



London Marathon runners will be timed by Tandem.

Tandem tots up runners

by Charles Arthur

For a day next April, Tandem Computers will be totting up the results when 16,000 exhausted people have strips torn off their shirts and are herded into lines in front of TV cameras.

This may sound unusual for a firm better known for its work in banking, but it is all part of providing the computer services for the London Marathon, where runners cross the finish line at an average rate of 250 every minute and every one must be timed.

Tandem, which makes the fault-tolerant machines, Non-Stop, has started the long

run-up to the race itself.

The first part will occupy six full-time programmers, 12 part-time volunteers and the storage of a 10 Mbyte disc to put the details of up to 75,000 applicants into a database of age, sex, nationality, profession, and other categories.

On race day the database will be accessed constantly by commentators and stewards.

For this a four-processor machine linked to nearly 20 terminals will be sited in a caravan parked near the finish line.

That is where the runners, with bar-coded numbers stuck to their shirts, will com-

plete the marathon during the afternoon.

But Tandem is confident that it will for the first time be able to have all the results and placings of the runners in time for the evening prize-giving and soon afterwards produce certificates for all the runners.

The cost of the total project is estimated at about £250,000.

Tandem hopes the "visibility" it gets from the work will make up for the financial cost. Last year's computer sponsor DEC withdrew because it felt the TV exposure it got was "not half what was expected".

Tesco stays with IBM for project

Tesco food chain has decided to stick with IBM kit for a five-year project to install distributed systems in its nationwide supermarket chain. This follows lengthy assessment of NCR's Tower and DEC Microvax systems, which were shortlisted in May as alternatives to IBM. IBM is to install about 200 System 36 computers at Tesco early next year, having previously failed to win Tesco's custom on its 8100 range.

Banking link

The three firms responsible for bank payment clearing and funds transmission in the UK have been brought together under the new Association for Payment Clearing Services, which began life on Monday. The companies include Chaps, for cheque clearing, and Bacs, which handles standing orders and direct debits. A fourth firm covering electronic funds transfer at the point of sale will be set up when a national system gets going.

Rumours of bid

Telecommunications group Air Call had its shares suspended on the Unlisted Securities Market last week, starting rumours of a takeover bid. The company denies it is in talks. It says it requested the suspension because it is negotiating a major price-sensitive contract. It expects to be able to announce the deal before Christmas.

Research group

An international association for research and development managers is being formed by Manchester Business School in response to industry demand. It will be

Private sector may be the winner

by Charles Arthur

More public sector computing work may be shifted to private companies following last week's meeting between top civil servants and the Computing Services Association (CSA).

Six members of the CSA's council and Doug Eyeions, its

ing done by members of the CSA.

Both sides have kept a guarded silence about the meeting.

But Eyeions says the meeting was "one of the most successful we've had with government in putting over what the CSA does".

He says: "There was a

of the meeting; one source said that such meetings are common with private companies and that department heads make their own decisions on attending.

However, it is very rare for all the heads to attend such a meeting, as the government admits.

The interest shown in the

Computer Systems - Industry Report
(continued)

Company	Short Term	Long Term
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Prime Computer, Inc.

B

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We believe that the pieces are all in place for Prime to outperform the industry and market over the next two years. Excellent financial and asset management places the company in a preferred position during the current environment and alone might support recommendation. This position is enhanced, however, by the considerable leverage that Prime enjoys as a result of its vastly expanded marketing effort. The direct sales force has been increased by 47% since last July and by more than 70% since the beginning of 1984, while indirect channels are simultaneously being developed. In short, Prime is a strong turnaround with a marketing flair. The two catalysts that could further accelerate growth are: (1) a decline in the dollar (50% of sales are international), or (2) higher-than-projected leverage off the marketing expansion. Our price objective is \$25 a share.

Quantum Corporation (*)

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Quantum's leading industry position in winchester disk drives and proven management capability are accompanied by the most compelling valuation in the group. Numerous catalysts for long-term appreciation exist including a new 3 1/2-inch add-in subsystem and high-performance 5 1/4-inch half-height drive. Both represent new market opportunities and incremental revenue streams, starting in the second half of 1985. Because competitive advantage is derived largely through positioning and manufacturing expertise, not technology, further success is more predictable. Shareholders' equity totals \$9.65 and should grow at a 20-25% annual rate over the next three years. Recent indications are that "HARDCARD's" (the 3 1/2-inch subsystem) acceptability is running above expectations. The second-quarter (September) drop in earnings was less than that factored into Street estimates including our own, and we believe that December earnings will also produce an upside surprise. Either one of these could provide an upward catalyst even in the current environment. Our price objective is \$33-35 a share.

Tandem Computers (*)

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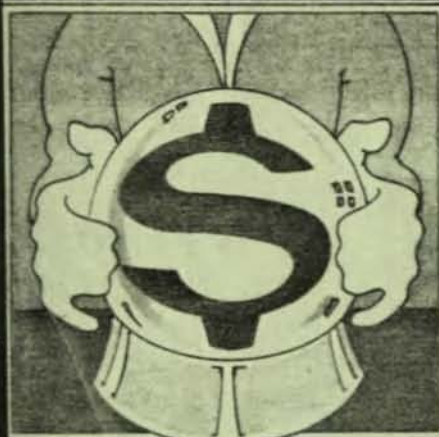
Investor concern about the sustainability of recent trends proved to be correct, as June results fell well below estimates while September saw a rebound above census. Asset management, however, has remained strong. Although some of the current weakness was cyclical, the magnitude was surprising and has renewed skepticism about Tandem's ability to manage the business, particularly head count. We believe that this is being addressed, but it sets things back. Longer term, a more aggressive marketing push, the inherent expandability of the system, and a leading position in on-line-transaction processing (OLTP) should provide growth above the industry.

Stocks, Some Bright After A Year Of Gloom

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market in 1986,

1986 would be in the big equipment suppliers, such as Digital Equipment Corp. and IBM. Nearly everyone who has ever crunched a number on Wall Street is now recommending Big Blue, which was trading at 153 as of Dec.

INVESTMENT OUTLOOK '86



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computer stocks

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24. The computer giant is expected to benefit in 1986 from a declining dollar, from any improvement in domestic spending and, especially, from high demand for its new Sierra mainframe line. There is also speculation that IBM might declare a stock split—a move the company last made in May 1979.

"IBM in 1986 will finally begin to bear the fruits of its massive prior investment program, which has totaled \$30 billion or so in the last five years," said Michael Geran, a research vice-president at E.F. Hutton. "The new product flow, coupled with a 'Scrooge-type' management, [which emphasizes] very lean costs, will turn margins."

Indeed, if there is one quality to which analysts are paying particular attention as they prepare their 1986 recommended lists, it is financial management. In fact, the strides (Continued on Page 10)

IBM Backs Off Policy On VARs' Use Of Agents

By Laura Allyn Post

MONTVALE, N.J. — IBM has reversed itself on its much-criticized plan to restrict its value-added resellers' use of independent sales agents, and will now make exceptions for those resellers that had agent programs in place before June 7.

IBM informed its Value-Added Remarketers and Value-Added Dealers of its change of heart in a letter mailed Christmas week only a week before the restrictions on using sales agents were scheduled to take effect. IBM had informed its resellers in June that as of Jan. 1, sales agents would only be allowed to generate leads for resellers, not carry out the actual selling process.

The restrictions were seen as an effort by IBM to control gray-market reselling of Personal Computers and System/36 mini- (Continued on Page 6)

Tandon Nets Key Pacts With Xerox, Tandem

By Julie Pitta

CHATSWORTH, CALIF. — Tandon Corp. has reached agreements in principle to supply Xerox Corp. and Tandem Computers Inc. with microcomputers and disk drive products valued at up to \$300 million over three years, according to industry sources.

