a choice of three
pre-conference tutorials

DESIGN OF MICROPROCESSOR SYSTEMS
A PRACTICAL VIEW OF COMPUTER COMMUNICATIONS PROTOCOLS
MICROPROCESSOR PROJECT MANAGEMENT

SEPTEMBER 4-7, 1979

NINETEENTH IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE
CAPITAL HILTON HOTEL, WASHINGTON, D.C.

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*ALPHABETICAL ORDER

September 4-7

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DESIGN OF MICROPROCESSOR SYSTEMS

This tutorial is intended for those individuals who are or will be involved in the design of microprocessor-based systems. The tutorial will stress the wide range of available microprocessor products and the development tools for microprocessor-based design. The entire design effort with emphasis on system configuration, software development, and system testing will be presented. The attendees should obtain an understanding of the steps in microprocessor-based system design, some knowledge of design tradeoffs, and a feel for available products and product trends.

- Microprocessor Based System Review
  Components – Microprocessors, Memory and Peripherals
  Architectures
- Design Steps
  Component Selection
  Architecture Selection
  Software Design
- Testing and Development Tools
  Special Hardware Monitors and Emulators
  Program Tools
- Design Alternatives
  Build or Buy?
  Mini or Micro?
- Current Trends Affecting Design
  Minicomputer Vendor Activities
  Component Consolidation or Explosion?

LECTURER:
Dr. John H. Carson is a member of the senior technical staff of RLG Associates, Inc., Reston, Virginia. His work there involves the design of specialized mini and microcomputer systems. He received his Ph.D. in Information Science from Lehigh University and has authored and presented IEEE tutorials on mini and microcomputer systems and distributed processing. Dr. Carson is also on the faculty of George Washington University and has lectured throughout the country for both the IEEE and George Washington University.

A PRACTICAL VIEW OF COMPUTER COMMUNICATIONS PROTOCOLS

The objectives of this tutorial are: first, to examine the fundamental design choices in computer communications systems; second, to investigate fundamental protocol choices within computer communications systems; and, third, to discuss existing offerings. The seminar is intended for those who may already have some background in one aspect of data communications and who wish to gain a more complete understanding of the field, as well as a working knowledge of the theory and practice of protocol design.

- Function of Computer Communications Protocol
- Design objectives
- Choice of Transmission Facilities
  Switching Method
  Topological Layout
  Communications Equipment
  Subnet Protocol Design
  Control Procedures, Link Level
  X.25 Interface
  Routing
  End-to-End Protocols
  Network Interfaces
- Host Level Protocols
  Basic principles and a hypothetical evolution of a reliable point-to-point protocol
- Network Sampler

LECTURER:
Dr. John M. McQuillan holds an A.B., M.S. and Ph.D. in applied mathematics from Harvard University. He has been with Bolt, Beranek and Newman, Inc., since 1971 where he was a major contributor in the design and implementation of the ARPANET. Currently, Dr. McQuillan is Manager of the Systems Analysis Department at BBN which performs systems studies, consulting, network design, evaluation and related activities. He is active in studying advanced computer communications systems of many kinds.

MICROPROCESSOR PROJECT MANAGEMENT

This unique course synthesizes the experience of hundreds of project managers (who learned the hard way) into a practical, field-proven methodology for managing all phases of a microprocessor application. The course emphasizes high-risk, high-cost and time-critical problems unique to microprocessors. Concrete and real-world case studies illustrate the methods presented, and these step-by-step methods can be immediately applied to your own project. This course will benefit managers, engineers, programmers and analysts who are involved in microprocessor project development and management.

- Fundamental concepts, definitions and jargon
- Avoiding pitfalls and "technical tunnel vision"
- Planning and specifying the project (the PERT/Flowchart)
- How to select personnel and evaluate performance
- How to select the right microprocessor (what's really important?)
- Software development and test equipment (what's really needed?)
- How to estimate overall project costs and schedule
- How to manage software design and development
- Software documentation: a practical methodology
- Verifying that the software works
- Manufacturing, testing and QA (both software and hardware)
- Component and product reliability: planning microprocessor field service
- How to prepare for the future today . . . and avoid obsolescence tomorrow

LECTURER:
Eric R. Garen has presented over 100 courses since 1974 in microcomputer system design, component selection, software and hardware development and microcomputer applications, including special presentations for the corporate management of companies such as N.V. Philips, New York Telephone, and Messerschmitt. A graduate of the California Institute of Technology with a Master's Degree in Computer Science from the University of Southern California, Mr. Garen has over ten years of experience in both the technical and managerial fields of minicomputer and microcomputer systems, and has contributed frequently to technical journals, symposia and conferences.

