1975 national computer conference program
# 1975 NATIONAL COMPUTER CONFERENCE

**sponsored by**

<table>
<thead>
<tr>
<th>Organization</th>
<th>Description</th>
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<tbody>
<tr>
<td>AFIPS</td>
<td>American Federation of Information Processing Societies</td>
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<tr>
<td>ACM</td>
<td>Association for Computing Machinery</td>
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<tr>
<td>DPMA</td>
<td>Data Processing Management Association</td>
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<tr>
<td>IEEE-CS</td>
<td>IEEE Computer Society</td>
</tr>
<tr>
<td>SCS</td>
<td>Society for Computer Simulation</td>
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**AFIPS CONSTITUENT SOCIETIES**

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<th>Society</th>
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<tr>
<td>AIAA</td>
<td>American Institute of Aeronautics and Astronautics</td>
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<td>AICPA</td>
<td>American Institute of Certified Public Accountants</td>
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<tr>
<td>ASIS</td>
<td>American Society for Information Science</td>
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<td>ASA</td>
<td>American Statistical Association</td>
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<tr>
<td>ACL</td>
<td>Association for Computational Linguistics</td>
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<td>ACM</td>
<td>Association for Computing Machinery</td>
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<tr>
<td>AEDS</td>
<td>Association for Educational Data Systems</td>
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<td>IEEE-CS</td>
<td>IEEE Computer Society</td>
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<tr>
<td>IIA</td>
<td>Institute of Internal Auditors</td>
</tr>
<tr>
<td>ISA</td>
<td>Instrument Society of America</td>
</tr>
<tr>
<td>SCS</td>
<td>Society for Computer Simulation</td>
</tr>
<tr>
<td>SIAM</td>
<td>Society for Industrial and Applied Mathematics</td>
</tr>
<tr>
<td>SID</td>
<td>Society for Information Display</td>
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<tr>
<td>SLA</td>
<td>Special Libraries Association</td>
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General Chairman’s Message

Donal A. Meier
Consultant
Escondido, Ca.

This Program Booklet is being made available prior to a National Computer Conference for the first time. We hope in this way to provide you with information to stimulate your interest in attending the 1975 National Computer Conference.

We know that our in-depth technical program will attract a large worldwide audience of computer professionals. I would like to welcome all of you to the 1975 NCC and to encourage you to participate in the broad range of activities outlined in this booklet.

The National Computer Conference can now be said to represent all the computer-related Professional Societies. This year we are joined by the Data Processing Management Association. They now join our other sponsors: The IEEE Computer Society, The Association for Computing Machinery, The Society for Computer Simulation and the AFIPS group. As members of the AFIPS group there are eleven other constituent professional societies which have a voice in the National Computer Conference. These members are listed on the front of the booklet. The Institute of Internal Auditors is a new member of this group.

Volunteers, for a Conference of this magnitude, number in the hundreds. Practically every committee member, session participant, and organizer belongs to one or more of the member societies. Although society affiliations are not listed, for the most part, their member support has been outstanding. To these AFIPS societies and their participating members, my heartiest thanks. To the NCC Board and the NCC Committee, my thanks for your confidence and support. To the AFIPS Staff and to members of the '75 NCC Steering Committee, thanks for your dedication and your time and effort.

For all attending, thanks for coming. Our extensive technical program, the total exhibit with its range of new equipment and services, and the other numerous activities outlined in this booklet, when combined with the Anaheim Convention facilities and locale, should make your attendance most interesting, productive and worthwhile.

We offer you an outstanding program — it’s now up to you to participate in NCC ’75.
Welcome to the 1975 National Computer Conference and to the Anaheim Convention Center in Southern California.

The '70's have been described as the "Decade for Dialogue" referring to the need for increased dialogue between the user and technician/designer of information processing systems. Most technical programs recently have found ways to introduce user viewpoints in order to stimulate this dialogue. One difficulty is the diversity of "users." To the hardware suppliers, the user is the system programmer. More often "user" refers to the application programmers and operators. Many non-computer people use computers, e.g., problem solvers, POS clerks, and bank tellers by simply entering parameters into established programs usually at a terminal, i.e., "parametric users." In these tight economic times a very important class of user is the manager whose budget must support the system. In fact, a significant portion of this year's program is aimed at this user/manager who must make dollar decisions about systems development.

By mid-decade, a third voice has begun to make its influence felt; that is, the voice of society via government regulations, law suits, and consumer pressure groups. This change, coupled with the profound changes in information system design brought about by the introduction of networks, microprocessors, and integrated data base, make the '70's a period of transition to information systems that are intimately integrated into the very corporate structure and operational procedures of the enterprise and responsive to the requirements of society, i.e., "The Era of Operational Systems."

It is our belief that we have assembled for you a technical program whose major topic areas match the challenges of this new era. We considered these challenges so important to the information processing community at large that we sought out the most competent of our professionals to be Technical Area Directors. This sets a high standard of quality control in each area. In each case these Technical Area Directors were chosen, not only for their technical preeminence, but also for their administrative ability to organize the necessary sessions to bring the most important message from these technical areas to the attention of this diverse, national audience. Most technical areas are treated as a "day" of four sessions in a single room. Many of these start with a tutorial session. Maximum information transfer to an audience frequently occurs when one or two good papers are presented followed by a discussion which is lead by experts in the field. In other cases, professional presentations and bilateral discussions are better suited to information transfer.

As usual, the Proceedings include the presented papers. Nearly all of the sessions will be taped and cassettes made available to aid in the distribution of information. A few select sessions will be transcribed and published as AFIPS Monographs.

The entire Technical Program Committee joins me in thanking the hundreds of authors, paper referees, session chairmen, panelists, and area directors who have made this Program possible.

*Thank you Walter M. Carlson See Forward to Computers in Crisis, R. W. Bemer, Editor ACM Conference 1970
Keynote Address

Jay W. Forrester
Massachusetts Institute of Technology
Monday, May 19, 1975
10:00 a.m., Anaheim Room
Anaheim Convention Center

We are privileged to have Jay W. Forrester, Germshausen Professor at the Alfred P. Sloan School of Management, Massachusetts Institute of Technology, as Keynote Speaker for the 1975 National Computer Conference.

Professor Forrester, a world-renowned authority in the fields of computer science and the dynamics of change, will discuss computer modeling of social systems with emphasis on social and economic forces underlying current national inflationary trends. He has been a leading figure in the Club of Rome and his landmark book *World Dynamics* led the Club of Rome to sponsor its much heralded Project on the Predicament of Mankind which resulted in a widely discussed report, *The Limits to Growth*.

A native of Nebraska, Professor Forrester obtained his B.S. degree in Electrical Engineering from the University of Nebraska and his S.M. degree from M.I.T. He has been awarded honorary Doctorate degrees in engineering from the University of Nebraska, Newark College of Engineering, and the University of Notre Dame. In addition, he holds honorary Doctorate degrees in science from Boston University and Union College.

Conference Luncheon

Neil Gorchow
Sperry Univac
Tuesday, May 20, 1975
12 Noon, Anaheim Room
Anaheim Convention Center

Neil Gorchow, Vice President, Product Strategy and Requirements, Sperry UNIVAC, will be the featured speaker at the Conference Luncheon on May 20 beginning at 12 Noon in the Anaheim Room.

In addition to his responsibilities for the short- and long-range direction of Sperry UNIVAC products through a product strategy, Mr. Gorchow is responsible for the planning of principal new computer systems, the developing of supporting technologies in hardware and software, and the collection and disposition of all product ideas.

Mr. Gorchow joined Sperry UNIVAC in 1956 as a systems analyst. In 1967, he was appointed Vice President of Systems Programming, a position which he held until 1970 when he was appointed Vice President, Worldwide Marketing and Support. He received his current appointment in January 1973.

A native of Sioux City, Iowa, Mr. Gorchow received his B.S. degree from the University of Iowa in 1948.
The Honorable Jimmy Carter, former Governor of Georgia, will deliver a major address on May 21 beginning at 1:00 p.m. in the Anaheim Room at the Anaheim Convention Center.

A technologist by initial training, Jimmy Carter has given serious thought and study as to how science and technology might be best tapped and utilized to serve the public good, including effective development and utilization of information processing as a national resource.

During 1973-74, he served as National Campaign Chairman for the Democratic Party. Recently, Jimmy Carter announced his candidacy for his party's Presidential nomination in 1976.

Elected Governor of Georgia in 1970, his tenure in the State House was an active one and included significant changes to existing legislative and judicial systems.

Jimmy Carter is a native of Plains, Georgia, and graduated from the U.S. Naval Academy. He served for seven years in the U.S. Navy during which time he undertook graduate work in nuclear physics and worked under Admiral Hyman Rickover on the development of the world’s first atomic submarines. He served as senior officer of the atomic submarine Seawolf prior to its commissioning. In 1962, Carter was elected to the Georgia State Senate. While Governor, he also served on the Southern Regional Education Board for four years and held the office of Chairman during 1971-72.

Recognizing the rapidly increasing role of computers in the modeling of economic systems and in such areas as banking, electronic funds transfer and long-range economic forecasting, the Honorable John E. Sheehan, Member of the Board of Governors of the Federal Reserve System, will address the '75 NCC Industry Luncheon.

Prior to his Presidential Appointment, Governor Sheehan was President and Chief Executive Officer of Corhart, a subsidiary corporation of Corning Glass Works. He has had a distinguished business and professional career and served as a Vice President of the Cement and Lime Division of Martin Marietta Corporation before joining Corhart. Previously, he served on the professional staff of McKinsey & Company in their New York office.

A native of Johnstown, Pennsylvania, Governor Sheehan received his B.S. degree in Engineering from the United States Naval Academy and served as a Naval Aviator with the Atlantic and Pacific Fleets. Later, at Harvard Business School, he was elected a George F. Baker Scholar for academic excellence and received his M.B.A. degree in 1960.
1975 Harry Goode Memorial Award

Dr. Kenneth E. Iverson
IBM Corporation
Conference Luncheon
Tuesday, May 20, 1975
12 Noon, Anaheim Room
Anaheim Convention Center

A special highlight of the Conference Luncheon will be the presentation by the American Federation of Information Processing Societies of its Harry Goode Memorial Award to Dr. Kenneth E. Iverson. Dr. Iverson is an IBM Fellow and Manager of the APL Design Group, IBM System Development Division in Philadelphia. He will be honored in recognition of the generalized notation, APL, which he conceived and developed; of the effectiveness in communications which has resulted from the use of APL in many diverse applications; and of the expected impact that APL will have on programming language theory and practice in the future.

The selection of Dr. Iverson marks the eleventh time that AFIPS has designated an individual or individuals to receive this prestigious award. It is named in memory of Dr. Harry H. Goode, former chairman of the National Joint Computer Committee and pioneer in promoting cooperative efforts of professional societies. The award was established by AFIPS in 1964 to encourage and honor outstanding contributions to the computing and information processing fields.

Educator, author, scientist, and research manager, Dr. Iverson has devoted more than twenty years to the development of more effective and convenient systems for interactive computing. He has been instrumental in developing a unifying conception of the role of executable languages, Dr. Iverson has had a most distinguished career both at Harvard University and the IBM Corporation.

Prior to joining IBM, he served as an instructor and assistant professor of applied mathematics at Harvard University. While taking his doctorate degree at Harvard he served as a Fellow in numerical analysis. He obtained his B.A. degree from Queen's University in Kingston, Ontario, and his A.M. and Ph.D. degrees at Harvard University.

SESSION 1

May 19
Monday Afternoon

2:00 p.m. - 3:40 p.m.
Santa Ana Room
NATIONAL CENTERS FOR SCIENTIFIC COMPUTING

Chairman: G. Stuart Patterson, Jr.
National Center for Atmospheric Research
Boulder, Co.

This session will start with short descriptions of the Institute for Advanced Computation now operating with the ILLIAC IV, the National CTR (Controlled Thermonuclear Research) Computer Center recently established at Lawrence Livermore Laboratory, and the National Center for Computation in Chemistry, presently in an advanced planning stage. Following these presentations there will be a panel discussion of these and other centers for scientific computing and about issues concerning their establishment, user base, and feasible modes of cooperation.

Speakers

"The Institute for Advanced Computation"
Allan Birholtz
The Institute for Advanced Computation, Sunnyvale, Ca.

"The National CTR Computer Center"
John Killeen
Lawrence Livermore Laboratory, Livermore, Ca.

"The National Center for Computation in Chemistry"
Peter Lykos
Illinois Institute of Technology, Chicago, II.