A Tandon spokesman said the first agreement calls for Tandon to supply a family of IBM Personal Computer/XT- and PC AT-compatible workstations to a "major office equipment and systems firm," which sources identified as Xerox. The workstations will use Tandon disk drives and Intel Corp.'s 80286 microprocessor and will bear the Xerox label. Shipments will be (Continued on Page 6)

Storage Technology Pulls Plug On Optical Disk Drive Operation

By Dan Murphy

LOUISVILLE, COLO. — Storage Technology Corp. last week pulled the plug on its optical disk drive development operation after deciding to dedicate its limited resources to existing magnetic storage and printer operations.

The company has halted any further funding for the operation, closed its optical drive devel-

opment facility here and is now attempting to reassign the unit's 50 workers.

The move was based on concerns that sufficient optical media would not be available for STC's planned 14-inch 4-gigabyte write-once optical disk drive. STC had previously halted optical media development and licensed the media technology to E.I. DuPont de Nemours & Co., which is not yet producing the media. Most other media suppliers and drive manufacturers have settled on the 12-inch format for large form-factor optical disk products.

"After consideration of the availability of production-level optical media from outside sources and the substantial additional funds that would be required to complete the development and begin product shipments by 1988, (Continued on Page 38)



Jerritts: Cuts funds.

CMI Lays Off 30%; President Resigns

By Julie Pitta
and Laura Allyn Post

CHATSWORTH, CALIF. — Computer Memories Inc. last week cut 30 percent of its work force, announced the resignation of president Gary Streuter, and said it expects to report a loss for the quarter ending Tuesday.

CMI also announced a tentative agreement to sell some of the assets of its Singapore manu- (Continued on Page 38)

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Computer Systems News
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Tandon Nets Major Deals With Xerox And Tandem

(Continued from Page 1)
spread over a three-year period.

Both Tandon and Xerox officials declined to comment further. However, Xerox has scheduled a Jan. 8 press conference in New York to introduce new computer systems.

The Tandon spokesman said the second agreement calls for Tandon to provide IBM-compatible PCs, memory

storage subsystems and other disk drive products over a two-year period to a "large computer manufacturer," which sources said is Tandem Computers. All products will be marketed under the Tandem label. Tandem officials refused to comment on the pact.

Under both agreements, shipments are tentatively scheduled to begin in the first half of 1986, the Tandon spokes-

man said, declining to elaborate further.

While none of the three parties would indicate dollar amounts of the individual contracts, industry sources said the Xerox agreement is the larger of the two pacts.

Wall Street analysts hailed the agreements as a "first win" for Tandon's new management team—a cadre of prominent former microcomputer industry executives.

The analysts said Tandon appears to be making good on its recent promise to more actively pursue private-label OEM computer deals.

"It's basically a way for them to enter the value-added business without the pricing competitiveness they're trapped in" with only disk drive products, said Michael Murphy, editor of *The California Technology Stock Letter*.

"It's easy for me to believe the Tandem agreement. Tandem is more and more installing networks that include their own products and other people's," Murphy said. "If they can buy some clones cheaper from Tandon rather than buying IBM PCs, they'll be able to improve their margins. It's nice business for them."

"Obviously it's a positive for Tandon in that their new strategy has been toward value-added systems," added George Elling, analyst for Oppenheimer & Co. "The company's taken enormous losses in the past. They started in floppy disk drives—a business with tremendous pricing pressure—and moved

into Winchesters, but never became the force they expected to be in that market."

These agreements "show that they can get that business," Elling said. "Now the question is can they be profitable in it."

Tandon reported a net loss of \$135.4 million, or \$2.66 per share, on net sales of \$268.8 million for the 1985 fiscal year ended Sept. 27. Included in the loss are tax credits of approximately \$31 million. In comparison, for fiscal 1984, Tandon posted a net income of \$29.4 million, or 58 cents per share, on net sales of \$400.8 million.

For the fourth fiscal quarter ended Sept. 27, Tandon reported a net loss of \$85.1 million, or \$1.67 per share, on net sales of \$54.7 million. For the corresponding quarter last year, Tandon posted a loss of \$724,000, or 1 cent per share, on net sales of \$95.8 million.

Company officials attributed the 1985 loss to an increase in obsolete inventory, lower margins resulting from industry pricing pressures, and under-use of manufacturing resources due to decreased production levels. In addition, the company increased its provisions for bad debts and incurred expenses as a result of litigation before the International Trade Commission.

Sales of private-label microcomputers and user-ready subsystems accounted for \$75 million, or 28 percent, of Tandon's fiscal 1985 revenue, as compared to an "insignificant" percentage the year prior.

Former IBM PC Engineering Exec Joins Tandon As Vice-President

CHATSWORTH, CALIF. — Tandon Corp. has tapped William L. Sydnies, former engineering manager on the IBM executive team that launched the Personal Computer, as engineering and development vice-president.

Sydnies, who will report to recently appointed Tandon president Dan H. Wilkie, will be in charge of engineering and product development for the company's computer systems and subsystem product lines. Most recently Sydnies was president of Systems Networks and Peripherals Inc., a Moorestown, N.J., developmental engineering firm he founded after leaving IBM in 1984.

Sydnies, an 18-year IBM veteran, is the fourth significant addition to Tandon's management team in recent months and the third IBM PC

veteran to come on board. In November, Tandon named Wilkie, who headed IBM's Personal Computer facility in Boca Raton, Fla., to assume control of day-to-day operations from Tandon chairman and chief executive Sirjang Lal "Jugi" Tandon. Prior to Wilkie's appointment, Tandon hired former IBM and Compaq Computer Corp. sales executive H.L. "Sparky" Sparks as executive vice-president of sales and marketing.

Chuck Peddle, a former vice-president of Commodore Business Machines and co-founder and former chairman of Victor Technologies Inc., recently joined Tandon as president of Tandon Computer Corp., a new subsidiary that will sell Tandon-labeled microcomputers and subsystems through dealers and distributors in Europe.

IBM Shifts Gears On Value-Added Resellers' Agent Use

(Continued from Page 1)
computers by VARs and VADs that were using agents to broker hardware. But several resellers have said the restrictions would make it impossible for them to continue marketing nationally and could prompt them to look for another hardware supplier.

Now, however, IBM is making an exception for those resellers that had legitimate agent programs in place when the restrictions were announced, out of "sympathy" for their predicament. The exception applies to those resellers that were using agents

contract changes IBM announced last summer.

"I know there was a substantial amount of pressure put on them by some pretty big hitters," said Rick Borg of DCD Co., Robbinsdale, Minn. "It appears to me they've succumbed to that pressure. It's in IBM's interest to allow it [the agent program] to continue, as long as they do a little better job of policing up front."

"Apparently the management philosophy is to come out and make a hard-line statement, see what the reaction is and then soften the statement," Borg added.

"You never know in this program what's going to

An exception to those restrictions would be a big plus, he added, "because there's significant additional cost involved in duplicating the agent network with a direct sales organization."

IBM said the exception will be extended to eligible resellers for "an indefinite period, although IBM reserves the right to revoke this exception with reasonable notice of at least 90 days." And, in an apparent warning to resellers about using sales agents as unauthorized brokers, the company noted, "Of course, as always, any confirmed contract viola-

Users Vie For Position On 3090

Worried that there won't be an investment tax credit in 1986, some purchasers of IBM's 3090 mainframe were paying as much as \$150,000 extra to move to the head of the 1985 delivery line.

According to several major leasing company executives, users have been forking over from \$50,000 to \$150,000 to buy "positions"—delivery dates held by leasing companies or other users—on the 3090s.

