OPERATIONS & AUTOMATION REPORT

# Fault-tolerant computers: Who's using them and why

## Two vendors dominate the business. Which one is best? If often depends on a user's software requirements

By M. William Friis

You can't yet call it a revolution, or even a major trend. It's more like a slow but steady evolution. But whatever you call it, fault-tolerant computer systems are being used by banks and other financial institutions, both here and abroad, in increasing numbers and for a steadily widening range of applications.

Industry reports indicate that at least 22 of the nation's 25 largest banks have installed such systems and are using them in at least one area of their operations. All told, almost 150 commercial banks in the United States and Canada are estimated to be using fault-tolerant systems at present.

Fault-tolerant computers are a class of data processing systems that offer continuous, uninterrupted processing when one or more system components fail. Generally they consist of one or more minicomputers or microcomputers, plus special software. Their major applications are in high-volume transaction processing and data communications systems where reliability and data integrity are primary requirements.

Like other large-scale users of data processing systems, major banks have for many years assured relative system reliability by using duplexed mainframe

computers. Each has invested millions of dollars in a cloned system that serves little purpose other than to provide backup for the bank's primary processor, should it fail.

Since the late 1970s and early 1980s, fault-tolerant computers have been available at entry-level prices as low as $140,000; top-of-the-line prices are well under $500,000. At these prices, many large and medium-sized banks and bank service organizations have found that fault-tolerant systems are highly cost-

effective for various areas of their operations.

Banking applications for these relatively new systems include automated teller machine and point-of-sale authorization, transaction processing and settlement, wire transfer, cash management, network management, and delinquent loan collection.

**Leading vendors.** A number of new hardware vendors have entered the fault-tolerant systems market in recent years. However, two manufacturers of fault-tol-

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## Fault-tolerant system vendors

The following is a list of companies that have either already installed fault-tolerant systems in banks (the first two), or that have systems designed for use in the banking industry:

Tandem Computers, Inc.
19191 Valico Parkway
Cupertino, CA 95014

Stratus Computer, Inc.
55 Fairbanks Blvd
Marlboro, MA 01752

IBM Information Systems Group
National Marketing Division
4111 Northside Parkway
Atlanta, GA 30327

NoHalt Computers
1750 New Highway
Farmingdale, NY 11735

Parallel Computers, Inc.
3004 Mission Street
Santa Cruz, CA 95060

Tolerant Systems
81 E. Daggett Drive
San Jose, CA 95134

Sequoia Systems, Inc.
3 Metropolitan Corporate Center
Marlboro, MA 01752

EnMasse Computer Corp.
125 Nagog Park
Acton, MA 01720

Mr. Friis is a freelance writer based in Falmouth, Mass. He specializes in business and high technology subjects.

erant systems account for virtually all existing or announced installations in banking. Those two companies are Tandem Computers, Inc. and Stratus Computer, Inc.

International Business Machines Corp recently entered the fault-tolerant marketplace, signing an agreement with Stratus Computer to purchase and market systems made by that company. The product will be marketed under the name of IBM System 88. Little information is currently available on IBM's success in marketing these systems or its long-range strategy with the fault-tolerant concept.

Established in the mid 1970s, Tandem was the first to develop and market fault-tolerant systems commercially. Tandem currently has the lion's share of installations in banks and other financial institutions. Stratus, which didn't get started until the early 1980s, is steadily catching up to Tandem in financial community sales. Its microcomputer-based technology is perceived by many to be more state-of-the-art than Tandem's. On the other hand, Tandem has considerably updated its minicomputer-based technology over the years and continues to do so.

One computer industry analyst, David Moschella, director of systems research for International Data Corp., of Framingham, Mass., views the relative positions of the two companies this way: "Tandem systems are probably more efficient in terms of hardware, because each system element is doing different tasks. But Stratus systems are probably more fault-tolerant, because they are based upon full hardware redundancy and more modern technology."

**Early user.** One of the first major users of Tandem fault-tolerant computers—which the company calls "nonstop" systems—was First Chicago Corp. The bank holding company took delivery of its first system in 1978. Donald R. Hollis, executive vice-president, is one of Tandem's staunchest supporters.

"We made an early commitment to Tandem in a big way, and we are pleased with the way the company has moved forward through the years with new hardware and software releases," Hollis states. "I believe we are using Tandems more extensively throughout our operations than any other financial institution," he adds.

In 1978, First Chicago began using fault-tolerant systems in back-office processing for its extensive network of international branches. The bank installed Tandem systems at all its major overseas locations and at its Edge Act subsidiary in New York City.

As part of that effort, the bank used a shared file approach. Data on all its products and related customer activities were stored in the overseas Tandems. Those systems were linked together in a worldwide network.

First Chicago has extended use of Tandem systems to its extensive ATM operations at its main office in downtown Chicago. Two nearby "unit state" facilities also rely on Tandem systems. The bank supports its ATM switch to the Cash Station ATM network with a Tandem system.

**Mixed preference.** Another long-time user of fault-tolerant systems is Mellon Bank, of Pittsburgh. Executive Vice-President George DiNardo no longer contends that mainframe computers are best for everything.

"We could meet all our reliability requirements with our new Sierra 3090

## "Fault-tolerant computers offer continuous processing when one or more system components fail"

mainframes. But there are places where fault-tolerant systems are absolutely lovely—for instance, where reliable, high-speed switches are needed. Also, the fault-tolerant systems can serve as giant controllers for a kludge of terminals," DiNardo observes.

At Mellon Bank, Tandem fault-tolerant systems were first used to create the proprietary Cashstream ATM network. "When we started Cashstream," explains DiNardo, "we needed to give the many medium-sized and small banks in our market area a good reason to tie their ATMs into our network. The idea of fault tolerance gave those smaller banks a great sense of security."

Mellon Bank has found many other uses for fault-tolerant systems. For some of these more recent applications, it has used Stratus computer systems. Its New York City Edge Act subsidiary is a case in point. There, a Stratus system—which the company calls a continuing

processing system—routes international funds transfers and messages through the SWIFT and CHIPS networks.

"We use Stratus systems in New York and in some of our other remote operations because they are easier to run," explains DiNardo. "In Pittsburgh, where I have qualified operations and systems people on hand, I prefer Tandems. But when I send off transactions to a remote site, I like Stratus systems, because a three-year-old can operate them," DiNardo states.

A Stratus system is in place for Mellon's Pittsburgh money transfer operations. There, the fault-tolerant system is used as a controller for 38 terminals. "We used to have several controllers with backup and store and forward capabilities. But, we did a study and found that we could handle all 38 terminals with one Stratus more economically. And we never have to worry about things going down," DiNardo reports.

In another area of the bank, DiNardo replaced an aging IBM Series 1 system that was used as a teleprocessing switch with a Tandem fault-tolerant system. "We concluded that because of the highly complex switching involved, the Tandem would fit better here," the Mellon executive notes.

**Software dictates.** Security Pacific Corp., another extensive user of fault-tolerant systems, started installing Tandem systems some four years ago. According to David McLeod, senior vice-president of Security Pacific Automation Co., the principal fault-tolerant system applications at this bank are cash management and balance reporting, funds transfer, and delinquent consumer loan collection.

Like many other users of fault tolerant systems, Security Pacific let software availability determine which system it would install. "When we began thinking about using fault-tolerant systems in certain areas of our operations, the only software packages that met our needs were written for Tandem systems. So that's why we run Tandems," McLeod reports.

When it put its delinquent consumer account collection activities on a fault-tolerant system, however, the bank couldn't find any existing software. The bank wrote its own software, for a Tandem system. "Since we had become comfortable with Tandems in other areas of our operations, we put the system together ourselves," explain McLeod. "Now our collectors have a reliable, real-time system that automatically

provides them with a display of all collection activities for each account.

"In addition, as they attempt to collect overdue payments from consumer loans, bank card loans, and personal lines of credit, they can enter the actions they have taken and the results directly into the system," McLeod adds. "We have on-line updates of customers' files. This new system has resulted in significant increases in our delinquent loan recovery rate and improved the productivity of our collectors," he reports.

**Switching needs.** Software availability was also a determining factor in National Bank of Georgia's choice of fault-tolerant system for its new ATM switching network and for its upcoming entry into the POS arena.

The bank had for many years been operating a proprietary ATM network off its IBM 4381 mainframe. National Bank of Georgia was also a member of the statewide AVAIL ATM network.

Transactions by its customers at other banks' ATMs, as well as transactions of the other banks' customers at its ATMs, had to be routed to a third-party processing center for switching purposes.

"We paid the processor some hefty fees to handle switching of our customers' transactions. But we weren't getting what we considered acceptable uptime and availability," reports Steve Dubois, the bank's director of information services. "So in 1984 we made a strategic decision: to establish a switching system for our own ATM transactions and to offer switching and settlement services to other banks in our state."

National Bank of Georgia chose a software package from Shared Financial Systems, Inc., of Dallas, to drive its new ATM transaction switching network. "This package offered settlement capabilities, the ability to handle ATM processing for small banks, thrifts, and credit unions, and an efficient interface

to our host 4381," Dubois says.

The Shared Financial Services retail EFT software was written for Stratus computers. That determined which fault-tolerant system the bank installed.

"We have found it very cost-effective to build our own transaction authorization, switching, and settlement network using a fault-tolerant system. We will increase our revenues significantly at a very small increase in cost. In fact, we expect our new system will pay for itself within two years," Dubois states.

When National Bank of Georgia initiated its new ATM network switch in April, it also joined an experimental POS network sponsored by AVAIL. The POS network uses the same fault-tolerant hardware and software.

"We're moving very slowly and cautiously in the POS area, and we don't want to invest a great deal of money in new hardware," Dubois notes. "If POS really begins to take off and we start generating large transaction volumes, we will be able to easily expand our Stratus system. We can add as many additional modules as we need," he states.

**ACH application.** Stratus has also been chosen by the Arizona Automated Clearing House, operators of one of the country's largest POS projects. The "Cactus Switch" ACH analyzed ten proposals for hardware and software before choosing a combination of a Stratus fault-tolerant computer and a software package provided by Applied Communications, Inc. This company recently began producing software for Stratus systems, as well as for Tandems.

Cost as related to performance was an important factor in the choice of the Stratus/ACI combination, according to Paul Finch, president of the ACH. The ACH wanted to process eight to ten transactions per second. Stratus was able to do that at lower cost, he says.

Across the country, First NH Banks, Inc., of Manchester. N.H., has just ordered a Tandem nonstop system to run its Resource 24 ATM network. It chose software designed by A.O. Smith Data Systems, of Brown Deer, Wisc.

"We wanted to be certain we were using proven technology. We talked to various banks that had installed fault-tolerant systems in their ATM operations. Most banks were using Tandem systems, and we concluded that Tandem would be the right system for us," reports Edward H. Lee, vice-president of operations at First NH

"In fairness to Stratus, many people seem to be viewing that company's prod-

ucts as possible improvements over Tandem. But we didn't find that many Stratus-based ATM systems up and running," he recalls.

**Software tools.** Because of the importance of software to the success of fault-tolerant systems, both Tandem and Stratus have entered into joint development and marketing agreements with a variety of independent software houses throughout the world. Information about these independent organizations and their products is readily available from both vendors.

In addition, both Stratus and Tandem provide software development tools for customers and independent software designers who want to develop new applications software. In mid-March, Tandem announced a new menu-driven COBOL application generator, called PATHMAKER, which it claims will cut in half the time required to develop on-line applications for its systems.

## "Tandem and Stratus offer roughly the same price performance"
—Omri Serlin, consultant

One of the hottest areas of contention between Tandem and Stratus is the performance, or transaction processing speeds, of their systems. Says Omri Serlin, a Los Altos, Calif.-based independent fault-tolerant systems consultant, "The two vendors make claims and counterclaims about performance, and each has a set of benchmarks to prove its case. My perception is that the systems of both companies have roughly the same price-performance characteristics, even though they do things in different ways."

This perception is echoed by Mellon Bank's George DiNardo. "Generally speaking, we can get eight to twelve transactions per second out of both our Tandems and our Stratuses, which is sufficient for our needs. Of course, this is nowhere near the 150 transactions per second we can get out of our mainframes. But, nobody said these systems would replace mainframes."□

TANDEM, Mgmt & Growk

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Computerworld

May 19, 1986

SECTION: COMPUTER INDUSTRY; Active Issues; Pg. 144

LENGTH: 545 words

HEADLINE: New products,confidence,strong quarter boost Tandem

BYLINE: Kathy Porteus; Porteus is president of Strand Research Associates, a
Centerville, Mass.-based company that provides customized research services for
financial and high-tech firms.

BODY:
   No one can fault the recent stock performance of  Tandem Computers,  Inc.
(TNDM -- 31 1/4 ).  A combination of well-received new products, increased
confidence in the company's financial management and surprisingly strong results
for the second fiscal quarter ended March 31 have propelled Tandem's stock price
up 40% since early April.

   Analysts adjusted their earnings estimates after Tandem posted second-quarter
earnings of 29 cents a share, when most were expecting per-share earnings of 20
to 22 cents.

   Frederic H. Cohen, analyst with L. F. Rothschild, Unterberg Towbin, changed
his estimates to $1.35 a share for fiscal 1986 ending Sept. 30 and $1.85 a share
for next year.  David Wu, analyst with S. G. Warburg, Rowe & Pitman, Akroyd of
San Francisco, raised his fiscal 1986 earnings estimate to $1.30 a share and
fiscal 1987 estimate to $1.75 a share.  Such adjustments reflect "basic
improvements in Tandem's management," Wu says.

   "There was a time," Cohen says, "when Tandem was not considered serious in
terms of product development." But in mid-April, Tandem introduced its high-end
system, the Nonstop VLX, which reportedly delivers about twice the performance
of the older Nonstop TXP at two-thirds the cost per transaction. Cohen says the
"VLX came right on schedule, underscoring management's much-improved controls
over product design and production."

   Tandem's near-term stock performance will likely be determined by what
investors anticipate the company's prospects are for fiscal 1987.

   Some analysts say that Tandem's prospects in its next fiscal year are
essentially tied to the timing of a turn in the U.S. computer industry.
Currently, domestic sales for Tandem, as well as for most other computer
companies, remain weak.

   "But Tandem's U.S. sales didn't fall off [in the second quarter] as had been
expected," Cohen argues, "suggesting strong demand for the company's product
line.  Like Digital Equipment Corp., Tandem has the momentum of a very powerful
product cycle working in its favor."

   Donald Haback, vice-president of research at Smith Barney, Harris Upham &
Co., says, "Tandem's international business may be able to make up for much of

the domestic weakness this year, especially with the currency translation factor." Its foreign operations provided 40% of second-quarter revenue.

According to Warburg's Wu, the company's sales in the UK are especially strong this year because brokerage firms, anticipating deregulation of the London Stock Exchange, are buying more computers.  Since such a sales boom may not recur next year, Wu expects Tandem's European sales to contribute less to total revenue in 1987. If next year's domestic sales increase by more than 10%, Wu says, then Tandem's net revenue growth should be about the same as this year's.

Based on this scenario and the likelihood of increased competition, Wu says he does not think there is much of an up side to Tandem's stock price.  To be a buyer at these levels, "you have to believe the company can earn $2 a share in 1987," Wu says. Another analyst maintains Tandem is already too expensive.

But Rothschild's Cohen continues recommending Tandem on its potential to reach 50 within the next 12 to 18 months, assuming "the stock market doesn't peter out."

*...," says Eosys.*

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The extent of the problem is illustrated by reams of anecdotal evidence from the case studies, which present a catalogue of horror tales. There are few examples of good practice to be found among these case studies.

Tales range from financial companies with 250,000 metres of cable in a single dealing room, to buildings taken almost to the point of collapse by the drilling of holes for cables to pass through.

