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### News and Information
CAST Division

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(Note the addresses include the COMPMAIL + account name which is described in detail in CAST Communications, Vol. 8, No. 1.)

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Chairman's Message: What's Happening

by Edward M. Rosen, Monsanto Co.

This has been a busy time for the CAST Division. A number of activities have been planned and a number of issues have been raised which could have long term effects on the CAST Division.

This is the first year that the long term planning policies have been implemented. Long range planning is now a routine function of the CAST executive committee. A major thrust has been the assignment of the directors to specific tasks for their three year term. Each year two of the six directors are elected. Their specific tasks assignments currently look something like this:

- **Year 1** Serve on Long Range Planning Committee, help with electronic mail
- **Year 2** CAST membership recruitment, coordinate with AIChE membership committee, public relations
- **Year 3** Associate editor of CAST Communications, speakers bureau.

All the directors also serve on the awards committee.

Each of the three major programming areas now have plans for major conferences. The 10a group, Systems and Process Design, is planning the third in its successful FOCAPD conferences (previous ones in 1980 and 1983) for the summer of 1989. The 10B group, System and Process Control, is now accepting applications for their third conference (previous ones in 1976 and 1981) to be held at Asilomar on January 12-17, 1986. Finally the 10C group, Computers in Management and Information Processing has scheduled its first Conference, FOCAPO, for the summer of 1987. These conferences have been the leading ones in their respective fields.

Programming for the national AIChE meetings is the major function of CAST. We program twice a year, once in the Spring and for the annual meeting. We have been able only to accept about one third of the total papers submitted. However, the interest in paper submissions by the CAST membership is gratifying.

**Ideas and comments wanted on new award.**

This issue of CAST Communications is the second in the series with the new format. I am delighted that Prof. Peter Rony has spearheaded this effort as well as the electronic mail experiment. The CAST executive currently uses the IIT Dialcom system for this purpose. It has proven to be most useful.

There has been considerable debate about the possibility of a third CAST award to supplement the Division's current two awards. The new award, which would be funded by Pergamon Press, has been proposed as being either a Computing Practice award or a Best Paper award. If you have any ideas about the suitability of this new award please let me know.

The survey conducted in the last issue of Communications as to the preference for hard copy of microfiche has shown a strong preference for the hard copy. What is being considered by national AIChE is to have the meeting registration form indicate if a hard copy is desired. If so, payment would be made at the time of preregistration.

The possibility of advertising in CAST Communications has been raised. Since this is a general issue affecting all Divisions, it is being discussed by the AIChE Council.

This November, I will have the privilege of addressing AIChE Council about the activities of the CAST Division. I will be delighted to report on its health, the enthusiasm of its members and its role as one of the fastest growing Divisions in AIChE.
The winners of two awards for outstanding contributions in the application of chemical engineering computing have been selected. Professor Warren E. Stewart is the 1985 winner of the Computing in Chemical Engineering Award, while the winner of the Ted Peterson Student Paper Award is Dr. Stephan F. Kistler. Both awards are sponsored by the Computing and Systems Technology Division of the American Institute of Chemical Engineers.

The Computing in Chemical Engineering Award is given in recognition of an outstanding contribution in the application of computing and systems technology to chemical engineering. The award, supported by Intergraph and Simulation Sciences Inc., consists of $1500 and a plaque. Professor Stewart is the McFarland-Bascom Professor of Chemical Engineering at the University of Wisconsin in Madison. He received his B.S and M.S. degrees from the University of Wisconsin and his Sc.D. degree from the Massachusetts Institute of Technology. He worked for Sinclair before joining the chemical engineering faculty at Wisconsin in 1956. He has coauthored five books and nearly one hundred papers, patents, and other contributions to the scientific literature. He is a Fellow of AIChE and served recently on the programming board of the CAST Division. He is also a member of the American Chemical Society, the American Society for Engineering Education, Alpha Chi Sigma, and Phi Beta Kappa. Professor Stewart was cited particularly for the development of innovative computational techniques for process simulation, analysis, and design, and for the inspiration which led to the widespread application of these methods by industry and academia.

The Ted Peterson Student Paper Award is given to recognize an outstanding published work, performed by a student, in the application of computing and systems technology to chemical engineering. This award, supported by ChemShare and IBM, consists of $500 and a plaque. Dr. Kistler was cited for his paper, “Coating Flow Theory by Finite Element and Asymptotic Analysis of the Navier-Stokes System,” based on research he conducted with Professor L. E. Scriven at the University of Minnesota. His theory has particular application to the manufacture of photographic film and other coated films such as adhesive tape. A native of Switzerland, Dr. Kistler received his undergraduate training at the Swiss Federal Institute of Technology (ETH) in Zurich before beginning his graduate studies at Minnesota. He is now employed in the Memory Technologies Research Laboratory of 3M Company in St. Paul, where his interests include computer modeling of process steps important in magnetic media manufacturing.

Both awards will be presented November 12, 1985 at the CAST Division Awards Banquet during the AIChE Annual Meeting in Chicago. Professor Stewart will give a talk entitled, “Approximation and Lumping in Process Models.”
AMERICAN INSTITUTE OF CHEMICAL ENGINEERS
1986 AWARD NOMINATION FORM*

A. BACKGROUND DATA

1. Name of the Award _______________________________ Today's Date ________________

2. Name of Nominee _______________________________ Date of Birth ________________

3. Present Position (exact title)

_________________________________________________________________________

4. Education:

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<th>Institution</th>
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6. Academic and Professional Honors (include awards, memberships in honorary societies and fraternities, prizes) and date the honor was received.

7. Technical and Professional Society Memberships and Offices

8. Sponsor's Name and Address

_________________________________________________________________________

_________________________________________________________________________

_________________________________________________________________________

Sponsor's Signature

_________________________________________________________________________

* A person may be nominated for only one award in a given year.
B. CITATION

1. A brief statement, not to exceed 250 words, of why the candidate should receive this award. (Use separate sheet of paper.)

2. Proposed citation (not more than 25 carefully edited words that reflect specific accomplishments).

C. QUALIFICATIONS

Each award has a different set of qualifications. These are described in the awards brochure. After reading them, please fill in the following information on the nominee where appropriate. Use a separate sheet for each item if necessary.

1. Selected bibliography (include books, patents, and major papers published.)

2. Specific identification and evaluation of the accomplishments on which the nomination is based.

3. If the nominee has previously received any award from AIChE or one of its Divisions, an explicit statement of new accomplishments or work over and above those cited for the earlier award(s) must be included.

4. Other pertinent information.

D. SUPPORTING LETTERS AND DOCUMENTS

List of no more than five individuals whose letters are attached.

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Please send the completed form and supplemental sheets by April 2, 1986 to the CAST Division Chairman, Dr. Thomas F. Edgar, Department of Chemical Engineering, University of Texas, Austin, TX 78712.
CACHE Position Paper: Expectations of the Competence of Chemical Engineering Graduates in the Use of Computing Technology

The CACHE Corporation, P. O. Box 7939, Austin, TX 78713-7939

This document was prepared by the CACHE Curriculum Task Force, approved by the CACHE Board of Trustees in March 1985, and submitted to the AIChE Education and Accreditation Committee for their consideration. Recognizing that computing technology is characterized by continual advances and innovations, CACHE plans to update the document periodically. Comments and recommendations should be addressed to Professors Morton M. Denn (University of California, Berkeley, CA 94720) and Warren D. Seider (University of Pennsylvania, Philadelphia, PA 19104), the co-chairmen of the Curriculum Task Force. The Task Force also included H. Scott Fogler (University of Michigan), G. V. Reklaitis (Purdue University), John H. Seinfeld (Monsanto), and Irven H. Rinard (Halcon SD International). CACHE is a non-profit organization that promotes cooperation among government, industry, and universities in the application of computing and computing technology based aids to chemical engineering education.

