Mitra Tells Air Force Amdahl 470 Up to 130% Faster Than 2M-Byte 370/168 in Tests

By Patrick Ward of the CW Staff

ANN ARBOR, Mich. - A 2-byte Amdahl 470 is performing various batch and on-line jobs 30% to 130% faster than a 2-byte IBM 370/168 in tests at the University of Michigan Computing Center, according to Michael Alexander, senior systems research programmer there.

The Amdahl machine is halfway through a free, two-month evaluation period [CW, July 2] and "looks good," Dr. Robert C.F. Bartels, the center's director, said.

"At this point it looks almost certain the 168 will go," he said, even though a 2-byte 470 has its standard 6-channel costs somewhat more than a 2-byte 168 with eight channels.

The center has set processing-time usage charges 50% higher for the Amdahl than the IBM machine to take advantage of the 470's greater speed, Bartels said.

As far as programmers can tell, the Amdahl 470 is a faster 168, Alexander said. For example, he explained, the 470 needs more memory, long-precision, floating-point operations than short-precision ones, but both are "much faster" than either short or long precision on the 168.

The 470 is running under the Michigan Terminal System, a virtual operating system (Continued on Page 2)

Users Who Ended Contracts Say Honeywell Tried to Take Specs

By Nancy French of the CW Staff

ST. LOUIS - Two users here have reported Honeywell service personnel attempted to remove wiring diagrams and related maintenance documentation from their computer centers in apparent re- culation for cancellation of maintenance contracts.

The users who reported the incidents said they came as a complete surprise. The had always believed things such as wiring diagrams belonged to them as owners of the systems, and Honeywell had never informed them otherwise.

Now Honeywell's St. Louis district service manager is contending they are the property of Honeywell and must be surrendered to the vendor after service contracts are terminated, the users said.

Lou Fox, vice-president of Emco Com-
IBM Says Telex Case Unworthy of Review

By E. Drake Lundell Jr.

WASHINGTON, D.C. — The Telex case "raises no issue worthy of review" by the Supreme Court, IBM declared last week in a filing with that court. In the filing, IBM basically supported the decision of the appeals court, which found IBM not guilty of monopolization while attacking the Telex filing to the Supreme Court.

The appeals court decision [CW, Feb. 51], IBM said, "is clearly correct. Moreover, if either of its two basic rulings is valid, its antitrust judgment must stand."

First IBM supported the appeals court contention that the market had to be defined more broadly than it was by the

Small Site Now

Program Palace

(Continued from Page 1)

which JCL statements apply if, for example, a program has to be run in two or more partitions.

Finally, the system permits the programmer to make "patches" in the machine-level code while the program is running. This makes very close to the console debugging practiced by programmers on earlier machines.

Once a change to a running program has been tested "live" through the patching facility, the programmer knows it will work and can make the corresponding change in the program's source code, Parrish noted.

Aids Management

Even while the system is providing programmers with these facilities, it is also accumulating accounting statistics for management including, for example, a daily turnaround transaction summary by partition.

This particular report covers such things as number of jobs and number of Abends, CPU time, 1/0 counts, phases and transi-

district court, which initially handed down a judgment against IBM.

The appeals court "correctly concluded" that "IBM was subject to a far broader range of competition than that embraced by the district court's narrow market definition," IBM said. "That decision is correct and is not in conflict with the decision of any other federal court."

Furthermore, "the court of appeals' decision corrected a novel and dangerous architectural feature of the Sherman Act," IBM said. "By combining condemnation of ordinary competition in the form of new products and optional short-term leases with an artificially narrow market definition framed in terms of the products of a single company and copies thereof, the

district court opened the door to unjustified treble damage litigation which would suppress ordinary competition and flood the federal courts with groundsless claims of monopolization," IBM added.

In addition, IBM claimed the appeals court finding that the firm had not engaged in predatory practices was also incorrect. IBM said:

"No federal court has ever suggested, much less held, that the introduction of new products and optional one- and two-

year leases constituted a violation" of the antitrust laws, IBM said.

In fact, the purpose of those laws is "to encourage, not suppress, competition on the merits, such as the introduction of new products and new options in terms of trade," the IBM statement said.

The Telex appeal to the Supreme Court, IBM said, "has some degree of arguable merit by repeatability of the findings of the district court."

In its petition [to be heard by the Supreme Court], Telex ignores the district court's findings against it and presents instead a series of magazine articles, speeches and other nonrecord statements to a statement of "facts" which is... wholly inconsistent with the record and findings" of the other courts, IBM stated.

Mitre Praises 6180 for Security

(Continued from Page 1)

commentary on how each of the ma-

chines matched up with the desirable security features.

While the B700 has "many pleasing architectural features that are desirable to implement a secure system," it also has serious weaknesses, the report noted.

As far as the 370, "the two major problems... are lack of adequate access vari-

ations and the availability of only two execution domains," the report said.

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"These two features are the ones that security relies most heavily upon, making the 370 architecture one of the most difficult upon which to implement a truly secure computing system," the report stated.

"Architectures for Secure Computing Systems" is report number AD-0009 221, available for $4.00 from the National Technical Information Service, 500 Spring Hill Road, Commerce, Springfield, Va. 22151.
Users Report Honeywell Attempts to Repossess Specs

(Continued from Page 1)

"I was talking with one Honeywell fellow in my office one day, one of my programmers came in and said another guy was out on the floor trying to take out our wiring diagrams. I told him to stop him." 

Amid this confusion, Fox said, "I got a phone call from my warehouse manager who said he had a certain number of diagrams they were going to send me. There was a lot of hurry to send it. And he gave me a number, and it was on the far side of the building, and I told him to get it to me as quick as he could."

Fox's attorney has contacted Honeywell's St. Louis district service manager to instruct him to return the documents, but at press time they had not been returned.

"As far as I'm concerned those materials belong to me and they stay with the machine," he said.

"What really bothers me about this whole thing is [Honeywell] never wrote me a letter or came in and said I had to get my own wiring diagrams. It just came in and stole them," he said.

"How can a company that has a salesman in here trying to sell me a new system stop so soon as to do a thing like that? As far as I'm concerned, forget Honeywell," he said.

Ron Fehr, at Pevey, described the incident in his installment similarly. In his case, however, no documents were lost. As Fehr told it, he had never had a maintenance contract with Honeywell, but had arranged for preventive maintenance service every fourth Wednesday morning, when the installation was almost 20,000 anyway. The dairy had been paying about $60 per hour for this service with a two-hour minimum, Fehr said.

Pevey had decided to handle maintenance this way when its first H-200 was installed in 1966, and it had been a good decision, Fehr said.

"About two months ago, on a Wednesday morning, a Honeywell engineer came in. I didn't call him, but thought one of my programmers had, which would have been all right," he said.

"During the course of conversation he told me no one had called, but that he had heard we signed a maintenance contract with Honeywell and he was there to pick up my wiring manuals," Fehr said.

"Then he asked me that I was going to stop him if he tried to take them, and he could just call his boss and tell him that."

The second day, left without the manuals, Fehr said:

"Then on Friday, the engineering manager and the sales manager of Honeywell's St. Louis branch office came out to talk about it and I told them that if they wanted the manuals, they would have to take them by force. Then I told them I would call the police. They haven't come back since," he said, but added something:

Court Denies Request To Delay Xerox Sale

WASHINGTON, D.C. - Judge June Green has denied the injunction sought by John C. McWilliams and Associates, Inc. (JMA) to delay the sale of Xerox Corp.'s Data Systems Division [CW, Aug. 27].

JMA asked for the injunction to ensure that Xerox made adequate provisions to honor its contract with the Seventh Church of the Seventh Day Adventists here.

JMA still hopes to file suit against Xerox, according to its attorney, Douglas J. Rykhus. JMA contends Xerox failed to make adequate provisions to honor the contract.

The Seventh Church contracted JMA as a systems integrator of the Sigma 9 and 560 it ordered from Xerox.

About two weeks later, on the Wednesday morning when Fehr expected Honeywell field engineering in for preventive maintenance, no one showed up. "About 10 o'clock I called the response center - the 800 number - to find out what happened and it was referred to the St. Louis district office."

"The engineering manager informed me I couldn't get service through the regular channels anymore, and that I had to be handled through his office on a special basis."

"The thing that got me mad about that was that his personal services are not available 24 hours a day or on weekends when I might need them," he said.

Since this difficulty occurred, Fehr said he has been depending on Raytheon for service on a per-call basis and has had no difficulties.

Fehr still has his wiring diagrams, he said.

Telephone calls to other Honeywell users in other locations indicated no other installations had experienced any difficulty over wiring diagrams.

Spokesmen from Burroughs and IBM confirmed that maintenance manuals, wiring diagrams and the like go along with their systems and are the property of the owner of the system.

According to Honeywell policy, a Honeywell spokeswoman said, maintenance manuals, operation manuals and instruction manuals are furnished with the systems and are the property of each customer.

"Honeywell, owns all manuals which contain wiring diagrams and manuals on the theory of maintenance," she said.

She disputed the contentions of both Fox and Fehr, saying "Honeywell personnel did not attempt to steal any documentation."

According to information provided to her, there was no attempt to divert the OPM manager at Efco-Elder. Engineers went to the site for the specific purpose of discussing the matter of the wired documents, she explained.

"They left without the manuals when Fox threatened to call the police because they didn't want to make more of the matter than had already been made," she said.

Engineers did take the documentation from the second Emco site, where the computer was purchased under a contract which gave no rights to customers to retain documentation.

"Without a maintenance contract, the form couldn't be allowed to retain the wiring diagrams," she said.

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After Two Decades in Lab, CBE Making March Forward

(Continued from Page 1) and funded by the National Science Foundation (NSF) [CW, Aug. 20]. Insofar as instruction is concerned, use of the computer in secondary education was found in 21.8% of all schools surveyed by AIR. At the college and university level, computer-based education (CBE)—an encompassing definition of computers used to supplement or provide the basis for educational instruction—is "very wide-spread," according to Martin Rubin, a research scientist at Human Resources Research Organization (Humro), and co-author of Learning Alternatives in U.S. Education: Where Student and Computer Meet.

Although updated figures of incidence rates in higher education are unavailable (no study has been undertaken since 1970), the instructional use of computers is "really a blossoming field that's working its way down the educational hierarchy," Rubin stressed.

Dr. Alfred Bork, chairman of the Association of Computing Machinery's Special Interest Group on Computers in Education (SigCue) and professor of physics and information and computer sciences at the University of California at Irvine, agreed there has been "impressive growth" in the educational use of computer systems, considering the problems in dealing with an application area as complex as education.

"It's spreading rapidly enough to be a creation and use material is a slow process. I'm not worried about the [modest] rate—the relatively slow pace is only natural. There's a tremendous amount to learn," Bork admitted.

"The extent of [computer] use will ultimately be determined by judgments of appropriateness by subject experts, and the correctness observed from records of student performance and costs which must be met...by the schools," according to Karl Zinn, a research scientist and associate director of the Merit computing network at the University of Michigan.

The major problem shared at all educational levels is one of cost, even though it is well known, as Zinn stated, that "computing costs are decreasing even while capabilities are increasing."

At the level of secondary education, according to the AIR report, "the future of instructional computing is intimately related to the resolution of problems involving system costs, the exchange of information, utilization of available resources and individual and institutional receptivity to innovation."

Present limitations imposed by current computer technology at the university level, according to Zinn, "are the unreliability of processing lengthy verbal constructions and the inability to interpret bodily gestures or vocal intonation."

"But one of the most difficult problems remaining is lack of organization of the subject matter," Zinn stated.

Resources Not Utilized

But in U.S. public secondary schools, that problem is not at the forefront because of the small amount of time schools have had computing power. "Out of the 1,459 individual computer-based courses listed by respondents, 43.2% were in mathematics. Obviously, there has been no major breakthrough of instructional computer applications into other than the more traditional math-oriented subjects," the AIR report found.

A major problem, then, is to use the resources now available. "The technological capability is here, it needs to be used," according to Karen Duncan, director of the office of computer resources at the College of Dental Medicine of the Medical University of South Carolina.

"The psychology of getting school faculties to author course programs is the next breakthrough that has to come in [computer-aided education]," Duncan explained.

470 Testing Faster Than 370/168

(Continued from Page 1) system on which the computing center originally designed for an IBM 370/67 and now uses on its 168.

Installing this operating system on the IBM-compatible Amdahl 470 took about two man-months with no discontinuities for the center's users. The only significant problem arose in converting the error-recovery aspect of the operating system, but that was not a major roadblock, Bartels said.

If the university had switched to a Burroughs or Control Data Corp. machine, the conversion effort probably would have cost about $2 million dollars, Bartels said.

The 470 currently offers Fortran G and H, Watfie and PL/I as well as Algol, Snobol, Basic, Assembly, AFL and several others, he said.

The computing center expects "no problem" in interfacing either new IBM hardware or software products to the 470, Bartels added.

"We are looking forward to attaching IBM 3350-compatible fixed-disk drives to the 470 next year," he said.

As yet, the university cannot fully utilize the 470 because it has no more trouble interfacing its IBM-compatible peripherals to the Amdahl 470 than it had linking them to the IBM machine, Alexander said.

The Amdahl system provides the maintenance engineer with considerably more information on the internal state of the machine, he added. However, this information is not particularly useful to the user interested in computer performance evaluation, he said.

The 470's communications-handling ability is "no better or worse" than the 168's, except that the Amdahl system comes with 16 standard channels, he noted.

As yet, the university cannot fully utilize the additional power of the 470 because of a lack of memory due to a heavypaging load, Alexander said.

The university brought in the 470 knowing the 2M-byte capacity was insufficient for its range of applications, but "fully expects to go up to 4M bytes in a few years," he added.

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Exhibit Crowd-Pleaser for 10,000

By E. Drake Lundell Jr. or the CW staff
TOKYO - Exhibitors and attendees alike were pleased with the exhibition in connection with the recent Second U.S.-Japan Computer Conference here.

More than 10,000 people visited the crowded exhibit area in the Tokyo Prince Hotel, with 1,000 of them registered for the full program of exhibits and seminars.

The quality of the exhibit attendees was kept high by a stiff exhibit entry fee, according to Ted Lorber of California Computer Products, Inc., (Calcomp) who was in charge of the exhibit part of the program.

Because of the high exhibit-only fee (about $100), the attendees were highly qualified and not the general public, he indicated.

And the reaction of the exhibitors seems to bear out that contention.

At Basic IV, for example, President Al Constantinides said the firm was seeing highly qualified contacts, even though it had not yet signed a marketing agreement in Japan.

"Japan is the one area of the world where we are not active at the present," he said. But because of the reaction from the attendees at the show, he indicated the firm would soon sign a marketing agreement with a Japanese trading company or manufacturing firm to market the firm's small business system there.

Calcomp also used the show to help launch several disk products into the Japanese market and indicated that prospects at the show showed particular interest in the Trident floppy disk system as well as larger disk units on display for OEMs.

At Tally, which has been marketing its printers in Japan for some time, Robert Maddy, international marketing liaison director, said response at the show had been "tremendous" and the firm could expect some sales directly from its participation.

At the same time, the mainframe makers, which included IBM, Japan and NCR plus the homegrown Fujitsu and Hitachi, packed attendees into their constantly crowded booths with demonstrations mostly of peripheral gear.

While there were some products on display for end users, primarily from the mainframe makers, most of the equipment on display was directed at OEMs, particularly by the U.S. firms that hope to crack the Japanese market by having their units integrated into other systems that would be marketed and maintained by Japanese firms.

"We really can't afford to have a maintenance operation here," one explained. "But the market is growing so fast we don't want to be left out of the action."

At the same time, there was little on display that would be considered new to U.S. audiences.

The minicomputer revolution was also largely absent from the displays. No large U.S. minicomputer makers, with the exception of Basic IV, participated and few firms emphasized mini products.

"We really can't afford to have a mini- frame is apparently still the way to go here," one U.S. marketing man said. "But that will probably change in a year or so."

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**System Design Must Account for Public Attitudes**

By E. Drake Lundell Jr.

**TOKYO** - The attitudes of the public at large may well determine the future direction of science in society must be "taken into account" when designing new systems, Dr. Lewis M. Branscomb said at the Second U.S.-Japan Computer Conference here recently.

"Research in computer science and technology must ultimately relate to the welfare of the rest of the world in which we live," Branscomb, IBM's vice-president for research, told the 1,000 attendees at the meeting.

At the same time, computer science draws on many different disciplines and many of the "really promising" ideas in the field arise "unexpectedly from the fields of basic science," Branscomb said.

Therefore, "it is important to recognize how much computer science draws on the humanities and to emphasize the importance of keeping computer science and the information sciences in good contact with their colleagues in other disciplines," he added.

Dr. Lewis M. Branscomb

**Nature of Systems**

With the exploding growth of new technologies, their application has to be guided by systems considerations which should take into account research on the nature of systems, he said.

"In the past, the rate of progress in semiconductor device technology has been so great that research projects on new systems architectures have been in danger of obsolescence on economic or technological grounds before they have had a chance to mature," he stated.

The proper choice of architectures, however, "is essential because these architectures must be guided by increasingly complex application environments," he said.

Therefore there is a need to devote research and development energy well beyond the immediate impact of these new technologies and to inquiring about their "ultimate potential and which are likely to be made obsolete before they mature," he said.

"We must ask ourselves - putting economics aside for the moment - what ultimate potential and which are likely to be made obsolete before they mature," he stated.

"For each of the promising radical ideas that come to mind, we should ask a similar question: Does this idea have the potential of ultimately being far superior to today's technology?" Branscomb said.

In that way, scientists will avoid putting too much effort into the development of technologies that do not have great ultimate potential and which are likely to be made obsolete before they mature," he said.

Over the past 25 years, improvement in performance has averaged around 40% annually in computer science, Branscomb said, noting that "in this circumstance, it is well to look as far ahead as we can in making technological decisions."

**Consideration for Users**

Another element in the strategy for research in the computer field is to be guided by the user's point of view, according to Branscomb.

"Indeed, when we think about the economics of computing, we must think of the user's total cost, not simply those attributed to his data processing installation," he said.

"As information-processing technology matures, the user will be more and more involved in the case with which new applications can be developed, installed and upgraded, in system availability and reliability, in recovery after failure and in the reduction of complexity with which he must contend," he predicted.

Therefore the technology of terminals will become extremely important, Branscomb said, as will the techniques needed to make the system transparent to the user.

"The complexity of systems and their scope will have to be balanced against the ease of use of the system," he said.

Computer scientists will also have to get involved with behavioral questions in the future, Branscomb said.

"If information systems of the future are to adapt to people and to human institutions rather than continuing to force people to adapt to machines, then systems architecture and the man-machine interface must be understood in their human dimensions," he said.

So far the "behavioral aspects of information science have not yielded to any significant research progress," he said.

"Nevertheless, computer scientists can and must avoid what are ultimately behavioral questions; they show up in the design of data structures, in the engineering of a storage hierarchy, in the specification of the speed and size of cache memory, in allocation of resources to control in a computer network," he said.

"Impartial judgments are confirming our own analysis - we have a Mass Storage System that outperforms the 3850 by a significant margin" - an interview with Arthur Hausman, President of Ampex Corporation.

Mr. Hausman, what's so new about the Ampex TBM Mass Storage System?

A. The TBM Mass Storage System isn't being announced as a "new product" but delivered our first system in July of 1972. It's been a very successful installation with better than 98% uptime.

Q. Then why haven't we heard more about the Ampex Mass Storage System until just recently?

A. We had two very good reasons for biding our time. First, we wanted to evaluate and test our first installed system under actual field conditions. This system has demonstrated high reliability and superlative performance. Our second reason for waiting was related to market conditions. Now we think mass storage has reached maturity. IBM's announcement of the 3850 Mass Storage System has confirmed our judgment that the time is ripe for MSS.

Q. How does IBM's announcement of the 3850 Mass Storage System affect your position in the mass storage market?

A. Quite frankly, we are related that IBM has joined us in the market. Interest in MSS technology has skyrocketed since they announced the 3850. IBM users are evaluating the performance of both the Ampex and the IBM systems. And from what we hear, the impartial judgments are confirming our own analysis - we have a system that outperforms the 3850 by a significant margin.

Q. Can you compare the two systems?

A. I'm not sure. IBM designed the 3850 to serve a very specific segment of their own equipment users. The 3850 is designed for a batch environment, operating under OS/VS. If you're in that category, you're a potential customer.

On the other hand, the Ampex TBM Mass Storage System satisfies a much broader range of applications. It's both interactive, OS/VS and multitask environments. It contains both IBM and non-IBM mainframes. TBM Mass Storage System users have a much wider range of operational and growth options.

Q. Speaking of other mainframes, how will those manufacturers meet the IBM challenge in the area of mass storage?

A. We hope they'll do it with the Ampex TBM Mass Storage System. We feel we offer OEs better performance and field-proven hardware, which would place them ahead of the competition.

Q. What about interfacing the TBM Mass Storage System to other mainframes?

A. We have interfaces for CDC, DEC and IBM 360 and 370 OS/VS. Others are under development.

Q. What is your opinion regarding the future of mass storage systems?

A. We know there is a substantial market for on-line mass storage systems. Offline tape and disk libraries are incommensurable with the power available today in the present state-of-the-art in a given area.

"Nevertheless, computer scientists can and must avoid what are ultimately behavioral questions; they show up in the design of data structures, in the engineering of a storage hierarchy, in the specification of the speed and size of cache memory, in allocation of resources to control in a computer network," he said.

**Impartial judgments are confirming our own analysis - we have a Mass Storage System that outperforms the 3850 by a significant margin** - an interview with Arthur Hausman, President of Ampex Corporation.

**An interview with Arthur Hausman, President of Ampex Corporation**

Q. Mr. Hausman, what's so new about the Ampex TBM Mass Storage System?

A. The TBM Mass Storage System isn't being announced as a "new product" but delivered our first system in July of 1972. It's been a very successful installation with better than 98% uptime.

Q. Then why haven't we heard more about the Ampex Mass Storage System until just recently?

A. We had two very good reasons for biding our time. First, we wanted to evaluate and test our first installed system under actual field conditions. This system has demonstrated high reliability and superlative performance. Our second reason for waiting was related to market conditions. Now we think mass storage has reached maturity. IBM's announcement of the 3850 Mass Storage System has confirmed our judgment that the time is ripe for MSS.

Q. How does IBM's announcement of the 3850 Mass Storage System affect your position in the mass storage market?

A. Quite frankly, we are related that IBM has joined us in the market. Interest in MSS technology has skyrocketed since they announced the 3850. IBM users are evaluating the performance of both the Ampex and the IBM systems. And from what we hear, the impartial judgments are confirming our own analysis - we have a system that outperforms the 3850 by a significant margin.

Q. Can you compare the two systems?

A. I'm not sure. IBM designed the 3850 to serve a very specific segment of their own equipment users. The 3850 is designed for a batch environment, operating under OS/VS. If you're in that category, you're a potential customer.

On the other hand, the Ampex TBM Mass Storage System satisfies a much broader range of applications. It's both interactive, OS/VS and multitask environments. It contains both IBM and non-IBM mainframes. TBM Mass Storage System users have a much wider range of operational and growth options.

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But Not as General-Purpose Robots

Process-Control Systems to Bring Major Cost Savings

By Edward J. Bride

TOKYO — While there may be no such thing as a general-purpose robot, the state of the art in programmable process-control systems, including visual parts inspection, is about to bring major labor cost savings to industry.

This was the consensus of speakers at several different sessions oriented toward industrial automation, pattern recognition and artificial intelligence during the recent Second U.S.-A. Japan Computer Conference here.

The goal of some of this research in these fields is to do a better job than human beings in such complicated areas as designing earthquake-proof buildings and automating traffic flow. But a spin-off benefit has been reductions in work forces during a period of worldwide inflation and unemployment, though the employment picture is less severe here than in much of the rest of the world, according to speakers.

An "upgrading of manpower use," rather than replacing people, was the result of installing a digital computer to control three batch reactors used to produce lubricating oil additives.

