

## News bits

### CDM/SDM equipment survey

The ESDA standards working group 5.3.2 on socketed discharge model (SDM) is seeking input on CDM/SDM test equipment to assist in the development of an SDM test standard. To participate in the survey, download the questionnaire from the ESDA Web site, [www.esda.org](http://www.esda.org).

### New on the Web

ESDA members can now download copies of ESDA standards technical reports as well as copies of significant device papers from the EOS/ESD Symposium. Go to [www.esda.org](http://www.esda.org) and click on "For Members."

### Exhibit space available

Nearly 70 exhibitors are already committed to the 2002 EOS/ESD Symposium. There is still good space available, but it's going fast. For information on exhibiting, contact Scien-Tech Associates, Inc., P.O. Box 2097, Banner Elk, NC 28604-2097, Phone: 828-898-6375, Fax: 828-898-6379.

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## A Symposium to remember



Taking a cue from the tradition of the theater, the 2001 EOS/ESD Symposium did go on in spite of the distractions.

As attendees, exhibitors, and committees coped with the extraordinary events of September 11, various Symposium and Association committees worked feverishly behind the scenes to reduce obstacles for attendees.

A record number of technical papers covered the latest developments in the area, including the emerging topics of RF ESD design and transmission line pulsing.

Authors answered probing questions from the audience and met in the authors' corners for further discussion.

Attendees visited the booths of more than 100 exhibitors of ESD control products and services.

Workshops and tutorials offered education and the opportunity to share experiences and obtain answers to specific problems.

Tak H. Ning from IBM's Thomas J. Watson Research center provided attendees with crystal ball look at the future of silicon device technologies.

And, during breaks in the Symposium activity and between visits to the exhib-

its, attendees dealt with changing travel plans, sought news of friends and relatives, and checked the events of the week.

*More Symposium on page 6*

## Association elects directors, officers

The ESD Association has selected board members and officers for 2002.

Elected to the Board of Directors for three-year terms were Kay Adams, Tech Wear, Inc., Carlsbad, CA; David Swenson, 3M, Austin, TX; Mark Kelly, Delphi Delco Electronics Systems, Kokomo, IN; and Mike Chaine, Micron Technology, Boise, ID.

The Board of Directors also elected its officers. They are President, Stephen Halperin, Stephen Halperin & Associates/Prostat Corporation, Bensenville, IL; Senior Vice President, Ed Weggeland, Richmond Technology, Redlands, CA; and Vice President, Mark Kelly, Delphi Delco Electronics Systems, Kokomo, IN. In addition, Kay Adams was reappointed as Secretary and Ron Gibson, Celestica, Inc., was appointed Treasurer.

## From the president

## Symposium adapts; the torch is passed

This column is typically a Symposium wrap up, a yearly wrap up, and my last article as President. My two terms as president are complete. However, accolades and wonderful future predictions are not what this column is about.



John Kinnear

This year's EOS/ESD Symposium featured a rich collection of tutorials and technical papers. The scope and technical content grow each year. When we began our Symposium planning, we expected this year's event to be just as good as last year. Little did we know that the economy would face such a decline. The bottom fell out of the electronics industry and our Symposium was going to suffer along with the rest of the industry.

But the economic downturn seems insignificant compared with the events that happened opening day of Symposium. September 11, 2001 will be a day that I and many others will remember for the rest of our lives. While the monitors in the halls replayed the events of the day, the Symposium took on a somber feeling for the rest of the event.

Sometimes, out of these events, people rise to the occasion. I would just like to thank Mark Kelly, the general chair for this year's Symposium for the leadership he showed during the entire event. He was able to keep the Symposium going by making decisions, even difficult ones, on the spot. With Mark and his team in charge, the Symposium continued without a hitch. At least without a hitch as viewed by the attendees. This was a direct reflection of Mark's leadership and his attention to details. Thanks again, Mark.

The ESD Association will have new officers for next year. As announced, Steve Halperin will be President, Ed Weggeland

will be Senior Vice President and Mark Kelly will be the Vice President. I am confident that the ESD Association is in good hands with that team. I have had the pleasure of working with them for the past couple of years and I have all the confidence in the world they are the right people for the job.

I would just like to close with my own thank you to the team that helped me lead the ESD Association for the past two years. My Senior Vice President Steve Halperin and Vice President Ed Weggeland made my job very easy with the support, teamwork and advice they have given me. I would also like to thank the Board of Directors for allowing me to lead the ESD Association with all the support that I needed for the last two years. I would like to thank all the volunteers who work so hard to make this Association as good as it is. Finally, I would like to thank our staff, Lisa, Lauri, Donna, and Maureen for all the help and support they have shown me. Thanks to everyone.

