

Components, Packaging, and Manufacturing Technology Society



IEEE

Newsletter



The Global Society for Microelectronics Systems Packaging



Vol. 26, No. 3, September, 2003 (ISSN 1077-2999)

www.cpmt.org

www.evh.ieee.org/soc/cpmt/newsletter

VICE PRESIDENT'S REPORT

Who are our Members? or, How can we best serve you?

Years ago - way back in the 20th century - it was pretty clear who were the members of the CPMT Society. They were certain researchers and technologists in our fields of interest willing to pay our dues and who received, in return, subscriptions to one or more of our journals, this NEWSLETTER, plus a "package" of other benefits such as networking and reduced fees on conferences. Still, in any survey, the key benefit identified by our Members has been the archival, peer-reviewed papers in our Transactions, to guide them in their own development work.

Is this still true? I think the situation has changed in the 21st century. As the IEEE has moved our archives to the internet, with all CPMT papers back to 1954 available and searchable in the XPLORE system, what has happened to our concept of "membership"? Are the "members of yesterday" still likely to be members today?

This year I subscribed to the IEEE's Member Digital Library (MDL - see www.ieee.org/products/ieeemdl/). For \$35 a month I can download not only the CPMT-themed papers (for the last 5 years), but any document from any of the IEEE journals and magazines, and even from any IEEE conference. I've been thinking about whether I should continue to belong to several of my career-long Societies (such as Reliability, Computer, Engineering Management, and several others - I'm a bit of a joiner!)

I know that many of you CPMT Members are part of a university, government, or company which subscribes to IEEE's IEL (IEEE/IEE Electronic Library), giving you a "site license" to the full IEEE and IEE collection. In essence, you have a valuable asset paid for by your employer with cost-effective desktop access for you at any hour of the day. Maybe you still like having a "paper" copy of the Transactions; I find it easier to scan and quickly read from the printed version. But online access appears to be the wave of the future.

So, why would you pay the extra Euros (or dollars) to belong to the IEEE and to the CPMT Society? Let me turn the question around: I think the model for the "future of our Society" is to be a generator and reviewer of key technical information, vetting it through peer review for the benefit of any technologist anywhere in the world. You'll notice that I didn't say that we'd be doing this "for our CPMT Members" - as Vice President for Publications, I intend to do this service for everyone, independent of membership status. And I don't limit this to printed

documents - I would definitely extend it to peer-reviewed multimedia, training modules, and other useful services.

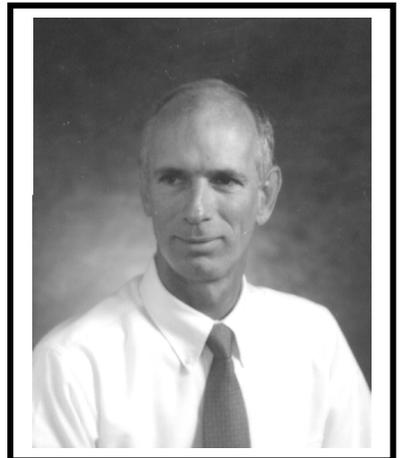
You see, those we serve (through XPLORE and IEL) include our several thousand "Members", of course, but also another 50,000 packaging/materials engineers and a larger group of perhaps 500,000 engineers in various other fields who have occasional need to quickly acquire some of the papers we've published - almost none of them IEEE Members. Since a great proportion of our Publications income is generated by this larger population of non-members (through the fees paid by their employers in becoming an IEL subscriber), I need to be very focused on serving them also.

You are reading this NEWSLETTER, and therefore are nearly certainly one of our CPMT Members - we appreciate that! I have a tough time getting any information to our non-member users, a huge group I'd like to be in touch with. But there are broader implications. For example, who can become a Board member or Chapter Chair for CPMT? It is "artificially" limited to those few willing to pay the dues (even when they already have full access

to all of our papers through a corporate subscription). Should we not consider for office those non-members who are contributors to our field? If we were able to track a person's "clicks" in downloading copies of our CPMT-reviewed papers (which we cannot do), could we then allow someone to run for office who had downloaded, say, 20 of our papers in the past year, and therefore were "active" in our fields? Or how about someone who comes to at least 5 local Chapter meetings in a year? If we know of top researchers in our field who accesses literature through university accounts, can we give them CPMT Society awards, or appoint them to our committees?

It seems to me that the concept of membership in our Society must be reconsidered. As more technologists get our "key benefit" through the internet, paid for by their employers, the Society still provides the same valuable service - perhaps made more valuable through the merging of our focused archives with the much broader multidisciplinary archives across the whole IEEE and IEE. The Society is more important than ever, organizing conferences and workshops for the sharing of

(continued on page 3)



CPMT OFFICERS

President -- Rao Tummala, +1 404 894 9097
Technical VP -- Phil Garrou, +1 919 248 9261
Administration VP -- H. Anthony Chan, +1 408 924 3656
Treasurer -- John Segelken, +1 540 961 1685
VP Publications -- Paul B. Wesling, +1 408 252 9051
VP Conferences -- James Morris, +1 607 777 4774
VP Education -- Albert Puttlitz, FAX +1 802 879 0466
Senior Past President -- Ralph Wyndrum, +1 732 219 0005
Junior Past President -- John Stafford, +1 602 413 5509
Secretary -- Ron Gedney, +1 703 834 2084
Executive Director -- Marsha Tickman, +1 732 562 5529
IEEE VP TAB -- Ralph Wyndrum, +1 732 219 0005

Elected Board Members at Large

2003

William D. Brown
Craig Gaw
Johan Liu
Ralph Russell
Tim Adams
C. P. Wong

2004

Rolf Aschenbrenner
N. Rao Bonda
Rajen Chanchani
Ricky Lee
Connie Swager
Naoaki Yamanaka

2005

William T. Chen
L. Merrill Palmer
E. Jan Vardaman

Li Li
Walter J. Trybula
David C. Whalley

Standing Committee Chairpeople

Student Chapter Development -- William D. Brown,
wdb@enr.uark.edu
Distinguished Speakers -- A. F. Puttlitz,
FAX +1 802 879 0466
Fellows Search--Rao Tummala-rao.tummala@ee.gatech.edu
& David Palmer-d.palmer@ieee.org
Fellows -- C. P. Wong, cp.wong@ieee.org
Constitution & Bylaws -- Tony Mak, +1 972 371 4364
Finance -- Ralph Wyndrum, Jr., r.wyndrum@ieee.org
Long Range Planning -- Dennis Olsen, d.olsen@ieee.org
Standards --
IEEE Books & C and D Magazine Editor, Joe Brewer,
+1 386 445 2593, j.brewer@ieee.org
Membership -- Ralph Russell, cpmt-membership@ieee.org
Chapter Development -- Ralph Russell, II, see membership
Nominations -- John Segelken, +1 540 633 5781
International Relations -- Leo Feinstein, +1 508 870 0051;
Europe -- Ephraim Suhir, +1 908 582 5301; Far East -- W.
T. Chen, +65 874 8110
Joint Committee on Semiconductor Manufacturing -- G. C.
Cheek

