**SS Number Becomes Banking ID Number**

WASHINGTON, D.C. — The government has found a new use for the Social Security number. As of July 1, it also became an individual's Taxpayer Identification (TID) number, and all banks are required to use it to facilitate retrieval of records.

Corporations have separate TID numbers, government sources reported, but for individuals, it is the SS number.

Filing of income tax information by using the SS number is not new, but now banks must use this system in case the Treasury Department needs financial records for investigating organized crime, sources said last week.

The disclosure of the new requirement came during a Computerworld investigation of regulations which implement the so-called Bank Secrecy Act of 1970. This act, designed to reduce tax evasion through Swiss bank accounts and to help fight organized crime, requires banks to microfilm, for government access, every check, draft or money order, in addition to other documents.

**GE Ready to Donate 10 CPUs Damaged in New York Flood**

ELMIRA, N.Y. — GE is trying to determine whether schools or other educational institutions would be interested in ten 265 CPUs that were damaged in this area during the recent floods.

According to a GE Information Services Division spokesman, “we are trying to find out if the schools could make some use of the damaged systems. We would donate them to the schools if we find a need.”

But at the same time, he also noted that the firm was exploring “commercial” avenues for the disposal of the systems.

**256K Model 30 In First Use**

SAN FRANCISCO — The first 360/30 was put into service here and the user is pleased with the initial results.

The 256K unit was installed in the San Francisco Data Center of Greyhound Computer Corp., by Computer Hardware Consultants & Services (CHCS) at the end of June.

Currently the largest standard Model 30 from IBM contains 64K. In a test comparing the 256K 30 against a 256K 40 on a series of heavy CPU-bound problems, Greyhound found “the job took only 18 minutes with the 256K 30, as compared to 14.5 minutes on the 40,” according to Larry Larsen, general manager of the center.

“On normal jobs that are more I/O bound, we want to do more benchmark studies, but feel certain we won’t lose any time on the Model 30. The time constraints are on the printers and tape drives which are identical for both models.”

Use of the upgraded 30 will allow the service bureau to offer 360/40 users “substantial” savings on their DP costs, Larsen said. In addition to the 30 and 40, the firm also operates a 360/65 and a 7094.

**Afips Moves to One National Show**

By Edward J. Bride

MONTVALE, N.J. — The Fall Joint Computer Conference will be the last Joint Computer Conference. A new, single National Computer Conference (NCC) and Exposition, lasting five days, is being planned for New York City next year, according to Walter Anderson, president of the American Federation of Information Processing Societies (Afips).

**Kiewit Official Urges 'Crash Now, Not Later'**

By Ronald A. Frank

HANOVER, N. H. — The user should allow his telecommunications system to crash whenever “serious software inconsistencies” are discovered.

“Rather than attempt a software error recovery procedure, the user should crash now, not later,” according to Robert Hargraves, associate director of the Kiewit Computation Center at Dartmouth College.

**Communications Seminar**

Speaking at the annual data communications seminar sponsored by the center, Hargraves said consistency checks should be inserted into the system to determine how long it continues to operate after an error has been committed. When errors or crashes occur, an error checkbacktracking procedure should be followed to remove the last error first, he said. “You may never get another chance to duplicate the condition that exists in the system at that point.”

In analyzing the cause of the crash the user should write out tables, registers, core memory contents or any other data that will help to diagnose the cause of the problem, he said.

One effective way to monitor system performance is to insert “statistics counters” at critical points, he suggested.

**Checkout System Checks In**

Clerks check out customers at the new Atlanta Richway discount store. The store is the first in the nation to use “almost every facet” of the NCR 280 Retail System, according to the vendor.

Frank Dooley, assistant DP manager for Rich’s, Inc., parent company of the discount chain, described the point-of-sale system as “the total works, from wand reading to tape.”

The light pens eliminate manual keying-in of transaction data. Despite Rich’s own programming bugs on the company’s IBM 370/145, Dooley said the point-of-sale side was doing “fine.”

**Checklist for Disposal of Systems**

Division spokesman, “we are trying to use of the damaged systems. We would donate them to the schools if we find a need.”

**Consistency Checks Suggested**

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But at the same time, he also noted that the firm was exploring “commercial” avenues for the disposal of the systems.

**On the Inside This Week**

British Study Discounts

Computer Privacy Threat

Minicomputer Shipments

Seen Rising 200% by 1978

Communications 13

Computer Industry 27

Editorial 8

Financial 34

Professional 10

Small Systems User 20

Software/Services 13

Systems/Peripherals 15

**Special Report: Communications, User’s Choice...**

**Follows**

Page 18
Let System Crash, Users Told

(Continued from Page 1)

Among these was a counter to keep tracks of "insignificant problems", line errors or transmission errors in a data set. At predefined levels the cause of any excessive indications on such counters should be investigated before they become major problems, Hargreaves added.

Network Optimization

In a session on network optimization the 40 attendees were told that a telephone bill for a telecommunication network is directly tied to the skill of the user in designing the network.

"The user’s operating characteristics direct the network design," according to Paul Shannon, president of Digital Systems Corp. Shannon said that a central "control center" has better operating characteristics in a communications system than a distributed network of regional processing centers.

The concentration of processing power on one computer centralized its software, his mainframe, and other DP functions, Shannon said.

With a proper mix of terminals and multiplexers in the field, the user can access his computer over an area of any location, he said. The introduction of intelligent terminals into a communication network can "completely change" the characteristics of a data network, Shannon added.

AT&T will not suggest the use of multiplexers in a network because this is "out of their control," a company official said. "They can control the terminal in their own company, in the public company, he said. In the ait of the advantage of multiplexers, Shannon said some networks had saved more than 50% by redesigning their routes and thereby reducing the number of private lines.

Some of the reduced cost service offered can actually degrade the performance of a data network, Shannon suggested. In a system with peak traffic "the important problem is that if you put a Watts line might prevent some messages from getting through because less incoming lines would be available at the central DP site.

In general, the rules should be concerned with the additional-time rates on Watts rather than deciding strictly on the initial period rate, he said.

Cutting Line Costs

One of the most effective ways for users to cut line costs is the design of least distance networks, Shannon said. Many networks expand in growth stages without considering the overall operating pattern in the system, he said. The selection of points of tie or nodes should be determined by such factors as traffic patterns or network design constraints, he continued.

While private line multiplex networks are among the most economical scales of many large networks, the user should retain dial-up and/or backup lines, he said.

Common Carrier Services

In a review of common carrier services, Robert Brewster, vice-president of Digital Systems Corp., said it is generally less costly to derive low-speed channels from one wideband line than to lease similar 1000 Series channels individually from the telephone company. Deriving such channels via the use of independent multiplexing equipment is usually cost effective, he said.

Most significant in determining monthly rates on private line systems is total mileage, Brewer said. The telephone company uses a vertical/horizontal grid pattern to determine the distances between toll centers, he added.

These "VH coordinates" should be utilized by users when optimizing their network routes - the "stages" in the telephone company's system for all toll centers is published in Tariff 255, he said.

In opening remarks to the seminar attendees, Dr. Thomas Kurtz, director of the National Center for Computer Information, was told that the "Unanimous" decision to cut line costs was "not entirely convinced" that the entire JCC had the same view as the Afips announcement is final, he said.

John McLeod, founder and past president of Computer Information, took a less serious view of the decision to cut line costs. He said that the move was "not an overjoyed." While the entire JCC board agreed that one national conference a year was preferred, he said other issues decided were not unanimous.

Ralsdon also said he and Hoagland would meet at the specially called meeting of the JCC. He said that the Afips agreement was of "National Computer Week" and that he would act as "chairman" to the JCC. He said that the Afips agreement was "not entirely convinced" that the entire JCC board agreed that one national conference a year was preferred, he said other issues decided were not unanimous.

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Manual Check Reverses County Election Results

ALBANY, Ore. - A routine manual check of a computerized vote count overturned the results of a recent election here.

Following the computer count it appeared that the race was won by Vern Schrock for the Democratic nomination for Linn County Board of Commissioner. However, a hand count of results revealed votes missing from two pro-Schrock precincts, and the election was turned over to Schrock after the recount.

News Wrapup

The recount was caused by a programming error, according to Linn County Clerk Don Riley. Although the votes were recorded in the two disputed precincts, the computer did not print out the results because of information omitted in one of the header cards in the controlling program, Riley said.

This was the first computerized election held in Linn County, and despite the problems Riley said the county will continue to use the computer, with safeguards built into the system to prevent such errors in future elections.

N.Y. May Centralize Tax Data

ALBANY, N.Y. - The state Board of Equalization and Assessment is studying a plan which would put information used by tax assessors in one central computer. If implemented, the program would enable any tax assessor in the state to obtain sales and market data to determine the "fair market value" of any piece of property.

The plan is still in the research stage, according to Robert Kitchen of the state board, but if approved, the first stage would be a physical inventory. "The first step is to know what we've got in this state in terms of the value of taxable property," Kitchen said.

The goal of the computerization, he said, is "to obtain equality of property taxation within a city, town or village and between municipalities, so that similar tax parcels will bear proportionally equal shares of the tax burden."

Aussies Probe Privacy Threat

SYDNEY, Australia - A judge has been appointed to head an inquiry into ways of protecting an individual's privacy by controlling the storage in files and computer banks of personal information.

The inquiry will concentrate particularly on the activities of credit bureaus and similar agencies, the federal attorney-general and the attorneys general of the Australian states decided at a recent meeting.

They agreed to appoint a judge to make an intensive investigation which would seek the views of all interested parties, including sociologists, members of the computer industry and those responsible for collecting and compiling public records and statistics.

Vaccination Data Bank Due?

ATLANTA - The Center for Disease Control is trying to get airlines to computerize the vaccination requirements of 160 nations in an effort to centralize data on international travel and reduce unnecessary vaccinations.

The computer program has been written but the efforts to get the airlines to adopt the procedure are in the beginning stages, according to Dr. Arthur S. Osborne, chief of the center's foreign quarantine program. He said several airline representatives had been discussing the computer project with officials of the Air Transport Association.

Osborne said the computer would contain current information on each country's required vaccinations, as well as other recommended shots.

Presently, the center provides county health offices with weekly reports on any changes in vaccination requirements, as well as any emergency changes.

Small Firms Get IRS Eye

WASHINGTON, D.C. - The Internal Revenue Service will use a computer to screen all tax returns of small businesses next year, a move expected to bring in $42 million in additional tax revenues, according to Assistant IRS Commissioner John Hanlon.

According to IRS sources, possibly less than two-thirds of the nation's small firms (assets of $1 million or less) conscientiously pay the taxes they owe under the law. This compares with a 97% compliance rate among corporate and individual taxpayers.

IRS plans to implement the computerized procedures next January, along with assigning more IRS personnel to the small business area.

NSF Aids Faculty DP Training

NEW YORK - The National Science Foundation has awarded $670,774 to support a regional cooperative computer network which will involve the State University of New York (SUNY) at Binghamton and 15 other participating New York State institutions.

The primary purpose of the project, entitled "A Consortium for Faculty Education and Curriculum Development Via Computer Resources," is to provide education in the instructional use of the computer to selected faculty members at the participating institutions.

See You Again in 96 Years!

PHOENIX - James Stokely, street maintenance director here, has earned a nice long vacation, according to a city hall computer. Officials said a keypunching error caused the computer to issue Stokely 96 years of vacation leave.

"I do not know just how this wonderful miracle came about," he said with a straight face. "But, as I have been taught to accept the infallibility of modern data processing, I find no reason to question it."

Ticket Fixers Fixed

LANSING, Mich. - One way to avoid computerized summonses is to eliminate one stage of data processing input. Five women employed in the DP division of the city's Traffic Department did just that recently, throwing out traffic tickets issued to their cars or to cars of fellow workers.

A suspicious meter maid uncovered the ticket-fixing, after ticketing one car several days in a row, local sources noted. She reported the fact to Herman Dallman, parking division supervisor, and he found traffic tickets in the waste basket.

A two-copy traffic ticket is now being replaced with a third copy for Dallman, to eliminate the temptation to the workers, local sources said.

After recent city hall hearings, the two keypunch operators who were determined to be "most involved" were suspended for a week without pay and demoted to the lowest pay grade; the other three received letters of reprimand, according to Bob Powers, assistant DP director.

Optimum tape subsystems for 360 and 3770

Totally Compatible Flexibility

When the name Ampex is on a tape subsystem, you know you'll get Ampex reliability plus optimum performance and flexibility. The Ampex TM-34/TC-38 is typical. It is totally compatible with IBM 360 and 370 systems, with the TC-38 replacing 2803 and 3803 controllers, and the TM-34 replacing 3420, 2420 and 2401 tape drives.

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What else could Ampex add to this complete tape subsystem? That the TM-34/TC-38 costs less to acquire and to operate than IBM subsystems? It certainly does! Call your Ampex computer specialist for details about tape subsystems, disk drives and core memories.
Proposes Board to Review DP Use

By Joseph Hanlon
Special to Computerworld

LONDON—"The computer problem as it affects privacy in Great Britain is one of apprehensions and fears and not, so far, one of facts and figures. We cannot conclude that the computer is at present a threat to privacy," So said the Younger Committee on Privacy in its long-delayed report issued this month.

The government committee decided the time was not right for detailed control of computer data banks because of lack of evidence of abuses and "because of the speed at which the computer industry is developing and the importance of not impeding its legitimate progress."

New Commission

The committee proposed a new standing commission be set up to keep the use of computers under review (effectively an extension of the Younger Committee). It also detailed a voluntary code of conduct for handling personal information.

Although "the privacy of computerized personal information . . . has attracted by far the most attention," the committee considered forms of privacy invasion in the private sector.

The committee strongly opposed any new legislation in nearly every area, arguing that banks, the medical profession and universities could best handle their own privacy problems voluntarily.

It urged strong legislation to curb the use of electronic surveillance devices (under many circumstances, bugging and wiretapping are legal in the UK, the committee noted) and milder legislation to regulate credit bureaus. The committee voted 14 to 2 against proposals for a legislated general right of privacy.

The softened recommendations brought criticism from civil libertarians. Leslie Hucklefield, Minister of Parliament, called the committee's recommendations "an哌grandiose and muddled mouse." The National Council for Civil Liberties (NCCL) charged the committee "had neither courage nor insight" and that its proposals were "breathtakingly inadequate."