As described by Glen R. Nieman of Fisher Controls Co., the system improved product quality, eliminated waste and brought higher productivity than older methods of manually adjusting temperature or having humans decide on the proper time to add raw materials and control pressure in these batch reactors.

"An additional benefit," said Nieman, was the release of head operator time which was previously used to back up a busy operator.

Gaining Wide Acceptance

Generalizing on the results of several case studies in industrial control, Nieman said computer-based process control systems are gaining "wide acceptance in industry." He credited several factors for this gain: improvements in computer performance, reliability and ease of programming, coupled with reduced hardware costs.

He also claimed computer controls in such industries as pulp and paper and ammonia plants are "becoming a routine matter," with production efficiencies and pay-out periods which are commonly "less than a year."

Looking more to the future, representatives of the Stanford Research Institute's Industrial Automatich Project said many techniques for visual inspection — combining cameras and computers — "are ready for cost-effective factory applications."

These techniques would be used both for parts recognition to assemble parts for assembly lines (separating them from common conveyor belts, for example) and for inspection to remove rejected parts from such conveyors.

A large, time-shared Digital Equipment Corp. Decsystem-10 was used to develop digitizing algorithms to perform such inspections as assuring the proper placement of holes in lamp bases, the sizes of holes in piston connecting rods and the location of handles on various parts to facilitate robotic movement of these parts.

While a large computer was used to develop these algorithms, they can actually be run on a PDP-11 mini with 25K of 16-bit core memory, according to researchers Gerald J. Agin and Richard O. Duda.

They noted in defining a "standard material-handling problem," such as the acquisition of parts from a moving conveyor or belt that, if the "identity, location and orientation of a part are all accurately known," a manipulator "can be programmed to acquire the part without the need for sensory feedback."

However, maintaining this control is expensive, and "the versatility of an industrial robot can be greatly increased by adding visual sensing." In using a camera placed over the belt and in using their algorithms, the amount of additional work which may properly be called "programming" is "fairly small," they said.

Their display-based interactive methods for designing and reprogramming the vision system require "significant computer facilities" only during the design phase, they said.

The resulting procedures, they continued, can be executed on minis, proving "indispensable in introducing these methods into the factory."

In a separate panel session, Agin cited the benefits of such artificial intelligence research, noting there are important social implications for workers in the factory.

"Industrial manipulators," he said, can work "in hostile or unsafe environments, lowering accident rates and health problems." They can take over "dull, repetitive assembly line work," he continued, "freeing workers to operate, train and maintain the machines."

Furthermore, rather than eliminating jobs, he said, artificial intelligence in industrial applications "can permit the same number of workers to produce a better quality product."

Meir Weinstein, of the California Institute of Technology, commented that there is no such things as a "general-purpose robot," and even when the intent is to construct a machine which can learn about its environment, this will result in performing a specific task.

In a paper on "graceful degradation" of the traffic control system on Osaka, Japan, Toshiharu Hasegawa of Kyoto University cited the need for operator training as well as hardware trade-offs.

In the latter case, for example, he noted that the mean time between failures can be less important if the mean time to repair is very short.
**Will Improve Human Knowledge**

**DP Seen Important Tool in Building Future Society**

By E. Drake Lundell Jr.

TOkyo — "Information technology will be an indispensable factor in contriving the post-industrial society to come," Bunichi Oguchi said at the Second U.S.-Japan Computer Conference here.

At the same time, information technology will be a powerful tool "to rationalize industrial operations and services" to construct an active and wealthy society, according to Oguchi, who is director of the Research Bureau at Nippon Telegraph and Telephone Corp.

The most prominent feature of postindustrial society will be that it is based on service industries, Oguchi said, such as commerce, trade, finance, transportation, recreation, health care, education and research.

The quality of that society will be evaluated by the available services and the amenity of life and not just by the production capacity of that society.

"Further, the growth of the postindustrial society will be governed through planning and forecasts, based on theoretical knowledge," he said.

"In this type of society, information and knowledge will occupy supreme positions, and computers and telecommunications systems will be indispensable tools for major activities such as service rationalization, forecast making, social planning and decision making," Oguchi predicted.

Therefore, while other technologies tend to improve the physical environment for man, Oguchi said computer and telecommunications technologies possess the potential to "directly influence and improve human knowledge and understanding, decision making and cultural patterns."

Specifically, Oguchi said computers should be used to rationalize production by economizing energy and resource consumption and by increasing the reuse or recycling of materials in short supply.

With this effort, computer systems should also be used to eliminate environmental pollution factors which accompany the production process, Oguchi said.

But, since the postindustrial society will be based more on the service to the people of that society than on production figures alone, there will be a wider role for computer systems, he said.

For example, computer systems will have to be used to improve current medical services and to provide a greater degree of security for a nation's people through such things as improved traffic systems aimed at reducing or preventing accidents.

The key to accomplishing all of this will be a "data communications system utilizing computers, telecommunication networks and terminals," he said.

Such a system will permit real-time decision making by gathering, recording and processing a wide range of data concerning such activities as medical service, traffic control and environmental pollution surveillance.

And, while an effective data communications system can also be used to provide such services, he also said it would "consume a smaller amount of resources and energy and, moreover, cause less environmental pollution," than any other system for delivering the same services.

"In the future, if information technology is to be uniformly infused into society, it will be essential to utilize it with social science as well as various other sciences and technologies," he noted.

"With the appearance of a global data communication system, people around the world should be able to communicate and cooperate with each other, thereby maintaining a uniform flow of information and knowledge," he said.

However, he noted that information technology is a double-edged sword.

"If not properly controlled, it can be misused to invade the privacy of others, to build a controlled society or even cause terrible disorder in case of possible system failure.

"Two advantages of networks derived through information technology must harmonize with human behavior and social customs if it is to be accepted in a society.

"In the future, the society will be based on the production of information and knowledge and, at the same time, to clarify both these facets of information technology to the outside world, he concluded.

**On-Line Library Search**

**Having Unexpected Results**

By Edward J. Bride

**TOKYO — Aside from the expected benefits of making better use of libraries' time, the use of on-line search methods has had some unanticipated side affects, according to several speakers at the Second USA-Japan Computer Conference here.**

"Two researchers from the Lockheed Palo Alto Research Laboratory, in examining the goal of "providing the public with on-line access to large bibliographic data bases,' found a relatively elite segment of the public was getting that access.**

"The key research question all of this will be a "data communications system utilizing computers, telecommunication networks and terminals," he said.

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The case for Tape Management Software.

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In short, UCC ONE means better control and greater efficiency. And, if you're considering MSS, effective tape management will be required before the conversion in order to insure smooth, error-free change-over and continued operation.

The case for tape management software: It's never been stronger than it is right now.
The comptroller general's office concluded the government is, therefore, spending millions of dollars to "sustain efforts beyond their scheduled completion dates and to operate and maintain standard equipment acquired for those systems, without achieving expected benefits, and to retain older computer equipment because of system delays."

The funds were being used to design, develop and maintain interim and non-standard systems operating on that equipment and to supplement saturated computers with commercial computer time, the comptroller said.

For example, the report said the Naval Ordnance Command will spend some $17 million through fiscal 1975 to sustain the development of its Management Information System for Ordnance Production Activities beyond its scheduled full implementation date of December 1968.

This expenditure, the comptroller noted, is the result of difficulties encountered in the multilead activity concept and the redirection of effort after centralized system development.

Major Stumbling Block

Standardizing, the Navy's major stumbling block, has not been successful "because Navy management allows local commanders to influence unduly the design of standard systems," the report said. This has resulted in the modification of development or systems which fit local needs, but do not conform to the Navy's overall DP objectives and needs, the report continued.

"The department's management has not been effective, primarily because of the underlying problem of command influence," the comptroller said. "That problem remains under a new management system initiated in 1970 and will not be resolved until the department more strictly controls systems development."

In accordance with this finding, the comptroller forwarded several recommendations to the secretary of the Navy, suggesting he:

- Require that system studies be documented and that the documentation be part of the equipment justification.
- Review the Navy's information and DP systems to identify, on a system-by-system basis, those actions needed to establish a program for upgrading and standardizing each system.
- Issue to the commands more definitive guidance for making economic analyses.
- Amend his instructions for redesign to require that the alternatives of redesign be considered as part of any economic analysis made to support system projects.
- Require the director of the Navy's DP management to establish monitoring procedures to ensure compliance with redesign policy.

Improving man's effectiveness through electronics...
**Labor Department Forecasts**

**DP Employment Prospects to Grow 30% in Next Decade**

By Toni Wiseman

WASHINGTON, D.C. — Employment prospects in the data processing field will continue to grow through the 1980s, according to a recent report from the U.S. Department of Labor.

Job openings in the computer field will show an overall growth of 30.4% in the next decade, the report predicted. The continuing growth in employment demand can be attributed to four major factors, the report said:

- **Growth in the number and types of computers and peripheral equipment manufactured.**
- **An increase in the number and types of organizations using computers or computer services.**
- **Continued development of new computer uses.**
- **Increasing emphasis on computers as tools for management information.**

A recent Bureau of Labor Statistics (BLS) study estimated approximately 765,000 systems analysts, programmers, computer operators and DP equipment repairmen were employed in 1970 — a rise of several hundred percent since 1960.

While growth will continue, it will be slower than during the past decade. A total of 997,600 jobs will be available in 1980, an increase of only 30%.

The BLS report predicted a 60.7% increase in systems analysts' jobs and a 41.6% increase in programmer openings, while 1980 requirements for operators was projected at 275,000, an 83.3% increase.

Employment of keypunch operators is expected to decline to 235,000 in 1980 from 300,000 in 1970. The 22% drop will reflect a reversal of the employment trend which has prevailed for this employment category during the past two decades, the report said.

**Changes in Job Functions**

An increasing demand by computer users for sophisticated systems able to do a variety of new things will force changes in the job functions of computer workers, the report said.

**International Harvester found more...**

International Harvester, which recently selected a large quantity of these models for use by its dealers for remote data entry and local processing in Service Parts Inventory Management and Dealer Systems network adaptability.

If your business system involves tying your Model 742 terminals together in a complete communications network, TI offers the Model 700 TPS® Terminal Polling System.

Designed around the TI Model 960 Series minicomputer, the TPS automatically calls remote "Silent 700" data terminals, collects data stored on the magnetic tape cassettes, and logs the data on magnetic tape in a format read-able by a host computer. This scheme gives users a complete, cost-effective data capture network for distributive data processing and communications.

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Your Serve, Telenet

The advent of a packet-switched communications service by Telenet Communications Corp. [CW, Aug. 27] marks the first commercial offering of a value-added network. But it also makes users wonder about the benefits.

The basic concepts were spawned by the Department of Defense Arpa network, and this type of network is now also operating in several European and Asian countries. But most of the existing nets are operated by government and/or research agencies serving mostly the same type of noncommercial users.

The Telenet service seeks to transfer the promised benefits of packet-switched networks to business users. One of the primary selling points is the idea that the user pays only for the amount of data actually transmitted (in addition to certain fixed monthly charges).

Another less tangible benefit is the promised more efficient utilization of communications links. The packet-switching people believe their transmission methods, which restructure the data into packets, are more efficient than conventional transmission modes.

What all this means to the average data communications user is still highly problematical. It is somewhat disconcerting that the first Telenet user turned out to be a time-sharing vendor with a high-volume data network.

While this type of "user" certainly is among the most innovative, the needs of a time-sharing vendor bear little resemblance to a company that operates a nationwide network for its in-house data communications needs.

Another yet-unanswered question relates to the benefits of packet-switched services for the smaller, low-volume data user. This is the user who may want control over his own DP equipment and lines, but does not have the volume to justify the operation of a private network.

Telenet now provides the opportunity for users to weigh these and other trade-offs. Unlike other new carriers, Telenet seems to have the blessing of AT&T, which restructure the data into packets, are more efficient than conventional transmission methods, which restructure the data into packets, are more efficient than conventional transmission methods.

Whether this Bell cooperation will change if Telenet proves to be a popular answer to current data communications user is still highly problematical. It is somewhat disconcerting that the first Telenet user turned out to be a time-sharing vendor with a high-volume data network.

Your Serve, Telenet

Wrong Comparison Chosen To Illustrate Discrimination

Joseph T. Rigo (Aug. 27) has chosen the wrong comparison to illustrate discrimination or non-discrimination in DP based on sex.

Rather than comparing women who stay on the job with men who stay on the job, he should compare women who "drop out of the labor force for 15 or 20 years to raise children" with men who "drop out of the labor force for 15 or 20 years to raise children."

Sauce for the gander is seldom sauce for the gander and, anyhow, how can he be so dense as to believe that raising children is not labor?

Montrose, N.Y.

Names Cause Problems, Too

In regard to Alan Taylor's column, "Why Does BankAmericard Still Regard Us as Numbers" [CW, Aug. 20], I completely agree the system does not seem to have enough checks, but I disagree with his solution of using names.

An account card is a necessity to keep account transactions separated. The account number, with proper checks against it, will help keep the accounts straight.

If account names were used on the card, even with a check digit or character, you would easily run into problems because many people have the same name.

If account names are used without a card, you have problems like I have had when I received bills for Ronnie Gardner, Ramond Gardner, Ronald Gardner and Rodney Garner. You may also have problems if your initials and last name are the same as someone else's.

Another case is when a name can be spelled different ways by different people, such as my wife's. The name "Sheryl" can also be spelled "Cheryl," which might cause someone else to be billed. My wife's name can be signed Mrs. Rodney Gardner, Tamond Gardner, Ronald Gardner or Sheryl Gardner.

Rodney T. Gardner

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Rodney T. Gardner

Itemized Lists Third Alternative

In considering the question of price marking in supermarkets, have any of the systems in use or under development considered a third alternative — itemized lists? It seems as though it would add minimal cost to the system to provide customers with an itemized list of purchases by brand name, item, size and cost.

On the other hand, it would provide the customer with an advantage in comparing costs, since corresponding purchases could be compared on the basis of factual data.

San Jose, Calif.

No Price Marking Back Then

When I was young, my mother would take me to the grocery store. She would tell the clerk, item by item, what she wanted and the clerk would get each item from behind the counter.

When he had gathered all of the items, he would write the price of each on a sack, add them manually and tell me the mother the total.

None of the items was price marked, and no one objected. What's all the fuss about?

Waltham, Mass.

Letters to the Editor

"Your Honor, Our Software Agreement With Catamore Was Too Vague to Be Enforceable — How Can You Give Anybody the Moon?"

September 10, 1975

COMPUTERWORLD
Back to Civilization

The scientific and engineering user community, especially that part which still requires or at least entertains over the giant number currently not being planned to talk again about Seymour, the last of the Neanderthals. Soon to be extinct, like the saber-toothed and the cave bear, Brether Cray has walled from enforced hibernation and is stirring rural Wisconsin to frenzied activity. Indeed, conversation about the Cray One is supplementing gossip about new dairy cow productivity records in Chipewa Falls, the metropolis of the region. I've been reliably informed that the proposed relocation of the giant-computer activity from that small community urban center to nearby EIR Model (population 471) was canceled by The Hero Of Livermore when he found out the city fathers were planning to pave the cross street.

Joking aside — and I really do think his projects have less chance to remain rural recluse — Cray has been responsible for some destruction and the partial construction of the majority of giant machines in place around the world. In white hat applications like numerical meteorology, in darkest nuclear weapons country, his Control Data offspring are dominant. I'm genuinely delighted to see his group surface in the community, especially that part which still requires the intervention of hopelessness that comes to someone who is trapped when acting as a contract negotiator.

Part 1 of this series on users' legal rights [CW, July 30] discussed the circumstances under which computer contracts could be set aside, thus lifting the restrictions to the rights of a computer user which are included in most preprinted, vendor-created contracts.

These circumstances included when the contract was obtained by giving the user incorrect information; when essential information was omitted; there was a lack of intention to be bound by the contract terms; and/or there was a failure to warn the unknowing customer of the dangers potentially involved in the use of the vendor's system.

Part 2 [CW, Aug. 13] translated these legal concepts into the computer procurement environment, dealing with the position of the user during the vendor's proposal and use stages.

Part 3 [CW, Aug. 27] dealt with the types of remedies that are available, including benefit of the bargain, being made whole and other legal actions. Computers are not desirable in themselves. No one hangs them on art gallery walls or buys them for themselves. Few manufacturers sell computers for themselves. No one hangs them on art gallery walls or buys them for themselves. Few manufacturers sell computers for themselves. Few manufacturers sell computers for themselves. Few manufacturers sell computers for themselves.

What could be wrong, however, is to see Cray, like Amdahl-san, eschewing architectural novelty and wild new Elsi [extremely large-scale integration] components. The great thing about Stretch, the IBM venture into supercomputers of 15 years ago, was that the designers tried far-out transistors, the look-ahead concept, from cooling and early overseas installation, all in one giant gamble.

"Ah," you may say, "but Cray and Amdahl are poor old codgers, not rich like IBM!" In a sense that is true, of course: even with money from Livermore and from Fujitsu respectively, neither man has had a bottomless purse to dip into. Neither did Dunwell and the other Stretch vendors just as well are. It seems to me that what Cray should be offering Livermore and other prospective customers, and Amdahl should be offering the Japanese, is far-out architecture, not economy.

The American taxpayer, I believe, would in the very long run get a reasonable return on his involuntary investment through the old Atomic Energy Commission and Sid Fernbach's Livermore shop, if it produced crazy new stuff like a hopped-up associative processor or the first hologram memory, rather than dull software-conserving extensions of current very big machines.

The giant-computer museum at Livermore is the more disappointing, therefore, to see Cray and Amdahl-san, eschewing architectural novelty and wild new [extremely large-scale integration] components. The great thing about Stretch, the IBM venture into supercomputers of 15 years ago, was that the designers tried far-out transistors, the look-ahead concept, from cooling and early overseas installation, all in one giant gamble.

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The giant-computer museum at Livermore.

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Software Protection Seekers Need Sound Perspective

By Roy N. Freed
Special to Computerworld

Many computer people and lawyers make the common mistake of trying to examine the question of software protection in isolation, separate and apart from other legal considerations. In doing so, they run the serious risk of proposing solutions that themselves introduce adverse legal consequences. Let me develop this point concretely.

Many people insist that statutory copyright is the proper— if not the ideal— measure for protecting software programs from unauthorized use. However, that protection reposes in the "writings" that reflect the program steps, such as the coding listings, and possibly also the magnetic tapes and other computer media for generating signals reflecting the coding to the computer, if and when courts hold those media to be "writings."

It does not repose in the process or series of steps themselves. This distinction is important because software program suppliers are not content to make their money charging for copies of the copyrighted work, as traditional publishers are.

Instead, they try to market their wares by pricing separately each program per CPU and by trying to restrict disclosure of the nature of licensed programs to others.

Incidentally, the first of these marketing tactics requires, for its legal foundation, that the supplier be able to control the use of the media, which copyright ownership alone does not support. The latter effort might be fundamentally inconsistent with statutory copyright.

Supplier Invites Adversity

With the statutory copyright approach, the supplier invites a number of adverse legal consequences for itself and its customers. The legal arrangement focuses on the media or the documentation or both.

It is thus very similar to book publishing and identical to the distribution of motion picture printers, which involves the leasing of copyrighted items. As a result, the transactions between supplier and user might become subject to sales and use taxes applicable to the charges.

Similarly, the computer media and documentation might be treated as tangible personal property subject to annual taxes, where they are in effect, on that type of property. In some states those taxes are imposed at high rates.

If the supplier purports to sell the software programs, which is rare, then the tangible personal property taxes fall on the customer.

More normally, where suppliers purport to have ownership of the computer media and related items, they are exposed to the tangible personal property taxes. That financial burden can be considerable.

Many suppliers which rely on retained ownership of the computer media as an adjunct to statutory copyright also might expose themselves to the need to qualify to do business in the states in which their licensees operate.

From a Legal Viewpoint

This corporate qualification involves expense and administrative burdens that would be preferable to avoid. The licensor of software that asserts ownership of the computer media might be in the same situation, for these tax purposes, as a lessor of computer equipment.

This brief review indicates why it is advisable to devise a software program marketing strategy from a sound legal perspective. Alternative means for legal protection for software programs well might be available that have protective qualities at least equal to those of statutory copyright but escape some, if not all, of the taxes described above.

The trade secret route to protection is a good example. It is based on the position that "software program is a process for producing information. The customer is licensed to practice that process. Rather than being the very heart of the transaction, the computer media and documentation can be deemed to be merely means for communicating the nature of the processes involved, equivalent to the technical manual normally furnished the licensee of a manufacturing process."

If that approach can be established effectively, the taxes and corporate qualification burden discussed above could be avoided.

It is important to recognize that some apparently simple transactions in the computer industry can run the risk of major economic and legal impacts. All transactions deserve to be examined carefully early in the game. Many adverse consequences can be avoided by foresight.
those dividing-line things, like the Vietnamese war, where people tend to choose up sides, and get locked in, and quit thinking about the underlying issues any more. Advocacy, not reason, results.

You may not recognize it as a fundamental question, the way I've asked it. Let me ask it some other ways, then:

Which is better, Assembler language code or high-level language code?

Which is better, special-purpose code or general-purpose code?

Which is better, clever code or readable code?

Beginning to get an image? There's Byron Iconoclast, speed-demon coder, who can spout machine language instructions at the drop of a core dump, solve all the tough problems in your shop including some you didn't want solved, work hours so odd no one is sure he's ever there except for the spouse and working programs he leaves behind—and give everyone else the feeling they're inferior to him in some way they don't understand.

And then there's Samuel Smoothdog, document extra-ordinaire, who writes programs which are so readable that he had one published in the Saturday Evening Post, has memorized the programming standards manual and quotes it at the drop of a design review, wears suits imported from IBM-Poughkeepsie and gives everyone else the feeling that he's going to be their boss some day regardless of who's superior.

Back Up a Little

Now that we're on the same wavelength, let's back up a little ways. This is a "Project Which Failed" story, right?

Well, considering that probably most computing shops have a zoo full of Byron Iconoclasts and Samuel Smoothdogs (and, what's even more interesting, probably need them both!), where's the "Project Which Failed"?

Well, try to picture the worst possible environment for Byron Iconoclast and Samuel Smoothdog. Got the picture yet? Assign them to the same (gasp — now you've get it!) project? From here on out, the story pretty well writes itself.

Clever Devil Toy Co. does more computing work than one might think. Besides the bookkeeping and payroll and all that jazz, it has some market analysis programs and some design code and even a simulation or two. And enough smarts that it occasionally bids on, and wins, a software contract. It helps balance out the industry's cyclic loading of people and computers, top-level management says.

All of that makes both Byron Iconoclast and Samuel Smoothdog, Clever Devil employees, very happy. It gives them some interesting projects to get involved in.

One of those projects, though, was an unmitigated disaster. It was a hardware analysis program, subcontracted to Clever Devil by a leading auto manufacturer, General MPG, which had more computers than it had people to configure them.

The purpose of the project was to analyze the General MPG shop, both hardware and software, for effectiveness by inserting software probes at various sensitive points and measuring microengstroms and nanocuries and drawing some automated graphic pictures of who was doing what to whom within the system.

Tricky stuff, but important, and worthwhile, and a veritable salivation stimulator for the Byron Iconoclasts of the world.

Off West Byron

Well, off to work went Byron. I mean that literally. It's not just that Byron flew off to Battle Creek to study General MPG's installation first hand. It's more that he did his analysis during production time at the General MPG computer consoles, his sleeping in the General MPG staff meetmes, his coding in a previously graffiti-free area of the General MPG Executive Per- son's Room — and he even tried to enter the General MPG sancrosanct Advanced Styling offices in order to use his graph- ics consoles for some system modification work.

At any rate, what happened next was quite predictable. To (Continued on Page 22)
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Efficiency or Maintainability? Choice a Subjective One

(Continued from Page 19)

put it automatically, Byron was recalled. General MPG had had it up to its hood ornaments with Byron's tie-dyed tee shirt, open-necked taffeta shirts and Adam's apple-length hair (front and back).

Clever Devil was told to either uphill Iconoclast or uphill the contract. It made the obvious decision.