Next News Deadline:
December 5, 2003

2

CPMT SOCIETY NEWSLETTER

Editor: David W. Palmer, email: d.palmer@ieee.org,
FAX +1 505 844 7011, Tel: +1 505 844 2138

Composition: Alina Deutsch: deutsch@us.ibm.com

Proofreading: S. Puccetti & Amity Ming

CPMT Archival Publications

Publications VP: Paul Wesling, email: p.wesling@ieee.org,
Tel: +1 408 252 9051.

Transactions-CPT editor, Avram Bar-Cohen, Univ. of Maryland,
2181B Martin Hall, College Park, MD 20742 USA,
Tel: +1 301 405 3173; email barcohen@eng.umd.edu

Transactions-AdvP editor; G. Subbarayan, Purdue University, ME
Department, Tel: +1 765 494 9770; email ganeshs@ecn.purdue.edu

Transactions EPM editor, Walter Trybula, Tel +1 512 356 3306,
email w.trybula@ieee.org

Technical Committee Chairpeople

TC-1 Electrical Contacts, Connectors and Cables--
Gerald Witter, Chugai, +1 708 244 6025

TC-2 Discrete and Integral Passive Components--
Leonard Schaper, Univ. of Arkansas, +1 501 575 8408

TC-3 IC and Package Assembly -- Michele Berry, Intel
michele.j.berry@intel.com

TC-4 Manufacturing Design & Process--Walt Trybula,
SEMATECH, +1 512 356 3306

TC-5 Materials--Rajen Chanchani, Sandia Labs,
+1 505 844 3482, r.chanchani@ieee.org

TC-6 High Density PWB packaging -- Yoshitaka Fukuoka,
weisti.fukuoka@rose.zero.ad.jp

TC-7 Environmental Stress & Reliability Test--Kirk Gray,
k.a.gray@ieee.org

TC-9 Thermal Management & Thermomechanical Design--
Tony Mak, Dallas Semi, +1 972 371 4364

TC-10 Fiber Optics & Photonics--Frank Shi, UC Irvine
email: FGSHI@uci.edu

TC-11 Electrical Test -- Bruce Kim, Bruce.Kim@asu.edu,
Tel: +1 480 965 3749

TC-12 Electrical Design, Modeling and Simulation--
Madhavan Swaminathan, G Tech, +1 404 894 3340

TC-13 Power Electronics Packaging--Doug Hopkins, SUNY
Buffalo, +1 607 729 9949, d.hopkins@ieee.org

TC-14 Systems Packaging-- John Segelken, jsegelken@
Actmicrodevices.com, and Connie Swager,
swager@us.ibm.com

TC-16 RF and Wireless-- Craig Gaw, Motorola,
+1 480 413 5920, c.a.gaw@ieee.org

TC-17 MEMS and Sensor Packaging--Eric Jung, IZM Berline
email: erju@izm.fhg.de

TC-18 Wafer Level Packaging--Michael Toepper, IZM Berline
toepper@izm.fhg.de

TC-19 Education--Rao Tummala, G Tech, +1 404 894 9097

TC-21 Green Electronics Manufacturing and Packaging,
Hansjoerg Griese, Email: griese@izm.fhg.de

*****IEEE Components, Packaging, and Manufacturing Technology Society Newsletter is published quarterly by the Components, Packaging, and Manufacturing Technology Society of the Institute of Electrical and Electronics Engineers, Inc. Headquarters: 3 Park Avenue, 17th Floor, New York, NY 10016-5997. \$1.00 per member per year (included in Society fee) for each member of the Components, Packaging, and Manufacturing Technology Society. Printed in U.S.A. periodicals postage paid at New York, NY, and at additional mailing offices. Postmaster: Send address changes to IEEE CPMT Newsletter, IEEE 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved, copyright (c) 2003 by the CPMT Society of IEEE. Authors and Artists given full permission for further use of their contributions. This Newsletter was printed in the U.S. of America. For circulation information call IEEE customer Service 908 981 1393, or FAX 9667.

(continued from page 1)

information, and peer-reviewing new and exciting developments that need to be archived and made available to the 500,000 engineers worldwide. But as these institutions phase out getting "paper" journals, and join the movement to online research and access, there are fewer reasons to join CPMT. It may be that IEEE and CPMT membership is something that will be essential only to those who aren't employed by an organization that subscribes to the well-regarded on-line collections, and for the (smaller) number of professionals who want to stay "in touch" with others working in the same profession.

What will we be like in 10 or 20 years? I suspect there will still be a "core" of members, perhaps half as many as today, even as the industry expands. But our influence and effect will keep spreading wider as more engineers gain access to IEL (and MDL) and don't need to associate with CPMT in order for us to help them in their careers. The challenge, I feel, is for the Society to find new ways to allow this large population of non-member researchers to participate in the governance of the Society and expansion of the work it does. One way is to encourage all researchers in our fields of interest to self-subscribe to a variety of free "special interest" distribution lists that they'll find valuable and not too intrusive, each one covering highlights of upcoming conferences, applicable new books, and discussion of some of the recent published papers; by encouraging them to dip into their library's IEL subscription and access the full text of recent papers (either from our Transactions or from a conference Proceedings) we "drive consumption" of our key products (the research papers) and excite some of them about publishing their own work within the IEEE.

I'm really quite interested in your observations on how the Society will serve both member and non-member technologists over the next decade and century. Please post your comments at our Discussion Board: www.quicktopic.com/23/H/tk2x9MK8hP8MS (case-sensitive). Then subscribe to the discussion, to follow the comments of others (and my responses). I'll look forward to exploring our new directions with you!

