Northcon®/2002
the Northwest’s OEM Electronics Event
for Design, Manufacturing & Test Engineers

Returns to Bellevue, Washington
Heart of the Northwest’s High Tech Corridor

October 23-24, 2002
Meydenbauer Center

2002 features:

- Exhibits
- Comprehensive Conference Program
  Sponsored by:
  ASQ, EMA, ERA, ESD, IEEE
- Special Exhibit – Electronic Assembly within a Paperless Factory
- Keynote - “Outsourcing – The New Landscape and Horizon”
- Keynote - “The Field Sales Function - Costs, Issues & Outsourcing”

Free Admission to Exhibits - www.northcon.org
An Industry Event
Sponsored by Industry
Celebrating 20 Years

Shorter design cycles…
tighter budgets…
increased competition.

In today’s challenging economic climate, you’re being asked
do more, in less time, with far fewer resources.

For 20 years, electronics professionals have turned to
Northcon for “one-stop” solutions to complex problems.
Northcon’s unparalleled product demonstrations, vendor
exhibits and high quality conference sessions offer answers
and solutions for the entire design and manufacturing team.
Best of all, it takes place in one location – minimizing the
amount of time away from the office.

Who Attends Northcon

• Design/Component Engineers
• Production/Manufacturing Engineers
• Test Engineers
• Mechanical Engineers
• R&D Specialists
• QC/QA & Packaging Engineers
• Purchasing Professionals
• Engineering & Corporate Managers
• Design/Component Engineers

Why Northcon

• Reduce Product Costs – Find new
Sources of Supply

• Product Knowledge – Directly from
the Manufacturer
Get answers to technical questions directly from
the people that have the answers.

• Earn CEUs at a Low Cost
IACET CEUs are awarded for all courses
and workshops.

• Learn What’s Happening in Your Industry
Stay in touch with your industry…learn about the trends,
changes and opportunities that can have an impact on
your professional career.

• Meet Engineer-to-Engineer in a
Creative Environment
Meet face-to-face with your peers – exchange
information and share ideas…away from the office,
in a creative environment.

Exhibit Hours
Wednesday, October 23
10am - 4pm
Thursday, October 24
10am - 4pm

Conference Hours
October 22, Tuesday
9am - 4pm
October 23, Wednesday
9am - 5pm
October 24, Thursday
9am - 5pm

Need a Hotel Room during Northcon?
Visit the Northcon website for discount hotel info & reservations,
or call 800-877-2668 x 242 or 310-524-4100

www.northcon.org • 800-877-2668 / 310-524-4100
**See, Touch and Compare...**
Some of the companies you’ll see at Northcon 2002