Introduction

Chemical engineering practice is now heavily dependent on diverse applications of computing technology. While specialized skills are required for particular tasks, all chemical engineers can expect to utilize certain areas of computing technology as a matter of course, and it is reasonable to expect certain areas to be covered in depth in all bachelors-degree curricula. The means by which such topics are incorporated in the curriculum will differ, depending on institutional traditions, strengths, and preferences, but failure to include the areas discussed here in some manner will result in a graduate who is ill-equipped to practice the profession.

Basic Skills

The uses of computing technology in chemical engineering practice can be roughly classified into the following categories:

- scientific computation
- text editing
- data management and manipulation
- data acquisition

While these categories are neither mutually exclusive nor totally inclusive, they provide a useful perspective for curricular needs. The first three pertain to computer software: computer speed and memory are relevant here only with regard to scale, though it can be anticipated that many applications will be carried out on personal computers. A common need is familiarity with at least one of the standard operating systems (UNIX, MSDOS, ...); it can be assumed that a graduate thoroughly familiar with one operating system can adapt to another as the need arises. We thus conclude that a fundamental expectation is that the chemical engineering graduate must be familiar with at least one operating system for personal and mainframe computers. Familiarity with an operating system implies competence in file manipulation, text editing, graphic display, and so forth.

All chemical engineering graduates are currently exposed to the elements of scientific computation, though few receive sufficient reinforcement in undergraduate course work to ensure the necessary competence. "Fluency" is required in at least one of the standard scientific programming languages (FORTRAN, PASCAL, C, ...); it can be assumed that an individual can learn others as the need arises. The chemical engineering graduate must be competent in the use of at least one scientific programming language. Competence in a language implies not only the ability to write scientific programs, but also a sufficient understanding of programming logic to test and adapt programs written in others.

Modern engineering practice is dependent on the acquisition and processing of data through electronic means. The practicing engineer must have a working familiarity with the methods by which data are acquired, transmitted, and recorded. The chemical engineering graduate must have experience in the computer-aided acquisition and processing of information.

Most chemical engineering graduates make surprisingly little use of library resources; for many, the senior design project provides their first real exposure to the engineering literature. Familiarity with modern library resources is important and, hence, it is desirable for each student to conduct at least one search using information retrieval from electronic data bases such as Chemical Abstracts Service and Scientific Information Systems.

Word processors are achieving the "essential" status of hand-held calculators. They are becoming the principal vehicle for the generation of reports. New computer-aided drafting packages are effective for preparation of figures and, hence, it is desirable for the chemical engineering graduate to have experience in the use of word processors and graphics programs for the generation of reports. Many
industrial organizations and university campuses are utilizing networks of computers that share common data bases. More and more, professional engineers, faculty, and students are finding it advantageous to communicate with external computers to utilize electronic mail and data base facilities. Although it is too early to require that all graduates have experience with electronic mail and external data bases, such a requirement should be feasible in the next 2-5 years.

Programming

The basic skills defined here can be achieved only if computing technology is integrated throughout the curriculum. Students are required in most curricula to write short programs of their own, and they are often required to use programs supplied by others. They are rarely asked to evaluate programs supplied by others for efficiency, or correctness of the underlying equations/algorithms. It is important to recognize that software selection is an important responsibility of many chemical engineering professionals, and students need experience in evaluating programs supplied by others as well as in their use. We must teach how to perform an evaluation and verification of programs supplied by others.

Scientific Computation

Most scientific computation requires the solution of algebraic or differential equations, maximization/minimization, or statistical analysis. Chemical engineering graduates should understand the principles underlying such computation, including the bases upon which typical algorithms are developed (numerical methods). They should also have an appreciation of concepts of numerical analysis such as convergence and stability; the latter are rarely covered, but are essential to the intelligent use of computational methods.

Data management and spreadsheet programs are becoming of increasing importance, and familiarity with their use is desirable; spreadsheets are now being used in the chemical industry for scientific calculations such as material balances.

Non-numeric programming is gaining importance for rank-ordering, generating combinatorial alternatives, implementing complex data structures, and for analytical calculus. Increasingly, chemical engineering graduates need to understand the principles of utilizing lists, queues, and pointers along with standard numerical methods. These play a key role in artificial intelligence and robotics and are increasingly being applied in the synthesis and analysis of process flowsheets. Although not widely used in the undergraduate curriculum, these structural problem-solving techniques are finding new applications.

Because of the increasing use of computer terminals for communications, as well as for computation, touch typing is a mechanical skill that should be encouraged.

Curriculum

Integration of the skills defined here into a chemical engineering curriculum can be carried out in many ways. Familiarity with methods of data acquisition is likely to be incorporated into a general laboratory course or as a laboratory associated with the course in process control. Scientific programming and the use of externally-supplied programs (FLOWTRAN, for example) is common in courses in design and control, but the other core courses are underexploited and provide an opportunity to establish the use of computational technology as a part of the normal “culture” of the graduate.

Furthermore, the effective use of computational technology provides an opportunity for the introduction of open-ended problems at all levels of the core curriculum; this is particularly relevant in view of the need to maintain a minimum level of design (i.e., open-ended problems) in the curriculum for accreditation purposes.

BITNET—Because It’s Time

Ira Fuchs, Vice Chancellor for University Systems, City University of New York, 535 East 80th Street, New York, NY 10021

NOTE: This article was first published in Perspectives in Computing two years ago. The article is reprinted here with the kind permission of IBM and Dr. Fuchs.

On many campuses today, the introduction of word processors and microcomputers for text processing is becoming commonplace. While the equipment is being used primarily for the preparation of correspondence, manuscripts, and other documents, many colleges and universities have begun connecting the devices to large central computers or to each other in local networks, thereby further expanding their capabilities. As a natural consequence of this development, some institutions have begun to consider extending the range of communications beyond their own campuses. In particular, many scholars have become interested in communicating electronically with colleagues at other institutions so that they might more easily prepare research proposals, participate in joint research efforts, share computer programs, and engage in the many
At the City University of New York (CUNY), we decided to explore the feasibility of such exchanges on a large scale. Early in 1981 we surveyed more than 50 universities in the eastern United States and Canada in an effort to determine the breadth and seriousness of interest in creating an easy, economical system for inter-university communications. Response to the survey was overwhelmingly positive, Greydon Freeman, Director of the Yale Computing Center, and I had already made plans to interconnect the computing facilities at Yale and CUNY. Encouraged by results of the CUNY survey, we proceeded to implement those plans as a first step toward realizing a network of university users. The link was established in May 1981, and the new network, which we dubbed BITNET, was born. Since then, other institutions have joined the network (see Table 1).

It is anticipated that within a few years, BITNET will encompass most major universities in the United States and Canada and will have become a primary medium for inter-university exchanges of information.

**Purpose of BITNET**

The primary purpose of BITNET is to facilitate communications among universities by lowering the threshold of effort normally associated with other means of exchange. BITNET was designed using simple, inexpensive software and cost-effective telecommunications facilities. Thus an institution can connect to BITNET easily, with negligible programming effort and cost, providing speedy and simple access for faculty and staff.

BITNET users share information via electronic mail, specifically in the form of interactive messages, text files, and computer programs.

