



# OFF THE DISK

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## ISO 9000: Global Certification Is Quantum's Target for 1995

**Q**uantum locations around the world made progress toward company-wide ISO 9000 certification in recent months, as employees worked to make ISO quality standards the way Quantum does business (see box on Page 2).

In September last year, Rocky Mountain Magnetics achieved its first certification to ISO standards, meeting the new, more stringent requirements that were instituted in 1994.

The new rules have changed the certification focus from part and product quality to process and systems quality and effectiveness.

As *Off the Disk* goes to press, The Dundalk, Ireland, facility is undergoing its fourth surveillance audit since achieving certification in 1993. While no one in Ireland was treating the occasion as a nonevent, neither were there any extraordinary efforts to change or improve systems during the audit. That's as it should be, says Jim Tobin, ISO program manager for Ireland.

"There's always heightened awareness before and during an audit," he says. "But we don't want the auditors to see anything other than what we do normally."



Targeting worldwide certification... Milpitas is ISO9001 certified for design, build, inspect and test. Here, Crispin Amores loads a Grand Prix drive into a Drive System Test chamber.

### International standards

Although first adopted by the European Economic Community (EEC), ISO quality standards have gained acceptance as the

standard for manufacturing and business practices worldwide.

Quantum's goal is to have all of its facilities, worldwide, ISO 9000 certified by

the end of 1995. Salma Abbasi, corporate strategic quality systems engineering manager, is leading the cross-functional team charged with making that happen. Certification across the board is critical to Quantum's success for a number of reasons, she says.

"ISO certification is important to our customers. It gives them a sense of comfort in our quality systems," she says. In fact, certification to ISO standards has become common enough in the computer industry that it is no longer a differentiator, but a necessity in the marketplace. But there are other reasons for maintaining certification as well.

"The certification process establishes a baseline that allows us to continuously measure and improve the effectiveness of our business practices," she maintains. "As our business needs change, a baseline helps

*Continued on Page 2*

### We're standing at the threshold

## Quantum: The Next Generation

By Bill Miller  
Chairman and Chief Executive Officer

**A**s you peruse this special edition of *Off The Disk*, you'll get a sense of Quantum's evolution during the past 15 years. In some ways, we've changed dramatically. For example, we no longer occupy the two-room office where at one time (*a long time ago*) we cleaned the bathroom in exchange for rent.



And, we no longer manufacture the 8-inch drives that marked Quantum's entrée into the mass storage market.

However, in other ways, this is the same Quantum it's always been. The qualities that made Quantum unique in its infancy still exist. When you read the interviews with our founders and others who have shaped our company and created our culture, you'll see much of the same initiative, team spirit, innovation and drive that characterize our employees today.

You'll see the commitment, focus and trust that initially created — and have since helped maintain — relationships with our customers. In 1987, our decision to pursue a 3 1/2-inch form factor drive was perceived by outsiders as a gamble. We know that it was simply Quantum understanding and meeting its customers' needs.

You'll read about risk-taking and thoughtful decision-making that made our founders — and many since them — confident that Quantum could be different . . . and better. In 1984, Quantum carved its own path by creating a partnership with MKE to emphasize process engineering and automation to achieve unmatched quality and consistency.

Quantum was and is successful because we invariably have offered a difference. These are the very same differences that have enabled our employees to achieve what few others have at any time in industrial history, let alone in 15 years.

Let's put those achievements in perspective. In 1980, our six founders incorporated Quantum and delivered pre-production models of the first product to potential customers. In December 1993, we shipped our 25 millionth drive. And this calendar year, we will surpass 50 million drives shipped.

But sheer volume is only part of the picture. In fiscal year 1982, sales were \$13.7 million and by fiscal year 1990, that figure had grown to more than \$877.7 million. Last quarter alone, we booked revenue of nearly \$1 billion.

Our once two-room operation now spans the globe, and we occupy more than 2.3 million square feet of real estate worldwide. The hopes and dreams of the original six engineers — and now more than 7,500 employees — have turned Quantum into a well-respected leader in one of the world's fastest-paced, most exciting industries.

As we stand on the threshold of our next 15 years, we have the opportunity to decide what we want to make Quantum in the future: It is rich with opportunities and ours for the taking. As we make decisions about the kind of company we want Quantum to be, we have to remember that Quantum's past successes are largely a result of its uniqueness. Our future will depend on whether we can build on our history to create the next generation of uniquely valuable Quantum products and services. ☐

Special  
15th  
Anniversary  
Section

Inside

Jim Patterson



1979

**QUANTUMTIME**

**October:** Six engineers begin meeting informally after work. All independent thinkers, they want to build disk drives but can hardly agree on anything else.

**WORLDTIME**

• IBM introduces the first 8-inch disk drive.

1980

**QUANTUMTIME**

**February:** Lengthy debate about company name ends when Marketing VP picks it off list at Sacramento registration office.

**February 20:** Quantum Corporation incorporated by its six founders. We're in business!

**March:** Founder team goes to work in cramped quarters shared with helicopter avionics company in San Jose. Quantum team serves as restroom janitors in exchange for rent.

**June:** Quantum moves manufacturing and R&D into larger quarters at 2150 Bering Drive, San Jose. Develops exclusive "clean tunnel" manufacturing line to dramatically lower costs.

**September:** Pre-production model of first product — the Q2000 8-inch hard drive — delivered to potential customers. Innovative unit weighs in at hefty 16 pounds.

**WORLDTIME**

• Seagate markets first 5 1/4-inch hard drive.  
• Mt. St. Helens blows its top.  
• First giant panda born in captivity (Mexico).  
• NBA adopts three-point shot.

**QUANTUM LEAP!**

What will Quantum be doing 15 years from today? On the following pages, find out the answers from employees who took the leap.

# Quantum: A Story of Firsts

## 1st office **Knock, knock**

By February 1980, the founding team had incorporated Quantum. Harrison, Brown, Daniels and McCoy quit their jobs at Shugart and joined Medley and Patterson at the two-room office in San Jose.

The six divided into two groups. Patterson and McCoy went to work on the business plan and venture capital funding while Brown, Daniels and Harrison focused on designing the drive. Medley floated between the two groups, and with his strong manufacturing background, helped assure the emerging product could be made efficiently.

Working in two rooms separated by one wall and sharing a single phone line, the group came up with "the simplest paging system in the world," Harrison remembers. "We just knocked on the wall, and each of us was assigned from one to six knocks. When the phone rang and it wasn't for you, you'd just knock on the wall the appropriate number of times. Jim Patterson as president of the company got most of the calls, so he was one knock. I didn't get many, so I was six."

## 1st computer **Invasion of the aliens**

Patterson brought from home his Apple II computer for Harrison and others to use in working through some of the mathematical equations related to designing the drive. It was a mixed blessing.

"Before then, none of us had really had our hands on a personal computer, Harrison remembers. "Every time we took a break, we'd end up playing Space

Invaders on the darn thing. Fooling with that game probably set us back a week."

The grand champion of Space Invaders turned out to be David Brown, who went on to become Quantum's president, chief operating officer and vice chairman.

## 1st technology **Capacity at a quarter of the price**

A radically different head-positioning technology, developed by Harrison, Brown and Daniels, was to become the pivotal advantage separating Quantum's new product from the nearly 30 other 8-inch hard drives on the market in the early '80s. Patented as the Masked Data Servo System, Quantum's technology was simpler and less capital-intensive than the stepper motor technology other manufacturers were using.

The key to the company's new approach was an optical encoder, which eliminated the need for servo-writers on the production line as well as stepper motors in the drives. The encoder — consisting of a scribed glass scale, an LED and a receiver — positioned the head over the proper track. The head stayed on track with the help of track-location data placed on a dedicated wedge of the disk.

Don Daniels, the electronics expert on the founding team, was responsible for the electronic design of the prototype unit. When the time came to assemble the

first units, Daniels rounded up the necessary circuit boards, then took them to his garage workshop in the evenings, where he and his children plugged in the components and soldered connections.

The innovative technology boosted capacity on the same size disk — from 10 to 40 megabytes on Quantum's first family of drives — and provided faster head-positioning time.

These features, combined with a highly efficient manufacturing method, meant Quantum could offer a 40-megabyte drive for the same price that competitors were selling their 10 MB units.

Quantum's "poor man's servo," as Brown refers to it, continued to be a core part of the company's technology for more than a decade. Miniaturized and blended with other innovations over the years, its staying power was nothing short of amazing in an industry of constant change.

## QUANTUM'S FIRST TEAM



David Brown — Engineering



Harold Medley — Manufacturing



Don Daniels — Electronics Design



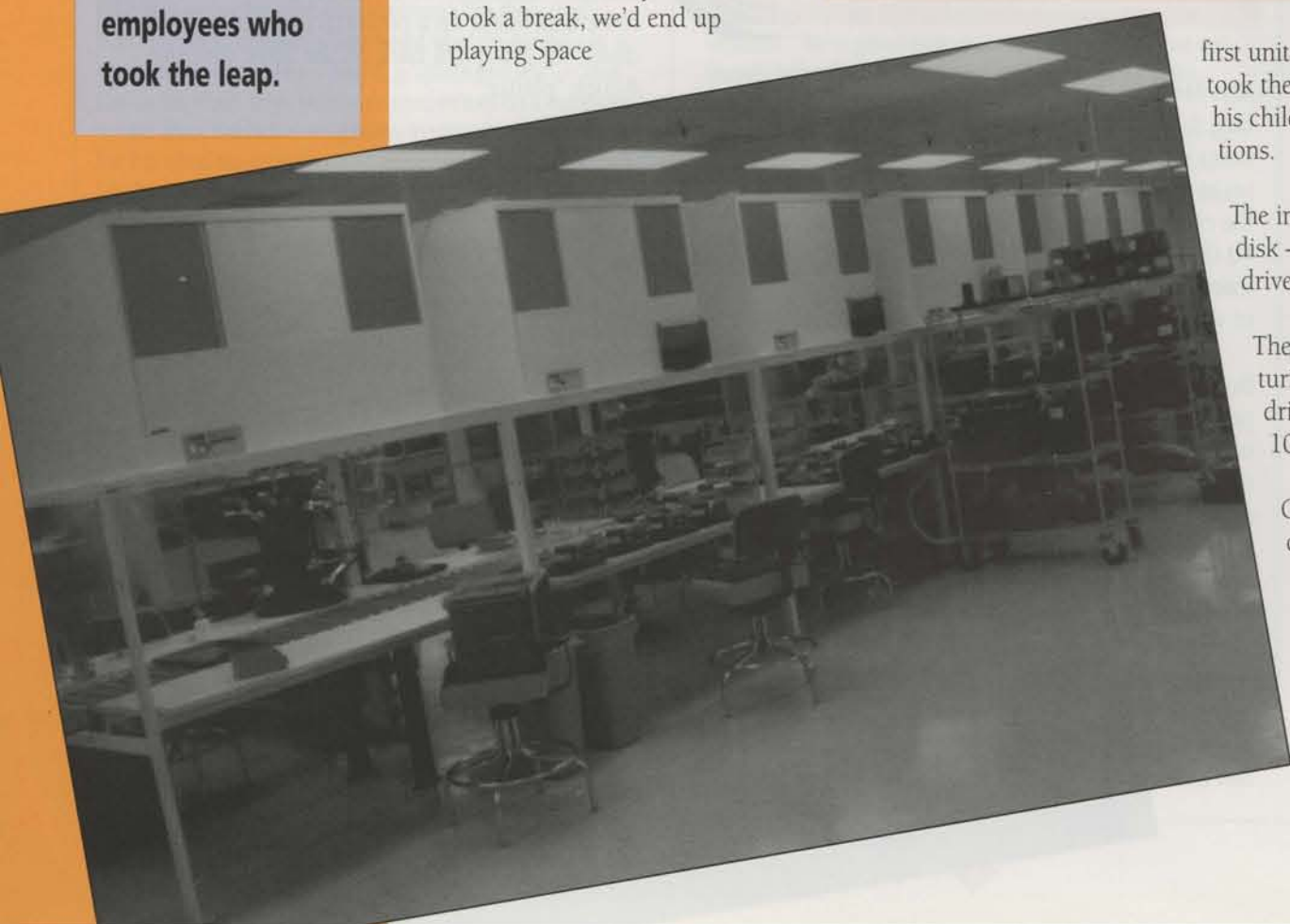
Jim McCoy — Marketing



Joel Harrison — Drive Design



Jim Patterson — President



Quantum's first "clean tunnel" production line was simply standard clean benches set side by side with a roller conveyor down the middle.