Users wanted to install the machines in 1985 so they could take advantage of the existing 10% investment credit. Because of the move in Congress to overhaul the tax code, many tax experts believe the ITC is doomed in 1986.

Sharing The Technology Basket

Amdahl Corp. and Fujitsu Ltd. both indicate extreme sensitivity whenever outsiders discuss the nature of their technology-sharing agreement. Senior officials of Amdahl once spoke of "generation skipping," in which Amdahl would design the 5890 generation, Fujitsu would design the Hawk generation (see *InformationWEEK*, Dec. 9), and Amdahl would design the next generation, and so on.

But now, Amdahl officials bristle at the suggestion that Amdahl will stop designing its own mainframes altogether and simply resell Fujitsu machines. Amdahl advises that a "technology basket" is a better image than "handing-off." That is, Fujitsu and Amdahl will both develop technologies, drop them into the "basket," and use the innovations to build new machines. Clearly, Fujitsu will drop chip and manufacturing technology into the basket, while Amdahl will most likely contribute IBM-compatible software and software-design technology.

IBM's 3480 Tape a Bit Short

It is disappointing enough, on opening a box of cereal that seems half full, to read on the box that it is sold by weight, not volume, and that some settling occurs during shipping.

It should be different with IBM 3480 tape cartridges. Nominally, according to the company's literature, there are 505 feet of tape usable for writing data.

Still, some curious early users found that the actual footage delivered varies between 500 feet and 550 feet, a 10% difference. One user, who also checked out 10-1/2-inch reels from various vendors, found they varied from 2358 feet to 2398 feet, a variation of just 2%. An IBM spokesman, however, says the firm specifies the 3480 tape cartridge in terms of the amount of data that can be recorded on it—200 Mbytes in 24K-byte blocks—not in terms of the footage.

The 3480 tape cartridge variance may seem small, but it can affect operations. When converting full tape reels to cartridge or during cartridge-to-cartridge copying, the variation in cartridge length can occasionally cause an operation to fail. It's possible that IBM's potential 3480 cartridge competitors could make hay from the imprecision—by offering more precise controlled lengths.

IBM Installs DB2 At Home

IBM continues to cause controversy in the data-base management system market with its two-data-base strategy.

The firm tells users they need two different—and incompatible—packages to meet all their needs: IMS for high-volume, standardized production work and DB2, a relational DBMS, for low-volume ad hoc query processing.

Competitors say relational data bases can handle both needs. Some people inside IBM apparently agree, since they report that the company is converting its own order processing data base to DB2.

Tandem Checks Its Competition

Just in time for Christmas, Tandem Computers Inc. began shipping beta-test versions of a new high-end processor to users. Code-named Check, the new machine makes extensive use of gate-array chips to consolidate its logic.

Check has just two boards, as compared with the four boards used in the Tandem TXP processor and the three boards in the less-powerful NonStop II.

Tandem believes that the smaller size should reduce manufacturing costs, increase reliability, and improve performance. Industry analyst Omri Serlin of ITOM International Co., in Los Altos, Calif., speculates that Check may offer a 50% performance improvement over TXP, putting it in the range of 5-to-9 transactions per second for each processor.

IBM To Expand System/36

IBM's System/36 will definitely continue to grow in 1986. Sources close to IBM have confirmed that the company was forced to boost System/36 power in order to continue to push it as a departmental processor.

The company would like nothing better than to see System/36 succeed—but users are balking, claiming the 36 is simply too slow for the task. IBM also plans to make 1986 the year the 36 will join IBM PCs on the new Token-Ring Network.

IBM Tests Front-End Processor

Telecommunications managers, take note: IBM may be planning to introduce a downsized 3275 front-end processor sometime in the next three months. The product is already at beta-test sites.

Introduction of the new front-end processor cannot come too soon, though, since NCR Comten has been shipping a similar product, the 5620, since last February. The 5620 brings application switching, polling, automated dialing, and data concentration to small sites and remote sites on a far-flung data network.

Size is important, since the smaller IBM communications processor would be cheaper to buy—and to maintain—than its big brothers, the IBM 3705 and 3725.

save the money and large amounts of money.

"We know that many companies are working on a version of the new standard. Some companies have already released subsets of the ANSI Cobol standard, but nobody else has claimed to release a version of the full standard," said Corinne Robinson, product manager for Cobol 85, an implementation from Tandem Computers, Cupertino, Calif., currently in beta-test that company officials claim is the first to incorporate all the required features of the new Cobol standard.

"We're working on it, but it's very difficult to talk about future products," said Ray Kanemori, product marketing manager for business languages at MicroSoft, Bellevue, Wash.

"We already have products that implement portions of the new standards and we have had

Estates, Calif. "We're taking very aggressive measures with the new standard."

Although just recently approved, work began on the new Cobol standard in 1977. The earlier Cobol 74 will be replaced by the new standard. Cobol has been in use almost 25 years and is still considered the most widely used computer language in the world. The new standard provides Cobol with structured programming facilities, making programs easier to write, read and debug.

Most important, say industry observers, the new standard should prolong the life of this popular business language.

"It's good news. The industry has been waiting quite a long time for this," said Micro Focus's Granvold. "The new standard gives newer language constructs to Cobol that were sorely lacking in the previous standards. Cobol

options based on C. That's something that h Pascal and C and son others for some time. can say it's available in Don Nelson, a soft signer at Tandem and of the Committee on I tems Languages (CC which accepts and revi dards proposals and sub mmentations to AN: "The new standard wi total programmer dev costs by a significant I've heard estimates u half. The bottom line is mer productivity, which both development and ance."

Ryan-McFarland's Z saw two improvements standard. "One is it cle number of ambiguities t in the 74 standard. For piler vendor that is very ant because, obvious

Pick-Based System Offered For Fault-Tolerant Tandems

By JULI CORTINO

CUPERTINO, Calif. —Tandem Computers Inc. last week became the first fault-tolerant computer manufacturer to offer an operating system, based on the Pick system, for its processors.

Under an agreement with Ever-On Corp., a fledgling software house and a Tandem value-added reseller (VAR), based in Houston, Tex., Tandem's Non-Stop EXT minicomputers will be offered with Ever-On's Pick-compatible software.

Ever-On will resell Tandem's hardware through a VAR network. Ever-On is in the process of recruiting VARs and expects to sign up three during the first quarter of 1986. When in place, the VAR network will also mark the first time Tandem has used such a distribution channel.

"We've written an applications package that works under Tandem's Guardian (its proprietary operating system)," said Ever-On chairman and chief executive officer Robert E. Jordan.

"With our implementation of Pick, Tandem's systems can still offer fault-tolerance, networking and linear expandability. With the Pick operating system itself, you run into an upper limit on those items," he said.

George Purnell, Tandem's director of reseller marketing, addressed the question of why the company decided to offer Pick.

"There seems to be a proliferation of software applications from third-party vendors for Tandem's machines that are Pick-compatible. We continue to evaluate Unix, but have found that there are just too many versions of Unix out there right now. And, applications that run on one version of Unix don't necessarily run on the others."

Purnell said the EXT/Ever-On combination is viewed as "a vehicle to attract new customers" in the low end of the fault-tolerant marketplace. But, he said, the agreement was not a direct attempt to secure the low-end market in the face of competition from Stratus.

"This has nothing to do with Stratus," said Purnell. "It's an alternate channel for us to attract new customers. It will get Tandem's systems into areas like county government, hotels, insurance, the oil and gas industries, law offices, advertising, transportation and retail. There are also a number of business applications written for the Pick system."