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ALL THREE TUTORIALS START
9:00 A.M., TUESDAY, SEPTEMBER 4, 1979

REGISTRATION FOR TUTORIALS AND CONFERENCE ON LAST PAGE
## Preliminary Program

**WEDNESDAY, September 5, 1979**

### Keynote Session
- **9:30 A.M.**
- **11:00 A.M.**
- **12:00 Noon**

### Lunch - 12:30 PM - 2:00 PM

### SESSION 1: Novel Microprocessor Architecture
- **Chairperson:** D. Bhandarkar, DEC
- **Tredennick, N., Motorola, Inc.**
- **Intel 8089 I/O Processor**
- **El-Ayat, K., Intel, Inc.**

### SESSION 2: Software Development Principles for Microprocessor Systems
- **Chairperson:** T.F. Gannon, Sperry Univac
- **Bisani, R., Mersberg, H., Carnegie-Mellon Univ.**
- **Design Principles of Structure**
- **Techniques for Designing Real-Time Executives for Mini/Microprocessor-Based Systems**

### SESSION 3: Practical Low Cost Natural Language Translators
- **Chairperson:** M. Levy, Lexicon Corp.
- **Design of the Lexicon LK-3000 Language Computer**
- **Porter, W.P., Lexicon Corp.**
- **Computer Assisted Translation**
- **The Craig M-100 Translator**

### Session 4: LSI Minicomputers
- **Chairperson:** D. Gaubatz, DEC
- **HP300**
- **Mai, K., Bergh, A., Hewlett Packard**
- **LSI-11/23**
- **Hashifune, B., DEC**
- **MN602**
- **Plough, D., Data General**

### Session 5: Microprogramming Languages
- **Chairperson:** T.F. Gannon, Sperry Univac
- **Lowry, J.A., Vehman, M.J., ITT**
- **Chamil, A Case Study in Microprogramming Language Design**
- **Implementation of Compilers for a Microcomputer**

### Session 6: Personal and Consumer Computing
- **Chairperson:** R. Kuzmack, MathTech, Mathematica
- **A Legal Roadmap for Personal Computing Software**
- **Novick, H.L., Larson, Taylor & Hinds**
- **Consumer Computing Through Low Cost Time-Sharing Networks**

### Break - 3:30 PM - 4:00 PM

### Session 4: LSI Minicomputers
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### 4:00 PM - 5:30 PM

### 5:30 PM - 7:00 PM

### Cocktail Party
## THURSDAY, September 6, 1979

### 9:00 AM – 10:30 AM

| SESSION 7: | HIGH LEVEL LANGUAGE ORIENTED MICROPROCESSORS  
Chairperson: D. Frailey, Texas Instr.  
PASCAL MICROENGINE – O’Neill, E., Western Digital  
LISP MICROPROCESSOR – Sussman, G., Steele, G., MIT  
A DIRECT EXECUTION PROCESSOR – Hidinger, R.M., Perrin, M., Martinez, R., NOSC; Korn, G., Univ. of Arizona |
| SESSION 8: | ENERGY & ENVIRONMENTAL MONITORING APPLICATIONS  
Chairperson: R. Quintana, SDC  
MICROCOMPUTER EXHAUST STACK MONITORING SYSTEM – Ethridge, C., Littlefield, L., Los Alamos Sci. Lab  
MICROPROCESSOR MONITORING TO DETECT ILLICIT PLUTONIUM PRODUCTION – Lewis, P., Ethridge, C., Los Alamos Sci. Labs  
MICROPROCESSORS FOR LIFE SUPPORT AND SAFETY NET WORKS IN UNDERGROUND COAL MINES – Nutter, R., West Va. Univ. |
| SESSION 9: | ISSUES IN SECURITY  
Chairperson: L. Hoffman, G.W. Univ.  
CRYPTOGRAPHIC PIN PROCESSING IN EFT SYSTEMS – Lennon, R.E., Mataya, S.M., IBM-Ingston  
MICROPROCESSORS AND DATA ENCRYPTION – Davida, G.I., NSF, Wells, D.L., SDC  
SECURITY DESIGN ISSUES FOR MICROPROCESSOR BASED SYSTEMS – Gilligan, J.M., SDC |
| SESSION 10: | MICROPROCESSOR TECHNICAL STANDARDS  
Chairperson: R. Stewart, Stewart’s Research Enterprises  
IMPROVEMENTS IN FLOATING POINT: PRESENT AND FUTURE BUSES; PASCAL; ASSEMBLY LANGUAGE MNEMONICS; AND OTHER DRAFT STANDARDS – Stewart, R., IEEE/CS/Standards Committee  
FLOATING POINT STANDARDIZATION – Payne, M., DEC  
The 5-100 BUS STANDARD: WHERE DO WE GO FROM HERE? – Emquist, K., Ithaca Audio, Inc.  
SOFTWARE QUALITY ASSURANCE STANDARDS – Buckley, F., RCA |