Panelists

Allan Birholtz
The Institute for Advanced Computation, Sunnyvale, Ca.

John Killeen
Lawrence Livermore Laboratory, Livermore, Ca.

Peter Lykos
Illinois Institute of Technology, Chicago, II.

G. S. Patterson, Jr.
National Center for Atmospheric Research, Boulder, Co.

William R. Baker
The National Institutes of Health, Bethesda, Md.
PROGRAMMING AS AN ACT OF COMMUNICATION

SESSION 2

Chairman: Robert Barton
Burroughs Corp.
La Jolla, Ca.

Programs are thought of as texts in artificial languages and the
analogy with natural language has been heavily exploited. They
may also be mathematical expressions, digital process descrip-
tions or, sometimes, records of sequenced manual operations.

We write programs but seldom read those written by others,
though the effects of those programs when executed may be of
much consequence to us.

It is fruitful to regard computers as communications media
rather than data processors or human surrogates. Programs are
then messages directed between persons. This viewpoint will be
explored.

Panelists
Lee Harrison, III
Computer Image Corp., Denver, Co.

Anatol Holt

William Huggins
Johns Hopkins University, Baltimore, Md.

Robert Merrell

Charles Seitz
Consultant, Palo Alto, Ca.

GRAPHIC MODELS OF PHYSICAL SYSTEMS

SESSION 3

Chairman: Charles M. Eastman
Carnegie-Mellon University
Pittsburgh, Pa.

In many applications, the goal is the representation of a physical
object. The task may be to interpret visual data for computer
vision, or to interactively generate and evaluate an object de-
scription for computer-aided design. Most work in both areas has
focused on the analysis of the input or output, neglecting the
modeling of the object itself. This session presents three related
efforts in modeling the physical environment, with applications
in vision and design.

Speakers
“A Polyhedron Representation for Computer Vision”
Bruce Baumgart
Stanford University, Menlo Park, Ca.

“Models for Computer Aided Geometric Design”
Richard Reisenfeld
University of Utah, Salt Lake City, Ut.

“A Database for Designing Large Physical Systems”
Douglas Stoker, Charles M. Eastman and Joseph Lividini
Carnegie-Mellon University, Pittsburgh, Pa.

DEVELOPER AND USER VIEWS OF USER REQUIREMENTS

SESSION 4

Chairman: Richard G. Mills
First National City Bank
New York, New York

Modest improvements may be taking place in the ability of tech-
nology users to formulate coherent requirements. Growing more
slowly is the corresponding recognition by technology devel-
opers that user requirements constitute their most important
input. The two papers in this session highlight certain issues that
arise on the two sides of this question. These papers focus on
some specifics within the general topic, but they set the stage for
the broad-ranging discussion of the following panel session.

Speakers
“Why Things Are So Bad For The Computer Naive User”
William C. Mann
USC Information Sciences Institute, Marina del Rey, Ca.

“A Functional Approach to Turnkey System Procurement”
Wayne Churchman
City of Dallas, Dallas, Tx.
INFORMATION PROCESSING: ITS IMPACT UPON SOCIETY THROUGH LIBRARY SYSTEMS

SESSION 5

Chairman: Susan Crowe
Aerospace Corp.
Los Angeles, Ca.

Three different aspects of information processing as related to libraries and information services will be presented. Bearman's paper details an ongoing project surveying abstracting and indexing services and the complications of international compatibility. Katz will talk about a just recently NASA funded project called Satellite Library Information Network which will serve 12 Western states. Cuadro will discuss the future possibilities for expanded information service utilizing interactive computer systems in a national library network.

Speakers

"Infais/FID World Inventory of Abstracts & Indexing Services"
Toni Carbo Bearman

"SALINET (Satellite Library Information Network"
Ruth Katz
University of Denver, Denver, Co.

"Interactive Systems: Potential for Library Networks"
Carlos Cuadro
System Development Corp., Santa Monica, Ca.

AFIPS PROGRAMS

SESSION 6

Chairman: Paul W. Berthiaume
Electronic Associates, Inc.
West Long Branch, N.J.

Several of the key problems facing the information processing community have been addressed by the AFIPS Board with financial support. These include projects on Systems Improvement, Professionalism, Privacy, etc. The New Activities Committee was instituted to encourage new proposals, and to serve as a preliminary review channel for submissions. This session will provide a forum for presentation of several recent projects, their objectives, and/or results. Adequate time will be left for audience discussion with the panel.

Speakers

"Guidelines to AFIPS Support"
Paul W. Berthiaume
Electronic Associates, Inc., West Long Branch, N.J.

"Programmers and System Analysts Job Description Projects"
Donn B. Parker
Stanford Research Institute, Menlo Park, Ca.

"System Review Manual on Security"
John Gosden
The Equitable Life Assurance Society of the U.S., New York, N.Y.

"History of Computing Project"
William F. Luebbert
Department of the Army, West Point, N.Y.

"Washington Activities Study Committee Project"
Keith Uncapher
USC Information Sciences Institute, Marina del Rey, Ca.

"AFIPS Privacy Project"
Willis H. Ware
The Rand Corp., Santa Monica, Ca.
ECONOMICS OF COMPUTER GRAPHICS SYSTEMS

SESSION 8

Chairman: Ira W. Cotton
National Bureau of Standards
Washington, D.C.

As computer graphics has developed from a toy in the hands of technologists to a practical tool for engineers and business persons, there has been an increased recognition of the need to justify these systems on an economic basis. This session will present actual economic experiences in the use of computer graphics in business, industry and government, with an emphasis on actual costs of installation, costs of operation, and realized savings (if any). Where data are scanty, a panel will seek to determine why the information has not been collected or why it has not been published.

Speakers

“Economic Principles for Interactive Graphic Applications”
S. H. Chasen
Lockheed Aircraft Corp., Marietta, Ga.

Panelists

Robert M. Dunn
U.S. Army Electronics Command, Ft. Monmouth, N.J.

Thurber J. Moffett
Thurber J. Moffett Consulting, Culver City, Ca.

Thomas H. Johnson

SESSION 9

Chairman: Richard G. Mills
First National City Bank
New York, N.Y.

A panel of senior and distinguished authorities will address the broad problem of technology transfer. Having now reached the proportions of a National issue, the difficulty experienced by the technology users in causing their needs to be met by technology suppliers must be overcome — a very tall order. How does a user “order up” the technologies that he needs to fulfill a specific need? Must not the technology suppliers drastically alter existing methods of establishing development goals? Audience participation invited.

Panelists

Lewis M. Branscomb
IBM Corp., Armonk, N.Y.

William F. Miller
Stanford University, Stanford, Ca.

George R. White
Xerox Corp., Stamford, Ct.

Chalmer G. Kirkbride

Richard G. Mills
First National City Bank, New York, N.Y.

SESSION 10

Chairman: Donald L. Thomsen, Jr.
SIAM Institute for Mathematics & Society
New Canaan, Ct.

The panel will present problems from three societal fields where computing has made significant contributions. The first field is
cultural evolution, which is concerned with how biological characteristics and ideas spread throughout a society. Next from that aspect of the environmental field which is concerned with waste, computer applications to ocean disposal will be discussed. The final presentation will concern programs for allocation of fire companies; this will be followed immediately by a computer demonstration.

Speakers
"Models in Cultural and Biological Evolution"
Marcus W. Feldman
Stanford University, Stanford, Ca.

"Computer Applications to Ocean Disposal Research and Engineering"
Robert C. Y. Koh
California Institute of Technology, Pasadena, Ca.

"Programs for Allocation of Fire Companies"
Jan M. Chaiken
The Rand Corp., Santa Monica, Ca.

Tuesday Morning
May 20

8:15 a.m. - 9:55 a.m.
Santa Ana Room
MICROPROCESSOR BASICS
SESSION 11

Chairman:  Rob Walker
Fairchild Semiconductor
Mountain View, Ca.

This introductory session, the first of four devoted to microprocessors, will open with a discussion by Bruce Threewitt of Signetics on operating principles and economic factors. In the second paper, Alan Weisberger of National Semiconductor will detail design considerations and user application of the industry's first 16-bit microprocessor. The session will conclude with Gary Sawyer of Motorola discussing data transfer within a microprocessor based system with particular emphasis on direct memory access techniques.

Speakers
"Microprocessor Rationale"
Bruce Threewitt
Signetics, Sunnyvale, Ca.

"Keeping Pace with a Single-Chip 16-Bit Microprocessor"
Alan Weisberger
National Semiconductor, Santa Clara, Ca.

"Tools and Techniques of Microprocessor Data Transfer"
Gary Sawyer
Motorola Semiconductor, Phoenix, Az.
for a multitude of industries. The potential scope of EFTS offers opportunities for completely new developments in computer hardware, software and communications technology. This panel discusses the interaction of the various EFTS components and how current and future development affects the computer-oriented professional.

Panelists

Barry D. Wessler
Telenet Communications Corp., Washington, D.C.

James F. DeRose
IBM Corp., Kingston, N.Y.

B. Ray Traweek

Tuesday Morning May 20

8:15 a.m. - 9:55 a.m.
California Room II

MAKING COMPUTERS SAFER THROUGH TECHNOLOGY

SESSION 14

Chairman: Eldred Nelson
TRW Systems Group
Redondo Beach, Ca.

Current commercial computers have known vulnerabilities which can be exploited to steal data, modify it, deny service to users, or invade personal privacy. Technology to make computers safer - virtual machine partitioning, security kernels, and processing restrictions on statistical data bases - and the cost of computer privacy are discussed.

Speakers

"Secure Computer Operation with Virtual Machine Partitioning"
Clark Weissman
System Development Corp., Santa Monica, Ca.

"The Cost of Computer Privacy"
Jerome Label
Honeywell Information Systems, Phoenix, Az.

"Insuring Individual's Privacy from Statistical Data Base Users"
Mohammed Inam ul Haq
State University of New York, Stony Brook, N.Y.

Panelist

Gerald Popek
University of California, Los Angeles, Ca.
from small, medium and large scale data processing installations. The view from education to be presented by leading educators from the community college level; from the four year/graduate level programs in information systems; and from computer science programs at all levels.

**Speakers**

- "Business Data Processing Education at the Community College"
  Thomas J. Cashman  
  Long Beach City College, Long Beach, Ca.

- "Realignment of Objectives in Information System Degree Programs"
  J. Daniel Couger  
  University of Colorado, Colorado Springs, Co.

- "Computer Science Education"
  Edward L. Glaser  
  Case Western Reserve University, Cleveland, Oh.

**Panelists**

- Gary B. Shelly  
  Educational Consultant, Fullerton, Ca.

- Dennis Fletcher  
  Management Consultant, Pasadena, Ca.

- Norman M. Goodkin  
  Computer Science Corp., El Segundo, Ca.

- Robert R. Brown  
  Hughes Aircraft, Fullerton, Ca.

**Tuesday Morning**  
**May 20**

**SESSION 17**

**Chairman:**  
Paul M. Russo  
RCA Laboratories  
Princeton, N.J.

This session will cover five broad microprocessor application areas. Formal presentations will discuss microprocessor applications in instrumentation, in numerical/process control, in CRT terminals, and in point-of-sale terminals. An informal presentation prior to the panel discussion will discuss microprocessor applications in data communications. Consumer and educational applications of microprocessors may be touched upon during the panel discussion.

**Speakers**

- "The Synergistic Combination of an Oscilloscope and a Microprocessor"
  Walter A. Fischer  
  Hewlett-Packard Co., Colorado Springs, Co.

**May 20**  
**Tuesday Morning**

- "Development of a Portable Compiler for Industrial Microcomputer Systems"
  Leroy H. Anderson  
  The Warner & Swasey Co., Solon, Oh.

- "Microprocessors in CRT Terminals"
  John Whiting and Sandy Newman  
  Beehive Medical Electronics, Salt Lake City, Ut.

- "Designing an Application Oriented Terminal"
  J. P. Kohli  
  NCR Corp., Dayton, Oh.

**Panelist**

- Dale Walls  
  Collins Radio, Richardson, Tx.

**May 20**  
**Tuesday Morning**

- 10:05 a.m. - 11:45 a.m.
  California Room I

**ISSUES IN PROGRAMMING LANGUAGE DESIGN**

**SESSION 18**

**Chairman:**  
Anthony I. Wasserman  
University of Wasserman  
San Francisco, Ca.

Recent progress in understanding the nature of problem-solving by computer and its relationship to programming languages has been reflected in development of new programming languages and modifications to existing languages in order to facilitate the systematic creation of reliable programs. This session focuses on a number of the issues involved in designing these programming languages, including data types, flow of control, program structure, and language extensibility, along with the complex interrelationships among these issues.