The NCCL noted the issue of computers is the "most important," but that "this section of the report is certainly the weakest. The proposals on data banks do not measure up to the urgency of the most grave and immediate threat to privacy," it added.

The proposed "toothless" commission in five years too late and merely another version of the "wait and see" approach of which the committee itself is part," the NCCL charged.

The committee's report seemed based on its inability to document more than a few abuses (none in the computer area) and on what it perceived as little public interest (it received only 214 unsolicited letters).

The Younger Committee conducted its hearings in secret with little press coverage, and apparently made little attempt at investigation outside the committee room. It conceded: "We were not able to estimate the extent to which personal profiles are being compiled in the private sector, nor how much correlation of information is taking place, nor how many cases of unauthorized access there may have been."

The NCCL charged the committee failed to realize that "it is hard to come by detailed information on invasions of privacy because such invasions go on in secret; most victims do not know their privacy is being invaded."

The committee's hesitancy on computer data banks surprised many observers because of five points stressed in the report:

@ Abuses feared by the public are not technically possible.

@ "We are not convinced that considerations of privacy are at present sufficiently in the minds of computer users."

@ "Technical means exist or can be devised to provide a very high degree of security over the handling of information by computers."

@ "The level of security to be achieved by a system should be specified in advance by the user and should include precautions against . . . misuse of information."

@ It will cost far more to add security provisions to systems after they are built than before. The committee quoted an International Computers Ltd. statement that security facilities added during the design stage would increase costs by 5%, while the same facilities added to existing systems would cost 25%.

Standing Commission

The proposed standing commission would "keep under review the growth and techniques of gathering and handling personal information on computers." Such a commission would have computer professionals as members, would collect information about computer data banks, receive complaints about invasions of privacy and make recommendations for legislation.

The committee urged that the new commission should immediately consider licensing of computer data banks and the "responsible person" concept. The "responsible person" would be a supervisory official at each installation who would be personally liable if information were misused.

Finally, the committee proposed the standing commission should be permitted to scrutinize government computers, a right refused to the Younger Committee.

Propose Voluntary Code

The committee's 10-point set of "principles for handling personal information" requires:

@ Information should not be used for purposes for which it was not supplied; in particular, the sale as a mailing list of names and addresses of magazine subscribers is "a clear breach of privacy."

@ Where data is being used for statistical purposes, identities should be separated from the rest of the data.

@ The subject should be able to find out what information is held concerning him.

@ A monitoring system should be required to detect security breaches.

@ In the original systems design, security should be specified and limits set on how long information can be retained.

@ "Care should be taken in coding value judgments."

Credit Bureaus

Credit reporting agencies also were covered. Of the three national reporting services, one hopes to be "fully computerized" by the end of this year, while the other two have decided that computerization is too expensive at the moment.

The committee declared: "We do not consider that comprehensive legislation on the lines of the U.S. Fair Credit Reporting Act is required." The committee only recommended "that an individual should have a legally enforceable right of access to the information held about him by a credit rating agency."

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9. Or write. Send your name and address to "How to Rent a Minicomputer" Rental Electronics, Inc., 16600 Oakmont Avenue, Gaithersburg, Maryland 20760, and we'll send you our brochure with all the details. We're serious about minicomputers.
It is final only in the sense that it marks a stopping, however, not a culmination or conclusion.

"Research in the technology and society area," he added, "has barely begun and much more needs to be done."

In his introduction to the work of the scholars connected with the program, Mesthene said the development of new technologies leads to social changes because new forms of organization and sometimes new institutions are required to take advantage of the opportunities and guard against the dangers that technology brings with it.

One major issue in the area "has to do with the implications of new technologies such as computer systems for public decision making, and, more generally, for the organization" of the nation.

"In relation to the decision-making process itself, questions arise about the desirability, feasibility and further construction of using technical aids such as computer-based information systems and scientific management techniques such as systems analysis," he stated.

Aids Necessary

"The problems of modern societies have become so complex and their ramifications so hard to anticipate that it seems patent that some such aids have to be used; tradition, political instinct and national habit no longer provide a sufficient basis for social policy," the director added.

Yet," he warned, "the prospect of employing such technical decision-making aids raises new problems. For example, the results of computer simulations and systems analyses are delivered mainly in quantitative form, which can lend them an aura of rigor and infallibility not justified by the hardness of the data or the validity of the assumptions on which they are based."

"They may thus come to be relied on disproportionately, especially in decision-making situations where the issues are large and the uncertainties great."

In addition, Mesthene charged that effects of such computer-based techniques cannot be "easily determined" by the average policy thinker or government official or the average man on the street.

Therefore, Mesthene said, if their use becomes widespread, "there is a danger that the experts who use them may come to have too large a voice in the determination of social policy."

"Conversely, there is a danger that such techniques will be used to give a 'scientific' and therefore incontrovertible appearance to decisions or policies that continue to be based on self-interest and political compromise."

"There is already some evidence that introduction of information systems into government has left old political habits and alignments unaffected," he stated.

The most important problems technology raises are thus political problems, Mesthene argued.

"They involve more than the application of new machines or new techniques; in the end, they raise questions of institutional change," he pointed out.

Threat to Privacy

In addition, he noted, that the application of the new technologies, especially computerized information systems, raises the threat to individual privacy through the "ease with which computerized systems can be used to store and retrieve large masses of data about individuals."

Technology also exerts pressures on the values of society, in the direction of more collective value orientation, Mesthene noted.

Values once held in high esteem become no longer appropriate and may become actually harmful in high technology societies, he stated.

Rugged individualism, for example, "cannot be allowed free rein in a society in which every act increasingly has unintended or unforeseen consequences to third parties and where actions taken for individual benefit may carry social costs that will impoverish every one in the end," he said.

"Many of the tensions of technological society are the result of a natural tendency to hold on to values too long after they have been superseded by events," he claimed.

The social tensions that arise from the application of computers and other new technologies are often "exploited by some individuals, groups and politicians for their own purposes," he added.

"The challenge to research and inquiry — and eventually to policy — is to find out why the old economic and political forms are not working and to modify them or design new ones that will both preserve the fundamental values of society and yet be adequate to modern technological realities," he concluded.

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Patients, Computer Linked
SAN DIEGO — Doctors at the University Hospital here are planning to link patients undergoing surgery by wire and a telephone network to a computer at the University of California in San Diego, 10 miles away.

The computer will take brain wave readings, analyze them and give the doctors up-to-date information on the condition of the patient, while the surgery is being performed.
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Present system ___________________________
Letters to the Editor

**Change for the Better**

The Joint Computer Conferences are dead. Long live the National Computer Conferences.

The question now is whether AIPS, its member societies and all the non-member societies and associations who worked together to make the change.

The joint conferences originally were national conferences where people with very different day-to-day problems could get together to discuss common problems.

But as data processing has grown in importance within specific industries, there has been a trend toward holding "vertical" DP conferences within these industries. Implicit in such parochial conferences is a belief that banking DP is different from, say, retail DP.

Actually, everyone in the DP community has the same problems - source data automation, efficient processing and delivering responsible output in an efficient manner to those who need it.

It's time for all the societies and associations to get together to agree on standard address definition and assignment techniques.

Urban Data Processing specializes in computerized census coding and zip-coding of name and address files. The experience of processing millions of names and addresses taught us that there will always be another exception. For example, the midwestern city that uses a 10-digit alphanumeric code for house numbers.

Our solution, designed to maximize the percentage of names and addresses which we can successfully process without manual intervention, is dual processing. During the preprocessing run we normalize the input file to our convention. During the geocoding processing run we execute a series of validity tests while matching to the directory table.

Although we've never hit 100%, we have geocoded as much as 97.6% of a file successfully. In addition, we assign error codes to rejected name and addresses in order to facilitate manual correction.

We have also successfully applied this concept to the elimination of duplicate names and the grouping of individual names into household units.

M.F. Eves Protection

**'Trial by Data Bank'?**

A further item in the grand march of government data processing: the FBI article on the front page of the June 14 issue. I refer you back a few times before the basic idea came clear - that the FBI believes in existence in the NCIC files is sufficient cause for "terminating"/"ending a budding career."

Not only this, much more precisely, punishment - deprivation of employment - now becomes a very simple matter of querying the file. Why bother with archaic delays like courts and juries? "Sentence first, trial later" as the Red Queen said to Alice.

I strongly resent this self-serving brainwashing by the FBI. How goes the case of the Boston taxi driver whose license was revoked because NCIC erroneously showed him as "case unsettled" on a drug charge?

I think we are long overdue for some really serious challenges to the legal significance of NCIC data files and the whole syndrome of "trial by data bank."

Robert Higgins

**DP Addressing Problems**

The June 28 issue of Computerworld contained a letter from Mark Latvuk of Burroughs disputing Univac's claim to the largest capacity disk subsystem in the industry. If Latvuk's statement that the Univac systems utilize 6-bit characters is correct, then your response to his letter is inaccurate and misleading.

A byte is recognized in the industry as an 8-bit storage unit, capable of storing two numeric characters of 4-bits each or one numeric character of eight-bits (256 possible characters). Since most computer-related data is numeric in nature, the difference is significant.

You are correct in stating that users are more interested in bit capacity than in character set capacity. The Burroughs' claim of 1.9 billion 8-bit bytes, the potential numeric storage is 2.2 billion for Univac vs. 3.8 billion for Burroughs. Burroughs the obviously larger capacity system.

It may prove "picky" type of issue but I think sometimes feel the advertising claims of "biggest and mostest" should have the necessary dose of salt applied before acceptance by the data processing fraternity.

Robert L. Sullivan

**Letters to the Editor**

Reading Ferguson's eulogies of loyalty to IBM in the face of IBM's calous disregard for his problems made me re-discover a fact that has been apparent for many years: IBM users who accept the "facts of life" dictated by IBM - as if they were hearing the Sermon on the Mount - deserve everything IBM gives them.

As for me, I'm looking hard at the Burroughs B1700. What I see there is an honest and exciting attempt to solve some of my problems as a small system user - particularly with regard to handling widely diverse programming languages with optimum efficiency in each case.

There is no doubt in my mind that the Burroughs concept of a virtual machine - like the concept of virtual memory Burroughs introduced in 1960 - will eventually be "discovered" by IBM, probably about 1976 or so, when it can no longer deny its existence.

V. Thompson, Manager

Project 500
St. Peter, Minn.

**Indicate Object Coding**

In your description of Capex Corp.'s Optimizer package (CW, Special Report, June 28), the general statement regarding the Perform statement is not valid. The statement "every procedural paragraph . . . ends . . . with a dummy branch . . ." does not apply universally to all Cobol compilers. Since each vendor or software house will hopefully generate object coding which will optimize a verbal instruction in the source coding, the writer should indicate the Cobol object coding to be run with the package.

In the future when discussing any software which operates on other software, please indicate which software was used as test data and the software it will operate on.

I. Z. Nitzberg

CIT CDP

Director, MIS

Sewacaus, N.J.

The original comment might have been better if it said "procedural paragraphs indicated by a Perform statement . . . end . . . with a dummy branch . . ." Capers' Optimizer is designed for use on OR/360 Cobol "E," and ANSI Cobol Version 2 and 3. Ed.
The Computer Processing Institute in East Hartford, Conn., is one of the schools I have had the good fortune to inspect as part of the Furr Challenge Cup contest. I was delighted because I found at least five major items worthy of being called real achievements, giving honor to the school and to the data processing profession.

The entry requirements, for instance, were also aimed at the achievement pattern of the PAT test — the way the scores from one part were reflected in the achievements in other parts of the tests. The idea was to check that student records were consistent with what the school believes to be a pattern of success. It is not surprising that the school has taken this approach. Dr. Harold Bingham, who is responsible for admissions, has been in education for over 40 years and has brought to data processing an understanding of how schools and universities really look at examinations.

Better Appreciation A study of the way people pass the test may well give us a better appreciation of what is needed than we currently have. By knowing what success really requires we may be able to end some of the setting tactics that induce students to think that practically nothing is needed to enter data processing.

Bingham has actually gone considerably further than merely dealing with comparative ratios. He has, for instance, instituted a full refund probationary period. If the results of the test a student takes in class on the first morning do not agree with the test results prior to entering the school, he will be put on probation. This probation period can last up to six weeks. If his work is not approaching standard, then the school will tell him it does not think he is suitable material — and will give him a full refund!

Even though he has received six weeks of classes! So there are two things the school is doing which I do not think are normal practice. I think both of these are well worth considering by the judges of the Furr Challenge Cup Contest.

Simulated Companies In the classroom, I also found a very helpful innovation. About 18 months ago, Joyce Rabinoff, an instructor, initiated a program in her classes which has since spread to other classes in the school.

The program sets up a few “companies,” which have officers, such as the president, the auditor, manager, the programmers, etc., and they compete with each other to do the highest numbers of copies for non-commercial purposes. It also limits the number of copies for commercial purposes and gives permission to copy only if the company pays for the copies.

The school has also been active. With this all too frequent occurrence there are usually no assets left, just some accounts receivable which may, or may not, be able to be collected, and some very hurt students and staff.

There are also liable to be some state officials trying to see what can be done, and hopefully also trying to prevent such occurrences in the future.

Computer Processing Institute was approached by the state last year about such an instance. Its reaction was to take on the students and help them complete their courses. In fact, it did more. It put them through, on an average, double the length of time they were due under their original contracts, because it felt they should go through a complete course rather than try to make do with two half courses.

The school did this for the accounts receivable only. In my opinion it must have suffered a considerable loss. But in doing it the school certainly helped the name of the DP profession. I think that is another reason why the judges will have to take Computer Processing Institute very seriously as a candidate for the Furr Challenge Cup.

Nor is that the end of the school’s involvement in community matters. There is a wider community we are all interested in — the society at large — where the school has also been active. Here it has realized that there are many people who need physical, or other reasons, need rehabilitation. They have served the country at home and overseas, and now look to the country to help them in their time of need.

Working with the Veterans Administration, Computer Processing Institute has admitted into classes in the past year many temporarily or permanently disabled veterans. It has treated them just like the other students (except for watching out for some of their special needs) and has helped in many cases ease their way back into society as valuable citizens. In some cases it has been able to help them develop and earn their own living.

This has not been done on a token scale. In some cases classes have consisted of up to 25% handicapped students. There have been problems but the school has persevered, and has helped society.