Ever-On will be offering the package to its VARs with a suggested retail price of \$228,000 in quantities of one. The package will include a dual-processor Tandem EXT with 32 asynchronous ports and associated software. Volume discounts will be available.

'Con-ne Works W

By PATRICIA ZENGERLE

RESTON, Va. —Software North America, Inc. introduced "Con-nect," a automation mainframe product that works with company's Natural fourth-generation language and Adabas database management system (DIBAS).

The new package provides document handling, electronic mail and scheduling services on IBM frame-based networks.

Con-nect, which is written in Natural, can centrally route documents regardless of their origin in a corporate database. It is Software's first office automation product and can be completely integrated with every other Software product.

Software AG said that

Prime To R

NATICK, Mass. —Prime Computer Inc. is opening the doors of the International Business Machines Corp. environment wider through its remarkable IFPS/Plus, a software package for modeling and analysis.

IFPS/Plus, by Execucom Systems Corp., of Austin, Texas, maintains a relational database manager and a communications package which allows it to be run on IBM PC/XT, PC/AT and compatibles, as well as the full Prime Series of computers.

petition out there. Frankly, I think it's sad and disgraceful," Morgan said.

The award process for both the House and the Senate systems was "becoming too screwed up and politicized" to reach an objective decision, a member of the Senate committee told Morgan, whose C&P Telephone put in bids for both contracts, Morgan said.

C&P Telephone bid a Northern Telecom DMS-100-based Centrex system for both the House and

service and, as such, is subject to the telephone company's receipt of federal and state tariff approvals.

Some users have been known to reject Centrex out of hand on the belief that monthly service charges may be raised to reflect tariff increases. Moreover, House administration staff said, it wanted its own equipment, rather than leased equipment, as was proposed by C&P.

all vendor proposals, hired Arthur D. Little Inc. to perform an analysis of the proposals at a cost exceeding \$200,000. The consultant firm recommended C&P's proposal in October, but was told by the subcommittee to rewrite the evaluation without a recommendation, at an additional cost.

On Nov. 20, Arthur D. Little presented its revised report to the subcommittee. One of the five members of the committee was

not to be as secure as a switch residing on Capitol Hill, according to Morgan, and would be more prone to tampering and break-ins.

"In 107 years of providing telephone service to the House, there has never been a security breach associated with C&P services," according to president Gibbons. "The C&P central office where the switch will be installed is a totally secure building closed to

committee through the FCC and the PSC found no inherent problem with the special tariff, although it would not be filed until after the award, Morgan said.

In addition, C&P claimed in the protest that it was the only vendor that could meet the 40-week installation interval. A spokesman for ATT-IS's Large Business Systems Division said that since this was part of the RFP, the company would meet it.

Store-Bought High-Tech Eqpt. Costs U.S. Govt. 12% More

WASHINGTON (FNS)—Software and computer equipment the government buys from stores under contract with the General Services Administration is costing an average of 12.8 percent more than the same items obtained under GSA Schedule contracts, the House Small Business Committee was advised.

In a study ordered by the committee, the General Accounting Office also reported that government software buys from such stores are costing 22 percent more than are the same purchases under schedule contract.

The House committee said computer store sales have expanded from about \$12.8 million to \$31 million since 1983, when the first GSA computer store opened for business. GAO, concentrating on the two-month period, May through June 1985, concluded that the government would have saved \$379,000 if the same computer equipment purchases had been made off the schedule contracts rather than via the computer stores.

Rep. Parren Mitchell, D-Md., chairman of the House committee, had asked GAO to look into whether or not the computer stores were driving small, multiple-award schedule contractors out of business, or were otherwise causing them to abandon the fed-

eral computer market.

One small firm had reminded the committee that agencies may buy up to \$100,000 at the stores without listing requirements in the Commerce Business Daily, but when they buy from the schedule, they must list all purchases over \$50,000.

The stores have a maximum per-order limit of \$100,000. The committee noted that orders of up to \$300,000 are within the limitations of most schedule contracts, although maximum-order limits vary among the schedule contracts.

Nevertheless, GAO found possible violations of the maximum GSA order limitation of \$100,000. It has referred these cases to the Inspector General's office for further investigation.

"Evidence suggests that agencies are routinely purchasing items from the store that are available at less expense from multiple-award schedule contractors," Rep. Mitchell said. "Unless the same rules apply to the stores as to the schedule contractors, we will witness further proliferation of costly and anticompetitive purchasing of goods and services by the federal government."

Tandem Boosts Presence In Japan

By ALEX MARKELS

CUPERTINO, Calif.—Tandem Computers last week announced the formation of a joint venture with Tokyo-based software house Computer Engineering and Consulting (CEC) for the development of custom applications software for Tandem's NonStop series of fault-tolerant processors.

The agreement is further evidence of Tandem's stated plans to increase its presence in the Japanese computer market. The new venture, to be named Vartecs Inc., will focus on developing applications software for Japanese value-added networking, financial and manufacturing industries.

Forrest Grein, director of new business development for Tandem, said the CEC venture is a test case but that Tandem is currently looking for other partners developing software for the Japanese market. With the help of such partners, Tandem officials expect a 50 percent annual growth rate for sales of its computers in Japan.

Tandem hopes the new venture with CEC will help to fill the company's growing requirement for software developers who will create applications for specific customer sites.

"We're beginning to get the major accounts," said Grein,

"but we haven't had the resources in-house, so we need to augment our own efforts with outside company help. We just can't support the necessary applications unless we have experienced people in place."

Grein said that since Tandem launched its Japanese effort almost five years ago, it has experienced continuing trouble in competing with companies, such as Hitachi and Fujitsu, that have sometimes promised customers the use of as many as 100 systems engineers for particular projects, in order to convince customers to purchase their particular computers.

Although Vartecs currently employs only 10 full-time software developers, Tandem expects to increase that work force by 50 percent annually over the next five years.

Grein pointed out that Vartecs also has the resources of CEC, which employs over 1,100 people, to draw upon immediately, either on a contractual basis or by bringing people over to Vartecs full-time.

CEC has already been working with Tandem on a project at a major Japanese manufacturing company, providing systems integration and software engineering staff.

Grein said that Tandem made the decision to commit to the joint

venture with CEC because it wanted to "insure CEC's undivided attention" to the project.

"We believe that you form a closer relationship by actually putting money into the company and forming a separate organization," said Grein. "That company is now focused and dedicated to Tandem."

H-P Eases Time-Off

PALO ALTO, Calif.—Hewlett-Packard Co. has "modified" an enforced time-off program for its U.S. employees due to "modest improvements" in the company's U.S. order rates.

Hewlett-Packard's 56,654 domestic employees have labored under some form of a mandatory time-off program since August, after the company announced a schedule of two unpaid days off per month for August, September and October.

Hewlett-Packard closed all non-sales facilities during the Thanksgiving holiday and intends to do the same over the Christmas holiday week.

But the company said a slight upturn in order rates for some of the company's divisions has made it possible to return most employees to a full work week.

substantially higher valuation by Ameritech as well as a removal from the quarterly

column earlier this year on that company, American Software has about 25 applica-

ware installation, as well as the operating system and data base that the customer

and earnings growth on the order of 25 to 30 percent per annum. On a preliminary

report of New York-based institutional research and investment company Swergold, Cheltz & Sirsbaugh Inc.

Street Talk:

New Respect For AGS

The stock of AGS Computers Inc., no Wall Street favorite in recent years, has been behaving very well of late. The stock hit new highs on consecutive days last week, closing at 20 on Thursday after trading as high as 20-1/8. Its 52-week low is 10-1/8.