Paul Wesling, VP-Publications
Respond to p.wesling@ieee.org

REGION 8 CHAPTER ACTIVITY ROUND - UP

The joint ED/MTT/AP/CPMT/SSC-SS Chapter in Nizhny Novgorod, Russia sponsored the International meeting on "Scanning Probe Microscopy", March 2-5, 2003 at the Russian Academy of Sciences Institute for the Physics of Microstructures. The meeting was also sponsored by Russian Foundation for Basic Research; the Ministry for Industry, Science and Technology of the Russian Federation; Nizhny Novgorod State University; the Ministry for Education of the Russian Federation; and NTI & NT-MDT Co (Zelenograd, Russia). There were 26 paper presentations and 4 poster sessions covering a broad spectrum of topics. Full details are available at: <http://www.ipm.sci-nnov.ru/>

The Chalmers University Student Branch Chapter, Sweden, arranged a trip to attend the MEMS Sensor Workshop held at the Danish Technical University (DTU), in Lyngby, Denmark. The visit took place on the 20-21 March 2003, and all of the Chalmers Ph.D. students who are members of the student chapter attended the workshop. (see Picture)

Submitted by *David Whalley*

REGION 10 CHAPTER ACTIVITY ROUND-UP

Taipei Chapter has been actively discussing for a co-opted event of CPMT Taipei Chapter, I-Shou University with Advanced Semiconductor Engineering (ASE) Inc. In this connection Chapter Chairman Dr. Shen-Li Fu visited ASE Inc. on 13th August for a meeting with Dr. J. J. Lee - President of Core Capability Center of Assembly and Materials at ASE.

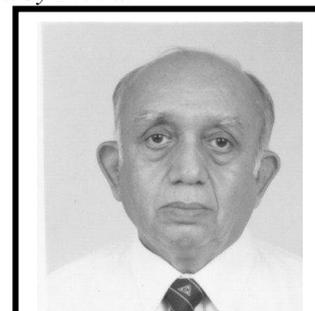
The Chapter has also planned a joint programme with 2003 IMAPS Pacific Rim Technical Symposium to be organised by IMAPS-Taiwan at Kaohsiung, Taiwan on September 26, 2003. The programme will cover important state-of-the-art topics in electronics materials and packaging related technologies.

Dr. Cheung, **HONGKONG Chapter** Chairman has reported that as the influence from SARS diminished by July, the chapter has well resumed the technical activities with a one-day workshop on 15th August by Dr. John Lau on "Impacts of Lead-Free on WLCSP". This was well attended. The chapter is now planning for another workshop on "Laser Diodes, VCSELs, Photodiodes, Modulators, Device Physics, Packaging, Integration and Qualification" by Dr. Torsten Wiplejewski on 10th September 2003. The chapter plans two more workshops on state-of-the-art topics by the end of 2003.

Malaysia Chapter has organised a technical lecture on "Thermal Design for Microelectronic Packaging" by Prof Goh Teck Joo of Assembly Technology Development in Malaysia, INTEL on 3rd September 2003 at the USM Engineering Campus, Malaysia. The chapter expects good response from CPMT members and the faculty.

The **India Council Chapter** concentrated efforts on the organization of the national level Annual Convention at New Delhi from 16th to 18th July 2003 as a joint activity with Surface Mount Technology Association - India Chapter (SMTA-IC). The event included two days of advanced level tutorials on electronic production techniques (including latest technologies in SMT) by Mr. Aaron Saxton and Mr. Jacques Coderre both from Universal Instruments Corp., U.S.A. and Mr. David Bernard of Dage Precision Industries, U.K. Dr. R. Sengupta conducted a special training session for the industry delegates on state-of-the-art techniques for quality improvement in electronic equipment production. The Convention on the 3rd day included two technical sessions of state-of-the-art review papers including one from Gred Haenelt of ERSA Germany and two papers related to industry case studies. The chapter also organised one technical lecture in Bombay on 7th August, which was well attended by IEEE members.

■ Submitted by *Dr. Parikh*





Chalmers University Student Branch Chapter

Report from the Hungarian and Romanian IEEE-CPMT Joint Chapter and Polytechnic University of Bucharest IEEE-CPMT Student Branch Bucharest, Romania

The Polytechnic University of Bucharest IEEE-COMTE Student Branch Chapter has been very active during its three years of existence. The member's efforts in familiarizing students of the Polytechnic University of Bucharest with IEEE CPMT goals and member benefits were recognized and encouraged through receiving the "2003 Best Student Branch Chapter of the Year Award". The prize was officially received by SBC advisor Prof. Paul Svasta at the 53rd Annual ECTC, COMTE Society Awards, on May 29.

Our chapter impressed the evaluation committee by organizing outstanding programs for members through global collaboration and participation in technical conferences, student contests and local meetings:

- **Collaboration with partner universities such as TU Vienna, TU Dresden, UTE Budapest, UT Cluj
- **Members' participation at national and international conferences (Romania, Czech Republic, Poland, Egypt, Slovakia);
- **Involvement in organization of conferences like the ISSE 2001, SIITME (2001, 2002, 2003), TIE student contest and students' debating society (Student Workshop on Electronics Technology, Reliability and Packaging);
- **Regular meetings for dissemination of knowledge in electrical engineering.

Further details regarding the SBC activities and events can be found at our home page: www.cetti.ro/sbc/index.html.



Victoras Ene Vice Chair of SBC receives the award from Professor Ioan Dumitrache Rector of the Polytechnic University of Bucharest

To facilitate better transparency of the SBC activities, the student Chapter organized on July 16 a Workshop on "The involvement of students in electronic modules' designing and manufacturing" with the purpose of attracting students towards electronic packaging research activities. In the workshop's opening, Professor Ioan Dumitrache, the Rector of our University, accorded officially the "2003 Best Student Branch Chapter of the Year Award" to the SBC officers.

Student members then gave interesting and informative presentations of their research results. At the end of the workshop a discussion forum took place where participants and organizers discussed important topics: updating our learning environment to the actual requests of informational society by including teamwork, and economics lectures in the learning program. More than 40 students attended this event .



Caption: Professor Viorel Popescu Dean of Electronic and Telecommunication Department of Polytechnic University of Timisoara; Alexandru Borcea ARIES President and Professor Paul Svasta Chair of HU&RO IEEE-CPMT Joint Chapter at TIE student contest, Timisoara, May 23, 2003

In future we will organize similar workshops every year. These will be in the autumn, after the start of the university lectures, for the newly arrived students and for all students interested in research and development of electronic microsystems packaging.

The Center of Technological Electronics and Interconnection Techniques (CETTI) sustains strongly our activity, offering modern laboratories, technical assistance and the financial support necessary for our research activities.

