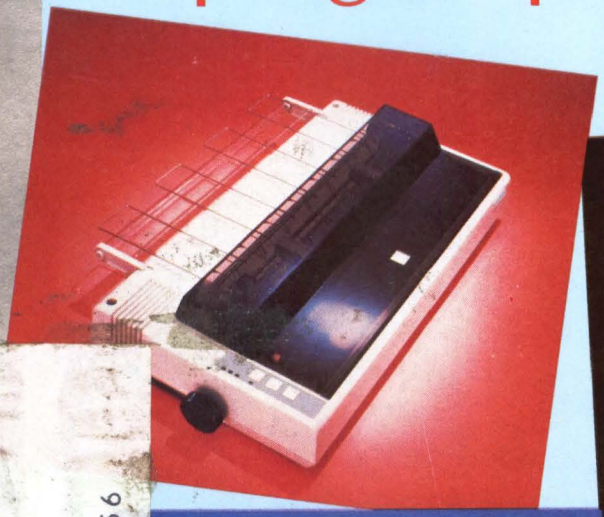
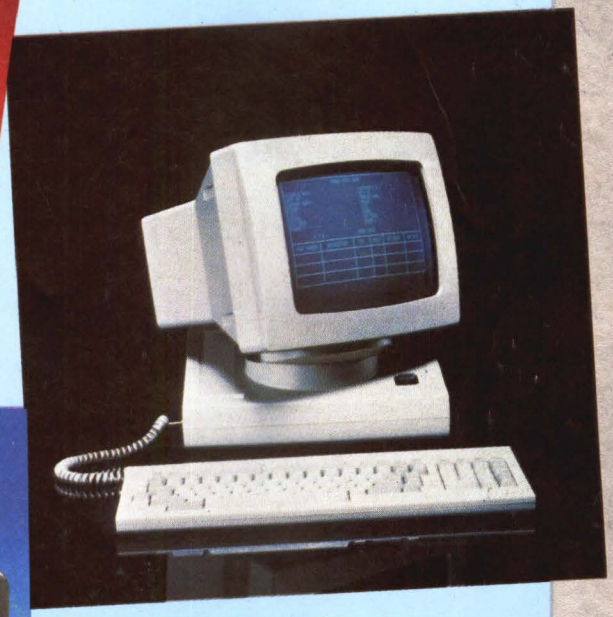
# Mini-Micro Systems

A CAHNERS PUBLICATION

APRIL 19, 1984

## Spring Peripherals Digest





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**The source book for system integrators**

You've concluded that you need the performance and capacity that only an 8 inch Winchester drive can provide. Which one should you buy?
There are 109 different models available.
Of this 109, only 39 are 8 inch floppy form-factor compatible.
28 of these 109 perform an average seek in 30 milliseconds or less.
And of this 109, only 17 offer true SMD compatibility.
Puzzled?

## Only *one* company provides a disk drive with all the features —

# Kennedy and Model 7300

**with the right size, the right interfaces and the right price.**
**Write or give us a call.**


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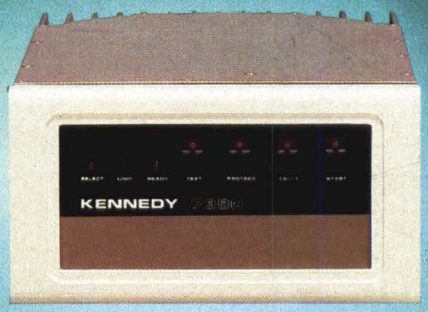




**SPECIFICATIONS:**
- 41 and 82 MB Capacities
- Rotary Voice Coil 30 msec average seek
- SMD, ANSI or PICO BUS Interfaces
- 1209 KByte/sec. transfer rate
- Available 30-45 days ARO
- Q100: $2,560/$3,195

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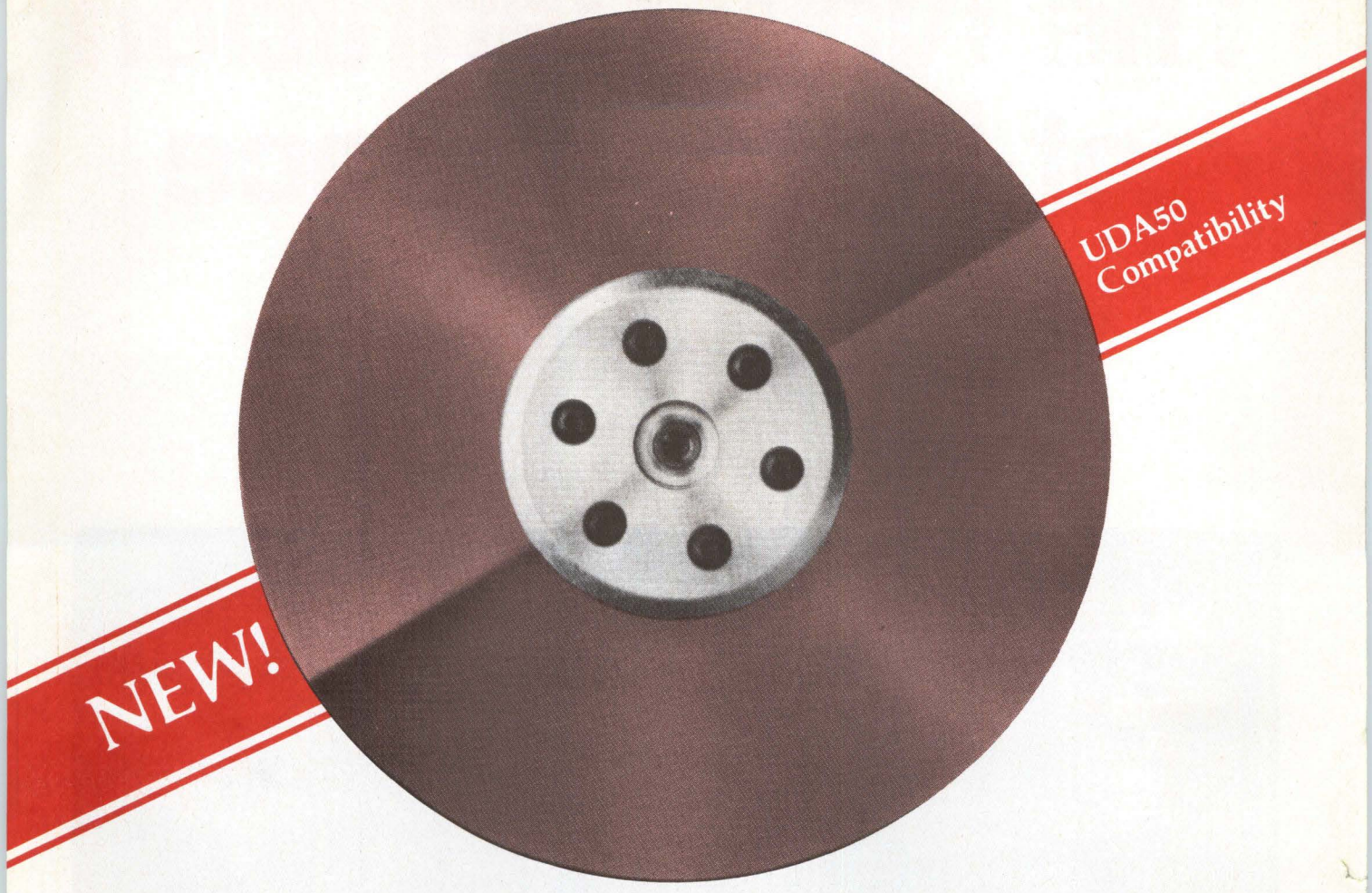
CIRCLE NO. 1 ON INQUIRY CARD

# DATARAM. Your disk drive connection.




## It's easy to interface your disk drive to a DEC computer. When you have connections.

Dataram provides connections to your host LSI-11, PDP-11, or VAX minicomputers for the full range of disk drives — from 5¼" Winchesters to Fujitsu's 1.8 MB/sec. Eagle. Emulations that go all the way from RL02 up to DEC's new UDA50. Cartridge drives, SMD drives, fixed and removable Winchesters. We connect with them all.

Our new single-board UDA50-compatible controller, the S35, is especially exciting. UDA50 compatibility allows you to interface any SMD drive (up to 1.8 MB/sec.) to the UNIBUS of any PDP-11 or VAX minicomputer. Sizing is done automatically and 100% of the disk is utilized —there is no lost capacity.

Dataram's available emulations are listed below. For more details on any of our disk controllers, call (609) 799-0071. We'll help you make the connection you need.

| LSI-11 | PDP-11 | VAX |
|---|---|---|
| RK05 | RK05 | UDA50 |
| RL02 | RM02 | |
| RM02 | RM05 | |
| RM05 | RK06 | |
| RK06 | RK07 | |
| RK07 | UDA50 | |

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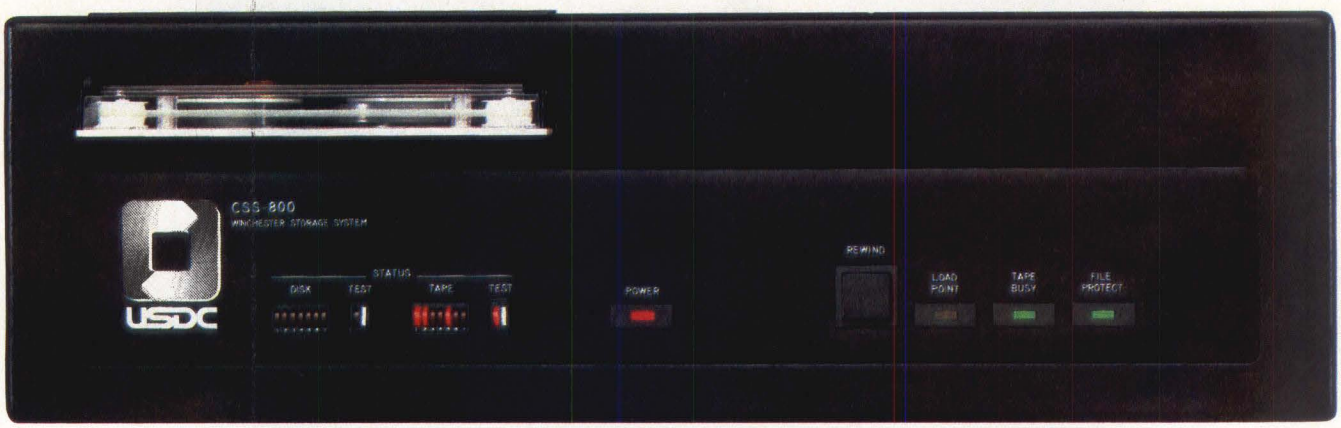
**CIRCLE NO. 4 ON INQUIRY CARD**

# The New Definition of Performance




## The CSS-800 Compact Storage System

**The Problem**—design a disk storage system that will raise the performance levels of a mini/micro computer by strategically managing data flow.

**The Solution**—our CSS-800, the most intelligent microprocessor-based storage system available today.

Our advanced architecture combines a cache memory with look-ahead buffering to cut access time by up to 90%, making your computer faster, more efficient, and more flexible than ever before. With 70 Mbytes of disk storage and 22 Mbytes of tape backup, our entry price, cost per Mbyte, and price/performance ratios are the best in the industry.

You need a storage system that is dependable as well as fast. The CSS-800 with Winchester technology affords maximum availability. Built-in diagnostics assure the reliability of all drives, controllers, and interfaces. Modular design makes repairs fast and easy. And we've backed the 800 with TRW's nation-wide service program to insure prompt and complete maintenance.

**The DEC Plug-in Solution** Totallly DEC* compatible, the CSS-800 emulates the RK07 disk and TU10 tape drives. System support is available under RSX-11M, RSTS/E and RT-11 operating systems as well as DSM, TSX, and UNIX. Q-bus or Unibus host interfaces are standard features. The whole rackmount or desktop package is only 5¼ inches high and weighs 42 pounds. Just plug our host interface into your back-plane and you're up and running with a truly compact and efficient system.

In today's complex world, the CSS-800 gives you a new definition of performance—more capacity and more speed for less money. Call us TODAY at (800) 368-2811, and we'll show you the technology of TOMORROW.

*DEC, RK07, TU10, RSX-11, RSTS/E, RT-11, DSM, Q-Bus and Unibus are registered trademarks of Digital Equipment Corporation. TSX is a registered trademark of S & H Computers. UNIX is a registered trademark of Bell Laboratories.

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# Mini-Micro Systems Peripherals Digest

A Cahners Publication

Vol. XVII No. 5 April 19, 1984



# QUADJET™ BY QUADRAM™

Quadram's new Quadjet ink jet printer is the ideal choice for your color graphics hard copy. It can take all your ideas and put them down on paper. So things like business, scientific and engineering applications are all of a sudden clearer and more meaningful.

**Colors to tempt the palette.**
With Quadjet you can color your charts, graphs and diagrams black, red, green, yellow, cyan, blue or magenta. Use all seven of them together, or in any combination. The color scheme is up to you.

Of course, Quadjet prints text as well as graphics, including standard and enlarged characters. With a maximum graphics resolution of 640 dots/line, your projects are printed crisply and clearly every time.

## OUTSTANDING COLOR GRAPHICS AT AN INCREDIBLY AFFORDABLE PRICE.

**Quadjet fits in.**
Quadjet is small and portable so you can put it just where you want it. Don't worry about the noise. State-of-the-art ink jet technology makes printing whisper quiet.

Quadjet uses disposable ink cartridges that are a snap to change. Just pop the old one out and the new one in. You'll find that each one prints about 4 million characters. As for paper, any 8½" sheet will do, whether it's form fed, sheet fed or some other kind.

**A word about compatibility.**
A standard centronics parallel interface makes Quadjet compatible with your IBM PC, XT or Apple computer. And if you have Quadram's Quadlink that allows you to use Apple software with your IBM PC, Quadjet can work that way too.

An easy-to-use software package lets you and Quadjet get down to business right away.

**The quality you've come to expect.**
Quadram put the same kind of quality into Quadjet that you find in all Quadram products.

Considering all of Quadjet's features, we'll let you draw your own conclusions. We think you'll find Quadjet gives you unsurpassed Quadram quality at an incredibly affordable price.

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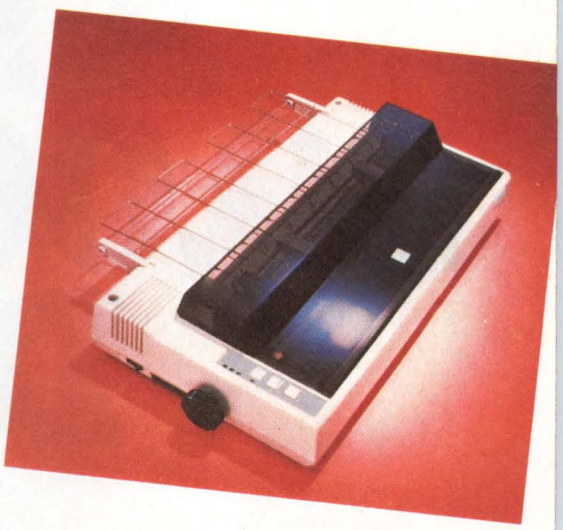
CIRCLE NO. 6 ON INQUIRY CARD



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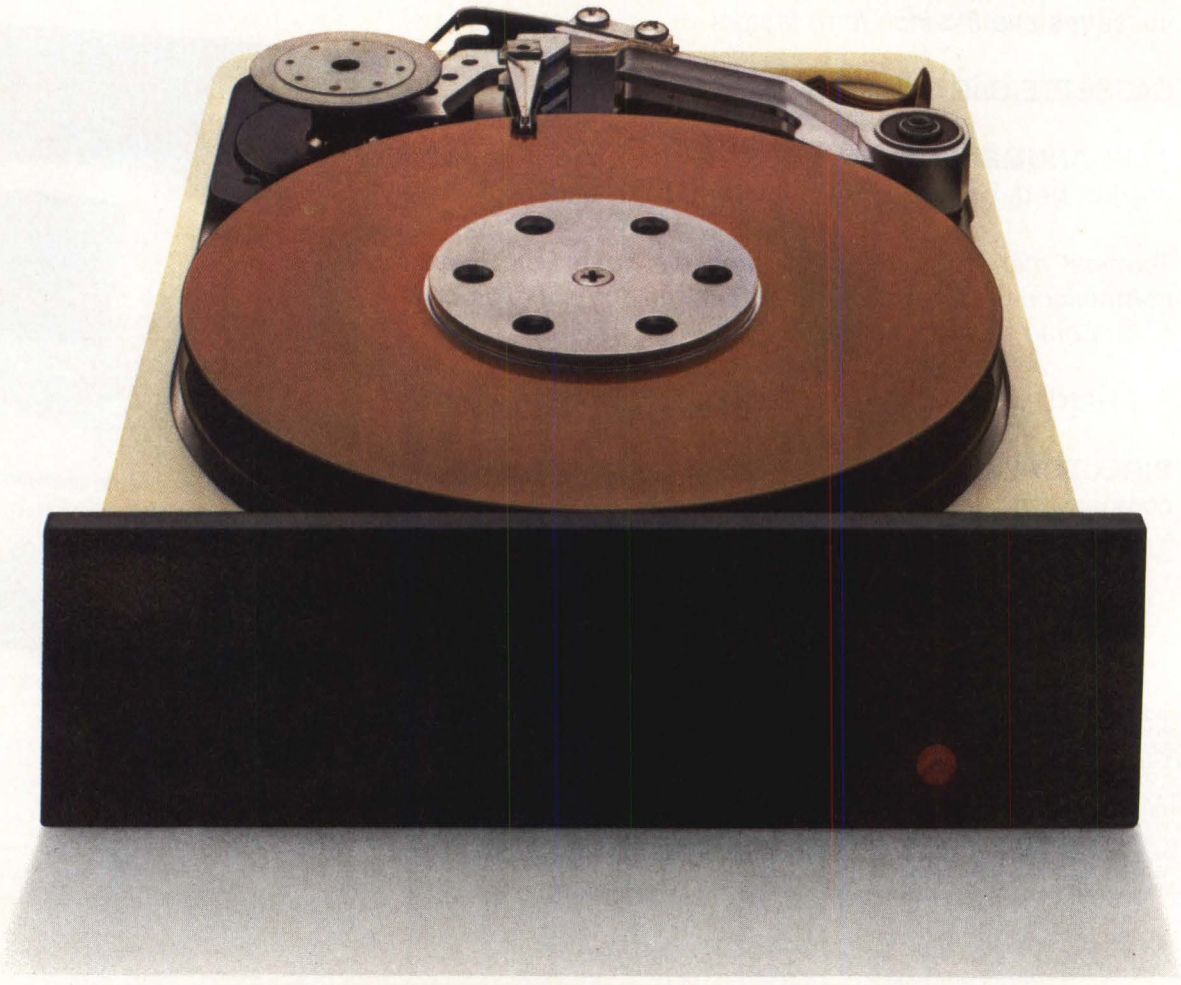
BPA ABP

# TAKE A SHORT 20,000-HOUR DRIVE.



And wave goodbye to the competition.

Presenting the Shugart 712. Our new 5.25" half-height 10 Mbyte Winchester.

It's a high performance compact that redefines reliability. So much so, it outdistances all other half-height Winchesters.

For starters, it runs at an MTBF of 20,000 power-on hours. That's 60% longer than other drives.

And it's roomy. With 10 Mbytes of formatted storage.

Plus four-point shock and vibration mountings, for a very smooth ride. And rugged enough to withstand up to 40 G's.

The 712 is based on 3370 flexure technology, bringing mainframe horsepower down to size.

And our new, low-mass head design complete with pre-amp is standard equipment, too. This makes flying height more uniform. And data integrity a given.

All this was made possible by our venture group approach. A specially chartered engineering and manufacturing team that makes sure the bugs are out the first time out.

And we make sure they have everything they need. Like the $40 million investment we made in capital equipment.

Which includes more progressive assembly lines. Class 100 clean tunnels. Even a more advanced spindle motor.

In short, everything you need for single-user personal computers. Intelligent workstations. And, down the road, multi-tasking software.

You won't have to reinvent the wheel every time you want to redesign, either. Thanks to our 1600 controller with built-in SCSI. Plus the drive level interface standard.

So test drive the 712 today. Or its 5 Mbyte version, the 706.

Just call your local Shugart sales office. Or, contact Hamilton/Avnet, our authorized distributor.

And find out how a little drive can take you a lot further.

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Right from the start.

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CIRCLE NO. 7 ON INQUIRY CARD

# EMULEX COMMUNICA
# HOW TO PLEASE ALL THE

New! CS02 allows LSI-11 through 11/23 PLUS and MICRO/PDP-11 systems to handle up to 16 lines on one board! Emulates DEC DHV11.

New! CS32 Series – Single-board controller is totally transparent to DEC DMF-32. Can handle up to 128 lines, *all* modem controlled.

New! Statcon Series 32 – Up to 256 local and/or remote lines on a single hex-sized controller. Totally software transparent to VAX-11 CPUs.

CS01 – A DH11 emulation for LSI-11 through 11/23 PLUS Series computers. Handles 8 to 64 asynchronous lines per controller. Replaces DEC DLV11 and DZV11.

No matter what type of DEC you're using, Emulex will make you happy. For LSI-11, PDP-11 and VAX-11 systems, we offer more than 17 transparent controllers emulating DHV11, DH11, DZ11, DV11, and DMF-32. All deliver improved line-handling capabilities, in a smaller package, at lower costs.

**TWO NEW HIGH-PERFORMANCE MULTIPLEXERS.**

FOR QBUS SYSTEMS:

Our new CS02 multiplexer is a good example of the kind of performance that only Emulex delivers. It allows LSI-11 through 11/23 PLUS and MICRO/PDP-11 systems to handle 16 lines – eight lines more than DEC's DHV11. The CS02 fits into existing space within the DEC system. It saves that valuable board slot, and power too, for those expanded system applications.

FOR VAX SYSTEMS:

VAX users will appreciate our new CS32. Totally transparent to DEC's DMF-32, this single-board controller can handle many more lines – up to 128. All modem controlled. (With DEC, only two out of every eight lines have modem control.)

If your VAX system needs even more power, our field-upgradable Statcon 32 Series is the answer. It allows your system to grow to 256 remote and local lines, still operating off a single controller.

**LESS BACKPLANE SLOTS.**

Since Emulex packs so much more capability onto each board, fewer boards are needed. For example,

*LSI-11, PDP-11, VAX-11, DH11, DZ11, DV11, DMF-32, DHV11, DEC, QBus and Unibus are trademarks of Digital Equipment Corp.

GSA Contract #: GS00K84015S5575

# TIONS CONTROLLERS: DEC USERS ALL THE TIME.

CS11 Series – DH11, DV11 and DMF-32 emulations for PDP-11 and VAX-11 CPUs. Handles 8 to 64 asynchronous lines.

Statcon Series 11 – Transparent remote statistical concentrators for PDP-11 and VAX-11 CPUs. Up to 64 local and/or remote lines on a single Unibus SPC slot.

CS21 Series – DH11, DZ11 and DMF-32 emulations for PDP-11 and VAX-11. Up to 16 lines per controller.

Statcon Series 21 – Up to 32 remote and/or local lines on a single hex-sized Unibus controller. Transparent to PDP-11 and VAX-11 CPUs.

take a 64-line DH11 emulation. Emulex does it on one board. DEC takes 36. The only thing more impressive than the savings in rack space will be the savings in price.

**NO GROWING PAINS.**

Emulex makes upgrading simple. As your system grows, just change PROM sets. For instance, DH to DMF costs just $350. In addition, Emulex's advanced microprocessor architecture is consistent throughout the product line. Just think of the inventory savings. For that matter, think of the dollar savings, too.

**THE PRICE IS RIGHT.**

Here's a typical example. A DEC DMF-32 controller lists at $3,995 per eight lines, with expansion chassis costing $3,500 or more. Compare that to Emulex's CS32/F at $5,000 for the first 16 lines and $3,200 for each additional 16 lines. At 128 lines, you suddenly have a savings of about $36,520 and a lot of extra slots to boot.

Now that ought to be enough to keep a DEC user happy. And Emulex can do the same for you. Call toll-free: (800) 854-7112. In California: (714) 662-5600. Or write Emulex Corporation, 3545 Harbor Blvd., P.O. Box 6725, Costa Mesa, CA 92626.

EMULEX

**The genuine alternative.**

CIRCLE NO. 8 ON INQUIRY CARD


# IT'LL BLOW YOU AWAY

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- 1536x1152, 60Hz non-interlaced, graphics display
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*From now until May 31, 1984 our $42,000 CX 1500-01 Colorgraphic Engine™ is being offered for $19,995 complete. Includes engine, monitor, keyboard, graphics executive software. Act Fast... Limited Offer... One Per Customer.

**CIRCLE NO. 9 ON INQUIRY CARD**

# How to use the Peripherals Digest

The Peripherals Digest is divided into six categories—five for products and the sixth for the directory of product manufacturers. Each of the five sections contains two subsections:

- one or more product overviews compiled by *Mini-Micro Systems* editors,
- one or more product pricing and specification tables arranged alphabetically by company name, compiled by computer and based on mail- and telephone-survey information.

The directory of manufacturers, the last section of the digest, is a consolidated alphabetical listing of all the vendors tabulated in the five product categories. Each directory entry provides a vendor's mailing address and telephone number, as well as a circle number for the reader service card.

To use the Peripherals Digest effectively, use the tabs to find the right product category. To find addresses or phone numbers, use the directory of manufacturers. To check product prices or specifications,

- turn to appropriate product category,
- find the product table,
- find the alphabetically listed vendor.

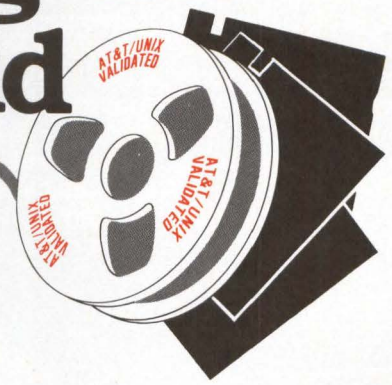
To select a peripheral:

- turn to the appropriate product category,
- refer to the product tables,
- refer to the directory of manufacturers to find suppliers' addresses.

To comment on the Peripherals Digest or to suggest future product coverage or entries, contact the Editor in Chief, *Mini-Micro Systems*, Peripherals Digest, 221 Columbus Ave., Boston, Mass. 02116.

The Peripherals Digest data research and editing staff includes Adrienne DeLeonardo, assistant editor; Steve Frann, assistant editor; Eileen Milauskas, editorial assistant; and Sheila Rao, editorial assistant. Production assistants Anabela Nunes and Carole Smith provide editorial support.

# Motorola introduces the first AT&T-validated UNIX™ operating system, putting the UNIX™ world in order.




**Motorola's SYSTEM V/68 Operating System is the first UNIX port validated by AT&T following rigorous test comparisons against the standard UNIX System V.**

**It's available now from Motorola as a standard operating system for the M68000 Family.**

**A powerful combination of industry standards.**

The unique combination of UNIX System V and Motorola's M68000 microprocessor family, both important industry standards, guarantees a rapidly expanding world of portable application software.

With major producers announcing commitments to UNIX System V each week, and the compatible M68000 Family of 8/16/32-bit microprocessors being overwhelmingly preferred by UNIX users, the System V/68 Operating System becomes the smart, assured investment for your computing future.

**Portability for system developers.**

To the system developer, the System V/68 Operating System means greater portability of source-code-level application software for a multitude of uses in business, science, and industrial automation. Software written in popular high-level languages--including C, PASCAL, FORTRAN, and BASIC--can quickly and efficiently be moved from mainframes and minicomputers to microcomputers using any of the M68000 family microprocessors.

And with all this capability, backed up by unsurpassed support, System V/68 software is available with attractive OEM volume licensing provisions.

**Count on complete Motorola support.**

Motorola provides comprehensive worldwide support for both source- and object-code versions of the System V/68 Operating System. Our complete package of system V/68 support service includes detailed user documentation, technical training seminars, regular software updates, newsletter, and a software problem hotline.

For additional information on System V/68 software, fill in the coupon and mail to Motorola Semiconductor Products, Inc., P.O. Box 20912, Phoenix, AZ 85036, or call our factory marketing team at (602) 438-3267. For local assistance, contact your Motorola Semiconductor Sales Office, authorized Systems distributor or Systems representative.


System V/68 is a trademark of Motorola, Inc.
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**MOTOROLA INC.**

TO: Motorola Semiconductor Products Inc., P.O. Box 20912, Phoenix, AZ 85036.

**Please send me more information on System V/68.**

178MMS041984

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Title_____

Company_____

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# HOW TO CONTROL THE RISE AND FALL OF POWER.

Your small business computer can give you the power to raise your productivity. But first you have to control the power you give it. Because even the slightest dip or surge of electricity can result in a shocking surprise. An instant loss of important data or misinformation. Even worse, a total power line failure can create department devastation... a total system crash. You can't afford errors, delays and other problems. After all, you've invested in a computer to increase efficiency.
But now there's a solution you can afford The Sola SPS. This economical, UL listed Standby Power System is designed to protect personal, micro and mini computers from AC line disturbances and failures. Sola SPS provides clean, regulated AC power to your computer when your power line experiences irregular voltage. Line dips or line surges are immediately converted to proper voltage. When the AC line is present, the SPS filters power to eliminate electrical noise. And when the AC line fails, the SPS goes into full action, providing precise AC power to the load from its internal battery. So the only noise you'll hear is the sound of performance. There's no maintnance. No installation. No kidding. Just plug it in and turn it on. Why let your productivity rise and fall with your power? The solution is as simple as SPS. The standby system that Sola stands behind.




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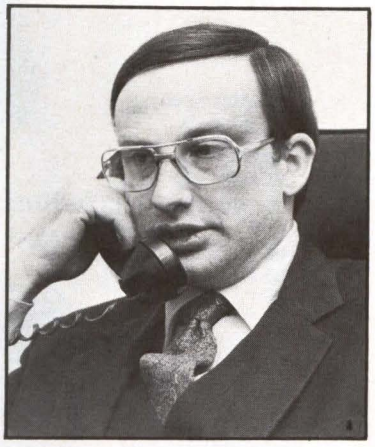
# Editorial

# Digest's growth matches product developments



This April's Spring Peripherals Digest is the first of three special *Mini-Micro Systems* issues to be published during 1984. That compares to two in 1983. In June, you will receive our new Computer Digest followed by November's Fall Peripherals Digest. These digests mark our second year of publishing special product issues, a practice that will continue as we develop improved methods of providing you with new and reliable product and market-overview information.

Perhaps you have already noticed a change in our regular monthly product survey articles. The monthly product surveys take a more focused look at exciting product groups, such as correspondence-quality printers, half-height Winchester disk drives and streaming-tape drives. We have taken this approach to complement the full coverage on printers, disk drives and tape drives now found in the Peripherals Digests. When you are searching for widespread product information, the digests are your most complete source. When a significant new product group emerges, *MMS* will cover it in a product survey article.

In June's Computer Digest, survey categories will include single-board computers, single-user microcomputers, multiuser microcomputer systems and minicomputer systems. We will also look at the various product configurations and business relationships offered by computer manufacturers for their OEM customers.

Our coverage this year is not limited to hardware. So far, our monthly issues have included four software survey articles, and many more will follow. As this digest issue goes to press, we are planning our 1985 editorial calendar. We welcome your suggestions for improving our product coverage because we want to continue to be your best source of product information.

Rick Dalrymple

**Rick Dalrymple**
**Senior Editor**

# At last, a modem that goes where you want.

## And does what you want.

The S-100 Modem™ by U.S. Robotics. 300/1200 baud. Auto dial/answer. A limited two-year warranty. Just $449.*

And it's fully-programmable with Telpac™— USR's telecommunications software package.

*Suggested list for S-100 Modem with complete manual and phone cord. Telpac software (optional) – $79.00.

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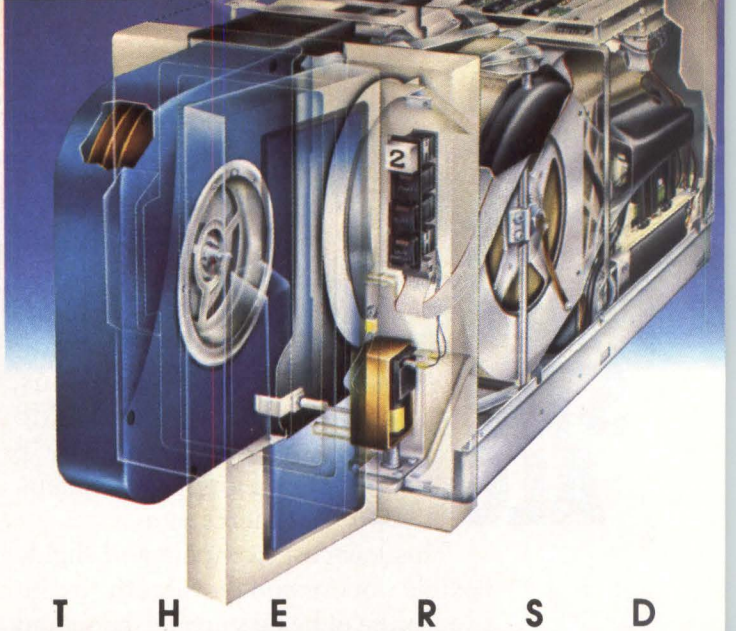

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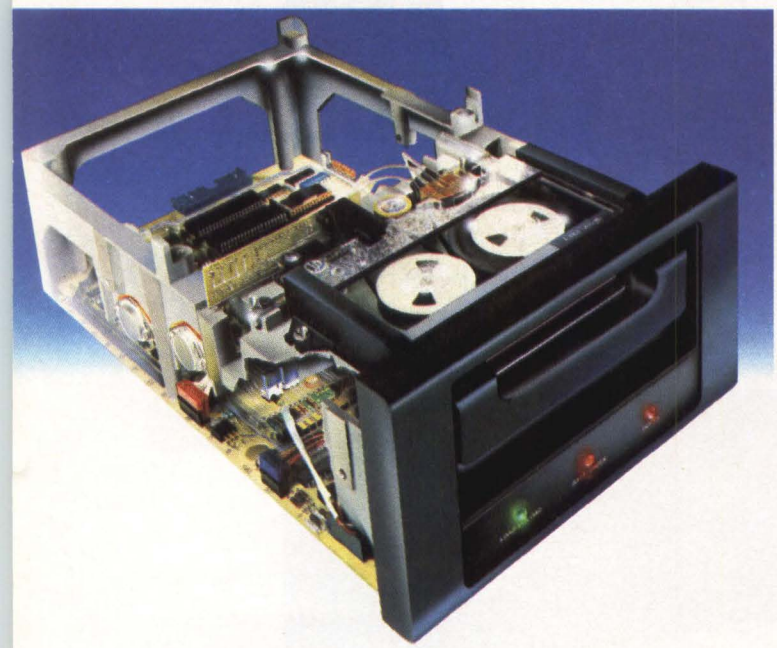

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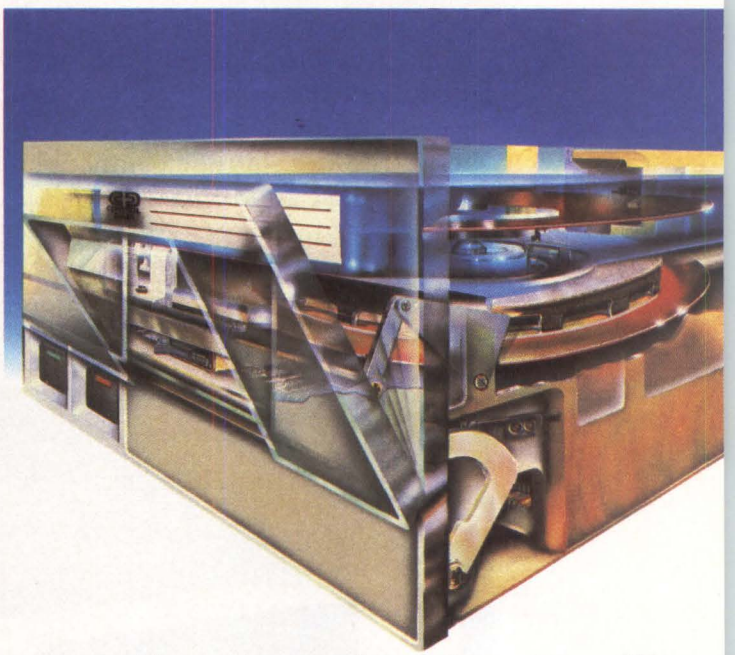

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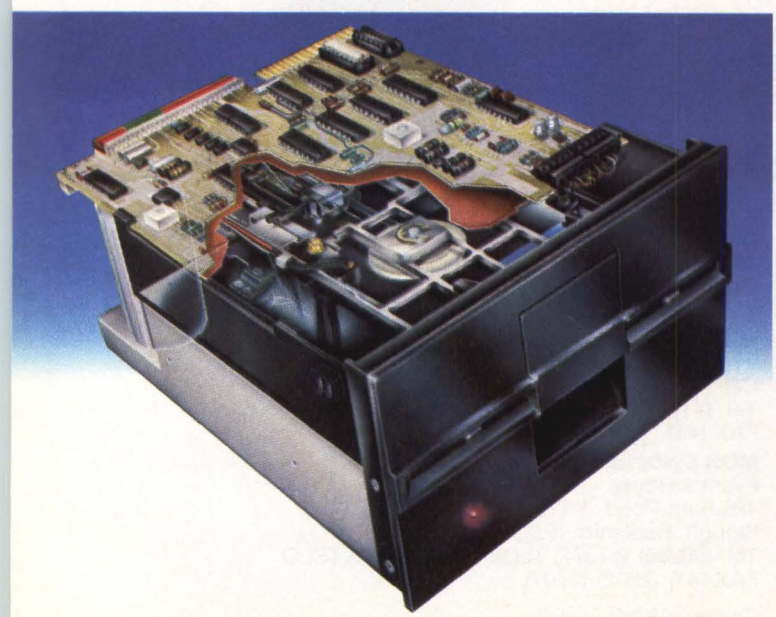

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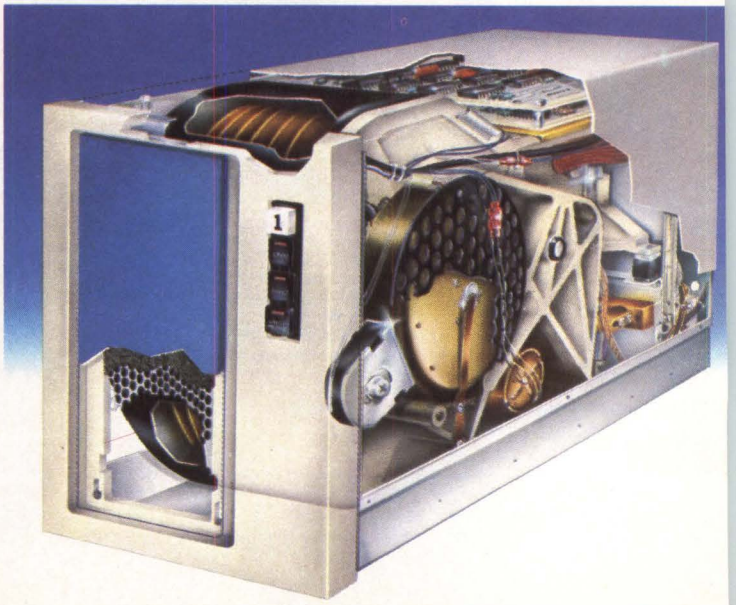

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**CIRCLE NO. 14 ON INQUIRY CARD**

# Seagate boosts market for 8-inch Winchesters

*Its 100M-byte drive fuels the debate on the near-term future of high-capacity, 5¼-inch Winchester drives*

**Robert Sehr,** Associate Editor

The low-end market for 8-inch Winchesters was born into a confusing world of interfaces and left to drift in the wind generated by the explosive growth of 5¼-inch Winchesters. Now, it seems the market can't even die in peace. Just when International Memories Inc. had joined Ampex Corp., BASF AG, Pertec Peripherals Inc. and other 8-inch Winchester makers in phasing their products out of the market, a reprieve came from an unlikely source—Seagate Technology, Scotts Valley, Calif.

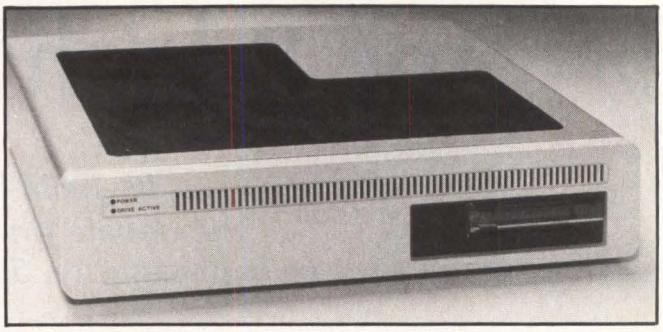
Seagate, which created the 5¼-inch Winchester four years ago—and ultimately doomed most low-end 8-inch products—has introduced the half-height, 8-inch, 100M-byte ST8100 Winchester disk drive, called the multiuser memory system (MUMS). The device is priced at $1,500 in large quantities—a price competitive with 5¼-inch drives and well below other 8-inch drives. Thus, with a single product, Seagate has revived the market for 8-inch Winchesters and delivered a message to manufacturers of high-end 5¼-inch Winchesters: the time is not yet ripe for a manufacturable 5¼-inch Winchester storing 100M bytes or more.

Like everything else about the 8-inch form factor, MUMS is controversial. Seagate sees MUMS as

intended for multiuser networking, graphics and shared-resource systems based on powerful desktop supermicrocomputers. Seagate's kindest detractors view MUMS as a fill-in product until the company can manufacture a 100M-byte, 5¼-inch product.

Independent analysts also disagree in their views of MUMS. Jim Porter, market analyst and author of *Disk/Trend Report,* Mountain View, Calif., contends that, no matter what Seagate does, 5¼-inch products will ultimately prevail. "The 5¼-inch drives which secure major market positions are expected to displace most existing 8-inch OEM drives in [the 30M- to 100M-byte] range and to share in the growth predicted for multiple-user desktop systems," states Porter in his 1983 forecast. He expects shipments of 8-inch drives to peak this year at 218,000 units and high-capacity, 5¼-inch drives to reach shipments of 353,200 units by 1986.

In estimates made before the Seagate announcement, research company Dataquest Inc. predicted a slight but steady increase in shipments of 8-inch Winchester drives from about 150,000 units in 1983 to 300,000 in 1987. Jim Moore, market analyst for



**Seagate's half-height, 100M-byte, 8-inch ST8100 Winchester** *has boosted the slow market for 8-inch drives. Seagate chose to use conventional technology in larger packaging as a safe route for a producible product, while other competitors opted for high technology in 5¼-inch packages.*

## Sub-5¼-inch Winchester: the British are coming

American disk drive companies have always kept a wary eye on Japanese competition, but they may have been looking in the wrong direction. Now, competition is coming from across the Atlantic: Rodime Plc., Glenrothes, Scotland, is threatening to take over the sub-5¼-inch Winchester market.

While U.S. companies concentrated on protecting their investments in the promising market for half-height, 5¼-inch Winchesters, Rodime unleashed a small invasion force of 3½-inch Winchester drives that is expected to number more than 60,000 drives this year. Late last year, Rodime signed a major contract with portable computer supplier Compaq Computer Corp., almost assuring Rodime a leadership position in the market.

"If American companies don't watch out," says Jim Porter, author of *Disk/Trend Report,* Mountain View, Calif., "Rodime will have an impenetrable market advantage."

Porter predicts that shipments of sub-5¼-inch Winchesters, which numbered 8,000 units in 1983, will rise to 872,000 in 1985 and 2.29 million in 1986, or 49 percent of the low-end (less than 30M bytes) market. As a result, he notes, market opportunities abound for half-height, 5¼- and sub-5¼-inch models.

By the beginning of this year, only two U.S. manufacturers—Control Data Corp. (CDC) and Microcomputer Memories Inc.—had announced sub-5¼-inch Winchester drives. CDC, Minneapolis, has shelved its product —the 6M-byte, 3½-inch Cricket drive announced at the 1983 National Computer Conference—until later in the year. Many observers say Cricket had many advances, such as thin-film media and thin-film heads, but not enough capacity. This year, CDC admitted there is insufficient demand for a 6M-byte drive and promised a revamped 12M-byte Cricket this July.

The other announced player in the market for sub-5¼-inch Winchesters, start-up Microcomputer Memories, Van Nuys, Calif., is ramping up production in the hope that it can beat the established manufacturers to market.

### Other big players hesitate

The big players in the low-end 5¼-inch market have not yet announced their moves in the sub-5¼-inch area, leading to speculation that Seagate Technology, Tandon Corp. and Miniscribe Corp. are protecting their investment in half-height, 5¼-inch Winchesters before engaging in 3½-inch competition. The three surprised industry observers by not introducing a sub-5¼-inch product at the 1983 Fall Comdex show in Las Vegas, Nev. Seagate did show a working 3½-inch Winchester at the 1982 Comdex show.

### Will customers pay more?

The profit margin on half-height, 5¼-inch drives is far greater than it would be for a 3½-inch drive. "Customers always assume that a smaller form factor means a smaller price," says a spokesman for Miniscribe. "The truth is quite the opposite."

The smaller drives cost more to manufacture because of the higher densities required to achieve as much capacity as larger drives on less real estate, explains Jeffrey Liu, president of Microscience International Corp., a manufacturer of half-height, 5¼-inch Winchester drives. Microscience will announce a 3½-inch drive this spring. Liu believes that customers will be willing to pay a premium for 3½-inch drives. "There are some specialty markets like portable computer manufacturers and instrument makers who will not be able to use half-high, 5¼-inch drives. I think they will pay extra for a 3½-inch drive," Liu says.

Analyst Porter disagrees: "Logic may show the need for a premium price, but logic has never been a consideration in setting disk drive prices. History dicates that, as the diameter of a disk drops, so does the price."

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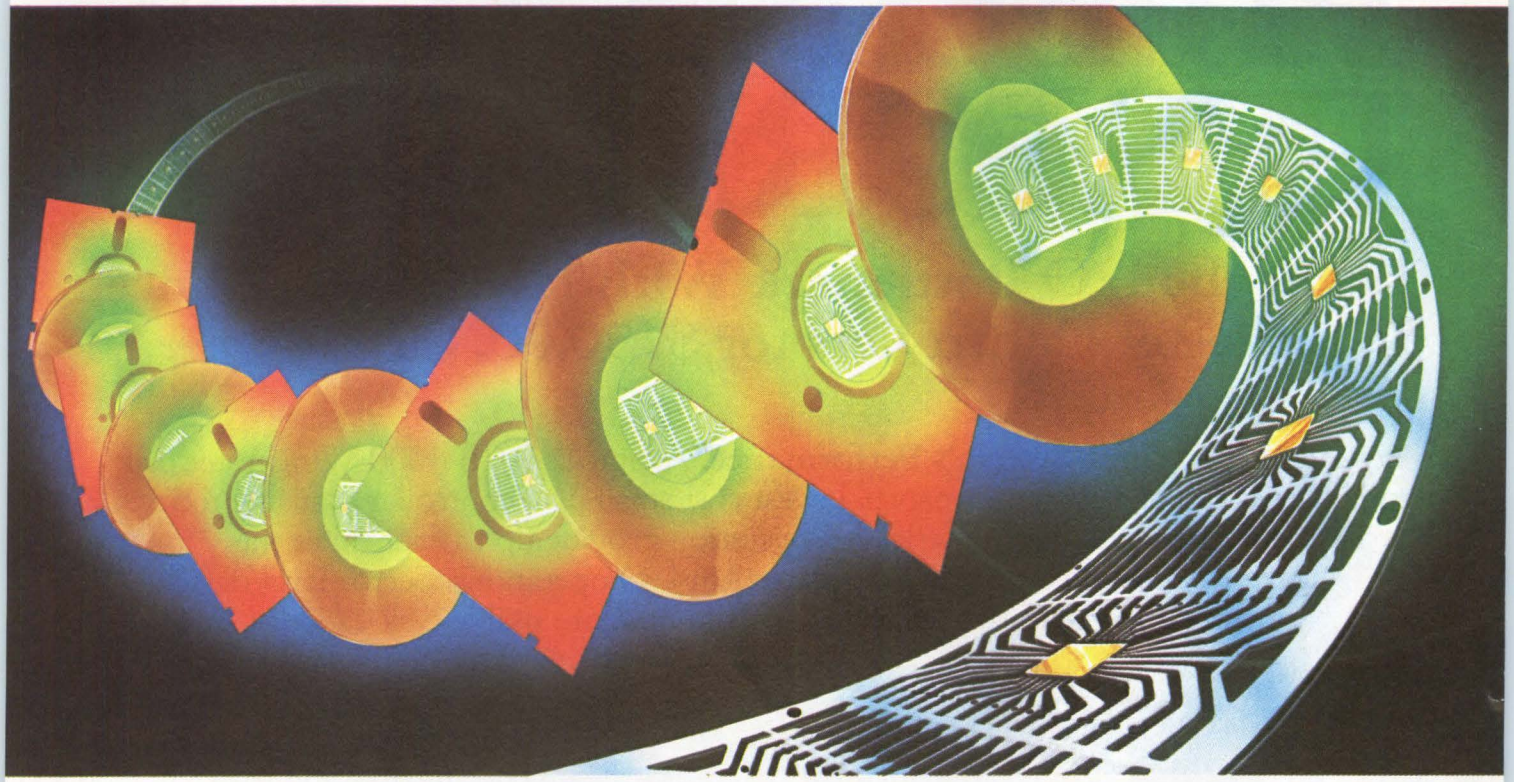

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Dataquest's Disc Memory Service, says MUMS' success depends on how serious Seagate is about the project.

### Seagate opts for producible technologies

"Our value added is marketing and manufacturing; as a result, we chose to do a product that is easy to manufacture and can be produced at the rate of 1,000 per day without problems," a Seagate spokesman notes. "The same cannot be said for 100M-byte, 5¼-inch drives."

Seagate has a reputation, especially in the financial community, as a dependable manufacturer that meets or exceeds its production schedules. "We believe the best-positioned vendor [in the 5¼-inch market] is Seagate Technology, a company with an enviable customer list, a 40 percent market share and an aggressive integration/offshore strategy," states a market report by Wall Street investment company Goldman, Sachs & Co.

However, the company also has a reputation for announcing and then shelving innovative products. In 1981, for example, Seagate announced a high-capacity drive using thin-film heads in what would have been the first application of thin-film heads in the OEM disk drive market. But Seagate never manufactured the product, reportedly because of the then-limited supply of heads. At the 1982 Comdex show, the company announced a 5¼-inch cartridge drive also using thin-film media, but Seagate never manufactured the product and withdrew it last spring because of concerns about the supply of thin-film media.

In 1982, Seagate confused the microfloppy market by announcing that it would manufacture its first floppy drive. After considering Sony Corp.'s 3½ microfloppy, Seagate bought a manufacturing license for a 3¼-inch drive from Tabor Corp., Westford, Mass. But Seagate has not yet produced any floppy drives because it claims that the market is not ready and that it can ramp up once the form-factor debate is settled.

Seagate is now concentrating on producing the industry standard 5¼-inch ST412, which is cranked out by the thousands each day at the company's assembly lines. The company has also begun high-volume produc-

## Shakeout looms in 5¼-inch Winchester market

As the explosive market for 5¼-inch Winchester disk drives drew competitors, observers began to wonder how soon the market would become saturated. "Despite the fact that the 5¼-inch Winchester market is the computer hardware industry's fastest-growing major segment, there is no need for 40 to 50 manufacturers," says a report by Wall Street investment company Goldman, Sachs & Co. "Over the next several years, a select handful will emerge as the prosperous leaders, relegating the rest to second-tier status."

The companies best positioned for the prosperous tier are Seagate Technology, Tandon Corp., Miniscribe Corp., International Memories Inc. (IMI) and Computer Memories Inc. Most of these suppliers have large contracts with IBM Corp. Miniscribe and Seagate, for example, depend on IBM for at least 50 percent of their business.

Disk drive analyst Jim Porter, author of *Disk/Trend Report,* says that 5¼-inch Winchesters will account for more than 90 percent of rigid disk drive shipments by 1986 and that four or five companies will ship most of those units. He predicts that more than 2.4 million 5¼-inch disk drives will be shipped annually by 1986, compared with 214,000 in 1982.

This year, suppliers that have IBM contracts learned an important lesson —IBM giveth, and IBM taketh away. A sharp curtailment in IBM's orders with Seagate, Miniscribe and IMI forced a drop in the companies' stock prices and slowed production. What caused the slowdown is not clear. Observers speculate that IBM increased the number of its suppliers, added an overseas supplier or planned to ramp up its own 5¼-inch production line; most OEM suppliers know that IBM will begin to produce its own 5¼-inch Winchesters soon. But most sources believe that IBM deliberately over-ordered to avoid a component shortage that would slow production of the PC XT.

### Large companies will alter market

"Early decisions to produce internally by only a few companies (such as IBM, Digital Equipment Corp. and Apple Computer Inc.) could sharply alter the (OEM vs. captive) balance in favor of captive production," Porter predicts. Porter forecasts that captive shipments will represent only 18.9 percent of all less-than-30M-byte, 5¼-inch Winchesters shipped in 1986.

Seagate, with a blue-chip customer base, is in the best position to ride out the storm. In addition to IBM, Seagate supplies a large number of drives to Apple, DEC, Hewlett-Packard Co. and numerous smaller companies. Tandon is also in a strong position because of its solid leadership in the floppy drive market.

Others are not so lucky. Late last year, Disctron Inc., a subsidiary of Computer & Communications Technology Corp., decided to drop out of the 5¼-inch Winchester market. Disctron, the product of the merger of Rotating Memory Systems and Data Peripherals Corp., introduced a series of 5¼-inch Winchester products at the 1982 fall Comdex show but could ramp up production on only one. The company says it will continue to market its low-end 8-inch drives, including a 20M-byte, 8-inch cartridge disk.

Porter believes Disctron will be the first of several 5¼-inch Winchester makers that won't be able to withstand either the competition from large component producers or the price competitiveness in the market. Like it or not, the 5¼-inch Winchester is becoming a commodity, and manufacturers must compete for the lowest bidder or find a new niche.

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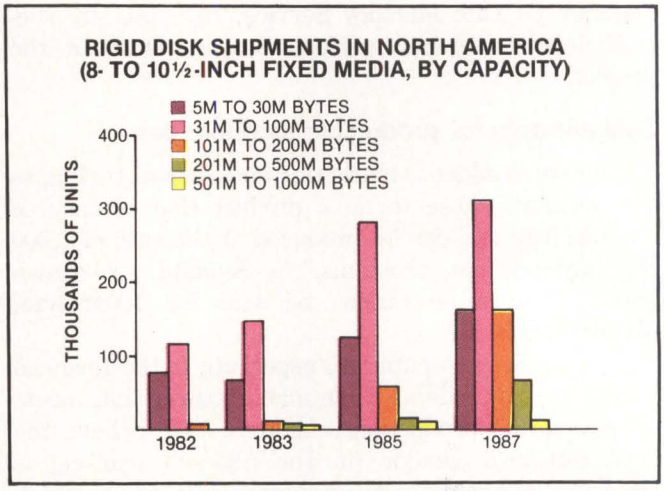


tion of what company officials and most analysts believe will eventually replace the 412: the half-height, 5¼-inch ST212. The question remains, however, about whether Seagate is serious about MUMS. From chairman Al Shugart and vice chairman Finis Conner, the answer is a resounding yes.

### ST8100's PC XT fit causes speculation

"I don't think they would have proceeded with this announcement unless they already had a customer in line for it," notes analyst Porter. While Conner says MUMS is the product of "customer demand," he does not comment on speculation that the customer in question could be Seagate's number-one drive buyer—IBM Corp. Seagate itself fueled speculation by demonstrating MUMS at last fall's Comdex show in a subsystem that fits the IBM PC. The subsystem package includes Seagate's new ST9100 controller, the ST412HP interface and a half-height Wangtek Corp. tape drive.

Porter believes that Seagate customers Hewlett-Packard Co. and Digital Equipment Corp. rather than IBM will most likely buy MUMS for use in current and future products. He predicts that IBM and makers of XT-like products will buy high-end 5¼-inch products for multiuser systems.

### Makers of 8-inch Winchesters welcome Seagate

Makers of low-end 8-inch Winchesters, such as Northern Telecom Inc., Ann Arbor, Mich., applaud Seagate's entrance into the 8-inch market. "I have been trying to tell people for the past year that 8-inch products can already deliver what 5¼-inch drives will only be promising for the next couple of years," says Richard E. Stusek, director of marketing at Northern Telecom. The company reduced drive prices after Seagate's entry, and Stusek believes price competition won't hurt the stagnant market. □

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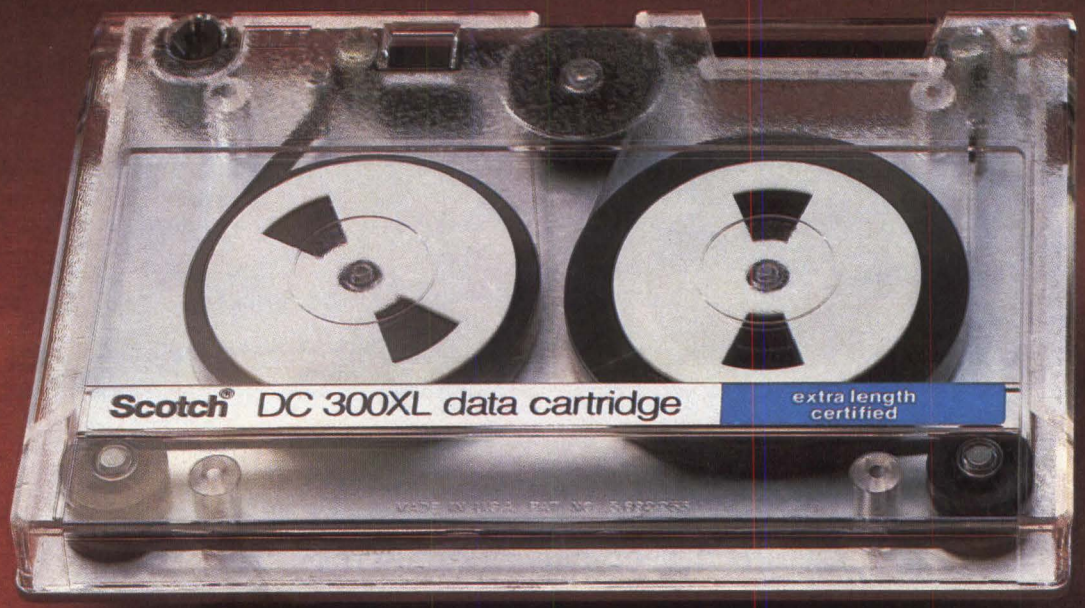
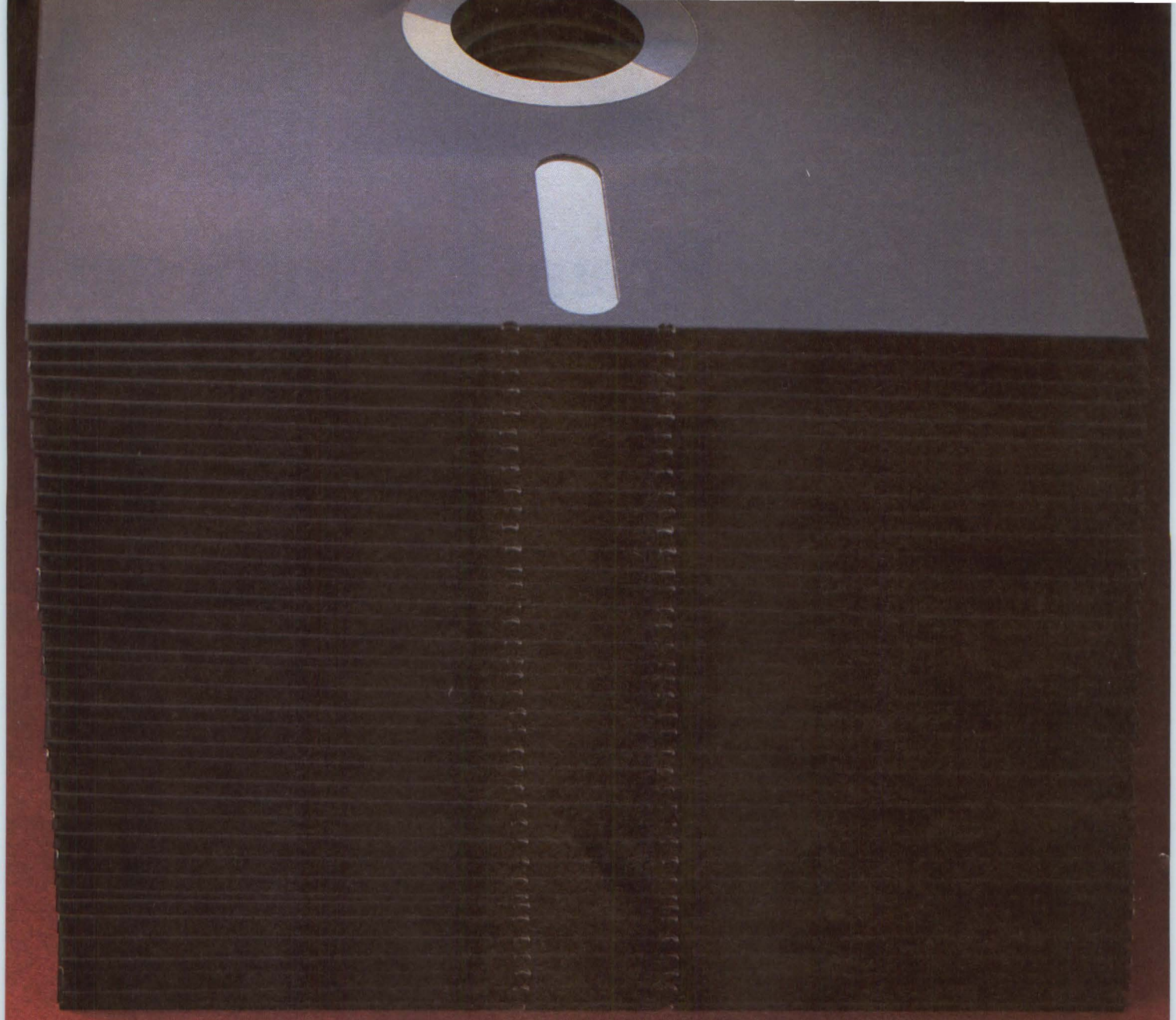



# The design solution: Winchester

**Save your customers time, space, and money with ¼" data cartridges.**
When 3M invented the ¼" data cartridge, they designed it to be fast, dependable, small in size, and big in capacity—up to 67 megabytes today, with more in store for the future. No wonder more and more systems designers are finding it the perfect choice for backing up Winchester drives. 45 megabytes of data can be transferred from disk to tape in under nine minutes—with no time lost for media changes. One cartridge does it all! It would take a stack of 38 eight-inch floppies* to hold the same amount of data. The cartridge is small enough to fit in a coat pocket—and rugged enough to be transported that way, too.