A&J Cases  
A-Laser, Inc.  
Adhesa-Plate Manufacturing  
Advanced Quality Sales  
AEI Components  
AEGIS  
Allied Components  
Altron, Inc.  
Ametek-Rotron  
APC  
Arconix Group  
Asemco  
ASQ, Seattle Section  
Astec  
B & J - USA  
The Bergquist Co.  
BTU  
Buckhorn Material Handling Systems  
CAE Northwest  
Cambridge Accusense  
Cascade Tek  
Celesco  
Central Semiconductor Corp  
Cherry Electrical Products  
Chicago Case  
Cinch Connectors  
Circuit CAM  
CKC Laboratories, Inc.  
Coast Wire & Plastic Tech., Inc.  
Cobro Buyers Directory  
Conductive Technologies  
Cooper Electronic Technologies  
CSMI  
CTS  
DA/PRO Rubber, Inc.  
Data Circuit Systems  
Dynapace  
ebm Industries  
Edak/Zargas Aluminum Cases  
Ekra  
Ellsworth Adhesive Systems  
EMA, Washington Chapter  
Enigma Interconnect Inc.  
EPCOS  
ERA, Pacific Northwest Chapter  
ESD Northwest  
ESF Industries, Inc.  
Ewing/Foley  
Fairchild Imaging  
Fischer Connectors  
Flameau Products  
Flameau Products  
Fosta-Tek Optics, Inc.  
Fulcrum Associates  
Gems Sensors  
General Tool And Supply Co.  
Halbar-RTS, Inc.  
Halco  
Hamamatsu Corporation  
Hardigg Cases  
Hardigg Storm Cases  
Hoffman Enclosures  
IEEE, Seattle Section  
Intertek Testing Services/ETL Semko  
Johnson Components  
Juki  
Kepco  
Kinetics Cases  
Kirkhill Rubber Company  
KY Seritech  
LaCroix Industries  
Lakeside Representatives  
lialli industrial  
Mill Max  
Mold rite, Inc.  
Monitor Products Co.  
MOUSER ELECTRONICS  
MYDATA Automation  
National Wire and Cable  
Nidec  
Northwest EMC  
Optical Polymers International  
OZ / Gedney  
Packaging Resources  
Panduit  
Parker Cases  
Parylene Engineering  
Pelican Cases  
The Pentagon Company  
Phihong USA Corp.  
Platt Cases  
Qualitel Corporation  
R-Stahl  
S.S.I. Cable Corporation  
Scandic Springs, Inc.  
Schippers & Crew, Inc.  
SKB  
Solid State Devices,Inc.  
Sparkle Power Inc.  
Sprague-Goodman  
ST Microelectronics  
Streleck  
Synergy Systems  
Techsystems Northwest  
Thin Film Technology Corporation  
Thordarson Inc.  
Tritek NW  
TT Electronics IRC  
W.L. Gore & Associates  
Zipertubing Co.

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**Northcon Special Exhibit**
Electronic Assembly within a Paperless Factory
sponsored by EMA

EMA presents this year’s special exhibit. The special exhibit, provided by Techsystems NW, Asemco, Inc. and Fulcrum Associates will demonstrate a completely automated line for assembling complex mixed technology circuit boards within a paperless environment. Quick changeover, flexibility, and paperless monitoring of the production floor will be highlighted.

Attendees will witness electronic data transfer to process specific sections of the assembly line (real-time) as ECN’s are introduced to the assembly in process.

Top manufacturers providing equipment for the Special Exhibit include:

- AEGIS - Circuit CAM Software
- Asemco, Inc.
- BTU - reflow ovens
- Dynapace – conveyors
- Ekra - screen printers
- Fulcrum Associates - software
- Juki - pick & place
- Streleck
Low-Cost Industry Sponsored Conference Program

This three-day conference with special events and short courses has been developed by a consortium of industry organizations and volunteers to meet the needs of today’s design, manufacturing, test, quality and purchasing professionals.

CEU’s are available for technical conference attendance. The IEEE is an authorized CEU Provider of the International Association for Continuing Education and Training. CEU credits, where available, are indicated with the individual course descriptions.

Register Early and SAVE $$$

Pre-registration is strongly encouraged, and a conference registration form is attached to this booklet. On-site registration will be accepted on a first-come, first-serve basis with no guarantee of classroom space or course material availability. (Advance registration rates are effective through October 4. Beginning October 5 the cost of each course increases by $50.)

Note: Sponsored Events Are Available to All Northcon Attendees
All paid (SC) courses include lunch

### Sponsored by ASQ

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<thead>
<tr>
<th>Course</th>
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<td>SC1</td>
<td>Wednesday, October 23, 2002</td>
<td>2:00 pm - 5:00 pm</td>
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<tr>
<td>SC2</td>
<td>Thursday, October 24, 2002</td>
<td>9:00 am - Noon</td>
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<tr>
<td>SC3</td>
<td>Thursday, October 24, 2002</td>
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### Sponsored by EMA

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<td>SC5</td>
<td>Wednesday, October 23, 2002</td>
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<td>SC6</td>
<td>Thursday, October 24, 2002</td>
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### The Basics of Electronic Components (3 Hrs.)