**Network Characteristics**

One of the most important differences between BITNET and other networks is that BITNET is unrestrictedly open to any college or university that has the ability to connect to it. Any such institution can become a member merely by acquiring a leased telephone line to another member and expressing a willingness to provide a connection point for at least one future member. Other networks such as ARPANET, CSNET, and COGNET generally restrict their membership, as by requiring that each member institution be involved in research relating to a specific discipline or be funded by a common organization. For example, ARPANET is funded by the Advanced Research Projects Agency of the United States Department of Defense, and it is intended only for work associated with Department of Defense contracts. CSNET requires that member institutions be involved in computer research. Similarly, COGNET requires that members be conducting research in cognitive science.

BITNET has neither requirements nor restrictions for membership, and it is by no means limited to faculty use.

Of course, a machine-readable document need not be readable by humans. It can be a program, a program fix, or a system enhancement, all of which are readable by computers. The network can transmit data, computer programs, and ordinary documents with equal facility. The benefits are convenience and time savings. Documents need not be printed or written to tape, and then packaged and mailed by regular post. Many other advantages of BITNET, or any network, are readily apparent to the modestly creative user after some initial exposure.
Figure 1. Current BITNET topology.
BITNET offers every member, even those connected to only one other member, the ability to communicate with any other member. Figure 1 shows the network’s current topology. Routing of messages and files is determined by each computer in the network and need not be known to the user.

BITNET supports any computer that can communicate using the RSCS (Remote Spooling Communications Subsystem) component of IBM’s VM370 operating system or the NJE (Network Job Entry) and NJI (Network Job Interface) line protocols. These protocols were developed to interconnect IBM’s medium- to large-scale computers, but their use is not restricted to IBM hardware or software. A program has been developed at Penn State University, for example, which emulates the VM/RSCS protocol and enables DEC, VAX/UNIX, and VAX/VMS systems to be part of BITNET. Four machines currently on the network are using this program, and it is hoped that similar implementations will provide compatibility for machines of other manufacturers, thereby increasing the potential user community. In addition, several schemes are being investigated that would allow systems that are not compatible to use a subset of BITNET’s capabilities. The computers in BITNET are connected by leased telephone lines running at 9600 bits (approximately 1200 characters) per second. This transmission rate is significantly faster than that which is possible using switched network (dial) connections. Moreover, BITNET is far less expensive than networks that require wide-band lines like those used in ARPA net.

BITNET is a financially self-supporting network. It has no central administration or paid staff. Its policies are determined by the management of the computer centers of the member institutions; its operations are sustained by the members’ respective systems and operations staffs. Each node in the network absorbs the cost of forwarding data. Message traffic is not billed as it is stored and forwarded to the intended recipient. BITNET is a cooperative and self-sustaining effort.

How BITNET Is Used

BITNET is easy to use, as illustrated in Figure 2. The first example shows how an interactive message is sent. If CUNY faculty member Jones (whose user identification, or “userid”, is JONES and whose node is CUNYVM) wants to send a message to his colleague Smith at Boston University (node name BOSTONU), he need only know his colleague’s userid (in this case, Smith) to issue the command as shown. He does not have to know the path between CUNY and Boston University. Routing is handled by common software running on each of the computers in the network. In this example, the computer at CUNY would refer to its routing table and determine that the message must be sent to Yale for the first leg of the trip. The Yale computer would pass the message on to Brown University, the next node in the path. Brown’s computer then would send the message to Boston University, its final destination, where it would be displayed on Smith’s terminal.

Text files are sent in much the same way. Figure 2 shows how a document called RESEARCH PROPOSAL is sent to SMITH at BOSTONU. The file would follow the same route as the interactive message in the previous example. One difference, however, is that if Smith were not logged on to the Boston University computer when Jones sent him an interactive message, or if there were no operative path to BOSTONU, then the interactive message would be discarded and Jones would receive a message indicating that his message was not deliverable. Text files, unlike interactive messages, are stored successively at each node in the path and are discarded only when they have been successfully transmitted to the next node. Hence BITNET is known as a store-and-forward network. Also, when a file reaches its destination node, it is saved until the intended recipient erases it.

Most implementations of these message and file-sending programs include the ability to associate nicknames with users and nodes with which there is frequent communication. For example, the address SMITH@BOSTONU could be replaced with a user-chosen nickname. This facility is especially useful if the userid and node name have little mnemonic value.

Network Services

Early in the evolution of BITNET we recognized that it would be highly desirable to provide network services such as a user directory network facilities. The user directory, analogous to a telephone directory, facilitates determining the electronic address (that is, userid and node name) of another user on the network (see Figure 3).

The community bulletin board is a file designed to contain announcements of forthcoming conferences and other events, postings of general interest, and users’ requests for specific information. The special offerings directory tells users how they may gain access to special computer facilities and services at various institutions on the network. An example is an advertisement for
the array processor at Cornell University, which is used by researchers in astronomy, chemistry, and high-energy physics. As shown in Figure 4, BITSERVE identifies the person to contact for information on using these facilities.

A BITSERVE file server enables the user to search a directory or files contributed by other users and request that a specific file be sent to him. These files can contain documents or computer programs of interest to network users. In addition, a directory of specialists is being developed which will contain the electronic addresses of users who have declared an expert knowledge of certain software or hardware and an willingness to respond to questions sent over the network. Although neither the expert status nor the responsiveness of these users can be ensured, the facility is expected to be among the most useful provided by the network. An example

"...it is impossible for a user to search another user's files or in any way to take data not intended for him."

in Figure 5 shows a user who needs help with the statistical package SPSS.

"...the processing time required to receive incoming data, deliver mail to local recipients, and pass other data to the next node is insignificant..."

The BITSERVE program has been designed for high performance while remaining flexible enough so that new files and directories can be added as needs arise. We hope to run the BITSERVE file server on more than one node in the network to maximize BITSERVE's availability and reduce the resources and storage required at any one node.

**Concerns** As a natural consequence of BITNET's rapid growth, concerns have been expressed regarding potential disruptions to the easy flow of information. Some of these concerns will require attention if the network is to grow in an orderly way and provide a high level of service. Others can be resolved easily, since they arise from a lack of understanding of the way BITNET works. These latter concerns include the following:

**Security** There is some fear that the security of proprietary or sensitive information may be compromised by having remote users connected to an institution's computer through BITNET. In fact it is impossible for a user to search another user's files or in any way take data not intended for him.

**Utilization of Resources** Some administrators are apprehensive that a network connection might add a significant and indeterminate load to an institution's computing system. In fact, the processing time required to receive incoming data, deliver mail to local recipients, and pass other data to the next node is insignificant—less than one percent of the capacity of a medium-size computer. The amount of computer time is also well bounded. It is limited by the speed of the communication facility—that is, 1200 characters per second. Therefore, even for network nodes that are hubs, serving several network connections, the load is minimal.