There are items, of course, about the school which bring some criticism. David S. Shefrin, the president, himself a member of the Society of Certified Data Processors, is well aware of these items but I believe he is willing and able to respond constructively to criticism. He has already received some of these criticisms, and I am pleased to say, taken action.

But, I believe that if every school in the country was as good as the Computer Processing Institute we would have little worry about whether DP schools could hurt the image of our profession. Instead we would be trying to see whether or not the profession was living up to the standard provided by DP schools.

And, you know, that is just how it should be! Schools should lead in professionalism.

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The Professional's Viewpoint

EDP Auditors Vote for CDP as Well as CPA Certificate

Many comments have been received from professionals on the recent discussion of qualifications for a CPA-like certificate — and, in particular, whether a CDP or CPA certificate, or both, are required for individuals giving such certificates.

The purpose of the audit function is to help management evaluate the effectiveness of the operation of the company and to ensure that effective controls are being maintained.

"Historically, the mechanism through which this was done was by interpreting financial records of the company, checking to see that these records were in order and that adequate controls were being applied. The function of the auditor was further expanded by performing management or operational-type audits. Webster defines an auditor to be '1. one that hears or listens. 2. one authorizing a systems viewpoint."

"The difference is that his role is not an interpretive one (i.e., defining and implementing customer requirements) but rather one of probing and testing to evaluate the effectiveness of the system operation. The effectiveness of the EDP auditor is dependent on his background and how good he is as an analyst."

"Who audits — data processor, internal auditor or consultant? The answer depends upon the nature of the workload, size and complexity of the EDP installation and available expertise. Generally, routine audit controls should be designed into the EDP computer and application systems or else exercised by the DP organization. Supplementary non-routine audits should be performed by the internal (EDP) auditor in a larger organization or EDP or MAS (Management Advisory Services) consultant in a smaller installation."

"Who Shall Audit?"

"EDP auditor — CPA or CDP?" — The prerequisites for an EDP auditor performing the array of audits described above would necessitate expertise in auditing, accounting and data processing. Consequently, both CPA and CDP certificates would be desirable." — Stuart Tyrnauer CPA, CDP, Founder, EDP Auditors Association.

Effective data systems have communications built in. Not built on.

Since most computers are linked to other computers through the telephone network, and send and receive data that way, it makes sense to involve telephone people early in the planning of your system.

And it can save you time and money.

Because a Bell System data specialist knows the latest developments in data communications, he'll assist in selecting the communications services that will enable your system to work most effectively.

So when you first begin to make new data plans, call your local Bell Company Communications Consultant.

He'll come to talk with you.

And it won't cost you a cent.

We are continually looking for new ways to improve our service.

This time, by helping you plan your data communications.

AT&T and your local Bell Company.
Random Notes

Mini-Biz' Applications Adapted to Run on S/3

ENGLEWOOD, Colo. — A package of business applications designed especially for minicomputers, Mini-Biz, will be available for IBM System 3 CPUs by the end of the year, according to the developer, Computing Corp. International (CCI).

The package includes billing, inventory control, accounts payable and receivable, payroll and financial reporting. Mini-Biz also includes a generalized RPG translator for the programmer and a data base management utility for the manager, according to Charles M. Lawrence, president of Lawrence Associates.

The package was developed and is marketed by Lawrence Associates, which has offices in Englewood, Colo., and New York City. It includes a data base management utility, a translator for the RPG programming language and a host of other applications, according to Lawrence.

"The Mini-Biz package is intended to fit the needs of small businesses," Lawrence said. "We have tried to provide a complete system that will allow a small business to grow into a medium-size one, without having to go through the S/3 experience all over again."
What is it?
When does a large calculator become a minicomputer? And when does a mini become a “general purpose” computer? We’ll try to define the mini, and we’ll discuss some of the pros and cons of word lengths, byte-oriented machines, micro-programming, core and solid state memories.

What can it do in communications?
The Mini can take a great deal of the load off the main processing system, and we’ll look at a sampling of dedicated communication applications. We’ll also examine the use of minis at remote sites — and the cost changes that can result.

What can it do in business?
We’ll look at what appear to be the best uses of the Mini in business applications. We’ll review peripherals available to the business user and take a look at business-oriented software.

Is there anything it can’t do in industry?
Minis are the greatest industrial tool since humans. They have all the advantages of a machine, with many of the capabilities of a brain. They can do hundreds of jobs that would be impossible for humans, and they make many other jobs economically feasible for the first time. They can’t do everything, of course, but their impact on industry can hardly be underestimated. We’ll speculate on the mini’s industrial future, look at specialized equipment for industrial use, and provide an introduction to the makers of process control equipment.

Computerworld’s August 30th Minicomputer Supplement will cover the field — and it will be read by people who use the Mini:
61% of the respondents to a recent Computerworld subscriber survey said their companies currently buy and use minis. Of the remainder, 57% said their companies will be buying minis within a year.

Reserve your advertising space today!

Closing date: August 11
For further information, call Dawn Silva or Dottie Travis at (617) 332-5606.
The dots in the eye pattern represent the four phases and two amplitudes as associated with the two parts of the modem, he said. The eye pattern generator converts the digital signal of the modern to an analog that can be detected by the oscilloscope, Codex said. Because it can monitor multiple types of line interconnections, the test replaces several separate meters normally used to monitor line characteristics.

The pattern generator is based on the "quadrature amplitude" modulation standard for the Codex models, and can be installed by the user, the company said. The eye pattern generator costs $450 and must be used with the user's oscilloscope to be most effective. The private and dial-up lines and does not record telstar transmissions, Codex said. The firm is at 15 Riverdale Ave., A2192.
Probably not.

And yet no computer built today can tell the user when he's running out of gas. Not, that is, short of the ingenious device of suddenly disappearing systems response.

Somehow, we don't think much of that idea. We believe computer users should know exactly how effectively (or ineffectively) their systems are being used... where the throughput bottlenecks are... where the performance inefficiencies lie.

For three years COMRESS has been demonstrating, via our DYNAPROBE® Computer Performance Monitors, that a proper systems tuneup can frequently buy as much net throughput gain as an investment in bigger and faster hardware.

How?

By having the right tools—the right gauges, so to speak. If your system is overheating, we believe you should know exactly why and where. If it's running out of gas, you should know—in advance—exactly how much mileage is left so you can take appropriate and timely action.

Data processing expenses can be controlled. Computer utilization can be a science rather than a guessing game.

Think about it.
IBM Pushes Least Preventive Maintenance

By Frank Plants

NEWTON, Mass. — IBM’s approach toward preventive maintenance (PM) can be illustrated by a quotation from one of the company’s maintenance manuals:

“The three basic steps of preventive maintenance are: cleaning, lubrication and inspection. Do not do more than the preventive maintenance scheduled on equipment that is operating satisfactorily.”

Military Usage

This definition will undoubtedly surprise those who learned the term in the context of its military usage. There, PM means any periodic activity of parts based on the number of hours in service.

This was done based on the average number of hours the component was expected to last and, though expensive, was designed to prevent equipment failure before it occurred.

Based on the IBM manuals and the statements of a company spokesman, IBM does not usually follow this policy. Parts are generally not replaced until the device becomes troublesome.

On the 360/30 CPU, for example, if there are no indications of intermittent or marginal conditions, the PM required is minimal, IBM said. The major items checked on a scheduled frequency basis include: blowers and filters, CCRS/500 driver voltage lamps and usage meter accuracy. IBM said.

A scope is not commonly used on the CPU unless a problem is detected, the spokesman said.

Considering the large electronic CPU, one would think the PM on an essentially mechanical device such as a printer would be considerably different. Yet, on the 1403 N1 and N2 and the scope is used only to check the timing head disk output in the normal PM routine. The rest of the checking is done visually.

The engineer is cautioned by IBM to look for corrosion, wear, cracks, burned contacts and loose connections, as well as for filters clogged with dirt.

The complaints about IBM maintenance most often heard by Computerworld were from users who said systems were taken over unnecessarily by the IBM engineers to perform maintenance that could have been done off-line. Printers, tape drives and disk drives were particularly cited by the users.

IBM said there were routine PM procedures that could be done off-line, but indicated the PM would be done better if the entire system was turned over to the engineer.

Presumably, this would allow the customer to watch his stack of waiting jobs.

Use OS, DOS

3330-Type Disk Suits 360s and 370s

STAMFORD, Conn. — IBM 360 users will be able to take advantage of 3330-like data capacity while using modified versions of the familiar OS and DOS software with a disk drive system from Computer Investors Group (CIG) [CW, June 7].

And when the user decides to get a 370, he will be able to retain the CIG system and attach it to his new computer by changing the disk controller adapters.

The 360 user will be allowed to purchase or rent the disk drives and basic controller and rent the 360 adapter, which is returnable when the installation is upgraded, CIG said.

The 370 version of the disk system, as well as those for 360 models 65 and above, will run under an unmodified IBM 370 OS, the company added.

The system controller adapters for the versions differ in that the 360/65 and up models include a block multiplex replacement channel. Adapters for the smaller 360s include buffer to reduce the drive transfer rate to the slower throughput of the computer’s selector channel.

The user can adjust the transfer rate to best suit his own configuration of peripherals, CIG said. The 370 version requires a special adapter.

Prices for both 360 versions are $6,015/mo or $1,950 in OEM quantities for purchase of an eight-spindle system. The 370 version carries a three-year price of $5,280/mo and sells for $203,000.

In contrast, the IBM 3830 controller plus eight spindles of 3330 storage rents $26,400/mo or $7,620/mo for a 24-month lease, and sells for $330,640.

First shipments of the 360/65 and 370 versions will be made in October. The version for the smaller 360s is scheduled for November delivery from 65 Washington Ave.

‘Universal’ Disk System Offered

CHERRY HILL, N.J. — Peripherals General Inc. (PGI) has a new single-density magnetic disk drive compatible with the IBM 2314.

The 741 drive, the company said, can be used with PGI’s recently announced Model 844 Universal Controller [CW, April 19] allowing any computer system to store data on 2316-type disk packs.

The disk drive is available in either single- or dual-spindle cabinets. The small size of the controller enables it to be included in the same cabinet with a single spindle drive, thus saving floor space, the company said.

Capacity of a single drive is 29MB bytes. As many as eight drives can be attached to a controller for a system capacity of 232MB bytes, the company said.

For the drive, the company credits its use of a linear motor actuator for the increased access speed. A maintenance panel with built-in diagnostic features, such as diagnosis of drive unsafe condition, diagnosis of write error condition and indication of head and/or cylinder address of error occurrence, is included in each drive.

The purchase price of the 741 disk drive is $9,500 and $30,000 for the 444 controller. Lease prices for the disk system range from $1,609 for a 2-spindle system to $3,224/mo for nine spindles.

Delivery is 30 to 90 days from Cherry Hill Industrial Park, 08032.

Our card equipment sees lower ED P costs in the cards

DATA PRODUCTS

Card readers and punches. We make them all. Our family of card readers starts with our new Model 8300 for minicomputers and remote terminals. It reads up to 318 straight or bowed cards a minute with 12 light-emitting diodes in the read head. And it's the lowest-priced of a complete line. Our basic electronics includes a microprocessor and card trans- port ($900 in OEM qualities) will drive the whole family...including soon the 600-com Model 8310 with 1000-card capacity. While we're talking low prices, you should see our SP-120 card punch. It's the lowest-priced serial punch for computer and terminal applications in production today! Call today for a line on our line.
CIG "THE PRICE/PERFORMANCE COMPANY"

ANNOUNCES...

CIGTROL -

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<th>Feature</th>
<th>CIGTROL Model 6730</th>
<th>IBM Controllers</th>
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<td>Microprogramming</td>
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The First Thinking
DISK CONTROLLER

- Interfaces 3330 compatible files to 370 and 360/30 and above computers
- 400% price/performance advantage - 3330 versus 2314 on 360
- Microprogramming speeds access time
- Plug compatible

LETS YOU DECIDE THE DISK FILES
YOU’LL NEED FOR YOUR COMPUTING SYSTEM

ROTATIONAL POSITION SENSING
— Channel and storage control are not tied up for the entire record search — are available for other operations

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— Controls and implements all 2314/3330 type functions plus extensive diagnostics

MULTIPLE REQUESTING
— Each disk module may have an active concurrent channel program

COMMAND CHAINING
— Several files can be accessed with multiple seek commands — microprogram tells systems when ready to transfer data

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PRICE
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FEATURES

Do these features make good sense to you? For immediate action, call Donald Butler, CIG Director of Field Marketing, (203) 359-2100 or contact your local CIG representative and ask him about CIGTROL.

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(203) 359-2100

Minicomputer-Based Systems Help Doctors Trace Isotopes

Two systems, one each from Digital Equipment Corp. and TC Systems, Inc., use minicomputers to aid the physician in determining the results of medical tests using radioactive substances.

The same principle is employed in both systems—a Gamma camera scans the patient to determine the flow of a radioactive isotope through a particular organ. The pattern detected by the camera is recorded on a matrix and can be stored for future reference by the physician.

The DEC Gamma-11 system is based on a 12K PDP-11/20 and uses a 1.2M-word tape drive to store the results of the tests. Also included in the system are paper tape reader/punch, clock, display and hardware to interface to the camera. The system can be expanded by the addition of tape drives, disks and communications equipment.

The system includes a General Automation SPC-16/50 minicomputer with 12K words of memory. Also included are a half-inch mag tape drive, Teletype ASR-33 terminal, CRT display and dual-buffered analog/digital converters. Prices start at $42,000.

A satellite system that includes the A/D converters and magnetic tape drives, allowing data to be recorded for processing at a central system is available for about $15,000. Delivery of the Scintillation Data System system takes 60 to 75 days from 3303 S. Rice Ave.

Based on a 4K Data General Nova 1210, the Comp-U-Grid system can be provided with electronic grid digitizing surfaces in four sizes: 20- by 20-in., 30- by 36-in., 36- by 48-in. and 42- by 60-in. An electromagnetic coupler is used between the surface and the pen-like cursor.

The accuracy and resolution options open to the user are 0.001 in. resolution, 0.005 in. or .010 in. resolution 0.010 in.

Software provided with the system can handle most general-purpose digitized data processing, the company said. The routines include input and output formatting, error-correction routines, tilt and scale factors, shifts, rotation, interpolation (smoothing) length and area calculations, entry of supplemental coordinates and the capture of digitized history summaries.

