

Q
Quantum

Q **Quantum**

October, 1985

This book is intended as a reference guide on Quantum Corporation and the Winchester disk drive market. For further information, contact Joseph T. Rodgers, Jr., Vice President, Finance and Treasurer, or Shirley Ann Stough, Manager, Corporate Communications

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BACKGROUND

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QUANTUM CORPORATION
Corporate Background
October, 1985

Overview

Quantum Corporation, Milpitas, California, was founded in February, 1980. The Company designs, manufactures and markets rigid disk drives based on Winchester technology which are sold to Original Equipment Manufacturers (OEMs) as mass storage units for microcomputer-based systems.

Quantum sells directly to major OEMs through a dedicated sales force located in key high technology areas of the United States. In 1984, a sales and service operation for Europe was established in Frankfurt, West Germany. Service for the Company's disk drives is also provided at the Company's headquarters in Milpitas, the Eastern Regional office in Salem, New Hampshire, and in England through an independent repair center. Quantum's products are distributed in the United States and Canada by Arrow Electronics, Inc., and in other major countries by independent distributors.

Products are initially manufactured in Milpitas. When the production process and the product have matured, manufacturing is transferred to the Company's wholly-owned subsidiary, Quantum Caribe, Inc., in Ponce, Puerto Rico.

In November, 1983, Quantum incorporated a majority-owned subsidiary, Plus Development Corporation, to design and market PC enhancement products to end users. Plus distributes its products through retail outlets, distributors and value-added resellers. In addition, Plus has an account management team to coordinate high volume sales to Fortune 1,000 end user companies.

OEM Products

Quantum's first products, the Q2000 Series® of 8-inch disk drives, were introduced in September, 1980. The products were designed to be a low-cost upgrade for low-capacity 8-inch disk drives (specifically, the Shugart SA1000), or a replacement for 8-inch floppy disk drives. The Q2000 Series was offered in unformatted capacities of 10-, 20-, 30-, and 40-megabytes.

In designing the Q2000 Series, Quantum combined key features of high-capacity, high-performance 14-inch drives with low-cost elements of stepper motor-based floppy and rigid disk drives. The resulting Q2000 Series was an innovative approach to achieving higher capacity and performance at a low manufacturing cost. Most notable is the Q2000 Series' read/write head positioning system, patented by Quantum in 1983. The system incorporates a rotary moving coil actuator for rapid access to data stored on the disks, an optical encoder for coarse positioning and a temperature-compensating wedge servo scheme for precise positioning.

In November, 1982, Quantum announced the Q2080®, an 85-megabyte (unformatted) 8-inch disk drive.

Since April, 1981, Quantum has shipped over 120,000 Q2000 Series disk drives to companies such as Wang, Nixdorf, Siemens, Convergent Technologies, Altos Computer Systems, and Xerox.

In November, 1982, Quantum introduced the Q500 Series® of full-height, 5 1/4-inch Winchester disk drives in capacities of 20-, 30-, and 40-megabytes (unformatted). The Q500 Series is based on the same proven technologies as the Q2000 Series. In the first year of production, the Q500 had captured approximately 25 percent market share.

Quantum has shipped over 100,000 Q500 Series disk drives since June, 1983, retaining most of its Q2000 Series OEM customers. In addition, new customers, such as Digital Equipment Corporation and Alpha Microsystems, were added to Quantum's prestigious customer list.

Quantum's third generation of products, the Q200 Seriestm was announced in April, 1985 for delivery in early 1986. The Q200 is a half-high 5 1/4-inch Winchester disk drive with an integrated disk drive controller, and is offered in formatted capacities of 53- and 80-megabytes.

A major advancement in disk drive performance and functionality, the Q200 Series incorporates the Small Computer Systems Interface (SCSI) and an integrated drive controller. These features allow the Q200 to manage disk media defects, and to perform various routine functions normally handled by the host computer, thereby freeing the host to perform more user-oriented tasks. The use of large-scale integrated (LSI) electronics allows Quantum to produce highly reliable, low cost drives with significantly higher manufacturing yields than traditional drive designs.

End User Products

In June, 1985, Plus Development Corporation unveiled its first product--a 10-megabyte (formatted) hard disk drive subsystem on a plug-in card. Called Hardcardtm, this product allows end users to quickly and easily upgrade IBM PCs and PC-compatible computers for hard disk storage. Hardcard can be installed in a PC with two floppy disk drives to effectively upgrade an IBM PC to the capabilities of a PC XT without giving up one of the floppies. A Hardcard installed in a PC XT with a hard disk drive gives the user an additional 10-megabytes of mass storage.