The Plot Sickens

However, and here is where the plot sickens, Clever Devil was in real manpower trouble. It was in the midst of simulation and market research studies for a possible pre-Christmas announcement of a toy Soyuz-Apollo spacecraft kit, and every person on its programming staff was already lashed fast to the coding pads. Byron's return was welcome enough, but how do we replace him back at Battle Creek?

You, of course, are way ahead of me in the plot line. You know that Clever Devil is going to pick, by some indefinable process, Samuel Smooththog to replace Byron, right?

And off went Samuel into the halls of General MPG.

There were some good things and some bad things about sending Samuel to Battle Creek. The good things were that they loved him there. Samuel was to General MPG as the installation of a Pepsi-Cola sign would be to a spot 800 miles north-east of Timbuktu.

Samuel did his analysis at the desk provided for him by General MPG, his thinking in the General MPG staff meeting, his coding on official General MPG coding pads, and he did right by both the General MPG Executive Person's Room and the General MPG Advance Styling offices. In short, he was, in a personal sense, a Computing Godsend.

But there were also the bad things. I don't know how to tell you this, but you can't ask a high-level language man to tinker with an operating system. You can't ask a general-purpose man to service nanosecond-dependent interrupts. You can't ask a readability man to write intricate solutions to intricate problems.

To be brief, Samuel's coding was on the task's technology. It was too much for him, and the standards manual didn't show him a way out.

To make matters worse, by the time Clever Devil, General MPG and Samuel Smooththog (in that order) realized that fact, it was nearly too late. Sam had destroyed all of Byron's original efforts as unmaintainable, unengener-purpose and unreadable. When the second recall occurred, Clever Devil was really right back at ground zero. And it had proven the old adage — you can't make a sow's ear out of a silk purse.

But that didn't fulfill the General MPG contract.

It was lucky for Clever Devil that hardware analysis was what it had contracted to do. I mean, if you fail totally, and do nothing, then you haven't hurt the company you failed to satisfy except in the pocketbook. Its hardware runs just as it did before, and its accounting algorithms were negotiated by any changes (fortunately, Samuel Smooththog's revisions were well-documented and easy to sort out.

That hunk of philosophy didn't really help General MPG, or Clever Devil, but it was all they had.

The contract was defaulted, and the project failed.

Now, I'm going to give you a little quiz.

Which is more important, efficiency or maintainability?

Which is better, Assembler code or high-level language code?

Which is better, special-purpose code or general-purpose code?

Which is better, clever code or readable code?

You have 60 seconds to answer. Oh, and before you start, these are not yes or no questions. I want an essay response.

Start.

Putting Cart Before Horse

The nonproductive arguments over certifying or licensing so-called "data processing professionals" have wasted enough of Computerworld's valuable space. I circulate quite widely among the working computer community and I've never had a discussion on this topic with an individual who believed such certification makes any sense at this point. And this includes many holders of the Certificate in Data Processing who uniformly have gotten certified just in case it might mean something to someone else.

It is putting the cart several miles in front of the horse to play at certifying before knowing such a thing as a "data processing professional" exists. It would surely be possible to certify that individuals are "Fortran Programmers," "Cobol Programmers," "hardware monitor specialists" and so forth, but to insist we must be "professionals" insults those among us who think we are tradesmen, artisans or hourly laborers. If skill tests existed covering a dozen or more of the crafts needed to use real computers in productive environments, then (perhaps) a practitioner who had passed all of the individual tests might qualify to be called something like a "master" of the computing trade. And after several hundred had qualified as "masters," they could decide who would have to bear the label of "professional." Please, let's get some professional roots, get to something worthwhile — or at least to something that won't distract the people at work. The issue of the number of angels that can stand on the head of a pin is still open for resolution.

Michael F. Morris

Mildred the Mugger Lauded

Joseph T. Rigo's account of "Mildred the Mugger" and her professionalism (CW, Aug. 20) was brilliant! Not only that, it was beautifully written. Why doesn't Computerworld get Rigo to quit hiding his light under a bush and become a regular columnist for CWW?

Lawrence F. Wyant

Efficiency or Maintainability? Choice a Subjective One

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Thereupon a typical VS installation will be increased 15-30% as a result of LIBRA's effective balancing of partition priorities.

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Efficiency or Maintainability? Choice a Subjective One

Now... Power/VS Job Accounting

by Jasper

"Jasper does it all" and does it better...

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Job Turnaround and Queue Time Statistics

and a Power/VS report that tracks jobs from reader start to printer stop including RJE activity.

VS Paging Activity

including page faults and deactivation time for every job and step. A Paging Analysis report shows which jobs mixes cause high paging rates.

A Computer Chargeback System

~a report generator that lets you 'do it your way' ~repeat calling capability that overcomes the problem of elapsed time variations in a multiprogramming environment ~zero-out capability for shops that operate as a zero cost center

Letter to the Editor

Certification of Dpers

Putting Cart Before Horse

The nonproductive arguments over certifying or licensing so-called "data processing professionals" have wasted enough of Computerworld's valuable space. I circulate quite widely among the working computer community and I've never had a discussion on this topic with an individual who believed such certification makes any sense at this point. And this includes many holders of the Certificate in Data Processing who uniformly have gotten certified just in case it might mean something to someone else.

It is putting the cart several miles in front of the horse to play at certifying before knowing such a thing as a "data processing professional" exists. It would surely be possible to certify that individuals are "Fortran Programmers," "Cobol Programmers," "hardware monitor specialists" and so forth, but to insist we must be "professionals" insults those among us who think we are tradesmen, artisans or hourly laborers.

If skill tests existed covering a dozen or more of the crafts needed to use real computers in productive environments, then (perhaps) a practitioner who had passed all of the individual tests might qualify to be called something like a "master" of the computing trade. And after several hundred had qualified as "masters," they could decide who would have to bear the label of "professional." Please, let's get some professional roots, get to something worthwhile — or at least to something that won't distract the people at work. The issue of the number of angels that can stand on the head of a pin is still open for resolution.

Michael F. Morris

Mildred the Mugger Lauded

Joseph T. Rigo's account of "Mildred the Mugger" and her professionalism (CW, Aug. 20) was brilliant! Not only that, it was beautifully written. Why doesn't Computerworld get Rigo to quit hiding his light under a bush and become a regular columnist for CWW?

Lawrence F. Wyant

Chicago, Ill.
NEW YORK -- Shipping Intelligence, Inc. has a complex function: keeping track of 100,000 shipping containers a year. It pinpoint's the location, contents and destination of any container or traces a container's movements during past voyages.

Before containerization, shipping companies tracked ship voyages; now they track fleets of containers. New logistical problems presented by container shipping have resulted in sophisticated control systems that can be best managed by computers.

Shipping Intelligence, founded 10 years ago, provides a variety of management programs tailored to the needs of the shipping industry. Its president, Sydney Pi Levine, is a computer consultant specializing in the marine industry.

The economics of containerization makes it important to know the status of every container used by a shipping company. Because all shipping companies lease all or part of their containers, the most effective container control system is one which is able to identify how many containers are not being utilized.

"If we can help a shipping company reduce its container fleet by 100 unnecessary containers, we can save it at least $73,000 a year in rental and storage costs," Levine said.

"Used in T/S System"

The container control program was designed for use in a time-sharing system linked to a data base maintained on the National CSS, Inc. network. The nature of ship operations makes time-sharing the most effective system for the job, Levine said.

One customer is Northeast Marine Terminals Inc., a major terminal in Brooklyn, N. Y. serving both conventional and container ships.

Despite its special requirements, containerization has proven a boon to the carrier of the public and its customers.

"Cost and time of movement are important," Levine said. "Containerization has speeded the process at every stage and reduced costs."

The combination of container shipping and computer controls now allows a ship to reach a terminal and load and unload in a new load the same day. Cargo delivery is expedited in hours rather than days. Labor costs are minimized all along the way. Steamship lines get more productivity out of each ship and manufacturers can ship goods more economically.

"After all, dockworkers are the people who must supply the computer with accurate information and then use the reports the computer can produce," he said. "So we keep our program close to the traditional methods of recording shipping material as possible."

"With on-line access to this data North-
The system supports retrieval of purchasing history, quotes and outstanding orders and requisitions. It contains an integrated receiving module to update the open order file and includes interfaces with both accounts payable and inventory systems.

Reports from the system include a purchase order/purchase requisition register, input and output audit reports, expediting logs, buyer/vendor analysis and blanket order registers.

Vendor and commodity ranking by dollars placed, a vendor directory and mailing labels are also produced, a spokesman noted.

Written in ANS Cobol, APS II has been implemented in 128K bytes in an IBM OS/VS environment on a 370. The system ranges in price from $50,000 to $75,000 depending on options selected. Decision Concepts is at 280 Park Ave., 10017.

Major System 2000 Enhancement To Include Recovery Facilities

AUSTIN, Texas — Phase I extensions to System 2000’s current save/restore and rollforward facilities will be available in Release 2.80, scheduled for delivery during the second quarter of 1976, according to the vendor, MRI Systems Corp. Features being added to the data base management system are upwardly compatible in the release and will be available to new as well as existing customers.

The extensions include:
- Program-initiated rollback/restore.
- Checkpoint/restore.
- Program-terminated rollback/restore will allow executing System 2000 natural language, PL/I message or PL/I batch programs to terminate, roll back and restart update transactions. Auto/rollback/restore will protect System 2000 data from user program Abends and OS failures. With this facility, System 2000 will recognize any data base damaged by abnormal system or user program termination and initiate a back out of the effect of all update transactions in process at the point of failure.

Where Am I?

Checkpoint/restore provides the PL/I message and batch program user with facilities to capture an image of the data base at any point during a program. The user or the data base administrator (DBA) may roll back to a predefined checkpoint and restart from there, MRI said.

As with save/restore and rollforward, the recovery facilities may be enabled and disabled for each data base, allowing the DBA to limit recovery logging to update sensitive data bases only, such as those supporting on-line data entry systems.

System 2000 is currently operational on IBM 360s and 370s under OS, VS1 and VS2, Univac’s 1100 series under Executive II, and Control Data Corp.’s 6000, Cyber 70 and Cyber 170 series under Scope, Kronos and NOS.

Currently the basic System 2000, of which Release 2.80 will be an update, is available for $30,000. MRI Systems can be reached through P.O. Box 9968, 78766.

On-Line Programming Supported by ‘Taps’

NEW YORK — Users building on-line programs can do their work “largely independent of communications monitor, data base design and terminals used” by using the Terminal Application Processing System (Taps), according to the vendor, American Computer Software Clearinghouse, Inc. (ACSC).

Taps includes routines to handle those functions common to all on-line applications. It also allows a data element dictionary which makes data file formats transparent to the user, a simplified macro language, a generalized batch mode on-line simulator and a facility for document generation, ACSC said.

Screens in Hours

User experience shows useful and usable CRT screen programs can be created in “a matter of hours” and reach production status on the first application in “approximately one-third the time originally estimated,” the vendor claimed.

Taps works under all versions of IBM’s CICS and the OS and VS versions of Tcsm. The VS versions have been optimized to make most efficient use of the IBM paging algorithms, ACSC said. The “real” version can reside in 48k bytes of main storage.

The package can be purchased for $25,000 or leased for $750/mo from ACSC at 2 W. 45th St., 10036.

Fortran Extended For DG Nova Users

VANCOUVER, B.C. — The Fortran Ex- tended Subroutine Library from F.E.S.L. provides users of Fortran IV on Data General minis with byte/string handling, arithmetic including double-precision integer support and efficient operations including a facility the vendor labeled an extensive Cobol-type edit.

Use of the library routines can result in a 7K-byte reduction in program size because of more efficient I/O, the company said.

A permanent license is available for $500 from F.E.S.L. through P.O. Box 48254, Benton Station, V7X 1A1.
ASIT/INQUIRY is an IMS DB/DC query language that operates completely as an interactive Message Processing Program. The design of ASI/INQUIRY is such that the structure of the data base is transparent to the user. Moreover, one need not have familiarity with DL/1 segment logic or the complexities of multi-pathing. Extremely rapid response time is assured.

MAJOR HIGHLIGHTS

- End-user oriented
  - Easy-to-use language
  - Requires no knowledge of IMS
  - Comprehensive diagnostic messages
- Rapid response time for even the most complex queries
- Dynamic priority scheduling to maximize system performance
- Availability of default as well as user-defined screen formatting

ASI/INQUIRY has been fully operational for over six months, and is currently installed in multiple sites here and in Europe. A number of seminars on ASI/INQUIRY will be held in major U.S. cities in the near future. Watch for announcement of the seminar schedule, and plan to attend the one near you. However, if you want to start answering "What if..." immediately, call or write today for further information.

Applications Software, Inc.
Corporate Offices
21515 Hawthorne Boulevard
Torrance, California 90503
(213) 542-4381
Almost by accident, users stumble upon interesting and apparently useful options in their language processors. In a letter accompanying this article, Souerwine said it "bothered" him that his IBM sales representatives "never mentioned the [Total] option's existence... Even after we became aware of [it], we could find very little on it in the IBM-supplied technical information support manuals.

"This experience makes me wonder how many more such enhancements are readily available and easy to use."

By David A. Souerwine
Special to Computerworld

In general, I/O tasks in PL/I programs are executed by library subroutines called from compiled code. We had heard, however, that the Total option in IBM's PL/I optimizing compiler can provide in-line code, under certain conditions, to optimize these operations. Being somewhat skeptical that the option would really impact I/O performance significantly, we devised a test keyed to data sets being accessed or created as consecutive, sequential and buffered.

These are the standard default attributes for files declared as either input or output. All tests were conducted on an IBM 370 Model 145 running under OS/VS1. To check out input optimization, a file with 50,000 records, 100 bytes each, was created on a 2314 disk drive with a block size of 3500. Both the "Move" mode (data transfer from external storage to the variable named in the read statement) and the "Locate" mode (data transfer from external storage to an input buffer through the use of a based variable) were tested using the input file declared with and without the Total option.

A program representing the pure overhead resulting from execution of file opens, file closes, DO loops, etc. was run eight times, with the mean and confidence interval being determined for each combination. This process yielded a 95% confidence interval about the mean for each of the four combinations was tested, including the best possible and worst possible execution times for each combination.

At this point, using the statistical confidence intervals, the longest overhead was subtracted from the fastest execution, and the shortest overhead was subtracted from the slowest execution for each combination. This process yielded a 95% confidence interval with the end points representing the best possible and worst possible execution times for each combination.

The "no Total"/Move mode is at least 100% slower than the Total/Locate mode, and possibly as much as 204.2% slower (mean indicates 144.9% slower). Even disregarding the Locate mode, the no Total/Move mode is at least 58.7% slower than the Total/Move mode and possibly as much as 106.3% slower (mean indicates 81.0% slower).

The remarkable fact is that, for a program using files with the above characteristics, there is no trade-off involved in declaring the file with the Total option. That is, this option is "free" to the programmer and does not necessitate changing any syntax or logic code.

The Total option cannot be specified for Vsm data sets, files reading Optical Mark Read data, or device-associated files. In addition, Total assumes no file attributes will be merged from any I/O statements or the OPEN statement.

Similar results were obtained in creating a file with 20,000 records, 80 bytes each, on a 2314 disk drive with a block size of 1650. The no Total/Move mode is 150% slower than the Total/Locate mode, on average. The no Total/Move mode is 86.1% slower than the Total/Move mode, on average.

Souerwine is marketing information systems coordinator for the Beach & Lomb Softens Division in Rochester, N.Y.

Software House Backs CDC User

PITTSBURGH, Pa. — Users of Control Data Corp. mainframes can enhance the efficiency of some very specialized operations with one package from Cyber Associates, Inc. and improve the handling of one class of business problems with another.

The Program Optimization Package (POP), designed for the hardware capabilities of CDC 6000 series CPUs, consists of a polynomial evaluation routine and a simultaneous equation solver. Cybersort is a high-speed stand-alone or Fortran callable sort program, with report generating facilities.

The Polynomial evaluation routine within POP evaluates the wave front equation in less than 2 usec/term, the vendor said. The simultaneous equation solver requires no extra buffers and allows unpacked matrices, the spokesman added.

POP is particularly suited for use in all curve-fitting applications, he noted, adding that the routines in the package are available separately; the polynomial routine going for $1,500 and the simultaneous equation solver for $1,425.

Cybersort accumulates user-specified fields, takes subtotals and totals and prints all headings and footings.

The sort program, working in core or from file to file, allows an unlimited number of sort keys and subtotal fields. This combination sort-report writer is available now for $25,000.

Cyber Associates is at 3512 Fifth Ave., 15213.
Keane Observations

'80-Hour Rule' Backs Project Control

By Don Leavitt

September 10, 1975

By the time "high-growth" areas, especially methods for improving the analysis and design process. These are particularly important, Bracken said, noting a recent Department of Defense survey showed 64% of software errors stemmed from these areas.

The course is designed to familiarize technical managers with the software engineering methods available today, including structured programming, structured analysis (a Softtech technique), top-down design, implementation and testing and new approaches to managing the development process, Bracken said.

The enrollment fee for each seminar is $300. The Conference Co. is at 797 Washington St., 02160.

Attention will be focused on the "high-leverage" areas, especially methods for one of the best known examples of this situation, when scheduling of the system is out of the hands of the programmer waiting for a test shot.

But having user department personnel unavailable to create test data or to evaluate the results of a test shot — if in either case that support was part of the project plan — is an equally valid example of resources that are effectively nonexistent, Keane said.

It has become almost a commonplace to stress the need for written communication, but the newsletter added another pointer in that respect: reports should be prepared on a regular, continuing basis, even if a form is used and it is an exception report of items that have missed deadline.

On major projects, Keane recommended use of an objective third party who stands apart but maintains good working relationships and communications between the developers and the user.

Even written reports won't always avoid another problem — the subjectivity of project staff personnel in estimating the degree to which their particular assignments have been completed.

The classic approach — though invariably the wrong one, according to Keane — is to measure project progress by yardsticks, such as actual vs. budgeted man-days, or by the subjective best guess of the personnel involved.

These measures are too elastic, Keane said, adding "a much more preferable technique is to remove all doubt from the measurement function by imposing 'all or nothing' rules on it."

The Concepts and Techniques pages are intended to serve as a clearinghouse of ideas to make use of programs — and the programmers themselves — more efficient.

Reactions to Souerwine's evaluation of the PL/I feature he "stumbled upon" are welcome, as are descriptions of other ideas readers have found helpful in their own coding efforts.

Contributions should be no more than 1,000 words long, and double-spaced, typed copy would be most appreciated.

With the "80-hour rule" every task in a system development, regardless of the size of the total system, can be quantified in measurable work units that do not exceed 80 hours of effort. Regardless of the nature of the task, it must be divisible into units of work not longer than two man-weeks, Keane said.

The virtue of the rule is obvious, the newsletter went on. First, it makes manpower assignments very straightforward.

Second, by segmenting large jobs into a string of small work units, it assures — at the outset of the project — a thorough and thoughtful step-through of every element in the total system.

Thirdly, it totally eliminates guesswork in measurement. The task, at the end of 80 hours, is either finished or it's not.

"How applicable is the rule?" Keane asked rhetorically. Totally, it answered. "In fact, one of the best measurements of the initial project work plan, and its orderliness and completeness, is the attempt to block it out into discrete work assignments not exceeding 80 hours each."

"With minor effort, you should be able to do it. If you cannot," the newsletter warned, "you are in for the type of project management problems that keeps fatalism alive and well in the software development profession."

Copies of The Consultant are available from Keane, 36 Washington St., 02160.
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the Hewlett-Packard
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The unique multi-terminal RJE system that increases the capability of IBM and CDC computers.

32 on-line terminals for:
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HEWLETT PACKARD

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Syntech Modem Suits For Multivendor Nets

ROCKVILLE, Md. - The ESP-201 modem from Syntech Corp. is a Bell 201-compatible unit that is said to be especially suited to networks using more than one vendor's modems.

The ESP-201 automatically senses the interface requirements and provides the necessary response, the firm said.

For example, when switched to a dial line, it will automatically provide fast turn-around, when switched to an auto-dial line, it will automatically provide the answerback tone, or when switched to a Bell modem, it will automatically provide the necessary handshake interface.

Additional features include built-in diagnostic testing, data quality indicator, status indicator lamps, manual busy-out switch and a call abort timer.

The ESP-201 costs $1,350 or $67/mo on a two-year lease with deliveries beginning in November from the firm at 11810 Parklawn Drive, 20852.

DCS Adds Short-Range Sets

DANBURY, Conn. - Data-Control Systems (DCS) has introduced two short-range data sets intended for large facilities or campuses where twisted-pair cabling is available.

Transmission ranges of up to 10 miles are possible, depending on wire size and data rate, the company said.

The SR-200, a synchronous data set, will operate at speeds of 2,400-, 4,800- and 9,600 bit/sec with no modifications in software. It consists of a terminal system disk.

The SR-100, an asynchronous data set, will operate at 1,200 bit/sec and provides temporary data storage.

The two systems can be used for illustration of polled and communications adapters which serve as interfaces between the data terminal network and the central facility.

"This new data communications network is a vast improvement over our previous admissions and data collection systems, and we estimate substantial savings will result," according to Cecil Rivers, vice-president of DP for Blue Cross and Blue Shield.

With an expected volume of over 12 million claims by 1978, this system will make an important contribution to holding down future costs of services provided by our Blue Cross and Blue Shield of Florida plans," he added.

The terminal data-capture process now allows information to be entered and edited off-line at the source and transmitted at high speed to Jacksonville. By reducing admissions and claims-processing time by as much as eight days in some instances, the firm said, the SR-200 can speed claims payments to patients, hospitals and physicians.

Two-Year Search

"We studied data terminals and companies manufacturing them for two years before making our decision. Ultimately, we determined that the terminals that were capable of meeting our system requirements were from companies manufacturing terminals that can be field-tested," said Bruce W. Fisher, director of DP planning for Blue Cross.

"They had to operate as quietly as possible and, at the same time, be compact in size... and, of course, we needed terminals that were low in cost, since we were talking about a rather sizably capital investment," he said.

After several months of careful evaluation, Blue Cross and Blue Shield selected Texas Instruments (TI) to install several hundred of the Sileks' 700 data terminals in hospitals and doctors' offices throughout the state. TI is also installing a number of its Model 960 minicomputers in Florida to serve as polling systems and communications adapters between the Blue Cross/Blue Shield central IBM 370 mainframe and remote locations.

The terminals use a quiet thermal printing technique, an important feature for hospital environments as well as medical offices. They fit into the existing data communications network with switch-selectable data printing speeds of 10-, 15- or 30 char/sec and data transmission speeds ranging up to 120 char/sec.

Questions and Answers

For hospital communications, TI replaced a network of mechanical teletypewriters with some 200 Silent 700 Model 733 automatic send/receive (ASR) terminals.

SYNTECH MODERN SG720 COMMUNICATIONS
Page 29
September 10, 1975
Computerworld

Paperless Claims Net
Gets Data at Source

JACKSONVILLE, Fla. - Blue Cross of Florida, Inc. and Blue Shield of Florida, Inc. have developed a 'paperless' claims-processing communications network which involves collection of data from originating sources.

The network includes a central DP facility at the groups' corporate offices here, a network of data terminals installed at offices throughout the state as a figuration of pollers and communications adapters which serve as interfaces between the data terminal network and the central facility.

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Terminal Ahoy!

PRINCETON, N.J. - Oursmen at the recent U.S. team trials here for the World Championships were able to view their relative positions during the race from computer-generated output.

The printout depicted where each boat was in relation to the other boats during each of the 500-meter points of the race, as well as the split times.

The system, designed by Kent Mitchell, a former Olympic coxswain, utilized a portable terminal, a digital clock and a remote central processor.

Buttons punched by volunteer timers at the start and at each 500-meter interval of the 2,000-meter race transmitted signals to receivers tuned for each lane.

The receiver closed a switch which signaled the clock to record the elapsed time and to display the digital time to the nearest 1/100 of a second.

Times for each lane were then fed to a Hewlett-Packard computer through a Computer Transceiver Systems portable terminal and computed results were printed out.