**New rules of standardization.**
Industry standards are now being formulated which will improve interchangeability of ¼" recorded data cartridges across most major manufacturers' ¼" drive systems.



# back-up that eliminates stack-up.

This means concerns about compatibility are diminishing.

**The logical choice.**

The ¼" data cartridge is the logical choice for designers specifying back-up systems for Winchester drives. It's small, reliable, easy to handle and transport, and has a very low cost per megabyte.

These high capacity cartridges are useful for archival storage and program loading, too. So don't wait, give your customers the future. Put this innovative technology to work in the next computer system you design. Data cartridge drives are available from over 30 manufacturers throughout the world.

**For more information:**
For more information on how 3M ¼" data cartridges can save your customers time, space, and money, write to Chris Binner, National Sales Manager—OEM Market, Data Recording Products Division, Building 223-5N, 3M Center, St. Paul, MN 55144.

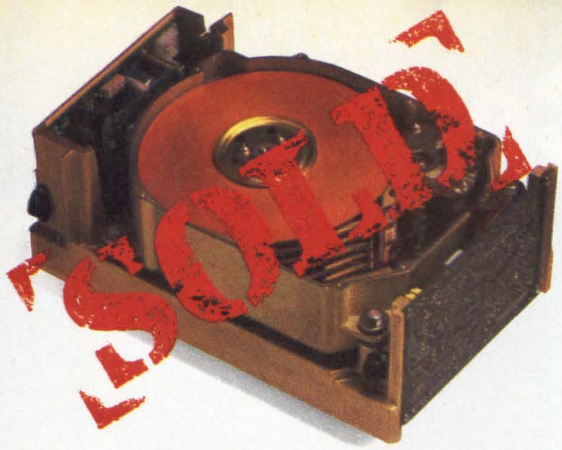
*Double sided/double density 1024 format 8" diskettes.

**3M hears you...**

3M

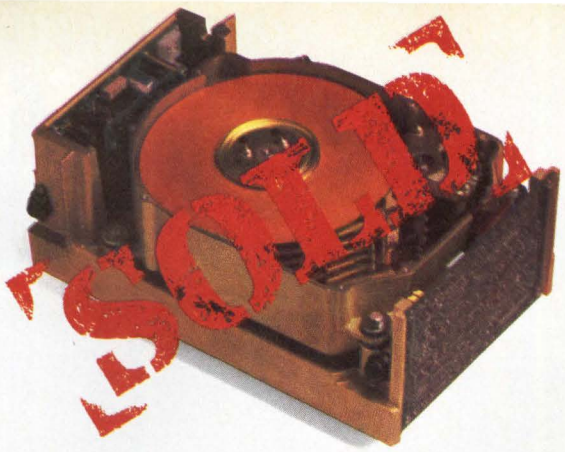
# Northern Telecom's 8" Winchester.

# Better memory.
# Better reliability.
# Better service.
# Better diagnostics.
# Better availability.
# Better read on.



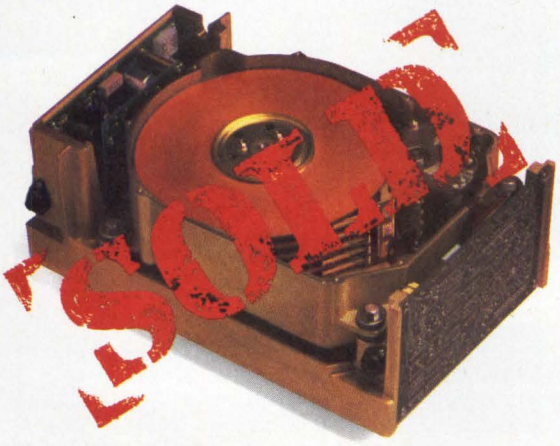
## Better memory.

Northern Telecom's MERCURY* disk drive has 225 megabytes of memory, the largest 8" capacity in volume production today. The same components used in this drive are also in 90 and 180 megabyte versions. Even higher capacity versions available in the same basic design in future.



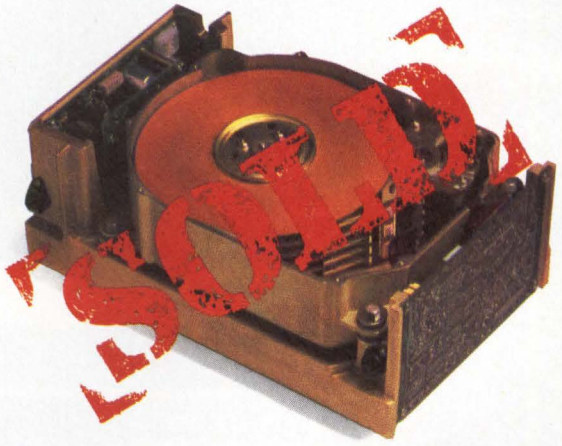
## Better reliability.

Mercury disk drive can be mounted in any plane. Contains significant component reduction for simplicity of operation. Has oxide media, and mini-composite heads: simple and reliable. Embedded servo control. Plus, Northern Telecom's heritage.



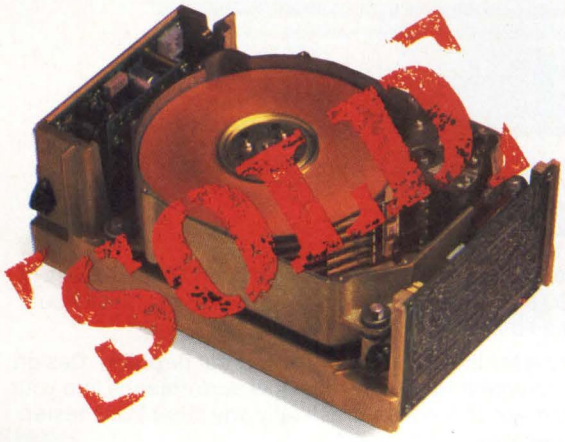
## Better service.

No routine maintenance or field adjustments. Modular design for total interchangeability of all sub-assemblies. Plus, you have Northern Telecom's network of service centers—135 in the U.S. and 19 in Europe.



## Better diagnostics.

Has both power-up and background diagnostics. Thirteen automatic pre-write checks. Automatic power monitoring capability. Speed regulation monitoring. And more can be brought to your computer panel by our intelligent interface.



## Better availability.

Not announcing! But shipping 225 megabytes today! Have 75,000 square feet of manufacturing space. Plus another 75,000 square feet when you need it.

## Better hurry.

Call today for your evaluation unit! Toll-free 1/800-521-FAST or your nearest district sales office: **(714)** 955-0450, **(408)** 297-6800, **(313)** 973-4534, **(214)** 239-0803, **(617)** 357-5159. Northern Telecom Inc., Memory Systems Division, 100 Phoenix Drive, P.O. Box D, Ann Arbor, MI 48106.

**CIRCLE NO. 20 ON INQUIRY CARD**

*Trademark of Northern Telecom Limited.

nt northern telecom

# Buy of the Century


## Century Data Systems' New 590 Megabyte Winchester Disk Memory

AMS 571—our largest, fastest disk memory—is loaded with value. New thin film heads and oxide media put 590 megabytes into a very compact, very economical package. To enhance system performance we've increased the data transfer rate to 1.98 megabytes per second while reducing the average head positioning time to 19 milliseconds. All for OEMs. And all at a very competitive price!

What's more, the AMS 571 gives your system a record low cost of ownership. Combining traditional Century Data Systems quality with inherent Winchester reliability, we've created a disk memory with an MTBF in excess of 10,000 power-on hours. A disk memory with quality built in for a lifetime of reliability.

Here's a terrific disk memory with great flexibility. Design your controller to pack all this new performance into your system—or to emulate practically any other Winchester disk memory.

Find out how the buy of the Century gives you a strong competitive edge in quality, capacity, performance, and price. Contact: Century Data Systems, 1270 N. Kraemer Boulevard, Anaheim, CA; (714) 999-2660.

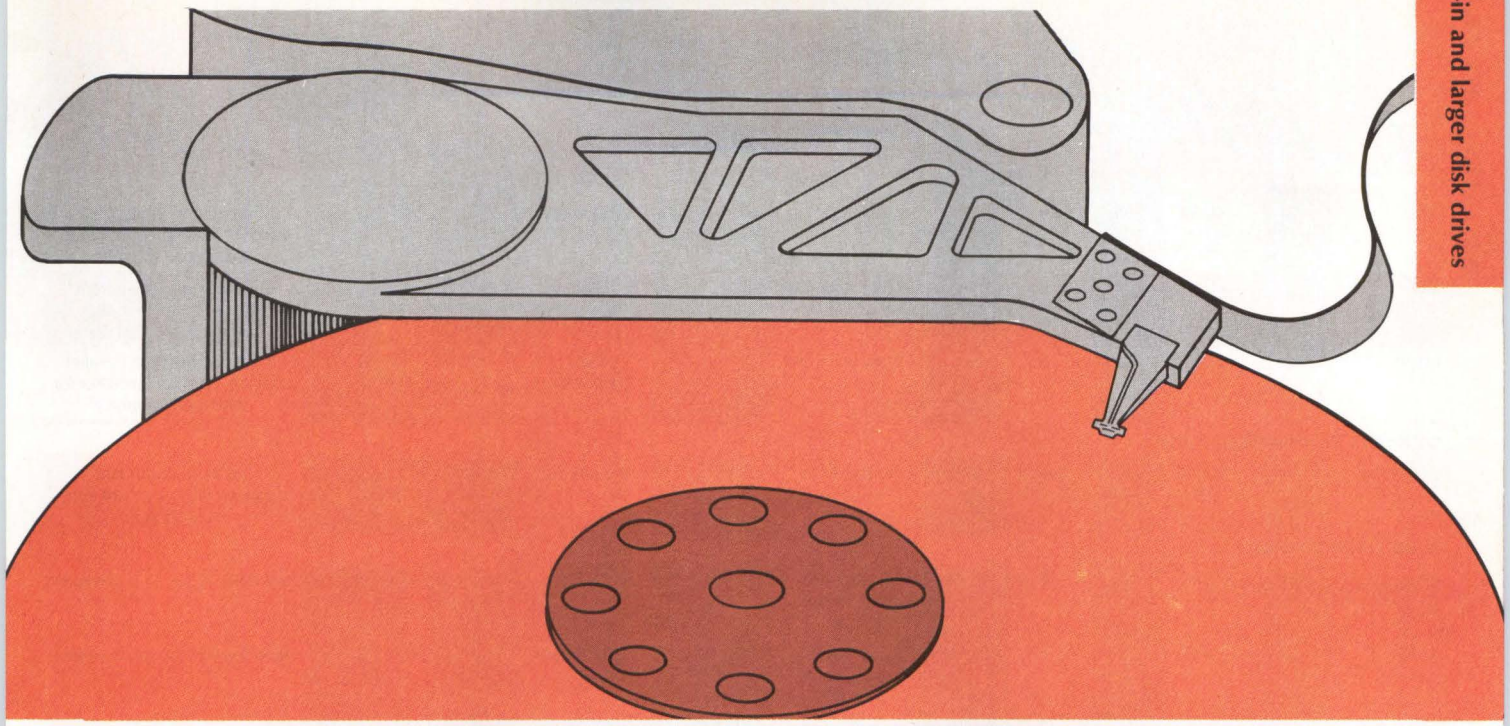
**Century Data Systems**

A Xerox Company

CIRCLE NO. 21 ON INQUIRY CARD

© 1983 Century Data Systems

# 8-INCH AND LARGER DISK DRIVES



| Company/ Model | Disk size (inches) | Unformatted capacity (M bytes) | Average access time (msec.) | Number of data surfaces | Number of read/write heads | Actuator type | Dimensions (HxWxD inches) | Interface | Prices ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|---|---|---|
| **ALPHA DATA INC.** | | | | | | | | | | |
| 80-8-128 | 8 | 2 | 8 | 1 | | | 8.25x19x23 | Alpha Data | 9,995(Q1);6,997(Q100) | |
| 80-8-256 | 8 | 4 | 8 | 2 | | | 8.25x19x23 | Alpha Data | 14,610(Q1);10,227(Q100) | |
| 80-8-512 | 8 | 8 | 8 | 4 | | | 14x19x23 | Alpha Data | 23,890(Q1);16,723(Q100) | |
| Atlas | 14 | 140 | 18 | 5 | 50 | rotary | 7x19x23 | SMD, ANSI | 8,750(Q1);5,725(Q100) | |
| **AMCODYNE INC.** | | | | | | | | | | |
| Arapahoe 7110 | 8 | 26.9 | 35 | 4 | 4 | closed loop, linear, voice coil | 4.63x8.55x14 | CDC Lark, SMD | 4,550(Q1);3,175(Q100) | ramp-launched heads, ANSI standard cartridge, embedded servo system |
| Comanche 8160 | 8 | 165.9 | 22 | 10 | 10 | closed loop, linear, voice coil | 4.63x8.55x14 | SMD | 3,800(Q100) | ramp-launched heads, pressurized clean air system |
| **AMPEX CORP.** | | | | | | | | | | |
| Capricorn C-165/330 | 14 | 165.9; 330.3 | 30 | 5, 8 | | linear motor | | SMD | | rack mount, self-test diagnostics |
| **APPLIED PERIPHERAL SYSTEMS** | | | | | | | | | | |
| 4830 | 14 | 337.1, 404.5 | 25 | 5, 6 | 10, 12 | closed-loop linear voice coil | 10.25x17.75 x29.31 | SMD | | thin-film heads, on-line and off-line diagnostics, rackmountable, 3370 technology |
| 4835 | 14 | 337.1, 404.5 | 25 | 5, 6 | 10, 12 | closed-loop linear voice coil | 10.25x17.75 x29.31 | SMD | | thin-film heads, on-line and off-line diagnostics, rackmountable, 3370 technology |
| 4865 | 14 | 640.4 | 25 | 10 | 19 | closed-loop linear voice coil | 10.25x17.75 x29.31 | SMD | | thin-film heads, on-line and off-line diagnostics, rackmountable, 3370 technology |
| **CENTURY DATA SYSTEMS, INC.** | | | | | | | | | | |
| AMS 315 | 14 | 315.2 | 25 | 19 | | linear voice coil | | SMD | 6,220(Q200) | 9766-compatible, dual access SMD |
| AMS 513 | 14 | 513.7 | 25 | 19 | | linear voice coil | | SMD | 6,600(Q200) | dual access SMD, A-M soft-sectoring |
| AMS 571 | 14 | 571 | 25 | 10 | | linear voice coil | | SMD | 8,400(Q200) | universal power supply |

## 8-INCH AND LARGER DISK DRIVES

| Company Model | Disk size (inches) | Unformatted capacity (M bytes) | Average access time (msec.) | Number of data surfaces | Number of read/write heads | Actuator type | Dimensions (HxWxD inches) | Interfaces | Prices ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|---|---|---|
| M40 | 14 | 40.32 | 65 | 8 | | stepper | | proprietary | 2,030(Q200) | X Marksman 8-bit parallel transfer, optional formatter for disk/tape streamer |
| M80 | 14 | 80.64 | 50 | 6 | | rotary voice coil | | SMD, proprietary | 3,040(Q200) | X Marksman 8-bit parallel transfer, optional formatter for disk/tape streamer |
| M160 | 14 | 161 | 50 | 6 | | rotary voice coil | | SMD, proprietary | 3,675(Q200) | X Marksman 8-bit parallel transfer, optional formatter for disk/tape streamer |
| **CYNTHIA PERIPHERAL CORP.** | | | | | | | | | | |
| D160-4, 6, 8 | 10.5 | 73, 109, 145 | 40 | 2, 3, 4 | 2, 3, 4 | linear voice coil | 5.6x12.5 x21.8 | proprietary | 3,608(Q1);2,775(Q500); 4,040(Q1);3,020(Q500); 4,357(Q1);3,265(Q500) | opt. SASI controller, power supply, cabinet and control panel |
| **DISC TECH ONE INC.** | | | | | | | | | | |
| 3306 | 14 | 84 | 38 | 6 | 12 | closed-loop rotary voice coil | 7.5x19x24.5 | SMD, Priam | 4,000(Q1);3,000(Q500) | rackmount rails, opt. controller |
| 4160 | 14 | 166 | 38 | 5 | 10 | closed-loop rotary voice coil | 7.5x19x26 | SMD, Priam | 5,000(Q1);4,000(Q500) | rackmount rails, opt. controller |
| 4300 | 14 | 301 | 38 | 7 | 14 | closed-loop rotary voice coil | 7.5x19x26 | SMD, Priam | 6,000(Q1);5,000(Q500) | rackmount rails, opt. controller |
| 8432 | 8 | 20 | 65 | 4 | 4 | rotary stepper motor | 4.5x8.5x14 | ANSI, SMD | 1,570(Q1);1,000(Q500) | opt. controller and power supply |
| 8533 | 8 | 60 | 29 | 4 | 4 | closed linear rotary voice coil | 4.5x8.5x14 | ANSI, SMD, Priam | 3,500(Q1);2,500(Q500) | opt. controller and power supply |
| **DISCTRON INC.** | | | | | | | | | | |
| DP400 | 8 | 46.4 | 60 | 4 | | linear voice coil | | Data Peripherals | 1,540(Q100) | |
| D1600 | 8 | 157.5 | 30 | 7 | | linear voice coil | | SMD | | |
| **FUJITSU AMERICA INC.** | | | | | | | | | | |
| M2280, M2284 | 14 | 84, 168 | 27 | 5, 10 | 5, 10 | voice coil | 9.84x16.38 x25.59 | SMD | 4,000(Q100); 5,000(Q100) | |
| M2294 | 14 | 336 | 27 | 16 | 16 | voice coil | 9.84x16.38 x25.59 | SMD | 7,000(Q100) | |
| M2298 | 14 | 671 | 27 | 16 | 16 | voice coil | 9.84x16.38 x25.59 | SMD | 9,000(Q100) | |
| M2302BE, M2303BE | 8 | 24, 48 | 70 | 4, 8 | 4, 8 | stepper motor | 4.4x8.5x14 | SA4000 | 1,850(Q100); 2,250(Q100) | |
| M2312 | 8 | 84 | 20 | 7 | 7 | voice coil | 5x8.5x15 | SMD, SCSI | 3,500(Q100) | |
| M2322 | 8 | 168 | 20 | 10 | 10 | voice coil | 5x8.5x15 | SMD | 4,500(Q100) | |
| M2333 | 8 | 337 | 20 | 10 | 10 | voice coil | 5x8.5x15 | SMD | 5,500(Q100) | |
| M2350 | 10.5 | 474 | 18 | 20 | 20 | voice coil | 14x19x27 | PTD | 25,000(Q100) | |
| M2351 | 10.5 | 474 | 18 | 20 | 20 | voice coil | 10.4x19 x27.6 | modified SMD | 9,000(Q100) | |
| **HARRIS CORP.** | | | | | | | | | | |
| 5332/52 | 14 | 80, 160 | 30 | 5 | | linear voice coil | | SMD | 19,900(Q1);23,700(Q1) | includes controller |
| 5662 | 14 | 675 | 33 | 20 | | linear voice coil | | SMD | 31,900(Q1) | includes controller |
| **HIGHTRACK COMPUTER TECHNICK GMBH** | | | | | | | | | | |
| HT80 | 8 | 83 | 32 | | 5 | | | SMD | | |
| ST160 | 8 | 166 | 19 | | 10 | | 5.11x8.54 x13.8 | SMD | | |
| **HITACHI AMERICA LTD.** | | | | | | | | | | |
| DK812S-5,-8 | 8 | 51, 85.1 | 25 | 3, 5 | 3, 5 | closed-loop rotary voice coil | 4.61x8.55 x14.96 | SMD | | opt. power supply, mounting frame and fan, dual port |

A DRAMATIC ADVANCE IN HALF-HEIGHT WINCHESTERS...

# STRAIGHTALK

With all the claims and counter-claims regarding capacities, availabilities and shipments of half-height 5.25" Winchesters, it's sometimes difficult to determine the facts.

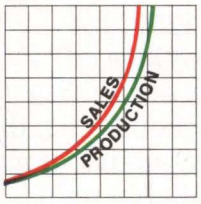
**FACT.** In early 1983, Microscience asked over 40 OEMs to participate in a 120-day evaluation program of our HH-612 10 MB half-height drives.

We randomly selected 150 drives for these field tests.

The evaluation proved that Microscience has the performance, quality and price today's small business and portable computer manufacturers demand.

**FACT.** Microscience ended 1983 with a significant order backlog. We could have shipped more, but we will not sacrifice quality for quantity.


Our returns are less than 1%. Every drive undergoes rigorous testing in our advanced, computer-controlled test facilities.

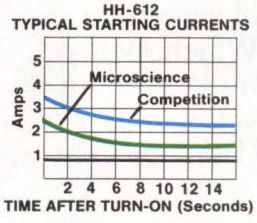



**FACT.** Microscience is rapidly expanding its highly automated manufacturing operation in California.

By the end of the first quarter, 1984, we will be able to meet more of the demands of large OEMs and distributors. And by the end of the year we will have expanded production by a factor of five.

Until then, when we commit to a quantity and shipment date, those commitments *will be met*. No ifs... no ands...no buts.

**FACT.** Microscience disk drives have extremely low voltage requirements...the lowest in the industry.

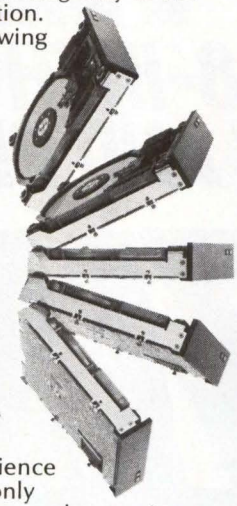



Small business and portable computers don't have the luxury of a lot of excess power capacity.

In every stage of our design we used procedures and components that would be misers with power yet still provide long-term performance and reliability.

**FACT.** Microscience drives aren't limited to functioning only in the horizontal position.

With the growing use of portable computers and increasingly compact packaging, we designed our stepper motor and head carriage assembly to permit flexible placement of the disk drive.



Positioning that is best for you, not us.

**FACT.** Microscience engineers use only proven technology advances in an innovative manner to produce disk drives that perform reliably.

That's why we incorporated plated media, microprocessor-controlled spindle motors and servo-positioning, embedded guard bands, extensive self-diagnostics and optional signal processing.

Plated media will stand up to the rigors of portable computer usage.

Microprocessor-controlled servo-positioning keeps the heads precisely on track by reading servo information written in the gaps on both sides of each data track.

Microprocessors constantly monitor drive performance and report irregularities to the user. They make repeated checks during operation and test themselves during Power Up.

Media-embedded guard bands keep the carriage head from exceeding pre-determined limits and protect the drives against "wall crashes."

Microscience uses only standard, off-the-shelf mechanical and electronic components in our drives so we can meet your demands as your system sales grow.

And, every component is second-sourced to ensure tested and approved availability.

**FACT.** In addition to our 10 MB half-height Winchesters, we have several other major advances in development.

But we will not announce them until they have been thoroughly tested and proven in our manufacturing and test operations as well as in the field.

When we say they are available later this year, they *will be* available.

**FACT.** Microscience has one of the best, most responsive support teams of engineers available in the industry today.

We will not vie for your business on price alone.

We are concerned with providing a product that is reliable... a product that has extensive capabilities and expanded performance... a product we can deliver in volume... and a product we can produce for you at a fair price.

For more straight talk regarding your half-height Winchester needs, call or write us today.

CIRCLE NO. 22 ON INQUIRY CARD

Microscience International Corporation

575 E. Middlefield Road
Mountain View, CA 94043 (415) 961-2212

# DRIVE YOUR SYSTEM TO NEW HEIGHTS.

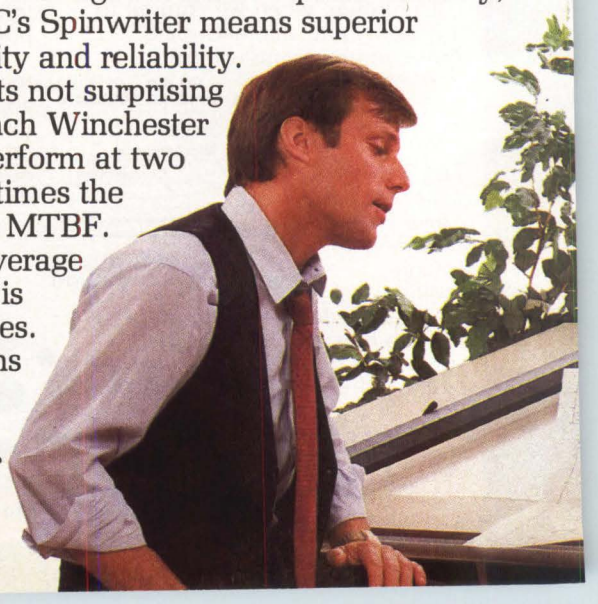
## UNPARALLELED 8-INCH WINCHESTER DRIVE CAPACITY AND PERFORMANCE.

167.7MB
167.7MB
167.7MB
167.7MB
167.7MB
167.7MB
167.7MB
167.7MB
167.7MB
167.7MB

The drive is on. Your customers expect more and more from computer systems today. And one of the best ways to stay ahead is to specify 8-inch Winchester drives from NEC Information Systems. Take the D2257, for example. It provides 167.7 megabytes of storage with access time of 20 milliseconds. It's the highest capacity available at any speed. And it's available right now – in volume.

**Proven reliability from the people who make Spinwriter.**

Throughout the computer industry, NEC's Spinwriter means superior quality and reliability. So its not surprising our 8-inch Winchester drives perform at two to three times the industry's MTBF. And our average repair time is just 30 minutes. That means lower service costs and increased customer satisfaction.



**We use a conventional SMD interface.**
**So our drives are easy to use.**

It's simple to integrate NEC's 8-inch Winchester drives into your system. The reason is our standard Storage Module Device (SMD) type interface.

In addition, you wind up with significant savings in installation, packaging, maintenance and cost-of-ownership.

**NEC. Technology drives us.**

NEC has been pioneering advancements in electronics for almost 85 years. We've been developing disk drives since 1959. Our 8-inch Winchester drive technology is state-of-the-art, while other NEC drives incorporate such advanced technology as plated media, thin-film heads and optical recording.

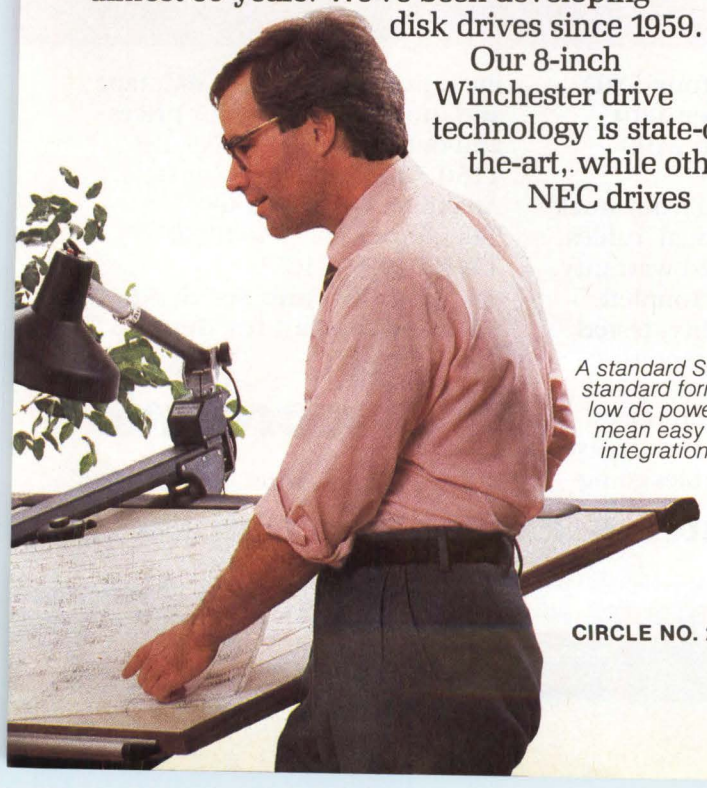
Clearly, NEC remains at the leading edge.

For more information on NEC 8-inch and 5¼-inch Winchester and flexible drives, or the name of your nearest NEC representative, call 1-800-343-4418 (In Massachusetts, call 617-264-8635). You'll find out why more and more OEM's are saying "NEC and me."

IMMEDIATE DELIVERY

*An evaluation unit will be shipped within 72 hours from the time your PO is received.*

*Choose from four high performance capacities: 25.7, 42.5, 85.0 and 167.7 MB.*



*A standard SMD interface, standard forms factor and low dc power requirements mean easy system integration.*

**NEC AND ME**

CIRCLE NO. 23 ON INQUIRY CARD

NEC Information Systems, Inc.
1414 Massachusetts Avenue
Boxborough, MA 01719

## PERKIN-ELMER USERS:

# The first compatible disk controller that's an intelligent alternative.

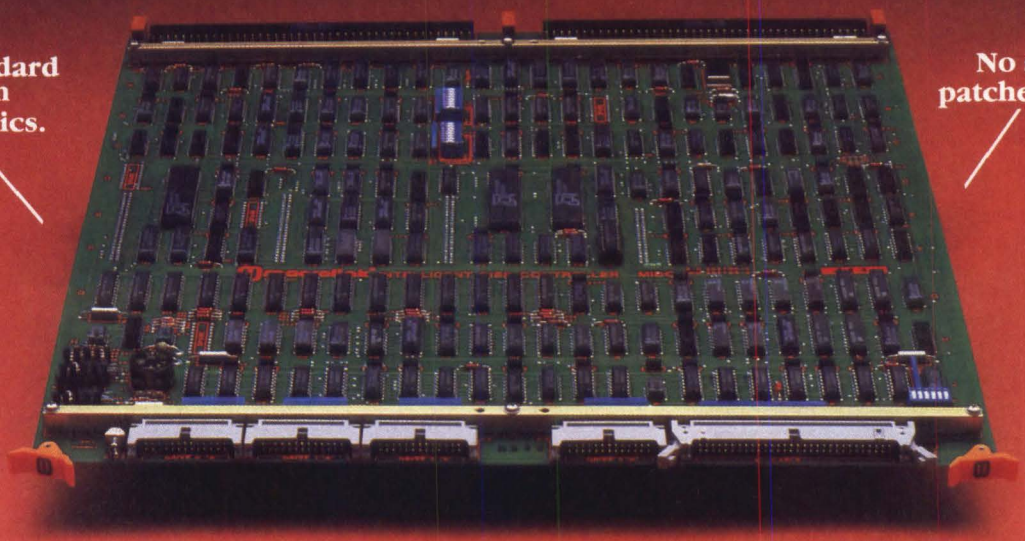
Completely compatible with Perkin-Elmer's IDC system.

Full emulation permits disk pack exchange with P-E drives.

Macrolink performance, pricing and support.

Uses standard system diagnostics.

No software patches required.



Only our Macrolink Intelligent Disk Controller (MIDC) offers full software and disk pack compatibility with the P-E IDC system. Using such advanced features as on-board ECC logic and micro-coded bit slice technology, MIDC corrects errors of up to 11 bits without operating system overhead. And when you plug this single-board controller into your Series 3200 CPU, you can mix or match four SMD drives from independent suppliers to put up to 2400 Mbytes on line.

MIDC is shipped from stock with installation manual, cables and a one-year limited warranty. Of course, it comes complete with the high reliability, tested performance and attractive pricing you'd expect from the world leader in P-E interfaces.

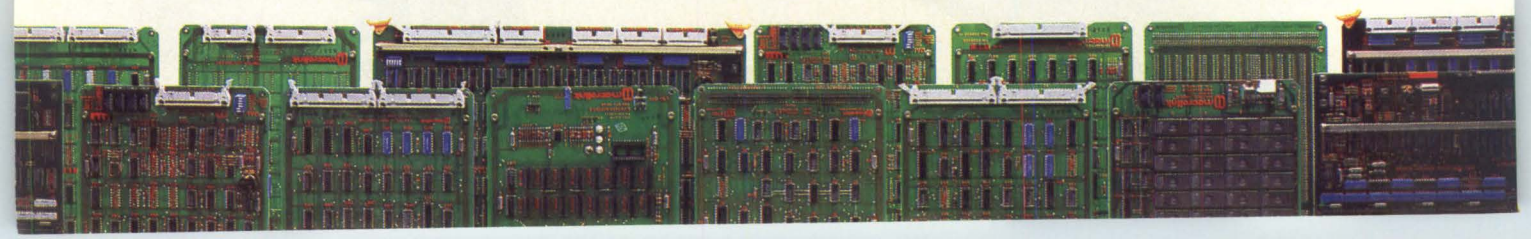
Find out about the largest family of P-E compatibles going—including memory, COMM, tape and more. Call today for prices and details. MACROLINK INC. 1150 East Stanford Court, Anaheim, CA 92805-6887. Telephone (714) 634-8080. TWX 910-591-1671.

**Installed and serviced nationwide—call for details.**

macrolink®

CIRCLE NO. 24 ON INQUIRY CARD

## Everything for Perkin-Elmer systems, except the computer.



## 8-INCH AND LARGER DISK DRIVES

| Company Model | Disk size (inches) | Unformatted capacity (M bytes) | Average access time (msec.) | Number of data surfaces | Number of read/write heads | Actuator type | Dimensions (H x W x D inches) | Interfaces | Prices ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|---|---|---|
| DK812S-12, -17 | 8 | 119, 170.1 | 25 | 7, 10 | 7, 10 | closed-loop rotary voice coil | 5.12x8.55 x14.96 | SMD | | opt. power supply, mounting frame and fan, dual port |
| DKU975 | 14 | 697 | 20 | 20 | 40 | closed-loop rotary voice coil | 44.1x22.5 x35.4 | SMD | | dual actuator, diagnostic microprocessor |
| **IBM CORP.** | | | | | | | | | | |
| 3310 Series | 8 | 64.5 | 27 | 11 | | rotary | | proprietary | 14,280(Q1) | |
| 3344BZ | 14 | 280 | 25 | 15 | | linear radial | | proprietary | 41,600(Q1) | |
| 3350AZ | 14 | 635 | 25 | 15 | | linear radial | | proprietary | 41,600(Q1) | |
| 3370A1 | 14 | 571.3 | 20 | 12 | | linear | | proprietary | 44,350(Q1) | |
| 3375A1 | 14 | 819.7 | 19 | 12 | | linear | | proprietary | 50,720(Q1) | |
| 3380AA4 | 14 | 1520 | 16 | 15 | | linear | | proprietary | 116,050(Q1) | |
| **IBIS SYSTEMS INC.** | | | | | | | | | | |
| 1400 (OEM) | 14 | 1400 | 16 | 16 | | split-linear motor | | custom | | |
| 5380-B4 | 14 | 2520 | 16 | 30 | | split-linear motor | | bit serial | 68,020(Q1) | |
| **KENNEDY CO.** | | | | | | | | | | |
| 5380/160 | 14 | 67.4, 134.8 | 40 | 5, 10 | | rotary voice coil | | SMD | 4,595;5,750 | rack mountable, includes power supply |
| 6172/73 | 8 | 22.6, 37.7 | 48.3 | 3, 5 | | linear voice coil | | SMD, ANSI, Disk Bus | 1,995;3,195 | |
| 7340, 7380 | 8 | 33, 67, 67.4 | 38.3 | 5 | | rotary voice coil | | SMD, ANSI, Pico Bus | 3,200;3,995 | |
| **MEGAVAULT** | | | | | | | | | | |
| 16, 48, 83 | 8 | 16.5, 49.7, 82.9 | 45 | 1, 3, 5 | | rotary voice coil | | SMD, ANSI, SCSI | 2,200(Q500);2,480(Q500); 2,690(Q500) | opt. dual access |
| 26, 80, 116 | 8 | 26.5, 79.6, 116.1 | 45 | 1, 3, 7 | | rotary voice coil | | SMD, ANSI, SCSI | 2,310(Q500);2,610(Q500); 2,900(Q500) | opt. dual access |
| 132, 186, 212 | 8 | 132.7, 185.7, 212.4 | 45 | 5, 7, 8 | | rotary voice coil | | SMD, ANSI, SCSI | 3,045(Q500);3,150(Q500); 3,240(Q500) | opt. dual access |
| **MEMOREX CORP.** | | | | | | | | | | |
| 101, 102 | 8 | 11.7, 23.4 | 70 | 4, 8 | 4, 8 | rotary stepper motor | 4.4x8.5x14 | SA4000 | 1,920(Q1);1,250(Q500); 2,270(Q1);1,475(Q500) | |
| 114 | 8 | 47.5 | 70 | 8 | 8 | rotary stepper motor | 4.4x8.5x14 | double data rate SA4000 | 2,770(Q1);1,800(Q500) | |
| 213, 214 | 8 | 48.3, 84.4 | 20 | 4, 7 | 4, 7 | closed-loop rotary voice coil | 5.1x8.5x15 | SMD | 4, 620(Q1);3,000(Q500); 4,900(Q1);3,185(Q500) | dual port option |
| 232, 234, 236 | 8 | 83, 116.1, 165.9 | 30 | 5, 7, 10 | 5, 7, 10 | closed-loop rotary voice coil | 5.1x8.5x5 x15 | SMD, CMD | 4,400(Q1);2,420(Q100); 4,800(Q1);2,640(Q500); 5,600(Q1);3,080(Q500) | |
| 680 | 14 | 1260 | 16 | 15 | 30 | closed-loop linear voice coil | 49.9x22.8 x31.9 | IPI/ISI | 28,600(Q1) | scheduled delivery: Oct., 1984 |
| 3680 | 14 | 1260 | 16 | 15 | 30 | closed-loop linear voice coil | 49.9x22.8 x31.9 | FIPS | 28,600(Q1) | 3683 string controller and 3688 storage control unit available |
| **MICROPOLIS CORP.** | | | | | | | | | | |
| 1403, 1406 | 8 | 82.96, 165.92 | 20 | 5, 10 | 5, 10 | closed-loop balanced rotary voice coil | 4.62x8.55 x14.32 | SMD | 2,888(Q1);2,387(Q500); 3,745(Q1);3,013(Q500) | dedicated landing zone, auto positioner latch;opt. power supply, dual port |
| 1456 | 8 | 331.8 | 20 | 10 | 20 | closed-loop balanced rotary voice coil | 4.62x8.55 x14.32 | SMD | 3,700(Q500) | dedicated landing zone, auto positioner latch;opt. power supply, dual port |
| **MITSUBISHI ELECTRONICS AMERICA INC.** | | | | | | | | | | |
| 2860-1, -2 | 8 | 21.73 50.71 | 35 | 3, 7 | 3, 7 | linear | 5.1x8.5x16.9 | SMD | | |

# Quality 5¼ Inch Drives.

# From FUJITSU.

Fujitsu quality has come to mean a lot of things to a lot of people. High performance, unparalleled reliability, and technical expertise, built on more than 15 years experience.

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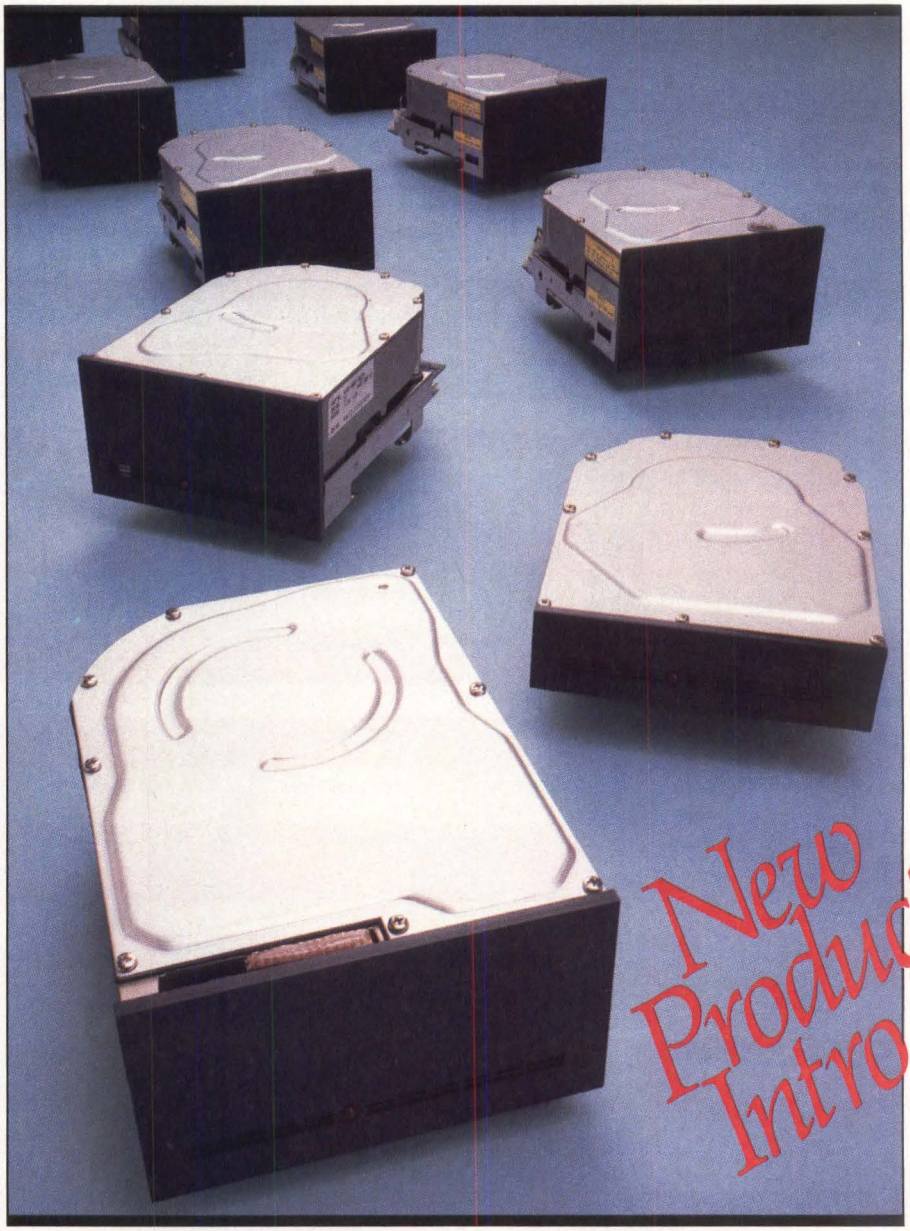



| | HALF HIGH | STANDARD | HIGH PERFORMANCE |
|---|---|---|---|
| CAPACITY (MBytes) | 7 / 13 | 7 / 13 / 20 / 27 | 31 / 55 / 86 |
| AVERAGE POSITIONING TIME (ms) | 95 | 83 | 35 |
| DIMENSIONS (inch) (HxWxD) | 1.6x5.7x8.0 | 3.3x5.7x8.0 | 3.3x5.7x8.0 |
| INTERFACE | ST506 / SA4000 | ST506 / SA4000 | ST506 / SA4000 |
| POSITIONING METHOD | Buffered Stepper | Buffered Stepper | Rotary Voice-Coil |

New products are indicated in red.

STORAGE PRODUCTS DIVISION

*Quality Lives*

FUJITSU



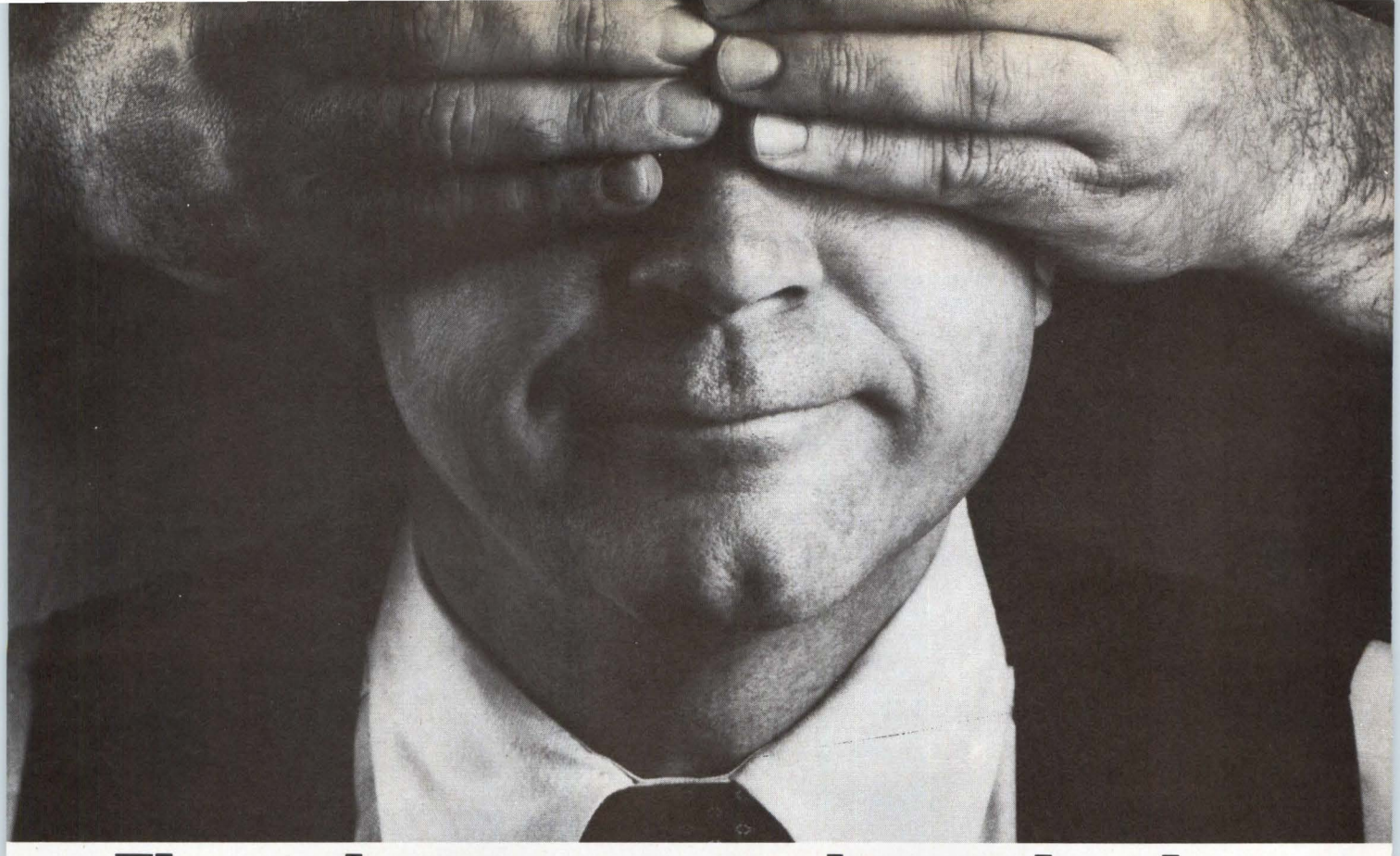
CIRCLE NO. 25 ON INQUIRY CARD

## 8-INCH AND LARGER DISK DRIVES

| Company Model | Disk size (inches) | Unformatted capacity (M bytes) | Average access time (msec.) | Number of data surfaces | Number of read/write heads | Actuator type | Dimensions (HxWxD inches) | Interfaces | Prices ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|---|---|---|
| 2860-3 | 8 | 85.37 | 30 | 7 | 7 | linear | 5.1x8.5x16.9 | SMD | | |
| M4870 | 8 | 251.4 | 20 | 12 | 12 | closed-loop linear | 10.2x8.5 x29.33 | SMD | | |
| **MODULAR COMPUTER SYSTEMS INC.** | | | | | | | | | | |
| 4177-3 | 14 | 67.4 | 30 | 5 | | linear motor | | | 30,200(Q1) | opt. dual port and computer interfaces |
| **NATIONAL MEMORY SYSTEMS CORP.** | | | | | | | | | | |
| NMS-02.5, 02, 03 | 14 | 84, 168, 335 | 27 | 4, 6, 10 | | rotary | | SMD | | dual port option allows two controllers to share access to same drive |
| NMS-04 | 10.5 | 474.2 | 18 | 10 | | rotary | | SMD | | |
| NMS-01, 01.5 | 8 | 48, 84 | | 6, 8 | | rotary voice coil | | SMD | | two NMS-01's can be mounted horizontally side by side in a 19-inch rack |
| **NEC INFORMATION SYSTEMS INC.** | | | | | | | | | | |
| D2246 | 8 | 85 | 26 | | 6 | rotary voice coil | 5.4x8.6x16.5 | SMD | 2,475(Q500) | |
| D2247 | 8 | 82.9 | 18.5 | | 4 | closed-loop rotary voice coil | 5.4x8.6x16.5 | SMD | 2,475(Q500) | |
| D2247E, D2257 | 8 | 104, 167.7 | 20 | | 5 | closed-loop rotary voice coil | 5.4x8.6x16.5 | SMD | 2,825(Q500); 3,250(Q500) | |
| D2300 | 9 | 520 | 15 | | 19 | rotary voice coil | 10.2x8.5 x29.9 | modified SMD | 6,850(Q500) | |
| **NORTHERN TELECOM INC., MEMORY SYS. DIV.** | | | | | | | | | | |
| MFD/8204, MFD/8208, MFD/8210 | 8 | 90.2, 180.4, 225.5 | less than 25 | 4, 8, 10 | 4, 8, 10 | rotary | 4.6x8.5x14.2 | SMD | 3,140(Q500); 4,045(Q500); 4,317(Q500) | |
| **PRIAM CORP.** | | | | | | | | | | |
| 803 | 8 | 85 | 35 | 5 | 5 | closed-loop linear voice coil | 4.62x8.55 x14.25 | Priam, SMD, ANSI | 4,600(Q1);2,550(Q500) | automatic carriage/ spindle locks |
| 806 | 8 | 188 | 20 | 11 | 11 | closed-loop linear voice coil | 8.55x4.62 x14.25 | Priam, SMD, ANSI | 5,200(Q1);3,095(Q500) | automatic carriage/spindle locks;dual port option |
| 807 | 8 | 330 | 25 | 11 | 11 | closed-loop linear voice coil | 8.55x4.62 x14.25 | Priam, SMD, ANSI | 6,200(Q1);3,680(Q500) | automatic carriage/spindle locks;dual port option |
| 808 | 8 | 500 | 25 | 11 | 11 | closed-loop linear voice coil | 8.55x4.62 x14.25 | Priam, modified SMD, ANSI | 7,000(Q1);4,150(Q500) | automatic carriage/spindle locks;dual port option;scheduled delivery: Sept., 1984 |
| 3450 | 8 | 35 | 42 | 5 | 5 | closed-loop linear voice coil | 4.62x8.55 x14.25 | Priam, SMD, ANSI | 3,500(Q1);1,950(Q500) | automatic carriage/ spindle locks |
| 7050 | 8 | 70 | 42 | 5 | 5 | closed-loop linear voice coil | 4.62x8.55 x14.25 | Priam, SMD, ANSI | 4,400(Q1);2,450(Q500) | automatic carriage/ spindle locks |
| 3350 | 14 | 34 | 46 | 1.5 | 3 | closed-loop linear voice coil | 6.9x16.6x20 | Priam, SMD, ANSI | 3,450(Q1);1,900(Q500) | |
| 6650 | 14 | 68 | 46 | 1.5 | 3 | closed-loop linear voice coil | 6.9x16.6x20 | Priam, SMD, ANSI | 4,000(Q1);2,235(Q500) | |
| 15450 | 14 | 158 | 46 | 3, 5 | 7 | closed-loop linear voice coil | 6.9x16.6x20 | Priam, SMD, ANSI | 6,200(Q1);3,440(Q500) | |
| **PERTEC PERIPHERALS CORP.** | | | | | | | | | | |
| D3321, D3322 | 14 | 3.17, 3.17 | 55, 47.5 | 4 | 4 | voice coil | 8.75x19x26 | | 5,275;3,710(Q250) | interchangeable bezels available, top-loading |

## 8-INCH AND LARGER DISK DRIVES

| Company Model | Disk size (inches) | Unformatted capacity (M bytes) | Average access time (msec.) | Number of data surfaces | Number of read/write heads | Actuator type | Dimensions (HxWxD inches) | Interfaces | Prices ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|---|---|---|
| D3341, D3342 | 14 | 3.17, 3.17 | 55, 47.5 | 4 | 4 | voice coil | 8.75x19x26 | | 5,275;3,710(Q250) | interchangeable bezels available, front-loading |
| D3421, D3422 | 14 | 6.34, 6.34 | 60, 52.5 | 4 | 1 | voice coil | 8.75x19x26 | | 5,275;3,710(Q250) | interchangeable bezels available, top-loading |
| D3441, D3442 | 14 | 6.34, 6.34 | 60, 52.5 | 4 | 4 | voice coil | 8.75x19x26 | | 5,275;3,710(Q250) | interchangeable bezels available, front-loading |
| D3461, D3462 | 14 | 19, 6.34 | 60, 52.5 | 8 | 8 | voice coil | 8.75x19x26 | | 6,280;4,405(Q250) | emulates two 10 M-byte disk drives, interchangeable bezels available, top-loading |
| D3481, D3482 | 14 | 19, 6.34 | 60, 52.5 | 8 | 8 | voice coil | 8.75x19x26 | | 6,280;4,405(Q250) | emulates two 10 M-byte disk drives, interchangeable bezels available, front-loading |
| **QUANTUM CORP.** | | | | | | | | | | |
| Q2010, 20, 30 | 8 | 8.4 16.8, 25.2 | 60 | 2, 4, 6 | | rotary torque | | SA1000 | 1,175(Q500);1,475(Q500); 1,775(Q500) | |
| Q2040 | 8 | 33.6 | 65 | 8 | | rotary torque | | SA1000 | 2,075(Q500) | |
| Q2080 | 8 | 67, 41 | 40 | 7 | | rotary torque | | SA1000 | 2,450(Q500) | automatic actuator lock |
| **SEAGATE TECHNOLOGY** | | | | | | | | | | |
| ST8100 | 8 | 102.1 | 30 | 5 | 10 | closed-loop linear voice coil | 2.3x8.5x12 | ST412-HP | | |
| **SHUGART CORP.** | | | | | | | | | | |
| 1004 | 8 | 10.67 | 70 | 4 | 4 | stepper motor | 4.6x8.5 x14.25 | ANSI | 1,037(Q500) | |
| 4004, 4008 | 14 | 14.5, 29 | 65 | 2, 4 | 4, 8 | stepper motor | 5.2x16.6 x21.9 | ANSI | 1,495(Q500); 1,813(Q500) | |
| **STORAGE TECHNOLOGY CORP.** | | | | | | | | | | |
| 8380 | 14 | 2520 | 16 | 15 | 30 | closed-loop linear voice coil | 62x54x32 | | 58,174(Q1); 40,904(Q500) | isolated actuator electronics;dual port option |
| 8650 | 14 | 1270 | 23 | 30 | 60 | closed-loop linear voice coil | 47x42x31.5 | | 40,200(Q1); 30,491(Q500) | opt. dual port, string switch, fixed head storage, media interchange switch |
| 8775 | 14 | 673 | 23 | 15 | 30 | closed-loop linear voice coil | 47.8x22.5 x31.5 | ANSI, SMD | 16,293(Q1); 13,346(Q500) | |
| **TECSTOR INC.** | | | | | | | | | | |
| Series 3 | 14 | 83, 100, 166, 199, 315, 332 | 29 | 5, 6, 10, 12, 19, 20 | | rotary | | SMD | 4,400(Q100);4,500 (Q100);4,850(Q100); 5,000(Q100);5,600 (Q100);5,700(Q100) | rackmount |
| **TELEFILE COMPUTER PRODUCTS INC.** | | | | | | | | | | |
| T3283 | 14 | 256.2 | 30 | 19 | | linear voice coil | | SMD | 28,320(Q1) | hard or soft sectoring; single-phase power requirement |
| T3285 | 14 | 553 | 23 | 15 | | linear voice coil | | SMD | 49,938(Q1) | hard or soft sectoring; self-test diagnostics |
| **TOSHIBA AMERICA CORP.** | | | | | | | | | | |
| MK80F-10, 20, 30 | 8 | 15.3, 23, 38.3 | 40 | 2, 3, 5 | | rotary voice coil | | SMD | | |
| MK182F | 8 | 83, 116.1, 165.9 | 35 | 5, 7, 10 | | rotary voice coil | | SMD | | |
| **VERMONT RESEARCH** | | | | | | | | | | |
| 8010 | 8 | 26.2, 10 | 55 | 2 | | linear voice coil | | ANSI, SASI, or drive level | | includes SASI controller, power supply, fan, operating temperature range (0°–55°C) |



# The only reason you're not using Pioneer's disk drive tester already.

If you still haven't seen the Pioneer hard disk drive tester in action, it's time to take a look. And judge for yourself.

Beginning with the price tag, every aspect of the Pioneer Qualifier™ is designed to meet your requirements for pocketbook *and* performance.

It's the only tester to interface with any and all SMD drives.

It's the only one with a hefty 20-megabit per second capability. Even at triple the price.

It's the only one that can read and transfer Fujitsu's error map right into your computer. In seconds.

It's the only one that will format to your custom specs. And it does it at one megabyte per second. Over five times faster than by computer.

It pinpoints your errors to a specific media sector. And separates the correctable from the uncorrectable. So you can detect and log either set.

Have you ever seen a tester that does all that?

And also checks the address mark capability of your drive? And isolates intermittents in the output? And works with embedded servos? And can be multiplexed to test four drives at once?

The Pioneer Qualifier does all those things. And easily, at that.

It's almost turnkey. It's totally programmable through the simplified keyboard. And you can input a custom set of drive characteristics with no EPROMS to modify or boards to change.

Plus, there's even a standard RS232 port for remote operation, data printout, uploading and downloading.

Call Pioneer for a demonstration today. It's an eye opener.

Pioneer Research, 1745 Berkeley St., Santa Monica, CA 90404. (800) 233-1745 (outside California). (800) 848-1745 (in California). Rep opportunities available.

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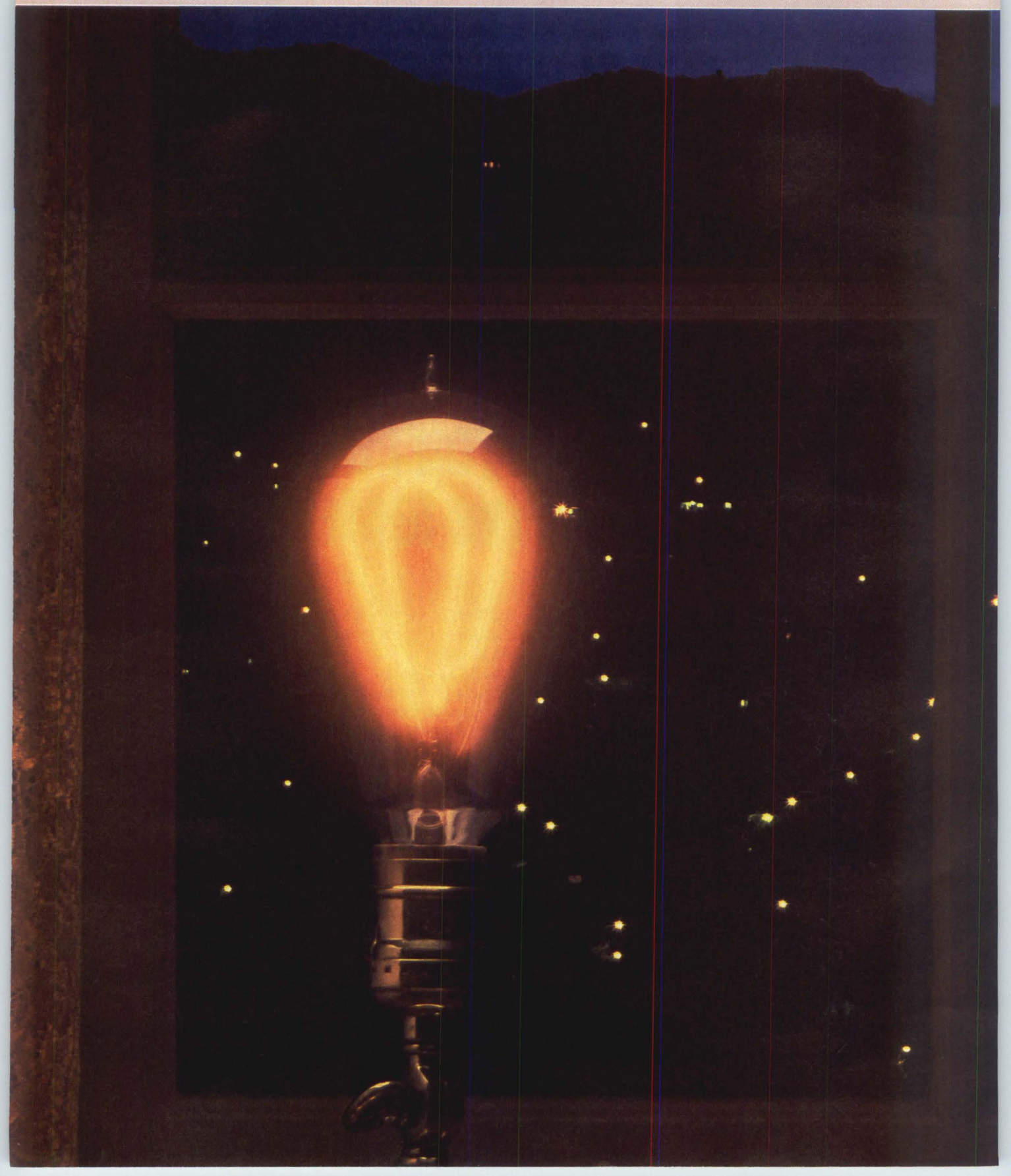
CIRCLE NO. 26 ON INQUIRY CARD

# THOMAS EDISON DIDN'T
# HE JUST MA



# INVENT THE LIGHT BULB. DE IT WORK.

Fifty years before Edison, people were inserting filaments into glass tubes, taking out the air, sending in current and hoping the filament would glow.