**Speakers**

- "Data Types and Program Correctness"
  Barbara H. Liskov  
  Massachusetts Institute of Technology, Cambridge, Ma.

- "Extensibility in Programming Language Design"
  Thomas A. Standish  
  University of California, Irvine, Ca.

- "Structured Languages"
  Leon Presser  
  University of California, Santa Barbara, Ca.

- "Structured Control in Programming Languages"
  Charles T. Zahn  
  Stanford Linear Accelerator Center, Stanford, Ca.

- "Issues in Programming Language Design: an Overview"
  Anthony I. Wasserman  
  University of California, San Francisco, Ca.
IMPLICATIONS & APPLICATIONS OF COMMUNICATIONS BASED SYSTEMS TECHNOLOGY ON BANKING OPERATIONS

SESSION 19

Chairman: Larry Dorf
Security Pacific National Bank
Glendale, Ca.

During the past half-dozen years the banking industry has engaged in some well-publicized efforts seeking to understand the ways in which available and future communications and computing technology could streamline the payment mechanisms in the United States. It appears, however, that the first breakthrough in the use of this technology will be in its internal applicability to banking operations with attendant improvements in operating costs and customer service.

Speakers
“Remote Devices in Banking Offices”
David Harris
IBM Corp., Los Angeles, Ca.

“Data Base in Banking Operations”
Leo J. Cohen
Performance Development Corp., Trenton, N.J.

“Networks and Money Transfer Operations”
Robert M. Wainwright
Robert Wainwright Assoc., El Toro, Ca.

SESSION 20

Chairman: Oliver R. Smoot
Computer and Business Equipment Manufacturers Assoc.
Washington, D.C.

State Licensing of Data Processing Personnel – Certification Examinations – Ombudsman Programs – Strictly Enforced

SESSION 21

Chairman: Orrin E. Taulbee
University of Pittsburgh
Pittsburgh, Pa.

One of the principal reasons that utilization of networks has not met expectations is that insufficient attention has been given to user concerns. Policy and procedures are being developed which, when implemented by management, will make ease of use of computing resources for the consumer a reality. New hardware improvements promise greater convenience to the user. The presentations in this session will be directed at current and future aspects of consumer-oriented networking and resource sharing.

Speakers
“User Orientation in Networking”
Siegfried Treu, Orrin E. Taulbee and Jiri Nehnevajsa
University of Pittsburgh, Pittsburgh, Pa.

Discussants
Carver A. Meade
California Institute of Technology, Pasadena, Ca.

Jiri Nehnevajsa
University of Pittsburgh, Pittsburgh, Pa.

Code of Ethics. Such proposed programs are a reaction to public concern about the quality of data processing systems with which the public must deal. At the same time, law, medicine and engineering are being attacked for price fixing, limiting entry, incompetence and unethical conduct. The key question is how can we become professionals, meet the public’s needs and avoid the abuses charged against other professionals?

Panelists
Kenniston W. Lord, Jr.
Society of Certified Data Processors, Hudson, Ma.

Mary Ann Chapman
Delphi Datasystems, Inc., Austin, Tx.

Fred H. Harris
Institute for the Certification of Computer Professionals, Chicago, Il.
GRADUATE AND UNDERGRADUATE PROGRAMS IN COMPUTER SCIENCE

SESSION 22

Chairman: Barry L. Bateman
Texas Technological University
Lubbock, Tx.

Although this panel will explore the aspects of graduate and undergraduate education in Computer Science, special emphasis will be placed upon interactions with industry. The four panelists will speak upon undergraduate education, graduate education, continuing education, and minor programs and how both the university and industry benefit when close cooperation and interaction is emphasized. All of the panelists have had extensive experience in this area and their methods should prove to be valuable to those wishing to enhance their programs.

Speakers

"Undergraduate Programs in Computer Science"
Norman Sondak
Worcester Polytechnic Institute, Worcester, Ma.

"Graduate Education in Computer Science and Its Relationship to Industry"
Marshall Yovits
Ohio State University, Columbus, Oh.

"The Role of Continuing Education in Computer Science"
Walter Karplus
University of California, Los Angeles, Ca.

"The Role of Computer Science Minors in Undergraduate and Graduate Curriculums"
Gerald N. Pitts and Barry L. Bateman
Texas Technological University, Lubbock, Tx.

BIPOLAR MICROPUSCROSORS

SESSION 23

Chairman: Theodore A. Laliotis
Fairchild Systems
San Jose, Ca.

Bipolar microprocessors are starting to emerge as a mature design component from the standpoint of both availability and price.

COBOL '74 – ITS IMPACT ON SOFTWARE ENGINEERING

SESSION 24

Chairman: Paul Oliver
Dept. of the Navy
Washington, D.C.

The Software Development Division of the Department of the Navy's Automatic Data Processing Equipment Selection Office is engaged in a study of the impact of the revised 1974 COBOL language on software engineering. This study/development effort is concentrated in three areas: the development of the 1974 COBOL Compiler Validation System, a study of the COBOL language constructs for the development of structured programs, and a study of the new debugging features of the COBOL language. The three papers included in this session describe these efforts.
Tuesday Afternoon

Speakers

"An Overview of the 1974 COBOL Standard"
M. M. Cook, W. Holmes, P. Hoyt, A. Johnson, G. Baird and P. Oliver
Dept. of the Navy, Washington, D.C.

"COBOL '74 – Contributions to Structured Programming"
Paul Oliver
Dept. of the Navy, Washington, D.C.

"Program Debugging Using COBOL '74"
G. N. Baird
Dept. of the Navy, Washington, D.C.

Panelists

Grace M. Hopper
Dept. of the Navy, Washington, D.C.

Jitse Couperus
Control Data Corp., Sunnyvale, Ca.

Tuesday Afternoon

2:00 p.m. - 3:40 p.m.
Garden Grove Room

BANKING'S "BACK OFFICE"
PAPER PROBLEMS AND
APPROACHES TO SOLUTIONS

SESSION 25

Chairman:       Watson M. McKee, Jr.
                 Wells Fargo Bank, N.A.
                 San Francisco, Ca.

The problem of "back office" paper processing is of critical concern throughout the industry today. Various surveys and studies indicate that volume will continue to increase for the foreseeable future, in spite of EFTS, credit cards and other innovations. A panel representing three major equipment manufacturers will discuss their approach to reducing costs in this highly labor intensive activity. Discussions will center around how each of these manufacturers has approached the paper processing problem, what equipment they employ, and an insight into their activities for the future.

Panelists

Roy F. Bonner
IBM Corp., Endicott, N.Y.

Don Lewis
Burroughs Corp., San Francisco, Ca.

Leonard J. Nunley
Recognition Equipment, Inc., Dallas, Tx.

May 20

Tuesday Afternoon

SESSION 26

Chairman: Bruce Gilchrist
           Columbia University
           New York, New York

Good practices in computer environments are basic to the safe use of data processing facilities. Certification or achievement of establishing adequate practices especially for public computer systems requires documentation and general agreement of what constitutes good practices. Progress to achieve this is being made by the British Computer Society with their Code of Good Practices, by the National Bureau of Standards with their FIPS publications and by AFIPS with the recently published System Review Manual on Security. The AFIPS effort, in particular, and other efforts will be examined in this session by a panel of distinguished consultants, data processing managers and authors.

Panelists

Robert L. Patrick
Consultant, Northridge, Ca.

Thomas G. Stephenson
Hughes Aircraft Co., Fullerton, Ca.

SESSION 27

Chairman: Siegfried Treu
           University of Pittsburgh
           Pittsburgh, Pa.

This panel session will supplement the papers and discussion from the two previous sessions by directing attention to the impact on the user.

Panelists

Frederic G. Withington
Arthur D. Little, Inc., Cambridge, Ma.
Computer scientists have been (correctly) predicting for years that civilization is moving into a new age, a computerized age. First, however, we must develop educational curricula to meet the needs of people in a variety of walks of life (e.g., the professions, the trades and vocations, and “grass-roots” citizens) so that they may reap the benefits and be protected from the abuses of computers. In this session, both the needs and the progress to date, are examined.

Speakers
“Computer Science Education for Majors of other Disciplines”
Julius A. Archibald, Jr.
State University of New York
Plattsburgh, N.Y.

“Data Base Education for Students of Management”
R. Clay Sprowls
University of California, Los Angeles, Ca.

“Computers in Architectural Education”
Jens G. Pohl
California Polytechnic State University, San Luis Obispo, Ca.

Panelists
Fred A Gluckson
National Bank of Detroit, Detroit, Mi.

William R. Hays
Brigham Young University, Provo, Ut.

Marvin Lubert
General Electric Co., Schenectady, N.Y.

Benjamin F. Courtright
University of Maryland, College Park, Md.

SESSION 29
Tuesday Afternoon
May 20

3:50 p.m. - 5:30 p.m.
Santa Ana Room

MICROPROGRAMMING AND
MICROCOMPUTER
PROGRAMMING

SESSION 29
Chairman: Harut Barsamian
NCR/CDC Advanced Systems Laboratory
Escondido, Ca.

This session will focus on state-of-the-art microprogramming and microcomputer (computer on chip) software technology.

EMMY exemplifies, dynamically, microprogrammable “soft” architecture for emulation of various target machines and development of specialized language processors. Contemporary methods of microprogrammed processor design are analyzed in the second paper: “Context-Free” modular microcode and structured microprogramming are proposed for achieving higher efficiency. Microcomputer programming and software development tools and projected trends are discussed in the third paper.

Speakers
“EMMY: An Emulation System for User Microprogramming”
Michael J. Flynn
Stanford University, Stanford, Ca.

“Instruction Sequencing in Microprogrammed Computers”
Louise H. Jones
E. I. du Pont de Nemours Co., Wilmington, De.

“Microcomputer Software Design — A Check Point”
Gary A. Kildall
Naval Postgraduate School, Monterey, Ca.

Panelists
Wayne T. Wilner
Burroughs Corp., La Jolla, Ca.

Fritz H. Clapp
NCR/CDC Advanced Systems Lab., Escondido, Ca.

Stanley Habib
Newark College of Engineering, Newark, N.J.
SOFTWARE ENGINEERING

SESSION 30

Chairman: Thomas E. Bell
TRW Systems Group
Redondo Beach, Ca.

Research in software engineering includes much in addition to the obvious area of techniques for “laying code”. While advances have been occurring in the coding process, significant improvements in other areas have also been made. This session is devoted to some of these other areas—rationalizing design reviews, obtaining and analyzing empirical data on software engineering, and improving the maintenance of existing programs.

Speakers
“Better Manpower Utilization Using Automatic Restructuring”
Guy de Balbine

“Towards Improved Review of Software Designs”
Peter Freeman
University of California, Irvine, Ca.

“Understanding Software Through Empirical Reliability Analysis”
Thomas Thayer
TRW Systems Group, Redondo Beach, Ca.

Panelists
James Burrows
United States Air Force, Washington, D.C.

Raymond Rubey
Logicon, Dayton, Oh.

Charles Vick
Department of the Army, Huntsville, Al.

Tuesday Afternoon
May 20
3:50 p.m. - 5:30 p.m.
California Room I

DATA BASE TECHNOLOGY IN THE BANKING INDUSTRY

SESSION 31

Chairman: Bernard K. Plagman
DBD Systems Inc.
Rockville Centre, N.Y.

The application of data base technology in the banking industry will be discussed in this session. Based on the experience of practitioners, the use of data base techniques in Central Information File Systems (CIFS), Financial & Accounting Systems, and bank operations will be explored. Panelists will be asked to provide insight as to how the technology can be adapted to the application as opposed to fitting the application to the technology.

Panelists
Gene Altshuler
Stanford Research Institute, Menlo Park, Ca.

Joseph Judenberg
Chase Manhattan Bank N.A., New York, N.Y.

Tuesday Afternoon
May 20
3:50 p.m. - 5:30 p.m.
California Room II

MAKING COMPUTERS SAFER THROUGH AUDITING

SESSION 32

Chairman: William E. Perry
The Institute of Internal Auditors
Orlando, Fl.

The technological advances in the development of computer hardware and software have exceeded our ability to develop the necessary controls. In an effort to promote the use of computers within organizations, the requirement to build in adequate controls was either unrealized or deemed not necessary.

