Tandem Goes All Out To Diversify Its Image

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Now everybody takes Tandem fault tolerance for granted. "We haven't had to pull a board out of a system during a demonstration in five years," McEvoy reports. The problem is, Tandem may not have moved quickly enough to prevent its image from hardening. McEvoy, for one, thinks the fault-tolerant theme could have been downplayed sooner. "Customers recognize we offer more than fault tolerance," he notes, but the unconverted cling to the old mindset: "It takes a long time to change the image."

Treybig is trying, however. He feels he has to in order to avoid being lumped together with competitors who really don't offer much more than fault tolerance. "IBM will try to put us in that box," he predicts. "We never wanted to be there, and we're not there now."

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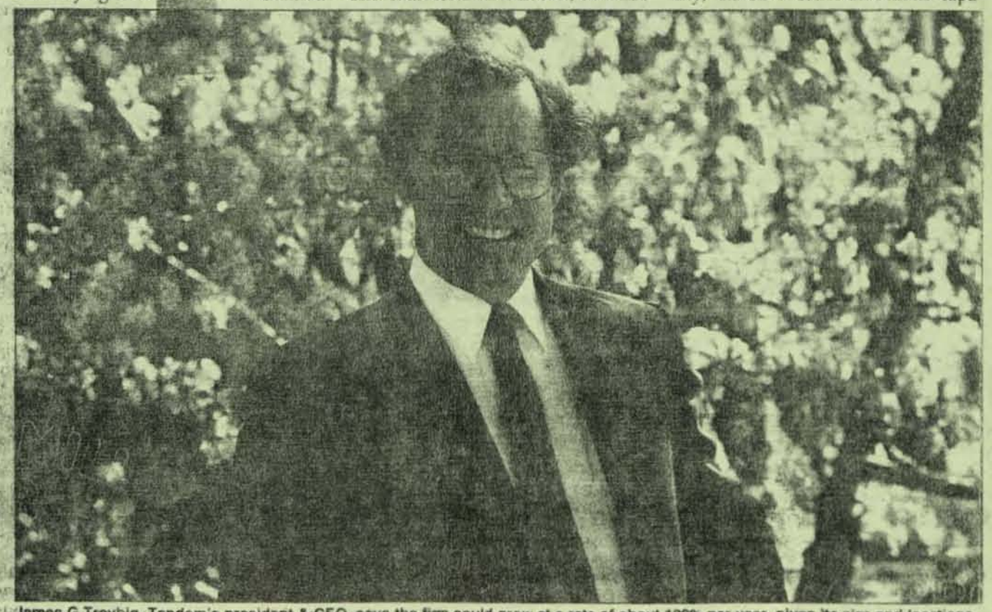

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They say other companies may achieve hardware fault tolerance using newer technologies—and they may even achieve some form of software fault tolerance—but they aren't likely to offer all of Tandem's other features any time soon.

In particular, McEvoy sees on-line transaction processing requirements shifting from what he calls application-driven to market-driven. An outsider might think the change is from standalone applications to network applications. But by whatever name they are called, Tandem began by serving needs in which applications were automated one at a time and ran pretty much by themselves.

That is what users wanted, and it's where they spend most of their money today. Soon, though, users are going to demand integrated applications, distributed data bases, and transparent communications. Tandem already has all of these features.

"Networking and distributed data bases give us an edge in the new market-driven segments equal to the edge fault tolerance gave us in the application-driven segment," says McEvoy. He sees most of his competition still working to beat Tandem in standalone applications, which it has no intention of abandoning. The integrated applications are for the most part uncontested.

Clearly, Tandem dominates some application areas, particularly within banking. While IBM machines perform most bank accounting and check sorting, Tandem handles a wide range of ancillary activities. It supplies more than half the nation's computers running automated teller machines that transfer electronic funds between banks or attach to the Federal Reserve Bank's Fed Wire. Tandem also supplies editing systems to a number of large newspapers. McEvoy hopes for the same kind of showing in the new market-driven applications he sees dominating future user expenditures.

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He distinguishes between the firm's conceptual architecture and the CPU hardware used to implement it, and claims both are doing fine. He further reports that Tandem's concepts are sturdy, and its technical progress has been sufficient to maintain customer satisfaction. Maybe the company doesn't offer the fastest underlying processors in the market, Treybig says, but raw processor speed is generally irrelevant to users and particularly irrelevant to Tandem users.

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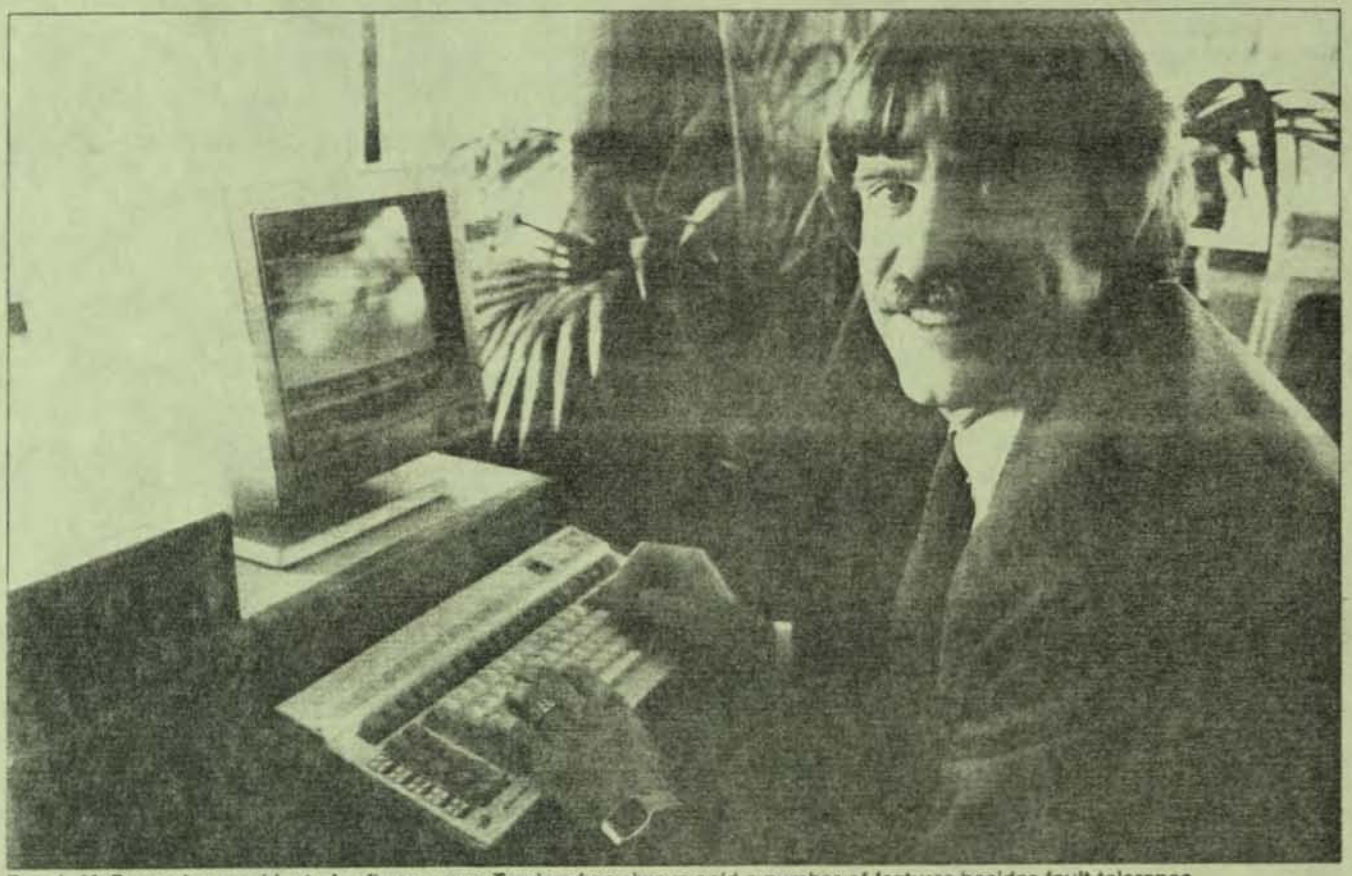
There is evidence to back up Treybig. Tandem ranked first in an independent survey of users' satisfaction with their minicomputers during the last six years. In addition, the company ranks first among minicomputer vendors whose equipment is used for remote networking applications. And it ranks last among major vendors when users are asked whether they plan to switch suppliers.

If Tandem equipment is so wonderful, and users love it, and the company signs up 40 new accounts each quarter, why has annual revenue growth plummeted? The company's revenue increased 17% from 1984 to 1985, which looks good compared with a lot of other companies this year. But it pales in comparison to the 100% annual growth of Tandem's early years, or even the 35% or more recent years. It would appear that the company is losing momentum.

There are many possible reasons for Tandem's slower growth. A common explanation is that the firm is simply getting too big to maintain its earlier pace. But Treybig won't hide behind that excuse. "A company our size, given the locations we have, could grow 100% per year. I have never attributed the reduction in our rate of growth to size. If we aren't growing fast, it's either because of economic factors or because of Tandem's errors." Treybig thinks the problem is the economy. It is probably a little of both.

Although Tandem's growth rate is slumping, the overall demand for on-line transaction processing is not. Increasing intelligence in terminals and remote devices means an ever-greater



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volume of transactions that need to be processed. In addition, deregulation and increasing competition, which greatly affect financial institutions—Tandem's core users——also tend to increase transaction processing demand. On top of that, there are the new applications, including electronic mail and computer-integrated manufacturing, which are just getting underway. In short, the number of transactions is booming. Tandem could continue its historic, torrid growth rate if it just held its share. But it is losing market share.

At least part of that drop stems from competition, although not the competition most people are aware of. Tandem's competitors are not primarily the new wave of companies selling fault tolerance that cropped up about five years ago. Those companies, except for Stratus Computer Inc., are not significant factors. Tandem also does not compete mainly with minicomputer companies such as Hewlett-Packard Co. and Digital Equipment Corp. Actually, Tandem's biggest competitor is very big indeed. According to Treybig, Tandem runs into IBM as a main competitor on more than two-thirds of the business it bids for.

The confusion about who Tandem's competitors are arises because it competes with different companies for different kinds of business. "No one would say we compete with Digital or HP for automated teller machine business," Treybig points out. In that arena, IBM is virtually Tandem's sole competition. In computer-integrated manufacturing, Tandem runs into HP. When it comes to telephone company 800-service support, Digital is most often the competitor.

For the most part, though, competitors offer "conventional computers with fault tolerance strapped on," McEvoy says. They compete with Tandem in its traditional, stand-alone, application-driven marketplace. Since that is where today's sales are, they are winning some business. But McEvoy believes that the competition is woefully unequipped to compete in the new, integrated, market-driven era to come. He thinks that, during the next few years, Tandem's other strengths will enable it to dominate the new uses for on-line transaction processing in the same way it dominates the existing ones.

The question about Tandem, then, is not whether the company can survive. It is whether Tandem will continue to be in the front rank of on-line transaction processing companies or will slide back to the second tier. If that happens, if Tandem loses its position as the de facto standard, customers could find themselves in a software backwater similar to that in which users of non-IBM mainframes find themselves.

Companies that compete directly with IBM, like Tandem, have been pondering their own mortality this year, after Storage Technology Corp. filed for Chapter 11 bankruptcy protection. These firms realize that they must make fruitful research-and-development investments, and they must respond quickly to customer demand. Storage Tech didn't. Some people wonder if Tandem can. It will have to change fast enough to compete with both its small, nimble competitors and its gigantic ones.

Treybig is, of course, optimistic. "The competition isn't going to blow us away. Not even IBM. Not as long as we do the best job on customer support and happiness. If we lose, it will be because they do a better job than we do."—*Paul E. Schindler Jr.*

Tandem Business
Information Center

Computer Industry Review & Forecast 1981-1990

Computer Industry Report

file OLTP

TABLE 11

CRITICALITY OF SYSTEM CHARACTERISTICS TO SUPERMINI USERS
(1 = MOST CRITICAL; 5 = NOT IMPORTANT)

	% Use Now	% of Respondents for Characteristic 1	2	3	4	5	Weighted Rank*
Online Transaction Proc.	45.7	64.6	22.6	4.5	4.1	4.1	1.60
DBMS	47.2	59.3	19.0	12.5	3.8	5.3	1.77
Multiprocessing	29.6	56.2	20.5	13.0	2.2	8.1	1.85
Real-Time Operating System	22.1	50.0	20.7	14.0	2.0	13.3	2.08
Batch Processing	57.9	40.2	26.4	19.9	8.4	5.1	2.12
Floating Point Performance	26.0	39.6	22.5	17.2	8.3	12.4	2.31
4th Generation Language	27.4	36.0	22.8	20.8	8.6	11.7	2.37
PC/Supermini Links	36.4	27.5	26.6	28.3	10.3	7.3	2.43
Graphics Software	31.7	20.9	25.7	30.1	10.7	12.6	2.68
Integrated Office Software	17.4	24.3	20.7	27.1	9.3	18.6	2.77
Hardcopy Graphics	23.4	19.5	25.3	26.0	13.6	15.6	2.81
Electronic Mail	31.5	13.9	25.4	32.5	12.0	16.3	2.91
Ethernet Support	8.9	22.6	22.6	17.4	8.7	28.7	2.98
Dist. Databases	7.0	18.1	20.2	24.5	11.7	22.5	3.06
Fault Tolerance	4.5	20.0	21.2	16.5	10.6	31.8	3.13
LAN Links	16.6	25.5	15.4	5.9	9.0	44.1	3.31
SQL Database Interfaces	2.8	7.4	12.3	17.3	45.7	17.3	3.53
IBM SNA Support	3.2	8.2	16.5	15.3	2.4	57.6	3.53
Array/Vector Proc.	3.4	9.7	13.9	19.4	5.6	51.4	3.75
Optical Storage	.9	4.3	20.0	15.7	11.4	48.6	3.80
Unix Support	5.7	11.0	6.6	18.7	11.0	52.7	3.88
Expert Systems	1.3	7.4	5.9	19.1	16.2	51.5	3.99
IBM Disoss Support	.4	1.4	9.9	5.6	12.7	70.4	4.41

*The weighted rating is calculated by multiplying each response by the rating number, then dividing the sum by the number of responses for each line item.