Applications can either be written by the user in assembly language or by the company at extra cost, the firm said.

Slew rate of the digitizing system is 300 in./sec. Data can be recorded either a point at a time or as a series of points, the company said.

The standard readout device is a Teletype ASR-33 terminal. In addition, the system can be provided with any standard minicomputer peripheral including magnetic or paper tape, printer or CRT. An interface from the company allows a standard keypunch to be used to punch data into cards. Data rate on the CRT is 3 char./sec.

A variation of the system, Cadmac, offers interactive operation. A "menu" listing several operations is on the digitizing surface, with each operation programmed by the user. The operator indicates the proper item with the cursor. An operation is then performed by the processor, with the output displayed on a CRT. The Cadmac unit includes a plotter, allowing the contents of the CRT to be captured on the surface of the table.

Prices of the Comp-U-Grid systems begin at $16,900. Delivery is 30 to 60 days from 14616 Southlaw Lane, 20850.

Tektronix Interfaces Suitable for Terminals

BEAVERTON, Ore. — Tektronix has a series of interfaces to enable its 4002A Graphic Computer Terminal and 4001 Computer Display Terminal family to be connected to a variety of minicomputers.

The computers include those manufactured by Digital Equipment Corp., Data General, Hewlett-Packard, Varian, Honeywell, Interdata and Raytheon.

The 4002A is an interactive graphic and alphanumeric CRT terminal equipped with a split screen including both storage and refreshed display areas. It costs $4,800 plus the interface which sells for $300 when ordered with the terminals or $600 field installed.

The 4010 system is a business-oriented CRT terminal with both alphanumeric and graphic capabilities and costs $4,450 with interface.

Delivery is normally four to eight weeks from P.O. Box 500, 97005.
Want an Independent Modem?  

Total System Approach Is Best

"This word compatibility has been overemphasized. A lot of users have been burned by selecting a compatible modem which turns out to have a small timing difference that can't be tolerated by the system."  
— Walt Straub

Modems have to be installed in pairs on data communication lines. And when the user selects his equipment he is confronted by a field of over 200 models from less than 50 vendor companies.

How then can anyone decide? As any user knows, it's not easy, but there are some criteria to help narrow the field.

One of the major considerations requires a user to choose between the Bell and the independent suppliers. And each grouping is usually determined by the comparable Bell modem and the 1,200 bit/sec type is designed to replace.

Within the 300 bit/sec asynchronous class are Bell System 103A, 103F, 113A, 101C and equivalent independent modems using frequency shift keyed (FSK) modulation for transmission up to 300 baud, Clark says.

The most commonly used is the Bell 103A and the independent equivalents. Since the 103A can be used for full duplex transmission on 2-wire lines, the data signals are frequency division multiplexed.

This technique necessitates the need for frequency assignments when full duplex transmission is required, either on a dial-up and Answer mode. The Bell 103 and independent modems all operate in either mode; however, very few applications need to switch, Clark says.

The two most important performance characteristics of 103-type modems are channel separation and receive level capability. FCC believes its customers that it supplies a complete communications package which includes a data set as an integral unit. Bell is implying that the total package will work just a little bit better if the user stays with the telephone company as his single supplier.

Don't Get Caught
For many years data users in-variably looked to Bell for their equipment. Many were simply afraid to get caught dealing with independent vendors. But for all the predictions of impending phone monopolies, many of which still circulate today among users, very few users can point to a degradation in service directly attributable to their dealing with independents.

Most of the horror stories have not subsided and the phone company modem is determined to meet the challenge of the independent modem makers with some new offerings.

Even when he decides to go independent of his phone company's, the user is still far from the phone company standards. Most independent suppliers have their own Bell compatibility. A typical independent modem the user can announce his new device is "fully compatible with the Western Electric 103A data set. But such a phrase may not be as all-encompassing as the user would like to believe.

"This word compatibility has been overemphasized," says Walt Straub, data set product manager at Ultratech Systems Corp., a GTE affiliate. "A lot of users have been burned by selecting a compatible modem which turns out to have a small timing difference that can't be tolerated by the system. The relationship between carrier detect times, different computer communication processes these things can blow your system's mind," Straub said. An independent Bell-compatible data set cannot always talk to another vendor's device, even though they both replace the same AT&T unit.

"Admittedly it is difficult for the user to become familiar with two sets of standards. The vendor of a data set that costs several hundred dollars cannot provide a private executive customer with the same type of service as the manufacturer that support the sale of a CPU costing several million dollars."

How to Determine But there are some basic steps the user can take to determine whether a modem will fit into his communications network. After obtaining all available in formation about the modem from the vendor, the user should ask for a list of users with similar requirements who are operating similar networks. While this sounds rather obvious, some straight talk with another user can often save a lot of headaches.

Three major points should be considered by the user, according to a technical source at International Communications Corp. (ICC). First the modem has to be "the most cost effective" for the job, he said.

In a peripheral-bound system capable of handling a maximum data rate of 3,600 bit/sec, there would be no point in installing a 4,800 or 9,600 bit/sec modem, the ICC spokesman said. In such a situation the modem would be "wasting half the time."

On the other hand, the same user should not try to get by with a 1,200 bit/sec data set which would be acting like a "constrainer" on a water pipe. A slower-than-required speed modem would be wasting time and line capacity all in the name of a small savings, he said.

When considering the right modem, the user should look at his total system, including central processor and I/O devices, rather than limiting his evaluation to the data communications side of his network.

Satisfied User Secondly, the user should be satisfied that the independent supplier has a service and maintenance system set up. Although the equipment savings may be impressive with smaller vendors (20%-35% compared with Bell rates), the company may not have a man available within an hour or two when problems arise.

One hedger open to the user is effective but more costly. This involves stocking enough spare parts or even an extra modem so that all but the most catastrophic failures can be overcome with little dependence on outside help.

The in-house ability to overcome many network problems is closely linked to the third ICC consideration. The user should have the means to rapidly isolate operational difficulties.

Bell Sees User One of the major opportunities for the independent modem makers came from Bell's failure to include troubleshooting features in its Bell modems. To understand this marketing approach, one has to consider the classical Bell image of the user. Since the little old grandmother with the phone in her hand to the local repairman when her phone went off, the Bell image of communications user has been re- jected to anything more. For years Bell apparently re- jected the concept that a data user should be more sophisticated than a telephone user.

But the independents had no problem in accepting the knowledge of the user. Of course this also served their own purposes. The user that could troubleshoot his own system could often save the independent the cost of dis- patching a service man. Whatever the reason, the user benefited by having greater control over his system.

Most independent modems have simple trouble lights on their front panels. While some of these light up like multicolored (Continued on Page 5/4)
On Choosing an Independent Modem... It All Comes Down to Price, Support

After all the factors affecting independent modem selection have been considered, the primary motivations for the data user are price and maintenance support. "We bought 20 Bell 103 equivalent modems, and the units paid for themselves in less than two years in order to be economically attractive. "You have to look at the payout period and try to anticipate whether any technological improvements can be expected during that time," one user said. After a modem has paid for itself, based on a monthly payout level comparable to a Bell rental price, any additional service is strictly a luxury. For those users who do only a minimum of maintenance in-house, some support charges may continue. But most important is that the endless monthly rental for phone company data sets no longer has to be tolerated.

Ability to Support
Many prospective customers of non-Bell data sets feel it is almost impossible to systematically evaluate the products of all suppliers. But one criterion that puts a vendor into active contention is the ability to provide service and support. "I want to know what happens after the installation specialist has gone back to the home office," one user said. "I don't want to be at the mercy of a company rep that services me and all other customers in a 500-square mile area." - A user.

The modem supplier should help the user pinpoint his problem and solve it as quickly as possible. But often this will mean digging in the network beyond the operation of the data set. "Only about 10% to 15% of all network problems can be traced to the modem," according to a spokesman for International Communications Corp. (ICC). There is a tendency for people to blame a modem, he said.

"To the DP person, the modem represents the transition to the unknown world of the telephone line. And to the phone company, when it does not supply the data set, the independent unit represents the transition to the unknown world of data processing," he noted.

When ICC maintenance personnel check the modem and find it functioning correctly, they will check other system equipment if the user agrees. "We don't want the user caught in a finger-pointing situation. Often the local telephone company man will not be able to find the problem and we will help," the ICC spokesman said.

But communications faults not caused by ICC modems can lead to a maintenance bill for the customer. The phone companies also reserve the right to charge a user for a trouble call when problems are traced to non-Bell equipment.

One vendor doesn't see these charges as holding back the user. "The user might get a bill of $100 to troubleshoot his communications circuit. But the alternative of using his own trial-and-error approach could lead to 12 hours of downtime or more.

Such extended outages cannot be tolerated by most users and when allowed to occur, the lost productive time usually costs considerably more than the charge for the service," the vendor said.

WHAT NEXT FOR MCI?

On June 25, MCI Communications sold $30 million worth of stock to the public. In addition, four banks agreed to lend the company another $64 million. MCI says it will spend the money to develop $100 million specialized microwave communications carriers. How will MCI invest this money? Where are its proposed routes going? Who are its key officers? What's the background behind the development of this major new communications carrier? What's the overall impact of the FCC decision last year that allows MCI to compete as a common carrier to improve its applica-

The consolidation of Raytheon's extensive communications and data handling capability in RDS... provides a single source capable of offering a complete data processing/data communications system. Proven 700 series Computers, Programmable Terminals, Digital Microwave, Cable and Multiplex Systems are all under one roof. The need for such communications-oriented data processing systems is growing and someday, probably within three years or so, everyone will be doing things this way. But who can afford to wait for everyone? If you'd rather see 1975 in sooner than your competition, just call Mr. Dave Caplan, Manager, Communication Systems, (617) 762-9328, or write Raytheon Data Systems, Dept. 0303, 1415 Providence Turnpike, Norwood, Massachusetts 02062.

RAYTHEON
Thinking about a Telecommunications Monitor?

CHECK OUT OUR COMPETITION

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the TASK/MASTER: a telecommunications monitor

turnkey systems inc.

eleven east avenue, norwalk, connecticut 06851
(203) 838-4581
identification with Bell method used in grouping four classes of modems

Want an Independent Modem? Total System Approach Is Best

This word compatibility has been overextended. A lot of users have been burned by selecting a compatible modem which turns out to have a small timing difference that can't be tolerated by the system. "WaltStraub".

Modems have to be installed in pairs on data communication lines. And while the user selects his equipment he is confronted by a field of over 200 models from more than 50 vendors. How then can anyone decide? As any data user knows, it's not easy, but there are some criteria to narrow the field.

One of the major considerations requires a user to choose between the Bell characteristically independently supplied modem. The telephone company can handle only a point of reminding its customers that it supplies a complete communications service which in-cludes a data set as an integral unit. Bell is implying that the total package will work just a little bit better if the user stays with the phone company as his single supplier.

Don't Get Caught

For many years data users in-varitably looked to Bell for their equipment. Many were simply afraid to dealt with independent vendors. But for all the predictions of impending doom for independents, many of which still circulate today among users, very few users can point to a degradation in service directly attributable to their dealing with independents.

Most of the horror stories have not subided and the phone company are determined to meet the challenge of the inde-pendent modem makers with some new offerings.

Even when he decides to go independent, the user can't get far from the phone company. Independent suppliers emphasize Bell compatibility. A typical independent modem maker who announces his new device is "fully compatible with the Western Electric 103A data set. But such a phrase may not be as all-com-prising as the user would like to believe.

"This word compatibility has been overextended," says Walt Straub, data set product manager at Ultronics Systems Corp., a GTE affiliate. "A lot of users have been burned by selecting a compatible modem which turns out to have a small timing difference that can't be tolerated by the system. The relationship between carrier detect times, dif-ference in the demodulation process—these things can 'blow your system,'" Straub said. An independent Bell-compatible data set cannot always talk to another vendor's device, even though they both have compatible modem data sets.

Admittedly it is difficult for the user to become familiar with 103s. The vendor of a data set that costs less than Bell's, can provide the prospective cus-tomer with the same type of operational features for that support the sale of a CPU costing several million dollars.

How to Determine

But there are some basic steps the user can take to determine whether a moderm will fit into his communications network. After obtaining all available in-formation from the vendor, the user should ask for a list of users with similar requirements who are operating similar networks. While this sounds rather basic, some straight talk with another user can often save a lot of headaches.

Three major points should be considered by the user, accord-ing to a technical source at Inter- national Communications Corp. (ICC). First the modem has to be "the most cost effective" for the job, he said.

In a peripheral-bound system capable of handling a maximum data rate of 3,600 bit/sec, there would be no point in installing a 4,800 or 9,600 bit/sec modem, the ICC spokesman said. In such a situation the modem would be "floating half the time."

On the other hand, the same user should not try to get by with a 1,200 bit/sec data set which would be acting like a "constrainer" on a water pipe. A slower-than-required speed modem would be wasting time that could be "the most cost effective" for the job.

Glen Arnold of Teletype Corp. believes it is important to know about the line loss and the users will have to provide the equivalent equipment. ToBerlin. These features relate primarily to the terminal—modem interface lead, Data Ter-minal Ready (DTR) and various modes of operation that may be provided via a screen buffer or switch.

For example, the Bell 202C allows the user to have DTR "on" and prevent automatic answering, if any.

In making a modern evaluation, the user should review which modes of operation his application requires and verify that modem he's considering will provide these capabilities, Clark believes. The Bell System 202C repre-sents the IEEE-Bell standard for syn-chronous private line class of modem. Clark says that "a few of the parameters for 202C's apply to 202As with a small modification. The 202As' capabilities need not be as wide since private lines do not contain the signal.

Secondly, the user should be satisfied that the independent supplier can provide the needed maintenance and system support when needed. Although the equipment savings will be impressive with smaller vendors (over 20% compared with Bell rates), the company may not be available within an hour or two when problems arise.

One hedge open to the user is effective but more costly. This involves stockinhg enough spare parts or even an extra modem so that all but the most cata-strophic problem will be over-come with little dependence on outside help.

The in-house ability to over-come many network problems is closely tied to the 103A point which says the equipment should "have the means to rapidly isolate operational difficulties."

Bell Sees User

One of the major opportunities for the independent modem makers came from Bell's failure to include troubleshooting features in its modems. To under-stand this marketing approach, one has to consider the classic Bell image of the user. Since the telephone had to call her local customer service representative dead, why should the compu-ter/communications user be en-titled to anything more? For many years Bell apparently re-jected the concept that a data user should be more sophisti-cated than a telephone user.