Recognizing the complexity of this problem, this session will review the problems, discuss the auditor’s role in EDP, and offer some practical solutions to auditability and control in an EDP environment.

Speaker
“Computers, Security and the Audit Function”
Norman R. Nielsen
Stanford Research Institute, Menlo Park, Ca.

Panelists
Keagle Davis
Toche Ross & Co., Minneapolis, Mn.

James Forshay
Eastman Kodak Co., Rochester, N.Y.

Arnold Schneidman
Seymour Schneidman & Assoc., N.Y., N.Y.

Frederick B. Palmer
Singer Co., N.Y., N.Y.

Naomi Lee Bloom
Bloom & Wallace, Sunnyvale, Ca.
SESSION 33

Tuesday Afternoon      May 20
3:50 p.m. - 5:30 p.m.
California Room III

ADVANCES IN COMPUTER TECHNOLOGY THROUGH AEROSPACE REQUIREMENTS

SESSION 33

Chairman: Richard H. Thayer
Space & Missile Test Center
Vandenberg AFB, Ca.

The aerospace requirements for lightweight, high speed, reliable computers have brought about certain specific technology advances in automatic data processing. This session will deal with those technology advances for which aerospace requirements were the forcing function and which are applicable to generalized automatic data processing. Specific papers will discuss how selected computer architecture, circuits, and software solve aerospace problems and how these technologies can be applied to more general requirements.

Speakers
"Synchronous Microcomputer System for On-Board Missile Guidance and Control"
Frank J. Langley
Raytheon Co., Bedford, Ma.

"A New Fourth Generation of Hybrid Computer System"
Robert M. Howe
University of Michigan, Ann Arbor, Mi.

"Design and Application of Electronically Programmable LSI Arrays"
Daniel Hampel
RCA Government Communications System, Somerville, N.J. and
Roger L. Barron and Dixon Cleveland
Adaptronics, McLean, Va.

"Software Reliability — A Method that Works"
Richard H. Thayer
Space & Missile Test Center
Vandenberg AFB, Ca. and
Edward S. Hinton

SESSION 34

Tuesday Afternoon      May 20
3:50 p.m. - 5:30 p.m.
California Room IV

USE OF COMPUTERS IN INSTRUCTION

SESSION 34

Chairman: Sylvia Charp
School District of Philadelphia

The computer as an instructional tool is having an impact in the educational environment. The panelists will review their personal experiences using computers on the elementary, secondary and university levels. Need for pre-service and in-service training of teachers will be discussed. How to make the most economical use of computers will be explored.

Panelists
Sylvia Charp

James E. Candlin
Hewlett-Packard, Cupertino, Ca.

Max Jerman
Seattle Pacific College, Seattle, Wa.

Robert Scanlon

Gopal Kapur
Consultant, Pleasanton, Ca.

SESSION 35

Tuesday Evening      May 20
8:00 p.m. - 10:30 p.m.
California Room I

THE EDITORS SPEAK OUT

SESSION 35

Chairman: Hesh Wiener
Computer Decisions
Rochelle Park, N.J.

What is the responsibility of the trade press? Is it to be a critic, a promoter, or an historian of the industry? Do the editors stand up for the underdogs or run in packs after the big advertisers? The editors face issues as complex as antitrust and as subtle as competitive technologies, as widespread in effect as privacy and as specific as professional society politics. By necessity the editors must specialize, and so must their publications. Four dozen people must grapple with a forty-billion dollar industry. It
Tuesday Evening

May 20

is no surprise that they see things quite differently. This panel will discuss current problems of computerdom, particularly those stemming from big-company domination and the paradox of individual privacy in a record-keeper's world. No conclusions are promised, but the fracas is destined for industry folklore.

Panelists
Drake Lundell
Computerworld, Newton, Ma.
John Kirkley
Datamation, Los Angeles, Ca.
Alan Kaplan
Modern Data, Hudson, Ma.
John Camuso
Computer Design, Concord, Ma.
Arnold Keller
Infosystems, Wheaton, Il.

Tuesday Evening

May 20

8:00 p.m. - 10:30 p.m.
Santa Ana Room

DATA PROCESSING IN 1980-1985

SESSION 36

Chairman: Ted A. Dolotta
Bell Laboratories
New Brunswick, N.J.

This study describes the environment and the requirements that the data processing industry will face in the period from 1980 to 1985. The primary purpose of the study is to identify the demands that will be placed on the data processing industry in that time period and, more importantly, to call attention to the problems that are not likely to be solved without some changes in direction or emphasis within that industry. These problems will vary likely limit the growth of the data processing industry in 1980-1985 unless they are solved. In view of the already critical and growing importance of data processing, vendors and users alike must recognize these problems and their potential impact, so that the necessary resources can be applied to their solution. The study makes a number of recommendations on how these problems might be approached.

Panelists
T. A. Dolotta
Bell Laboratories, New Brunswick, N.J.
M. I. Bernstein
System Development Corp., Santa Monica, Ca.
R. S. Dickson, Jr.
Phillips Petroleum Co., Bartlesville, Ok.
SESSIONS 38 & 39

Wednesday Morning May 21

8:15 a.m. - 9:55 a.m.
California Room I

OPERATING SYSTEMS THEORY
SESSION 38

Chairman: R. Stockton Gaines
The Rand Corp.
Santa Monica, Ca.

This session has three papers on diverse areas of computer Operating Systems. The first paper, by Jon C. Strauss, concerns modelling of systems. The second paper, by Robert H. Thomas, describes a mechanism for redefining the virtual machines seen by processes. The third paper, by Richard Linde, presents some interesting information concerning the way operating systems can fail to be secure.

Speakers
“Dynamic Dispatch in Job Class Scheduler Systems”
Jon C. Strauss

“JSYS Traps — TENEX Mechanism for Encapsulation of User Processes”
Robert Thomas

“Operating System Penetration”
Richard R. Linde
System Development Corp., Santa Monica, Ca.

Wednesday Morning May 21

8:15 a.m. - 9:55 a.m.
Garden Grove Room

OPTIMIZING THE COMPUTER INSTALLATION
SESSION 39

Chairman: Leo J. Cohen
Performance Development Co.
Trenton, N.J.

The computer installation consists of the machine, its software, application systems, procedures and people. To optimize the installation is to bring into harmony these diverse elements whose sponsors often have conflicting objectives. Just what these objectives might be, and practical problem oriented tools for monitoring them, are of concern. Sometimes these tools are systems operated by the machine itself, and sometimes they are well beyond the machine and vested in the intelligent strategies of its planning. This session will examine both types of approach to installation optimization.

SESSIONS 39 & 40

May 21 Wednesday Morning

Panelists
Robert J. Garabedian
Aetna-SPAN Data Processing, Hartford, Ct.

Cal Bower
United Bank Service, Denver, Co.

May 21 Wednesday Morning

8:15 a.m. - 9:55 a.m.
California Room II

LEGAL RESPONSIBILITIES IN BUYING, USING AND SELLING DATA PROCESSING
SESSION 40

Chairman: Robert P. Bigelow
Computer Law & Tax Report
Boston, Ma.

This session will consider the responsibilities of data processing management in buying, using and selling hardware, software, system and services. The major emphasis will be on contractual problems, both in private industry and government. Protection of property rights, particularly in software, will be considered, as will liability for injury by computer — intentional and unintentional. There will be a brief discussion of privacy and security; and it is expected that there will be time for questions.

Speakers
“Contracting for Computers”
Richard L. Bernacchi
Irrell & Manella, Los Angeles, Ca.

“Contracting with the Government”
Terry Miller

“Legal Protection of Proprietary Rights”
Robert P. Bigelow
Computer Law & Tax Report, Boston, Ma.

“Non-Contractual Responsibilities”
Susan H. Nycum
MacLeod, Fuller, Muir & Godwin, Los Altos, Ca.
SESSION 41

Wednesday Morning  May 21

8:15 a.m. - 9:55 a.m.
California Room III

ENHANCING STORAGE RELIABILITY BY SOPHISTICATED CODING SCHEMES

SESSION 41

Chairman: Jack Moshman
Moshman Associates, Inc.
Washington, D.C.

This session is a coordinated report of the development and application of algebraic coding theory to the sophisticated detection and correction of errors in the transmission of data in a large scale computer environment. The first paper provides the background theory. The second paper describes the experiences of the Bureau of the Census, a large scale user, in the application of the theory in its system. The final paper discusses the implementation of the theory by means of hardware for mass storage applications.

Speakers

"Algebraic Codes for Improving the Reliability of Tape Storage"
Elwyn R. Berlekamp
University of California, Berkeley, Ca.

"The Role of Automatic Error Correction in Large Scale Data Processing"
Walter E. Simonson
U.S. Bureau of the Census, Suitland, Md.

"Hardware Implementation of Algebraic Codes for Improving the Reliability of Mass Storage"
Larry Patin
U.S. Bureau of Census, Suitland, Md.

Panelists

S. W. Golomb
University of Southern California, Los Angeles, Ca.

R. W. Hamming
Bell Telephone Laboratories, Inc., Murray Hill, N.J.

SESSION 42

Wednesday Morning  May 21

8:15 a.m. - 9:55 a.m.
California Room IV

STATUS REPORT ON PUBLIC PACKET-SWITCHING

SESSION 42

Chairman: Vinton Carf
Stanford University
Stanford, Ca.

A decade has passed since the first definitive studies of packet-switching were made and in that time, packet-switched networks have advanced from experimental prototypes to the threshold of commercial operation.

We have assembled a panel whose members are all deeply involved in developing this new communication medium into a viable service. The panel will explore some of the technical, legal, political and economic issues facing the new carriers and especially examine the difficulties of international interconnection.

Panelists

David Horton
Bell Canada, Ottawa, Canada

Lawrence G. Roberts
Telenet Communications Corp., Washington, D.C.

Lee Talbert
Packet Communications, Inc., Waltham, Ma.

Roy D. Bright
UKPO Data Communications Div., London, England

Remi Despres
CCETT, Rennes Cedex, France
Wednesday Morning

May 21

8:15 a.m. - 9:55 a.m.
Anaheim Room

WHAT WENT WRONG WITH MEDICAL INFORMATION SYSTEMS: AN OPTIMISTIC OUTLOOK

SESSION 43

Chairman: Jan F. Brandejs
Canadian Medical Association
Ottawa, Canada

For the past two decades, medical information systems have been attracting computer specialists and physicians who envisage the role of this new technology in the medical field. Many attempts have been made across the world; all but a few failed badly. The aims of the session are to summarize "what went wrong" and outline a solution. The session is composed of physicians who are active in these systems and will present their experiences.

 Speakers
"Information Processing Needs and Practices of Clinical Investigations - Survey Results"
Norman A. Palley and G. F. Groner
The Rand Corp., Santa Monica, Ca.

"The Canadian Medical Association Information Base"
Jan F. Brandejs
Canadian Medical Assoc., Ottawa, Canada

Panelists
Robert G. Wilson
University of British Columbia, Vancouver, B.C., Canada

H. K. Litherland
Vancouver General Hospital, Vancouver, B.C., Canada

Galen P. Robbins
The Cardiovascular Clinic, Oklahoma City, Ok.

Wednesday Morning

May 21

10:05 a.m. - 11:45 a.m.
Santa Ana Room

DATA BASE MACHINES

SESSION 44

Chairman: Michael M. Hammer
Massachusetts Institute of Technology
Cambridge, Ma.

The increasing importance of data base management systems has led to interest in the design of computer hardware designed to support them and in the structure of computer systems dedicated to them. This session deals with two such data base machines. One is a large-scale data utility system, to be used in a network environment, the other is an associative processor supporting a relational model of data.

Speakers
"RAP: An Associative Processor for Data Base Management"
E. A. Ozkaran, S. A. Schuster, and K. C. Smith
University of Toronto, Toronto, Canada

"The Datacomputer: A Network Data Utility"
T. Marill and D. Stern
Computer Corp. of America, Cambridge, Ma.

May 21

Wednesday Morning

10:05 a.m. - 11:45 a.m.
California Room I

PROGRAM VERIFICATION IN 1980

SESSION 45

Chairman: Ralph L. London
USC Information Sciences Institute
Marina del Rey, Ca.

This panel will provide a five-year view of various methods for demonstrating that computer programs meet their specifications. The methods include proofs, symbolic execution, assertion generation, and new programming methodology and languages. The basis for each panelist's assessments will be, in part, his experiences with several operational computer programs designed for program verification. The discussion will include open problems, theoretical and practical limitations, potential short-term and long-term payoffs, and research questions.