# "Quantum is the company to watch."

—Jim Porter  
President, Disk/Trends  
November, 1981

## 1st financing

### Can you spare \$3 million?

The initial money for the new company came right out of the pockets of the founders, none of whom had a great deal to spare. However, it was enough to pay the phone bill and buy parts and some basic lab equipment.

But the need for big money was just around the corner. By March 1980, the prototype drive was finished and the business plan was ready to shop to Bay Area venture capitalists. The objective was to raise the \$3 million required to get pre-production drives built and out to prospective customers for evaluation.

Harrison remembers the initial self-confidence of the team as they began to call on potential sponsors. "We thought we had a well-balanced team, but what these venture capitalists saw were six engineers trying to act like businessmen."

Despite their financial inexperience, the founders' technical credentials and the strength of the product concept won the day. By June 1980, five venture capital groups had provided the critical \$3 million. The team popped a bottle of champagne in David Brown's family room. Quantum Corporation was on its way.

## 1st production line

### Short and sweet

With initial financing in place, Quantum in June 1980 moved into a larger location at 2150 Bering Drive, San Jose. The team starting hiring its first employees, who had been interviewed during the previous three months. The design group continued to refine the prototype while Medley laid out the first manufacturing line.

Like the drive itself, Quantum's first small production line also was different from anything else in the industry. Because of critical head-to-disk tolerances (which are many times narrower today) other manufacturers had to jam their production lines



Working in cramped quarters, Quantum's first employees spent a lot of time getting the bugs out of early production drives.

into clean rooms costing millions of dollars. Medley came up with an economical alternative that served the company well for nearly the next 10 years.

His "clean tunnel" concept was simply a line of standard clean benches placed head-to-head with a roller conveyor down the middle. A "river" of clean air from above flowed over the benches and out underneath clear vinyl curtains which hung along each side of the line. Assemblers worked inside the tunnel, and the positive air flow from inside kept particles from creeping into the drive mechanism.

With the optical encoder and clean tunnel manufacturing, "Quantum was on the leading edge of creating products that were really manufacturable," observes Brown. "You have to remember that back in the early '80s, people could barely design disk drives, let alone manufacture them and have them perform reliably in the field. Quantum was a leader in getting them out the door and having satisfied customers in the field."

## Why We Call It Quantum

**Q**UANTUM. The name seems so right for a company which from its very beginning aimed to leap ahead of its competitors. In reality, however, the company came very close to being called something else and ended up with the name Quantum by mere chance.

Harold Medley recalls a Christmas party in December 1979 where the name of the yet-to-be-formed company was the focus of discussion. The six founders and their spouses all gathered for the big decision.

"A few weeks earlier I had suggested Spindata, and everybody just about threw up over it," says Medley. With incorporation just around the corner and time running out, Medley suggested that everyone bring their favorite names to the Christmas Party.

Following a big meal, a flip

chart was placed at the front of the room. Soon the chart was covered with possibilities.

"Polara was one of the names we discussed a lot," says David Brown, Quantum's first engineering vice president. "But there was a losing Dodge with the same name at the time, and we didn't want to be associated with that."

"In the end, nobody liked anybody else's ideas on what the company's name should be," says Medley. "They were a stubborn bunch."

As the party dissolved into the late evening, the group pointed to marketer Jim McCoy. Medley recalls, "We told Jim, it's a marketing problem. Take care of it."

The group gave McCoy some guidelines. "We wanted a name that would go well in a sentence," says Brown, "so we could go to customers and ask them, 'How is your \_\_\_ disk drive

doing?'" Medley insisted that the name be easy to remember, spell and pronounce. "And I didn't like initials, like IBM."

A few days later, McCoy came back with his recommendation: Data Plus. The group agreed, and McCoy headed to Sacramento to register the name with the State of California. There, after all the effort, he found that Data Plus already had been taken by another corporation.

Not wanting to return empty-handed, McCoy started running through a list of names that had been released by other companies. Down among the Q's, he discovered Quantum.

On the spur of the moment, McCoy snapped up the name. Six guys with no product to show, no money to speak of, no telephone number or office address, but with a big idea suddenly became Quantum Corporation.



Quantum's original logo was used on David Brown's business card.

## 1981

### QUANTUMTIME

**January:** Full-scale marketing efforts begin to OEMs. Altos is first major customer, followed by Nixdorf, Wang and others. Top-of-the-line 40 MB unit goes for \$2,450.

**March:** Lousy quality control from vendor causes failures of optical encoders. "Shake 'n bake" test devised to weed out problem-prone components. Gosh, it's loud in here!

**May:** New drive gets infamous life-test evaluation in men's room. Gosh, it's hot in here!

**June:** Expanding demand for the Q2000 pushes Quantum into bigger facilities at 1804 McCarthy Blvd. in Milpitas with 85 employees.

### WORLDTIME

- Twenty-eight other companies making 8-inch hard drives.
- IBM launches the personal computer.
- First female judge named to Supreme Court.
- Movie-goers find Raiders of the Lost Ark.

## 1982

### QUANTUMTIME

**March:** Yes! The 10,000th drive leaves the plant and the company wraps up the fiscal year with profits of \$186,000.

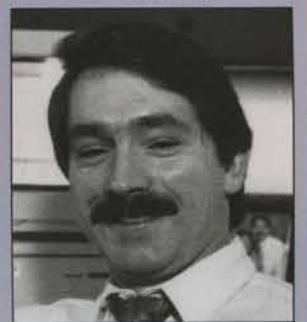
**December:** New 5 1/4-inch Q500 drive rolls out to customers. We're building a mind-boggling 150 drives a day!

**December:** Quantum goes public with stock offering of 2,500,000 shares at \$20 1/2 share. Investors snap them up.

### WORLDTIME

- Vietnam Veterans' War Memorial dedicated.
- First genetically engineered product goes public.
- EPCOT opens at Disneyworld.
- World title boxing reduced from 15 to 12 rounds.

## QUANTUM LEAP!



"Quantum will be number one in the storage industry, but who knows what it's going to be like. We'll probably be making hard disk drives you can wear on your wrist."

—Chuck Cisler  
Floor Control



**QUANTUMTIME**

**June:** Shipments soar. Quantum recognized as market leader, capturing 25% of 8-inch drive sales.

**November:** New Plus Development subsidiary tackles the "asparagus" project — because it may take two years before a crop comes up. Actually, the leading-edge Hardcard pops out ahead of schedule.

**December:** Employment climbs to nearly 300 and will double in '84.

**WORLDTIME**

- First American woman rides in space.
- Cellular phones debut in Chicago.
- Hill Street Blues nabs Emmy.

**QUANTUMTIME**

**March:** Plus Development team visits MKE's facilities in Japan and strikes landmark agreement with this innovative manufacturer. The beginning of a beautiful relationship.

**WORLDTIME**

- Apple unveils the user-friendly Macintosh.
- Ma Bell gives up her 22 offspring.
- Space shuttle Discovery takes first trip.

**QUANTUMTIME**

**May:** Quantum applauded as Entrepreneurial Company of the Year by Stanford University Business School Alumni Association.

**June:** Small wonder — the Hardcard — becomes the first hard disk on an IBM plug-in board. This 3½-inch unit allows PC users to easily boost storage.

**WORLDTIME**

- 49ers dunk the Dolphins 38-16 in Super Bowl.
- World shipments of hard drives approach 5 million.
- Live Aid rock concert raises \$60 million to feed hungry.
- U.S. becomes the world's largest debtor nation.

# "We Knew the Kind of Company We Wanted To Be."

"From early in the process of building the business, we spent a lot of time talking about the kind of company we wanted to be," says founder Jim Patterson. "We wanted an organization where people would be candid, direct and straightforward, and not let barriers grow up between teams. It became a very strong part of our culture and has served the company well."

The founders felt so strongly about the need to define the company's values that they documented them on a page in their formal business plan. The page spelled out how

Quantum employees would relate to each other, their vendors and customers. The core concept, according to founder David Brown, was honesty.

"There was great intensity around our values," says Brown. "We decided how we were going to behave in the world... and then we stuck to our word." That philosophy applied inside as well as outside the company, Brown says.

"When we did have problems in the field, we were really forthright with the customer. We believed

if you erred on the side of being open and honest, you gained a lot of loyalty in the long run."

Steve Berkley, who succeeded Jim McCoy as marketing vice president in 1981, notes, "We were very careful in our hiring. Sometimes a person would be interviewed by eight or ten people, because we wanted to make sure that we brought on people who

would continue the kind of positive environment we wanted."

As a result, he says, "Quantum became a great place to work. It was characterized by respect for the individual, open communication, no special treatment or perks. It was very egalitarian."

## QUANTUM'S PEOPLE

### Employee Contribution & Share of Success

- The highest level of accomplishment will be achieved through the success of outstanding people.
- Quantum will select, train and motivate the right people.
- These people will work as a team in an atmosphere in which excellence is expected.
- Individual excellence will be recognized and rewarded, giving each person a sense of satisfaction and accomplishment in his or her work.
- In this way, Quantum's people will share in the company's success.

### Management's Responsibilities

- Set priorities on critical issues.
- Create through example a sense of urgency driving efforts to a conclusion.
- Set objectives and expect dedicated efforts to meet commitments.
- Be firm but fair in all relations with employees, customers and suppliers.
- Set and demand the highest standards of excellence with no compromise.
- Recognize contribution and reward achievement.
- Be open and communicative.
- Solicit maximum employee involvement.

Above: A page from Quantum's original 1980 business plan emphasized a commitment to employees.

### 1st pre-production model

## Anybody got a fork lift?

'Be creative' were the watchwords of the design team as it assembled Quantum's first pre-production drives. A little scrounging brought forth a small air conditioner fan motor that drove the disk spindle belt. A simple gas mask filter allowed the sealed unit to breathe without the risk of contamination.