## Threshold

THRESHOLD™ is published six times a year for members of the ESD Association, a not-for-profit corporation. It strives for the advancement of theory and practice of electrical overstress avoidance and of allied arts and sciences and the maintenance of a high professional standing among its members and others.

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## Threshold™ Publication Schedule

Issue	Deadlines
January/February	Dec. 1
March/April	Feb. 1
May/June	April 1
July/August	June 1
September/October	Aug. 1
November/December	Oct. 1



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## EOS/ESD Symposium

## Symposium presents paper and presentation awards



The EOS/ESD Symposium has presented its Best Paper, Best Student Paper, and Best Presentation awards from the 2000 Symposium. The awards were presented September 11 during the annual awards breakfast at the 2001 Symposium in Portland, OR.

**Above, left:** The Best Paper award was presented to James W. Miller, Michael G. Khazhinsky, and James C. Weldon, Motorola, Inc., Austin, TX for their paper *Engineering the Cascoded NMOS Output Buffer for Maximum  $V_{it}$* . Symposium Vice

Chair, Steve Voldman (right) presented the award to James Miller.

**Above, right:** The Best Presentation award was presented to Koen Verhaege, Sarnoff Europe, Gistel, Belgium, and Christian Russ, Sarnoff Corporation, Princeton, NJ for their paper *Wafer Cost Reduction Through Design of High Performance Fully Silicided ESD Devices*. Symposium Vice Chair, Steve Voldman (right) presented the award to Koen Verhaege.

The Best Student Paper was presented to Jaesik Lee and Sung-Mo Kang from the

University of Illinois, Urbana, IL, for their paper *Chip-Level Simulation for CDM Failures in Multi-Power ICs*. The paper was co-authored by Yoonjong Huh, Jau-Wen Chen, and Peter Bendix of LSI Logic Corporation, Milpitas, CA.

The Best Paper and the Best Student paper are based on the technical content of the paper and are chosen by the Symposium's technical program committee. The Best Presentation is based on the presentation quality and style and is determined by the attendees.

## Calendar of events

## November 2001

**Northeast Chapter Membership Meeting:** November 7, 2001, How to Comply with S20.20, [www.nechapteresda.org](http://www.nechapteresda.org)

**Arizona Chapter Membership Meeting:** November 12, 2001, Packaging and Handling of ESD Sensitive Devices, Denny's, [www.azesd.org](http://www.azesd.org)

**Texas Chapter Membership Meeting:** November 12, 2001, Sematech, Austin, TX, [www.centxesdassoc.homestead.com](http://www.centxesdassoc.homestead.com)

**Midwest ESD Chapter Meeting:** November 14, 2001, Drive-By ESD, Ken Kern, Siemens Medical Systems, Bimbo's Restaurant, Palatine, IL, [www.midwestesd.org](http://www.midwestesd.org)

**ESD Northwest Membership Meeting:** November 14, 2001, ESD Concerns in Medical Device Manufacturing, Mark Miller, Medtronic, Sweetbrier Inn, Tualatin, OR, [www.esdnw.org](http://www.esdnw.org)

**Silicon Valley ESD Society Membership Meeting:** November 20, Silicon Valley Ramada Inn, Sunnyvale, CA, [www.esdsiva.org](http://www.esdsiva.org)

## December 2001

Silicon Valley ESD Society Holiday Party, [www.esdsiva.org](http://www.esdsiva.org)

## January 2002

**Midwest ESD Chapter Meeting:** January 9, 2002, Zap Zar Panel, Bimbo's Restaurant, Palatine, IL, [www.midwestesd.org](http://www.midwestesd.org)

ESD Northwest Membership Meeting: January 9, 2002, [www.esdnw.org](http://www.esdnw.org)

**Texas Chapter Membership Meeting:** January 28, 2001, Sematech, Austin, TX, [www.centxesdassoc.homestead.com](http://www.centxesdassoc.homestead.com)

## What makes the ESD Association run?

The volunteers, nearly 200 of them.

They were all honored at the annual Volunteer Recognition dinner, immediately preceding the 2001 EOS/ESD Symposium.

In assessing the role of volunteers in the Association, John Kinnear, Jr., President, and Ginger Hansel, Volunteer Program Chair, commented, "Without the outstanding effort of our volunteers, the ESD Association would not be the 'class act' that it is today."

During the past year alone, here are some of the Association's volunteer accomplishments:

- A diverse Symposium program with a full tutorial program
- Standards that have been recognized by the IEC, FDA and major corporations worldwide
- A facility certification program to ANSI/ESD S20.20 that now has registrars in North America and Asia
- Continued growth of the ESD Professional Certification program
- The strengthening of our own ability to work together as a team
- Work with organizations, such as Cleanroom/Datator, IEST, IPC, and others, to create, review and carry out new programs
- Increased interest in local chapters throughout the US as well as in Mexico, Singapore, Malaysia, and Finland

In addition to recognizing the nearly 200 volunteers in the organization, several individuals were cited for special contributions during the year. You'll find photos of these individuals on pages 4 and 5 of this issue.