Fee: $160 (.3 CEUs will be awarded.)
Instructor: Mr. Jim Carroll, Halbar RTS

Non-technical individuals working in the electronics industry need to understand the parts used in their products, and must be able to work effectively with associated technical personnel. From the basic concepts and terminology of electronics (AC, DC, voltage, current, and wattage) to a thorough but easy-to-follow study of the most common electronic components (capacitors, resistors, inductors/transformers, relays, diodes, mosfets, IGBTs, memory), this course will give you an understanding of the terminology, types, uses, packages and operation of the various devices.

### ESD Control on the Factory Floor (4 Hrs.)

Fee: $160 (.4 CEUs will be awarded.)
Instructors: Mr. Irvan Guss, ESD Consultants - Mr. James Dull, President, Static Technology, Inc.,

This course will explore techniques for reducing ESD damage. The static control measures of grounding, shielding, ionization, testing, training and auditing will be detailed. Fundamentals of air ionization, application and performance testing will be reviewed, and attendees will understand what to look for in performing ESD audits to assure that procedures are being followed.
EMC Essentials - Shielding and Grounding (6 Hrs.)
(Organized by IEEE EMC Society)
Fee: $310 (.6 CEUs will be awarded.)
Instructor: Mr. Colin E. Bench, Principal Member, Technical Staff, Compaq Computer Corp.
Shielding and grounding will be explained from fundamental principles through traditional design methodologies. Ignoring the fact that these two areas are tied together can result in poor EMC performance. Advanced concepts will be presented to help those involved in leading edge design develop their expertise.

EMC Modeling - A Practical Introduction (3 Hrs.)
(Organized by IEEE EMC Society)
Fee: $255 (Includes Book)
(3 CEUs will be awarded.)
Instructor: Mr. Colin E. Bench, Principal Member, Technical Staff, Compaq Computer Corp.
The application of computational electromagnetics to real EMC design problems is an emerging and powerful technology. Relying on existing rules of thumb and traditional design equations often is not cost-effective. Basic techniques will be described to set the stage for the heart of the course - EMC model development. A number of examples will be used to highlight some of the important aspects of CEM in EMC.

IEEE 802.11 Wireless LAN Technology (3 Hrs.)
(Organized by IEEE Oregon Section and IEEE Seattle Section)
Fee: $210 (Includes Book)
(3 CEUs will be awarded.)
Instructors: Mr. John E. Byler, Sr. Technology Editor, Wireless Systems Design Magazine - Dr. Rob Roy, Co-founder and Senior Director of Business Development & Technology Strategy, Mobileian Corp. - Mr. Todd Stockert, Software R&D Engineer, Agilent Technologies, Electronic Product Solutions Div., Signal Analysis Product Generation Unit
The major aspects of the IEEE 802.11 (Wi-Fi) family of wireless networking standards will be introduced, and the various efforts and state of deployment will be described. The basic protocol physical and MAC layers for 802.11a, b, and new g services will be presented. Coexistence with other wireless networks (e.g. Bluetooth, Hiperlan) will be discussed.

Opto-Electronic Design Considerations (3 Hrs.)
(Organized by IEEE Seattle Section)
Fee: $160 (.3 CEUs will be awarded.)
Instructor: Mr. Percy F. (Butch) Shadwell, Jr., Principal Consultant, Shadwell Technical Services
This course will explore the opto-electronic design problem domain. Optical data transmission through open space will be emphasized, and specific design solutions for reducing product costs and shortening R&D time in opto-electronic design will be offered. You'll understand how to read specifications to insure component performance and applicability to the problem domain.

PCB and Backplane Signal Integrity in a GigaBit World (3 Hrs.)
(Organized by IEEE EMC Society)
Fee: $160 (.3 CEUs will be awarded.)
Instructor: Mr. Franz Gisin, Director, Backplane Design Technology and Signal Integrity Design, Sammima / SCI Systems
This course explains how PCB and backplane materials (conductors & dielectrics), interconnect geometries (traces & vias) and manufacturing processes (mixed dielectric stackups & micro-vias) impact the signal integrity of giga-bit/second transmission lines structures commonly found in FibreChannel, Gigabit Ethernet, and Infiniband architectures.