Speakers
"A Synthesizer of Inductive Assertions"
Steven M. German and Ben Wegbreit
Xerox Palo Alto Research Center, Palo Alto, Ca.

Panelists
Ralph L. London
USC Information Sciences Institute, Marina del Rey, Ca.

Bernard Elspas
Stanford Research Institute, Menlo Park, Ca.

Donald I. Good
University of Texas, Austin, Tx.
Wednesday Morning  May 21

10:05 a.m. - 11:45 a.m.
Garden Grove Room

ISSUES AND ANSWERS – DATA SECURITY AND PERSONAL PRIVACY

SESSION 46

Chairman:  James A. Case
Dylakor
Encino, Ca.

The twin issues of data security and personal privacy and the related problem of invasion of personal privacy have been much before us in recent years, particularly as they relate to computer-based information systems. State Legislatures, the Congress and the White House are all addressing these issues. This session will address some of the ramifications of legislation proposed or enacted to deal with the misuse or abuse of personal information in the private sector.

Panelists
Willis H. Ware
The Rand Corp., Santa Monica, Ca.

Douglas Metz
White House Domestic Council Committee on the Right of Privacy, Washington, D.C.

William Fenwick
Davis, Stafford, Kellman & Fenwick, Palo Alto, Ca.

Wednesday Morning  May 21

10:05 a.m. - 11:45 a.m.
California Room II

ANTITRUST AND REGULATORY ASPECTS

SESSION 47

Chairman:  F. Sherwood Lewis
Sanders Associates, Inc.
Nashua, N.H.

This session will be devoted to an examination of antitrust and regulatory developments in data processing and telecommunications having immediate bearing on the data processing user and data processing operations. An up-to-date review and analysis will be made. Emphasis will be placed on Government litigation and regulation, with comment on the effects of private actions, in both data processing and communications.

May 21  Wednesday Morning

Speakers
“Antitrust Activities in Data Processing”
J. Thomas Franklin
Sweeney & Franklin, Attorneys, Boston, Ma.

“Regulatory and Antitrust Actions in Telecommunications Affecting Data Processing”
F. Sherwood Lewis
Sanders Associates, Inc., Nashua, N.H.

May 21  Wednesday Morning

10:05 a.m. - 11:45 a.m.
California Room III

THE MASS STORAGE IMPACT

SESSION 48

Chairman:  John R. Morrison
Computer Peripherals Inc.
Norristown, Pa.

End user surveys and special studies have firmly established the need for a peripheral system with low cost, on-line storage to a trillion bytes of data with no manual intervention. Today, user acceptance of these devices has been limited. However, with the recent announcement of the IBM 3850 Mass Storage System, the impact of mass storage is about to be felt throughout the computer industry. This session will analyze the mass storage impact.

Speakers
“Requirements of a Mass Storage System”
W. F. Morgan
Control Data Corp., Minneapolis, Mn.

“Bridging the Memory Access Gap”
D. E. Speliotis
Micro Bit Corp., Lexington, Ma.

“A Mass Storage Facility”
G. F. Puffett
Control Data Corp., Minneapolis, Mn.

D. L. Boyd
University of Minnesota, Minneapolis, Mn.

“3850 Mass Storage System”
C. T. Johnson
IBM Corp., Boulder, Co.

Panelists
D. L. Boyd
University of Minnesota, Minneapolis, Mn.

W. F. Morgan
Control Data Corp., Minneapolis, Mn.

C. T. Johnson
IBM Corp., Boulder, Co.
INTERNATIONAL DATA COMMUNICATION POLICY

SESSION 49

Chairman: Alex Curran
BNR, Inc.
Palo Alto, Ca.

Although data communication is still a small segment of the communication industry, it is growing rapidly. The quality and reliability of existing telecommunication services must improve to meet the new needs, and policies concerning interconnection, sharing, tariffs, regulation, and balance of payments may have to change too. Even our institutional organizations will be affected by the need to cope with a vastly improved and more interconnected worldwide telecommunication system. This panel will explore some of the short and long term policy issues to be resolved before international data communication becomes as accessible as voice communication today.

Panelists
M. Clayton Andrews
IBM Corp., Zurich, Germany

Paul Muench
AT & T, New York, N.Y.

Louis Pouzin
Institute de Recherche d’Automatique, Roquencourt, France

Peter Kirstein
University College of London, London, England

Dieter Kimbel
Office of Economic Cooperation and Development, Paris, France

Wednesday Afternoon

SESSION 51

Chairman: David M. Dahm
Burroughs Corp.
Detroit, Mi.

For several years a debate has raged between advocates of the relational approach and advocates of the network approach to database management. Some of the issues have been ease of use, understandability to the naive user, and practicability of implementation. The papers presented in this session will discuss recent implementation which differ greatly in scope and style.

May 21

Wednesday Afternoon

2:00 p.m. - 3:40 p.m.

RELATIONAL DATA BASE IMPLEMENTATIONS
Workload characterization is the central and basic problem of computer measurement. A single quantitative workload representation is needed by all installation methodologies based on computer measurements. These include configuration design, performance improvement, workload forecasting, charging, etc.

This session consists of a single paper and a panel discussion. The paper is concerned with on-line system characterization. The panel will consider the broader requirements on characterization. Presentations will include other characterization techniques and their applications.

Speakers
“Deterministic Analytic Model of a Multiprogrammed Interactive System”
Domenico Ferrari
University of California, Berkeley, Ca.

Panelists
Donald C. Harder
CRU, Inc., Cleveland, Oh.
LEGAL AID FOR EDP MANAGERS — COMPUTER RELATED TAX, RECORDKEEPING, INSURANCE, AND LABOR QUESTIONS

SESSION 54

Chairman: Roy N. Freed
Peabody, Brown, Rowley & Storey
Boston, Ma.

EDP managers encounter a varying assortment of legal questions. Because of the legal novelty of computer technology, many of those questions are unique and require special attention while computer transactions and properties are being characterized for legal purposes. EDP managers suffer the impacts of many legal rules, such as those taxing transactions or properties and those relating to program protection. This paper will help EDP managers understand many types of legal questions, identify them when they are present and communicate with lawyers about them more effectively.

ADVANCES IN NOVEL STORAGE TECHNOLOGIES

SESSION 55

Chairman: John C. Davis
Dept. of Defense
 Ft. Meade, Md.

In this session the speakers will present current information on the most promising storage technologies under development today. The technologies to be discussed are: magnetic bubbles, charge coupled devices, electron beam memories, optical memories and Josephson junction memories. These technologies will have a significant impact on advanced system designs. An understanding of both the technologies and their place and function in the future memory hierarchy will be emphasized.

Speakers
"Charge Coupled Devices for Memory Applications"
G. F. Amelio
Fairchild Research and Development, Palo Alto, Ca.
**TECHNICAL AREAS AND AREA DIRECTORS**

**Banking Industry**  
William P. Stritzler  
AT&T, Morristown, NJ

**Computer-Communications Networks**  
Robert F. Daly  
Stanford Research Institute, Menlo Park, CA

**Computer Software**  
Robert Merrell  
Burroughs Corp., Mission Viejo, CA

**Data Base Management**  
Edgar F. Codd  
IBM Corp., San Jose, CA

**Education-Curricula-Training**  
Gopal K. Kapur  
Consultant, Pleasanton, CA

**Forecasting EDP**  
Earl C. Joseph  
Sperry Univac Defense Systems, St. Paul, MN

**Health Care and Computers**  
Vaughn Alexander  
American Medical Association, Chicago, IL

**Innovative Applications of Computer Science**  
Bertram Raphael  
Stanford Research Institute, Menlo Park, CA

**Interaction of Technology and Architecture**  
Ugo O. Gagliardi  
Honeywell Information Systems Inc., Waltham, MA

**Interactive Graphics**  
Donald C. Lincicome  
Control Data Corp., Sunnyvale, CA

**International Dialogue**  
Vinton Cerf  
Stanford University, Stanford, CA

**Legal Aspects of Computer Management**  
Susan H. Nycum  
MacLeod, Fuller, Muir and Godwin, Los Altos, CA

**Making Computers Safer**  
Donn B. Parker  
Stanford Research Institute, Menlo Park, CA

**Management and Computers**  
John J. Donovan  
MIT-Sloan School, Cambridge, MA

**Microprocessors**  
Theodore A. Laliotis  
Fairchild Systems Technology, San Jose, CA

**Storage Technology**  
Glen Bacon  
IBM Corp., San Jose, CA

**User Requirements**  
Richard G. Mills  
First National City Bank, NY, NY

**Users' Viewpoint on EDP**  
Bruce Wrigley  
Travelers Insurance, Hartford, CT  
and  
Edward J. Palmer  
Boston University, Boston, MA

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**WEDNESDAY morning**

8:15 a.m.-9:55 a.m.  
10:05 a.m.-11:15 a.m.

**Santa Ana Room**

- Tutorial and Panel Discussion on Relational Data Base Management  
  *Edgar F. Codd*
  
  - Data Base Machines  
    *Michael M. Hammer*

**California Room I**

- Operating Systems Theory  
  *R. Stockton Gaines*

**California Room II**

- Legal Responsibilities in Buying, Using, and Selling Data Processing  
  *Robert P. Bigelow*

**California Room III**

- Enhancing Storage Reliability by Sophisticated Coding Schemes  
  *Jack Moshman*

**California Room IV**

- Public Packet-Switching Status Report  
  *Vinton Cerf*

**Anaheim Room**

- What Went Wrong With Medical Information Systems: An Optimistic Outlook  
  *Jan F. Brandejs*

**SPECIAL ADDRESS**

1:00 p.m.-2:00 p.m.  
Speaker: The Honorable Former Governor of
**Monday afternoon**

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**Tuesday morning**

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Wednesday afternoon

Anaheim Room

Thermal and Panel Discussion on Relational Database Management
Edgar F. Codd

Data Base Management
Michael F. Hammer

Relational Database Implementations
David M. Dahn

Government Funding in Computer Science
Kent J. Curtis

Relational Data Base Technology
Dennis W. Fife

Query Languages and Comparative Evaluation
Ben Shneiderman

Performance Evaluation, Data Compression and Search
E. E. Lifson

Santa Ana Room

FUNDING II

DATABASE MANAGEMENT

COMPUTER SOFTWARE (continued)

DETECT MEASURES

California Room I

Operating Systems Theory
R. Stockman Gaven

Program Verification in 1980
Ralph L. London

Workbook Characterization
Kenneth W. Keenan

Psychological Research on the Use of Computer Languages
James H. Gr♂

Anaheim What Went Wrong With Medical Computer Applications

Anaheim Room

Chairman: G. Octo Barnett
Massachusetts General Hospital
Boston, Ma.

The general theme of this session is the use of MUMPS (Massa-
chusetts General Hospital Utility Multi-Programming System) in
the data management activities related to patient care. There will
be discussions both of the general characteristics of the language
and of a specific application program for the ordering and
administration of medications. Other topics will include the
commercial distribution of these types of applications and the
problems of implementing MUMPS under a large operating sys-
tem.

Speakers

"MUMPS - A General Purpose Data Management System"
Jack Bowie
Massachusetts General Hospital, Boston, Ma.

"Automation of the Medication Ordering System"
Daniel E. Souder
Massachusetts General Hospital, Boston, Ma.

"Integrity and Efficiency Considerations in a Shared Tree-Struc-
tured Data Base"
John MacCrisken

"Commercial Support of Medical Information Systems"
Neil Pappalardo
Meditech, Inc., Cambridge, Ma.
It is quite fitting that this year's Pioneer Day should be devoted to the Institute for Advanced Study Electronic Computer Project. This project was the one out of which virtually all subsequent modern computers were developed. Its importance lay not just in its stored program capability but rather stemmed from the fact that it covered the entire spectrum of computer science. It not only pioneered in logical design and programming but also in engineering, in numerical meteorology, in modern numerical analysis as well as in that branch of formal logic known as automata theory. This is why this project was basic to the modern computer world. It was perhaps the only one of the early groups that saw the global problems in a broadly encompassing way.

The program will consist of a series of talks and panel discussions. The participants are a who's who of the various computer worlds. There will be discussions on automata theory, logical design, engineering, programming, numerical analysis, numerical meteorology and the impact of these Institute activities on the development of our computer society today.

Participants

"History Background and Overview"
Herbert Goldstine, IBM Fellow
Institute for Advanced Study, Princeton, N.J.

Arthur W. Burks
University of Michigan, Ann Arbor, Mi.

