b>PCB Design</b> (May 5)	\$595	<input type="checkbox"/>
May 3 & 5	<b>PCB Design</b>	\$995	<input type="checkbox"/>
	Add <b>Mech. Design</b> (May 6)	\$595	<input type="checkbox"/>
May 3 & 6	<b>Mechanical Design</b>	\$995	<input type="checkbox"/>
	Add <b>PCB Design</b> (May 5)	\$595	<input type="checkbox"/>
May 9	<b>Spectrum Analyzer</b>	\$795	<input type="checkbox"/>

**SIGN UP FOR 3 OR MORE DAYS OF CLASSES AND SAVE 15%!**

#### Registration:

To register, check off the classes that you wish to attend and mail this form with payment, call Diane Querze at SILENT (603) 578-1842 X 201, or register online at [www.silent-solutions.com](http://www.silent-solutions.com).

Name

Company Name

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Phone

Email

#### Method of payment (circle preference)

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Name as it appears on card

Visa / Master / AMEX 3 digit CVC (security code on back)

Signature  Exp date

If paying by check or company purchase order, please make payable to: **SILENT Solutions LLC**

10 Northern Boulevard, Suite 1  
Amherst, NH 03031  
Phone: +1 (603) 578-1842  
Fax: +1 (603) 578-1843  
Email: [dquerze@silent-solutions.com](mailto:dquerze@silent-solutions.com)

All class registrants will receive an email and letter confirming receipt of registration information and providing additional details about the course content.

**SILENT**

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