Other components were also off-the-shelf items, with the exception of the custom-made proprietary elements of the drive. A hefty cast aluminum base provided stability, and a clear plastic cover allowed observation of the unit in operation. The unit weighed in at a hefty 16 pounds and was the size of a bulky encyclopedia.

### 1st customers

## We deliver!

In September 1980, a small sales team headed by Jim McCoy started visiting prospective OEMs. Their pitch was compelling: Quantum's Q2000 product neatly replaced the industry-leading Shugart Associates hard drive for mini-computers, and

byte-for-byte, sold for a quarter of the price. Plus the Quantum drive performed better.

One of the first sales calls was at Altos Computer, just down the street from the Bering Drive facilities. "We literally walked it across the street and delivered it. We personally delivered a lot of our first units like that," says David Brown.

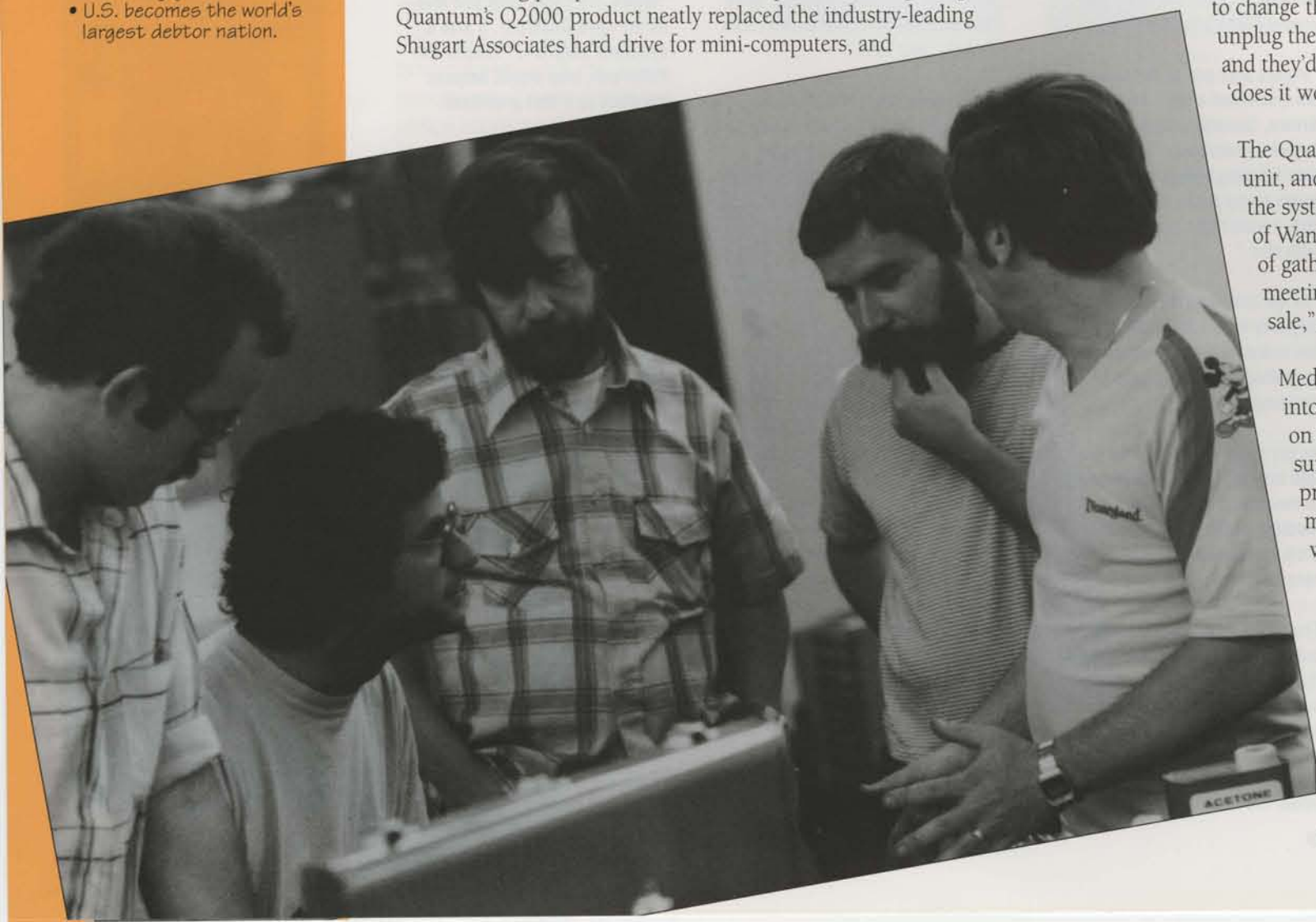
A visit to Wang Labs, the then powerhouse of word processing, "was the best sales call in my life," says Jim Patterson. "Wang was a committed customer of Shugart. At that time they were using the 10-megabyte drive, and they desperately needed 40 megabytes. When we called to show them our drive, we had a difficult time getting anybody's attention. Finally, they had one or two of their engineers meet with us."

At Wang's Massachusetts lab, the Quantum team watched engineers adding capacity to one of Wang's popular word processing units. "They were literally welding on a steel box containing a 14-inch drive," Patterson says. "We told them we had a 40-meg drive that was plug-compatible so they didn't need to change their unit. All they had to do was unplug the Shugart drive and plug in ours, and they'd have 40 megabytes. They asked — 'does it work?'"

The Quantum team plugged drive into the unit, and in a matter of minutes had the system on line. Before long, a crowd of Wang engineers from all over the lab of gathered. "What started as a quick meeting to get rid of us ended up in a sale," says Patterson.

Medley recalls that once the Q2000 got into the marketplace, customers came on fast. "The size of the market really surprised us," he says. "Ramping up production was a real problem. No matter what our forecasts were, they were always too conservative."

Production came to a halt for six weeks in mid-1981 as engineers grappled with a troublesome encoder component. Sitting is David Brown, chief of engineering, with electronics expert Don Daniels to the right — both company founders.





### 1st problems

## No problem

By January 1981, Quantum was gaining customers for its new drive, but as with any new technology, glitches popped up. Bill Moon, a newly hired engineer in the design group, became the chief troubleshooter. Moon, now vice president of advanced product engineering, remembers his first big assignment: figuring out why some drives would suddenly begin to erase data.

"One Friday night," recalls Moon, "an engineer asked me to look at something on the oscilloscope that was hooked up to one of the drives we were testing. Sure enough, the drive was erasing all the data. I knew that Hewlett-Packard had had a similar problem at one time, and it took them two years to figure it out."

Not having two years or even two months to solve the problem, the Quantum team gathered early the next morning. They had no sophisticated test equipment, but found what they needed in the Yellow Pages — someone with an electron scanning microscope. "This guy literally had one in his garage," recalls Moon. "I guess he bought it as surplus from some big company."

With the help of the microscope, the group pinpointed the problem to barium ferrite particles stuck on the read/write head. The particles, which turned the head into a bit-bashing magnet, had strayed out of another drive component. A quick call to the component vendor resulted in a simple change, and within a few days, Quantum was back on track.

### 1st really big problem

## This is not easy!

A much larger problem was just around the corner, however. Bill Moon sets the stage: "We had two buildings on Bering Drive. In the back building, we were testing faulty drives that were coming back from customers. In the front building, we had just finished having a party celebrating the shipment of our 500th drive. Everyone was really pleased with the progress we were making."

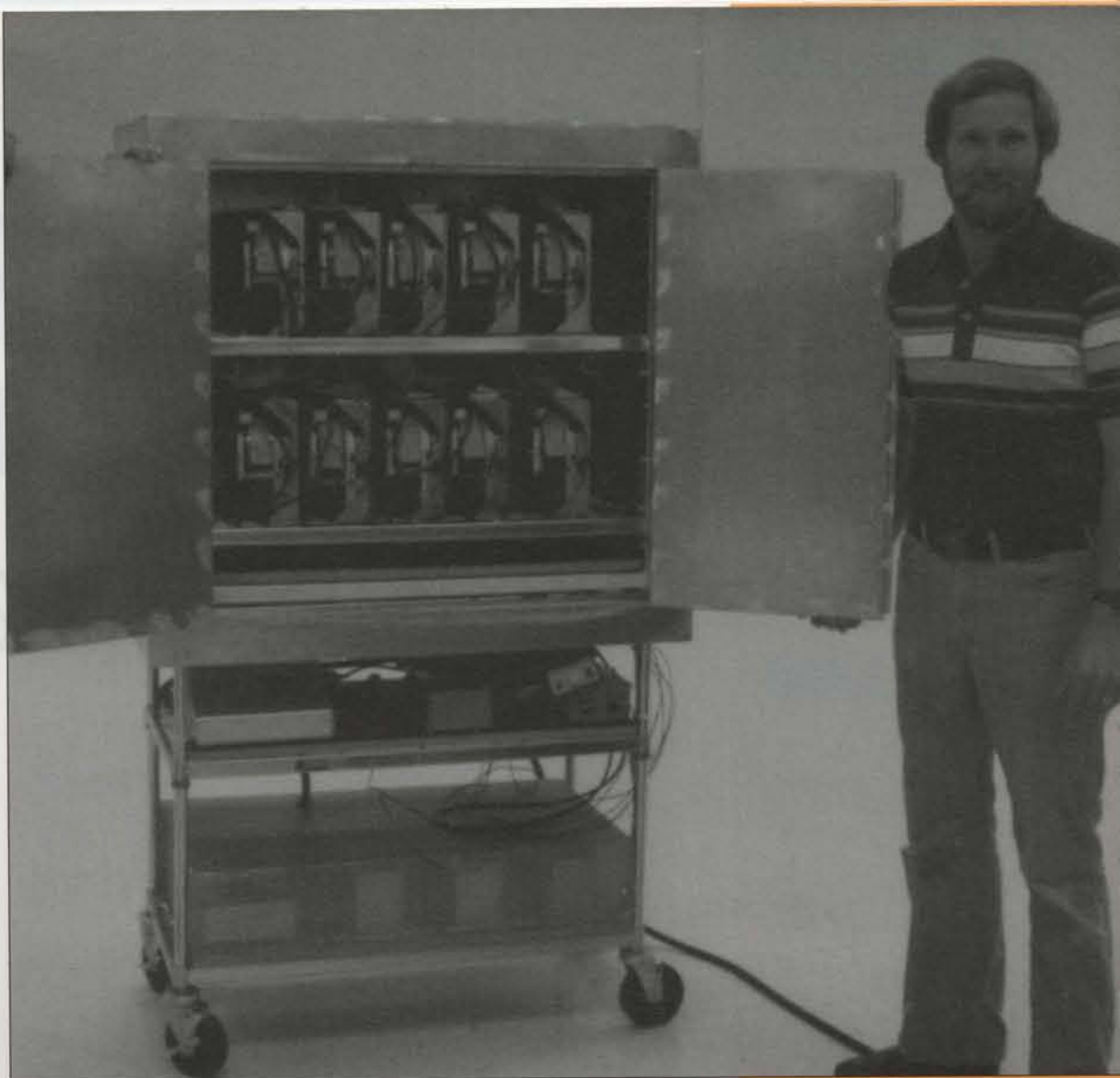
The celebration was short lived, however, for when Moon and his partner returned to the back building, they counted 100 drives that had already been returned. Says Moon: "I knew right then that there was a big problem!"