But the independent modem makers have no problem in accepting the know-ledge of the user. Of course this also served their own purposes. The user that could troubleshoot his own system could often save the independent the cost of dis-patching a service man. Whatever the reason, the user benefitted by having greater control over his system.

Most independent modems have simple trouble lights on their front panels. While some of these light up like multicolored (Continued on Page 5/4)
On Choosing an Independent Modem... It All Comes Down to Price, Support

After all the factors affecting independent modem selection have been considered, the primary motivations for the data user are price and maintenance support. "We bought 20 Bell 103 equivalent modems, and the units paid for themselves in less than a year," one user said.

Asked how he determined which vendors he would consider, the user admitted to a rather un-sophisticated approach, "We relied strictly on word of mouth from other users who had the same needs." Most users agree an independent modem should pay for itself in less than two years in order to be economically attractive. "You have to look at the payout period and try to anticipate whether any technological improvements can be expected during that time," one user said.

After a modem has paid for itself, based on a monthly payout level comparable to a Bell rental price, any additional service is strictly gravy. For those users who do only a minimum of maintenance in-house, some support charges may continue. But most important is that the endless monthly rental for phone company data sets no longer has to be tolerated.

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These questions are answered in the latest issue of DATACAST, a special 12-page edition entirely about MCI. This issue is available as a bonus if you order a six-month subscription to DATACAST, the twice-monthly newsletter that concentrates on Specialized Common Carriers. DATACAST was introduced two years ago to forecast the advent of new communications carriers. Now, it is concentrating on the one very important carrier perspective. The latest issue contains a detailed analysis of MCI, Datran, etc.

Receive the bonus issue on MCI and the trial subscription to DATACAST with your check for $30 to: Paul Keegan Associates, Oceanside, N.Y. 11572. Subscriptions are tax deductible and may not be assigned without your consent.
# Thinking about a Telecommunications Monitor?

**CHECK OUT OUR COMPETITION**

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The **Task/Master** is a telecommunications monitor operated by Turnkey Systems Inc. located at One Eleven East Avenue, Norwalk, Connecticut 06851. Phone: (203) 838-4581.
A lot of people have been making Digital has been

We've asked a group of very intelligent people to work on data communications. And data communications only. The DECComm Group. They already have communications interfaces, software packages and computers. And there's
TDM Versus FDM

Multiplexing Costs Based on Volume and Distance

Out of the nearly 700 DP users estimated to have data communications networks, only about 7% have multiplexers, according to a recent report by International Data Corp. But more users are considering a multiplexer when it comes to optimizing their networks. "There's only one justification for multiplexing and that's saving money," said Lloyd Bond, president of Timeplex Inc., Norwood, N.J. "The user has to evaluate individual lines with individual modems and compare them with single multiplexed lines and a single pair of modems," he added. The crossover point at which a communications user should begin to consider multiplexing equipment is usually undefined. It is probably based in some combination on the number of miles and channels in a particular data network, according to Bond. Not Restricted "The more miles, the fewer channels are required in order to make multiplexing feasible," Bond said. Contrary to other network designers, Bond does not feel that multiplexers are restricted only to the larger user. Even on a 100-mile system, the user can save on only two lines because he can get greater usage from the same facilities, Bond feels. To understand the trade-offs involved, one must realize there are two types of multiplexing—the older Frequency Division Multiplexing (FDM) and the later Time Division Multiplexing (TDM). Multiplexers accept inputs from several distinct terminal sources, transmit the combined input over one telephone line, and at the other end a similar unit again separates the discrete data inputs. An FDM unit combines the separate signals by slicing up the bandwidth of a voice-grade (or other) channel and allocating each separate signal to its own portion of the frequency band available. It is clear that a frequency band can be split just so many ways and the number of FDM channels on any given type of line is limited. The TDM approach is more flexible, it does not offer an unlimited number of derived channels, it provides increased flexibility by slicing up the available transmitting capability according to available time elements. "The use of multiplexing is not a technological decision, it is an (Continued on Page S/7)

Modem Tied To Data Speeds

(Continued from Page 1) to the same extent as dial-up lines, he adds. One difference between 202C- and 202D-type modems is transmission speed capabilities. Bell 202Ds operate at 1,200 bit/sec on Type 3002 unconditioned lines, 1,400 bit/sec on 3002 C1 conditioned lines and 1,800 bit/sec on 3002 C2 conditioned lines.

2,400 Bit/Sec Synchronous

The 2,400 bit/sec synchronous modem is represented by the Bell 201A (2000 bit/sec on dial-up lines) and the Bell 201B (2400 bit/sec on C2 conditioned private lines).

For this modem, the user must be aware that different modulation schemes are used by various suppliers. This is not the case in 300 bit/sec and 1,200 bit/sec type modems where FSK is the only modulation scheme used. For 2,400 bit/sec modems, there are three schemes most frequently used: vestigial side band (VSB) modulation, duobinary FSK modulation and differential phase shift keyed (DPSK) modulation Clark says. Above 2,400 bit/sec there are no industry standards such as Bell provides for lower-speed operation. As a result, modulation schemes vary between suppliers.

This type of modem contains one of two types of equalizer: manual or automatic adaptive. Manual equalization is implemented as "eye pattern" adjustments which tend to be qualitative at best, or as adjustments measured by meter reading with meter adjustments preferable due to ease of adjustment. One measure of the quality of automatic adaptive equalizers is initial set up time. In high-speed modems today, this time varies from 100 msec to 10 sec, Clark states. Obviously, a unit that can set up in the shorter time, and operate with the same error rate as a unit with slower set up time, contains a better equalizer, he adds.

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Multiplexers Can Cut Line Costs

(Continued from Page S/15)

The major differences between multiplexers and concentrators are shown in this chart from Bergland Associates, a communications consulting firm. Digital Systems applied its Netset program to the task and the results are considered by many as a classic case (Continued on Page S/11)

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DATA ACCESS ARRANGEMENT

CONCENTRATORS

<table>
<thead>
<tr>
<th>Multiplexers</th>
<th>Concentrators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Many remote terminals or circuits, each of which requires its own channel to the CPU.</td>
<td>Many remote terminals or circuits no one of which requires its own channel to the CPU.</td>
</tr>
<tr>
<td>Frequency Division</td>
<td>Store and Forward</td>
</tr>
<tr>
<td>Each channel has its own &quot;data set&quot; pair; guard bands between channels waste bandwidth so FDM provides fewer channels; less costly for widely dispersed terminals, less costly for few channels.</td>
<td>Incoming messages accepted (to buffer limits) even if output channel is busy. More costly.</td>
</tr>
<tr>
<td>Time Division</td>
<td>Contention</td>
</tr>
<tr>
<td>One data set pair; very efficient use of bandwidth and provides more channels.</td>
<td></td>
</tr>
</tbody>
</table>

The Dartmouth Time Sharing System gradually evolved from serving first a few schools to many spread over a multistate area. In 1969 when line costs began to become prohibitive, the school asked Digital Systems Corp. to analyze the network and suggest an economic reconfiguration.
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More Functions to Front End

Smart Users ‘Deemphasize’ Host

With the increasing complexity of computer communications systems, the use of separate front-end processors to assume the communications control is on the rise.

The front-end or program-mable communications processor has been around for some time. The first innovators with this type of device were probably the time-sharers who realized relatively early that the main CPU or “host” computer should be reserved for manipulating data and not controlling communications inputs.

“Users want to remove all the communications overhead from their host computer,” noted Herb Rikelman, marketing manager of communications at Computer Communications Inc., Culver City, Calif. While many have defined the capabilities of this type of system, the user has to consider hundreds of lines, all operating at different speeds, and bits are being transmitted in various formats. And the system has to do parity checking and it has to assemble bits into characters, and characters into messages.

“These types of functions deal strictly with communications and they have to be handled before the data gets into the main CPU.”

While all this sounds a bit hectic, it is exactly the type of operations normally handled by a front-end processor.

For the teleprocessing user the communications front end offers some real advantages and cost savings. “The use of a front end can result in great savings in system cost by removing certain functions from the host computer,” according to Jon Gould, director of data communications at Interdata Inc. The savings include longer system life achieved by reducing the main CPU memory previously dedicated to communications and the maintenance and training which these new lines brings.

While the various functions of a front-end processor have been described as a recent report by the Datapro Research Corp., it seems to be among the most complete.

Datapro lists the following 10 functions:

- Line control which includes the polling of terminals, automatic call answering, etc.
- Character and message assembly, which includes the formatting of messages for compatibility with the requirements of the mainframe.
- Data conversion into the “native machine code” of the host CPU.
- Data and message editing, which includes data compression and other restructuring schemes for faster transmission.
- Error control to keep incomplete messages from reaching the main processor.
- Message buffering and queuing to allow data to be fed to the host CPU at a compatible rate.
- Message switching, which becomes important when a front end is connected to several mainframes.
- Message answering including simple replies which do not have to tie up the host system.
- Message recording which becomes important when a network failure occurs.
- Statistics recording which includes keeping a record of traffic, errors and other bookkeeping functions.

Any and sometimes all of these functions can be assumed by the front-end processor depending on size, configuration and the many other parameters in a data network.

And if the functions of a front-end processor seem almost unlimited, there are some applications where they can improve network efficiency are also varied. Among the possibilities are the replacement of an existing hardware communications control with an IBM 270X type, or the configuration of a front end in the initial design of a communications network.

To users familiar with the independent peripheral environment, the 270X replacement will sound the same approach.

7305 Has Its Limits

With the introduction of the IBM 3705, independent suppliers now feel the mainframe has given its stamp of approval on the concept which until now the independents are quick to caution the user that the 3705, with its presently available features, has some limitations that can be overcome by independent front-end systems.

“IBM is now supporting the idea of taking the processing load off the mainframe with their introduction of the 3705,” says Daniel Simnott, president of Interdata Inc. “We are looking forward to follow-up systems built around a satellite computer. With that impetus we will see a lot more of this type of system. The tasks previously done by the mainframe around the host computer have been ridiculous in terms of its fundamental power,” he said.

The tasks Simnott referred to were related to the IBM 270X hardwired controllers which used up core in the mainframe. With its 3705 IBM followed the independents in their efforts to move the communications processing out into a front-end minicomputer.

“But there are a lot of limitations to the 3705,” Herb Rikelman of Computer Communications Inc. feels. As a prime example, the 3705 will not support 300 bit/sec terminal devices, he added.

“I agree that the system has some limitations but there is a good reason for each,” Phil Cleveland of Tempo Computers Inc. stated. “IBM can’t support 300 bit/sec terminals with the 3705, except on an RFQ, simply because there aren’t any IBM terminals that operate at that speed,” he noted.

But the 3705 limitations go deeper than just transmitting speed, Cleveland said. Many independent suppliers operating in different code, communications procedures and terminal functions, he pointed out.

“Here the user is getting into areas where IBM has difficulty supporting. Things like polling techniques for CRTs, special display cursor controls for graphics and new non-IBM asynchronous (dual speed) data rates are the type of features that the 3705 can’t support,” he said.

Cleveland defines this as a stored collection of messages using slower-speed Selectric-type devices as opposed to the higher-speed intelligent terminals. And any type of front-end application where the processor requires interfacing with a CPU peripheral such as a tape, disk, drum, card reader or line printer, is not available to the 3705 user, according to Cleveland.

While the independents concede it is well within IBM’s capabilities to rectify the current limitations of the 3705, they feel they still have the edge.

“We find that the majority of communications users still have special problems that require custom software support. This type of service will always be difficult for IBM to supply,” related one supplier of programmable front ends, “and this is where we already have extensive experience in supporting the communications user.”

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Multiplexers Can Cut Net Costs

Continued from Page S/7

study for multiplexing. Based on the Net-
set analysis, and the installation of FDM
multiplexers made by Northern Radio
and supplied by Ultronics Corp., the
Kiewit Computation Center saved about
$3,000 per month on more than $100,000/yr.
By multiplexing its lines. Even if the cost
of the FDM equipment is subtracted from
the line savings, the case for multiplexing
becomes very conclusive.

No Flexibility

Significantly, Dartmouth had been the
Bell Labs test site for the Datrex service
to be offered later by Bell. The Datrex
service, later renamed Data Line Concen-
trator Service, did not give Dartmouth the
flexibility it could get by buying its
multiplexers and writing them off. Some
of the Datrex features offered during the
test period were not included when the
service was tariffed, according to Thomas
Byrne, assistant director at Kiewit.

Today the Dartmouth system includes
more than 300 terminals, mostly of the
teleprinter class, which the school
owns and maintains with its own staff.
Although some equipment at outlying
sites is serviced by third-party mainte-
nance firms, the combination of pur-
chased terminals and multiplexing has
given the Kiewit center "fantastic" yearly
savings on its operation. About 60 termi-
nals are connected to the network via
multiplexers.

It is now three years since the initial
Netset study, and the school has asked
Digital Systems to take another look at
the time-sharing network to determine
whether additional savings are possible,
Byrne said.

Timeplex encourages the use of TDM
equipment based on its transmitting
scheme which it calls characterplexing.
The key to characterplexing is the elimi-
nation of start and stop bits from the
data transmission, according to Lloyd
Bond. "If you know where the character
starts and stops, you can 'artificially re-
introduce' the dropped bits on the receiv-
ing end," Bond said.

20% Savings

On transmission at 150 or 300 bit/sec,
Bond said, the characterplexing method
can delete "two bits out of every 10"
with a 20% savings in transmitted
throughput.

The transmission method is similar to
the data compression used by other ven-
dors such as Tally and Data 100, Bond
said. He sees an additional benefit in the
Timeplex method because "we sample
the data signal and can accept TDM
signals which are 'time distorted by as
much as 45%.'" Signals with this distortion
can be re-
transmitted with less than 1% distortion,
he added. The Timeplexer T-16 is priced
at about $3,000 with modem or about
$180/channel for a 16-channel system.
Bond said. A comparable all-Bell system
with individual modems on each channel
would cost about $350/channel, he esti-
mated.

One of the recent developments is a
change in AT&T tariffs that will allow
multiplexing on wideband private lines.
Computer Transmission Corp. has a sys-
tem that will multiplex any number of
synchronous and asynchronous terminals
with any combination of data rates up to
a maximum total throughput of 2 million
bit/sec. For users, the wideband tariff will
allow the operation of low-, medium-
and high-speed terminals simultaneously
over a single high-capacity line. But users
must have enough data traffic in their system
to warrant the higher line costs of wide-
band facilities.