*Eosys Cable Management Report, £6,000, Eosys, Clove House, The Broadway, Farnham Common, Slough, Berks SL2 3PQ.*

# slate to Braille

translated into Braille.

Stephen Helms, manager of BIS Testing, says: "After a series of discussions with the commercial training sector of the Royal National Institute for the Blind (RNIB) we have decided to go ahead."

The RNIB says computing is a particularly suitable profession for visually handicapped people — especially as there are now tactile keyboards and Braille printers that interface to conventional computer systems.

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in battling with them". The firm will concentrate in selling other manufacturers' machines.

## Plessey rises

Plessey, the UK electronics group currently the target of a £1.2 billion takeover bid by GEC, increased its 1985 profits after a strong final quarter. Profits rose 4% to £170.17 million after a 37% jump in the fourth quarter. But the company's year-end order book is down 15%. It blames delays in defence business.

## Financing win

East London graphics specialist Whitechapel Computer Works has won £900,000 in a third round of financing. The bulk of the money, £750,000, comes from a new investor — an unnamed financial institution. The company has also whittled down its list of possible partners from 20 to six.

## Rights issue

Micro Business Systems won shareholders' approval last week for a two-for-five rights issue to raise £7.7 million. It also confirmed the sale of its Technirent subsidiary for £2.9 million.

## Tandem order

Fault-tolerant specialist Tandem has signed a multimillion dollar agreement with Unix micro-maker Altos for its Motorola 68020-based supermicrocomputers. Archie Thomas, UK managing director of Altos, believes the Altos micro will form the basis of a new low-end fault-tolerant offering from Tandem.

## Allied remarks

In our case study of Allied Dunbar on April 10, remarks attributed to the company's divisional manager, systems, David Hewitt, should have been attributed to the company's divisional director, systems, Brian Metters.

information and communica-
tions services such as Pres-
tel, videotex and packet
switching, and can be fitted
with a full length communica-
tions board to enable users to
take advantage of IBM-com-
patible applications software.

The 8810/35 supports Dap
4 emulation, which enables it
to function as a workstation
for use with larger Nixdorf
computer systems using a
plug connector and respec-
tive communications soft-
ware. File transfer between
hardware is also possible.

The 8810/35 is based on
the Intel 8088 microproces-
sor and runs under the MS-
DOS operating system.

It can be fitted with either
a 12-inch colour or a mono-
chrome display. The colour
display is a high resolution,
740 × 580 dots, 16-colour,
non-glare screen.

The 8810/35 has two floppy
disc drives which both offer
360 formatted Kbytes, and a
hard Winchester-based 5¼-
inch disc drive with 10
Mbytes of formatted capacity
is available as an alternative.

Three expansion slots and
RS-232 C serial and Centron-
ics parallel interfaces are
fitted as standard, and a
separate three-slot expan-
sion chassis is available optio-
nally. **Nixdorf Computer
(CW), 125-135 Staines
Road, Hounslow,
Middlesex TW3 3JB. Tel:
01-570 1888.**

## Tandem unveils workstations

Tandem Computers has
launched two PC/AT-compati-
ble workstations that can
function as either standalone
units or as fully integrated
system terminals for Tandem
Nonstop systems.

The 6AT/20 has a 20
Mbyte internal hard disc
drive, and the 6AT/40 has a
40 Mbyte internal hard disc
drive.

The 6AT is expandable to
a maximum of 80 Mbytes of
disk storage and 11 Mbytes
of RAM.

Both models are based on
the Intel 80286 microproces-
sor, and have 512 Kbytes of
RAM memory, which can be
expanded to 11 Mbytes.

The 6AT comes with a

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## up Pick PCs

Tecmar's QIC-60 tape
streamer developed for the
IBM-PC and compatibles is
now able to back up hard disc
data for the Pick operating
system.

Tecmar supplies three
versions of this 60 Mbyte
tape streamer. The most
popular is the external QIC-
60H which is a unit designed
to sit next to the monitor on
the PC base.

It is available with or with-
out an integral 20 Mbyte hard
disc and can be shared be-
tween PCs with the addition
of low-cost host adapter
cards.

**Tecmar International
(CW), Westward House,
Bramshall, Uttoxeter,
Staffordshire ST14 5DN.
Tel: (08893) 2275.**

## Versatec has raster processor

Versatec Electronics has
announced the Model 850
Series of Raster processing
machines, which uses ad-
vanced rasterisation techno-
logy to provide off-line high-
speed plotting for users
whose systems are not
locally or channel attached to
mainframe computers.

The Model 850 RPM is the
latest product to be an-
nounced in the 800 RPM
series.

The system processes all
Versatec Data Standard
(VDS) data types including
Random, Ordered Vector,
Compressed Raster and
Blocked Raster.

The 850 is designed to
drive all Versatec plotters,
including the Spectrum 11-
inch electrostatic colour plot-
ter, the 24, 36 and 42-inch
colour plotters, the V-80 mo-
nochrome desktop printer-
plotter and the 7000 series of
monochrome plotters.

Three versions of the
Model 850 RPM are available
– the Dual Density 800/1600
bpi 45 ips low speed, the
Dual Density 800/1600 bpi
125 ips high speed, and the
Tri-density 800/1600/6250 bpi
45 and 75 ips versions.

**Versatec (CW), 5 Oxford
Road, Newbury, Berkshire
RG13 1QD. Tel: (0635)
42421.**

... tiable with Quintus's, one of the field leaders.

A US spokesman says Texas Instruments is seeking to patent the compiling tech-

... proaches will eventually converge.

Meanwhile, Texas's main thrust remains Lisp. This summer it intends to deliver its Compact Lisp Machine, a

It bought a stake in hardware manufacturer Lisp Machine Inc (LMI) and got the rights of Massachusetts Institute of Technology's Nubus system.

# Carnegie looks for UK partners

by George Black

Carnegie Group, the US artifical intelligence developer which has just set up shop in this country, is looking for partners to become both investors and customers.

Last year the Ford Motor Company became the fifth firm to take a 10% stake in Carnegie and to work with it on research into artifical intelligence applications in industry.

DEC, Boeing, Texas Instruments and the French Generale Service Informatique (GSI) are also Carnegie affiliates. Now it wants UK firms to join it.

Carnegie was formed in 1983 by four artificial intelligence specialists from Carnegie-Mellon University, Pittsburgh.

Its world trade director Ranjan Chak has just opened its UK subsidiary at Camberley, Surrey, in the heart of the British defence, aerospace and real time computing territory.

The company expects to turn over around $12 million this year, "a significant amount" of this from outside the US, according to Chak. He says the UK market is now ready to accept artificial intelligence technology and is ahead of the rest of Europe in this respect.

Carnegie also has a partner company in Tokyo called Intelligent Technology, and distributors in France and West Germany.

Its most successful product to date is the set of software tools called Knowledge Craft.

## SOFTWARE BRIEFS

Thorn EMI subsidiary **Datasolve** has introduced a service for users to test out fourth generation software, such as ADR's Datacom/Ideal, CCA's Model 204 and Cullinet's IDMS, without having to install it in-house.

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Bristol software house **Metacomco** claims to have the first Pascal compiler for the Commodore Amiga micro with an International Standards Organisation validation certificate.

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**NCR** is to sell a Unix-based manufacturing system from software writer McGuffie Brunton, on its Tower 32 supermicro. NCR says that the two will be bringing out more products together covering related areas and moving towards computer-integrated manufacturing.

**Logica** has launched a set of software design tools running on the Apple Macintosh.

Christened McCadd, the tools have been developed by Logica's software engineers who are using them for their own work. The diagrams can be moved to a DEC Vax or Unix-based machine.

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Scottish software houses will meet to discuss how to promote their wares at a seminar in Edinburgh on May 29. The event at the Sheraton Hotel is being organised by the **Scottish Development Agency** and local software house **Owl**. Around 200 people are expected.

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**Tandem** has approved a software suite that allows an Apple Macintosh micro to be used to emulate a Tandem terminal. It will market the code, from Menlo Business Systems, California, as well as three other Meale products aimed at users of its Nonstop mini range.
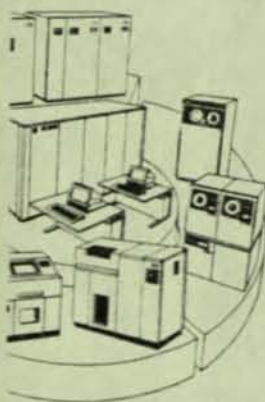
TECHNOLOGY TOPICS: A New Hampshire firm installed a Tandem
fault-tolerant computer system.

## TECHNOLOGY TOPICS
By MICHAEL WEINSTEIN and DAVID O. TYSON

TANDEM IN N.H.: Tandem Computers Inc., Cupertino, Calif., said the
Amherst Group Inc., North Hampton, N.H., has installed a Tandem fault
tolerant computer system to support the firm's point-of-sale service.

Amherst provides credit card authorization and check verification
services to banks and merchants in New England.

ANOTHER BANKLINE CLIENT: Denver-based Security Pacific Information
Systems Inc., a subsidiary of Security Pacific Corp., Los Angeles, said it
has signed an agreement to provide First America Savings Bank of Longmont,
Colo., with an in-house data processing service.

Known as Bankline, the software package can run on several different
brands of computers and handles deposit and loan processing, general
ledger, and customer information files.

MASSTOR INSTALLATION: Masstor Systems Corp. has installed its first
system at a U.S. bank - a 55 gigabyte storage management system at
National Westminster Bank USA, New York.

The announcement by the company, which is based in Santa Clara,
Calif., said that the M860 system was delivered at the start of the year,
took two weeks to install, and underwent a 30-day acceptance test.

"In just under two months' time, the bank has reclaimed approximately
6% of valuable on-line storage space by more aggressively archiving data
to the M860 system," said Frank Fatone, National Westminster vice
president.

He said the bank also has reduced magnetic tape manual work by using
the M860 system for incremental and weekly backup.

Among the 60 worldwide corporate clients for Masstor information
management systems are National Westminster Bank PLC, London; Caisse
Nationale du Credit Agricole, France; Deutsche Bank; PK Banken; Royal Bank
of Scotland, and Svenska Handelsbanken.

DP EXECS WELL PA⁻D: Salary increases averaged 15% last year for data
processing executives, more than double the 6% to 7% national average
raises, according to a survey.

Edward Perlin Associates Inc., New York consulting firm specializing
inScompensation management, surveyed more than 1,000 executives in 31
DISCARD OFF

## Managing at work

**Andrew**

**Q** I have worked as a planner for a high-tech organization for the past three years and was recently promoted to production control supervisor. During my tenure within this department, I observed several inefficiencies that I thought I could correct as a supervisor. When I got promoted, I attacked these problems, but so far I have failed to get any results.

I believe this is due to my subordinates not following through with my changes. I have held meetings explaining the changes and why I made them, but still haven't gotten through to my employees. Do you have any advice for me?

**A** The key is, don't blame your subordinates for the lack of the desired improvements; accept full responsibility for your lack of success. You are the person in charge, you know what you are trying to achieve, and you have all means at your disposal to achieve it. If you don't succeed, go to work to find out why and

try again, [...]

For star[...] your new s[...] they under[...] ing to mak[...] to describe[...] find that tl[...] than you tl[...] go over th[...] feedback y[...]

As a nev[...] that comm[...] subordinat[...] fully under[...] them.

If your subordinates understand the changes but don't follow them, ask them why. Maybe they know something about the workings of the system that you don't. Maybe they just think they do. In either case, you must reach common ground.

One of your assets in this situation is [...]y, you viewed the world [...]ive of your subordinates. Your ability to relate to [...]rom their point of view [...] formulating, explaining, [...] the changes you have in [...]

[...] right way to look for [...] while one is employed? I [...]nce a person's current [...]e of his interest to move [...] can make no gains there [...] to stay.

[...]me truth to this. Once [...]ger knows that you are

likely to leave — and accepts that fact — he will concentrate on figuring out how he will get along after you leave. He will start looking for your replacement or think about dividing your job differently ... he must be concerned with the future of his group more than with yours.

My suggestion is to discuss your career ambitions and desires with your supervisor before you start looking for a job elsewhere. You may find that you can satisfy these within your current employment setting. If you find that this is unlikely, look elsewhere, but do so without calling attention to the fact that you are. Talk about it only after you have found another job that you clearly prefer and are ready to leave for.

In a recent column I answered a question from a disabled person who was looking for work, and later received this note from the executive director of Project HIRED, in Sunnyvale:

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## ■ Memoranda ■

# New ESD executive wants to keep company i[n]

Regis H. Farrell has been elected chief executive officer and vice chairman of the board of Engineered Systems & Development Corp., a disk manufacturing and defense contracting firm in San Jose.

Farrell, who also is a member of ESD's board of directors, replaces William H. Price, who remains as president of ESD.

Farrell comes to ESD management from the Nesco Design Group of Tampa, Fla., a subsidiary of Nesco Inc., a Cleveland-based diversified engineering and manufacturing firm.

Nesco is the principal stockholder in ESD with more than 60 percent of the company's 1.8 million outstanding shares.

"We had a very bad fourth quarter," said Farrell, who is also president of Nesco and splits time between Tampa and San Jose. "We felt pretty happy

**Regis H. Farrell**

ter ending March 31, ESD rebounded and posted earnings of $6,000, or less than 1 cent a share on sales of $5.7 million.

While that represents a 98 percent drop in earnings from the 1985 first quarter, when net income was $366,000, Farrell feels that ESD has turned a corner.

ESD has obtained orders from Bulgaria and China for its floppy disk manufacturing systems "that will be generating sales in the second half of this year," Farrell said.

— *John Schneidawind*

### Management changes

Tandem Computers Inc. of Cupertino appointed Alois J. Strnad vice president of management information systems. Strnad assumes overall responsibility for the company's management information systems.

Rolm Corp. of Santa Clara appointed Jack W. Blumenstein vice president of its Business Communications Group. Blumenstein will have responsibility for the divisions which directly sell, install and service Rolm telecommunications systems. He was pre-

experience. Most recently he was senior vice president of Dataquest Inc. and director of their Information Systems Group.

Lockheed Missiles & Space Company Inc. of Sunnyvale announced two key appointments in the company's Space Systems Division. Don F. Tang is vice president of operations and Jim P. Phillips is vice president of programs.

Donald Littler and James Peoples were named assistant general managers for the Western Division of GTE Government Systems Corp. Littler, whose title is assistant division general manager for strategic defense systems, is responsible for acquisition and program performance of strategic collection and special access systems as well as electro-optical systems. Peoples, who is assistant division general manager for electronic defense systems, has responsibility for all programs comprising tactical systems for mobile platforms.

Imahara & Keep Advertising and Public Relations Inc. of Sunnyvale appointed Barbara Kohn as vice president and director of public relations. Kohn was formerly a vice president with Ketchum Communica-

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May  27, 1986, Tuesday

DISTRIBUTION: Business Editors

LENGTH: 662 words

HEADLINE:   TANDEM-COMPUTERS;   (TNDM) Signs agreement with Arthur Young to
advance factory automation

DATELINE: CUPERTINO, Calif.

 BODY:
    Tandem Computers  Inc. (OTC:TNDM) and Arthur Young, an international
accounting and consulting firm, Tuesday announced that they have signed an
agreement under which the two companies will work together to deliver
copmprehensive computer-integrated manufacturing (CIM) solutions to
manufacturers to increase productivity and decrease costs.

    Under this agreement, as part of Tandem's new Solutions Implementer program,
Arthur Young will ensure that Tandem users in the manufacturing industry realize
successful CIM implementations. Arthur Young will provide pre-installation
analysis and definition of software requirements, and post-installation
implementation, training and support.

    This spans from strategic planning for CIM to hands-on implementation.