Hardcard incorporates a 3 1/2-inch oxide disk, LSI circuitry, and some of the same proven technologies from Quantum's products, to provide a complete hard disk subsystem that plugs into an IBM PC expansion card slot.

To quickly achieve high volume and reliability in the manufacture of Hardcard, Plus entered into a manufacturing agreement with Matsushita Kotobuki Electronic Industries, Inc. (MKE), Shikoku, Japan. MKE is a world-class manufacturer of electro-mechanical devices for the consumer market.

Markets

Since Quantum's founding in 1980, the company's products have been targeted for the multi-user, small systems market; that is, business and commercial systems for two to eight users. The new Q200 Series products will provide a capacity upgrade for those systems, as well as opening the larger multi-user systems market (8-16 users), and markets that requires higher capacities and performance, such as advanced graphics, engineering workstations, and file servers for local area networks.

With the formation of Plus, the Company's market penetration now encompasses the single-user, personal computer segment. Hardcard is targeted for sale to the 2.5 million users of IBM PCs and PC-compatibles who have purchased their systems with floppy disk drives only. There is an additional installed base of 900,000 PCs and compatibles which could benefit from Hardcard's additional 10-megabytes of mass storage.

Financial Position

Quantum Corporation has steadily and consistently grown since its inception. The company made its initial public offering in December, 1982 at \$20.50 per share, raising \$32 million. There is no debt.

There are approximately 9.5 million shares of common stock outstanding. Institutional holdings by 45 organizations represent approximately 50% of outstanding shares.

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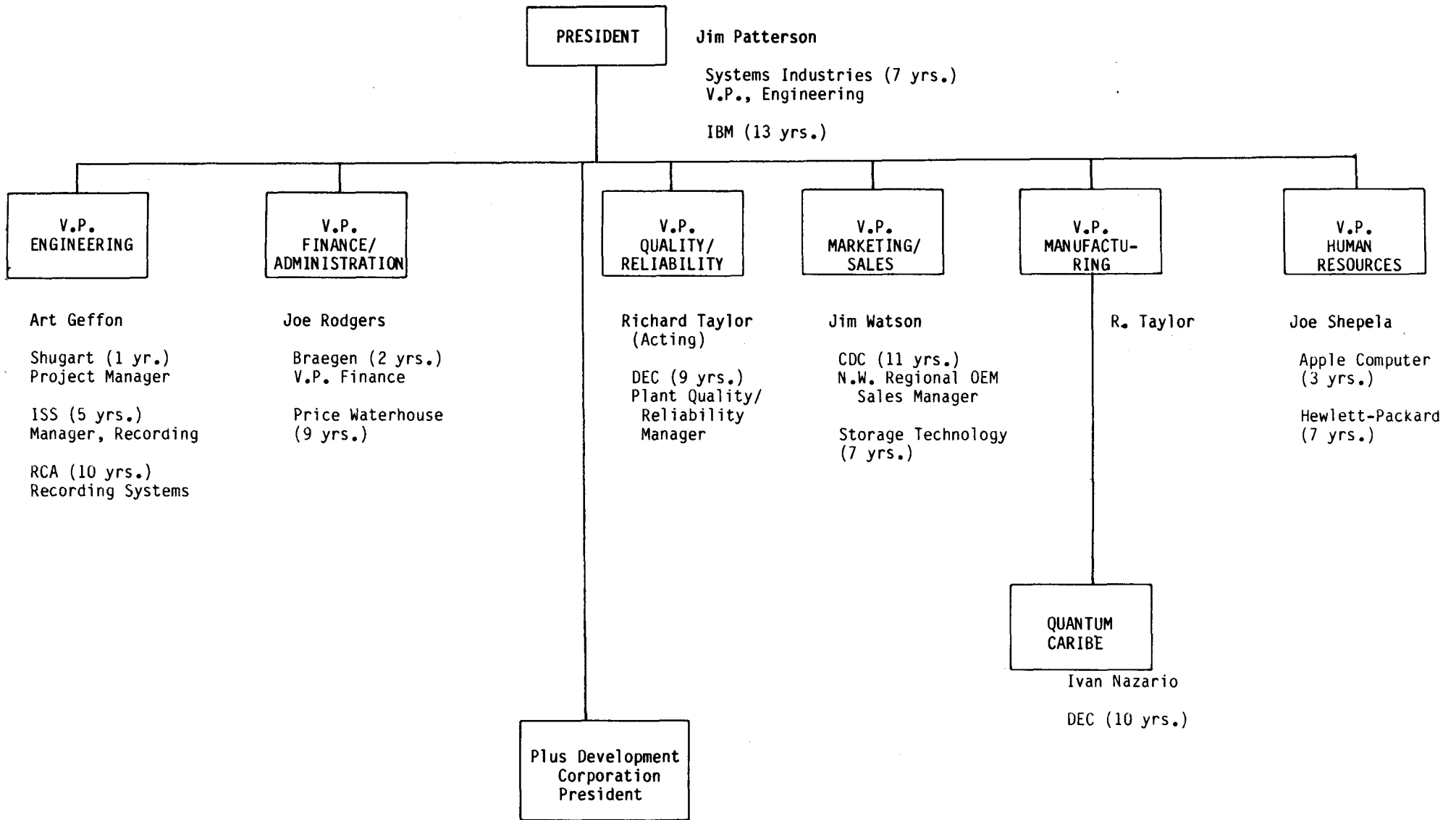
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QUANTUM CORPORATION ORGANIZATION CHART
October, 1985