The Hungarian and Romanian (HU&RO) Joint Chapter is an important promoter of CPMT goals in our countries. Members participate every year in ECTC, ISSE, Polytronic, SIITME and other conferences. For many years the Chapter has been the Technical co-sponsor of SIITME (International Symposium for Design and Technology for Electronic Modules). This symposium promotes electronic packaging in our region and allows researchers from Hungarian and Romanian Universities to exchange ideas and maintain contact with partner Universities from the United States and other European countries.



Caption: - Members of IEEE-CPMT Student Branch Chapter Polytechnic University of Bucharest and participants at the Workshop on "The involvement of students in electronic modules' designing and manufacturing", Bucharest, July 14, 2003

The HU&RO Joint Chapter also brings a major contribution to the ARIES (Romanian Association for Electric and Software Industry) activity in promoting High Tech industry to interested firms. These issues will be applied at the coming BINARY 2003 (BusIness iNovAtion and gReat qualityY) Fair for the electronic and software industry, in Bucharest 24-26 September, where members of the HU&RO Joint Chapter and IEEE Student Branch Chapter will be present.

And we will not stop here. As soon as the school year begins, student members will participate with papers at the upcoming conference SIITME 2003. Together with students coming from Romania's main universities and from abroad we will participate with papers in the second edition of the Student Forum & Workshop. At the same time, ARIES will support the TIE (Technology for Electronic Interconnection) student contest (www.cetti.ro/sbc). [picture 3]

Next year our student chapter will have the pleasure to be involved in organizing SIITME 2004 in Bucharest, which will be the jubilee edition (10th) of the conference, which you are all invited to participate in between 23 and 26 September, 2004. See you there!

Romina Daniela Macabinski
romina@cetti.ro
Press Officer of IEEE -CPMT SBC
Polytechnic University of Bucharest, Romania

New East Coast USA Chapter meets

The ACME (AP/CPMT/MTT/ED) Chapter kickoff meeting was held on August 27th at the MCNC Research and Development Insititute in Research Triangle Park NC. There were over 20 attendees representing six area companies, the US Army Research Office, Duke University, and North Carolina State University.

At the meeting, Dr. Dev Palmer was elected Chair and Dr. Brett Guenther was elected Vice-Chair. The ACME winter meeting will be in late November, with technical talks on high-speed and high-density electronic packaging by chapter members from DuPont and Unitive Electronics.

-- submitted by Ralph Russell

New Senior Members (with Chapter or Country)

Salman Akram -- Boise
Chee Hiong Chew -- Malaysia
Carlos A. Couto -- Portugal
Leslie Falkingham -- France
Russell T. Fiorenzo -- Phoenix
Craig A. Gaw -- Phoenix
Teck-Joo Goh -- Malaysia
John Jackson -- Santa Clara Valley
Joel A. Jorgenson -- Red River Valley
Dongming He -- Phoenix
Nobuo Iwase -- Tokyo
Sung Swon Kang -- Westchester Subsection
Sampath K. V. Karikalan -- Phoenix
Li Li -- Phoenix
Jong-Kai Lin -- Phoenix
Zhigang Lin -- Orange County
Larry Moresco -- Boise
Siu Wing Or -- Hong Kong
Ravinder K. Sharma -- Phoenix
Franklin Schellenberg -- Santa Clara Valley
Kankanhally N. Seethara -- Malaysia
Thomas O. Tarter -- Santa Clara Valley
Dustin Wood -- Phoenix

JAPAN PACKAGING TECHNOLOGY SEMINAR -TOKYO, JAPAN

The Japan Chapter of CPMT had the 3rd Japan Packaging Seminar on June 16, 2003, in Tokyo. The 150 attendees studied and discussed the main theme of the seminar: packaging technology for the mobile information era. The meeting had 6 technical presentations concerning: LTCC for automobiles, non-shrinkage LTCC, LTCC materials, cellular phone packaging, and software-wireless-telecommunication technology. Mr. Susumu Nishigaki of the Robert Bosh GmbH (Germany) received the electronic circuits packaging technology award from the chair of the Japan Chapter.

- submitted by Nobuo Iwase, Secretariat, CPMT Society Japan Chapter.



Susumu Nishigaki receives the Technology Award



Seminar attendees in Session



Susumu Nishigaki presents LTCC Technology

6



Chair M. Umeno gives the opening address

6

MEMORIES OF KOJI NIHEI



Memorial to Dr. Koji Nihei

Dr. Koji Nihei of Waseda University in Japan passed away July 22. His funeral was held in Yokohama City, Japan on July 27. He was a leader in Japan's semiconductor packaging industry and made worldwide contributions to the field. Dr. Nihei was an IEEE Fellow and served on the IEEE CPMT Board of Governors for many years. He was awarded the CPMT Outstanding Contribution Award (now called the David Feldman Outstanding Contribution Award) in 1998.

Dr. Nihei spent a long career at Oki Electric Industry Co., Ltd. where he was an Associate Director and a Fellow. At Oki Electric, he was instrumental in many semiconductor package developments. He constantly promoted exchange of ideas in an international setting and encouraged many of Japan's young engineers to participate in industry societies and events. Dr. Nihei was active in promoting cooperation between the packaging societies, especially in developing a joint technical program by combining the Japan International Electronics Manufacturing Technology Symposium (IEMT) and the International Microelectronics Conference (IMC). The meeting is now called the International Conference on Electronics Packaging (ICEP) and continues to draw international participation. Dr. Nihei was a good friend, a great gentleman, and a major contributor to our industry.

He will be missed by all.

--submitted by E. Jan Vardaman

Koji Nihei leads visiting delegation to 3COM in Chicago in 1999



IEMT Symposium Big Hit with SEMICON West

The International Electronics Manufacturing Technology Symposium was held in conjunction with SEMICON West in July. A record crowd of 222 attendees enjoyed a variety of excellent presentations at the back-end assembly and test show in San Jose, California. The symposium focused on electronic components and systems manufacturing technology.

Joseph Adam, Vice President Technology Integration, Skyworks, Inc. and Co-Chair, ITRS Packaging Technical Working Group gave an exciting keynote presentation. It focused on the major technology challenges facing the industry in packaging substrates, design tools, new materials requirements, packaging of low K/Cu semiconductors, and high frequency design.



IEMT had the largest attendance ever, thanks to the associated SEMI show and the great technical content of the sessions.