    ''The manufacturing industry is changing with the advent of new technology
and the need to integrate the resulting islands of automation,'' said Gerald L.
Peterson, Tandem vice president of marketing.

    ''Working together, Arthur Young and Tandem can offer clients and customers a
powerful way to choose and implement the solutions they need to make
productivity gains a reality.''

    Woodrow W. Chamberlain, a partner in Arthur Young's manufacturing consulting
group, said, ''As far as we know, this agreement between Arthur Young and Tandem
is the first where a computer manufacturer and consulting firm have taken a
joint approach to CIM.''

    The agreement will take advantage of Tandem's NonStop computer architecture
and Arthur Young's management consulting experience in the manufacturing
industry and in application software.

    Chamberlain adds, ''In order for computer-integrated manufacturing to be
effective, the computer must demonstrate the capability to handle large
transaction volumes, be on-line, have a  fault tolerant  architecture, and be
expandable. We think that Tandem demonstrates these capabilities extremely
well.''

    According to Tandem's Peterson, ''Arthur Young has worldwide resources and
presence in our customer and prospect base. By combining this presence with
Tandem on-line transaction processing capabilities, we will greatly strengthen

@ 1986 Business Wire, May 27, 1986

our position in the manufacturing market.''

Arthur Young is the charter member of the Tandem Alliance new Solutions Implementer program, one of five categories of Tandem's program to encourage the development of software solutions for Tandem users.

The new Solutions Implementer category is designed to provide a framework for teaming relationships within a specific industry. Members of this category have a strong international presence in their respective industries.

The services they are to provide to Tandem users include definition, specification, design, programming, education and training, plus on-going support of application solutions.

The Tandem Alliance is a program which encourages application designers to develop software solutions for Tandem users. Since the Alliance program was inaugurated in August 1983, the number of companies qualified to design applications for Tandem users has grown from 35 to 165.

Arthur Young is an international accounting, tax and management consulting firm with over 23,000 employees in over 250 offices worldwide. Through its Manufacturing Consulting Group, Arthur Young has dedicated over 600 specialists to the manufacturing industry.

Tandem Computers  Inc., a Fortune 500 company, manufactures and markets computer systems and networks for on-line transaction processing.

Tandem, a multinational company, has sales, service and training facilities located in 20 countries with distributors in an additional 13 countries. The company is headquartered at 19333 Vallco Parkway, Cupertino, Calif., 95014, 408/725-6000.

Contact:  Tandem Computers,  Cupertino
          Joyce Strand, 408/725-6516
          or
          Arthur Young, New York City
          Mindee Hansen, 212/407-1724

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Is Informix-SQL Sequent's fry-
ing pan? "I think it's a real begin-
ning," Powell said. "It is a major
product for us."

Informix-SQL took a European
detour on its way from RDS head-
quarters in Menlo Park, Calif. to
Sequent's offices in Beaverton,
Ore. The initial port of the soft-
ware to Sequent hardware took
place early this year in Munich,
where Siemens A.G. adapted
both products for the European
market.

Siemens, which has marketed
Informix-SQL since 1983, this
year signed a $50 million agree-
ment to incorporate Sequent
hardware in its line of Unix-based
computers.

### Based On The Same Chip

"We did (the Informix-SQL
port to the Balance) the same
way we did it for other Siemens
machines based on the same Na-
tional Semiconductor micropro-
cessor," said Joachim
Feldmann, the marketing and

That was up to RDS engineers."

Since Siemen's engineers work
closely with RDS development
staff, the port was immediately
added to the RDS product line,
said Dick Murphy, RDS' vice
president of marketing. RDS en-
gineers quickly executed a sec-
ond port to Encore Computer
Corp. machines, which are simi-
lar to that of Sequent. An RDS
customer previously did its own
port of Informix-SQL to a parallel
processor, Murphy said, but he
refused to name the customer.

"The point is, our architecture
complemented the architecture
of Sequent and Encore," Murphy
said. "We found tremendous pro-
ductivity improvements."
Murphy expects more per-
formance increases in the third
quarter of this year, when a new
version of Informix-SQL will take
advantage of the new shared-
memory feature the Unix System
V operating system.

Encore's vice president of mar-
keting, Julius Marcus, said RDS
is only among the first of many

pigeon-holed parallel processing
as a scientific speciality tool. Ra-
ther than rely on benchmarks
which measure raw power, users
will make head-to-head com-
parisons of Informix-SQL's per-
formance on parallel processors
to the database's performance on
conventional, single-processor
machines, said Richard Shaffer,
a consultant and publisher of the
Technologic Computer Letter in
New York.

"This gives Sequent and En-
core the chance to say, 'hey, this
is real work,'" Shaffer said. "It
gives them the chance to make
the only real comparison, and
that is to take the job to two com-
puters and run them both.

"The publicity on your parallel
computer will get you looked at,"
Shaffer said, "and benchmarks
will get your salesman an ap-
pointment. But no one will buy
one until they see it do real
work." The availability of In-
formix-SQL "won't make or
break a company—but it will sure
help."

Omri Serlin, president of Itom
International, a Los Altos, Calif.
research firm, agreed that In-
formix-SQL could boost sales of
Sequent and Encore hardware.
"It certainly will help," he said.
"But I am not sure that it is suffi-
cient to call the world and declare
it the winner.'"

Informix-SQL is "naturally"
suited to parallel processing be-
cause of the software's "front-
end per back-end" architecture,"
said RDS vice president Laura
King. The back-end process is
the "engine" of the SQL query
language, she said, interacting
with the disks to perform com-
mands such as select, insert, up-
date and delete, she said. The
front-end handles everything
else, such as user interface, re-
port formats and processing the
application code, King said.
While parallel processors can
handle multiple front-ends, the
SQL servers typically choke off a
processor, slowing response
time.

Instead, Informix-SQL's pro-
cess allocation algorithm "scat-
ters" back-end among available
processors as well as front-end,
using the parallel machines' mul-
tiple processors to handle SQL
servers simultaneously, King
said. "This eliminates a major
bottleneck found in most mul-
tiple-user databases," she said.
The Unix System V shared-mem-
ory feature will boost access
speeds even further, creating
common data buffers which re-
duce disk access time, she said.

# Its First OSI Product Is Fielded By Tandem

CUPERTINO, Calif.—Tandem Computers Inc. has unveiled its
first Open Systems Interconnection (OSI) product, the OSI4AM,
which supports the first four layers of the International Standards
Organization's (ISO) seven-layer model.

Tandem's OSI4AM is an implementation of the OSI transport
layer operating over X.25. The transport layer is the fourth layer
of the model and handles communication over a variety of
networks. Tandem's OSI4AM also supports classes 0, 1, 2 and 3 of
the ISO standard Transport protocol.

In the past, users of X.25 networks had to develop or write their
own upper layer protocols to ensure delivery of data across a
diversity of networks.

Dennis McEvoy, Tandem vice president for software, said, "OSI
products provide a standard of interoperability that makes com-
munication across multi-vendor networks more cost-effective. We
expect that many of our customers faced with the challenge and the
costs of tying distributed systems together will be interested in this
product."

Tandem is one of a few vendors to have implemented OSI, the
networking standard that compares with IBM's Systems Network
Architecture (SNA). The standard, developed between 1977 and
1983, purports to make it possible for any networking product
conforming to the OSI standard to work with other OSI products
without the need for customized software.

The OSI4AM software will make it possible for Tandem's on-line
transaction processors to communicate more readily with with
standard OSI systems from other vendors, particularly those of
Digital Equipment Corp., which is the only other systems manu-
facturer with a Level 4 OSI product.

Priced at $750 for an initial license fee, with a monthly license fee
of $150 per system for the NonStop II, NonStop TXP and NonStop
VLX systems, the OSI4AM software is available now. The OSI4AM
product for the EXT system is priced at $375 for the initial license
fee and $75 per system, per month.

—Juli Cortino

# Tandem Adds Software Supporting OSI Transport Layer

CUPERTNO, CALIF. — Tandem Computers Inc. next week will unveil software to support protocols for the transport layer of the International Standards Organization's Open Systems Interconnection reference model.

Called OSI4AM, the product allows data exchange between programs running under Tandem's proprietary Guardian90 operating system. The operating system runs on the company's NonStop II, NonStop TXP, NonStop VLX and NonStop EXT computers.

Because of its adherence to the OSI's fourth—or transport—layer specification for multivendor computer networking, the software is also said to allow data exchange between the Tandem systems and other vendors' computers that support OSI Transport specifications.

The product is considered an industry leader, since it is one of the first commercially available OSI software implementations from a major U.S. computer manufacturer. Earler this year Digital Equipment Corp., Maynard, Mass., launched a similar product (*CSN*, March 3), which has subsequently been enhanced.

DEC's software allows data exchange between programs running on DEC VAX computers based on the VMS operating system and between the VAXes and other vendors' computers that also strictly adhere to the OSI transport layer standard.

**Modify Applications**

Existing applications for Tandem's computers will need to be modified slightly to be supported on OSI4AM, a Tandem spokesman said. Those familiar with Tandem software could handle the changes, and customer training programs are available from Tandem personnel, the spokesman said.

The new product, aimed at multivendor networking, is of limited use now, as most of the U.S. installed base of computers runs on proprietary protocols, Tandem said. But by implementing OSI4AM, Tandem customers would be taking a preliminary step toward OSI networking, the spokesman said.

OSI4AM is priced at $750 for an initial license fee, with a $150 monthly license fee per system for NonStop II, Non-Stop TXP, and NonStop VLX systems. For NonStop EXT systems, the product is priced at $375 for an initial license fee and $75 for a monthly license fee.

—*Eric Hindin*

## DEC Unveils OSI-Compatible Product Barrage

dressing scheme.

PSI also allows DECnet applications to run over packet-switched data networks, he noted.

PSI is available in two versions: PSI for VAX systems supporting local access to X.25 networks and PSI Access, which allows remote access to packet-switching networks.

VAX PSI is priced at $300 for VAXstation II, $900 for

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Computerworld

May  19, 1986

SECTION: NEW PRODUCTS; Microcomputers; Systems; Pg. 91

LENGTH: 112 words

BODY:
    Tandem Computers,  Inc. has unveiled the 6AT/20 and the 6AT/40, two IBM
Personal Computer AT-compatible workstations that reportedly can function as
stand-alone units or as fully integrated system terminals for Tandem Nonstop
systems.

    The 6AT/20 has a 20M-byte internal hard disk drive; the 6AT/40 has a 40M-byte
internal hard disk drive.

    Both are expandable to 80M bytes of disk storage and 11M bytes of
random-access memory. They come standard with Microsoft Corp.'s MS-DOS 3.1,
eight IBM PC AT-compatible option slots and a detachable keyboard.

    The 6AT/20 costs $3,995, and the 6AT/40 costs $4,495.

    Tandem Computers,  19333 Vallco Pkwy., Cupertino, Calif. 95014.

HEADLINE: New products,confidence,strong quarter boost Tandem

BYLINE: Kathy Porteus; Porteus is president of Strand Research Associates, a Centerville, Mass.-based company that provides customized research services for financial and high-tech firms.

BODY:
   No one can fault the recent stock performance of  Tandem Computers,  Inc. (TNDM -- 31 1/4 ).  A combination of well-received new products, increased confidence in the company's financial management and surprisingly strong results for the second fiscal quarter ended March 31 have propelled Tandem's stock price up 40% since early April.

   Analysts adjusted their earnings estimates after Tandem posted second-quarter earnings of 29 cents a share, when most were expecting per-share earnings of 20 to 22 cents.

   Frederic H. Cohen, analyst with L. F. Rothschild, Unterberg Towbin, changed his estimates to $1.35 a share for fiscal 1986 ending Sept. 30 and $1.85 a share for next year.  David Wu, analyst with S. G. Warburg, Rowe & Pitman, Akroyd of San Francisco, raised his fiscal 1986 earnings estimate to $1.30 a share and fiscal 1987 estimate to $1.75 a share.  Such adjustments reflect "basic improvements in Tandem's management," Wu says.

   "There was a time," Cohen says, "when Tandem was not considered serious in terms of product development." But in mid-April, Tandem introduced its high-end system, the Nonstop VLX, which reportedly delivers about twice the performance of the older Nonstop TXP at two-thirds the cost per transaction. Cohen says the "VLX came right on schedule, underscoring management's much-improved controls over product design and production."

   Tandem's near-term stock performance will likely be determined by what investors anticipate the company's prospects are for fiscal 1987.

   Some analysts say that Tandem's prospects in its next fiscal year are essentially tied to the timing of a turn in the U.S. computer industry. Currently, domestic sales for Tandem, as well as for most other computer companies, remain weak.

   "But Tandem's U.S. sales didn't fall off [in the second quarter] as had been expected," Cohen argues, "suggesting strong demand for the company's product line.  Like Digital Equipment Corp., Tandem has the momentum of a very powerful product cycle working in its favor."

   Donald Haback, vice-president of research at Smith Barney, Harris Upham & Co., says, "Tandem's international business may be able to make up for much of

the domestic weakness this year, especially with the currency translation
factor." Its foreign operations provided 40% of second-quarter revenue.

According to Warburg's Wu, the company's sales in the UK are especially
strong this year because brokerage firms, anticipating deregulation of the
London Stock Exchange, are buying more computers.  Since such a sales boom may
not recur next year, Wu expects Tandem's European sales to contribute less to
total revenue in 1987. If next year's domestic sales increase by more than 10%,
Wu says, then Tandem's net revenue growth should be about the same as this
year's.

Based on this scenario and the likelihood of increased competition, Wu says
he does not think there is much of an up side to Tandem's stock price.  To be a
buyer at these levels, "you have to believe the company can earn $2 a share in
1987," Wu says. Another analyst maintains Tandem is already too expensive.

But Rothschild's Cohen continues recommending Tandem on its potential to
reach 50 within the next 12 to 18 months, assuming "the stock market doesn't
peter out."

May  19, 1986, Monday

DISTRIBUTION: Business Editors

LENGTH: 379 words

HEADLINE:  TANDEM-COMPUTERS;  (TNDM) One of first U.S. vendors to announce
availability of OSI product

DATELINE: CUPERTINO, Calif.

BODY:
     Tandem Computers  Inc. (OTC:TNDM) Monday announced OSI4AM, becoming one of
the first vendors to announce for delivery a product conforming to the Layer 4
standard of the Open Systems Interconnection model.

OSI4AM supports the first four layers of the International Organization for
Standardization's seven-layer OSI reference model.  The product is an
implementation of the OSI Transport layer operating over X.25.

The Transport layer, the fourth layer of the model, handles end-to-end
communication across various subnetworks that might separate a sender and
receiver of data.

Users of X.25 wide area networks had to develop or write their own upper
layer protocols to guarantee data delivery across diverse networks until now.

''OSI products provide a standard of interoperability that makes
communication across multi-vendor networks more cost-effective,'' said Tandem
vice president of software, Dennis McEvoy.

''We expect that many of our customers faced with the challenge and the costs
of tying distributed systems together will be interested in this product,''
McEvoy stated.

One of the first vendors to be certified for X.25 (1979), and a founding
member of the Corporation of Open Systems (1985), Tandem continues to provide
users with the broad range of communications protocols necessary to design and
integrate large networks.

OSI4AM supports classes 0, 1, 2, and 3 of ISO 8073, the OSI standard
Transport protocol. For operation with X.25 networks, this product offers the
maximum degree of flexibility available from any vendor and represents the first
in a series of OSI products for Tandem.

OSI4AM will be marketed worldwide and is available now. Pricing below is in
U.S. dollars.

The product is priced at $750 Initial License Fee with a $150 Monthly License
Fee per system for NonStop II, NonStop TXP and NonStop VLX systems. For NonStop
EXT systems the product is priced at $375 ILF with a $75 MLF.