Lawrence Schoenberg, the company's chairman and chief executive, said the stock may have been helped by a favorable Wall Street recommendation from brokerage house PaineWebber Inc. But he also said investors may be starting to realize the premium on AGS stock is low relative to other software companies. AGS has enjoyed a compound growth rate of close to 50 percent for the last few years.

"Assuming we're measuring 1985 earnings, our P/E ratio after the move in the stock is now at about 14," Schoenberg said. "Before the move it was at 11 or 12."

Although 1985 has not been as good as AGS would have liked, the company still managed to post increases through the first nine months of the year. Nine-month sales at AGS reached \$204 million, from \$160 million last year. Profits also moved up, though less dramatically, from about \$4.6 million to \$5.5 million this year.

Schoenberg said another reason for the rise in stock price may be that Wall Street's skepticism about the microcomputer distribution business has eased. AGS, based in Mountainside, N.J., got into the microcomputer distribution business in early 1983 when it purchased a company now called Micro-America Inc.

"There has been a great deal of sensitivity

to the fact that we are in the microcomputer distribution business," Schoenberg said. "Perhaps there's starting to be a realization that the distribution business and our business in particular is better than many people had anticipated."

• • •

Wall Street has turned moderately bullish on **Tandem Computers Inc.** in the wake of a recent analysts meeting from the company. At least two brokerage firms—Robertson Colman & Stephens and Goldman Sachs—have been recommending purchase of Tandem shares lately. A third firm, Drexel Burnham Lambert Inc., also considers Tandem shares to be "moderately undervalued."

A couple of things have happened to make Tandem (whose stock closed Thursday at 21-7/8) look attractive to some investors. The company's fourth-quarter results were somewhat better than expected, showing the highest gross margins at the company in several years. Cash during the quarter also rose to a record level, \$129 million, underlining the strength of Tandem's balance sheet.

Then there is speculation about one particularly significant new product that Tandem is expected to introduce in the first part of next year. The product, based on ECL gate-array technology, is positioned above Tandem's top-end TXP computer—an area where analysts believe Tandem must remain strong. As Goldman Sachs analyst John C. Levinson said, "New high-end products are critical to Tandem, since it is in the high-transaction processing applications area that the company has the most opportunity to win market

share from IBM."

Indeed, it is IBM, and specifically the agreement Big Blue has to remarket fault-tolerant computers from **Stratus Computer Inc.**, that represents the biggest external threat to Tandem, most analysts say. Levinson said Tandem's challenges would be determined in part by how aggressive IBM gets in its marketing of Stratus products.

Stratus' stock, by the way, has continued to be a stellar performer. Apparently still benefitting from the IBM connection, the stock rose 1-3/4 points to 25 in heavy over-the-counter trading last Thursday. The stock's 52-week low is 8-3/4.

• • •

Anybody who thinks that company officials necessarily like to sell off stakes in their company bit by bit might consider the example of Howard B. Hillman. Hillman, chairman of **Auto-Trol Technology Corp.**, has been a heavy buyer of Auto-Trol's shares lately. In mid-November, Hillman plunked down something on the order of \$75,000 to purchase 17,250 shares in the company, according to *Vickers Insider Report*.

And just last week, the company announced it had to agreed to sell 1.6 million newly issued shares to Hillman at a price of \$3.75 a share. That deal, if it goes through, will give Hillman control of 4.1 million of Auto-Trol's 6.4 million shares outstanding. And the \$6 million the deal would give Denver-based Auto-Trol more working capital and enable it to reduce \$7.6 million in outstanding debt on its revolving credit line.

—Robert Hertzberg

Microamerica salutes Wyse.

Wyse terminals have set industry standards with their new ergonomic and technical features, and they run the gamut from A to Z with functionality to fit every need. There's yet another plus in the Wyse assets column. If it's a true IBM-compatible personal computer that sets your business rockets glaring, Wyse can fill the bill here, too! Now for the final clincher, all Wyse products are backed up by an extensive support and service program.

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Here's another wise move.

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Don't simply take our word for it. Call us today and learn more about our enviable list of services and Wyse's star-spangled product line. You'll find out we're wise on Wyse!

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800-922-1949 (In MD)

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617-480-0780

icked by other application programs, Kaplan said HAL will significantly ease the use of 1-2-3 for both the novice and expert user.

"Not everyone, not even experienced users, remembers all the commands all the time," Kaplan said. "We were impressed with the HAL technology because it provides a way for those occasionally used commands and utilities to be accessed more easily."

Kaplan said Lotus' internal AI efforts are progressing on schedule, and GNP's development efforts will "provide very strong synergy" with the internally developed AI software.

"We saw the opportunity to bring this product to market near term and develop that technology further," the Lotus spokeswoman said.

HAL also features a natural language data base query facility for manipulating the data base component of 1-2-3.

Tandem Forms Venture With Tokyo Concern

CUPERTINO, CALIF. — Tandem Computers Inc. has formed a joint venture with Computer Engineering & Consulting Ltd. (CEC), Tokyo, to develop and support applications software for Tandem systems in Japan.

Tandem currently has two sales offices in Japan, so the "purpose of this venture is not to sell Tandem hardware," a company spokesman said.

"The point of it is to provide better levels of software and applications support to customers we already have there," he added.

Initial Focus

The new venture will be called Vartecs Inc. and initially will focus on supporting value-added networks and on financial and retail point-of-sale applications running on Tandem's NonStop fault-tolerant computers.

CEC is a subsidiary of the Mitsuwa Group, a Tokyo-based electronics and financial and leasing services company.

The deal marks Tandem's first attempt at a joint-venture company, the spokesman noted.

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December 12, 1985, Thursday

DISTRIBUTION: Business Editors

LENGTH: 466 words

HEADLINE: TANDEM-COMPUTERS; New Mexico Interchange Network Inc. selects
Tandem Computers for statewide ATM system

DATELINE: CUPERTINO, Calif.

BODY:

Tandem Computers Inc. (OTC:TNDM) announced Thursday that New Mexico Interchange Network Inc. of Albuquerque, N.M., has selected Tandem NonStop computer systems to operate a statewide network of automated teller machines (ATMs). New Mexico Interchange Network Inc. is a cooperative venture of six New Mexico financial institutions to construct a shared network called Lynx that allows ATM cardholders from each member firm to withdraw money from any ATM in the system. When it goes into operation in early 1986, Lynx will serve over 280 ATMs. Eventually it will link over 90 percent of all ATMs belonging to banks, savings and loans, and credit unions throughout New Mexico and serve approximately 400,000 cardholders. The Lynx network will unite the major ATM networks in New Mexico, including Southwest Exchange, Bankmate, and New Mexico First Interstate ATM network. The founders of Lynx are Albuquerque Federal Savings and Loan Association, First Interstate Bank of New Mexico, First National Bank of Albuquerque, New Mexico Banquest Corp., Sunwest Financial Services Inc. and United New Mexico Financial Corp. Acasio Turrietta, technical support manager for Sunwest Bank of Albuquerque, the member bank that will run the Lynx switch for the next three years, commented, "The Lynx network will expand upon an already successful Tandem-based switching network that has proven to be extremely reliable." Jerry Peterson, Tandem's vice president of marketing, said, "Thirty of the top 50 ATM networks in the U.S. use Tandem technology to provide switching services. "We are pleased that the Lynx network has joined that list. We are confident that our architecture, with its combination of hardware and software fault tolerance and modular linear growth, will meet their needs as they serve the expanding New Mexico marketplace." The network will use the ACI/NET software package from Applied Communications Inc. (ACI), headquartered in Omaha, Neb. ACI/NET is an integrated, on-line electronic funds transfer system designed to provide continuous fail-safe service. ACI joined the Tandem Alliance as a software house in 1983. ACI is located at 330 S. 108th Ave., Omaha, Neb. 68154-2684. Phone is 402/390-7600. Tandem Computers Inc. manufactures and markets computer systems and networks for the on-line transaction processing marketplace. The company is headquartered at 19333 Vallico Parkway, Cupertino, Calif. 95014. Phone is 408/725-6000.

