<table>
<thead>
<tr>
<th>Session</th>
<th>Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Application of High Performance Microprocessor Families to Computer Graphics</td>
</tr>
<tr>
<td>3</td>
<td>Inventory and Materials Management</td>
</tr>
<tr>
<td>5</td>
<td>Issues in Selecting The Components of A Graphics System</td>
</tr>
<tr>
<td>6</td>
<td>Bar Code Symbology and Applications</td>
</tr>
<tr>
<td>7</td>
<td>Modula-2: Steps Beyond Pascal</td>
</tr>
<tr>
<td>8</td>
<td>Robotics, Artificial Intelligence and Vision</td>
</tr>
<tr>
<td>9</td>
<td>Design Automation = Productivity +</td>
</tr>
<tr>
<td>10</td>
<td>Advanced 16/32-Bit Microprocessor Architectures for the '80s</td>
</tr>
<tr>
<td>11</td>
<td>Very Fine Line Imaging for Printed Circuit Boards</td>
</tr>
<tr>
<td>12</td>
<td>Financing the High Tech Company From Start-Up Phase Through Going Public</td>
</tr>
<tr>
<td>13</td>
<td>New VLSI 16/32-Bit Peripherals</td>
</tr>
<tr>
<td>14</td>
<td>Circuit Board Materials For Ceramic Chip Carriers</td>
</tr>
<tr>
<td>15</td>
<td>Controlling EMI — Contending with the FCC</td>
</tr>
<tr>
<td>16</td>
<td>Multiplier/Divider Units Open Up New Applications for Microprocessors</td>
</tr>
<tr>
<td>17</td>
<td>Troubleshooting Microprocessor Equipment</td>
</tr>
<tr>
<td>18</td>
<td>VLSI Advances In Digital Signal Processing</td>
</tr>
<tr>
<td>20</td>
<td>Development of Multiprocessor Systems</td>
</tr>
<tr>
<td>22</td>
<td>Perspectives in Custom VLSI</td>
</tr>
<tr>
<td>23</td>
<td>Local Area Networks</td>
</tr>
<tr>
<td>24</td>
<td>Practical Everyday Number Crunching</td>
</tr>
<tr>
<td>25</td>
<td>Outlook on Logic Array Technology</td>
</tr>
<tr>
<td>26</td>
<td>Data Communications in Public and Private Networks</td>
</tr>
<tr>
<td>27</td>
<td>Single Chip News/Applications</td>
</tr>
</tbody>
</table>
Session 2 Application of High Performance Microprocessor Families to Computer Graphics

Session Organizer and Chairman
Richard Mateosian
National Semiconductor Corporation
Santa Clara, CA

2/1 NS16000: Implementing a Workstation Featuring Graphics

Max Baron, Keith Winter and David Bell
National Semiconductor Corporation
Santa Clara, CA

2/2 A MC8000 Color Graphics System

Mitchell B. Taylor
Motorola, Inc.
Austin, TX
Session 3  Inventory and Materials Management

Session Organizer
Mary C. Clark
TRAC LINE Computer Corporation
Hicksville, NY

Session Chairman
Art Lekacos
TRAC LINE Computer Corporation
Hicksville, NY

3/1  Hardware in the Manufacturing Environment

A. Jobie Flores
DYNABYTE Business Computers
Milpitas, CA

3/2  Manufacturing Software: What Should It Do?