TANDEM, FUTURE

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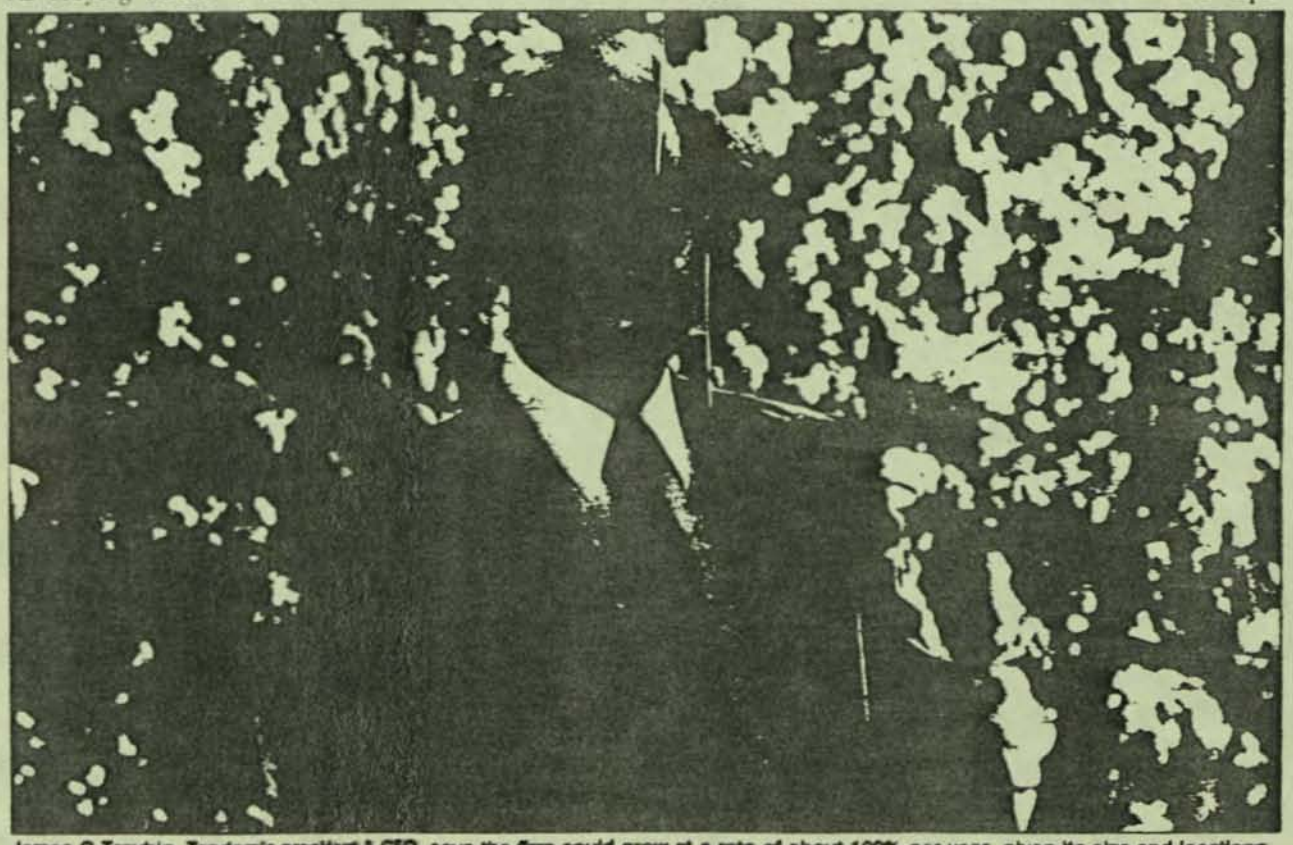

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Dataquest
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RESEARCH NEWSLETTER

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ON-LINE TRANSACTION PROCESSING
WHY IS THIS MARKET GROWING?

INTRODUCTION

While the business computer system slump that began in 1985 has affected most of the big players, a few companies have managed to more than hold their own. Companies such as Tandem and Stratus have experienced excellent revenue and earnings growth over the past two years due to specialized product offerings designed to fulfill the needs of on-line transaction processing (OLTP) users. What is OLTP? How big is the market? Why has this market experienced such vigorous growth? This newsletter will provide some of the answers.

Definitions

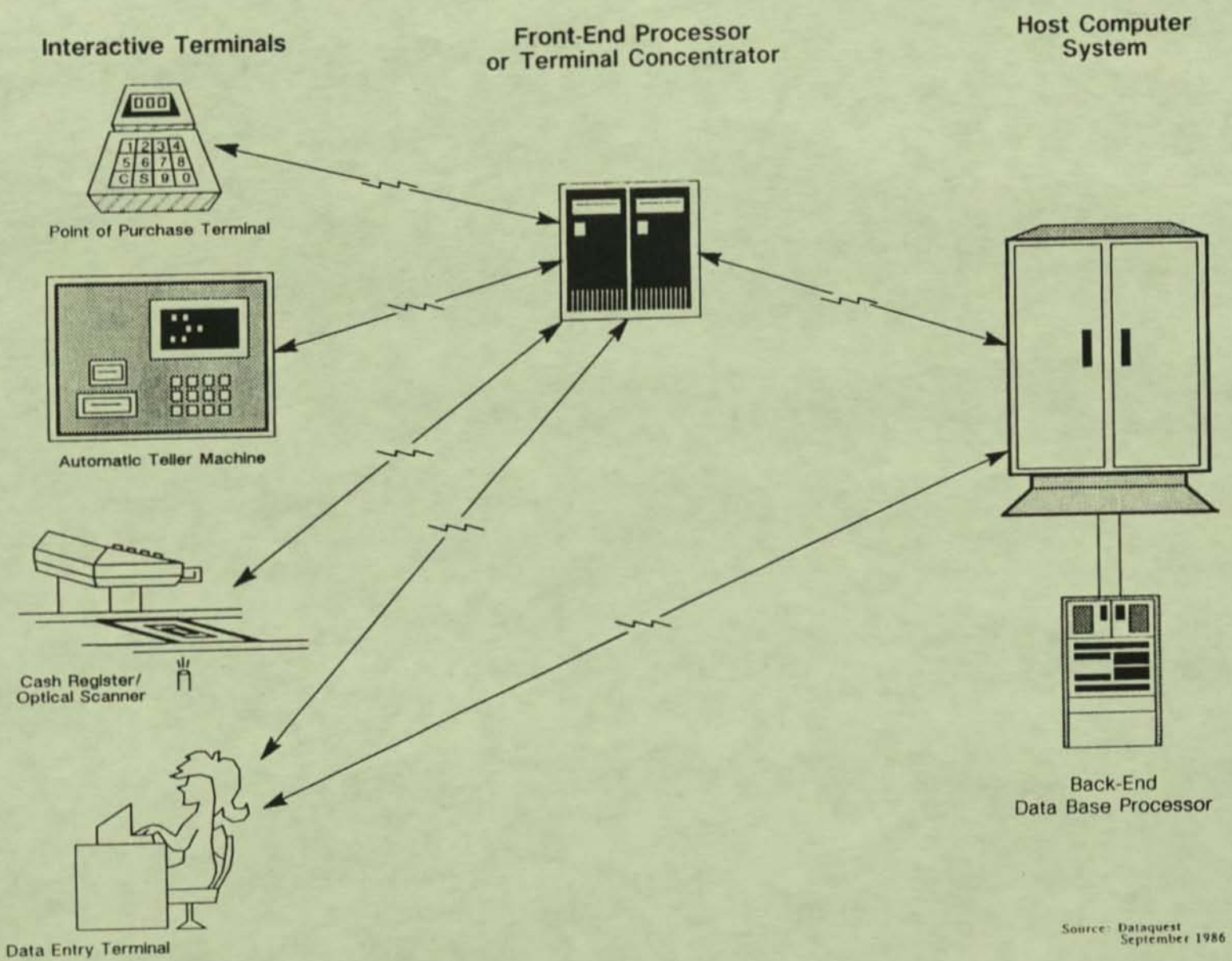
The following definitions are provided to avoid any confusion over terms used in this newsletter. (Some readers may already be familiar with the terminology and wish to skip this section.)

With on-line transaction processing, the state of a company's business is changed by updating, in real time (as the transaction occurs), a computer data base that describes some part of the business. The process also allows a customer or employee to make a decision that can change the state of the business as a result of consulting (querying) the data base. A transaction of this type has a distinct beginning and end, and occurs between an interactive terminal and a host processor (or processors) that manipulates the data base.

Figure 1 illustrates a typical OLTP configuration. Notice the front-end and back-end processors. The front-end processor (or terminal concentrator) acts as an intermediate processor that can check for input errors, and in general, can off-load many functions from the host. It is usually located some distance away from the host and is connected via telecommunications equipment. The back-end processor is located in the computer room with the host, and is either channel attached, connected via a bus, or can be integrated into the host. The back-end processor also off-loads functions from the host. In Figure 1, the back-end data base processor off-loads the data base-specific functions from the host.

Figure 1

OLTP CONFIGURATION



Source: Dataquest
September 1986

To be considered for an OLTP application, a system must either have high availability or be fault tolerant. Dataquest defines a high-availability system as one that can statistically be expected to be down less than four hours per year. This number is reached by multiplying the number of failures expected each year, using the mean time between failure (MTBF) of the system, by the average downtime per failure. Both the MTBF and average downtime per failure are initially provided by the vendor. When the systems are installed in user accounts, third-party companies such as Reliability Plus provide independent MTBF and average downtime figures.

Fault tolerance refers to a system's ability to continue to process any application being run, even in the event of a system failure. Particular architectures used to achieve fault tolerance are referred to later in this newsletter. Fault-tolerant systems theoretically have an infinite MTBF, and therefore are expected never to be down.

HISTORY OF OLTP

In the 1950s and 1960s, computers were predominantly used to process batch applications. Data were collected during the day, and the data base was updated at night all at one time. As sophistication in multi-processing and teleprocessing grew, data bases were updated dynamically and OLTP emerged. Not only was the cost per transaction high in a hardware sense, but many man-years of programming were needed to implement applications. Programmer tools were crude, and system software was not able to off-load functions such as terminal polling and data transfer across networks. As a result, OLTP was not popular until the '70s, with the advent of business minicomputers that offered easy implementation of on-line applications. However, the cost per transaction was still a limiting factor in the growth of OLTP. The use of Automated Teller Machines (ATMs), which replaced costly human tellers, and electronic securities trading, which brought handsome commissions, could be justified at the high cost per transaction in the mid-70s. Since then, many technologies have evolved to reduce costs, and hence, more applications have become justifiable.

Typical Applications

ATM and electronic securities trading are only two OLTP applications. Many new applications have emerged in addition to these. OLTP applications are broken down into industry segments. Typical applications are presented below.

Banking and Finance

- Automated teller machines
  - The terminal is the ATM and the user's bank account record is updated in the data base that resides on the host system.

- Bank branch office support

  - The teller's terminal performs a transaction with the front-end processor (terminal concentrator), which completes the transaction (bank account update, credit authorization) with the host.

- Electronic funds transfer

  - These transactions can occur between terminals located anywhere from across the street to halfway around the world.

Retail

- Point-of-sale support

  - Almost all supermarket chains now use laser checkout stations, which read the universal product code (UPC) printed on most products. As a result, store managers can more efficiently manage their inventory by having an up-to-the-minute inventory count in the store's data base.

- Credit authorization

  - Credit card and checking account balances can be queried within seconds to ensure credit and to keep lines at the checkout counter to a minimum. The terminal is the machine that reads the magnetic strip on the credit or debit card.

Telecommunications

- Directory assistance

  - When a customer calls 411, the operator consults the telephone data base and a computer with voice synthesis capabilities completes the transaction by reading back the number.

- Videotex

  - As the cost per transaction comes down, home banking and retail shopping from the home will become more popular, with customers using home computers or terminals over their telephone lines.

Manufacturing

- Material resource planning (MRP)

  - "Just-in-time" inventory management is made possible with OLTP.

- Manufacturing shop floor control

  - Tools and supplies can be replaced just before the end of their expected lives.

Government, Education, and Medical

- Requests for proposals
  - Large data bases must be updated constantly and kept up to date to effectively manage huge defense contracts.
- 911 services
  - Current, constantly updated records of available police cars and ambulances can be critical to saving lives.
- Hospital services
  - Organs available for transplant can now be tracked using an OLTP system. Also, inventory systems and patient monitoring systems involve OLTP.

Other

- Airline reservation systems
  - Airlines can gain a competitive advantage by implementing faster and more comprehensive reservation systems.
- Library management
  - Terminals are quickly replacing card-based systems. Legal firms rely on vast libraries of cases to locate precedents.

USER BUYING CRITERIA

End-user buying criteria must be considered when designing features into an OLTP system. The buyer of an OLTP system is interested in many of the same benefits that buyers of any computer system would be interested in (e.g. cost, performance); however, because the system is used in a real-time mode, availability becomes a key buying criterion. Also, because OLTP involves updating a shared data base that must be accurate at all times, data integrity is a key need. Availability is broken down into several elements:

- Reliability
  - MTBF is one measure of reliability. A fault-tolerant system theoretically has an infinite MTBF. However, software failures, power failures, and multiple system component failures can still bring down fault-tolerant systems. High-availability systems have a small but definable expected downtime per year.

- Vendor system support

  - Field engineering response time must be considered. Also, the vendor's long-term viability is very important. The vendor must not only be able to support the system now, but several years into the future as well.

- On-line expandability

  - Once the system is implemented, it usually is needed 24 hours per day, 7 days per week. The system should be expandable without bringing it down.

- Applications availability

  - Systems can be implemented quickly if applications are available from third-party vendors or can be easily and quickly designed using vendor-supplied design tools.

- Stable architecture

  - As follow-on price/performance improvements are made to a vendor's product line, architectural changes often necessitate application program rewrites or recompilations. These changes are disruptive and can cause downtime. An unchanging, stable architecture for the applications software will relieve this problem.