For Local Forms Control

Incoterm System Emulates IBM 3270

NATICK, Mass. - Incoterm Corp. has developed an enhanced software emulator for IBM 3270 terminal emulators on its IBM 3270-compatible SPD 20/20 terminal system.

The emulator provides the SPD 20/20 with more features at lower costs than the IBM 3270, Incoterm said.

Primary emphasis of the system is on maximizing the efficiency of local forms and data storage while minimizing the core requirements for new programs and disk buffers, a spokesmen said. He described the system as compatible with IBM 3270 data communications protocols, but said it often extended data entry capability.

Designated the SPD 20/20 LFC, the system operates at speeds from 1,200- to 9,600 bit/sec with no modifications in software. It consists of a terminal processing unit with 32K of storage, communications controller and 165 char/sec printer costs about $34,915, or about $5,469 per terminal.

A comparable six-terminal 3270 system costs about $54,388, or $9,065 per terminal, which makes the Incoterm system about 36% less expensive than the IBM 3270, an Incoterm spokesman said.

The Incoterm system is $1,085/mo on a three-year lease. First deliveries are scheduled for early 1976 from 6 Strathmore Road, 01760.
'Paperless' Claims Processing
Starts With Source Data Capture

Continued from Page 29
In effect, the process is a question-and-answer sequence. A format tape "asks" the same questions that appear on a Blue Cross admissions form, which the hospital clerks use as source information for keying admissions data into a local data terminal.

As admissions data is entered at the remote location, the entries are stored on a cassette. After business hours, the operator switches the terminal on-line.

Then, when the polling units in Jacksonville call the local site, the terminal automatically answers and transmits the day's admissions information to the corporate headquarters over voice-grade phone lines. The polling system passes data to the computer for processing, which occurs immediately, and subsequently transmits a response to the originating terminal.

Transmission errors have been minimized and downtime has been noticeably reduced, compared with that of previous equipment. The magnetic tape procedure of the terminal enables operators to correct errors in a fraction of the time previously required, Scott said.

The TI Model 742 programmable data terminal was selected for installation in doctors' offices to collect data directly from originating sources.

The operating procedures for this terminal are essentially the same as those for the terminals used in the hospital communications network.

Another phase of the paperless claims processing network is the in-house data entry portion, which will eventually be installed in the corporate headquarters in Jacksonville. This portion will also use intelligent programmable terminals providing source-editing capabilities.

Schools to Get Cut
On Price of Portacom

STAMFORD, Conn. - Dataproducts Corp. will offer schools a special 5% price reduction on its portable typewriter terminal, Portacom.

By discounting the price of the $1,495 data terminal to $1,420, the firm hopes to position Portacom well within the range of most public school system budgets and encourage greater use and interest by secondary school students in computer use, a spokesman said.

The 31-pound data terminal comes in a briefcase and features an ASCII keyboard, separate numeric key pad, RS-232 connector, built-in acoustic coupler, an impact printer that uses ordinary paper, and may write on both sides of the tape cassette, thereby increasing the storage capacity from 240,000 characters per tape to 480,000 characters.

Users of the NCR 399, the Honeywell Series 60 and the Litton 1300 small business system should be particularly interested in the data entry and preprocessing capabilities of the Model 340-E, a Sycor spokesman said.

Options on the terminal include a flexible disk recorder, four speeds of printers, three magnetic tape drives, card readers and both asynchronous (110- to 1,200 bit/sec) and binary synchronous (1,200- to 4,800 bit/sec) communications.

The Model 340-E with one recorder is priced at $216/mo on a one-year lease and $184/mo on a two-year lease; both prices include maintenance. The purchase price of the Model 340-E is $7,800. Deliveries are expected in the fourth quarter from 100 Phoenix Drive, 48104.

Model 340 Version Designed for Minis

ANN ARBOR, Mich. - Sycor, Inc. has introduced a version of its Model 340 intelligent terminal - with an Ecma/Ansi-compatible cassette recorder - designed primarily to interface with small business computers.

The Model 340-E is functionally the same as the company's earlier Model 340 terminal.

The Model 340-E with its Ecma/ Ansi-compatible recorder features a read-after-write head for improved data throughput, a data capacity of 2,000 80-character records or 950 256-character records on 280 feet of cassette tape and an error rate of less than one error in 10^8 bits.

The Model 340-E terminal uses a phase-encoded recording technique and may write on both sides of the tape cassette, thereby increasing the storage capacity from 240,000 characters per tape to 480,000 characters.

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FEC 772 Display Offers
Alternative to IBM 3277-2

HOUSTON - The Model 722 display station from Financial Electronics Corp. (FEC) is described as a plug-in plug replacement for the IBM 3277-2.

In addition, the Model 772 offers a home cursor key, capability to display both upper and lower case, input field identifiers, operator-selectable attribute character display and generation for display format composition and debugging and block cursor.

The Model 722 plugs directly into the same cable from an IBM 3271-2 or 3272-2 controller that is used for an existing 3272-2 display station. Model 772s can also be operated together with Model 2277-2s on the controller, FEC stated.

Priced at $3,800, the terminal is available from the vendor at 9730 Town Park Drive, Suite 101E, 77036.
Clustering data entry and concurrent processing with shared files...$677 a month.

**The Sycor 440 System:**
- The newest addition to our family of compatible intelligent terminals.
- Our new distributed processing system lets you use entry and inquiry/response concurrent with background processing. So you don't need multiple systems to do multiple jobs. At $677 a month (for four keyboards, communications, cassette, and a five mb disk on a three year lease, with maintenance) you can perform all these functions—plus many more you never thought possible at such a low price.
- Intelligent data entry.
- You can save time and money by catching operator errors as they happen, prior to transmission to the central computer site. And reduced errors mean greater operator productivity, lower communication costs and reduced mainframe processing.
- Field editing. As soon as you get the system, you can implement our basic field editing. Without any fancy programming.
- TAL II. To extend the 440's power, use our new data entry language, TAL II. This easy-to-use, high-level language lets you customize data entry programs.
- Instructions are also provided for arithmetic operations, conditional data entry, range checking, table look-up, equal/compare and a host of other intelligent features.
- Shared file access.
- The 440 system lets you share and access files locally, reducing investments in expensive communication and central CPU resources.
- Data entry made easy. Now each operator, at her own display, can make use of current data in shared files to support data entry functions. For reduced keystrokes and lower error rates.
- Inquiry/Response. File look-up is made simple with up-to-date personal information on-site, using the 440's own file management and disk storage capabilities.
- System modularity.
- Design your own system with a variety of options and peripherals.
- Supports up to 10 displays. Each is controlled by the Sycor processor and is capable of performing tasks independent of other displays.

**Choice of 5 and 10mb disk.**
- Store and retrieve programs, shared files at data remote locations.
- Wide variety of peripherals.
- And to complete our system configuration, choose from matrix and line printers, computer-compatible tape drives, card readers, and a variety of communications options.

**Compatibility.**
- There's full software compatibility with our Model 240 and 340 stand-alone terminals. Keyboards are also compatible.
- Programming. One program fits three different systems—340, 350 and 440.
- Communications. Communicate with the mainframe, emulating IBM 2770, 2780 or 3780 protocols. Or use the 440 as a polling station at your central computer site to receive and transmit data to remote 340s, 350s, and 440s.
- Concurrent processing.
- And best of all, while data entry is being performed in the foreground, you can be doing other jobs concurrently in the background. Jobs that can save you time and money. Jobs like:
  - Remote job entry. Use the 440 with its card reader and 300 LPM printer for large-scale remote job entry. And since the system contains a CRT and a keyboard, you don't pay extra for them.
  - Multi-terminal printer support.
  - Each display can interface print data to one printer as the data is being entered. So, you don't need a separate printer for each display.

Report generation. Sycor-provided programs let you produce all sorts of management reports—sales to customers, inventory, or billing—at the same time as you are performing data entry.
- File maintenance. And the Sycor 440 allows you to do editing, sorting, updating, and file transfer in a background operation.
- The lowest-priced distributed processing system.
- When you consider all the advantages of our 440 system, and then consider its low monthly cost, we think you'll agree: it's the best system in the industry.
- For more information on the new Sycor 440, or any of our other intelligent terminal systems, contact your Sycor representative, or write our corporate offices.

-...applying intelligent remote processing.
You don’t have to go to Las Vegas to make a mint.

You can make it — or lose it — standing right there in your company’s computer room.

How can you be sure that the tape you buy will do its job from the very start?

Buy Epoch 4. It’s 100% certified on all the tracks. Plus, it has a coating that’s 8,000% tougher than any other tape to help keep it error-free.

All this for just 6¢ a month, considering the 20-year warranty.

Epoch 4. It’s a great way to save a mint, for only pennies a day.
One for Two

MT. LAUREL, N.J. — Spectron Corp. has a modem eliminator, the ME-81, that permits direct connection between terminals and computers. It is intended for applications where transmission over short distances would otherwise require two modems connected back-to-back.

An Identical Interface

One ME-81 replaces the two modems. The unit presents an identical interface to the business machine as a modern and operates at speeds up to 20 kbit/sec over a distance of 50 feet. The clock frequency and clear to send delay are specified by the customer.

Price is $240 from the firm at Church Road and Roland Ave., 08057.

Why the last five years saw us grow from 2 units in place to 12,895 in a field that's as competitive as they come.

In the data terminal business, it takes more than a great product to produce that kind of upward motion. It also takes a combination of instant response and superior service.

That's why TCI is not just growing, but growing fast. From ground zero in 1969 to 355 units placed by 1971, 3,540 by 1973, 12,895 by 1975. And we've grown in the face of stiff competition. By developing, making and servicing quality data terminals and other communications equipment. Tailored to the needs without the need for modern, easy-to-use, hotel and motel systems. Medicine. Trucking. Insurance. Industry. With a demonstrated willingness and ability to customize equipment for special needs.

More evidence of our growing power: a service network that now has people in more than 90 cities. And service is coordinated from our Raleigh headquarters, so any problem gets 24-hour attention. All of which makes TCI pretty unusual. Fast and flexible, yet stable and reliable. With the solid backing of a $3.5 billion blue-chip corporation. All of which makes us a company with what it takes to keep right on going. And growing. Terminal Communications Inc., 3301 Terminal Drive, Raleigh, North Carolina 27611.

TERMINAL
COMMUNICATIONS INC.

Tech Control Module Added to Cooke Line

ALEXANDRIA, Va. — Cooke Engineering Co. has added another module to its line of Dynapatch and Dynamic data communications tech control modules.

The unit is a combined programmable digital fallback switcher with four-wire VF signal patching. This feature is said to permit recutting signals for 16 channels at the digital and analog sides of modems. The unit handles 16 full-duplex EIA RS-232C digital channels and 16 four-wire VF channels, the company said.

In the digital interface, the unit provides patching and programmable "fallback" switching of individual channels or all 16 channels as a group, the company added. Prices are $4,500 ($281 per channel) when equipped with 12-circuit Dynapatch EIA jacks and $4,775 ($298 per channel) when equipped with 16-circuit Dynapatch jacks. Delivery is 30 days from the firm at 900 Slaters Lane, 22314.

Reallocates Materials

Net Controls Steel Plate Facilities

PORT KEMBLA, Australia — An Australian steel works uses on-line data communications to monitor and actually re-allocate more than 15,000 tons of plate without taking individual plates off the production line.

Australian Iron and Steel Pty. Ltd. (AIS) employs a network of some 80 terminals to provide on-line control for its flat products facilities here. Last year the group produced more than three million tons of steel plate, strip and tinplate.

By constantly monitoring its plate mill and finishing lines via terminals, AIS is ensured an uninterrupted production flow despite changes in steel plate characteristics that may occur during the processing of a particular order.

Whenever a plate with order-differing specifications is produced, the terminals communicate these new characteristics to one of two central-site Control Data Corp. 3500s. The mainframe then searches its file of up to 25,000 customer orders for one that requires a plate meeting the changed specifications and sends the new order allocation back to the terminal located beside the finishing line. The plate is reallocated to the new customer.

This process is completed in less than 10 seconds, thus allowing continuous production of plates with varying characteristics for different customer orders, without removing plates from the production line.

The system, installed in January 1974, reallocated its 25,000th ton last July. Over 17,600 tons were reallocated for the 12 months ending in May, according to R.A. Hardy, manager of systems and data processing for the firm.

In addition to a significant improvement in plate yield, Hardy noted, cash flow is optimized now that material does not have to be stocked and rehandled when finishing line capacity becomes available.

The system has also improved "starting point" yield, that is, automating production planning used in producing the plate rolling schedule, Hardy explained.

AIS developed the reallocation and other real-time production control operations for Cash Plus. 'Cash Plus' Allows Shopping, Banking

(Continued from Page 31)

cash Plus to be a real boost to the savings and loan business."

Social Security Funds

"Direct deposit of Social Security funds, for example, which did not look too good for savings and loans in tests in Georgia last spring, is quite feasible through electronic funds transfer systems (EFTS)," Levy noted.

RSU members are not alone in their enthusiasm for Cash Plus; the merchants involved are equally pleased with the system.

Among advantages to the merchants, 'Cash Plus has allowed us to provide an added service to our customers on a one-stop shopping system, in addition to broadening our own customer base with some 500,000 savings and loan customers who are potential Cash Plus users," R.H. Neslund, vice-president of Jewel Food Stores Wisconsin Division, said.

Still another advantage to the merchant, he noted, is the guaranteed check feature built into the system. Since checks are deposited to and cash is withdrawn from depositor savings accounts, the store has no liability for checks processed through the Cash Plus system.

"As long as the bank gets underway, it should reduce our cash-on-hand requirements, particularly on paydays," he said. "And should a bad check be presented, it is the responsibility of the savings and loan associations, not the store."

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TERMINAL
COMMUNICATIONS INC.
IBM means computers. Intel means semiconductor memories. We’ve been leaders in semiconductor memories and microcomputers since the beginning. While becoming the largest independent manufacturer of semiconductor memory systems in the world and making headlines with our 4K RAMs and computers on a chip, we have also been quietly building a reputation in the IBM add-on memory business.

Until now all our IBM add-on systems have been sold through others under private labels. Now they may be leased or purchased directly from us with direct service.

For IBM 370/158 users, there’s the Intel IN-7158. This system is built with Intel 4K RAMs making it the most reliable system available today and capable of expansion to 8 megabytes in a single frame. That’s twice as much as is available from anyone else. Memory can be expanded in 1/2 megabyte increments up to 4 megabytes and in 1 megabyte increments from 4 to 8 megabytes.

As an added feature an Intel microcomputer has been built into the system to control the “intelligent” maintenance panel, monitor memory system status and automatically track system performance.

We have also delivered memory for the 370/135 and 370/145. All of our IBM add-on memory systems offer savings in space, cooling, power and cost. For more information call any Intel sales office listed below or write: Intel Memory Systems, 1302 North Mathilda Avenue, Sunnyvale, California 94086, (408) 734-8102.

Put two good names together.
Mixed vendor systems and networks need more than on-call service. We're more. We're maintenance managers.

Preventive maintenance...communications network maintenance...engineering support, as well as on-call service are all within the range of Raytheon Service Company capabilities. We're servicing customers with all these requirements and more — with a complete RSC systems maintenance management package.

We have the capability because all RSC service people, in all RSC service facilities, have a minimum of three years experience. Broad-based hardware and communications backgrounds. Solid experience with 360, 370, Honeywell and other mainframes...and with peripherals from IBM, Telex, Ampex, Potter, CalComp, and more.

If you have a mixed vendor system or network, we'd like to show you how Raytheon Service Company can handle service more efficiently and economically than your present setup. We'll show you what we've done already for several airlines, government agencies and major industrial firms. With Dan Minter, Director, Maintenance, and Mike Salter, Director, Commercial Marketing, at Raytheon Service Company, 12 Second Avenue, Burlington, Massachusetts 01803, (617) 272-9300.
If you punch cards, read cards or do anything else with cards, we want to talk to you.

We want to talk to you about the Tab 501 Data Entry Microprocessor.

About the unique versatility and operating capabilities resulting from its built-in microprocessor, RS-232C interface and unmatched performance characteristics:
- Minicomputer card input or output.
- Data transmission via modem or cable for terminal applications.
- Interfacing to virtually any type of data entry or processing system.
- On-line or off-line versatility.
- Reading, punching, printing, verifying and interpreting capabilities.
- Attractive purchase or lease plans.

We want to tell you about our standard features:
- Constants from memory—up to 220 columns.
- Up to 28 program levels with automatic sequencing.
- Instant verification.
- Completely automatic error correction.
- High speed character duplication.
- Exceptionally quiet.
- Unparalleled operator acceptance of over 2,000 installed units.
- Easy to learn—easy to operate.

Let's talk about "specials." We want your specials. Special applications. Special operating characteristics. Special interfaces. Special keyboard requirements. Because the Tab 501 Data Entry Microprocessor has this unique flexibility, we can give you what you want—easily and inexpensively. It's worth talking about.

Gentlemen: Let's talk.

Name_______________________________
Company_____________________________
Address_____________________________
City_____________________ State_________ Zip_____
Telephone_____________________________

Let's talk:
☐ Interfaces.
☐ Terminal applications.
☐ Special requirements.
☐ Send more information.

2690 Hanover Street
Palo Alto, California 94304
**Combines Beehive Terminals, Nova**

**Tesy Edits Text of Optically Scanned Typewritten Data**

ST. LOUIS - The Terminal Editing System (Tesi) from Electronic Keyboarding, Inc. (EKI) utilizes multiple Super Beehive terminals hard-wired to a Data General Nova to edit, update and store text material captured through optical scanning of typewritten documents or entered on IBM-formatted magnetic tapes.

The Nova in Tesy is normally supported by a 125M-byte IBM-type moving-head disk, an industry-compatible 9-track magnetic tape, a 1,000 line/min. electrostatic printer and a computer console, EKI said.

**Translates to Ascii**

The system translates the original data code to Ascii and creates lines of text, with 70 characters on each, including spaces. Tesy recognizes special formatting control characters for such operations as paragraphing.

**Microdisc Gets Mag Tape I/O, Software Option**

ST. PAUL, Minn. - Minnesota Mining and Manufacturing (3M) has added a magnetic tape input/output unit and a software option to its Microdisc parameter-search microfilm retrieval system.

The input/output unit permits computer- or keyboard-generated data on tape to be written onto the disk storage in the Microdisc system. The I/O unit is especially suitable for input of index data stored on a host computer, facilitating the search of BPL-coded film cartridges produced by a computer output microfilm (COM) device, 3M said.

Used in an output mode, the tape unit can create tapes from which COM units produce film indexes to retrieve older documents in the file.

**Scans Indexes**

The interpolative search module allows scanning of long lists of index data to determine the microfilm frame on which a desired item is located. The terminal index reference for each frame is stored in the Microdisc memory, and the system indicates that a desired item (falling between two such references) must be on a specified microfilm frame.

The Microdisc system consists of a minicomputer, disk storage unit, CRT terminal and page reader/printer. The system enables the user to search for specific frames of microfilmed data by their content parameter. While this usually involves locating frames on 16mm roll film cartridges, the unit can also supply lists of microfiche frames containing a specific type of information.

The input/output unit costs $30,500 and the software module $4,250. The Microdisc system itself costs about $67,000. Rental plans are also available from the firm at P.O. Box 33686, 55101.

**Our name will get to you**

**So will our newest KeyProcessing System**

**The CMC 1800**

Heralding the next generation of data entry, the CMC 1800 does it all - foreground editing, background editing, remote job entry, and provides modularity for future growth - all at a price that's hard to beat.

The CMC 1800 starts small with just a few keystations, storage for 25,000 80-character data records, and a processor with 64K bytes of core memory. But it grows big with storage for over 300,000 records, 160K bytes of memory, KOBOL™ (Keystation On-Line Business Oriented Language), RPG II, and up to 64 keystations.

The CMC 1800, while the newest member of the KeyProcessing Family, is a family all by itself. It's cost effective for keypunch replacement applications, oriented for high volume requirements, and sophisticated enough to handle today's jobs and tomorrow's challenges.

CMC KeyProcessing is a trademark of Computer Machinery Corporation 2500 Walnut Avenue, Marina Del Rey P.O. Box 92300 Los Angeles, California 90009 Telephone: (213) 390-8411

CMC KeyProcessing Systems are installed throughout the world. Get to us, you'll be pleasantly surprised. Call or write today for more information.

ST. PAUL, Minn. - Minnesota Mining and Manufacturing (3M) noted. Since Tesy is designed to allow several retrieval processes if the first number keyed was erroneous. Once "approved," the operator keys in batch number and project to be edited.

The operator is allowed to work through an entire text data file page by page with a terminal control key. Once the page to be changed is located, a blinking cursor can be moved to the point where the correction is to be made.

Editing commands allow character insertion, replacement or deletion as well as line insertion and deletion. Maintenance of the same line numbers throughout the life of a file enable users to audit the changes made over time, the vendor noted.

If insertions cause a new line to be created, it is given a number between the two on either side of it.

A typical Tesy system costs under $80,000. Delivery is three to four months from the firm at 140 Weldon Parkway, 63043.
SS-Series
The SS-Series Cassette achieves perfection in performance which has resulted in its use on more digital cassette equipment than any other cassette in the Synchron line. The precision machined crowned corner rollers and patented ribbed slip sheets assure even winds, uniform tension and accurate tape guidance which reduces the possibility of skew and tape lag.
The SS-Series Cassette's polypropylene construction is reinforced with fiberglass for added strength and durability in the event of droppage or other mishandling. Contamination problems are eliminated and extra ruggedness, as well as dimensional stability, are provided by the use of tongue and groove seal methods. An unbreakable polypropylene storage case is used to house the cassette.

S-Series
The S-Series Cassette is engineered for use when tolerances, environment and application requirements are less critical than those for Synchron's SS-Series Premium Cassette. Included in the S-Series Cassette are most of the engineering features of the SS-Series and the manufacturing process is monitored to the same close quality controls.
The S-Series Cassette is made of high strength polystyrene. The corner rollers are molded and the slip sheets are pressed flat. Precision tape guides, perpendicular corner posts, and a spring foam pressure pad are featured. The same unbreakable polypropylene storage case is used to house the cassette. The S-Series achieves a high performance rating at a somewhat lower cost.

...from the QUIET one

...with CERTIFIED DIGITAL Cassettes
In-House System Cuts Firm's T/S Costs Almost 75%

LOS ANGELES - When Union Oil Co.examined its outside time-sharing costs, it decided it had an opportunity to cut costs.

The analysis was right. An in-house system, installed the next year, cut per-hour time-sharing costs in half.

Now, three years later, per-hour charges are down an additional 25%. These savings are partially offset by increased communications costs, however.

Union Oil's computer services personnel estimate about three-quarters of the system's connect hours are used by far-flung departments and divisions to handle a range of economic, technical and scientific tasks.

The remaining time-sharing connect hours go to application program development and, to a small extent, improving the system's operation.

Union Oil users, anywhere from Texas to Alaska, can use computer terminals in their offices to get the answers they need from the system in the company's headquarters here. A combination of leased and dial-up telephone lines link the remote terminals to Los Angeles.

Union Oil's computer installation centers around an IBM System 370/168. It operates with IBM's Time Sharing Option (TSO) to interface to the Oil and Gas Division.

Time-sharing's contribution before 1973 was also significant, Ragland said. "It helped increase computer programmers' productivity by about 200%.

significant Contributions

Another use of the system became apparent in 1973 and 1974 when Union Oil, like other oil companies, received requests for information, as well as new regulations and decisions issued by the Federal Energy Administration.

"Time-sharing enabled us to respond quickly," said Thomas M. Ragland, manager of systems and programming for them and Gas Division.

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Configure it yourself with Dynaprobe®

Performance Measurement Systems

New building blocks to help you pinpoint data processing problems—quickly and efficiently.

The 8028 Data Handler
- 500 nanosecond event tracing
- built-in comparator
- programmable control memory
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The 8018 Tape Controller
- up to 4K internal buffer
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- allow DYNAPROBE devices to communicate with each other
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Like all DYNAPROBE products, they're portable, modular and easily affordable.

Dynaprobe® the EDP problem-solver.