© 1986 Business Wire, May 19, 1986

Tandem Computers  manufactures and markets computer systems and networks for on-line transaction processing. The company is headquartered at 19333 Vallco Parkway, Cupertino, Calif 95014. The phone number is 408/725-6000.

    CONTACT:   Tandem Computers  Inc., Cupertino
               Corinne DeBra, 408/725-7574

# LOOK AHEAD

**ANOTHER RIDER ON OSI BANDWAGON**

Burroughs is entering the world of OSI with the creation of a network systems division, to be based in England. It will develop OSI products for Burroughs mainframes and workstation systems for the European market, with efforts to target the U.S. market to come later. The company will be working on joint ventures with LDR Systems--a U.K.-based software developer-- to develop programs for the American firm's mainframes. The OSI effort also involves Plessey Co. Burroughs began working with Plessey last fall by taking over its Convergent Technology workstation business, which included 500 user sites. Five divisions will reportedly be developing OSI products jointly with Burroughs, including a plan to use OSI software to link Plessey's PBX to Burroughs' line of B25 workstations.

**THE "INS" SCORE HIGHER**

As we all know, IBM's salespeople get a credit for each sale and installation of the giant's equipment. In addition, high points can be scored each year for the sale of what IBM calls "strategic" products. These biggies tend to vary from year to year. One IBM source says the "in" products this year, according to IBM's sales plan, are any database manager but especially DB2; any DOS to VTAM 2 (IBM's universal SNA telecom access method) software that facilitates an eventual DOS-to-MVS migration (as revealed earlier, IBM is expected to announce a simpler and less costly MVS entry product late this year); the fault tolerant (and Stratus-oemed) System/88; any SNA-related networking software, but especially PROFS and DISOSS; and, of course, IBM's flagship, MVS/XA.

**MORE COMING FROM TANDEM**

Watch for Check +, a new machine from Tandem due out in six to nine months. The new computer is being built using new memory chips with twice the speed of the earlier VLX high-end system, which uses ECL gate arrays, and will have twice the throughput of the prior machine. Tandem wouldn't comment on this development or on an office-based CMOS processor, said to be in the works.

**DOUBLE STANDARD FOR THOSE WITH CLOUT**

Penologists have known for years that traditional corporate criminals rarely end up in the penitentiary, and new evidence shows the same good fortune for executives who use computers to steal. "The cardinal rule seems to be, Thou shalt not steal small," says Joseph O'Donoghue, a professor of sociology at Mercy College in Dobbs Ferry, N.Y. O'Donoghue sent a questionnaire recently to Fortune 500 companies, asking how they handled computer crime. Of the 189 firms that replied, two thirds said they punished peons, but often let major executive-level offenders go free. Execu-

# NEWS

# Tandem Brings Out IBM AT Compatible

*6AT is hardware and software compatible with IBM's PC*



Tandem's 6AT functions as a fully integrated terminal for NonStop systems

Tandem Computers Inc., continuing its push to link its Guardian proprietary operating system to the rest of the world, last week introduced the 6AT workstation. As its name suggests, the 6AT is hardware and software compatible with IBM's PC AT: It runs MS-DOS, Xenix, and other PC AT operating systems, and it accepts PC AT option cards.

The 6AT also functions as a fully integrated terminal for Tandem Non-Stop systems, and provides communications and file transfer between Tandem and the standalone operating system applications.

The 6AT's main advantage over the PC AT is storage. Most PC hard disks only hold 5 Mbytes to 10 Mbytes. Even IBM's top-of-the-line PC AT configuration offers a maximum of 30 Mbytes of storage. The 6AT includes a standard 20-Mbyte or 40-Mbyte hard disk. The 20-Mbyte disk can be upgraded to 40 Mbytes, and the 40-Mbyte disk can be doubled to give 80 Mbytes of storage capacity. The main memory on both models is 512K bytes, expandable to 11 Mbytes, of RAM.

The 6AT is available immediately. It is priced at $3,995 with a 20-Mbyte hard disk or at $4,495 with a 40-Mbyte

hard disk. Both versions also include a 1.2-Mbyte floppy-disk drive and two eight-bit and six 16-bit PC AT option slots. MS-DOS 3.1, Microsoft Corp.'s GW-Basic, Tandem 653X terminal emulation, and Tandem's Information Xchange Facility (IXF) file-transfer software are bundled with the 6AT. By comparison, an IBM PC AT with a 30-Mbyte hard disk and no software is priced at $5,295.

Options for the 6AT include an enhanced graphics controller providing a high-resolution (640 by 350 pixels) monochrome or color display; a serial/parallel interface card that contains both RS-232-C and current loop; 2-Mbyte RAM memory cards; and a 20-Mbyte cartridge tape backup system.

Although some may buy 6ATs for use as standalone PCs or as the seeds for larger Tandem installations, most 6AT users will probably be current Tandem users looking for an upgrade to Tandem's similarly priced Dynamite 654X workstation series and; to the older 652X and 653X terminal lines. The top of the line for the Dynamite workstations, which also run MS-DOS but are not hardware compatible with IBM PCs, is a low-resolution color model with a 10-Mbyte hard

disk and 256K bytes of memory.

The 20 6AT field test sites have found the workstation's high-resolution graphics and extra disk storage ideal for distributed computer-integrated manufacturing applications. Using Microsoft Windows, 6AT operators are able to use the power of the 6AT's Intel 80286 chip for local applications through one window while simultaneously executing an application on the larger system through another.

The power of the 6AT's chip also means it can be used in networking applications that used to require low-end minicomputers. "We've had requests for rack-mount configurations, we've had people using it as a communications controller," says a Tandem spokeswoman.

MIS shops with a mixture of Tandem and IBM equipment will be able to use the 6AT interchangeably with their IBM PC ATs: The 6AT can emulate an IBM 3270 terminal using Tandem's 3270 software, and IBM's PC AT can emulate a Tandem terminal using Tandem's PC-Link software.

Tandem is bringing other vendors into its terminal network as well. Under Alliance, its independent software vendor program, the company will support and market Mac Menlo, a $395 program from Menlo Business Systems Inc. that allows an Apple Computer Inc. Macintosh to emulate a Tandem 653X terminal. Menlo Business Systems is a Los Altos, Calif., applications-development and consulting house focusing on Tandem users.

Tandem has also announced an agreement with Menlo to jointly market three other Menlo products as part of the Tandem Alliance software program. The three products are the Foundation, an applications-development tool; Menlo Mail, an electronic mail application; and Menlo Pims, a product and inventory-management system.

Under the terms of the agreement, Menlo Business Systems will market the Foundation, Menlo Mail, and Menlo Pims software products directly to NonStop system users. The Foundation will be priced at $26,000, while Menlo Mail and Menlo Pims will sell for $10,000 and $78,000, respectively. Menlo charges an additional 10% annual usage and service fee for each product.

*—Diana ben-Aaron*

# ps Quadraplex Mainframe

by NAS—a minimum of 28 million instructions per second (mips). But NAS president David Martin said the XL 60 and 80 will "maintain the performance that we announced."

NAS also added an entry-level system to its XL line-up last week. That system is the XL model 50, priced at $3.05 million in a standard configuration of 32 Mbytes of storage and 16 channels.

Base price for the XL 90 is $9.8 million. The XL 100 is priced at $12.4 million in its basic configuration.

NAS would not say who has purchased the XL Models 50, 90 and 100, but the company reportedly has sold nine of its XL Models 60 and 80, and has about 20 letters of intent to purchase the systems.

NAS has a backlog of orders for Models 60 and 80 that will take the company through November. By the end of calendar 1986, NAS expects to ship ten units (of the 60/80 mix) per month, a company source said.

### 75% Of Revenue Predicted

Jerry T. Ungerman, NAS vice president and general manager of North American business operations, said the XL series of mainframes is expected to bring about 75 percent of the company's systems revenue in fiscal 1987, which begins June 1.

NAS derives about 50 percent of its revenue from systems and 50 percent from disks. That split could tilt in favor of the systems side with the introduction of the new XL models.

NAS said its XL 60 and 80 models are equal to IBM's 3090 Models 200 and 400. The XL 50 is the equivalent of IBM's 3090-180. NAS claims the XL 90 offers 240 to 270 percent higher performance than IBM's 3090 Model 200 and says the XL 90 is the equivalent of Amdahl's most powerful processor, the 5890 Model 600.

NAS said it will upgrade its XL systems in the field.

Martin reported NAS is interested in expanding its "product partnerships" beyond the agreement with Hitachi. The company is looking at software vendors serving the engineering and scientific markets. Partnerships with networking companies are also said to interest NAS.

"If you could buy them (the XL Models 90 and 100) today," said Thomas Henkel, senior market analyst with the Yankee Group in Boston, "you could say NAS has leaped over IBM's market. But you can't get them until late 1987. IBM, and Amdahl, could do many things between now and then."

Henkel said the XL series is the "best mainframe Hitachi has made to date." And though NAS would not quantify its Models 90 and 100 in mips, Henkel said the XL 90 offered about 70 mips of performance while the XL 100 offers 84 mips.

### "What We Had Expected"

"This is more of a positioning announcement," said Henkel. "It's . . . what we had expected. It shows customers that NAS offers an upward migration path."

NAS said its processors can offer the speed they do because of a feature called "dynamic working storage." This serves as a system-wide memory cache that speeds up access time between high-speed cache and main storage and access time for input/output processors.

Henkel said he "buys" the NAS claim. He said the systems "look good on paper," though their true performance remains to be seen.

Henkel said he expected NAS to ship from 50 to 70 of the new XL systems announced last week by the end of calendar year 1986. He also noted that NAS and Hitachi probably chose to bring out the models 90 and 100 in the third quarter of 1987 "so they can sell some of those XL 60s and 80s."

# Sites & Sales

Lanham, Md.-based **Computer Sciences Corp. (CSC)**, has announced an agreement with **Eastman Kodak Co.**, Rochester, N.Y., to install the first Kodak Image Management System (KIMS) at the federal government's **National Flood Insurance Program (NFIP)** offices, which CSC has managed since 1984. CSC will install 12 KIMS display workstations, two KIMS film autoloaders and a high-quality laser printer, all linked by a high-speed local area network. KIMS weds advanced computer database, image processing and communications technologies. It captures, stores and delivers computer-based and source-document-based information and images to users at multifunction, high-resolution workstations.

**Tandem Computers Inc.** Cupertino, Calif., reports that the **Amherst Group Inc.**, a North Hampton, N.H., provider of point-of-sale (POS) network services, has installed a Tandem NonStop EXT computer system and software from **LeRoux, Pitts & Associates (LPA)** for POS Network operation. The Amherst Group, which currently supports 3,000 POS terminals, will run LPA's Total Payment System (TPS), a credit/debit authorization and draft-capture package designed to operate on Tandem equipment.

**ITT Corp.** New York, announced that the **Norwegian State Railway (NSB)**, has signed an agreement with **Standard Telefon og Kabelfabrik A/S (STK)**, the corporation's Norwegian company, to purchase some $10 million worth of Office 2000 equipment. Office 2000 is a package of hardware and software products that enables organizations to integrate their communications systems. Under terms of the agreement, STK will provide NSB with the Office 2000 digital 5500 Business Communication System (BCS), training and installation, transmission and telephone sets. The ITT 5500 BCS, which was developed by STK, is one of a range of advanced digital PABXs included in the Office 2000 program. NSB officials said they will use the equipment to develop a nationwide communications network for both voice and data and will integrate it into their existing network. The system will serve the organization's administrative functions, including its travel agency.

Chatsworth, Calif.-based **Datametrics Corp.**, which supplies non-impact printers and printer/plotters for military and airborne systems, announced that it has been selected by **Magnavox Government and Electronics Co.**, Fort Wayne, Ind., to supply high-speed full-page printers for the Magnavox Regency Net Program, a secure **U.S. Army** communications network. The initial contracts are valued at $2.8 million, with a total potential value to Datametrics of approximately $11 million over a period of five years. Datametrics will supply its full-page, nuclear-hardened, EMP-protected model RNTP, a high-speed full-page 80/132-column thermal printer.

**Masstor Systems Corp.**, Santa Clara, Calif., said it has completed installation of a 55-gigabyte M860 Storage Management System at **National Westminster Bank USA**, New York. The installation marks the company's first at a banking institution in the United States. According to National Westminster, the bank has been able to reduce manual activity associated with magnetic tape operations by using the M860 system for weekly backups.

May  9, 1986, Friday

DISTRIBUTION: Business Editors

LENGTH: 195 words

HEADLINE: TANDON-1; (TCOR) Reports contract with  Tandem Computers

DATELINE: CHATSWORTH, Calif.

BODY:
  Tandon Corp. said Friday that under a multi-million dollar sales agreement
with  Tandem Computers  Inc. it is manufacturing Tandon-developed processors and
disk drive subassemblies which Tandem will integrate into its two new
workstations, the Tandem 6AT/2D and 6AT/4D.  Under the terms of the multi-year
agreement, the dollar value could not be disclosed. Product shipments have
already begun.  The Tandem workstations, which are compatible with the IBM PC
AT-a, can function as either stand-alone units or as fully integrated system
terminals for Tandem NonStop-b systems.  Tandem Computers,  headquartered in
Cupertino, Calif., manufactures and markets computer systems and networks for
on-line transaction processing.  Tandon is a leading U.S.-based manufacturer of
disk drives for the microcomputer industry, and also produces microcomputers for
private label sale in the United States and under the Tandon name in Europe.
(a) Tandem and NonStop are trademarks of  Tandem Computers  Inc. (b) IBM and PC
AT are trademarks of International Business Machines Corp.

   CONTACT: Tandon Corp., Chatsworth
            Ranjit Sitlani, 818/993-6644

May  8, 1986, Thursday

SECTION: SECTION I; International Companies & Finance; Pg. 35

LENGTH: 928 words

HEADLINE: Tandem Makes The Running In European Sales Chase

BYLINE: Jane Rippeteau

BODY:
   Last month's London Marathon gave Mr James Treybig and  Tandem Computers,
the California-based company of which he is president and chief executive, an
unusual opportunity to show their paces.

   Mr Treybig, running for the first event, came close to the back of the field,
but his computers fared rather better.

   Tandem, leader in the market for computers that will not fail, supplied
machines for the Marathon and their performance broke all records, the company
says.  Full results were produced five hours faster than before.

   Mr Treybig is hoping that the showing by his computers will characterise his
company's push into overseas markets as sales growth slows at home.  The
Cupertino company is off to a strong overall start.  Late last month it posted
second quarter revenues up 20.4 per cent over the same period last year, and net
earnings that surged more than 80 per cent to Dollars 12.4 m, or an unexpectedly
high 29 cents per share.

   Tandem, founded in 1974, shipped its first NonStop computer in 1976.  The
machine for the first time offered an alternative to double-teaming computer
systems - a company requiring no down-time would typically buy two mainframe
computers, keeping one on "hot standby" should the primary unit fail.  The
Tandem machine duplicate functions internally so that they will continue working
even if one part fails.

   European sales account for a fast-rising share of present business.  Last
year, one-third of Dollars 624 m in total revenues came from Europe.  The UK
alone accounted for 10 per cent of the business, and the company believes UK
sales could increase by 40 per cent this year to some 47 m Pounds (pds).

   Mr Treybig is now targeting the UK manufacturing sector to augment already
lively sales for the company's costly machines among the major clearing banks
and with commercial customers.  Tandem has developed substantial industrial
business in Germany, which is now its second-largest market for
computer-integrated manufacturing applications.  Software for shopfloor
applications in the UK is under development for a product launch this spring.
"British manufacturing," notes Mr Treybig, "is trying to turn itself around."