Engineers determined that the problem was coming from Quantum's unique head-positioning mechanism — the optical encoder, which was built by a vendor. Until the problem was fixed, the company decided to stop all production. For six weeks, nothing rolled off the line.

Several days of testing revealed that the soldered connections between the optical encoder and a printed circuit board often broke down as the drives warmed up. To weed out the faulty components, the team devised the now legendary "shake 'n bake" test.

The rigorous process involved placing the optical encoders in a small chamber, where they were shaken violently and "baked" in hot air. The hearty survivors went into the finished product.

"It was an effective way to get out the bad parts," Moon observes, "but it was clear that we'd never get a totally reliable product unless we



In an early-day "infant mortality test," drives shipped after mid-1981 were heated to 120 degrees and operated for eight hours inside this insulated box. The test, which was the successor to the "shake 'n bake" process, was developed by Bob Hall, shown here with his creation.

went into the optical encoder business ourselves." By January 1982, components were being built in house and passing all quality tests. Shake 'n bake tests were discontinued.

### 1st product life-testing

## No loitering in the men's room

The first Quantum drives underwent life-testing in the most unlikely of places — the men's room of the Bering Drive building. In April 1981, Bill Moon was asked to create an endurance

test so customers could be assured of the drive's reliability. As with many things in the company's formative days, the test was simple but effective.

Moon placed 20 disk rotors on a motor-driven shaft that moved them back and forth at five times a second — duplicating months of use in a few days.

In addition, 10 assembled drives were put on a rack along with the rotor-testing device. When fired up, the noisy contraption "sounded like a carnival," according to Moon.

To keep peace with the rest of the staff, Moon wheeled the unit into the men's bathroom. And there it stayed... for several months. The heat from the motors raised the temperature the unairconditioned room to "at least 120 degrees."

"I wasn't a very popular person at the time, but one thing for sure — people didn't spend much time in the bathroom."

*"Quantum is one of the most successful disk drive businesses today because they knew what they wanted to do and stuck with it."*

—Mark Ferelli  
*Computer Technology Review*

## 1986

### QUANTUMTIME

**June:** Q200, innovative 5¼-inch drive with built-in controller, takes longer than expected to develop. Impatient OEMs begin to go elsewhere. But Apple's Mac comes to the rescue.

**September:** Overpopulated memory market collapses and many drive companies fold or merge. Quantum hangs on, but product shipments plummet.

**December:** Revenues flatten, as market loses interest in company's older products. Hardcard sales begin to kick in.

### WORLDTIME

- Scientists discover first gene known to inhibit growth.
- Chernobyl nuclear reactor blows up.
- *Les Misérables* wins eight Tony awards.
- The Mets rip the Red Sox in the World Series.

## 1987

### QUANTUMTIME

**April:** Plus Development management team returns to Quantum and takes first steps in what will be a successful turn-around based on new 3½-inch drive.

**May:** Crash effort well underway to create the ProDrive series for the burgeoning 3½-inch market.

**December:** Revenues still flat with Hardcard sales to retailers providing all the profits. Down to three major OEM customers.

### WORLDTIME

- Federal budget tops \$1 trillion for first time.
- Microsoft founder becomes micro-computing's first billionaire.
- Biologists trap last wild California condor for breeding.
- Everyone's reading *The Bonfire of the Vanities*.



**QUANTUMTIME**

**March:** Ugh. Quantum posts its first annual loss. But help is on the way.

**April:** Powered by strong sales of new ProDrive 3 1/2-inch series, Quantum takes off again.

**WORLDTIME**

- Prairie Tek introduces first 2 1/2-inch drive.
- Fires scorch Yellowstone National Park.
- B-2 Stealth bomber unveiled to public.
- First trans-Atlantic fiber optic cable starts carrying calls.

**QUANTUMTIME**

**January:** Watch out, world. Quantum starts its global expansion with sales offices in France and England.

**April:** First stock split since going public in 1982. Stockholders get 3 shares for every 2 they own.

**June:** With a strong tradition of working together, Quantum launches formal cross-functional teams to improve time-to-market.

**August:** Play it again, Sam. Stock is split once more, this time 2-for-1. Now, 24 million shares outstanding.

**September:** With debut of the Magnum drive, Quantum re-enters the high performance, high-end market.

**November:** Low-profile ProDrive LPS announced and becomes the fastest, most reliable among one-inch-high drives.

**WORLDTIME**

- Voyager 2 gets dazzling snapshots of Neptune.
- Exxon Valdez makes a big mess in Alaska.
- The voice of Bugs Bunny and Daffy Duck passes on.

**QUANTUM LEAP!**



**"Quantum will be a leader in storage technology, which may not be disk drives, but perhaps the magical cube. We will be very effective at providing information storage and retrieval solutions for our customers."**

—Dave Harrison  
Engineering

**We grew rapidly because our culture was constantly looking at different ways to reach new markets that were changing all the time.**

—Steve Berkley  
Marketing VP, Hardcard Pioneer and  
Quantum CEO, 1987-92

**Small Drive Teaches Big Lessons**

By 1982, Quantum's first product — the Q2000 — had captured a quarter of the market for low-cost 8-inch drives. But the needs of OEMs were changing rapidly. The smaller 5 1/4-inch drives offered by competitors were becoming the preferred choice for compact, desktop products.

"By April of 1982, it became obvious that we were way behind," recalls Jim Patterson, Quantum's first president. "Other people were bringing out a whole range of 5 1/4-inch products that were going to eat our lunch. That led to the crash development of the Q500."

In a period of nine months, Quantum developed its first 5 1/4-inch drive, ironically the product it had nearly produced some two years earlier. The Q500 offered in 10 MB to 40 MB capacities, was basically a small version of the original 8-inch drive. It debuted at Comdex in late 1982.

"Actually, about all we had for the show was a pretty box with a Q500 nameplate on it," says Joel Harrison, who helped design the drive. "There wasn't even a motor inside." Within a few weeks, however, the manufactured product was shipping out to customers.

Almost immediately, Quantum began to develop its next generation of 5 1/4-inch products. It featured a range of technical innovations and a SCSI interface.

"From a technical standpoint, it was a little too much to bite off at one time," recalls David Brown, "plus we greatly underestimated the market's reluctance to change interfaces." Although the product took three years to bring to market and was only a commercial success with Apple, the drive pioneered some crucial technology that would be applied in later products.

"We learned some lessons about time-to-market. We also learned some very valuable lessons about listening to our customers," Brown concludes.

**Big Decision ... Big Risk**

In late summer 1983, Joel Harrison took the top off an IBM XT for the first time and took a long look. "For whatever reason, the Hardcard appeared," says Harrison, designer of Quantum's original disk drive.

What Harrison "saw" was the vision of an IBM compatible card, bearing a small disk drive, plugged neatly into the XT's expansion port. At the time, PCs were shipped with floppy drives only. "Quantum had the technology to produce a thinner drive at the time, although we hadn't used it," says Harrison.

Several Quantum employees, including founders David Brown and Harrison, started Plus Development, a Quantum subsidiary that would develop and manufacture this revolutionary product.

Hardcard was an industry first in many regards. It was built around a 3 1/2-inch disk with the 3-chip controller, which in itself was an industry first. Second, it was designed for the retail market, where it was sold to PC owners eager to easily and economically upgrade their systems. It was produced in greater quantities than any previous Quantum product.

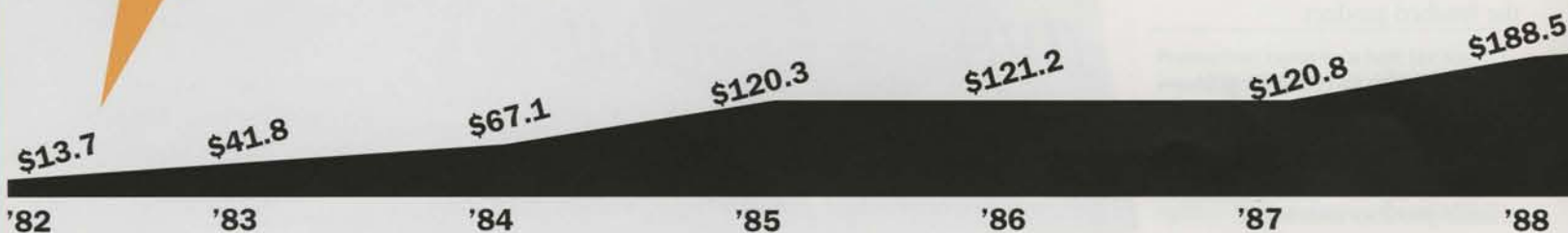
Although Harrison and the other designers didn't know it, the Hardcard was Quantum's greatest gamble.

After the success of the plug in Hardcard, the development team decided to move forward. However, the project was nearly scrapped in lieu of Passport, another product.

"When Quantum learned about the possible project cancellation, Jim Patterson, who was at that time, a Plus VP," says Bill Moon. "They decided that the project would not be cancelled, but transitioned to Quantum."

At the same time, Quantum was anticipating an eventual drop off in revenue from Apple. The precipitous drop off, as David Brown describes it, was related to Apple transitioning to a 3 1/2-inch product. Brown, by then Quantum's president, decided to discontinue development of any more 5 1/4-inch drives and concentrate solely on delivering 3 1/2-inch drives.

The quality of the decision speaks for itself. Nonetheless, Brown remains proud of the decision to deliver a 3 1/2-inch product. "We weren't smart. We just did what our customers wanted."





**QUANTUMTIME**

**February:** ProDrive shipments hit one million mark since introduction in 1988. Major customers for Quantum products now include Apple, AT&T, H-P, Intel, NeXT, Sun, Tandy, Commodore, UNISYS.

**February:** Memorable 10th Anniversary Party is highlighted by rock video of top management team lip synching to music by Dire Straits. Hilarious, but keep your day jobs, guys.

**March:** Quantum ends fiscal 1990 with sales of \$446 million, double the previous year and earnings more than tripled. Are we on a roll or what?

**May:** Company moves to new 37-acre campus with room for five buildings and a high-capacity drive manufacturing facility.

**September:** Go•Drive 2 1/2-inch series enters the laptop and personal computer market.

**October:** Quantum increases its global influence with new sales offices and distributors throughout Pacific Rim.

**WORLDTIME**

- Van Gogh's *Dr. Gachet* sells for record \$82.5 million.
- Mysterious circles appear in U.K. cornfields.
- Dow Jones breaks through 3,000 mark.
- FDA approves first low-calorie fat substitute.

ulture supported rapid changes,  
ways to do things, adjusting  
all the time.