Tandem and NonStop are trademarks of Tandem Computers Inc.

CONTACT: Tandem Computers Inc., Cupertino
Tom Waldrop, 408/725-7191
or
New Mexico Interchange Network, Albuquerque

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LEVEL 1 - 2 OF 2 STORIES

Copyright © 1985 Business Wire Inc.;
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December 11, 1985, Wednesday

DISTRIBUTION: Business Editors

LENGTH: 364 words

HEADLINE: TANDEM; Announces joint venture with Computer Engineering and Consulting of Tokyo

DATELINE: CUPERTINO, Calif.

BODY:

Tandem Computers Inc. (OTC:TNDM) Wednesday announced it has formed a joint venture with Tokyo-based Computer Engineering & Consulting Ltd. (CEC) to develop, market and support custom application software for Tandem NonStop computer systems in the Japanese marketplace. The new firm, Vartecs Inc., will initially emphasize support for value-added networks, financial and retail point-of-sale applications. CEC is one of the largest information processing service companies in Japan and among Japan's fastest growing firms. It is the largest subsidiary of the Mitsuwa Group, a Tokyo-based electronics, engineering, and financial and leasing services company. In addition to software and support, the joint venture will also provide contract consulting services to Tandem customers for projects in the development and implementation stages. It already has contracts with a number of users of Tandem equipment. Commenting on the new venture, Gerald L. Peterson, Tandem's vice-president of marketing, said, "This will benefit Tandem by enabling us to better support our growing customer base in Japan. "We chose to establish this relationship with CEC, one of Japan's leading software houses, because of its experience with complex on-line transaction processing systems and its excellent support of one of our largest customer accounts." CEC chairman Hirosato Iwasaki said, "We are pleased to be associated with Tandem Computers. Their leading-edge products and technology offer many opportunities for mutual success." Vartecs is located at Yasukuni Kudan Minami Building 3F, 2-3-14 Kudan Minami, Chiyoda-Ku, Tokyo 102. Tandem Computers Inc. manufactures and markets computer systems and networks for the on-line transaction processing marketplace. The company is headquartered at 19333 Vallico Parkway, Cupertino 95014, telephone 408/725-6000. Note to editors: Tandem and NonStop are trademarks of Tandem Computers Inc.

CONTACT: Tandem Computers Inc., Cupertino
Tom Waldrop, 408/725-7191
or
Computer & Consulting Ltd., Tokyo
Tadashi Igari, 03/407-8561

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LEVEL 1 - 1 OF 4 STORIES

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December 9, 1985, Monday

DISTRIBUTION: Business Editors

LENGTH: 560 words

HEADLINE: TANDEM/EVER-ON; Ever-On of Houston to resell Tandem NonStop EXT Systems with popular PICK-compatible software

DATELINE: CUPERTINO, Calif.

BODY:

Tandem Computers Inc. (OTC:TNDM) Monday announced that Ever-On Corporation of Houston has signed an agreement to resell Tandem NonStop EXT systems with Ever-On's PICK-compatible system. The Ever-On software provides upward compatibility with PICK, a popular, industry-standard operating system that runs on a variety of computer systems and is installed at over 35,000 sites. With Ever-On software, Tandem's NonStop EXT will be the first fault-tolerant, modularly-expandable computer that can run more than 2,500 business software applications that have been developed for PICK-compatible systems. Ever-On's software includes all the user-friendly features of the PICK Operating System, while adding the new dimensions of networking and modular expansion. In addition to Tandem's advanced EXPAND network, Ever-On's software is capable of supporting many communications protocols, including X.25, HYPERchannel, IBM Bisync, IBM SNA and 3270. Ever-On's software supports the PICK BASIC programming language and is the first PICK-compatible system to support C, COBOL, FORTRAN 77, TAL and Tandem Extended BASIC. Each of these languages may access PICK structured databases directly or through the use of Ever-On's English-like query language. The agreement opens a new low-end distribution channel for NonStop EXT systems. Ever-On's target market consists of value-added resellers that are currently marketing PICK applications on non-fault-tolerant, non-expandable hardware. With Ever-On's product, these companies can quickly migrate their PICK applications to NonStop EXT systems and for the first time, provide turnkey solutions on fault-tolerant hardware to the PICK marketplace. Commenting on the significance of the agreement, Michael K. Bateman, Tandem's vice president of third party marketing, stated, "This agreement opens up new vertical market opportunities for Tandem at the low end. "It is the first time our systems will be marketed through this type of distribution channel, and it is consistent with our strategy to provide full solutions within all segments of our market." Ever-On's products will be available during first calendar quarter 1986. The company is currently recruiting value-added resellers with PICK applications and expects to sign its first three during first calendar quarter 1986. The Ever-On agreement was signed under the sponsorship of the Tandem Alliance, Tandem's third-party marketing program. The primary goal of the Alliance program is to provide vertical applications solutions that run on NonStop systems. Ever-On is headquartered at 15531 Kuykendahl, Suite 330, Houston, Texas 77090. Phone is 713/537-8658. Tandem Computers Inc. manufactures and markets computer systems and networks for the on-line transaction processing marketplace. The company is headquartered at 19333 Vallco Parkway, Cupertino, Calif. 95014. Phone is 408/725-6000

Tandem, NonStop, NonStop EXT and EXPAND are trademarks of Tandem

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Computers Inc.

PICK is a trademark of PICK Systems.

HYPERchannel is a trademark of Network Systems Corp.

CONTACT: Tandem Computers, Cupertino

Gina Burr, 408/725-7455

or

Ever-On, Houston

Bob Jordan, 713/537-8658

THIS WEEK'S PRODUCTS

TANDEM ADD-ONS ENCRYPT PC DATA

A new family of peripherals from Tandem Computers is designed to provide data security to users of IBM personal computers and 3270 terminals that are connected to Tandem NonStop mini-computer systems.

The Safe-T-Net products are channel-attached units that provide data encryption, message authentication, and an on-line master key mechanism. They are said to increase control in securing access to sensitive information that is distributed across devices, files, and systems in a Tandem transaction-processing installation.

The initial offering in the line, available now for \$35,000 per system, provides general-purpose encryption via a file system interface. Future releases will

include management capabilities as well as encryption.

Tandem Computers Inc., Cupertino, Calif. 95014; (408) 725-7574

GRAPHICS CARD AIMS TO REPLACE IBM's EGA

Video-7, a supplier of personal computer graphics hardware, has come out with Vega, an enhanced graphics adapter that provides all of IBM EGA modes on a single short-slot card.

Vega, available now for \$599, offers 256K bytes of on-board memory and runs the IBM Enhanced Graphics Adapter, the IBM Color Graphics Adapter, the IBM Monochrome Adapter, and the Hercules Graphics Card.

It can run all leading PC productivity software packages, and features 12 graphics/text display modes, including high resolution for

16 colors composed from a palette of 64.

Video-7 Inc., Milpitas, Calif. 95035; (408) 943-0101

FUJITSU RELEASES DAISYWHEEL PRINTER

A daisywheel printer, the SP32OE, from Fujitsu America offers users a choice of 88-, 92-, 96-, and 192-character print wheels. It features a full extended character set, IBM PC graphics compatibility, and Diablo 630 extended character set command code compatibility.

Additional features include a print speed of 48 characters per second, proportional line spacing programmability, and a wide variety of word processing functions, such as underlining, bold printing, and justification.