Paul N. Gillon
U.S. Army, Madison, Va.

"Engineering Perspectives"
Julian H. Bigelow
Institute for Advanced Study, Princeton, N.J.

James Pomerene
IBM Corp., Armonk, N.Y.

Willis H. Ware
The Rand Corp., Santa Monica, Ca.

Hewitt D. Crane
Stanford Research Institute, Menlo Park, Ca.

Gerald Estrin
University of California, Los Angeles, Ca.

"Meteorology Research"
Julian C. Charney
Massachusetts Institute of Technology, Cambridge, Ma.

Norman A. Phillips
National Weather Service, Washington, D.C.

Bruce Gilchrist
Columbia University, New York, N.Y.

"Dissemination of the IAS Machine"
Willis H. Ware
The Rand Corp., Santa Monica, Ca.

Cuthbert C. Hurd
Consultant
Portola Valley, Ca.

William F. Gunning
Xerox Research Center, Palo Alto, Ca.

May 21
Wednesday Afternoon

3:50 p.m. - 5:30 p.m.
Santa Ana Room

GOVERNMENT FUNDING IN
COMPUTER SCIENCE

SESSION 59

Chairman: Kent K. Curtis
National Science Foundation
Washington, D.C.

The Government's reasons for supporting computer science research range from the need for specific new devices and techniques to carry out important tasks, on one hand, to the importance of maintaining the country's scientific strength on the other. Representatives of three parts of the Federal Government concerned with the country's defense, health, and scientific strength, respectively, will describe their programs followed by a panel discussion with three R & D performers from industry and the universities.

Speakers

"Advanced R&D Projects Agency Programs"
J. C. R. Licklider
ARPA, Arlington, Va.

"National Institutes of Health Programs"
William Baker
Bureau of Health, Professional Education & Manpower Training, Bethesda, Md.

"National Science Foundation Programs"
Kent K. Curtis
National Science Foundation, Washington, D.C.

Panelists

Richard L. Shuey
General Electric Co., Schenectady, N.Y.

Keith Uncapher
USC Information Sciences Institute, Marina del Rey, Ca.

Robert W. Ritchie
University of Washington, Seattle, Wa.
SESSION 60

Wednesday Afternoon  May 21

3:50 p.m. - 5:30 p.m.
California Room I

PSYCHOLOGICAL RESEARCH ON THE USE OF COMPUTER LANGUAGES

SESSION 60

Chairman: James H. Carlisle
USC Information Sciences Institute
Marina del Rey, Ca.

Programming languages and user languages can be improved to complement the strengths and weaknesses of human information processing. This session includes an overview of recent theory and research and reports of progress made by a few investigators in this area. Discussion will focus on the benefits and pitfalls of alternative types of research and on the problems arising from the application of psychological theory and methods and THE INTERPRETATION OF RESULTS by and for computer scientists.

Speakers
“Experimental Testing in Programming Languages”
Ben Shneiderman
Indiana University, Bloomington, In.

“Naive Programmer Problems with Specification of Transfer of Control”
Lance A. Miller
IBM Corp., Yorktown Heights, N.Y.

“Teaching Computing for the Social Sciences”
Dan Freedman
School of Advanced Technology, SUNY, Binghamton, N.Y.

Discussant
Ruven Brooks
University of California, Irvine, Ca.

SESSION 61

Chairman: Harold Uhrbach
DBD Systems, Inc.
Rockville Centre, N.Y.

SESSION 62

Chairman: Susan H. Nycum
MacLeod, Fuller, Muir & Godwin
Los Altos, Ca.

SESSION 61

May 21 Wednesday Afternoon

3:50 p.m. - 5:30 p.m.
Garden Grove Room

SELECTION TECHNIQUES FOR PACKAGED DATA MANAGEMENT SYSTEMS

This session addresses the issues involved in the selection and evaluation of generalized data base management software. These issues include formalized scoring methodologies, selection criteria, procedures to minimize subjectivity and special management considerations. The panelists will consider practical experience with commercial DBMS packages and highlight the important aspects of the selection and evaluation process.

Panelists
David Goodman
Mattel, Hawthorne, Ca.

Charles Testa
University of Maryland, College Park, Md.

William Otto
CIBA/GERGY, Ardsley, N.Y.

SESSION 62

May 21 Wednesday Afternoon

3:50 p.m. - 5:30 p.m.
California Room II

FUTURE TRENDS IN THE LAW OF COMPUTERS

Rapid changes in computer technology create an environment in which the law must respond quickly in order to provide the proper protections to proprietors, users and others directly involved with the technological developments, and to society as a whole. Session leaders from the earlier sessions in the legal aspects area will comment on the future directions the law may take to meet the needs of the “computer era”. International business transactions, transnational transfers of information, privacy, and EFTS, are among the topics to be considered.
Panelists
Roy N. Freed
*Peabody, Brown, Rowley & Storey, Boston, Ma.*

Robert P. Bigelow
*Computer Law & Tax Report, Boston, Ma.*

F. Sherwood Lewis
*Sanders Associates, Nashua, N.H.*

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3:50 p.m. - 5:30 p.m.
California Room III

**SYSTEM IMPLICATIONS OF ADVANCING STORAGE TECHNOLOGY**

SESSION 63

Chairman: Jerome H. Saltzer
*M.I.T. Project MAC
Cambridge, Ma.*

An important aspect of advancing storage technologies is its impact on system organization and use. Are there ingenious strategies for harnessing technologies with unfamiliar performance and cost parameters? Does availability of terabit storage devices mean that random access to large data bases is just around the corner? Or is there a possibility of engineering surprises when size, performance, reliability, and protection are pressed simultaneously? What about the effect of megabyte CCD or bubble memories on the "intelligent terminal"? Does it become the site of most computing with a centralized system serving only as a library and data sharing medium?

---

Panelists
George C. Feth
*IBM Corp., Yorktown Heights, N.Y.*

Craig I. Fields

William C. Lynch
*Case Western Reserve University, Richmond Heights, Oh.*

Thomas M. Marill
*Computer Corp. of America, Cambridge, Ma.*

Juergen Witte
*Siemens A.G., Munich, Germany*

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Many conflicting viewpoints currently exist in Europe on Computer interfaces. New technologies may allow for revolutionary concepts. Standardization is viewed as mandatory for remote peripherals only, while some argue that a new channel level I/O interface could be used to interconnect computers. Users seem to be looking forward to a modular system allowing for varied configurations based on standard, economically designed, easy to use, reliable modules, produced in mass quantities, at popular prices.

Panelists
Thomas Crawford
*Nixdorf Computers, Inc., Costa Mesa, Ca.*

Bruno Lussato
*Conservatoire National Des Arts & Metiers, Paris, France*

Mamoru Mitsugi
*Fujitsu Ltd., Kawasaki, Japan*

A Representative from ICL (International Computers Limited)

A Representative from CII (Company International Information)

---

The panel will attempt to identify those problems currently impeding near term advances in medical information science—and hopefully avoid futuristic scenarios depicting solutions for problems of little concern. Issues will include: what educational programs are needed? Can we develop an applied science in the
absence of a basic science? Do we adequately distinguish among computer systems, people systems, and people-computer systems? Are our most serious problems at the level of systems, software, hardware, or even deeper?

Speakers

"Architecture for a Graduate Level Educational Program in The Area of Computer Systems in Medicine"
Laurens V. Ackerman
Rush Medical School, Chicago, Ill.
and
Daniel K. Harris
American Medical Association, Chicago, Ill.

Panelists

Jan F. Brandejs
Canadian Medical Association, Ottawa, Canada
Carlos Vallbona
Baylor College of Medicine, Houston, Tx.
G. Octo Barnett
Massachusetts General Hospital, Boston, Ma.
Laurens V. Ackerman
Rush Medical School, Chicago, Ill.

Thursday Morning

8:15 a.m. - 9:55 a.m.
Santa Ana Room

RELATIONAL DATA BASE TECHNOLOGY

SESSION 66

Chairman:
Dennis W. Fife
National Bureau of Standards
Washington, D.C.

The session will describe two new developments in basic design technology for relational data base systems. The first is an unusual technique for the evaluation of data selection expressions. The second is a mechanism supporting multiple tabular views of data, as well as locking and authorization services.

Speakers

"Evaluating Inter-Entry Retrieval Expressions in a Relational Data Base Management System"
J. B. Rothnie
DOD Computer Institute, Washington, D.C.

"Views, Authorization, and Locking in a Relational Data Base System"
J. N. Gray, D. D. Chamberlin and I. L. Traiger
IBM Corp., San Jose, Ca.

May 21
Wednesday Afternoon

May 22
Thursday Morning

8:15 a.m. - 9:55 a.m.
California Room I

COMPUTER COMMUNICATIONS:
WHO, WHAT, WHEN, WHERE, AND WHY?

SESSION 67

Chairman:
Howard Frank
Network Analysis Corp.
Glen Cove, N.Y.

A computer communication network is a collection of terminals, computers, communication devices, transmission facilities, and software to enable data flow between terminals and/or processors. In this session, the evolution of such networks is traced, network architecture and alternatives are discussed, communication devices and transmission facilities are characterized, protocol requirement defined, and the offerings of conventional, specialized, satellite and value added network carriers summarized. The impact of various alternatives on network cost and performance is illustrated.

Speakers

"Computer Communications: How we Got Where we Are"
Ivan T. Frisch and Howard Frank
Network Analysis Corp., Glen Cove, N.Y.

"Computer Networks: The Parts Make up the Whole"
Wushow Chou
Network Analysis Corp., Glen Cove, N.Y.

"Moving Bits by Air, Land, and Sea: Carriers, Vans, and Packets"
Mario Gerla and John Eckl
Network Analysis Corp., Glen Cove, N.Y.

May 22
Thursday Morning

8:15 a.m. - 9:55 a.m.
Garden Grove Room

A MANAGERIAL PERSPECTIVE OF THE EVOLUTION AND FUTURE OF DATA PROCESSING: A DATA PROCESSING EXECUTIVE VIEW

SESSION 68

Chairman:
John F. Rockart
M.I.T. – Sloan School
Cambridge, Ma.

The computer-based information system function has changed
considerably in its 20-year history. Hardware and software have evolved significantly. Applications have been added in abundance. Methods of managing the technology, human resources, systems and user/computer interfaces have all evolved considerably. The panel will address this evolution — laying emphasis on the future events which will require intelligent management response and action. The viewpoint is that of an involved computer executive.

Panelists
Robert B. Anderson
Sun Services, Co., St. Davids, Pa.

Barry D. Rowe
Martin Marietta Corp., Baltimore, Md.

Phillip Whidden
Aluminum Company of America, Pittsburgh, Pa.

Thursday Morning
May 22

8:15 a.m. - 9:55 a.m.
California Room II

COMPUTER AIDED MANUFACTURING

SESSION 69

Chairman: Tony C. Woo
University of Illinois
Urbana, I1.

Computer Aided Manufacturing is an area of great interest to the industry as well as the universities. This session focuses on advanced systems and draws upon the experience, expertise, and results from both communities. The presentation covers the future of computer aided manufacturing, computer description of machine parts, graphical communication between design and manufacturing, computer understanding of machine parts and procedure synthesis, and automatic inspection using computer vision techniques.

Speakers
“The Future of CAM Systems”
M. Eugene Merchant
Cincinnati Milacron, Inc., Cincinnati, Oh.

“Parts Representation in CAD/CAM”
Ikuo Oyake
OKI Electric Industry Company Limited, Tokyo, Japan

“Two Application Programs Which Link Design and Manufacture”
Henry Merryweather
Computer Aided Design Centre, Cambridge, England
SESSIONS 71 & 72

Thursday Morning May 22

8:15 a.m. - 9:55 a.m.
California Room IV

INNOVATIVE APPLICATIONS OF COMPUTER SCIENCE IN MEDICINE

SESSION 71

Chairman: G. Anthony Gorry
Massachusetts Institute of Technology.
Cambridge, Ma.

Attempts to provide replicable and distributable computer packages of medical expertise until recently have been confined to rather sharply circumscribed medical problems. Advances in computer science, and in particular in the domain of artificial intelligence, offer hope that some of the major impediments to success in this area can be eliminated. This session will consider the cutting edge of computer science and artificial intelligence technology in medicine and the major problems which, as yet, remain unresolved.

Panelists
Harry Pople
University of Pittsburgh, Pa.
Saul Amarel
Rutgers University, New Brunswick, N.J.
Bruce Buchanan
Stanford University, Palo Alto, Ca.
David West
Lawrence Livermore Laboratory, Livermore, Ca.