**Big Risks**



systems. Finally, because of the expanding PC market, Hardcard  
uct.

ard would set the stage for what was perceived at the time as the

ided to define an 3 1/2-inch OEM product using Hardcard technology.  
r plug in for the retail market.

n Patterson, Quantum's president, held a meeting with David Brown,  
the 3 1/2-inch product was critical to Quantum's future, and it would

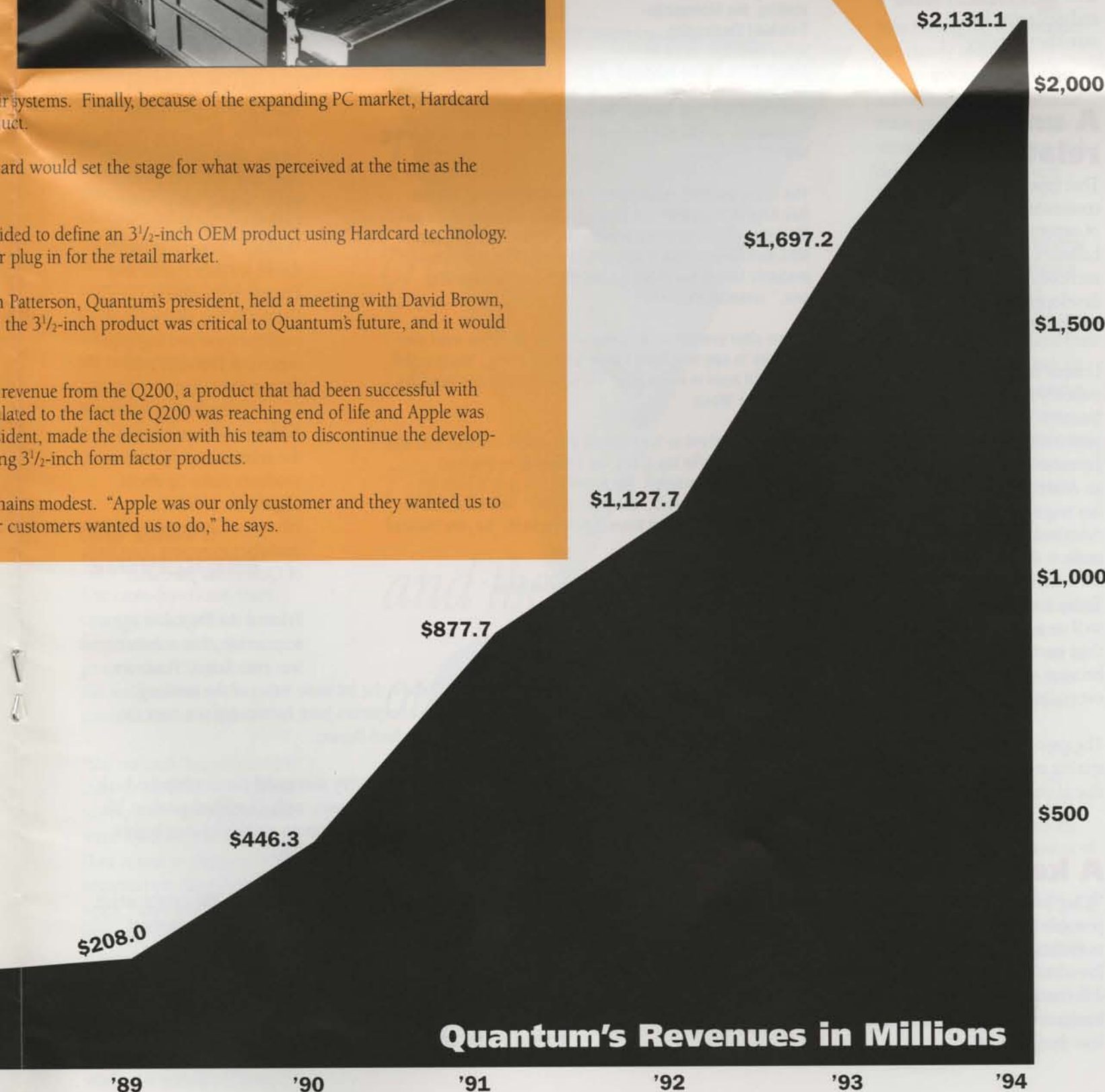
revenue from the Q200, a product that had been successful with  
lated to the fact the Q200 was reaching end of life and Apple was  
ident, made the decision with his team to discontinue the develop-  
ng 3 1/2-inch form factor products.

ains modest. "Apple was our only customer and they wanted us to  
customers wanted us to do," he says.

**Building a Mountain  
in Just 15 Years**

Doing a lot of things right has made Quantum one of the fastest growing companies in America. As the chart shows, revenues grew nearly 10-fold between 1982 and 1985 and 10-fold again between 1989 and 1994. Although fiscal 1995 results won't be announced until April, for the first three quarters, revenues reached nearly \$2.4 billion, which included sales from the businesses acquired from Digital.

Employment between fiscal 1982-94 grew from 262 employees to nearly 3,000. The acquisition of Digital's storage business unit in October added more than 4,000 employees to the Quantum workforce.



**Quantum's Revenues in Millions**

Fiscal year ending March 31.

**QUANTUM  
LEAP!**



"We will still be ahead of Seagate. Dave Brown will come out of retirement to transition the company into the next technological age. By then Ken Lee will be a world traveler on his own time, not Quantum's, and Marsha Nakamura will have trained two more engineering vice presidents!"  
—Marsha Nakamura  
Engineering



**QUANTUMTIME**

**March:** WriteCache debuts as the industry's first write-caching technology for 3 1/2-inch form factor drives. Boosts data transfer rates up to 200%.

**March:** Employment nearly doubles in fiscal 1991, growing from 763 to 1,445. By fiscal 1994, it doubles again.

**April:** San Francisco Chronicle declares Quantum as "fastest growing turn-around company in the country." Who can argue?

**July:** Formation of Nippon Quantum KK makes Quantum the only American hard drive manufacturer to provide marketing, technical support and local manufacturing (through MKE) to expanding Japanese market.

**November:** Passport XL removable hard drive unveiled, with features surpassing all other removables in market.

**WORLDTIME**

- *Dances With Wolves* named best picture.
- Four-day ground offensive ends Persian Gulf War.
- Soviet Union dissolves.
- Dow Jones reaches new record high of 3168.

**QUANTUM LEAP!**

**"In 15 years Quantum will be the leading disk drive manufacturer and number one in the industry. The completion of Building 5 represents Quantum's success and future. Quantum continues to grow in terms of customers and employees and it keeps getting better."**  
— Shirley Robles  
Materials

# MKE Partnership Puts Quantum in Fast Forward

In 1984, a team from Quantum's new Plus Development subsidiary went looking for someone to manufacture their innovative Hardcard. They found exactly what they needed in Matsushita-Kotobuki Electronics Industries, Ltd. (MKE), a Japanese mass producer of VCRs and other consumer electronics.

"We simply didn't have the manufacturing capability in-house to support a high volume ramp necessary to stock dealer shelves for a retail product like the Hardcard," says DSPG President Michael Brown. "MKE's expertise in high-volume consumer electronics, especially VCRs, made it a likely candidate. A VCR is an electro-mechanical device, like a hard disk drive."

What happened next was an indication of how the relationship would develop over the following 11 years.

MKE sent nine engineers to the U.S. to work with the Hardcard development team for a year. "They came here to learn about disk drives and how to manufacture them, recalls Mark Jackson, vice president, worldwide logistics. "But, at the same time, they imparted back to us their knowledge of process and designing for manufacturability."

## A unique relationship

That type of two-way communication and sharing of expertise has been the hallmark of the extremely successful partnership that developed between the two companies.

Unique in the computer industry and unusual in the business world at large, this partnership between a Japanese manufacturer and an American disk drive firm has required a new set of rules and a new mindset to make it work.

Today, it continues to work well on a much larger scale than envisioned at the outset because of both companies' overriding trust and commitment to each other.

The payoff for Quantum has been a reputation for product quality and a manufacturing capability for ramping to volume that is unequalled in the industry.

## A key differentiator

"A big part of the reason our customers buy desktop and portable products from Quantum is because they know MKE's manufacturing processes are the best in the world," says DSPG President Michael Brown. "Our partnership with MKE has been a differentiator for the desktop and portables segment of our business in the past, and we expect that it will continue to be into the future."

## Leave Your White Horse at Home

**P**roduction of the Hardcard required watch-making precision. For manufacturing help, a team from Quantum visited several Japanese electronics firms with highly automated facilities.

**Bill Moon, a chief engineer on the project, recalls visiting the Matsushita-Kotobuki Electronics Industries, Ltd. plant in March 1984 on the island of Shikoku, where at that time half the VCRs in the world were manufactured. "More than 95 percent of the plant was automated. It was phenomenal. We had never seen anything like it."**

**The Quantum-MKE relationship looked promising, but the Bay Area disk jockeys anticipated a long learning curve as MKE started up Hardcard production. "We felt that because MKE had never made a disk drive before, that it would probably take them at least a month to produce the first one," remembers Moon.**

**"Soon after production was supposed to start, we went over to Japan to see how things were coming along. We thought we would have to come in on our white horses and save the day," says Moon.**

**"When we arrived at the train station where the MKE bus was going to take us to the plant, we were met by the lead engineer on the project. We asked him if they'd built the first drive yet. He said, 'We're finished.' And we said, 'Oh, you've finished the first drive.' And he said, 'No, we finished the first 300.'**

**"It was then we realized we had a real winner."**

The relationship forged in 1984 continually strengthened as Plus Development executives (former Quantum CEO Steve Berkley, and former president David Brown) worked with then-MKE President Mr. Inai. The relationship evolved to a new level with Quantum's 1987 decision to work with MKE in producing a 3 1/2-inch form factor drive for the PC market.



**At the signing of the first Quantum-MKE agreement, Quantum executives received symbolic "marriage dolls" from their Japanese partners.**

"In terms of really expanding, it was the decision to go to the 3 1/2-inch form factor and have MKE make our products that solidified our relationship with MKE," Michael Brown recalls.

"That first year we produced 250,000 3 1/2-inch drives with MKE. We're now producing at a rate of millions per year."

## Investment has grown

MKE's investment in the relationship has grown in that time from one to three manufacturing facilities dedicated to Quantum products. The Ipponmatsu, Japan, plant supplies more than half of DSPG products to the world, while newer facilities in Singapore and Dundalk, Ireland, produce drives for Asia Pacific and Europe, respectively. Quantum has also located configuration and logistics centers in Dundalk and Singapore.

Adding to the stability of the relationship, Quantum products make up about 50 percent of MKE's business. Conversely, MKE manufactures more than half of Quantum's products.

Prior to the Digital acquisition, that number was even larger. However,

the numbers don't show the intrinsic value of the working relationship the two companies have hammered out over the past 11 years, says Michael Brown.

"This has developed onto a very successful partnership for both of us," he says. "In the PC industry, with shortened product life cycles, customers demand we ramp up quickly to ever higher volumes, with consistently lower DPMs.

"We have developed a world-class capability in the combination of our designs plus MKE's process that will allow us to meet future demands in the desktop and portables marketplace.

"Withstanding the challenges of our industry for the past 11 years has been no small feat, but standing this test of time has laid the foundation for an even longer lasting partnership."



**QUANTUMTIME**

**April:** Fortune magazine places Quantum 363 on its prestigious 500 list. (Two years later, we climb to 250.)

**May:** Quantum and MKE announce they will build a European manufacturing facility in Dundalk, Ireland. European sales represent nearly a third of Quantum's \$1.1 billion revenue.

**December:** By end of '92, company has introduced 11 new drive models and upgraded removables. Time-to-market strategy cuts cycle time from 24 to 15 months.

**WORLDTIME**

- Record numbers compete in the Olympic Winter Games.
- IBM's profits tumble. Big Blue goes on diet.
- Twelve-year Republican reign in White House comes to end.
- Presidents of U.S., Canada and Mexico sign NAFTA.