- Product availability

  - Customers want a product that is available NOW--not one that will be available in six months or a year.

Data integrity plays an extremely important role in OLTP. If the data in the data base are incorrect, the OLTP system is worse than useless. UNIX has been panned for its poor file integrity; however in recent years, the UNIX vendors have drastically improved file structures to bring UNIX to an acceptable integrity level.

Price/performance is always a factor in choosing a system of any kind. Computer system performance has traditionally been measured in terms of internal processing speed (millions of instructions per second or MIPS). In OLTP, two other measures are commonly used:

- Transactions per second (TPS)

  - Because OLTP involves updating data bases that reside on peripheral devices such as disk drives, transaction throughput becomes more important than internal processing speed. The TP1 or debit/credit benchmark is becoming a standard that is used to measure transaction throughput (TPS). This benchmark uses a simple transaction that is similar to an ATM transaction.

- Response time

  - Response time is measured from the time a transaction is entered (when the Enter key is pressed) to the time the host responds to the transaction (the screen is filled with needed data). Obviously, the faster the response time, the more expensive the system. Several studies have shown that subsecond response time improves worker productivity dramatically. Also, customers can be lost if response time spent is too slow (e.g., long periods of time on hold waiting for an airline reservation can cause the customer to call another airline).

System Costs

Calculating the cost of the system is more complicated than simply adding up the cost of the hardware and software. Many other hidden costs must be considered, such as:

- Personnel costs

  - Is a systems programmer (or several) needed or can a key operator be used? Is an operator needed at all?

- Training

  - Are the applications difficult to use, and therefore is it expensive to train people to use them? Also, programmers may have to be trained if the operating system is proprietary and there is no existing in-house expertise on the system. Is training available from the vendor?

- Environmental considerations

  - Must the host be kept in the controlled environment of a computer room or can it be installed in the same area as the operators?

- Telecommunications

  - Almost all OLTP systems use terminals that are remote to the host system. Are the telecommunications capabilities of the vendor's offerings able to connect to a network effectively and at a reasonable cost?

- Multivendor considerations

  - Can a new OLTP application be implemented using some parts of the previously installed system (e.g., can a new vendor's front-end processor be integrated with the current host system's hardware and software)?

In general, cost is always a factor, and the buyer must weigh the cost against all other factors (e.g., availability, data integrity, and performance). Are a few hours of expected downtime per year acceptable if the cost is appreciably lower? Can the extra cost incurred by achieving subsecond response time be justified? With the varying customer needs to be satisfied, vendors have chosen varied system architectures to fulfill those needs.

OLTP SYSTEM ARCHITECTURES

Although a myriad of system architectures have been devised to penetrate the OLTP market, most vendors have adopted one or a mixture of the architectures discussed below.

Monolithic Mainframes

Most large OLTP systems use host mainframes upon which their data bases are kept. IBM's IMS and CICS data bases running on 308X, 3090, or plug-compatible mainframes account for more than half of the OLTP revenue dollar. The Bunch companies also have a large installed base of host processors used in OLTP applications. These applications are firmly entrenched due to the huge investment in applications software, networks, and training. Most of the other OLTP vendors have targeted companies' new applications or specific subsystems within an OLTP system (e.g., front- or back-end processors) with their offerings.

Minicomputers with Systems-level Fault Tolerance

Minicomputers often serve as host processors for smaller OLTP systems. Last April, NCR announced fault tolerance as a feature of its new 9800 system. By mirroring applications across multiple minis and multiple disk drives, the aim of fault tolerance is achieved: if any system component goes down, the end-user application continues to run. The system uses a common bus, with processors that can be programmed to back each other up and/or process separate application streams. Changes have been made to the VRX operating system to incorporate the fault tolerance. Dataquest expects Digital Equipment, Data General, and Wang to have similar offerings via common bus or clustering techniques as soon as changes to their operating systems can be made.

Hardware-only Fault Tolerance

Fault tolerance is most important at the front-end processor. If the eventual host goes down, data can still be collected and forwarded when the host is brought up. Firms such as Stratus offer a hardware-only fault-tolerant product that doubles up the processors, controllers, buses, etc., and uses a comparator to ensure that both sets of hardware come up with the same answer. IBM, which OEMs the Stratus product, has added extensive SNA capabilities so that it will integrate well with its

host systems. Tandem uses a combination of both systems-level fault tolerance and hardware duplication fault tolerance, as do Concurrent with its Resilient series and Computer Consoles with its POWER 6/32 FT system. Burroughs and Honeywell are also beginning to provide products with fault tolerance.

UNIX-based Systems

Many start-up companies, such as Arete and Tolerant, offer UNIX-based systems. By offering UNIX, these companies can concentrate their R&D dollars on the hardware and specific segments of the operating system (e.g., file management) rather than on the entire operating system, data base, data communications, and languages. A UNIX-based system is like a double-edged sword. Cost of entry is lower, and more applications are available each year to run under UNIX. UNIX is practically a nonproprietary system, so if a user decides to convert to it, he will not be tied to one vendor, but rather to any UNIX vendor. However, in the long run, the UNIX hardware market becomes a commodity market with margins growing very thin. Dataquest believes that the real winners in the UNIX world will realize better margins through excellent services and support. The quality of a vendor's applications development tools will be paramount to success.

Back-end Data Base Processors

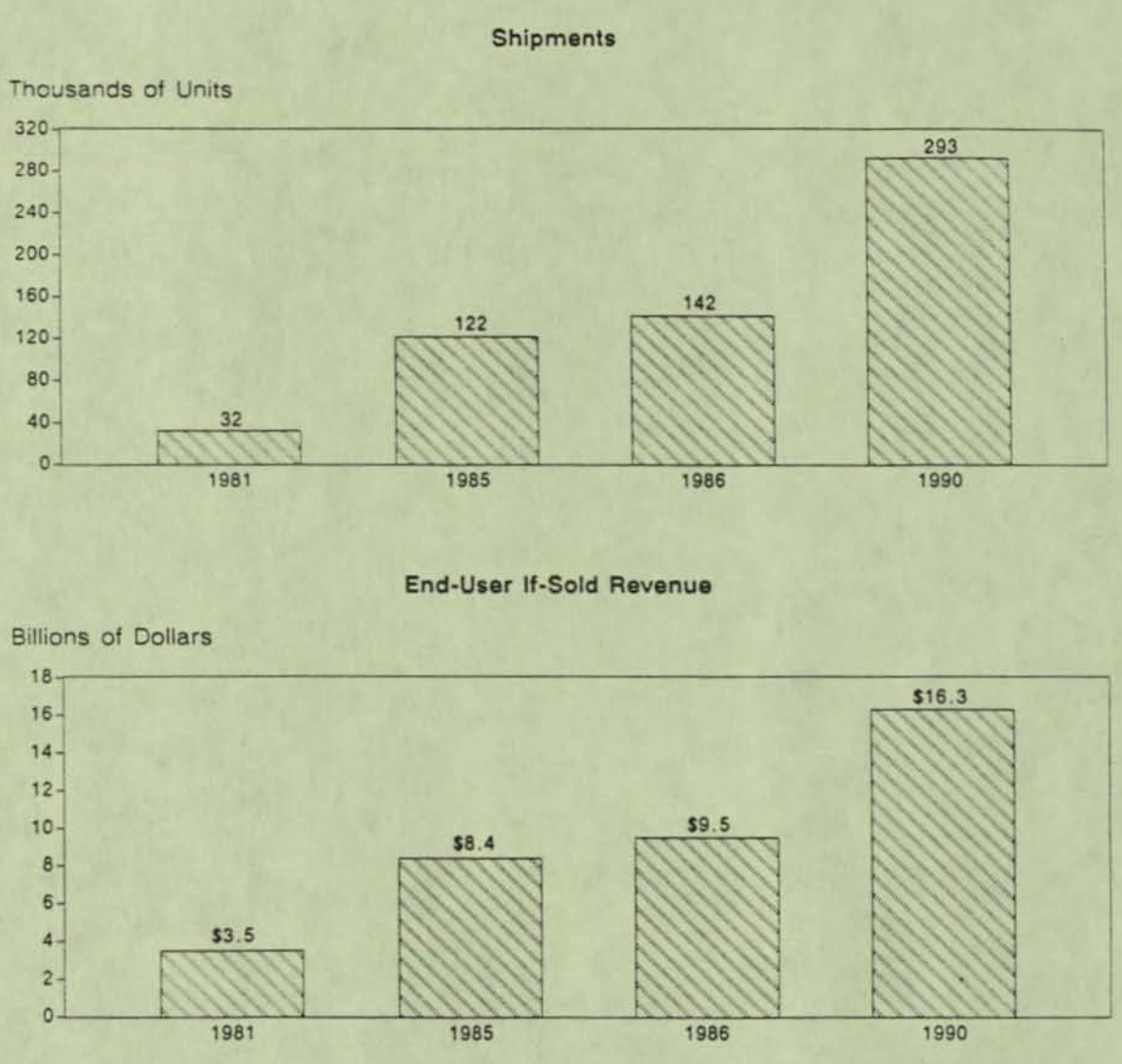
A relational data base structure offers an excellent by-product when implemented for OLTP. Once the data base is built, decision support capabilities are available to further enhance the company's business. Queries of the data base can be made by managers who do not have programming expertise. The drawback of relational data bases is that they are notoriously slow and demand great resources such as processor power and memory. Britton Lee and Terradata offer back-end relational data base processors with specialized hardware and software that off-load the data base management systems (DBMSs) from the host processors. The results are efficient, relational DBMSs with high transaction rates and the ability to process queries without requiring programmer expertise. Dataquest expects IBM and possibly Amdahl to offer back-end data base processors designed to add great efficiency to IBM's DB2 relational data base. In the near future, we also expect Digital to announce a back-end data base processor, which will put pressure on IBM to announce its offering.

OLTP MARKET SIZE

Since 1981, when OLTP accounted for less than one-third of new business computer system sales, the OLTP market has grown in size and importance to more than $17 billion in worldwide revenue in 1985. As the effective cost per transaction continues to shrink, Dataquest predicts that this market will grow to more than 70 percent of new business computer system sales (not necessarily unit placements) or $35 billion in 1990. See Figures 2 and 3 and Tables 1 and 2 for Dataquest's forecast of the U.S. and worldwide markets.

Figure 2

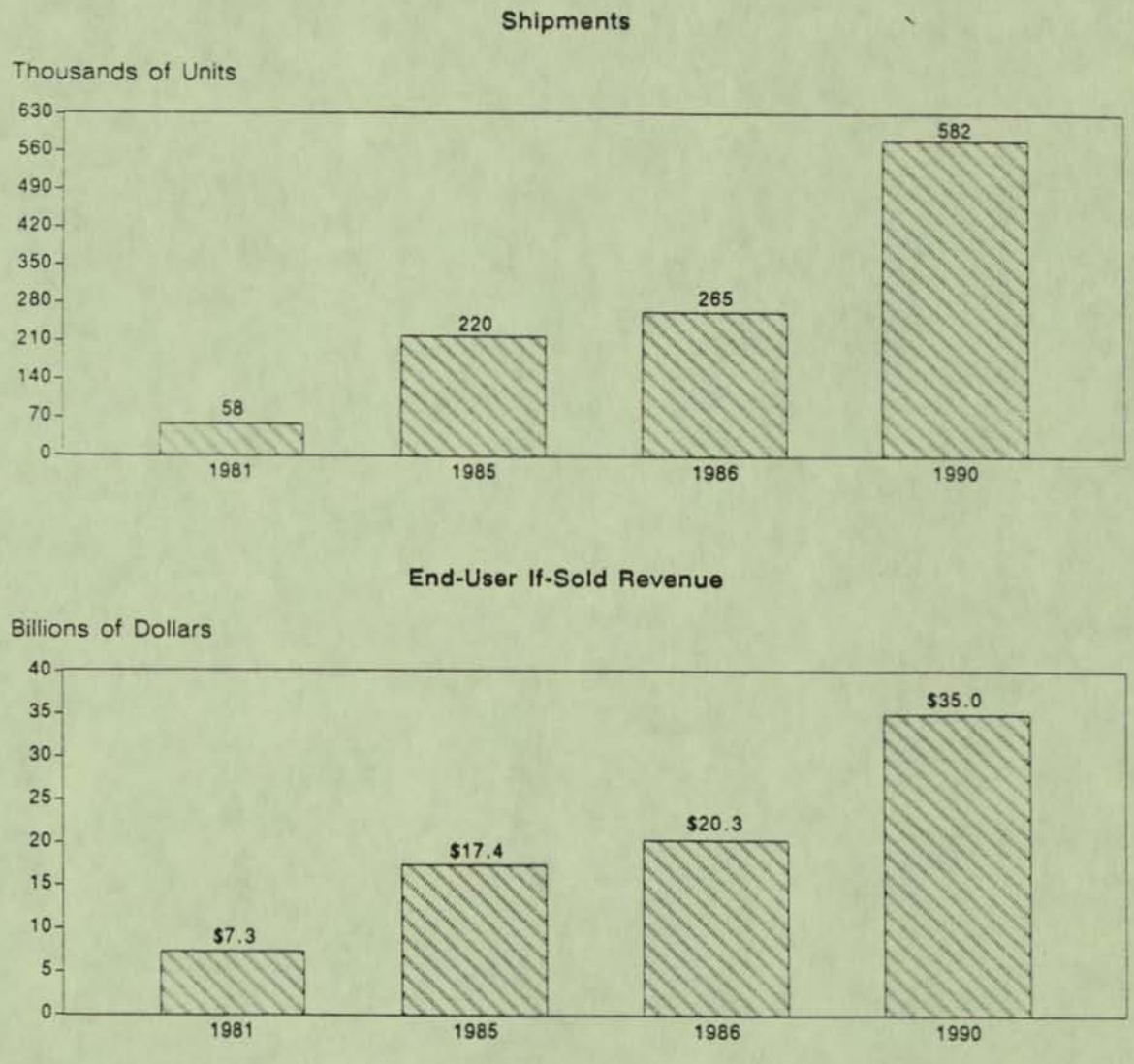
OLTP SEGMENT OF THE U.S. BUSINESS COMPUTER SYSTEMS INDUSTRY



Source: Dataquest
September 1986

Figure 3

OLTP SEGMENT OF THE WORLDWIDE BUSINESS COMPUTER SYSTEMS INDUSTRY



Source: Dataquest
September 1986

Table 1

DATAQUEST MARKET ANALYSIS
OLTP SEGMENT OF THE U.S. BUSINESS COMPUTER SYSTEMS INDUSTRY

	Actual					CAGR
	1981	1982	1983	1984	1985	1981-1985
Annual Shipments in Thousands of Units	31.9	46.3	67.1	97.0	122.2	39.9%
Average Selling Price in Thousands of Dollars per Unit	$108.7	$103.4	$88.9	$76.5	$68.7	(10.8%)
Total End-User If-Sold Revenue in Billions of Dollars	$3.5	$4.8	$6.0	$7.4	$8.4	24.8%
Revenue Growth	64.5%	38.2%	24.6%	24.4%	13.1%	
Retirements from Installed Base in Thousands of Units	7.5	11.8	25.4	35.8	53.3	63.3%
Year-End Installed Base in Thousands of Units	68.5	103.0	144.7	206.0	274.8	41.5%
Installed Base Growth	55.3%	50.4%	40.5%	42.3%	33.4%	