Most 'Concentrators' Really Front Ends

While the term concentrator is often used
when referring to data communica-
tions equipment, most of the definitions are incorrect. Many definitions include
a computer-controlled device which does not fit within the telephone meaning
of concentrator, according to one expert.

"A concentrator differs from a multiplexer because it introduces the element
of contention into a system," said Lloyd Bond of Timeplex Inc. A concentrator
takes 10 terminals and allows any six of them to transmit their data over the six
available lines, Bond said.

The seventh terminal to contend for the facility will get "busied out," while in
a multiplexed system all 10 terminals can be accommodated. "With a multi-
plexer system we assume every terminal is 100% used," he noted.

The savings with a multiplexer are based on combining the data while the
same in a concentrator are based on the amount of traffic in the system. In
effect, the concentrator "hedges" that all of the terminals will not be in
contention for the available facilities at any one time.

Perhaps the best example of a true concentrator is the switched telephone
network. While theoretically all subscribers can access all other subscribers, the
system is configured to expect that this situation will never happen at the same
time.

In effect, the subscribers using the system access the available lines on a
first-come, first-served basis. A concentrator handles data terminals on the same
type of priority sequence.

The devices which operate under computer control are more properly called
front-end processors. They should not be confused with concentrators.
Minicomputer as Network Front End
Signaling New Dispersion of Power

While today's front-end processors offer users only a connection to the communica-
tions user, many users feel the real poten-
tial of this device has not yet been real-
ized. The functions of the front-end pro-
cessor will be more complex, their price will go down because of increased utilization and the decreasing price of the minicomputers, according to Max Beere, director of telecommunications systems at Tymshare Inc.

The dispersion of computer power is just beginning, Beere believes. "The main-
frames are becoming less sophisticated and doing bulk types of processing," he
said.

One of the most significant trends in the evolution of front-end processors is the conversion of minicomputers to perform specialized communications tasks, Beere noted. The mini that can handle 100 terminals designed on the basis of traffic demand rather than the number of devices is the front end of tomorrow, Beere thinks.

While today only the more sophisticated communications users are modifying their minicomputers, Beere believes the approach will become more widespread. Tymshare has reconfigured the Varian 620 mini into a network front-end device used in the firm's Tymnet communica-
tions system.

Called a Tymsat, the mini performs communications functions including the control of remote terminals. (Some have referred to this type of control as intelligent multiplexing.)

For innovative users, Tymshare will sell the Tymsat mini for communications net-
works. Explaining the changes to the basic 620 design, Beere said: "We put a syn-
chronous front end on the mini which allows us to interface eight simultaneous
lines each up to 5,600 bps and all this is included on one logic card, he
added.

"You lose the definition of what a front end is and what a multiplexer is when you
look at this type of device," he noted. While it acts as a front end to the main
CPU, it also becomes a ter-

nial controller when seen from the other end, he stated. The modified mini can also act as a message-switching device and a line switch, he said.

The Tymsat is "a different breed of cat," and although it is available to users, few have yet indicated an interest because of its advanced concepts, he admitted. A Tymsat would cost about $40,000 to $50,000 depending on configuration, Beere estimated, and this would include full systems support. While the Tymsat does not have many interested users today (Beere thinks it is still several years off), the modified 620 is already an integral part of the Tymnet system. Asked if the Tymsat configura-
tion was patterned after any similar devices, Beere said it applied many of the principles of the mini-switchers used in the Advanced Research Projects Agency (Arpa) network.

Beere carries the Tymsat concept one step further to apply to the subscriber of tomorrow's time-sharing or computer utility networks. He foresees the user configuring a complete network subsystem or node of terminals controlled by one mini which in turn will interconnect with a larger computer resource network. "I think we will see a tremendously accelerating trend in the use of minicomputers as front ends to networks or front ends to host computers," Beere said.

There are those who agree with Beere that the flexibility of multiple minis used in networks will provide greater advan-
tages than the single larger mainframe. The new uses in communications-oriented minis will lead the way to the much-
Users Save by Giving More Functions to Front End

(Continued from Page S/10)

"large scale" is the correct description, for one of the access methods can use from 30K to 50K or more valuable native mainframe core depending on the size of the system.

The independent suppliers disagree on the value of 270X replacement equipment operating in a mode that emulates the IBM hardware. "The emulation approach gives the user a "security blanket" so he doesn't have to drastically change his communication software organization," stated Phil Cleveland, manager of systems marketing at Tempo Computers Inc., Fullerton, Calif.

But when the user breaks out of the emulation mode, with the proper software, he can take portions of his operating system that are resident in 360/370 core and move them out into the front-end processor. Such functions as polling and error-correction routines can be moved out," Cleveland said.

While the IBM access methods will not support independent terminals "without extensive software changes," the front-end processor does allow the user to utilize this type of device if the front-end "absorbs" the software differences," Cleveland said.

But some vendors see even stronger advantages with independent front-end in emulation mode. "We have used the IBM access method to deal with the independent terminal and we have put the extended features of the terminal into the data," Interdata's Gould explained.

As an example, Gould cites a CRT feature that can be identified in the data sent from the 360 as opposed to the access method. In such a case the user is still working in emulation mode with the IBM access method, but an "extra character or two has been added" to the data developed by his application program.

And this additional software capability is included with front-end processors of the type supplied by Interdata, Gould said. "The IBM access method and the mainframe are still in operation but we have just 'fooled it a little,'" Gould added. The capabilities here are limited only by the features included in the independent terminal equipment, he said. Another advantage of an independent 270X replacement unit would be in the area of time-division multiplexers, Gould said. The independent front end could perform the demultiplexing function, thereby eliminating the half of the TDM equipment in a network that is installed at the central site. This could be accomplished while the system continues to run in emulation mode, he explained.

But regardless of any advantages in emulation mode, the independent suppliers agree the real savings come to the user who moves his communications functions out of the mainframe and into the front-end processor.

"In a 100-terminal system if the user replaces his IBM 2703 and goes to a 270T system from Tempo, the savings could be from $2,000 to $5,000/month," according to Phil Cleveland. And if this user were running his system on a 360/50, the savings in core, fees, and the IBM access method, could forestall a planned mainframe upgrade to a 360/65 or even a 370/155, he added.

The release of mainframe core, when the IBM access method is dumped in favor of the independent front end can be significant. Typically the user can cut access method software residency requirements by one third to three quarters depending on how he uses the front end and how many functions are moved out of the mainframe, Cleveland said.

While Btram can typically consume about 10K bytes, Qtam or Tcam with their more sophisticated approaches can eat up from 75K to 200K bytes, he estimated. The actual total is usually a function of the number of communications lines supported in the network.

The user planning to expand his teleprocessing capability will often be advised by his IBM representative to add a larger mainframe. The independents feel they have an important alternative to this approach. And they can offer substantial savings.

An interesting additional benefit to the front-end processor approach is that later memory expansions are less costly. "As a general rule it is cheaper to add memory to a programmable front end than it is to add core to the mainframe," Cleveland explained. "Typically mainframe core storage is half the price of IBM mainframe core," he said.

An unusual approach to the IBM front-end system was introduced recently by Digital Equipment Corp. The mini maker has chosen the IBM Graphics Access Method (GAM) as a vehicle for its emulation scheme. Called the DEC 11D23, the system uses the familiar PDP-11/20 and a hardware interface, the DX11-B, which connects to the multiplexer channel on a 360/370 or the selector channel on a 360.

"The typical user for our front-end approach is either out of line addressing capability on his 360 or he has run out of mainframe core on his Model 50 or 65," noted Dave Stackpole, product manager for the 11D23 system.

"This type of user needs to move his network control out of the mainframe to relieve the pressure on his mainframe," Stackpole said.

With GAM and its limited mainframe core requirement of 5K bytes, the user is less vulnerable to hardware changes since the front end acts like a hardware controller, Stackpole said.

NotLimited to Devices

The initial DEC system emulates the IBM 2848 CRT controller, but other hardware emulators including the 3705 will be available, he said. People familiar with GAM as talking to a display, but actually all that is in the application program. The access method is not limited to display devices, but the user's software will have to be changed. And the user goes to GAM be he is not limited to one type of device, Stackpole said.

"The user can pass a data buffer from the applications software written on the 360, to the DEC network control program in the PDP-11. One part of the software tells him where to send the data and the other part is the actual data," he said.

The intelligent software that knows how to make various types of terminal devices respond is now resident in the front end, Stackpole said. "A new type of terminal user interface that our users want, to our knowledge doesn't have this flexibility. All it provides is physical control to the line and the full format of the data is just passed on to the 360," he said.

Since the hardware interface is programmable, it can be made to respond to virtually any peripheral on the 360 channel, Stackpole said. The DEC interface can also be programmed to look like a 2703 if "a user really wants to do this type of emulation," he remarked.

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Front-End Configurations Based On User's Mainframe Applications

The best way to classify front-end processor systems is by the interface methods with the host computer, according to Jon Gould, director of data communications at Interdata Inc. There are basically five ways to connect a front-end processor to a mainframe and the interfacing involves both software and electromechanical considerations, Gould noted.

One approach to communications interfacing is to emulate an existing device in the host computer. With the appropriate software packages in the communications processor, independent terminals can be supported without modification to the host CPU communications support programs, Gould said.

Plug-for-Plug Replacements

The plug-for-plug replacement system connects physically and electrically to the standard host computer channel as though it were a standard peripheral. The front-end processor emulates a well-defined subset of the device it is replacing, Gould said.

The advantages to this approach are dollar savings without modifying the host software. For equivalent configurations of 128 terminals there could be savings of $40,000 to $100,000 when replacing an IBM 2703 control unit with a minicomputer-based equivalent system, Gould said.

The value of the plug-compatible front-end becomes much more important if the user takes advantage of its power to perform some of the functions that might otherwise be done by the host. For example, the front-end might perform code conversion, character-to-message assembly, error control, line usage and statistical journaling, Gould stated.

With such techniques, it is estimated host CPU and core usage can be cut as much as 50%. In many cases, response times can be improved since less manipulation (drum access, etc.) would be required by the host computer.

The major advantage to the use of a plug-compatible processor is in its flexibility and resulting system cost savings. The programmable nature of the front-end allows the direct connection of asymmetrical TDMs, thus reducing the number of adaptors and halving the TDM costs, Gould estimated.

Plug-Compatible Front End

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Plug-Compatible Processor With TDMs

In this case, the front end performs the demultiplexing function directly from the multiplexed medium-speed port. The system also allows connection of devices which would not normally be supported by the host hardware or software.

For example, computer-based message concentrators, non-compatible host computers, non-supported terminals and TDM equipment can all be made acceptable to the host computer complex by appropriate front-end software, Gould said.

(Continued on Page S/15)

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Terminal 2011—the one terminal that does the whole job
But TTYs Still Plentiful

Need for Faster Terminals Leads Users to CRTs

For years the data communications user has thought of the teletypewriter first when selecting his terminal equipment. And there are still more TTY's installed than any other type of terminal. But as users expand their terminal requirements from the basic 10 char/sec electronics to the more sophisticated 100 char/sec, more options are growing.

The initial attempts at teletypewriter upgrades have been little more than mirror images of a teletypewriter, operating at higher speed or with added features.

Still the Same

More recently magnetic tape, upper and lower case characters and faster speeds have been added to the teletypewriter. The product has been tailored more toward the needs of the data user, but despite the bells and whistles, it is still the same TTY.

Front-End Uses Tied to Mainframe Applications

(Continued from Page S/14)

A core-to-core front-end system is generally reserved for larger systems where fast core cycle time transfer speeds are required. This same approach is used for software compatibility. This approach becomes more and more attractive when coupled with a host that has a sophisticated operating system, Gould said.

These operating systems are generally provided with standard peripheral methods that allow applications programs to communicate with a wide variety of peripheral devices in a standardized way, and it is desirable to use these methods without modification.

Data Link

The use of a data communications link between the host CPU and the front end is illustrated below.

Data Link Processor Connection

In general, the data link will be accomplished through common-carrier facilities using modems and other communications hardware to effect the connection, Gould said. In certain cases, when the front end and the host are in the same room (approximately 1,000 feet from each other), both the front end and host limited distance line adapters may be used in place of the normal common-carrier link. This is generally less expensive and improves the overall system reliability, Gould added.

The data link approach is probably the "cleanest" interface between multi-computer systems, especially where several manufacturers are involved, Gould believes. The connection generally involves standard off-the-shelf data communications interfaces from each vendor. At the same time, the data link method is probably the most expensive since it involves communications equipment at all ports and probably a good deal of redundancy, Gould explained.

Efficiency the Word

But despite the price, many users are selecting faster, more versatile terminals and many are making the equipment pay for itself. Usually this means replacing people-dependent applications with more efficient equipment.

The department store CRT credit validation system pays for itself by making the individual operator more efficient, and spotting bad credit accounts that previously slipped through manual procedures. The manufacturer that now writes shipping invoices at remote sites with intelligent terminals eliminates long error-prone phone calls that were required to instruct the operator on printing the proper information.

In the area of TTY upgrades, the 30 character/sec terminals offer some real advantage.

(Continued on Page S/16)
Supplement/Page 16

July 26, 1972

Users Consider Dial-Up and Private Lines

For many users, designing a data net-
work involves complex trade-offs. One set of choices is between use of private lines versus dial-up facilities. There are a number of factors to con-
sider when making the decision.

The economic trade-offs often require the assistance of a communications con-
sultant to find the lowest cost method.

Probably the most important factors in choosing between private or dial-up lines are the type of facility available. In the opposite direction, dial-up lines will probably be a problem unless the equipment has a reverse channel capability, Doll said.

Best of Both Worlds

Some users combine the best of both environments, with primary transmissions via private lines and secondary transmissions via dial-up facilities. With thousands of dollars on the line, the user has the added advantage of being able to condi-
tion a private line when quality becomes critical, usually at higher transmission speeds.

Top Data Rates

Maximum transmitting speeds on differ-
ent types of lines depend very much on the type of facility available. In general, users can reach a top data rate of 3,600 to 4,800 bit/sec on dial-up lines while private lines usually can support rates from 7,200 to 9,600 bit/sec. There are, of course, exceptions.