Mort Siegelbaum
TRAC LINE Computer Corporation
Hicksville, NY

3/3  Cost Benefits of Computerization

Allan Ullman
Microflector Incorporated
Inwood, NY

3/4  MRP Implementation Strategy

Walt Zipperman
The Business Systems Center, Incorporated
Anaheim, CA
Session 5
Issues in Selecting the Components of a Graphics Systems

Session Organizer and Chairman
Gary Romans
Metheus Corporation
Hillsboro, OR

5/1 Issues in Selecting a Graphics Engine – Device Intelligence

Gary Romans
Metheus Corporation
Hillsboro, OR

5/2 Issues in Selecting a Graphics Display

Carlo Infante and William A. Hodge
Tektronix, Inc.
Wilsonville, OR

5/3 Issues in Selecting Graphics Hardcopy Devices

Jeffrey S. Madsen
Benson, Inc.
Mountain View, CA


Karla Vecchiet
Metheus Corporation
Hillsboro, OR
<table>
<thead>
<tr>
<th>Session 6</th>
<th>Bar Code Symbology and Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Session Organizer and Chairman</td>
</tr>
<tr>
<td></td>
<td>Richard R. Dilling</td>
</tr>
<tr>
<td></td>
<td>INTERMEC Corporation</td>
</tr>
<tr>
<td></td>
<td>Lynnwood, WA</td>
</tr>
<tr>
<td>6/1</td>
<td>Which Bar Code Symbology?</td>
</tr>
<tr>
<td></td>
<td>David C. Allais</td>
</tr>
<tr>
<td></td>
<td>INTERMEC Corporation</td>
</tr>
<tr>
<td></td>
<td>Lynnwood, WA</td>
</tr>
<tr>
<td>6/2</td>
<td>Bar Code Scanning System Reduces Short Shipment Claims and Provides Other Benefits</td>
</tr>
<tr>
<td></td>
<td>Norman C. Hamlow</td>
</tr>
<tr>
<td></td>
<td>K2 Corporation</td>
</tr>
<tr>
<td></td>
<td>Vashon, WA</td>
</tr>
<tr>
<td>6/3</td>
<td>Automated Tool Inventory Control and Tracking System</td>
</tr>
<tr>
<td></td>
<td>Dale R. Branscomb, CDP</td>
</tr>
<tr>
<td></td>
<td>Todd Pacific Shipyards</td>
</tr>
<tr>
<td></td>
<td>Seattle, WA</td>
</tr>
<tr>
<td>6/4</td>
<td>Corporate Distribution Group Barcode Project at Tektronix</td>
</tr>
<tr>
<td></td>
<td>Merlyn Webster</td>
</tr>
<tr>
<td></td>
<td>Tektronix, Inc.</td>
</tr>
<tr>
<td></td>
<td>Beaverton, OR</td>
</tr>
</tbody>
</table>
Session 7  Modula-2: Steps Beyond Pascal

Session Organizer
A. Winsor Brown
Volition Systems
Huntington Beach, CA

Session Chairman
James O. Baker
Portland Community College
Portland, OR

7/1  A Brief Comparison of Pascal and Modula II  
Implementor's Point of View

David Coar
Floating Point Systems, Inc.
Portland, OR

7/2  Teaching Modula-2 -- In the Spirit of Pascal

James O. Baker
Portland Community College
Portland, OR
Session 8  Robotics, Artificial Intelligence and Vision

Session Organizer and Chairman
Pieter A. Frick
Portland State University
Portland, OR

8/1  Programming Vision and Robotics Systems with RAIL

Cri Hilmer
Automatix
Billerica, MA

8/2  Characteristics and Constraints of Robotic Assembly
A Primer

Debra Earle
Tektronix, Inc.
Beaverton, OR

8/3  Cubot, A Robot for Solving Rubik's Cube

R. D. Dyer
P. D. Bondurant
F. R. Reich
R. C. Kelley
L. S. Dake
M. A. Lind
J. S. Hartman
S. D. Rosier
Batelle, Pacific Northwest Laboratories
Richland, WA

8/4  Robots in Hostile Environments

Richard W. Hanson
Management Engineering Group
Portland, OR

8/5  Application of Artificial Intelligence to Robotic Vision

Pieter A. Frick
Portland State University
Portland, OR

Peter S. Chao
Tektronix and
Oregon State University
Beaverton, OR
Session 9  Design Automation = Productivity +