	Actual					CAGR
	1981	1982	1983	1984	1985	1981-1985
Annual Shipments in Thousands of Units	141.7	171.8	210.7	250.6	292.9	19.9%
Average Selling Price in Thousands of Dollars per Unit	$67.3	$63.8	$60.7	$58.2	$55.5	(4.7%)
Total End-User If-Sold Revenue in Billions of Dollars	$9.5	$11.0	$12.8	$14.6	$16.3	14.83
Revenue Growth	13.6%	15.0%	16.7%	14.0%	11.5%	
Retirements from Installed Base in Thousands of Units	75.1	106.4	138.9	169.0	195.3	27.0%
Year-End Installed Base in Thousands of Units	341.4	406.8	478.7	560.3	657.9	17.8%
Installed Base Growth	24.2%	19.2%	17.7%	17.1%	17.4%	

Note: Dataquest defines on-line transaction processing as the process by which the state of a company's business is changed by updating, in real time, a computer data base that describes some part of the business, or allows a customer or employee to make a decision that may change the state of the business as a result of consulting (querying) such a data base. These transactions occur between an interactive terminal and a host processor(s) that manipulates the data base.

Source: Dataquest
September 1986

Table 2

DATAQUEST MARKET ANALYSIS
OLTP SEGMENT OF THE WORLDWIDE BUSINESS COMPUTER SYSTEMS INDUSTRY

	Actual					CAGR
	1981	1982	1983	1984	1985	1981-1985
Annual Shipments in Thousands of Units	57.9	81.1	122.2	175.8	220.4	39.6%
Average Selling Price in Thousands of Dollars per Unit	$126.4	$120.2	$103.3	$87.7	$79.0	(11.1%)
Total End-User If-Sold Revenue in Billions of Dollars	$7.3	$9.8	$12.6	$15.4	$17.4	24.2%
Revenue Growth	65.0%	34.2%	28.3%	22.2%	13.0%	
Retirements from Installed Base in Thousands of Units	6.4	11.3	23.9	46.0	73.8	84.5%
Year-End Installed Base in Thousands of Units	129.9	200.3	298.7	428.5	575.1	45.1%
Installed Base Growth	65.9%	54.3%	49.1%	43.5%	34.2%	

	Estimated					CAGR
	1986	1987	1988	1989	1990	1986-1990
Annual Shipments in Thousands of Units	256.1	338.7	409.3	490.7	582.4	21.7%
Average Selling Price in Thousands of Dollars per Unit	$67.0	$63.5	$63.5	$63.5	$60.1	(11.1%)
Total End-User If-Sold Revenue in Billions of Dollars	$20.3	$23.9	$27.4	$31.1	$35.0	14.6%
Revenue Growth	16.6%	17.9%	14.6%	13.5%	12.4%	
Retirements from Installed Base in Thousands of Units	111.2	167.4	250.4	309.3	380.1	36.0%
Year-End Installed Base in Thousands of Units	729.1	900.4	1,059.3	1,240.7	1,443.0	18.6%
Installed Base Growth	26.8%	23.5%	17.6%	17.1%	16.3%	

Source: Dataquest
September 1986

DATAQUEST CONCLUSIONS

OLTP has become the most explosive growth segment in business computer system sales. Many factors have contributed to this growth:

- Cost per transaction has come down dramatically in recent years. This decrease in cost is the result of cheaper disk drives, telecommunications, memory, and all other components. With a lower transaction cost, many more applications can be justified.

- Data base technology has evolved in recent years to offer better price/performance as well as more functionality. Data base processors will further enhance data base efficiency.

- More applications software has been written to sell into this fast-growing market. Software houses and VARs have focused on OLTP applications because the demand has grown. These applications have increased worker productivity, further raising the utility of OLTP applications.

- The services sector of the economy has been growing much faster than the manufacturing sector. OLTP lends itself to service businesses such as telemarketing, insurance, and banking. Service companies have seen OLTP as a way to gain a competitive advantage.

- When IBM decided to OEM the Stratus system, it legitimized the fault-tolerant front-end OLTP processor, much as it legitimized the personal computer market in 1981.

- The new architectures developed in recent years offer users greater flexibility in implementing OLTP systems.

Dataquest believes that the OLTP market will continue to grow as more applications are developed and more batch applications are converted to real time. Because OLTP offers hope in an otherwise dismal computer marketplace, we expect more vendors to develop products to address the market, competition to continue to bring prices down, and more applications to be justified. We foresee the snowball effect building even higher demand for these products, resulting in higher total business computer system revenue and more ease in performing business transactions for consumers.

Kimball Brown

TANDEM, PRODUCT, CHECK

CORPORATE INFORMATION CENTER

LOOK AHEAD

OSI PICKS UP STEAM; ICL PAPER EMERGES

The Open Systems Interconnect (OSI) networking standards are garnering greater world attention. In the U.S., the Computer & Communications Industry Association (CCIA), Washington, D.C., has joined with 17 computer makers to form the Corporation for Open Systems, a nonprofit organization that will promote OSI standards in the U.S. and validate members' implementations of OSI protocols. IBM is being invited to join. Heading the group as acting chairman is NCR executive vice president Don Herman. Meanwhile, six major Japanese computer makers are forming a consortium to throw their weight behind OSI and establish stronger relations with the original European OSI movement.

Prompting much of this increased concern for OSI and IBM is a provocative, 25-page paper circulating among U.S., European, and Japanese computer companies. Reflecting a dissatisfaction among Europeans with IBM's 1984 agreement to provide certain product information earlier than usual, the paper, authored by an official at Britain's ICL, blasts IBM as abusing its market position in mainframes. By changing network interfaces, all of which depend on MVS, IBM could conceivably lock out all others from the marketplace, the paper argues. The paper concludes that unless its growing power is somehow checked, IBM will likely extend beyond the computer and related markets into service industries. "Steps have to be taken now to ensure that a free market for information products and services exists--the alternative will be a massive flight to protectionism," the paper says. Among the remedies proposed are mandatory use of OSI standards, a renewed investigation by the EEC into IBM's control over interfaces, "forced licensing" of monopolized software (as is done with certain drug formulas), and "the breaking up of IBM Europe to eliminate cross-subsidized growth." A quick survey of U.S. computer firms revealed no recognition of or reaction to the paper.

A NEW TANDEM TO CHECK OUT

Tandem Computers Inc., Cupertino, Calif., is readying its first ECL-based computer, sources claim. A new line-topping machine, code-named **Check** and utilizing Motorola 2800 ECL macro array technology, is said to exceed the performance of its existing TTL-based NonStop TXP family by 50%. Check is expected to be the first of a new ECL-based family to be called the EXP series. It is believed that the first Check machines began to trickle out to customer sites for beta testing last month, with first customer shipments to follow as early as March. Tandem declines to comment on the machine, but did confirm it is jointly developing 2800 ECL macro array technology with Motorola for inclusion in its transaction processing architecture.

Tandem Computers (NASDAQ-TNDM)

Recent Price:	$22	Book Value/Share:	$10.09
52-Week Price Range:	$29-13	Indicated Dividend:	nil
		Yield:	nil
1985 E.P.S.:	$0.82	1985 P/E:	24.4X
1986 E.P.S. (est.):	$0.95	1986 P/E:	21.1X
1987 E.P.S. (est.):	$1.35	1987 P/E:	14.8X

Fiscal year ends September

Shares Outstanding:	41.8 million
Shares Traded:	11.0 million in November
Market Value of Common Stock:	$920 million

Capitalization (9/30/85):

	Millions	%
Long-Term Debt	$ 4.4	1.0
Deferred Taxes	32.7	7.1
Stockholders Equity	420.4	91.9
Total	$457.5	100.0

Total Assets:	$552.3 million
Return on Equity - latest 12 mos.:	8.6%

Summary and Conclusion

In the next year we believe that Tandem Computers' earnings will begin to reap the benefits from:

-- A marketing force that is better equipped to contend with large corporate accounts burdened by entrenched IBM relationships.

-- Continued upgrading in the company's products, including a new high-end processor, further improvements to its operating systems and refinements to its already formidable networking capability.

-- Increased marketing productivity stemming from a rapidly growing number of alliances with independent software vendors.

-- Rigorous financial control that should enable the company to build cash and reverse the trend of declining operating margins.

Notwithstanding unfavorable earnings comparisons through the first half of the current fiscal year, we estimate that Tandem will have an up year - $0.95 versus $0.82. Furthermore, as the marketing, product and financial control programs take hold, Tandem's fiscal 1987 earnings could rebound to $1.35 per share. Because the company has always been able to demonstrate unusual technological prowess, it has been able to command a premium valuation despite successive earnings disappoints. However, we believe that very constrained financial programs are in place to create upside earnings surprises. We like the company's strong balance sheet and its ability to build cash, which we estimate will amount to almost $160 million or $4 per share. Tandem's $920 million market value is slightly more than one times its 1987 sales.

Moreover there is increased evidence in the field that Tandem's product offerings can more than hold their own in major markets against IBM and in niche markets against Stratus computer. While we cannot precisely time the earnings benefits from an eventual order upsurge, it is apparent that beyond the next two quarters very favorable earnings gains are probable. In the event that Tandem realizes its potential for a resumption of strong earnings growth, we believe that stock can command a price earnings multiple in the low thirties. We are adding Tandem Computers to our Recommended List.

Background

Tandem is the original fault-tolerant computer company, having pioneered the concept of low-cost fail-safe computing as the foundation of its system design philosophy. As the company's products evolved, it extended its systems offerings to include distributed relational databases, advanced networking facilities that are compatible with industry standard communication protocols, and very cost effective disc and tape storage devices. In its early years the company enjoyed spectacular growth and commanded a stock valuation as high as sixty times trailing earnings. In recent years, despite strong revenue growth, the company's bottom line performance has been disappointing. Revenues rose from $208 million in fiscal 1981 to $624 million in 1985, but earnings per share have been essentially flat - $0.76 to $0.82.

FY ended 9/30	1982	1983	1984	1985
	($ millions except per share)			
Revenue	312.1	418.3	532.6	624.1
Operating income	40.7	49.8	51.1	50.1
Operating margin	13.0%	11.9%	9.6%	8.0%
Net income	29.9	30.8	42.9	34.4
Earnings/share	$0.76	$0.76	$1.04	$0.82
Working capital	194.8	254.1	263.4	298.6
Total assets	337.4	415.5	501.9	552.3
Stkhldrs. equity	251.0	311.0	375.1	420.4
No. of employees	3,821	4,396	5,223	5,494

For the last several years revenues fell short of projections by ten to fifteen percentage points annually. Consequently, despite the promise of huge potential in the on-line transaction processing market and Tandem's vaunted technological prowess, periodic disappointments loomed for the Tandem investor. We think management's orientation has really changed. In contrast to last year at this time, Tandem has an extremely conservative operating plan for the current fiscal year. Revenue gains are targeted in the 10% range, employment levels are projected to be flat and expense budgets are targeted to improve margins even if revenue growth is limited to 10% in the current fiscal year. With such modest growth objectives, we expect the company to generate another $30 million in cash to bring cash levels to almost $160 million. If order conditions improve, upside earnings surprises are possible in the second half of this fiscal year.

Basic Position

Tandem enjoys substantial fundamental attributes which, if properly managed, can restore revenue growth rates approaching, if not exceeding, 20% and even better earnings improvements for the following reasons: the company's manufacturing resources are currently underutilized; its marketing force still needs considerable seasoning in large account sales, and; it has yet to reap any benefits from proliferating alliances with software vendors. Tandem's fundamental attributes include:

-- A superb computer architecture that enables the Tandem computer user to increase his processing requirements linearly - that is, to expand his system without increasing incremental cost per transaction. The company's processor offerings presently consist of the TXP (its high end system), the Nonstop II (a dated medium scale system), and the EXT (an entry level system which is essentially a Nonstop II repackaged for the office environment).

Tandem's marketing philosophy does not focus on MIPS (millions of instructions of processing per second), but rather on reliability, ease of programming with complex on-line transaction processing applications, and lowest cost per transaction. It is Tandem's contention that performance criteria such as system integrity, transparent access to distributed databases, painless upward migration as processing requirements grow and ease of programming in a networking environment are more important than raw processing power.

-- Very advanced networking and database management facilities that enable Tandem computers to serve as message switchers as well as distributed processing nodes on large on-line teleprocessing applications. With its ENCOMPASS high performance distributed relational database management software, neither programmer nor computer user need be concerned with the location of the database. With its EXPAND networking software, applications across a network are treated as simply as programming a single standalone application.

-- Because of such software tools and the richness of its system architecture, which is optimized for distributed transaction processing, Tandem has consistently demonstrated superior networking and database handling capability over IBM in such prestigious accounts as Citibank, Federal Express, J.C. Penney, Nomura Securities, and Mercedes Benz.

-- Because Tandem offers telecommunications software that is compatible with IBM's SNA (Systems Network Architecture), its processors are able to coexist with IBM host mainframes that are entrenched with most large corporate accounts, thereby obviating the lack of IBM communications compatibility as a selling issue.