But in 1879, Edison attacked the bigger problem of how to distribute the electricity. So that by developing the power grid first, he was able to determine the precise combination of carbon rod, vacuum, voltage and current that his lamp would demand.

At Priam, we build our disc drives with a similar focus—on your system's requirements, and on your production schedule. It's a commitment that has made us the leading U.S. manufacturer of high-performance, high-quality 8" voice-coil Winchesters—from 35 to 500Mb. A commitment we're now making to our new 86Mb 5¼" drives as well. It's why we provide total, industry-standard interface support, including ST412, SMD, SCSI, IPI-3, and our own Priam interfaces. And it's why we've just opened a new, automated production facility, one of the largest and most modern in the OEM world.

Priam. When it comes to high-performance disc drives, check with us first. We'll make sure it works.

PRIAM®

JUST THE RIGHT DISTANCE FROM THE LEADING EDGE.

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CIRCLE NO. 27 ON INQUIRY CARD

# WORK FAST. BUT WORK SMART.

You've got to work fast to get ahead in the systems and sub-systems business. But you'll just spin your wheels if you don't also work smart.

That's why disk drive vendor selection is so important. And VERTEX is the smart choice.

We work fast. In our first full year of production we will deliver over 30,000 30MB, 50MB and 70MB V100 5¼" Winchesters. That's because the V100 was designed intelligently with a low parts count, simple assembly procedure and "off the shelf" components. This design approach provides greater manufactureability, but it also means higher reliability and margins.

Our new V2100 100MB 5¼" Winchester is an extension of this design philosophy. The V2100 family is based upon our V100 family. By increasing bit density and implementing the ST412HP interface (with 10Mbit/second transfer rate) we've maintained our four-platter, eight-head configuration. So you get lower cost and higher reliability.

And since few changes were made to upgrade the V100 family to the V2100, we'll be able to get up the high volume production ramp faster.

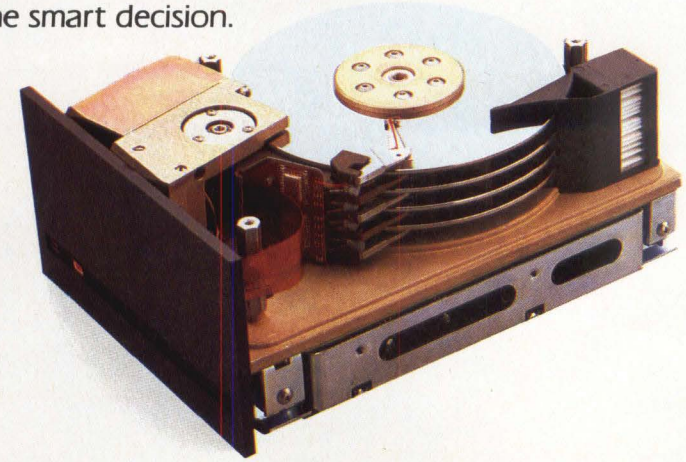
Speaking of fast . . . the V2100 also has a 25msec average access time (including settling) and a microprocessor interface that starts head arm movement at the first seek pulse.

Every VERTEX drive is backed by the best Winchester engineering and manufacturing team in the business. So get your system and sub-system plans going now. Call us at (408) 942-0606. Or write VERTEX, 2150 Bering Drive, San Jose, CA 95131.

It's the smart decision.

**VERTEX**
PERIPHERALS

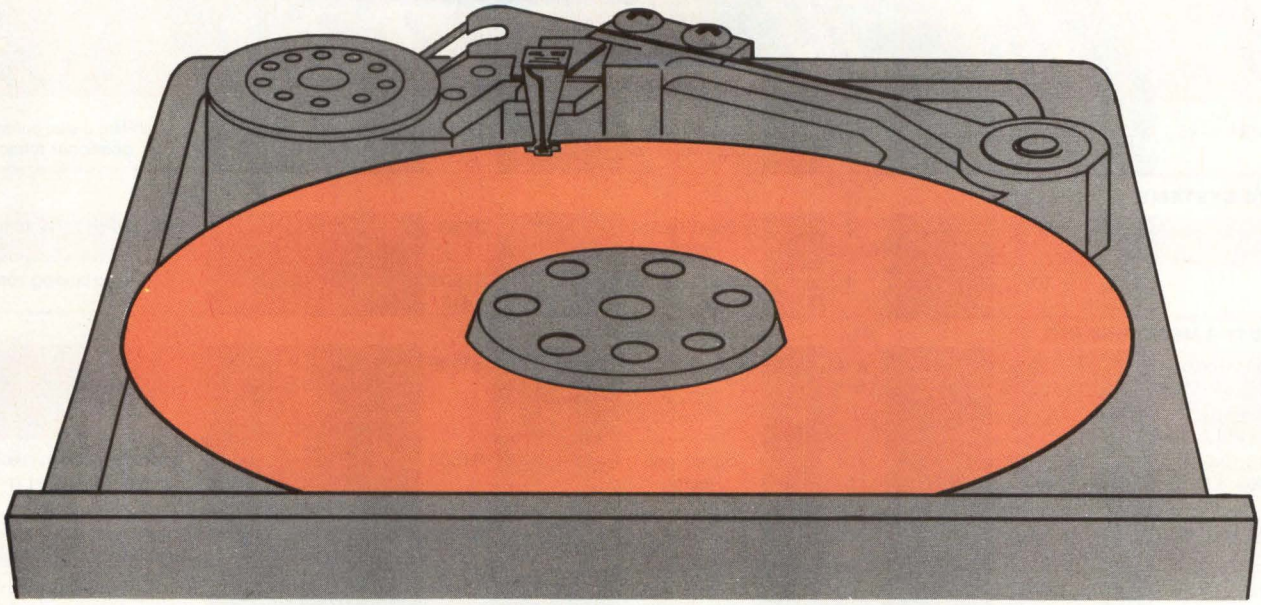
**You Can Plan On Us . . .**





CIRCLE NO. 28 ON INQUIRY CARD

# 5.25-INCH AND SMALLER DISK DRIVES



| Company Model | Disk size (inches) | Unformatted capacity (in M bytes) | Average access time (msec.) | Number of data surfaces | Number of read/write heads | Actuator type | Dimensions (HxWxD inches) | Interface | Price ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|---|---|---|
| **AMPEX CORP.** | | | | | | | | | | |
| Pyxis P-7, P-13, P-26, P-27 | 5.25 | 5.24, 10.48, 15.72, 20.96 | 96 | 2, 4, 6, 8 | | stepper motor | | ST506 | | built-in diagnostics |
| **APPLIED INFORMATION MEMORIES** | | | | | | | | | | |
| Dart-130 (SCSI) | 5.25 | 133.57 | 18 | 7 | 7 | linear | 3.25x5.75x8 | SCSI | 4,500(Q1);2,570(Q500) | thin-film media |
| Dart-130 (SMD) | 5.25 | 129.27 | 18 | 7 | 7 | linear | 3.25x5.75x8 | SMD | 4,500(Q1);2,570(Q500) | thin-film media |
| Lance-530 (SCSI) | 5.25 | 534.28 | 18 | 16 | 28 | linear | 10.5x17x24 | SCSI | 18,500(Q1);9,850(Q500) | thin-film media, four independent Winchester spindles in one package with two power supplies |
| Lance-530 (SMD) | 5.25 | 517.08 | 18 | 16 | 28 | linear | 10.5x17x24 | SMD | 18,500(Q1);9,850(Q500) | thin-film media, four independent Winchester spindles in one package with two power supplies |
| Lance-850 | 5.25 | 853.57 | 18 | 16 | 28 | linear | 10.5x17x24 | SCSI, IPI | 22,200(Q1);11,820(Q500) | thin-film media, four independent Winchester spindles in one package with two power supplies |
| **ATASI CORP.** | | | | | | | | | | |
| 3033, 3046 | 5.25 | 33.1, 46.3 | 30 | 5, 7 | 5, 7 | closed-loop linear voice coil | 3.25x5.75x8 | ST506, ST412 | 1,950(Q1);1,480(Q500); 2,100(Q1);1,590(Q500) | dedicated head landing zone, automatic carriage return and lock |
| 3065, 3075 | 5.25 | 65.6, 75 | 24 | 7, 8 | 7, 8 | closed-loop linear voice coil | 3.25x5.75x8 | ST506, ST412 | 2,500(Q1);1,900(Q500); 2,700(Q1);2,060(Q500) | dedicated head landing zone, automatic carriage return and lock |
| **ATHENAEUM TECHNOLOGY INC.** | | | | | | | | | | |
| Aegis 30 | 5.25 | 38.25 | 35 | 6 | 6 | closed-loop linear voice coil | 3.25x5.75x8 | ST506 | 2,500(Q1);2,100(Q500) | drive electronics housed in separate 3.25-x-5.75-x3.75-inch module |
| **BASF AG** | | | | | | | | | | |
| 6182, 6183 | 5.25 | 6.38, 9.57 | 76 | 4, 6 | | | 3.25x5.75x8.23 | | | |
| 6184 | 5.25 | 14.35 | 107 | 6 | | | 3.25x5.75x8.23 | | | |
| 6185, 6186 | 5.25 | 27.5, 18.3 | 108 | 6, 4 | | | 3.25x5.75x8.23 | | | |
| 6188 | 5.25 | 15 | 87 (360 cyl.), 78 (306 cyl.) | 4 | | | 1.6x5.75x8 | | | |

# 5.25-INCH AND SMALLER DISK DRIVES

| Company Model | Disk size (inches) | Unformatted capacity (in M bytes) | Average access time (msec.) | Number of data surfaces | Number of read/write heads | Actuator type | Dimensions (HxWxD inches) | Interface | Price ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|---|---|---|
| 6193, 6194, 6195 | 5.25 | 52, 72.9, 93.7 | 30 | 5, 7, 9 | 5, 7, 9 | closed-loop rotary voice coil | 3.25x5.75x8 | ST412 | | thin-film disks, automatic positioner retract |
| **COGITO SYSTEMS** | | | | | | | | | | |
| 906 | 5.25 | 5 | 85 | 2 | | buffered stepper motor | | ST506/412 | 795(Q100) | head landing zone, actuator lock |
| 912 | 5.25 | 10 | 85 | 4 | | buffered stepper motor | | ST506/412 | 895(Q100) | head landing zone |
| **COMPUTER MEMORIES INC.** | | | | | | | | | | |
| CM-5206, CM-5412, CM-5619, CM-5826 | 5.25 | 6.4, 12.8, 19.1, 25.5 | 77 | 2, 4, 6, 8 | 2, 4, 6, 8 | stepper motor | 3.25x5.75x8 | ST506 | 1,000(Q1);560(Q500); 1,200(Q1);660(Q500); 1,400(Q1);760(Q500); 1,600(Q1);910(Q500) | |
| CM-6213, CM-6426, CM-6640 | 5.25 | 13.3, 26.7, 40 | 40 | 2, 4, 6 | 2, 4, 6 | closed-loop rotary | 3.25x5.75x8 | ST506 | 1,400(Q1);960(Q500); 1,700(Q1);1,065(Q500); 1,800(Q1);1,170(Q500) | positioner locking mechanism, head parking zone |
| CM-7660, CM-7880 | 5.25 | 60, 80 | 40 | 6, 8 | 6, 8 | closed-loop rotary | 3.25x5.75x8 | ST506 | 2,200(Q1);1,420(Q500); 2,700(Q1);1,700(Q500) | parking zone, head-locking mechanism, 3370 technology |
| CM-3212 | 5.25 | 12.76 | 98 | 2 | 2 | closed-loop stepper motor | 1.65x5.75x8 | ST508 | 1,100(Q1);560(Q500) | parking zone, head-locking mechanism |
| **CYNTHIA PERIPHERAL CORP.** | | | | | | | | | | |
| D530, D550, D570 | 5.25 | 30.8, 51.4, 72 | 30 | 3, 5, 7 | 3, 5, 7 | rotary voice coil | 3.75x5.75x8 | ST507, ST506 | 1,850(Q1);1,200(Q500); 2,350(Q1);1,530(Q500); 2,750(Q1);1,790(Q500) | opt. SASI-/SCSI-level controller, power supply, cabinet and control panel |
| **DATAFLUX** | | | | | | | | | | |
| 5800R | 5.25 | 40 | 68 | 6 | | rotary voice coil | | ST506 | 9,975(Q50) | dual drives in a ruggedized, militarized chassis with controller for LSI-II |
| **EVOTEK** | | | | | | | | | | |
| ET-5510, ET-5520, ET-5530, ET-5540 | 5.25 | 7.8, 15.6, 23.4, 31.2 | 49 | 2, 4, 6, 8 | 2, 4, 6, 8 | linear stepper motor | 3.25x5.75x8 | ST506 | | thin-film plated media, on-board diagnostics |
| ET-5810, ET-5820, ET-5830, ET-5840 | 5.25 | 12.9, 25.8, 38.8, 51.7 | 49 | 2, 4, 6, 8 | 2, 4, 6, 8 | linear stepper motor | 3.25x5.75x8 | | | thin-film plated media, on-board diagnostics |
| **FUJITSU AMERICA INC.** | | | | | | | | | | |
| M2230, M2233, M2234, M2235 | 5.25 | 6.6, 13.3, 20, 26.6 | 83 | 2, 4, 6, 8 | 2, 4, 6, 8 | stepper motor | 3.3x5.7x8 | ST506 | 750(Q100); 850(Q100); 950(Q100); 1,150(Q100) | |
| M2241, M2242, M2243 | 5.25 | 31.4, 54.9, 86.3 | 30 | 4, 7, 11 | 4, 7, 11 | voice coil | 3.3x5.7x8 | ST506 | 1,600(Q100); 1,800(Q100); 2,000(Q100) | |
| MS2230AT, M2233AT | 5.25 | 6.7, 13.3 | 95 | 2, 4 | 2, 4 | stepper motor | 1.62x5.78x8 | ST506 | 750(Q100); 850(Q100) | |
| **INTERNATIONAL MEMORIES INC.** | | | | | | | | | | |
| 2306H, 2312H | 5.25 | 6.38, 12.75 | 85 | 2, 4 | 2, 4 | linear stepper motor | 1.62x5.75x8 | ST506, ST412 | 1,070(Q1);535(Q500); 1,195(Q1);615(Q500) | 3370 flexure with mini-monolithic heads |
| 5006H, 5012H, 5018H | 5.25 | 6.38, 12.76, 19.14 | 68 | 2, 4, 6 | 2, 4, 6 | linear stepper motor | 3.25x5.75x8 | ST506, ST412 | 1,070(Q1);715(Q500); 1,195(Q1);615(Q500); 1,320(Q1);535(Q500) | thin-film plated media, two-piece design with shock mounts |
| 5624H, 5636H, 5650H | 5.25 | 25.52, 38.28, 51 | less than 49 | 4, 6, 8 | 4, 6, 8 | closed-loop linear stepper motor | 3.25x5.75x8 | ST506, ST412 | 1,440(Q1);1,060(Q500); 1,590(Q1);935(Q500); 1,715(Q1);810(Q500) | thin-film plated media, two-piece design with shock mounts, 3370 flexure with mini-monolithic heads |
| **MAXTOR CORP.** | | | | | | | | | | |
| XT-1065, XT-1105, XT-1140 | 5.25 | 66.99, 105.27, 143.55 | 30 | 7, 11, 15 | 7, 11, 15 | closed-loop rotary voice coil | 3.25x5.75x8 | ST506, ST412 | 2,390(Q1);1,890(Q500); 3,340(Q1);2,660(Q500); 4,290(Q1);3,430(Q500) | dedicated head landing zone, automatic actuator lock |
| XT-2085, XT-2140, XT-2190 | 5.25 | 89.24, 140.24, 191.24 | 30 | 7, 11, 15 | 7, 11, 15 | closed-loop rotary voice coil | 3.25x5.75x8 | ST506, ST412 | 2,630(Q1);2,080(Q500); 3,675(Q1);2,930(Q500); 4,720(Q1);3,775(Q500) | |
| EXT-4075, EXT-4175, EXT-4280, EXT-4380 | 5.25 | 76.4, 178.28, 280.16, 382.03 | 30 | 3, 7, 11, 15 | 3, 7, 11, 15 | closed-loop rotary voice coil | 3.25x5.75x8 | ESDI | 2,040(Q1);1,610(Q500); 3,285(Q1);2,795(Q500); 4,590(Q1);4,065(Q500); 5,900(Q1);5,215(Q500) | uses 2,7 RLL coding |

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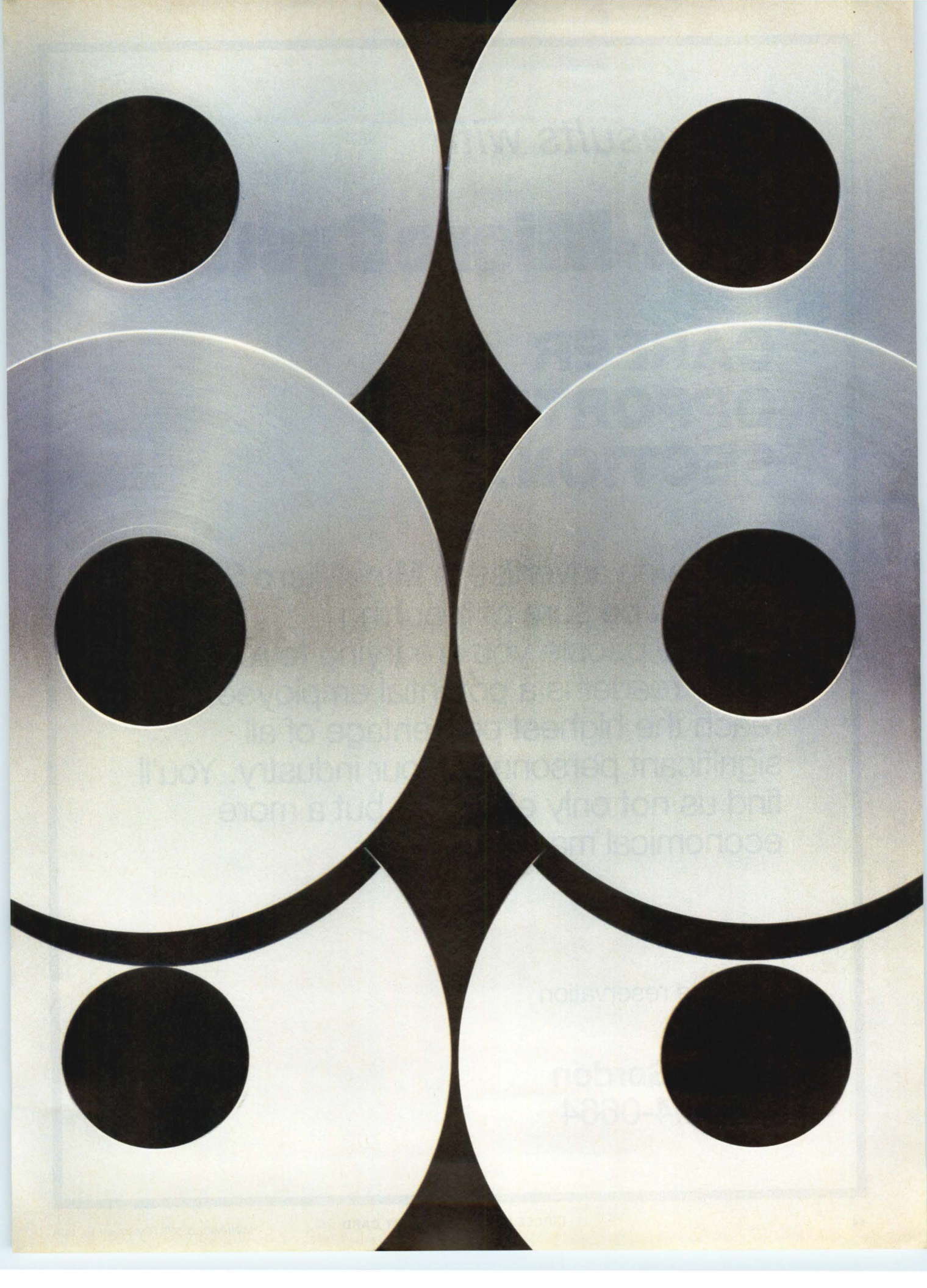

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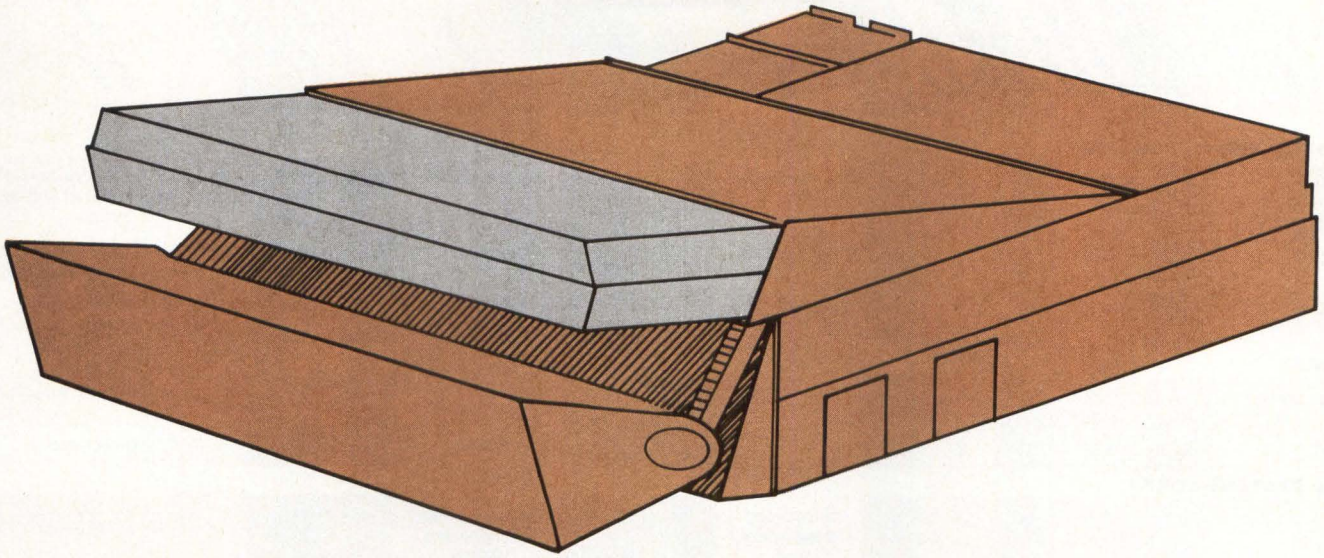
# 5.25-INCH AND SMALLER DISK DRIVES

| Company Model | Disk size (inches) | Unformatted capacity (in M bytes) | Average access time (msec.) | Number of data surfaces | Number of read/write heads | Actuator type | Dimensions (HxWxD inches) | Interface | Price ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|---|---|---|
| **MEMOREX CORP.** | | | | | | | | | | |
| 321, 322, 323, 324 | 5.25 | 6.7, 13.3, 20, 26.7 | 80 | 2, 4, 6, 8 | 2, 4, 6, 8 | rotary stepper motor | 3.25x5.75x8 | ST506, ST412 | 990(Q1);545(Q500); 1,190(Q1);655(Q500); 1,390(Q1);765(Q500); 1,590(Q1);875(Q500) | |
| 512, 513, 514 | 5.25 | 30, 50, 70 | 23 | 3, 5, 7 | 3, 5, 7 | closed-loop linear voice coil | 3.25x5.75x10.5 | ST412, ST506 | 2,200(Q1);1,210(Q500); 2,800(Q1);1,540(Q500); 3,400(Q1);1,870(Q500) | opt. SECA interface |
| **MICROCOMPUTER MEMORIES INC.** | | | | | | | | | | |
| M106, M112 | 3.5 | 6.38, 12.75 | 93.3 | 2, 4 | 2, 4 | linear stepper motor | 1.625x4x5.75 | ST506, ST412 | 1,400(Q1);964(Q500); 1,400(Q1);964(Q500) | |
| M212 | 3.5 | 12.75 | 93.3 | 4 | 4 | linear stepper motor | 1.625x5.75x8 | ST506, ST412 | 1,400(Q1);964(Q500) | |
| **MICROPOLIS CORP.** | | | | | | | | | | |
| 1302, 1303, 1304 | 5.25 | 25.9, 43.2, 51.9 | 30 | 3, 5, 6 | 3, 5, 6 | closed-loop balanced rotary voice coil | 3.25x5.75x8 | ST506, ESDI | 1,463(Q1);1,092(Q500); 1,749(Q1);1,306(Q500); 1,988(Q1);1,484(Q500) | auto positioner lock, dedicated landing zone |
| 1323, 1324, 1325 | 5.25 | 42.6, 63.9, 85.2 | 25 | 4, 6, 8 | 4, 6, 8 | closed-loop rotary voice coil | 3.25x5.75x8 | ST506, ESDI | 1,899(Q1);1,418(Q500); 2,159(Q1);1,612(Q500); 2,453(Q1);1,831(Q500) | auto positioner lock, dedicated landing zone |
| **MICROSCIENCE INTERNATIONAL CORP.** | | | | | | | | | | |
| HH612 | 5.25 | 12.76 | 50 | | 2, 4 | closed loop linear stepper motor | 1.65x5.75x8 | ST506, ST412 | 490(Q10,000) | plated media; servo information recorded in gaps between tracks (embedded) |
| **MINISCRIBE CORP.** | | | | | | | | | | |
| 2006, 2012, 5338 | 5.25 | 5, 10, 30 | 85 | 2, 4, 6 | | rack and pinion | | ST412/ 506 | 474(Q1000); 563(Q1000);895(Q1000) | |
| 3006, 3012 | 5.25 | 5, 10 | 85 | 2 | | rack and pinion | | ST412/ 506 | 425(Q1000); 499(Q1000) | half-height drive |
| 5451 | 5.25 | 40 | 90 | 8 | | rack and pinion | | | 980 (Q100) | |
| **MITSUBISHI ELECTRONICS AMERICA INC.** | | | | | | | | | | |
| M2860-1, -2 | 5.25 | 21.73, 50.71 | 35 | 3, 7 | 3, 7 | | 5.12x 8.54x16.93 | SMD | | |
| M2860-3 | 5.25 | 85.37 | 30 | 7 | 7 | | 5.12x 8.54x16.93 | SMD | | |
| MR521 | 5.25 | 13.33 | 85 | 2 | 2 | | 1.62x5.75x8 | ST506 | | |
| **MODULAR COMPUTER SYSTEMS INC.** | | | | | | | | | | |
| 4185-2 | 5.25 | 20.2 | 158 | 2 | | rotary | | | 8,300(Q1) | opt. second 20.2 M-byte disk or 653 K-byte floppy disk |
| **NEC INFORMATION SYSTEMS INC.** | | | | | | | | | | |
| D5124 | 5.25 | 12.91 | 85 | 4 | 4 | stepper motor | 1.6x5.7x8.1 | ST506 | 500(Q500) | |
| D5214, D5224, D5244 | 5.25 | 6.45, 12.91, 25.83 | 85 | 2, 4, 8 | 2, 4, 8 | stepper motor | 3.2x5.7x8.1 | ST406 | 580(Q500);670(Q500); 810(Q500) | |
| **NEW WORLD COMPUTER CO. INC.** | | | | | | | | | | |
| Turbo-Disc 5/0 | 5.25 | 6.5 | 16 | 1 | 24 | stepper motor | 1.35x5.75x8 | ST506 | 1,800(Q1);1,275(Q500) | |
| **PRIAM CORP.** | | | | | | | | | | |
| 502, 504 | 5.25 | 55, 86 | 32 | 7, 11 | 7, 11 | closed-loop linear voice coil | 5.75x3.25x8 | ST412 | 2,400(Q1);1,550(Q500); 2,890(Q1);1,850(Q500) | dedicated landing and shipping zone, automatic actuator lock, automatic spindle brake, integral shock mounting |
| 503, 505 | 5.25 | 71, 111 | 32 | 7, 11 | 7, 11 | closed-loop linear voice coil | 5.75x3.25x8 | Priam, ANSI | 2,730(Q1);1,750(Q500); 3,590(Q1);2,300(Q500); | dedicated landing and shipping zone, automatic actuator lock, automatic spindle brake, integral shock mounting |
| **QUANTUM CORP.** | | | | | | | | | | |
| Q520, Q530, Q540 | 5.25 | 16.78, 25.17, 33.55 | 45 | 4, 6, 8 | | rotary torque | | ST412/ 506 | 895(Q1000); 995(Q1000); 1,095(Q1000) | |

## 5.25-INCH AND SMALLER DISK DRIVES

| Company Model | Disk size (inches) | Unformatted capacity (in M bytes) | Average access time (msec.) | Number of data surfaces | Number of read/write heads | Actuator type | Dimensions (HxWxD inches) | Interface | Price ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|---|---|---|
| **RODIME PLC.** | | | | | | | | | | |
| Series RO200 | 5.25 | 6.67, 13.33, 20, 26.67 | 90 | 2, 4, 6, 8 | 2, 4, 6, 8 | rotary stepper motor | 3.25x5.75x8 | ST506, ST412 | | opt. stepper motor lock, strengthened side frames |
| Series RO200E | 5.25 | 40, 53.34 | 60 | 6, 8 | 6, 8 | rotary stepper motor | 3.25x5.75x8 | ST506, ST412 | | |
| Series RO350 | 3.5 | 6.38, 12.75 | 85 | 2, 4 | 2, 4 | rotary stepper motor | 1.625x4x5.75 | ST506, ST412 | | opt. mounting frame to make drive size compatible with half-height Winchesters |
| **SEAGATE TECHNOLOGY** | | | | | | | | | | |
| ST212 | 5.25 | 12.76 | 65 | 2 | 4 | stepper motor | 1.62x5.75x8 | ST506, ST412 | | |
| ST406, ST412, ST419 | 5.25 | 6.38, 12.76, 19.14 | 85 | 2, 4, 6 | 2, 4, 6 | stepper motor | 3.25x5.75x8 | ST506, ST412 | | |
| ST425 | 5.25 | 25.52 | 65 | 4 | 8 | stepper motor | 3.25x5.75x8 | ST506, ST412 | | |
| **SHUGART CORP.** | | | | | | | | | | |
| 612 | 5.25 | 12.7 | 92 | 6 | 6 | stepper motor | 3.3x5.8x8.1 | ST506 | 593(Q500) | dedicated head landing/shipping zones; spindle-actuator lock |
| 706, 712 | 5.25 | 6.6, 13.3 | 85 | 2, 4 | 2, 4 | stepper motor | 1.63x5.8x8 | ST506 | 444(Q500);449(Q500) | dedicated head landing/shipping zones |
| 706S, 712S | 5.25 | 5.6, 11.3 | 85 | 2, 4 | 2, 4 | stepper motor | 3.25x5.75x8 | ST506 | 661(Q500);716(Q500) | intelligence incorporated within form factor of drive |
| **SYQUEST TECHNOLOGY** | | | | | | | | | | |
| SQ312F, SQ325F, SQ338F | 3.9 | 12.75, 25.5, 38.2 | 85 | 2, 4, 6 | 2, 4, 6 | stepper motor | 1.625x4.8x8 | ST506 | 990(Q1);600(Q500); 1,100(Q1);800(Q500); 1,500(Q1);1,200(Q500) | thin-film plated media, scheduled delivery: June 1984 |
| **SYSGEN** | | | | | | | | | | |
| 112 | 5.25 | 10, 40 | 80 | 8, 16 | | SASI | | SASI | 2,995(Q1) | up to two 5.25-inch Winchesters, 20 K-byte streaming cartridge backup, controller |
| **TANDON CORP.** | | | | | | | | | | |
| TM251, TM252 | 5.25 | 6.4, 12.8 | 85 | 2, 4 | 2, 4 | stepper motor | 1.625x5.75x8 | ST506 | 790(Q1);920(Q1) | plated media |
| TM501, TM502, TM503 | 5.25 | 6.4, 12.8, 19.1 | 85 | 2, 4, 6 | 2, 4, 6 | stepper motor | 3.25x5.75x8 | ST506 | 800(Q1);880(Q1); 1,040(Q1) | |
| TM703 | 5.25 | 30.1 | 39 | 5 | 5 | closed-loop rotary voice coil | 3.25x5.75x8 | ST506 | 1,810(Q1) | plated media |
| TM705 | 5.25 | 50.1 | 39 | 5 | 5 | closed-loop rotary voice coil | 3.25x5.75x8 | ST506 | 1,950(Q1) | plated media |
| **TEAC CORP. OF AMERICA** | | | | | | | | | | |
| SD-510 | 5.25 | 12.76 | 85 | 4 | 4 | stepper motor | 1.625x5.75x8 | ST506 | 995(Q1);625(Q500) | |
| **TEXAS INSTRUMENTS INC.** | | | | | | | | | | |
| 525/122 | 5.25 | 12.76 | 100 | 4 | | | | ST412 | 1,575(Q1) | |
| 525/61 | 5.25 | 6.38 | 100 | 2 | | | | ST506 | 1,225 | |
| **TULIN CORP.** | | | | | | | | | | |
| TL213, TL226, TL240 | 5.25 | 13:34, 26.7, 40 | 75 | 2, 4, 6 | 2, 4, 6 | closed-loop stepper motor | 1.625x5.75x8 | ST506, ST412 | 985(Q1);650(Q500); 1,305(Q1);850(Q500); 1,475(Q1);1,055(Q500) | |
| **UNITED PERIPHERALS** | | | | | | | | | | |
| 9705 | 5.25 | 6.38 | 85 | 4 | | stepper motor | | SASI | 2,995(Q1 – 10) | error correction compatible with most small computers |
| 9800 | 5.25 | 6.38 | 85 | 4 | | stepper motor | | HP-IB | 2,995(Q1 – 10) | error correction compatible with most Hewlett Packard computers |
| **VERTEX PERIPHERALS** | | | | | | | | | | |
| V100 | 5.25 | 30, 51, 72 | 30 | 7 | 7 | closed-loop rotary voice coil | 3.25x5.75x8 | ST506, ST412 | 2,750(Q1) for 72M-byte model | thin-film disks, automatic actuator lock with dedicated landing zone |
| V2100 | 5.25 | 100 | 25 | 7 | 7 | closed-loop rotary voice coil | 3.25x5.75x8 | ST412 HP | 2,750(Q1) | thin-film disks, RLL encoding |

# CARTRIDGE DISK DRIVES



| Company/ Model | Disk size (inches) | Unformatted capacity fixed (removable) (M bytes) | Average access time (msec.) | Number of data surfaces | Number of read/write heads | Actuator type | Dimensions (H x W x D inches) | Interface | Price ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|---|---|---|
| **ATHENAEUM TECHNOLOGY INC.** | | | | | | | | | | |
| Aegis 1010 | 5.25 | 12.75 (12.75) | 35 | 4 | 4 | closed-loop linear voice coil | 3.25 x 5.75 x 8 | ST506 | 2,500 (Q1); 2,100 (Q500) | drive electronics housed in separate 3.25-x 5.75-x 3.75-inch module |
| **AMPEX CORP.** | | | | | | | | | | |
| DFR 932 | 14 | 16.29 (16.29) | 30 | 2 | | fixed rotary, cartridge linear | | SMD/CMD | | rack mount |
| DFR 964 | 14 | 48.87 (16.29) | 30 | 4 | | fixed rotary, cartridge linear | | SMD/CMD | | rack mount |
| DFR 996 | 14 | 81.45 (16.29) | 30 | 6 | | fixed rotary, cartridge linear | | SMD/CMD | | rack mount |
| DM 9300 AQ | 14 | 315 | 28 | 19 | | linear motor | | SMD | | CDC 9766-compatible |
| DM 9399 Q | 14 | 312 | 28 | 19 | | linear motor | | SMD | | |
| **BALL ELECTRONIC SYSTEMS DIVISION** | | | | | | | | | | |
| BDA 50 | 14 | (54.7) | 30 | 5 | | linear stepper motor | 10.5 x 17.5 x 31.5 | SMD/Trident | | variable length sectoring |
| BDA 80 | 14 | (82.9) | 30 | 5 | | linear stepper motor | 10.5 x 17.5 x 31.5 | SMD/Trident | | variable length sectoring |
| BDA 100 | 14 | (103.2) | 30 | 5 | | linear stepper motor | 10.5 x 17.5 x 31.5 | SMD | | variable length sectoring |
| **CARDIFF TECHNOLOGY INC.** | | | | | | | | | | |
| D240 | 5.25 | 20 (20) | 25 | 4 | 4 | closed-loop linear voice coil | 3.25 x 5.75 x 8 | ST506 | 2,600 (Q1); 1,500 (Q500) | thin-film heads and disks |
| **CENTURY DATA SYSTEMS INC.** | | | | | | | | | | |
| C2075 | 8 | 42 (21.08) | 30 | 2, 4 | | voice coil | | SMD | 3,240 (Q200) | |
| T 80 | 14 | (82.1) | 30 | 5 | | linear motor | | TTL/SMD | 5,675 (Q200) | tabletop or rack slide mount |
| T 200 | 14 | ( 208 ) | 30 | 19 | | linear motor | | TTL/SMD | 8,950 (Q200) | |
| T 300 | 14 | ( 312 ) | 30 | 19 | | linear motor | | TTL, SMD | 9,750 (Q200) | CDC 9766-compatible |

# CARTRIDGE DISK DRIVES

| Company/ Model | Disk size (inches) | Unformatted capacity fixed (removable) (M bytes) | Average access time (msec.) | Number of data surfaces | Number of read/write heads | Actuator type | Dimensions (H x W x D inches) | Interface | Price ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|---|---|---|
| **CYNTHIA PERIPHERAL CORP.** | | | | | | | | | | |
| D520 | 5.25 | 13 (13) | 30 | 4 | 4 | rotary voice coil | 3.25 x 5.75 x 8 | ST706, ST506 | 3,150 (Q1); 1,380 (Q500) | opt. SASI/SCSI-level controller, power supply, cabinet and control panel |
| D120 | 10.5 | (12) | 50 | 2 | 2 | linear voice coil | 5.6 x 12.2 x 21 | proprietary | 2,076 (Q1); 1,800 (Q500) | opt. SASI controller, power supply, cabinet and control panel |
| D140 | 10.5 | 12 (12) | 50 | 4 | 4 | linear voice coil | 6.7 x 12.2 x 21 | proprietary | 3,144 (Q1); 2,540 (Q500) | opt. SASI controller, power supply, cabinet and control panel |
| **DATREX** | | | | | | | | | | |
| Series 6000 | 14 | 6.25 (6.25) | 35 | 4 | | | | | 2,590 | integral power supply |
| WD 505 | 5.25 | 6.38 | 55 | 2 | | | | ST506 | 975 | soft-sectored |
| **DMA SYSTEMS CORP.** | | | | | | | | | | |
| 11/11 Double Density | 5.25 | 13.62 (13.62) | 40 | 4 | 4 | closed-loop linear voice coil | 3.25 x 5.7 x 10.5 | hard-sectored cartridge and ST506 | 2,400 (Q1); 1,675 (Q500) | |
| 11R Double Density | 5.25 | (13.62) | 40 | 2 | 2 | closed-loop linear voice coil | 3.25 x 5.75 x 10.5 | hard-sectored cartridge and ST506 | 2,200 (Q1); 1,500 (Q500) | |
| Micro-Magnum 5/5 | 5.25 | 6.4 (6.4) | 40 | 4 | 4 | closed-loop linear stepper motor | 3.25 x 5.75 x 10.5 | hard-sectored cartridge and ST506 | 2,200 (Q1); 1,400 (Q500) | |
| Micro-Magnum 5R | 5.25 | (6.4) | 40 | 2 | 2 | closed-loop linear stepper motor | 3.25 x 5.75 x 10.5 | hard-sectored cartridge and ST506 | 2,000 (Q1); 1,135 (Q500) | |
| 360 | 5.25 | (12.75) | 97 | 2 | 2 | closed-loop linear stepper motor, rack-and-pinion | 1.625 x 5.75 x 8 | cartridge and ST506 | 1,295 (Q1); 865 (Q500) | |
| **HARRIS CORP.** | | | | | | | | | | |
| 5632 | 14 | (80) | 38 | 5 | | linear voice coil | | SMD | 20,900 | includes controller |
| 5652 | 14 | (300) | 38 | 5 | | linear voice coil | | SMD | 20,900 | includes controller |
| **IBM CORP.** | | | | | | | | | | |
| 3340A2 | 14 | (140) | 25 | 12 | | linear radial | | | 24,570 | |
| 3340B1 | 14 | (70) | 25 | 11 | | linear radial | | | 13,510 | |
| 3340B2 | 14 | (140) | 25 | 22 | | linear radial | | | 17,200 | |
| **IOMEGA CORP.** | | | | | | | | | | |
| ALPHA-10 | 8 | (14) | 35 | 1 | 1 | closed-loop rotary voice coil | 4.5 x 8.5 x 14.09 | SCSI | 1,745 (Q1); 1,295 (Q500) | includes controller; available as a plug-compatible IBM PC/XT or Texas Instruments subsystem |
| ALPHA-10.5 | 8 | (14) | 35 | 1 | 1 | closed-loop rotary voice coil | 4.5 x 8.5 x 14.09 | SCSI | 1,745 (Q1); 1,295 (Q500) | includes controller; available as a plug-compatible IBM PC/XT or Texas Instruments subsystem |
| ALPHA-10H | 8 | (14) | 35 | 1 | 1 | closed-loop rotary voice coil | 2.3 x 8.5 x 12 | SCSI | 1,745 (Q1); 1,295 (Q500) | includes controller; available as a plug-compatible IBM PC/XT or Texas Instruments subsystem |
| BETA-5 | 5.25 | (7.5) | 39 | 1 | 1 | closed-loop rotary voice coil | 3.25 x 5.75 x 8 | ST506 | 895 (Q1); 595 (Q500) | |
| **MEMOREX CORP.** | | | | | | | | | | |
| 410 | 5.25 | 6.4 (6.4) | 40 | 4 | 4 | closed-loop linear voice coil | 3.25 x 5.75 x 10.6 | ST706-, ST506-, ST412-type | 2,550 (Q1); 1,405 (Q500) | |
| 450 | 5.25 | (12.75) | 98 | 2 | 2 | linear stepper motor, rack-and-pinion | 1.625 x 5.75 x 8.0 | ST706, ST506, ST412 | 1,480 (Q1); 815 (Q500) | |
| 677-70, -30 | 14 | (206), (312) | 28.5 | 19 | 19 | closed-loop linear voice coil | 47 x 22 x 32 | SMD | 13,000 (Q1); 10,500 (Q500); 14,000 (Q1); 10,500 (Q500) | |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| **MODULAR COMPUTER SYSTEMS INC.** | | | | | | | | | | |
| 4178-1, 4178-2 | 14 | (67.4) | 30 | 9.6 | | linear motor | | | 23,150 (Q1); 43,600 (Q1) | model 4178-2 features dual-port access, two computer interfaces |
| 4178-5, 4178-6 | 14 | (256.1) | 30 | 19 | | linear motor | | | 31,700 (Q1); 47,000 (Q1) | model 4178-6 features dual-port access, two computer interfaces |
| 4179-11 | 14 | 13 (13) | 30 | 2 | | linear motor | | | 15,400 | |
| 4181-11 | 8 | 6.7 (6.7) | 35 | 4 | | linear motor | | | 11,775 | |
| **NEW WORLD COMPUTER CO. INC.** | | | | | | | | | | |
| Turbo-Disc 5/5 | 5.25 | 6.5 (6.5) | 16 | 2 | 48 | stepper motor | 3.25 x 5.75 x 8 | ST506 | 2,325 (Q1); 1,800 (Q500) | |
| **SYQUEST TECHNOLOGY** | | | | | | | | | | |
| SQ306R | 3.9 | (6.38) | 85 | 2 | 2 | closed-loop stepper motor | 1.625 x 4.8 x 8 | ST506 | 995 (Q1); 600 (Q500) | thin-film plated media |
| **VERMONT RESEARCH CORP.** | | | | | | | | | | |
| 5017 | 14 | 26.2 (26.2) | 45 | 4 | | linear voice coil | | drive level | | |
| 8010 | 8 | (10) | 55 | 2 | | linear voice coil | | ANSI, SASI or drive level | | includes SASI controller, power supply fan, wide operating temperature range (0° to 50°C) |
| 8520 | 8 | 10 (10) | 55 | 4 | | linear voice coil | | ANSI, SASI, or drive level | | includes SASI controller, power supply fan, wide operating temperature range (0° to 50°C) |
| 5017 | 14 | 26.2 (26.2) | 45 | 4 | | linear, voice coil | | drive level | | |


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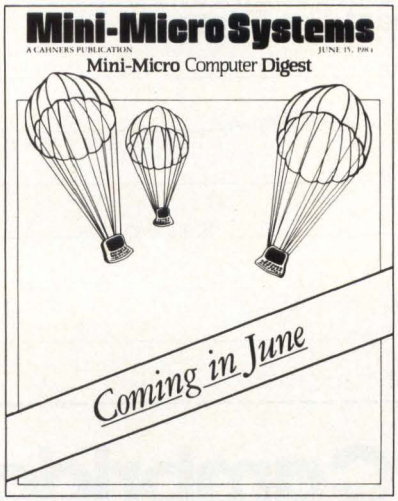
Second Issue in June

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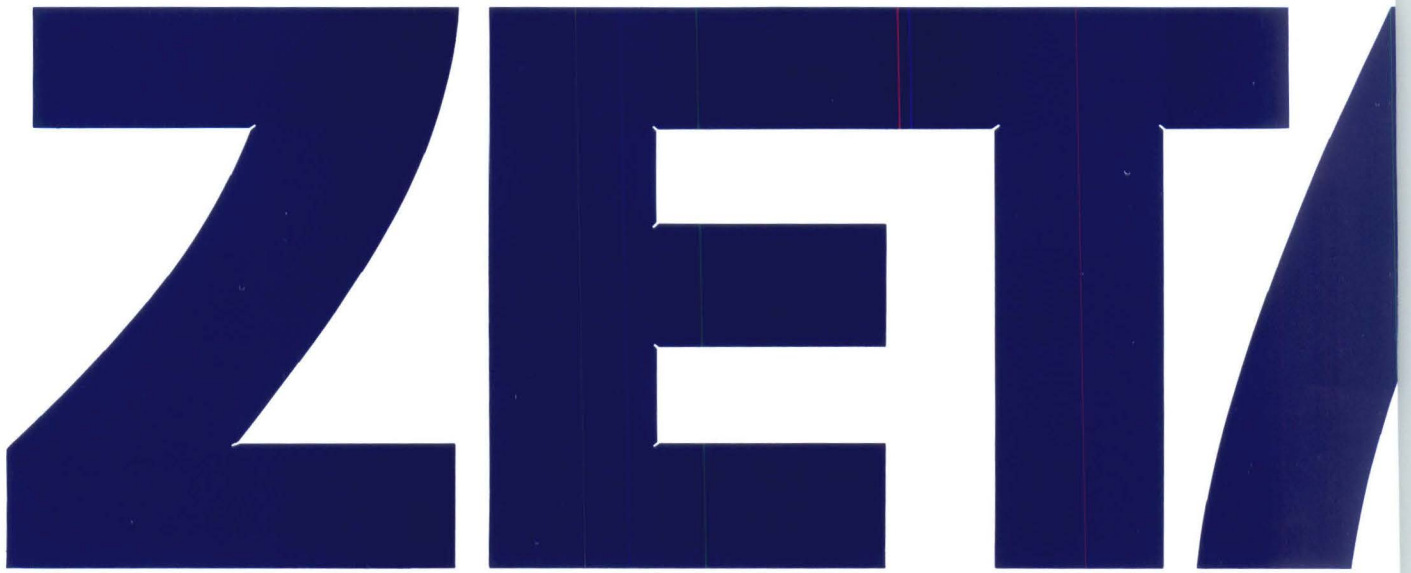
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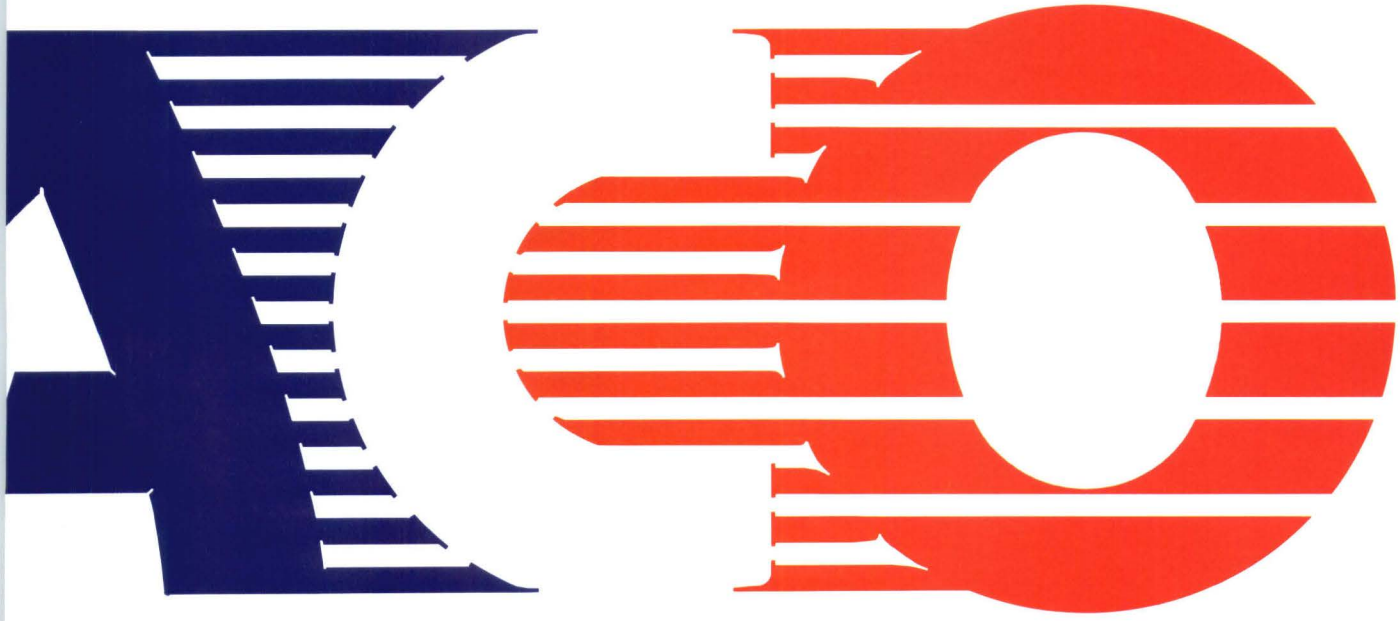


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# Need for Winchester backup pushes floppies to higher densities

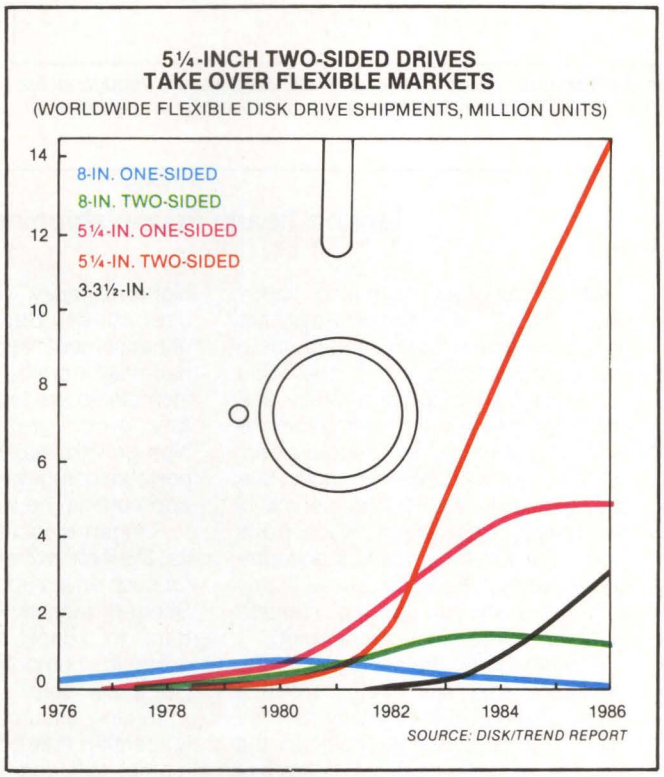
*Manufacturers could use new media to offer 5M-byte floppy drives within a year*

**Robert A. Sehr,** Associate Editor

The proliferation of multiuser, multitasking operating systems such as UNIX and user-friendly "shells" have combined to increase memory requirements for personal computers. As a result, the market for small Winchester disks should grow explosively for the forseeable future. Keeping pace with that growth will be the floppy disk drives necessary to back up Winchester data.

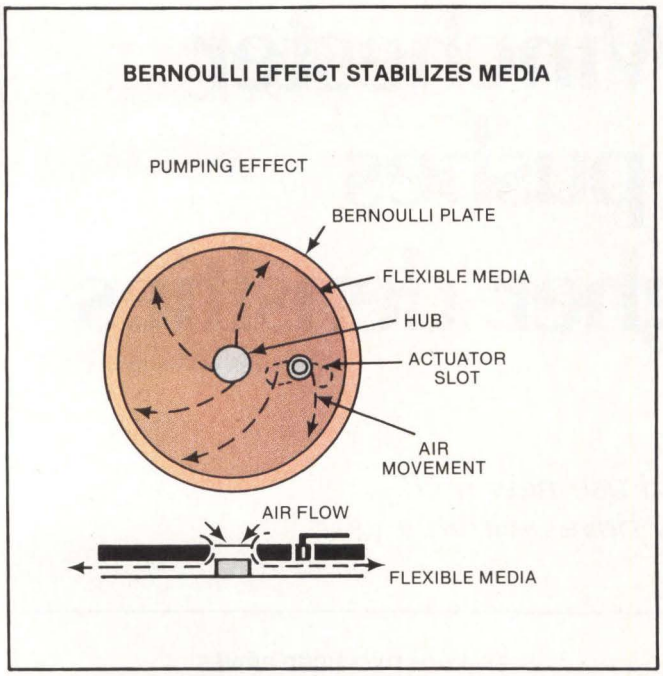
The standard 48-track-per-inch (tpi) minifloppy introduced by Shugart Corp. in 1978 remains the predominant choice of system manufacturers. There is a trend in the market toward 96-tpi, 5¼-inch floppy drives with capacities as high as 1.6M bytes. Jim Porter, author of *Disk/Trend Report*, Mountain View, Calif., anticipates that IBM Corp.—which has so far resisted using 96-tpi drives in its Personal Computer—will phase in 96-tpi drives over the next two years. He predicts that 96-tpi drives will occupy 26 percent of the market for double-sided, 5¼-inch drives by 1986.

Even while the market gradually shifts to 96-tpi drives, at least three new companies—Drivetec Inc., Amlyn Corp. and Iomega Corp.—are projecting a need for higher-capacity drives and are offering floppy drives with at least double the current generation's densities and storage capacities. The three companies are still small, but each has connected with a larger, established manufacturer to push their new technology to its ultimate potential.




### Kodak, Drivetec could make 10M-byte floppy

Last fall, Eastman Kodak Co. announced it would acquire a license to manufacture the Drivetec 320 drive at Kodak's Rochester, N.Y., plant and market it through a Kodak subsidiary, Data Technology Corp., Santa Clara, Calif. Kodak officials indicated they were interested in a drive that would use a technology from another Kodak subsidiary, Spin Physics. Spin Physics developed an 800-oersted isotropic media, Isomax, which it plans to sell to OEMs this year. Use of Isomax will increase bit densities to 45,000 bits per inch (bpi), permitting standard 96-tpi drives to quadruple capacities to 5M bytes. This year, Tandon Corp., the largest U.S. manufacturer of floppy disk drives, may become




**In the Bernoulli effect,** *moving air stabilizes pressure throughout the disk drive. The media floats on and is stabilized by a cushion of air.*

one of the first users of Isomax in a conventional drive.

Kodak chose the Drivetec 320 drive over a similar high-capacity offering by Amlyn partially because of the 320's compactness and performance. The 192-tpi, half-height 320 has a 9,908-bpi bit density, and the Amlyn drive uses a closed-loop servo system for a track density of 170 tpi and a bit density of 9,500 bpi in a full-height configuration.

Robert Gaskin, a researcher for Dataquest Inc.'s Disc Memory Service, says the alliance between Kodak and Drivetec could produce the world's first 10M-byte floppy disk drive. "The combination of the Drivetec drive and the Spin Physics [media] could produce a 10M-byte floppy drive as early as this summer's National Computer Conference," Gaskin notes.

### Amlyn switches to half-height package

Most industry observers agree that Amlyn made a mistake in offering a full-height drive in a world dominated by half-heights. Analyst Porter predicts that, by 1986, 90 percent of all double-sided drives shipped will be half-heights.

Amlyn is now concentrating on perfecting a half-

## Tandon heads floppy shipments, Shugart continues to slide

Silicon Valley was once also "floppy drive valley." But those days are gone. The action has moved south to Chatsworth, Calif., and the San Fernando Valley. Tandon Corp. and Micro Peripherals Inc. dominate the explosive market for double-sided, 48- and 96-track-per-inch (tpi), 5¼-inch floppy drives. Not far behind is Chatsworth neighbor, Micropolis Corp. The three companies accounted for nearly 50 percent of the floppy disk drives shipped in 1982. Tandon alone accounted for 37.9 percent.

Shugart Corp., the developer of the minifloppy that still makes 5¼-inch floppy drives in Silicon Valley (Sunnyvale), has dropped far back in the pack, representing only 2.8 percent of the market, according to figures from the *1983 Disk/Trend Report,* published by market analyst Jim Porter. Shugart still leads in shipments of 8-inch floppy drives. According to Porter, however, the 8-inch market is stagnating.

Double-sided, 5¼-inch drives represented almost half of the industry's worldwide unit shipments in 1983, Porter says. He expects such drives to stay on top for many years, as higher-capacity versions expand in usefulness. Because of capacity enhancements and wide availability of half-height drives, double-sided, 5¼-inch drives are better positioned than any other group to exploit the high-growth market for desktop and portable computers used for business applications, he says.

Shugart is focusing its attention on its 3½-inch microfloppy. The market for such drives appears to be growing: Shugart recently announced a contract to supply 3½-inch drives to portable computer maker Gavilan Computer Corp.

Tandon assured itself a continued leadership role in the 5¼-inch floppy market last year by signing a $300 million floppy disk drive contract with IBM. The contract reflects expected continued sharp demand for IBM's Personal Computer and the PCjr and indicates that it will be some time before IBM ramps up to produce high volumes of its own 5¼-inch floppy drives.

Porter expects IBM to ship 285,000 floppy drives to its captive markets this year and predicts the number will rise to 2.48 million by 1986, out of expected worldwide shipments of 14.56 million. Coupled with IBM's shipments of 8-inch floppy drives, Big Blue will represent a significant challenge to OEMs such as Tandon. However, Porter believes that IBM will not manufacture enough drives to meet its internal needs. In addition, makers of PC compatibles will be battling for supplies that will keep their systems IBM compatible.

Porter predicts IBM will increase its floppy drive track densities to 96 tpi from the 48 tpi in the drives used on the PC. More than 70 percent of all drives shipped last year were 48-tpi units. Porter expects that percentage to drop to 40 percent by 1986. "IBM will start using 1.6M-byte, two-sided 5¼-inch drives in 1984 on new versions of its PC family, which will supersede the Displaywriter word-processing system and System/23 Datamaster small business system," Porter forecasts.

He believes Tandon and other U.S. manufacturers could lose out to Japanese companies unless they speed production of 1.6M-byte, 96-tpi drives.

height drive, which it expects to introduce around the time of the Spring Comdex show in Atlanta. Like Drivetec, Amlyn's major funding source is Dysan Corp. Amlyn has also signed a second-source agreement with Micro Peripherals Inc., Chatsworth, Calif. Despite the company's late entry into the market for half-heights, Amlyn executive vice president Thomas McCrystal is optimistic about Amlyn's chances, especially after another recent infusion of capital from Dysan.

One primary stumbling block to widespread acceptance of the Drivetec and Amlyn products is that the drives are not interchangeable; that is, they cannot read each other's media. Both drives can read diskettes with lower densities, however. As with other standards, market preferences rather than the decision of a standards committee will likely solve the problem. In the meantime, system integrators comtemplating the use of a high-capacity floppy drive must choose the drive they expect to proliferate.

### Seagate's half-height floppy may help Iomega

The third player in the market for high-capacity flexible media, Iomega, also is making a comeback after a slow start. The company was slowed by internal problems and by a market described as not ready for its technically advanced 10M-byte, 8-inch Alpha 10 and 5M-byte, 5¼-inch Beta 5 flexible cartridge drives.

The Iomega drive features flexible media within a hard-jacket cartridge package with Winchester-like floating heads. Based on Bernoulli technology, the media floats over the head on an air cushion. The media is stabilized by the Bernoulli forces between the rotating disk and a stationary flat reference plate.