A friction sheet-feeder is standard; other feeders are

available as options.

The printer is priced at \$1,495, with shipment scheduled to begin this month.

Fujitsu America Inc., San Jose, Calif. 95134; (408) 946-8777

DATA COMMUNICATIONS

GTE OFFERS UPDATED KEY PHONE SYSTEM

GTE is marketing an advanced key telephone system that can work as a programmable standalone system or behind a private automatic branch exchange or Centrex service.

The Jupiter system's base configuration can support eight to 32 users through five cartridge packages that plug in to the key service

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E. Drake Lundell, Jr.

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ADVERTISING SALES OFFICES

CORPORATE OFFICE

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600 Community Drive
Manhasset, N.Y. 11030
(516) 365-4600

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Karen M. Musmeci
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(617) 237-5588

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12/9/85 p6

Tandem In Deal With Developer Of Pick-Like OS

By Susan Kerr

CUPERTINO, CALIF. — Tandem Computers Inc. has signed a reseller contract with software developer Ever-On Corp., reportedly marking the industry's first Pick-like operating system implementation for a fault-tolerant computer system.

The agreement represents Tandem's first move away from its proprietary operating system strategy, thereby opening up its architecture to other operating environments in an effort to provide a broader range of software applications.

Houston-based Ever-On has developed software that will allow Pick code to run on top of Tandem's proprietary Guardian operating system. Under the terms of its pact with Tandem, Ever-On will market its software with Tandem's smallest computer—the NonStop EXT—to value-added resellers, which then will add specialized Pick-based applications.

The agreement opens up the low end of the computer market to Tandem, both companies said. Pick traditionally is used for general-purpose business applications running on systems ranging from the IBM Personal Computer/XT to IBM's 4300 processors, whereas Tandem has primarily targeted on-line transaction processing applications calling for high-end minicomputers and mainframes.

"We've been looking at how to address more aggressively the low end of the market," said Tandem sales and marketing director Ed Peverell. "We looked at how we could add tried and tested applica-

tions. In Pick we saw quite a lot of development. But what we didn't see was Pick on systems like Tandem's."

Peverell estimated that as a result of Ever-On's work, more than 2500 existing Pick-based software applications will be able to run on a fault-tolerant system for the first time.

Fault tolerance is not a superfluous feature for the smaller accounts that typically use Pick, said Tandem reseller marketing director George Purnell.

"The smaller manufacturer has just as much requirement for high availability as does the big one. If anything, many of these small businesses have a larger need just because they have all their applications and data running on one machine," said Purnell.

Manufacturing is one application in which Tandem systems with the Ever-On software could be used, said Ever-On chairman and chief executive Robert Jordan. "There are lots of Tandem systems on the shop floor, but when you get to the front office, they don't use them for shipping and receiving and accounting functions. We can bring Tandem into markets it hasn't been before."

Pick was developed by Irvine, Calif.-based Pick Systems Inc., but Ever-On is not a Pick licensee, Jordan said. "We're not utilizing any of his [developer Dick Pick] code, so we didn't talk to them about how to do this. Early on, we inquired what they [Pick Systems] thought about putting Pick on a Tandem, but they indicated that they thought it would be extremely difficult

and take lots of time."

According to Pick Systems sales and marketing vice-president Richard Lauer, the Ever-On product could lead to a source-code investigation by Pick. Pick Systems has already made it clear it intends to defend its source-code copyright. In two other cases involving Pick-like implementations sold by Prime Computer Inc. and VMark Computer Inc., Pick has investigated possible copyright infringements.

"We obviously have some concerns about that product," said Lauer. "Pending some additional investigation, we'll have a better idea where we stand."

Pick has also been interested in pursuing the development of a Pick version for fault-tolerant systems, Lauer said.

Both Tandem and Ever-On officials emphasized that the agreement did not result in an implementation of the Pick operating system but rather a system that allows Pick applications to run on Guardian.

"In every case I know of

[where Pick runs on top of a proprietary operating system], people have thrown away the operating system and put in Pick," Jordan said. "What we've done instead is write an application that resides as a guest of Guardian. We didn't compromise a single thing. All of Tandem's networking and other features are still there. But anyone with an application program running on a Pick system can now run it on a Tandem with no changes. Tandem is a multitasking box. We're running just as a task."

The Ever-On software supports the Pick BASIC programming languages as well as C, COBOL, FORTRAN 77, Tandem Extended BASIC, and TAL, Tandem Assembly Language.

Jordan said his company already has demonstrated the software and plans to deliver it in the first quarter of 1986. The company also has begun recruiting VARs, he added.

Previously, Jordan and his brother Randy developed applications software for facili-

ties management in government agencies, which they sold on Honeywell Inc./Ultimate Corp. systems. They have also developed software for Microdata Inc. systems.

"We began exploring the marketplace about 18 months ago. We determined the need for fault-tolerant boxes because we had to put in hot-standbys. So, we decided if we had a need for fault tolerance, other people must be in the same boat," Jordan said.

Tandem, which is well known for its strictly proprietary operating system and hardware, has also considered implementing other operating systems, including Unix, Peverell said.

"We've always been evaluating Unix. I can't really say what we are or aren't going to do," he said. "But when Unix becomes generally accepted, then Tandem may take a hard look at it."

Purnell added that in Tandem's view, Unix "clearly does not have [as much] application code available as Pick does."

Pick, VMark Still In Negotiations

(Continued from Page 1)

Parsons. But ironically, Pick officials have since threatened to hit VMark with a lawsuit alleging that VMark has infringed on its operating system source code.

By failing either to identify particular areas of infringement or to publicly exonerate VMark from wrongdoing, Pick has violated a preliminary pact that the two companies signed in September, Parsons said. That agreement detailed the manner in which the Pick-initiated copyright investigation could proceed.

Parsons said the dispute could dampen VMark's efforts to begin selling AT&T-IS 3B computers equipped with VMark's non-

statement to the effect that no infringement was found.

Pick so far has not taken either course, Parsons said.

Pick Systems sales and marketing vice-president Richard Lauer would not comment on such an agreement last week, saying, "To be honest, we are at a very delicate stage with VMark right now. Anything is possible right now, but we're in a position where we can't comment."

Parsons said VMark received its first contact from Pick Systems on Aug. 26 in a letter advising that there might be some potential copyright infringement of Pick's operating system source code. Subsequent letters were followed by Mitchell's visit on Sept. 25 to set up the

December 3, 1985

RESEARCH NOTES

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TANDEM COMPUTERS INCORPORATED

Current Price	52-Week Range	Ticker Symbol	Fiscal Year	Earnings PerShare			Calendar P/E	
				F1984	F1985	F1986E	1985E	1986E
\$19-3/8	\$29-13	TNDM	Sept	\$0.80	\$0.82	\$1.05	29.8x	16.1x

Tandem's surprisingly strong fourth quarter results were suggested several weeks prior to being reported when the Company announced that revenues for the quarter would set an all-time high record. Operating results improved significantly compared with the two sequentially prior quarters. The Company's 63% gross margin was the highest in several years. Operating expenses showed only small (dollar) growth from the third quarter due to several expense control programs begun over the summer and still in place. Asset management also showed strong results during the quarter with an increase in the cash-equivalent position to a record level of \$129 million, and improvements in lowered inventory months of sales and accounts receivables days outstanding.