Many Thanks to Newsletter Volunteers

This issue owes a lot to volunteers. Particular thanks go to Len Schaper, Jan Vardaman, and Paul Wesling who wrote much copy with little time remaining. Also a thanks to Dr. Parikh, Ralph Russell, R. D. Macabinski, Nobuo Iwase, and Dave Whalley for rounding up the Chapter News. James Morris for the conference update. Also a general thanks to all those that sent in announcements of upcoming meetings.

Many of your Society's most active volunteers are grieving and stunned by the passing of two long standing experts in our field -- Koji Nihei and Jack Balde. With a Society our size, actuarial statistics suggest that 100 will die each year. What is unusually about these two great men is that they remained active well beyond the age that most engineers consider fishing, strolling, and watching TV as their major activities. Because both were active before the transistor, at least 3 generations of Society engineers learned from them.



Sessions included topics from wire bond to flip chip and wafer level packaging. The best paper of the symposium award was presented to Scott Barrett of the K&S Flip Chip Division for "A New Wafer Level Package for Improved Electrical and Reliability Performance." A special session on "Green" manufacturing included discussions on lead-free solders from ChipPAC, Fairchild Semiconductor's implementation of lead-free bumping in a power package, IBM's lead-free CBGA, a lead-free flip chip assembly process from Philips, a perspective on lead-free solder reliability from the Wolfson School of Mechanical and Manufacturing Engineering, and Infineon's package using a halogen-free molding compound. Hot topics at the symposium also included stacked packages and system-in-package with presentations from Bridge Semiconductor, AIT, Tessera, STATS, DT Microcircuits, and Flextronics. A variety of papers featured reliability studies and advanced material developments. Special sessions on test, factory simulation, automation, and integration rounded out the symposium.

--submitted by Jan Vardaman



Len Schaper and Rick Ulrich authors of new IEEE book "Integrated Passives", are both from University of Arkansas

CPMT Meeting of Interest to Members

2003

**Holm Conference on Electrical Contacts, Sept 8 - 10, 2003, Washington DC, www.ewh.ieee.org/soc/cpmt/tc1/

**9th International Workshop on Thermal Investigations of ICs & Systems (Therminic) September 24-26, 2003; Aix-en-Provence, France Bernard Courtois THERMINIC@imag.fr

**TC-7 2003 Workshop on Accelerated Stress Test & Reliability (AST'03) October 2-4, 2003; Seattle WA Mark Morelli Mark.Morelli@Otis.com +1-860-676-6140

**MST'03 (Microsystems Technologies), Munich Germany, October 7 - 8, 2003, Erik Jung, erju@izm.fhg.de, fax 49 30 46403 161

**3rd Internat IEEE confer on Polymers & Adhesives in Microelectronics & Photonics (Polytronic 2003), Montreux, Switzerland, October 20 - 23, 2003, Bernard Courtois, polytronic2003@imag.fr

**1st IEEE CPMT Regional Workshop on Microsystem Integration Technology, October 23-24, 2003, Shanghai, China, johan.liu@ivf.se

**FDIP03, Future Directions in IC and Packaging Design Workshop, October 26, 2003, Princeton New Jersey, www.epep.org.

**2003 IEEE Electrical Performance of Electronic Packaging (EPEP), October 27-29, 2003, Princeton, NJ, Paul Baltes, baltes@enr.arizona.edu

**ICEPT, International Conference on Electronic Packaging Technology, October 28-30, 2003, Shanghai China, www.icep2003.org.

**EDAPS03, Electrical Design of Advanced Packaging and Systems, Nov 10, 2003, Daejeon Korea, teralab#ee.kaist.ac.kr

**5th International conference on Electronic Materials & Packaging (EMAP), November 17-20, 2003, Singapore, Sung Yi, sungyi@cecs.pdx.edu.

**5th International Workshop on Flip Chip, CSP, Wafer Level Packaging, December 1-2, 2003, Berlin, elke.zakel@ieee.org (German Chapter)

**5th Electronics Packaging Technology Conference (EPTC'03), December 10-12, 2003, Singapore; Mahadevan Iyer, iyer@ime.a-star.edu.sg, fax +65 6774 5747.

2004

**Int'l IEEE Confer on Asian Green Electronics (AGEC), January 5-9, 2004; Hong Kong/Shenzhen, China; Angie Wong, wywong@ee.cityu.edu.hk

**2004 IEEE/CPMT 20th Semiconductor thermal Measurement & Management Symposium (SEMI-THERM), March 9-11, 2004, San Jose, cscomm@earthlink.net

**1st International Workshop in Nano Bio-Packaging, May 22-23, 2004; Atlanta GA, wlp@ee.gatech.edu

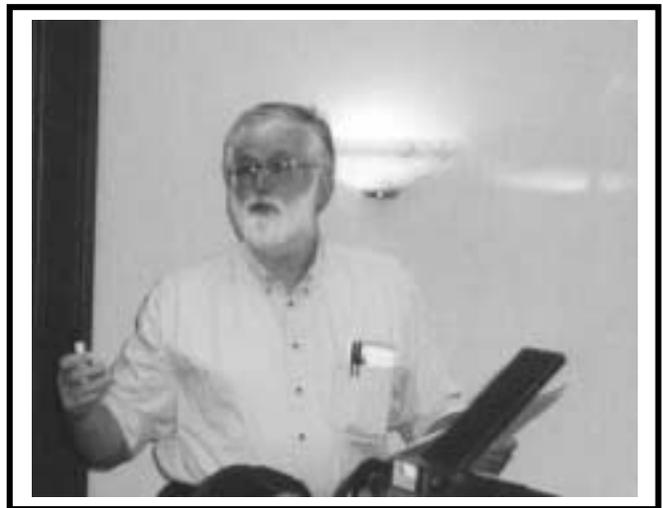
**2004 IEEE/SEMI Advanced Semiconductor Manufacturing Conference & Workshop (ASMC), May 4-6, 2004, Boston, mkindling@semi.org