# Tapping the Power of TEAMWORK

Talk with early members of the Quantum work force and you will find that their stories abound with examples of successes and crises overcome through the collaborative spirit that reigned in the early days. The ability to pull together as a cross-functional team just came naturally in the Quantum environment.

Today, we see teams tackling everything from product development to manufacturing at Quantum. But the decision to create a formal team process grew out of the need to simply survive during the mid-1980s.

At that time, competition among Quantum's biggest customers began compressing product cycle times dramatically. Manufacturers such as Apple and Compaq were looking to their component suppliers for product features and performance that would give them an edge before anyone else had it.

Quantum learned a hard lesson about the importance of the time-to-market component as a strategic differentiator during the development of the Q200 drive. According to company founder David Brown, the drive took an agonizing 36 months to develop. By the time it reached the market in 1986, customers had gone elsewhere. The gap created in Quantum's product pipeline resulted in the company's first loss in fiscal 1988.

After a great deal of soul searching in 1989 and a commitment to master the time-to-market differentiator, Quantum set about recapturing the historic momentum of its informal teams. The company realized that it could no longer rely on informal conversations in the cafeteria to beat the competition to market. It needed to institutionalize cross-functional communication.

## No more 'stovepipes'

The cross-functional team concept was revitalized and formalized, and in the process the "throw it over the wall" mentality was thrown out the window.

"We realized that we couldn't manage the company within 'stovepipes,' where decisions went up one pipe to the top, then across to another organization then down again," says Jane Creech, manager of DPSG human resources development. "The process burned up a lot of time we just didn't have."

Despite a tradition of teamwork, the transition from

informal to formal teams met with some predictable resistance, Creech says. "When you give accountability over to teams, you're agreeing that the company is not going to be driven by any one function, such as engineering or marketing. That kind of delegation of authority can be tough on some functional managers who are used to having the final say."

The Batman Team marked one of the first successes of rejuvenated cross-functional teams at Quantum. The team brought the 3½-inch ProDrive LPS 52/105 to market in a quick 16 months. That success was followed by the Lethal Team, which developed and launched Quantum's first drive for notebook computers. By overlapping some design and testing steps, the team brought the 2½-inch Go•Drive to market in 17 months.

Quantum's approach to team building is, of course, dynamic. The Quantum team model has undergone four evolutions in five years. The current model, Creech says, is particularly robust — emphasizing dedicated leadership, small size, careful member selection and intense training in communications, interpersonal skills and general management thinking.

## Fine tuning

Fine tuning the team model has clearly improved Quantum's time-to-market standard. Maverick was in mass production just eight months after the design and development teams were formed.

"The key to cross-functional collaboration is combining the right people," says Creech. "The most effective team members represent their functions, yet think and act from a general management perspective. That means making decisions based on what's best for Quantum versus what's best for the team or a particular function."

DPSG President Michael Brown has been instrumental in rejuvenating the team concept at Quantum, yet he emphasizes that teams are simply a means to an end.

"Teams are a big part of the answer, certainly," he says. "But teams are not an end in themselves. Teams are an organizational component of an overall strategy to constantly reduce cycle time and improve time to market. Meeting that challenge will require the company to constantly re-invent itself, and that includes finding new ways to tap the power of teamwork."

*The concept of cross-functional teams was revitalized in '89, and the "throw it over the wall" mentality was thrown out the window.*

## QUANTUM LEAP!



"I think we'll be the number one storage company. We'll be different from others because of our high quality products. We've grown so much since the Digital acquisition and the demand for our HCSG products has far surpassed what we ever imagined it could be. Success is inevitable!"

—Romeo Damian  
OEM/HCSG Shipping



**QUANTUMTIME**

**January:** "Drive For Excellence" quality initiative launched. We're good, but we want to be better.

**February:** More than one million ProDrive LPS 240 MB drives shipped in prior year, locking in Quantum's position as market leader in the 200 MB capacity range.

**August:** Quantum unveils its latest high-capacity product: the 2-gigabyte-class ProDrive 1800. Its price is about the same as Quantum's original 10 MB drive sold 10 years earlier.

**October:** Quantum joins *Fortune* magazine's 100 Fastest Growing Companies based on '92 performance. We make the list again for '93.

**WORLDTIME**

- General public hits the Information superhighway.
- Record floods ravage Midwest.
- NAFTA approved by U.S. Congress.
- *Jurassic Park* top-grossing film (\$337 million).

**QUANTUM LEAP!**

"Fifteen years is an eternity in this business. We may be making some other storage medium by 2010. Regardless of what business we're in 15 years from now, to stay in business we'll have to be customer-driven, flexible and cost-effective. Most of all, we will have to continue to rely very, very heavily on our employees."  
—Joe Rodgers  
Chief Financial Officer

# The Quantum Name Means 'Customer Satisfaction'

**W**hy do people pick Quantum as their supplier? Here are the answers from four key customers. Their responses are encouraging, but they also challenge us to new levels of quality and service.

**Dell Computer**

"Most of our customers are large corporate and government computer users, who choose Dell because they value having a direct, interactive relationship with their PC vendor. These customers also greatly value quality, reliability and having early access to new enabling technologies. We are pleased to do business with Quantum because in each of these critical areas, Quantum continues to meet or exceed all of our expectations."

— Greg Weir  
Manager, Peripheral Product Marketing

**Bell Microproducts**

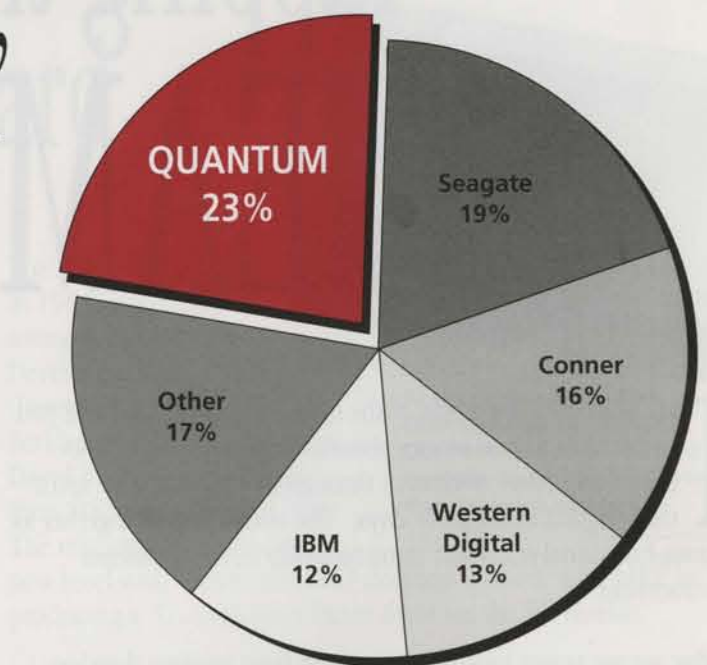
"Quantum has clearly established itself as a preferred provider. That comes from a quality reputation going back through the years. You've really excelled in delivering quality products, coupled with outstanding design and manufacturing capabilities. Quantum has managed to bring all of this together quickly with a quality level that exceeds your competition. When you combine that with a good service organization, you've got a true industry leader."

— Don Bell  
President and CEO

**Hewlett-Packard**

"There are a number of items of importance about Quantum. The company is on the leading edge in the area of total quality management. This is part of the culture. Quantum is very responsive, and it provides competitive products. Also, the Quantum people who work with the Hewlett-Packard team are very professional. We appreciate the fact that they are dedicated, motivated and have the skills and competencies we need to build a strong relationship."

— Bernard Fouré  
OEM Business Manager, Grenoble Personal Computer Division



In 1994 Quantum was the world leader in total number of drives shipped with an estimated 23% of the market.

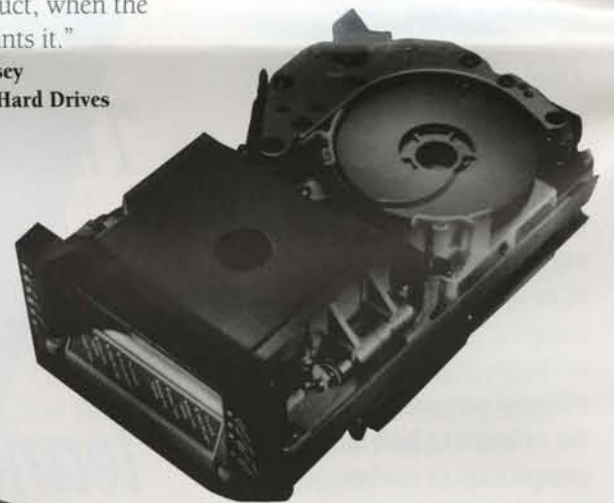
Source: *Wall Street Journal*, December 28, 1994

**Apple Computer**

"Quantum for the last five years has been one of the largest suppliers to Apple Computer Inc. The Quantum name to me is synonymous with true 'Customer Satisfaction,' in their outstanding ability to consistently deliver high-quality product, when the customer wants it."

— Dermot Casey  
Senior Buyer, Hard Drives

One of the latest additions to the Quantum family — acquired from Digital — is a series of streaming tape drives for data backup in servers and high-end workstations.

**THE INCREDIBLE SHRINKING DRIVE**

Quantum's customers have witnessed a remarkable example of high tech miniaturization as the original 8-inch, 16-pound bruiser has been replaced by 2 1/2-inch featherweights (both products shown approximately actual size).



# High Hopes for High Capacity Pay Off in Industry-Leading Position



Trace Quantum's history back to its roots, and what you will find products aimed at the high end of the market.

"Quantum's first product — an 8-inch drive introduced back in 1980 — was a high-capacity, high-performance product for its time. At 10 to 40 MB and about 60 MS average access time, it was selected by some of the leading mini-computer and workstation companies such

as Wang, Xerox and Convergent," says DPSG President Michael Brown. "We continued our focus on workstations with two families of 5 1/4-inch products, then exited that end of the market in 1987 when we made the strategic decision to focus on the emerging desktop personal computer market."

Tako, a 3 1/2-inch drive with 40/80-megabyte (MB) capacities, was Quantum's first product for the desktop market. But, even as Tako was launched, Quantum was defining Magnum, a follow-on product designed for workstations with capacities of 120, 168 and 210 MB. Introduced in 1989, Magnum captured a respectable share of the market, recalls Sheryl Lewis. Lewis, Quantum's director of business excellence, was the product marketing manager for Magnum.

"We had a market share of 20 to 25 percent and a list of customers that included Sun and H-P Apollo, the H-P PC group, AT&T and Zenith," she says. Maui, at 425 MB, followed Magnum in 1990, but, Lewis says, high cost structures and being late to market prevented them from contributing significantly to Quantum's results.

Empire, Quantum's next high-capacity product, was launched in 1993 at 540/1080 MB. The drive is Quantum's most successful high-capacity product to date.

"It succeeded by focusing very specifically on the entry level workstation products for H-P and Apple. As evidence of its success, it was the first HCSG product Apple purchased. In fact, on several of Apple's proprietary benchmarks, Empire produced the highest performance they had seen on a drive," notes Product Line Manager Jon Toor.