Session Organizer
Judy A. Quammen
John Fluke Mfg. Co., Inc.
Everett, WA

Session Chairman
Neil Mathison
Digital Equipment Corporation
Bellevue, WA

9/1  The Ultimate Interactive Device Voice Recognition

Norm Witherbee
Intel Corporation
Hillsboro, OR

9/2  Design Automation for Printed Circuits

Judy A. Quammen
John Fluke Mfg. Co., Inc.
Everett, WA

9/3  Design Productivity Increases Through Solid Modeling

Roy M. Salzman
MATRA DATAVISION, Inc.
Burlington, MA

9/4  CAD/CAM System Evaluation, Implementation and Management, Second Time Around

Leroy Leland
ISC Systems Corporation
Spokane, WA
Session 10  Advanced 16/32-Bit Microprocessor Architectures for the '80s

Session Organizer and Chairman
Robert A. King
Motorola, Inc.
Austin, TX

10/1  The Z8000® Family Provides Advanced System Solutions

Tom Cramer
Zilog, Inc.
Campbell, CA

10/2  A Multiprocessor Interface Device

Robert Canepa
Texas Instruments Incorporated
Houston, TX

10/3  System Integrity and Virtual Memory of the M68000 Architecture

Thomas W. Starnes
Motorola, Inc.
Austin, TX

10/4  NS16000: An Architecture for the Future

Geoffrey R. Kates
National Semiconductor
Santa Clara, CA
Session 11  Very Fine Line Imaging for Printed Circuit Board

Session Organizer and Chairman
Larry W. Burgess
Tektronix, Inc.
Beaverton, OR

11/1  Direct Laser Imaging

Dr. Don B. Neumann
Excellon Automation
Costa Mesa, CA

11/2  The Degree of Collimation Required for Fine Line Imaging

Dr. Richard T. Holzmann
Christopher Group
Laguna Hills, CA

and

Verne Y. Kurisu
Consultant
San Juan Capistrano, CA

11/3  Very Fine Line Imaging

Kerry Grimes
Dynachem Corporation
Irvine, CA

11/4  Automatic Exposure Systems

S. James Hara
OAC Incorporated
Los Angeles, CA
<table>
<thead>
<tr>
<th>Session 12</th>
<th>Financing the High Tech Company From Start-Up Phase Through Going Public</th>
</tr>
</thead>
</table>
|           | Session Organizer and Chairman  
Les R. Fahey, C.P.A.  
Peat, Marwick, Mitchell & Co.  
Portland, OR |

<table>
<thead>
<tr>
<th>12/1</th>
<th>High Tech Tax Strategies That Provide Working Capital</th>
</tr>
</thead>
</table>
|           | David H. McClintock, C.P.A. and  
David L. Brinker, C.P.A.  
Peat, Marwick, Mitchell & Co.  
Portland, OR |

<table>
<thead>
<tr>
<th>12/2</th>
<th>Financing the High-Tech Company and the Banker's Role</th>
</tr>
</thead>
</table>
|           | Jean-Claude Paris  
U. S. National Bank of Oregon  
Portland, OR |

<table>
<thead>
<tr>
<th>12/3</th>
<th>How the Venture Capital Process Works</th>
</tr>
</thead>
</table>
|           | Ralph R. Shaw  
Shaw Management Company  
Portland, OR |

<table>
<thead>
<tr>
<th>12/4</th>
<th>Preparing for the Public Market</th>
</tr>
</thead>
</table>
|           | Alan L. Stein  
Montgomery Securities  
San Francisco, CA |

<table>
<thead>
<tr>
<th>12/5</th>
<th>An Entrepreneurs Guide to Financing the High-Tech Company</th>
</tr>
</thead>
</table>
|           | Thomas H. Bruggere  
Mentor Graphics Corporation  
Portland, OR |
Session 13  New VLSI 16/32-Bit Peripherals