The bottom line is that the ESD Association would not exist without its volunteers.

*continued on page 5*



### Unsung heroes

*Raivo Leeto (left) and Cheryl Checketts work in the background, helping make the Symposium and Association activities run smoothly. Raivo has served as Symposium Registration Advisor, and Cheryl has worked with standards, Symposium arrangements, and the women's reception.*



### Familiar faces

*Andy and Doris Murello have organized the Symposium spouse and guest hospitality and manned the information booth, providing directions, help, and casual conversation, to make Symposium attendees feel comfortable during Symposium week. Mark Kelly (left), 2001 Symposium Chair paid special recognition to the Murellos for their efforts in behalf of the Symposium.*

*continued from page 4*

## ESDA volunteers



*John Mick (right) is recognized for his hours of work on Symposium arrangements by Mark Kelly, Symposium Chair.*



*Ron Gibson (right), Standards Chair, cited Steve Gerken for his work heading the standards TAS committee.*



*John Kinnear, Jr. (right), Association President, presents Mark Kelly with a plaque for Mark's work as 2001 Symposium Chair.*

### The Association's roster of volunteers

The following individuals were acknowledged for their contributions to the Association during the Volunteer Recognition dinner.

Kay Adams - Tom Albano - Jack Allen - Ryne Allen - Yogi Anand - Warren Anderson - Robert Ashton - Rick Asmar - Marise Bafleur - Kaustav Banerjee - David Barber - Sandy Barber - Jon Barth - Ben Baumgartner - Brent Beamer - Carol Beaulieu - Kim Becker - Donn Bellmore - Bob Benson - Joseph Bernier - Joe Blanchard - Don Boehm - Ray Bowman - Mike Brandt - Rick Brin - Julius Brodbeck - Tilo Brodbeck - Nicki Brown - Larry Burich - Bob Carey - Al Cash - William Casselman - Mike Chaine - Jack Chandler - Gene Chase - Cheryl Checketts - David Chestnut - Gregg Croft - Joseph Crowley - Ted Dangelmayer - Jeff Daughton - Keith Davies - Ed Davis - Dale Day - Louis DeChiaro - Sonny Delucca - Ron Dempshar - Rick Diaz - Tom Diep - John Dollar - Hank Domingos - Belinda Doyle - Mike Doyle - Jerry Dull - Charvaka Duvvury - Raffy Espiritu - Tim Fahey - Marty Farris - Melissa Feeney-Jolliff - Stephen Fowler - Reinhold Gaertner - Steven Gerken - Ron Gibson - Horst Gieser - Jerry Giuliano - Kurt Goodson - Eric Granstrom - Guido Groeseneken - Vaughn Gross - Davide Guarisco - Toni Gurga - Irvan Guss - Stephen Halperin - Jay Hamlin - Ginger Hansel - Arleigh Hartkopf - Colin Hatchard - Leo G. Henry - Gene Hernandez - Jenny Himle - Masamitsu Honda - Mike Hopkins - Brent Howard - Timothy Hughbanks - Tom Hume - Minty Huynh - Hugh Hyatt - Richard Ida - Satoshi Isofuku - Natarajan Mahadeva Iyer - Tim Jarret - Joe Jesse - Gene Johnson - Harry Jolliff - Niels Jonassen - Jason Kelley - Mark Kelly - Ming-Dou Ker - Ken Kern - George Kilner - Kyung Kim - John Kinnear - Stephen Koehn - Harry Lamberth - Dave Leeson - Raivo Leeto - Don Lin - John Maas - Andrew Magenheim - Timothy Maloney - Mike Manders - Jim Mann - Kris Meacham - Markus Mergens - Bill Metz - Carl Metz - Thomas Meuse - John Mick - John Mikel - Stephanie Milam - Jim Miller - Renee Mitchell - Vermillion - Julian Montoya - Ian Morgan - Ken Morman - Russ Moulton - Ton Mouthaan - Andreas Mueller - Andy Murello - Doris Murello - Carl Newberg - Steve Nosek - Jim Novak - Chris O'Connor - Sue Ohrman - Dale Parkin - Salome Pascal - Louis Patterson - Charles Perry - Robert Perry - Donald Pierce - David Pommerenke - Donald Pritchard - Bernie Reiland - Joachim Reiner - Bob Renker - Corinne Richier - Bill Ricker - Dennis Rivers - Richard Rodrigo - Martin Rudat - Christian Russ - Jeff Salisbury - Craig Salling - Glenn Saracino - John Schuch - Ross Scimeca - Gary Seale - Don Skinner - Theo Smedes - Doug Smith - Jeremy Smith - Harlan Snyder - Joe Spitz - Arnold Steinman - Gary Sutorius - David Swenson - Wayne Tan - Howard Tang - Fred Tenzer - Gary Timmons - Larry Ting - Ernest Tousignant - Dale Tucker - Art Tully - Julius Turangan - Burt Unger - Art Varga - Julie Vaughn - Tony Vengarick - Koen Verhaege - Bob Vermillion - Jim Vinson - Steven Voldman - Albert Wallash - Rocke Warren - Debbie Weggeland - Ed Weggeland - Merle Weight - Gary Weiss - Stan Weitz - Gene Williams - Dave Wolf - Heinrich Wolf - Eugene Worley - Craig Zander