### Table 1. Institutions connected to BITNET

<table>
<thead>
<tr>
<th>Institution</th>
<th>Nodes</th>
<th>Connected</th>
</tr>
</thead>
<tbody>
<tr>
<td>The City University of New York</td>
<td>17</td>
<td>May 1981</td>
</tr>
<tr>
<td>Yale University</td>
<td>4</td>
<td>May 1981</td>
</tr>
<tr>
<td>The Pennsylvania State University</td>
<td>5</td>
<td>October 1981</td>
</tr>
<tr>
<td>New Jersey Educational Computing Network</td>
<td>2</td>
<td>January 1982</td>
</tr>
<tr>
<td>Brown University</td>
<td>3</td>
<td>January 1982</td>
</tr>
<tr>
<td>Cornell University</td>
<td>7</td>
<td>February 1982</td>
</tr>
<tr>
<td>Princeton University</td>
<td>1</td>
<td>March 1982</td>
</tr>
<tr>
<td>Columbia University</td>
<td>2</td>
<td>May 1982</td>
</tr>
<tr>
<td>Rockefeller University</td>
<td>1</td>
<td>June 1982</td>
</tr>
<tr>
<td>Boston University</td>
<td>1</td>
<td>June 1982</td>
</tr>
<tr>
<td>University of California at Berkeley</td>
<td>8</td>
<td>July 1982</td>
</tr>
<tr>
<td>University of California at San Francisco</td>
<td>2</td>
<td>July 1982</td>
</tr>
<tr>
<td>Massachusetts Institute of Technology</td>
<td>1</td>
<td>August 1982</td>
</tr>
<tr>
<td>University of Rochester</td>
<td>1</td>
<td>August 1982</td>
</tr>
<tr>
<td>State University of New York at Binghamton</td>
<td>1</td>
<td>September 1982</td>
</tr>
<tr>
<td>Harvard University</td>
<td>1</td>
<td>September 1982</td>
</tr>
<tr>
<td>Ohio State University</td>
<td>1</td>
<td>October 1982</td>
</tr>
<tr>
<td>University of Maine</td>
<td>1</td>
<td>December 1982</td>
</tr>
<tr>
<td>University of Illinois/Chicago Circle</td>
<td>2</td>
<td>January 1983</td>
</tr>
<tr>
<td>Stanford University</td>
<td>1</td>
<td>April 1983</td>
</tr>
<tr>
<td>George Washington University</td>
<td>3</td>
<td>April 1983</td>
</tr>
</tbody>
</table>
Jones at CUNY could send a message to Smith at Boston University as follows:

**USER:**
msg smith@bostonu hi, how are you jerry?

**SYSTEM:**
MESSAGE SENT TO: SMITH@BOSTONU

Smith at Boston University would receive the following:

**SYSTEM:**
FROM CUNYVM(JONES): HI, HOW ARE YOU JERRY?

Jones at CUNY could send a file to Smith at Boston University as follows:

**USER:**
ship smith@boston research proposal a
ship jerry research proposal a

**OR:**
ship smith@boston research proposal a

Where research proposal a represents the file name (research), file type (proposal), and file mode (a), and jerry is the nickname (see text) for SMITH@BOSTONU.

The following messages would be displayed at Jones’ terminal as the file was passed from node to node on its way to Boston University.

**SYSTEM:**
TO BE SHIPPED: TEMP TEMP A

**SYSTEM:**
PUN FILE 3171 TO NETWORK COPY 001 NOHOLD

**SYSTEM:**
11:14:54 FILE 3171 (3171) ENQUEUED ON LINK YALEVM

**SYSTEM:**
11:14:55 SENT FILE 3171 (3171) ON LINK YALEVM TO BOSTONU SMITH

**SYSTEM:**
11:14:57 FROM YALEVM: SENT FILE 2646 (3171) ON LINK BROWNVM TO BOSTONU SMITH

**SYSTEM:**
11:14:57 FROM BROWNVM: SENT FILE 5327 (3171) ON LINK BOSTONU TO BOSTONU SMITH

**USER:**
bit search

**SYSTEM:**
What subfile(s) do you wish to search??

**USER:**
?

**SYSTEM:**
U - User directory
B - Community bulletin board
I - Index of BITSERVE's CMS files
O - Special offerings
S - Specialists
A - All of the above

**USER:**
u

**SYSTEM:**
Enter the keywords you wish to search by, separated by the appropriate Boolean operators:
('space'=logical AND;'I'=logical OR;'-'=logical NOT)

**USER:**
morgan yale

**SYSTEM:**
Your request has been submitted to BITSERVE

**BITSERVE:**
ENTRY: U000137 (Bill Morgan (BJM@YALEVM) 203-432-4000)
Problems that require further study include the following:

**Unwanted Transmissions** In a network like BITNET, to which thousands of users have access, the sending of nuisance messages and files—"junk mail"—must be controlled. A related but more important and potentially costly problem is controlling the unauthorized transmissions of data to remote output devices such as laser printers, typesetters, and unattended remote-job-entry stations. A mechanism must be provided to effectively limit unwanted data transmission.

**File Size** There is no technical limit on the size of a file that a user can transmit through the network. Since there is no interleaving of files in a single direction, portions of the network can be tied up for extended periods, inhibiting users who wish to send small files. A possible solution to this problem would be enhancement of the existing protocol to permit multistream file transmission, with some limits on the size of the files transmitted. Another potential remedy would be to automatically break up large files into a number of smaller files which would be reconstructed at the destination node. Pending a technical solution to this problem, BITNET members have agreed upon a voluntary policy regarding the maximum size of transmitted files. It should be noted that interactive messages are not blocked by large text files because such messages are interleaved with large files.

**Alternate Routing** Currently there is no automated alternate routing scheme for avoiding communication links or nodes that are out of service. For example, if the link between Yale and Brown were unavailable, it would not be possible for JONES at CUNYVM to communicate with SMITH at BOSTONU until the outage was repaired. Extended downtime of any link can clearly reduce the throughput capacity of the network and result in the storage of a great deal of data in the last operating node along that route, possibly degrading operations at that node.

Solutions to this problem could take many forms. A simple but perhaps inelegant remedy would be to use dial backup to go around a failing node or communications line. In the example above, Yale could temporarily replace its leased line to Brown with one or two switched-network lines. And if Brown's computer failed, Yale could simply bypass Brown and dial Boston directly. Brown's mail would remain at Yale, while mail to and from other nodes would be delivered as usual.

"Plans are being developed to provide gateways, or connections, between BITNET and several other material and international networks ..."

A more sophisticated but more costly solution would involve the use of redundant pathways, with adaptive routing logic at each node to bypass failing nodes or lines. This strategy is used in ARPANET and is quite effective in providing a high level of availability. BITNET currently uses a nonredundant topology, but as the network grows, more complex routing strategies may be added to maintain reliability.

**Unique Node Names** Every machine connected to BITNET must have a unique node name. Several institutions that have connected or are contemplating connecting to the network find that the names by which they identify their machines are not unique, except for local use. For example, some machines have been given short, convenient names such as OS or VM. This problem can be resolved either by renaming the node or by providing alias names. The latter solution would provide maximal flexibility by allowing the node to maintain its original name for local use while assuming a new name for network access.

Interconnecting BITNET with other networks would dramatically increase the potential for information exchange. Plans are being developed to provide gateways, or connections, between BITNET and several other national and international networks, including CSNET and MAILNET. One such gateway, developed at Penn State University, connects BITNET with USENET, a network of several hundred UNIX systems. BITNET members are discussing addressing and mail standards to facilitate the development of such gateways.

CUNY and IBM are currently investigating the gateway requirements for a potential interconnection of BITNET and VNET, IBM's own international network. If implemented, this gateway would permit faculty and researchers to communicate directly with development and research personnel at IBM locations around the world. It would facilitate joint studies and enhance the flow of information between IBM and the academic community. For example, this article was prepared on the CUNY computer and submitted to the editor of Perspectives in Computing by means of an experimental link between CUNY and a VNET node at the IBM Scientific Center in Cambridge, Massachusetts.

BITNET is a new computer network that already has become an important medium of exchange...
bit search

What subfile(s) do you wish to search?