Simple Network Management Protocol (SNMP) Technology Overview (3 Hrs.)
(Organized by IEEE Seattle Section)
Fee: $160 (.6 CEUs will be awarded.)
Instructor: Mr. Larry R. Walsh, President, Chateau Systems, Inc.
This course will provide an overview of SNMP terminology and will give attendees the information necessary to make technology choices. The viewpoint is that of a technical practitioner who develops MIB (management information base) specifications and the agents who manage such data. Mainstream usage will be emphasized.

Supply Management Fundamentals (6 Hrs.)
(Organized by IEEE Oregon Section)
Fee: $360 (Includes Book)
(.6 CEUs will be awarded.)
Instructor: Mr. Greg Hutchins, P.E., Engineering Principal, Working It, LLC
Supply management has become a core, competitive organizational area as more companies outsource non-core activities. This practical, value-laden workshop offers practical tools, tips and techniques for aligning supply management processes with strategic initiatives and goals; starting and managing a supply development process; moving from a low-price and product-based relationship to a value-added relationship; managing supply risks throughout the supply development lifecycle and improving supply base maturity and capability.

Design Courses

Advanced Signal Conditioning Design (6 Hrs.)
Fee: $310 (.6 CEUs will be awarded.)
Instructors: Mr. Ronald Mancini, Applications Engineer, Texas Instruments, Inc. Mr. Charles Wray, Member Technical Staff Texas Instruments, Inc., Advanced Analog Products
This course, in five sections, will describe the fundamental tools used in designing analog circuits. Sections one and two will explain and develop the tools that will be used and applied in sections three, four and five where the same approach to designing signal-conditioning circuits will be applied in three different ways.

Analog Electronic Design (6 Hrs.)
Fee: $310 (.6 CEUs will be awarded.)
Instructors: Mr. Ronald Mancini, Applications Engineer, Texas Instruments, Inc. - Mr. Charles Wray, Member Technical Staff, Texas Instruments, Inc., Advanced Analog Products
This introductory-level course will teach analog electronics from the basics to the latest analog applications including high-frequency amplifiers, data converters, single-supply op amps, and low power circuits.

Ball Grid Arrays: Principles and Practice (3 Hrs.)
Fee: $160 (.3 CEUs will be awarded.)
Instructor: Mr. Ray P. Prasad, P.E., President, BeamWorks, Inc.
### Design Courses

**SC17** Electronic Interconnection Technologies (3 Hrs.)
- **Fee:** $160 (.3 CEUs will be awarded.)
- **Instructor:** Mr. Joe Fjelstad, Sr. Consultant, J.C. Fjelstad & Assoc.
- A brief but comprehensive overview of the hierarchy of electronic interconnections from the IC to the wall socket with emphasis on key technologies including IC packaging, HDI substrates, backplanes and connectors.

**SC18** High-Frequency Digital Design and PCB Layout (12 Hrs.)
- **Fee:** $685 (Includes Book)
- **Instructor:** Mr. Robert Hanson, President, AmeriCom Test & SMT Technology, Inc.

**SC19** Logic Design with CPLDs, FPGAs and ASICs (6 Hrs.)
- **Fee:** $310 (.6 CEUs will be awarded.)
- **Instructor:** Mr. Ken Coffman, Technical Sales Engineer, ES/Chase Co.
- Architectures and successful design methods for CPLD, FPGA, gate array and ASIC conversions will be explored. Attendees will be exposed to modern device architectures and proven design methods.

**SC20** Power Supply Topologies - An Introduction (3 Hrs.)
- **Fee:** $160 (.3 CEUs will be awarded.)
- **Instructor:** Mr. Ken Coffman, Technical Sales Engineer, ES/Chase Co.
- An introduction to power supply AC/DC and DC/DC technologies, course topics will include power tradeoffs, discussion and analysis of common power supply topologies, and an intuitive approach to understanding power supply circuitry.