*Floppy drives have the advantage of lower media costs and simpler integration.*

Increasing capacities of 5¼-inch Winchesters had a bad effect on the market for which the Alpha 10 was designed—low-end 8-inch Winchesters. Last fall's announcement by Seagate Technology of a half-height, 8-inch, 100M-byte Winchester drive, however, may give the Alpha 10 a shot in the arm. "We're certainly wishing Seagate every possible success," says Iomega president Gabriel Fusco.

Fusco obtained new funding after reorganizing and streamlining the two-year-old company. He secured

### Apple, IBM moves ease microfloppy controversy

When Sony Corp. introduced the 3½-inch microfloppy drive several years ago, it didn't know it was opening a can of worms. Sony appears to be in the winner's circle with its 3½-inch form factor microfloppy after taking on Matsushita and two of the biggest names in U.S. magnetic recording—IBM Corp. and Dysan Corp. It also won the favors of Apple Computer Inc. and Hewlett-Packard Co., which have adopted the Sony drives for use in their microcomputers.

IBM, used to dictating standards to the U.S. market, discovered that it could not sell a non-standard 4-inch floppy disk to its captive market or to OEMs. The company was forced to withdraw the drive from the market. Dysan, with a major stake in drive manufacturer Tabor Corp., Westford, Mass., as well as media supplier Brown Disc Manufacturing Inc., Colorado Springs, Colo., continues to battle for the 3¼-inch form factor. Matsushita, along with Hitachi Ltd. and Maxell Corp. of Japan, continue to push the 3-inch form factor, but most have restricted their efforts to Japan—where it remains strong—and have surrendered their U.S. marketing to the 3½-inch form factor.

Jim Porter, disk drive analyst and author of *Disk/Trend Report,* predicts that worldwide shipments of microfloppy drives will reach 810,000 units this year and 3.01 million in 1986. Dataquest Inc., a San Jose, Calif., market research company, projects 1984 shipments of microfloppies at 598,000, rising to 4.22 million in 1986. In addition, Sony recently agreed to supply 3½-inch disk drives for Apple's new Macintosh and Lisa 2 personal computers. Dataquest researcher Robert Gaskin believes the Sony/Apple agreement just about retires the controversy in favor of the 3½-inch form factor. He also notes that HP has shipped more than 75,000 3½-inch drives with its small computers, far outstripping any other contender.

However, James DeStefano, director of business planning at Dysan, the largest supplier of software duplication on minifloppies, does not agree that the battle is over. The bottom line, he says, is software distribution. Dysan has committed large resources to making software-duplication services for 3¼-inch diskettes widely available. Dysan is also marketing a subsystem manufactured by Concorde Peripherals Inc., Costa Mesa, Calif., that uses Tabor Corp.'s 3¼-inch drive.

Despite industry observers' expectations that Apple's Macintosh will win big, DeStefano does not think Apple will be the deciding factor in the microfloppy controversy: "There is still a pretty big name out there that's undecided," he notes, referring to IBM, which must now find a new standard to embrace. An industry analyst who does not want to be named predicts that IBM will not only embrace the 3½-inch form factor but also will integrate it into a forthcoming portable computer, which is expected this year.

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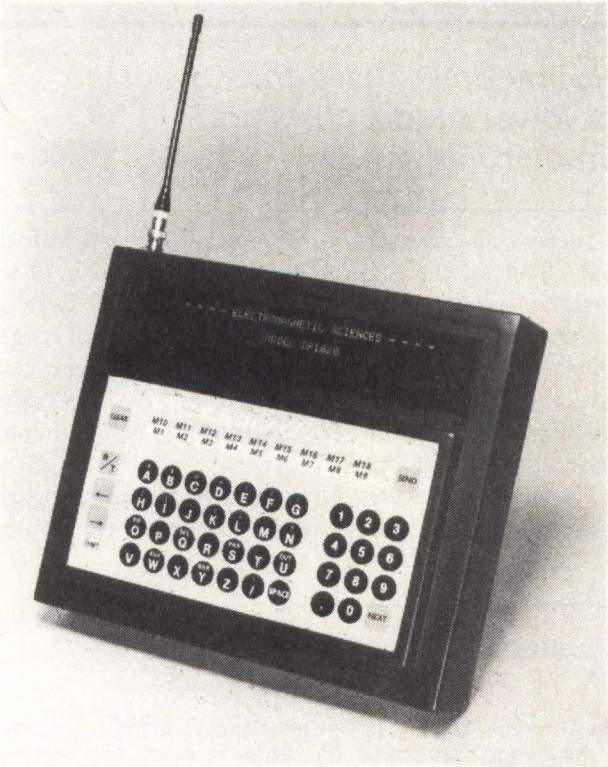

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long-sought second-source manufacturing agreements with SCI Corp., Huntsville, Ala., for the drives and with Verbatim Corp., Sunnyvale, Calif., for the media. In the company's first effort in the end-user market, he secured a distribution agreement with ComputerLand retail stores to sell "Bernoulli boxes"—packaged subsystems featuring the Alpha 10 and a controller with an interface for the IBM PC.

*The high-capacity flexible media products from Drivetec, Amlyn and Iomega will face competition from other backup technologies.*

The company is now concentrating on shipping the Beta 5 series of 5M-byte, 5¼-inch Winchesters. Iomega plans to increase its capacity to 10M bytes to simplify backup for the 10M-byte Winchesters now standard on PC XT-compatible systems. Fusco has also moved the company's corporate headquarters from Ogden, Utah, to Stamford, Conn., to bring the company closer to financial centers and increase its visibility.

*This year, Tandon may become one of the first users of Isomax in a conventional drive.*

The high-capacity flexible media products from Drivetec, Amlyn and Iomega will face competition from other backup technologies such as streaming-tape drives and data cartridges. Floppy drives have the advantage of lower media costs and simpler integration. "No matter what backup devices a system integrator chooses, there will always be a need for a floppy drive on a system for input and output of software," says Ivo Adam, former vice president of marketing at Drivetec. "Why should anyone have to put on two backup devices?"

However, technology is advancing. Cartridge and tape drives will one day be able to compete cost-effectively as software I/O devices with floppy drives. In preparation, floppy makers must keep an eye on increasing recording densities through perpendicular and vertical recording. □


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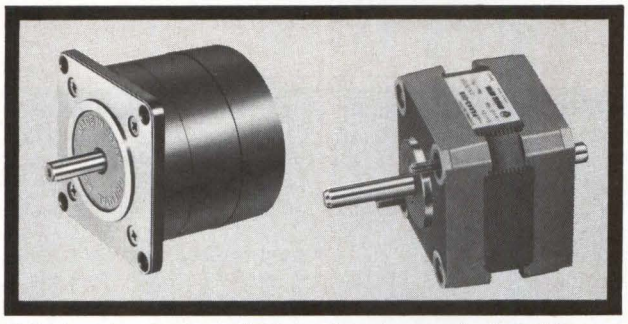

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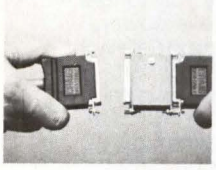

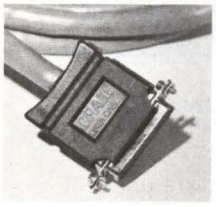

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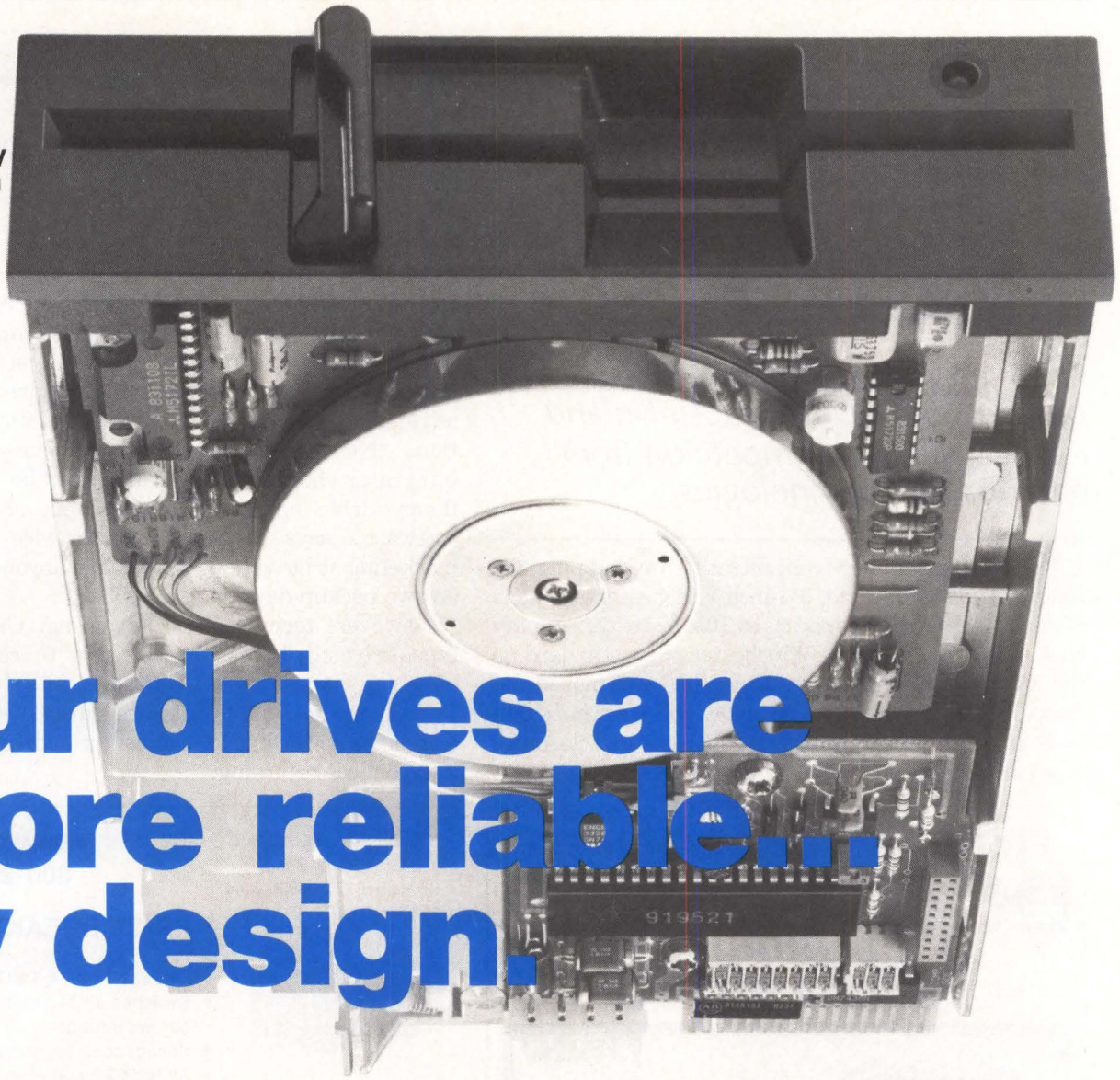

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| Track density | 48 tpi | 48 tpi | 96 tpi | 96 tpi |
| Positioning time (track to track) | 6 msec. | 6 msec. | 3 msec. | 3 msec. |
| Interface | ANSI/INDUSTRY STANDARD | | | |
| Media | ECMA 66 | ECMA 66/70 | ECMA 78 | ECMA 78 |

Warranty: One year on all parts and labor (seldom used).

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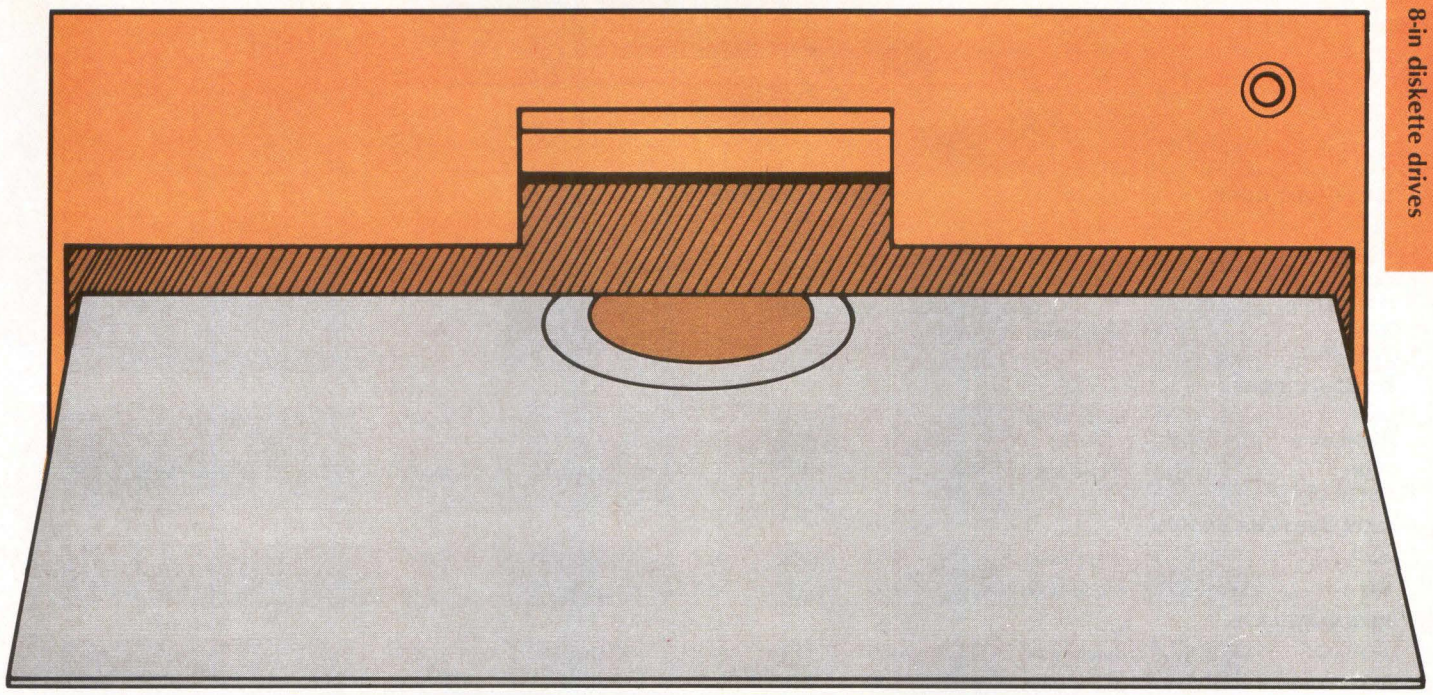
CIRCLE NO. 39 ON INQUIRY CARD

# 8-INCH DISKETTE DRIVES



| Company Model | Capacity (K bytes) | Single-sided/ double-sided | Average access time (msec.) | Transfer rate (K bits/sec.) | Tracks/ surface | Tracks/ inch | Dimensions (HxWxD — inches) | Price ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|---|---|
| **ADVANCED ELECTRONICS DESIGN INC.** | | | | | | | | | |
| FLEX-02 (subsystem) | 1000 | double-sided | 9 | | 77 | 96 | 5.3x17.6x21 | 3,710(Q1) | power supply included, formats blank diskettes, software transparency |
| **BASF SYSTEMS CORP.** | | | | | | | | | |
| 6102 | 800 | single-sided | 152 | 500 | 77 | 48 | 4.3x8.5x14 | | IBM media compatible |
| 6104 | 1600 | double-sided | 76 | 500 | 77 | 48 | 4.3x8.5x14 | | IBM media compatible |
| 6105 (Slim-line) | 1600 | double-sided | 76 | 500 | 77 | 48 | 2.3x8.5x13 | | |
| **BERING INDUSTRIES INC.** | | | | | | | | | |
| 2895 | 2400 | double-sided | 174 | 370 | 77 | 48 | 7.3x19x21.6 | 4,990 | |
| **BILLINGS COMPUTER CORP.** | | | | | | | | | |
| 142M | 802 | single-sided | 6 | 500 | | 48 | 4.9x8.4x15 | 550(Q1); 420(Q500) | |
| 143M | 1600 | double-sided | 6 | 500 | 77 | 48 | 4.9x8.4x15 | 610(Q1); 505(Q500) | |
| 143M1 | 800 | single-sided | 6 | 500 | 77 | 48 | 4.9x8.4x15 | 510(Q1); 427(Q500) | |
| **BURROUGHS CORP.** | | | | | | | | | |
| MD-122 | 3131 | double-sided | 40 | | 139 | 150 | 5.5x10x20.5 | | dual drive, single head positioning system |
| **COMARK CORP.** | | | | | | | | | |
| MF85 | 1000 | single-sided | 210 | 500 | 77 | 48 | 6.96x17.4x22.63 | 2,995(Q1) | IBM, Intel compatible interfaces |
| MF85 subsystem | 200 | double-sided | 91 | 500 | 77 | 48 | 6.96x17.4x22.63 | 3,495(Q1) | IBM, Intel compatible interfaces |
| **COMPUPRO SYSTEMS** | | | | | | | | | |
| Floppy Disk (subsystem) | 2400 | double-sided | 91 | | 77 | 48 | 22x5.5x18 | 3,295(Q1) | S-100 bus, includes CP/M-80, 86 operating systems |
| **CONTROL DATA CORP.** | | | | | | | | | |
| 9406-4 | 800/1600 | double-sided | 91 | 250/500 | 77 | 48 | 4.65x8.55x14 | 406(Q1); 510(Q1000) | |
| **CGRS MICROTECH INC.** | | | | | | | | | |
| 877-1 | 330 | single-sided | 15 | 250 | 77 | | 5x10x14 | 995(Q1) | available as a complete system for operation with Commodore 64 |

# 8-INCH DISKETTE DRIVES

| Company Model | Capacity (K bytes) | Single-sided/ double-sided | Average access time (msec.) | Transfer rate (K bits/sec.) | Tracks/ surface | Tracks/ inch | Dimensions (HxWxD— inches) | Price ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|---|---|
| **DATAPOINT CORP.** | | | | | | | | | |
| 1401 (subsystem) | | double-sided | 10 | 500 | 77 | | 7.2x21.8x23.9 | | can be used with DATASHARE System |
| 1403 (subsystem) | | double-sided | | | | | | | can be used with DATASHARE System |
| 1404 (subsystem) | | single-sided | | | | | | | can be used with DATASHARE System |
| **DATARAM CORP.** | | | | | | | | | |
| FD-311 (subsystem) | 500 | single-sided | 300 | | 77 | | 5.25x17.3x22 | 2,490(Q1) | DEC RX02 emulation for the Q-bus |
| FD-511 (subsystem) | 1000 | double-sided | 180 | | 77 | | 5.25x17.3x22 | 3,490(Q1) | DEC RX02 emulation for the Q-bus |
| **DATA SYSTEMS DESIGN** | | | | | | | | | |
| 440 | 512 | single-sided | 246 | 500 | 77 | 48 | 5.28x17.6x21 | 3,895 | |
| 480 | 1024 | double-sided | 296 | 500 | 77 | 48 | 5.28x17.6x21 | | |
| **ELCOMATIC LTD.** | | | | | | | | | |
| ACP1500 | 3200 | double-sided | 91 | 500 | 154 | 96 | 4.4x8.5x12 | 550(Q500) | |
| ACP700(AC) | 1600 | double-sided | 91 | 500 | 77 | 48 | 4.4x8.5x12 | 408(Q500) | |
| ACP750(AC) | 1000 | double-sided | 91 | 500 | 77 | 48 | 4.4x8.5x12 | 442(Q500) | |
| **HEWLETT PACKARD CO.** | | | | | | | | | |
| 9895A (dual subsystem) | 2300 (formatted) | double-sided | 179 | 500 | 75 | 48 | 7.6x19x22.6 | 5,910(Q1) | |
| 9895A (single subsystem) | 1150 (formatted) | double-sided | 179 | 500 | 75 | 48 | 7.6x19x22.6 | 4,580(Q1) | |
| **HITACHI AMERICA LTD.** | | | | | | | | | |
| FDD-413B | 1600 | double-sided | 76 | 500 | 154 | 48 | 8.54x13x2.25 | contact vendor | |
| FDD-441 | 9600 | double-sided | 168 | 1500 | 308 | 96 | 8.54x13x2.24 | contact vendor | ST506 interface |
| **HONEYWELL INC.** | | | | | | | | | |
| DIV 9603 (subsystem) | 512 (formatted) | double-sided | 96 | 250 | 77 | 64 | 12.8x6.6x19 | 2,500(Q1) | |
| **INNOTRONICS CORP.** | | | | | | | | | |
| 410 | 802 | double-sided | 8 | | 77 | 48 | 4.4x9x14 | | |
| **INSTOR CORP.** | | | | | | | | | |
| 80 | | single-sided | | | 77 | | 6.5x11x15 | 3,000 | IBM compatible |
| 85 | | double-sided | | 219.2 | 77 | | 13x7x17 | 3,500 | |
| 85P | | double-sided | | | 77 | | 13x7x17 | 4,000 | Prime interface, IBM compatible |
| SMDR | | double-sided | | 219.2 | 77 | | 13x7x17 | 3,500 | |
| **IOMEGA CORP.** | | | | | | | | | |
| Alpha 10 | 14000 | single-sided | 35 | | 343 | 300 | 4.5x8.5x14.1 | 1,080(Q1000) | integrated SCSI, controller included |
| **MATCHLESS SYSTEMS** | | | | | | | | | |
| SL-848-1 | 1300 | single-sided | 3 | 500 | 77 | 48 | 2.5x8.5x14 | | |
| SL-848-2 | 2600 | double-sided | 3 | 500 | 77 | 48 | 2.5x8.5x14 | | |
| **MEMOREX CORP.** | | | | | | | | | |
| 550 | 802 | double-sided | 10 | | 77 | 48 | 4.4x8.8x14 | | |
| 651 | 312 | single-sided | 10 | | 64 | 48 | 4.5x9x14 | | |
| **MICRO PERIPHERALS INC.** | | | | | | | | | |
| 41 | 800 | single-sided | 91 | 500 | 77 | 48 | 2x8.55x11.5 | 305(Q1000) | |
| 42 | 1600 | double-sided | 91 | 500 | 154 | 48 | 2x8.55x11.5 | 350(Q1000) | |
| **MILTOPE CORP.** | | | | | | | | | |
| DD400 | 1000 | double-sided | 86 | 500 | 77 | 48 | 6x10x18 | 4,950(Q1) | Mil qualified |
| **MITSUBISHI ELECTRONICS AMERICA INC.** | | | | | | | | | |
| M2894-063 | 1600 | double-sided | 91 | 500 | 77 | 48 | 4.62x8.55x14.18 | | |
| M2896-063 | 1600 | double-sided | 91 | 500 | 77 | 48 | 2.25x8.55x12.40 | | 10,000-hour MTBF |

# Now, A Brand Preference And Attributes Report That Tells You Where Your Product Stands *And Why*

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- Minicomputers
- Microcomputers
- Terminals
- Printers
- Plotters
- Hard Disk Drives
- Floppy Disk Drives
- Tape Drives
- Add-in/Add-on Memories
- Modems
- Multiplexers/Concentrators
- Controllers
- Software
- Media

They were asked to substantiate their choices by indicating each brand's perceived strengths and weaknesses:

- Compatibility
- Ease of operation
- Price
- Reliability
- Availability/Delivery
- Availability of Aftersale Assistance

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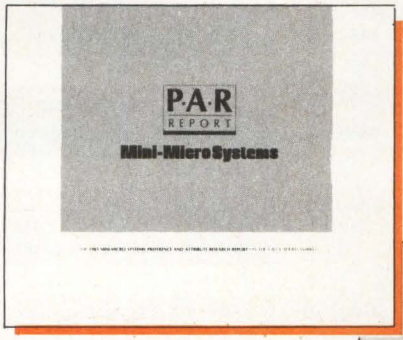


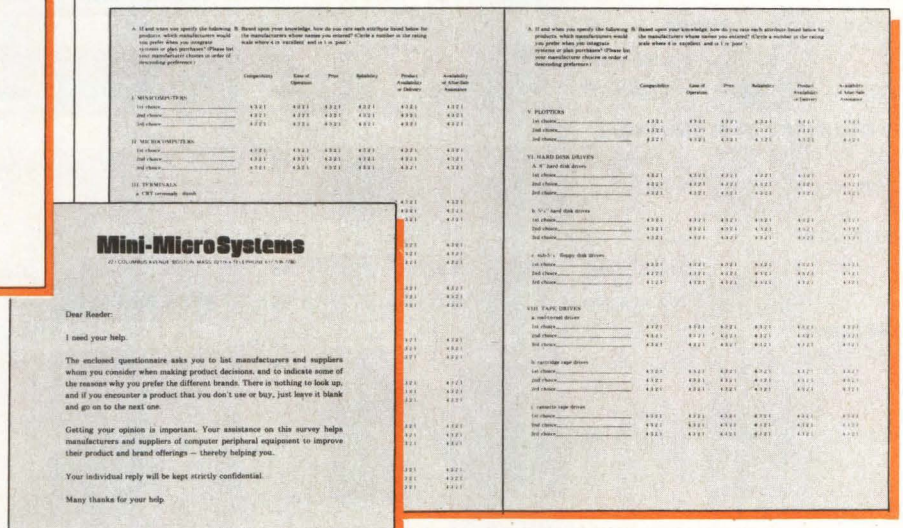




- Do volume buyers in the value-added market prefer your product(s)? Or your competitor's?
- What do they think of your product's availability and delivery?
- Do they think your aftersales assistance is below or above average?
- Is your price right?
- Is your product readily available? Compatible? Reliable?
- Are you on PAR?

**CIRCLE NO. 42 ON INQUIRY CARD**

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# 8-INCH DISKETTE DRIVES

| Company Model | Capacity (K bytes) | Single-sided/ double-sided | Average access time (msec.) | Transfer rate (K bits/sec.) | Tracks/ surface | Tracks/ inch | Dimensions (HxWxD — inches) | Price ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|---|---|
| **MODULAR COMPUTER SYSTEMS INC.** | | | | | | | | | |
| 4521 | 315 | single-sided | 290 | 31 | 77 | 48 | 26.7x48.56x49.68 | 4,300 | |
| 4522-1 | 630 | single-sided | 290 | 31 | 77 | 48 | 26.7x48.56x49.68 | 6,000 | |
| 4523-1 | 512 | single-sided | 260 | 62.5 | 77 | 48 | 26.42x48.56x49.68 | 3,850 | |
| **MOTOROLA MICROSYSTEMS** | | | | | | | | | |
| EXORdisk III | 1600 | double-sided | | 250 | 77 | 48 | 6.96x17.75x23.5 | 5,195 | |
| **NCR CORP.** | | | | | | | | | |
| 7642 | 243 | single-sided | 260 | 31 | 73 | | 11x19x21 | 2,050 | |
| **NEC INFORMATION SYSTEMS INC.** | | | | | | | | | |
| FD1165 | 1,600 | double-sided | | 500 | 77 | 48 | 2.28x8.55x13.19 | 370(Q1); 330(Q500) | opt. variable frequency oscillator |
| **PERSI INC.** | | | | | | | | | |
| 277 | 1600 | single-sided | 93 | 500 | 76 | 45 | 8.6x4.4x15 | 1,050 | dual disk drive; opt. single or double density |
| 299B | 3200 | double-sided | 93 | 500 | 76 | 45 | 8.72x4.38x15.4 | 1,685 | dual disk drive |
| **PLESSEY PERIPHERAL SYSTEMS** | | | | | | | | | |
| 610 subsystem | 1,600 (formatted) | double-sided | 91 | 500 | 77 | 48 | 5.25x19x27 | 3,195(Q1) | for Q-bus-based systems; includes power supply and cables |
| 910 subsystem | 1,600 (formatted) | double-sided | 91 | 500 | 77 | 48 | | 3,495 | for Unibus-based systems; includes power supply and cables |
| **QUME CORP.** | | | | | | | | | |
| QumeTrak 841 | 800 | single-sided | 91 | 500 | 77 | 48 | 4.5x8.55x14.57 | 405(Q500) | AC motor; opt. DC motor |
| QumeTrak 842 | 1600 | double-sided | 91 | 500 | 77 | 48 | 4.5x8.55x14.57 | 445(Q500) | AC motor; opt. DC motor |
| **REMEX DIV./EX-CELL-O CORP.** | | | | | | | | | |
| RFD 2000 | 800 | double-sided | 91 | 500 | 77 | 48 | 4.56x8.55x14 | 300(Q500) | plug compatible with Shugart drives |
| RFD 4000 | 1600 | double-sided | 91 | 500 | 77 | 48 | 4.56x8.55x14 | 425(Q500) | plug compatible with Shugart drives |
| **SCIENTIFIC MICRO SYSTEMS INC.** | | | | | | | | | |
| FWT Series (subsystem) | 1,600 (formatted) | double-sided | 91 | 64 | 76 | 48 | 5.25x19x22 | 3,600(Q1); 2,200(Q500) | DEC LSI-11, Unibus, Multibus, SASI, RS232C interfaces; opt. 10M- to 80M-byte Winchester disk drives |
| **SHUGART CORP.** | | | | | | | | | |
| 801 | | single-sided | 210 | 500 | 77 | 48 | 4.62x8.55x14.25 | 376(Q500) | industry-standard interface |
| 851 | | double-sided | 91 | 500 | 77 | 48 | 4.62x8.55x14.25 | 453(Q500) | industry-standard interface |
| **TANDON CORP.** | | | | | | | | | |
| TM848E-1 | 800 | single-sided | 91 | 500 | 77 | 48 | 2.3x8.55x12.2 | | microprocessor controlled, LSI circuitry, brushless direct drive operation |
| TM848E-2 | 1,600 | double-sided | 91 | 500 | 77 | 48 | 2.3x8.55x12.2 | | microprocessor controlled, LSI circuitry, brushless direct drive operation |
| **TEXAS PERIPHERALS** | | | | | | | | | |
| 01-0018 | 800 | single-sided | 10 | 500 | 77 | 48 | 4.5x8.5x14.75 | | interfaces to Radio Shack Model II |
| 01-0038 | 1800 | double-sided | 10 | 500 | 77 | 48 | 4.5x8.5x14.75 | | interfaces to Datapoint 1800, 1550 |
| **TOSHIBA CORP.** | | | | | | | | | |
| ND-40D | 1600 | double-sided | 94 | 500 | 77 | 48 | 8.55x2.24x12.13 | | |
| **Y-E DATA INC.** | | | | | | | | | |
| YD-174D | 1600 | double-sided | 91 | 500 | 77 | 48 | 4.5x8.55x14.57 | | |
| YD-180 | 1600 | double-sided | 91 | 500 | 77 | 48 | 2.25x8.55x12.6 | | |
| **ZENITH DATA SYSTEMS** | | | | | | | | | |
| Z-207 | 1262 | double-sided | 90 | | 77 | 48 | 7.75x13.75x20 | 1,599 | |

# THE FLOPPY IS DEAD

# LONG LIVE THE SUPERMINIFLOPPY

**3.33MB ON ONE 5¼" DISKETTE.** Drivetec's 3.33MB SuperMinifloppy™ creates new tracks others are sure to follow. You see, high capacity is just one benefit of this drive's field-proven (we've shipped

thousands) technology advances.

For instance, our track-following servo instantly responds to servo information on each sector of each track. So you get a built-in guarantee of diskette interchange even if you write in Death Valley and read in Dubuque.

And 2.78MB of formatted capacity means your customers can load very large programs or files with very few diskettes . . . one, for example.

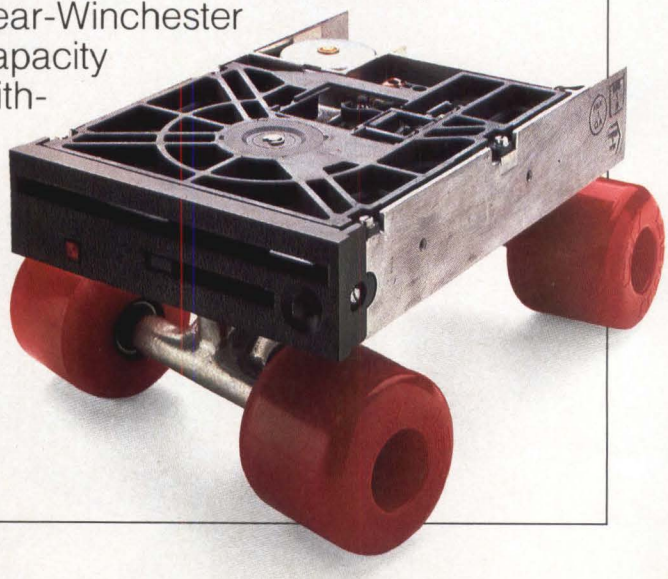
Our high-compliance Gumball Heads™ are manufactured in-house and virtually eliminate head and media wear. That reduces your service burden and increases customer satisfaction.

The SuperMinifloppy also reads 48tpi or 96tpi diskettes, and uses a standard floppy interface and 500 Kbit/second transfer rate. So integrating the new standard in flexible disk drive technology will seem like old hat.

**RELIABLY TRANSPORTABLE.** If your system or sub-system is portable, or easily transportable, the SuperMinifloppy is perfect.

Our servo and head positioning system requires no adjustment, just like old fashioned floppies, only better. Because we guarantee on-track performance. It's easy with features like our Absolute-Vertical clamping mechanism which provides accurate, repeatable diskette registration.

The 3.33MB SuperMinifloppy is much more cost-effective than multiple floppies or low-end Winchesters, as well. And since flexible drive technology is designed for head-to-media contact, you get near-Winchester capacity with-



# Drivetec's 3.33MB Half-Height SuperMinifloppy Delivers Guaranteed Diskette Interchangeability And Transportability--Field Proven In Thousands Of Systems.

out Winchester head-aches from head slap during transport.

Of course, our half-height 5¼" format provides still more benefits including low power consumption and less weight for a more compact, portable system.

**RUGGED BACKUP.**

One discussion is sure to get your back-up . . . back-up. Conventional floppies require multiple diskettes to provide adequate capacity. Tape is old fashioned and much more costly. Winchester cartridges are yet to prove their reliability, and are also quite expensive.

The SuperMinifloppy however, delivers high capacity, random access and guaranteed interchange and reliability. At the same time, typical media cost is less than $10.00 so off-line storage costs are minimized.

It is also perhaps the most manufactureable of your viable back-up selections. We designed the SuperMinifloppy to be assembled with only one size screw. There is no interior cabling to the PCB. In fact, only one adjustment is required in the manufacturing process.

That means your supply of the SuperMinifloppy is assured. And it's backed up by a team that includes the original patent holders on flexible drive head and media technology.

So put life into your system today. Call us at (408) 946-2222. Or write Drivetec, Marketing Dept., 2140 Bering Drive, San Jose, CA 95131.

DRIVETEC

**Creating New Tracks In Drive Technology**



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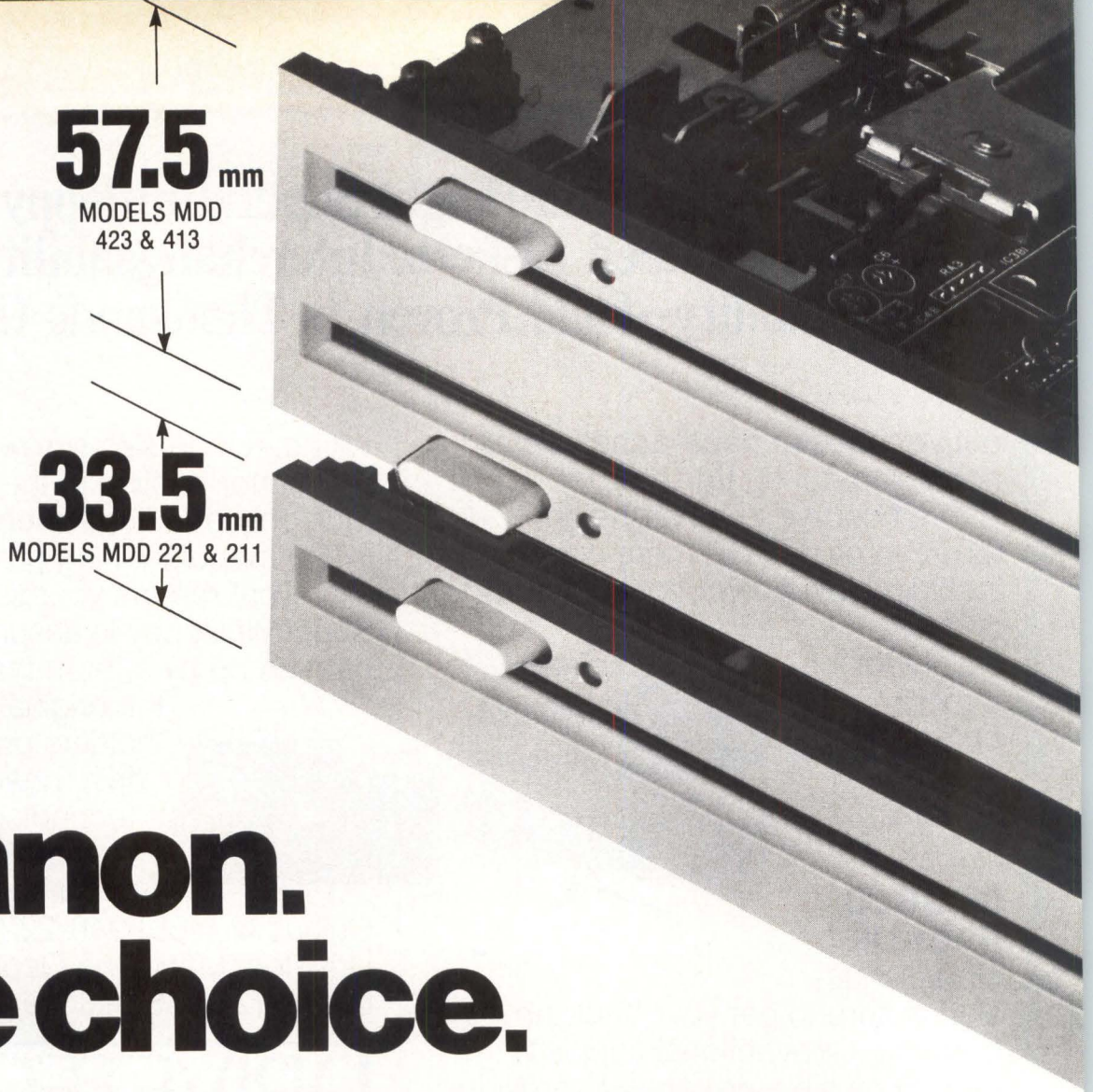



# Canon. The choice.

## Canon gives you lots of choices with their 5-1/4" floppy drives and lots of reasons why they should be your choice.

**The choices:**

- Standard half-height panels — or panels 20% thinner than half height: 33.5 mm.
- 96 TPI — or 48 TPI. • Single drive — or double drive.
- Double drive with two stepper motors.

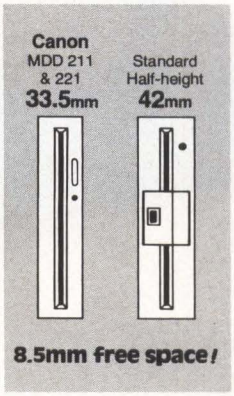
**The reasons a Canon floppy drive should be your choice:**

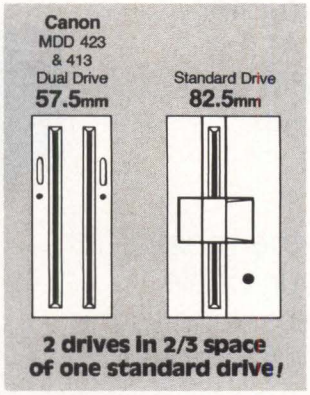
Our single drive is only 33.5 mm high — 20% less than a standard half-height drive; our double drive is only about two-thirds the height of a full size drive.

The single drives weigh 1.2 Kg, the double drives 1.9.

The single drives use 0.8A (12V and 5V); the double drives 0.9A (5V) and 1.3A (12V). As you can see, our double drives use 25% less power than two separate single drives — even ours!

Single-pushbutton media locking and ejection, and anti-crunch mechanism to prevent damage to improperly inserted media. Pushbutton is locked while heads are loaded, automatically.




Extremely thin wear- and shock-resistant head — designed and manufactured by Canon. Soft-landing head mechanism eliminates tap damage...brushless direct drive motor...low parts count...quiet operation...total head shielding...circuit design minimizes noise interference.

Further, our single drives can be used in existing designs because they're available with half-height front panels. The electronics of all our drives are compatible with an industry standard interface.

Canon offers its single drives with track densities of 96 TPI, double density, double side, which can store 1 Mbyte per disk; and its new 48 TPI-drive which can store 0.5 Mbyte per disk. Both of these are available, in quantity, now.

We have much more to tell you about these drives. Call Lee Heller at (516) 488-6700, Ext 4958, Canon U.S.A., Inc., Disk Drive Division, One Canon Plaza, Lake Success, NY 11042.

**Canon**

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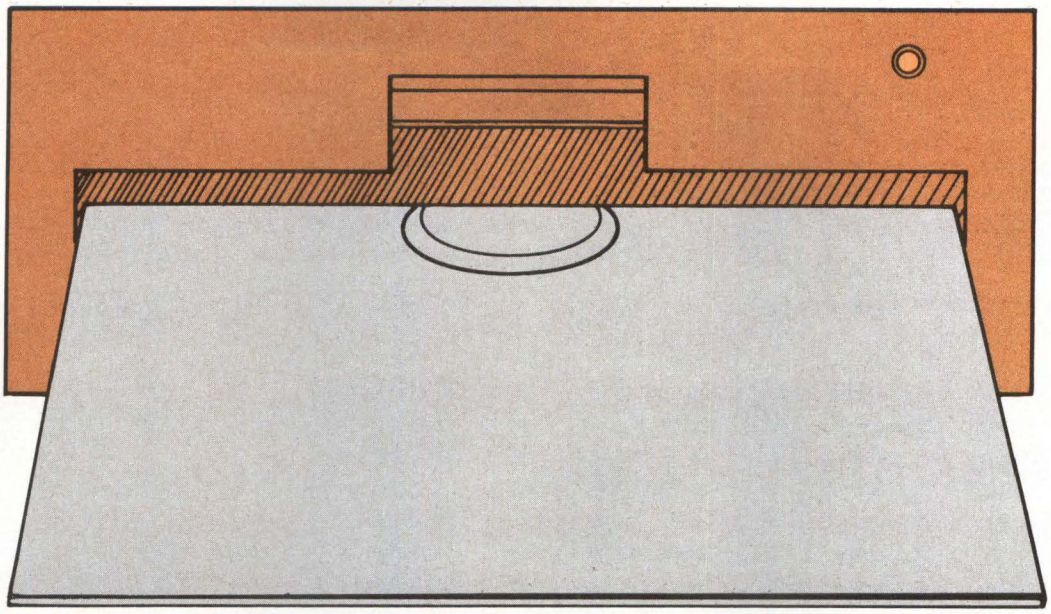
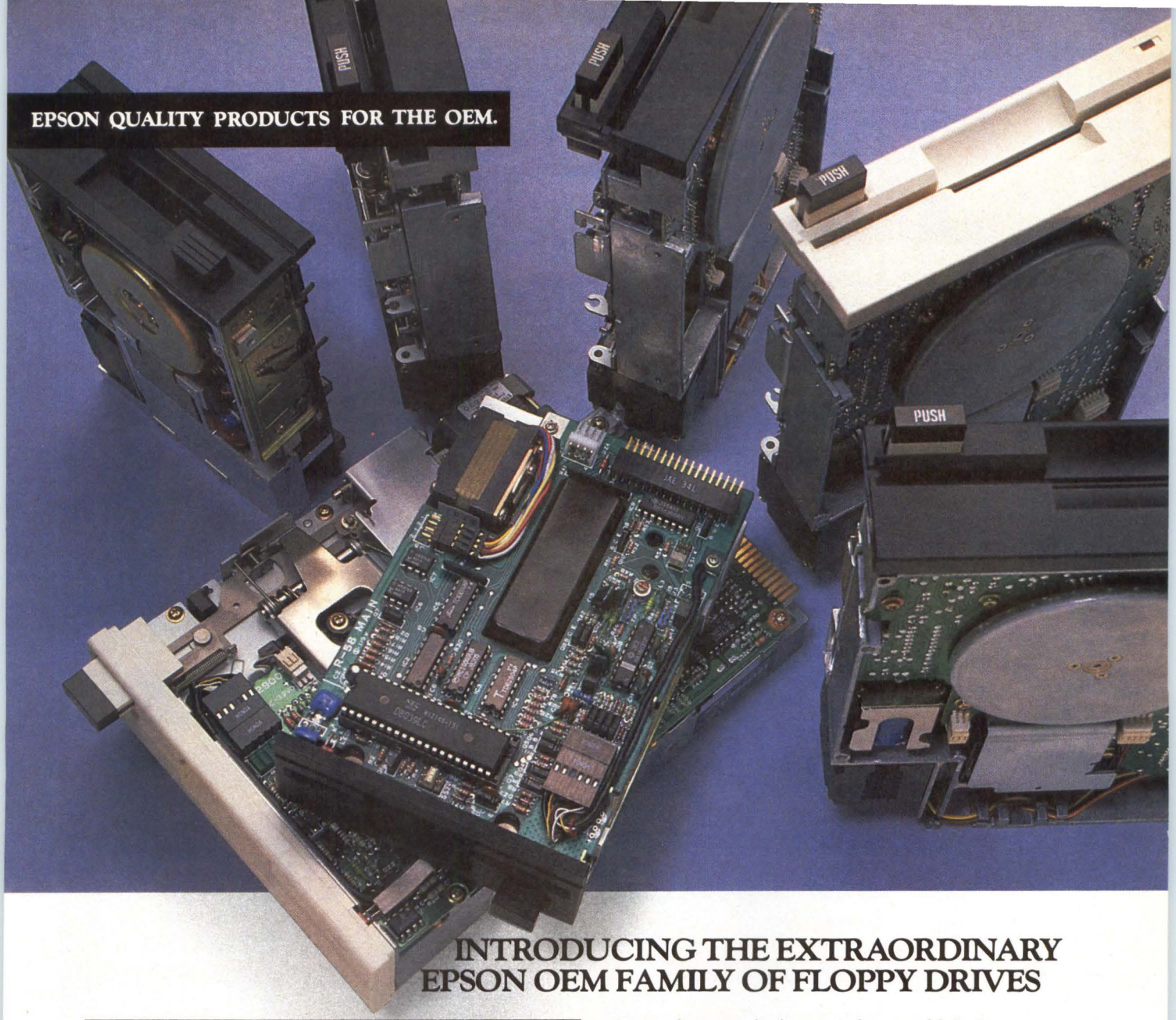
# 5.25-INCH DISKETTE DRIVES



| Company Model | Capacity (K bytes) | Single-sided/ double-sided | Avg. access time (msec.) | Transfer rate (K bits/sec.) | Tracks/ surface | Tracks/ inch | Dimensions (HxWxD inches) | Price ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|---|---|
| **ALPS ELECTRIC CO. LTD.** | | | | | | | | | |
| AFD 211 | 250 | single-sided | 156 | 250 | 40 | 48 | 1.61x5.75x8 | | half-height; opt. analog control board |
| AFD 212 | 500 | double-sided | 156 | 250 | 80 | 48 | 1.61x5.75x8 | | half-height |
| AFD 221 | 500 | single-sided | 94 | 250 | 80 | 96 | 1.61x5.75x8 | | half-height |
| AFD 222 | 1000 | double-sided | 94 | 250 | 160 | 96 | 1.61x5.75x8 | | half-height |
| **AMDEK CORP.** | | | | | | | | | |
| AMDISK V | 500 | double-sided | 82 | 250 | 40 | 48 | 1.61x5.73x7.97 | 329 | half-height |
| **AMLYN CORP.** | | | | | | | | | |
| 5855 | 8000 | single-sided | 88 | 500 | 154 | 170 | 3.25x5.75x10.45 | 890(Q1); 500(Q500) | evaluation kit available for IBM PC, Apple II, III; drive handles 5 diskettes simultaneously |
| 5860 | 16000 | double-sided | 88 | 500 | 154 | 170 | 3.25x5.75x8 | 1,085(Q1); 610(Q500) | evaluation kit available for IBM PC, Apple II, III |
| 5865 | 16000 | double-sided | 88 | 500 | 154 | 170 | 3.75x5.75x10.45 | 1,085(Q1); 610(Q500) | evaluation kit available for IBM PC, Apple II, III; drive handles 5 diskettes simultaneously |
| 1860 | 3200 | double-sided | 88 | 500 | 154 | 170 | 3.25x5.75x7.6 | 595(Q1); 300(Q500) | evaluation kit available for IBM PC, Apple II, III; uses UHR II media |
| 1865 | 3200 | double-sided | 88 | 500 | 154 | 170 | 1.62x5.75x8 | 595(Q1); 300(Q500) | evaluation kit available for IBM PC, Apple II, III; uses UHR II media |
| 5850 | 8000 | single-sided | 88 | 500 | 154 | 170 | 3.25x5.75x8 | 890(Q1); 500(Q500) | evaluation kit available for IBM PC, Apple II, III; uses UHR II media; drive handles 5 diskettes simultaneously |
| **ANALOG AND DIGITAL PERIPHERALS INC. (ADPI)** | | | | | | | | | |
| Easi-Disk Model 1 | 500 | double-sided | 80 | 110–200 | 40 | 48 | 1.6x5.7x7.9 | 995(Q1); 895(Q500) | RS232C interface available with case and power supply |
| Easi-Disk Model 2 | 1000 | double-sided | 80 | 110–200 | 80 | 96 | 1.6x5.7x7.9 | 1,300(Q1); 995(Q500) | RS232C interface available with case and power supply |
| Easi-Disk Model 3 | 2000 | double-sided | 80 | 110–200 | 80 | 96 | 1.6x5.7x7.9 | 1,400(Q1); 995(Q500) | RS232C interface available with case and power supply |
| **ANDERSON JACOBSON INC.** | | | | | | | | | |
| 460 | 204 | double-sided | | | 40 | | 8x13.5x22.5 | 1,595 | |

## 5.25-INCH DISKETTE DRIVES

| Company Model | Capacity (K bytes) | Single-sided/ double-sided | Avg. access time (msec.) | Transfer rate (K bits/sec.) | Tracks/ surface | Tracks/ inch | Dimensions (HxWxD inches) | Price ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|---|---|
| **APPLE COMPUTER INC.** | | | | | | | | | |
| Duodisk subsystem | 280 | | | | | | | 795(Q1) | interfaces to Apple II, II Plus, IIe; sits between computer and monitor |
| **ATARI** | | | | | | | | | |
| 1050 subsystem | 135 | single-sided | 25 | 125 | 40 | 48 | 3.375x7.5x12 | 499(Q1) | disk operating system included, help screens |
| **BASF AG** | | | | | | | | | |
| 6106 | 250 | single-sided | 156 | 125,250 | 40 | 48 | | | |
| 6108 | 500 | double-sided | 156 | 125,250 | 40 | 48 | 2.27x5.91x7.74 | | |
| 6116 | 250/500 | single-sided | 158 | 125,250 | 80 | 96 | 2.27x5.91x7.74 | | |
| 6118 | 500/1000 | double-sided | 158 | 125,250 | 80 | 96 | 2.27x5.91x7.74 | | |
| 6128 | 500 | double-sided | 158 | 250 | 40 | 48 | 1.32x5.91x8.7 | | |
| 6138 | 1000 | double-sided | 79 | 250 | 80 | 96 | 1.32x5.91x8.7 | | |
| 6148 | 1600 | double-sided | 91 | 500 | 77 | 96 | 1.3x5.9x8.6 | | |
| **C. ITOH ELECTRONICS INC.** | | | | | | | | | |
| YD-380T | 1600 | double-sided | 3 | 500 | | 96 | 1.62x5.75x8 | 350(Q500) | |
| **CANON USA INC.** | | | | | | | | | |
| MDD 211 | 500 | double-sided | 100 | 250 | 40 | 48 | 1.32x5.9x8.7 | 300(Q1) | standard half-height front panel available, push-button clamping |
| MDD 221 | 1000 | double-sided | 100 | 250 | 80 | 96 | 1.32x5.9x8.7 | 350(Q1) | standard half-height front panel available, push-button clamping |
| MDD 413 | 1000 | double-sided | 100 | 250 | 40 | 48 | 2.3x5.9x8.7 | 600(Q1) | one spindle motor, 2 stepper motors, push-button clamping |
| MDD 423 | 2000 | double-sided | 100 | 250 | 80 | 96 | 2.3x5.9x8.7 | 700(Q1) | one spindle motor, 2 stepper motors, push-button clamping |
| **CONTROL DATA CORP.** | | | | | | | | | |
| 409 subsystem | 320 | double-sided | 80 | 250 | 40 | 48 | 3.38x5.88x8 | 430–525(Q1) | plugs into IBM PC |
| 9408 | 125, 250 | single-sided | 80 | 125, 250 | 40 | 48 | 3.38x5.88x8 | 190(Q1000) | |
| 9409 | 250, 500 | double-sided | 80 | 125, 250 | 40 | 48 | 3.38x5.88x8 | 240(Q1000) | |
| 9409T | 500, 1000 | double-sided | 95 | 125, 250 | 80 | 96 | 3.38x5.88x8 | 311(Q1000) | |
| 9428 | 250, 500 | double-sided | 80 | 125, 250 | 40 | 48 | 1.625x5.88x8 | 190(Q1000) | |
| 9429 | 500, 1000 | double-sided | 95 | 125, 250 | 80 | 96 | 1.625x5.88x8 | 220(Q1000) | |
| **CGRS MICROTECH INC.** | | | | | | | | | |
| 540-1 | 280 | single-sided | 28 | 250 | 40 | 48 | 5.5x3x10 | 595(Q1) | available as a complete system for operation with Commodore 64 |
| **COLUMBIA DATA PRODUCTS INC.** | | | | | | | | | |
| 400 | 180 | single-sided | | 250 | 35 | 48 | 5.3x7x13.5 | 2,195 | opt. current loop; 220V power, rack mount |
| **COMMODORE BUSINESS MACHINES INC.** | | | | | | | | | |
| 2031 | 170 | single-sided | | 125 | 35 | 48 | | 595 | |
| 4040 | 330 | double-sided | | 125 | 35 | 48 | 7.1x15x15.5 | 1,295 | |
| 8050 | 1050 | single-sided | | 125 | 77 | 96 | 7.1x15x15.5 | 1,795 | |
| 8250 | 2100 | double-sided | | 125 | 77 | 96 | 7.1x15x15.5 | 2,195 | |
| **COMREX INTERNATIONAL INC.** | | | | | | | | | |
| 1000 | 160 | single-sided | | 250 | 35 | 48 | 2.1x14.9x10.1 | 699 | dual diskette drive |
| **CROMEMCO INC.** | | | | | | | | | |
| CFD | 390 | double-sided | 250 | 250 | 40 | 48 | 3.38x5.87x8 | 595(Q1) | for use with Cromemco C-10 computer |
| DDF (dual drive) | 780 | double-sided | 250 | 250 | 40 | 48 | | 1,295(Q1) | for use with Cromemco System Zero computer |




# INTRODUCING THE EXTRAORDINARY EPSON OEM FAMILY OF FLOPPY DRIVES

| SERIES | SMD 100 | | SD 500 | | | SD 300 |
|---|---|---|---|---|---|---|
| MEDIA SIZE | 3½" | | 5¼" (1/2 High) | | | 5¼" (1/3 High) |
| | 4" x 1.57" x 5.98" | | 5.75" x 1.6" x 7.68" | | | 5.75" x 1.1" x 9.27" |
| Max. Capacity (2 Sides) (Unformatted) | 500 KB | 1000 KB | 500 KB | 1000 KB | 1604 KB | 500 KB |
| Drive Motor Speed | 300 RPM | 300 RPM | 300 RPM | 300 RPM | 360 RPM | 300 RPM |
| Track Density | 67.5 TPI | 135 TPI | 48 TPI | 96 TPI | 96 TPI | 48 TPI |
| Access Time | 6 msec | 3 msec | 6 msec | 3 msec | 3 msec | 15 msec |

Extraordinary is the best word we could find to describe the new Epson family of 3½" and 5¼" floppy disk drives. Because there is nothing ordinary about them.

The 3½" drives, for instance, feature two-sided capacities up to 1MB. And some draw so little power they can operate on batteries.

The half-height 5¼" drives offer capacities from 500KB to 1.6MB and access times down to 3 msec. And the one-third height 5¼" drive is the industry's slimmest.

But that's only part of the story. What really makes them extraordinary is the fact that they're Epson drives. Designed and built by the people who have made "quality in quantity" their trademark around the world.

That means they're designed and engineered with such state-of-the-art features as noise and RF shielding, ultra-high precision head positioning and loading, perfect disk centering, reduced power consumption and heat generation. But, even more importantly, it means they're manufactured by the people who have established the lowest rejection rate in the industry. When you buy Epson, you buy confidence.

If you'd like more information about the extraordinary Epson family of floppy drives and how they can solve your storage problems, write or call us today.

EPSON

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**Peripherals Group**
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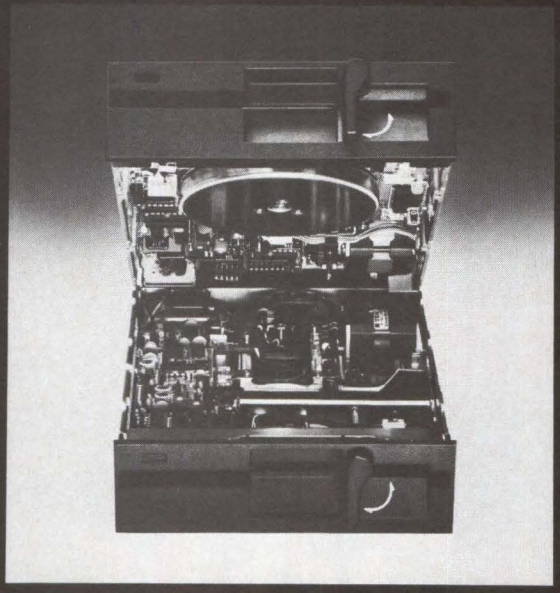
**NE Region** (617) 245-8007 • **CENTRAL Region** - (815) 338-5810

CIRCLE NO. 45 ON INQUIRY CARD

# 5.25-INCH DISKETTE DRIVES

| Company Model | Capacity (K bytes) | Single-sided/ double-sided | Avg. access time (msec.) | Transfer rate (K bits/sec.) | Tracks/ surface | Tracks/ inch | Dimensions (HxWxD inches) | Price ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|---|---|
| **DRIVETEC INC.** | | | | | | | | | |
| D320 | 3300 | double-sided | 160 | 500 | 160 | 192 | 1.62x5.75x8 | 495(Q1); 333(Q500) | |
| **EPSON AMERICA, INC.** | | | | | | | | | |
| SD320 | 250, 500 | double-sided | 220 | 125, 250 | 80 | 48 | 1.1x5.7x9.3 | | |
| SD321 | 250, 500 | double-sided | 220 | 125, 250 | 80 | 48 | 1.1x5.7x9.3 | | |
| SD521 | 250, 500 | double-sided | 97 | 125, 250 | 80 | 48 | 1.6x4x5.8 | | |
| SD540 | 500, 1000 | double-sided | 96 | 125, 250 | 160 | 96 | 1.6x4x5.8 | | |
| SD560 | 802, 1604 | double-sided | 93 | 250, 500 | 154 | 96 | 1.6x4x5.8 | | |
| **HEWLETT-PACKARD CO.** | | | | | | | | | |
| 82901M Dual subsystem | 540 | double-sided | 187 | 250 | 33 | 48 | 4.31x16.75x14.74 | 2,230(Q1) | |
| 82902M Single subsystem | 270 | double-sided | 187 | 250 | 33 | 48 | 4.31x16.75x14.74 | 1,520(Q1) | |
| **HI-TECH PERIPHERALS CORP.** | | | | | | | | | |
| 548-25 | 250 | single-sided | 95 | 250 | 40 | 48 | 1.66x5.75x8 | | opt. bezels |
| 548-50 | 500 | double-sided | 95 | 250 | 40 | 48 | 1.66x5.75x8 | | opt. bezels |
| 548-A | 140 | single-sided | 95 | 250 | 40 | 48 | 1.66x5.75x8 | | opt. bezels |
| 596-10 | 1000 | double-sided | 95 | 250 | 80 | 96 | 1.66x5.75x8 | | opt. bezels |
| 596-16 | 1600 | double-sided | 92 | 500 | 77 | 96 | 1.66x5.75x8 | | opt. bezels |
| **HONEYWELL INFORMATION SYSTEMS INC.** | | | | | | | | | |
| DIV9607 subsystem | 650 | double-sided | 160 | 164 | 80 | 96 | 8.8x5x10 | 1,900 | |
| **MICRO PERIPHERALS INC.** | | | | | | | | | |
| 51 | 250 | single-sided | 5 | | 40 | | 3.25x5.75x7.75 | | MPI and SLI bezels |
| 52 | 500 | double-sided | 5 | | 40 | | 3.25x5.75x7.75 | | MPI and SLI bezels |
| 91 | 500 | single-sided | 5 | | 80 | | 3.25x5.75x7.75 | | MRI and SLI bezels |
| 92 | 1000 | double-sided | 5 | | 80 | | 3.25x5.75x7.75 | | |
| 501 | 250 | single-sided | 5 | | 40 | | 16.25x5.75x7.5 | | MPI or rotary bezel |
| 501C | 250 | single-sided | 5 | | 40 | | 16.25x5.75x7.5 | | MPI or rotary bezel |
| 502 | 500 | double-sided | 6 | | 40 | | 16.25x5.95x7.5 | | |
| 901 | 500 | single-sided | 3 | | 80 | | 16.25x5.95x7.5 | | |
| 902 | 1000 | double-sided | 3 | | 80 | | 16.25x5.95x7.5 | | |
| 1722 | 3200 | double-sided | 3 | | 154 | | 3.25x5.75x7.75 | | |
| **MICROPOLIS CORP.** | | | | | | | | | |
| 1115-V | 100 | single-sided | | 250 | 80 | 96 | 3.25x5.75x8 | 175(Q5000) | |
| 1115-VI | 1000 | double-sided | | 250 | 80 | 96 | 3.25x5.75x8 | 205(Q5000) | |
| 1117-VI | 1700 | double-sided | | 500 | 80 | 96 | 3.25x5.75x8 | 300(Q1000) | |
| **MICROSCI CORP.** | | | | | | | | | |
| A2 subsystem | 143 | single-sided | | 250 | 35 | 48 | 3.75x6x8.75 | 345(Q1) | Apple compatible; opt. controller |
| A3 subsystem | 143 | single-sided | | 250 | 35 | 48 | 3.75x6x8.75 | 379(Q1) | Apple compatible, can be daisy chained, includes SOS driver |
| A73 subsystem | 286 | single-sided | | 250 | 70 | 48 | 3.75x6x8.75 | 529(Q1) | Apple compatible, can be daisy chained, includes SOS driver |
| A82 | 328 | double-sided | 328 | 250 | 80 | 48 | 3.75x6x8.75 | 569(Q1) | Apple compatible; opt. controller |
| A143 subsystem | 572 | double-sided | | 250 | 140 | 96 | 3.75x6x8.75 | 659(Q1) | Apple compatible, can be daisy chained, includes SOS driver |
| **MITSUBISHI ELECTRONICS AMERICA INC.** | | | | | | | | | |
| M4851 | 500 | double-sided | 103 | 250 | 40 | 48 | 1.61x5.75x8 | | 10,000-hour MTBF |
| M4852 | 1000 | double-sided | 94 | 250 | 80 | 96 | 3.25x5.75x8 | | 10,000-hour MTBF |
| M4853 | 1000 | double-sided | 94 | 250 | 80 | 96 | 1.61x5.75x8 | | 10,000-hour MTBF |
| M4854 | 1600 | double-sided | 91 | 500 | 77 | 96 | 1.61x5.75x8 | | |
| M4855 | 2000 | double-sided | 94 | 500 | 80 | 96 | 1.61x5.75x8 | | |

# TAKE ONE FOR A TEST DRIVE.



Introducing the 1984 TEACS.