Symposium highlights

Attendees at the technical sessions concentrated on the content, asked questions of the speakers (right), then continued further discussion at the authors' corners (below).



(Above and left) Three days of ESD tutorials provided attendees with in-depth education in specific areas of interest such as ESD basics, understanding ESD in magnetic recording, and on-chip protection.

(Below) The exhibit hall offered attendees the opportunity to find specific products and services to help them solve their EOS/ESD problems.



For some attendees, the week ended on Friday with the ESDC professional certification exam.





*Whether it's meeting keynote presenter, Tak Ning (above, left), conversing at the university professor and student reception (above), or renewing acquaintances at the women's reception (left), sharing information and experiences is a key activity at the Symposium.*

*(below) Workshops give participants the chance to ask questions and share relevant experiences on specific topic areas.*



## September 2001 standards meetings and activities

by

Michael T. Brandt, Editor

### Document review

Two existing standards were reaffirmed. *STM 5.3.1: Electrostatic Discharge Sensitivity Testing — Charged Device Model* was reaffirmed as a Standard Test Method with corrections made of printing errors in the Table 1 — device sensitivity classifications.

*S8.1: Symbols* was reaffirmed as a standard with no changes.

### New technical reports

The Association has published three new technical reports:

*ESD TR10-01: Machine Model (MM) Electrostatic Discharge (ESD) Investigation – Reduction in Pulse Number and Delay Time*

*ESD TR11-01: Electrostatic Guidelines and Considerations for Cleanrooms and Clean Manufacturing*

*ESD TR12-01: Survey of Constant (Continuous) Monitors for Wrist Straps*

Copies may be purchased from Association headquarters. ESDA members may download copies for free from the Association Web site, [www.esda.org](http://www.esda.org)

### Working group activities

**Ionization WG-3** continued review of a draft technical report covering alternate test methods to the charged plate monitor (CPM) for determining discharge time and offset voltage in ionizers. The group discussed preliminary CPM test results of measurements taken with different plate sizes, different plate shapes, and different plate spacing to ground and reviewed a report on neutralization of charged conductors.

**Worksurfaces WG-4** reviewed input to its draft technical report *A Survey of Static Control Worksurfaces and Grounding Mechanisms* and made several changes. The re-

port will be reviewed again in February. The group also began discussions of future work including low voltage measurements and looking at technical advances that have occurred since the introduction of *ANSI/ESD STM4.2 —ESD Protective Worksurfaces Charge Dissipation Characteristics*

**Human Body Model Device Testing WG-5.1** is working on methods for measuring and calculating the peak current, adding new rise time requirements to the standard, and developing a definition for ringing. The group is considering two methods of measuring the peak current. One manually fits a straight line to an exponential curve and the other uses actual scope data to calculate the peak current. The group is evaluating whether to include both methods in the document. The issues of rise time and ringing will be covered in a new technical report to be written during the coming year.

**Machine Model Device Testing WG-5.2** completed its technical report, *Machine Model (MM) Electrostatic Discharge (ESD) Investigation – Reduction in Pulse Number and Delay Time*, which is now available from Association headquarters. The group is planning an industry survey on machine model ESD for distribution in 2002.

**CDM Device Testing WG-5.3.1** reviewed various “hot topics” (dielectric materials, verification modules, ground plane, calibration and CDM stress testing) and decided to concentrate on developing a calibration procedure by its February meeting.

**Socket Discharge Model (SDM) Device Testing WG-5.3.2** is distributing a survey on socketed CDM test equipment. (Download a copy from the ESDA Web site, [www.esda.org](http://www.esda.org)). An initial draft standard practice document is complete and is now being reviewed. Major issues to be resolved include the procedure for charging the device and whether a section on de-rating factors should be included in

the appendix or the body of the document.

**Transient Latch-Up Device Testing WG-5.4** reviewed comments received on its initial draft standard practice covering transient latch-up. The majority of the issues were related to specification of equipment and support data. The group is identifying and obtaining sample devices to be used in round-robin testing. The group anticipates having test data available for review by the February meeting series.