During October, the Company effected a major reorganization of the marketing and sales departments in an effort to improve direct sales efficiency, increase third-party sales leverage, and maintain the current high level of customer satisfaction while improving operating margins in the service organization. We expect the marketing reorganization to have a significant long-term positive impact, although expense levels near term will not be reduced as headcounts were not reduced. The field sales management structure was streamlined, freeing up former first-level managers to resume full time selling — effectively increasing the field's revenue potential without additional hiring. Responsibility for the service organization, now separated from sales, falls to Vice President Schmidt, who over the past two years has improved gross margins by over four percentage points, while simultaneously effecting a significant reduction in inventory days of sales.

Tandem's third-party marketing program was also strengthened and responsibility shifted to the Company's first vice president of third-party marketing. In addition to three existing categories of participants in the Tandem Alliance (software houses marketing their own products direct to Tandem users, OEMs, and systems integrators), the Company announced that it will now also directly sell to its customers software developed by third parties. During the fourth quarter, Tandem signed up an additional 22 third parties, bringing the fiscal year-end total in the Alliance program to 132 companies.

Several new peripherals and software products were introduced over the past few months. The SAFE system security product family includes an access control and auditing software program (SAFEGUARD) and the SAFE-T-NET data encryption subsystem. Complementing the fast access V8 disk subsystem introduced in January 1985 are the recently introduced cost-effective, high-capacity XL8 disk subsystem and companion high-performance tape subsystem. Also introduced were several new Tandem terminals.

On November 20, the Company held the first in what it described as annual analysts' meetings. The financial review stressed the multiyear trends in improved gross margins and inventories, the result of management emphasis on improved efficiency in operations. The marketing presentations focused on Tandem's shift from selling stand-alone transaction processing systems to integrated, networked distributed database systems and the Tandem Alliance program. Modular growth of Tandem systems was discussed as a key attribute of the Company's architecture (in addition to fault tolerance). While there was no formal discussion of specific future new products, we gained considerable insight into Tandem's future product strategy during a private tour of the Company's R&D laboratories with some top executives the day before the analysts' meeting. It appears that Tandem's considerable investments

since 1980 in VLSI CAE, CAD, and prototype fabrication facilities will begin to bear fruit in 1986 with the beginning of a major new product cycle.*

Tandem began the development of its own VLSI design tools (primarily for gate arrays) in 1980, followed by a \$5.5 million investment in 1982-84 in the construction of a 7,000 square foot semiconductor fabrication facility for the final processing (metallization) of lab prototype gate arrays. (Tandem figures such internal wafer processing saves approximately ten weeks in each silicon fabrication cycle as compared with commercial vendor turnaround, yielding potential a six-month shortening of the overall system development cycle.) The first Tandem VLSI designs were single gate arrays for peripheral controllers, followed by the recent introductions of multichip designs for the Company's tape and disk controllers. A new communications subsystem currently in test uses several gate arrays to reduce the ten printed circuit boards in the current controller to a single board. In the labs we saw Alpha test systems of the first Tandem VLSI computer system — the first system in an anticipated two- to three-year rollover of the entire Tandem product line to VLSI.

Tandem's new system products are expected to be unveiled in two levels over the next few years — new processor (CPU) designs and new packaging. We believe the Company is currently working on four new processors:

1. "Check" — Tandem's first ECL design offering performance above the current top-end TXP and anticipated in the first calendar quarter of 1986. (While not publicized, it should be noted that the recently introduced high-end Data General MV20000 system is based on the same 2,800-gate Motorola ECL gate arrays used in Check. Tandem management noted that the gate array packaging was jointly developed with Motorola and that Data General is a licensee for the design.)
2. A CMOS gate array entry-level system processor for a system to be priced under \$100,000. We anticipate such a system in early fiscal 1987.
3. A very high-performance ECL processor (exceeding Check's performance), approximately 18-24 months in the future.
4. A (potentially) OEMed hardware system for sale into low-cost computer integrated manufacturing (CIM) applications.

In contrast to the Company's historical emphasis on computer room (i.e., raised floor, special air conditioning) environments, future system packaging designs will span a variety of environments. New designs in progress include:

1. The "Check" package (nicknamed "Darth Vader") designed for the computer room, anticipated in early 1986.
2. A new smaller copy room (NonStop EXT) package incorporating compact tape and disk units, anticipated in mid-1986.
3. An office environment package (for use in conjunction with the CMOS CPU design) which is anticipated to open new market opportunities in early fiscal 1987.

* While most observers, ourselves included, have wondered when and how Tandem's significant VLSI investments would begin to pay off, we find it interesting to compare and contrast the VLSI strategies for systems design at Hewlett-Packard and Tandem. Hewlett-Packard developed proprietary CAE/CAD tools in Fort Collins, Colorado, for the design of the Company's high-performance (4-6 MIPS) Spectrum reduced instrumentation set computer (RISC) custom NMOS III processor. We understand that the NMOS Spectrum project is significantly behind schedule because, after the design engineers had been using the CAE/CAD tools, it was discovered that the tools needed significant additional development. Tandem, in contrast, took a "crawl, walk, run" approach and moved from single to multiple-chip peripheral controller designs to verify its design tools and methodology before tackling a major system design.

Management reports that revenue growth was depressed in fiscal 1985 due to: (1) the industry downturn, especially reduced computer purchases in the banking market (a leading Tandem market segment), and (2) increased competition from Stratus and IBM. While the outlook for near-term revenue growth is cloudy, we are projecting revenue growth in fiscal 1986 comparable to that in fiscal 1985, 17% year-to-year growth, based upon the anticipated strength of the new products (including upgrade sales of Check to the installed base). We believe there is upside potential above our revenue projection if the new products (especially Check) and marketing reorganization are especially effective in the second half of fiscal 1986. We have assumed continued constraint in expense growth in fiscal 1986; a return to rapid operating expense growth would reduce our EPS projections unless accompanied by rapid revenue growth. Our earnings model projects fiscal 1986 revenues in a range of \$700-760 million with corresponding EPS of \$0.90-1.15. We believe that Tandem has excellent opportunities in 1986 to make progress in moving toward higher revenue growth rates and increased profitability, especially with the beginning of a major new product cycle. With the stock selling at 16 times our calendar 1986 earnings estimate, we recommend that aggressive technology investors add to their positions in Tandem stock.

September FY	F1985	Fiscal 1986E				
		Q1E	Q2E	Q3E	Q4E	Year
Revenues (MM)	\$624.14	\$165.00	\$173.00	\$190.00	\$202.00	\$730.00
Operating Income (MM)	50.08	10.95	14.49	21.20	24.26	70.90
Operating Margin	8.02%	6.64%	8.38%	11.16%	12.01%	9.71%
Pretax Income (MM)	\$56.35	\$12.45	\$15.99	\$22.70	\$25.76	\$76.90
Pretax Margin	9.03%	7.55%	9.24%	11.95%	12.75%	10.53%
Tax Rate	39.00%	42.00%	42.00%	42.00%	42.00%	42.00%
Net Income (MM)	\$34.37	\$7.22	\$9.27	\$13.17	\$14.94	\$44.60
Earnings Per Share	\$0.82	\$0.17	\$0.22	\$0.31	\$0.35	\$1.05
vs. F 1985	...	0.34	0.16	0.06	0.27	0.82

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SECTION: SYSTEMS AND EQUIPMENT; Pg. 86

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HEADLINE: Tandem Offers Three Ergonomic Terminals

BODY:

Tandem Computers Inc. offers three ergonomic terminals that take up less counter space and meet European ergonomic requirements. New models are the 6535 with a 15" diagonal screen; the 6536 with a 12" diagonal screen and the 6537 with a 9" diagonal screen.

The typewriter-style keyboard is lighter and smaller than the keyboard on existing 653X models. It also has a simplified cursor key layout in relation to the alpha and numeric keypads. The keyboard maintains the 16 program function keys and two-position tilt adjustment common to the 6530 keyboard.