Session Organizer and Chairman
Michael A. Davidson
Motorola, Inc.
Austin, TX

13/1  Zilog's Advanced Peripherals for New-Generation Processors

Ken Thomas
Zilog, Inc.
Campbell, CA

13/2  The NS16000 Peripheral Family

Richard Mateosian
National Semiconductor
Santa Clara, CA

13/3  A High Performance Serial Data Link for the MC68000 Family

Robert Biems
Motorola, Inc.
Austin, TX

13/4  Up System Performance with Bipolar Direct Memory Access Interface - SCB68430

Stephen Y. Lau
Signetics Corp.
Sunnyvale, CA

13/5  An Intelligent Floppy Disk Controller for the 68000 Family

Hugh L. Logan, Jr.
Rockwell International
Newport Beach, CA
Session 14  Circuit Board Materials for Ceramic Chip Carriers

Session Organizer and Chairman
Germaine F. Jacky
Tektronix, Inc.
Beaverton, OR

14/1  HCC-Compatible Substrate

W. C. Wilkinson
The Boeing Aerospace Company
Seattle, WA

14/2  Polymide-Quartz Fiber Reinforced Laminate Materials

Bruce Mahler
The Mica Corporation
Culver City, CA

14/3  Low Thermal Expansion Rate Clad Metals for Chip Carrier Applications

Francis J. Dance
Texas Instruments Incorporated
Attleboro, MA

14/4  Kevlar® Epoxy for Chip Carrier MLBs

Rodman A. Mogle
General Electric Company
Utica, NY

and

Douglas J. Sober
General Electric Company
Coshocton, OH
Session 15  Controlling EMI - Contending with the FCC

Session Organizer and Chairman
Robert M. Simon
Transmet Corporation
Columbus, OH

15/1 Rapid Solidified Aluminum Flake Filled Composites
A Tool to Permit FCC Compliance

Donald Cullen
Transmet Corporation
Columbus, OH

15/2 Shielding Effectiveness Measurement Methods -
Current Procedures and Standards

David E. Stutz
Battelle Columbus Laboratories
Columbus, OH

15/3 Conductive Structural Foam for EMI Shielding

Suzanne Rondeau
University of Lowell
Lowell, MA

15/4 Direct Metalizing VS. Conductive Coatings - A
Comparison of EMI Shielding Techniques

John J. Reilly
Electro-Kinetic Systems, Inc.
Wilmington, DE
Session 16  Multiplier/Divider Units Open Up New Applications for Microprocessor

Organizer and Chairman
Suneel Rajpal
Monolithic Memories, Inc.
Sunnyvale, CA

16/1  Arithmetic Computing for Industrial Control

Michael Alan Baxter
Design Engineer
Corvallis, OR

16/2  A DSP Architecture for a 4800 BPS Modem

Stevan D. Bradley
Racal-Vadic
Sunnyvale, CA

16/3  Memory Aliasing to Improve Math Processor Performance

Charles F. Shelor
Vought Corporation
Dallas, TX

16/4  Superecharging Microprocessor Arithmetic

Suneel Rajpal
Monolithic Memories Inc.
Sunnyvale, CA 94086
Session 17  Troubleshooting Microprocessor Equipment

Session Organizer and Chairman
Al Carlson
John Fluke Mfg., Co., Inc.
Everett, WA

17/1 Control Interface Testing: A Systems Test Approach to Product Service

Donald Cassas
GenRad, Inc.
Phoenix, AZ

17/2 Computer Assisted Troubleshooting

John Seaton
Hewlett Packard
Santa Clara, CA

17/3 Microprocessor Emulation in the Service Environment

Steven E. Rolfe
Applied Microsystems Corporation
Redmond, WA

17/4 Performance Aspects of Digital Troubleshooting

Patrick James Turkatte
Data I/O Corporation
Redmond, WA

17/5 System Test Via IEEE-488-Bus-Controlled Microprocessors

Kenneth R. Hallmen
John Fluke Mfg., Co., Inc.
Everett, WA
Session 18  VLSI Advances in Digital Signal Processing