**Transmission Line Pulsing WG-5.5** reviewed comments to its WIP standard practice draft with emphasis on the varification and calibration sections.

**Flooring WG-7** is addressing the issue of making resistance measurements at 10 volts. Initial testing will be conducted to

*Continued on page 9*

### Tentative Schedule February ESD Association Standards Meeting Series

Charlotte, NC  
February 1-3, 2002

#### Friday, February 1, 2002

8:00 AM: Ionization WG-3  
Device Testing Working  
Groups WG-5  
1:00 PM Worksurfaces WG-4  
Handlers WG-10

#### Saturday, February 2, 2002

8:00 AM: Device Testing Working  
Groups WG-5  
Footwear WG-9  
Work Stations WG-53  
Cleanroom Consider-  
ations WG-55  
1:00 PM Packaging WG-11

#### Sunday, February 3, 2002

8:00 AM: Handtools WG-13  
Simulators WG-14  
Flooring WG-7 (Tenta-  
tive  
Gloves WG-15  
1:00 PM: Standards Committee

Continued from page 8

## Standards update

determine issues involved and to gain a better understanding of these issues. The group is also discussing preparation of a technical report covering installation considerations with flooring materials. The group is looking for new members. Interested persons should contact interim chair Dale Tucker via e-mail at dhtucker@vpicorp.com.

**Footwear WG-9** reviewed comments to its initial draft document for measuring the electrical resistance of foot grounders and is considering whether there is sufficient data for the document to be a standard test method rather than a standard practice.

**Handlers WG-10** reviewed comments on its draft technical report on automated handlers. The group clarified references

to soft grounds and non-contact voltage measurements.

**Packaging WG-11** has completed its draft 541 document and will be conducting a group review and vote on the document. **Two Point Resistance (Packaging) WG-11.13** needs to acquire a third probe before beginning round-robin testing.

**Handtools WG-13** reviewed capacitance versus energy test data for pliers and screwdrivers. The group discussed the need to test other types of tools and decided to concentrate on tweezers and vacuum pencils. The committee also will investigate whether existing text fixtures are applicable to small handtools.

**Simulators WG-14** will develop its discharge current document as a standard practice rather than as a standard. The group also reviewed initial work on a docu-

ment covering radiated fields.

**Gloves WG-15** is redesigning its text fixture because of variability problems due to force and pressure. Additional testing will be conducted with the new fixture as well as with other probes.

**Workstations WG-53** reviewed its existing advisory, working on a section on troubleshooting guidance to assist users in meeting the compliance verification requirements of *ANSI/ESD S20.20*. The existing advisory is being updated with a goal of converting it to a standard practice or standard test method.

**Cleanrooms WG-55** completed its technical report, which is now available. The group is also working on future additions covering cleanroom garments and cleanroom tape and reel packaging.

## From the Threshold chair

### Thanks to all of you

This is the last issue for 2001. Your newsletter chair wishes to thank all of you for whatever role you played in making *Threshold* what it is today - successful. I also wish to thank the editor, Mike B., for making my



Leo G. Henry

job so much easier for the last year, and especially since he started the job as editor. You, the readers, have helped us achieve many of the *Threshold* objectives. Specifically, I point to the image of the ESD Association being a knowledgeable, professional organization in its dominant field of interest- ESD. You have done that in many ways, including providing technical articles and letters to the editor on a consistent basis. Keep up the good work and keep the submissions coming.

*Leo G*

## EOS/ESD Symposium

### Symposium 2002 cycle underway!

by Steven H. Voldman  
2002 Symposium General Chair

EOS/ESD 2001 ended only a few weeks ago and yet the cycle has begun for preparing for 2002!

First, the EOS/ESD Symposium 2002 steering committee is beginning to take shape. An experienced team is being put together to provide the best Symposium support possible. Joe Bernier will serve as vice chair and John Kinnear will serve as technical program chairman. The rest of the team will include Mark Kelly, Past General Chair; Cheryl Checketts, Arrangements Chair; Leo G. Henry; Arrangements Support; Raivo Leeto, Registration Advisor; Dale Parkin, Workshop Chair; Tim Jarrett, AV Chair; Debbie Weggeland,



Exhibitors Liaison; Michael Brandt, marketing consultant; David and Sandy Barber of Scien-Tech Inc., Symposium and convention consultants; the ESD Association headquarters team...and more!

With next year's Symposium just around the corner, we need to close up the development and research notebooks and begin to write the summary and abstract for the 2002 Symposium. We are looking for your best submissions in materials, factory issues, systems, magnetic recording, standards, testing, transmission line pulse testing, MEMs, compound semiconductors, RF applications, and traditional areas. Contact Association headquarters for the call for papers or download it from [www.esda.org](http://www.esda.org).