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301/948-8000

Cost of T/S Drops Almost 75%
After Company Buys Own System

(Continued from Page 39)

well worth the expense.

Charles R. Gahr, manager of computer services, pointed out that the total connect time billed to users has increased from 1,000 hours when the in-house system was first installed to over 4,000 hours per month. Gahr expects time-sharing usage to increase 25% to about 5,000 hours per month this year, and eventually to about 8,000 hours. Meanwhile, hourly rates to users are expected to drop somewhat in the future.

Much of the growth will come in the distribution area, Gahr predicted. "Our exploration and producing groups have gone a long way in using computers for economic analysis. Our refining and manufacturing have also done much. And we have extensive experience in our refineries in using computers to solve problems."

Connect Time Billings Up

"But in distribution," Gahr noted, "we are learning constantly how to improve our operations through computer-based economic analysis. As the distribution and marketing picture changes—and as problems get more and more complex—I anticipate a sharp increase in time-sharing utilization by distribution planners and marketing personnel."

Union Oil's corporate planning unit is already an important time-sharing user. Warren H. Buell, manager of corporate planning services, told why.

"When the corporate plan and budget is presented to the executive committee, there are inevitably a great many questions about how the plan would be affected by changes in taxes, in prices and a wide variety of other factors," he said.

Answers Ready

"Often, we have anticipated the questions and have the answers ready. As for the few unexpected questions, time-sharing enables us to furnish the executive committee with answers in a matter of minutes—instead of hours or even days."

"In a complicated business like oil," Buell added, "where millions of dollars can depend on a single assumption—and decision making is exceedingly complex—that's a very helpful service to provide the decision makers."

Series 300 Extends Forms-Handling Line

Of Standard Register

DAYTON, Ohio — The Series 300 slitter/merger/imprinter (SMI) is the latest addition to the auxiliary continuous forms-handling equipment line of The Standard Register Co.

Depending on the optional features included, the Series 300 SMI may be converted from its free-standing base unit, having a positive pinbelt forms-feeding control, into any one of seven different machines.

These include use as a simple margin slitter (Model 302) or as an imprinter of one-wide (Model 303) or two-wide forms (Model 305).

Works in Tandem

For use in tandem with a forms-bursting device, the unit is equipped with a Photo-cell Loop Control allowing synchronized operation of both devices at speeds up to 300 ft/min.

The SMI device handles paper weights from 12- to 125 lbs at speeds varying from 80- to 300 ft/min, depending on the forms and function involved.

Prices range from $1,250 to $1,895 or $48- to $75/ino on a lease arrangement from the firm here in Dayton, 45401.

Device Protects DP Shops

With Water-Cooled CPUs

ROCKVILLE, Md. — DP shops that use chilled water under raised floors to help cool their DP equipment may be interested in the Denco Model WD 2-10 water detection system.

The device's "continuous-element sensor" is said to be capable of detecting even minute quantities of water anywhere along its entire length. The unit costs $1,995 from the firm at P.O. Box 1442, 20850.
Invest in yourself this fall.

Announcing the EDP Seminar Series Fall Schedule

The world of EDP is caught up in a continuous revolution. It’s only 24 years since the first business computer made its appearance, and we’ve gone from tubes, batch processing and single-site giants to multiprogramming, time sharing, data communications, giant minicomputers and hundreds of other technological innovations that were unheard of only recently. Keeping up with this revolution is difficult, to say the least. And that’s why we’ve created the EDP Seminar Series. The EDP Seminar Series gives you practical applications of the newest advances in computer management. What you learn will save you time and money, because each course is geared to practical dollars and sense application.

Data Communications Course #1010 - Practical Data Communications Systems & Costs
Dr. Dixon Doll, the nationally recognized teleprocessing consultant will lead this two-day seminar on the newest advances in data communications. The course covers areas like SDLC, HDLC, DDS, newly approved major revisions to WATS, and the impact of Satellite Carriers. Total Cost, including workbook, reference materials luncheons and all course materials is $350. Additional registrants from the same company qualify for a reduced rate of $300.

San Diego Plaza Int'l Hotel Sept. 29-30
New York St. Moritz Oct. 13-14
San Francisco Dunfey's Royal Coach Oct. 20-21
Dallas Hilton Inn Nov. 10-11
Miami Marriott Nov. 17-18

Data Communications Course #1020 - Advanced Teleprocessing Systems & Design
Also led by Dr. Dixon Doll, this course is a follow-up to course #1010. Special emphasis is given to techniques that minimize operating costs in commercial data communications networks. This three-day seminar covers procedures, approaches, and algorithms for evaluating and cost-optimizing network operations. Total cost, including an extensive set of customized course materials, is $450. Additional registrants from the same company qualify for a reduced rate of $400.

Miami Holiday Inn Airport Lakes Dec. 1-3

Legal Tools for Computer Contracting and Protection
Under the instruction of Roy N. Freed, a nationally known lawyer, author and educator experienced in presenting their techniques to industry and management. If you’re involved in one of the areas shown, you should attend the EDP Seminar Series this fall. What you learn will benefit your company, your installation, and you.

Data Base Design
Given in association with Leo J. Cohen and Performance Development Corporation, this three-day seminar is a package-independent examination of the techniques required for the design of effective data base systems. The seminar covers Effective Record Design, Physical Storage Techniques, Optimization File Organization/Indexed Techniques, File Integration, and much more. Cost for the seminar, including course materials, continental breakfasts and luncheons is $350. Additional registrants from the same company qualify for a reduced rate of $300.

New York St. Moritz Oct. 8
Boston Sherraton Oct. 15

Performance Evaluation and Improvement
Saul Simler, author of Data Processing Systems: Their performance, evaluation, measurement, and improvement will lead this two-day seminar on measurement techniques designed to save your installation money. As well as system performance at your own installation, topics covered include: Criteria for quantifying performance, pencil and paper analysis of a system, Benchmarking techniques, Realtime, Batch and interactive time sharing systems.

Cost for the seminar, including continental breakfasts and luncheons and all course materials is $250. Additional registrants from the same company are charged only $275.

New York Summit Hotel Oct. 22-24
San Francisco Hyatt Regency Nov. 12-14
Chicago Hyatt Regency O'Hare Nov. 19-21

How to Draft Effective Legal Agreements
This one-day seminar is a complete workshop for non-legal technical people who may be called upon to draft legal agreements for their company. Also led by Roy Freed, this seminar covers a variety of formal agreements, their structure and the legal factors involved. You’ll have all the basic skills necessary to write legal agreements, and you’ll be able to spot items that really require the attention of lawyers.

Cost for the seminar, including luncheons and a complete workbook on the subject, is $135.

New York St. Moritz Oct. 8
Boston Sherraton Oct. 15

How to Increase Programming Productivity
John W. Brackett, PhD, Vice President of SofTech, Inc., will lead this two-day seminar on technical management on the state of the art of Software Engineering. Under his direction you will learn how to: create more precise and visible analysis and design; reduce integration problems; improve software reliability; incorporate visible outputs into the software development cycle; increase programmer productivity; and improve programming management methods. Topics covered include: Structured programming, Top-down analysis, design, implementation, and Chief Programmer teams. Cost for the entire seminar, including continental breakfasts, luncheons, and all course materials is $300. Additional registrants from the same company are charged only $250.

New York St. Moritz Oct. 6-7
San Francisco Berkeley Nov. 10-11

Cost for the seminar, including course materials, continental breakfasts and luncheons is $350. Additional registrants from the same company qualify for a reduced rate of $300.

New York St. Moritz Sept. 22-24
Denver Denver Hilton Dec. 1-3

Legal Tools for Computer Contracting and Protection
Under the instruction of Roy N. Freed, a nationally known lawyer, author and educator experienced in presenting their techniques to industry and management. If you’re involved in one of the areas shown, you should attend the EDP Seminar Series this fall. What you learn will benefit your company, your installation, and you.

Data Base Design
Given in association with Leo J. Cohen and Performance Development Corporation, this three-day seminar is a package-independent examination of the techniques required for the design of effective data base systems. The seminar covers Effective Record Design, Physical Storage Techniques, Optimization File Organization/Indexed Techniques, File Integration, and much more. Cost for the seminar, including course materials, continental breakfasts and luncheons is $350. Additional registrants from the same company qualify for a reduced rate of $300.

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Performance Evaluation and Improvement
Saul Simler, author of Data Processing Systems: Their performance, evaluation, measurement, and improvement will lead this two-day seminar on measurement techniques designed to save your installation money. As well as system performance at your own installation, topics covered include: Criteria for quantifying performance, pencil and paper analysis of a system, Benchmarking techniques, Realtime, Batch and interactive time sharing systems.

Cost for the seminar, including continental breakfasts and luncheons and all course materials is $250. Additional registrants from the same company are charged only $275.

New York Summit Hotel Oct. 22-24
San Francisco Hyatt Regency Nov. 12-14
Chicago Hyatt Regency O'Hare Nov. 19-21

How to Draft Effective Legal Agreements
This one-day seminar is a complete workshop for non-legal technical people who may be called upon to draft legal agreements for their company. Also led by Roy Freed, this seminar covers a variety of formal agreements, their structure and the legal factors involved. You’ll have all the basic skills necessary to write legal agreements, and you’ll be able to spot items that really require the attention of lawyers.

Cost for the seminar, including luncheons and a complete workbook on the subject, is $135.

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Exotic Security Devices Sure to Be Part of DP Future

By Ralf Brent
Special to Computerworld
NEW YORK — A new set of government regulations and guidelines is due to go into effect at the end of this month that will materially change the security environment in which computers will be operated.

The implications of the Privacy Act of 1974 particularly apply to systems containing sensitive personal data and proprietary information which might be deemed secret or confidential.

As with most legislation, there are unforeseen results which have cropped up, resulting in a whole new set of restrictions and problems with which most computer people have not had to deal until now.

If these restrictions and measures to comply with them are not already the talk of the industry, they soon will be, as manufacturers, distributors and installers of various security devices of a quite exotic nature begin to aggressively sell their wares.

NBS Efforts
The systems and software section of the National Bureau of Standards (NBS) has already published a set of guidelines and is offering lists of workshops and seminars.

It has also recommended that four papers published by the Computer and Business Equipment Manufacturers Association (Cbea) be placed on the reading list of computer executives and security directors.

In those industries with sensitive government contracts, the government apparently intends to prescribe just how rigid security must be. And it seems that before too long, certain types of devices will be finding their way into the government handbooks for computer security.

According to NBS publications, there are over 1,000,000 computers in place in the country representing a physical asset value of almost $5.0 billion.

"There is no way to place a value on the millions of data files and programs used by these machines or on the value of the services performed by these machines. Companies have nearly been put out of business by manipulation of their data files," the pamphlets stated.

"Computer-services usually operate as far as possible according to guidelines and instruction provided by their customers, special care such as the use of a dedicated computer may be provided for users if requested and paid for," these reports said.

And then comes the portent for the future as far as government intervention in security procedures are concerned. "Eventually the requirement for computer security may create specialized computer facilities which are certified to be secure for specified purposes." "Certified" and "specified" are not imprecise terms, but words which definitely imply that, at some point, the prospect of government standards and specified solutions to computer security will become the order of the day.

The new techniques which seem called for in the government's new computer security guidelines have now gone far beyond locks and keys, dial combinations and guards. Photo badges, even with electronically coded information about the bearer, seem already too simplistic. Embossed and punched identification cards, which can all too easily be lost, borrowed, stolen or duplicated, also will no longer fit the bill, at least not without additional verification that the person carrying the card is actually the one to whom it was originally issued.

All indications, as uncovered in a study by John Moynahan & Co., point to a combination of key cards and encoded biometric data or computer-stored memory concerning the individual.

Those who in the future will be permitted to enter a particular data center and use certain portions of data files will carry special cards designed to be slipped into sophisticated "readers" installed on walls, doors or actually attached to the computer console. The biometric measurements at

(Continued on Page 43)

Now computers can talk to each other

The Bell System Introduces Two-station and multi-station private-line service is now available between Boston, Chicago, New York, Philadelphia and Washington. The system will be expanded to 19 other cities this year, and we hope to serve many more metropolitan areas in the near future.

The Bell System's new Dataphone Digital Service offers you end-to-end, full duplex transmission of data at synchronous speeds of 2400, 4800, 9600 and 56,000 bits per second.

You save because: More economical digital service units replace modems. Digital transmission improves error-free
more accurately and for a lot less money.

Dataphone Digital Service.

performance. New diagnostic features and automatic switching of network standby equipment reduce downtime. And when you choose Dataphone Digital Service, you can be assured that Bell takes total responsibility for design, research and development, supply, installation, maintenance, and 

transmission—100%.

Your Bell Account Representative has all the details. AT&T and your Bell Company know your need for data transmission service increases every day. Our Dataphone Digital Service delivers. We Hear You.

Key-to-Disk Reduces Moving Company's Staff, Shifts

GLENDALE, Calif. — Replacing keypunches with key-to-disk had a marked effect on Bekins Moving and Storage Co.'s data entry department was able to cut its staff by a third and go from three shifts to two. Bekins performed a feasibility study on staying with keypunches vs. going to key-to-disk. Boris Popin, operations manager, recalled. The study looked at the current costs of cards and people and the amount of work a person can do at a keypunch or keystation, he said.

The DP shop's responsibilities were growing rapidly and the volume of punch cards was already "just astronomical," Popin said. "On just one financial system, we were creating 100,000 card records a month." The study found key-to-disk better able to cope with further growth, he said.

Bekins bought an Entrex System 480 with 10 keystations because of the "software, the disk, the keyboards and the price," Popin said. Once prepared, the data runs on a Burroughs B3700 CPU.

Since the key-to-disk system was installed in February, Bekins has reduced its data preparation staff from 27 to 18, all through attrition, Popin noted. The firm also dropped its third shift. Additionally, the firm had spent an average of $2,065/month on outside keypunch services between January 1974 and August 1974. Since that August, the company has had no keypunch work done outside its own shop.

"We have about four other users in the area, plus Entrex, that we could go to in case the system controller failed," he said.

The company has copies of its key-to-disk software ready for such an emergency, he added. Popin said he has not experienced any downtime on the $67,000 system other than two hours of preventive maintenance a month.

Exotic Security Devices in Future

(Continued from Page 42)

present fall into several categories: hand geometry, fingerprints, voice prints and signature impressions. The "Computer Security Guidelines for Implementing The Privacy Act of 1974," prepared by the NBS, stated: "There are three categories of methods by which a person's identity may be established for the purpose of allowing access to an information system. "The methods, which can be applied singly or in combination, are based on (1) Something the person knows (a code word or number), (2) Something the person has (a key card or key) (3) something the person is." This third category, the guidelines said consists of characteristics, such as a person's appearance, fingerprints, hand geometry, voice or signature."

Referring to unique physical keys, the pamphlet said: "Such physical items, however, are easily lost, stolen or counterfeited."

Again quoting the "Executive Guide" on biometric data: "These biometric methods promise high reliability and accuracy, but most techniques are still in the research stage.

However, the Identimat Co. has installed its hand-geometry machines in over 100 locations. Another biometric device, Fingerscan, utilizes fingerprints, which are compared against coded information previously recorded.

Other biometric measurement devices include "voice print" techniques which compare the unique characteristics of a person's speech which are unique. The device must interface with a certain dedicated section of the computer's storage capacity.

Veripen's signature-based system utilizes an electronic-ballpoint pen hooked to a computer. The processor compares pressure of the pen and time taken for the formation of each letter of a person's signature with previously recorded data.

The Federal Reserve System is reported to be testing some of these devices; no findings have yet been made, however, and no recommendations have been forthcoming.

Brent is senior vice-president at John Mcaulayh & Co., New York City.
Traffic Court System Triples City's Parking Ticket Revenues

PITTSBURGH, Pa. — Pittsburgh's conversion to a central, large-scale DP facility has had a notable effect on the city's Traffic Court — revenue collections tripled in four years, even though the number of tickets issued rose only 50%.

Back in 1968, Traffic Court operated with a manual card file. Copies of the parking tickets were filed by number. When a ticket was paid, the copy was pulled.

When a copy was missing from the file, it was assumed the ticket was paid. There was no particular system for tracking down scofflaws.

Then, in 1969, a new administration with a heavy commitment to DP took office. A staff was assembled under the Office of the Mayor and, the following year, an NCR Century 200 computer was installed to take on jobs from all departments.

Before long, the workload became overwhelming and, by the end of the year, a second Century 200 was added. For economic reasons, the two Century 200s were replaced in July 1973 by a Century 300 with 256K words of memory, six dual disk units, and two magnetic tape drives, two printers and seven CRT terminals.

With this system, Traffic Court has been able to capture the details of every parking ticket on the magnetic disk file. At any one time, there are about 50,000 parking tickets outstanding.

After the computer pulls a ticket, copies are brought to Traffic Court, where they are batched and keypunched for entry onto the computer file. The stored data includes ticket number, automobile license number, vehicle make, type of violation, time and location.

The computer's unpaid ticket file is on-line to four CRT terminals, three in Traffic Court and one in the Police Communications Center. When a ticket is paid, the number and fine amount are keypunched for entry into the computer that night to erase the item from the file.

The unpaid ticket file is therefore current to the previous day's transactions.

For all tickets not paid in a week, the computer automatically prepares a magnetic tape containing each vehicle's license number. The tape is sent to the state motor vehicle bureau, where the owners' names and addresses are picked up from the state's computer files.

The tape is returned to Pittsburgh where the names and addresses are read into the Century 300 and added to the unpaid ticket file.

System Prints Summonses

Using this name and address information, the computer prints summonses that are mailed to the vehicle owners. Every time a summons is issued, court costs are added to the fine and these are both printed on the notice and posted to the unpaid ticket file.

If a summons is not returned in 10 days, the computer prints a warrant, again adding court costs to it and the on-line file. The warrant is sent to the violator and a constable.

In most cases, the arrest warrants bring almost immediate results. When fines are paid in Traffic Court, the clerks enter the ticket and license numbers through the CRT terminals. The computer searches the file and displays the data on the unpaid ticket.

In a cross-check, the computer also scans the file for the vehicle license numbers and, when there are other unpaid tickets charged to those cars, it will print them. There are additional tickets.

To find out what these additional tickets are, the clerks make another inquiry through the terminals.

It is almost impossible for a violator to pay one fine and not be nailed for other outstanding tickets. It is possible for a violator not to answer a summons or a warrant, but if he is an habitual offender — 25 or more tickets — and has not paid his fines, the computer adds his vehicle's license number to an updated list for distribution to the police.

Then, if the car is spotted on the street, it is towed away and can be recovered only after the fines and costs have been paid.

The warrant for violation also gives the police authority to tow the vehicle.

With access to the same computer information, the terminal in the Police Communications Center is used to answer inquiries radioed in from patrol cars and meter maids who have spotted what they think are scofflaw vehicles.
Transaction Processing:

Honeywell’s Transaction Driven System can give you a big jump on your competition.

It can make your people more productive — give you more control over your business.

Transaction processing — putting people in touch with up-to-the-minute data so they can do their jobs more quickly, accurately, and efficiently. This spontaneous style of information processing puts the power of a central computer into the mainstream of business activity. Information inquiries and entries are made through an onsite terminal. Then, rapid transmission over communication lines gets the information where it’s needed, when it’s needed — for decision making, cost control, better customer service.

Transaction processing is one of the many computing dimensions available with Honeywell’s Series 60 Level 66 systems. These are systems made to meet your present and future requirements. The modular design of Level 66 hardware allows tailored growth from your first large-scale system all the way to a superpower computer. Start with the Level 66 system that meets your current price-performance needs. Then add hardware as you need it, and upgrade without reprogramming. All Level 66 systems use one version of Honeywell’s General Comprehensive Operating Supervisor (GCOS). All user software and data files are compatible on all Level 66 systems.
Honeywell's newest software for interactive processing is the Transaction Driven System (TDS). Operating within the GCOS operating software, TDS offers advantages in processing and implementation:

**Timeliness** — Information is current. Each transaction triggers immediate updating of the online database.

**Responsiveness** — Transactions are processed as they occur, in direct response to the sender's inquiry or instructions.

**Protection** — Stored data is guarded against erroneous updating, or loss, through Honeywell's data base management system, Integrated Data Store.

**Flexibility** — TDS can run concurrently with local batch processing, remote job entry, and time sharing. The user provides the variables to tailor the system, and TDS supplies a COBOL-like language to simplify the programming.

**Speed** — Separate management of the network and the central system expedites processing.

Honeywell's Network Processing Supervisor and DATANET Front-End Network Processor handle all communications between terminals and the central system.

**Simplicity** — It's quick and easy for anyone familiar with a keyboard or terminal to learn how to retrieve and update information with TDS.

**Economy** — Design and implementation costs are reduced by easy-to-use interfaces for the whole system — operating system software, data base management, and terminals.

**How TDS is used**

When your business requires quick response — in order processing, inventory control, or management-oriented inquiries — TDS is an efficient tool to meet that requirement.

Insurance companies, hospitals, brokerage firms and airlines are typical industries that need to maintain the high quality of customer service and operational efficiency that TDS can provide.

Manufacturers and distributors use TDS to improve inventory management and online order entry. Banks use TDS to speed teller operations and tie their remote locations into the central computer.
...In Manufacturing

A high-technology electronics equipment manufacturer uses TDS to organize and control manufacturing inventories. By integrating and managing critical functions in the inventory cycle, such as controlling backorders, issuing work authorizations, and generating internal purchase orders, TDS helps minimize the problems surrounding the flow of materials.

At work stations throughout the company—purchasing, incoming inspection, receiving—employees enter data at visual display terminals. All input data is edited as it is entered. Errors can be detected and corrected immediately by the originator. Once information has been entered into the data base, it is immediately accessible to all the work stations. As a result, backorders can be monitored more closely, work authorizations are easy to trace, and purchase orders can be printed automatically.

...In Distribution

A large regional drug distributor uses TDS for online order entry and accounts receivable. Visual display terminals at key points in the distribution cycle gather the information at its source.

Input begins with customer orders, written or by telephone. Operators enter the orders on terminal keyboards. TDS automatically verifies and checks product item and quantity-on-hand. Discounts, due dates, and bonuses are established, and the customer is advised of any promotional offerings.

TDS follows up through the order processing activities, immediately updating online the product and customer files, automatically preparing backorders, purchase orders, and shelf-replenishment orders, and accumulating order data for analysis.
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In Banking

A major commercial bank uses TDS for account updating and currency and bond transactions, as well as for loan and mortgage accounting. TDS speeds file inquiries and such complex calculations as securities evaluations, financial ratio analysis, and amortizations. The system links an online central computer to a network serving nearly 200 terminals, 1,100 employees, and 33 branch offices.

TDS helps the bank keep its document production, circulation, and inquiries to a minimum, giving employees more time to do their jobs. And since the network shares a common data base, all personnel can obtain necessary information quickly and economically.

Transaction processing plays an important role at the teller windows. TDS enables tellers to record customer account transactions easily and update the data base. The teller or operator simply types in a message to begin processing a transaction. Service operations — check approvals, holds, or stop payments — are also handled by TDS. In a typical check transaction, the check is accepted or rejected immediately on the basis of the account status.


Get more for your investment. Let Honeywell’s TDS and multidimensional computer power improve information management and apply new and advanced techniques. Level 66 systems have all the general purpose capabilities of any large system, plus local batch, remote job entry, time sharing, and transaction processing.

Level 66 systems with TDS make online transaction processing practical for a wide variety of industries and applications. Flexibility, very high performance, fast recovery and restart capabilities, efficient terminal and data base management, and easy-to-use concepts make TDS one of the most advanced systems for transaction processing in the industry today.

Honeywell Information Systems
200 Smith Street (MS 440), Waltham, Massachusetts 02154

I’m interested in Transaction Processing. Tell me more.

Name ____________________________________________
Title ____________________________________________
Company __________________________________________
Address __________________________________________
City ____________________________________________ State ________
Zip __________ Phone __________

The Other Computer Company: Honeywell
Ann Arbor, Mich. — Apodictics, Inc., a subsidiary of the Computer Equipment Corporation of Framingham, Mass., announced a new line printer to be offered as an option on its System/3 model computer.