   Securities customers affected by the Big Bang also have Mr Treybig's eye.
Tandem has supplied four processors to Hoare Govett to use in development of new
software for settling multiple-product, multiple-currency transactions

@ 1986 Financial Times, May 8, 1986

globally.  With the new software, the settlements will be done in "real time,"
that is, master files and data bases will be updated as the deal is settled -
not at the end of the day.  And it will be done throughout the system, so that
information is available to everybody as change occurs.

Despite great strength in the US brokerage market, Tandem "had not really
penetrated the securites business here," says Mr Jeremy Bishop, director of
operations and computerisation at Hoare Govett.  He predicts the new software
will greatly boost Tandem's appeal as companies tap such new technology to
improve their competitive edge.  "The Big Bang has levered us all off our
seats," says Mr Bishop.

Tandem has some 37 brokerage customers worldwide, with another "very big
order" just signed, the company says.  It dominates the market for online
transaction processing, which updates data instantly as changes occur in a
network.  The service is the largest chunk of the  fault-tolerant  computer
business, which consultants Frost & Sullivan predict will reach Dollars 1.8 bn
this year and Dollars 4.7 bn by 1990.  Tandem's strong second quarter comes on
the heels of a well-received launch of a major new product, the Non-Stop VLX,
which it says uses advanced semiconductor technology called very large scale
integration (VLSI) to achieve higher performance at lower operating costs.

"I am very impressed with the new machine.  It's a different scale product
for Tandem, a high-end mainframe positioned directly against IBM," says Mr
Stephen Smith, an analyst with Paine Webber in New York.  Smith has just
reversed an "unattractive" rating on Tandem made six months ago.  The stock then
traded at about Dollars 14 and is now about Dollars 34.

A chief reason for Mr Smith's reservations about Tandem was the move by
International Business Machines (IBM) last year to begin selling a competitive
machine made by  Stratus Computer,  also of the US.  Olivetti of Italy also
sells the machines, under its own label.

IBM initially positioned the product as part of its systems product division,
responsible for small- and mid-range computers.  Late last year, however, it
shifted the machine, called the System 88, to its communications products
division.  This signalled a recognition of the product's communications role in
networks.

IBM is developing software to allow the System 88 to operate with groups of
IBM mainframes, and to perform specific network functions, as well as act as an
IBM-compatible back-up processor.  A recently - developed application places the
System 88 in a network of bank teller machines to control the network, that is
direct transactions to mainframes for processing much as a traffic policeman
orders cars around, but also step in to do the processing itself should the
mainframes be too busy.

The communications and network functions of no-fail computers have driven
Tandem's philosophy from the start, says Mr Treybig.  Machine design calls for
compatibility with equipment made by a variety of manufacturers, and a modular
design that allows incremental increases in workload so that processing power
can be added as needs rise.

GRAPHIC: Picture Mr James Treybig - targeting the UK manufacturing sector

**CORPORATE
INFORMATION CENTER**

May  7, 1986, Wednesday

SECTION: Pg. 30

LENGTH: 49 words

HEADLINE: Tandem Sells to Amherst Group

DATELINE: CUPERTINO, Calif.

BODY:
   Tandem Computers  Inc. said the Amherst Group Inc., North Hampton, N.H., has installed a Tandem  fault-tolerant  computer system to support the firm's point-of-sale service.

   Amherst provides credit card authorization and check verification services to banks and merchants in New England.

May  7, 1986, Wednesday

DISTRIBUTION: Business Editors

LENGTH: 182 words

HEADLINE:  TANDEM-COMPUTERS;   (TNDM) Names Alois J. Strnad to MIS post

DATELINE: CUPERTINO, Calif.

BODY:
    Tandem Computers  Inc. (OTC/TNDM) Wednesday announced the appointment of
Alois J. Strnad (cq) to the post of vice president of management information
systems.

    The announcement was made by David J. Rynne, vice president and chief
financial officer of the California-based manufacturer of NonStop computer
systems. Strnad, 49, assumes overall responsibility for the company's management
information systems, reporting to Rynne.

    Prior to joining Tandem, Strnad was active in research at Massachusetts
Institute of Technology, and was vice president of Bank of America in key
management positions, vice president of MIS and software development at Victor
Technologies and president of ATAA, a management consulting company.

    Tandem Computers  Inc., a FORTUNE 500 company, manufactures and markets
computer systems and networks for the on-line transaction processing
marketplace. The company is headquartered at 19333 Vallco Parkway, Cupertino
95014. The telephone number is 408/725-6000.

    CONTACT:  Tandem Computers  Inc., Cupertino
             Leslie Stull, 408/725-6237

Tandem Computers has launched two IBM PC AT-compatible
workstations in the US.  The machines can be used as
stand-alone desk-top PCs or as terminals to the company's
NonStop fault tolerant CPUs.  The 6AT range starts at $3,995
for the 6AT-20 with 20Mb hard disk and 512Kb RAM, while the
6AT-40 sells for $4,495 with a 40Mb disk.  Tandem UK has yet
to decide a release date for the 6AT workstations.

# U.S.-Japan chip talks

By Paul Magnusson
Mercury News Washington Bureau

WASHINGTON — Negotiations with the Japanese over semiconductor trade are stalled and facing a breakdown, U.S. trade ambassador Clayton Yeutter said Tuesday.

The two countries "are still a long way apart, and it is still too early to tell if we are anywhere nearer" an agreement than when the talks began nearly a year ago over allegedly unfair Japanese pricing practices in the United States, he told reporters at a breakfast briefing.

Yeutter's remarks were in contrast to the optimism expressed by U.S. trade officials before the Tokyo economic summit meeting, which concluded Tuesday.

U.S. officials had once predicted that the

## Trade official expects retaliation by U

Japanese would wish to clear up the fractious issue before Japanese Prime Minister Yasuhiro Nakasone and President Reagan met at the summit.

But on Tuesday Yeutter pointed to the July 28 deadline for the negotiations and predicted "a retaliatory response" by the United States if this country and Japan don't reach agreement by then.

Lower-level negotiations are scheduled this month in Tokyo between Yeutter and Michio Watanabe, head of the Japanese

Ministry of International Trade and I try. The administration considers semiconductor talks to be its most in tant bilateral trade negotiations.

The chip talks result from three complaints alleging that the Japa semiconductor industry is dumpin chips — selling them at below fair-ma values — in the United States.

The U.S. charges allege that the J nese firms intend to drive U.S. compet out of business and then raise prices.

# Financial Digest
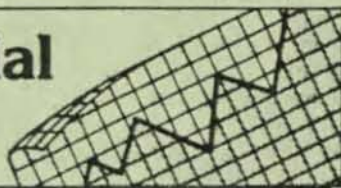
## Dow falls 5.82 points; computer stocks mixed

Stock prices were mixed on Wall Street as investors, seeing interest rates inch higher, decided to capture some profits in blue-chip issues. Investors exchanged more than 15.6 million shares of Sperry, which received a takeover bid of $70 a share from

**TANDON, TANDEM IN PACT:** Tandon Corp., the leading independent U.S. maker of disk drives for the microcomputer industry, will manufacture computer components for Xerox and Tandem Computers Inc. of Cupertino. The agreements will bring Chatsworth-based Tandon as much as $100 million a year in new revenue for each of the next three years, according to industry sources. The agreements call for the company to make disk drives and central processing units for personal computer work stations that will be sold under the Xerox and Tandem labels.

**ALZA WILL SPLIT:** Alza Corp. of Palo Alto plans to split its Class A Common stock 2-for-1 if it gains shareholder approval in June. The pharmaceutical

**'I enjoy knowing I'm willing to do sor people are not willing to do.'**



Paul Karlebach shows a vacuum cleaner t

**CORPORATE
INFORMATION CENTER**

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May  6, 1986, Tuesday, Late City Final Edition

SECTION: Section D; Page 8, Column 3; Financial Desk

LENGTH: 272 words

HEADLINE: COMPANY BRIEFS

 BODY:
   * Coca Cola Co., Atlanta, said it had completed the acquisition of Merv
Griffin Enterprises for an undisclosed amount of cash.

   * Conna Corp., Louisville, Ky., said its directors had unanimously rejected
the $18-a-share unsolicited tender offer by Convenient Food Mart Inc. and urged
shareholders not to tender their shares.

   * Dresser Industries said that it had agreed to sell the assets of four
divisions that had sales of $350 million to $400 million last year to the N. C.
Fitzpatrick Acquisition Corp. for an undisclosed amount.

   * Gulf and Western announced that it had completed the purchase of Silver
Burdett Co., an elementary school textbook publisher based in Glenview, Ill.,
from SFN Cos. for about $125 million.

   * Libbey-Owens-Ford Co., Toledo, Ohio, said its Vickers subsidiary had signed
a definitive agreement to acquire Sterer Engineering and Manufacturing Co. of
Los Angeles. Terms were not disclosed.

   * Mitsubishi Motor Sales of America Inc., Fountain Valley, Calif., said it
had raised suggested retail prices of two- and four-wheel-drive trucks an
average of $154, or 2.4 percent.

   * Tandem Computers  Inc., Cupertino, Calif., introduced two PC-AT compatible
work stations that can function as either stand-alone units or as fully
intergrated system terminals for Tandem nonstop systems.

   * TRW Inc., Cleveland, said it had reached an agreement with Chromalloy
American Corp. for the sale of TRW's Turbine Airfoil division for an undisclosed
sum.

   * Victoria Station Inc., Larkspur, Calif., said it was actively considering
various restructuring plans, including a Chapter 11 bankruptcy filing.

SUBJECT: COMPANY BRIEFS (NYT COLUMN)

# Altos, Tandem Ink Unix System Pact

SAN JOSE, Calif. — Altos Computer Systems said it has signed an agreement with Tandem Computers, Inc., to jointly develop a Unix multi-user system based on Altos' 68020-based computer that will be marketed by Tandem.

The length and dollar value of the agreement were not revealed by either company. As reported, sources believed the agreement to be worth about $50 million to Altos (EN, April 28).

Gerald D. Held, Tandem's director of new ventures, said Tandem wanted a system that could support multiple users, was based on industry standards such as Unix and the 68020, provided local storage, and could function as a remote controller. Tandem "customers have been asking for this kind of product," he said. Mr. Held maintained that Tandem did not have any specific contracts it planned to bid on using the Altos-based system.

Mr. Held would not reveal the changes that will be made in Altos' 3068 multi-user system, but did say Tandem would offer a product that has the ability to communicate with its fault tolerant on-line transaction processing systems. He would not say what type of communication capabilities would be offered between the Altos system using the Unix operating system, and Tandem's system using its proprietary Guardian 90 operating system. Altos officials declined to comment on the joint development work or other aspects of the agreement.

The agreement between the two firms could involve the development of other products in the future, Mr. Held said, without indicating what those systems might be.

Tandem "did look at other alternatives" before choosing Altos, Mr. Held said. He would not reveal the names of the other firms competing for the contract, but did say Convergent Technologies "was not even under consideration." A Convergent spokesman said his firm did attempt to bid on the Tandem contract last month, but claimed that Tandem already had awarded the deal to Altos.

Mr. Held said the decision to offer a multi-user Unix-based system from Altos was part of Tandem's strategy to offer industry-standard small computer systems from its Austin, Tex., Terminal Products division. That division this week introduced an IBM PC AT-compatible microcomputer that can function as a stand-alone PC, a PC tied into a Tandem network or a Tandem terminal (see related story, page 22).

May 5

Technical Reports available from the Corporate Information Center,
                                  Tandem Computers, Inc.
                                  Mail Stop 3-07
                                  19333 Vallco Parkway
                                  Cupertino, CA 95014-2599 U.S.A.
                                  attn: Barbara Nepple

When requesting reports please include your location number, mail
stop (if applicable), and your mailing address.

Or - you may pick up copies at the Corporate Information Center.
We are on the second floor of building 3, near the stairwell from
lobby 2.


TR81.1   Approach to End-User Application Design, by Jim Gray

TR81.2   Transaction Monitoring in ENCOMPASS, by Andrea Borr

TR81.3   Transaction Concept: Virtues and Limitations, by Jim Gray

TR81.4   A NonStop Kernel, by Joel F Bartlett

TR81.5   Relational Data Base Management for On-line Transaction
         Processing, by Stewart A Schuster

TR84.1   A Technical Overview of the Tandem TXP Processor,
         by Robert Horst and Sandy Metz

TR84.2   Robustness to Crash in a Distributed Database:
         A Non Shared-Memory Multi-Processor Approach, by Andrea Borr

TR85.1   One Thousand Transactions Per Second, by Jim Gray,
         Bob Good, Dieter Gawlick, Pete Homan, Harald Sammer

TR85.2   A Measure of Transaction Processing Power, by Anon Et Al

TR85.3   Hardware Architecture and Linear Expansion of Tandem
         NonStop Systems, by Robert Horst and Tim Chou

TR85.4   An Approach to Decentralized Data Management Systems,
         by Jim Gray

TR85.5   Four Case Studies on Distributed Systems, by Mark Anderton
         and Jim Gray

TR85.6   Varieties of Concurrency Control in IMS/VS Fast Path,
         by Dieter Gawlick and David Kinkade

TR85.7   Why Do Computers Stop and What Can Be Done About It?,
         by Jim Gray

## SYSTEMS

# PCs Added, Tags Cut in IBM Ripple Effect

Reaction to IBM's recent product additions and pricing actions continued to ripple through the personal computer industry last week as more manufacturers added new systems and trimmed prices of existing machines.

A host of new PC AT-compatible desktop and kneetop computers were added to the product rosters of such companies as TeleVideo Systems, NEC, Kaypro, Tandem, and Toshiba.

Televideo Systems last week introduced its second IBM PC AT-compatible system, which is said to offer a smaller footprint at a lower price than its initial system.

The TeleCat-286 uses the 8-MHz Intel 80286 microprocessor, which can be switched to 6 MHz, 512K bytes of RAM expandable to 1M byte on the motherboard, a 1.2M byte 5.25-inch flexible disk drive, and a 20M byte or 30M byte Winchester disk drive. The system also includes a graphics controller and 14-inch monochrome monitor which can support both 640 by 200 pixel AT-compatible graphics applications as well as 640 by 400 bit map graphics.

The TeleCat-286 has a 16-inch by 16.5-inch footprint, said by Tele-Video to be 28 per cent smaller than the IBM PC AT.

TeleVideo continues to offer its earlier Tele 286 IBM PC AT-compatible systems at the same price, but is expected to take some pricing action. A spokesman for the firm declined to comment on pricing, but said the firm will continue to offer the product.

The Tele 286 also offers eight expansion slots instead of the five offered on the new TeleCat 286. The Tele 286 Model 1 comes with a 1.2M byte flexible disk drive, but no Winchester disk drive, and is price at $3,395. The Tele 286 Model 2 comes with a 40M byte Winchester disk drive, and a 1.2M byte flexible disk drive, and is priced at $5,795.

Because of the differences in the two products, the Tele 286 and TeleCat 286 are positioned to be more attractive to VAR customers and retail outlets, respectively, the spokeswoman said.

NEC Information Systems, Inc., also introduced an Intel 80286-based personal computer said to be compatible with the IBM PC AT.

In addition, the company brought out a pair of color monitors it said would be marketed as options for the new Advanced Personal Computer (APC) IV.

Shipments of the 80286-based personal computer with the color display, which has a resolution of 800 x 560 pixels, will begin this month. Shipments of Power Graphics Display monitor, with a 1120 x 750 resolution, are slated to start in July, a spokesman said.

The processor includes a standard 640-KB RAM and can be operated at 6 or 8 MHz, the company said.

A low-end APC IV with 640-KB RAM, a 1.2-MB floppy disk drive, a 40-MB hard disk, and keyboard, lists for $5,045, according to NEC.