On dial-up lines where the user is not assured of making the same connection each time, dial rates of 1,800 bit/sec or less are in use.

Terminals Based on TTY Upgrades

(Continued from Page S/15)

ters," according to Dave Beafer, staff consul-
tant at Arthur D. Little. The effect of the
highly sophisticated terminal is to increase the user's speed and capability of the TTY interactive terminal system.

A system such as the Sycor terminal includes the CRT for editing, the built-in terminal software capability is used by Sycor.

RTTY (radio telegraphy) devices are being used as a communications link for IBM terminals. The two cassettes allow both unattended transmission and receipt of data.

The blue lines between the speeds and capabilities of the TTY interactive type terminal and the more intelligent remote batch system is one of the biggest questions mark features for users. When the user moves from one type of terminal to the other, not only must the costs, but the operat-
ing characteristics of his communications system change radically.

Invariably the more sophisticated re-

mote batch terminal is a complex com-
plexated system, requiring more complex operator procedures. One company has found that the move to a more sophisticated terminal was a relatively painless way for the user to handle RTTY data.

The company makes a point of concen-
trating on common keyboard configura-
tions. The 120 character/sec terminal is a common unit in the field in the major metropolitan areas.

The system of the future, Beaber says. This is the threshold where the difference in speed is so great, the user can't see the difference. This is the threshold where the user is the CRT terminal. But this type of terminal software capability is used by Sycor. With thousands of dollars on the line, the user has the added advantage of being able to condi-
tion a private line when quality becomes critical, usually at higher transmission speeds.

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Vt. Gets Tough With Drunk Drivers, Builds Data Base

BURLINGTON, Vt. — Some-where in Vermont, possibly at this very moment, a problem drinker is being pulled off the road, the latest in a long column of statistics — with one exception. This particular driver will be integrated into a data base on the University of Vermont campus and become part of Project Crash, an operational demonstration of a large-scale computer designed to remove drunk drivers from the state's highways.

Data on the impaired driver goes into building a computerized vehicle operator file which staff members of Project Crash can analyze on demand. The information is stored in a large-scale computer some 30 miles away; Project Crash headquarters has immediate access to it through an NCR 260 Thermal Printer terminal.

"Delays cannot be tolerated" explained Linda Flowers, chief of research and statistics. "For daily operations, we want to be key into changes in arrests, injuries, fatalities and convictions and to correlate with the base line data. We must be able to monitor any changes that result from our program," she added.

Funded by the National Highway Traffic Safety Administration, as part of the National Alcoholic Safety Action Program (Assp), Project Crash (Countermeasures Related to Alcohol Safety on the Highways) has been implemented in six Vermont counties, which house slightly less than 50% of the state's population and account for a proportionate number of drunk driving accidents and arrests. The remaining counties in the state serve as a control.

Because the program has neither the personnel nor the facilities to maintain records on a current basis, Project Crash became a part of a communications network linking a variety of data terminals to a multi-purpose time-sharing computer in the university's Academic Computing Center. The computer enables Project Crash to store and analyze different types of information.

"Ours is not the kind of operation that needs specific information on a schedule basis," Flowers pointed out. "When the director needs a particular table or fact, he wants it now," she said.

For example, when conducting seminars for judges and state's attorneys, the staff needs to have the latest statistics to report.

Simply, the terminal, a printer that generates 30 char./sec, is an economic and convenient method of making use of a large-scale computer. On-line to the system, it also offers a dynamic means of obtaining information.

Compact and quiet, the terminal sits on a desk in an office occupied by several people. Yet, because printing occurs from heat transfer rather than impact of keys against an ink ribbon the printer does not disturb others in the room.

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For many companies this complexity was compoundng problems, not solving them. If you want your computer to provide immediate verification of input, immediate response to inquiries and prompt action to requests — T-Scan terminal has the answer.

Only the T-Scan terminal reduces computer communication to pencil simplicity. The Terminal reads pencil input, converts it to computer language, and prints the results in a few seconds, all on the same piece of paper — the T-Scan transaction document.

Transaction documents are processed concomitantly through the same terminal and network by using different designs of the low cost card. Card design can be changed as new conditions warrant; the terminal hardware stays the same. You may select the hand that suits you — an electric typewriter; the computer can be three feet or 3000 miles away. And many workers can share the same terminal.

Simplicity of both operation and application is the essence of the T-Scan terminal. It gives business a data processing device that is comprehensible, fast and economical.

Life is simple again.
Markland said, "and a number of the issues indicated they were "presently using a manual accounting system which was not satisfactory." Markland published his findings in a recent issue of the Journal of Systems Management, the monthly magazine of the Association for Systems Management (ASM).

The businessmen expressed "generally favorable" attitudes toward computers, but many expressed "some skepticism concerning their feasibility," the report noted. Negative Comments

Typical negative comments on computer costs, time for implementation, job security, start-up funding and reliability, Markland listed some of the comments:

- As a small businessman, I don't understand the computer.
- I'm too small to afford, let alone use, computers in my business.
- A lot of computer systems don't work very well.

The report concluded that there was a "high degree of awareness" by small businessmen of the computer's potential. Those interviewed expressed "an acute concern for the lack of information needed" to efficiently operate businesses. While a "sizeable potential" for computer usage may exist within the small business community, Markland advised the small businessman contemplating development of computerized information systems to first "make a careful economic and operational analysis."

Such a potential user must define "whether or not the proposed application will save more than it will cost to develop," he commented. Another factor in small-business planning must be manpower, specifically whether there is adequate manpower to "successfully utilize the system after it has been developed." Research showed "economic feasibility" to be the most important element, Markland reported.

"Likely Starting Points"

Accounting and financial applications, he continued, are the "most likely starting points" for developing computerized systems, but even then, "it is unlikely that many small businessmen would be "willing to make any financial commitment... without first seeing tangible results" over a reasonable time period.

Assuming successful development and implementation, Markland said, the small businessmen expressed concern for the lack of information concerning their feasibility, the report noted.

More accurate information for decision-making "through computer-oriented management would greatly contribute to the health and growth of the small urban business," he said.

In-House Education Helps New Operators Understand Jargon

PHILADELPHIA — Day-to-day clerks who become computer operators sometimes don't understand computer jargon, but a continuing in-house education program is solving that problem, according to Gerry Boyle, DP director for U.S. Cold Storage Corp.

Boyle is currently involved in installing IBM System 3s in the company's 26 warehouses around the country, following a year's operation here. Sites start with inventory applications, and then the operators are trained on payroll, accounts receivable and general ledger. Boyle said IBM had developed some of the software he had developed, and that the software could be used by other small offices.

"Virtualy Ignored"

"The small businessman," he concluded, "particularly the small minority businessmen, has been virtually ignored in terms of computer usage."

Identifying the small businessman's "real problems" and the development of systems at a "reasonable cost" could permit such a person to use computers in business, he said.

More accurate information for decision-making "through computer-oriented management would greatly contribute to the health and growth of the small urban business," he said.

2 Packages Ready

Elsewhere in this issue, specifically in the Software and Services section, there are items of interest to small systems users.

Two packages are described in that section, both from independent vendors and both suited for general business applications.

One is an operating system for the Singer System Ten; the package gives real-time users more flexibility, according to the vendor. The other package is actually a miniaturization of Mini-Biz, which can now be used on the IBM System 32.

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PHILADELPHIA — Day-to-day clerks who become computer operators sometimes don't understand computer jargon, but a continuing in-house education program is solving that problem, according to Boyle. "I'm too small to afford, let alone use, computers in my business."

While there is no direct computer-to-computer communications now, the company is "looking at" the possibility of establishing communications with Cold Storage's parent, American Canners Industries Inc., which has a 360/20, also in Philadelphia. Boyle is responsible for the 5/1 development and installation for the Cold Storage Corp. sites.
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Key-Disk-Tape Solves Agency Problems

AUSTIN, Texas — Government agencies face increasing demands for efficiency in their operations as workloads rise, often on tightened budgets. The Railroad Commission of Texas, boasted here is no exception.

The Railroad Commission serves primarily as a regulatory agency for the oil and gas industry. It maintains records on more than 200,000 oil and gas wells that produce about $4-billion worth of raw products annually.

Maintaining production records and calculating "allowables" (amounts of hydrocarbons permitted to be taken from the ground) for the whole state imposes a heavy data processing load on the Railroad Commission. Production reports must be made monthly. Allowable schedules are issued monthly and some 600 allowable supplements are issued daily. In all, about 285,000 records are susceptible to change at any time.

The agency has fully computerized its DP to handle this volume. But entering data into the computer proved more of a problem than the main processing — at least until recently. To solve the problem, the Railroad Commission installed a new data entry system, an Inforex 1301 Intelligent Key Entry System. It consists of eight keypunch stations, at which operators, working independently, enter data from source documents directly into a shared processing and control center. Data is stored there on a magnetic disk, edited and verified before being transferred onto magnetic tape for processing in the main computer.

The Railroad Commission replaced 10 keypunch machines with the eight keystations of the single Inforex system. In addition, the agency got rid of its card sorters.

Overall savings resulting from these moves run around $700/mo. Also, a 20% smaller workforce is handling a gradually increasing workload.

The system is known as a key-to-disk-to-tape data entry system because the shared processor temporarily stores and permits editing of data before its transfer from disk to tape, ready for computer entry.

The Railroad Commission has gained greater work flexibility as well as control with its system. The general ratio of operators keying data to operators verifying is five to three, but this balance between functions can easily be changed as required without switching operators between keystations.

90,000 Students Share Computer

CHICAGO — The Northwest Educational Cooperative (NEC), a consortium of eight grade school and two high school districts in suburban Chicago, has selected a Xerox Sigma 6E computer for its member schools.

NEC serves 93 elementary schools and nine high schools, with a combined student population of approximately 90,000 as well as some 7,500 full-time and part-time employees.

The computer will replace two computers already being used by the cooperative. Initially, it will take over the tasks of payroll, student scheduling, attendance and grade reporting, accounts payable/receivable, general ledger accounting and program/cost accounting.

As a second phase in its program, NEC plans to install remote, on-line computer terminals in its member schools, linked by telephone lines to the computer.

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Used DP Market Seen Steady
ELMSFORD, N.Y. — "The market for used computers was generally steady dur-
ing the past quarter," according to a recent report by Time Brokers, Inc. Prices of 360/30s recovered somewhat from the lows early this year, and 360/40 prices are up slightly. The 128K core model is seen as a very attractive alternative" to adding extended core to a 30, the report stated.

"...360/30 market demand, created by capacity upgrades from Model 25 and 360/20 sub-model S5, is very strong. There is a good possibility that this trend will continue," according to the report.

"Large machines, such as 360/50s and 65s, have held relatively stable at their current low prices." A recent flurry of demand for 65s came from orders placed by one or two companies, and the "general long-term trend for 65s and 50s appears to be down," Time Brokers noted.

Office Dealers to Sell Computers
GRAND RAPIDS, Mich. — Cascade Data Inc. is seeking office equipment dealers as agents for its line of small computers and software programs.

"The office market is an important management tool for small businesses. ... The office dealers serve these small businesses and know their needs," observed Frank Malis, Cascade vice-president.

Supershorts
Greyhound Computer of Canada Ltd. will market Calcomp tape and disk drive systems in Canada.

Potter Instrument Co., Inc. has been awarded the development of its "Hard Coat" magnetic re-

Order of the Development of its "Hard Coat" Magnetic Recording, a co-involves coating dual-gap magnetic heads with a hard ceramic material on each side of the transducing gaps.

Data General Corp. has delivered its 3,000th Fortorgan, the Fortorgan 1200, to Action Communications Systems of Dallas. The computer will control communications for Fraschauf Corp. in its Detroit headquarters.

I/O Devices, Inc. has signed a memorandum of understanding with Omeon Taiseli Electronics Co. of Japan and its subsidiaries and Marubeni America Corp., under which Omeon and Marubeni will invest in I/O Devices and receive rights to manufacture and market I/O products.

GTE Information Systems has established its Service Division as a separate corporation which will have headquarters and training operations in Boulder, Colo.

Cybernetics has granted Cable and Wireless Ltd. a Nova 1200, 2,000, to Data Stor Division as a sales representative for America, Cybermatics' Tin Can telecom-

Randolph Computer Corp. has formed Randolph Leasing & Financial Ltd., based in Zurich, Switzerland, and Randolph Leasing Corp. in New York City, a new sales and services corporation, which will handle the ex-

Study Spots Selected Markets

New York — The value of yearly minicomputer shipments will grow by more than 200% between the end of 1971 and 1978, according to Fridt and Sullivan, a computer industry research firm here.

The value of the systems shipped during 1971 was $250 million, the firm said, predicting this would grow to $820 mil-

Iomec Prefers Mini Peripheral

Market to Plug-Compatible Fight

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Iomec Prefer Mini Peripheral

Market to Plug-Compatible Fight

WASHINGTON, D.C. — "Federal Avia-

tion Administration purchase of unac-

cquired display equipment from the Raytheon Corp. amounts to little more than stealing out the contractor at the expense of the taxpayers," Rep. Jack Brooks (D-Texas) declared recently.

"Raytheon's drive, with additional inter-
faces in the development stages, plus the Iomec peripheral solutions, magnetic tape trans-

The company markets to both OEM and end users, and has about 25/0's stronger area, he continued.

All disk products will be manufactured on the West Coast by a new, tentatively named Data Stor Division.

Iomec, Inc. of San Diego, Calif., has owned the company now employs about 170 persons in the Data Stor Divi-

RANDOLPH, N.J. — "Meanwhile," Brooks continued, "over the years, government liability to Raytheon for this equipment has risen to more than $115 million, and despite Ray-

the market segment was esti-

Mini Shipments to Grow 200% by 1978

By a CW Staff Writer

study the expansion in communications software systems as part of the overall market by 1978.

"Increased shares of the market will go to data handling, data communications and other end uses including business, transportation, typsetting, educational, and moving vehicles. Assisting these new penetrations will be a continuing downturn in average minicomputer costs."

Foreign markets have been and will continue to be important to the U.S.- based minicomputer manufacturers, the firm said, projecting a 25% growth rate in sales abroad. In 1972, the firm noted, foreign market contracted by 10%.