A full line of 5¼ inch half-high flexible disk drives. Available in single/double sided, 48 tracks per inch/96 tracks per inch, single/double density.

With Teac's exclusive system of half-high at half power you get less heat build-up, less media expansion and disk off-tracking problems. Which means more reliability plus more adaptability.

And, Teac's brushless DC direct drive motors are proven mileage champs with up to 10,000 hours MTBF. Which only goes to show, as always, Teac quality pays off down the road.

**TEAC® ICPD**

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CIRCLE NO. 46 ON INQUIRY CARD

# High Capacity and Removable Data Storage

## The Hard Facts About Our 3.3 Disk Drive.

When you consider the hard facts, KODAK's new 3.3 megabyte 5¼" flexible disk drive is an easy solution to today's microcomputer needs. It not only challenges the capacity of Winchesters, it also outmatches them in performance. The 3.3 Drive is removable, too. So you're not limited to how it can be used. And what makes the drive even harder to pass up is that KODAK incorporated only proven technologies in its manufacture...and that means incredible reliability.

In fact, everywhere you look it's easy to see the quality you've come to expect from KODAK. Like 3 millisecond track to track speed...a 192 tpi double-sided record format...a proprietary servo system for remarkably precise read/write head positioning. The 3.3 Drive even features automatic, transparent microprocessor reading of 48 and 96 tpi diskettes. And to ensure easy operation, there's no preventive maintenance required.

So look at the hard facts and you'll have to agree: KODAK's new drive is the superior choice for a high-capacity floppy upgrade or a back-up for Winchester-based systems.

The 3.3 flexible 5¼" drive. Another easy solution from DTC to help you manage information.

**COMDEX SPRING—MAY 22 TO 25 ATLANTA—BOOTH NO. 3854**

Call or write Data Technology Corporation today for technical and sales information on the new KODAK 3.3 Drive.

DTC

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Santa Clara, CA 95051
Telephone: (408) 496-0434
TWX: 910-338-2044

Eastern Regional Sales
15 Wiggins Avenue
Bedford, MA 01730
Telephone: (617) 275-4044

KODAK

3.3

CIRCLE NO. 47 ON INQUIRY CARD

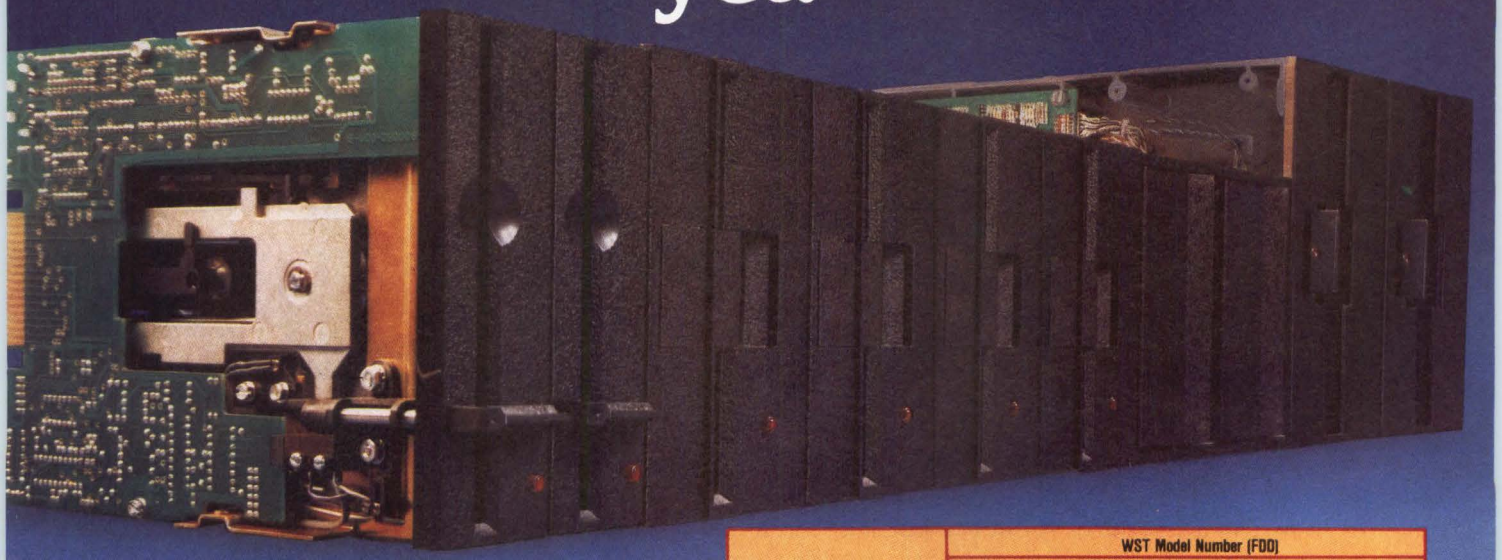
## 5.25-INCH DISKETTE DRIVES

| Company Model | Capacity (K bytes) | Single-sided/ double-sided | Avg. access time (msec.) | Transfer rate (K bits/sec.) | Tracks/ surface | Tracks/ inch | Dimensions (HxWxD inches) | Price ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|---|---|
| **NISSEI SANGYO AMERICA LTD.** | | | | | | | | | |
| FB501 | 250 | single-sided | 81.2 | 250 | 40 | 48 | 1.61x5.75x8.03 | 200(Q1); 150(Q500) | |
| FB502 | 500 | single-sided | 87.3 | 250 | 80 | 96 | 1.61x5.75x8.03 | 225(Q1); 170(Q500) | |
| FB503 | 500 | double-sided | 81.2 | 250 | 40 | 48 | 1.61x5.75x8.03 | 235(Q1); 200(Q500) | |
| FB504 | 1000 | double-sided | 87.3 | 250 | 80 | 96 | 1.61x5.75x8.03 | 300(Q1); 225(Q500) | |
| **PHILIPS PERIPHERALS INC.** | | | | | | | | | |
| X3131 | 250 | single-sided | 80 | 250 | 40 | 48 | 1.61x5.75x7.9 | | |
| X3132 | 500 | double-sided | 80 | 250 | 40 | 48 | 1.61x5.75x7.9 | | |
| X3133 | 500 | single-sided | 80 | 250 | 80 | 96 | 1.61x5.75x7.9 | | |
| X3134 | 1000 | double-sided | 80 | 250 | 80 | 96 | 1.61x5.75x7.9 | | |
| **QUME CORP.** | | | | | | | | | |
| QumeTrak 142 | 500 | double-sided | 160 | 250 | 40 | 48 | 1.59x5.75x8 | 185(Q500) | half-height |
| QumeTrak 542 | 500 | double-sided | 175 | 250 | 40 | 48 | 3.24x5.75x8 | 210(Q500) | |
| QumeTrak 592 | 1000 | double-sided | 95 | 250 | 80 | 96 | 3.24x5.75x8 | 315(Q500) | |
| **REMEX DIV./EX-CELL-O CORP.** | | | | | | | | | |
| RFD 480 | 500 | double-sided | 80 | 250 | 40 | 48 | 2.11x5.75x8 | 255(Q500) | |
| RFD 481 | 250 | single-sided | 80 | 250 | 40 | 48 | 2.11x5.75x8 | 220(Q500) | |
| RFD 485 | 500 | double-sided | 80 | 250 | 40 | 48 | 1.61x5.75x8 | 210(Q500) | half-height |
| RFD 486 | 250 | single-sided | 80 | 250 | 40 | 48 | 1.61x5.75x8 | 160(Q500) | half-height |
| RFD 960 | 1000 | double-sided | 147 | 250 | 80 | 96 | 2.11x5.75x8 | 295(Q500) | |
| RFD 961 | 500 | single-sided | 147 | 250 | 80 | 96 | 2.11x5.75x8 | 255(Q500) | |
| RFD 965 | 1000 | double-sided | 94 | 250 | 80 | 96 | 1.61x5.75x8 | 255(Q500) | half-height |
| 966 | 500 | single-sided | 94 | 250 | 80 | 96 | 1.61x5.75x8 | 210(Q500) | half-height |
| 1600 | 1600 | single-sided | 100 | 500 | 154 | 170 | 3.25x5.75x8 | | 8-inch interface |
| 3200 | 320 | double-sided | 100 | 500 | 154 | 170 | 3.25x5.75x8 | | |
| **SHUGART CORP.** | | | | | | | | | |
| 200 | 250 | single-sided | 358 | 250 | 40 | 48 | 2.05x5.75x7.87 | 135(Q500) | industry-standard interface |
| 400L | | single-sided | 260 | 250 | 40 | 48 | 3.25x5.75x8 | 149(Q500) | proprietary LSI electronics |
| 450F | | double-sided | 78 | 250 | 80 | 96 | 3.25x5.75x8 | 177(Q500) | |
| 455 | 500 | double-sided | 94 | 250 | 40 | 48 | 1.63x5.75x8 | 197(Q500) | |
| 465 | 1000 | double-sided | 94 | 250 | 80 | 96 | 1.63x5.75x8 | 246(Q500) | |
| **SPERRY** | | | | | | | | | |
| 8439 subsystem | 655 | double-sided | 6 | 31.25 | 80 | | 14.5x3.25x13.1 | | |
| **TANDON CORP.** | | | | | | | | | |
| TM50-1 | 250 | single-sided | 287 | 250 | 40 | 48 | 1.625x5.75x8 | | |
| TM50-2 | 500 | double-sided | 98 | 250 | 40 | 48 | 1.625x5.75x8 | | |
| TM55-2 | 500 | double-sided | 90 | 250 | 40 | 48 | 1.625x5.75x8 | | microprocessor-controlled performance |
| TM55-4 | 1000 | double-sided | 90 | 250 | 80 | 96 | 1.625x5.75x8 | | microprocessor-controlled performance |
| TM100-1 | 250 | single-sided | 75 | 250 | 40 | 48 | 3.38x5.87x8.29 | | |
| TM100-2 | 500 | double-sided | 75 | 250 | 40 | 48 | 3.38x5.87x8.29 | | |
| TM101-4 | 1000 | | 90 | 250 | 80 | 96 | 3.38x5.87x8.29 | | microprocessor-controlled power-on initialization |
| TM102-2 | 2000 | | 90 | 500 | 80 | 96 | 3.38x5.87x8.29 | | microprocessor-controlled power-on initialization |
| **TEAC CORP. OF AMERICA** | | | | | | | | | |
| FD-55A | 125, 250 | single-sided | 93 | 125, 250 | 40 | 48 | 1.625x5.75x8 | 298(Q1); 175(Q500) | microprocessor-controlled |

## 5.25-INCH DISKETTE DRIVES

| Company Model | Capacity (K bytes) | Single-sided/ double-sided | Avg. access time (msec.) | Transfer rate (K bits/sec.) | Tracks/ surface | Tracks/ inch | Dimensions (HxWxD inches) | Price ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|---|---|
| FD-55B | 250, 500 | double-sided | 93 | 125, 250 | 40 | 48 | 1.625x5.75x8 | 360(Q1); 190(Q500) | microprocessor-controlled |
| FD-55E | 250, 500 | single-sided | 94 | 125, 250 | 80 | 96 | 1.625x5.75x8 | 360(Q1); 190(Q500) | microprocessor-controlled |
| FD-55F | 1000 | double-sided | 3 | 250 | 80 | 96 | 1.625x5.75x8 | 395(Q1); 210(Q500) | |
| FD-55G | 1,600 | double-sided | 3 | 500 | 77, 80 | 96 | 1.625x5.75x8 | 455(Q1); 245(Q500) | |
| **TECHTRAN INDUSTRIES INC.** | | | | | | | | | |
| 980X | 200 | single-sided | 85 | 286 | 35 | 46 | 5.25x10x11.75 | 1,485 | |
| 980XX | 400 | double-sided | 85 | 268 | 35 | 46 | 5.25x10x11.75 | 1,585 | |
| 981X | 200 | single-sided | 85 | 268 | 35 | 46 | 5.25x10x11.75 | 1,985 | |
| **TERMINAL DATA CORP.** | | | | | | | | | |
| | 125 | single-sided | 100 | 125 | 40 | 18 | 14x9x8.5 | 895 | designed for terminal storage; plugs into LA 120, VT100, others |
| **TEXAS PERIPHERALS** | | | | | | | | | |
| 01-0053 | 250 | single-sided | 75 | 250 | 40 | 48 | 3.38x5.87x8 | | interfaces to Radio Shack III, IV; color computer |
| **TOSHIBA CORP.** | | | | | | | | | |
| ND-04 D | 500 | double-sided | 80 | 250 | 40 | 48 | 5.75x1.61x8.27 | | |
| ND-06 D | 1000 | double-sided | 97 | 250 | 80 | 96 | 5.75x1.61x8.27 | | |
| **WESTERN TELEMATIC INC.** | | | | | | | | | |
| DataMate II | 328 | single-sided | | | 80 | 96 | 5.75x12x14 | 1,995 | |
| MiniMate III | 816 | double-sided | | | 80 | 96 | 4.75x8.75x12.5 | 1,475 | |
| **WORLD STORAGE TECHNOLOGY INC.** | | | | | | | | | |
| FDD111-5 | 125, 250 | single-sided | 80 | 125, 250 | 40 | 48 | 3.25x5.75x8 | 350(Q1); 215(Q500) | |
| FDD121-5 | 250, 500 | single-sided | 94 | 125, 250 | 80 | 96 | 3.25x5.75x8 | 440(Q1); 290(Q500) | |
| FDD211-5 | 250, 500 | double-sided | 80 | 125, 250 | 40 | 48 | 3.25x5.75x8 | 450(Q1); 300(Q500) | |
| FDD221-5 | 500, 1000 | double-sided | 94 | 125, 250 | 80 | 96 | 3.25x5.75x8 | 550(Q1); 350(Q500) | |
| **Y-E DATA INC.** | | | | | | | | | |
| YD-274 | 500 | double-sided | 281 | 250 | 40 | 48 | 3.25x5.75x8 | | |
| YD-280 | 1000 | double-sided | 95 | 250 | 80 | 96 | 3.25x5.75x8 | | |
| YD-380 | 1600 | double-sided | 91 | 500 | 77 | 96 | 1.61x5.75x8 | | half-height |
| YD-480 | 1000 | double-sided | 95 | 250 | 80 | 96 | 1.61x5.75x8 | | half-height |
| YD-580 | 500 | double-sided | 148 | 250 | 40 | 48 | 1.61x5.75x8 | | half-height |
| **ZENITH DATA SYSTEMS** | | | | | | | | | |
| Z-37 | 1360 | double-sided | 260 | 250 | 80 | 96 | 6.125x13.25x13.25 | 1,699 | dual floppy drive, 640 K-bytes per diskette |
| Z-87 | 200 | single-sided | 433 | 128 | 40 | 48 | 6.125x13x13 | 999 | dual floppy drive, 100 K-bytes per diskette (as much as 160 K-bytes with Z89-37 controller card) |

# While our family is well known, our name is not a household word... yet.



| Specification | | WST Model Number (FDD) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 100-8 | 200-8 | 100-5 | 200-5 | 111-5 | 121-5 | 211-5 | 221-5 | 112-5 | 212-5 |
| Media Size (in.) | | 8.0 | 8.0 | 5.25 | 5.25 | 5.25 | 5.25 | 5.25 | 5.25 | 5.25 | 5.25 |
| Heads (number) | | 1 | 2 | 1 | 2 | 1 | 1 | 2 | 2 | 1 | 2 |
| Access: | | | | | | | | | | | |
| Track-to-Track | (msec) | 3 | 3 | 20 | 20 | 5 | 3 | 5 | 3 | 20 | 20 |
| Average | (msec) | 91 | 91 | 275 | 275 | 80 | 110 | 80 | 110 | 275 | 275 |
| Unformatted Capacity (Kbytes) | (FM) | 400 | 800 | 125 | 250 | 125 | 250 | 250 | 500 | 125 | 250 |
| | (MFM) | 800 | 1600 | 250 | 500 | 250 | 500 | 500 | 1000 | 250 | 500 |
| Track Density (TPI) | | 48 | 48 | 48 | 48 | 48 | 96 | 48 | 96 | 48 | 48 |
| Drive Size (in.) | Height | 4.5 | 4.5 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 1.62 | 1.62 |
| | Width | 8.55 | 8.55 | 5.75 | 5.75 | 5.75 | 5.75 | 5.75 | 5.75 | 5.75 | 5.75 |
| | Length | 14.25 | 14.25 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |

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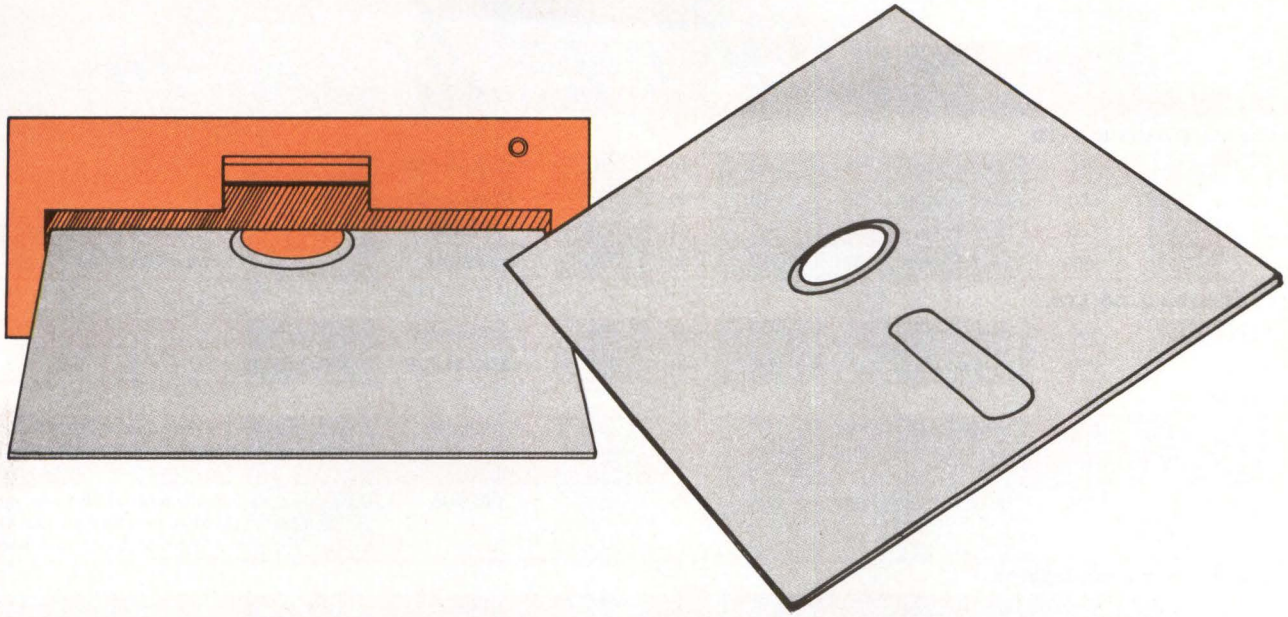
# MICRO DISKETTE DRIVES



| Company Model | Size (inches) | Capacity (M bytes) | Single-sided/ double-sided | Avg. access time (msec.) | Transfer rate (K bits/sec.) | Tracks/ surface | Tracks/ inch | Dimensions (HxWxD inches) | Price ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|---|---|---|
| **AMDEK CORP.** | | | | | | | | | | |
| Amdisk III | 3 | 250 | single-sided | 55 | 125 | 40 | 100 | 4.25x7.5x8.75 | 499(Q1) | |
| Amdisk OEM | 3 | 250 | single-sided | 55 | 125, 250 | 40 | 100 | 1.77x3.74x 6.02 | 299(Q1) | |
| **CGRS MICROTECH INC.** | | | | | | | | | | |
| 340-2 | 3 | 280 | single-sided | 28 | 250 | 40 | 48 | 4.5x6x8 | 895(Q1) | available as a complete system for operation with Commodore 64 |
| **EPSON AMERICA INC.** | | | | | | | | | | |
| SMD110 | 3.5 | 125, 250 | single-sided | 97 | 125, 250 | 40 | 67.5 | 1.6x4x5.8 | 160(Q1000) | AC power or battery operation |
| SMD120 | 3.5 | 250, 500 | double-sided | 97 | 125, 250 | 80 | 67.5 | 1.6x4x5.8 | 160(Q1000) | AC power or battery operation |
| SMD130 | 3.5 | 250, 500 | single-sided | 96 | 125, 250 | 80 | 135 | 1.6x4x5.8 | 160(Q1000) | AC power or battery operation |
| SMD140 | 3.5 | 500, 1000 | double-sided | 96 | 125, 250 | 160 | 135 | 1.6x4x5.8 | | |
| SMD150 | 3.5 | 125, 250 | single-sided | 97 | 125, 250 | 40 | 67.5 | 1.6x4x5.8 | | battery-powered |
| SMD160 | 3.5 | 250, 500 | double-sided | 97 | 125, 250 | 80 | 67.5 | 1.6x4x5.8 | | battery-powered |
| SMD170 | 3.5 | 250, 500 | single-sided | 96 | 125, 250 | 80 | 135 | 1.6x4x5.8 | | battery-powered |
| SMD180 | 3.5 | 500, 1000 | double-sided | 96 | 125, 250 | 160 | 135 | 1.6x4x5.8 | | battery-powered |
| **HEWLETT-PACKARD CO.** | | | | | | | | | | |
| 9121D Dual Drive subsystem | 3.5 | 540 (formatted) | single-sided | 415 | 500 | 66 | 135 | 2.99x12.8x11.2 | 1,270(Q1) | auto shutter, media protection system |
| 9121S Single Drive subsystem | 3.5 | 270 (formatted) | single-sided | 415 | 500 | 66 | 135 | 2.99x12.8x11.2 | 900(Q1) | auto shutter, media protection system |
| **JANOME SEWING MACHINE CO. LTD.** | | | | | | | | | | |
| MFD-80 | 3 | 250, 500 | single-sided | 21 | 125 | 40 | 100 | 1.57x3.25x5.91 | 125(Q1) | scheduled delivery: July, 1984 |
| **MICRO PERIPHERALS INC.** | | | | | | | | | | |
| 302 | 3 | 500 | double-sided | 3 | | 40 | | 1.5x3.5x6 | | |
| 321 | 3.25 | 500 | single-sided | 6 | | 80 | | 1.625x4x5.5 | | |
| 322 | 3.25 | 1000 | double-sided | 6 | | 80 | | 1.625x4x5.5 | | |
| **MITSUBISHI ELECTRONICS AMERICA INC.** | | | | | | | | | | |
| MF351 | 3.5 | 500 | single-sided | 94 | 250 | 80 | 135 | 1.62x4x5.87 | | |
| MF353 | 3.5 | 1000 | double-sided | 94 | 250 | 80 | 135 | 1.62x4x5.87 | | |

# MICRO DISKETTE DRIVES

| Company Model | Size (inches) | Capacity (M bytes) | Single-sided/ double-sided | Avg. access time (msec.) | Transfer rate (K bits/sec.) | Tracks/ surface | Tracks/ inch | Dimensions (HxWxD inches) | Price ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|---|---|---|
| **NISSEI SANGYO AMERICA LTD.** | | | | | | | | | | |
| FB301 | 3 | 250 | single-sided | 55 | 250 | 40 | 100 | 1.57x3.54x6.57 | | |
| FB302 | 3 | 500 | double-sided | 55 | 250 | 40 | 100 | 1.57x3.54x6.57 | | |
| FB352 | 3.5 | 500 | single-sided | 94 | 250 | 80 | 135 | 1.62x4x6 | | scheduled delivery: July, 1984 |
| FB354 | 3.5 | 1000 | double-sided | 94 | 250 | 80 | 135 | 1.625x4x6 | | scheduled delivery: Sept., 1984 |
| **SANKYO SEIKI MFG. CO. LTD.** | | | | | | | | | | |
| FDU-300-DA | 3 | 500 | double-sided | | 250 | 80 | 100 | 1.57x3.54x5.9 | 152(Q10,000) | |
| FDU 300-SA | 3 | 250 | single-sided | | 250 | 40 | 100 | 1.57x3.54x5.9 | 142(Q10,000) | |
| **SHUGART CORP.** | | | | | | | | | | |
| 300 | 3.5 | 500 | single-sided | 158 | 250 | 80 | 135 | 1.62x4x6 | less than 200 (QOEM) | interface compatible with industry-standard minifloppies; operates with hard-shell cartridge media |
| 350 | 3.5 | 1000 | double-sided | 158 | 250 | 80 | 135 | 1.62x4x6 | less than 200 (QOEM) | interface compatible with industry-standard minifloppies; operates with hard-shell cartridge media |
| **SONY CORPORATION OF AMERICA** | | | | | | | | | | |
| OA-D31V | 3.5 | 500 | single-sided | 365 | 500 | 70 | 135 | 2x4x5.1 | 250(Q1); 185(Q500) | Sony interface, auto shutter |
| OA-D32V | 3.5 | 500 | single-sided | 350 | 500 | 80 | 135 | 2x4x5.1 | 250(Q1); 185(Q500) | Sony interface, auto shutter |
| OA-D32W | 3.5 | 1000 | double-sided | 350 | 500 | 80 | 135 | 2x4x5.1 | 300(Q1); 230(Q500) | Sony interface, auto shutter |
| OA-D33V | 3.5 | 500 | single-sided | 350 | 250 | 80 | 135 | 2x4x5.1 | 250(Q1); 185(Q500) | auto shutter |
| OA-D33W | 3.5 | 1000 | double-sided | 350 | 250 | 80 | 135 | 2x4x5.1 | 300(Q1); 230(Q500) | auto shutter |
| **TABOR CORP.** | | | | | | | | | | |
| TC 500 | 3.25 | 500 | single-sided | 6 | 250 | 80 | 140 | 1.625x4x5.5 | 225(Q1) | low power requirements, flexible jacket microfloppy |
| TC 1000 | 3.25 | 1000 | double-sided | 6 | 250 | 80 | 140 | 1.625x4x5.5 | 295(Q1) | low power requirements, flexible jacket microfloppy |
| **TANDON CORP.** | | | | | | | | | | |
| TM35-1 | 3.5 | 500 | single-sided | 94 | 250 | 80 | 135 | 1.625x4x6 | | on-board microprocessor |
| TM35-2 | 3.5 | 1000 | double-sided | 94 | 250 | 80 | 135 | 1.625x4x6 | | on-board microprocessor |
| TM35-3 | 3.5 | 500 | single-sided | 94 | 500 | 80 | 135 | 1.625x4x6 | | Sony OA-D30V interface, on-board microprocessor |
| TM35-4 | 3.5 | 1000 | double-sided | 94 | 500 | 80 | 135 | 1.625x4x6 | | Sony OA-D30V interface, on-board microprocessor |
| **TEAC CORP. OF AMERICA** | | | | | | | | | | |
| FD-30A | 3 | 125, 250 | single-sided | 171 | 125, 250 | 40 | 100 | 1.625x3.5x5.875 | | FC-55 controller, bezel available in 4 colors |
| FD-35A | 3.5 | 125, 250 | single-sided | 93 | 125, 250 | 40 | 67.5 | 1.725x4x5.375 | | FC-55 controller available, head-load solenoid |
| FD-35B | 3.5 | 250, 500 | double-sided | 93 | 125, 250 | 40 | 67.5 | | | FC-55 controller available; head-load solenoid |
| FD-35E | 3.5 | 250, 500 | single-sided | 94 | 125, 250 | 80 | 135 | 1.625x3.5x5.875 | | FC-55 controller available, head-load solenoid |
| FD-35F | 3.5 | 500, 1000 | double-sided | 94 | 125, 250 | 80 | 135 | 1.625x3.5x5.875 | | FC-55 controller available, head-load solenoid |

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**DISK CONTROLLER, 8″ and 14″ SMD I/O compatible.** **Model DQ202A**
Emulates RP02/RP03. Universal Formatting. RT-11, RSX-11 and RSTS compatible. Quad board.

**DISK CONTROLLER, 8″ and 14″ SMD I/O compatible.** **Model DQ214**
Emulates RL01/RL02. Universal Fomatting. 56-bit ECC. 22-bit addressing. RT-11, RSX-11 and RSTS. Quad board.

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Emulates RK06/RK07. Universal Formatting. 56-bit ECC. 22-bit addressing. RT-11, RSX-11 and RSTS. Quad board.

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Emulates RM02/RM05/RM80. Universal Formatting. 56-bit ECC. 22-bit addressing. RT-11, RSX-11 and RSTS. Quad board.

**DISK CONTROLLER, 8″ Disk Drive Controller.** **Model DQ404**
Emulates RL01/RL02. Universal Formatting. SA4000 I/O compatible. RT-11, RSX-11 and RSTS compatible. Quad board.

**DISK CONTROLLER, 8″ and 14″ Disk Drive Controller.** **Model DQ413**
Emulates RP02/RP03. Priam I/O compatible. RT-11, RSX-11 and RSTS compatible. Quad board.

**DISK CONTROLLER, 8″ and 14″ Disk Drive Controller** **Model DQ414**
Emulates RL01/RL02. Universal Formatting. Priam I/O compatible. RT-11, RSX-11 and RSTS compatible.

**DISK CONTROLLER, 5¼″ Disk Drive Controller.** **Model DQ614**
Emulates RL01/RL02. Universal Formatting. ST506/412 I/O compatible. 32-bit ECC. 22-bit addressing. RT-11, RSX-11 and RSTS. Dual Height.

**DISK CONTROLLER, 5¼″ Disk Drive Controller.** **Model DQ615**
Emulates RK06/RK07. Universal Formatting. ST506/412 I/O compatible. 32-bit ECC. 22-bit addressing. RT-11, RSX-11 and RSTS. Dual Height.

**DISK CONTROLLER, 5¼ Disk Drive Controller.** **Model DQ634**
Emulates RL01. DMA Systems Micro Magnum compatible. 32-bit ECC. 22-bit addressing. RT-11, RSX-11 and RSTS. Dual Height.

**½″ MAGNETIC TAPE DRIVE CONTROLLER** **Model DQ120**
Emulates TM-11. Industry Standard I/O. Pertec compatible. Quad board.

**½″ MAGNETIC TAPE DRIVE COUPLER** **Model DQ130**
Emulates TM-11. Formatted Industry Standard I/O. (Pertec formatted I/O) and ½″ streamer tape drive compatible. Quad board.

**½″ MAGNETIC TAPE DRIVE COUPLER** **Model DQ132**
Emulates TSV05/TS-11/TU-80 (22-bit)...Formatted Industry Standard I/O (Pertec formatted I/O) and ½″ streamer and CacheTape drive compatible. Quad board.

**¼″ CARTRIDGE TAPE DRIVE CONTROLLER** **Model DQ330**
Emulates TM-11/TS03. Interfaces Kennedy 6455. Quad board.

**FLOPPY DISK DRIVE CONTROLLER 8″** **Model DQ419**
Emulates RX02. Interfaces Shugart SA850 Floppy I/O. 22-bit addressing Dual Height.

**FLOPPY DISK DRIVE CONTROLLER 5¼″** **Model DQ619**
Emulates RX02. Interfaces Industry Standard I/O. 22-bit addressing. Dual Height.

## UNIBUS (PDP AND VAX)

**DISK CONTROLLER, 14″ Cartridge (2315 or 5440).** **Model DU100**
Emulates RK05. Interfaces Diablo, Pertec and RK05J compatible I/O. Quad board.

**DISK CONTROLLER, 8″ and 14″ SMD I/O Compatible.** **Model DU202A**
Emulates RP02/RP03. Universal Formatting. Interfaces SMD I/O. Quad board.

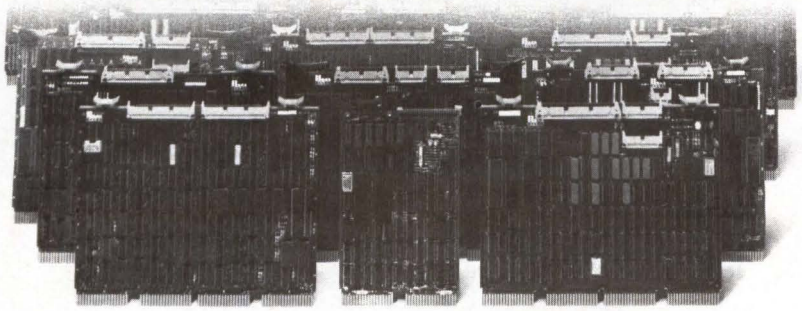
**DISK CONTROLLER, 8″ and 14″ SMD I/O Compatible.** **Model DU215**
Emulates RK06/RK07. Universal Formatting. 56-bit ECC. Interfaces SMD I/O. VAX.Quad board.

**DISK CONTROLLER, 8″ and 14″ SMD I/O Compatible.** **Model DU218**
Emulates RM02/RM05. 56-bit ECC. Interfaces SMD I/O. Hex board.

**½″ MAGNETIC TAPE CONTROLLER** **Model DU120**
Emulates TM-11. Interfaces Industry Standard I/O (Pertec Compatibility). Quad board.

**½″ MAGNETIC TAPE COUPLER** **Model DU130**
Emulates TM-11. Interfaces Formatted Industry Standard I/O (Pertec formatted I/O) and ½″ streamer tape drive compatible. Quad board.

**½″ MAGNETIC TAPE COUPLER** **Model DU132**
Emulates TS-11/TU80. Interfaces Formatted Industry Standard I/O (Pertec formatted I/O) and ½″ streamer and CacheTape drive compatible. VAX.Quad board.



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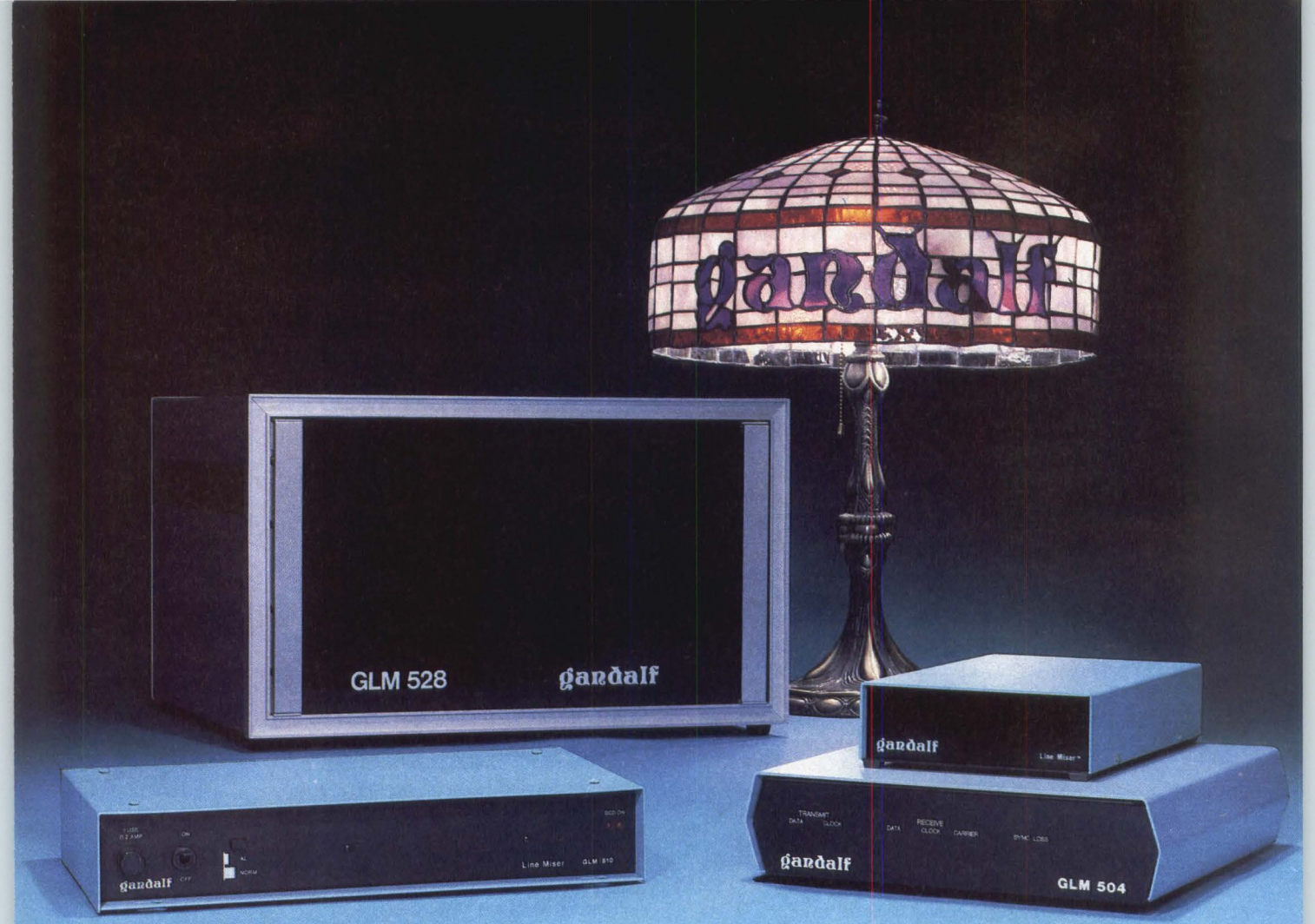


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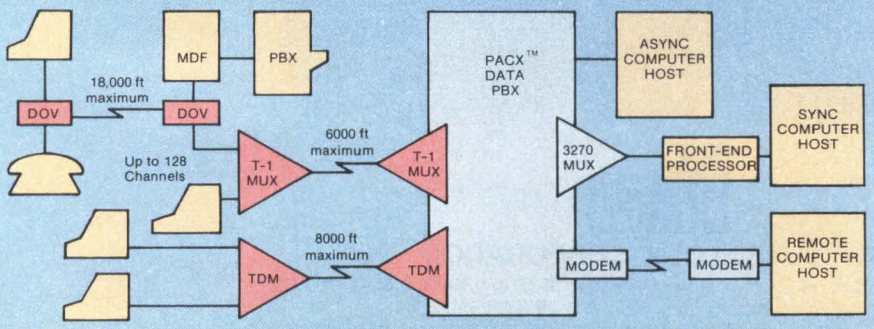


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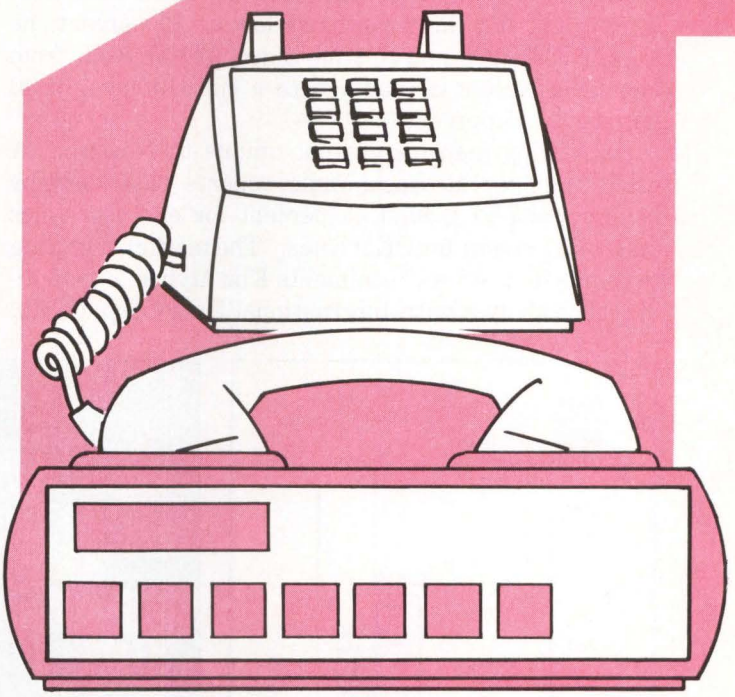
CIRCLE NO. 51 ON INQUIRY CARD

# Modem manufacturers cut costs, add features

*Eroding profit margins are forcing suppliers of standalone modems to produce full-featured units, while board-level modems offer increased options for OEMs*





**Stephen J. Shaw,** Contributing Editor

The market for low-end modems—those operating at 300 to 1,200 bits per second (bps)—is the setting for continuing price and feature wars as suppliers scramble to differentiate their products. Increasing pressure on profit margins is forcing manufacturers to cut production costs by packing more functions on fewer integrated circuits. Standalone modems are getting smarter and less expensive, but board-level modems are gaining an increasing market share. Meanwhile, the "single-chip" modem is slowly becoming a reality.

### Personal computer boom spurs modem sales

Fueled by rapid acceptance of personal computers, unit shipments of low-end modems will grow at a compounded annual rate of 70 percent through 1987, according to Dataquest Inc., a San Jose, Calif., market research organization (Fig. 1). Modem sales for applications involving personal computers will climb from $53.6 million in 1983 to $363.7 million in 1987, representing a 51 percent compounded annual growth rate. During the same period, the average price of a 300-bps modem will decline from $220 to $60, and the price of 300- to 1,200-bps devices will plummet from $510 to $270 (Fig. 2).

Modem manufacturers, however, have yet to exploit fully a major market segment that will be key in realizing these attractive growth projections—personal computer manufacturers. For a variety of reasons, including costs, a lack of application flexibility and packaging constraints, personal computer manufacturers have been reluctant to bundle modems with other peripherals.

But there are indications that this is changing. Apple Computer Inc. announced in February that it had reached an agreement with Chicago modem manufacturer U.S. Robotics Inc. under which U.S. Robotics will supply Apple with as many as 20,000 standalone units per month during the next three years. Apple will sell the modems under its own label. In mid-1982, Texas Instruments Inc. signed with Cermetek Microelectronics Inc. and Racal-Vadic Inc. for 300-bps and 300- to 1,200-bps integral modems to supplement TI's 99532 single-chip modem family. Several other modem suppliers report that discussions with personal-computer manufacturers are under way, and similar arrangements are likely to surface this year.

### Standalone modem suppliers eye profit margins

High volumes, low prices and value-added features characterize the market for standalone modems. For example, Novation Inc., a leading vendor of low-end

modems, offers its 300-bps J-Cat modem at a list price of $149. Even at this relatively low price, competitive pressure mandated that the company incorporate some rudimentary added-value features into the modem such as automatic originate/answer and a diagnostics program. This reflects the fact that end users can now purchase bare-bones devices—basic 300-bps modems with no extras that sold for $600 several years ago—for as little as $49.

The downward price spiral is taking its toll on manufacturers' profit margins. During the past 12 months, says P.K. Padhi, marketing vice president at Novation, the company's margins on retail sales have eroded to around 50 percent from around 65 percent. They could fall this year to as low as 30 percent, he says. OEM sales margins have dropped as well, from about 60 percent a year ago to a current level of 40 percent to 45 percent.

Decreasing margins are not unique to Novation. A sales manager at Racal-Vadic reports that margins have slipped to around 45 percent for end-user sales and to 35 percent for OEM sales. "The market is getting to commodity prices," comments Kim Myhre, a communications analyst with International Data Corp. (IDC), a research organization in Framingham, Mass. "Those companies that survive will be those able to subsidize the lower end [of their product line] with margins from their higher-priced, higher-quality products."

To combat declining margins, manufacturers are turning to value-added features. Led by Hayes Microcomputer Products Inc.'s Smartmodem series, modem suppliers routinely add a near-standard set of features to modems priced below $500. Such features include auto dial/answer, auto re-dial, diagnostics, pulse/tone dialing, timed pause for a second dial tone, audio monitor, line-status detection and same-call voice/data switching.

In the $500 to $700 single-quantity price range, manufacturers are offering even more. Anderson Jacobson Inc. recently introduced three 300- to 1,200-bps, full-duplex modems that are differentiated only by the added extras. The $495 212ST incorporates most of the Hayes Smartmodem features, including an auto dialer. The $595 212AD1 provides automatic log-on/log-off capabilities. The $695 212AD2 incorporates all of its siblings' characteristics plus a two-level password security system, down-line loading functions, speed dialing and a 16-number memory.

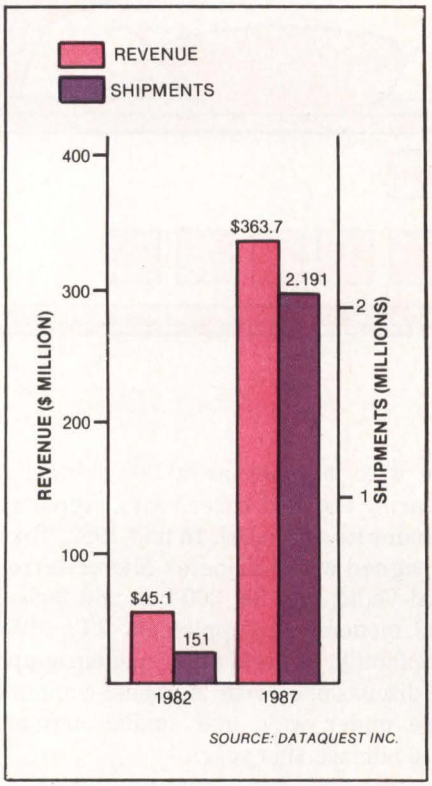



**Fig. 1. The U.S. personal computer modem market** *is expected to go from $45.1 million in 1982 to more than $363 million in 1987. Shipments over the same period will grow at a 70 percent compounded annual rate, topping 2 million units in 1987.*

| | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | Compound annual growth rate 1982-1987 |
|---|---|---|---|---|---|---|---|
| **Total market** | | | | | | | |
| Shipments (000) | 151 | 208 | 310 | 531 | 1,026 | 2,191 | 70% |
| Installed base (000) | 226 | 424 | 714 | 1,210 | 2,176 | 4,258 | 80% |
| Average selling price | $299 | $258 | $221 | $197 | $181 | $166 | (12.5%) |
| Market (000,000) | $45.1 | $53.6 | $68.5 | $104.4 | $185.3 | $363.7 | 51% |
| **300-bps modems** | | | | | | | |
| Shipments (000) | 140 | 181 | 243 | 367 | 614 | 1,127 | 52% |
| Installed base (000) | 215 | 386 | 609 | 946 | 1,513 | 2,564 | 64% |
| Average selling price | $270 | $220 | $160 | $115 | $83 | $60 | (35%) |
| Market (000,000) | $37.8 | $39.8 | $38.9 | $42.2 | $51.0 | $67.6 | 12% |
| **1,200-bps modems** | | | | | | | |
| Shipments (000) | 11 | 27 | 66 | 161 | 405 | 1,048 | 149% |
| Installed base (000) | 11 | 38 | 104 | 260 | 652 | 1,667 | 173% |
| Average selling price | $665 | 510 | $435 | $370 | $317 | $270 | (20%) |
| Market (000,000) | $7.3 | $13.8 | $28.7 | $59.6 | $128.4 | $283.0 | 108% |
| **2,400-bps modems** | | | | | | | |
| Shipments (000) | — | — | 1 | 3 | 7 | 16 | 152% |
| Installed base (000) | — | — | 1 | 4 | 11 | 27 | 200% |
| Average selling price | — | — | $900 | $873 | $847 | $821 | (3%) |
| Market (000,000) | — | — | $0.9 | $2.6 | $5.9 | $13.1 | 14% |

*Source: Dataquest Inc.*

**Fig. 2. Modems operating at 300 bps** *currently account for the largest slice of the total US. modem market, but shipments of 1,200- and 2,400-bps units are expected to grow at compounded annual rates of 149 percent and 152 percent, respectively, between 1982 and 1987. Prices of all classes of modems will drop steadily over the same period.*

In March, U.S. Robotics was expected to unveil its Supermodem, which carries the added-value trend one step further. Compatible with Bell Laboratories' 103, 113, 212A and CCITT V.22 communications standards, the 300- to 1,200-bps, full-duplex modem incorporates a 130-phoneme voice synthesizer for unattended operation and remote programming from touch-tone phones. The Supermodem also provides a variety of remote and local diagnostic features and a user-programmable command structure. End-user price is expected to be between $700 and $800.

Despite the added value and reduced prices, the market share for standalone, personal computer modems is expected to decline significantly through 1987, according to Tom Bredt, Dataquest vice president of telecommunications industry service. From holding 60 percent of the market for units shipped and revenues in 1982, standalone devices will slip to 33 percent and 32 percent, respectively, during the following five years (Fig. 3). Bredt predicts that growth of personal computer modems in the portable and home computer markets will drive the integrated, board-level modem from a 1 percent unit market share and 1 percent revenue market share in 1982 to a 39 percent unit share and a 29 percent revenue share by 1987. Dataquest expects plug-in modems to gain market share at the expense of standalone devices because systems with IBM card-slot compatibility will account for an increasing percentage of personal computer sales.

At the plug-in level, vendors scurried to take advantage of the popularity of the IBM PC by introducing compatible boards during 1983. Getting on the IBM PC bandwagon were, among others, Anderson Jacobson, Novation and Racal-Vadic with 300- to 1,200-bps, full-duplex boards at prices ranging from $449 to $595, including software. According to Novation, three weeks after the introduction of its Access 1-2-3 PC-compatible board, a backlog of 4,000 orders had developed.

The board-level market is characterized by the same price pressures as the standalone market. Many modem manufacturers are using identical circuit boards in both modem configurations to realize production economies. To lower production costs, many manufacturers are reducing the number of chips on the board. According to IDC's Myhre, the number of on-board chips is expected to drop during the next two years, and three- to five-chip modems will be commonplace.

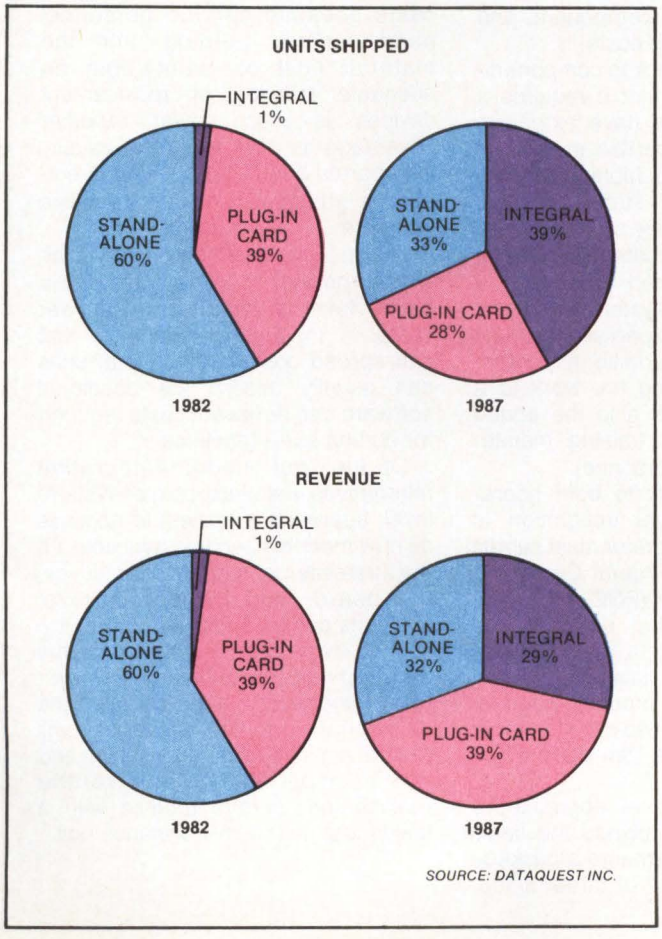



**Fig. 3. The market share of standalone modems** *will shrink as personal computer manufacturers begin to integrate modems into their systems.*

Industry executives agree. Karl Shimada, product planner for low and medium-speed modems at Anderson Jacobson, reports that the company is working on a new design of its Bell 212A-compatible IDO modem series. Using very large-scale integration (VLSI) techniques, Anderson Jacobson expects this year to reduce its 40-square-inch board to less than 25 square inches and to reduce the number of on-board components to fewer than a dozen. Likewise, Cermetek has reduced the chip count to 10 on some units, according to marketing vice president Steve Durham. By 1985, he predicts, full-featured 300- to 1,200-bps, full-duplex modems will contain only two or three ICs.

Shimada and Durham agree that the investment in VLSI production processes is expensive and may initially cause VLSI-based boards to cost more than comparable non-VLSI devices. However, they believe the investment is necessary for the companies to remain competitive in the long term and will eventually pay off in sharply reduced costs.

CTS Corp., a manufacturer of Bell 212A-type modems, says it is following the developments in reducing the number of chips on the modem board but is content to let others take the lead. "VLSI is not going to have much positive impact on costs in the near future," says Wendell Bankston, CTS national marketing manager.

CTS has concentrated its research efforts on developing proprietary technology in certain modem functions. Nine months ago, CTS submitted 23 claims to the U.S. Patent Office to protect proprietary processes involving command-code generation and an all-digital approach to analyzing telephone-line status. Bankston says no one has challenged any of the claims.

The technology incorporates command-code generation on the same chip set that performs the modulation/demodulation and filtering functions. The approach also allows the modem to sense more subtle variations in the telephone circuit and to respond to them more quickly and efficiently than conventional energy-detection techniques, which determine only whether a dial tone is

## Methods of modem integration

**Stephen J. Durham**
Cermetek Microelectronics Inc.

System integrators and OEMs who want to incorporate a modem have four choices: they can attach a standalone box at the system level, or they can integrate internal modems at the board, component or module level. At each level, key make-or-buy decisions arise. The trade-offs center on component availability, testing, interface options, software development and manufacturing costs.

Production volume is another factor. If a system integrator wants to add modems in relatively small volumes—say, fewer than 500—the best alternative is probably system-level integration with a standalone modem. This approach involves the least investment, not only in cost but also in time and effort. Integrating at the board, component or module level requires more time and expertise and is practical only in higher volumes. On the other hand, incorporating a modem internally offers the advantage of higher reliability, mainly because it eliminates the external modem power supply. In addition, it reduces interfacing and compatibility problems.

Whether an integrator should incorporate modems at the board, component or module level depends on a variety of factors. Board-level integration requires more commitment than does system-level integration. Because the board is usually customized to the exact physical configuration of a user's system, this approach requires specific production volumes and schedules and involves expensive preliminary engineering.

Although less diverse than the number of system-level modems, numerous board-level modems are available. The basic limitation is physical space. Because the board is incorporated into the internal architecture of the system, it must fit physical requirements. Of the internal-modem alternatives, the board-level solution requires the most customization. An alternative to customized boards, however, is a modem-expansion board, which is physically-, electrically- and software-compatible with a specific computer (MMS, March, Page 193).

Component-level integration is in some cases the most economical internal-modem approach. In this method, the components reside on the host's printed-circuit board and require no separate boards or cables. The cost of the modem is the sum of the cost of each component and associated assembly costs.

The major drawback to component-level integration is that it requires a system integrator to have extensive knowledge and expertise in modem design, testing and fabrication. Because the design staffs of most system integrators are trained mainly in digital circuitry, integration of a highly analog-oriented modem is a challenge. If the system integrator doesn't have the expertise, he must acquire it by hiring additional personnel or by contracting the work to a consultant. There is also the added cost of hiring and training maintenance and repair personnel.

Another drawback to both board- and component-level integration is that the system integrator must submit the design to the Federal Communications Commission (FCC) for approval, which can be a long and expensive process. In the long run, expense and time delays are not a major concern. At product introduction, however, the two- to six-month registration process can be prohibitively long.

In the module-level approach, a module supplier combines the basic elements of a modem into a package that usually consists of three or four ICs. The basic elements include a command controller, a signal processor, a data coupler, an RS232 interface and automatic calling-unit circuitry.

A major advantage of the module-level solution is that, because all the critical analog functions are in one package, an integrator has only to connect the module to the microprocessor system bus on one side and to the telephone-line connector on the other. Thus, there is no need to hire new design personnel with experience in modem or analog design or testing. This approach also reduces maintenance and repair costs because service personnel need minimal training, and the material cost of maintaining an adequate backlog of replacement devices is much lower. Another advantage is that modules usually incorporate an FCC-registered direct-access attachment or telephone-line interface.

The module-level approach typically incorporates more features and a higher level of intelligence at lower costs. A module manufacturer that can spread costs over several units can usually absorb the additional software and hardware costs required for adding extra functions.

Of the four modem-integration alternatives, the black-box, or system-level, approach is easiest to upgrade as new modems become available. Of the three internal-modem alternatives, the board- and component-level solutions can be upgraded only at the cost of extensive hardware redesign and software modification. For system integrators who choose the module-level route, upgrades will require a minimum of modification and will in most cases involve the replacement of one module with a lower-cost, higher-performance unit.

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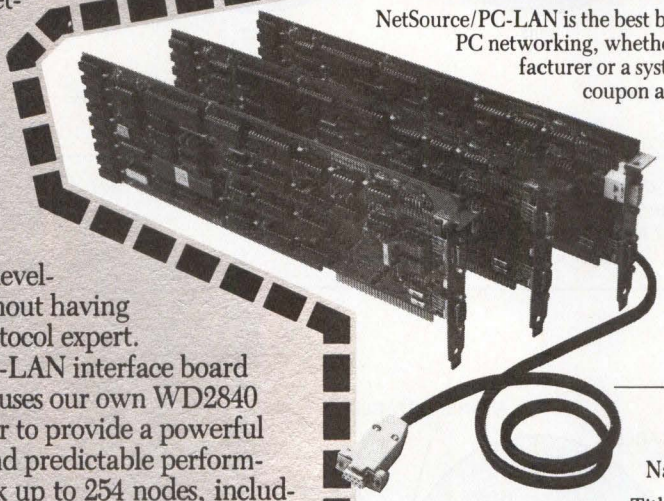

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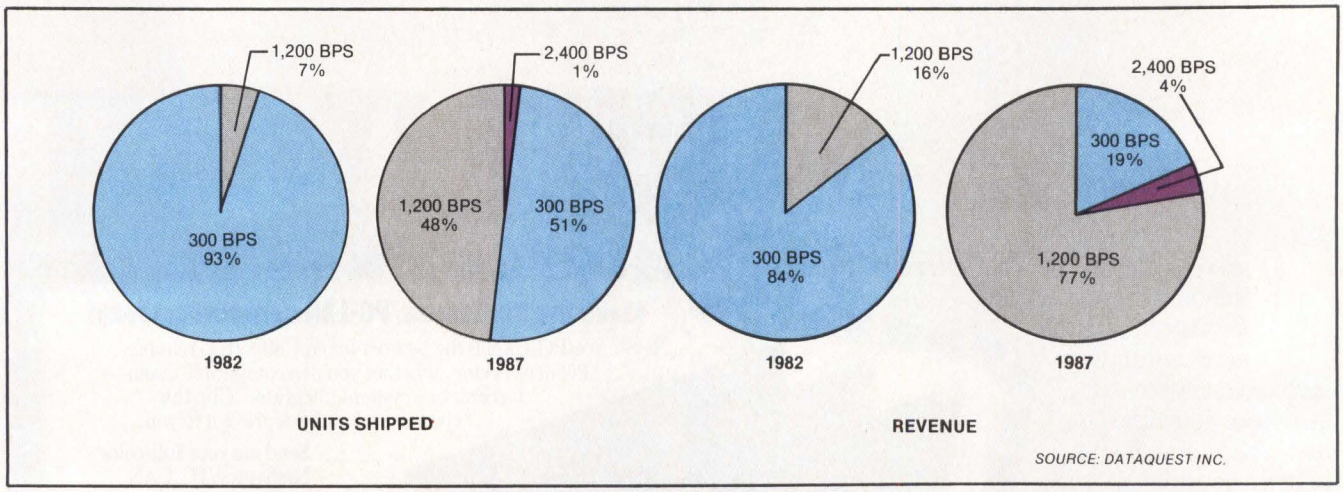
present when the modem is on-line. CTS all-digital techniques, says Bankston, reduce bit error rates to $10^{-5}$ at 12-decibel noise levels. The company is licensing OEMs to incorporate the proprietary chips on modem boards.