### Design/Manufacture/Test

**SC23** Design for Built-In Self-Test (3 Hrs.)
- **Fee:** $160 (.3 CEUs will be awarded.)
- **Instructor:** Mr. Louis Y. Ungar, President, A.T.E. Solutions, Inc.
- This course will offer tools for going beyond the testability techniques offered by boundary scan and create not only self-testable ICs and systems, but also use BIST to deal with many board-level faults.

**SC24** Design for Testability (6 Hrs.)
- **Fee:** $310 (.6 CEUs will be awarded.)
- **Instructor:** Mr. Louis Y. Ungar, President, A.T.E. Solutions, Inc.
- Techniques including boundary scan will be explored as a means of giving test a fighting chance in finding and diagnosing faults in today’s ever-more-complex circuitry.

**SC25** EMC Standards and Regulations - The Impact on Design and Test (3 Hrs.)
- **Fee:** $160 (.3 CEUs will be awarded.)
- **Instructors:** Mr. Todd Robinson, Sales & Marketing Manager, CKC Laboratories, Inc. - Mr. Chris Kendall, Principal Consultant and CEO,
- Design concerns of high-speed digital designs (crosstalk, ground bounce, metastability, reflections, terminations, bypassing, clock control and how to design to eliminate their negative effects on signal integrity will be explored. How to control Zo, PB stack/layout and logic parameters also will be covered.

**SC26** Six Sigma - Implementation for Real Results (6 Hrs.)
- **Fee:** $310 (.6 CEUs will be awarded.)
- **Instructor:** Mr. Praveen Gupta, Partner, Quality Technology Company
- The course offers a practical approach for successfully implementing Six Sigma by understanding how quality and profitability can go hand in hand, and explores how to establish dramatic improvement objectives and implement the appropriate performance measurements. Mathematical basis, methods, measurement and necessary tools to implement Six Sigma will be given.

**SC27** SMT - Design for Manufacturability, Test & Repair (3 Hrs.)
- **Fee:** $160 (.3 CEUs will be awarded.)
- **Instructor:** Mr. Ray P. Prasad, PE., President, BeamWorks, Inc.
- Technical issues in SMT, BGA and fine-pitch technology design and manufacture that should be understood for effective implementation of SMT and newer packaging technologies will be explored. Factors in selecting appropriate components and DFA-related issues in qualifying a subcontractor will be discussed along with techniques to help ensure that boards are designed for manufacturability and yield.

**SC28** SMT Implementation with New Process Technologies (6 Hrs.)
- **Fee:** $365 (Includes Book)
- **Instructor:** Mr. Ken Coffman, Technical Sales Engineer, ES/Chase Co.
- HDL topics including device architectures and successful design capture methods will be explored.

**SC29** SMT - Troubleshooting Yield Problems (3 Hrs.)
- **Fee:** $160 (.3 CEUs will be awarded.)
- **Instructor:** Mr. Ray P. Prasad, P.E., President, BeamWorks, Inc.
- This course will focus on identifying and correcting SMT assembly problems related to the three major areas of SMT defects - design, assembly and incoming material quality. By offering a step-by-step method for investigating the assembly process (related problems and remedies), the information gained in this course will help you achieve high-yield manufacturing.

### Using Reprogrammable Microcontrollers to Enhance Product Design and Functionality (3 Hrs.)
- **Fee:** $160 (.3 CEUs will be awarded.)
- **Instructor:** Mr. Rodger Ritchey, Applications Manager, Microchip Technology, Inc.
- This course will examine Flash microcontrollers and how they can be used to enhance product design. Real-world design examples will serve as the basis for the discussion. All of the concepts, technology and material on reprogrammable technology discussed here can be applied to any microcontroller manufacturer’s products.
Register Early: Prices shown are effective through October 4, 2002. Beginning October 5, the cost of “SC” events will increase by $50 each. Corporate discounts available for multiple registrants. Call for information.