May 22 Thursday Morning

10:05 a.m. - 11:45 a.m.
Santa Ana Room

QUERY LANGUAGES AND COMPARATIVE EVALUATION

SESSION 72

Chairman: Ben Shneiderman
Indiana University
Bloomington, In.

This session reviews the human factors aspects of database query languages. The first paper introduces a novel approach to querying a relational database using a terminal display and a technique of specification by example. Then follows a psychological study in which non-programmers were taught this technique and tested for speed and accuracy in formulating sample queries. The third paper reports on an experiment to evaluate and compare two high level database query languages in use by a sample of programmers and non-programmers.

Speakers
"Query by Example"
M. M. Zloof
IBM Corp., Yorktown Heights, N.Y.

"A Psychological Study of Query by Example"
J. C. Thomas and J. D. Gould
IBM Corp., Yorktown Heights, N.Y.

"Human Factors Evaluation of Two Database Query Languages: SQUARE AND SEQUEL"
P. Reinsner, R. F. Boyce, and D. D. Chamberlin
IBM Corp., San Jose, Ca.

SESSION 73

May 22 Thursday Morning

10:05 a.m. - 11:45 a.m.
California Room I

ADVANCES IN PACKET-SWITCHING

SESSION 73

Chairman: David C. Walden
Bolt Beranek and Newman Inc.
Cambridge, Ma.

One of the major areas of development of computer communications networks over the past several years has been their use of the technology of packet-switching. The difficult basic issues of packet-switching are now reasonably well understood, and the effects of packet-switching on other areas of computer technology are beginning to be understood. The time appears to be ripe for the application of packet-switching technology to areas beyond simple intercomputer communication, e.g., speech transmission and ground and satellite radio communication.

Speakers
"Speech Transmission in Packet-Switched Store-and-Forward Networks"
James W. Forgie
MIT Lincoln Laboratory, Lexington, Ma.

"Dynamic Control Schemes for a Packet-Switched Multi Access Broadcast Channel"
Simon S. Lam
IBM Corp., Yorktown Heights, N.Y.

and
Leonard Kleinrock
University of California, Los Angeles, Ca.
SESSIONS 73 & 74

Thursday Morning  May 22

“Operating System Design for a Packet-Switched Environment”
David L. Retz
Speech Communications Research Laboratory, Inc., Santa Barbara, Ca.

“Issues in Packet-Switching Network Design”
William R. Crowther, Frank E. Heart, Alexander A. McKenzie,
John M. McQuillan and David C. Walden

Thursday Morning  May 22

10:05 a.m. - 11:45 a.m.
Garden Grove Room

A MANAGERIAL PERSPECTIVE OF
THE EVOLUTION AND FUTURE
OF DATA PROCESSING: A USER EXECUTIVE VIEW

SESSION 74

Chairman:  John F. Rockart
            M.I.T. – Sloan School
            Cambridge, Ma.

The computer-based information system function has changed considerably in its 20-year history. Hardware and software have evolved significantly. Applications have been added in abundance. Methods of managing the technology, human resources, systems and user/computer interfaces have all evolved considerably. The panel will address this evolution — laying emphasis on the future events which will require intelligent management response and action. The viewpoint is that of an involved user executive.

Panelists

W. J. Evans
Aluminum Company of America, Pittsburgh, Pa.

Horace L. Kephart

William Madden

Peter E. Viemeister
Grumman Corp., Bethpage, N.Y.

SESSIONS 75 & 76

Thursday Morning  May 22

10:05 a.m. - 11:45 a.m.
California Room II

NEW APPLICATIONS IN PRINTING
AND PUBLISHING

SESSION 75

Chairman:  Joseph J. Guiteras
            The Times Mirror Company
            Los Angeles, Ca.

The publishing industry is moving toward total automation. Publishers and printers are using computer systems with video display terminals for text entry, correction, editing, proofreading display ad composition and limited pagination. Computer systems also are used for galley and page composition of books, magazines, newspapers, maps, charts, directories, catalogs and display ads. The change from hot metal to cold type output requires computers to drive phototypesetters, laser scanners and plotters, and direct plate making equipment.

Speaker

“Automatic Full-Page Formatting of Technical Primary Journals”
Stanley E. Bammel
Bammel Software Engineering, Columbus, Oh.

Panelists

Charles Ying
ATEX, Inc., Bedford, Ma.

Donald Roland
Times Mirror Press, Los Angeles, Ca.

Jerome Lee
Los Angeles Times, Los Angeles, Ca.

SESSION 76

Chairman:  Stuart E. Madnick
            M.I.T. Sloan School
            Cambridge, Ma.

Significant cost reduction advances in processor technology have
Thursday Morning May 22

now made multiple processor architectures economically feasible. In this session three specific examples are presented. The first uses an ensemble of up to 13 identical processors to implement a highly-reliable communications switching node (ARPA IMP). The second addresses the problem of asymmetric task scheduling in a multiprocessor system with heterogeneous processors (HITAC 8700’s and 8800’s). The third describes a highly modular network of microprocessors connected together by a common ring-bus.

Speakers

"Pluribus — A Reliable Multiprocessor"
S. M. Ornstein, W. R. Crowther, M. F. Kraley, R. D. Bressler, A. Michel and F. E. Heart

"Design Considerations for a Heterogenous Tightly-Coupled Multiprocessor System"
Kenichiro Noguchi, Isao Ohnishi and Hiroshi Morita
Hitachi, Ltd., Yokohama, Japan

"Microprocessor-Based Multiprocessor Ring Structured Network"
Hoo-min D. Toong
Massachusetts Institute of Technology, Cambridge, Ma.

Thursday Morning May 22

10:05 a.m. - 11:45 a.m.
California Room IV

INNOVATIVE APPLICATION OF COMPUTER SCIENCE IN EDUCATION

SESSION 77

Chairman: Alan Kay
Xerox Palo Alto Research Center
Palo Alto, Ca.

The aim of this session is to present a particular point of view for the future of Computer Science in Education as seen by those who have already been working toward these ends. Each participant has built his own hardware/software system, has had real experience with student and professional users, and will show a short film illustrating his recent work.

Speakers

"An Intelligent On-Line Assistant and Tutor: NLS—Scholar"
Mario C. Grignetti, Catherine Hausmann and Laura Gould

Panelists

John Seely Brown
SESSION 79 & 80

Thursday Afternoon  May 22

2:00 p.m. - 3:40 p.m.
California Room I

ADVANCES IN PACKET RADIO COMMUNICATION

SESSION 79

Chairman:  Harry L. Van Trees
Defense Communications Agency
Washington, D.C.

The current status of packet radio communications will be discussed. The first paper gives an overview of the problem of organizing computer resources into a packet radio network, outlines the requirements of a target system, and formulates a system structure. The second paper discusses random access procedures for packet radio networks. It emphasizes Carrier Sense Multiple Access (CSMA) techniques and their extension. The third paper presents a complete description of the ALOHA System and outlines some of the lessons learned.

Speakers
“The Organization of Computer Resources Into a Packet Radio Network”
Robert E. Kahn

“Random Access Techniques for Data Transmission Over Packet Switched Radio Networks”
Leonard Kleinrock and Fouad Tobagi
University of California, Los Angeles, Ca.

“ALOHA Packet Broadcasting – A Retrospect”
N. Abramson, R. Binder, F. F. Kuo, A. Okinaka and D. Wax
University of Hawaii, Honolulu, Ha.

Thursday Afternoon  May 22

2:00 p.m. - 3:40 p.m.
Garden Grove Room

MANAGEMENT ISSUES IN COMPUTERS

SESSION 80

Chairman:  John J. Donovan
M.I.T.—Sloan School
Cambridge, Ma.

This session focuses on issues important to management and computers. We have a planning paper, a cost benefit analysis paper and a technology paper which exposes an approach to an operational information system for New England energy policy analysis. These are instances of three separate issues which management should be aware of.

SESSION 80 & 81

May 22  Thursday Afternoon

2:00 p.m. - 3:40 p.m.
California Room II

COMPUTER SYSTEM SIMULATION AND PERFORMANCE EVALUATION

SESSION 81

Chairman:  Hans Kaspar
TRW Systems Group
Redondo Beach, Ca.

Computer system simulation and performance evaluation are inextricably intertwined. Both modeling and construction of suitable drivers and simulator representation of computer system hardware and software depend upon availability of appropriate performance monitor data. Discussed in this session are: on-line computer system response time measurement utilizing simulation from a remote portable device; a high-speed analytically driven approach to computer system performance prediction; and a two level simulation approach used for design verification of an LSI computer.

Speakers
“A Simple Technique for Controller On-Line System Stimulation”
Thomas E. Bell
TRW Systems Group, Redondo Beach, Ca.

Jo Ann Lockett
The Rand Corp., Santa Monica, Ca.

Stephen R. Kimbleton
USC Information Sciences Institute, Marina del Rey, Ca.

“Computer Design Verification Via Software Simulation”
R. E. Karnes and W. A. Carter
IBM Corp., Huntsville, Al.
The hardware capabilities provided by new technologies and the software requirements generated by new applications are exerting a powerful influence on memory subsystem architecture. This session will consider both hardware and software factors and will include discussions of the conceptual and architectural support of data base systems, the use of LSI technology to provide logical processing capabilities within a memory subsystem, and the use of microprocessors to support both memory subsystem hierarchies and software hierarchies in a uniform manner.

Speakers

“Trends in Data Base Management – 1975”
Charles W. Bachman
Honeywell Information Systems, Waltham, Ma.

“A Data Sorting System Using High Speed Bus”
P. M. Thompson and Z. H. Glanz
University of Ottawa, Ottawa, Canada

“INFOPLEX – A Functional Decomposition of Large Information Management Systems Into a Hierarchical Microprocessor Complex”
Stuart E. Madnick
MIT – Sloan School, Cambridge, Ma.

Panelists

Richard Muntz
University of California, Los Angeles, Ca.

Stewart Schlesinger
The Aerospace Corp., Los Angeles, Ca.

Donald S. Miller
TRW Systems Group, Redondo Beach, Ca.

James C. Maloney
TRW Systems Group, Redondo Beach, Ca.

Many interesting computer based, general purpose systems are currently under development. This work, presently directed towards inspection and assembly, is based on the robot work of the past. Computers, used in ever increasing numbers, are beginning to change the nature of work. This panel will investigate the impact of computers on conventional automation and the practicability, potential, and workforce impact of the latest developments in the field of artificial intelligence.

Speakers

Eugene Merchant
Cincinnati Milacron Inc., Cincinnati, Oh.

James L. Nevins
Charles Stark Draper Laboratory, Cambridge, Ma.

Charles A. Rosen
Stanford Research Institute, Menlo Park, Ca.

Robert H. Anderson
The Rand Corp., Santa Monica, Ca.

Thomas O. Binford
Stanford University, Stanford, Ca.

Anthony W. Connole
United Auto Workers, Detroit, Mi.

The advent of computer networks has stimulated interest in
shared data bases that are comprised of logically related but
physically separate files. The first paper of this session provides
formal guidelines within which to address the problem of opti-

mally allocating data and programs to various nodes of a distrib-
uted network. The remaining papers discuss the economic and
administrative motivation for constructing decentralized data
bases for two important application areas: clinical medicine and
municipal management.

Speakers
“Optimizing Distributed Data Bases: A Framework for Re-
search”
K. D. Levin and H. L. Morgan

“Structured Organization of Clinical Data Bases”
Gio Wiederhold, J. F. Fries and S. Weyl
Stanford University, Menlo Park, Ca.

“Integrated Data Bases for Municipal Decision-Making”
P. E. Mantey and Eric D. Carlson
IBM Corp., San Jose, Ca.

Thursday Afternoon

3:50 p.m. - 5:30 p.m.
California Room 1

PACKET RADIO: FUTURE IMPACT

SESSION 85

Chairman: Robert E. Kahn
Advanced Research Projects Agency
Arlington, Va.

Radio based computer communication techniques introduce a
wide range of new possibilities in mobile data processing and
communication. A major benefit of this technology is a conven-
ient and flexible organization of terminals, computers, and data
bases. Additional benefits include more effective shared use of
the frequency spectrum, improved urban communication tech-
niques, new systems alternatives and highly reliable, low power
transmission for personal computing.

This session will discuss the motivation for radio based computer
communication networks, the current state-of-the-art, theore-
tical approaches to the analysis and modeling of packet radio
systems, and an assessment of their potential impact.