? - User directory
B - Community bulletin board
I - Index of BITSERVE's CMS files
O - Special offerings
S - Specialists
A - All of the above

Enter the keywords you wish to search by, separated by the appropriate Boolean operators:
('space' = logical AND; '|' = logical OR; '-' = logical NOT)

ibm I array

Your request has been submitted to BITSERVE

Entry: 0000041 (Array Processor (contact AG2@CORNELLA))

Enter the database entry that you wish to retrieve

Do you want the entry returned as a file? (default = no = (cr))

Your request has been submitted to BITSERVE

Entry for AG2@CORNELLA added by AG2 on 6/30/82

Cornell Array Processor

Floating Point Systems FPS-164 Attached Processor with four megabytes of memory, 64-bit precision, available on IBM 370/168 mainframe under VM/CMS. Prototype BITNET access for 3-4 sites in fourth quarter 1982; full availability first quarter 1983.

Contact: Alec Grimison, Cornell Computer Services.

401 Uris, Cornell University, Ithaca, NY 14853

(607-256-4981 AG2@CORNELLA)

bit search s spss

Entry: S000292 (Jim Daly (JOD@CORNELLA) SPSS Expert)

bit get S292

Entry for JOD@CORNELLA added by JOD on 06/30/82

Jim Daly (JOD@CORNELLA) SPSS Expert

Cornell University, 607-654-1234

223 Day Hall

Ithaca, NY 14853

I have used SPSS for over 10 years and have taught statistics courses for the past 7 years. My specialties include the use of the REGRESSION and CROSSTABS tools.
among the member institutions. It comes at a time when many colleges and universities are planning or already have implemented local networks to improve the ability of their faculty and staff to share information. We hope BITNET will help to expand that horizon and thereby enhance academic interchange.

Remember, the BIT in BITNET stands for Because It's Time. Readers who are interested in learning more about the network should contact the author.

1. For a technical discussion of RSCS (the Remote Spooling Communications Subsystem), which enables virtual machines to communicate with one another, see E. C. Hendricks and T. C. Hartmann, "Evolution of a virtual machine subsystem," IBM Systems Journal 18, No. 1, pages 111-142 (1979).


6. DEC, VAX, and VMS are trademarks of Digital Equipment Corporation; UNIX is a trademark of ATT.

Microcomputer/Personal Computer Notes

Edited by Peter R. Rony, Department of Chemical Engineering, Virginia Tech, Blacksburg, VA 24061

Business Computer Systems (July 1985) reports the following fifteen "irrefutable laws of computer system operation" developed by Dr. Michael Kasavana, Professor of Computer Science at Michigan State University School of Hotel, Restaurant, and Institutional Management.

1. Any computer program that runs well is obsolete.
2. A good computer program is always accompanied by extremely bad documentation.
3. The value of a computer program is inversely related to the weight of its output.
4. Program complexities always grow to exceed the capabilities of the programmer responsible for it.
5. Any time a system appears to be working well, something has been overlooked.
6. What you don't do is always more important than what you do.
7. In any computer program, constants should always be treated as variables.
8. Investments in system-reliability products always exceed the probable cost of errors they are designed to avoid.
9. The problem is not that computer salespeople are not knowledgeable, it's that most of what they know isn't true.
10. If a system requires "n" number of spare parts, there will always be "n-1" parts in stock.
11. Major software revisions are always requested after software installation is completed.
12. Installation and operating instructions are always discarded with the shipping containers.
13. Any component part requiring the most frequent service or adjustment will be the least accessible.
14. Undetectable errors are infinite while detectable errors, by definition, are finite.
15. Nothing is impossible for the person who doesn't have to do the work.

The Amiga Personal Computer, a 68000-based machine manufactured by Commodore International, is described in the August 1985 issue of Byte. For a list price of $1295, you get a 7.15909 MHz 68000; 256K bytes dynamic RAM, user expandable to 512K bytes (machine's design allows for a maximum of 8.5 Megabytes); 128K bytes of ROM containing multitasking, graphics, sound, and animation support routines; five modes of graphics, including 840 by 400, 16 colors; built-in 3.5-inch doublesided disk drive for disks that hold 880 Kbytes in 160 tracks; detachable 99-key keyboard with calculator pad, function, and cursor keys; disk port onto which three additional disk drives can be connected in daisy chain fashion; serial port with maximum transfer rate of 500,000 bits/second; Centronics-compatible parallel port; bundled software that includes Amiga DOS and ABaSiC; two stereo audio jacks; RGB analog, RGB digital, and NTSC composite output. This machine should put price pressure on the Apple Mac.

language? To quote Susan Eisenbach:

"The major goals of declarative programming are to provide structurally transparent languages, so programs can be verified and optimized mechanistically, and to facilitate the implementation of multiplustransparent, discovery, parallelism in the coming generation of parallel-processing computers. The way that declarative languages attempt to achieve these goals is by separating the task that the program is to perform from the way that the computer is to do it. That is, unlike imperative programming languages, declarative languages do not specify the flow of control but only the flow of data in a program." Interesting reading.

"New Microprocessor Chips" are briefly discussed by Philip Robinson in Byte (August 1985, page 369): iAPX 386, 80C86, and the AT Probe. "The iAPX 386 (the official name for the 80386) is made using CHMOS III technology. CHMOS is Intel's latest version of the CMOS process. The 386 is pipelined, has a high-bandwidth 32-bit bus, and supports full 32-bit addressing (4 gigabytes of physical space, 4 gigabytes per segment, and 64 terabytes of virtual address space per task). The 386 also has memory management and protection (compatible with the 286), virtual-memory support, caches, and paging (optional) all on chip. It can handle 8-, 16-, and 32-bit data, has a multiprocessor interface, and supports integrated multitasking. The 386 is object-code software-compatible with the 8086, 8088, 80186, 80188 and 80286. The 386 instruction set is a superset of the 286 set. All instructions are extended to support the 32-bit addresses and operands...That means 8088 programs (such as those for the IBM PC) should run without recompilation on an 80386 box." It appears that Intel will continue to be in the driver's seat in its competition with the Motorola 68000 family of microprocessors. Industry standardization around the IBM PC line should continue without serious challenge for the next several years.

George Raeder, in "A Survey of Current Graphical Programming Techniques" (Computer, August 1985), provides succinct commentary on alternative graphical programming techniques. Examples: (a) "Flowcharts were originally developed as tools for assembly language programming. They clarify a program's control structure, but do not describe its data structure." (b) "Nassi-Schneiderman diagrams impose structure on program control; however, they do not display expressions, procedure calls, types, and data graphically." (c) "State diagrams lack support for data and control structures and can be used only for simple, automaton-type program pieces, but they illustrate very clearly how those pieces parse input and generate output." (d) "Petri nets are often used for hardware descriptions. They use a token mechanism to show control flow." (e) "Dataflow diagrams have been used mostly in connection with dataflow languages and systems." He comments on recent graphical-programming systems such as the Program Visualization environment, Omega, PegaSys, Pecan, and Programming-in-Pictures.

The August 1985 issue of Dr. Dobb's Journal provides what they believe is the definitive C compiler review in "C Compilers for MSDOS," by the PicoNetC-SIG and the SVCS. "These two groups have assembled a suite of 30 benchmarks, run them through the most popular MSDOS compilers and interpreters, and tabulated the results." If pressed to declare a winner, the authors would probably select the Microsoft or Aztec compilers. The Wizard compiler had excellent diagnostics, and the Mark Williams compiler had the best debugger.