**54th Electronic Components and Technology Conference (ECTC), June 1-4, 2004, Las Vegas NV, www.ectc.net

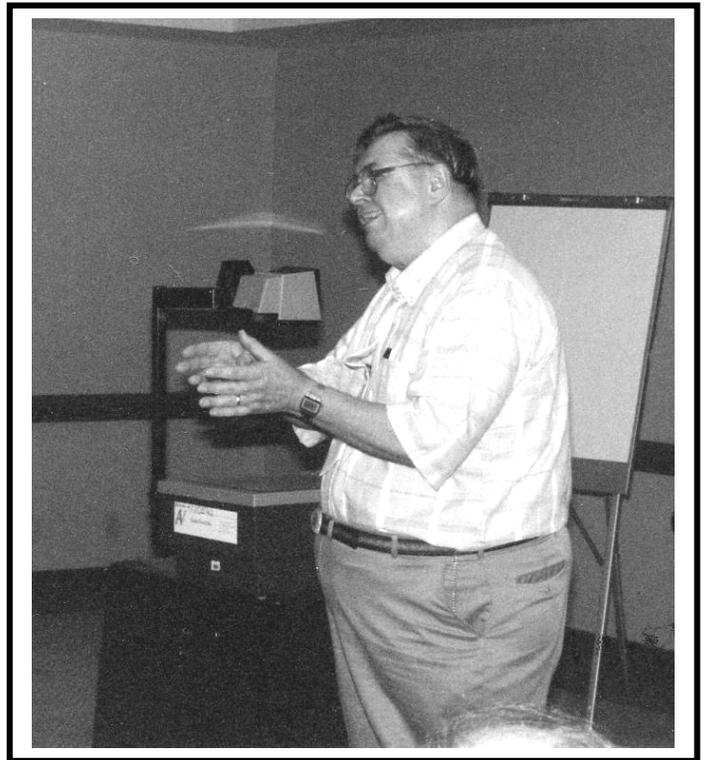
**Photomask Europa 2004, June 21-24, 2004, Dresden Germany

**2004 IEEE Holm Conference on Electrical Contacts, September 20-23, 2004, Seattle WA, Jennifer Lambert, j.lambert@ieee.org

■ submitted by **Jim Morris, Vice President** of Conferences



In Memory of Jack Balde



Applauding a creative comment from audience



Cheering up the CPMT Society Executive Director,
Marsh Tickman.



Sharing a perspective with the CPMT board
of Governors. Always addressing the techno-
logical needs of industry. Always leading the
charge

John W. (Jack) Balde

1923 – 2003

Some knew him only as the rotund man sitting close to the front of the meeting room, asking piercing technical questions of almost all the presenters in a booming voice that needed no microphone. Others were privileged to have known him for many years, working with him on a book project, or a difficult technical problem, or on the organization of a conference or a workshop on a new cutting edge topic. Those working with him would always get phone calls, or long messages on their answering machines, late into the evening or on weekends, for Jack seemed never to stop thinking about the problem at hand, or about how to organize an IEEE or IMAPS activity on the latest technology, or about exactly what speakers to put together in what order to make that activity the best it could be. Those phone calls always ended with, "I've got a funny for you..." and Jack would launch into some off-color story guaranteed to coax a laugh from even the most puritanical.

Jack Balde passed away on September 8, 2003. It is doubtful we will see another like him in our profession.

Jack was born on March 4, 1923, in Brooklyn, NY. He received his BS in electrical engineering from Rensselaer Polytechnic Institute in 1943. Jack began his career at Western Electric and Bell Laboratories that same year, and in his first few years was awarded ten fundamental patents in Tantalum Thin Film technology, the core technology for thin film microelectronic hybrids. This early development of hybrids, with precision tantalum-based resistors and capacitors, led to the industry-wide use of hybrids for precision RF and military applications.

He was later involved in flat under-carpet cable development, which then became an industry standard. He led the IEEE standards task force for this technology (mid-1970s), which continues in widespread use. He received a special IEEE award for this development in 1975. He later also led an IEEE task force on the use of silicone gels as a means of environmental protection for integrated circuits (1981 report), at a time when the norm for reliable ICs was expensive hermetic packaging. In 1980, he retired from Bell Labs, and in 1981 founded Interconnection Decision Consulting, Inc., a firm that has consulted for 200 clients.

In 1985 he led another IEEE task force on lead compliance in surface mounted IC chip carrier packages, recognizing that the high failure rate of these packages was due to improper lead design and inappropriate lead frame material. Without the work of Jack's group, the early-stage development of surface mount package technology, now mainstream, could have come to a crashing halt.

Jack was an early proponent of MCM (multichip module) technology, with a Spectrum article in 1985, one book in 1986, and another in 1987 (both with co-authors). MCM technology was then only getting started outside of mainframe computer companies. He developed the nomenclature for the characterization of various MCM substrate configurations, and led an IEEE task force on MCM standardization. He spearheaded the establishment of a joint annual IEEE-ISHM-IEPS=EIA conference on MCMs beginning in 1990, and was general chair that year and active in every subsequent year. His leadership and advocacy of MCM technology are responsible for the extensive use of multichip packaging in many areas today.

In the IEEE, Jack led the CPMT-TC for System Packaging, which he founded in 1968, for 34 years. (This TC started out as the Computer Society Packaging Committee.) He was responsible for organizing the annual Computer (now System) Packaging Workshops for many of those years. The unique workshop format he introduced enabled packaging professionals to form a strong sense of community and collegiality. The informal nature of the workshops encouraged communication that cannot happen at large conferences. He also worked with CPMT chapters in Europe and Japan to begin similar workshops, which continue on an annual basis, alternating between Japan and Europe. His leadership was both organizational and technical; his talks often set the stage for focusing the discussions on cutting edge questions.

In other IEEE-related activities, he served on the CPMT Board of Governors, and on the CPMT Fellows committee for 10 years. He was a member of the Electronics Components and Technology Conference (ECTC) organizing committee for 33 years.

Jack recognized that electronic packaging is a multidisciplinary field, and that strictly IEEE activities could not encompass all aspects of, and all professionals associated with, packaging. Thus he was instrumental in forming the International Electronics Packaging Society (IEPS) in 1980, to provide an avenue for the interaction of EEs, MEs, materials scientists, and others involved in packaging. He served on the Board of Directors for many years, and was Chairman in 1982. He organized annual MCM workshops for IEPS and IMAPS (the International Microelectronics and Packaging Society) after the IEPS merger with ISHM.

Always on the cutting edge, Jack edited the book "Foldable Flex and Thinned Silicon" for Kluwer in 2002. This advanced 3-D packaging technology may someday be widely used as a result of Jack's involvement in bringing together the work of many early practitioners in one place, just as his work has fostered the development and widespread use of hybrid technology, under carpet cable, non-hermetic IC packaging, surface mount technology, and multichip packaging.