For next year's Symposium we will continue to support the paper awards program, including the best student paper award that was initiated in 2001. We encourage research facilities and universities to participate in this new program. We need and want student submissions.

## Portland smiles on golfers

Blue skies, warm temperatures and a cordial welcome greeted 46 golfers in the first ESDA David F. Barber Jr. Charity golf tournament on Saturday, September 9 preceding the EOS/ESD Symposium.

Novices teamed up with more experienced players for an afternoon of fun that also raised fund for the Portland area Ronald McDonald Houses.

When the afternoon sun finally set on the course, the Ronald McDonald Houses were the clear winners. Not only did the organization receive a check from the tournament, but a team field by organization also took first place in the scramble event. The winning teams were:

**First Place:** Tom Soma, Bill Swindells, Doug Wacker, Alex Schwindt (Representing the Portland area Ronald McDonald Houses)

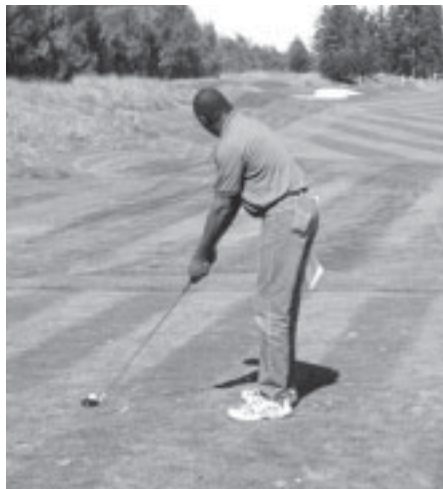
**Second Place:** Dale Gross, In-Kyu Chang, John Truitt, Bret Briggs (Representing Flexco)

**Third Place:** Steve Gerken, Don Pierce, David Swenson, Geri Swenson (Representing the ESD Association)

Plans are underway for a similar event preceding the 2002 Symposium in Charlotte, NC.



Mike Chaine shows off his putting technique.



Leo G. Henry takes aim down the fairway.



### Tournament Sponsors and Contributors

The following organizations were sponsors or prize contributors for this year's golf tournament:

- 3m Handling and Protection Division
- EOS/ESD Symposium
- ESD Association
- Marketing Resources Ltd.
- Prostat Corporation
- Scien-Tech Associates
- Stephen Halperin & Associates
- Tech Wear, Inc.
- Texas Instruments
- Z-Mar Technology
- International Golf Discount and "Taylor Made"
- Pop's Golf Shop
- Caplan Sportsworld
- Monte Shelton Motor Company



The net proceeds from the tournament were presented to Tom Soma (right), Executive Director of the Portland area Ronald McDonald Houses, by David Swenson (center) and Steve Gerken (left), event co-chairs, during the ESD Association Annual Luncheon, September 12.

Some consultation among Sarnoff Europe team members was necessary to sink the putt.