Speakers
“Packet Radio System – Network Considerations”
H. Frank, I. Gitman, and R. van Slyke
Network Analysis Corp., Glen Cove, L.I.

“Technological Considerations for Packet Radio Networks”
S. Fralick
Stanford Research Institute, Menlo Park, Ca.

J. Garrett
Collins Radio Corp., Dallas, Tx.

“Functions and Structure of a Packet Radio Station”
J. Burchfield, R. Tomlinson, and M. Beeler

“Digital Terminals for Packet Broadcasting”
S. Fralick and D. Brandin
Stanford Research Institute, Menlo Park, Ca.

F. Kuo and C. Harrison
University of Hawaii, Honolulu, Ha.

May 22
Thursday Afternoon

May 22
Thursday Afternoon

3:50 p.m. - 5:30 p.m.

Garden Grove Room

DESIGN AND IMPLEMENTATION
OF DISTRIBUTED SYSTEMS

SESSION 86

Chairman: David J. Farber
University of California
Irvine, Ca.

This session will explore three aspects of the design implementa-
tion cycle in distributed systems. These are: planning, protocol
development, and debugging. Distributed systems are becoming
increasingly commonplace and thus the issues faced in this
session are of interest to designers in business and production.

Speakers
“An Integrated Approach to Network Protocols”
Louis Pouzin
Institute de Recherche d’ Automatique, Requencourt, France

“Interaction Monitors in a Distributed System”
Rajiv Malhotra
Burroughs Corp., Irvine, Ca.
SESSIONS 87 & 88

Thursday Afternoon May 22

3:50 p.m. - 5:30 p.m.
California Room II

DATA BASES IN THE HUMANITIES

SESSION 87

Chairman: James Joyce
University of California
Berkeley, Ca.

Data Bases in the Humanities — represented here by language and literature, music, and visual arts — enlist the aid of information science and technology to provide and manage information that, by its nature, is not thought of as quantitative. Panelists will discuss humanities' data bases already in operation and, aided by demonstration and color slides, will illustrate their problems, uses and goals — both short and long range.

Panelists
John R. Allen
University of Manitoba, Winnipeg, Canada
Theodore F. Brunner
University of California, Irvine, Ca.
Robert J. Dilligan
University of Southern California, Los Angeles, Ca.
Hank Epstein
Stanford University, Stanford, Ca.
Joseph Raben
Queens College-CUNY, Flushing, N.Y.
Benjamin Suchoff
SUNY-Stoneybrook, Stoneybrook, N.Y.
Alice F. Worsley
Stanislaus State College, Turlock, Ca.

Thursday Afternoon May 22

3:50 p.m. - 5:30 p.m.
California Room III

PANEL DISCUSSION ON TECHNOLOGY AND ARCHITECTURE

SESSION 88

Chairman: Richard P. Case
IBM Corp.
Poughkeepsie, N.Y.

This session concludes the sequence on the interaction of new technology and systems architecture. The panel will discuss the

SESSIONS 88 & 89

May 22 Thursday Afternoon

principal topics raised at the two previous paper sessions and their assessment of the probable future effects of the technological developments. An opportunity will be available for questions from the audience.

Panelists
Stuart Madnick
MIT — Sloan School, Cambridge, Ma.
Jeffrey Buzen
Honeywell Information Systems, Waltham, Ma.
Rex Rice
Fairchild Semiconductor, Mountain View, Ca.
Gerry Estrin
University of California, Los Angeles, Ca.

May 22 Thursday Afternoon

3:50 p.m. - 5:30 p.m.
California Room IV

KNOWLEDGE-BASED EXPERT SYSTEMS

SESSION 89

Chairman: Norton R. Greenfeld
USC Information Sciences Institute
Marina del Rey, Ca.

Knowledge-based expert systems are those which have an expertise in some domain, and can utilize their understanding to facilitate the formulation, expression, and solution of problems within that domain. The panelists will discuss systems which are being built now, along with the major methodological questions facing the field: scope of the object domain, communicative ability, problem-solving capabilities, acquisition and representations of knowledge, and economic practicality.

Panelists
Robert M. Balzer
USC Information Sciences Institute, Marina del Rey, Ca.
Richard E. Fikes
Stanford Research Institute, Menlo Park, Ca.
Edward A. Feigenbaum
Stanford University, Stanford, Ca.
W. Gerry Howe
IBM Corp., Yorktown Heights, N.Y.
William A. Martin
Massachusetts Institute of Technology, Cambridge, Ma.
Special Activities

Conference Receptions
The 75 NCC will feature a Conference and International Reception to be held on Monday, May 19, from 6:00 p.m. to 8:00 p.m., in the Center Ballroom of the Disneyland Hotel. The cost for this event is $7.50. Those attendees who have taken advantage of the NCC Travel Package already have tickets to this event.

“NCC DAY AT DISNEYLAND” — Tickets for this event cost $4.75 and will be sold through pre-registration, at the Special Events booth in the registration area and are automatically included in the NCC Travel Package. Attendees will have full and unlimited access to all rides and attractions, with the exception of the shooting galleries, from 10:00 a.m. to 10:00 p.m., on Wednesday. Free parking included.

Computer Science Theatre
During all days of the Conference, computer-related films will be shown along with others of general current interest. The Theatre is located in Rooms 5 and 6 at the Convention Center and is open from 11:00 a.m. to 5:00 p.m. Programs detailing the films to be shown will be available at the Information Booth and at the entrance to the Theatre.

Computer Science Fair
A Computer Science Fair for high school students will be a feature of the Conference. Projects will include the hardware implementation of computers, components, and other digital implementation; the display of new computer applications; the presentation of systems programming efforts; and the exhibition of research results produced by applied programming. Attendees are cordially invited to visit the exhibit and chat with the participating students.

The Fair is located in the North Lobby of the Convention Center and is open from Monday through Wednesday.

NCC Art Show — “Sixteen on the Silicon Age”
“Sixteen on the Silicon Age” is an exhibition of paintings with commentary identifying technology with man. It is divided into three groups: ‘The Runes’, which presents an historical perspective; ‘The Folk Heroes’, which comments on the celebrities born from the phenomenon of mass media; and ‘The Longings’, which explore the emotional side of technology.

This exhibition is given by Holly Ann Sweeney of Mt. Holly Springs, Pa, and will be located at the east end of the North Lobby of the Convention Center.

Computer Sound & Light Show — “SOLEIL” — Presentation in Sound & Light
SOLEIL is presented to the NCC as an example of how computer technology is being used toward artistic ends. The computer as a musical instrument offers the potential to create sound, ranging from electronic to instrumental sounds and from chaotic noise of nature to new unimaginable sounds. Music, including both original compositions and “orchestrations” of existing pieces, will be played through a computer music system.

In conjunction with this, a production encompassing both sound and light will be presented. Music generated with computer and light from computer modulated laser beams will be combined in space and time in a higher compositional order.

This exhibition is being presented by a group of artist/technologists from Indiana University and will be located in Room 18 of the Convention Center.

Special Activities

General Conference Information

Conference Proceedings
NCC Conference Proceedings are available in the Proceedings Booth off the South Lobby of the Convention Center. Copies may be claimed by presenting your badge insert included as part of your Full Conference Registration. Proceedings can be mailed to you for a prepaid fee of $1.00 by presenting your exhibit inquiry card along with the badge insert to the Proceedings Booth.

Additional copies of the Proceedings may be purchased at the special Conference price of $25.00. Post-Conference price for the Proceedings is $50.00 and copies may be obtained by writing AFIPS Press, 210 Summit Avenue, Montvale, N.J. 07645.

Members of AFIPS Constituent Societies may obtain a 50% discount on post-conference Proceedings prices.

Exhibit Hours
The scheduled hours for viewing the exhibits at the Anaheim Convention Center are as follows:

<table>
<thead>
<tr>
<th>Date</th>
<th>Hours</th>
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<tr>
<td>Monday, May 19</td>
<td>11:00 a.m.-7:00 p.m.</td>
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<tr>
<td>Tuesday, May 20</td>
<td>10:00 a.m.-6:00 p.m.</td>
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<tr>
<td>Wednesday, May 21</td>
<td>10:00 a.m.-6:00 p.m.</td>
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<tr>
<td>Thursday, May 22</td>
<td>10:00 a.m.-6:00 p.m.</td>
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Admission is by Conference or Exhibit badge only.

Message Center
Telephone: 714-635-8440
The Message Center is located in the South Lobby of the Convention Center.

Press Room
For the convenience of the press, a fully staffed press room will be maintained throughout the Conference in Room 19 at the Convention Center.

Speaker Lounge, Registration and Practice Rooms
Speaker Registration, Lounge and Practice Rooms will be located at the Convention Center, Rooms 9, 10, 11 and 12.

Information Center
The Conference Information Center is located in the registration area in the Grand Lobby of the Convention Center.
General Conference Information

International Visitors Lounge
Foreign Visitors are urged to visit and take advantage of the facilities offered to them in the International Visitors Lounge located in the Grand Lobby of the Convention Center.

First-Aid Room
The First-Aid Room is located off the Grand Lobby of the Convention Center.

Busing
The NCC will provide complimentary bus service between the Anaheim Hotels and the Convention Center between the hours of 7:15 a.m. and 6:00 p.m., Monday through Thursday and from 2:30 p.m. to 7:30 p.m. on Sunday.

Cassette Recordings
Included in your NCC Registration Kit is a list of sessions which have been selected by the Program Committee for recording. These cassettes will be available for purchase within 24 hours after the session has been recorded. Sale of these cassettes will take place in the South Lobby of the Convention Center.

Please Note: At the request of our speakers, it is the policy of AFIPS that only authorized recording will be permitted. Anyone wishing to record a presentation should make application to AFIPS.

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While the format is similar to that of other computer conferences, the emphasis in the technical program is less on state-of-the-art and more on papers that will explain developments in one country to the representatives of the other. The goal of the conference is to permit technical and management personnel of both nations to discuss subjects of common interest, identify common problems, and make contrasts and comparisons of the methodologies employed to effect solutions.

In addition to the formal program, the conference will feature technical exhibits and tours of Japanese computing activities. Exhibits will be held at the Tokyo Prince Hotel. The tours will include visits to computer manufacturing facilities, industrial computer installations, and computer science research laboratories.

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Further information on the conference or on participating in the exhibit program may be obtained by writing to:

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Stanford Research Institute
333 Ravenswood Avenue
Menlo Park, CA 94025

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Join us in New York and celebrate the 25th Anniversary of the First Joint Computer Conference and our national Bicentennial.

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The 1976 National Computer Conference will feature:

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as well as discussions of the computer’s influence on society.

The focus for 1976 will be Performance, Productivity and Profits. The NEW will be added to the USUAL to provide the BEST. Suggestions for sessions, panels, demonstrations or any other great ideas for the 1976 NCC are very welcome. Write to Carl Hammer or Stanley Winkler ASAP.

WANTED — Authors

200 Authors wanted. Your paper will be published in historic 1976 NCC Proceedings, AFIPS Volume 45.

Papers in every area of Computer Science, Data Handling, EDP Applications, and Information Processing are needed.

WHO — Submit a paper if you use, build, buy, sell or think about computers, data handling, information processing. We would like to hear from everyone, from Architects to Zoologists including Bankers, Congressmen, Doctors ... not to mention Lawyers, Manufacturers, Programmers, Regulators, Teachers, Wizards and Young Turks.

WHAT — Submit a paper if you can write with authority and conviction on a computer-related topic. New, hitherto unpublished, papers are solicited; the total length should not exceed 5000 words; each paper must include an abstract, not over 200 words; illustrations keyed to the text; and an appropriate set of keywords.

HOW — Six copies of the manuscript, each complete with cover page, abstract, index terms, and illustrations must be submitted. Manuscripts must be cleanly typed and double spaced, one side of the paper only. On the coversheet must be given: Full name of author(s) with co-author(s) in the desired order; company, university or other professional affiliation of each author; name, address and telephone number of the responsible author. All papers will be refereed. Submission of a paper implies a guarantee by the author that all necessary approvals and clearances have been obtained.

WHEN — Deadline for submission of complete papers is January 5, 1976. Authors will be notified before March 1, 1976, about the acceptance of their papers.

WHERE — Send all submissions and suggestions to the '76 NCC Program Chairman:

Dr. Stanley Winkler
IBM
18100 Frederick Pike
Gaithersburg, MD 20760
(telephone: 301/840-7384)

'76 NCC • NEW YORK • JUNE 7-10, 1976
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