## On the organization

In 1992, when CEO Bill Miller and the executive staff decided to increase the company's focus on high-performance, high-capacity products, they brought Bob Maeser aboard to lead the effort. In 1993, recognizing the differences in the product characteristics

and the market, the company created two distinct business units: The Desktop and Portables Storage Group (DPSG) and the High Capacity Storage Group (HCSG).

"We created a separate high-capacity product division because that marketplace has requirements that are distinctly different from the desktop area," says Quantum Chairman and CEO Bill Miller. "Separating management of the businesses also was consistent with our philosophy to get the decision-making power into the hands of people who can do something about it."

About a year and a half into divisionalization, HCSG has gained the edge on the four objectives identified early on, says High Capacity Storage Group President Bob Maeser. The objectives include: growing revenue and market share, improving time-to-market, improving quality and reliability and achieving profitability. Today, DPM levels are at about 2,000 and AFRs (annualized field returns) are below 2 percent. And, HCSG has been given the highest supplier rating by its top three OEMs.

Just as significantly, before the Digital acquisition, revenue had tripled and market share doubled year after year. Following the acquisition, revenues increased dramatically and high capacity products accounted for 23 percent of sales in Q3 FY95. Moreover, the last two product introductions, Empire and Grand Prix, were on time to market with 12-month development cycles.

At the same time, the recent addition of high-capacity technologies, such as magneto resistive (MR) heads, PRML and the ultra-SCSI interface, has exponentially increased HCSG's prospects for the future.

"These are achievements that all the people in HCSG — and Quantum — can be proud of," Maeser says. "We now stand as the number two market share leader in the high end and we have one of the top two technology portfolios in the industry."

But, as with many things at Quantum, the best is yet to come.

"During the next several years, we expect for the high-capacity group to grow more rapidly than the PC side," Miller predicts. "We certainly have all the tools and resources now to pursue that growth and all the opportunities that go along with it."

"In looking at our two disk drive units, the challenge for DPSG will be to differentiate ourselves to our desktop and portables customers and convince them we provide greater value than our competitors. On the high-capacity side, we must combine revenue growth with achieving world-class operating effectiveness to make HCSG a major contributor to profitability."

"The combination of strengths in DPSG and HCSG will provide Quantum with a more stable future," Miller says.



1994

## QUANTUMTIME

**January:** Twenty-five million drives shipped since company began, with 84% shipped from 1991 through 1993.

**March:** Grand Prix family launched to go after the fast-growing high-end market of high-performance servers, technical workstations and advanced disk arrays. Top unit boasts 4 gigabytes.

**July:** Introduction of QCard flash memory cards launches Quantum into the solid-state storage market.

**October:** Quantum purchases Digital Equipment's storage business unit. With broadened product portfolio and additional manufacturing and technology resources, Quantum takes another step toward being the best mass storage company in the world.

**December:** Quantum "is now the world's top shipper of disk drives, with an estimated 23% of the market," declares *Wall St. Journal*. Not a bad way to end the year.

## WORLDTIME

- World shipments of hard drives reach estimated 60 million units.
- Los Angeles rocked by powerful earthquake.
- Famous 1934 photo of Loch Ness monster uncovered as fake.
- Japan launches first satellite with Japanese-only technology.

FEBRUARY 20, 1995

Happy 15th  
Birthday,  
Quantum.  
All right!

## QUANTUM LEAP!



"Quantum will be very successful and very large. We'll expand, and we'll be manufacturing much more than hard disk drives."  
—Brandi Weems  
Facilities



## THE FUTURE

### Keeping a Great Thing Going

Here's what industry analysts from around the world say about Quantum's first 15 years. The challenge ahead is to thrive in an industry where, as one analyst puts it, "the weak will succumb and even the leaders could get killed by just one false move."



"Quantum sees a broad and big market out there and wants to serve the whole arena. This is a big market and Quantum has the moxie to take on the whole thing."

—Mark Ferelli  
Computer Technology Review



"Their key strength is probably the ability to establish OEM relationships with the top computer companies and to maintain those successfully. They offer high-quality products, value pricing, and a broad catalog of products with consistent supply."

—Phil Devin  
Dataquest



"They're a technology leader because they have partnered with good people."

"I have very high regard for their quality. I've never, ever heard anything bad about a Quantum drive."

—Robert Abraham  
Freeman Associates, Inc.



"Quantum was growing fast by itself, and now with its recent acquisition, it is growing even faster. Now they have a broader base for growth, and they have the technology to grow."

—Florence Ladouce  
Electronique International Weekly, France



"Quantum maintains the strongest combination of time-to-market performance, low-cost manufacturing skills, high-quality products, OEM customer base, and financial health among all of the major disk drive manufacturers."

—Todd Bakar  
Hambrecht & Quist Inc.



"Their strength is in the range of drives they offer, the extra development capabilities they've got and their engineering and technology."

—Colin Holland  
Electronics Times, UK

Quantum, Plus Development, ProDrive, GoDrive, WriteCache, Passport XL, Magnum, Maverick, Grand Prix, Hardcard, QCard, Q2000, Q500 and Q200 are registered trademarks of Quantum Corporation, Milpitas, CA.

# "It's Simply the Right Thing to Do"

As Quantum has grown and matured, so has its sense of responsibility as a corporate citizen. From the beginning, Quantum's employees have been active in the community, both as individuals and as representatives of the company, volunteering time and money to worthy causes.

A corporate responsibility initiative was recently approved by the board of directors which will formalize and expand Quantum's role in the community. The initiative earmarks one to two percent of Quantum's pre-tax income to be used for programs that will help improve the quality of life in the communities where the company does business. The focus will initially be in the U.S., but plans are to expand the scope to include our international communities as well.

There are four elements of Quantum's corporate responsibility plan:

- A focus on education for charitable contributions,
- An expanded drive donation capability,
- The Employee Giving Campaign, and
- Corporate sponsorship of volunteer events.

The program was developed by a Corporate Responsibility Committee which was co-chaired by Deborah Barber, vice president of human resources, and Catherine Hartsog Toor, director of corporate communications.

"It is clear that Quantum should be playing a more active role in the community," says Barber. "In developing the plan, the Corporate Responsibility Committee solicited input from executive staff and from employees. We also wanted to build on employee strengths and interests by leveraging from current volunteer activities."

"Our goal was to define a role for Quantum in the community that leveraged our cash, volunteer time, and in-kind donations to maximize the impact of our efforts and increase the opportunity for significant visibility," says Hartsog Toor. "The decision to focus on education was motivated in part by the significant employee interest and existing volunteer efforts, as well as our belief that it is crucial to our future as a company and to our communities."

One key education program Quantum will support is the Challenge 2000 initiative sponsored by Joint Venture Silicon Valley. Quantum has committed \$1 million over a three-year period in a combination of money, volunteer time and equipment donations to the Challenge 2000 initiative.

A recently formed Education Committee will determine how Quantum will meet its \$1 million commitment. This committee also will evaluate and/or develop other education programs for Quantum's support.

The Education Committee will work closely with the Donations Committee, which is managed by Public Relations Manager Kelli Trask. The committee has helped Quantum donate disk drives to worthy organizations around the world,



Giving Campaign chairperson Barbara Fagan-Smith and Second Harvest Food Drive chairperson Kara Seyedi display some of the "thank you" they received for the company's volunteer efforts.

including the East West Education Development Foundation of Boston, the Doran Resource Center for the Blind, local schools and many other groups (see *Quantum drives create a multimedia playground, next page.*)

## A history of volunteer enthusiasm

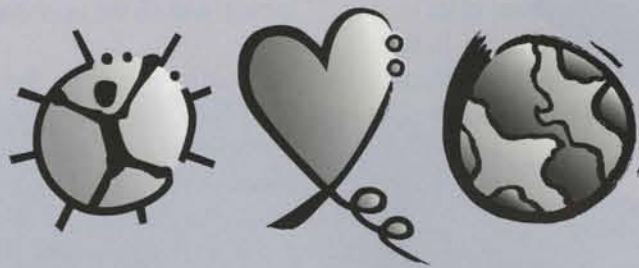
The corporate commitment will be a boon to the network of volunteers who have built an infrastructure for community involvement at Quantum in Milpitas, Colorado and Shrewsbury.

In the past, employee enthusiasm for community programs and volunteer efforts programs has outpaced formal corporate commitment. Now, Quantum will support these efforts on a more consistent and more formal basis.

"We can build on the caring attitudes of Quantum employees, as demonstrated by their involvement in community volunteer activities, as we launch the more formalized corporate responsibility program," says Barber.

Quantum's corporate responsibility statement sums up the rationale for the expanded commitment to the community: "We are part of the community in which we do business. Active participation in efforts to improve the quality of life in the community is consistent with our values and is simply the right thing to do. Quantum and its employees will be involved in such efforts through corporate-sponsored initiatives and donations of time, talent and resources."

## LOOKING FORWARD



## GIVING BACK

*"We are part of the community in which we do business. Active participation in efforts to improve the quality of life in the community is consistent with our values and is simply the right thing to do. Quantum and its employees will be involved in such efforts through corporate-sponsored initiatives and donations of time, talent and resources."*



*You wanted to know*

# Are We Changing Too Fast? — And Other Employee Questions

**W**hen Bill Miller, Quantum's CEO, travels around the company, he schedules plenty of time for listening to and talking with employees. During a recent road trip, he was asked a number of questions he thought should be shared with employees at large. The questions and answers are as follows:

**Q: Regarding the acquisition, it feels like we are moving too fast in changing some things, specifically the design team processes. Has anyone looked into this?**

A: We refrained from reorganizing the structure of Development Engineering immediately following the Digital acquisition in October to make sure we didn't move too fast. Instead, we undertook a comprehensive three-month study during the October quarter to determine what changes should be made.

The changes resulting from that study were announced January 19 at a Shrewsbury all-employee meeting.

— **Dave Jones, vice president, product development, HCSG**

**Q: How can employees order disk drives?**

A: Quantum employees may make two disk drive purchases per fiscal year, as part of the Employee Purchase Program. A memo, with an order form and instructions for making purchases, was distributed to all employees at the beginning of February.

Order forms should be filled out, signed and accompanied by a check made out to "Quantum Corporation," then sent to: Quantum Corporation; Attn: Lisa Butler; 500 McCarthy Blvd.; Building 14; Milpitas, CA 95035. Prices are subject to change, so be sure to call before placing your order.

For more information, or to obtain another order form, contact Lisa Butler at 408-894-5047 in Milpitas. LaCie products must be ordered directly through LaCie. Contact Marie Murders at 503-520-9000, ext. 2271.

— **Lisa Butler, customer service representative, DPSG**

**Q: Employee reimbursement is taking too long. It is particularly inconvenient when employees have to charge — and then pay for — their own airline tickets, even if it's on the corporate card. How can we fix this?**

As of January 11, airfares for company travel will be directly billed to the company and charged to the appropriate cost center for all Quantum locations, including Shrewsbury, Colorado Springs and Rocky Mountain Magnetics.

— **Mary Burkhart, manager, corporate travel**

**Q: Are there plans to have Quantum badges accepted at Rocky Mountain Magnetics?**

A: Quantum badges should be accepted today at the main entrance to the facility at RMMI. However, the security service we contract with at the plant uses a different system from Quantum to scan and read badge magnetic strips. For that reason, Quantum badges can't be used for card key entrances.