Flights Teacher

Flight instructor controls performance of DC-10-30 flight simulator on two Sanders Adds 300 display terminals. The units, linked to any digital C3E Electronics Ltd., Montreal, display system, will provide 10,000 malfunction lists, tables of aircraft perfor-

Notes from the Office Staff

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The Novar 5-10 Touch Tone Telephone Translator makes it possible to use the millions of Touch Tone phones around the country as remote keyboards for data entry. One has simply to call a Novar data collection station (of which the 5-10 is a part), enter information by using the phone's 12 keys, then sign off by hanging up the phone. A quick, easy, inexpensive way to a nationwide network.

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$200 Million to Be Spent

**Western Firms Rule Hungarian Market**

By Bohdan G. Szuprowicz  
Special to Computerworld

MUNICH - In all of East Europe, Hungary and Czechoslovakia are leading in the variety of Western-, Soviet- and East European-produced computers installed.

The situation in Hungary never was as bad as that in Czechoslovakia [CW, Feb. 23] but became significantly serious a few years ago when, in a rush to computerize, equipment was bought indiscriminately from 15 different suppliers in eight different countries.

Today, estimates put the total Hungarian computer population at 120 to 160 machines depending on who calls what a computer. By discounting some punched card accounting machines, often counted as electronic computers in East Europe, the lower figure is probably more representative.

**60% From West**

Among the Hungarian installations, as many as 70% by value and at least 60% by number come from the West, making Hungary an Eastern socialist country with one of the highest proportions of Western computer equipment base.

At the Budapest International Fair last May the Hungarian R-10 computer was introduced to the public, but went mostly unnoticed because other machines on display captured attention.

ICL, Honeywell-Bull and Univac are the leading Western computer suppliers to Hungary. IBM, Siemens and Fujitsu have also made their mark and Control Data is involved in long-range training of computer personnel with the Hungarian state organization Szamok. Soviet Ministries and Polish Ordas are the main socialist imports.

**Modular R-Units**

According to a recent Hungarian report Russian Rial computers are made up of modular R-units on a building block principle. Hungary, within the Rial project, specialized in the production of the R-10 which is the smallest of the Rial series.

But the Unified Computer System apparently encompasses more than the Rial series; the Videotron produced 10010B and 0010B, under license from the French CII, also fall into this category. By the end of 1971 15 such machines were built and Hungary expects to complete 200 units by the end of 1975.

The Central Physics Research Institute came up with a mini-computer of its own and the first of this series, the TPA/1, is already in production. Designed for scientific and educational use it was already successfully introduced to users in the Soviet Union and East Germany.

Negotiating with Univac

Hungarians also claim they are negotiating with Univac regarding exploitation and promotion of the TPA/1 computer, presumably in the West. Of the Western suppliers of computers in Hungary, Univac is well entrenched with about 20 machines installed and follows only ICL and Honeywell-Bull in number of installations. Significantly, most Univac installations are in the small computer category.

Another area of considerable activity in Hungarian data processing is peripherals. Here Hungarian enterprises appear to favor cooperative and licensing agreements with Western firms. Hungarian reports indicate such arrangements have been made with the French firm, Sapem, a peripherals manufacturer. They also state that negotiations are taking place with Data Products for licensing of certain peripherals in Hungary.

**Big Plans**

Hungary is struggling to define a meaningful program which will allow its industry to produce 10 computers as many by 1975 as it did in 1970.

There is also a Central Development Program for Computer Technology created by the Council of Ministers for purchase of computers and services abroad. In this case, approximately $200 million will be spent for computers and services from abroad during the current Five Year Plan (1971-1975).

Not all such appropriations, of course, will go to Western suppliers because the Soviet Union, Poland, Czechoslovakia and East Germany all have a stake in the Hungarian computer market. But if one considers the past preference of the Hungarians for Western equipment, the market is significant and a large Western equipment base is already there to help.
Those responsible for directing data communications operations know that data, to be meaningful, must be properly collected and interpreted. From our extensive involvement with users, we sense much confusion in the communication of that data—leading to costly misdirections for today's businesses. As dedicated proponents of the data communications industry, we feel obliged to provide a vehicle to replace this confusion with comprehension.

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Sponsored by Data Communications Interface, Inc., a subsidiary of Communication Trends, Inc., The Publishers of THE DATA COMMUNICATIONS USER
A Job Accounting System is only as good as its data base...

We took the approach that IBM's System Management Facility (SMF) for OS/360 and 370 was probably the best place to start. And we were right. But we found that there were many extensions which must be made to the information generated by SMF. So we made them.

First we restructured and reduced the SMF accounting data into a manageable file. Then we applied our extensions to SMF data generation, taking advantage of the SMF User Exit to provide the data validity and additional accounting information absolutely essential to a job accounting system. The result? The most meaningful and usable output reports available in any job accounting system.

Briefly, our SMF enhancements cover the following areas:

---

**Additional Accounting Data**

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- periodic accounting for online or long-running jobs
- ICL error accounting
- system down-time accounting
- integration of Accounting data
- HASP record analysis
- accountability of HASP RJE usage
- terminal job initiation data for all jobs, at both SMF recording levels

**Data Validity**

- improved AREND reporting
- validation of account codes
- SMF data editing and range checking
- restriction of TIME = 1440 entry
- IPU, data correction

**Data Collection**

- automatic collection of SMF data
- recovery of most SMF data
- alternate SMF file processing

---

Similar extensions have been applied to our DOS version of PACES, as well. And both versions of PACES are compatible, due to the identically structured data base and reporting formats.

Ours was one of the first job accounting systems. Now there are many, but they are report-oriented systems only, and ours is much more. It provides better information to start with—resulting in better reports. We are the only ones who've done it all.

A reliable and complete data base...

....only PACES has it!
Adapso Charges
Government on Defensive in IBM Case

NEW YORK - Recent pretrial testimony in the Justice Department antitrust suit against IBM indicates that IBM's requests for information from the government have put the government on the defensive in the case, the Association of Data Processing Service Organizations (Adapso) said recently.

Adapso is monitoring all of the court records filed in relation to the case and making them available to the press and the public, because it contends that the government has failed to meet its responsibilities in the area of government information. "Our regular inspection of the court docket and documents made available to us discloses that all recent court developments made public during the past two weeks, as during the past several months, continue to relate almost entirely to IBM's demands that the government produce a vast amount of documents for IBM's inspection," J.L. Dreyer, executive vice-president, said.

"The transcript of a hearing before the court, held on March 31 but not docketed or made available until June, shows that the government initially agreed to IBM's discovery. "Therefore, despite government protestations to the contrary, it was so clearly forced to reverse its original position that even Chief Judge David N. Edelstein, the judge presiding over the litigation, finally stated that the government's claim was 'certainly a position contrary to what you took approximately two weeks ago.'"

"Claims of national security privilege were thereafter interposed by the directors of Central Intelligence, the National Security Agency and the Federal Bureau of Investigation."

"Finally on June 29, 1972, the testimony of Charles F. McIntyre of the Federal Aviation Administration, Department of Transportation, persuaded Judge Edelstein to sign a modification order with respect to the government's production of documents."

Bernard Goldstein, Adapso president, said: "We are most disappointed that the government seems to be cast in the role of a defendant rather than a prosecutor. Perhaps all of this is the result of an IBM delaying tactic, in accordance with the strategy that the best defense is a good offense. "The government has conceded that there will be at least a year or more of additional pretrial discovery; no trial date has yet been fixed," Goldstein said. "One of the reasons we are so insistent that all proceedings before the court be in public, not in chambers, or undocked, or unavailable even where docked as at present, and that the press have access to what is going on in this litigation, is because we believe that with public surveillance this kind of thing would stop," he concluded.

Contracts

Documentation Inc. has received an order from Nixdorf Computer of West Germany for 1,000 M-Series card readers.

Dustracraft Corp. has received an order from Fairchild Camera & Instrument Corp. to build a 1.5M byte semiconductor memory subsystem for an IBM 3690/67.

SYS Computer Corp. has received a contract from Med Data Central, Inc. for the manufacture of CRT displays for use with Med's computerized legal and accounting research services.

Universal Technology Inc. has received a $300,000 contract from Litton Industries for electronic keyboards.

Conrac Corp. has received a $2.5 million contract to provide a Race Information Display for the New York City Off-Track Betting Corp.'s 100 betting offices.

Peoples' Pension Plans, Inc. of New York has contracted Computer Facilities Corp., Ltd. to provide DF services with respect to tax-sheltered retirement plans offered by Peoples'.
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09 Education/Medical/Legal

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11 Communications/Printing/Publishing

12 Other

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02 Data Processing & Operational Management

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05 Lawyer/Accountant

06 Engineering/Management/Scientific

07 Sales/Marketing/Account Executive

08 Librarian/Educator/Student

09 Other

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Earnings at IBM, Burroughs, Honeywell Up Sharply in 2d Quarter, Six Months

The computer industry appears to be regaining some of its strength. Judging from greatly improved second-quarter and six-month earnings reports from IBM, Honeywell, and Burroughs.

Second-quarter earnings figures show a 20% improvement at Burroughs, a 22.4% hike for IBM and a 65.9% rise at Honeywell compared with the same period last year. Although earnings for the second quarter and six months last year were not spectacular, real progress was made, with Burroughs setting records for the six months, and IBM posting new highs in earnings for both periods.

IBM's second quarter earnings reached $312.2 million, or $2.70 a share, up from $255.1 million, or $2.22 a share, in the same period last year. Revenues rose 21.8% to $2.36 billion, a record for the second quarter, up from $1.94 billion in the 1971 period. Honeywell showed earnings of $151.0 million, or 81 cents a share, up 65.9% from $91.1 million, or 52 cents a share, in the 1971 quarter. The figures incl-ude tax credits of $1.6 million in this year's quarter and $881,000 in the 1971 quarter. Revenues rose to $531.0 million, up 10.3% from $462.2 million.

Burroughs' second-quarter earnings rose to $20.1 million, or $1.09 a share, compared with $18.9 million, or 92 cents a share in the year-ago period. Revenues reached $232 million from last year's $225.8 million, a 12% climb.

For the six-month period also showed strength. At IBM, earnings rose to another than $461.9 million, or $3.34 a share, an increase of 22.1% above last year's $350.9 million, or $4.41 a share. Revenues reached $4.68 billion from $3.81 billion a year ago. But sales and rental revenue increased 8.6% in the first half, compared with a 14.4% gain in 1971's first six months.

Installations of new DP equip-ment continued at a "relatively high level" in the second quar-ter, President T. Vincent Lear-ay noted, adding the propor-tion of equipment sold rather than rented "was considerably higher in the second-quarter and six-month periods than the de-pressed level of the comparable periods of 1971." This factor contributed significantly to the year-to-date increase of 22.7% in total gross income," he noted.

Honeywell's six-month earn-ings rose 63.7% to $26.3 million, or $4.41 a share, from $16.1 million, or 92 cents a share in the 1971 period. Revenues were up 7.6% to $960.2 million from $892.7 mil-lion.

Chairman James H. Binger called the earnings picture "heartening" but cautioned that the rate of improvement was af-fected by the slow first half last year. "The outlook for the balance of the year is good," he said. The computer business is "strong worldwide and is con-trIBUTING signif-ICANTLY to im-proved earnings."

Net computer bookings showed solid improve-ment, he said, "reflecting among other things the strong accep-tance of the new product lines, the Series 6000 and Series 2000."

Burroughs set records for six months in earnings, revenues, orders and backlog. Earnings rose 16% to $32.5 million, or $1.52 a share, from last year's $27.9 million, or $1.52 a share. Revenue for the first half totaled $472.6 million, a 9% rise from last year's $433.9 million.

Worldwide incoming orders for the six months reflected a 28% increase over 1971, according to President Roy W. MacDonald. Orders for DP products and systems were "particularly strong," he noted, showing a 52% increase over the 1971 period.

Total worldwide backlogs are at record levels, 29% above those at the beginning of the year, he said.

Acquisitions

Planning Research Corp. has agreed to acquire Inmarco, Inc., a 80%-owned subsidiary of International Data Research Inc. for about $5 million.

Information Dynamics, Inc., a Chicago-based computer soft-ware company, was acquired by World Management Systems, Inc., a computer management and holding company. Information Dynam-ics will operate as a wholly owned subsidiary.

Richard C. Jones has acquired a majority interest in Program-matics, Inc., a subsidiary of Ap-pied Data Research Inc.

Cubic Corp. has purchased the facilities and property of West-ern Optics with an option to acquire the California firm. Western Optics is a supplier of optical equipment for commer-cial and defense markets.

Graphic Sciences Inc. has agreed to acquire the remaining minority interest in Hidco Interna-tional Inc., a computer leasing firm, which is presently a 49%-owned subsidiary of Graphic Sciences.

United Computer Facilities Inc. has agreed to acquire the controlling stock in Toitec Corp., which will be known as UCF of Washington Inc.

International Health Sciences Inc. has acquired a 79% interest in Systems for Advanced Infor-mation, Inc.

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For more information on the 18/30 Disk Monitor System, write us today. We'll also send you your very own length of rope and a book, "Knots and Splices." All very handy for people at the end of their rope.

Earnings Higher at 4 Service Firms

Four service bureaus have reported improved earnings in recent periods, and two, National CSS, Inc. and United Data Centers, Inc., have revealed record first-quarter operating revenues and earnings.

Earnings at National CSS, Inc. totaled $214,071, or 17 cents a share, for the first quarter. The 1972 figure includes a $50,000 extraordinary tax benefit. Revenues rose to $3.8 million, a 49% improvement over the $2.5 million registered in the same period last year.

Improved earnings and revenues were attributed to the installation of new leased computers at the data centers in Stamford and Sunnyvale, Calif., productivity improvements and the general improved economy.

$50,000 Tax Benefit

United Data Centers' earnings reached $144,076, or 10 cents a share, compared with a loss of $214,071, or 15 cents a share, in the first quarter last year. The 1972 figure includes a $50,000 extraordinary tax benefit. Revenues rose to $2.2 million from $1.9 million in the year-ago period. The 1971 loss, according to President Bernard Goldstein, was a result of the treatment as a pooling of interest of the Dyna-

Keydata Corp.'s nine-month earnings before taxes and non-

Sterling Computer Systems, Inc. concluded the year ended March 31 with earnings of $348,126, or 17 cents a share, compared with a loss of $173,991, or 8 cents a share, for the entire first half of 1971.

Revenues rose to $5.4 million from $4.4 million a year ago.

$1.5 million

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