Session Organizer
David E. Anderson
Synertek
Santa Clara, CA

18/1  A VLSI Array Processor Chip Set

Phil Mylet
Honeywell Marine Systems Division
Seattle, WA

18/2  A Low Power, Low Cost 16-Bit NMOS Multiplier That Achieves Bipolar Performance

VR Ranganath and Richard O'Keefe
Synertek
Santa Clara, CA

18/3  Flexible Single Chip Solution Paves Way for Low Cost DSP

Lee V. Kaplan
Texas Instruments Incorporated
Houston, TX

18/4  Floating Point Arithmetic and the FFT

Dr. John Eldon
TRW LSI Products
La Jolla, CA

18/5  Application Areas for LSI Digital Signal Processors

Steve Sweitzer
NEC Electronics U.S.A. Inc.
Natick, MA
<table>
<thead>
<tr>
<th>Session 20</th>
<th>Development of Multiprocessor Systems</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Session Organizer and Chairman</strong></td>
</tr>
<tr>
<td></td>
<td>Sigurd L. Lillevik</td>
</tr>
<tr>
<td></td>
<td>Oregon State University</td>
</tr>
<tr>
<td></td>
<td>Corvallis, OR</td>
</tr>
<tr>
<td>20/0</td>
<td><strong>Development of Multiprocessor Computers: An Overview</strong></td>
</tr>
<tr>
<td></td>
<td>Sigurd L. Lillevik</td>
</tr>
<tr>
<td></td>
<td>Oregon State University</td>
</tr>
<tr>
<td></td>
<td>Corvallis, OR</td>
</tr>
<tr>
<td>20/1</td>
<td><strong>Multiprocessor Integration Methods</strong></td>
</tr>
<tr>
<td></td>
<td>Michael A. Milhalik</td>
</tr>
<tr>
<td></td>
<td>Tektronix, Inc.</td>
</tr>
<tr>
<td></td>
<td>Beaverton, OR</td>
</tr>
<tr>
<td>20/2</td>
<td><strong>In-Circuit Emulation for Multi-Processor Systems</strong></td>
</tr>
<tr>
<td></td>
<td>Harry &quot;Buzz&quot; Schadel</td>
</tr>
<tr>
<td></td>
<td>Intel Corporation</td>
</tr>
<tr>
<td></td>
<td>Hillsboro, OR</td>
</tr>
<tr>
<td>20/3</td>
<td><strong>Development of a Multiprocessor Controlled Filament Winding Machine</strong></td>
</tr>
<tr>
<td></td>
<td>Engineering Technology, Inc.</td>
</tr>
<tr>
<td></td>
<td>Salt Lake City, UT</td>
</tr>
<tr>
<td>20/4</td>
<td><strong>Development of a Fault Tolerant Multi Processor</strong></td>
</tr>
<tr>
<td></td>
<td>Steven G. Frison and John H. Wensley</td>
</tr>
<tr>
<td></td>
<td>August Systems, Inc.</td>
</tr>
<tr>
<td></td>
<td>Tigard, OR</td>
</tr>
</tbody>
</table>
Session 22 Perspectives in Custom VLSI

Session Organizer and Chairman
Naveen Tangri
American Microsystems, Inc.
Santa Clara, CA

22/0 Perspectives in Custom VLSI

Naveen Tangri
American Microsystems, Inc.
Santa Clara, CA

22/1 Semicustom VLSI Microcomputer Design with CMOS Functional Cells

John Cofield
American Microsystems, Inc.
Santa Clara, CA

22/2 The ZyCOMP-4: An Innovative Standard Cell Approach to Designing Custom Microcomputers