The Advanced Color display is priced at $800, the spokesman said. An advanced graphics board, priced at $525, includes 256-KB Video RAM, and provides 640 x 350 resolution and IBM EGA-compatibility.

The Power Graphics display is priced at $995, while a Power Graphics Board, which improves resolution to 1120 x 750, and also is IBM EGA-compatible, carries a price tag of $1,495, the spokesman said.

### Toshiba Kneetop

Meanwhile, Toshiba Information System's newly-formed Systems Marketing group (EN, April 7) has come out with a kneetop computer sporting a plasma display and said to be IBM PC AT-compatible.

The new T3100 incorporates the 8-MHz Intel 80286 and 640-KB of RAM as well as a single floppy and hard disk drives in a 15-pound unit.

The new kneetop comes in above the earlier Model T1100 kneetop computer, which was introduced last year. The T1100, which the company will continue to market, weighs 11 pounds and is IBM PC-compatible.

The kneetop machine will be available in quantity beginning in July, according to Tom Sherrard, systems product marketing manager for the new ISD group. The machine has a suggested retail price of $4,495. The basic configuration of the system includes a 720K-byte 3.5-inch floppy drive, presently one manufactured by Epson but soon to be shifted to a similar Toshiba unit, Mr. Sherrard said. Additional storage is available through a 10M-byte 3.5-inch Winchester disk drive secured from JVC, Toshiba said.

The unit's gas plasma display measures 25 lines by 80 characters and has a graphics resolution of 640 x 400 pixels. Toshiba said the T3100 is software compatible with the IBM color graphics adapter.

Also bundled with the portable are serial, parallel and RGB ports, and a power supply that can be switched from 110 to 220 useage.

Options available with the system include an internal 1,200-bps Hayes compatible modem, an external expansion chassis that holds up to five IBM PC-compatible expansion boards, a 15-key numeric keypad, and an internal 1M-byte memory expansion board. The company said prices of those options have not yet been established.

### Tandem Beef-Up

Tandem Computers, Inc., also beefed up its IBM-compatible offerings with two PC AT-compatible computers designed to function as stand-alone machines or part of a Tandem network.

Both the 6AT/20, which has a 20M byte Winchester disk drive, and the 6AT/40, which has a 40M byte drive, use the 6-MHz Intel 80286 microprocessor. The two systems can accommodate up to 80M bytes of Winchester disk drive storage internally, have eight IBM PC AT-compatible board slots, come with 512K bytes of RAM expandable up to 11M bytes, as well as a 1.2M byte 5.25-inch flexible disk drive.

The PC AT-compatible machines are put together from equipment supplied by other vendors, including what a spokeswoman said were "subassemblies" from Tandon Corp., Chatsworth, Calif., and undergo final assembly and testing at Tandem's Austin, Tex., plant.

Included with the two systems are Tandem's terminal emulation software which enables the 6AT to function as a Tandem terminal, as well as Tandem's Information Xchange Facility (IXF) software which allows the 6AT to function as a PC on a Tandem network and exchange files.

# IBM Federa Integration c

Enterprise travel agency sy: (EN, Feb. 10).

IBM supplies its PC AT, processor and token ring net to United but at the time di indicate whether FSD's worl United represented the kick-( a new activity.

IBM president and chief ecutive John F. Akers is sa have recently given FDS green light to enter the mercial systems integration ness in what is beleived to re the growing importance of I tive software and service nesses in the corporation's enue mix as some hardware become more hard presse show large margins.

Pointing out that FSD has handling systems integr. work for the federal govern for more than 30 years, Mr. E suggested IBM now cons comparable activities in co ate environments to be favoi markets. "Commercial ma were lagging for awhile," he "but now they're starting to up."

Responsibility for providin; thrust into the new market fall on the Complex System ganization, a unit of FSD for in 1983 to market standard

## BOWS TO PC USE AS

# IBM to Halt Disp

BOCA RATON, Fla. — are moving to personal c( said it will stop marketin; processing system.

As reported (EN, Data To Oct. 21, 1985), IBM had qu shifted the production statu the word processor to the "lin new" category, which meant some orders for the machine filled with reconditioned unit

The Displaywriter is the se system to be withdrawn marketing in recent weeks b Boca Raton, Fla.-based E Systems division. At the intrc tion of the PC Convertible ( last month, IBM disclosed th had pulled its Portable PC

# -P Named Dataproducts CEO

Cantrell — still considered by some employes as an outsider compared to veteran executives — is a likely successor to Mr. Davis. Harris had no comment on whether Mr. Cantrell would be picked to replace Mr. Davis.

Another possibility is that Harris may go outside the company to recruit someone to head the sector, pointing out that several former IBM employes have been joining Harris in lower-echelon positions.

Reached at Harris Corp., Mr. Davis said he will aid Messrs. Boyd and Hartley in a transition and, concerning his departure to Dataproducts, remarked only that "This is just a unique opportunity for me to reach my career aspirations."

He said he has no idea who would succeed him at Harris, and declined to comment on whether he made a recommendation for a successor.

Mr. Davis, 47, joined Harris Corp.'s predecessor company, Radiation, Inc., as an engineer in 1962. He became vice-president and general manager of Harris Controls division in 1972, vice-president and general manager of the Data Communications division in 1974, a group executive of Information Systems in 1977. When the company changed its groups into sectors in 1982, Mr. Davis was named senior vice-

president and executive of the Information Systems sector. That sector was beefed up last year with the addition of Lanier activities as well.

Meanwhile, according to Mr. Tyson, during Dataproducts' executive search the company interviewed candidates from both inside and outside the company. "We had some good people inside the company," said Mr. Tyson, "but Jack Davis was our first choice. If he had not been available, we probably would have chosen someone from within."

According to Mr. Tyson, Mr. Davis is already familiar with Dataproducts products since Information Systems is a customer, adding: "We searched him out...I think our headhunters found him for us, and then we went after him," said Mr. Tyson. "He wasn't looking for a job."

Mr. Tyson said he will be active as a consultant to Mr. Davis for several months during the transition.

Since Mr. Dickinson's departure from Dataproducts last year, industry observers, including several in the investment community, have raised concern that Mr. Tyson and director and co-founder Erwin Tomash might find it difficult to totally release control of the company to a strong chief executive and allow him the authority to make decisions.

One source described Dataproducts as having a "checkered history" of locating and releasing chief executives in the last decade. Since the late 1970s, Dataproducts has had three men in that position, not counting Mr. Tyson's year-long reassignment to the position.

Although fairly quiet on the reasons for Mr. Dickinson's departure at the time, Mr. Tyson told shareholders at last year's annual meeting that his ouster was the result of a disagreement over which level of the company's management should determine what products were to be developed (EN, Aug. 19, 1985).

In the year since Mr. Tyson reassumed the helm, Dataproducts has reversed itself from Mr. Dickinson's plans for a decentralized management structure and has cut payroll and operations severely to reduce mounting losses. Since mid-1975, payroll has been reduced by one-third, from nearly 6,000 to about 4,000 and manufacturing operations have been abandoned in Puerto

## DEC Low End



DEC's VAXstation II/RC

June, DEC unveiled the VAXstation II/GPX as an Ultrix-based system early this year and promised availability of MicroVMS for e workstation by this summer

# Recent IBM Acts Spur Firms To Introduce PCs, Cut Tags

A Tandem spokeswoman said the 6AT would be targetted primarily at those among Tandem's existing customer base that want a PC AT. Tandem will continue to offer its Intel 8086-based Dynamite PC, which is not fully IBM-compatible, and plans to lower its price in the future.

In their base configuration with 512K bytes of RAM, system software, CPU and keyboard, the 6AT/20 is priced at $3,995, while the 6AT/40 is priced at $4,495. A monochrome monitor is priced at $250, while a high-resolution color monitor is priced at $775.

An upgrade from 512K byte of RAM to 1M byte of RAM is priced at $250. Additional memory is available in 2M byte increments at a price of $1,095 for each 2M bytes.

### Kaypro Cuts Tags

Meanwhile, Kaypro Corp. last week joined the ranks of other personal computer suppliers who have dropped prices in the wake of IBM's recent pricing moves (EN, April 7).

Kaypro has lowered prices on both models of its PC AT-compatible Kaypro 286i desktop system by 17 per cent, while increasing storage in the hard-disk based Model C, the company said.

The cuts bring the price of the basic 286i Model A from $2,995 to $2,495 and the Model C from $4,795 to $3,995.

At the same time, Kaypro said it has increased the main memory on its 11-pound laptop Kaypro 2000

from 512K bytes to 768K bytes RAM, and enlarged the size of the unit's display by 28 per cent to 4 inches by 8-7/8 inches. The price of the 2000 will remain $1,995, Kaypro said.

The company also adjusted prices on its PC AT-compatible units. Kaypro said it increased Winchester disk drive storage on the high-priced Model C from 20M bytes to 30M bytes. The unit also incorporates a 1.2M byte floppy disk drive, Kaypro said, while the lower-priced Model A is configured with the single floppy only.

Kaypro said all of its PC-compatible products will now be equipped with MS-DOS 3.2. Unlike previous MS DOS versions, the new operating system can be used with both 3.5- and 5.25-inch disk drives, Kaypro said.

Panasonic's Computer Products division also added an IBM PC AT-compatible system designed for both single- and multi-user applications.

The new Business Partner 286 has 10 expansion slots with five for PC AT boards and five for PC-compatible boards. The processor, which comes standard with 512 KB of memory, can operate either 6 MHz or 8 MHz.

The machine is offered in two versions: a $2,795 model with a 1.2-MB floppy, and a $2,995 system with a 1.2-MB floppy and a 360-KB diskette.

The machine comes standard with MS-DOS 3.1 and GW Basic. The unit will run Xenix. Volume shipments will begin in July.

## Burroughs Lays Off 300 at Memorex

of its communications and storage divisions, and the layoff of about 500 employes at its Westlake, Calif., plant, which was shut down in June, 1985.

Memorex now has about 4,000 employes in Santa Clara, 1,500 in the rest of the U.S., and 3,500 in other countries.

When Burroughs revealed its first-quarter earnings last month, W. Michael Blumenthal, chairman of Burroughs, said in a prepared statement "We are hopefull that Memorex will (return to) profitability in the second half of 1986."

### Unprofitable Since 1985

Memorex has been unprofitable since the third quarter of 1985, and

which of the other PCMs — Amdahl, National Advanced Systems and Storage Technology Corp. — he was referring.

Memorex plans to introduce a double capacity 3680 disk subsystem by the end of this year, and will have its first customer installation by Christmas, Mr. Etheredge said. He would not reveal any more details about the schedule of the double capacity system. Memorex will be the last vendor of 3380-compatible systems to introduce the product.

The development of the double capacity 3680 was delayed because of the problems which Memorex had with its single-capacity 3680, which required most of the company's engineering staff's attention during part of

# Tandem Net Jumps 81% in 2d Quarter

CUPERTINO, Calif. — Tandem Computers, Inc., reported an 81 per cent jump in second-quarter profit to $12,410,000, or 29 cents a share, compared with the $6,841,000, or 16 cents a share, earned a year ago.

Revenues totaled $142,754,000, up 20 per cent from $120,088,000.

For the first 6 months of fiscal 1986 ended March 31, net totaled $24,058,000, or 56 cents a share, up 15.3 per cent from $20,869,000, or 50 cents a share.

Revenues totaled $279,982,000, a 10 per cent advance from $254,223,000.

Tandem also improved its balance sheet during the latest quarter, with cash and cash investments totaling $160,767,000, compared with $107,737,000 a year ago. While inventories also improved, totaling $69,872,000, down from $91,273,000, accounts receivable were up, totaling $182,577,000 compared with $162,927,000.

TANDEM COMPUTERS REPORTS FINANCIAL RESULTS FOR SECOND
FISCAL QUARTER OF 1986

Cupertino, CA--Tandem Computers Incorporated (OTC/TNDM)
announced operating results for the second fiscal quarter,
which ended March 31, 1986.  The California-based
manufacturer of NonStop computer systems reported that
revenue increased to 20.4% to $176,327,000, compared with
revenue of $146,489,000 in the second fiscal quarter of
1985.

The Company's pretax income was $22,360,000, or 12.7% of
revenue, compared with the 1985 second fiscal quarter
level of $11,276,000, or 7.7% of revenue.  Net income
increased 81.4% to $12,410,000, or $.29 per share, versus
$6,841,000, or $.16 per share, earned in the same quarter
of last year.

For the six months ending March 31, 1986, revenue increased
13.1% to $346,388,000, from $306,142,000 in the same period
of fiscal 1985.  Net income advanced 15.3% to $24,058,000,
or $.56 per share, compared with fiscal 1985 first-half net
income of $20,869,000, or $.50 per share.

Commenting on the company's financial results, Tandem
president James G. Treybig stated, "While we have seen no
change in the economy, we have seen improvement in our
business.  In particular, business in Europe remains very
strong.  We continue to be optimistic about the second half
of our fiscal year.

Contact:   Cacey Tangney
           408/725-7555

week's Spring Comdex here and the good news is the machines are continuing reductions in both cost and size.

In fact the smallest AT-compatible—though certainly not the least expensive—weighed in at only 15 pounds (see adjacent story.)

At a luncheon featuring live tigers, TeleVideo Systems Inc. announced its TeleCat-286, an AT clone touted as "smaller and less expensive" than the Big Blue original.

"It's a reduced-footprint machine, 28 percent smaller than a standard-sized AT," said Elliot Wassarman, senior vice president of marketing and sales for the Sunnyvale, Calif. firm.

### For "Sophisticated" Users

Wassarman touted the product and the TeleCat line as "dedicated to sophisticated power users who are looking to move up to an XT and don't realize that

veloped toward connectivity," Wassarman said. "We're interested in movement of information in environments where there are either power users or multiple users who need to transmit information."

The company's mini-file server is capable of handling up to 128 workstations, Wassarman said.

"We're going after the small business . . . even up through the Fortune 2000 that have to rationalize their use of productivity tools either by their work group or the individual power user."

### 3 Competitive Tiers

Wassarman said he sees three tiers of competition in the micro business these days.

"We see IBM, which is pretty much by itself and does what it wants and has a loyal following. Then we see the second tier of well-known companies such as TeleVideo, NCR, Sperry, Compaq, well-known corporations who produce a quality product line."

computer away and maybe you with it, because you got an illegal machine."

PC's Limited, the Austin, Tex., clone assembler, announced what company president Michael Dell described as "the fastest machines out there in the marketplace."

Speed is the word for the company's new 10- and 12-MHz 80286-based machines, priced at $2,295 and $2,695, respectively. That includes 1 Mbyte of memory on the motherboard, 1.2 Mbyte on the floppy drive and a keyboard switchable from 6 to 12 MHz, but it only has one hard disk drive, and the price does not include the monitor.

### Clock Speed Still Ahead

IBM's PC-AT has an 8-MHz clock speed. And, while experimenters have been replacing the clock crystals with higher values for some time, PC's Limited is first company to move to higher speeds in mainline products. Dell said his machines, the 286-10 and 286-12 are 20 percent smaller than the standard IBM box.

The company sells directly to end-users and offers a 30-day satisfaction guarantee, Dell said.

Panasonic Industrial Co. introduced its Business Partner 286, an 80286-based machine, and the 8086-based Business Partner, costing $2,995 and $1,495, respectively, for machines with two 360-Kbyte floppy disk drives.

### Emphasis On 2 Points

"The concept of product development for those two machines puts emphasis on two points," said Yoshi Yamada, marketing planning manager in the computer products division of the Secaucus, N.J., company.

"One is the expandability of the product for further use and the flexibility of the configuration. Expandability means expansion slots—10 for the Business Partner 286 and six for the Business Partner. And in order to support expansion, we incorporated a 220-watt power supply in the 286 and 130 watts in the other machine."

which might last for a [...] or so, Toshiba decided to [...] line cord and take some [...]