-- A growing number of alliances with software vendors in such applications as point of sale terminals, banking, brokerage, airlines and manufacturing. These value-added resellers can provide turnkey solutions incorporating Tandem systems and will, over time, leverage Tandem's technical marketing efforts.

-- A large and loyal customer base that is locked in by Tandem's proprietary architecture and software. While Tandem needs to develop new accounts, its existing base will provide the foundation for substantial future growth, especially as the economic environment improves.

-- A continued heavy level of research and development effort amounting to 11.5% of last year's sales and an estimated 12.5% of the current year's revenues. From these efforts we expect to see at least one major new processor (an upward extension from the TXP, the current high end), a very large disc storage device, and several enhancements to the company's networking and system software facilities.

-- Revitalized management orientation towards tight financial control and the need for profit improvement. While the computer recession of the past year has thwarted the company's efforts to improve overall returns over fiscal 1984, meaningful gains were realized in gross margins (61.5% vs 58.9%) and this trend is expected to continue. Additionally, the company's tight asset management has protected its strong balance sheet despite hefty increases in product development and marketing expenses. At year end September 1985 Tandem had $129 million in cash, amounting to $4.40 per share, $11.4 million in total debt, and $420 million in stockholders' equity.

Outlook

Tandem has set in place programs that are likely to bear fruit in the second half of the current fiscal year. The year-to-date game plan is extremely conservative because the U.S. data processing marketplace is still experiencing considerable softness. Accordingly, as set forth in our earnings model, we project unfavorable earnings per share comparisons through the first half of the current fiscal year. A substantial recovery is envisioned in the latter part of the year, particularly in the final period, which is expected to benefit from new products. For fiscal 1986 we estimate Tandem's earnings will improve to $0.95 versus $0.82 per share.

Fiscal 1987 will probably benefit from a somewhat improved selling environment in the U.S. As the company has matured it is facing a much longer selling cycle to very large accounts for multi-million dollar systems. There are already some encouraging signs that Tandem has been able to dislodge IBM in major account situations where the vendor choice is based on technical rather than political considerations. In the next year Tandem will have products and programs in place to garner more business at the low end where Stratus, a high-momentum fault-tolerant computer company, has enjoyed most of its success. In large account situations IBM had incorporated the Stratus computer as part of its product line as a last resort, preferring to sell its own 3090 mainframes, which are much more profitable. In large

complex systems Tandem's unique architecture, networking and systems software continue to provide it with formidable advantages.

Further impetus for revenue growth is expected from the influence of a new high-end processor, sales garnered by value-added resellers stemming from the rapidly developing software alliance programs, and from more successful penetration of large IBM accounts as Tandem improves its marketing approach in the large corporate arena. We expect Tandem to have a good year in fiscal 1987. Accelerating revenue growth combined with operating margin improvement should bring earnings per share to $1.35 versus our $0.95 estimate for this year.

Peter T.T. Lieu

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TANDEM COMPUTERS
QUARTERLY EARNINGS ANALYSIS

	1Q	% Change	2Q	% Change	3Q	% Change	4Q	% Change	Year-End	% Change
Product Revenue	134135	24%	120088	32%	116868	-2%	144018	11%	515109	15%
Service & Other	25518	43%	26401	32%	27297	19%	29813	28%	109029	30%
Total Revenue	159653	26%	146489	32%	144165	2%	173831	14%	624138	17%
Cost of Revenue	62021	23%	57713	22%	56116	-3%	64298	2%	240148	10%
% Total	38.8%		39.4%		38.9%		37.0%		38.5%	
Product Dev.	15127	39%	17075	33%	18027	33%	21348	40%	71577	36%
% Total	9.5%		11.7%		12.5%		12.3%		11.5%	
M, G, & A	59996	24%	61998	26%	69482	23%	70856	25%	262332	25%
% Total	37.6%		42.3%		48.2%		40.8%		42.0%	
Total Costs	137144	25%	136786	25%	143625	13%	156502	16%	574057	19%
Operating Income	22509	33%	9703	384%	540	-96%	17329	-3%	50081	-2%
Operating Margin	14.1%		6.6%		0.4%		10.0%		8.0%	
Interest, Net	1888	75%	1573	38%	1298	4%	1510	-12%	6269	21%
Pretax Income	24397	36%	11276	258%	1838	-88%	18839	-4%	56350	0%
Pretax Margin	15.3%		7.7%		1.3%		10.8%		9.0%	
Taxes	10369	31%	4435	278%	-550	NMF	7722	NMF	21976	6%
Tax Rate	42.5%		39.3%		-29.9%		41.0%		39.0%	
Net Income	14028	40%	6841	247%	2388	-74%	11117	-49%	34374	-20%
Average Shares	41384		42150		41896		41603		41765	
E.P.S.	0.34	42%	0.16	220%	0.06	-74%	0.27	-49%	0.82	-21%

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TANDEM COMPUTERS
QUARTERLY EARNINGS ANALYSIS

	1Q	% Change	2Q	% Change	3Q	% Change	4Q	% Change	Year-End	% Change
Product Revenue	140000	4%	132000	10%	134400	15%	166000	15%	572400	11%
Service & Other	32000	25%	33000	25%	34000	25%	36000	21%	135000	24%
Total Revenue	172000	8%	165000	13%	168400	17%	202000	16%	707400	13%
Cost of Revenue	63640	3%	61050	6%	61466	10%	73730	15%	259886	8%
% Total	37.0%		37.0%		36.5%		36.5%		36.7%	
Product Dev.	21500	42%	21700	27%	22000	22%	23000	8%	88200	23%
% Total	12.5%		13.2%		13.1%		11.4%		12.5%	
M, G, & A	71500	19%	72500	17%	74000	7%	77000	9%	295000	12%
% Total	41.6%		43.9%		43.9%		38.1%		41.7%	
Total Costs	156640	14%	155250	13%	157466	10%	173730	11%	643086	12%
Operating Income	15360	-32%	9750	0%	10934	1925%	28270	63%	64314	28%
Operating Margin	8.9%		5.9%		6.5%		14.0%		9.1%	
Interest, Net	1500	-21%	1575	0%	1500	16%	1510	0%	6083	-3%
Pretax Income	16860	-31%	11325	0%	12434	576%	29780	58%	70397	25%
Pretax Margin	9.8%		6.9%		7.4%		14.7%		10.0%	
Taxes	7587	-27%	5095	15%	5595	NMF	13401	74%	31679	44%
Tax Rate	45.0%		45.0%		45.0%		45.0%		45.0%	
Net Income	9273	-34%	6225	-9%	6839	186%	16379	47%	38718	13%
Average Shares	41700		41900		42100		42400		41765	
E.P.S.	0.22	-35%	0.15	-6%	0.16	167%	0.39	44%	0.93	13%

Tandem Computers (NASDAQ: 23-TNDM)

Tandem reported first quarter results as follows:

	First Quarter		
	1985	1986	% Chg.
	($ thousands)		
Product Revenue	134,135	137,228	2
Service & Other	25,518	32,833	29
Total Revenues	$159,653	$170,061	7
Operating Profit	22,509	19,315	(14)
Operating Margin	14.1%	11.4%	
Interest, Net	1,888	1,673	(11)
Pretax Income	24,397	20,988	(14)
Pretax Margin	15.3%	12.3%	
Tax Rate	42.5%	44.5%	
Net Income	14,028	11,648	(17)
Average Shares O/S (millions)	41,384	42,177	
E.P.S.	$0.34	$0.28	(18)

For the first fiscal quarter ended December 31, 1985, Tandem reported a 7% revenue gain, a 14% decline in operating income and a 17% drop in net income, bringing earnings per share to $0.28 versus $0.34. The unfavorable first quarter comparison has been well discounted and exceeded our own estimate as conveyed in the January 17 Notes.

We are most encouraged that gross margins in the first quarter increased to 65.4% compared with 63.0% recorded in the immediately preceeding fourth period. This profit improvement stems from several plant closings last year to trim overhead. Current trends suggest that the company's gross margins will improve as much as 3 percentage points for the full year. The lifting of salary freezes in the second fiscal quarter will result in higher levels of both product development and marketing, general, and administrative costs. However, we estimate better gross margins will largely offset these other cost pressures and will enable the company to realize operating margin improvement to about 10% versus 8% for last year.

While international orders improved by 25%, overall orders for the quarter were up only 6.5% because considerable weakness persists in the company's domestic markets. International revenues represented 39% of total revenues for the quarter compared to 34% for last year. We believe Tandem's marketing programs are in place to improve productivity in the large corporate accounts and with the third-party software vendors. Evidence of marketing progress will more likely be realized in the second half of the fiscal year.

The company's cost containment programs are taking effect, and we are encouraged enough to revise our earnings estimates for fiscal year 1986 from $0.95 to $1.05 per share and our fiscal year 1987 estimate from $1.35 to $1.65 per share. The makeup of our quarterly earnings model for the current and next fiscal year is attached. Our financial assumptions anticipate accelerating revenue and earnings growth. Furthermore, we believe investor confidence will be bolstered by meaningful product introductions, which will further strengthen the company's ability to contend with IBM in major account confrontations. Finally, we are comforted by the company's strong balance sheet, which we project will show $160 million in cash, nominal debt, and an estimated $460 million in equity amounting to $11 per share by year end. We continue to recommend purchase.

Peter T.T. Lieu

1986E

TANDEM COMPUTERS
QUARTERLY EARNINGS ANALYSIS

	1QA	% Change	2QE	% Change	3QE	% Change	4QE	% Change	Year-End	% Change
Product Revenue	137228	2%	132000	10%	134400	15%	166000	15%	569628	11%
Service & Other	32833	29%	34000	29%	35000	28%	37000	24%	138833	27%
Total Revenue	170061	7%	166000	13%	169400	18%	203000	17%	708461	14%
Cost of Revenue	58844	-5%	59760	4%	60137	7%	72065	12%	250806	4%
% Total	34.6%		36.0%		35.5%		35.5%		35.4%	
Product Dev.	19817	31%	21700	27%	22000	22%	23000	8%	86517	21%
% Total	11.7%		13.1%		13.0%		11.3%		12.2%	
M, G, & A	72085	20%	73500	19%	74500	7%	78000	10%	298085	14%
% Total	42.4%		44.3%		44.0%		38.4%		42.1%	
Total Costs	150746	10%	154960	13%	156637	9%	173065	11%	635408	11%
Operating Income	19315	-14%	11040	14%	12763	2264%	29935	73%	73053	46%
Operating Margin	11.4%		6.7%		7.5%		14.7%		10.3%	
Interest, Net	1673	-11%	1700	8%	1700	31%	1700	13%	6773	8%
Pretax Income	20988	-14%	12740	13%	14463	687%	31635	68%	79826	42%
Pretax Margin	12.3%		7.7%		8.5%		15.6%		11.3%	
Taxes	9340	-10%	5669	28%	6436	NMF	14078	82%	35922	63%
Tax Rate	44.5%		44.5%		44.5%		44.5%		45.0%	
Net Income	11648	-17%	7071	3%	8027	236%	17557	58%	43904	28%
Average Shares	42177		42400		42600		42800		41765	
E.P.S.	0.28	-18%	0.17	6%	0.19	217%	0.41	52%	1.05	28%

1987E

TANDEM COMPUTERS
QUARTERLY EARNINGS ANALYSIS

	1Q	% Change	2Q	% Change	3Q	% Change	4Q	% Change	Year-End	% Change
Product Revenue	161000	17%	151800	15%	161280	20%	199200	20%	673280	18%
Service & Other	40040	22%	41560	22%	42000	20%	43920	19%	167520	21%
Total Revenue	201040	18%	193360	16%	203280	20%	243120	20%	840800	19%
Cost of Revenue	70364	20%	66709	12%	70132	17%	82661	15%	289866	16%
% Total	35.0%		34.5%		34.5%		34.0%		34.5%	
Product Dev.	22500	14%	23500	8%	25300	15%	26450	15%	97750	13%
% Total	11.2%		12.2%		12.4%		10.9%		11.6%	
M, G, & A	85800	19%	79278	8%	82328	11%	88550	14%	335956	13%
% Total	42.7%		41.0%		40.5%		36.4%		40.0%	
Total Costs	178664	19%	169487	9%	177760	13%	197661	14%	723572	14%
Operating Income	22376	16%	23873	116%	25520	100%	45459	52%	117228	60%
Operating Margin	11.1%		12.3%		12.6%		18.7%		13.9%	
Interest, Net	1700	2%	1800	6%	1700	0%	1510	-11%	6710	-1%
Pretax Income	24076	15%	25673	102%	27220	88%	46969	48%	123938	55%
Pretax Margin	12.0%		13.3%		13.4%		19.3%		14.7%	
Taxes	10714	15%	11425	102%	12113	88%	20901	48%	55772	55%
Tax Rate	44.5%		44.5%		44.5%		44.5%		45.0%	
Net Income	13362	15%	14249	102%	15107	88%	26068	48%	68166	55%
Average Shares	42900		43100		43200		43400		41765	
E.P.S.	0.31	11%	0.33	94%	0.35	84%	0.60	46%	1.63	55%

LEVEL 1 - 6 OF 11 STORIES

Corporate EFT Report

January 29, 1986

SECTION: IN BRIEF; Vol. 6, No. 2; Pg. 6

LENGTH: 99 words

BODY:

Tandem Computers Inc. has penned an agreement with DML of New York to market DML's Mortgage-Back Accounting System (MBAC) to banks and brokerages. Under terms of the agreement, DML will market MBAC directly to Tandem NonStop computer system users under the sponsorship of Tandem. MBAC offers on-line capabilities for the processing of securities transactions from order entry to settlement. The system is designed to handle multi-account and multi-issue processing under a single transaction number supporting retail, inventory and agency transactions, according to Tandem officials.

LEVEL 1 - 2 OF 4 STORIES

Business Wire

January 28, 1986, Tuesday

DISTRIBUTION: Business Editors

LENGTH: 489 words

HEADLINE: TANDEM; Ticketnet to use Tandem systems for ticketing and box office management services

DATELINE: CUPERTINO, Calif.