Jack received many honors for his career achievements, including the rank of IEEE Fellow in 1989, the IPC President's Award in 1975, IMAPS Fellow and Life Member in 1997, the Founder's Award from IEEE and IMAPS for establishing the MCM Conference, the IMAPS Hughes Award for excellence in electronic packaging in 1999, and the IEEE-CPMT Millennium Medal in 2000. But more important than these formal recognitions, Jack captured the respect and admiration of those who knew him well. Many have e-mailed some of their recollections.

George Harmon, NIST Fellow, wrote:

"We will all miss Jack, both for his contributions, and as a person. In recent years he didn't travel to meetings as much as in the past. However, as always, he used e-mail to convey his wisdom to us. When a burning issue arose, he used his experience to interpret it and advise us as to the best solution. I personally looked forward to hearing his opinion. Often these were policy issues, but also many on technical direction. When he disagreed with the common wisdom, I observed that he was usually right.

He was an indefatigable organizer of conferences, workshops, standards, and working groups across three Societies (IEEE, IMAPS, IEPS) that I know of. I served on his IEEE Gel Task Force. As chairman and with strong opinions, Jack could have dominated the results, but he never argued when the vote went against him, accepting the collective opinion as his own. I learned to admire him with his objectivity in handling that committee. Above all, he was honest with himself and his peers.

Jack served on my CPMT Fellow committee for about 10 years. The members often had strong opinions, with large standard deviations, but I always looked forward to Jack's ratings/comments. They were well thought out, written, insightful, and extremely objective.

Jack, you will be sorely missed and well remembered!"

Eric Bogatin, CTO of GigaTest Labs, wrote:

"I first met him when I was a young engineer fresh out of graduate school, in my first job at Western Electric's ERC in Princeton. I remember the first time I ever saw him, everyone was crowded in a conference room around a table and Jack was at the center of it, explaining why multi chip modules were going to revolutionize electronics.

I was passing by the conference room and stuck my head in to see why everyone seemed so excited. There were at least 20 engineers standing around in rapt attention. I had never heard anyone so passionate about a vision before. It was a passion that he communicated to all those around him.

Since then, I have always been in rapt attention whenever I have heard Jack speak. I brought Jack in as a consultant for me while I was at Sun Microsystems and had the privilege of working with him on his consulting team when I went independent.

Whether he knew it or not, Jack has been a mentor for me for over 20 years and was the prime influence that steered me into packaging technology and in particular, multi chip modules, where I spent more than half my career.

I will miss his insights and he will be a great loss to the packaging community."

Srinivas Rao, VP of Technology at Solectron Corporation:

"The message I just received on Jack passing away deeply saddens me. I first came in contact with Jack about 14 years ago. The issues then were MCMs. Anyone that has met with him would agree the first impression one captures is one of size. However, very quickly - once engaged in conversation as I learned - his physical size was really small. What really impressed me (and surely others would have picked the same) was the size and immensity of his big heart. His attitude, passion and concern for technology, solutions, and people were really his winning qualities. He had a logical reason and concern for most anything, but he had an extremely soft side towards people.

I will remember Jack for his technology passion just as much as his 'guarded' compassionate (that he concealed at times) views. I have enjoyed working with him on various occasions - Workshops at Maine, Ojai, and Palm Springs.

I offer my condolence to his family. Jack, you ought to be pleased to know that you have served well, been a good source of knowledge and inspiration to many of us."

Dick Otte, President of Promex Industries, wrote:

"Jack was a major force driving technical progress in our industry. His contributions will be sorely missed. The void he leaves behind will have a major detrimental impact on our Conferences and Workshops

and IMAPS and IEEE.

Jack's contributions to our industry are hard to underestimate. He was a major force to commercialize SMT technology, a major organizer of Workshops and Conferences related to electronic components, packaging and assembly, an important industry consultant, an author of leading edge technical books, a major participant at industry conferences, a visionary constantly seeking the best, most workable directions for the technologies and, finally, a friend over the years to many of us in the industry.

We, in the industry, owe much to his energy and commitment to technical "truth".

Jack will be missed by many of us."

Don Brown, head of the IWPC, wrote:

"I've known Jack for many years. He and I co-authored a book, "VLSI and the Substrate Connection" in 1981, and then in the mid 80's he and I were on opposite sides of the largest patent infringement lawsuit in the history of the US. We served on the former IEPS board of directors together, and worked together on countless activities. His wisdom, kindness, vision and strength of personality were a beacon for us to follow. For me personally, Jack was an unforgettable mentor."

IMAPS President Peter Barnwell wrote:

"Jack was remarkable man of whom I have many memories. He was a demanding but always fair individual with great energy and vision. I had many discussions with him over the years and he was a great help to me when I took over as President of IMAPS last year. I will miss him greatly and he will be a tremendous loss to our Society and particularly the Advisory Council."

Noted industry consultant Werner Engelmaier wrote:

"Jack's passing leaves a significant hole for me personally and for our industry as a whole. I met Jack way back in my early days at Bell Labs and I was part of Jack's IEEE Compliant Lead Task Force when we all tried very hard to make SMT work. We had many sessions together at the IEPS conferences and served as directors together.

While I was never a member of Jack's team of consultants, he was extremely helpful when I took early retirement from Bell Labs and started as a consultant. Without him, I may never have had the courage to strike out on my own. Jack, your wisdom, experience and enthusiasm will be missed very much."

Retired colleague Tony Lubowe wrote:

"I first met Jack in 1971 when Bell Labs, in its wisdom, set up an Interconnection Technology Laboratory, staffed by a group of bright young people, almost all of whom knew nothing about interconnection technology. The really wise thing was to send us down to ERC to be trained (and entranced) by Jack. He held court in the largest, brightest, best, corner office in the building. (It took me a few visits to realize he wasn't at least a VP. Western Electric's mistake on this was worse than mine.) It was impressive how he patiently trained (and re-trained, as needed) the hordes that descended upon him. We all did some good work for Bell Labs, and AT&T, and Western Electric, and later on, for many other companies, always with Jack available to answer or re-answer a question.

When I decided to retire 26 years later, my family was afraid I would go nuts without working. Jack took me on at IDC and for a while I again enjoyed working with him. I appreciated Jack's understanding on this also - it was clear to me (and us all) that he loved consulting more than anything but his family.

Conclusion

That indeed sums up this hastily written, deadline driven tribute to our late colleague, mentor, and friend. We have been blessed to know Jack. We shall not see his like again.