### Manufacturers move toward 'single-chip' units

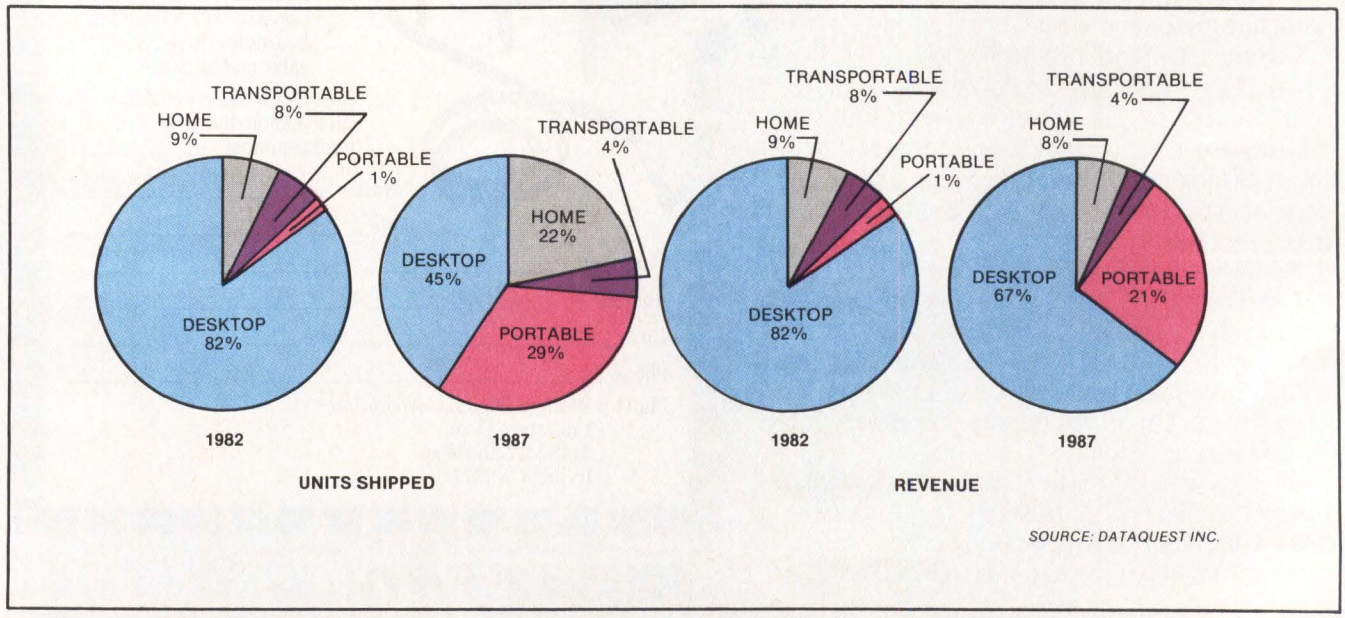
To traditional modem manufacturers—those that build and integrate modulators/demodulators, filters, power supplies and line drivers—the one-chip modem is a logical impossibility. For modem suppliers emerging from the IC manufacturing arena, the single-chip modem not only is possible but has arrived.

"A single-chip modem? It's a myth if you think you can put a single chip on a computer motherboard and, presto, have a modem," says U.S. Robotics marketing director John Cleve. "You need an interface for modulation techniques, voltage regulation and other functions that just don't lend themselves to being embedded in the same silicate with mod/demod and filtering functions."

It is possible, however, to integrate the basic modem functions into a single IC, responds Neil Edmundson, modem applications manager for TI. The TI 99532

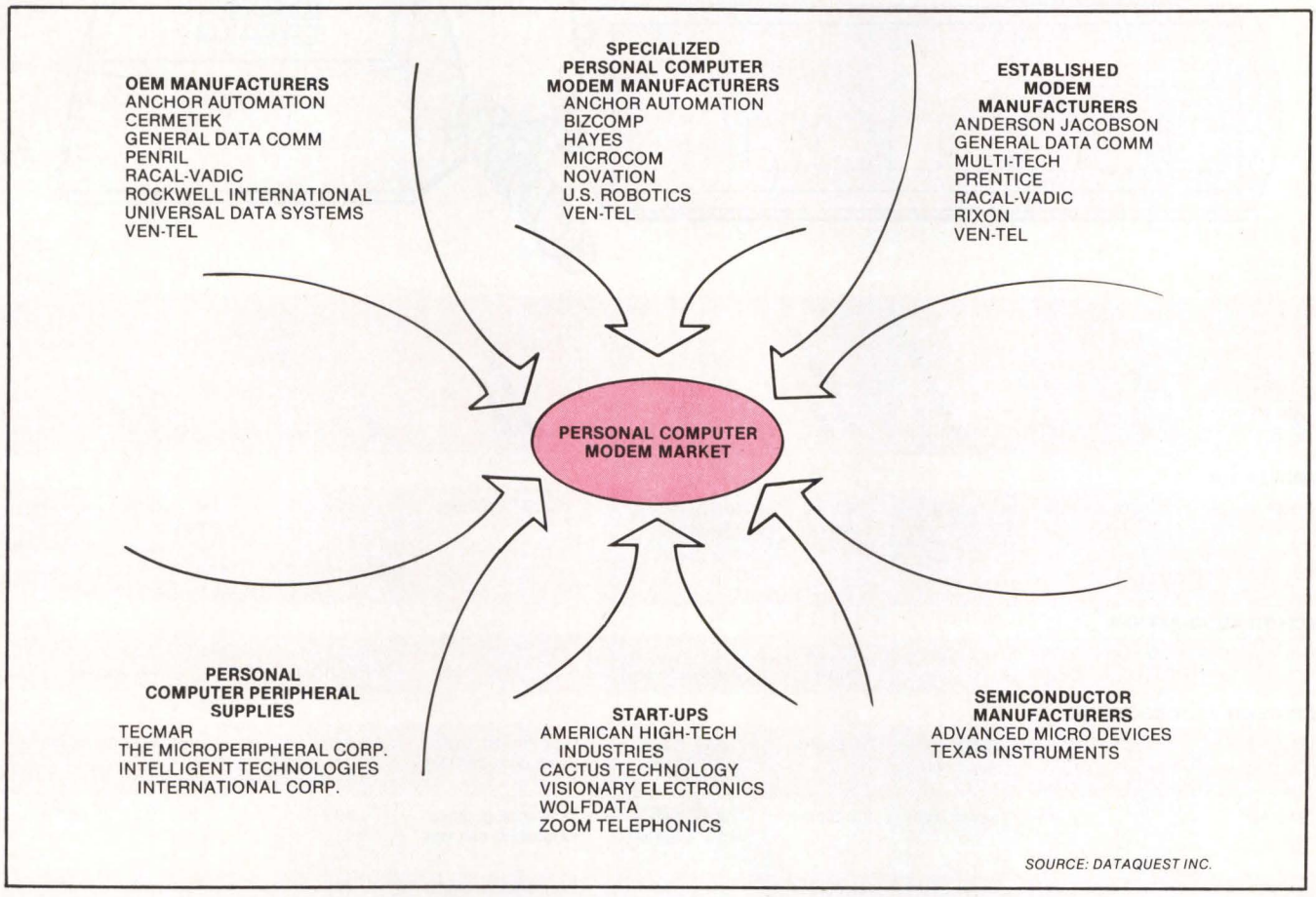



**Inexpensive 300-bps modems** *will decrease in units-shipped market share from 93 percent to 51 percent and in revenue share from 84 percent to 19 percent from 1982 to 1987. During this period, OEMs and end users will migrate toward high-speed (primarily 1,200-bps) units.*




**Desktop computer applications for modems** *will continue to dominate market revenue share, but the explosive growth in portable computers will increase the units-shipped market share for portable modem applications. Similarly, development of electronic banking, shopping and other home services will expand the units-shipped market share for home computer modems.*

**An estimated 80 percent compounded annual growth rate,** *in terms of units installed, for the personal-computer modem market is attracting suppliers from a variety of areas.*




circuit incorporates all modulator/demodulator, filtering and energy/carrier detection functions on a single chip. The 99532 family operates at 300 bps in full-duplex mode and 1,200 bps in half-duplex mode. It is integrated into the TI Professional computer. Edmundson concedes that the TI chips lack some modem ingredients. "It's tough to put a power transformer in silicate," he says.

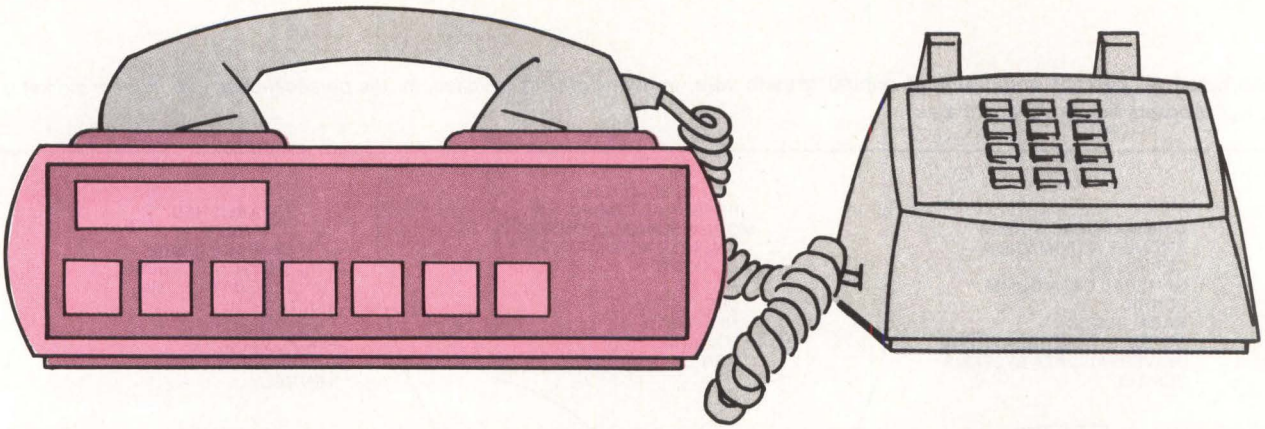
Edmundson hints that TI is close to developing a 1,200-bps, full-duplex chip modem. The primary obstacle is designing the IC to handle the phase-shift-keying modulation technique, as opposed to the half-duplex frequency-shift-keying scheme.

According to Motorola Inc.'s telecommunications group, the basic functions of a Bell 103-type, 300-bps modem can easily be incorporated into one IC. But in addressing the market for high-speed, half-duplex modems, Motorola opted for a two-chip solution, separating the filter from the modulator/demodulator circuit. "The Bell 212A-type chip modem is still a fantasy. It's two years away at the earliest," says Randy Hutcheson, Motorola product planning and applications manager.

Another barrier to development of the chip modem may be economic rather than technical. Motorola's Hutcheson explains that, although the carrier controller could be incorporated into an IC containing the other basic modulator/demodulator and filtering functions, the controller would have to be designed for specific telephone-line characteristics such as noise levels or pulse/tone line-activation. This lack of flexibility limits the manufacturer to custom orders. The market for custom requirements, Hutcheson claims, has not yet developed to make the design and manufacture of one-chip modems attractive.

TI's Edmundson does not entirely agree: "You've got to look at the trade-offs involved in two- vs. one-chip modems," he says. "For one-chip modems, costs increase exponentially when more functions are added, and the physical size of the chip increases. You have to compare this with the doubled costs of putting in an additional ceramic or plastic package around the extra chip and the added costs of testing, assembly, handling, inventory maintenance and transportation." □

# VOICE GRADE DDD MODEMS



| Company Model | Data rate (bps) | Modulation method | Synchronization | Transmission mode | Calling modes | Diagnostic features | Unit price ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|---|
| **ADMINET INC.** | | | | | | | | |
| Simultaneous modem | 0–9600 | FSK | async. | half, full duplex | local area modem for PBX's | digital loopbacks | 499 | transmits data and voice simultaneously on single telephone line for PBX's, can not directly access dial-up network |
| **ANCHOR AUTOMATION** | | | | | | | | |
| MARK XII | 300, 1200 | FSK, DPSK | async. | half, full duplex | auto. dial/ auto. answer | | 399(Q1); 215(Q100) | Bell 212A, Hayes compatible; 2 year warranty |
| **ANDERSON JACOBSON INC.** | | | | | | | | |
| AJ1212-AD2 | | FSK, PSK, QAM | async./sync. | full duplex | auto. dial/ auto. answer | local analog, digital loopbacks; self test | 695 | Bell 212 compatible |
| AJ1212-AD1 | | FSK, PSK, QAM | async./sync. | full duplex | auto. dial/ auto. answer | local analog, digital loopbacks; self test | 595 | Bell 212 compatible |
| AJ1212-ST | | FSK, PSK, QAM | async./sync. | full duplex | auto. dial/ auto. answer | local analog, digital loopbacks; self test | 495 | Bell 212 compatible |
| AJ1212-ID01 | | FSK, PSK, QAM | async./sync. | full duplex | auto. dial/ auto. answer | analog, digital loopbacks; self-test | | Bell 212 compatible |
| AJ1212-IS01 | | FSK, PSK, QAM | async./sync. | full duplex | orig./auto. answer | analog, digital loopbacks; self-test | | Bell 212 compatible |
| AJ1212-2B01 | | FSK, PSK, QAM | async. | full duplex | auto. dial/ auto. answer | analog, digital loopbacks; self test | 495 | expansion-board modem plugs into IBM PC; Bell 212 compatible |
| **AVANTI COMMUNICATIONS CORP.** | | | | | | | | |
| 600A | 0–9600 | | async. | half, full duplex | orig./auto dial | digital loopbacks | 285 | speed transparent; rackmounted |
| 2400 | 1200, 2400 | QAM | async. | half, full duplex | orig./auto. dial | digital loopbacks | 1,100 | dual channel, multipoint, unrestricted character format |
| 4800 | 2400, 4800 | QAM | async. | half, full duplex | orig./auto. dial | digital loopbacks | 1,950 | dual channel, multipoint, micro-processor based |
| **BIZCOMP CORP.** | | | | | | | | |
| 1012 | 300, 1200 | FSK, PSK | async. | half, full duplex | auto. dial/ auto. answer | local analog, digital loopback; self test | 549 | Bell 212A compatible, programmable log-on message, auto. repeat dial |
| 2120 | 110, 300, 1200 | FSK, PSK | async. | half, full duplex | auto. dial/ auto. answer | local analog loopback; self-test | 499 | expansion-board modem plugs into IBM PC, XT; Bell 212A compatible |
| **BLACK BOX CORP.** | | | | | | | | |
| MODEM 212 | | FSK, PSK | async./sync. | full duplex | auto. dial/ auto. answer | local digital loopback; self test | 595 | Bell 212 compatible |
| AUTO MODEM 103 | | PSK | async. | full duplex | auto. dial/ auto. answer | local digital loopback; self test | 199 | Bell 103 compatible |

# VOICE GRADE DDD MODEMS



| Company Model | Data rate (bps) | Modulation method | Synchronization | Transmission mode | Calling modes | Diagnostic features | Unit price ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|---|
| **BO-SHERREL CO. INC.** | | | | | | | | |
| M-1A | | | async. | full duplex | manual originate | | 138(Q1); 96(Q100) | |
| M-3 | | | async. | full duplex | manual originate | | 49(Q1); 38(Q100) | |
| M-4 | | | sync. | full duplex | | | 440(Q1); 296(Q100) | |
| **BYTCOM INC.** | | | | | | | | |
| 212AD | 0–300, 1200 | FSK, PSK | sync. | full duplex | auto. dial/ auto. answer | local analog, digital loopback; self test | 495 | Bell 212A compatible; remote boot, programmable disconnect, voice/ data transfer switch, 9 name and number memory |
| **CERMETEK MICROELECTRONICS INC.** | | | | | | | | |
| CH1760 | 110, 300, 1200 | FSK, PSK | async./sync. | full duplex | auto. dial/ auto. answer | local analog, digital loopback; self test | 495 | Bell 103, 212A compatible; stores 52 telephone numbers or log-on messages |
| INFO-MATE 212A | 110, 300, 1200 | FSK, PSK | async./sync. | full duplex | auto. dial/ auto. answer | local analog, digital loopback; self test | 595 | Bell 103, 212A compatible; CROSSTALK software coupon |
| INFO-MATE 212PC | 110, 300, 1200 | FSK, PSK | async. | full duplex | auto. dial/ auto. answer | local analog, digital loopback; self test | 495 | Bell 103, 212A compatible; expansion-board modem plugs into IBM PC, XT; MODEM-MATE software included |
| **CODEX CORP.** | | | | | | | | |
| 212/ACU | 0–300, 1200 | FSK, PSK | async./sync. | full duplex | auto. dial/ auto. answer | analog, digital loop-back; self test | 645(Q1); 525(Q100) | Bell 212, 103, 113 compatible |
| 20IR | | PSK | sync. | half, full duplex | orig./auto. answer | analog, digital loop-back; self test | 775(Q1); 620(Q100) | Bell 201 compatible; alternate voice/ data, satellite delay option |
| 208R | | 8-phase DPSK | sync. | half, full duplex | orig./auto. answer | analog, digital loop-back; self test | 1,750(Q1); 1,400(Q100) | Bell 208 compatible; satellite delay option |
| 224 | | QAM | async./sync. | full duplex | auto. dial/ auto. answer | analog, digital loop-back; self test | 905(Q1); 770(Q100) | CDS 224, VA Quad compatible |
| 202R | 0–1200 | FSK | async. | half, full duplex | orig./auto. answer | local, remote analog loopback; self test | 475(Q1); 380(Q100) | Bell 202 compatible; satellite delay option |
| 212R | 0–300, 1200 | FSK, PSK | async./sync. | full duplex | orig./auto. answer | analog, digital loop-back; self test | 595(Q1); 475(Q100) | Bell 212A, 103, 113 compatible |
| LSI 48/V.27 bis/ter | 4800 (2400 fallback) | FSK, DPSK, QAM | async./sync. | half, full duplex | orig./auto. answer | remote digital loop-back; self test | 3,500(Q1); 2,105(Q100) | CCITT V.27 bis/ter compatible |
| MX 2400 | | DPSK | async./sync. | half, full duplex | orig./auto. answer | remote digital loop-back; self test | 1,600(Q1); 1,071(Q100) | CCITT V.26, Bell 201 compatible |
| **COHERENT COMMUNICATIONS CORP.** | | | | | | | | |
| DAM-50 | 1200, 1800 | FSK | async. | half, full duplex | orig./answer | analog loopback; self test | 482 | Bell 202 compatible; built-in statistical delay equalizer |
| SPM-94A | 300 | FSK | async. | half duplex | orig./answer | self test | 475 | simultaneous voice and data |
| **COMDATA CORP.** | | | | | | | | |
| 208 A/B | 4800 | PSK | sync. | half, full duplex | orig./auto. answer | local analog, remote digital loopback; self test | 1,697 | Bell 208 A/B compatible |
| 332F-22 | 0–1800 | FSK | async. | full duplex | | local analog, remote digital loopback | 187 | Bell 202T compatible |
| 370E2-42 | 0–300 | FSK | async. | full duplex | orig./auto. answer | | 277 | Bell 103 compatible |
| 370E2-12 | 0–300 | FSK | async. | full duplex | originate | | 277 | Bell 103 compatible |
| 305E2-12 | 0–300 | FSK | async. | full duplex | manual orig. | | 117 | Bell 103 compatible |
| 151A2-13 | 0–300 | FSK | async. | full duplex | manual orig. | | 127 | Bell 103 compatible |
| 30532-22 | 0–300 | FSK | async. | full duplex | manual answer | | 117 | Bell 103 compatible |
| P212A | 300, 1200 | FSK | async./sync. | full duplex | orig./auto. answer | analog, digital loopback; self test | 595 | Bell 212A compatible |
| 212E2-32 | 1200 | FSK | async. | full duplex | orig./answer | | 377 | Bell 212A compatible |
| 312E-42 | 1200 | FSK | async. | full duplex | orig./auto. answer | analog, digital loop-back; self test | 397 | Bell 212A compatible |

## VOICE GRADE DDD MODEMS

DDD modems

| Company Model | Data rate (bps) | Modulation method | Synchronization | Transmission mode | Calling modes | Diagnostic features | Unit price ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|---|
| 32E2-42 | 1200 | FSK | async. | half duplex | orig./auto. answer | | 247 | Bell 202S compatible |
| 334E2-42L | 2400 | PSK | sync. | half duplex | orig./auto. answer | | 587 | Bell 201C compatible |
| 334F2-22L | 2400 | PSK | sync. | full duplex | | local analog, remote digital loopback; self test | 527 | Bell 201C compatible |
| **COMMODORE BUSINESS MACHINES** | | | | | | | | |
| AUTOMODEM 1650 | 0–300 | | async. | half, full duplex | auto. dial/ auto. answer | | 149 | |
| VIC MODEM 1600 | 0–300 | | async. | half, full duplex | orig./answer | | 100 | |
| **COMPUTER COMMUNICATIONS SPECIALISTS** | | | | | | | | |
| Audiomodem | 1200 | FSK | async. | half, full duplex | auto. dial/ auto. answer | self test | 2,895 | Bell 202 compatible; audio. speech processor for verbal response |
| **COMPUTER DEVELOPMENT INC.** | | | | | | | | |
| ET Series intelligent modem | 300, 1200 | FSK, PSK | async. | half, full duplex | auto. dial/ auto. answer | local digital, analog loopback; self-test | 695 | expansion-board modem plugs into IBM PC; CCITT V.23, Bell 103, 212A compatible |
| ETC Multi User Series | 300, 1200 | FSK, PSK | async./sync. | half, full duplex | auto. dial/ auto. answer | local digital, analog loopback; self test | 1,695 | expansion-board modem plugs into IBM PC; CCITT V.23, Bell 103, 212A compatible |
| ETC Single user series | 300, 1200 | FSK, PSK | async./sync. | half, full duplex | auto. dial/ auto. answer | local digital, analog loopback; self-test | 1,095 | expansion-board modem plugs into IBM PC; time/date clock, CCITT V.23, Bell 103, 212A compatible |
| **COMREX INTERNATIONAL** | | | | | | | | |
| ComMunicator CR-103 | 300 | FSK | async. | full duplex | auto. dial/ auto. answer | local digital loopback | 159 | expansion-board modem plugs into Epson QX-10, Bell 103 compatible; tandem dialing for MCI, SPRINT |
| **CONCORD DATA SYSTEMS** | | | | | | | | |
| 212 | 1200 | DPSK | async./sync. | full duplex | orig./auto. answer | digital, analog loop-back; self test | 770(Q1); 660(Q100) | Bell 212A compatible; automatic-adaptive equalization |
| 224 | 2400, 1200 | QAM | async./sync. | full duplex | orig./auto. answer | digital, analog loop-back; self test | 995(Q1); 895(Q100) | CCITT V.22 bis, Bell 212 compatible |
| 224 AD | 2400, 1200 | QAM | async./sync. | full duplex | auto. dial/ auto. answer | digital, analog loop-back; self test | 1,195(Q1); 1,095(Q100) | CCITT V.22 bis, Bell 212 compatible; keyboard or software driven |
| V.22 | 1200 | DPSK | async./sync. | full duplex | orig./auto. answer | digital, analog loop-back; self test | 965(Q1); 685(Q100) | CCITT V.22 compatible; automatic adaptive equalization |
| V. 22 bis | 2400, 1200 | QAM | async./sync. | full duplex | orig./auto. answer | digital, analog loopback; self test | 995(Q1); 895(Q100) | CCITT V.22 compatible |
| V.22 bis AD | 2400, 1200 | QAM | async./sync. | full duplex | orig./auto. answer | digital, analog loopback; self test | 1,195(Q1); 1,095(Q100) | CCITT V.22 compatible; keyboard or software driven |
| **CTS CORP. (Electronic Products Group, Knights Div.)** | | | | | | | | |
| CTS 212 AH | 0–300, 1200 | FSK, PSK | async./sync. | full duplex | auto. dial/ auto. answer | digital, analog loopback; self test | 459 | Bell 103, 113, 212 compatible |
| CTS 212AR | 0–300, 1200 | FSK, PSK | async./sync. | full duplex | auto. dial/ auto. answer | digital, analog loopback; self test | 320 | Bell 103, 113, 212A compatible |
| CTS 212AT | 0–300, 1200 | FSK, PSK | async./sync. | full duplex | auto. dial/ auto. answer | digital, analog loopback; self test | 285 | expansion-board modem plugs into TTL bus interface; Bell 103, 113, 212A compatible |
| **DATAPRODUCTS NEW ENGLAND** | | | | | | | | |
| DDU-1 | 75–19.2K | DPSK | async./sync. | half, full duplex | | local analog, digital loopback; self test | | meets Bell Metallic spec (pub 43401); rackmounted available |
| **DATAPOINT CORPORATION** | | | | | | | | |
| 9478 | 1200 | FSK | async. | full duplex | auto. answer | | 750(Q1); 675(Q100) | works in conjunction with DATA SHARE system |
| 9479 | 1200 | FSK | async. | full duplex | auto. dial | | 750(Q1); 675(Q100) | works in conjunction with DATA SHARE system |
| **DATEC INC.** | | | | | | | | |
| 212 | 0–300, 1200 | FSK, DPSK | async./sync. | half, full duplex | auto. dial/ auto. answer | digital, analog loop-back; self test | 695 | Bell 103, 113, 212A compatible |


# EVEN WHEN YOUR MODEM SENDS IT BY WAY OF THE OKEFENOKEE SWAMP.

When you send data by telephone through nasty environments like this, it can run into problems tougher than just alligators. Problems like impulse noise. Chatter from the switchgear. Static from the atmosphere or bad weather. Distortion due to crosstalk or just plain white noise.

To get your message through, your IBM PC or XT needs the advanced performance features of the PC:IntelliModem.™ It's got the best receive sensitivity available today—actually down below -50 dBm. So now you can achieve a high level of data transmission integrity. Even with bad connections.

**Get patented modem technology.**
The PC:IntelliModem is elegantly simple. Its patented design does it all on a single microprocessor chip, with just one crystal. Other modems take two, four or more $\mu$Ps (and even more oscillators), and still accomplish less.

How do we do this? By creating architectural innovations in firmware, and by pushing the chip to its limit, close to 12 MHz. Since it uses fewer parts, the PC:IntelliModem's no-compromise design offers higher reliability, a more compact form factor, and lower costs.

This design elegance leads naturally to more elegant performance. Take line status detection, for example. The PC:IntelliModem's adaptive, decision-directed logic monitors line status more closely than other modems. Even at weak or degraded signal levels. So it can make connections with less chance of error, by detecting signals for dial tone, remote ringback, busy and voice—some of which other modems ignore.

**Plan ahead with integrated voice and data.**
For opening up a whole new world of integrated voice and data applications, there's nothing like the PC:IntelliModem. Literally. Its easy-to-use software package—PC:IntelliCom™—lets you switch repeatedly between talking or listening and sending or receiving data. All at the touch of a single function key. That means now both you and your computer can talk on the same line. Without having to hang up, re-dial or plug and unplug a lot of cables.

So if you're designing microcomputer datacomm products—or just looking for a PC/XT modem for yourself, check out the PC:IntelliModem at your local dealer. You'll get the message. And so will they. Or contact: Bizcomp, 532 Weddell Drive, Sunnyvale, CA 94089; 408/745-1616.

**Bizcomp: A history of innovation.**

| | |
|---|---|
| 1980 | Invented first command-driven modem |
| 1981 | Introduced proprietary line-status monitoring |
| 1983 | Designed first single-$\mu$P 212A-compatible modem |
| 1983 | Introduced first integrated voice/data modem for IBM PC |
| 1983 | Granted patent on command-driven modem |

**Make sure your modem has all these PC:IntelliModem features**

**Integrated Voice/Data**
- Switch between voice and data communications
- Programmable telephone handset jack

**Status Reporting**
- Line status detection (dial tone, busy, remote ringback, voice answer, modem answer, incoming call)
- Audio monitor
- Programmable status LED

**PC:IntelliCom™ Software Included**
- 99-name on-line telephone directory
- Auto-dial, auto-repeat dial, auto-answer
- Link to another number if busy
- File transfer
- Data capture to diskette
- Programmable auto log-on sequences

**Compatible with Crosstalk™ and PC-Talk III™**
**Pulse and Tone Dialing**
**Receive Sensitivity: -50 dBm**
**Speeds: 110, 300, 1200 baud**

**BIZCOMP®**
*We've got people talking.*



CIRCLE NO. 52 ON INQUIRY CARD

## VOICE GRADE DDD MODEMS

| Company Model | Data rate (bps) | Modulation method | Synchronization | Transmission mode | Calling modes | Diagnostic features | Unit price ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|---|
| Datec 212R | 300, 1200 | FSK, DPSK | async. | half, full duplex | orig./auto. answer | analog, digital loopbacks; self test | 595 | Bell 103, 212 compatible |
| Datec 212AD | 300, 1200 | FSK, DPSK | async. | half, full duplex | auto. dial/ auto. answer | analog, digital loopbacks; self test | 695 | Bell 103, 212 compatible |
| Datec 212H | 300, 1200 | FSK, DPSK | async. | half, full duplex | auto. dial/ auto. answer | self test | 495 | Bell 103, 212 compatible |
| DatecPal 103 | 0–300 | FSK | async. | half, full duplex | auto. dial/ auto. answer | local digital, analog loopback; self test | 195 | Bell 103, 113, 212A compatible |
| DatecPal 212 | 0–300, 1200 | FSK, DPSK | async. | half, full duplex | auto. dial/ auto. answer | digital, analog loop-back; self test | 449 | Bell 103, 113, 212A compatible |
| DatecPal Plus | 0–300, 1200 | FSK, DPSK | async. | full duplex | auto. dial/ auto. answer | | 599 | expansion board modem plugs into IBM PC, XT; COMPAQ portable; Bell 103, 113, 212A compatible |
| **DEVELCON ELECTRONICS** | | | | | | | | |
| 2x212 | 300, 1200 | FSK, PSK | async. | full duplex | auto. dial/ auto. answer | local analog, remote digital loop-back; self test | 995 | Bell 212A, 103, compatible; stores phone numbers, battery backup |
| 6212 | 1200 | PSK | async./sync. | full duplex | auto. dial/ auto. answer | local analog loopback | 495 | Bell 212A compatible; dials from memory |
| 7212 | 300, 1200 | FSK, PSK | async./sync. | full duplex | auto. dial/ auto. answer | local analog, remote digital loop-back; self test | 575 | Bell 212A, 103 compatible |
| 8212 | 300, 1200 | FSK, PSK | async./sync. | full duplex | auto. dial/ auto. answer | local analog, remote digital loop-back; self test | 650 | Bell 212A, 103 compatible; dials from memory, battery backup |
| 9212 | 300, 1200 | PSK | async./sync. | full duplex | orig./auto. answer | local analog, remote digital loop-back; self test | 785 | Bell 212A, 103 compatible |
| **DIGITAL EQUIPMENT CORP.** | | | | | | | | |
| DF126 AA, AM | 2400 | | async./sync. | half duplex | auto. dial/ auto. answer | analog, digital loopbacks; self test | 895(AA); 745(AM) | Bell 201 B/C compatible; available in rackmount or standalone for same module |
| DF104 | 150, 2400 | | async. | | auto. dial | analog, digital loopbacks; self test | | recognizes 150 bps, send at 2400 |
| DF 129 AA, AM | 9600 | | sync. | full duplex | orig./answer | analog, digital loopbacks | 3,045(AA); 2,850(AM) | CCITT V.29 compatible; available in rackmount or standalone for same module |
| DF 112 AA, AM | 0–300, 1200 | | async. | full duplex | auto. dial/ auto. answer | analog, digital loopbacks; self test | 745(AA); 595(AM) | Bell 212 compatible; available in rackmount or standalone for same module |
| **ERICSSON INFORMATION SYSTEMS AB** | | | | | | | | |
| ZAT 2400-5 | 1200, 2400 | DPSK | sync. | half, full duplex | auto. answer | local digital, analog loopback; self test | 1,095 | CCITT V.26, V26 bis compatible; echo suppression disabler |
| ZAT 4800-5 | up to 4800 | DPSK | sync. | half, full duplex | auto. answer | analog, digital loop-back; self test | 1,795 | CCITT V.24, V.27, V.28 compatible; backward channel optional |
| **GANDALF DATA INC.** | | | | | | | | |
| SAM 201 | 1200, 2400 | DPSK | async./sync. | half, full duplex | orig./auto. answer | analog, digital loop-back; self test | 725 | CCITT V.26, Bell 201C compatible; rackmounted available |
| SAM 212A | 300, 1200 | FSK, DPSK | async./sync. | full duplex | auto. dial/ auto. answer | analog, digital loop-back; self test | 618 | Bell 212A, 103 compatible; stores 52 phone numbers, tone or pulse dialing |
| Super Modem II | 4800, 9600 | extended QAM | sync. | full duplex | orig./answer | analog, digital loop-back; self test | 2,800 | CCITT V.24, V.28 compatible; two call dial back-up, line analyzer |
| **GENERAL DATACOMM INDUSTRIES INC.** | | | | | | | | |
| DC 208 B/A | 4800 | DPSK | sync. | half duplex | orig./auto. answer | analog, digital loopback; self test | 1,695 | Bell 208 A/B compatible |
| DC 4800S | 4800 | DPSK | async./sync. | half duplex | auto. dial/ auto. answer | analog, digital loopback; self test | 1,645 | Bell 208 compatible; auto RTS/CTS |
| DC 20K-K | 1200, 1800, 2400 | DPSK | async./sync. | half duplex | orig./auto. answer | local digital, analog loopback; self test | 795 | Bell 201 compatible |

## VOICE GRADE DDD MODEMS

| Company Model | Data rate (bps) | Modulation method | Synchronization | Transmission mode | Calling modes | Diagnostic features | Unit price ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|---|
| DC 201C | 1200, 2400 | DPSK | sync. | half duplex | orig./auto. answer | local digital, analog loopback; self test | 935 | Bell 201 compatible; private line operation available |
| DC202S/T | 1200, 1800 | FSK | async. | half duplex | auto. dial/ auto. answer | local digital, analog loopback; self test | 445(Q1); 320(Q100) | Bell 202 S/T compatible; data commonality feature |
| DC212A | 300, 1200 | FSK | async./sync. | full duplex | orig./auto. answer | local digital, analog loopback; self test | 880(Q1); 713(Q100) | Bell 212A compatible |
| GDC 212ED | 300, 1200 | FSK | async./sync. | full duplex | auto. dial/ auto. answer | local digital, analog loopback; self test | 550 | Bell 212 compatible |
| GDC 212SS | 300, 1200 | FSK | async./sync. | full duplex | auto. dial/ auto. answer | local digital, analog loopback; self test | 435 | Bell 212 compatible; auto equalization |
| **HAYES MICROCOMPUTER PRODUCTS INC.** | | | | | | | | |
| Smartmodem 1200B | 0–300, 1200 | PSK | async. | full duplex | auto. dial/ auto. answer | local analog loopback | 599 | expansion-board modem plugs into IBM PC, XT; Corona portable PC, TI Professional; Bell 103, 212A compatible |
| Smartmodem 1200 | 0–300, 1200 | PSK | async. | full duplex | auto. dial/ auto. answer | local analog loopback | 699 | Bell 103, 212A compatible |
| **IBM** | | | | | | | | |
| 3863-2 | 1200, 2400 | DPSK | sync. | half duplex | orig./auto. answer | local digital, analog loopback; self test | 2,935(Q1); 2,201(Q100) | data quality indicator |
| 3864-2 | 2400, 4800 | DPSK | sync. | half duplex | orig./auto. answer | local digital, analog loopback; self test | 3,925(Q1); 2,944(Q100) | data quality indicator |
| **ICOT CORP.** | | | | | | | | |
| 103J | 300 | FSK | async. | full duplex | auto. dial/ auto. answer | analog, digital loopbacks; self test | | Bell 103, 113 compatible; utilizes CMOS logic circuitry |
| 208 A/B | 4800 | DPSK | sync. | half, full duplex | auto. answer | analog, digital loopbacks; self test | | Bell 208 A/B compatible; low power consumption |
| 212A | 0–300, 1200 | FSK, PSK | async./sync. | full duplex | auto. answer | analog, digital loopbacks; self test | | Bell 212A compatible |
| **INCOMM** | | | | | | | | |
| 212A | 300, 1200 | FSK, PSK | async. | half, full duplex | orig./auto. answer | local analog loopback; self test | 549 | Bell 212A compatible |
| A1200 | 1200 | PSK | async. | half, full duplex | orig./auto. answer | local analog loopback; self test | 499 | Bell 212 compatible |
| Oscom | 300, 1200 | FSK, PSK | async. | half, full duplex | auto. dial/ auto. answer | self test | 519 | built-in software for Osborne computers, velcro patch included for easy mounting |
| Starcom | 300, 1200 | FSK, PSK | async. | half, full duplex | auto. dial/ auto. answer | self test | 449 | Bell 212, Hayes compatible; velcro patch included for easy mounting |
| **INFINET INC. (Formerly Intertel)** | | | | | | | | |
| CM2020 | 1200 | FSK | async. | half duplex | orig./auto. answer | local analog loopback; self test | 250(Q1); 180(Q100) | Bell 202S compatible; low power requirements |
| M2400A | 2400 | PSK | sync. | half, full duplex | orig./auto. answer | local analog, digital loopback | 725 | Bell 201C compatible; leased line version available |
| NCM 14400 | 9600, 12K, 14.4K | QAM | sync. | half, full duplex | | local digital, analog loopback; self test | 7,650(Q1); 6,650(Q100) | CCITT V.29 compatible; internal "hot spare" modem |
| NCM 9600 | 4800, 7200, 9600 | QAM | sync. | half, full duplex | | local digital, analog loopback; self test | 4,450(Q1); 4,050(Q100) | CCITT V.29 compatible; internal spare fault tolerant modem, rack-mount available |
| SBC1200 | 1200 | FSK | async. | full duplex | | local analog loopback | 290(Q1); 230(Q100) | expansion-board modem plugs into Intel 80/10 Multibus; Bell 202T compatible |
| **INFORTRON SYSTEMS CORP.** | | | | | | | | |
| DL212B | 300, 1200 | FSK, PSK | async./sync. | full duplex | auto. answer | analog, digital loopback | | Bell 212A, 103 compatible |
| DMS/Triple | 300, 1200 | FSK, PSK | async./sync. | full duplex | auto. answer | analog, digital loopback | | Racal-Vadic VA3400, Bell 212A, 103 compatible |
| **INMAC–DATACOM DIVISION** | | | | | | | | |
| 8045 | 300 | FSK | async. | half, full duplex | orig./answer | self test | 179 | Bell 103 compatible |

## VOICE GRADE DDD MODEMS

| Company Model | Data rate (bps) | Modulation method | Synchronization | Transmission mode | Calling modes | Diagnostic features | Unit price ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|---|
| 8063 | 300 | FSK | async. | full duplex | auto. dial/ auto. answer | self-test | 149 | Bell 103 compatible |
| 8065 | 300 | FSK | async. | full duplex | orig./ answer | self test | 125 | Bell 103 compatible |
| 8070 | 1200 | FSK | async. | full duplex | orig./ answer | self-test | 445 | Bell 212 compatible |
| 8071 | 300, 1200 | FSK | async. | full duplex | auto. dial/ auto. answer | self-test | 595 | Bell 212A compatible |
| **INTEGRATED DESIGN ENGINEERING** | | | | | | | | |
| IDE-1200 | 1200 | FSK | async. | half, full duplex | orig./auto. answer | | 500 | expansion-board modem plugs into NCR personal computer |
| **INTERFACE TECHNOLOGY INC.** | | | | | | | | |
| DTMF | 10 | DTMF | async. | full duplex | auto. dial/ auto. answer | | 698 | Bell 403, 407 compatible |
| **KINEX CORP.** | | | | | | | | |
| 4800/27 | 2400, 4800 | DPSK | sync. | half, full duplex | orig./answer | analog, digital loopback | 2,225 | dial-up, leased line selection by front-panel switch |
| 4800/M | 2400, 4800 | DPSK | sync. | half, full duplex | | analog, digital loopback | 2,395 | 2x2400 multiplexer |
| 9600/29 | 4800, 7200, 9600 | QAM | sync. | half, full duplex | | analog, digital loopback | 2,750 | |
| 9600/DCM | 4800, 9600 | QAM | sync. | full duplex | | digital, analog loop-back; self test | 3,650 | opt. 2-call dual back-up |
| 4800/208AB | 4800 | DPSK | sync. | half, full duplex | | digital, analog loop-back; self test | 1,700 | Bell 208A/B compatible; opt. modular telephone set for switched service |
| 9600/M | 4800, 7200, 9600 | QAM | sync. | half, full duplex | | digital, analog loop-back; self test | 3,650 | built-in bit error test set, digital read out of line quality |
| **LEXICON CORP.** | | | | | | | | |
| LEX-15 | 1200 | FSK | async. | half duplex | orig./auto. answer | | 325 | Bell 202S compatible; acoustic coupler switchable to handset |
| **MICOM SYSTEMS INC.** | | | | | | | | |
| M3012 | 300, 1200 | FSK, DPSK | async./sync. | full duplex | orig./auto. answer | analog, digital loop-back; self test | 495(Q1); 396(Q100) | Bell 103, 212 compatible; rackmounted version holds up to 16 modems |
| M3012+ | 300, 1200 | FSK, DPSK | async./sync. | full duplex | auto. dial/ auto. answer | analog, digital loop-back; self test | 595(Q1); 476(Q100) | Bell 103, 212 compatible; 20 number auto-dial directory, rackmount available |
| M3012T | 300, 1200 | FSK, DPSK | async./sync. | full duplex | orig./auto. answer | analog, digital loop-back; self test | 695(Q1); 556(Q100) | Racal-Vadic 3400, Bell 103, 212 compatible; "triple" modem feature for central site applications |
| M3024 | 1200, 2400 | DPSK, QAM | async./sync. | full duplex | orig./auto. answer | analog, digital loop-back; self test | 795(Q1); 636(Q100) | CCITT V.22 bis, Bell 212 compatible; rackmounted version holds up to 16 modems |
| M3024+ | 1200, 1400 | DPSK, QAM | async./sync. | full duplex | orig./auto. answer | analog, digital loop-back; self test | 895(Q1); 716(Q100) | CCITT V.22 bis, Bell 212 compatible; 20 number auto-dial directory |
| **MICROCOM** | | | | | | | | |
| Era 2 | 0–300, 1200 | FSK, DPSK | async. | half, full duplex | auto. dial/ auto. answer | local analog loopback | 429 | expansion-board modem plugs into IBM PC, XT; Apple IIe, Bell 212A compatible |
| PCS/2000 | 0–300, 1200 | FSK, DPSK | async. | half, full duplex | auto. dial/ auto. answer | remote digital loopback | 995 | Bell 212A compatible |
| RX/1000 | 0–300, 1200 | DPSK | async. | half, full duplex | auto. dial/ auto. answer | remote digital loopback | 895 | Bell 212A compatible |
| **MICRO-BAUD SYSTEMS INC.** | | | | | | | | |
| MB80512 | 300, 1200 | FSK | | full duplex | auto. dial/ auto. answer | local analog loopback; self test | 430 | expansion-board modem plugs into CRT; Bell 102, 212A compatible; auto-redial up to 15 times |
| **MICROPLEX INC.** | | | | | | | | |
| Versacom 1200 | 0–1200 | FSK | async. | half, full duplex | orig./answer | local analog, digital loopback | 187 | Bell 202 compatible; weighs 2 oz, 2-inx2-inx.6-in |

## VOICE GRADE DDD MODEMS

| Company Model | Data rate (bps) | Modulation method | Synchronization | Transmission mode | Calling modes | Diagnostic features | Unit price ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|---|
| Versacom 212, 212A | 0–300, 1200 | DPSK | async. | half, full duplex | auto. dial/ auto. answer | analog, digital loop-back; self test | 319–439 | Bell 212, 212A compatible; weighs 2 oz, 2-inx2-inx.6-in |
| Versacom 300A | 0–300 | FSK | async. | full duplex | | | 119 | Bell 100 series compatible; weighs 2 oz, 2-inx2-inx.6-in |
| Versacom 300B | 0–300 | FSK | async. | full duplex | orig./auto. answer | | 159 | Bell 100 series compatible; weighs 2 oz, 2-inx2-inx.6-in |
| **MULTI-TECH SYSTEMS INC.** | | | | | | | | |
| MT212AD | 300, 1200 | FSK, PSK | async./sync. | half, full duplex | auto. dial/ auto. answer | analog, digital loopbacks | 695 | Bell 212A, 103J compatible; non-volatile phone number storage, continuous redial |
| MT212AH | 300, 1200 | FSK, PSK | async. | half, full duplex | auto. dial/ auto. answer | local analog loopback | 549 | Bell 212A, 103J compatible; non-volatile phone number storage |
| MT212C | 1200 | FSK, PSK | async./sync. | half, full duplex | auto. dial/ auto. answer | local analog loopback | 550 | Bell 212A compatible; runs on dial-up or leased lines |
| MT212HC | 300, 1200 | FSK, PSK | async. | half, full duplex | auto. dial/ auto. answer | local analog loopback | 549 | Bell 212A, 103J, Hayes compatible |
| MT212PC | 300, 1200 | FSK, PSK | async. | half, full duplex | auto. dial/ auto. answer | local analog loopback | 549 | expansion- board modem plugs into IBM PC, Bell 212A, 103J compatible, includes software |
| **NCR COMTEN INC.** | | | | | | | | |
| 7163 | | DPSK, QAM | sync. | half, full duplex | orig./auto. answer | local analog, remote digital loop-back; self test | 2,450 | IBM 3863, SNA compatible |
| 7164 | 4800 | DPSK, QAM | sync. | half, full duplex | orig./auto. answer | local analog, remote digital loop-back; self test | 3,700 | IBM 3863, SNA compatible |
| 7165 | 9600 | DPSK, QAM | sync. | full duplex | orig./auto. answer | local analog, remote digital loopback; self test | 5,800 | IBM 3863, SNA compatible |
| **NCR CORP.** | | | | | | | | |
| NCR 7120 | 1800 | FSK | async. | half, full duplex | auto. dial/ auto. answer | local analog loopback; self test | 735(Q1); 521(Q100) | Bell 202C/S/T compatible; soft carrier tone option |
| NCR 7121 | 2400 | DPSK | sync. | half, full duplex | auto. dial/ auto. answer | local analog loopback; self test | 1,315(Q1); 907(Q100) | Bell 201C compatible; variable delay option |
| **NEC AMERICA INC.** | | | | | | | | |
| 201CR-LID | 2400 | DPSK | sync. | half duplex | | local analog, remote digital loop-back; self test | 845(Q1); 550(Q100) | Bell 201C compatible |
| 212AR | 300, 1200 | PSK | async./sync. | full duplex | orig. auto. answer | local analog, remote digital loop-back; self test | 695(Q1); 390(Q100) | Bell 212A compatible |
| 212BR | 300, 1200 | PSK | async./sync. | full duplex | auto. dial/ auto. answer | local analog, remote digital loop-back; self test | 795(Q1); 680(Q100) | Bell 212A compatible |
| 224 | 300, 1200, 2400 | QAM | async./sync. | full duplex | auto. dial/ auto. answer | local analog, remote digital loop-back; self test | 1,195(Q1); 680(Q100) | CCITT V.22 compatible |
| DSP 4800 | 4800 | DPSK | sync. | half, full duplex | | analog, digital loop-back; self test | 1,695(Q1); 1,070(Q100) | CCITT V.27 compatible |
| DSP 9600 | 9600 | QAM | sync. | half, full duplex | | analog, digital loop-back; self test | 2,695(Q1); 1,695(Q100) | CCITT V.29 compatible; built-in 6 channel multiplexer |
| DSP208A/B | 4800 | DPSK | sync. | half duplex | auto. dial/ auto. answer | local analog, digital loopback; self test | 1,750(Q1); 1,055(Q100) | Bell 208A/B compatible |
| N201CR | 2400 | DPSK | sync. | half duplex | auto. dial/ auto. answer | local analog, remote digital loop-back; self test | 895(Q1); 560(Q100) | Bell 201C/R compatible |
| **NORTHERN TELECOM INC.** | | | | | | | | |
| 2230 | 300, 1200 | FSK, PSK | async./sync. | full duplex | orig./auto. answer | analog, digital loopbacks; self-test | | Bell 103, 113, 212A compatible; microprocessor based |
| 2240 | 2400 | DPSK | sync. | half duplex | orig./auto. answer | self test | | Bell 201C compatible |
| 2250 | 4800 | QAM | | full duplex | orig./auto answer | local analog, digital loopbacks; self-test | | simplified CMOS, multiple strapping capabilities, Bell 208 A/B compatible |
| 2260 | 9600 | QAM | | full duplex | | analog, digital loopbacks; self test | | |

## VOICE GRADE DDD MODEMS

| Company Model | Data rate (bps) | Modulation method | Synchronization | Transmission mode | Calling modes | Diagnostic features | Unit price ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|---|
| **NOVATION INC.** | | | | | | | | |
| 103/212 Smart-Cat | 300, 1200 | FSK,PSK | async. | full duplex | auto. dial/ auto. answer | analog, digital loop-back; self test | 595(Q1); 428(Q100) | Bell 103, 113, 212A compatible; soft-ware command set |
| 212 Apple-Cat | 0–300, 1200 | FSK,PSK | async. | half, full duplex | auto. dial/ auto. answer | analog, digital loop-back; self test | 389(Q1); 292 (Q100) | expansion-board modem plugs into Apple II, II+, IIe; Bell 103, 113, 212A compatible |
| 212 Auto-Cat | 0–300, 1200 | FSK,PSK | async./sync. | half, full duplex | auto. dial/ auto. answer | analog, digital loop-back; self test | 695(Q1); 521(Q100) | Bell 103, 113, 212A compatible |
| Access 1-2-3 | 300, 1200 | FSK,PSK | async. | full duplex | auto. dial/ auto. answer | analog, digital loop-back; self test | 595(Q1); 428(Q100) | expansion-board modem plugs into IBM PC, XT and compatibles; Bell 103, 113, 212A compatible |
| **PARADYNE** | | | | | | | | |
| LSI-24C | 1200, 2400 | DPSK | sync. | half, full duplex | auto. answer | local analog, remote digital loopback | 1,200 | Bell 201C compatible; standalone or nest mounted |
| **PENRIL/DATA COMM** | | | | | | | | |
| 2127 | | PSK | sync. | half, full duplex | auto. dial/ auto. answer | local analog loopback; self test | 1,695 | CCITT compatible; dial backup |
| 2129 | | QAM | sync. | full duplex | orig./answer | local analog loopback; self test | 2,495 | CCITT compatible; dial backup |
| 300/1200 | | FSK, PSK | async./sync. | full duplex | orig./auto answer | analog, digital loop-back; self test | 650 | Bell 212A compatible |
| 300/1200AD | | FSK, PSK | async./sync. | full duplex | auto. dial/ auto. answer | analog, digital loop-back; self test | 750 | Bell 212A compatible; security access optional |
| 8201DN | | PSK | sync. | half duplex | orig./answer | local analog loopback; self test | 795 | Bell 201 compatible |
| 8208A/B | | PSK | sync. | half duplex | orig./auto. answer | local analog loopback; self test | 1,750 | Bell 208 A/B compatible |
| **PRENTICE CORP.** | | | | | | | | |
| 212 TCM | 0–300, 1200 | FSK, DPSK | async. | half, full duplex | auto. dial/ auto. answer | analog, digital loop-back; self test | 795 | Bell 212A compatible |
| 9600A/B | 9600 | QAM | sync. | half duplex | orig./auto. answer | analog, digital loop-back; self test | 2,995 | Bell CCITT V.29 compatible |
| P-201C | 2400 | DPSK | sync. | half duplex | orig./auto. answer | analog, digital loop-back; self test | 795 | Bell 201 B/C compatible |
| P-208A/B | 4800 | DPSK | sync. | half duplex | orig./auto. answer | analog, digital loop-back; self test | 1,750 | Bell 208 A/B compatible |
| P-212 | 0–300, 1200 | FSK, DPSK | async./sync. | half, full duplex | orig./auto. answer | analog, digital loop-back; self test | 595 | Bell 212A compatible |
| P-V.22 | | DPSK | async./sync. | half, full duplex | orig./auto. answer | analog, digital loop-back; self test | 795 | CCITT V.22 compatible |
| Trimodem | 0–300, 1200 | FSK, DPSK | async./sync. | half, full duplex | auto. answer | analog, digital loop-back; self test | 850 | Bell 212A compatible |
| **RACAL-MILGO INC.** | | | | | | | | |
| 24 LST Mark II Dial | 2400 | FSK | sync. | half duplex | orig./auto. answer | local digital, analog loopback; self test | | line level/signal quality, status indicators |
| MDS 48 Dial | | DPSK | sync. | half duplex | orig./auto. answer | self test | | |
| **RACAL-VADIC** | | | | | | | | |
| V1 1222 | 1200 | QAM | async./sync. | full duplex | orig./auto. answer | analog, digital loop-back; self test | | |
| V1 1223L | 1200 | FSK | async./sync. | half, full duplex | | | | |
| V1 1223S | 1200 | FSK | async./sync. | half duplex | | | | |
| V1 3400 | 1200 | DPSK | async./sync. | full duplex | | analog, digital loop-back; self test | | |
| VA 1244/45 | 1200 | FSK | async. | half duplex | | analog, digital loop-back; self test | | rackmounted |
| VA 1250/55 | 0–1200 | FSK | async. | half duplex | orig./answer | analog loopback | | Bell 202 C/S compatible |
| VA 1251/52 | 0–1800 | FSK | async. | half, full duplex | | analog, digital loopback | | Bell 202 D/R/T compatible |
| VA 2440/45 | 1200, 2400 | DPSK | sync. | half duplex | orig./auto. answer | analog loopback | | Bell 201 B/C compatible; rackmounted |

## VOICE GRADE DDD MODEMS

| Company Model | Data rate (bps) | Modulation method | Synchronization | Transmission mode | Calling modes | Diagnostic features | Unit price ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|---|
| VA 2450 | 2400 | FSK, DPSK | sync. | half, full duplex | orig./auto. answer | local analog, digital loopback; self test | | Bell 201 B/C, 201 C/LIC compatible |
| VA 4400 | 300, 1200, 2400 | FSK, QAM | async./sync. | half, full duplex | auto. dial/ auto. answer | analog, digital loop-back; self test; TXR; RTRT | | CCITT V.22 bis, Racal-Vadic 3400, Bell 212A, 103 compatible |
| VA 4840 | 4800 | DPSK | sync. | half, full duplex | auto. dial/ auto. answer | analog, digital loop-back; self test | | rackmounted |
| VA212LC | | FSK, DPSK, QAM | async. | half duplex | orig./auto. answer | remote digital loop-back; self test | | Bell 212, 103 compatible |
| VA212PAR | | FSK, DPSK, QAM | async./sync. | full duplex | auto. dial/ auto. answer | local analog, digital loopback; self test | | Bell 212A, 103 compatible |
| VA2430 G/K | 2400 | DPSK | sync. | half, full duplex | | analog, digital loopback | | Bell 201 B/C compatible; rackmounted |
| VA3455 | 1200 | DPSK, QAM | async./sync. | full duplex | orig./auto. answer | analog, digital loopback | | |
| VA3413 | 300, 1200 | FSK, QAM | async./sync. | full duplex | originate | local analog, digital loopback; RTRT | | Racal-Vadic 3400, Bell 103, 113 compatible |
| VA3467 | 1200 | FSK, DPSK | async./sync. | full duplex | auto. answer | analog, digital loop-back; self test | | rackmounted |
| VA3481 | 1200 | FSK, DPSK | async./sync. | full duplex | orig./auto. answer | analog, digital loopback | | Bell 103, 113, 212A compatible; rackmounted |
| **RADIO SHACK** | | | | | | | | |
| DC-1200 76-1005 | 300, 1200 | FSK,PSK | async./sync. | half, full duplex | orig./auto. answer | | 699 | |
| **RIXON INC.** | | | | | | | | |
| PC 212A | 300, 1200 | FSK,PSK | async. | full duplex | auto. dial/ auto. answer | local analog loopback | 499 | expansion-board modem plugs into IBM PC; Bell 212, 103 compatible; stores 10 phone numbers |
| R212A Intelligent | 200, 1200 | FSK,PSK | async. | full duplex | auto. dial/ auto. answer | local analog, remote digital loopback | 499 | Bell 212A, 103 compatible; stores 10 phone numbers |
| R2424 | 1200, 2400 | PSK, QAM | sync. | full duplex | orig./auto. answer | local analog, remote digital loopback; self test | 1,295 | Bell 212A compatible; international applications |
| **ROCKWELL INTERNATIONAL** | | | | | | | | |
| R1212DC | 300, 1200 | FSK, DPSK | async./sync. | full duplex | auto. dial/ auto. answer | local analog, remote digital loopback | 250 | CCITT V.22 A/B, Bell 103, 202 compatible |
| R1212M | 300, 1200 | FSK, DPSK | async./sync. | full duplex | auto. dial/ auto. answer | local analog, remote digital loopback | 220 | CCITT V.22 A/B, Bell 103, 202 compatible |
| R2424M | 300, 600, 1200, 2400 | FSK, DPSK, QAM | async./sync. | full duplex | auto. dial/ auto. answer | local, remote digital loopback | 295 | CCITT V.22 bis, V.22 A/B, Bell 212, 103 compatible |
| R24DC | 1200, 1400 | DPSK | sync. | half duplex | orig./auto. answer | local analog loopback | 450 | CCITT V.26 bis, Bell 201 B/C compatible |
| R48DP | 2400, 4800 | DPSK | sync. | half, full duplex | | analog, digital loopback | 310 | CCITT V.27 bis/ter, Bell 208 A/B compatible |
| R96DD | 2400, 4800, 7200, 9600 | DPSK QAM | sync. | half, full duplex | | analog, digital loopback | 495 | CCITT V.29, V.27 bis/ter compatible |
| R96FAX | 300–9600 | FSK, DPSK, QAM | sync. | half duplex | | | 310 | CCITT V.29, V.27 compatible |
| R2424DC | 300, 600, 1200, 2400 | FSK, DPSK, QAM | async./sync. | full duplex | auto. dial/ auto. answer | local analog, remote digital loopback; self test | 325 | CCITT V.22 bis, V.22 A/B, Bell 212, 103 compatible |
| **SCIENTIFIC LABS** | | | | | | | | |
| Versacom 300B | 0–300 | FSK | async. | full duplex | orig./answer | | 159 | Bell 100 series compatible; weighs 2 oz.; 2-inx2-inx.6-in |
| Versacom 1200 | 0–1200 | FSK | async. | half, full duplex | orig./answer | local digital, analog loopback | 187 | Bell 202 compatible; weighs 2 oz.; 2-inx2-inx.6-in |

## VOICE GRADE DDD MODEMS

| Company Model | Data rate (bps) | Modulation method | Synchronization | Transmission mode | Calling modes | Diagnostic features | Unit price ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|---|
| Versacom 212, 212A | 0–300, 1200 | DPSK | async./sync. | half, full duplex | auto. dial/ auto. answer | analog, digital loop-back; self test | 319–439 | Bell 212 compatible; weighs 2 oz.; 2-inx2-inx.6-in |
| Versacom 300A | 0–300 | FSK | async. | full duplex | originate | | 119 | Bell 103, 113A compatible; weighs 2 oz.; 2-inx2-inx.6-in |
| **SPERRY COMPUTER SYSTEMS** | | | | | | | | |
| 8610 DCM | 9600 | FSK | async./sync. | half, full duplex | orig./answer | local digital loopback; self test | 852 | extended distance modem, up to 15,000 feet at 2400 baud |
| **TECMAR INC.** | | | | | | | | |
| Modem 1200 | 0–300, 1200 | FSK, PSK | async. | full duplex | auto. dial/ auto. answer | local digital loopback; self test | | expansion-board modem plugs into IBM PC and compatibles; Bell 103A compatible |
| Modem 300 | 0–300 | FSK | async. | full duplex | auto. dial/ auto. answer | local analog, digital loopback; self test | | expansion-board modem plugs into IBM PC and compatibles; full terminal software |
| **TIMECOR** | | | | | | | | |
| The Operator | 110, 300 | FSK | async. | half, full duplex | orig./auto. answer | | 159 | Bell 103 compatible |
| **TIMEPLEX INC.** | | | | | | | | |
| Timeplex 103 C/D | 300 | FSK | async. | half, full duplex | auto. dial/ auto. answer | analog, digital loop-back; self test | 335 | Bell 103, 113 compatible; rack-mounted version available |
| Timeplex 202 C/D | 1800 | FSK | async. | half, full duplex | auto. dial/ auto. answer | analog, digital loop-back; self test | 325 | Bell 202 series compatible; 5 baud reverse channel option |
| Timeplex R103 | 300 | FSK | async. | half, full duplex | auto. dial/ auto. answer | analog, digital loop-back; self test | 315 | Bell 103, 113 compatible; rack-mounted version available |
| Timeplex R202 Modem | 1200 | FSK | async. | half duplex | auto. dial/ auto. answer | analog, digital loop-back; self test | 360 | Bell 202 series compatible; synchronous operation available |
| **TRANSEND CORP.** | | | | | | | | |
| AMC 300 | 110, 300 | FSK | async. | half, full duplex | auto. dial/ auto. answer | local analog loopback | 325 | expansion-board modem plugs into Apple; Bell 103, Hayes Micromodem compatible |
| MDM 1200 | 0–300, 1200 | FSK, DPSK | async. | full duplex | auto. dial/ auto. answer | local analog loopback | 695 | Bell 103, 212A compatible; touch tone and pulse dialing |
| PCM 1200 | 0–300, 1200 | FSK | async. | full duplex | auto. dial/ auto. answer | local analog loopback; remote digital loopback | 549 | expansion-board modem plugs into IBM PC; Bell 103, 212A, Hayes compatible |
| **TRI DATA** | | | | | | | | |
| Oz Guardian 1200 | 1200 | FSK, PSK | async. | full duplex | auto. dial/ auto. answer | analog, digital loop-back; self test | 750 | Bell 103, 103J, 212A compatible; security application |
| Tri-net modem | up to 300 | FSK | async. | half, full duplex | auto. dial/ auto. answer | self test | 1,480 | Bell 103, TWX, Telex compatible; 16K byte battery protected data storage |
| **TYMSHARE INC.** | | | | | | | | |
| 912 | 0–300, 1200 | FSK, PSK | async. | full duplex | | analog, digital loopbacks; self test | 695 | Bell 212A compatible; used on TYMNET |
| 921 | 300, 1200 | FSK, PSK | async. | full duplex | orig./auto. answer | analog, digital loopbacks; self test | 449 | Bell 212A compatible; used on TYMNET |
| 923 | 300, 1200 | FSK, PSK | async. | full duplex | orig./auto. answer | analog, digital loopbacks; self test | 495 | Bell 212A compatible; used on TYMNET |
| 925 | 300, 1200 | FSK, PSK | async. | full duplex | orig./auto. answer | analog, digital loopbacks; self test | 625 | Bell 212A compatible; used on TYMNET |
| **U.S. ROBOTICS INC.** | | | | | | | | |
| Password | 300, 1200 | PSK | async. | full duplex | auto. dial/ auto. answer | | 449(Q1); 297(Q100) | Bell 103, 113, 212A, Hayes compatible; velcro patch included, 2-year warranty |
| Auto Dial 212A | 300, 1200 | FSK, PSK | async. | full duplex | auto. dial/ auto. answer | local analog loopback; self test | 599(Q1); 396(Q100) | Bell 103, 113, 212A, Hayes compatible; 2-year warranty |
| Microlink 1200 | 1200 | PSK | async. | full duplex | orig./answer | local analog loopback; self test | 499(Q1); 297(Q100) | Bell 212A compatible; 2-year warranty |
| Password 300 | 300, 1200 | FSK | async. | full duplex | auto. dial/ auto. answer | | 189(Q1); 125(Q100) | Bell 103, 113, Hayes compatible; velcro patch included, 2-year warranty |
| S-100 Modem | 300, 1200 | FSK, PSK | async. | full duplex | auto. dial/ auto. answer | | 449(Q1); 297(Q100) | expansion-board modem plugs into S-100 bus; Bell 103, 113, 212A, Hayes compatible |