BODY:

Tandem Computers Inc. (OTC:TNDM) announced Tuesday that Ticketnet Corp. of Ottawa and New York will market worldwide unique ticketing and box office management products and systems based on a network of Tandem NonStop EXT computers. Ticketnet, whose new ticketing services were demonstrated today at the Box Office Management International conference in New York, will be the first company to offer users both nationwide ticket distribution and full box office management services as an integrated package. It was also announced that Air Canada is developing the entertainment and sports ticketing and management system for Ticketnet. Air Canada's computer and systems services branch is creating the software required to operate the system in Canada and the United States on Tandem computer architecture. Ticketnet's service will rely on a network of regional computer centers, said David Clark, Ticketnet executive director. ''By storing ticket information in regional Tandem NonStop EXT computers and making all tickets available anywhere in the network, we give ticket purchasers a wider choice of outlets, a greater selection of events and the guarantee that the seats they buy are the best available.'' But the unique feature, said Clark, is that Ticketnet will allow box offices to connect personal computers to regional centers to carry out other activities, including sales analysis, subscription campaigns, mailings, event accounting and financial management. Users will pay for ticketing and management services only as they use them. Clark added that Ticketnet chose Tandem systems because of their networking, distributed database and fault tolerant features. ''Tandem offered the best solution,'' he said. ''The NonStop EXT is ideal for smaller computer centers, while the easy expansion of Tandem systems means we can add computer resources as needed.'' The first computer installations for Ticketnet will be in Montreal and Toronto. Installations in the United States are also under consideration. Ticketnet has also signed an agreement with Tandem enabling it to sell and lease Tandem equipment to Ticketnet systems operators covering specific geographic regions. Tandem Computers Inc. manufactures and markets computer systems and networks for the on-line transaction processing marketplace. The company is headquartered in Cupertino.

Note to editors:
Tandem, NonStop and NonStop EXT are trademarks of Tandem Computers Inc.
Ticketnet is a trademark of Ticketnet Corp.

CONTACT: Tandem Computers Inc., Cupertino
Tom Waldrop, 408/725-7191
or

MISWeek 1/27/86 p42

CORPORATE INFORMATION CENTER

SOFTWARE

Tandem In Pact To Sell Retail Inventory Pkg.

CUPERTINO, Calif.—Tandem Computers Inc. announced last week that it has signed an agreement with Performance Associates Corp. of Pittsburgh to jointly market Performance Associates' retail applications software.

Under terms of the agreement, Performance Associates will license the Computer-Assisted Merchandising/Reservation and Order Control (Cam/RCon) automated retail software directly to Tandem NonStop system users under the sponsorship of Tandem.

The Cam/RCon software collects and reports information to and from the retail sales floor, the warehouse and all levels of management. It is designed to control inventory, reduce shortages, define merchandise requirements, track sales and margins, monitor merchandise commitments, minimize staff and provide overall financial control.

Ed Peverell, Tandem's director of third-party marketing, said the "availability of Performance software will help Tandem increase its penetration of the retail market. This product applies the Tandem NonStop architecture—with its continuous availability and linear growth capabilities—to the needs of retail operations."

Bruce Tomlin, president of Performance Associates, added, "With Cam-RCon, a sales clerk on the retail floor can check instantly whether a particular item is available from the warehouse or from another store."

Written by Performance Associates Corp., Cam/RCon software modules are designed to operate on all Tandem NonStop systems. Pricing of Cam/RCon starts at $48,000 and ranges to $250,000, depending on customer requirements. The product is immediately available.

On-Line Acquires Boole Package

FORT LEE, N.J.—On-Line Software International Inc. has acquired a security package for International Business Machines Corp. mainframe computers running under the Multiple Virtual Storage (MVS) operating system.

On-Line acquired the security software, previously called Secure, from Boole & Babbage, Sunnyvale, Calif. The package will be incorporated into On-Line's Omniguard line of mainframe-based security products.

The MVS security program will be used in part to provide the MVS interface and the revamped product will incorporate the user interface of the CICS, VM and DOS/VSE versions of Omniguard. The CICS version of Omniguard, known as Secure/CICS, had also been acquired from Boole & Babbage last April.

Jack Berdy, president of On-Line, said, "We are committed to providing large corporations with a truly global software security product. Global security means MIS departments need to support only one security system. Reports and screens are standardized across multiple operating environments and end-user training costs are minimized."

Current MVS users of Secure will be supported by On-Line and will eventually be given the opportunity to convert to the enhanced package. Current pricing for the Omniguard product line ranges from $15,000 to $28,000, depending on operating environment.

Culler In Sales Pacts With 2 Software Firms

SANTA BARBARA, Calif.—Culler Scientific Systems Corp., a vendor of departmental supercomputers, has announced a pair

the Mentat portion is. CAD/CAM (computer-aided design/manufacturing) people use this for doing little element analysis

Ex-Super Bowler's Firm Speeds

Fran Tosses TD Pa

By MELINDA McADAMS

NEW YORK—Almost 10 years have passed since Fran Tarkenton last took the Minnesota Vikings to a Super Bowl, but the quarterback-turned-corporate-chairman still knows how to be a team player, as evidenced by his company's new alliance with Nastec Corp. of Southfield, Mich.

Generation Sciences Inc. in Syosset, N.Y., had already been working on an applications generator called Gamma for two years when Tarkenton bought the firm and the rights to the product three years ago. Tarkenton Software Inc. was formed as a result, huddling with his information systems firm under the general managership of Tarkenton Productivity Group.

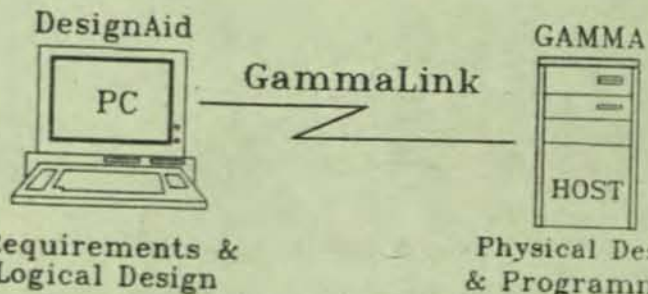
Since then, about 70 companies have become Gamma users, including Chase Manhattan Bank, Security Pacific Bank and Southwestern Bell Corp. The users claim that Gamma, by generating program code automatically, lets them produce new systems 4 to 10 times faster than when programmer/analysts wrote the code by hand, Tarkenton said.

design phases and runs on I national Business Mac Corp. PCs or Convergent T nologies workstations; Life C Manager, which supports D nAid and adds planning co and automation for project agers, and HostLink, which ports two-way communica between designers' PCs an IBM host (see Dec. 4 MIS W page 1).

APPL

Until the advent of Nas new GammaLink—the bridg tween Nastec's product line Tarkenton's Gamma—syst developers could use the Na tools to automate every ste the design up to where code to be written. From that p things were much as the always been: programm spent hundreds of hours tr lating diagrams and descripti of a system into code, a langu a computer can understand.

The companies claim that r programmers never need write a single line of code at t terminals and, from a certain



Automated Software Development With Integrated Tools

GammaLink ties micro-based design tools to host code generator

Users have also told him that Gamma has cut their system maintenance costs by as much as 80 percent.

"And they say that now their users are satisfied with the systems when they are delivered," Tarkenton emphasized, explaining that most systems require ad-

tance, it would seem as if t system had almost design itself.

That's not exactly true, course—the analyst/progra mers won't find themselves s ting on the bench while softwa carries the ball for them. B

se Document Preparation

oftware, IBM announced ancements to five Sys- office applications a variety of new office on functions that im- ase of use and per- e, as well as extend ease nd performance, as well graphics and data man- capabilities.

programs are Dis- e/36, Personal Service/ Support/36, Business Utility/36 and Query/

M spokesman said, "For one of several Dis- e/36 enhancements al- lows users to calculate automatically columns or rows of numbers within a text document for easier, more productive document preparation. Improvements for PC/ Support/36 reduce access times when retrieving data from a System/36 virtual disk for processing on a locally attached PC."

IBM also claimed that Query/ 36 now can join up to five files at a time, giving the System/36 data retreival functions similar to many data base systems.

Some of the office application enhancements will be available in February, while others will be available during the second quarter of 1986, IBM said. The S/36 Business Graphics Utility (BGU) has been upgraded to an IBM licensed program and will be available for the 5360 and 5362 this month for a one-time charge of $800. It will be available for the System/36-PC in February for a one-time charge of $320.

Further, IBM released a new 5250 Enhanced Emulation Program, Version 2.1, that provides new functions for IBM PCs attached to a System/36,; specifically PC/5292-2 host graphics support, keyboard enhancements and expanded printer support.

The host graphics support allows a PC to emulate an IBM 5292 model 2 color display station to perform many graphics functions available only with that color display.

"For example," an IBM spokesman said, "Graphics created at a PC using host graphics support and the IBM System/36 Business Graphics Utility (BGU/36) can be plotted on an IBM plotter attached to the PC or directed to a graphics-capable printer attached to the System/36 host."

IBM said that Version 2.1 of the enhanced 5250 Emulation Program will be available this month for a one-time upgrade charge of $50.

The functional keyboard enhancements that were announced for System/36 PCs, include a user-defined "hot key" and additional PC functions that can be used during System/36 emulation sessions. "Now the PC keyboard can function almost identically, whether in stand-alone PC mode or while emulating a 5250 terminal," an IBM spokesman said.

The enhancements also allow additional IBM and Non-IBM printers—both parallel and serial—to be used as S/36 printers with an IBM PC attached to a S/36.

The last new S/36 product, an IBM 6157 streaming tape drive, can be used with all models of the S/36, providing a common convenient medium for saving, restoring and interchanging information within the System/36 family, IBM said. The quarter-inch cartridge tape unit can save up to 40 Mbytes of data in approximately 15 minutes.

Support for the IBM 6157 will be available for the 5362 next month, while availability on the System/ 36-PC is scheduled for the third quarter of 1986.

s Fall Flat New S/36

w-cost streaming-tape s announced for all three odels. This unit uses a -inch 55-Mbyte cartridge. fers at a maximum effec- e of 4 Mbytes per minute. new printers were an- . The 4224 dot matrix provide three modes of at 100, 200 and 400 ers per second. This can combine draft, DP, ter-quality and graphics gle page.

224 is an intelligent print- erforms print-formatting n independent of the host IBM provides a special (Program Request to ueue) to allow this printer rate OCR (Optical Char- eader), logos and other graphics.

234 printer uses a new gy, "dot band," which to be a hybrid based on -matrix and band-printer gies. The unit uses a 44- nd with many dots. An ng set of hammers can n impression over 800 second. This technique erate printed output at of up to 410 lines per (lpm), depending upon nsity selected

w Features

dition to the hardware above, IBM's SSP (Sys- port Program) release

Tandem Profit Dips A Little

CUPERTINO, Calif.—Tandem Computers Inc. recorded a slight dip in earnings for the first quarter of fiscal 1986 ended Dec. 31.

Net income was $11.64 million, or 28 cents per share, compared with a net of $14.02 million, or 34 cents a share, in the like quarter a year ago.

"This is the first time that Tandem's first quarter has been sequentially down from its fourth quarter," noted Hambrecht & Quist securities analyst Jeffrey Canin. "Earnings could be off because it is widely speculated that Tandem will soon announce a new high-end line of processors. Customers may be putting orders on hold until the new machine, code-named Check, is announced."

Tandem's Check Processor, an ECL-based machine, is expected to be introduced in April as the successor to Tandem's top-of-the-line TXP family of NonStop minicomputers.

A low-end CMOS-based (complementary metal oxide semiconductor) machine is also expected to be introduced this year, according to Canin.

Positive news from Tandem is the fact that revenue increased 6.5 percent to $170.06 million in the first quarter, from $159.65 million in the first fiscal quarter of 1985.

"This shows that Tandem has been achieving good manufacturing efficiencies and good foreign exchange rates," said Canin.

—Juli Cortino

Earnings

Tandem profits fall, sales rise slightly

Tandem Computers Inc. of Cupertino, which makes computer systems used in transactions processing, reported a decline in profits and a small rise in sales for the first fiscal quarter ended Dec. 31.

Net income was $11.6 million, or 28 cents a share, down 17 percent from $14 million, or 34 cents a share, a year ago.

Sales grew 6.5 percent to $170 million from $159.6 million a year ago.

In a prepared statement, Tandem president James G. Treybig said, "This was a strong quarter for our international business, particularly in Europe. However, in the United States, we continue to see a very weak demand environment. During this quarter, we continued to make progress in our strategic product programs."

Altos' sales, profits show strong growth

Altos Computer Systems of San Jose, which makes multi-user computers, reported strong increases in profits and sales for the second fiscal quarter ended Dec. 28.

Net income was $2.6 million, or 18 cents a share, up 53 percent from $1.7 million, or 12 cents a share, a year ago.

Sales were $36.0 million, up 35 percent from $26.6 million in the comparable quarter a year ago.

"The increase in revenue resulted from an across-the-board, worldwide demand for our new products, led by strong and immediate acceptance of the Altos 886, 1086 and 2086, all new multi-user (computer) systems based on the Intel 80286 microprocessor," said David Jackson, president. "The outlook for Altos is very positive," he said. "During this past quarter we closed several major contracts valued at approximately $50 million over the next three to four years."

Daisy Systems has increased earnings

35 cents a share, up 48 percent from $4.3 million, or 27 cents a share, a year ago.

Included in net income is $1.1 million, or 6 cents a share, from the adoption of a FASB (Financial Accounting Standards Board) statement providing for the capitalization of certain software costs.

Income for the comparable quarter last year excluded the cumulative effect upon prior years of changing to a different depreciation method. As a result, the company gained $603,000, or 4 cents a share.

Revenues were $36.6 million, up 44 percent from $25.5 million a year ago.

"This quarter's strong revenues and the high level of profitability are a clear demonstration of the acceptance of Daisy product lines both with existing customers and in new accounts," said Aryeh Finegold, president and chief executive officer.

PG&E earnings rise slightly for 1985

Pacific Gas and Electric Co. finished 1985 with a net income of more than $1 billion and earnings per share of $2.65.