Electronics Week, a McGraw-Hill publication, has reverted back to its old name, Electronics. The July 1, 1985 issue has several articles of interest: (a) "Dual Operating Systems: A Compromise in Quest for a Standard," (b) "Will 'Smart House' Provide Shelter for High-Tech Firms?" and (c) "The Pell-Mell Rush Into Expert Systems Forces Integration Issue." Replacing the common two-plug 110-Volt AC receptacle in the U.S. is a proposed smart-housewiring scheme that integrates electricity, telephones, security, and fire detection while distributing audio, video, and data throughout the home. A picture of the new receptacle is shown on page 45. Now, if somebody could figure out how to retrofit millions of homes and buildings with such a receptacle as well as good reasons why one should do so, a revolution in home communications could be launched. Concerning article (c), "It is likely that nearly every major U.S. corporation has or is initiating an AI group to start building-or at least start looking at-expect systems." The teaching of principles of AI and expert systems will become very important, if not fashionable, in engineering colleges during the next several years.

This column is being typed on a dual operating system system, namely, the Zenith Z-100, which has both CP/M-85 and ZDOS (a dialect of MSDOS). The author also has access to a university-owned IBM PC. What are the advantages and disadvantages of owning a Z-100 relative to an IBM PC? Perhaps the biggest disadvantage is the fact that S-100 bus add-ons for the Z-100 are considerably more expensive than their IBM PC bus counterparts. Software has proven to be less of a problem, in general, because many of the most popular software packages operate on either machine. For example, PeachText 5000, Microsoft FORTRAN, and Turbo Pascal can be configured for either machine. Media Master, a disk-to-disk format conversion software package, makes text files on IBM PC diskettes accessible to the Z-100.
COMPAQ must be doing very well in the depressed computer market. The author encountered 7-page, glossy, color ads in a variety of magazines in recent months. COMPAQ focuses only on the business market. The COMPAQ DESKPRO 286 is an IBM PC/AT clone, but has several improved features.

AQ focuses only on the business market. The COMPAQ DESKPRO 286 Megacells (a form of standard cell) and application-specific integrated circuits (ASIC): two very important recent developments in VLSI semiconductor technology. Both topics are discussed in Electronics (July 15, pp. 56-58, and July 22, pp. 40-45). Integrated circuit technology has moved up one architectural level. Now, circuits that used to be sold as individual microprocessors or programmable interface chips (e.g., 8250, 8254, 8255, 8259, 8237, 6845, ROM, 6502, and so forth) are being combined as standard cells to permit rapid integration of systems and subsystems—disk controllers, counters, serial and parallel I/O, and microprocessors—within a single chip. Megacells now or soon available from VLSI Technology Inc. include CMOS-based functions such as the 82C54, 82C84, 68C45, 65C02, 82C50, 82C59, 82C55, 82C38, and 82C37A. An entire CPU board (with the exception of RAM), perhaps a group of boards, will be shrunk within the next several years into a single, large integrated circuit with 40 to 128 pins. The importance of standardization in such efforts cannot be overstressed. Standard microprocessor instruction sets and standard programmable functions will be used, thus preserving software skills of microcomputer system designers that date back to the mid-1970s, when programmable interface chips were first introduced by Motorola and Intel. Note also the trend to CMOS technology.

Continuing our discussion of application-specific integrated circuits (ASIC), standard cells, macrocells, megacells, and supercells, Figure 4 in the July 22 issue of Electronics (page 43) shows a single CMOS silicon chip created at Zymos that contains 87 of the 90 ICs that comprise the IBM Personal Computer AT motherboard. The chip holds the equivalent of 28,000 gates. A PC-on-a-chip? It has almost arrived. CMOS is an acronym for complementary metal-oxide-semiconductor. It is a technology that now permits a designer to achieve (almost) the speeds of n-MOS but with one-tenth to one-hundredth the power dissipation. It appears that almost all of the new VLSI developments are in CMOS, CHMOS, and related technologies. By 1990, it is predicted that application-specific ICs will command 25% to 30% of the total IC market.

The May 20, 1985 issue of Electronics Week reports on the Custom Integrated Circuit Conference in Portland, Oregon. Shown in Figure 2 is the Toshiba "microengine," a CMOS version of the Z-80 microprocessor that includes interface circuits, clock generator, and a 3500-transistor custom macrocell. "It took only four weeks to complete the design through the mask data-base generation phase, and the first sample met all specifications."

In the June 24 issue of Electronics (pp. 58-63), "IC-Design Automation Strides Into Silicon-Compilation Era" describes how more conventional chip-design tools get boost from hardware accelerators and expert-system technology. "Entire LSI functions have been captured in huge standard cells VLSI Technology Inc. calls Megacells. To avoid wasting silicon real estate, all the firm's Megacells conform to a standard height and tie to the on-chip Megabus, which runs above and below them." You can detect our hardware bias in these items on system-on-silicon design. IC technology is the engine that drives most of the fastest growing segments of the computer industry. Megacell technology presages the ability to provide equal or higher performance computer and embedded-computer systems at ever lower cost in ever smaller packages. A firm such as DEC remains isolated with its LSI-11 and VAX product lines, which are not based upon standard, commodity microprocessors and programmable functions.

Speaking about DEC, Electronics Week (May 27, pp. 68-70) describes DEC's latest product, the MicroVAX II or VAXstation II. The $19,000 system challenges the VAX-11/780 in CPU performance, and uses the VAX-on-a-chip processor, formerly called the MicroVAX 7892. "The 32-bit chip contains 125,000 transistors, but it is an n-MOS and not a CMOS device. The decision to use n-MOS was made at the start of the 33-month development process in 1982. At that time, explained Bob Supnik, MicroVAX II-chip project manager, DEC was reluctant to risk development work in CMOS technology. 'Future technology will be CMOS,' he says." Within the next several years, DEC will have to learn how to sell MicroVAX systems below $7000 if it wishes to remain competitive with 32-bit systems based upon chips such as the 80386 and 68020 as well as systems based upon megacells, macrocells, and the like. The improvement in price/performance ratios of low-end computer systems is proceeding much faster than DEC would desire.

Green, Jr. discuss "Communications for Personal Computers."

D. M. Vaidya describes a "Universal RS232C Cable," in Microprocessors and Microsystems, June 1985. Something along this line is also available commercially. It is considerably easier, from both a hardware and software standpoint, to hook up a peripheral with a Centronics-type 1/0 port than with a RS232C serial port.

Mini-Micro Systems (July 1985) reviews desktop multi-pen plotters such as the Howard Instruments PC Plotter 695; the Hewlett-Packard 7470A and 7475A, and the IBM XY/749 Digital Plotter. Also mentioned is the Hewlett-Packard 7510 Color film recorder, which uses vector technology instead of raster technology. Instead of drawing on paper with ink, the HP 7510 draws on film with light. There are 15,344 by 10,895 addressable points per frame with over 16 million available colors. Cost? A paltry $13,300. You need lots of memory to take advantage of the HP 7510. We have used the Hewlett-Packard 7470A; it is superb.

Phil Wiswell, in "Word Processing: The Latest Word" (PC, August 20, 1985), puts eighteen popular word processor through a series of rigorous benchmarks. Included in this survey are: WordStar Professional, WordStar 2000, XyWrite II-Plus, Word Perfect, Volkswriter Deluxe, DisplayWrite 2, DisplayWrite 3, EasyWriter II System, SuperWriter, Perfect Writer, MicrosoftWord, MultiMate, Sammy Word III, OfficeWriter, Textra, Spellbinder, Personal qwerty, and FPS:Write. The author recently obtained a copy of SuperWriter for use with his IBM PC in his lab. The problem: new commands and menus to learn. Phil Wiswell correctly identified the problem associated with deciphering C D F G I M N R S X Z CR/TAB ESC, which appears in a small window across the bottom of the Superwriter screen. Perhaps many of you have more stamina than the author, who is getting fatigued by the necessity to learn ever new commands for an increasing collection of "user friendly" software packages. Software command knowledge is steadily pushing out residual chemical engineering knowledge. We need a name for this phenomenon.