## Institutional Listings

<p><b>Desco Charleswater East</b> 90 Hudson Rd., Canton, MA 02021-1407 Tel: 781-821-8370 Fax: 781-575-0172 www.charleswater.com Manufacturer of ESD control products including wrist straps, mats, floor finish, Micastat laminate, shielding bags, &amp; much, much more</p>	<p><b>ACL Staticide</b> 1960 E. Devon Avenue, Elk Grove Village, IL 60007 Tel: 847-981-9212 Fax: 847-981-9278 www.aclstaticide.com Cleanroom products, topical antistats, floor finishes and coatings, static detection meters, monitors, computer cleaning products</p>
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<p><b>ESD Systems.com</b> 19 Brigham St. Unit 9, Marlboro, MA 01752 Tel: 508-485-7390 Fax: 508-480-0257 www.esdsystems.com A full line of ESD control products: wrist straps/foot grounders/mats/ionizers/floor finish/shielding bags/smocks/ testers &amp; more</p>	<p><b>Wolfgang Warmbier</b> Untere Giesswiesen 21, D-78247 Hilzingen, Germany Tel: 49-7731-86880 Fax: 49-7731-868832 www.warmbier.com ISO 9002 Certified for advice, supply and manufacturing of static control materials and systems</p>
<p><b>Bijl/Barneveld</b> Hermesweg 28, NL-3771 ND Barneveld, Holland Tel: 31-342-490147 Fax: 31-342-416845 Europe's small but most reputable distributor of ESD Control Products. ISO 9002 certified.</p>	<p><b>C &amp; M Consulting</b> ESD Control Program Consultants www.esdconsultants.com Tel: 512-282-9039 Facility Audits • Training • Technical troubleshooting "A Quality System Approach to ESD Control Programs"</p>
<p><b>Monroe Electronics</b> 100 Housel Avenue, Lyndonville, NY 14098 Tel: 716-765-2254 Fax: 716-765-9330 www.monroe-electronics.com Full line manufacturer of static measurement equipment</p>	<p><b>Carmelstat</b> P.O.B. 1468, Haifa 31014, Israel Tel: 972-4-846-6016 Fax: 972-4-846-6958 www.carmelstat.com Manufacturer of ESD thermoplastic compounds for shipping, storage, and inplant handling products</p>
<p><b>Static Solutions, Inc.</b> 331 Boston Post Rd. E., Marlboro, MA 01752 Tel: 508-480-0700 Fax: 508-485-3353 www.staticsolutions.com World Wide Mfg. of Industry First ESD-Clean Room Products Monitors/Testers/Coatings, Industry First Products</p>	<p><b>PSSI (Plug-in Storage Systems, Inc.)</b> 284-A Racebrook Road, PO Box 928, Orange, CT 06477 Tel: 800-231-5952 Fax: 800-532-2999 Email: info@pluginstorage.com Protective storage cabinets, carrying cases, carts, work benches and seating for handling ESD-sensitive circuit boards and electronic devices.</p>
<p><b>HMS Compounds, Inc.</b> P.O. Box 388, Mansfield, TX 76063 Tel: 817-468-3099 Fax: 817-468-3122 www.hmscompounds.com Manufacturers of Conductive and Static Dissipative Thermoplastic Sheet and Roll Stock for ESD Protection</p>	<p><b>PRF USA, INC.</b> P.O. Box 6505, Carlstadt, NJ 07072 Tel: 201-804-5565 Fax: 201-804-5567 www.esdrubber.com Static Dissipative/ESD Control Rubber Flooring Static Dissipative Floor Mats and Table Mats</p>
<p><b>Polyonics</b> 867 Rt. 12, Westmoreland, NH 03467 Tel: 603-352-1415 Fax: 603-352-1936 Toll Free: 888-POLYONX Manufacturers of high temperature and static dissipative tape, tag, and label materials</p>	<p><b>ALX Technical</b> 30 MacIntosh Blvd., Suite 5, Concord, Ontario L4K 4P1 Canada Tel: 905-761-0370 Fax: 905-761-0371 info@alxtechnical.com www.alxtechnical.com Manufactures of ESD and ESD Cleanroom Paper, ESDNotes™ adhesive backed paper and ESD Labels</p>
<p><b>rubberbands.net</b> P.O. Box 75267 Colorado Springs, CO 80970 Tel/Fax: 719-683-2419 www.rubberbands.net Electronic Grade Rubber Bands, mfd. in the USA, vacuum-sealed Antistatic, dissipative, conductive with distributors worldwide</p>	<p><b>Polyflor Static Control Flooring</b> 365 Walt Sanders Memorial Drive, Newnan, GA 30265 Tel: 800-852-8292 Fax: 770-252-4894 Email: Fhill@lowandbonar.com www.Polyflor.com Worldwide manufacturer and distributor of ESD control conductive and dissipative vinyl floors available in both sheet and tile.</p>
<p><b>VPI Mirrex Corp</b> 1389 School House Road, Delaware City, DE 19706 Tel: 302-836-5950 Fax: 302-836-7571 www.vpicorp.com Manufacturer of ESD thermoplastic materials for the display and protection of static sensitive components.</p>	<p><b>Saint-Gobain Advanced Ceramics</b> 1225 Aeroplaza Drive, Colorado Springs, CO 80916 Tel: 719-637-8734 Fax: 719-380-5591 Email: JB.Lafon@saint-gobain.com Manufacturer of Cerastat™ ESD ceramics products to customers prints: tools, fixtures, wear parts for data storage and other electronic industries</p>

Minimum rates are \$600.00 for six consecutive issues. Larger contributions will be most welcome. No agency fee is granted for soliciting such contributions. Inquiries, or contributions made payable to the ESD Association, plus instructions on how you wish your Institutional Listing to appear, should be sent to: ESD Association, 7900 Turin Rd., Building 3, Rome, NY 13440-2069 Tel: (315) 339-6937, Fax: (315) 339-6793, email: eosesd@aol.com http://www.esda.org