"It does require AC p[...] it is so very portabl[...] power," said Loren [...] product manager for the [...] chine. "It blurs the [...] between portables and [...] ables."

A sleek, black machi[...] glowing reddish screen, [...] said the 3100 is aimed a[...] "right between the eye[...]

"The market we're l[...] is the power computer [...] body who would use [...] think our market is br[...] the regular AT market [...] can clear the desk."

The 3100 utilizes g[...] technology to produc[...] screen image conside[...] readable that conventi[...] crystal display techn[...] we sit in a dimly lit roo[...] at the plasma displa[...] looking at a cathode [...] said Dan Crane, Tos[...] president of persona[...] marketing.

The 640x400-pixel sc[...] ware-compatible wit[...] color graphics adapte[...] a full 80-line by 25-ch[...] play.

The 3100's market[...] cludes taking adva[...] high-tech version of [...] which the company [...] make it an attract[...] computer."

"Our advertising g[...] thing has 'I want' wri[...] it," Crane said. "Th[...] want things are going [...] one. We've looked [...] bers and we could [...] (sales) we need jus[...] market."

But the 3100 could [...] market, "penetratin[...] stream AT country,"[...]

### Has Similar Specs

The new machin[...] much like other 8082[...] including an 8-MHz [...] and provisions for e[...]

"It has a port on it[...] put several things [...] them is a 300/1200-b[...] Or you can put an e[...] on it that goes out [...] cage. You can plug [...]

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## Tandem AT-Compatible Seen Bid To Shield Customer Base

### By JULI CORTINO

CUPERTINO, Calif.—Tandem Computers Inc. has developed two International Business Machines Corp. PC/AT-compatible workstations, a move seen as protecting its existing customer base.

"A lot of Tandem customers are potential heavy AT users," said a company spokeswoman, who noted that Tandem's new 6AT/20 and 6AT/40 workstations will give the company the opportunity to offer users a "total integrated solution." The workstations, to be unveiled this week, function as stand-alone systems or as terminals for Tandem's NonStop on-line transaction processors.

Tandem's 6AT/20 and 6AT/40, like AT-compatibles offered by Hewlett-Packard Co. and other minicomputer vendors, will be sold to the company's existing customers. Without the new systems, Tandem has been leaving the powerful workstation market open for IBM. Tandem's new microcomputers are more powerful than another desktop workstation the company offers, called Dynamite.

The 6AT/20 has a 20-Mbyte internal hard disk drive, while the 6AT/40 features a 40-MByte internal hard disk. The systems can be expanded to a maximum of 80 Mbytes of disk storage and their 512 Kbytes of random-access memory (RAM) can be expanded to 11 Mbytes.

The 6AT is based on the 80286 microprocessor from Intel. The workstations run the MS-DOS 3.1 operating system. Unix and Xenix operating systems can also be used with the 6AT.

Tandem's 6AT/20 is priced at $3,995. The 6AT/40 sells for $4,495. Available for the new personal computers is MS-Windows from Microsoft.

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# Symbolics Rockets 177%

CONCORD, Mass.—Symbolics
Inc. reported here last week that
its net income for its third fiscal
quarter, ended March 30, was
$3.48 million, or 13 cents per
share, a 177 percent increase
over net income of $1.25 million,
or 6 cents per share, for the third
quarter of fiscal 1985.

Revenues for the quarter were
$30.88 million, up 71 percent from
$18.09 million in the year-ago
quarter.

Symbolics Inc. is a developer,
manufacturer and marketer of
advanced computer systems for
artificial intelligence and other
symbolic processing appli-
cations.

For the first nine months of
fiscal 1986, Symbolics reported
revenues of $82.49 million, a 72
percent increase over revenues
of $47.9 million reported for the
same period in fiscal 1985. Net
income for the nine months was
$8.99 million, or 34 cents per
share, a 246 percent increase
over net income of $2.59 million,
or 13 cents per share, for the
same period in fiscal 1985.

During the quarter, Symbolics
used its remaining net operating
loss tax carryforwards. These
carryforwards have substantial-
ly reduced the company's tax

liabilities for the last several
quarters and resulted in ex-
traordinary income of 11 cents
per share for the first nine
months of fiscal 1986, a spokes-
man said.

"Now that the NOL carryfor-
wards have been used, we have
begun applying investment and
research and experimental tax
credit carryforwards," com-
mented Ernest L. Godshalk,
Symbolic's chief financial of-
ficer.

"The use of these credits has
resulted in a significantly lower
tax provision for the third quar-
ter. We expect that this will con-
tinue into the fourth quarter of
this fiscal year but that the rate
will stabilize in early fiscal 1987,"
added Godshalk.

Russell Noftsker, president and
chairman of Symbolics, noted
that during the quarter the com-
pany introduced the 3610AE ap-
plications delivery system and a
Symbolics SNA Facility, a com-
munications link that allows ex-
change of data between Sym-
bolic's systems and IBM's tra-
ditional data processing environ-
ments. He added that the com-
pany's installed base of symbolic
processing systems has doubled
over the past year.

The producer
systems said its sales for the
quarter were $26.95 million for
the quarter, an increase of 77 per-
cent from the $15.2 million for the
1985 quarter.

Analyst John McCarthy, re-
search manager for Forrester
Research Inc., Cambridge,
Mass., said the earnings reflect
International Business Machines
Corp.'s original equipment
manufacturer (OEM) business
with Stratus, adding that the
company "is in one of the niches
in this marketplace that's still
growing."

But, McCarthy said, he ex-
pected Stratus to get increased
competition from another fault-
tolerant machine producer, Tan-
dem Computers Inc., Cupertino,
Calif.

"Tandem has been very ag-
gressive over the last couple of
months with some hardware and
software product announce-
ments. Tandem is coming on
strong. They're really getting ag-
gressive in the market," Mc-
Carthy said.

In a prepared statement, Stra-
tus president William E. Foster
said the company "met all of its
financial performance goals for
the quarter. The company en-
joyed significant growth in terms
of new business and increased
product offerings."

"During the first quarter,"
Foster said, "Stratus increased
its market penetration with the
addition of several new cus-
tomers." He said First Interstate
Bancorp, one of the 10 largest
banks in the country, chose the
company's selected continuous
processing sytem for an inter-
state cash management and elec-
tronic banking services sytem.

# Tandem Profit Doubles
# As Revenue Leaps 20%

CUPERTINO, Calif.—Tandem
Computers Inc. reported a doubl-
ing in net income over the same
period a year ago, on a 20.4 per-
cent increase in revenue for its
second fiscal quarter, ended
March 31.

James G. Treybig said, "Our
earnings gains reflect the pro-
gress we have made in improving
the efficiency of our manufac-
turing operations, as well as re-
flecting the attractive margins of
our new products. The weaker
dollar also had a beneficial im-
pact on our financial results."

Net income for the second
quarter was $12.4 million, or 29

cents a share, on revenue of
$176.3 million. Comparatively,
net income for the 1985 second
fiscal quarter was $6.8 million, or
16 cents per share, on revenue of
$146.48 million.

The news was a shot in the arm
for Tandem, which saw a finan-
cially disappointing year in fiscal
1985 when total net income was
$34.37 million on revenue of
$624.13 million. Fiscal 1984 earn-
ings, on the other hand, were
$42.9 million on revenue of $532.6
million.

Tandem said 1985 was a "disap-
pointing" year and blamed most
of its problems on the sluggish

economy. Treybig vowed at a
shareholder meeting in February
that Tandem would make a
comeback this year. He said the
economy had not changed much,
but added that Tandem had seen
an improvement in its business,
especially in Europe.

He attributed Tandem's sec-
ond-quarter success to "a
positive cycle of new hardware
and software products introduced
over the past year."

First fiscal quarter 1986 earn-
ings were not so cooperative,
however. Net income was $11.64
million for the period ended Dec.
31. In the fiscal 1985 first quarter,
earnings were $14.02 million.

Earnings for the first half were
$24.05 million, or 56 cents a
share. Revenue was $346.38
million.

# PERIPHERALS

## Briefs

Computer Systems News
May 5, 1986 p28

**WYSE SIGNS TRW FOR SERVICE**

SAN JOSE, CALIF. — Wyse Technology Inc. has entered a deal for TRW Inc.'s Customer Service Division to provide nationwide third-party service for Wyse's display terminals, monitors, and personal computers.

Wyse said the agreement will supplement its existing service capabilities; Wyse already operates four company-owned domestic service depots.

Under the agreement, TRW will service Wyse products at all of its 58 repair locations.

**NEC INKS PACT WITH TANDEM**

BOXBOROUGH, MASS. — NEC Information Systems Inc. said it has received an OEM contract to supply high-capacity disk drives to Tandem Computers Inc., Cupertino, Calif.

Terms of the agreement were not disclosed. Tandem reportedly is purchasing NEC's D2352 9-inch drive, a 520-Mbyte device that is being configured in Tandem's XL8 disk storage facility.

**PERICOM CUTS TAGS ON ITS TERMINALS**

NOVATO, CALIF. — Pericom Inc. has cut prices $400 on two of its graphics terminals.

The company's MG-600 terminal, offering 1024-X-780-pixel resolution on a 15-inch display, was reduced to $2495 from $2895; the MG-200, an entry-level device, was cut in price to $1995 from $2395.

**INTELOGIC TRACE TO SERVICE CORDATA PRINTERS**

SAN ANTONIO, TEXAS — Intelogic Trace, the third-party service company spun off last year from Datapoint Corp., said it will provide maintenance service for Cordata Inc.'s Desktop Printshop family of laser printers.

Intelogic Trace will provide on-site service for Cordata's printers at all ot its 260 nationwide service locations.

**HONEYWELL LANDS GEISCO ORDER**

PHOENIX — Honeywell Inc. has received a $9.5 million order to supply mass storage devices to General Electric Information Services Co.

The agreement covers a combination of 100 of Honeywell's MSU 3380 large-scale disk storage units and MSP 3880 mass storage processors.

**PRIMAGES SIGNS DISTRIBUTION DEAL**

RONKONKOMA, N.Y. — Primages Inc. has agreed to sell its printers in the United Kingdom through an agreement with The O.E.M. Group, London.

Primages said The O.E.M. Group and its subsidiaries operate a 300-plus-dealer network throughout the United Kingdom. Primages put the value of the deal—covering the company's Primage 90 and Primage 100 Daisygrapher printers—at a minimum of

# ognition Cos. Focus On Telephone Uses

applications has not been on telephone companies, h have made various agreements with speech synthesis recognition companies.
pically, such systems are l by persons calling into es. The system often incts a person what to say or t numbers on a phone to to get information or messages. Some systems limited speech recognicapabilities.
st November, Voice Conystems, Dallas, licensed eaker-independent voice nition technology to Southern Bell. Last March, x Business Information ms Co. said it would pur speech recognition techy from Speech Systems Tarzana, Calif., for intein into Nynex's office iation products.
en Peterson, marketing sales vice-president at h Plus Inc., Mountain Calif., said his company ocus on marketing its products to value-addsellers and telephone nies. He said two major cts with telephone comwill be announced withnext two weeks.

At the show, Digital Sound Corp., Santa Barbara, Calif., said it signed a three-year, $25 million contract with GTE TeleMessager Inc., Stamford,

for its turnkey voice response system, called the VCT Series 2000.
A spokesman said the PBX system is designed to perform of a switchboard message center. will eliminate oing that job," Glass, marketvice-president. start at around Glass, with a $1000 per user. don, marketing vmail Inc., Co, said his comto cut a $1 mil1 Texas Instruorate its boards voice messagvmail uses Vooards and is and its market,
so, sales and e-president for

Votan, Fremont, Calif., said, "Factory automation has done very well . . . We have sold a lot of systems into the factory." However, he said office applications such as voice messaging are easier to integrate and will probably represent a larger market.
Votan recently introduced its PC Executive Secretary, a hardware/software package that allows users to accept voice commands and provides a variety of secretarial call management chores.
Most applications finding their way into the office use speech synthesis techniques rather than speech recognition. A number of companies are developing recognition systems having vocabularies greater than 5000 words for office use and are expected to hit the market late this year or early next.

## Tandem To Remarket Altos Micro

CUPERTINO, CALIF. — Tandem Computers Inc. said it will remarket Altos Computer Systems' Unix-based microcomputer as a front-end to its fault-tolerant systems.
Tandem, which for the first time will market a Unix system, plans to sell an enhanced version of Altos' 68020-based 3068 multiuser computer.
Tandem new ventures director Gerald Held declined to place a value on the deal. He said rumors that the contract is worth $50 million to Altos over three years "are not based on anything I know. The relationship is not a strict OEM one; it's more of a technology transfer and joint product development."
Held said Altos and Tandem have been working together for several months. He said Tandem had considered several supermicrocomputer vendors, adding that, contrary to speculation, Convergent Technologies Inc. was "never ever involved."
Held said Tandem will not remarket an off-the-shelf Altos product. "There is some Tandem value-added. We may eventually sell a product that includes their base product, but I can't really talk about that yet," he said.
Among the joint-development work in progress is the design of an interface between the 3068 and Tandem's proprietary NonStop computer

line, Held said. All work is being based at Tandem's Austin, Texas, Terminal Products Division. That group also oversees Tandem's IBM PC-compatible offerings, including those based on Tandon Corp. technology.
"Our customers have been looking for additional ability at the low end, particularly for local storage," said Held. "At that end, we're committed to standards such as PC-DOS and Unix."
A day before the deal officially was announced, Held said, "While we're watching Unix, it is slow to develop [in the market]." Held clarified that comment later, saying Tandem "doesn't have a lot of customers asking for Unix; it's just a way to get at applications. Unix is not suited for large transaction processing, but as a standard, it does bring in some third-party software and support for some small systems devices."
Asked if Tandem was pushed into finding a Unix front-end because of the increasing requirement for Unix in government bids, Held said, "We've been awarded a number of large contracts without that capability, so we don't have an absolute pressing need for Unix." But a "terminal cluster controller" will help in all of Tandem's markets, he said.

## Tandon Profit Hits $1.95M In Qtr.

CHATSWORTH, CALIF. — Tandon Corp. last week posted a modest profit of $1.95 million, or 4 cents per share, on sales of $58.15 million for the second quarter ended March 28.
The results represent Tandon's second consecutive profitable quarter after a year of losses. Tandon posted a loss of $19.91 million, or 39 cents per share, on $61.13 million in sales for the second quarter of fiscal 1985, after tax credits of $8.53 million. The company was also burdened by an inventory writedown of about $31 million

sponding period last year.
Additionally, the company reported an extraordinary credit of $627,000, representing a net operating loss carryforward for the first six months of this year.
Tandon executive vice-president Ranjit Sitlani said system and subsystem sales represented 34 percent of the quarter's revenue, while floppy disk drive sales comprised 34 percent, and Winchester disk drives accounted for 32 percent.
In comparison, Tandon's floppies were

y for a full-duplex te synchronously,

# Tandem unveils workstations

## PC AT compatibles emulate 6530 terminals

**By Jeffry Beeler**

CUPERTINO, Calif. — In a move to strengthen its distributed processing capabilities, Tandem Computers, Inc. today is set to introduce two IBM Personal Computer AT-compatible workstations that reportedly support Tandem's key communications software products.

Even though both the 6AT/20 and 6AT/40 can operate in a stand-alone mode, they are primarily intended to serve as system terminals and to be integrated into networks that incorporate Tandem's Nonstop mainframes.

In addition to being configured with a program that allows micros to emulate a Tandem Model 6530 terminal, the 6AT/20 and 40 support the vendor's Information Xchange Facility (IXF) software, according to John Gully, manager of product management at Tandem's Austin, Texas, site.