Stephen R. Pollock
ZyMOS Corporation
Sunnyvale, CA

22/3 From Database Tapes to Custom Chips

Len Bogle and Robert A. King
Motorola, Inc.
Austin, TX
Session 23  Local Area Networks

Session Organizer and Chairman
William P. Selmeier
Sytek Incorporated
Mountain View, CA

23/1 Beyond Ethernet: Integration of Office Functions in the Xerox 8000 Network Systems

Juan Bulnes
Xerox Office Systems Division
Palo Alto, CA 94304

23/2 LAN Function in the Multi Service Environment

Jack Moynihan
Sytek, Incorporated
Mountain View, CA

23/3 Ethernet: In the DEC Environment

David Potter
InterIan, Incorporated
Westford, MA 01886

23/4 Comprehensive Broadband Networks

David B. Beckett
Wang communications, Inc.
Englewood, CO
Session 24 Practical Everyday Number Crunching

Session Organizer and Chairman
Chuck Hastings
Monolithic Memories, Inc.
Sunnyvale, CA

24/1 High Performance Digital Music Synthesis

Michael Alan Baxter
Consultant
Corvallis, OR

24/2 Fast 64x64 Multiplication Using 16x16 Flow-Through Multipliers and Wallace Trees

Marvin Fox, Chuck Hastings and Suneel Rajpal
Monolithic Memories, Inc.
Santa Clara, CA

24/3 A Practical Architecture for Feeding Number Crunchers

Gerald B. FeldKamp
Aptec Computer Systems, Inc.
Portland, OR

24/4 Cycle vs Access Time: Optimizing Semiconductor Parts for Number Crunching

Alan Charlesworth and W. Eric Hall
Floating Point Systems, Inc.
Portland, OR
Session 25  Outlook on Logic Array Technology

Session Organizer and Chairman
Pradip Madan
LSI Logic Corporation
Milpitas, CA

25/1 Developments in Products, Technology, and Design Tools

Steve Chan and Pradip Madan
LSI Logic Corporation
Milpitas, CA

25/2 On-Chip Memory and Test Functions for Gate Arrays

Dennis Sabo and I. Mackintosh
National Semiconductor Corp.
Santa Clara, CA

25/3 The Gate Array Dilemma: Provisions for the Generic Special Case

Russ Pate and Bill Berg
United Technologies Microelectronic Center
Colorado Springs, CO

25/4 Semi-Custom Logic -- Today's Most Powerful Design Tool

Jim H. Lang
Fujitsu Microelectronics, Inc.
Santa Clara, CA
Session 26  Data Communications in Public and Private Networks

Session Organizer and Chairman
Patrick H. Bougeois
Micom Systems, Inc.
Chatsworth, CA

26/1 The Fundamentals and Terminology of Data Communications

Thomas W. MacLean, Jr.
Rush Drake Electronics, Inc.
Portland, OR

26/2 Interfacing to Packet Data Networks

Samir L. Stavro
Micom Systems, Inc.
Chatsworth, CA

26/3 New Advances in Modem Technology

David L. Peters
Racal Vadic
Sunnyvale, CA
Session 27 Single Chip News/Applications

Session Organizer
Mark Virts
Motorola Incorporated
Austin, TX

27/1 Analog/Digital Processing with Microcontrollers

John Katausky, Ira Horden, Lionel Smith
Intel Corporation
Chandler, AZ 85224

27/2 Keeping Software From Being Copied — A New Silicon Method

Bill Huston
Motorola Incorporated
Austin, TX

27/3 Improved System Performance with the CMOS-Z8

James Curtis
Synertek, Incorporated
Sunnyvale, CA

27/4 New 16/32-Bit Microcomputer Offers 200-NS Performance

Jim Potts
Texas Instruments Incorporated
Houston, TX

27/5 The CDP1804A Single Chip CMOS Microcomputer

Paul K. Sferrazza
RCA Solid State
Somerville, NJ