____ Northcon Exhibits (Weds. and Thurs.– October 23-24) ................. No Charge
____ Keynote K1 – Wed. – October 23 – 8:30 am - 10:00 am ................. $10 ................. $ ________
____ Keynote K2 – Thurs. – October 24 – 8:30 am - 10:00 am ................. $10 ................. $ ________

Conference Program Courses (All courses shown below include box lunch)

__SC1 ($160)  ___SC9 ($210)*  ___SC16 ($310)  ___SC23 ($160)
__SC2 ($160)  ___SC10 ($160)  ___SC17 ($160)  ___SC24 ($310)
__SC3 ($160)  ___SC11 ($160)  ___SC18 ($685)*  ___SC25 ($160)
__SC4 ($160)  ___SC12 ($160)  ___SC19 ($310)  ___SC26 ($310)
__SC5 ($160)  ___SC13 ($360)*  ___SC20 ($160)  ___SC27 ($160)
__SC6 ($160)  ___SC14 ($310)  ___SC21 ($160)  ___SC28 ($310)
__SC7 ($310)  ___SC15 ($310)  ___SC22 ($365)*  ___SC29 ($160)
__SC8 ($255)*

Subtotal __________ 

* Includes Book

Subtotal __________ 

Grand Total $ __________

Method of Payment

___ Check (payable to Northcon 2002).
___ I agree to pay the grand total amount according to my credit card issuer (circle one) VISA     MC     AMEX

Card No. ___________________________CVV2 No.** ___________________________ Expiration Date ___________________________

Name appearing on card (Printed) ___________________________ (Signature) ___________________________

Billing address of card ______________________________________________________________________________________________ (Street/City/State/Zip)

**For Visa and Mastercard - the CVV2 number appears on the back of the card in the signature area. American Express cards do not contain this number.

Persons under 18 years of age not admitted. Students 18 or older admitted on Thursday, October 24 only.

Special Assistance: If you require special assistance covered under the Americans with Disabilities Act, please call (800) 877-2668, Ext. 218 by October 5, 2002.
Outsourcing - The New Landscape and Horizon

Fee: $10 (Includes Continental Breakfast)

Speaker: Mr. David North, Vice President, Business Development, Qualitel Corp.

Outsourcing just changed! Outsourcing changed radically for many users and providers of electronics manufacturing services when the economy crashed. Did the economy cause it, or just trigger it? Who benefitted and who got hurt? How is outsourcing different today than it was a year ago, and where is it headed from here? Electronics manufacturing outsourcing isn’t just a topic for contract manufacturers and their customers. Equipment and component manufacturers, sales representatives, distributors, professional service firms, banking, governments and many others are players. All play key roles in shaping outsourcing, how it works and the consequences—good and bad—for all involved. Better understanding of our roles and how we each influence mutual success will make outsourcing work as a more rewarding strategy for customers, and a more rewarding livelihood for contract manufacturers and all of the suppliers of goods and services that support them. This provocative keynote challenges the electronics industry to adapt to a new landscape, and prepare for a new horizon of outsourcing. Eyes will be raised; feathers will be ruffled; and new insights, challenges and information will be openly discussed.

The Field Sales Function - Costs, Issues, and Outsourcing

Fee: $10 (Includes Continental Breakfast)

Speaker: Mr. Raymond J. Hall, Executive Vice President & CEO, Electronic Representatives Association Int'l

This presentation focuses on today’s field sales and specifically the outsourcing of the field sales function to professional field sales organizations (manufacturers representatives). Special attention will be paid to "the function under fire"—i.e., from customers (trying to cut out the field sales function and therefore the commission), from distributors (trying to take over the field sales function and get the commissions), and even from some manufacturers (trying to find ways to cut that commission, take over house accounts or keep larger and larger portions of split commissions). Electronics has become a truly global industry. Tracking products, applying split credits, consolidations, line conflicts and instant international communications are just a few of the issues that impact the effectiveness of today’s field sales. Attendees will receive an incisive overview of these critical issues and an insider’s current perspectives on the world of outsourced field sales.