The earnings were up slightly from the $2.62 per share paid in 1984. The company said each share of common stock earned 58 cents per share during the fourth quarter of the year, as compared to 63 cents for the same period in 1984.

Net income during the fourth quarter was more than $232 million, down from $241 million for the same period in 1984. Net income for the year was $1.03 billion, up from $975 million in 1984.

Triad's profits, sales show quarterly rise

Triad Systems Corp. of Sunnyvale, a supplier of business management systems, reported improved profits and sales for the first fiscal quarter ended Dec. 31.

Net income totaled $403,000, or 5 cents a share, compared with a net loss of $1.6 million, or 22 cents a share, a year ago. Revenue was $27.7 million, up 16 percent from $23.9 in the same period a year

nues will be approximately $8.7 million, a 22 percent increase over 1984. For all of 1985, VeloBind expects operating income to rise about 40 percent compared to the prior year, to approximately $5.8 million. Annual sales are expected to rise 20 percent to about $31.7 million. VeloBind plans to release its final profit and sales figures in February.

American Airlines reports profits grew

AMR Corp., parent company of American Airlines Inc., had net earnings of $345.8 million in 1985, up 48 percent from $233.9 million in 1984. Earnings per share last year were $5.94, compared with $4.37 in 1984. Operating revenue was $6.13 billion in 1985, a 14.5 percent increase over $5.35 billion in 1984.

Loral profits, sales rise in 3rd quarter

Loral Corp., a New York-based defense electronics manufacturer that owns several Bay Area firms, reported higher earnings and sales for the third fiscal quarter ended Dec. 31.

Net income was $12.9 million, or 54 cents a share, up 17 percent from $10.7 million, or 46 cents a share, a year ago. Quarterly sales grew nearly 24 percent to $163.6 million, compared with $125.1 million in the same period a year ago.

Loral subsidiaries include Rolm Mil-Spec and Narda-Western Operations, both of San Jose, Frequency West of Santa Clara, and Randron Systems of Menlo Park.

Tri-Data

3 Q 9/28	1985	1984	%chg
Sales	$2.7 million	$1.7 million	+62
Net income	516,000	5,000	+10,260
Per share	0.20	0.00	

The Mountain View company makes data communications computer systems and software, and is privately-held.

Hytek Microsystems Inc.

LEVEL 1 - 12 OF 14 STORIES

January 23, 1986, Thursday, Home Edition

SECTION: Business; Part 4; Page 7; Column 1; Financial Desk

LENGTH: 51 words

HEADLINE: EARNINGS

BODY:

Tandem Computers said its first-quarter net income slipped 17% in the quarter despite a 6.5% rise in revenues. Tandem, based in Cupertino, Calif., said its net income was $11.6 million in its first fiscal quarter ended Dec. 31. Tandem makes computer systems and networks used for processing transactions.

TYPE: Column

LEVEL 1 - 2 OF 5 STORIES

January 23, 1986, Thursday, Late City Final Edition

SECTION: Section D; Page 5, Column 1; Financial Desk

LENGTH: 35 words

HEADLINE: TANDEM COMPUTERS INC reports earnings for Qtr to Dec 31

BODY:

** COMPANY REPORTS **
TANDEM COMPUTERS INC (OTC)

Qtr to Dec 31	1985	1984
Revenue	170,061,000	159,653,000
Net inc	11,648,000	14,028,000
Share earns	.28	.34

TYPE: Statistics

SUBJECT: COMPANY REPORTS

LEVEL 1 - 5 OF 5 STORIES

January 22, 1986, Wednesday

DISTRIBUTION: Business Editors

LENGTH: 1215 words

HEADLINE: TANDEM-COMPUTERS; Financial Results

DATELINE: CUPERTINO, Calif.

BODY:

Tandem Computers Inc. (OTC:TNDM) Wednesday announced operating results for the first quarter of fiscal 1986, which ended Dec. 31, 1985. The California-based manufacturer of NonStop computer systems reported that revenue increased 6.5 percent to $170,061,000 compared with revenue of $159,653,000 in the first fiscal quarter of 1985. The company's pretax income was $20,988,000, or 12.3 percent of revenue, compared with the 1985 first fiscal level of $24,397,000, or 15.3 percent of revenue. Net income for the first fiscal quarter was $11,648,000, or $.28 per share, versus $14,028,000, or $.34 per share, earned in the like quarter of fiscal 1985. The tax rate in the latest fiscal quarter rose to 44.5 percent from 42.5 percent in the like quarter of last year. This increase resulted from the expiration of the federal research and development tax credit program. Tandem president James. G. Treybig commented, ''During this quarter, we continued to make progress in our strategic product programs. For example, we announced leading-edge security products, a capability that is critical for large, network-based applications. ''We launched our SAFE system security family with SAFEGUARD software to control access to shared resources in a network and the SAFE-T-NET data encryption subsystem. SAFE-T-NET is already installed with a major bank in a large wholesale delivery network. ''In addition, we announced the XL8 disc drive, which joins the very successful V-8 disc drive introduced last year,'' Treybig continued. ''Both products employ a unique, proprietary architecture that is optimized for on-line transaction processing applications. The V-8 disc drive meets the need for rapid data access, while the complementary XL8 disc drive provides the largest storage capacity per spuare foot in the industry. ''We also introduced a state-of-the-art, large capacity tape storage system to allow customers to archive data from discs faster and more efficiently.'' Treybig stated further, ''Products such as these are designed for outstanding performance and low cost of manufacture. The advantages of our products enable us to win important business, such as a major contract recently awarded to Tandem by GTE Corp. valued at more than $40 million for a telephone equipment facilities management system. Further, our 65 percent gross profit margin illustrates the combination of good design and efficient manufacturing processes at Tandem.'' Commenting on business trends during the first fiscal quarter, Treybig stated, ''This was a strong quarter for our international business, particularly in Europe. However, in the United States, we continue to see a very weak demand environment.''

Tandem Computers Inc., one of the Fortune 500 largest U.S. industrial corporations, manufactures NonStop computer systems and networks for the on-line transaction processing market. Tandem Computers Inc. is headquartered at 19333 Vallco Parkway, Cupertino, Calif. 95014. Telephone is 408/725-6000

Tandem Computers Inc. and Subsidiaries
Consolidated Interim Statement of Income
(Unaudited)
(In 000s, except per share amounts)

	Three Months Ended 12/31/85	12/31/84
Revenue		
Product revenue	$137,228	$134,135
Service and other revenue	32,833	25,518
Total revenue	170,061	159,653
Costs and expenses		
Cost of revenue	58,844	62,021
Research and development	19,817	15,127
Marketing, general and administrative	72,085	59,996
Total costs and expenses	150,746	137,144
Operating income	19,315	22,509
Interest income, net	1,673	1,888
Income before income taxes	20,988	24,397
Provision for income taxes	(9,340)	(10,369)
Net income	$11,648	$14,028
Earnings per share	$.28	$.34
Weighted average shares outstanding	42,177	41,384

Tandem Computers Inc. and Subsidiaries
Consolidated Interim Balance Sheet
(Unaudited)
(In 000s)

Assets

	12/31/85	12/31/84
Current assets		
Cash and cash investments	$134,311	$112,163
Accounts receivable	178,252	152,920
Inventories	75,139	91,836
Prepaid income taxes	1,924	---
Prepaid expenses and other	13,774	9,542
Total current assets	403,400	366,461
Property, plant & equipment, at cost	246,915	199,674
less accumulated depreciation	(88,808)	(57,161)
Net property, plant & equipment	158,107	142,513
Other assets	8,591	5,101
Total assets	$570,098	$514,075

Liabilities and Stockholders' Investment

	12/31/85	12/31/84
Current liabilities		
Current portion of long term debt and capitalized lease obligations	$7,310	$6,638
Accounts payable	33,877	34,142
Accrued liabilities	47,773	37,585
Income taxes payable	---	9,022
Total current liabilities	88,960	87,387
Capitalized lease obligations	6,978	10,772
Long term debt	4,426	3,237
Deferred income taxes	34,684	19,252
Stockholders' investment	435,050	393,427
Total liabilities and stockholders' investment	$570,098	$514,075

CONTACT: Tandem Computers Inc., Cupertino
Cacey Tangney, 408/725-7555
or
Pat Becker, 408/725-6035

LEVEL 1 - 2 OF 8 STORIES

January 21, 1986, Tuesday

DISTRIBUTION: Business Editors

LENGTH: 507 words

HEADLINE: TANDEM-COMPUTERS; Announces agreement with DML to jointly market on-line mortgage-back accounting software to brokerages, banks

DATELINE: CUPERTINO, Calif.

BODY:

Tandem Computers Inc. (OTC:TNDM) Tuesday announced that it has signed an agreement with DML, New York, to jointly market the DML Mortgage-Back Accounting System (MBAC) to banks and brokerages. The announcement will be made to bankers and brokers at a conference to be held in New York by Tandem on Wednesday (Jan. 22). Under the terms of the agreement, DML will market MBAC directly to NonStop system users under the sponsorship of the Tandem Alliance. MBAC offers on-line capabilities to process security transactions from order entry to settlement. Designed to provide on-line access to all information entered into the system, MBAC allows multi-account and multi-issue processing under a single transaction number supporting retail, inventory and agency transactions. The speed of each pool is displayed on-line. With the on-line capabilties offered by MBAC, users are provided with a means to control all processed securities. MBAC is particularly useful to banks and brokerage firms dealing in the trade processing of mortgage-back securities, including the GNMAs, FNMAs, TBAs and Standbys. These securities require significant clearance and accounting functions. According to Daniel McLoone, president, DML, ''Given the clerically intensive nature of mortgage-back accounting, automated processing is essential. By taking advantage of the continuous availability features of the Tandem systems, the paperwork associated with this process is greatly reduced and the burden of error checking is relieved.'' Ed Peverell, Tandem director of third party marketing, added, ''The Tandem/MBAC solution meets the back-office needs for mortgage backed securities processing of most banks and brokerages. This will complement other financial software available to these Tandem users.'' Developed by DML, MBAC is designed to operate on Tandem NonStop TXP, NonStop II and NonStop EXT systems. The MBAC package is priced beginning at $75,000. DML is a financial software company dedicated to supporting the banking and brokerage communities with its proprietary software products. DML is located at 115 Broadway, New York, N.Y. 10006. Telephone is 212/602-5440. 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 130. Tandem Computers Inc. manufactures and markets computer systems and networks for the commercial on-line transaction processing market. Tandem is located at 19333 Vallco Parkway, Cupertino, Calif. 95014. Telephone is 408/725-6000.

Tandem, NonStop, NonStop II, NonStop TXP and NonStop EXT are trademarks of Tandem Computers Inc.

LEVEL 1 - 13 OF 14 STORIES

January 20, 1986, Monday, Home Edition

SECTION: Business; Part 4; Page 2; Column 5; Financial Desk

LENGTH: 39 words

HEADLINE: INDUSTRY NOTES

BODY:

Tandem Computers, Cupertino, said it formed a joint venture, Vartecs Inc., with Tokyo-based Computer Engineering & Consulting, a unit of Mitsuiwa Group, to develop market and support software for Tandem computer systems in Japan.

TYPE: Column

draft of the proposal and a ballot within two weeks.

The proposed system involves a "lock and key" system described as a lock box that attaches to an RS232 port on the backplane of a computer, and a key-like device with a small ROM chip containing an au-

Tandem Enters Joint Accord

CUPERTINO, CALIF. — Tandem Computers Inc. has signed a joint marketing agreement with automated retail software developer Performance Associates Corp.

The pact calls for Pittsburgh-based Performance Associates to become a member of Tandem Alliance, a third-party software development group consisting of approximately 130 developers. Tandem's Alliance program will enable Performance Associates to license its Computer Assisted Merchandising/Reservation and Order Control (Cam/RCon) software directly to users of Tandem NonStop fault-tolerant computers.

The Cam/RCon software gathers information from retail sales floors and warehouses, and is designed to control inventory, track sales and margins and provide other financial controls.

Cam/RCon modules are priced from $48,000 to $250,000.

Science Mgmt. Nets $6M Pact

WASHINGTON — Science Management Corp.'s Information Systems Division has landed a $6 million contract from the U.S. Department of Housing and Urban Development (HUD) to provide custom mainframe software and support.

Under the terms of the contract, SMC Information Systems will provide administrative and accounting software to run on Sperry Corp.'s Univac 1100 mainframe systems under Sperry's proprietary OS1100 operating system. The contract will run for 18 months with an 18-month option to renew.

CORPORATE INFORMATION CENTER

LEVEL 1 - 1 OF 2 STORIES

Business Wire

January 14, 1986, Tuesday

DISTRIBUTION: Business Editors

LENGTH: 330 words

HEADLINE: TANDEM-COMPUTERS; Selected for major retail banking network in Singapore

DATELINE: CUPERTINO, Calif.

BODY:

Tandem Computers Inc. (OTC:TNDM) Tuesday announced that the Overseas Chinese Banking Corp. (OCBC), Singapore, has selected Tandem NonStop systems to help operate all of its retail banking service operations. OCBC, with assets of Sing $8.3 billion (U.S. $4 billion), is one of the largest banks in Singapore and is ranked as 406th in the world. The contract, valued at over U.S. $1 million, includes the purchase of a six processor NonStop TXP/NonStop II system to be used for processing data generated by tellers, ATMs, videotex and all other retail banking information needs of the bank. The system will enable OCBC to increase its services to its customers at its 43 branches in Singapore. OCBC also has 25 branches in Malaysia, two branches in China and one branch each in Australia, New York, Hong Kong and the United Kingdom. The new system will replace a service bureau currently performing some of the retail banking functions. They will join another Tandem system currently being used as an EFT switching system for electronic funds transfer at the point of sale. Cap Information, representing ACI/BASE24 in the ASEAN region, will provide the application software for OCBC. According to Gerald L. Peterson, Tandem vice president of marketing, ''Tandem is particularly pleased to receive the OCBC contract because the competition was particularly strong. The bank intends to put its entire retail data processing onto Tandem systems -- a recognition that Tandem systems can meet the needs of all of the bank's data processing requirements.'' Tandem Computers Inc. manufactures and markets computer systems and networks for the on-line transaction processing market. The company is headquartered at 19333 Vallco Parkway, Cupertino, Calif. 95014.