QUANTUM CORPORATION
Management Profiles

James L. Patterson

President, Chief Executive
Officer

A founder of Quantum, Mr. Patterson has been a director of the company since its inception in February, 1980. He currently serves as Chairman of the Northern California Council of the American Electronics Association. From August 1979 to February 1980, Mr. Patterson was self-employed as a technical and marketing consultant. Prior to August 1979, he served for six years as Vice President, Engineering, of Systems Industries, Inc., a manufacturer of computer peripheral equipment. He spent three years at Memorex as Director of Product Development for communications products and Director of Business Planning for disk drive and microfilm products. Prior to that time, Mr. Patterson held various engineering and management positions at IBM.

Joseph T. Rodgers, Jr.

Vice President, Finance
Secretary and Treasurer

Mr. Rodgers joined the company in December 1980 as Vice President, Finance and was elected Secretary in May 1981 and Treasurer in September 1981. From July 1979 to December 1980, he served as Vice President, Finance of Braegen Corporation, a manufacturer of computer peripheral equipment. From September 1978 to July 1979, he served as Assistant Vice President, Finance of Plantronics Corporation, a manufacturer of telecommunications equipment. Prior to that time, Mr. Rodgers was employed by Consolidated Video Systems, a manufacturer of broadcast equipment, as its Vice President, Finance. He also has over nine years' experience at Price Waterhouse, last serving as an audit manager.

James G. Watson

Vice President, Sales and
Marketing

Mr. Watson joined Quantum in October 1982 as Director of Sales. He was appointed Vice President, Marketing and Sales in February 1984. Prior to joining the company, Mr. Watson was Northwestern Regional Manager of OEM Peripheral Sales for Control Data Corporation. Previous experience includes seven years in sales and marketing with Storage Technology Corporation.

Arthur P. Geffon

Vice President, Engineering

Mr. Geffon joined Quantum in June 1980 as Manager, Recording Systems. In February 1984, he was promoted to Vice President, Engineering. Previously, Mr. Geffon served at Shugart Associates as Project Manager for the SA850 floppy disk drive program. Other experience includes five years with ISS and ten years with RCA in recording systems engineering.

Richard P. Taylor

Vice President, Manufacturing

Mr. Taylor joined Quantum in June 1983 as Vice President, Quality and Reliability. He was named Vice President, Manufacturing in February 1984. Prior to joining Quantum, he served for seven years with Digital Equipment

Corporation, most recently as Manager, Quality and Reliability at DEC's Colorado Springs disk drive facility. He has also held various quality and reliability management positions in DEC's storage systems manufacturing, corporate quality assurance and corporate component engineering groups.