Together, 6530 emulation and IXF reportedly enable the workstations to connect to Tandem hosts through standard access methods and make the two 6ATs compatible with the firm's Pathway transaction processing system.

### Distributed processing

One key to the workstations' distributed processing capabilities is their local intelligence and storage capacity. Both units use Intel Corp.'s 80286 microprocessor and support an array of operating systems, including Microsoft Corp. MS-DOS 3.1, Unix and its look-alike — Microsoft's Xenix. The units are expandable to 11M bytes of main memory and 80M bytes of external storage.

A basic 6AT/20 incorporates a 20M-byte disk system and costs $3,995, compared with $4,495 for a minimum 6AT/40, which provides 40M bytes of mass storage.

Both products are available for immediate delivery.

Computer World
May 5, 1986 p2

# 1st 'Thinking Machines'

**By BILL DOOLEY**

CAMBRIDGE, Mass.—Thinking Machine Corp. (TMC) here, one of the most ambitious start-

processors, 32 Mbytes of memory and is priced at $3 million. A lower end machine contains 16,384 16-Kbyte processors and 8 Mbytes of memory. It is priced at

...ident Sheryl Handler ...six machines have ...n ordered. She said ...er Corp. and the Yale ...Computer Science De-...d ordered one each, ...ch would be going to ...chusetts Institute of ...(one for its Media ...and the other to the ...ntelligence Labora-...o the U.S. govern-...nse Advanced Re-

**SEE 1ST, PAGE 8**

# Drop Coul Grow Bigge

**By PAUL McCLOSKEY**

WASHINGTON—AT&T's precedented $1.5 billion rate duction, scheduled to go into fect June 1 and likely to pi profit margins of rival carri could grow by another $ million if local telephone c pany access charges are pro excessive, federal officials s last week.

Meanwhile, users expres mixed reactions to the propo cuts, which cover standard l distance (MTS) service as wel

**SEE AT&T, PAGE**

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# Tandem Buys Altos's Unix

**By JULI CORTINO**

CUPERTINO, Calif.—Tandem Computers Inc. confirmed reports last week that it has signed a pact for Altos Computer Systems' model 3068 Unix processor. Both companies refused to confirm industry reports that the contract was valued at $50 million and spanned three years.

In a terse prepared statement, Tandem's director of new ventures Gerald D. Held said, "The agreement with Altos is consistent with our strategy to complement our technology through relationships with leading industry suppliers."

In an interview with MIS Week, Held said the strategic alliance with Altos, which involves a

**SEE TANDEM, PAGE 9**

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Bo Landin

MIS Week photo by Jim Fallo

Ericsson Hopes Sales Follow Switch Trials

# Bellcore Swings Axe

**By JAMES FALLON**

STOCKHOLM (FNS)—It's been a tough trip to the United States for L.M. Ericsson, but after five years and an investment of about $70 million, the Swedish telecommunications company thinks it sees light at the end of the tunnel.

By summer Ericsson expects Bell Communications Research to have finished its evaluation of the Ericsson Axe digital central-office switch, and the company is looking to deliver its first field-trial exchange to one of the Bell operating companies by early next year.

Bellcore approval will put Ericsson in a prime position to capture major orders from the BOCs, said Bo Landin, Ericsson's senior vice president for corporate market coordination and strategic planning. While Siemens A.G. and other foreign switch suppliers have received small orders without Bellcore approval, Ericsson views certification as vital to win major contracts.

# Tandem Buys Altos's 3068 Unix

transfer of technology and joint product development, will "affect the microcomputer product line coming out of Austin."

Tandem manufactures its NonStop EXT system, terminals and workstations in Austin, Tex.

"Our customers tell us they want more programmability and more storage at a low cost," said Held. "That's not easily done. At the same time, we have been working over the last two years to develop our microcomputer expertise. We have seen that the Intel 8086 microprocessor, with the MS-DOS operating system, and the Motorola 68020 microprocessor, coupled with Unix, are driving the low end of the marketplace."

Tandem stopped short of acknowledging that it was interested in using the 68020-based Altos model 3068 as a front-end Unix-based processor. Tandem, in fact, has maintained a certain distance from the Unix operating system. But the pact with Altos could signify that Tandem is bowing to industry pressure for standardization.

Jeffry Canin, a Tandem analyst with Hambrecht & Quist, San Francisco, doubted that the alliance with Altos represented an abandonment of Tandem's proprietary Guardian operating system.

"Tandem has invested hundreds of man-years in the Guardian operating system," said Canin. "It would not be a wise move at all for Tandem to switch to Unix. That would open the door to too many competitors. If Tandem is interested in Unix, it is

probably for a very specific type of application. Many government agencies, for instance, require Unix capabilities."

Reports, in fact, have said that Tandem has sold its fault-tolerant on-line transaction processors to the Air Force, which is interested in Unix.

Phil White, Altos senior vice president of marketing and sales, said Altos attributes the success of its 3068 "super microcomputer" to "flexible design features" that provide customers with high-performance, low-cost systems that can be "adapted to changing market requirements."

Early industry reports indicated that Altos had won the Tandem contract over Convergent Technologies Inc. But Convergent sales vice president Richard G. Meise said, "Passed over. Beat out. Those are tough terms. If we were passed over, then so was every other Unix developer in the industry. We weren't even considered. If there was a fight and we didn't win, we didn't even know about it."

The Altos 3068 incorporates the 32-bit Motorola 68020 microprocessor and runs the Unix System V operating system. It features an 8-Kbyte central processing unit (CPU) cache, fast disks and a multiple microprocessor design. It offers up to 16 Mbytes of random-access memory (RAM) and 200 Mbytes of Winchester disk storage capacity. The system can accommodate up to 30 users.

When introduced in March 1985, a basic configuration sold for $7,000. Shipment of the 3068 began last November. The system now makes up 20 percent of Altos' revenue, which amounted to $37.7 million in the recently concluded quarter.

The 3068 is targeted to the original equipment manufacturer (OEM) marketplace. If the contract with Tandem is indeed worth $50 million, it would represent the largest contract Altos has yet signed for the 3068.

An agreement for the 3068 with ADP, previously made public by Altos, reportedly is valued at less than $50 million.

## Bull, U. S. Firm

May  5, 1986, Monday

DISTRIBUTION: Business/Computer Editors

LENGTH: 567 words

HEADLINE:  TANDEM-COMPUTERS;  (TNDM) Announces new 6AT/20 and 6AT/40
workstations

DATELINE: CUPERTINO, Calif.

 BODY:
    Tandem Computers  Inc. (OTC:TNDM) Monday unveiled two new PC AT-compatible
workstations that can function as either stand-alone units or as fully
integrated system terminals for Tandem NonStop systems.

    The 6AT/20 has a 20 megabyte (MB) internal hard disk drive and the 6AT/40 has
a 40 MB internal hard disk drive. The 6AT is expandable to a maximum of 80 MB of
disk storage and 11 MB of Random Access Memory (RAM), yielding more storage and
memory capacity than the IBM PC AT.

    Fully compatible with the PC AT, the 6AT can run a wide variety of business
software and comes with extra features at a lower price.

    Tandem also announced the availability of MS-Windows for the new units. When
operating as part of a Tandem system, the 6AT has access to on-line information
and the ability to transfer files using Tandem Information Xchange Facility
(IXF) software.

    With optional MS-Windows software, IXF allows the user to work with system
information in one window and with local information in other windows.

    ''We expect that users in all of our major market segments can benefit from
these models. These include users in banking and finance, manufacturing and
telecommunications who need a more powerful workstation that can also access
host-based applications,'' said Tandem Vice President of Marketing Gerald L.
Peterson.

    Both models are based on the Intel 80286 microprocessor and have 512 KB of
RAM memory, which can be expanded to 11 MB.

    The 6AT comes with a standard MS-DOS 3.1 operating system, and can execute
applications that run on the IBM AT under PC-DOS. UNIX and XENIX operating
systems can also be used with the 6AT. GW-BASIC, Tandem terminal emulation and
IXF file transfer software are included.

    The 6AT has eight IBM PC AT-compatible option slots (two 8-bit and six
16-bit). A serial/parallel/current loop option card fits in one option slot. A
user can select either an RS-232-C or current loop interface with this card.

    Users can choose one of nine detachable keyboards. National keyboard sets are
available for the UK and USA, and for French, German, Swedish, Spanish,

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Danish, Norwegian and Italian languages.

Monochrome and high-resolution color monitor options are available.  A monitor adapter card is required to provide text and graphics.

The 6AT workstation is designed so that customers can install and support it. On-site support and installation is available. Users can also call toll-free to the Tandem customer support center for telephone assistance.

Both the 6AT/20 and the 6AT/40 are available now.

The 6AT/20 is priced at $3995 and the 6AT/40 at $4495 (US).  Quantity discounts are available for the 6AT alone, and for the 6AT in combination with other Tandem terminal and workstation products.

Tandem Computers  manufactures and markets computer systems and networks for on-line transaction processing. The company is headquartered at 19333 Vallco Parkway, Cupertino, Calif., 95014.

Note to editors: Tandem, NonStop, 6AT, 6AT/20 and 6AT/40 are trademarks of  Tandem Computers  Inc.
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CONTACT:  Tandem Computers,  Cupertino
          Corinne DeBra, 408/725-7574

ALTOS LANDS $50m PACT

Altos Computer Systems has landed a $50m, three year contract from fault tolerant computer maker, Tandem.  Under the pact Altos will supply its 68020-based Unix boxes which will be offered by Tandem as front-end Unix processors for its host systems.  Tandem is believed to have considered a list of suppliers including Convergent Technologies.

the closely watched indicator at 1,783.98 — the first time since April 11 that the average has been below the 1,800 level.

On a percentage basis, however, Wednesday's single-session decline of 2.3 percent in the Dow's value was less than the 2.5 percent loss of Jan. 8 because the average is higher now. And the 2.5 percent loss pales in comparison with that of Oct.

shares, compared with 148.77 million the day before. The number of declining stocks outnumbered those advancing by four-to-one.

Among the principal losers in the day's trading were utility stocks, which were hurt by fears that the Soviet crisis would increase anti-nuclear sentiment in the United States. Stocks of some food compa-

ecuted "program trading," analysts said. Such transactions, which can involve several hundred different stock issues and millions of dollars, are triggered by price disparities between the stock market and the market in stock-index futures.

Reacting to the Soviet accident, the Dow Jones average of 15 utilities fell 3.02, to

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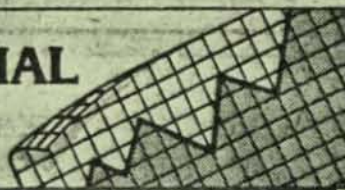
# Treatment varies for laid-off U.S. workers

Less than half of U.S. firms that permanently lay off workers help them find another job, and white-collar workers and union members fare much better than other workers, concludes a study of layoffs done

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**ALTOS, TANDEM IN PACT:** Altos Computer Systems of San Jose, a maker of super microcomputers, has signed a deal to provide technology to Tandem Computers Inc. of Cupertino, which makes minicomputers used in on-line data processing, such as banking. Terms weren't disclosed, but the firms plan to develop a computer system for Tandem, built around Altos' new 3068 multiuser computer.

**BIG BLUE IN BOOKS:** International Business Machines Corp. is going into the publishing business. The giant, which already dominates the computer industry, will publish computer books to be sold in book stores and other retail outlets. Titles on portable computers, networks, graphics, word processing and maintenance are to be published this fall.

**HIGH-TECH FIRM IS FAKE:** A purported high-technology weapons manufacturer claimed in national advertisements that it had developed a self-cooling beverage can. But the claim — and the company — were created to defraud investors, federal authorities charged. In a complaint filed in U.S. District Court, the Securities and Exchange Commission alleged that Laser Arms Corp. and a principal of the firm, Marshall Zolp, drew unwary investors with a phalanx of false claims. Zolp sold at least 940,000 shares of Laser Arms common stock for at least $1.5 million from

## Commercial Real Estate

# S.K. Brown drops ou



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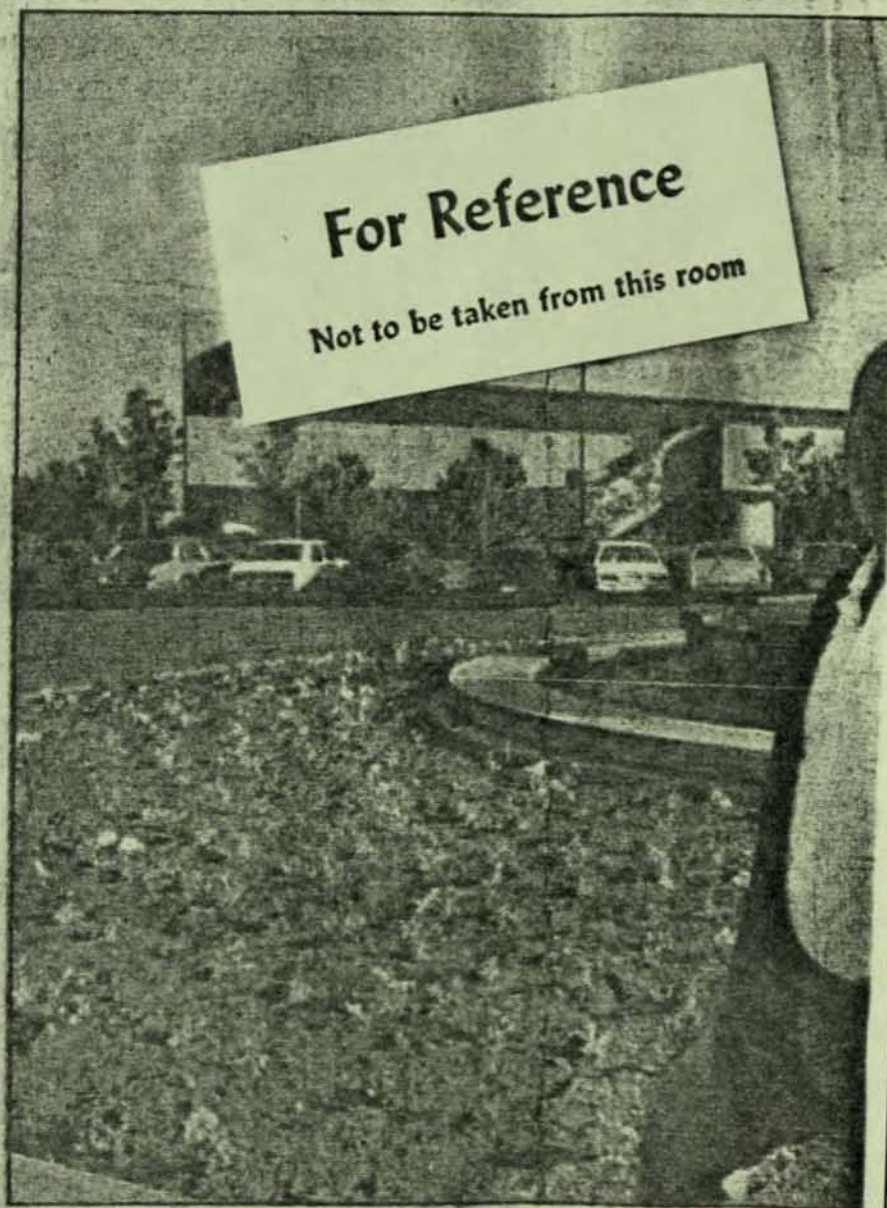
Steven Brown, in front of a building his firm built at C

# An industry leader retir

By Kirstin Downey
Mercury News Business Writer

S.K. Brown Construction Inc., which peaked with $127 million a year in construction income just a few years ago, is leaving the business.

Citing personal reasons, Steven

More Commercial
Real Estate,
Pages 5G - 7G