### BREAK – 10:30 AM – 11:00 AM

### 11:00 AM – 12:30 PM

| SESSION 11: | DATA BASE MACHINES  
Chairperson: A. Bandurski, USNSRD.C  
A CAM-AUGMENTED MICRO-BASED RELATIONAL DATA BASE – Greenblatt, D., Waxman, J., Queens College, CUNY  
A MICROPROCESSOR-BASED DESIGN OF THE DATA BASE COMPUTER – Freeman, H., Sperry Univac  
THE MICRO-SEED AND ITS APPLICATION – Gerristen, R., Hackathorn, R., Inti. Data Base Systems  
DATA MANAGEMENT FOR MICROCOMPUTERS – Johnson, H., Larson, J., Sperry Univac |
| SESSION 12: | ADVANCES IN VOICE COMMUNICATIONS  
Chairperson: C. Davis, Time & Space Proc.  
STATISTICAL MULTIPLYING OF LOW-SPEED DIGITIZED VOICE AND DATA CHANNELS – Michaud, M., Codec  
MICROPROCESSOR BASED SIMULTANEOUS VOICE AND DATA NETWORK PROCESSOR – Sammartino, F., Bajor, R., Davis, C., Time & Space Proc.  
MICROPROCESSOR IMPLEMENTATION OF A LINEAR PREDICTIVE CODER – Goldberg, A., DeLillis, J., Bergeron, L.E., Lynch, W., GTE Sylvania |
| SESSION 13: | EXPORT CONTROLS ON MICROPROCESSORS  
Chairperson: R. Stewart, Princeton Univ.  
Panel to explore the impact of the new export law on the microprocessing industry – Panelists: S. Abrahamson, CDC; V. Johnson, House of Reps. Staff; R. Russell, U.S. Senate Staff; C. Phipps, Tex. Instr.; T. Christianson, HP; C. Borkland, Govt. Exec. Magazine (DOD Participant to be announced) |
| SESSION 14: | NEW DIRECTIONS IN VIRTUAL MACHINE TECHNOLOGY  
Chairperson: R. Goldberg, BGS Systems  
VIRTUAL MACHINE TECHNOLOGY: A BRIDGE FROM LARGE MAINFRAMES TO NETWORKS OF SMALL COMPUTERS – Goldberg, R.; Magé, P., BGS Sys.; Perry, J., NSWC  
CPX – AN EXPERIMENTAL VIRTUAL MACHINE MONITOR – Derry, S., Russell, W., NSWC  
PARTITIONING FOR VIRTUAL MACHINE EFFICIENCY – Anderson, L., Sperry Univac |

### LUNCH – 12:30 PM – 2:00 PM

### 2:00 PM – 3:30 PM

| SESSION 15: | PICTURE PROCESSING GRAPHICS  
Chairperson: L. Biscomb, Consultant  
ON-LINE IMAGE ENHANCEMENT IN THE TIME DOMAIN WITH A MICROPROCESSOR  
Orbach, Z., Ruhan, S., Manor, E., Weizmann Inst. of Science, Israel  
GUMBI: A GRAPHIC USER MICROPROGRAMMABLE BIT-SLICE INTERPRETER – Ackland, S., Weste, N., Bell Labs. |
| SESSION 16: | ADVANCES IN VOICE COMMUNICATIONS II  
Chairperson: C. Davis, Time & Space Proc.  
A NON-LESS SQUARES CRITERION FOR SPEECH CODING – Malti, S., Sys. Control, Inc.  
A MICROPROCESSOR BASED SPEECH RECOGNITION SYSTEM – Yuschik, M., Martens, H., SUNY Buffalo |
| SESSION 17: | SPACE AND MILITARY APPLICATIONS  
Chairperson: C. Pleiffer, CSC  
SPACELAB PAYLOADS MULTIPROCESSOR COMPUTER SYSTEM – Zipse, J., Engel, A., Herreid, R., CSC  
SPACECRAFT LOADS MULTIPROCESSOR COMPUTER SYSTEM – Zipse, J., Engel, A., Herreid, R., CSC  
MICROPROCESSORS IN AEROSPACE APPLICATIONS – Mersten, G., Bendix |
| SESSION 18: | MICROPROCESSOR DEVELOPMENTS IN THE MIDDLE EAST, AFRICA, AND S.E. ASIA  
Chairperson: W. Swift, Advanced Technological Services, Inc.  
Panel: Trends of Use of Microcomputers in the Arab Middle East – Samaha, J., Mid-East Corp.  
Panel: Developments in Micro Applications in Africa and Asia – Higgins, W., Advanced Technological Services, Inc.  
Panel: Microprocessor Applications in S.E. Asia – Hed, K., Educational Systems Inc. |