Five megamemory multifunction boards for the IBM PC AT are briefly described in the August 20, 1985 issue of PC (pp. 146-155). You can add combinations of 64K or 256K DRAMs to boards such as the Advantage! (AST Research, Inc.), SMF/AT210 (Sigma Information Systems), Grande Byte (STB Systems, Inc.), RioGrande (STB Systems, Inc.), and Maestro (Tecmar Incorporated). 256K DRAMs are surprisingly cheap, in quantity, these days. Business Computer Systems (May 1985) provides an extensive listing of multifunction boards for the IBM PC. In the same issue of Business Computer Systems is a listing of new technology printers, the ink jet, thermal transfer, and laser printers (pp.119). We prefer a nice laser printer, if we could afford it.

In Byte (May 1985), J. Markoff, P. Robinson, and D. Osgood discuss "homebrew chips," VLSI chips that you design yourself. A Syracuse University "AI coprocessor chip was actually fabricated through MOSIS (MOS Implementation System), a brokerage that connects chip and board designers with chip and board fabricators. MOSIS is an outgrowth of both the Arpanet and an idea from Xerox Palo Alto Research Center. MOSIS will make two or more if you send them your design in either CIF (Caltech Intermediate Format) or Calma-GDS 2-stream format." There are about 900 chips per run; all you have to pay is your proportional share, which may be $5000 for a batch of 20 chips.

Bruce D'Ambrosio discusses "Building Expert Systems with M.1" in the June 1985 issue of Byte (pp. 371-375). M.1 is a knowledge-engineering tool for the IBM PC that costs a modest $12,500. Of course, if you wish a scaled-down version of the program, you need plunk down only $2000. Electronics (June 24, pp. 50-51) briefly discusses Gold Hill Computers and their software, Golden Common Lisp, which runs on an IBM PC. No price is given. Your author is waiting for Borland Turbo Expert, which should become available for $69.95 in several years if Borland International remains solvent. By the late 1980s, expert system software should become as plentiful as word processing software is today.

Marshall D. Abrams provides a nice overview and technical discussion, "Observations on Operating a Local Area Network," in Computer (May 1985). Concepts discussed include DTE, DCE, interconnection, interoperability, broadband, virtual circuits, datagrams, internets, bridge, name service, file transfer, flow control, speed conversion, error control, echoing, data forwarding, code conversion, protocol conversion, resource sharing, and so forth.

Our chemical engineering colleagues—Mordechai Shacham, Michael B. Cutlip, and Paul D. Babcock—have teamed up to contribute an article, "Simulation Package for Small-Scale Systems," in Microprocessors and Microsystems (March 1985, pp. 76-83). CAST Communications has been given permission from the publisher and authors to reprint this article in the spring 1986 issue. You may be interested in "A New Alternative to Assembly Programming," which appears in the April 1985 issue of the same magazine (pp. 124-132).

Mini-Micro Systems is a good source for product listings in well-defined categories. The Spring Peripherals Digest issue (April 19) surveys disk drives, printers, tape drives, and graphics terminals; the Computer
In the May 1985 issue of PC Tech Journal, "Reflections of Unix" discusses PUX, VENIX/86, XENIX, COHERENT, QNX 1.2, and uNETrix SP 2.0. Tables 2-4 compare the availability of 193 different UNIX System III commands, including system administration, text processing, and programming development commands in the six software packages. One-hundred ninety-three commands? Ugh! Unix is an operating system that seemingly only a computer scientist could love.

"Word Processing Programs: Bundles of Functions," in Business Computer Systems (March 1985), compares the features of 57 different word processors. This listing gives us an opportunity to add a sixteenth "irrefutable law" of computer systems: 16. A comparative listing of 50 different software packages will not contain the software package that is of interest to you.

PeachText 5000, the one we use, is not mentioned. Actually, the value of software becomes apparent when it is tested. At Virginia Tech, a room in our Conference Center is dedicated to the testing of personal computer hardware and software. About 15 different types of PCs as well as 40 to 50 different, major software packages are represented (all donated). The author is becoming tired of writing about articles on word processing software; perhaps a moratorium is in order for this column . . . for five or ten years.


"What's Wrong with Computer Graphics: Tufte Talks Chartjunk and WYSIWYG" is the feature article in the April 1, 1985 issue of Datamation. Says Tufte, a noted statistician and information designer: "Too much chartjunk. No sense of visual craft. What good are 4028 colors without [the user having] any sense of color? What good are 22 type fonts if they all have jaggies? Computer graphics has tremendous potential, but for several reasons it's largely unexploited." Tufte believes that in many cases the application of a computer to graphics has been a step backward, "for in the change from monotype to microcode much of the graphical wisdom accumulated since Gutenberg began printing books 500 years ago has been lost." The author immediately purchased Tufte's book, The Visual Display of Quantitative Information ($34 postpaid. Send check or money order. Available only by ordering directly from Graphics Press, Box 430, Cheshire, CT 06410) and was well rewarded. One of the important messages of the book is that most figures are too cluttered and hide, rather than emphasize, the important message that the graphed data provides. Tufte's ideas should be required reading for all chemical engineering students. The book makes an excellent gift; a couple of months ago the author saw of stack of them in the office of his CACHE colleague, John Hale (DuPont, Wilmington).

Dr. Dobb's Journal, March 1985, is a Special Prolog Issue. Three articles are provided: "Programming in Logic," "Tour of Prolog," and "Tax Advisor: A Prolog Program Analyzing Tax Issues." A fifteen-page listing is associated with the Tax Advisor article, which was the winner of Dr. Dobb's AI programming contest and is "a program that knows how it knows what it knows, and why it wants to know what it doesn't know." This is the type of issue that makes Dr. Dobb's such a fine magazine. G. A. Edgar discusses "A Compiler Written in Prolog" in the May 1985 issue of Dr. Dobb's. A complete listing is given for the 8080 microprocessor instruction set in Micro-PROLOG, which is available on a CP/M Z80, MSDOS, PC DOS, CP/M-86, and Unix.

The February 1985 issue of IEEE Control Systems Magazine is a special issue on Future Directions in Control Systems. You may be interested in the article, "Control Engineers Workbench–A Methodology for Microcomputer Implementation of Controls."

Fault Tolerance is the subject of an article, "Computers That are 'Never Down,'" in IEEE Spectrum (April 1985). For you 'smart-home' buffs, the May 1985 special issue of Spectrum, "At Home with High Technology," may be of interest. Would you believe a house that "will contain 10 IBM computers on a local area network, an Apple IIe, and two Apple Macintoshes?" The logical defense to this seemingly absurd circumstance is, "You can never have too many computers." Read about it in "Portia's Perfect Pad: Super high Tech," on page 56-63. This is the type of magazine that CEP should strive to become.
No column is complete without mentioning our favorite computer industry gossip, sage, and seer, Felgercarb N. Eloi, the editor of DTACK GROUNDED (The Journal of Simple 68000/32081) who is known, with or without affection, to subscribers as FNE. In Issue Nos. 42 through 44, covering the period June through August 1985, FNE discusses topics such as "Machintosh meets IBM PC Guru Norton," "Jack (Jackintosh) and GEM," "ATT's 32-bit micro chipset," "The Very Strange World of DRAM Pricing," "C HLL OVERHEAD (by Otherwise Intelligent)," "More DRAM Pricing Wars," "The p-System: REQUIESCATIN PACE," "Tandon Lawsuit and Apple 800K floppies (??)," "32-Bit Micros," "4-layer printed circuit boards," "Mackish Color Graphics Revisited," "Monochrome Graphic CRT Monitors," "Color Graphic CRT Monitors," "Nat'l Semi's 32000 series: third party architecture-our first look," "CHEAP DRAMS," "RULE BRITANNIA" (Inmos woes), and others. See the next item for RISC comments. [Subscriptions are $15 for 10 issues in the U.S. and Canada (U.S. funds) or $25 for 10 issues elsewhere. Make check payable to DTACK GROUNDED, 1415 E. McFadden, Ste. F, Santa Ana, CA 92705.]