## Institutional Listings

<p><b>Howell Packaging, Division of F.M. Howell &amp; Company</b>  P.O. Box 286, Elmira, NY 14902  Tel: 607-734-6291 Fax: 607-734-8667  Designers &amp; Manufacturers of ESD Protective Packaging,  Paperboard &amp; Thermoformed Plastic, In-House Testing</p>	<p><b>Julie Industries, Inc.</b>  355 Middlesex Avenue, Wilmington, MA 01887-0783  Tel: 978-988-8802 Fax: 978-988-8803  Email: questions@julieindustries.com  StaticSmart™ products including carpet, rubber &amp; polymeric flooring,  personnel grounding products &amp; materials, ESD workstations and chairs</p>
<p><b>Desco Charleswater West</b>  3651 Walnut Avenue, Chino, CA 91710  Tel: 909-627-8178 Fax: 909-627-7449 www.desco.com  Manufacturer of ESD control products including wrist straps, mats,  foot grounders, ionizers, shielding bags, floor finish &amp; more</p>	<p><b>ITW Electronic Component Packaging Systems</b>  2001 E. Randol Mill Road, Suite 117, Arlington, Texas 76011  Tel: 817-277-5004 Fax: 817-277-3453  Static Dissipative &amp; Conductive Shipping &amp; Handling Tubes,  Carrier Tape &amp; Reels, JEDEC Carrier Trays, Thermoformed Packaging</p>
<p><b>Conductive Containers, Inc.</b>  4500 Quebec Ave. North, New Hope, MN 55428  Tel: 1-800-FARADAY Fax: 612-537-1738 www.corstat.com  Manufacturer of CORSTAT and ESD protective plastic  materials for shipping, storage and inplant handling</p>	<p><b>Aesops, Inc.</b>  636 S. Glenwood Place, P.O. Box 4119, Dalton, GA 30721  Tel: 800-235-8817 Fax: 706-278-6562 www.aesops.com  A full line manufacturer of static control products.  Special sizes or shapes... No problem. Buy only what you need.</p>
<p><b>Vermason Ltd.</b>  Birds Hill, Letchworth, SG6 1HX, England  Tel: +44 1462 672005 Fax: +44 1462 670440 sales@vermason.co.uk  DurAstatic E9* bins, boxes, racks, inserts and trays are permanently  static dissipative, anti-static, coloured, non-sloughing and re-cyclable.  For more information, www.vermason.co.uk or e9@vermason.co.uk</p>	<p><b>3M</b>  Electronic Handling &amp; Protection Division  Tel: 1-800-328-1368 www.3M.com/EHPD  Manufacturer of static control permanent flooring, wrist/heel straps,  static shielding bags &amp; containers, &amp; testing/monitoring equipment</p>
<p><b>Richmond Technology/BayStat – An ITW Company</b>  1897 Colton Ave, Redlands, CA 92374  Tel: 800-829-2942 Fax: 909-794-4003  Email: sales@richmond-technology.com  ESD films and bags, shielding, DryPack®, CleanPackaging, grounding,  wrist straps, heel grounders, work surfaces, floor mats, &amp; monitors.</p>	<p><b>Work Surfaces Corporation</b>  1-800-553-5015 (USA)  Tel: 626-836-3749 Fax: 626-836-8979 www.worksurfaces.com  Brass terminus flush mount grounding systems,  wrist strap receptacles--bus bars</p>
<p><b>Brick Container Corporation  Protektive Pak®</b>  P.O. Box 548, La Mirada, CA 90637-0548  Tel: 714-994-4140 Fax: 714-994-1377 www.brickcontainer.com  Impregnated ESD Corrugated Stock Boxes, Crates, &amp; Foam</p>	<p><b>Technical Coating International, Inc.</b>  150 Backhoe Road, Leland, NC 28451  Tel: 910-371-0860 Fax: 910-371-0929 www.tciinc.com  Manufacturer of ESD Films, Foil Laminates, and Specialty  Structures (Barrier, Opaque, Transparent, &amp; Recyclable)</p>
<p><b>VPI</b>  3123 S. 9th St. PO Box 451, Sheboygan, WI 53082-0451  Tel: 800-874-4240 Fax: 920-458-1368 Email: floor@vpicorp.com  www.vpiflooring.com  Manufacturer of ESD Control Vinyl Floor Tile</p>	<p><b>UTP/ United Technical Products, Inc.</b>  111 Morse Street, Norwood, MA 02062  Tel: 781-255-1155 Fax: 781-255-1166 www.utp.com  ESD Carpet Tile • ESD Vinyl Tile • ESD Flex Floor™ •  ESD Polymeric Flooring</p>
<p><b>Trek Incorporated</b>  11601 Maple Ridge Road, Medina, NY 14103  Tel: 1-716-798-3140 Fax: 1-716-798-3106  Manufacturer of instrumentation for measuring  surface voltage, ionizer performance, and surface resistivity</p>	<p><b>Kenflex Corporation</b>  460 NE Hemlock, Suite A, Redmond, OR 97756  Tel: 541-923-4765 Fax: 541-923-4190 kenflex@coinet.com  Manufactures FLEXCELL®, FLEXSTAND®, FLEXTOTE®  circuit board transport and protection units, also on web.</p>

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