The "Line Printer to System/3 Model 6" has a maximum output of 321 lines per minute, printing 132 characters per line, and can print up to 1,500 characters per second. The printer attaches directly to the System/3, providing a direct interface to the computer's processor. It is designed to be used in conjunction with the System/3's built-in memory and peripherals, and is capable of handling a wide range of printing tasks, including the production of high-volume output for business and industrial applications.

The printer is priced at $4,900, with an optional card reader system at $500, and a choice of IBM-compatible or non-compatible printers at $2,400 each. The system is available in either analog or digital configurations, and is compatible with IBM's line of printers.

Apodictics also announced its availability as a full-service computer manufacturer, with a complete line of products for business and industrial use. The company is based in Framingham, Mass., and is a subsidiary of the Computer Equipment Corporation of Framingham, Mass.
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**TDS and Level 66 Can Help You Improve Your Business, Too.**

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Mini Bits

Tape Drive for DG Nova Requires No Formatter

BOULDER, Colo. — The Model 103D interface system provides 1/2-in. industry-compatible tape storage for Data General's minicomputers at a price comparable with cassette and paper tape systems, according to its developer, Rela Designs, Inc.

The interface uses programmed I/O transfers rather than the data channel, resulting in fewer components than in commonly available interfaces. The interface occupies one card slot in the Nova.

No formatter is required since this function is performed by the software provided. Special connectors plug directly into the Nova backplane, making installation simple, the vendor said, adding it will provide complete programming support for the system.

The interface circuit board is priced at $900 and tape drives (Pertec 5000, 7000 and 8000s) range from $5200 to $53,800. The MSOS operating system (including Basic driver) is $700.

The firm is at 1122 Arapahoe, 80302.

BDSC Offers Business Mini

PALO ALTO, Calif. — Business Data Systems of California, Inc. (BDSC) has introduced the BDS 0/100 business minicomputer system, which consists of a 16k-word CPU, 12M bytes of fixed disk, a 24 x 80 character CRT and a 100 line/min printer.

A variety of equipment options are offered, including application libraries designed to tailor the BDS 0/100 for individual end-user requirements.

All system components are enclosed and tested in a desk configuration.

The BDS 0/100 utilizes a disk operating system called BDOS, and features Executive, a standard IBM-compatible form of the System/3, the company added. Additional features include full line buffer and electronic forms control.

Special custom software is available for use with the printer handles multipart forms and multiple printer applications on all models of the System/3, the company added.

The printer handles multipart forms and has 132 print positions and 64 characters and 48- or 96-character sets. Additional features include full line buffer and electronic forms control.

ANN ARBOR, Mich. — Apodics, Inc. has introduced the 750 line/min printer to the IBM System/3 Model 6 computer.

Designated the System/3 Fast Printer, it can also be used as a second printer on other System 3 systems, the company said.

IBM hardware or software is needed and the size of the supervisor is not changed, the company said.

RPG program output may be directed to an 80-character IBM printer or to the Fast Printer under program or operator control.

System logging, utility program and RPG compiler output can also be directed to the Fast Printer when it is attached to the terminal.

Special custom software is available for unique printer applications on all models of the System/3, the company added.

The printer handles multipart forms and has 132 print positions and 64 characters.

Automatic Conversion

Automatic ASCII-to-EBCDIC conversion is done in the software and an option is included which allows the programmer to specify any code conversion table desired or read and punch straight EBCDIC.

The reader/punch system is priced at $4,900. The 300 char/sec reader is available as a separate system for $3,385, the firm said from 321 S. Main St., 48106.
Small Brewery Finds Small System Lifts Its Spirits

HENLEY, England - It may be surprising to a local brewery like Brakspear's here should need to computerize its accounting systems. Brakspear's, however, in common with other small breweries, has special problems which only computerization can solve. After considering various alternatives, the company opted for an installation which has not only solved its accounting and management information problems, but has also allowed it to offset a large percentage of the costs.

The brewery has about 350 customers and processes some 50 invoices averaging 40 items each day out of a stock base of about 900 items. Before computerization, customers sent in their orders and the clerical staff then had to prepare the invoices and bills of lading so the six lorries operated by the brewery would be loaded and ready to start their deliveries early the following morning, complete with invoices.

The problem was that a large percentage of the costs. Several enquiries were received from other small breweries, has special problems which only computerization can solve. After considering various alternatives, the company opted for a system which has not only solved its accounting and management information problems, but has also allowed it to offset a large percentage of the costs.

The brewery has about 350 customers and processes some 50 invoices averaging 40 items each day out of a stock base of about 900 items. Before computerization, customers sent in their orders and the clerical staff then had to prepare the invoices and bills of lading so the six lorries operated by the brewery could be loaded and ready to start their deliveries early the following morning, complete with invoices.

The problem was that the spare time may be fully utilized.

HENLEY, England - It may be surprising to a local brewery like Brakspear's here should need to computerize its accounting systems. Brakspear's, however, in common with other small breweries, has special problems which only computerization can solve. After considering various alternatives, the company opted for an installation which has not only solved its accounting and management information problems, but has also allowed it to offset a large percentage of the costs.

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Publisher's System Reports Data
On Products, Handles Accounting

SAN FRANCISCO, Calif. — Royalty accounting and product-line profitability are key features of the business computer system now in operation here at W.H. Freeman & Co., the textbook-publishing subsidiary of Scientific American, Inc.

“The system tracks sales, cost of sales, royalties, promotional giveaways, and profitability by book/production number, before available to us by product,” according to Vice-President Adam Kudlacik. In addition to complex royalty accounting, including the printing of royalty checks, the system automates order entry and prebilling invoicing (6,000 invoices monthly, 70% of which are for Freeman’s 4,000 regular customers), accounts receivable, sales analysis and inventory accounting.

Installation of the system software was handled by the Palo Alto, Calif., office of Informatics, Inc. Western Systems Co.

The system hardware was manufactured by Qantel and includes a Qantel System 1200, three video terminals (for input and inquiry), a 12M-byte disk drive (6 million of which are removable) and a 200 line/min hard-copy impact printer.

The system operates on-line, with output sent to a Bowe forms cutter. The two units will work in tandem to cleanly trimmed sheets with no perforations.

A Bowe forms cutter. The two units will work in tandem to cleanly trimmed sheets with no perforations.

On-line inquiry into customer or inventory account status is available, and the visual display of information such as invoice amount, customer name and address and product description allows for data verification and correction at the point of entry.

Freeman publishes text and reference books, plus reprints of Scientific American articles as pamphlets in sets and bound collections. Its system replaces two billing machines, multifunction off-line processing by a service bureau and a variety of other business applications previously done by hand.

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A TV Terminal in Every Home?

PHOENIX — A computer in every American home? For obvious reasons, that continues to be the dream of American computer manufacturers and the science fiction writers who trail in their wake.

In a major planned community here, created by Rossmoor Corp., the dream begins to approach reality as installation continues on a two-way cable TV system that links each residence with an Interdata mini.

“In most cable TV installations, the traffic is one-way, as the black box on top of the TV set brings in more channels than would otherwise be accessible to the subscriber,” explained Brian Belcher, director of engineering for Tocom, Inc. of Dallas, Texas, prime contractor for the two-way cable TV installation.

“When it comes to COM, we have an unusually broad range of COM compatible readers and readers — plug in, type in, use. In short, Bell & Howell's entire COM program, from hardware to software to support functions, are focused on your way of doing business...not ours. And a Bell & Howell COM system speaks your language in still another way, it costs a lot less than you might think. To get the word, write Bell & Howell COM Products Division, 1651 Quail Street, Newport Beach, California 92660. Or call Pat Flynn collect. 714 772-9340.

Business Equipment Group

When your computer speaks, Bell & Howell's COM understands.

If you've been hesitant about getting into COM because of the alterations it would require, Bell & Howell has some reassuring news for you.

Our COM recorder is compatible with most computers now in use. It speaks virtually any computer language. Job setup is accomplished through the use of a single job control card, which makes the changes needed in the program virtually impossible.

And when it comes to COM retrieval, we have an unusually broad range of COM compatible readers and readers — plug in, type in, use.
Age No Barrier to Ownership of Mini

EASTHAMPTON, N.Y. — Why do most teenage boys save money? To buy a 10-speed bicycle, perhaps, or a first car or, if they are practical, for college.

Eric Hahn, a sophomore at Easthampton High School on Long Island, already owns a 10-speed bicycle and, at 15, is too young to drive. He hasn't been saving for college, either, although what he purchased with his money will certainly help him get there.

He bought a computer.

Hahn gained his first exposure to computing about a year ago, using a school terminal tied into the Long Island Regional Interactive Computer System (Linics) Project, a time-sharing facility. Almost immediately computers became an all-consuming interest with him and, during frequent evenings until 11 p.m., he could be found at the school's computer center, becoming familiar with computing languages and learning programming techniques.

Return for Investment

He has already begun to give to the school and community a return in services for his educational investment. Last fall he helped develop some special software for the ophthalmology laboratory at the local hospital, which owns a Digital Equipment Corp. PDP-8 minicomputer.

At school, he has been working on programs that will enable the time-sharing system to take raw data from weather stations' instruments and turn it into tables for the drawing of weather maps and forecasting by earth science students. Independently, he has been developing a high-level language for the PDP-8 which, he said, "combines the features of the best languages I know and optimizes the features of the PDP-8."

As early as last summer Hahn resolved somehow to acquire his own computer, and he spent his vacation plus available evenings and weekends during the school year in a component assembly line at his father's electronics firm, stowing away each hour's wages toward the day when his dream would come true.

Large-Size Drives, Floppy Disk Systems Get Diva Reductions

EATONTOWN, N.J. — Diva, Inc. has reduced prices up to $1,300 on its line of large-capacity and floppy disk systems.

The DD-25, a 127M-byte capacity, dual-spindle drive which includes a DOS I/O driver on paper tape or 800 bit/in., 9-track drive magnetic tape, is now priced at $28,500.

The DD-23, a 63.7M-byte, single-spindle drive, has been reduced to $17,990; the DD14/2, a 63.7M-byte dual-spindle drive, is priced at $22,900; and the DD-14, a 31.8M-byte, single-spindle drive is now $12,600.

The DD-25, DD-14/2 and DD-14 all offer the DOS I/O driver on paper tape or 800 bit/in., 9-track magnetic tape at no additional charge.

Diva's DF-100 floppy disk controller, which includes a microprocessor and a controller/formatter with 16 bidirectional data bus lines, is now being offered at $2,095.

These systems accommodate up to four drives and range in capacity from 3.1M bits to 12.4M bits. A DF-DMA interface is included with each system at no additional cost.

The firm is at 607 Industrial Way West, 07724.

Help From Higher Quarters

Disappointed but undaunted, Hahn wrote to C. Gordon Bell, vice-president of engineering for DEC. Hahn recounted his activities, included a sample of the language he is developing — he calls it the Advanced Computer Emulating System (Aces-8) — and told Bell of his dream to have his own computer and terminal "so I can work on these projects without interruptions."

Hahn said he had saved enough to buy a small PDP-8 at the discounted quantity price for lots of 100 or more, but not enough to acquire one.

Bell responded first with a telephone call to Hahn to discuss his predicament and then contacted managers of DEC's Education Products Group for consideration.

Earlier this year, the group, through Alice D. Peters, applications development manager, offered Hahn a PDP-8/M with Teletype terminal at terms within his reach — if he would deliver on his promise to pick it up at the company's headquarters in Maynard, Mass.

One thing Hahn's new possession is sure not to be is idle. "I'm working on an advanced time-sharing monitor for the PDP-8," he said. "Our school wants to give kids in the mathematics department access to a computer, and I'm working on a plan that may allow them to use mine."

Teenage computer owner Eric Hahn realizes operation of computer terminal in the company of DEC's engineering vice-president, C. Gordon Bell. Hahn visited DEC recently to pick up a PDP-8/M computer and terminal for which he had worked and saved.
Small System Provides Answer for Telephone Bureau

SANTA ANA, Calif. — How do you handle 3,000 orders a day by telephone through 18 branch offices with monthly bills averaging $45 and about 4% client turnover each month?

George W. Smith, president of Telephone Bureau of America (TBA), found the answer when he selected a small computer for on-site data processing.

Since its establishment in 1956, Smith has seen TAB grow in both size and complexity. Serving Orange County and nearby Los Angeles counties, the system operator now performs over 40 different types of transactions, each with an appropriate unit cost.

Keeping track of many small items was cumbersome on bookkeeping paper, and so TBA's first step toward DP was a terminal unit with printer.

Early in 1973, Smith teamed with Norm Hagelstrom, president of Business World Computer Systems here. Together they developed a package of programs designed to provide TBA with a telephone answering service.

This program package was written by Business World in RPG-II and operates on a Lockheed System III business computer with two disk units, 244,600 bytes of memory and a medium-speed printer.

All input is through the CRT/keyboard console and specially designed forms which are prepared for each client once per month. Charges are consolidated daily at each branch office and TAB has four billing cycles per month.

In Complete Control

"What causes me most is that now, for the first time, I have complete control and insight into the operation of my business," Smith said.

One of the benefits he cited was classification and analysis of accounts. "We know where our new accounts came from, and we know why they terminated service or if they are residence accounts." This brought improved response to TAB's computerized direct mail program and also reduced its cost. The system also includes a rate schedule, types of service and analysis of supplementary services.

Smith also sends a detailed 274-item monthly questionnaire report to evaluate performance of each branch office.

TAB has approximately 200 employees, of which only 14 are computer oriented. Smith said they have reduced their bookkeeping labor by 50% and now have closer control over office costs.

Two PDP-11 Models Get Add-On Memory

BEVERLY HILLS, Calif. — An add-on core memory system that can double the capacity of Digital Equipment Corp. PDP-11/15 and PDP-11/20 computers within their available chassis spaces is available from Litton Memory Products.

The Litton LM-820 core is an 8K-word by 16-bit core memory system which is pin-compatible with both DEC models, the firm said.

Maximum storage capacity of 32K words is available by using two units of the available memory card slots within the computer chassis. This is accomplish-

ed through the use of a connector block designed to fit into the chassis spaces. Because each core connector block accepts two LM-820 memories, two blocks will accommodate the full internal memory capacity of these models without the requirement for extra equipment or power sources, the vendor noted.

The LM-820 core memories have a cycle time of 650 nsec, an access time of 280 nsec and 86-pin, edge-type connectors, the firm said.

Litton is at 360 Crescent Drive, 90241.

Mini-steps, Design, Build Circuit Boards

GLEN COVE, N.Y. — Photocircuits Corp. bought a minicomputer to help design circuit boards for automobiles, but now everyone wants to get in on the act.

The company takes the circuit board specifications required by customers and develops the most efficient design using a Hewlett-Packard HP Model 3000/C mini-

computer system and special in-house programs.

After the results are drawn by a peripheral plotter and given final approval by the customers, the design data is recorded on paper tape. The tape is then fed into numerically-controlled wiring machines.

The Model 3000 replaces two older computers, according to Michael B. French, director of computer engineering.

"We were reaching the point where the pair of older computers just could not keep up with our order load."

"We are now not only at full operation, but have even expanded our capabilities. With extra terminals and acoustic couplers, programmers can now work on new programs at their desks, instead of within the hectic computer control room.

"In fact, as a result of our purchase of the mini," the firm is more computer-minded. Taking advantage of the system's time-share capabilities, a number of other departments, like engineering design and inventory, are renting terminal time," French said.

Mini UPS Priced Under $2,000

GAINESVILLE, Fla. — An uninterrupted power source (UPS) from Synergetic Scientific Systems, priced under $2,000, is aimed at the small computer market.

Designed to give minicomputer users the same protection normally only available on larger systems, the unit can supply power source (UPS) from Synergetic Scientific Systems, priced under $2,000, is aimed at the small computer market.

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Streamlined System Speeds Bank’s Trust Operations

The streamlined system made it possible to slash the time needed to open trust accounts by more than two-thirds. Manual preparations were a slow process, said James A. Austin, assistant vice-president of trust operations. They often involved as many as five people and required the rearrangement of the same information as many as four times to satisfy the needs of the various functions through which it passed.

It was slow, and error-prone, since the information had to be recorded many times by hand, he said.

In all, it took about 10 days from the original receipt of the securities until the assets were recorded on the computerized trust accounting system, Austin noted. Using an NCR 399 accounting computer, the bank established its own mini data processing unit in trust operations. At the same time, systems analysts took a hard look at the paperwork and procedures. In most cases, the various forms required only a reformatting of the same information, so a standard five-part form was designed to replace them.

Data concerning customer identification, name and numbers of securities and transfer instructions now is entered on tape upon receipt of the assets. Once the assets are delivered to the minicomputer operator, he keys the basic data onto tape cassette and commands the machine to print out the standard five-part form.

Within minutes, one copy of the form goes back to the customer and another accompanies the securities to the vault.

The memory is programmed to then type out the transfer form and automatically punch the input cards for the main computer that will update the CTAS.

The information has been eliminated, including input data for the main computer, because the information is machine-available. This eliminates many possible errors, Austin said.

Sets Up Assets Values

Under the manual system, before the securities could be entered into the main computer, the inventory value of the assets had to be established. It was more efficient to wait for the values and key- punch the cards on hand.

However, because the key-punching now is an automatic by-product of the minicomputer's operation, it is changed. If the values are not available within three days of the receipt of these securities, cards now are punched to set up the assets at nominal values for the CTAS, and the basic account information is retained on tape.

When the values do come through, new cards are punched which modify the data in the main computer. This makes it possible to set up assets within three days instead of the 10 days it formerly required.

The program, major security names and numbers and transfer agents' names and addresses are read into the computer's memory from tape cassettes.

To print out the name and address of a prime security or a transfer agent the operator keys in a single code number at the appropriate point in the program and the 399 automatically prints it out in the right place on the form.

The minicomputer is equipped with two tape handlers. After the program and constants are read into the memory, a master tape cassette containing data on all accounts in process is mounted. A blank tape is mounted on the second handler. When data is added or modifications are required, the operator calls up the account by code number.

The minicomputer then writes all previous data on the master tape to the blank tape. The operator keys in the modifying data, which is then recorded on the new tape. Thus, nothing is lost and the new data is recorded in sequence.

After completion of the new entries, which may number up to 150 a day, the rest of the data on the master is written on the new tape automatically and, with a keypunch peripheral, punches the cards.

While the minicomputer speeded up the entry of securities and reduced the number of people handling the data, it had time available for other applications. The bank realized it on other accounts to provide more meaningful reporting to the Personal Trust Department, Austin said.

Facit Addo Tape Reader, Spooler Added to 4020

GREENWICH, Conn. — Facit-Addo, Inc. added the 4023 optical tape reader and the 4014 servo tape spooler in a rack mount unit for full tape-handling capability as an addition to its 4020 line of optical tape readers.

The 4023 and 4014 may also be incorporated individually into any system, but are especially designed for use in combination.

The Facit 4023 is equipped with electronics which permit the reading direction to be reversed at the desired character. It also features a lighter solenoid for the pinch roller, which permits reading during high-speed spooling in either direction.

Among the features of the Facit 4014 servo tape spooler are a push button for manual high-speed spooling at an average speed of 1,200 characters per second.

The unit is priced at $2,290 from the firm at 66 Field Point Road, 06830.
By Edith Holmes
MUNCIE, Ind. — Parents and teachers of 300 children beginning kindergarten at four elementary schools here this month will soon receive printouts of priorities and activities customized to fit each student's learning needs.

Based on a screening program designed to spot potential learning and behavior problems, according to Fred R. Glancy Jr., director of the program, called "Insights Unlimited," the computer program takes the results generated by a series of perceptual and motor tests and prints out the items parents and teachers first need to concentrate on with the child.

The list includes those specific activities most likely to improve the student's performance, he said. "The problem is that the computer proves especially attractive to children with learning disabilities and, for instance, reading difficulties are being labeled with learning disabilities," he added.

The system had been financed by a federal grant to the district of Winnetka and three terminals at the Purdue University computer system. Robinson said some of his chief concerns in designing the program first to get as much as we could into data entry. Now that we've entered it, we're retrieving it to see what we can do to help improve skills.

Noting that teachers are often scared by automation in their classrooms, Robinson said some of his chief concerns in designing the program so they will adopt the program on a regular and consistent basis," he added.

The system allows the student to interact with a terminal which types out arithmetic problems, generated by the mini at random and at the level appropriate to the child's knowledge, he explained. The student responds by typing the answer; if correct, a new problem can be displayed on a CRT, again at random.

If the answer isn't correct, the problem is retyped with the appropriate answer. The child has five seconds to study the problem and choose the correct answers.

The error is stored in the mini's 8K core memory and, within the next eight problems or so, reappears to test whether the student remembered the correct answer. Weller explained that the computer can store six such errors, feeding them back to the child at random in between the programmed problems of the drill.

At the drill's end, the child receives a printout of the exercises, the problems missed, a percentage grade for performance and the average amount of time each problem required. May noted the children love to walk away with that piece of paper showing what and how they have done on the drill. Teachers appreciate the self-grading feature because of the time it saves them from a boring and routine task, and they can use such facts as mean time per problem to help slow students who may be solving problems by counting on their fingers, she said.

The teacher can also control the level of difficulty of each drill, Weller said. "Not only are mini-drills available, including six addition, five subtraction, three multiplication, four division, four enumeration and inequality and seven level totals," he added.

In a related complaint, some instructors thought the use of a computer "annealed" of programmed learning, a technique in which many teachers disapprove, Goetz said. "I have a reservoir feeling that the philosophy of computers in education has not been accepted because of the mechanics used," he added. But the main reason the computer was disapproved was financial; he noted, citing a lack of funds to run the computer to its full capability.

"I was not meeting the requirements we felt it should," Goetz said, "and this was due to the fact we could not provide the information or the equipment the teachers needed to realize the full capability of computers in education."

The system had been financed by a federal grant to test its effectiveness as a test-scoring and recordkeeping tool designed to leave teachers more time to concentrate on classroom teaching. When the funding ran out last year, the system was discontinued.
CHICAGO — What would you do if, every afternoon at 3:30, a bunch of kids congregated in your office to use a mini-computer to practice their arithmetic problems?

Walt Weller decided the time had come to write a time-sharing version of the system he had constructed for his own children to help them improve their basic math skills. Now the children gather around Tele-types located at two Chicago-area schools at 3:30 or whenever they think they'll be able to work a drill in addition, multiplication, subtraction or division on the machines.

Running Automation Software Associates from an office located in his home, Weller said his specialty is exotic computer applications, particularly those for computers at work in education.

With System 2300, you can consolidate your data processing, reduce central computer usage, and provide this resource, he said, "but it has to be terminals readily available for everyone." The mini is such a hit with the kids "they act as if somebody died whenever there's a breakdown," according to Lola J. May, mathematics consultant for the town. Commenting on his efforts, Weller remarked, "Children are human beings and they deserve to be taught by human teachers. I'm not an exponent of automation in education, except where the information is the kind that can only be learned by use."

They did more of your work today, so you can do more tonight.

The new MDS System 2300 lets the people who create your workload handle some of the load.

"We acquired an old Alpha 16 and a purloined office desk," he said. "I removed the drawers from one side of the desk, replaced them with a rack and set the minicomputer on the rack on its side."

Weller has studied basic math skills. In addition, multiplication, subtraction or division on the machines.

Computers At Work

"I went right through the ceiling," Weller said. "Oh, Dad, we don't do that any more."

With a little research, Weller discovered that, during the preceding 10 years, arithmetic achievement in American schools had dropped one full year. Attributing much of this to "new math," a program strong on concepts and problem solving but weak on memorization and note learning, he set about devising a way to help his children improve their basic math skills.

They said his specialty is exotic computer applications, particularly those for computers at work in education.

"That was fine, but it meant I couldn't get any work done. And that tended to put a strain on my livelihood."

So he sat down again and converted his programs into a time-sharing system that would be economically feasible. "We found a private angel to fund the hard-ware — an LSI II Naked Mini from Computer Automation, Inc. and three 10 char./sec Teletypes," he said. "I regret that we're no longer able to service these terminals, but the mini is backed by one of the finest support teams in the industry."