The August 1985 issue of IEEE Spectrum features an article, "Toward Simpler, Faster Computers," that probes the advantages of reduced-instruction-set computers (RISCs). The object is to minimize the number of different instructions but provide numerous internal registers so that data need not be swapped between the CPU and memory so often. Those who question the approach make the following points: (a) "RISCs require larger programs than complex-instruction-set computers (CISCs) to do equivalent problems, (b) RISC instruction sets have been pared down to the point where certain operations that might take only a few instructions on a conventional computer require complex subroutines, and (c) RISC principles make no use of the increasing density available with advances in integrated-circuit technology." Felgercarb N. Eloi remains to be convinced that a RISC makes sense. Comparing a CISC to a RISC is like comparing apples and oranges. A RISC is faster than a CISC, but the former needs its increase in speed to handle the additional memory fetch operations. As FNE states, "WE STRONGLY SUGGEST THAT YOU IGNORE THE MIPS RATING OF RISC MACHINES! RISC machines HAVE to have a high MIPS rating just to get out of their own way!"

Forum

Although CAST Communications is only a semi-annual publication, it is still possible that readers may wish to express their opinions on matters related to computers in chemical engineering. We had hoped that following Volume 8, Number 1, some of you would have written with suggestions for new articles, expressed support or disagreement with some of the editorial opinions in the articles, and so on. We urge you to take a moment to write to us with your views on matters of interest to the CAST Division of AICHE so that we may pass them on to all our members.

As a separate invitation, we are interested in receiving for possible publication, your comments and reviews of new applications of computers in chemical engineering. This may include reviews of software you have used, new computers and systems, or new algorithms for standard problems. If you have items of potential interest, please contact us at CAST Communications.

The Editors

Meetings and Conferences

The following items summarize information in the hands of the Editor by the end of September. By the spring of 1986, we hope that up-to-date programming information will be available on a CAST Division electronic bulletin board. Please send CAST Division session information and meeting announcements to me by February 1, 1986, in time for inclusion in the spring CAST Communications, which will be in our Division members' hands prior to the New Orleans AICHE meeting.

Editor, CAST Communications

CANADIAN SOCIETY OF CHEMICAL ENGINEERS MEETING, CALGARY (October 6-9, 1985)

Two sessions on Process Dynamics and Control, Dale Seborg (Co-Chairman), (805) 961-3352, J.D. Wright (Co-Chairman), (416) 823-7091.

4 sessions on Personal Computers and Microcomputer Applications in Chemical Engineering.

CHICAGO AICHE MEETING (November 10-15, 1985)

Area 10a Sessions

1. Interface Between Design and Control (co-sponsored with Area 10b). J.M. Douglas (Chairman), Department of Chemical Engineering, University of Massachusetts, Amherst, MA 01003, (413) 545-2252.

THIRD INTERNATIONAL CONFERENCE ON CHEMICAL PROCESS CONTROL, ASILOMAR
(January, 1986)

Manfred Morari (Co-Chairman), Department of Chemical Engineering, Caltech, Pasadena, CA 91125, (818) 356-4186. Thomas J. McAvoy (Co-Chairman), Department of Chemical Engineering, University of Maryland, College Park, MD 20740, (301) 454-4593. "The program is as follows:

Session I. Control in the Presence of Model Uncertainty


Session II. An Industrial View of Advanced Process Control


 "Multivariable Constraint Control Using a Frequency Domain Design Approach," S. Treiber.

Session III. Model Predictive Control


"Advances in Industrial Model-Predictive Control," C.E. Garcia and D.M. Prett.


Session IV. Process Operability


"Insuring Operability of a Large Multifaceted Coal Gasification Power Plant," G. Quentin.

Session V. Adaptive Control

"Adaptation, Auto-Tuning and Smart Controls," K.J. Astrom.


Session VI. On-Line Identification and Optimization

"Recent Results in Identification with Application to Adaptive Control," G.C. Goodwin.

"Large Scale Optimization in Real Time," A.M. Morshed.


Session VII. Control of Chemical Reactors


"Problems and Opportunities for Control of Biological Reactors," G. Stephanopoulos.


Session VIII. Expert Systems in Process Control


"An Expert System for the Design of Distillation Controls," F.G. Shinskey
Session IX. Reflections on CPC-III
F.G. Shinskey

NEW ORLEANS AIChE MEETING
(April 6-10, 1986)
The meeting program chairman is Jack R. Hopper, Department of Chemical Engineering, Lamar University, P.O. Box 10053, Beaumont, TX 77710, (409) 838-8784.

Area 10a Sessions
1.-2. Simulation in Chemical Engineering. Mark A. Kramer (Chairman), Department of Chemical Engineering, Massachusetts Institute of Technology, Cambridge, MA 02139, (617) 253-6508. Herb Britt (Co-Chairman), Aspen Technology, 251 Vassar Street, Cambridge, MA 02139, (617) 497-9010.

Area 10b Sessions
1. Process Monitoring and Identification. Fred Ramirez (Chairman), Department of Chemical Engineering, University of Colorado, Boulder, CO 80302.

BOSTON AIChE MEETING
(August 24-27, 1986)
No CAST Division sessions are planned.

MIAMI BEACH AIChE MEETING
(November 2-7, 1986)
Area 10a Sessions

Area 10b Sessions
1. The Relative Gain Array – A 20 Year Retrospective. Tom McAvoy (Chairman), Department of Chemical Engineering, University of Maryland, College Park, MD 20740, (301) 454-4593.
2. Unsolved Problems in Process Control. Manfred Morari (Chairman), Department of Chemical Engineering, California Institute of Technology, Pasadena, CA 91125, (213) 863-2923.
3.-4. Recent Advances in Process Control. Joseph Wright (Chairman), Xerox Research Centre of
Canada, 2660 Speakman Drive, Mississauga, Ontario, Canada L5K 2L1, (416) 823-7091.

Area 10c Sessions


2. Design and Application of Special Purpose Computers and Processing Systems. Peter R. Rony (Chairman), Department of Chemical Engineering, Virginia Tech, Blacksburg, VA 24061, (703) 961-7658 or 961-6370.

HOUSTON AIChE MEETING (Spring 1987)

Area 10c Sessions


2. Production Scheduling.


FOUNDATIONS OF COMPUTER-AIDED PROCESS OPERATIONS (Summer 1987)

Area 10c is planning to hold this conference, which will be patterned after the highly successful "Foundations of Computer-Aided Process Design" (FOCAPD) series, but with much more emphasis on industrial aspects of computer applications.

AIChE MEETING (Fall 1987)

Area 10c Sessions

1. Large Scale Optimization.

2. Intelligent Processing (Manufacturing) Systems.