## VOICE GRADE DDD MODEMS

| Company Model | Data rate (bps) | Modulation method | Synchronization | Transmission mode | Calling modes | Diagnostic features | Unit price ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|---|
| USR PC Modem | 300, 1200 | FSK,PSK | async. | full duplex | auto. dial/ auto. answer | | 449(Q1); 297(Q100) | expansion-board modem plugs into IBM PC, XT; Bell 103, 113, 212A, Hayes compatible |
| **UNIVERSAL DATA SYSTEMS** | | | | | | | | |
| 103 LP O/A | 0–300 | FSK | async. | full duplex | orig./answer | | 145 | Bell 103, 113 compatible; rackmounted version available |
| 103J | 0–300 | FSK | async. | full duplex | orig./auto. answer | local analog, remote digital | 425 | Bell 103, 113 compatible; rackmounted version available |
| 108 | 0–300 | FSK | async. | half, full duplex | orig./answer | local analog, digital loopback; self test | 295 | Bell 103 private line compatible |
| 201B | 2400 | PSK | sync. | full duplex | | local analog, remote digital loopback | 695 | Bell 201B compatible; rackmounted version available |
| 201C | 2400 | PSK | sync. | half, full duplex | auto. answer | local analog loopback; self test | 775 | Bell 201 compatible; rackmounted version available |
| 202 LP | 0–1200 | FSK | async. | half, full duplex | | | 195 | Bell 202 compatible; rackmounted version available |
| 202 S/SS | 0–1200 | FSK | async./sync. | half, full duplex | auto. answer | local analog loopback; self test | 550 | Bell 202 series compatible; rackmounted version available, integral test pattern generator |
| 202S LP | 0–1200 | FSK | async. | half duplex | auto. answer | | 245 | Bell 202 compatible; rackmounted version available |
| 202T | 0–1800 | FSK | async. | half, full duplex | | analog, digital loopback; self test | 425 | Bell 202 series compatible; rackmounted version available |
| 208 A/B | 4800 | | sync. | half, full duplex | auto. answer | analog, digital loopback; self test | 1,750 | Bell 208 compatible; rackmounted version available |
| 212 A/D | 0–300, 1200 | FSK, PSK | async./sync. | full duplex | auto. dial/ auto. answer | analog, digital loopback; self test | 645 | Bell 103, 113, 212 compatible; stores 5 phone numbers, rackmounted version available |
| 212 LP | 1200 | PSK | async. | full duplex | orig./answer | | 445 | Bell 212A compatible |
| 212A | 0–300, 1200 | FSK,PSK | async./sync. | full duplex | auto. answer | analog, digital loopback; self test | 595 | Bell 103, 113, 212 compatible; rackmounted version available, 11 strapping options |
| 9600 | 4800, 7200, 9600 | QAM | sync. | full duplex | | analog, digital loopback; self test | 2,650 | CCITT V.24 compatible; rackmounted version available, compact size |
| 9600 A/B | 4800, 7200, 9600 | QAM | sync. | half, full duplex | auto. answer | local analog, digital loopback; self test | 2,650 | CCITT V.29, UDS 9600 A/B compatible; rackmounted version available |
| 103J LP | 0–300 | FSK | async. | full duplex | orig./auto. answer | | 195 | Bell 103, 113 compatible; rackmounted version available |
| 202S | 0–1200 | FSK | async./sync. | half, full duplex | auto. answer | local analog loopback; self test | 475 | Bell 202 series compatible; rackmounted version available, satellite delay option |
| **VEN-TEL INC.** | | | | | | | | |
| 1200-Plus | 300, 1200 | FSK,PSK | async./sync. | full duplex | auto. dial/ auto. answer | | 499(Q1); 370(Q100) | Bell 212A, 103, 113 compatible; Hayes Smart Modem dialing protected |
| MD103J | 0–300 | FSK | async. | full duplex | orig./auto. answer | local analog, digital loopback | 315(Q1); 329(Q100) | Bell 103J, 212A compatible; rackmounted card available |
| MD103J Plus | 0–300 | FSK | async. | full duplex | auto. dial/ auto. answer | local analog, digital loopback | 415(Q1); 314(Q100) | Bell 103J, 212A compatible; help commands, rackmounted card available |
| MD201-2E | 2400 | DPSK | sync. | half duplex | orig./auto. answer | local analog, remote digital loopback; self test | 800(Q1); 600(Q100) | Bell 201C compatible; rackmounted card available |
| MD202-2E | 1200 | FSK | async. | half duplex | orig./auto. answer | local analog, remote digital loopback | 380(Q1); 285(Q100) | Bell 202S compatible; rackmounted card available |
| MD212-1E | 300, 1200 | FSK,PSK | async./sync. | full duplex | orig./auto. answer | analog, digital loopback; self-test | 445(Q1); 330(Q100) | Bell 212A, 103, 113 compatible; rackmounted card available |
| MD212-3E | 300, 1200 | FSK,PSK | async./sync. | full duplex | auto. dial/ auto. answer | analog, digital loopback; self test | 495(Q1); 365(Q100) | Bell 212A, 103, 113 compatible; battery supported memory; dials stored phone numbers |

## VOICE GRADE DDD MODEMS

DDD modems

| Company Model | Data rate (bps) | Modulation method | Synchronization | Transmission mode | Calling modes | Diagnostic features | Unit price ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|---|
| MD212-5E | 300, 1200 | FSK,PSK | async./sync. | full duplex | auto. dial/ auto. answer | analog, digital loop-back; self test | 625(Q1); 465(Q100) | Bell 212A, 103, 113 compatible; programmable; rackmounted card available |
| MD212-7E | 300, 1200 | FSK,PSK | async./sync. | full duplex | auto. dial/ auto. answer | analog, digital loop-back; self test | 675(Q1); 515(Q100) | Bell 212A, 103, 113 compatible; security features; rackmounted card available |
| PCM-1202 | 300, 1200 | FSK,PSK | async. | full duplex | auto. dial/ auto. answer | | 499(Q1); 370(Q100) | expansion-board modem plugs into IBM PC and compatibles; Bell 103, 113, 212A compatible |
| PCM-H150P | 300, 1200 | FSK,PSK | async. | full duplex | auto. dial/ auto. answer | | 425(Q1); 315(Q100) | expansion-board modem plugs into HP-150; 212A, 103, 113 compatible |
| PCM-XT | 300, 1200 | FSK,PSK | async. | full duplex | auto. dial/ auto. answer | | 549(Q1); 410(Q100) | expansion-board modem plugs into IBM PC, XT; Bell 212A, 103, 113 compatible |
| **VISIONARY ELECTRONICS** | | | | | | | | |
| Visionary 1200 | | PSK | async. | half, full duplex | auto. dial/ auto. answer | | 795 | Bell 212A compatible; clock/ calendar; includes software |
| **WESTERN DATA COM** | | | | | | | | |
| 212 Autodial | 0–300, 1200 | FSK, DPSK | async./sync. | full duplex | auto. dial/ auto. answer | local analog, digital loopback | 625 | Bell 212A, 103 compatible; rackmounted |
| Worldcom 200 | 0–300, 1200 | FSK | async. | half, full duplex | auto. dial/ auto. answer | local analog, digital loopback | 595 | CCITT V.21, Bell 103, 212 compatible; tone and pulse dialing |
| **WOLFDATA INC.** | | | | | | | | |
| WD212 | 300, 1200 | FSK,PSK | async. | full duplex | orig./answer | local analog loopback | 125 | Bell 212 compatible |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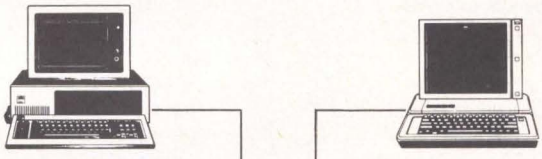


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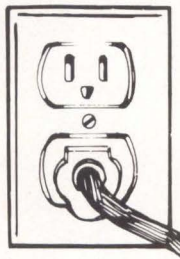

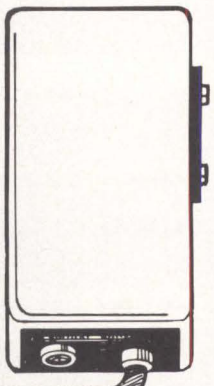

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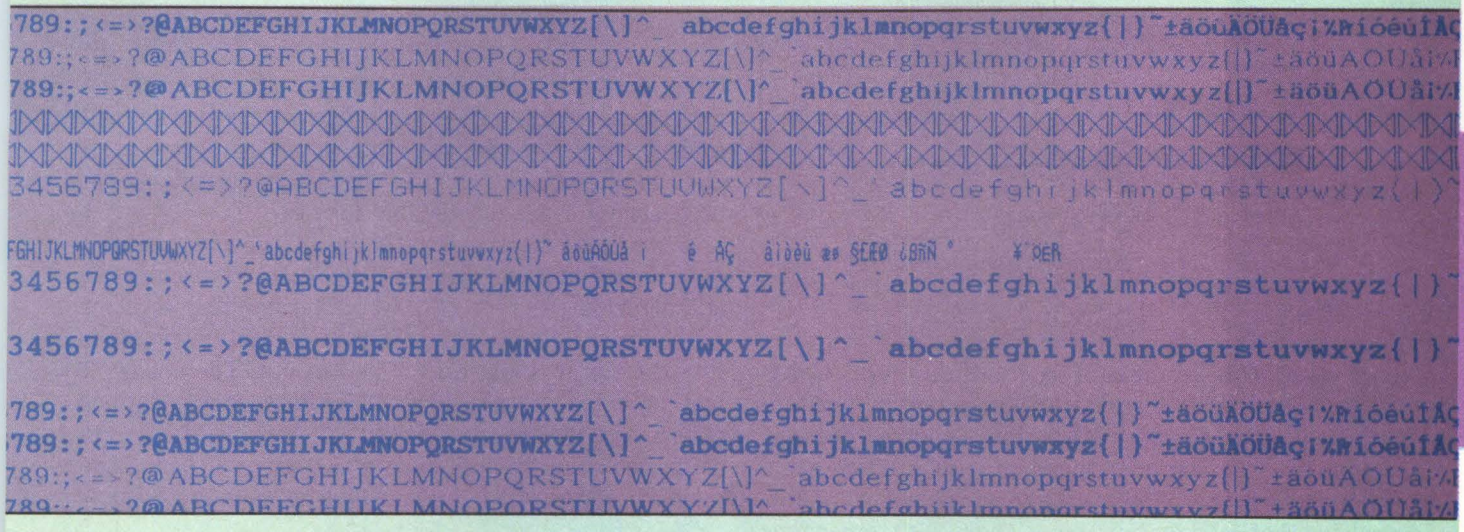
CIRCLE NO. 54 ON INQUIRY CARD

# New non-impact printers may shake up stable printer market

*Growth in non-impact printer market shares will be evolutionary rather than revolutionary*





**Edward S. Foster,** Associate Editor

A host of market opportunities that could spawn evolutionary growth in laser, ink-jet, thermal, thermal-transfer and other non-impact printer sales is appearing in the wake of rapid changes in the computer system industry.

One example is Hewlett-Packard Co., which offers low-end microcomputers. With the recent introduction of the HP Thinkjet ink-jet printer series, HP is positioning itself to become a low-end printer supplier. Even before the product was announced, HP lowered the price of the Thinkjet from less than $600 to $495 (MMS, March, Page 36).

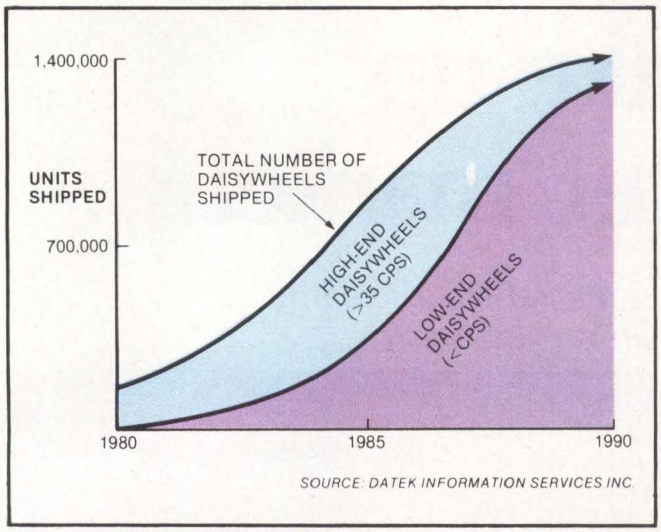
Plagued by premature expectations in the past, ink-jet printing is finally showing signs of challenging impact printers with the help of HP's introduction. The Thinkjet has a disposable print head and ink supply. It is targeted at the serial matrix market, according to Norbert Gotner, business development manager for HP's personal printer operation. By producing an 11-by-12-matrix character at 150 characters per second (cps) for a list price of $495, HP will "gain a significant proportion of the personal computer market for printers," Gotner says. Those who assume that non-impact printers are not going to make their mark until the 1990s, he warns, are in for a surprise this year.

### Impact printers bottom out

Non-impact printers are causing impact printers to hit their bottom price level, says Craig Ringuette, merchandising manager for Okidata Corp., Mount Laurel, N.J. "The real low-end printers, $200 or less, are not going to use impact technology," he concedes. "In my opinion, thermal and thermal-transfer devices are going to be the low-cost printers." IBM Corp.'s introduction of a thermal printer priced at $175 for use with the PCjr has convinced many that thermal printing is on the road to acceptance in the United States, at least in the home computer market.

"Thermal technology is going to produce the $99 printer," agrees Peter Steiner, director of the Electronic Printer Industry Service for market research company Dataquest Inc., San Jose, Calif. Japanese developments with dye-based thermal papers, Steiner believes, will remove many of the problems of carbon-based thermal papers. He expects a second low-end price point of around $150 for thermal printers that can use thermal-transfer ribbons for plain-paper printing.

"Our study indicates that fewer than 5 percent of the home computers that have been sold have a printer," says William Sobieski, vice president of consumer




**Annual daisy-wheel printer shipments** *are starting to be adversely affected by new-technology printers, led by near-letter quality impact matrix units. These technologies, including ink-jet and non-impact page printers, are influencing the high-end daisy wheels more significantly than they are the low-end daisy wheels.*



marketing for Alphacom Inc., Campbell, Calif. Alphacom produces 40- and 80-column thermal printers with dedicated interface cables for a number of home computers. "If you say there are 10 million home computers out there, and you look at the software now available that calls for hard copy, there is a tremendous market, even without considering new sales of home computers," he says.

### Line printers come under fire from non-impacts

The market segment for line printers, particularly fully formed character technologies such as band and chain/train, is the one most frequently cited as ripe for encroachment from non-impact offerings. "It is a very mature market," says John Harker, senior vice president of marketing and corporate development for Dataproducts Corp., Woodland Hills, Calif. "There is going to be encroachment—from the high-speed serial matrix printers, from low-speed line matrix printers as well as non-impact devices. Over the next five years, though, we still see our line printer business growing." Such growth will lag behind that of other segments of the printer market, particularly in revenues, Harker admits.

Harker does not expect many technological innovations in fully formed character line printers, but he does not rule out the possibility of a new generation of line printers. "Line printers with fewer parts, more intelligence and better print quality are going to be needed, and we are going to continue to drive costs down and increase reliability with designs better-suited to automated assembly," he states. Printers in the 600-line-per-minute (lpm) range are becoming increasingly critical low-end anchors for Dataproducts and other manufacturers, as other technologies erode the market for 300-lpm devices.

### Dot-matrix line printers are on the rise

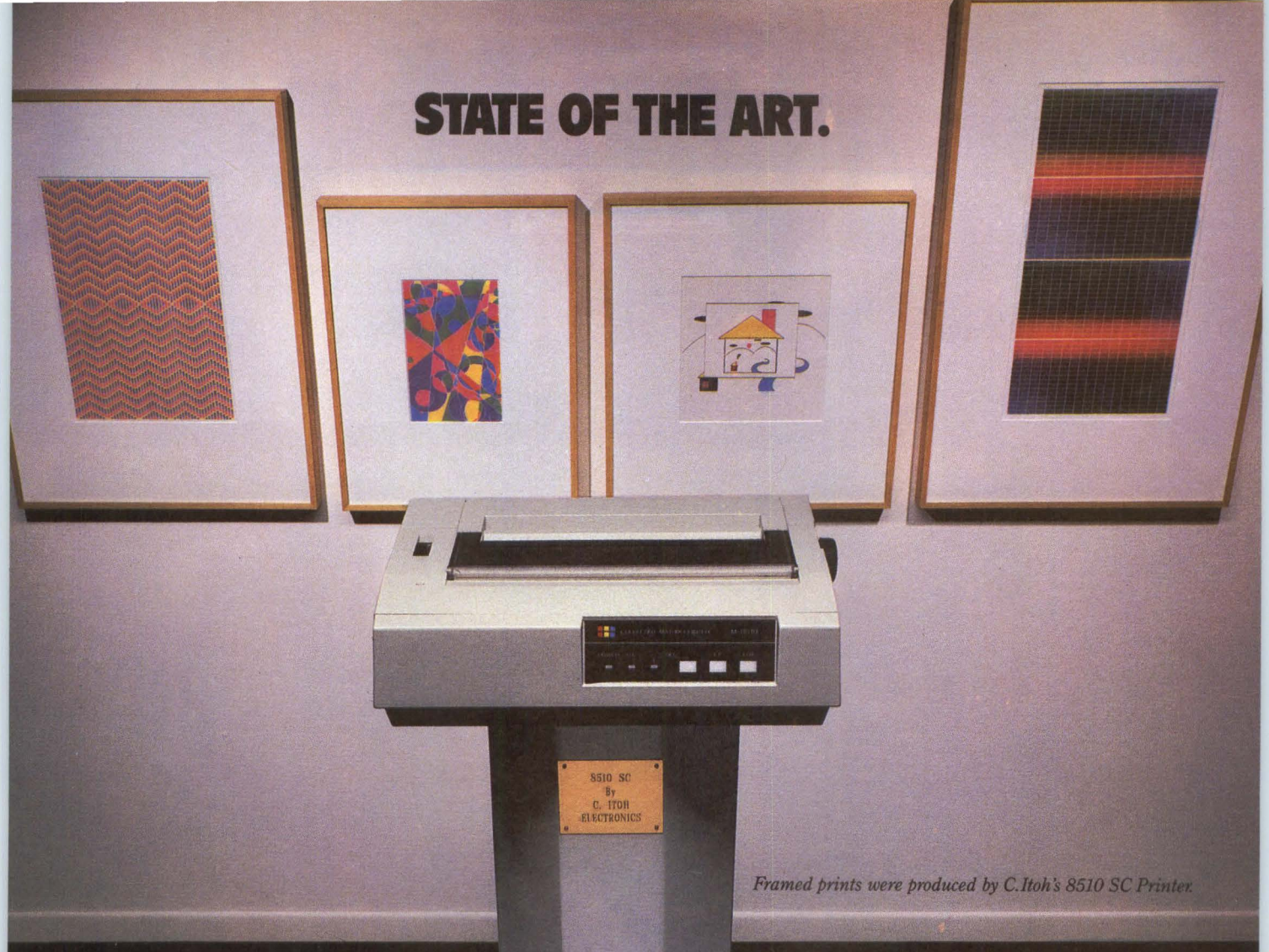
Harker and others predict dot-matrix line printing will find increasing acceptance for certain applications. "The matrix segment of the overall line printer market is going to grow faster," agrees David Mayne, senior vice president for corporate development at Printronix Inc., Irvine, Calif. "It still represents a relatively young technology, the full potential of which has not been exploited." Mayne adds that Printronix, the traditional leader in the matrix line printer market and a band printer vendor since its acquisition last year of Data Printer Corp., expects the line printer market to be healthy for the foreseeable future.

Mayne expects the fine-tuning of current products and the introduction of more fully featured machines to characterize the rest of 1984. "The addition of more sophisticated electronics and front-end intelligence...is just the tip of the iceberg," he asserts. The ability of matrix line printers to do graphics for such applications as forms generation, bar codes, computer-aided design/computer-aided manufacturing and others is one of the main strengths of the technology, he says.

*Plagued by premature expections in the past, ink-jet printing is finally showing signs of challenging impact printers.*

Harker and Mayne note that their companies do not doubt the possibility that non-impact technologies will play a significant—or even predominant—role in the printer business. And both are betting on sooner-than-anticipated sales growth for new technologies. Southern Systems Inc., Fort Lauderdale, Fla., an established supplier of line printers to data-processing end users, last year began shipping the 60-page-per-minute Mercurion ion-deposition printer with a Delphax Systems Inc. engine. Southern Systems president Joseph Horn says selling the non-impact device to established line printer users was a much slower process than the company anticipated. "Once they make the decision to try it, however, we're finding our customers don't want to go back to impact printing." Southern Systems installed about 75 Mercurions last year at an average price of nearly $70,000 each.

# STATE OF THE ART.




*Framed prints were produced by C.Itoh's 8510 SC Printer.*

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Shown are 8510B/1550B, 8510SC and 1550S.

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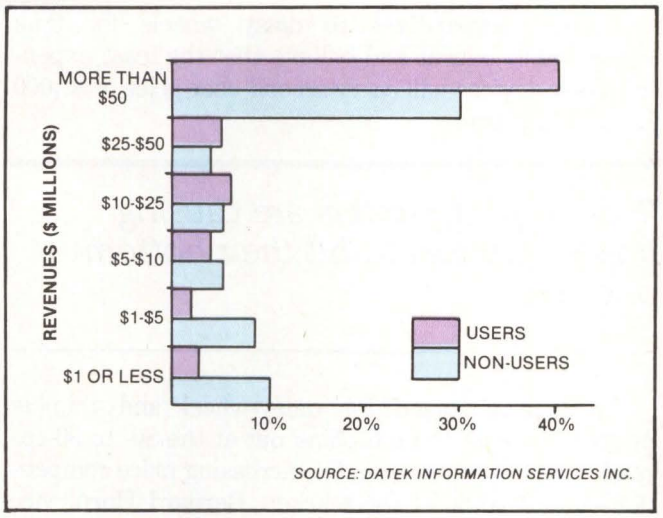
### Application solutions are key to success

Quality Micro Systems (QMS) Inc., Mobile, Ala., which has for years sold a value-added version of a Printronix matrix line printer, last year introduced the Lasergraphix 1200, a laser printer with Xerox Corp.'s XP-12 engine and QMS' graphics controllers. "We have found the acceptance of our printer to be very impressive," says Art Hyzer, QMS executive vice president. He says his company installed 300 units in the first nine months of the printer's production and expects to double that rate this year. "One of the problems with many of the non-impact products is the lack of application-oriented solutions for the user. If you can show a customer a product that is ready to do what he needs, he really doesn't care what technology it employs."

Hyzer also doubts the validity of a traditional argument—that users in data-processing sites are too closely tied to using multipart forms to switch to non-impact printers, which use A-sized cut sheets. "Only the most traditional transaction-processing environments won't give up multicopies because for most applications we can show them how to save from 50 cents to $1.25 per transaction."




**Based on a telephone survey of more than 500 office automation planners and managers,** *Datek found that the ratio of users to non-users of "new technology" printers such as ink-jet, impact matrix and non-impact page printers is directly related to organization size, expressed in company revenues.*

*The most dynamic segment of the printer market in 1983 was serial dot-matrix printers.*

### Serial dot-matrix printers show dynamic growth

The most dynamic segment of the printer market in 1983 was serial dot-matrix printers, and many observers expect the trend to continue in 1984, both at the high end (multimode devices printing at 200 cps or faster) and the low-end (single-function machines printing at 120 cps or slower). "There is an interesting trend to an hourglass-shaped market with both low-cost and high-performance printers doing well but with not much of a middle ground," notes Neil Kleinfeld, vice president of marketing and planning for Centronics Data Computer Corp., Hudson, N.H. Kleinfeld sees the high end of the market becoming increasingly application driven, with such features as sheet feeding, forms handling, bit-mapped graphics and color becoming standard rather than optional.

Kleinfeld, who once doubted that high-speed matrix printers would be used much with personal computers, now has changed his mind. "A lot of people are doing important business on PCs, which in some cases justifies an output device being a large part of the system price," he says. Kleinfeld cites IBM's dot-matrix color graphics printer, introduced at $1,995 last November for use with the IBM PC, PC XT and PCjr. Many dot-matrix printer vendors have introduced similar devices, so IBM's "blessing" on the technology —and the standardization of software that blessing is expected to engender—is likely to make color impact printing a fast-growing market.

### Revenues are slower than shipments

The low-end matrix printer market has experienced several years of high growth in shipment volumes. Sources estimate 1983 shipments at 3 million to 5 million units. Revenues have not grown as swiftly, as prices have fallen to less than $300 for the lowest-priced units. Some price-war survivors, however, believe the worst of the fighting is over. "With prices reaching the $300 level, there is going to be a shift to products with mid-range capabilities," says Okidata's Ringuette. "Within the next year, it is going to become very hard to sell a printer with only one print mode; correspondence-quality modes are going to be a necessity, even in the $500 to $600 price range." Ringuette expects that 120 cps will soon be the minimum print speed even at the low end and predicts much near-term activity in the $1,000 to $1,500 range from dot-matrix printers employing 18- and 24-wire print heads.

### Daisy wheels hold their own

It is almost ironic that the impact devices suffering the least from the threat of non-impact printers are fully formed character serial printers, now that many see the technology as having reached its performance limits. Most observers see laser printers as the only

non-impact alternatives to daisy wheels for true letter-quality output and believe that the least expensive laser devices will carry an end-user price of $3,000 for the near future.

*'Non-impact printers are causing impact printers to hit their bottom price level.'*

While print speed for daisy-wheel and thimble printers appears to be topping out at the 80- to 90-cps range, there may be room for increasing price competition at both ends of the market. Bernard Horn, vice president of sales and marketing for printer maker Diablo Systems Inc., Fremont, Calif., expects competition in the 30- to 60-cps range. "The average retail price of medium-speed printers runs approximately $2,000," says Horn. "What the market needs is a medium-speed, richly featured printer that is priced close to the low-speed offerings."

The price of low-speed daisy-wheel printers is becoming more difficult to pinpoint as the market for 20-cps and slower printers becomes a commodity market. "This year, we will see daisy-wheel printers at $399 and under," says Toshikazu Koike, marketing manager of information systems and peripheral equipment for Brother International Corp., Irvine, Calif. "If manufacturers decide to offer 8-cps printers, it is very hard to foresee how low prices would go."

Japanese manufacturer Brother helped pioneer the market for less-than-20-cps printers but does not plan to lead the sub-10-cps market, Koike says. He does not, however, offer such assurances for his compatriots. "Some of those companies are a little crazy. There is no way to keep up with their costs," he says, echoing the lament of several U.S. manufacturers.

Koike and others believe that the real threat to daisy-wheel printers will come not from non-impact technology but from serial dot-matrix printers with improved print quality, especially as high-volume manufacturing of 18- and 24-wire printers reduces costs. Print quality, throughput and reliability remain the key issues for the printer industry, and price trade-offs will continue in all technologies—impact and non-impact. □

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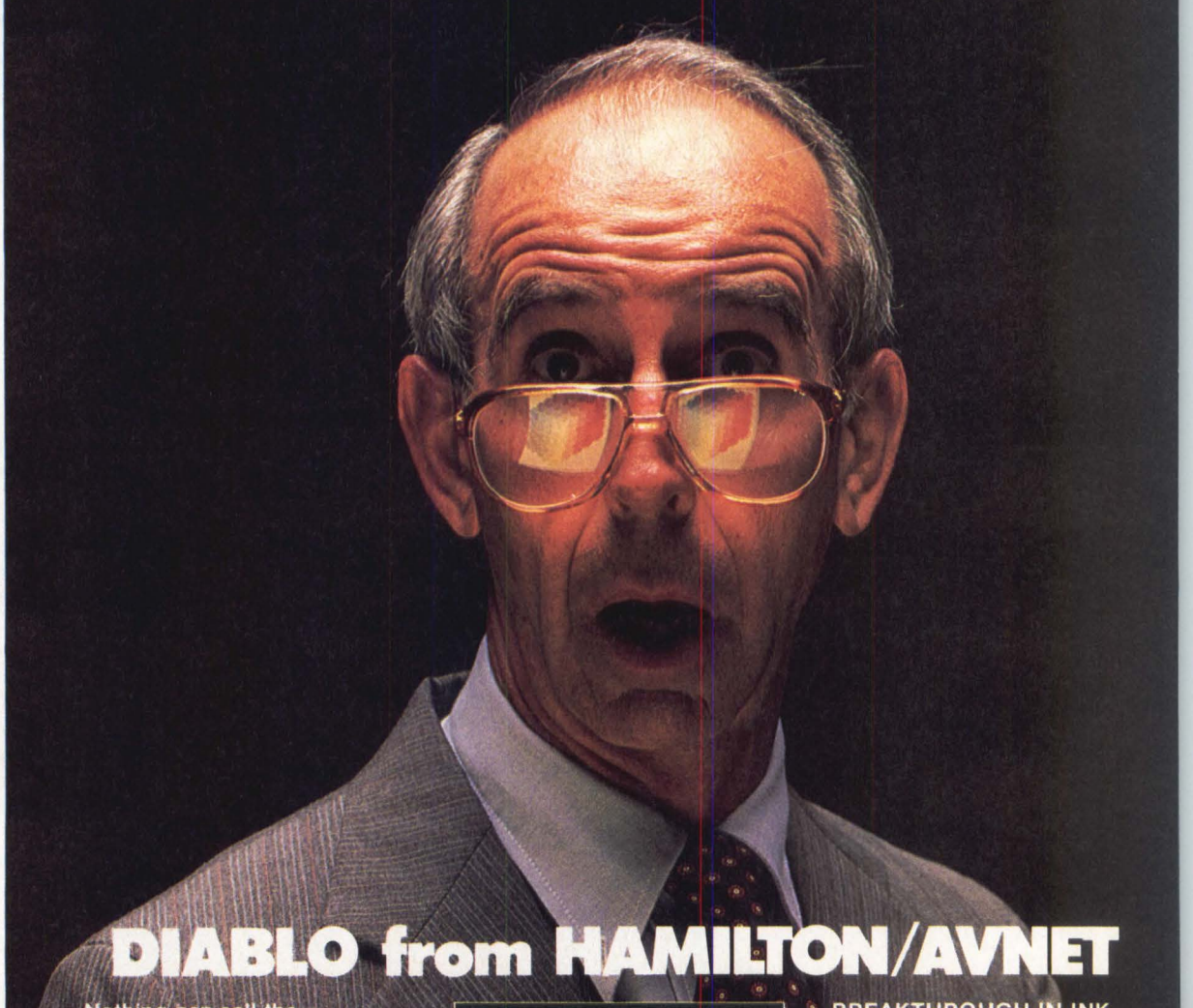

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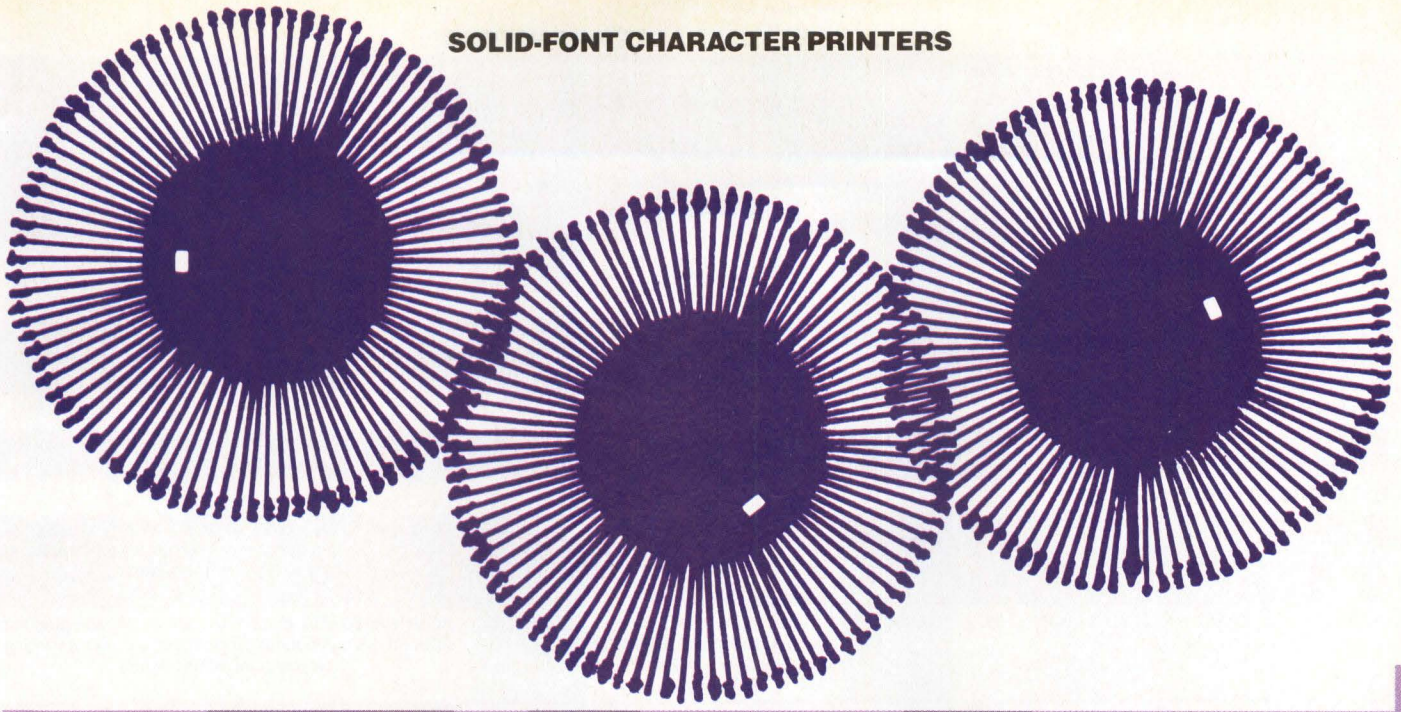



| Company Model | Print method | Print speed (cps) | Chars./ line | Interface (protocol) | Price ($) | Notes, features, options |
|---|---|---|---|---|---|---|
| **APPLE COMPUTER INC.** | | | | | | |
| Daisywheel Printer | daisywheel | 40 | 198 | RS232C | 2,195(Q1) | auto forms feed, horizontal/vertical formatting |
| **ATARI** | | | | | | |
| 1027 | daisywheel | 20 | | RS232C | 349.95(Q1) | |
| **BROTHER INTERNATIONAL CORP.** | | | | | | |
| HR-15 | daisywheel | 13 | pro-grammable to 165 | RS232C, Centronics (110–9600 bps, Diablo 630) | 649(Q1) | second red ribbon, programmable spacing, noise level less than 65 dBA |
| HR-25 | daisywheel | 23 | pro-grammable to 198 | RS232C, Centronics (110–9600bps, Diablo 630) | 1,045(Q1) | second red ribbon, programmable spacing, noise level less than 65 dBA |
| **C. ITOH ELECTRONICS INC.** | | | | | | |
| A10-20 | 100-char. daisywheel | 18 | 115 | Centronics, RS232C (300–2400 bps, X-on/X-off, ETX/ACK) | 695(Q1) | programmable vertical spacing |
| A10-30 | 100-char. daisywheel | 30 | 115 | Centronics, RS232C (300–2400 bps, X-on/X-off, ETX/ACK) | | programmable vertical spacing |
| F10-40 | Diablo or any 96-char. daisywheel | 40 | 136, 163 | Centronics, RS232C (1200 bps, X-on/X-off, ETX/ACK) | 1,750(Q1) | noise level 65 dBA, downloadable wheel and impact sequences |
| F10-55 | Diablo or any 96-char. daisywheel | 55 | 136, 163 | Centronics, RS232C (9600 bps, X-on/X-off, ETX/ACK) | 1,895(Q1) | noise level 65 dBA, downloadable wheel and impact sequences |
| **COMPUTERS INTERNATIONAL INC.** | | | | | | |
| 2000 | 96-char. printwheel cassette | 40 | 132 | RS232C, IEEE-488, Centronics, current loop (50–19200 bps, X-on/X-off, ETX/ACK) | 1,495(Q1) | Diablo 630, 1600; Qume Sprint 9/11 protocols |
| **COMREX INTERNATIONAL** | | | | | | |
| CR-1 | daisywheel | 17 | 132 | parallel, serial (300–9600 bps, X-on/X-off) | 799(Q1) | noise level 65 dBA, serial version: $849(Q1) |
| CR-11 | daisywheel | 21 | 110 | parallel, serial (300–9600 bps, X-on/X-off) | 599(Q1) | noise level 65 dBA, alternate red ribbon, proportional spacing, serial version: $649(Q1) |
| **DATA TERMINALS & COMMUNICATIONS** | | | | | | |
| 380Z | Diablo 1640/1650 daisywheels | 18–32 | 132–198, pro-grammable | RS232C, Centronics, IEEE-488 (50–19,200, DTR, X-on/X-off, ETX/ACK) | 1,495(Q1); 950(Q100) | 48K buffer, bidirectional printing, self-diagnostics, proportional and programmable horizontal spacing, programmable vertical spacing, noise level 68 dBA. |

## SOLID-FONT CHARACTER PRINTERS



| Company Model | Print method | Print speed (cps) | Chars./ line | Interface (protocol) | Price ($) | Notes, features, options |
|---|---|---|---|---|---|---|
| Stylewriter | Diablo 1640/1650 daisywheels | 12–18 | 110–165, pro-grammable | RS232C, Centronics (ACK/ETX) | 899(Q1); 650(Q100) | red ribbon, noise level 65 dBA, 35K buffer (opt. 67K), bidirectional printing, proportional and programmable horizontal spacing, self-diagnostics |
| Stylewriter special | Diablo 1640/1650 daisywheels | 12–18 | 110–165, pro-grammable | RS232C, Centronics (ACK/ETX) | 639(Q1); 495(Q100) | red ribbon, noise level 65 dBA, bidirectional printing, proportional and programmable horizontal spacing, programmable vertical spacing |
| **DATAPOINT CORP.** | | | | | | |
| 9611 | daisywheel | 35 | 132, 158, 198 | RS232C (1200–9600 bps) | 3,495(Q1) | bidirectional printing, horizontal spacing in 1/120-inch increments, vertical spacing in 1/48-inch increments |
| **DATAPRODUCTS CORP.** | | | | | | |
| DP-35 | Diablo/Qume compatible daisywheels | 35 | 132, 158, 196 | RS232C, current loop, Qume, Diablo, Centronics (150–9600 bps, X-on/X-off, DTR or RTS, ETX/ACK) | 1,795(Q1) | noise level 60 dBA, compatible with all WP and graphics software, 3K input buffer, proportional horizontal spacing, bidirectional forms tractors |
| DP-55 | Diablo/Qume compatible daisywheels | 55 | 132, 158, 196 | RS232C, current loop, Qume, Diablo, Centronics (150–9600 bps, X-on/X-off, DTR or RTS, ETX/ACK) | 2,195(Q1) | noise level 60 dBA, compatible with all WP and graphics software, 3K input buffer, proportional horizontal spacing, bidirectional forms tractors |
| **DECISION DATA COMPUTER CORP.** | | | | | | |
| 6355-01 | Qume daisywheel | 55 | 132 | (IBM S/34, S/36, S/38) | 4,550(Q1) | IBM S/34, S/36, S/38 compatible, superscript/subscript, bold print, shadow print |
| **DIABLO SYSTEMS INC.** | | | | | | |
| Series 35 | Diablo 98-char. daisywheel | 35 | 132, 158, 198 | RS232C, Centronics, IEEE-488 (110, 300, 1200 bps, X-on/X-off, DTR, ETX/ACK) | 1,450(Q1) | blue, black, brown and green ribbons; noise level 65 dBA, compatible with most WP software, serial and parallel interfaces |
| 620 API | Diablo 98-char. daisywheel | 21 | 132, 158, 198 | RS232C, Centronics, IEEE-488 (110, 300, 1200 bps, X-on/X-off, DTR, ETX/ACK) | 1,095(Q1) | blue, black, brown and green ribbons; noise level 65 dBA, compatible with most WP software, serial and parallel interfaces |
| 630 API | Diablo 88-, 92-, 96-char. daisywheels | 40 | 132, 158, 198 | RS232C, Centronics, IEEE-488 (300, 1200, 2400, 9600 bps, X-on/X-off, DTR, ETX/ACK) | 2,340(Q1) | blue, black and brown ribbons; Hyplot graphics, noise level 67 dBA, compatible with most WP software, serial and parallel interfaces |
| 630 API/ECS | Diablo 88-, 92-, 96- and 192-char. daisywheels | 40 | 132, 158, 198 | RS232C, Centronics, IEEE-488 (300, 1200, 2400, 9600 bps, X-on/X-off, DTR, ETX/ACK) | 3,495(Q1) | blue, black and brown ribbons; Hyplot and character graphics, noise level 67 dBA, compatible with most 16-bit WPs, serial and parallel interfaces |
| 630 ECS for the IBM PC | Diablo 88-, 92-, 192-char. daisywheels | 40 | 132, 158, 198 | Centronics | 2,595(Q1) | blue, black and brown ribbons; Hyplot and character graphics, noise level 67 dBA, compatible with most 16-bit WPs |
| **FACIT DATAROYAL** | | | | | | |
| 4560 | 105- to 112-char. daisywheels | 22 | 130 | RS232C (9600 bps, X-on/X-off, DTR, ETX/ACK) | 1,095(Q1) | programmable vertical and horizontal spacing, noise level less than 60 dBA |
| 4565 | 96-char. daisywheel | 40 | 132 | RS232C (2400 bps, X-on/X-off, DTR, ETX/ACK) | 1,895(Q1) | programmable vertical and horizontal spacing, noise level less than 62 dBA |
| **FUJITSU AMERICA INC.** | | | | | | |
| SP320 | 96- and 127-char. daisywheels | 48 | 136, 163 | RS232C, current loop, Centronics (150–9600 bps) | 1,499(Q1) | daisywheel graphics, noise level less than 60 dBA, compatible with standard WP packages, programmable and proportional horizontal spacing, programmable vertical spacing |
| SP830 | 96- and 127-char. daisywheels | 80 | 136, 163 | RS232C, CCITT V.24, current loop, Centronics (150–9600 bps) | 2,950(Q1) | daisywheel graphics, noise level less than 60 dBA, compatible with standard WP packages, programmable and proportional horizontal spacing, programmable vertical spacing |
| **GENERAL BUSINESS TECHNOLOGY INC.** | | | | | | |
| 5205WP | NEC Spinwriter thimbles | 55 | 198 | IBM S/34, S/36, S/38 | 4,295(Q1) | |
| 5206WP | NEC Spinwriter thimbles | 35 | 198 | IBM S/34, S/36, S/38 | 3,695(Q1) | |
| **HEWLETT-PACKARD CO.** | | | | | | |
| 2602A | daisywheel | 25 | 132, 158 | RS232C, IEEE-488 (110–1200 bps, X-on/X-off, DTR, ETX/ACK) | 1,545(Q1) | emulates Diablo printers, compatible with most WP software |
| 2601A | daisywheel | 40 | 132, 158 | RS232C (110–9600 bps, X-on/X-off, DTR, ETX/ACK) | 3,520(Q1) | emulates Diablo printers, compatible with most WP software |

# Lotus 1-2-3™

## Lotus 1 2 3™ and Dataproducts P Series color printer are the best combination for any business assignment.

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**COMDEX™/Spring '84**

BOOTH #D356

# Dataproducts computer printers

Nobody puts ideas on paper so many ways.

Dataproducts, Route 13 South, Milford, N.H. 03055

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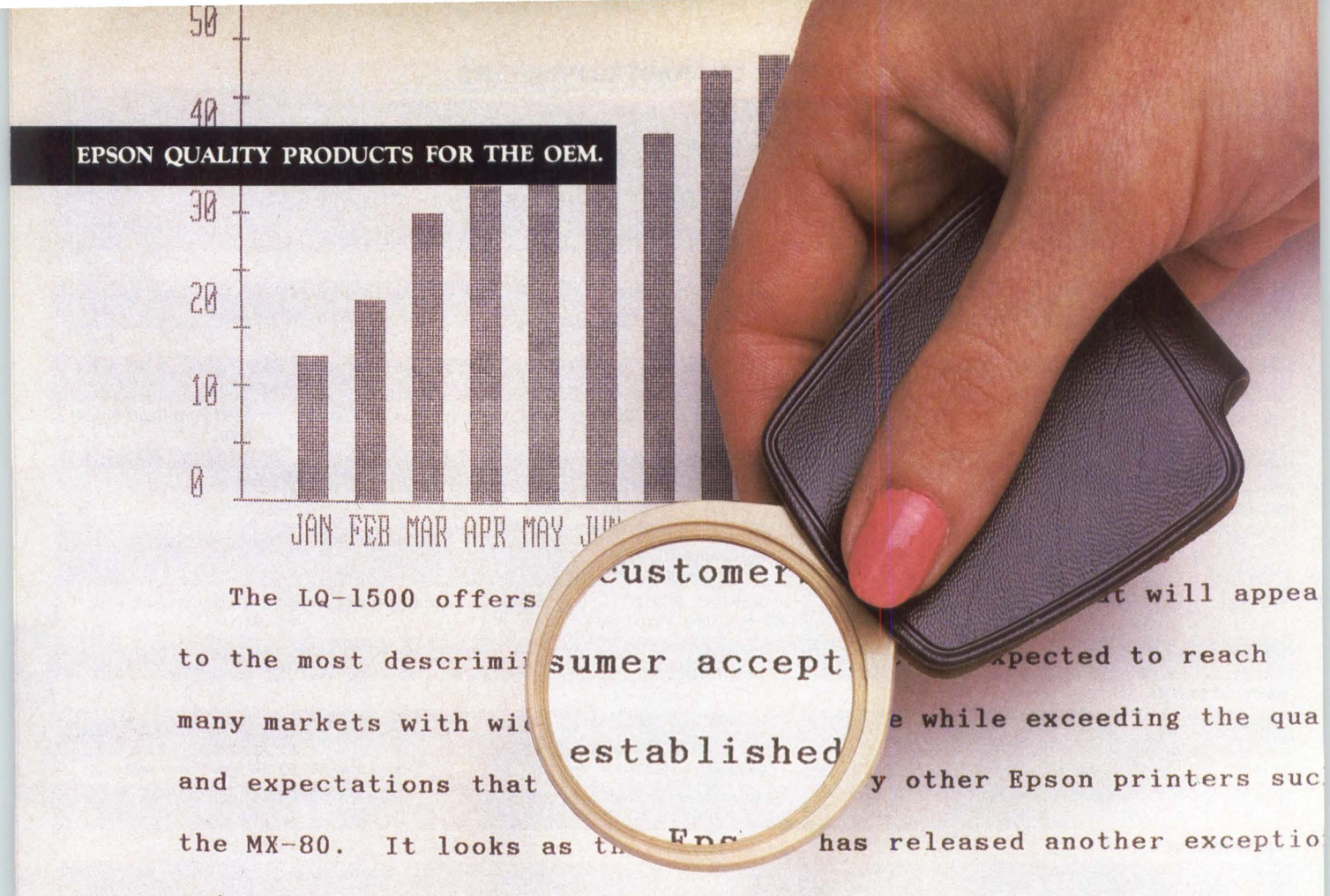
CIRCLE NO. 59 ON INQUIRY CARD

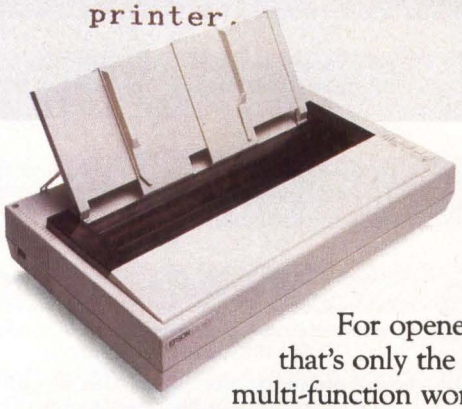
## SOLID-FONT CHARACTER PRINTERS

| Company Model | Print method | Print speed (cps) | Chars./ line | Interface (protocol) | Price ($) | Notes, features, options |
|---|---|---|---|---|---|---|
| **HONEYWELL INFORMATION SYSTEMS INC.** | | | | | | |
| PRU7004/ 7006 | NEC thimble | 55 | 136 | RS232C, current loop | 5,300(Q1) | supported on Honeywell Office Automation Systems |
| PRU7007/ 7009 | NEC thimble | 35 | 136 | RS232C, RS422 | 2,450(Q1); 2,700(Q1) | supported on Honeywell Office Automation Systems |
| **LEADING EDGE PRODUCTS INC.** | | | | | | |
| A10-20 | daisywheel | 18 | 115, programmable | Centronics, RS232C (X-on/X-off, ETX/ACK) | 695(Q1) | less than 62 dBA, programmable and proportional spacing |
| F-10 Print Master | Diablo 96, Qume 96 WP daisywheels | 55 | 136, programmable | Centronics, RS232C (X-on/X-off, ETX/ACK) | 1,995(Q1) | noise level less than 65 dBA, programmable and proportional spacing |
| F-10 Starwriter | Diablo 96, Qume 96 WP daisywheels | 40 | 136, programmable | Centronics, RS232C (X-on/X-off, ETX/ACK) | 1,795(Q1) | noise level less than 65 dBA, programmable and proportional spacing |
| **LEXICON CORP.** | | | | | | |
| LEX-21 | thermal | 30 | 40 | (300 bps; X-on/X-off opt.) | 395(Q1) | noise level 53 dBA, 2k memory; opt. acoustic modem |
| **MDS TRIVEX** | | | | | | |
| 8010 | thimble | 55 | 136 | Trivex 8074, IBM 3274/3276 | 4,960(Q1) | |
| **MORROW DESIGNS INC.** | | | | | | |
| MP-100 | daisywheel | 12, 14 | 101, 151 | Centronics | 595(Q1) | noise level 65 dBA; opt. tractor feed |
| MP-200 | daisywheel | 16, 17 | 132, 197 | Centronics | 895(Q1) | noise level 65 dBA; opt. tractor feed |
| MP-300 | daisywheel | 27, 31 | 132, 197 | Centronics | 1,195(Q1) | noise level 65 dBA; opt. tractor feed |
| **NCR CORP.** | | | | | | |
| 6455-2310 | NEC-compatible thimble | 33 | 136, 163, 203, programmable | RS232C (110–9600 bps, X-on/X-off, ETX/ACK) | | noise level 68 dBA, programmable and proportional spacing, NCR WP packages |
| **NEC INFORMATION SYSTEMS INC.** | | | | | | |
| Spinwriter 2010, 2015 | thimble | 20 | 136, 163, 203 | RS232C (110–9600 bps, X-on/X-off, DTR, ETX/ACK) | 1,095(Q1) | noise level 60 dBA |
| Spinwriter 2030 | thimble | 20 | 136, 163, 203 | Centronics (110–9600 bps, X-on/X-off, DTR, ETX/ACK) | 1,095(Q1) | noise level 60 dBA |
| Spinwriter 2050 | thimble | 20 | 136, 163, 203 | parallel | 1,250(Q1) | IBM PC, PCjr compatible, noise level 60 dBA, programmable spacing |
| Spinwriter 3510 | thimble | 30 | 136 | RS232C (up to 9600 bps, X-on/X-off, ETX/ACK) | 1,825(Q1) | noise level 60 dBA, programmable spacing |
| Spinwriter 3550 | thimble | 30 | 136 | IBM PC | 2,250(Q1) | noise level 60 dBA, programmable spacing |
| Spinwriter 7710 | thimble | 55 | 136, 163 | RS232C (up to 1200 bps, X-on/X-off, ETX/ACK) | 2,580(Q1) | noise level 60 dBA; opt. forms handlers |
| Spinwriter 7715 | thimble | 55 | 136, 163 | RS232C (up to 1200 bps, X-on/X-off, ETX/ACK) | | noise level 60 dBA; opt. forms handlers |
| Spinwriter 7730 | thimble | 55 | 136, 163 | Centronics | 2,580(Q1) | noise level 60 dBA, programmable spacing; opt. forms handlers |
| **OLYMPIA USA INC.** | | | | | | |
| 102 | daisywheel | 17 | 141, 212 | RS232C, Centronics, IEEE-488 (X-on/X-off) | 1,399(Q1) | noise level 62 dBA, proportional spacing, 4000-char. print buffer; opt. tractor feed |
| 3000 | daisywheel | 50 | 150, 225 | RS232C, Centronics, IEEE-488 (X-on/X-off) | 1,899(Q1) | noise level 62 dBA, proportional spacing, 4000-char. print buffer; opt. tractor feed |
| Electronic Compact RO | daisywheel | 14 | 115, 172 | RS232C, Centronics (X-on/X-off) | 999(Q1) | noise level 65 dBA, serial and parallel ports, built-in tractor |
| **OPE PRINTERS INC.** | | | | | | |
| DY250 | Olivetti daisywheel | 25 | 132 | RS232C, current loop (110–9600 bps, X-on/X-off, DTR, ETX/ACK) | | noise level 61 dBA, proportional horizontal spacing |
| DY450 | Olivetti daisywheel | 45 | 132 | RS232C, current loop (110–9600 bps, X-on/X-off, DTR, ETX/ACK) | 899(OEM) | noise level 61 dBA, proportional horizontal spacing |
| **PRIMAGES INC.** | | | | | | |
| PRIMAGE I | daisywheel | 45 | 135, 162, 202 | RS232C, Centronics (110–9600 bps, X-on/X-off, DTR, ETX/ACK) | 1,695(Q1); 1,210(Q100) | noise level 65 dBA, proportional horizontal spacing, programmable vertical spacing, emulates Diablo 620 |

## SOLID-FONT CHARACTER PRINTERS

| Company Model | Print method | Print speed (cps) | Chars./line | Interface (protocol) | Price ($) | Notes, features, options |
|---|---|---|---|---|---|---|
| **PRINTER SYSTEMS CORP.** | | | | | | |
| DP55 | daisywheel | 50 | 132 | IBM 3270, S/34, S/36, S/38 (IBM) | 3,700(Q1) | noise level 60 dBA, IBM 3270, S/34, S/36, S/38 compatible |
| **RADIO SHACK** | | | | | | |
| DWII | daisywheel | 43 | 136, 163 | parallel (Radio Shack) | 1,995(Q1) | programmable spacing, compatible with Radio Shack WP software |
| DWP-210 | daisywheel | 18 | 110, 132 | parallel, serial (600–1200 bps, Tandy) | 799(Q1) | programmable spacing, compatible with Radio Shack WP software |
| DWP-410 | daisywheel | 25–30 | 136, 163 | parallel (Radio Shack) | 1,295(Q1) | programmable spacing, compatible with Radio Shack WP software |
| **SILVER REED AMERICA INC.** | | | | | | |
| EXP-500 | daisywheel | 14 | 101–151 | Centronics, RS232C (300–9600 bps, X-on/X-off, ETX/ACK) | 599(Q1) | block graphics, Diablo 1610 emulation |
| EXP-550 | daisywheel | 17 | 156–180 | Centronics, RS232C (300–9600 bps, X-on/X-off) | 895(Q1) | block graphics, proportional spacing, Diablo 1610 emulation |
| EXP-770 | daisywheel | 31 | 136–180 | Centronics, RS232C (300–9600 bps) | 1,299(Q1) | block graphics, 2K buffer expandable to 48K, proportional spacing, Diablo 630 emulation |
| **SMITH-CORONA** | | | | | | |
| L-2000 | daisywheel | 12 | 105, 126, 157 | Centronics and RS232C (X-on/X-off) | | noise level 63–69 dBA, bidirectional printing; opt. tractor feed |
| TP-1 | daisywheel | 12 | 105 | Centronics or RS232C | 695(Q1) | noise level 63–69 dBA; opt. tractor feed |
| TP-2 | daisywheel | 12 | 105 | Centronics and RS232C (X-on/X-off) | 749(Q1) | noise level 63–69 dBA; opt. tractor feed |
| **SPERRY CORP.** | | | | | | |
| 0791 | daisywheel | 45 | | RS232C, CCITT V.24 [Univac] | 6,550 | bidirectional printer, 96 character set |
| **STAR MICRONICS INC.** | | | | | | |
| Powertype | daisywheel | 18 | 110, 132, 165 | RS232C, current loop, Centronics (110–9600 bps, X-on/X-off, BUSY/ACK) | 499(Q1) | programmable and proportional spacing, 7- or 8-bit selectable interface, self-test, WordStar compatible |
| **TELETEX COMMUNICATION CORP.** | | | | | | |
| TTX-1014 | 100-char. daisywheel | 14 | 115, 138, 173 | RS232C, Centronics (110–9600 bps, DTR, X-on/X-off) | 649(Q1) | noise level 65 dBA, programmable vertical spacing, superscript, subscript, shadow print, underlining |
| **VIVITAR COMPUTER PRODUCTS INC.** | | | | | | |
| Transtar 120S | daisywheel | 14 | 120 | Centronics, RS232C (X-on/X-off, ETX/ACK) | 599(Q1) | noise level 65 dBA, Diablo 1610, 1620 code compatible |
| Transtar 130S | daisywheel | 20 | 132 | Centronics, RS232C (X-on/X-off, ETX/ACK) | 895(Q1) | noise level 65 dBA, proportional horizontal spacing, Diablo 1610, 1620 code compatible |
| Transtar 140S | daisywheel | 40 | 132 | RS232C (300–9600 bps, X-on/X-off, ETX/ACK) | 1,695(Q1) | noise level 65 dBA, proportional horizontal spacing, Diablo 1610, 1620 code compatible |
| **WANG LABORATORIES INC.** | | | | | | |
| 6581W | 96-char. daisywheels | 35 | 132, 158, 198 | custom | 5,000(Q1) | noise level 62 dBA, bidirectional forms feeder |
| 6581WC | 96-char. daisywheels | 35 | 132, 158, 198 | custom | 7,000(Q1) | noise level 62 dBA |
| DW/OS-55 | 96-char. daisywheels | 55 | 132, 158, 198 | custom | 4,800(Q1) | noise level 62 dBA, self-test diagnostics |
| OIS-PTR-20 | 98-char. daisywheels | 20 | 132, 158, 198 | RS232C | 2,000(Q1) | noise level 62 dBA; optional bidirectional forms tractor, single-sheet feeder |
| PCPM012 | 98-char. daisywheels | 20 | 132, 158, 198 | RS232C | 1,295(Q1) | noise level 62 dBA |



# EPSON® LQ-1500 INTRODUCES DOT-LESS MATRIX PRINTING

For openers, it gives you letter print quality so high the dots disappear. But that's only the beginning. The LQ-1500 is more than a letter quality printer. It's a multi-function work station.

In the draft mode, for instance, the LQ-1500 prints at 200 cps with a character structure of 9 x 17—already superior to much dot matrix printing. And at 37 x 17 in the letter mode, the dots are virtually non-existent.