— **Dennis Pardini, manager, security/investigations**

**Q: Can the voice mail systems be linked between Shrewsbury and Milpitas? Right now, a lot of the administrative assistants have two voice mail boxes — one here and one in Milpitas. It takes a lot of time and toll calls to check both boxes.**

A: We are currently beta testing the voice mail linkup between Shrewsbury and Milpitas. The system is scheduled to be up and running by February 28, with instructions being sent to users during the second week of February. We are also studying the feasibility of voice-mail linkup to other Quantum locations.

— **Nader Habash, manager, MIS**

**Q: How do we know who to contact if we need help with our benefits or if something's not working?**

A: Thanks to the people who provide so many of the services available at Quantum, we have pulled together a list of telephone numbers to help employees at Quantum get the information they need. You will find it on the back page of this issue.

— **Editor**

**Q: The signature authority loop has doubled since the Digital acquisition. How can we decrease this bureaucracy?**

A: At the time of the acquisition, we implemented Quantum's existing signature authority procedures at all the facilities that were joining the company. Following that, we set about reviewing the signature policies to see how they could be customized to meet the needs of the new, more decentralized structure.

We just recently issued new guidelines that will delegate much of the signature authority out to the various Quantum locations. We believe the new procedures will significantly simplify the signature authority process. The new guidelines will be broadly communicated soon.

— **Joe Rodgers, chief financial officer**

*A lot of people want to get on board early*

## WARP Team Takes to the Road

**T**he Worldwide ASK Replacement Project (WARP) implementation team has been visiting Quantum facilities worldwide in recent months to spread the word that the company is about to begin transitioning from current business management systems to new Oracle applications software.

The move from ASK Manman and Maxcim to Oracle systems is a key step in Quantum's drive to speed its order-to-fulfillment process. Once in place, the system will allow for real time available to promise capabilities and will streamline financial reporting processes.

These early WARP team meetings are designed to give an overview of system changes to come.

"People have a lot of questions about how it will work, but everyone recognizes this is crucial," explains Holland Brown, information services manager and a roadshow host. "There are a lot of people who want to get on board early."

The first round of meetings were held in Shrewsbury, Colorado Springs and Rocky Mountain Magnetics in December, followed by Japan, Singapore and Penang. A second round of meetings will take place during March and April to acquaint major Quantum facilities around the world with project progress. ☐

## New Building Completes 37-Acre Headquarters Complex

**T**he last five acres of weed patch had disappeared from the Milpitas campus by yearend, with the completion of Building 5. Employees began moving into the final addition to Quantum's corporate headquarters complex in early January.

"Building 5 was completed on time and on budget," reports Norm Claus, director of real estate and facilities services. "The new building ends the final phase of a five-year project to meet Quantum's facility needs at the corporate headquarters location."

Construction for the 95,000 square-foot facility began May 18, 1994. Its modular design provides flex space to meet engineering needs, which include labs with clean rooms, environmental rooms and digital scan facilities.

The building and covered walkways enclose the courtyard of the campus and provide free access to all other buildings.

"With the completion of the campus headquarters, we will continue to evaluate alternatives to accommodate Quantum's future growth," Claus says. ☐



# Who Ya Gonna Call?

**B**een trying to figure out who to call to get that light bulb fixed over your cube? Don't know who to contact with questions about payroll? Sometimes it's the little things that can be the most difficult to take care of.

With all the change going on around Quantum, *Off The Disk* thought this might be a good time to offer a list of contacts to help you take care of business. Some of these contacts may change over time, so watch these pages for updates. And good luck with that light bulb.

## Facilities:

Milpitas	Facilities Help Desk	(408) 894-4350
Shrewsbury	Facilities Help Desk	(508) 770-5000
Colorado Springs	Help Desk	(719) 592-5357
Rocky Mountain Magnetics	Gary Anderson	(303) 673-5418
Dundalk	Conor Moore	(353) 425-9236
Penang Disk Drive	J. L. Quek	604-642-8000
Penang Peripherals	Razali Babjan	604-810-3116
Batam	Edgardo Linsangan	62-778-611-496
Singapore Logistics	Michael Thomas	65-266-4755

## Computer Support:

Milpitas	Help Desk	(408) 894-6470
Shrewsbury	Help Desk	(508) 841-3000
Colorado Springs	Help Desk	(719) 592-5357
Rocky Mountain Magnetics	I.S. Hotline	(303) 673-4974
Asia Pacific	Grace Chong	(65) 535-8200
Europe	First Contact	Nigel Russell (353) 425-9274
	Second Contact	Murt O'Seaghda (353) 425-9214

## Travel:

Milpitas	Associated Travel	(408) 894-5351
		(800) 305-5351
Shrewsbury	Associated Travel	(508) 770-2145
Colorado Springs	Associated Travel	(800) 203-8928
Rocky Mountain Magnetics	Associated Travel	(800) 203-8928
Dundalk	Mary Matthews	(353) 425-9234

## Security:

Milpitas	Control Center	(408) 894-5503
Shrewsbury	Control Center	(508) 770-2550
Colorado Springs	Control Center	(719) 548-6100
Rocky Mountain Magnetics	Security	Call Your Supervisor or Human Resources
		(303) 673-7911
Dundalk	Emergency Surge Team	(353) 425-9213
Penang Disk Drive	Abdul Manaf Idirs	604-642-8000
Penang Peripherals	W. S. Foong	604-642-3200
Batam	Mr. Tjitrosoemarto	62-778-611-496
Singapore Logistics	Ee Ieng Eng	65-6625-325

Current as of February 13, 1995

## Employee Benefits:

Many of your benefits questions can be answered by referring to your *Employee Handbook*. If you have further questions or need clarification, these sources are available...

## Benefits Hotline ..... (800) 282-5879

Health care eligibility; direct line to CIGNA for information on Core, Option 1, Option 2 and Vision/Preventive coverage; Health Care and Dependent Care reimbursement accounts; referral phone numbers for other coverages.

## CIGNA Medical, Vision/Prevention ..... (800) 572-0072

Group Number 2013588 — Information on what's covered under Core, Option 1, Option 2, and the Vision/Prevention plan; how to file a claim; problem with how a claim has been paid.

## Payroll:

Dept. 5000 (All Shifts)	Natalie Patania	(408) 894-4560
All Other Dept.'s in Milpitas	Ann Nguyen	(408) 894-4320
All Other Locations	Payroll Hotline	(408) 324-7191

## Stock Administration: Norma Schaffer (408) 894-5327

## 401(k) Hotline: Wells Fargo Bank (800) 776-4015

Personal Identification Numbers; changes in 401(k) contributions, investments and beneficiaries; distribution of accounts; account balances and status information.

## Wellness/Fitness: Cheri Eplin-Pierce (408) 894-5393

## Employee Assistance Program ..... (800) 227-1060

Group Number K556 — Problem assessment, short-term counseling, crisis intervention and referrals.

## Credit Unions:

Milpitas	AEA Credit Union	(800) 669-6937
	Technology Federal C.U.	(800) 553-0880
Shrewsbury	Digital Credit Union	(800) 770-2550
		(508) 770-2176
Colorado Springs/ Rocky Mountain Magnetics	Community Financial Federal Credit Union	(303) 469-5366

## Site human resources operations:

To report changes in address or family status (except on COBRA).

Milpitas	(408) 894-5207
Shrewsbury	(508) 770-2551
Colorado Springs	(719) 536-5483
Rocky Mountain	(303) 673-3874

## Human Resources Hotline ..... (800) 401-4601

For additional human resources information and direction. You should discuss with your manager any questions about Quantum policies and procedures, leaves of absence, educational reimbursement approvals, or work related problems and injuries.

## Drive For Excellence

# DFE Can Help You Meet Your Goals

**C**onsider your work: What are the challenges you face? How will you deal with increasing demands for greater productivity without additional resources? How will you ramp your product, sustain high yield and quality levels, develop and maintain effective partnerships with our customers? What does doing your job successfully mean now that Quantum is so much larger and geographically dispersed?

The Drive For Excellence staff has helped many groups within Quantum solve these and other problems. DFE consultants are available to help your group achieve its goals most effectively, better understand how to coordinate cross-functional activity and improve your results.

For information on bringing DFE to your work area, call (408) 894-5722, or E-mail: joannec@qntm.com. Sign up for a training session (see box) or arrange to have a DFE consultant come to your staff meeting to discuss how DFE can help your group succeed. ☐

## Introduction to Drive For Excellence

### Course Description:

It is critical to Quantum's success for all employees to understand the management philosophies and methodologies for improvement. This short course will provide an overview of these and help you begin to execute Drive For Excellence in your work area.

Date	Time
Thursday, March 2, 1995	9 a.m. - 12 p.m.
Thursday, May 18, 1995	9 a.m. - 12 p.m.

## Process Thinking & Management

### Course Description:

The key to achieving any sustainable improvement is to manage the underlying processes that control the result. This session will explain the concepts of managing by process, understanding customer requirements and measuring those processes for which you are responsible.

Date	Time
Thursday, April 6, 1995	8 a.m. - 12 p.m.
Thursday, June 8, 1995	8 a.m. - 12 p.m.

Both classes are open to all Quantum employees and are held on the Milpitas campus. To enroll, contact Joanne Cowperthwaite at ext. 5722 or for Milpitas employees, use the on-line registration in "DFE," located in the HR Server, Bldg. 3 IP70. Employees outside Milpitas can E-mail Joanne at joannec@qntm.com.

# Local Culture Celebrated at Batam Heads Facility Opening

**Q**uantum took the opportunity to celebrate the diversity of its worldwide workforce at the opening of its heads manufacturing facility in Batam, Indonesia, January 18. Festivities included a good luck-inducing "claybreaking" ceremony and traditional dances performed by employees.

The heads facility is located in a special economic zone supported by the governments of Singapore and Indonesia. The opportunity to learn high technology job skills has attracted enthusiastic employees from throughout the region.

In anticipation of the plant opening, teams of employees — many of whom live on-site — competed for the chance to display their knowledge of cultural dance during the celebration.

The event was attended by local dignitaries, including Indonesia's minister of Industry, Mr. Tungky Ariwibowo, and Philip Yeo, chairman of Singapore's Economic Development Board. Quantum CEO Bill Miller and George Raniuk, general manager, Asia Operations for RHG, plus other Quantum



executives attended the festivities hosted by Batam managing director L.H. Ang.

The facility began operations in June 1994 and became part of Quantum last October with the Digital acquisition. It is located in the Mukakuning district of central Batam, an island that lies 20 kilometers southeast of Singapore. The 100,000 square-foot plant employs more than 1,000 employees who manufacture recording head components, including gymbal and stack assemblies.

The Batam heads facility will incorporate many of Quantum's latest technologies, including magnetoresistive (MR) heads, into the components it produces.

"Quantum Peripherals Indonesia will provide a diversified, low-cost and highly-skilled head manufacturing capability in Asia," says George Raniuk. "We look forward to an exciting year ahead with aggressive plans to implement magnetoresistive assembly operations in 1995."

The event garnered good media coverage in the region, including a 90-second spot on Singapore's evening TV news. ☐

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