Len Schaper, Professor, Electrical Engineering,

12 University of Arkansas --CEO, Xanodics LLC



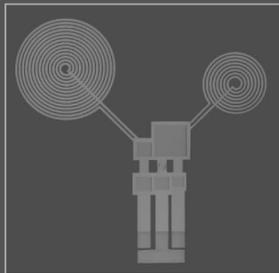
Jack Getting an award in front of his many peers



Making a joke while posing with many the CPMT Technical Committee Chairs

CPMT Volunteers Delight in Jack Balde

Integrated Passive Component Technology



EDITED BY
RICHARD K. ULRICH
LEONARD W. SCHAPER

An important real-world look at the status and future
of integrated passives

Integrated Passive Component Technology

Richard K. Ulrich, Leonard W. Schaper

This book provides an overview of the technology, potential applications, motivations, and problems associated with integrating resistors, capacitors, and inductors into circuit boards instead of mounting them as discrete components on the surface. Written primarily for engineers and scientists in industry who want to determine if passive integration is a viable option for a particular product, the text describes the processes available for designing and fabricating integrated passives, measuring their properties, and applying them to microelectronic systems.

In order to bring professionals up to date in this fast-moving technology and enable them to implement it into their own manufacturing environments, the authors address some basic questions concerning the trade-offs between discrete and integrated approaches, including:

- What are the advantages and disadvantages of integrated passives?
- Is this processing compatible with existing substrates?
- Can integrated passives be made with conventional PWB fabrication equipment?
- How do the electrical characteristics of integrated passives differ from discretely?
- How are integrated passives designed?
- What must be considered in the economic analysis?

Integrated Passive Component Technology is the first book dedicated to this subject. A comprehensive survey of the state of the art, it will be an invaluable resource for engineers and materials scientists in the microelectronics industry. Interdisciplinary issues are presented in clearly delineated sections throughout the book so readers can pick those parts that are most beneficial to them.

A Wiley-IEEE Press Publication

ISBN: 0-471-24431-7

Price: ~~\$89.95~~ \$76.45

Pages: 400

Publication Date: July 2003

IEEE Members Receive 15% off
Wiley-IEEE Press titles.
Please use your member ID
when ordering



CALL:

North America: 1-877-762-2974
Rest of the World +44(0) 1243 779 777



FAX:

U.S. Customers: 1-800-597-3299
Outside U.S.: +44(0) 1243 843 296



MAIL:

John Wiley & Sons, Inc.
Customer Care-Wiley
10475 Crosspoint Blvd.
Indianapolis, IN 46256



E-MAIL:

U.S. Customers: custserv@wiley.com
Outside U.S.: cs-books@wiley.co.uk

Check enclosed (Make payable to John Wiley & Sons)

Charge my: Visa MC AMEX Discover

Card # _____

Exp. Date _____

Signature _____

(Credit card orders invalid unless signed.)

SHIP TO:

Name _____

Address _____

Telephone _____

E-mail _____

www.wiley.com/ieee

CD-ROM Compendium of the CPMT Society *Transactions*

*All Past Transactions on CD-ROM –
Simplify your literature research!*

JC2100: 2000-2002 Compendium (1 CD – over 600 papers)
JC2150B: 1954-2002 Compendium (10 CDs – over 4000 papers)

- Includes all predecessor journals: CPMT, CHMT, PHP, PMP, Mfg, PEP, CP
- Each paper is in PDF format, and is easily viewable/printable on Mac, PC, or UNIX systems. **Full-text searchable** across all papers.
- Access the archived papers:
 - Using the **Tables of Contents**, to look through the papers in any particular year or issue;
 - Using the **Author Index**, where you can see/access all the papers from a particular author;
 - Using the **Subject Index**, to select those papers addressing a topical area;
 - Doing a **full-text search** across the contents of all papers.
- For owners of the original Compendium (1954-1999): the new CD works seamlessly with your current 9-CD set.

Further information: www.cpmt.org/cd/

Marsha Tickman, Executive Director

Components, Packaging & Mfg Technology Society

445 Hoes Lane / PO Box 1331

Piscataway, NJ 08855 USA

Email: m.tickman@ieee.org

Tel: +1-732-562-5529

FAX: +1-732-981-1769

ORDER ONLINE: shop.ieee.org/store/search.asp

Enter **JC2100** or **JC2150** in the “4: Search by Product Number” field

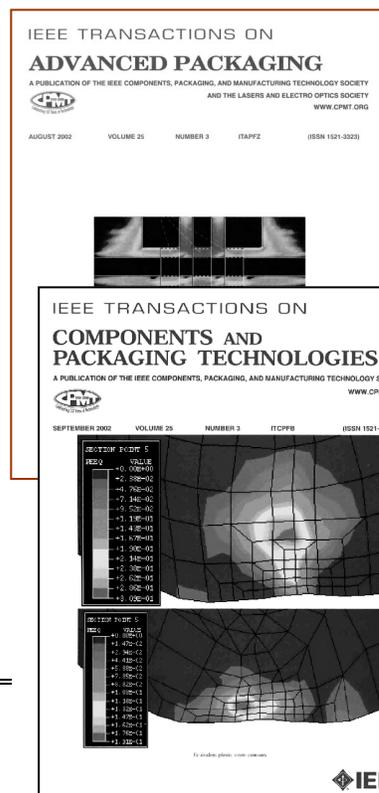
And select the “Search Product No.” button



IEEE COMPONENTS, PACKAGING AND
MANUFACTURING TECHNOLOGY SOCIETY

組件 封装 生产技术

部品、パッケージング、および製造技術



OR ORDER BY MAIL: *Ship to:* _____ *order form*

Product	IEEE Member *	Shipping: In US and Canada /Outside US and Canada	Non-Member	Shipping: In US and Canada /Outside US and Canada	Total Amount of Order
JC2100 (2000-2002)	\$ 60	\$ 7.95/\$12.95	\$ 300	\$17.95/\$26.95	US\$ _____
JC2150B (1954-2002)	\$200	\$17.95/\$26.95	\$ 500	\$22.95/\$68.95	US\$ _____

Credit Card: MC Visa AmEx Diners EuroCard # _____ Exp _____

(Or include check)

*- IEEE Mem # (for discount) _____

Mail/FAX to:

IEEE Customer Service Center

445 Hoes Avenue / PO Box 1331

Ship to:

Name _____

Shipping Addr _____

Piscataway, NJ 08855 USA

Phone: +1-732-981-0060 (Worldwide)

+1-800-678-4333 (Toll-Free, USA & Canada)

Fax: +1-732-981-9667

City/Country/Code _____

Customs and duties may be charged by the country to which you have requested shipment. All charges incurred are the responsibility of the customer.