Joseph C. Shepela

Vice President, Human Resources

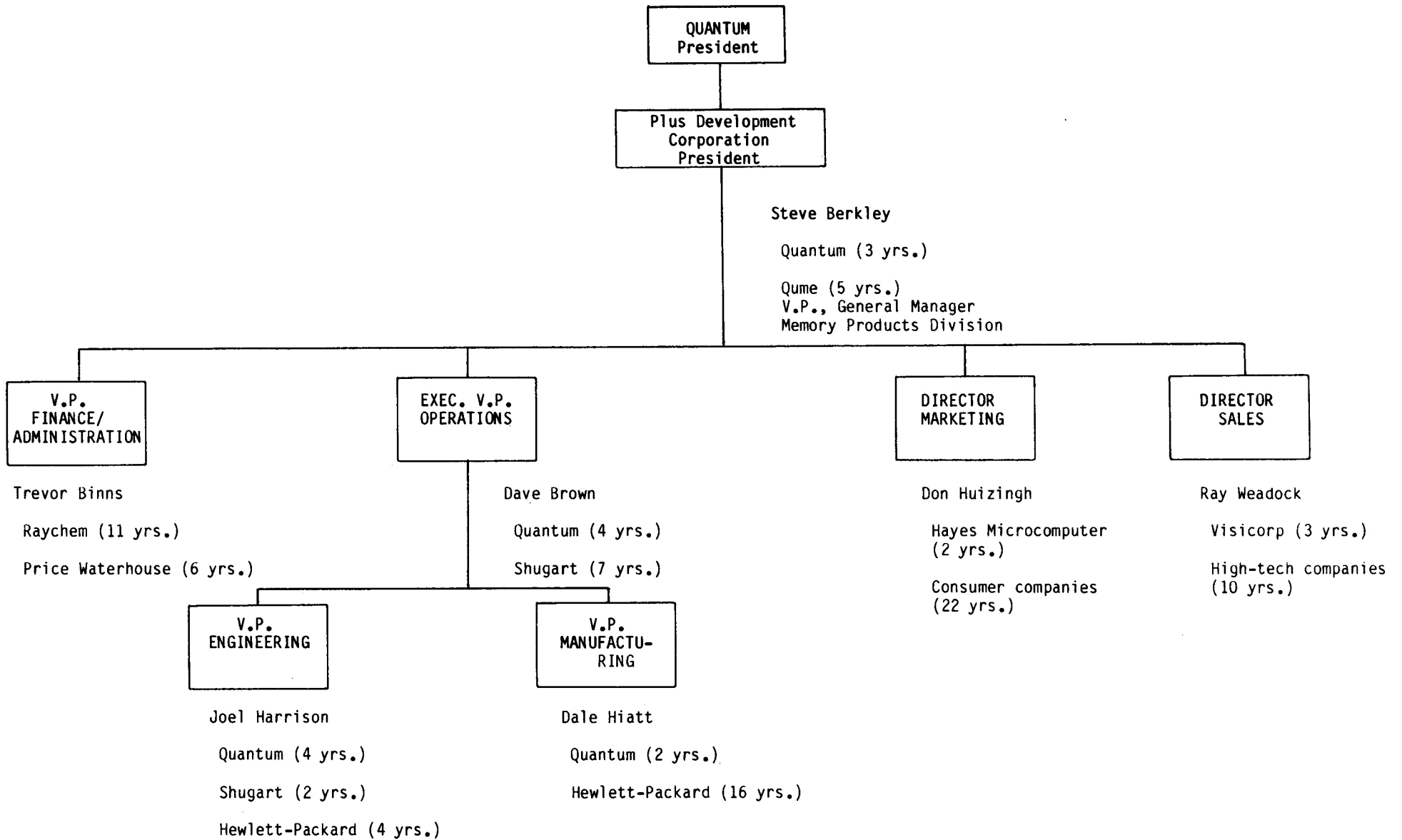
Mr. Shepela joined Quantum in December 1984. Previously, he served as Senior Human Resources Manager for Apple Computer, Inc.'s corporate administrative departments, and has held various other Human Resources management positions with Apple. He also served for seven years in similar capacities with Hewlett-Packard.

Ivan Narazio

Vice President and General
Manager, Quantum Caribe, Inc.

Mr. Nazario joined Quantum in September 1983 as General Manager of Quantum Caribe, Inc. He was promoted to Vice President in June 1984. Prior to joining Quantum, Mr. Nazario served ten years with Digital Equipment Corporation, most recently as Area Resources Manager for the establishment of a Digital manufacturing operation in Mexico.

PLUS DEVELOPMENT CORPORATION ORGANIZATION CHART
October, 1985



Donald J. Huizingh

Director of Marketing

Don Huizingh joined Plus as Director of Marketing in April, 1984. He was previously employed by Hayes Microcomputer Products, Inc., a manufacturer of data communications products for personal computers, as Director of Marketing and Sales from July, 1982 to February, 1984. Prior to that time, Mr. Huizingh held various marketing management positions with technically-oriented consumer products companies and oil companies for twenty-two years.

Raymond L. Weadock

Director of Sales

Ray Weadock joined Plus as Director of Sales in August, 1984. He was previously employed by Visicorp from July, 1981 to June, 1984, last serving as National Sales Manager. Prior to that time, Mr. Weadock held various sales management positions with high-technology companies for ten years.