"Living just one block from the school, my lab was soon filled with kids every afternoon," he said. "That was fine, but I couldn't get any work done. And that tended to put a strain on my livelihood."

Records can be kept for 250 children this way, relieving the teacher of a considerable amount of recordkeeping.

"I regret that we're no longer able to service these terminals, but the mini is backed by one of the finest support teams in the industry."

"Most of all, there will have to be a clear-cut plan for funding."

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"If students are in stitches all the time, then you know they're messing around," he said. The CAl center supports about 40 courses, including a majority of math courses and courses in English, psychology, natural science and guidance, among others, Taylor said.

There are a total of 12 Model 3270 CRTs (two have light pens) and Anderson-Jacobson (AJ) portable typewriter terminals which can be used at off-campus locations through a standard telephone interface, he noted. The AJ terminals, he said, can be used to access the verbally spirited system from another university during a demonstration.

And Taylor said he's done exactly that, just for the Hell of it.
Standing out in Chicago is only part of our story.

Consumer Systems Services Group, we're the consulting company that's making things happen in data processing. And we're doing it in Chicago for companies throughout the nation.

Building a reputation on integrity and combining flexibility with our expertise has made it possible to accomplish a wide range of commercial applications within a variety of businesses — such as, the insurance business, manufacturing, retail, marketing and distribution as well as government.

From full systems design and implementation, to D.P. audits and evaluation, to programming services, Consumer Systems Services Group has successfully provided data processing to business for over seven years. We're proud of our proven success, our clients, our people and being a part of Chicago's dynamic business community.

If your company can benefit by what we can offer, then let's get together. We're only a phone call away and located in the heart of the midwest. That puts our people only a few hours away from helping you. We'll be there!
By John Hebert

Computers At Work

In Education

Local computation for the project, funded by the National Science Foundation (NSF), and serving 29 courses ranging from zoology to aerospace engineering, is accomplished by a Data General Nova 840 CPU with 48K memory on dual disks and two Nova 820 acquisition systems, a spokeswoman said.

The four-year endeavor was aimed at exploring the effects of computer-based instruction at a large university. Project C-BE has received over $1.6 million in NSF grants since its inception, she added.

But NSF support was terminated last month, and the university must cultivate new funding sources.

This may prove a difficult task because of the large scale of the project. Courses in the humanities may suffer a reduction or a loss of computer capability because subject matter is less concrete and, therefore, harder to apply than in the pure sciences, according to Susan Wittig, assistant professor of English at the university.

Wittig considers the use of computer capability a real boost to teaching the university's freshman English course, "typically the problem course in the English curriculum," she said.

Using Datapoint 3300 CRTs to present instruction modules, sentence syntax can be taught in an interesting and productive way, Wittig said. Seven computer-tutorial programs in English syntax have been used to supplement the course work of 150 students.

Students in the course are expected to develop retention skills — not having hard copy as reference — and put learned concepts into subsequent writing assignments, Wittig noted.

The use of the automated system has had the "effect of concretizing subject matter in the humanities where everything is not cut and dried."" Once the student sits down at the CRT terminal, both student and instructor perceive difficulties in teaching methods that were never imagined before," Wittig said.

Buy a brand new machine for as little as $1995. Rent it for as low as $65 monthly, including maintenance by NCR. Or take a lease/purchase plan. Any way, it's unbeatable!

Now, you can have it all together — the convenience of a portable . . . reliability . . . and down-to-earth prices. In addition, our 265 Portable 30 cps KSR Terminal gives you a choice of standard keyboard or the new switchable APL/ASCII keyboard. Whichever model you choose, you get the industry's lowest prices, in a choice of three plans:

1. THE DDI PURCHASE PLAN: outright purchase is now $2295 for a single unit down to $1995 for quantity purchases.

2. THE DDI RENTAL PLAN: Single units rent from $115 down to $75 monthly, and multiple units down to $65, depending on rental terms. NCR maintenance is included in your rent.

3. THE DDI LEASE/PURCHASE PLAN: prices range from $110 down to $55 per unit monthly, depending on term. At lease end, one dollar buys the machine.

Data Dimensions introduces...

Data Dimensions introduces... the industry's lowest-priced portable terminal!

NEW SWITCHABLE KEYBOARD MODELS offer comparable savings. Single unit rentals run from $130 down to $90 monthly, including NCR maintenance. Single unit purchase price is $2495. Quantity discounts are available under both plans. Lease/purchase plans run from $125 down to $70 monthly.

Standard or switchable, DDI 265 is an exceptionally reliable terminal with a quiet thermal printer. Its design dissipates heat so effectively no fan is needed, and it's the only "portable" with U.L. approval.

What if you need a terminal other than a portable? You still save with DDI. As one of the nation's largest suppliers of data communications equipment, we seek out the best buys in terminals and modern of all types — and offer you a choice to best serve your needs and budget! Try us.

For more information, write: Data Dimensions, Inc., 51 Weaver Street, Greenwich, Conn. 06830. Or better yet, call Bob Loomin at (203) 661-1700.
To Bridge Gap With Congress

Afips Opens Washington Office

By Catherine Amst

WASHINGTON, D.C. — The American Federation of Information Processing Societies (Afips) has opened an office here to communicate in two directions — from Washington to our societies and from the societies to Washington — to the legislative agencies and to others who have an interest in technology and where it might be going,” according to George Glaser, past president of Afips.

Afips, speaking at the office’s official opening earlier this summer, he added that although “we are explicitly excluded from lobbying activities as well as involvement in policy questions (because of Afips’ tax status), we would like to believe we can be helpful in assisting people to sort out the technological implications of proposed policies.


Their remarks centered around the theme “Information Processing as a National Resource.”

Culver remarked that Congress remains a “computer backwater” in the effective utilization of DP technology, despite the rising level of consciousness among increasing numbers of its membership.

“Too many legislators are under the delusional impression that there can be no useful marriage of computers and the legislative process,” he said.

DP professionals must, however, consider the needs of Congress with a sense of realism,” he added. “Computers cannot relieve the congressman of the pains of decisions, of a congested calendar or of the multitude of demands placed on him.

“But computers can provide him with some navigational aids which he doesn’t have right now. And they can help achieve a more rational use of the resources we do have,” he said.

Optimizing resources was also stressed by McMillan, who said the central question is not “what kind of gadgets we are going to have, but rather how effectively we use them.”

Davis emphasized the “great and increasing need for technologists and others to speak the same language in order to achieve maximum use of computers.

“We have a highly interactive technology that affects every one of our daily lives,” she said, “and we do not know how to deal with it. The people who are making the policies generally are not the scientists and technologists, and yet the changes we see today are generally caused by science and technology.”

Davis said she hopes the Afips Washington office will be able to bridge this gap and help foster a greater understanding of computer science and technology. In his remarks, Newell implied that, as a national resource and a discipline, computer science itself might add to this understanding.

He stressed the role of the university in developing this resource.

The Afips office will be directed by Philip Nyborg, and Glaser extended an open invitation to all to call upon Nyborg.

The office is located at 2100 L Street N.W., Suite 420, 20037.

Sen. John Culver, Dr. Ruth Davis, Dr. Brockway McMillan and Dr. Allen Newell spoke at the opening of Afips’ Washington, D.C. office.

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Line Interface Modules. Synchronous and asynchronous modems offer total coverage of a wide variety of line connects and modems. Current loop, RS232, wide bandwidth.

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For more information write Communication Marketing, Modcom Computer Systems, 1650 West McNab Road, Ft. Lauderdale, Fla. 33310. Phone: 305-974-1380.

European Headquarters: 104 Mylatt Street, Midsford, Surrey. Telephone: 0252/54125.
Law Group Looks at Taxes
WASHINGTON, D.C. — The Computer Law Association will discuss taxes of all kinds at their next meeting here Sept. 24.
Speakers from the Internal Revenue Service, the Tax Department of the District of Columbia, the private bar and the computer industry will discuss deducting software program costs for federal income taxes, what sales and use taxes apply to commercial time-sharing across state boundaries, the real estate tax implications of a computer installation and the effect of municipal taxes, among other issues.
Attendance at the program is open to members of the association. For further information, contact Edward J. Grenier, secretary-treasurer, Computer Law Association, c/o Sutherland, Asbill & Brennan, 900 17th St., Washington, D.C.

Westin to Keynote ACM '75 Meeting
MINNEAPOLIS — "Computers and the Quality of Life" is the theme of ACM '75, the annual conference of the Association for Computing Machinery. The conference is scheduled here for Oct. 20-22.
Dr. Alan F. Westin will open the conference with a keynote speech addressing "The Next Decade of the Computer Revolution: Privacy, Participation and Power." Westin is currently professor of public law and government at Columbia University and served as a consultant to the Senate Committee on Government Operations, which drafted the Senate bill that ultimately was enacted as the Federal Privacy Act of 1974.
The conference's technical program will emphasize panel and tutorial sessions considered of general interest to most ACM members.
The program will consist of 60 sessions, including three on microprocessors; four on computer networks; two on data structures and computational practice in mathematical programming; a debate on high-level languages; a panel on memory management and operating systems; a variety of tutorials, including a demonstration of four symbolic-manipulation systems; and several sessions devoted to software management and documentation.

Special Features
Special features of the conference include the Sixth Annual Computer Chess Championship Tournament, a student program on Oct. 21, a computer arts display and a publishers' book fair of current offerings in the field.
Also, a two-day graphics seminar will be conducted prior to the conference on Oct. 18-19 to provide a broad introduction to the fundamentals of computer graphics.
For further information on the conference, contact ACM Headquarters, 1133 Avenue of the Americas, New York 10036.

Fadpug Elects New Officers
WASHINGTON, D.C. — The Federal ADP Users Group (Fadpug) has recently elected a slate of officers for two-year terms of office beginning July 1. The new president is Paul D. Oyer of the U.S. Census Bureau. Fadpug's purpose is to improve the management and use of the Federal Government's ADP resources with a view toward optimizing the effectiveness of government operations. Activities focus on the sharing and exchange of ideas and techniques, promoting professional development of personnel, developing better communication between DP installations and clarifying DP policies and guidelines.
Membership is open to any Federal Government employee.
For further information, contact Fadpug, Room 1133, South Building, U.S. Department of Agriculture, Washington, D.C. 20250.

IEEE/CS Offers Index Update
LONG BEACH, Calif. — The first cumulative index to the IEEE Computer Society Repository may now be ordered. Covering holdings from 1966 through 1973, the 135-page volume contains an author and subject index of just under 1,600 papers, reports and documents.
The repository is a collection of technical papers and documents relating to computer science and engineering that is operated by the Computer Society as a service to the information processing community. There are about 300 entries per year and updates to the index are planned at appropriate intervals.
The index is priced at $12 for society members, $16 for non-members. Copies may be ordered from the IEEE Computer Society Publications Office, 5855 Naples Plaza, Suite 301, Long Beach, Calif. 90803.
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Four speakers representing the Federal Government, industry and the academic community helped inaugurate the office as well. Dr. John C. Culver of the State Department, for example, "initiated" the office. Culver said he hopes the Afips office will be able to bridge this gap and help foster a greater understanding of computer science and technology. In his remarks, Culver, a national resource and a discipline, computer science itself might add to this understanding. He stressed the role of the university in developing this resource.

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Covered with mud, dropped off a desk, and working like a champ.

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Seemingly determined to destroy our unit, this same fellow then put this same Execuport 300 portable terminal in a rain barrel. Covered with mud, plugged in, and working beautifully. The 300 came through with shining, if somewhat muddy, colors. Plugged in, it operated beautifully. If you'd like to know more about a terminal that can stand up in this tough world get in touch with Charles Kaplan or Shirley Newman at (201) 261-6800. Computer Transceiver Systems, Inc., East 66 Midland Ave., Paramus, New Jersey 07652.
By Nancy French

Financial analysts who watched computer systems stocks begin to climb sharply in late June, peak during the week of July 11 and plummet a week later agreed the computer stocks have followed the basic pattern set by the rest of the stock market.

There, typified by the Dow Jones Industrial average, stock prices dropped sharply, with selling triggered by continuing recession, threats of higher energy prices and inflation.

Computerworld's index of computer systems stocks showed a climb from 102 on June 19 to nearly 120 on July 17. As of August 21, it had hit 94.

Analysts disagreed on the subject of performance. Bernard Dorshow, a computer consultant with Lehman Brothers and a senior analyst at Drexel Burnham & Co. said the computer stocks were even underperforming the market.

Bob Golden, an analyst with Shearson Hayden Stone, Inc., disagreed, saying the rest of the stock market is doing equally poorly.

"And within the computer framework, there are some divergences, in that IBM is down rather sharply in spite of its good performance, whereas some of the other stocks which are in worse shape on a performance basis yet do relatively well," he said.

However, there was no disagreement over the effect of Xerox's decision to leave the mainstream business. All said it may have caused an initial flurry of selling, and Golden added the demise of Xerox Corp.'s Data Systems Division may have "raised questions about the disappearances of still another of IBM's competitors, providing more grist for the Justice Department's antitrust suit against IBM.

However, the announcement had little effect on buyers and sellers of stock.

"If it had, everybody would be buying IBM now, and they're not," said Edelson pointed out.

On an immediate basis, the Xerox announcement may have affected the price of a few stocks of companies about which many people are already asking questions, such as Honeywell and Control Data Corp., Golden said.

Both Golden and Dorshow agreed, however, that there was a definite decision that has been announced by Control Data Corp. Honeywell or Unisys, for example, the impact would have been considerable.

"The basic principle we see acting here is typical of a down market," Golden said. "If there's any question at all about the quality of a stock, its price will drop during a down period, and that principle could be applied to almost every computer company, including IBM, he said. Both Dorshow and Edelson linked two other factors to the general downturn of the computer stocks:

The worldwide recession, which has affected the multinationals with special severity, and the theory that computer stocks in general tend to rise and fall with the fortunes of IBM.

"And a number of factors have affected IBM's fortunes this year," Edelson continued.

First, he cited the Justice Department's antitrust suit against IBM and, second, the company's relatively lackluster earnings, which are considered typical performance during the wane of a product cycle — in this case, the System 370.

Secondly, Edelson noted the Employee Retirement Income Security Act — a pension law passed this year — which asks fund managers to keep stock volumes at "prudent" levels.

Other fund managers have come under Congressional criticism for overemphasizing the upper tier of "favored stocks" in favor of diversification. The conclusion of the rest of the market, Golden said.

Funds and banks have become sensitive to criticism and, as a result, have sold large blocks of IBM, eroding the price and bringing about a considerable redistribution of the stock, Edelson explained.

Edelson, however, sees this situation as "bullish" for IBM, and, therefore, "bullish" for the computer stocks in general.

"I think they are forming the base here for IBM. If banks, insurance companies and funds and had kept their holdings of IBM, I wouldn't have thought so, but because many may have sold from, say, 10% of their portfolios consisting of IBM to, say, only 5%, they can buy in again without being imprudent.

This redistribution process will probably end "very soon," Edelson predicted, and IBM will again sell on the fundamentals.

"There are no fumes so long as there is a rational market and there is no fundamental reason for IBM not to be at an attractive level," Edelson concluded.

(Continued on Page 66)
LOOK AT THESE SAVINGS ON NEW 370 MEMORY!

<table>
<thead>
<tr>
<th>370/145 Memory</th>
<th>IBM Rental</th>
<th>FMA Rental</th>
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<tr>
<td>From 256K to 512K</td>
<td>$3,770</td>
<td>$1,953</td>
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<tr>
<td>From 512K to 768K</td>
<td>2,880</td>
<td>2,115</td>
<td>1,739</td>
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<td>From 512K to 1024K</td>
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<td>3,600</td>
<td>2,868</td>
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<tr>
<td>From 1024K to 2048K</td>
<td>11,210</td>
<td>6,412</td>
<td>5,214</td>
<td>4,404</td>
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*Lease prices include memory and CPU upgrade to 370/158 Model 3.*

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**GA Reorganizes in Wake Of Management Changes**

ANAHEIM, Calif. — In the wake of the management shuffle at General Automation Inc. (GA), five functional profit and loss groups have been formed including customer service, products, systems and international and subsidiary groups as well as a domestic sales division.

Chairman Lawrence A. Goshorn, who has stepped into the additional roles of president and vice-president following the resignations of Raymond Noorda and Michael Ford respectively [CW, Aug. 27], made the announcement.

A Systems Group has been formed under the direction of group executive George Voszka, who is in charge of all industrial, communications and data management system marketing, development and manufacturing.

W. Joseph Watson, vice-president of the Products Group, has additional responsibility for marketing and manufacturing of all computer and peripheral products.

All international activities, including the European, Far Eastern and International Distributors Division, have been consolidated into the International Group under the direction of Goshorn.

Jay L. Kear continues as vice-president of sales with responsibility for the Domestic Sales Division.

Richard P. Carroll retains responsibility for all field service, training and technical publications as vice-president of the Customer Service Group.

"All of the organizational changes are in accordance with our continuing plan to structure the company to provide strong financial control over our various lines of business," Goshorn explained.

**Qume Gets Financing**

HAYWARD, Calif. — Qume Corp. is planning to increase production of its printers after completing $1.2 million in additional financing.

Qume currently ships over 450 printers a month, the firm said.

The financing includes $680,000 in equity from private investors and a $500,000 addition to a $2 million line of credit with First Pennsylvania Bank.

**Need System 32 Supplies?**

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Check our complete System 32 supply package—Pryor Pak 32. Every supply item you need for your new System 32. One source. One order. One box. And one price. You get 30 diskettes, 1000 one-part forms, 500 two-part forms, five binders, and up to six ribbons—all for only $232, the same as the OEM price for just the diskettes alone. Pryor Pak 32 is easy to ship (it meets United Parcel specs), easy to store. Five plants, our own truck fleet or United Parcel shipping give quick service—anywhere. Call now to place your order.

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Remex Catering to Smaller OEMs for Floppy Business

By Molly Upton

Of the CW Staff

SANTA ANA, Calif. — Remex is carving a niche in the floppy drive business by catering to the smaller OEM customer who needs electronics and interface design as well as the drive mechanism, according to Bill Walker, the company's director of marketing.

"We're probably one of the few drive makers looking at the total system all the way back to the software," Walker said.

Often, he explained, "the OEM knows he wants a floppy, but doesn't know how to apply it." Remex designs the formatter and helps the customer decide which functions of the controller to put in hardware and software.

One customer, for example, has the double-density feature controlled by the formatter in the drive. The rest of the controller is on a printed circuit board placed in his computer. The customer supplies the power supply and will write the driver.

Walker said. Eventually, Walker expects many of these customers to take the electronics in-house, but "they'll buy several hundred before that.

"If we can supply the OEM with 300 to 500 drives with electronics on the front end, we can do it," Walker said, explaining Remex "has most of the building blocks; we just repack it.

Within the floppy disk industry, drive manufacturers generally concentrate on supplying hardware, he said, and the systems houses are principally oriented toward creating turnkey systems for the end user, "but no one is concentrating on what the smaller OEM needs."

End-User Sales

Remex is also selling a floppy disk drive and electronics to the end user, which is one of its first forays into the end-user market, Walker said.

The firm has interfaces for the Digital Equipment Corp. PDP-11 and Data General Nova and will have one for the DEC PDP-8/E.

The software for the PDP-11, called ROS-11, supports other peripherals on the 11, he said.

In keeping with Remex's more traditional line of supplying paper tape punches, many of which are used in numerical control, Remex is working with an OEM customer to design a floppy for use in "dirty environments."

The heat level is higher at such sites because the units are exposed to keep out the dirt.

The principal problem seems to be the media, Walker said, but Remex is working closely with one of the manufacturers and a new jacket has been designed. Some of the units are being field-tested and are performing well, he said.

Remex began its entry into the floppy business with a marketing agreement with Orbis. The agreement also included manufacturing rights to Orbis' Model 74B drive, Walker explained.

Remex chose to obtain a license rather than design its own units because of expediency.

DP Stocks Join Others in Drop

(Continued from Page 63)

One thesis holds that the IBM product cycle is much like an inverted V, or the Greek letter lambda, Edelson said. At present, the end of the 370 cycle has placed the stock on the downward leg of the lambda. Both revenues and earnings have slowed. This, combined with heavy selling by the institutions, has kept prices down, he said.

Although the Future Systems terminology has been scrapped, IBM Chairman Frank T. Cary recently said in Barrons that this action in no way precludes introduction of an intermediate-level new product, Edelson said. The "new, more sophisticated peripherals demand it," Edelson added.

Dorshow said another factor contributing to IBM's sluggish earnings this year was last year's unusually large number of 370/158 and 168 purchases.

Another analyst, whose clients are principally individuals, agreed with Golden's contention that all computer stocks have not performed uniformly.

"Mines are where all the action and excitement is today — it's a very volatile area. They over- swing up and over swing down. Both Digital Equipment Corp. and Data General Corp. have done well," he said, "although a lot of other mini stocks have not been able to survive the recession too well, and are heavily depressed.

"Their stocks have reacted to earnings performance," he said. "Some are concerned that growth has slowed in the mainframe area, and people are hesitating to buy. People are almost totally afraid of peripheral companies," he added.

"What's more, interest in technology is temporarily waning," he remarked.

"The street always gets very hung up on one thing at a time, and right now that thing is basic industries such as chemicals and steel.
September 10, 1975

Merger Meets Snags
PARIS — The proposed merger of Compagnie Internationale de l'Informatique (CII) and Honeywell Bull has run into some snags arising from certain clauses in the contract. Although the agreement calls for Honeywell Information Systems (HIS) to control 47% of the newly merged entity, one clause provided that whichever company has the larger revenues would control decisions on world research and development operations.

By consolidating its Canadian and British revenues, Honeywell would have the larger share, an article in The Financial Times of London pointed out.

The agreement called for Thomson CSF to take over CII's Toulouse, France plant and its military, space and minicomputer operations. But a clause would effectively prohibit Thomson from competing with CII-Bull in these fields for at least 15 years, the article said.

According to Entrex Head
Source Data Processing on Rise
By Molly Upton
Of the CW Staff
NEWTON, Mass. — Source data processing is one of the fastest growing areas in the data entry field, said Entrex, Inc. President Donald W. Feddersen.

"More and more users today are doing all possible DP before that data reaches the mainframe," explained W. Harry Vickers, vice-president of market development and support. Entrex plans to broaden the scope of its market, he said, and a product announcement is scheduled for the first of the year, concerning either intelligent terminals or a data base management system.

Currently, Entrex terminals can be used in both the cluster environment with a shared processor and in remote user departments, linked to the Entrex processor either by hard wire or communications, he explained.

Entrex emphasizes thinking of data entry as an integral part of DP in a customer's operation, Vickers said.

"People think mainframes, and they don't quite understand the cost involved in data entry," he said. "Some have gone on-line to IBM's Customer Information Control System," which he characterized as a very expensive method not geared to handling real volume applications.

Entrex markets its systems to the central DP department, he explained, rather than to the divisions, as is the practice with several intelligent terminal makers, Vickers said.

With the trend in the market toward the sophisticated, upper-level product, users are finding they can pre-process decisions or preprocess data by pre-processing in the Entrex units, he said.

Domestic Orders Up
The domestic order rate was up 86% in the first six months of 1975 compared with the same 1974 period. "We were not entirely happy with the first quarter's results, but the second quarter was up 30% over the first quarter of 1975," he said.

Rental and service revenue was up 108% in the first half of 1975, he added.

Recently, Entrex has been shipping one communications controller for every four systems, and about 20% of all shipments have remote keystations.

A growing number of Entrex orders are coming from displacement of first generation key-to-disk systems. Recently that percentage has been as high as 20%.

Because other vendors' lines are not upward-compatible, when users decide to upgrade, they evaluate other vendors' products such as Entrex, Vickers said.

The Entrex line is software-compatible, he added.

Entrex had virtual capability in its products as early as 1972, but it wasn't until 1973 or 1974 that it figured what to call that capability, Vickers said.

$399*
Get an ASR terminal from us for less than a KSR terminal from someone else.