### BREAK – 3:30 PM – 4:00 PM

### 4:00 PM – 5:30 PM

| SESSION 19: | VLSI ARCHITECTURAL IMPLICATIONS IN JAPAN  
Chairperson: T. Sugano, Univ. of Tokyo  
COLOR GRAPHIC DESIGN SYSTEM FOR IC MASKS – Shuto, T., Watanabe, Y., Kikuchi, Y., NEC-Toshiba, Japan  
Others to be Announced |
| SESSION 20: | SHORT NOTES  
Chairperson: H. Wood, NBS  
The Brooks Law and Microcomputers – Miller, T., Govt. Sales Consultants, Inc.  
Others to be Announced |
| SESSION 21: | INTERPROCESS COMMUNICATION  
Chairperson: R. Rosenthal, NBS  
INTERPROCESSOR COMMUNICATION IN MULTIPROCESSOR SIMULATION SYSTEMS – O’Grady, E.P., Ariz. State Univ.  
A COMPONENT FOR MULTIMICROCOMPUTER STRUCTURES – Courvoiser, M., CNRS, France  
CONTROL: THE UNDEFINED THIRD DIMENSION OF DISTRIBUTED PROCESSING ARCHITECTURE – Coop, R., Sperry Univac |

### COCKTAIL PARTY – 5:30 PM – 7:00 PM

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<th>SESSION 25: MULTIPLE MICROPROCESSORS</th>
<th>SESSION 26: MICROPROCESSOR APPLICATIONS IN JAPAN</th>
<th>SESSION 27: PERIPHERAL CONTROLLER CHIPS</th>
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<td>COMMUNICATION LINKS IN A HIERARCHICAL MULTICOMPUTER</td>
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<td>LSI BUBBLE MEMORY CONTROLLER – Yamaguchi, N., Kita, Y., Sugie, M., Yoshizawa, S., Hitachi, Ltd.</td>
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<td>Bhatt, D., Smith, D., SUNY at Stony Brook</td>
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<td>BIPOLAR MICROPROCESSOR-BASED MEMORY CONTROLLER – Chen, C., Sperry Univac</td>
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<td>AN ARCHITECTURE FOR A UNIFIED SYSTEM OF COORDINATED MICROCOMPUTERS – Reddy, C., PRC</td>
<td>CHINESE CHARACTER INPUT/OUTPUT AND TRANSMISSION IN JAPANESE PERSONAL COMPUTING – Ishida, H., Univ. of Tokyo</td>
<td>LUNCH – 12:30 PM – 2:00 PM</td>
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<th>SESSION 28: USING TOOLS IN MICROPROCESSOR SYSTEM DEVELOPMENT</th>
<th>SESSION 29: TEST TECHNOLOGY</th>
<th>SESSION 30: DESIGN AND APPLICATION OF INTELLIGENT SCIENTIFIC DEVICES</th>
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<td>STANDARDIZATION AND CONTROL OF MICROPROCESSOR SYSTEM DEVELOPMENT IN A LARGE CORPORATION – Shechter, J., Boeing Computer Serv.</td>
<td>ON-LINE FAULT DETECTION AND CORRECTION IN MICROPROCESSOR SYSTEMS – Agrawal, D., Wsu; Agrawal, V., McGill Univ.</td>
<td>A MICROCOMPUTER CONTROLLED U.V. OZONE CALIBRATOR – Moore, D.H., SAI</td>
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<td>MICROPROCESSOR SYSTEMS TESTING AND DIAGNOSTICS – Davidson, R., Miller, N., Bell Labs</td>
<td>MICROCOMPUTER-AIDED DESIGN OF FILTERS – Medley, R., Lim, T., U.S. Nav. Academy</td>
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FRIDAY, September 7, 1979

9:00 AM – 10:30 AM

BREAKE – 10:30 AM – 11:00 AM

11:00 AM – 12:30 PM

LUNCH – 12:30 PM – 2:00 PM

2:00 PM – 3:30 PM
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NOTE: Requests for refunds must be received in writing no later than August 24, 1979.
- Tutorial registration fee includes luncheon and notes.
- Conference registration fee includes one copy of the proceedings and provides you with 2 complimentary drink tickets for each of the conference hosted parties, Wednesday and Thursday nights.

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