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QUANTUM FINANCIAL SUMMARY
(\$ Millions Except Per-Share Amounts)

Fiscal Year	Revenue	Net Income (Loss)	Earnings (Losses) Per Share
1982			
1Q	\$.4	\$ (.9)	\$ (.49)
2Q	2.1	(.2)	(.10)
3Q	3.3	(.4)	(.21)
4Q	7.9	1.6	.24
Year End	\$ 13.7	\$.2	\$.03
1983			
1Q	\$ 8.7	\$ 2.1*	\$.28*
2Q	10.0	1.6	.21
3Q	11.3	1.9	.23
4Q	11.9	2.2	.24
Year End	\$ 41.8	\$ 7.8	\$.96
1984			
1Q	\$ 12.5	\$ 2.1	\$.22
2Q	15.1	2.5	.26
3Q	17.5	2.9	.30
4Q	21.9	3.2	.34
Year End	\$ 67.0	\$ 10.7	\$ 1.12
1985			
1Q	\$ 25.4	\$ 4.3	\$.45
2Q	30.1	4.7	.49
3Q	31.8	5.9	.62
4Q	33.1	6.1	.63
Year End	\$120.4	\$ 21.0	\$ 2.19
1986			
1Q	\$ 34.0	\$ 5.7	\$.60

*Includes extraordinary credit of \$814,000 or \$.10 per share for tax benefit of loss carryforwards.

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SUMMARY OF FORECASTS BY FINANCIAL ANALYSTS

(\$ Millions Except per Share Amounts)

<u>Firm</u>	<u>Analyst</u>	<u>Report Dated</u>	<u>Year Ending March 31</u>			
			<u>1986</u>		<u>1987</u>	
			<u>Sales</u>	<u>Earnings Per Share</u>	<u>Sales</u>	<u>Earnings Per Share</u>
Adams, Harkness & Hill	Oakes Spalding		\$140	\$2.20	\$185	\$2.90
Donaldson, Lufkin & Jenrette	Tom Rooney	8/29/85	147	2.20-2.25	220	3.50
Drexel, Burnham, Lambert	Jean Orr	9/24/85	135	2.05		
Janney Montgomery Scott	Jim Meyer		155-165	2.30	225-250	3.35
Kidder, Peabody	Bill Easterbrook	8/22/85	130	2.10	170	2.80
Laidlaw, Adams & Tek	Mark Obenzinger			2.25		
Morgan Stanley	David Moy	9/13/85	142.5	2.20		3.50
Robertson, Colman & Stephens	Blake Downing	8/29/85	147.0	2.20	229.5	3.45
Shearson/American Express	Jim Stone			2.00		2.00
Standard & Poors	Lisa Kildahl	9/09/85		2.10		
S G Warburg, Rowe & Pitman, Akroyd	Paul Evans	8/26/85	148.7	2.25	195.6	2.85
Wertheim & Co.	Harvey Allison			2.40		

Donaldson, Lufkin & Jenrette

Donaldson, Lufkin & Jenrette Securities Corporation • 140 Broadway, New York, N.Y. 10005 • (212) 504-3000

Research Bulletin

Thomas T. Rooney

August 29, 1985

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SPII: 209.89

QUANTUM CORPORATION (QNTM-23)*

Reemphasis of Recommendation

52-Week Range	Earnings Per Share			P/E Ratio		Dividend
	1985	1986E	1987E	1986E	1987E	
31-16	\$2.19	\$2.20-2.25	\$3.50	10.3	6.6	Nil

Shares outstanding: 9.6 million

Market capitalization: \$221 million

Note: Fiscal year ends March of the following year.

We are highlighting our recommendation of Quantum because the risk of a difficult second quarter (September) and third quarter (December) is now well known, quantifiable, and, in our opinion, discounted, while the potential for accelerating earnings over 1986-87 is not. The potential for weakness has overhung the stock for some time because of the generally soft demand in the industry and the transition that the company has been in while developing new products.

We base our emphasis of Quantum on the following:

1. The risk engendered by new products is largely behind Quantum, with the first of the new products ("Hardcard") slated for volume shipment late in September. The new products represent incremental revenue for Quantum, taking the company above and below its traditional market (the mid-range 20-40 megabytes).
2. We believe that the major element in the company's second-quarter shortfall--delayed orders from DEC--is a short-term macro phenomenon that should be corrected through normal inventory workdown over the next 90 days. DEC represented 15% of fiscal 1985 revenues and better than 20% of first-quarter 1986 as DEC ramped for the new MicroVAX II. About 65-70% of the drives go into the older, economically sensitive PDP-11 line and the other 30-35% into the MicroVAX. Inventory adjustment will result from continued growth in MicroVAX II shipments, or firming in PDP orders, or both.