Compared to our competitors, KSR terminals are "type" model 33 ASR's are price-perilously close.

For example, our $399 ASR includes as standard many of the features other charge extra for: Features like paper-tape reader and punch, answer back, high-speed automatic carriage return and line feed if you need it, as well as a pedestal.

The ASR receives and processes automatically at 100 words per minute using standard one-inch paper tape. It is also compatible with most minicomputer and communications systems. This compatibility is just one reason why over 50,000 model 33's have already been sold.

There's another big reason for our popularity: Flexibility. You can double the data transmission capacity of the model 33 with a simple wiring option. Called "full duplex," this option permits simultaneous sending and receiving.

If you think our $399 price tag is rock bottom, you're wrong. We've got KSR's for as little as $400, and FO's starting at $594. So whether your main-computer is on a "bare-bones" or a "plush" budget, Entrex has a terminal for you.

Service? As much or as little as you need. You tell us and we'll come up with a plan that suits you to a "T." No matter where you are, we can help you. But when you gone right down to it, you won't need much service. Because the model 33 is one of the most dependable terminals in the industry.

We set the standards. And we live up to our name.

The model 33. It's what you need. At a price no one can touch.

For more information, write or call TERMINAL CENTRAL, Teletype Corporation, 5555 Tully Ave., Skokie, Ill. 60076 (312) 986-2000.
Remex Catering to Smaller OEMs for Floppy Business

By Molly Upton

SANTA ANA, Calif. - Remex is carving out a niche in the floppy drive business by catering to the smaller OEMs who need both electronics and interface designs as well as the drive mechanism, according to Bill Walker, the company's director of marketing.

"We're probably one of the few drive makers looking at the total system all the way back to the software," Walker said. "We're probably one of the few drive makers looking at the total system all the way back to the software." Walker said.

Eventually, Walker expects many of these customers to take the electronics in-house, but "they'll buy several hundred before that. If we can supply the OEM with 300 to 500 drives with electronics on the front end, we can do it," Walker said, explaining Remex "has most of the building blocks; we just repack it."

Within the floppy disk industry, drive manufacturers generally concentrate on supplying hardware, he said, and the systems houses are principally oriented toward creating turnkey systems for the end user, "but no one is concentrating on what the smaller OEM needs." Walker said.

End User Sales

Remex is also selling a floppy disk drive and electronics to the end user, which is one of its first forays into the end-user market, Walker said.

The firm has interfaces for the Digital Equipment Corp. PDP-11 and Data General Nova and will have one for the DEC PDP-8/E. The software for the PDP-11, called ROS-11, supports other peripherals on the 11, he said. In keeping with Remex's more traditional line of supplying paper tape punch, many of which are used in numerical control, Remex is working with an OEM customer to design a floppy for use in "dirty environments."

The heat level is higher at such sites because the units are enclosed to keep out the dirt.

The principal problem seems to be the media, Walker said, but Remex is working closely with one of the manufacturers and a new jacket has been designed. Some of the units are being field-tested and are performing well, he said.

Remex began its entry into floppy business with a marketing agreement with Orbis. The agreement also included manufacturing rights to Orbis Model 748 drive, Walker explained.

Remex chose to obtain a license rather than design its own units because of expediency.
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Entrex emphasizes thinking of data entry as an integral part of DP in a customer's operations, said Vickers.

"People think mainframes, and they don't take into account the cost involved in data entry," he said. "For example, some have gone on-line to IBM's Customer Information Control System," which he characterized as a very expensive method not geared to handling real volume applications.

Entrex markets its systems to the central DP department, he explained, rather than to the divisions, as is the practice with several intelligent terminal makers, Vickers said.

With the trend in the market toward the sophisticated, upper level product, users are finding they can reduce central processor time by preprocessing in the Entrex units, he said.

Some users have found they are able to put a lot more applications on the upper-end Entrex systems, which have a Digital Computer Controls, Inc. minicomputer. In fact, Entrex performs bill-of-materials processing on its in-house system, Feddersen said.

Data Entry-Oriented

But, instead of marketing the Entrex systems as an upper-level equipment, machines, which would be getting a bit close to marketing vs. IBM, Entrex continues to tout its products as data entry-oriented devices.

Since the Entrex products come with software designed to accommodate data entry, with checks and screens, it is more suited to many data entry-type applications than a processor with a raw language capability such as Basic or Cobol, Feddersen said.

Although the shared processor data entry market is leveling off, Entrex is still growing, he noted.

Domestic Orders Up

The domestic order rate was up 86% in the first six months of 1975 compared with the same 1974 period. "We were not entirely happy with the first quarter's results, but the second quarter was up 30% over the first quarter of 1975," he said.

Rental and service revenue was up 100% in the first half of 1975, he added.

Recently, Entrex has been shipping some communications controllers for every four systems, and about 20% of all shipments are of complete systems.

A growing number of Entrex orders are coming from displacement of first generation key-to-disk systems. Recently that percentage has been as high as 20%.

Because other vendors' lines are not upward-compatible, when users decide to upgrade, they evaluate other vendors' products such as Entrex, Vickers said.

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$969*

Get an ASR terminal from us for less than a KSR terminal from someone else.

Compared to our competitors' KSR terminals, the Teletype* model 33 ASR's price is unbelievably low.

For example, our $969 ASR includes as standard many of the features others charge extra for: Features like paper tape reader and punch, answer back parity generation, automatic carriage return and line-feed if you need it, as well as a pedestals.

The ASR version sends and receives automatically at 100 words per minute using standard one-inch paper tape. It's also compatible with most mini-computer and communications systems. This compatibility is just one reason why over 500,000 model 33s have already been sold.

There's another big reason for our popularity: Flexibility. You can double the data transmission capacity of the model 33 with a simple wiring option.

Called "full duplex," this option permits simultaneous sending and receiving.

If you think our $969 price tag is rock bottom, you're wrong. We've got KSRs for as little as $693* and R0s starting at $584*.

So whatever your mini-computer operation, don't pay a max-price for a data terminal.

Service? As much or as little as you need. You tell us and we'll come up with a plan that suits you to a "T." No matter where you are, we're there at your beck.

But when you come right down to it you won't need much service. Because the model 33 is one of the most dependable terminals in the industry.

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View From Below Shows Manager Should Leave His Quirks Home

By Robert Powers

Although the youth of the DP industry has made it easier to incorporate new concepts in marketing and manufacturing than in older industries, there is still tremendous need and opportunity for management training.

Within our group the ability to pole vault over the present state of the art in DP, however, doesn't seem likely that we will be able to do it in our present state of unprepared management.

According to composite management profiles drawn up from 50 first-and second-level managers in about 14 nationally known companies, 66% of frontline management requires some degree of retraining.

We can do better than this.

The management profiles, drawn from both hardware and software fields, fell fairly evenly into five composite characterizations of Al, Bob, Dave and Ed (see the chart at the left).

They are judged not on neatness, clarity and aptness of thought, but on matters considered to be important to the people who work for them.

In category one, attainment of the position itself, the Al's and Daves reached management through political means — some through power plays, others selected from above with the hope of an unhesitating yes vote whenever required.

Bob is a classic example of promoting the most technically competent person as a result of reorganization or an unexpectedly large expansion. Unfortunately, two voids are created in the single move. Not only is the best source of technical expertise lost to that capacity, but a manager is created who must look up the word in the dictionary.

Carl, having both technical and managerial training, is a good and obvious choice. Even if there is need for him to train a technically competent replacement, there is time because the managerial skills are already present, providing the freedom to do so.

Ed is a strange bird. Competent in managerial abilities, but in touch only with the physical work at hand in a more academic sense, he must employ higher level management techniques in his lower level position.

Healthy Work Environment

At category two, personality, Carl and Ed treat the people working for them with professional courtesy and respect — a great psychological asset for them, creating a healthy working environment. Dave carries around an "I'm one of the guys" sign, giving off an aura of not quite being ready for a leadership position.

Bob feels even less secure in a leadership role, but John Wayne would be proud of the way he conceals it.

Al doesn't have much time for his people socially. A sort of class consciousness permeates the "I'm always right" attitude of this personality.

Category three is the attitude with which these leaders view their part in the job at hand.

Both the Al's and the Bobs are unable to delegate authority, but for different reasons. Al wants assurance things will be done his way, for fear of loss of power.

Bob, however, is forever convinced that no one can do the job better than he.

While both slow the job with this policy, Bob does more damage because he needs to be involved in more minute detail.

Dave has an unhealthy concept of his role in production. Concerned more with his reputation than his responsibilities, he jeopardizes both.

Carl and Ed are somewhat alike here. Both believe they and their troops have a mutual goal of finally popping whatever is under development out of the far end of the assembly line.

Ed, however, has an additional goal — to pop "Production 1" out at such a time and in such a way that the home office will remark, "Isn't Ed one hell of a guy?"

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LOS ANGELES — Univac has landed an order for systems valued at about $14.5 million from the county of Los Angeles. The award came after a year-long evaluation of bids submitted by 17 computer and peripheral equipment manufacturers. Evaluations were performed by three independent consulting firms and 11 organizations from the county, state and federal governments.

Title: Two 1110 multiprocessors in a two-by-two configuration will be installed in the Welfare and General Government computer centers along with line printers, tape and disk drives and communications controllers.

The CPUs are scheduled for installation in October and mid-1976. Eligibility determination, one of the initial applications to go on-line in the Welfare Computer Center, is scheduled to be operational next May.

The General Government conversion is scheduled to be completed by November 1976. One 1110 CPU will monitor and control nearly 1.5 million active individuals on Welfare and provide information, when needed, on about three million other individuals.

The system will also print purchase authorizations for food stamps, issue Welfare warrants and automate many procedures for determining the eligibility of applicants.

When the communications network is completed next spring, the computer will be accessed by 562 Uniscope terminals located in 62 neighborhood Welfare offices from Long Beach to the Mojave Desert.

Some of the departments to be serviced by the second 1110, which will be installed in the county's General Government Computer Center, include auditor-controller, register recorder, assessor, tax collector, child support, purchasing and stores, chief administration officer, forester and fire warden and mechanical and personnel (for payroll).

The Transaction Interface Program will not only check passwords but the physical identifications of terminals to validate their access to the system, Univac said.

The Communications Management System software will log each transaction as it enters the system in the event recovery is necessary.

Commenting on what is believed to be the largest civil government contract ever negotiated in the state of California, Los Angeles DP director Robert A. Best said, "More than 400 different evaluation criteria were applied in measuring the capabilities of the equipment and software proposed by the bidders.

"When all the tests were completed, we found Sperry Univac offered the most cost-effective total system solution to the county's Welfare and General Government needs."

"Being selected as the vendor for this major procurement, after an extremely thorough and objective analysis by the County of Los Angeles and the state and federal governments, is something we prize very much," said C.R. Williams, vice-president and general manager of western operations for Univac.

The General Government computer center for the county currently uses Burroughs, Univac and IBM equipment to write payroll warrants and prepare the assessor's role, tax bills and other documents as well as process elections.

The Welfare Computer Center currently uses Honeywell equipment.

The 1110s will replace a Honeywell 3200, a Burroughs B3500, two Univac (RCA) Series 70's and one 70's. They will also be taking some of the workload off an IBM 360/40, Univac said.

To give an idea of the workload, the county, with a 1974 population of 7.1 million people, accounts for about 34% of the total population of California and is larger than 41 of the 50 states.
Orders & Installations

United Computing Systems, Inc. has ordered three models from Control Data Corp.'s Cyber 170 series, a 175 and two 174s, to be installed at its data center in Kansas City, Mo. The 175 will be delivered this year, the 174s in 1976.

North East Services Co., Inc. has installed a mid-range System 380 key-to-disk system from Exteris, Inc.

The Reader's Digest is replacing existing disk drives supplied by several vendors with a four-control unit, 16-drive complement of Intel 3330-compatible drives.

United Air Lines has ordered California Computer Products, Inc. 1030 disk controllers and 230 disk memories for use in its passenger reservations system.

The Nutmeg Bakers Supply Co. of New Haven, Conn., is the first installation of IBM's System/32 Wholesale Food Distribution Accounting and Management System.

Tucson Data Center, Inc. has ordered a Burroughs B3700 to provide on-line DP services for 42 credit unions throughout Arizona.

Marine Midland Services Corp., the DP services arm of Marine Midland Bank, has ordered a 24K ICL 2903 computer system from International Computers Ltd., for use by its International Banking Division in New York.

The Long Beach, Calif., Community Hospital has ordered an HP3000 Model 300 CX computer system from Hewlett-Packard Co. to handle patient record-keeping and billing, personnel records and other administrative and medical tasks.

Wire CRT Chassis Gives Titchener High Hopes for Market Capture

BINGHAMTON, N.Y. — CRT manufacturers are finding they can save money, time and space by using welded wire chassis instead of solid metal enclosures.

Developed by the E.H. Titchener Co. here, the technique enables the electronics to be mounted on a custom-designed frame. A cabinet is then dropped over the frame.

The open wire frame ends heat problems and eliminates the need for cooling fans, according to Ed Wayne, vice-president of research and development at Titchener.

Frame weight is cut approximately one-third, he said, and customer studies show components can be positioned on the chassis and tested 20% to 25% faster.

Lower cost, reduced dimensions and ease of servicing in the field are additional attributes claimed for the new system.

"Surveys tell us applications for CRT terminals are expected to increase 300% within the next two years alone," Bob Lindridge, manager of sales, said.

"Quite frankly, with all its advantages, we expect the steel wire chassis to just about capture this market totally. This year we'll probably build 20,000 units, and the frame's penetration of the field is only beginning," he said.

35% Savings Claimed

Raytheon is saying 35% by using the wire frame chassis instead of the solid metal version in its airlines reservations terminals, Titchener said. Bunker-Ramo (BR) reported the wire chassis is 15% less expensive and expedites assembly time by 20%. BR uses the frames in its desktop stock quotation terminal.

Haustline Corp., Computer Optics and Redactron Corp. are other users.

In most cases, the parts-holding chassis is manufactured of bright basic wire, 1/8-in. to 3/16-in. in diameter, and coated to afford corrosion protection and a shiny, chrome-like surface. Cold-rolled strip steel and stampings are welded onto the chassis to provide mounting studs and screw holes for holding the electronic gear.

Circuit boards are mounted with permanent fasteners or plastic snap locks which permit the boards to be popped out and replaced. The picture tube is normally bolted to four stampings with weld studs, and the power transformers affixed to a heavier stamping on the bottom of the frame for a lower center of gravity.

DDS Clearinghouse To Market Software For Interdata Systems

TUCSON, Ariz. — Diversified Data Systems, Inc. (DDS), a systems and software firm marketing a Cobol compiler for Interdata computers, intends to become a clearinghouse for independently written software that operates on Interdata 16-bit and 32-bit computers.

"The Interdata user group has a lot of good software available which is free to Interdata users," said Rick Dural, vice-president of marketing for DDS, "but there are many software packages written for Interdata computers whose authors are not willing to supply without charge.

"The expense of marketing a package which might sell for $2,500 or less, however, would be prohibitive for most small companies or individuals who develop software but do not maintain marketing organizations," he said.

The authoring firm will handle the technical support of the package, should any be required.

Our A 5, for example, is designed and priced to ease small businesses into computerization.

Our A 7 microcomputer is ideal for diverse users, from individuals and distributors to funded organizations (such as school boards and municipalities).

Our A 9, for instance, is designed and priced to ease small businesses into computerization.

Our A 7 microcomputer is ideal for diverse users, from individuals and distributors to funded organizations (such as school boards and municipalities).

And our TC-800 financial terminal features its own memory, some wonder what happens to any of the computers if it fails? The TC-800 can keep operating.

And our TC-800 financial terminal features its own memory, some wonder what happens to any of the computers if it fails? The TC-800 can keep operating.

To Market Software

"The Interdata user group has a lot of good software available which is free to Interdata users," said Rick Dural, vice-president of marketing for DDS, "but there are many software packages written for Interdata computers whose authors are not willing to supply without charge.

"The expense of marketing a package which might sell for $2,500 or less, however, would be prohibitive for most small companies or individuals who develop software but do not maintain marketing organizations," he said.

The authoring firm will handle the technical support of the package, should any be required.

The TC-800

The Nutmeg Bakers Supply Co. of New Haven, Conn., is the first installation of IBM's System/32 Wholesale Food Distribution Accounting and Management System.

Tucson Data Center, Inc. has ordered a Burroughs B3700 to provide on-line DP services for 42 credit unions throughout Arizona.

Marine Midland Services Corp., the DP services arm of Marine Midland Bank, has ordered a 24K ICL 2903 computer system from International Computers Ltd., for use by its International Banking Division in New York.

The Long Beach, Calif., Community Hospital has ordered an HP3000 Model 300 CX computer system from Hewlett-Packard Co. to handle patient record-keeping and billing, personnel records and other administrative and medical tasks.

One thing all our minicomputer systems have in common is uncommon modularity.

Our A 5, for example, is designed and priced to ease small businesses into computerization.

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And our TC-800 financial terminal features its own memory, some wonder what happens to any of the computers if it fails? The TC-800 can keep operating.

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The authoring firm will handle the technical support of the package, should any be required.
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The Memorex 1380 Communications Processor!—our intelligent entry into the communications front-end marketplace. The 1380 provides throughput up to eight times that of the IBM 3705. It outperforms the 3704/3705 in network control for the same reason our 1270 is a step ahead of 2701/2/3. Memorex uses more advanced hardware and software.

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For details, call your nearest Memorex sales office, located in major cities. Memorex Equipment Products Group, San Tomas at Central Expressway, Santa Clara, California 95052. (408) 987-1000.
Microdata Corp. has received a contract valued at more than $1.4 million from Dymo Graphic Systems, Inc. for 9000 series tape transports and Model 9217 formatters. Okidata Corp. has received a contract from Lear Siegler, Inc. for 500 Okidata 110 char/sec desktop printers, which will become part of the ADMS series of display terminal systems. In addition, Lear Siegler will offer maintenance services to Okidata CP110 printers in the U.S. and Europe.

The company's Model II xerographic-type printer, which operates at 9.200 line/min will sell in small quantities for $38,000 per unit, according to Edward M. Brown, vice-president of marketing. The Model II is the culmination of a five-year development effort during which original market estimates of $160 million were vastly increased by IBM's entry into the nonimpact printer market with the Model 3800, Wall Street market forecasters said. Neither Brown nor Upsetter's president Joseph Klockenbrink was willing to estimate Upsetter's potential share of the nonimpact market or the $8.5 billion total printer market.

Foreign sales will be handled under a distribution agreement with Idac S.A., a French corporation, which calls for an irre-
Computer memories.

developed into the basis for practical

ing with the concept to see if it can be

resents the information stored.

distinguishing among the different number of

turns a magnetic direction makes in one

rounding magnetic film, rather than by

the presence or absence of a bubble.

Slonczewski has devised a way of distin-

guishing magnetic bubbles.

Slonczewski of the IBM Research

Center here has received a patent for a

technique allowing higher storage density

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DALLAS — Cash-hungry Wyly Corp. reported a second-quarter loss of $9.5 million and a $12 million loss for the six months ended June 30. The losses were due primarily to underwriting losses in its insurance subsidiary and operating losses from its Data Transmission Co. subsidiary. Wyly has been attempting to sell its Gulf Insurance subsidiary and said it anticipates such a sale could result in a net loss of $20 million or more and a substantial reduction in debt.

Discussions are continuing with Haefner Holding AG on a possible substantial investment in Wyly stock, the firm said. Haefner has been supplying Datran with interim loans which are expected to satisfy Datran’s cash requirements for 1975. Datran will need additional cash during 1976, which has not yet been arranged, Wyly said.

Wyly changed its accounting methods to conform to new standards for development-stage companies. Datran’s operating and other costs, previously defered, are shown as losses. Wyly’s investment in the firm and its shareholder equity were also restated.

The figures for 1974 were also restated to reflect the sale of the consumer line, the Michael Milken Computer Leasing Co. and the Energy Division of UCC. Revenues from the first half of 1975 totaled $30.8 million from continuing operations.

Breaking down the quarter, Wyly’s consolidated revenues declined to $15.5 million from $21.1 million in the same period last year. The loss grew to $9.5 million or $1.14 a share including a $2.4 million credit from discontinued operations, compared with a loss of $1.8 million or 22 cents a share in the 1974 quarter, which included a $353,000 credit from discontinued operations.

UCC’s service operations’ income before taxes and corporate costs declined to $1 million compared with $2.8 million in the year-ago quarter, while Gulf Insurance lost $6.2 million compared with a $861,000 loss in the 1974 quarter.

Datran contributed a loss of $3 million compared with a $1.5 million loss before taxes and corporate costs in the year-ago period.

Datran’s unconsolidated revenues, however, grew to $131,000 in the quarter from $19,000 in the same period last year.

Same Picture

During the six months, the picture was much the same. Consolidated revenues declined to $31 million from $39.9 million in the year-ago and losses grew to $1.8 million or 44.5 a share, including a $2.8 million credit from discontinued operations.

The loss in the 1974 six months, when there was a $975,000 credit, was $2.4 million or 29 cents a share.

Gulf Insurance lost nearly $6 million in contrast with earnings of $1.9 million in the year-ago half, while Datran showed a deficit of $5.5 million before taxes and costs. A year ago the restated Datran debt was $3.3 million.

UCC Figures

UCC’s consolidated net income increased to $2.8 million compared with $3.7 million in the year-ago half. The 1974 figure included a $1.5 million sale of software to a single customer and profits of $800,000 on services contract later sold.

Revenues for the first half of 1975 amounted to $51.9 million from continuing operations. There was a $2.8 million gain from the sale of three UCC operating units, a service center in Seattle, a custom programming operation in Pennsylvania and its energy group.

“A decision to increase bank- ing product development and to accelerate our scientific/engi neering equipment consolidation program is reducing earnings in the first half,” Donald G. Thom son, UCC president said. “But this is expected to produce revenue and profits in 1976, offsetting the loss of profits from those entities sold,” he added.

All UCC divisions were profitable at midyear, although the

HORSHAM, Pa. — Despite a sharp drop in second-quarter earnings, Decision Data Computer Corp. reported an increase in earnings during the six months ended May 31. President Lord of the company attributed the second-quarter decline to general economic conditions and especially to the lower order rate experienced in the first quarter.

The original equipment manufacturers (OEM) are deferring decision on contracts and order rates experienced in the first quarter.

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Revenues grew to $11.2 million compared with $9.9 million in the 1974 quarter.

For the first six months, however, earnings rose to $493,000 or 3 cents a share compared with $411,000 or 11 cents a share.

The credits were $261,000 and $190,000 respectively.

Revenues during the half expanded to $22.8 million compared with $17.2 million a year ago.

Scan-Data Results

Up in 6 Months

NORRISTOWN, Pa. — Scan-Data Corp.’s earnings and revenues increased for the second- quarter and six-month periods ended June 30.

For the quarter and six months ended June 30.

For the quarter and six months ended June 30.

For the quarter and six months ended June 30.

For the quarter and six months ended June 30.

For the quarter and six months ended June 30.

For the quarter and six months ended June 30.

For the quarter and six months ended June 30.

For the quarter and six months ended June 30.

For the quarter and six months ended June 30.

For the quarter and six months ended June 30.
### Computerworld Stock Trading Summary

#### Closing Prices September 3, 1975

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Name</th>
<th>Price</th>
<th>Change</th>
<th>Volume</th>
</tr>
</thead>
<tbody>
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<td>IBM</td>
<td>International Business Machines</td>
<td>185 3/8</td>
<td>+3 5/8</td>
<td>400,000</td>
</tr>
<tr>
<td>Apple</td>
<td>Apple Computer, Inc.</td>
<td>76 5/8</td>
<td>+1 3/4</td>
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<td>Xerox</td>
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<td>75 3/8</td>
<td>+1 1/4</td>
<td>100,000</td>
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<tr>
<td>HP</td>
<td>Hewlett-Packard</td>
<td>50 7/8</td>
<td>+1 5/8</td>
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<tr>
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#### Computer Systems

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#### Software & EDP Services

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#### Peripherals & Subsystems

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Meet Stretch.
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