Tandem, NonStop, NonStop II and NonStop TXP are trademarks of Tandem Computers Inc.

CONTACT: Tandem Computers Inc., Cupertino
Joyce Strand, 408/725-6516

LEVEL 1 - 2 OF 2 STORIES

January 13, 1986, Monday

DISTRIBUTION: Business Editors

LENGTH: 465 words

HEADLINE: TANDEM-COMPUTERS; Signs agreement with Performance Associates to market retail software

DATELINE: CUPERTINO, Calif.

BODY:

Tandem Computers Inc. (OTC:TNDM) announced Monday that it has signed an agreement with Performance Associates Corp. of Pittsburgh to jointly market the Performance Associates automated retail software. The announcement was made at the National Retail Merchants Association's Annual Convention being held in New York, Jan. 12-15. Under the terms of the agreement, Performance Associates will license the Computer Assisted Merchandising/Reservation and Order Control (Cam/RCon) automated retail software directly to Tandem NonStop system users under the sponsorship of the Tandem Alliance. The Cam/RCon software collects and reports information to and from the retail sales floor, the warehouse and all levels of management. It is designed to control inventory, reduce shortages, define merchandise requirements, track sales and margins, monitor merchandise commitments, minimize staff and provide overall financial control. According to Ed Peverell, Tandem's director of third party marketing, ''The availability of the Performance software will help Tandem increase its penetration of the retail market. This product applies the Tandem NonStop architecture -- with its continuous availability and linear growth capabilities -- to the needs of retail operations.'' Bruce Tomlin, president, Performance Associates, added, ''With Cam-RCon, a sales clerk on the retail floor can check instantly whether a particular item is available from the warehouse or from another store.'' Written by Performance Associates Corp., Cam/RCon software modules are designed to operate on all Tandem NonStop systems. Pricing of Cam/RCon starts at $48,000 and ranges to $250,000 depending on customer requirements. The product is immediately available. Performance Associates Corp. was founded in 1979 to meet the systems and programming needs of large system users. The company has developed solutions for retailers, manufacturers and general service companies. Performance is headquartered at 3111 Banksville Road, Pittsburgh 15216. Phone is 800/PAC-AIDE. 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 over 130. Tandem manufactures and markets computer systems and networks for the on-line transaction processing market. Tandem is headquartered at 19333 Vallco Parkway, Cupertino 95014. Phone is 408/725-6000.

CONTACT: Tandem Computers, Cupertino
Joyce Strand, 408/725-6516
or
Performance Associates Corp., Pittsburgh
Robert Meyers, 800/PAC-AIDE

LEVEL 1 - 14 OF 14 STORIES

January 12, 1986, Sunday, Home Edition

SECTION: Business; Part 4; Page 5; Column 3; Financial Desk

LENGTH: 35 words

HEADLINE: INDUSTRY NOTES

BODY:

Tandem Computers of Cupertino said it formed a joint venture with a Tokyo-based software firm, Computer Engineering & Consulting, to develop and sell software for Tandem NonStop computer systems in Japan.

TYPE: Column

the semiconductor manufacturer. Reduced demand because of excess customer inventory, softness in the end-user market and stiff pricing pressure from Japanese competitors resulted in the company's worst-ever loss in

ment" in its pre-tax margins through continued emphasis on cost control and asset management. Sporck said the company was able to reduce its debt by $50 million in fiscal 1985.

had expected the semi maker to receive a tax credit. "They paid income taxes instead," he said.

Girton said he expects NSC to move closer to "break-even" earnings in the third fiscal quarter.

development and offic
mation.

Xerox is also provid
years of maintenance on
hardware and software
thing which is not usu
cluded in grants from

$ites & $ales

Recently signed bank branch automation contracts with four U.S. banks and one international bank should net **Bunker Ramo** $20 million, the company has announced. The banks will receive various parts of Bunker Ramo's Aladdin system, which handles teller, platform and back office operations. In the U.S., the new sites are **First People's Bank of New Jersey, Irving Bank Corp.**, New York City, **Central Bank,** Walnut Creek, Calif., and **Midlantic Banks Inc.**, Edison, N.J. The international bank contract, already reported here earlier, is with **Yapi ve Kredi Bankasi** of Istanbul, Turkey.

Alex Brunner Enterprises (ABE), an affiliate of McDonnell Douglas's value-added reseller **Image Conversion Systems (ICS)**, Englewood Cliffs, N.J., has concluded an agreement worth nearly $1 million with **Lawyers Title Insurance Corp.** Under the contract, ICS/ABE will convert approximately nine million documents to microfilm and then load the indices onto a McDonnell Douglas Microdata 9208 computer in Lawyers Title's Decatur, Ga., office.

The **Food and Agriculture Organization (FAO)** of the United Nations has awarded Ottawa-based **SHL Systemhouse Inc.** a $6.5 million computer system development contract. Systemhouse won the contract, the largest development and services project in its history, against international competition. Specifically, the Canadian company will develop and implement FAO's new on-line financial and personnel management systems that will accommodate budgeting, revenue collection, payments, investment management activities and data security of the approximately $500 million organization. Additionally, the system will handle the payroll, position classification, postings, recruitment and benefits functions for the roughly 7,000 FAO personnel working in over 70 countries.

Cupertino, Calif.-based **Tandem Computers Inc.'s** NonStop computer system, has been selected by the **New Mexico Interchange Network Inc.** to operate a statewide network of automated teller machines. The New Mexico Interchange is a cooperative venture of six New Mexico financial institutions formed to construct a shared network called Lynx, to allow ATM cardholders to use ATMs at any of the six member institutions. Scheduled for operation early this year, it will serve over 280 ATMs. 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.**

Detroit-based **Burroughs Corp.** announced it has received a
for two model A 15 computers, valued at $7.5 million, fro
Tractor Operations, a Troy, Mich.-based division of **Ford**
Co. The units, which have been shipped and installed, are th
powerful of Burroughs' new generation of A Series comp
Roger Bisschop, Ford Tractor's supervisor of systems contr
the A 15s will replace four Burroughs B 7800 mainframes. T
systems will be involved in all the division's business oper
including accounting, engineering, communications, sal
manufacturing. Ford Tractor had plans to expand its co
room by 1,500 square feet, "but the A 15s made it poss
increase our processing power without increasing our floor s
Bisschop said.

The **National Cancer Institute,** Bethesda, Md., will install a C
MP/22 computer system from **Cray Research Inc.**, Minneap
the first quarter of next year. The system is valued at a
imately $8.3 million. It will be purchased from **Falcon S**
Inc., a Bethesda-based provider of systems integration se
The institute will use the system for complex bio-engineeri
molecular modeling in its cancer research. John A. Roll
chairman of Cray Research, said, "We have received ma
portant and exciting orders for Cray computer systems in th
but none has filled us with as much good feeling as this o
share with everyone the hope that the research efforts
National Cancer Institute will bear much fruit, and it
wonderful if a supercomputer can contribute to that."

The first customer shipment of Wilsonville, Ore.-based **Sc**
Computer Systems' SCS-40 mini supercomputer, valued at $5
will be donated to the newly established **San Diego Supercon**
Center, which is affiliated with a San Diego university.

E.I. Du Pont de Nemours & Co., the prime contractor f
Department of Energy at the Savannah River Plant, has se
Systems Control, Palo Alto, Calif., to provide a state-of-t
supervisory control and data acquisition system.

Adage Inc., Billerica, Mass., has sold 24 Adage CADstatio
Systems to **Grumman Aircraft Systems,** Bethpage, N.Y
Edgerly, manager of Grumman engineering and manufac
services, said the company decided on the $500,000 purchas
cause of its remote capability and price/performance, as
the fact that it's user-friendly." The system is to be installed
end of this month.

School Wins DEC Discount

DURHAM, N.H.—The University System of New Hampshire (USNH) has acquired an educational discount agreement from Digital Equipment Corp. under which it may purchase $16.2 million in hardware and software over the next three years, to link five campuses in Durham, Keene, Manchester, Plymouth and Lee.

Expected to be one of the most sophisticated integrated computer networks in higher education, it will surpass similar systems at most other educational institutions, the company said, and more than triple the university's existing computing capabilities.

Gordon Haaland, USNH president said both the university and Digital "stand to benefit enormously." The university will benefit by obtaining the equipment at the educational discount while DEC will have access to both courseware and software developed by the university on the equipment.

One DEC VAX 8600 has already been installed under the agree-

ment and two addition
will be installed before n
The discount covers pu
from across the DEC pro
and will also include Mi
IIs and VAXstation II
stations.

Two of the 8600s will ser
school's administrative
while the third will se
needs of the students and
Albert Shar, executive

LOOK AHEAD

OSI PICKS UP STEAM; ICL PAPER EMERGES

The Open Systems Interconnect (OSI) networking standards are garnering greater world attention. In the U.S., the Computer & Communications Industry Association (CCIA), Washington, D.C., has joined with 17 computer makers to form the Corporation for Open Systems, a nonprofit organization that will promote OSI standards in the U.S. and validate members' implementations of OSI protocols. IBM is being invited to join. Heading the group as acting chairman is NCR executive vice president Don Herman. Meanwhile, six major Japanese computer makers are forming a consortium to throw their weight behind OSI and establish stronger relations with the original European OSI movement.

Prompting much of this increased concern for OSI and IBM is a provocative, 25-page paper circulating among U.S., European, and Japanese computer companies. Reflecting a dissatisfaction among Europeans with IBM's 1984 agreement to provide certain product information earlier than usual, the paper, authored by an official at Britain's ICL, blasts IBM as abusing its market position in mainframes. By changing network interfaces, all of which depend on MVS, IBM could conceivably lock out all others from the marketplace, the paper argues. The paper concludes that unless its growing power is somehow checked, IBM will likely extend beyond the computer and related markets into service industries. "Steps have to be taken now to ensure that a free market for information products and services exists--the alternative will be a massive flight to protectionism," the paper says. Among the remedies proposed are mandatory use of OSI standards, a renewed investigation by the EEC into IBM's control over interfaces, "forced licensing" of monopolized software (as is done with certain drug formulas), and "the breaking up of IBM Europe to eliminate cross-subsidized growth." A quick survey of U.S. computer firms revealed no recognition of or reaction to the paper.

A NEW TANDEM TO CHECK OUT

Tandem Computers Inc., Cupertino, Calif., is readying its first ECL-based computer, sources claim. A new line-topping machine, code-named Check and utilizing Motorola 2800 ECL macro array technology, is said to exceed the performance of its existing TTL-based NonStop TXP family by 50%. Check is expected to be the first of a new ECL-based family to be called the EXP series. It is believed that the first Check machines began to trickle out to customer sites for beta testing last month, with first customer shipments to follow as early as March. Tandem declines to comment on the machine, but did confirm it is jointly developing 2800 ECL macro array technology with Motorola for inclusion in its transaction processing architecture.

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Further information can be obtained from Joel M. Lee, ALANET System Manager, ALA Headquarters Library, 50 E. Huron St., Chicago, IL 60611, (312)944-6780.

BRITISH LIBRARY TO EXPAND PIRATE PROJECT

The British Library (2 Sheraton St., London W1V 4BH, England, 01/636 1544) has announced it will expand its PIRATE (Public Information in Rural Areas: Technology Experiment) project over the next three years with funding of L209,000, provided jointly by the Library and the Development Commission.

During the last 18 months, PIRATE has enabled two public libraries in the Devon towns of South Molton and Honiton to build up databases of local, regional and county information covering housing, industry, commerce, transport and education. The data, which are mounted on Torch microcomputers, can be called up using touch-sensitive screens.

In the next phase a third rural center will be established in Devon. Microcomputers will be supplied to Exeter and Plymouth reference libraries, and all five sites will be linked in a network to allow exchange of information. One or two rural villages will also be provided with equipment that will enable them to become satellite users of the network and make information more readily available in remote rural areas. Technical experiments will be conducted to explore the possibility of using the PIRATE system on other makes of microcomputers, and the possibility of making PIRATE commercially available will be investigated. Links will also be developed between the PIRATE information centers and local schools with BBC microcomputers and with external databases.

The PIRATE database is on display in the Library Technology Centre, Polytechnic of Central London, 309 Regent St., London W1.

UTLAS ACQUIRES FOUR TANDEM COMPUTERS

UTLAS (80 Bloor St. W., Toronto, Ontario M5S 2V1, Canada, 416/923-0890) has acquired four Tandem TNS II computers to its system at a cost of $1.2 million.

The addition augments the UTLAS Catalogue Support System (CATSS) and supports its ongoing research and development activities. The four computers are being added to UTLAS' existing Tandem computer hardware.

"Tandem hardware has proven its ability to handle our highly complex and sophisticated applications. This addition to our system will enable us to move ahead quickly and efficiently with our development plans," according to Mel Duke, UTLAS operations manager.

The UTLAS system is the single largest Canadian Tandem database system and is the only Tandem library-related installation in Canada.

UTLAS Adds Directory of Canadian Film Producers, Distributors

UTLAS has also announced the addition of the National Film Board of Canada's Directory of Canadian Film Producers and Distributors to the UTLAS online system.The Directory contains information on over 3000 producers and distributors

Advanced Technical Libraries Jan 1986

LEVEL 1 - 4 OF 4 STORIES

The Magazine of Bank Administration

January, 1986

SECTION: SYSTEMS AND EQUIPMENT; Pg. 60

LENGTH: 147 words

HEADLINE: High-Performance Storage Products from Tandem

BODY:

Tandem Computers Inc. offers "XL8" disk storage facility and "5130/31" tape subsystem and new VLSI-based controllers for each. They join "GUARDIAN 90" operating system to enable customers to manage very large on-line data bases and improve transaction throughput.

XL8 stores large numbers of megabytes per square foot, requires no preventive maintenance and lowers ownership costs it is stated.

5130/31 tape subsystem complements high-performance disk storage subsystems by allowing users to archive data from disks faster and more efficiently. To increase operator productivity and improve data accuracy, it offers automatic tape threading, power windows, tape quality monitoring and auto cleaner. It also offers a new controller that enhances data integrity by incorporating high-density gate arrays to provide advanced error checking, fault detection and recovery.