*DONALDSON, LUFKIN & JENRETTE SECURITIES CORPORATION MAKES A MARKET IN THIS SECURITY AND HAS PERIODIC POSITIONS IN THIS SECURITY IN CONNECTION WITH THIS ACTIVITY.

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Additional information is available upon request

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3. Quantum represents one of the most leveraged, yet diversified, plays in the computer industry. It enjoys cyclical exposure from the OEM nature of its business, its broad customer base (DEC, Wang, Nixdorf), and new product thrust. We expect a cyclical pickup in the second half of 1985. At the same time, it possesses the disinflationary characteristics of rising unit growth and high return on operating assets. In fact, Quantum's return on operating assets is the highest in our group at nearly 70%.
4. We believe that the company may, on any weakness, enact an open-market stock-purchase program to satisfy option commitments. It would represent only a marginal investment for the company because most of the options are exercisable at \$17 or higher and comes at a time when Quantum is generating a sizable positive operating cash flow. Cash and marketables totaled \$52 million as of June 30.

We estimate flat earnings for fiscal 1986 (March) of \$2.20-2.25 per share (\$2.19 in fiscal 1985), with down comparisons in both September and December. The September quarter should post earnings of \$0.35-0.40 per share versus \$0.49, while December should come in at \$0.50-0.55 versus \$0.62. With the full effect of new products expected in the March quarter, earnings momentum should return and carry through calendar 1986-87. Our fiscal 1987 estimate is \$3.50.

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EMERGING GROWTH

August 19, 1985

QUANTUM
(QNTM - OTC)

Recent Price	52-Week Price Range	Div	Yield	Earnings Per Share			Price/Earnings	
				1985A	1986E	1987E	1986E	1987E
22	30 - 16	--	--	\$2.19	\$2.20	\$3.50	10.0	6.3

Common Stock: 9.6-million shares outstanding

DIGITAL EQUIPMENT CUTS ORDERS; ESTIMATES REDUCED

Digital Equipment has cut its orders for Quantum disk drives for the September quarter, primarily for inventory reasons. We have therefore reduced our estimates for Quantum for that interval from \$32-million in revenues and \$0.50 in per share earnings to \$28-million and \$0.38, respectively. Our full-year forecasts (fiscal year ends in March 1986) are now \$142.5-million in sales and \$2.20 in profits, down from \$153-million and \$2.55 per share, respectively. Our fiscal 1987 projection remains at \$3.50, however, and, in view of the modest valuation on the stock, this analyst continues to consider Quantum attractive for purchase.

The computer manufacturer indicated that end-demand for its Micro PDP-11, MicroVax, and Rainbow systems is strong, in aggregate. No "significant" shift in market share has occurred between Quantum and Micropolis in sales of disk drives for the MicroVax II, although the latter firm suggests that it has made some gains.

Digital Equipment emphasized a strong desire to fulfill a three-year-old goal of improving inventory turnover and suggested that, this year, the ratio could rise from the 2.1 of prior years to about 2.3. Such an improvement implies a reduction in buffer stocks and may thus have positive as well as negative consequences. Should demand for the microprocessor-based, low-end programs exceed Digital's estimate, the computer manufacturer may have to increase orders to both of its suppliers immediately.

We believe most original-equipment-manufacturer (OEM) and virtually all the larger, multi-user, end-user MicroVax configurations will incorporate the high-capacity Micropolis product. Single-user/very-small-multi-user configurations and expansions, however, are likely to

employ a mix of Quantum and Micropolis drives, and the split could well be in Quantum's favor. In our opinion, the Micro-PDP-11 will continue to be the most important of Digital's programs for Quantum, although, if the MicroVax II is as successful as some anticipate, Digital Equipment could once again account for 20% to 25% of Quantum's revenues (versus our estimate of under 11% in the September quarter).

David K. Moy
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Within the last three years, Morgan Stanley & Co. Incorporated co-managed a public offering of the securities of Quantum.

Morgan Stanley & Co. Incorporated makes a market in the securities of Quantum.

Morgan Stanley & Co. Incorporated has a trading position and holds options in the securities of Digital Equipment.

Additional information on recommended securities is available on request.

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