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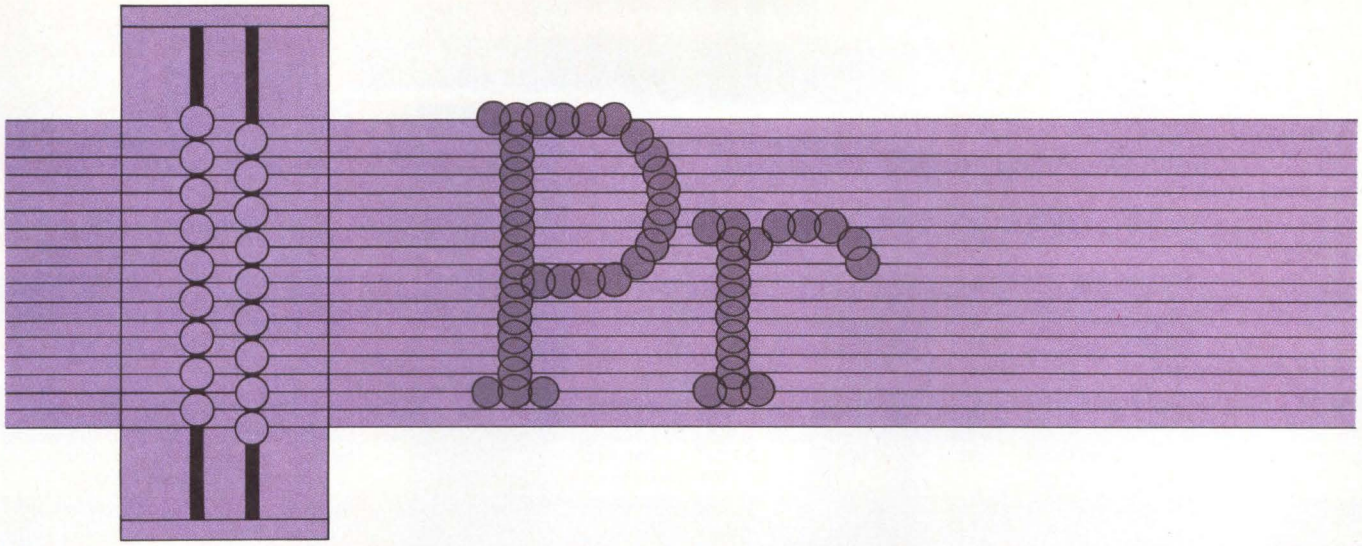
CIRCLE NO. 60 ON INQUIRY CARD

# MATRIX CHARACTER PRINTERS
## (including Teleprinters)



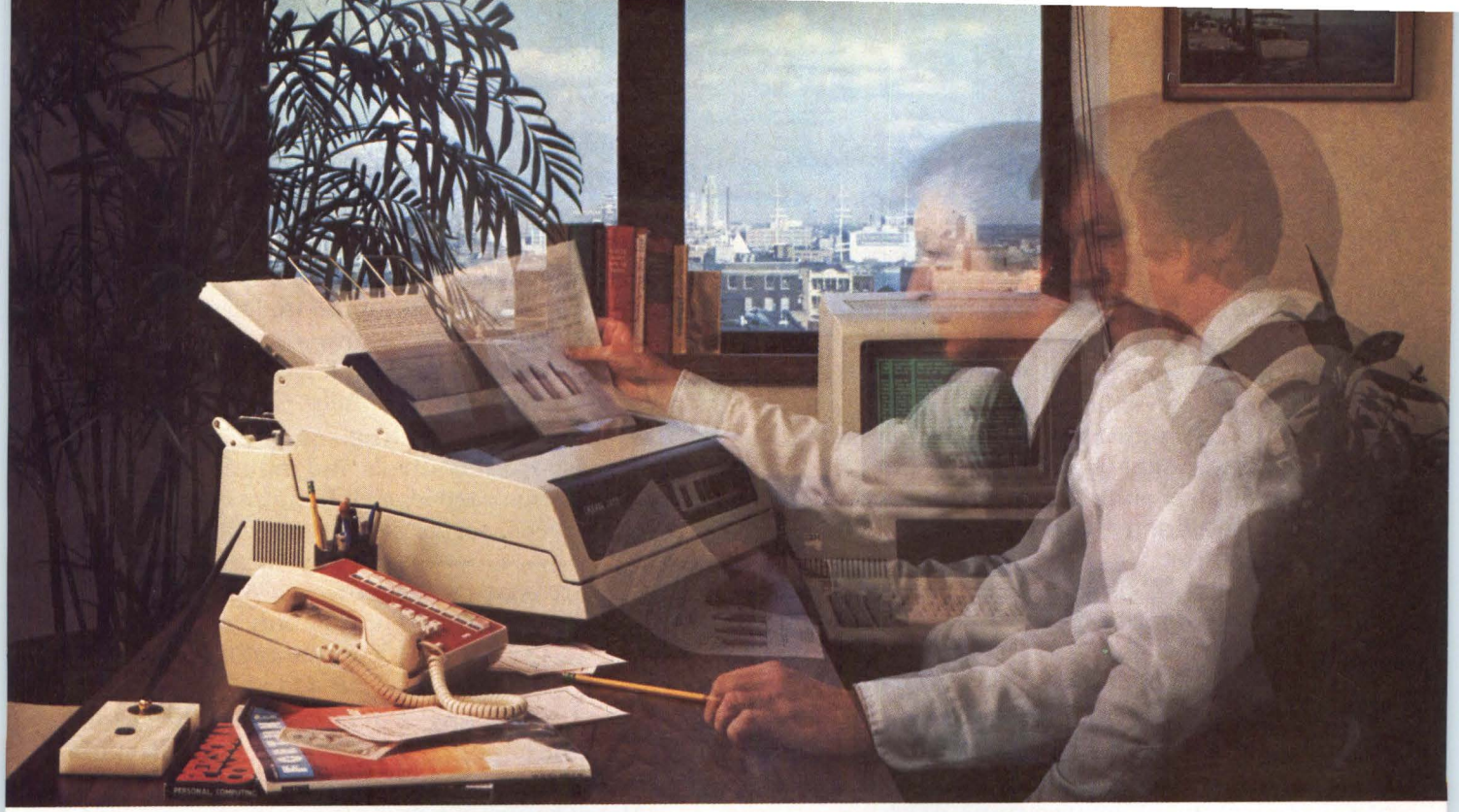


| Company Model | Print (method matrix size) | Printing speed (cps) | Chars. line | Interface (protocol) | Price ($) | Notes, features, options |
|---|---|---|---|---|---|---|
| **ADDMASTER CORP.** | | | | | | |
| 171 | impact (7x5) | 52, 45 | 18, 21 | TTL parallel | 345(Q1); 249(Q100) | point of sale printers; built-in clock calendar, internal 3-line buffer |
| 172 | impact (7x5) | 52, 45 | 18, 21 | RS232C (75–9600 bps, X-on/X-off) | 345(Q1); 249(Q100) | point of sale printers; built in clock calendar, internal 3-line buffer |
| **ADVANCED MATRIX TECHNOLOGY INC.** | | | | | | |
| AMT. OFFICE PRINTER | impact | 45, 100, 250 | 136, 163, 232 | RS232C, Centronics (110–19,200 bps, ETX/ACK, DTR, X-on/X-off, Qume II/ Diablo 630, NEC) | 2,895(Q1); 2,000(Q100) | single/dual bin sheet-feeder, bidirectional tractors, bit-mapped graphics up to 240x720 dpi, 4-color option $100 |
| **ALPHACOM INC.** | | | | | | |
| 8125 | thermal (5x7) | 100 | 80 | Atari, Commodore, TI, Centronics, RS232C, IEEE-488, Apple (110–9600 bps) | 215 (incl. interface) | intelligent interface module, bit-mapped graphics |
| **ANADEX INC.** | | | | | | |
| DP-9000B | impact | 180, 216, 240 | 80, 96, 106 | parallel (9600 bps, X-on/X-off, STX/ETX/LRCC) | 1,200 | |
| DP-9001B | impact | 150, 188, 225, 250 | 80, 100, 120, 133 | parallel (9600 bps, X-on/X-off, STX/ETX/LRCC) | 1,200 | noise level less than 55dBA; opt. RS232C interfaces; bit-mapped graphics |
| DP-9500B | impact | 180, 216, 240 | 132, 158, 175 | parallel (9600 bps, X-on/X-off, STX/ETX/LRCC) | 1,280 | noise level less than 55dBA, bit-mapped graphics; opt. RS232C interface |
| DP-9501B | impact | 150, 188, 225, 250 | 132, 158, 198, 220 | parallel (9600 bps, X-on/X-off, STX/ETX/LRCC) | 1,280 | noise level less than 55dBA, bit-mapped graphics; opt. RS232C interface |
| DP-9620B | impact | 120, 144, 180, 197, 240 | 132, 158, 198, 216 | parallel (9600 bps, X-on/X-off, STX/ETX/LRCC) | 1,380 | noise level less than 55dBA, bit-mapped graphics; opt. RS232C interface |
| DP-9625B | impact | 60–240 | 132, 158, 198, 216 | parallel (9600 bps, X-on/X-off, STX/ETX/LRCC) | 1,500 | noise level less than 55dBA, bit-mapped graphics; opt. RS232C interface |
| DP-9725B | impact | 60–240 | 132, 158, 198, 216 | parallel (9600 bps, X-on/X-off, STX/ETX/LRCC) | 1,625 | proportional spacing, 4-color ribbon, noise level less than 55dBA; opt. RS232C interface |
| DP-6500 | impact | 100–540 | 132, 158, 198, 216 | RS232C, RS422, parallel (19,200 bps, X-on/X-off, STX/ETX/ACK) | 2,995 | proportional spacing, 8 int'l. character sets |
| WP-6000 | impact | 125–285 | 132, 158, 216 | parallel, RS232C (19,200 bps, X-on/X-off, STX/ETX/ACK) | 2,700 | proportional spacing, Diablo 630 emulation |

# MATRIX CHARACTER PRINTERS
## (including Teleprinters)

Matrix printers

| Company Model | Print (method matrix size) | Printing speed (cps) | Chars. line | Interface (protocol) | Price ($) | Notes, features, options |
|---|---|---|---|---|---|---|
| **APPLE COMPUTER** | | | | | | |
| Dot Matrix | impact | 120 | 136 | parallel | 675 | dot addressable graphics |
| **ATARI INC.** | | | | | | |
| 1025 | electrostatic (5x7) | 40 | 40, 80, 132 | RS232C | 399 | |
| 1027 | impact | 20 | 80 | Atari | 350 | bidirectional printing, underline |
| **B-G INSTRUMENTS INC.** | | | | | | |
| PP201 | thermal | 34 | 17 | RS232C, current loop (75–9600 bps) | 520(Q1); 445(Q100) | bit-mapped graphics up to 10 dpi, word processing software included |
| DataPlot 401 | thermal | 30 | 34 | RS232C, current loop (300–1200 bps) | 755(Q1); 595(Q100) | bit-mapped graphics up to 10 dpi, word processing software included |
| DataPlot 416 | thermal | 30, 100 | 34, 68 | RS232C, current loop (300–1200 bps) | 985(Q1); 795(Q100) | bit-mapped graphics up to 10 dpi, word processing software included |
| **C. ITOH ELECTRONICS INC.** | | | | | | |
| 8510SC | impact | 180, 120 | 80, 132 | RS232C, Centronics (110–9600 bps, X-on/X-off, ETX/ACK) | 895–940 | 7-color printing, built-in tractor tear bar, 13 languages |
| 1550B | impact (7x9) | 120 | | RS232C, Centronics (110–9600 bps, X-on/X-off, ETX/ACK) | 995–1,025 | built-in tractor tear bar, 5 languages, dot-addressable graphics 144x60 dpi |
| 1550S | impact (7x9) | 180, 120 | | RS232C, Centronics (110–9600 bps, X-on/X-off, ETX/ACK) | 1,125–1,170 | built-in tractor tear bar, 13 languages |
| 1550SC | impact | 180, 120 | | RS232C, Centronics (110–9600 bps, X-on/X-off, ETX/ACK) | 1,125–1,270 | built-in tractor tear bar, 18 languages |
| 8510B | impact (9x9) | 120 | 80, 132 | RS232C, Centronics (110–9600 bps, X-on/X-off, ETX/ACK) | 495–645 | built-in tractor tear bar, 5 languages, dot-addressable graphics 144x160 dpi |
| 8510S | impact (9x9) | 180, 120 | 80, 132 | RS232C, Centronics (110–9600 bps, X-on/X-off, ETX/ACK) | 795–840 | 13 languages |
| **CANON USA INC., PRINTER DIVISION** | | | | | | |
| A1200 | impact (9x7) | 120 | 80, 40, 136 | Centronics | 495 | 3 paper feed methods available |
| A1210 | ink jet | 37 | 40, 80 | Centronics | 745 | 7-color printing, high resolution |
| A1250 | impact (9x9) | 140 | 156 | Centronics | 795 | 3 paper feed methods available |
| X-8220A | impact (5x7) | 60, 120 | 136 | RS232C, V.24, Centronics | | 3 paper feed methods available |
| **CENTRONICS** | | | | | | |
| 357 | impact (7x8) | 400 | 132 | RS232C, current loop, Centronics (50–19,200 bps, X-on/X-off, DTR, ETX/ACK) | 2,750 | compatible with WordStar, WordPerfect, Digital Research graphics packages, bit-mapped graphics 66.7x72 dpi |
| 358 | impact (7x9) | 400, 100 | 132 | RS232C, current loop, Centronics (50–19,200 bps, X-on/X-off, DTR, ETX/ACK) | 3,295 | 4–7 color printing, compatible with WordStar, WordPerfect, Digital Research graphics packages |
| **COMPRINT** | | | | | | |
| 912 series | electrosensitive (12x9) | 225 | 80 | RS232C, Centronics, IEEE-488 (4800 bps) | 595(alpha); 995(graphic) | 100 dpi graphics resolution; opt. 2K buffer |
| **COMPUTER DEVICES INC.** | | | | | | |
| Series 2000 | thermal | 160 | 80, 132 | RS232C, current loop (110–9600 bps) | 1,395 | bit-mapped graphics (64x124 dpi), 4K-byte buffer, 6 programmable function keys |
| **COMPUTER TRANSCEIVER SYSTEMS INC.** | | | | | | |
| MSP 200 | thermal (1x16) | 200 | 80, 136 | RS232C (RJ11C, X-on/X-off) | 2,595 | modem spooler printer with 12K-byte buffer, Bell 212A compatible, bit-mapped graphics |
| P 200 | thermal (1x16) | 200 | 80, 136 | 8-bit parallel TTL | 995 | bit-mapped graphics, self-test |



# THE PRINTER TO PICK WHEN THE PACE QUICKENS.

It's happening all over the value-added world.

Your multi-user customers are getting hit with a ton of increased throughput requirements and they need more printer speed. A lot more.

They're also looking for more professional-looking presentations so they need better print quality. A lot better.

Where can you find the best of both worlds for them? And at the same time find some margins that'll look real good to you?

With Okidata's Pacemark 2350 and 2410 dot matrix printers.

Take throughput. The 2350 and 2410 can quickly get your customers out of the waiting game to where they're *really* cranking it out.

But wait. Cranking *what* out, you may ask? A single, restrictive printing mode? No way. The 2410 can give your customers DP, draft, and correspondence quality that truly rivals the daisy-wheel. And with flexibility, too: up to 5 pages per minute.

And the 2350 and 2410 can both print at up to 350 cps. While producing 120 to 420 lines a minute for them. With bidirectional printing and short line seeking logic. And both high speed and vertical slew.

## SYSTEMS COMPATIBILITY. SOFTWARE COMPATIBILITY.

The 2350 and 2410 use industry standard interfaces making them hardware compatible with most mini and microsystems on the market today. In addition, they are supported on the menus of most of the important software being offered to microsystem users.

You also get an outstanding graphics capability with 144 x 144 dots per inch resolution.

Two color printing for highlighting. Down line loadable font sets for flexibility. Subscripts and superscripts so your scientific and technical usage won't bog down. Six-part forms handling. The capability to print 132 columns on eight-inch paper using 17.1 characters per inch to save paper costs and make output easier to handle.

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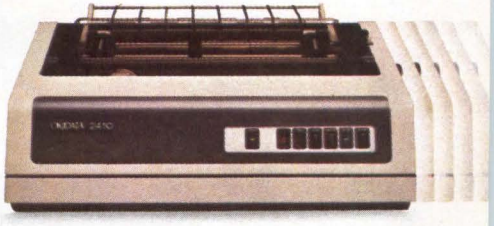
No doubt about it, the quicker the pace at your customers' place, the more you need Pacemark from our place. For more information, call toll free 1-800-OKIDATA. In New Jersey, 609-235-2600. Or write OKIDATA, Mt. Laurel, NJ 08054.



CIRCLE NO. 61 ON INQUIRY CARD

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# Better printing for better impressions.

**OEMs, Systems Integrators, Office Computer Specialists, DP Department Heads**

— all appreciate the remarkable new PRINTEK® 930. For print quality so sharp it's hard to believe it came from a dot matrix machine. For versatility that offers impeccable letters, fast drafts, intricate graphics, and easier-to-read spreadsheets. All done with the 930's sophisticated internal software which is setting the industry standard for versatility and flexibility.

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In a side-by-side comparison of 6 different printers' print quality in the PRINTEK Nov. '83 COMDEX booth, visitors chose the 930 print over any other by a 5-to-1 margin or better.

**Graphics for Impact.** The 930 punches up presentations. With special effects, charts, graphs — in raster format with true data compression— in 144x144 or 72x72 densities. Dot addressable.

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**Executive's Friend.** Office-quiet (less than 60 dBA), easy front controls and indicators, quick-change cartridge ribbon, tractor and friction feeds, serial/parallel interfaces standard, go-anywhere multi-voltage power supply, Diablo* emulation for software compatibility, unobtrusive size and styling to complement the executive suite.

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**PRINTEK, INC., Benton Harbor, MI 49022**
**616/925-3200 TWX 810-270-3112**

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# PRINTEK 930
# the executive's printer


CIRCLE NO. 62 ON INQUIRY CARD

# MATRIX CHARACTER PRINTERS (including Teleprinters)

| Company Model | Print (method matrix size) | Printing speed (cps) | Chars. line | Interface (protocol) | Price ($) | Notes, features, options |
|---|---|---|---|---|---|---|
| 430 KSR | impact | 55, 80 | up to 140, programmable | RS232C, current loop (110–1200 bps, X-on/X-off, DTR) | 995 | bit-mapped graphics, programmable horizontal and vertical spacing |
| 443 KSR | impact | 55, 80 | up to 140, programmable | RS232C, current loop, RJ11 (110–1200 bps, X-on/X-off, DTR) | 1,795 | Bell 103 compatible, 300 baud modem answer/orig., DDD network compatible; bit-mapped graphics, 16K character memory, 13 programmable keys; opt. non-volatile memory |
| 440 KSR | impact | 55, 80 | up to 140, programmable | RS232C, current loop, RJ11 (110–1200 bps, X-on/X-off, DTR) | 1,195 | Bell 103 compatible, 300 baud modem answer/orig., TWX, Telex, DDD network compatible; bit-mapped graphics, programmable horizontal and vertical spacing |
| 420 RO | impact | 55, 80 | up to 140, programmable | RS232C, current loop (110–9600 bps, X-on/X-off, DTR) | 795 | programmable horizontal and vertical spacing, bit-mapped graphics, 2K character buffer |
| 4000 KSR | thermal (5x7) | 30 | 80–136 | RS232C (110–300 bps) | 3,495 | horizontal and vertical spacing, super/subscript, Bell 103 compatible; data logger |
| 4000 KSR Sherlock | thermal (5x7) | 30 | 80–136 | RS232C (110–300 bps) | 3,995 | horizontal and vertical spacing, super/subscript, data logger; encryption conforms to DES Algorithm |
| 4120 "KSR Teleprinter" | thermal (1x16) | 200 | 80–136; 136–233 | two RS232C (300–9600 bps, X-on/X-off) | 3,495 | horizontal and vertical spacing, super/subscript; 3400/103 acoustic/direct connect or 212/103 direct connect answer originate; graphics, self-test, data logger |
| 4120 "KSR Memory Teleprinter" | thermal (1x16) | 200 | 80–136; 136–233 | two RS232C (300–9600 bps, X-on/X-off) | 3,695; 3,995 | horizontal and vertical spacing, super/subscript; 3400/103 acoustic/direct connect or 212/103 direct connect answer/orig.; graphics, self-test, data logger |
| **CRADEN PERIPHERALS CORP.** | | | | | | |
| DP4 | impact (7x9, 9x9) | 35, 125, 150 | 40, 48, 80, 96 | RS232C, RS422 (1200–9600 bps, DTR, full duplex) | 2,250 | 16 keypad, 32 character display, prints on passbooks, 128 character ASCII, multipass CQ mode, 120x120 dpi graphics |
| **DATA MACHINES INTERNATIONAL** | | | | | | |
| 40 | impact (5x7) | 80 | 40 | RS232C (300–4800 bps, ASCII) | 460 | ribbon cartridge option, limited graphics |
| **DATAPOINT CORP.** | | | | | | |
| 9621 | impact (9x9) | 160 | 132 | RS232C | 2,500 | |
| 9628 | impact (9x9) | 160 | 80, 136 | RS232C | 995 | |
| 9629 | impact (9x9) | 160 | 136, 233 | RS232C | 995 | |
| **DATAPRODUCTS CORP.** | | | | | | |
| M-100 | impact (9x14) | 140 | 66, 111, 132, 220 | Dataproducts, RS232C, Centronics, current loop (up to 9600, X-on/X-off, DTR or RTS, ACK/NAK) | 3,000 | status display, self-test, universal power supply; opt. programmable character generator, graphics, bar codes, variable height block letters, line drawing |
| M-120 | impact (7x7) | 180 | 66, 132, 220 | Dataproducts, RS232C, Centronics, current loop (up to 9600 bps, X-on/X-off, DTR or RTS, ACK/NAK) | 2,700 | status display, self-test, universal power supply, forms length select switch |
| M-200 | impact (7x7) | 340 | 66, 132, 220 | Dataproducts, RS232C, Centronics, current loop (up to 9600 bps, X-on/X-off, DTR or RTS, ACK/NAK) | 3,000 | status display, self-test, universal power supply, forms length select switch |
| **DATASOUTH COMPUTER CORP.** | | | | | | |
| DS180 | impact (9x7) | 180 | 66–217 | RS232C, Centronics (110–9600 bps, X-on/X-off, DTR) | 1,595 | non-volatile format retention, 50 programmable features via front keypad |
| DS220 | impact (9x7, 9x15, 18x48) | 220, 90, 40 | 66–217 | RS232C, Centronics (110–9600 bps, X-on/X-off, DTR) | 1,995 | dual-mode operation, 50 programmable features via front keypad |

# MATRIX CHARACTER PRINTERS
## (including Teleprinters)



| Company Model | Print (method matrix size) | Printing speed (cps) | Chars. line | Interface (protocol) | Price ($) | Notes, features, options |
|---|---|---|---|---|---|---|
| **DATEL-INTERSIL** | | | | | | |
| APP-20A1 | thermal (5x7) | 21 | 20 | | 625 | |
| APP-48A1 | thermal (5x7) | 57 | 48 | | 695 | |
| **DECISION DATA COMPUTER CORP.** | | | | | | |
| 6541-02 | impact (5x7) | 150 | 132 | IBM 3270 "B" adaptor (SNA/SDLC, BSC, coax) | 4,144(Q1); 3,688(Q100) | cartridge ribbon, off-line test |
| 6541-05 | impact (5x7) | 150 | 132 | IBM 3270 "A" adaptor (SNA/SDLC, BSC, coax) | 5,314(Q1); 4,729(Q100) | cartridge ribbon, off-line test |
| 6541-07 | impact (5x7) | 150 | 132 | IBM S/34, S/36, S/38 (SDLC, twinax) | 3,995(Q1); 3,616(Q100) | cartridge ribbon, off-line test |
| **DIABLO SYSTEMS INC.** | | | | | | |
| Series 11CQ | impact | 100, 30 | 40, 48, 66, 80, 96, 132 | RS232C, Centronics (300–9600 bps, X-on/X-off, DTR, ETX/ACK) | 749 | NLQ, bit-mapped, mosaic graphics, word processing software compatible |
| Series 32CQ | impact | 150, 60 | 66, 80, 110, 132, 158, 220 | Centronics | 995 | prints IBM PC character set, NLQ, bit-mapped, mosaic graphics, word processing compatibility |
| Series 38 | impact | 400 | 66, 132 | RS232C, Centronics (1200–19,200 bps, X-on/X-off, DTR, ETX/ACK) | 2,195–2,345 | prints IBM PC character set, NLQ, bit-mapped, mosaic graphics, word processing compatibility |
| Series C | (ink jet) | 20 | 85 | Centronics | 1,250 | 12-color printing, mosaic and bit-mapped graphics |
| **DIGITAL MATRIX CORP.** | | | | | | |
| 9/80 Formwriter | impact (9x9) | 150 | 132 | RS232C, Centronics (300–9600 bps, X-on/X-off) | 1,200 | demand document printer, prints forms |
| 9/80 PS | impact (9x9) | 150 | 132 | RS232C, Centronics (300–9600 bps, X-on/X-off, buffer full) | 1,051(Q1); 750(Q100) | 7-channel VFU, dot-addressable graphics |
| 9/80 ME | impact (9x9) | 150 | 80 | | 299 | controller board, power supply available; dot-addressable graphics |
| 9/132 Durawriter | impact (9x9) | 165 | 132, 136, 163, 225 | RS232C, Centronics (X-on/X-off, 300–9600 bps) | 1,395(Q1); 995(Q100) | bidirectional, logic seeking printing; dot-addressable graphics |
| 9/132 Durawriter Plus | impact (9x9) | 180 | 132, 136, 163, 225 | RS232C, Centronics (X-on/X-off, 300–9600 bps) | 1,500(Q1); 1,170(Q100) | bidirectional, logic seeking printing; NLQ, dot-addressable graphics |
| 9/132 Formwriter | impact (9x9) | 165 | 132, 136, 163, 225 | RS232C, Centronics (300–9600 bps, X-on/X-off) | 1,575 | demand document printer, prints forms |
| **DIGITEC CORP.** | | | | | | |
| 6430 | electrostatic (7x5) | 50 | 20 | RS232C, current loop, 8-bit parallel (DTR) | 399 | small size, 3.08x7.38x6.12 inches |
| 6430J | electrostatic (7x5) | 80 | 32 | RS232C, current loop, 8-bit parallel (DTR) | 444 | small size, 3.08x7.38x6.12 inches |
| 6431 | electrostatic (7x7) | 50 | 20 | RS232C (110–1200 bps, DTR) | 549 | small size, 3.08x7.38x6.12 inches; real-time clock |
| 6431J | electrostatic (7x7) | 80 | 32 | RS232C (110–1200 bps, DTR) | 594 | small size, 3.08x7.38x6.12 inches; real-time clock |
| 6432 | electrostatic | 50 | 20 | 8-bit parallel | 549 | small size, 3.08x7.38x6.12 inches; real-time clock |
| 6432J | electrostatic | 80 | 32 | 8-bit parallel | 594 | small size, 3.08x7.38x6.12 inches; real-time clock |
| 6433 | electrostatic (7x5) | 50 | 20 | IEEE-488 | 430 | small size, 3.08x7.38x6.12 inches |
| 6433J | electrostatic (7x5) | 80 | 32 | IEEE-488 | 475 | small size, 3.08x7.38x6.12 inches |
| 6434 | electrostatic | 50 | 20 | Centronics | 430 | small size, 3.08x7.38x6.12 inches |
| 6434J | electrostatic | 80 | 32 | Centronics | 475 | small size, 3.08x7.38x6.12 inches |
| 6470 | thermal (7x5) | 50 | 20 | RS232C, current loop, 8-bit parallel (DTR) | 445 | small size, 3.08x7.38x6.12 inches |
| 6471 | thermal | 50 | 20 | RS232C (110–1200 bps, DTR) | 595 | small size, 3.08x7.38x6.12 inches; real-time clock |

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**CIRCLE NO. 63 ON INQUIRY CARD**

## MATRIX CHARACTER PRINTERS (including Teleprinters)

| Company Model | Print (method matrix size) | Printing speed (cps) | Chars/line | Interface (protocol) | Price ($) | Notes, features, options |
|---|---|---|---|---|---|---|
| 6472 | thermal | 50 | 20 | 8-bit parallel | 595 | small size, 3.08x7.38x6.12 inches; real-time clock |
| 6473 | thermal | 50 | 20 | IEEE-488 | 475 | small size, 3.08x7.38x6.12 inches |
| 6474 | thermal | 50 | 20 | Centronics | 475 | small size, 3.08x7.38x6.12 inches |
| 6610 | impact | 16 | 24 | RS232C (75–9600 bps, DTR) | 495 | real-time clock, calendar and interval timer; 2K buffer options |
| 6611 | impact | 16 | 24 | RS232C (75–9600 bps, DTR) | 525 | real-time clock, calendar and interval timer; 9–35V DC power, 2K buffer option |
| 6620 | impact | 16 | 24 | Centronics | 495 | real-time clock, calendar and interval timer; 9–35V DC power, 2K buffer option |
| 6630 | impact (7x5) | 16 | 22 | parallel BCD | 565 | real-time clock, calendar and interval timer; 2K buffer option |
| **DURANGO SYSTEMS INC.** | | | | | | |
| Poppywriter | impact (9x9, 36x18) | 165, 40 | | RS232C, RS422, Centronics (9600 bps, X-on/X-off, DTR, ETX/ACK) | 2,495(Q1); 1,697(Q100) | |
| **EATON CORP.** | | | | | | |
| 4000T | impact (9x7) | 120 | 40 | | 1,295 | |
| 7000+ | impact (7x7) | 40 | 40 | | 495 | |
| **ENVISION** | | | | | | |
| 430 | impact (18 wire) | 1000, 300 | up to 132 | RS232C (19,200 bps, X-on/X-off, DTR) | 3,495 | vector-to-raster converter, HP 74175 pen plotter compatible, HP-GL plotter emulation |
| **EPSON AMERICA INC.** | | | | | | |
| RX-80 F/T | impact (9x9, 18x18) | 100 | 40–137 | RS232C, Centronics, IEEE-488 (X-on/X-off) | 599 | |
| RX-80 | impact (9x9, 18x18) | 100 | 40–137 | RS232C, Centronics, IEEE-488 (X-on/X-off) | 399 | |
| RX-100 | impact | 100 | 68–233 | RS232C, Centronics, IEEE-488 (X-on/X-off) | | |
| FX 80 | impact (9x9, 18x18) | 160 | 40–80 | RS232C, Centronics, IEEE-488 (X-on/X-off) | 699 | |
| FX 100 | impact (9x9, 18x18) | 160 | 40–80 | RS232C, Centronics, IEEE-488 (X-on/X-off) | 895 | |
| LQ-1500 | impact (9x17, 37x17) | 200 | 136, 163 | RS232C, Centronics, IEEE-488 (X-on/X-off) | 1,499 | |
| **ERGOTRON** | | | | | | |
| 310 | impact (7x9) | 160 | 80 | RS232C, current loop, Centronics (9600 bps, X-on/X-off, ACK/NAK, ENQ/ACK) | | ticket printer, adjusts to document thickness, bidirectional printing |
| 320 | impact | 72 | | RS232C, current loop (9600 bps) | | ticket printer, bar codes, reverse image printing |
| **EXTEL CORP.** | | | | | | |
| A Series | impact (5x7) | 30 | 80 | RS232C | 1,760 | |
| ComScribe | impact (12x28) | 60 | 80 | parallel, Centronics (50–300 bps) | 895 | friction or tractor feed, NLQ, 240 dpi resolution; opt. keyboard for teleprinter capability |
| **FACIT INC.** | | | | | | |
| 4510 | impact (9x15) | 120, 100 | 80 | RS232C, Centronics (9600 bps, DTR, X-on/X-off, ETX/ACK) | 695 | proportional spacing, low noise, pitch operator selectable, block and 7-pin graphics |
| 4512 | impact | 140, 50 | 132 | RS232C (9600 bps, DTR, X-on/X-off, ETX/ACK) | 1,195 | proportional spacing, low noise, NLQ, pitch operator selectable, block and 8-pin graphics |

## MATRIX CHARACTER PRINTERS (including Teleprinters)

| Company Model | Print (method matrix size) | Printing speed (cps) | Chars/line | Interface (protocol) | Price ($) | Notes, features, options |
|---|---|---|---|---|---|---|
| 4528T | impact | 285, 165 | 136 | RS232C, Centronics (110–9600 bps, DTR, X-on/X-off, ETX/ACK) | 1,595 | proportional spacing |
| 4528V | impact | 285, 165 | 136 | RS232C, Centronics (110–9600 bps, DTR, X-on/X-off, ETX/ACK) | 1,995 | proportional spacing, bit-mapped graphics 120x60 dpi |
| 4542 | impact (9x9) | 250–535 | 150 | RS232C, Centronics, IEEE-488, Facit SPI (110–19,200 bps, DTR, X-on/X-off, custom) | 3,995 | proportional spacing, 2-color printing, bit-mapped graphics 72x140 dpi |
| 4544 | impact (9x9) | 225 | 150 | RS232C, Centronics, IEEE-488, Facit SPI (110–19,200 bps, DTR, X-on/X-off, custom) | 4,695 | proportional spacing, 8-color printing, bit-mapped graphics |
| 4570 | impact (9x9) | 250, 80, 50 | 132 | RS232C, serial V.24/V.28 (9600 bps) | | |
| 5000A | impact (9x9) | 150, 125 | 136 | RS232C, parallel, current loop (110–9600 bps) | 1,295–1,495 | |
| 5000C | impact (9x9) | 150, 285 | 136 | RS232C, parallel, current loop (110–9600 bps) | 1,595–1,695 | 6-bit full dot graphics 120x60 dpi |
| 5000V | impact (9x9) | 150, 285 | 136 | RS232C, Centronics (110–9600 bps) | 2,095–2,195 | 6-bit full dot graphics 120x60 dpi |
| **FLORIDA DATA CORP.** | | | | | | |
| OSP 120 | impact | 600 | 237 | | 3,900 | |
| OSP 125 | impact | 600 | 237 | | 4,300 | |
| OSP 130 | impact | 600 | 237 | | 4,100 | |
| **FUJITSU AMERICA INC.** | | | | | | |
| DPL24 | impact (24x180) | 80, 160, 240 | 136, 163, 244 | RS232C, current loop, Centronics (up to 9600 bps, X-on/X-off, DTR, ETX/ACK) | 1,950 | 2 downloadable RAMs; dot-addressable graphics |
| TTP16 | thermal (16x20) | 45 | 40, 80, 132 | Centronics (150–9600 bps) | 625 | noise level under 50dBA; prints on plain paper, envelopes and vinyls; color printing capabilities |
| **GENERAL BUSINESS TECHNOLOGY** | | | | | | |
| 5203DP | impact (7x9, 40x18) | 200, 50 | up to 198 | IBM S/34, S/36, S/38 (twinax) | 4,795 | |
| 5203MP | impact (7x9) | 200 | up to 198 | IBM S/34, S/36, S/38 (twinax) | 4,495 | |
| 5207FA | impact (9x9) | 120 | up to 132 | IBM S/34, S/36, S/38 (twinax) | 2,795 | |
| 5207MP | impact (9x9) | 120 | up to 198 | IBM S/34, S/36, S/38 (twinax) | 2,995 | |
| 5210BL | impact (9x7) | 150 | up to 198 | IBM S/34, S/36, S/38 (twinax) | 4,995 | Printonix software compatible |
| 5220DP | impact (9x9, 9x18) | 400, 100 | up to 198 | IBM S/34, S/36, S/38 (twinax) | 5, 400 | |
| 5220MP | impact (9x9) | 400 | up to 198 | IBM S/34, S/36, S/38 (twinax) | 4,750 | |
| **GENICOM CORP.** | | | | | | |
| 200 | impact (7x9) | 200 | 136–227, programmable | RS232C, current loop (1200 bps, X-on/X-off) | 2,270–2,470(Q1); 1,816–1,976(Q100) | teleprinter compatible with Bell 103, 202, 212A modems, red/black printing, 40K-byte character text editor; opt. single/dual cassette tape storage |
| 200LP | impact (7x9) | 200 | 136–227, programmable | RS232C, current loop, Centronics, Dataproducts (9600 bps, X-on/X-off) | 2,590(Q1); 2,072(Q100) | expanded proportional spacing |
| 2030 | impact (9x7) | 60 | 132–217, programmable | RS232C (4800 bps, X-on/X-off) | 1,175–1,250(Q1); 940, 1,000(Q100) | teleprinter compatible with Bell 103, 202, 212A modems; current loop, 16K-byte line buffer; opt. 32K-byte character text editor |
| 2120 | impact (9x7) | 150 | 132–217, programmable | RS232C, current loop (4800, 9600 bps, X-on/X-off) | 2,120–2,195(Q1); 1,756–1,696(Q100) | teleprinter compatible with Bell 103, 202, 212A modems; bit-mapped 73x72 dpi graphics, 32K-byte character text editor, numeric cluster, Printronix compatible; opt. pedestal |

# MATRIX CHARACTER PRINTERS
## (including Teleprinters)



| Company Model | Print (method matrix size) | Printing speed (cps) | Chars. line | Interface (protocol) | Price ($) | Notes, features, options |
|---|---|---|---|---|---|---|
| 3014 | impact (9x9, 9x18) | 32–160 | 132–224 | RS232C, Centronics (X-on/X-off) | 1,199(Q1); 959(Q100) | 2K-byte line buffer, bit-mapped graphics, Epson Graftrax Plus and Okidata 84 Step 2 compatible |
| 3024 | impact (9x9, 9x18) | 40–200 | 132–224 | RS232C, Centronics (X-on/X-off) | 1,499(Q1); 1,199(Q100) | 2K-byte line buffer, bit-mapped graphics, Epson Graftrax Plus and Okidata Step 2 compatible |
| 3180 | impact (9x9) | 90, 180 | 136, 227 | RS232C (9600 bps, X-on/X-off) | 2,030(Q1); 1,624(Q100) | automatic underline, expanded proportional spacing, bit-mapped graphics, super/subscripts; opt. Centronics interface |
| 3184 | impact (9x9, 9x18) | 45, 90, 180 | 136–227 | RS232C (9600 bps, X-on/X-off) | 2,230(Q1); 1,784(Q100) | automatic underline, proportional spacing, italics, super/subscripts, bit-mapped graphics, 6K-byte buffer; opt. Centronics interface |
| 3184C | impact (9x9, 9x18) | 45, 90, 180 | 136–227 | RS232C (9600 bps, X-on/X-off) | 2,730(Q1); 2,184(Q100) | automatic underline; 2-, 4-, 7-color ribbons, bit-mapped graphics, 6K-byte buffer; opt. Centronics interface |
| 3300 | impact (9x9, 7x7) | 300 | 136–227, programmable | RS232C (9600 bps, X-on/X-off) | 2,250(Q1); 1,800(Q100) | proportional spacing, automatic underline, 6K-byte buffer, bit-mapped graphics; opt. Centronics interface |
| 3304C | impact (7x7, 9x18) | 100, 300 | 136–227, programmable | RS232C (9600 bps, X-on/X-off) | 2,990(Q1); 2,392(Q100) | proportional spacing, automatic underline, super/subscripts, 6K-byte buffer expansion, italics; opt. Centronics interface |
| 3400 | impact (9x9) | 400, 200 | 136–227, programmable | RS232C (9600 bps, X-on/X-off) | 2,450(Q1); 1,960(Q100) | proportional spacing, automatic underline, super/subscript; 6K-byte buffer expansion, bit-mapped graphics; opt. Centronics interface |
| 3404 | impact (9x9, 9x18) | 400, 200, 100 | 136–227, programmable | RS232C (9600 bps, X-on/X-off) | 2,650(Q1); 2,120(Q100) | proportional spacing, automatic underline, super/subscript; 6K-byte buffer expansion, bit-mapped graphics; opt. Centronics interface |
| 3404C | impact (9x9, 9x18) | 400, 200, 100 | 136–227, programmable | RS232C (9600 bps, X-on/X-off) | 3,150(Q1); 2,520(Q100) | proportional spacing, automatic underline, bit-mapped graphics, 7-color ribbon, super/subscript; opt. 6K-byte buffer |
| 3404PC | impact | | 136–227, programmable | RS232C, Centronics (9600 bps, X-on/X-off, Diablo 630, Epson Graftrax Plus) | 2,800(Q1); 2,240(Q100) | proportional spacing, automatic underline, italics, bit-mapped graphics; opt. 6K-byte buffer |
| 3304PC | impact (9x9, 9x18) | 300, 100 | 136–227, programmable | RS232C, Centronics (9600 bps, X-on/X-off, Diablo 630, Epson Graftrax Plus) | 2,640(Q1); 2,112(Q100) | proportional spacing, automatic underline, italics, bit-mapped graphics; opt. 6K-byte buffer |
| **HARRIS CORP., COMPUTER SYSTEMS DIV.** | | | | | | |
| 4415 | impact | 165 | 132 programmable | RS232C | 2,400 | screen dump or trailing mode printer, self-test |
| **HEATH DATA SYSTEMS** | | | | | | |
| Z-125, H-125 (kit) | impact | 150 | selectable | RS232C (110–9600 bps, X-on/X-off) | 1,499 (assembled); 899 (kit) | block graphics, WordStar compatible, 256 character buffer, ASCII character set |
| **HEWLETT-PACKARD** | | | | | | |
| 2635B | impact | 180 | 136 | | 4,370 | teleprinter |
| HP2225A ThinkJet | ink jet (11x12) | 150 | 96 | HP-IB | 600 | bidirectional, compatible with Epson America's dot-matrix printers, built-in ink reservoir and print head, dot-addressable graphics |
| HP2225B ThinkJet | ink jet (11x12) | 150 | 96 | HP-IL | 600 | bidirectional, compatible with Epson America's dot-matrix printers, built-in ink reservoir and print head, dot-addressable graphics |
| HP2225C ThinkJet | ink jet (11x12) | 150 | 96 | Centronics, parallel | 495 | bidirectional, compatible with Epson America's dot-matrix printers, built-in ink reservoir and print head, dot-addressable graphics |
| HP2932A | impact | 200 | 223, 136, 68 | RS232C, RS422, Centronics, IEEE-488 (ENQ/ACK, X-on/X-off) | 2,495 | last-form tearoff, raster graphics |
| HP2933A | impact | 200 | 68, 136, 223 | RS232C, RS422, Centronics, IEEE-488 (ENQ/ACK, X-on/X-off) | 2,795 | last-form tear-off, raster graphics, bar codes, large characters |
| HP2934A | impact | 200, 67, 40 | 68, 136, 223 | RS232C, RS422, Centronics, IEEE-488 (ENQ/ACK, X-on/X-off) | 2,895 | last-form tear-off, bar codes, large characters |


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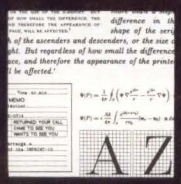
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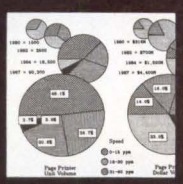
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CIRCLE NO. 64 ON INQUIRY CARD

## MATRIX CHARACTER PRINTERS
## (including Teleprinters)

| Company Model | Print (method matrix size) | Printing speed (cps) | Chars. line | Interface (protocol) | Price ($) | Notes, features, options |
|---|---|---|---|---|---|---|
| **HONEYWELL INFORMATION SYSTEMS** | | | | | | |
| PRU1005 | impact (7x7) | 120 | 132 | RS232C, current loop (1200 bps) | 3,390 | |
| PRU7070, 7071, 7072 | impact (9x7) | 100 | 80 | RS232C, RS422 (300, 1200, 9600 bps, Honeywell ASPI) | 1,195 | |
| PRU7075, 7076, 7077 | impact (9x7) | 100 | 132 | RS232C, RS422 (300, 1200, 9600 bps, Honeywell ASPI) | 1,495 | |
| PRU7170, 7171, 7172 | impact | 150 | 132 | RS232C, RS422 (300, 1200, 9600 bps, Honeywell ASPI) | 1,795 | |
| PRU7270, 7271, 7272 | impact (7x7) | 400 | 132 | RS232C, RS422 (1200–9600 bps, Honeywell APSI) | 3,450 | |
| TWU1005 | impact | 120 | 132 | RS232C, current loop (1200 bps) | 3,600 | teleprinter with ANSI keyboard, N-key rollover |
| **INFOSCRIBE INC.** | | | | | | |
| 500 | impact (9x9, 18x9) | 75, 150 | 136 | RS232C, Centronics (X-on/X-off) | 830(Q100) | |
| 700 | impact | 75, 150 | 132 | RS232C, Centronics (X-on/X-off) | 1,160(Q100) | demand document printer |
| 1400 | impact | 100, 200 | 136 | RS232C, Centronics (up to 9600 bps, X-on/X-off) | 1,200(Q100) | 18-wire color printing; opt. friction feed, character sets |
| 1500 | impact (9x9, 18x9) | 200, 400 | 132 | RS232C, Centronics (X-on/X-off) | 1,676(Q100) | |
| 1600 | impact (18 wire) | 100, 200 | 136 | RS232C, Centronics (up to 9600 bps; X-on/X-off) | 1,300(Q100) | 18-wire color printing, tractor and friction feed standard |
| 1000 | impact (7x9, 14x9) | 100, 200 | 136 | RS232C, Centronics (up to 9600 bps, X-on/X-off) | 985(Q100) | NLQ, multiple character sets, opt. 3K buffer |
| 1100 | impact (7x9, 14x9) | 40, 200 | 136 | RS232C, Centronics (up to 9600 bps; X-on/X-off) | 1,061(Q100) | opt. manual friction feed |
| 1200 | impact (7x9) | 40, 200 | 132 | RS232C, Centronics (up to 9600 bps; X-on/X-off) | 1,200(Q100) | color graphics; opt. manual friction feed |
| **JANOME SEWING MACHINE CO. LTD.** | | | | | | |
| CP-1009 | impact | 90 | 90 | Centronics | | RS232C, 7-color printing; opt. GP-IB, RGB video |
| CP-1018 | impact | 90, 180 | 136 | Centronics | | RS232C, 7-color printing; opt. GP-IB, RGB video |
| **JAPAN DIGITAL LABS** | | | | | | |
| JDL 750 | impact (24 wire) | 67, 133 | 152 | RS232C, Centronics (110–9600 bps) | 3,250(Q1); 1,766(Q500) | 6-color cartridge ribbon, 64K buffer memory, self-diagnostics, enlarges letters to quadruple size |
| **KAYE INSTRUMENTS** | | | | | | |
| LP-1 | impact | 137 | | RS232C, current loop (110–2400 bps) | 2,990 | industrial rackmount package, page count feature, internal 3000 character buffer |
| **LEADING EDGE PRODUCTS** | | | | | | |
| 8510A | impact | 120 | programmable | Centronics (ready/busy, X-on/X-off, ETX/ACK) | 495 | |
| 8510S | impact | 180 | programmable | RS232C, Centronics (ready/busy, X-on/X-off, ETX/ACK) | 795 | |
| 8510SC | impact | 180 | programmable | RS232C, Centronics (ready/busy, X-on/X-off, ETX/ACK) | 895 | color printing capability |
| 8510BPI | impact | 120 | 80, 136, programmable | Centronics (ready/busy, X-on/X-off, ETX/ACK) | 525 | |
| 8600B | impact | 180, 90, 60 | 80, 132, programmable | RS232C, Centronics (ready/busy, X-on/X-off, ETX/ACK) | 1,295 | red/black color printing |
| **LEAR SIEGLER/DATA PRODUCTS DIV.** | | | | | | |
| VersaPrint 500 Series | impact | 45, 90, 180 | 136, 163, 224 | RS232C, Centronics (75–9600 bps, X-on/X-off, busy/ready) | 1,695–2,495(Q1) | dot-addressable graphics, noise level less than 55dBA, straight paper path; opt. 4-color ribbon |

# MATRIX CHARACTER PRINTERS
## (including Teleprinters)

| Company Model | Print (method matrix size) | Printing speed (cps) | Chars. line | Interface (protocol) | Price ($) | Notes, features, options |
|---|---|---|---|---|---|---|
| **MDS TRIVEX** | | | | | | |
| 8087 | impact | 180 | 132 | IBM 3274, 3276; IBM 3271, 3272; Trivex 0722, 0712 | 4,500 | |
| **MANNESMANN-TALLY** | | | | | | |
| 1600 | impact (7x9, 40x18) | 200 | 66–218 | RS232C, Centronics (150–9600 bps, X-on/X-off) | 1,695 | automatic front feed, bottom form load, bit-mapped graphics |
| 1800 | impact (7x9, 40x18) | 200, 50 | 66–218 | RS232C, Centronics (150–9600 bps, X-on/X-off) | 1,995 | automatic front feed, bottom form load, bit-mapped graphics |
| 16R KSR | impact (7x9) | 200 | 66–218 | RS232C (150–9600 bps, X-on/X-off, ETX/ACK) | 1,945–2,295 | teleprinter with ANSI keyboard, 1200 bps, 42 programmable features |
| SPIRIT 80 | impact (9x8) | 80, 40 | 40–142 | RS232C, Centronics (150–9600 bps, DTR) | 399 | tear off bar, bit-mapped graphics |
| MT-160 | impact (9x7, 18x20) | 160, 40 | 40–160 | RS232C, Centronics (150–9600 bps, X-on/X-off, DTR, ETX/ACK) | 698 | proportional spacing, small footprint, bit-mapped graphics |
| MT-180 | impact (9x7, 18x20) | 40, 160 | 66–264 | RS232C, Centronics (150–9600 bps, X-on/X-off, DTR, ETX/ACK) | 998 | proportional spacing, small footprint, bit-mapped graphics |
| 420 | impact (9x7, 18x40) | 50, 200 | 66–220 | RS232C, Centronics (150–9600 bps, X-on/X-off, DTR, ETX/ACK) | 2,295 | bar code, OCRA, OCRB, bit-mapped graphics |
| 440 | impact (9x7, 18x40) | 100, 400 | 66–220 | RS232C, Centronics (150–9600 bps, X-on/X-off, DTR, ETX/ACK) | 2,395 | bar code, OCRA, OCRB, bit-mapped graphics |
| **MEMODYNE CORP.** | | | | | | |
| MAP-20S | thermal | 40 | 20 | RS232C | 725 | low-temperature and DC operation series available |
| MAP-20P | thermal | 40 | 20 | 8-bit parallel | 625 | |
| MAP-20I | thermal | 40 | 20 | IEEE-488 | 825 | low-temperature and DC operation available |
| **MEPCOM INTERNATIONAL INC.** | | | | | | |
| EZ Print 21 | impact (5x7) | 50 | 21 | RS232C/422/423, parallel (120–9600 bps, RF or RJ11-C) | 995 | dot-addressable graphics, software driven, 600 character buffer; opt. modem |
| EZ Print 40 | impact (5x7) | 50 | 40 | RS232C/422/423, parallel (120–9600 bps, RF or RJ11-C) | 1,295 | 600 character buffer; opt. modem, graphics packages |
| **MICRO PERIPHERALS INC. (MPI)** | | | | | | |
| Print Mate 99 | impact (7x9, 11x9) | 100 | 80, 96, 136 | RS232C, Centronics, IEEE-488 (9600 bps, X-on/X-off, DTR, ETX/ACK) | 599 | includes AP-PAKS hardware/software packages |
| Print Mate 150 | impact (7x9, 11x9) | 150 | 136, 163, 204, 231 | RS232C, Centronics, IEEE-488 (19.2K baud bps, X-on/X-off, DTR, ETX/ACK) | 1,045 | includes AP-PAKS hardware/software packages |
| Sprinter | impact (7x9, 11x9) | 160 | 80, 96, 115.2, 120, 136 | RS232C, Centronics, IEEE-488 (19.2K baud bps, X-on/X-off, DTR, ETX/ACK) | 795 | includes AP-PAKS hardware/software packages |
| **MILTOPE CORP.** | | | | | | |
| PK-200 | impact (9x7) | 120 | 80 | RS232C | 12,000 | meets military specifications |
| **NCR CORP.** | | | | | | |
| 2600 | thermal (5x8) | 30 | 80 | RS232C, NCR, current loop (110–300 bps, DTR) | | teleprinter, modem, 2K-byte buffer; opt. paperholder |
| 6411 | impact | 120 | 80, 136, 230, programmable | RS232C, Centronics (110–9600 bps, DTR, X-on/X-off, ETX/ACK) | | proportional spacing, bit-mapped graphics, includes NCR DRGRAPH software, 2K-byte buffer, paper guide; opt. spare head |
| 6442 | impact | 80, 320 | 132, 218, programmable | RS232C, Centronics, NCR parallel (110–9600 bps, DTR) | | |

# MATRIX CHARACTER PRINTERS
## (including Teleprinters)

| Company Model | Print (method matrix size) | Printing speed (cps) | Chars. line | Interface (protocol) | Price ($) | Notes, features, options |
|---|---|---|---|---|---|---|
| **NEC INFORMATION SYSTEMS** | | | | | | |
| PINWRITER P2 | impact (7x9, 25x18) | 30, 90, 180 | 80 | IBM PC, RS232C, Centronics (up to 9600 bps, X-on/X-off, ETX/ACK, reverse channel) | 799 | compatible with IBM software, bit-mapped graphics |
| PINWRITER P3 | impact (7x9, 25x18) | 30, 90, 180 | 136 | IBM PC, RS232C, Centronics (up to 9600 bps, X-on/X-off, ETX/ACK, reverse channel) | 1,199 | compatible with IBM software, bit-mapped graphics |
| **NEWBURY DATA RECORDING LTD.** | | | | | | |
| 8820 | impact (9x7) | 150 | 132, 226 | RS232C, current loop, Centronics (50–9600 bps, X-on/X-off, ETX/ACK/ENQ, DTR) | | teletype compatible, block graphics up to 200 dpi, pedestal keyboard, code convert answerback, red/black color capability |
| 8840 | impact (9x7) | 240 | 132, 226 | RS232C, current loop, Centronics (50–9600 bps, X-on/X-off, ETX/ACK/ENQ, DTR) | | teletype compatible, block graphics up to 240 dpi, front feeder, pedestal keyboard, code convert answerback |
| 8850 | impact (9x7, 9x11) | 320, 480 | 132, 226 | RS232C, current loop, Centronics (50–9600 bps, X-on/X-off, ETX/ACK/ENQ, DTR) | | download character/graphics 240 dpi, quietised coverset 55dBA, non-volatile memory, 8 languages, 4 character fonts |
| 8910 | impact | 160, 240 | 132, 226 | RS232C, current loop, Centronics (50–9600 bps, X-on/X-off, ETX/ENQ/ACK, DTR) | | teletype compatibility, block graphics 240 dpi, keyboard, code conversion answerback; opt. red/black printing |
| 8905 | impact (12x8, 12x20) | 90, 180 | 132, 226 | RS232C, current loop, Centronics (50–9600 bps, X-on/X-off, ETX/ENQ/ACK, DTR) | | teletype compatibility, block graphics 240 dpi, keyboard, code conversion answerback; opt. red/black printing |
| 8925 | impact (12x8, 12x20) | 120, 240 | 132, 226 | RS232C, current loop, Centronics (50–9600 bps, X-on/X-off, ETX/ENQ/ACK, DTR) | | teletype compatibility, block graphics 240 dpi, code conversion answerback; opt. red/black printing |
| 8930 | impact (12x8, 12x20) | 120, 240 | 132–226 | RS232C, current loop, Centronics (50–9600 bps, X-on/X-off, DTR, ETX/ENQ/ACK) | | multi-lingual character sets, Diablo code compatible software, red/black printing capability, non-volatile memory |
| 8931 | impact (12xN) | 120, 240 | 132–226 | RS232C, current loop, Centronics (50–9600 bps, X-on/X-off, DTR, ETX/ENQ/ACK) | | multi-lingual character set, Diablo code compatible software, non-volatile memory; opt. single/dual bin sheet feeder |
| 8935 | impact | 90, 200 | 132–226 | RS232C, current loop, Centronics (50–9600 bps, X-on/X-off, DTR, ETX/ENQ/ACK) | | multi-lingual character set, Diablo code compatible software, non-volatile memory; opt. single/dual bin sheet feeder |
| **OKIDATA CORP.** | | | | | | |
| ML80 | impact (9x7) | 80 | 80, 132 | Centronics | 299 | 64 block graphic shapes |
| ML82A | impact (9x9) | 120 | 80, 132 | Centronics, RS232C (up to 1200 bps, X-on/X-off) | 349 | high resolution graphics available |
| ML83A | impact (9x9) | 120 | 136, 224 | RS232C, Centronics (up to 1200 bps) | 749 | high resolution graphics available |
| ML84 | impact (9x9) | 50, 200 | 136, 231 | parallel | 1,395 | 64 block graphic shapes |
| ML92 | impact (9x9) | 40, 160 | 80, 136 | parallel; opt. serial card | 599 | 64 block graphic shapes |
| ML93 | impact (9x9) | 40, 160 | 136, 233 | parallel; opt. serial card | 999 | 64 block graphic shapes |
| PACEMARK 2350 | impact (9x9) | 350 | 136, 233 | parallel; opt. serial | 2,695 | high resolution 144x144 dpi graphics |
| PACEMARK 2410 | impact | 350 | 136, 233 | parallel; opt. serial | 2,995 | NLQ, red and black ribbon available |
| **OLYMPIA USA** | | | | | | |
| ELECTRONIC COMPACT NP | impact | 165 | 40, 80, 136 | Centronics; opt. RS232C (ETX/ACK) | 499 | fine print for NLQ, EPSON graphics |
| **PANASONIC INDUSTRIAL CO.** | | | | | | |
| KX-P1092 | impact | 180 | 40–137 | 8-bit parallel (X-on/X-off, ETX/ACK) | 599 | opt. RS232C interface |

## MATRIX CHARACTER PRINTERS (including Teleprinters)

| Company Model | Print (method matrix size) | Printing speed (cps) | Chars. line | Interface (protocol) | Price ($) | Notes, features, options |
|---|---|---|---|---|---|---|
| KX-P1093 | impact | 160 | 40–137 | 8-bit parallel, RS232C | 899 | |
| KXP1090 | impact | 80–96 | 80–158 | parallel | 499 | opt. RS232C interface |
| KXP1160 | impact | 165–196 | 136–272 | parallel | 1,550 | opt. front feed |
| KXP1091 | impact | 45–120 | 40–132 | parallel | | opt. RS232C interface |
| **PHILIPS PERIPHERALS INC.** | | | | | | |
| GP300 | impact (9x9, 36x50) 18x25, 18x 50 | 80–120, 300 | 120 | RS232C, Centronics (300–19,200 bps, DTR, X-on/X-off, ACK/NAK) | 2,995(Q1) | proportional spacing, mosaic and bit-mapped graphics, logo printing capability, WordStar compatible |
| GP300L | impact (9x9, 18x50, 18x25) | 80–120, 300 | 144 | RS232C, Centronics (300–19,200 bps, DTR, X-on/X-off, ACK/NAK) | 3,100(Q1); | proportional spacing, mosaic and bit-mapped graphics, logo printing capability, WordStar compatible |
| GP150 | impact (9x9, 18x25) | 60–80, 150–170 | 120 | RS232C, Centronics (300–19,200 bps, DTR, X-on/X-off, ACK/NAK) | 1,850 | proportional spacing, mosaic and bit-mapped graphics, logo printing capability, WordStar compatible |
| **PRINTACOLOR CORP.** | | | | | | |
| TC1040 | ink jet | 90 | | RS232C, Centronics, RG3 (19,200 bps) | 5,495 | noise level less than 50 dBA |
| **PRINTEK** | | | | | | |
| 910 | impact (9x9) | 200 | 40 | RS232C, Centronics (300–9600 bps, X-on/X-off, ETX/ACK) | 1,595 | 7 foreign character sets, dot-addressable, dual density graphics |
| 920 | impact (9x9) | 340 | 40 | RS232C, Centronics (300–9600 bps, X-on/X-off, ETX/ACK) | 2,495 | 7 foreign character sets, dot-addressable, dual density graphics |
| 930 | impact | 200 | 40 | RS232C, Centronics (300–9600 bps, X-on/X-off, ETX/ACK) | 1,995 | executive quality print, 7 foreign character sets, dot-addressable, dual density graphics |
| **PRINTER PRODUCTS** | | | | | | |
| MT160 | impact | 160, 40 | 80 | IBM 3270, S/34, S/36, S/38 | 2,400 | IBM compatible |
| MT180 | impact | 40, 160 | 132 | IBM 3270, S/34, S/36, S/38 | 2,700 | IBM compatible |
| PSC-M200 | impact | 340 | 132 | IBM 3270, S/34, S/36, S/38 | 3,300–4,500 | |
| PSC-MT1600 | impact | 200 | 132 | IBM 3270, S/34, S/36, S/38 | 3,300–4,500 | IBM compatible |
| PSC-MT1800 | impact | 50, 200 | 132 | IBM 3270, S/34, S/36, S/38 | 3,300–4,500 | IBM compatible |
| 100 | impact (5x7) | 65 | 27 | RS232C, current loop | 460(Q1); 402(Q100) | red and black color printing |
| S100 | impact (5x7) | 65 | 27 | RS232C, current loop | 460(Q1); 402(Q100) | red and black color printing |
| 100T | impact (5x7) | 65 | 27 | RS232C, current loop | 660(Q1); 578(Q100) | |
| 270 | impact | 65 | 27 | | 660(Q1); 578(Q100) | |
| S400 | impact | 150 | 40 | | 775(Q1); 678(Q100) | 176 character buffer, bidirectional printing |
| S400T | impact | 150 | 40 | | 775(Q1); 678(Q100) | 176 character buffer, bidirectional printing |
| S400G | impact | 150 | | RS232C, Centronics, current loop | 885 | inverted printing, bidirectional paper feed, bit-mapped graphics |
| **QUANTEX/NORTH ATLANTIC INDUSTRIES** | | | | | | |
| 7020 | impact (4x5, 9x7, 9x12) | 75, 150, 180 | up to 256, programmable | RS232C, Centronics, current loop (300–19,200 bps, X-on/X-off, STX/ACK, DTR) | 1,495 | bit-mapped graphics, character amplification; Epson, Anadex bar code emulation |
| 7030 | impact (4x5, 9x12, 24x18) | 37.5, 75, 150, 180 | up to 256, programmable | RS232C, Centronics, current loop (300–19,200 bps, X-on/X-off, STX/ACK, DTR) | 1,695 | character amplification, bit-mapped graphics; opt. bar code emulation |
| 7035 | impact | 37.5, 75, 150, 180 | up to 256, programmable | RS232C, Centronics, current loop (300–19,200 bps, X-on/X-off, STX/ACK, DTR) | | character amplification, bit-mapped graphics; opt. bar code emulation |


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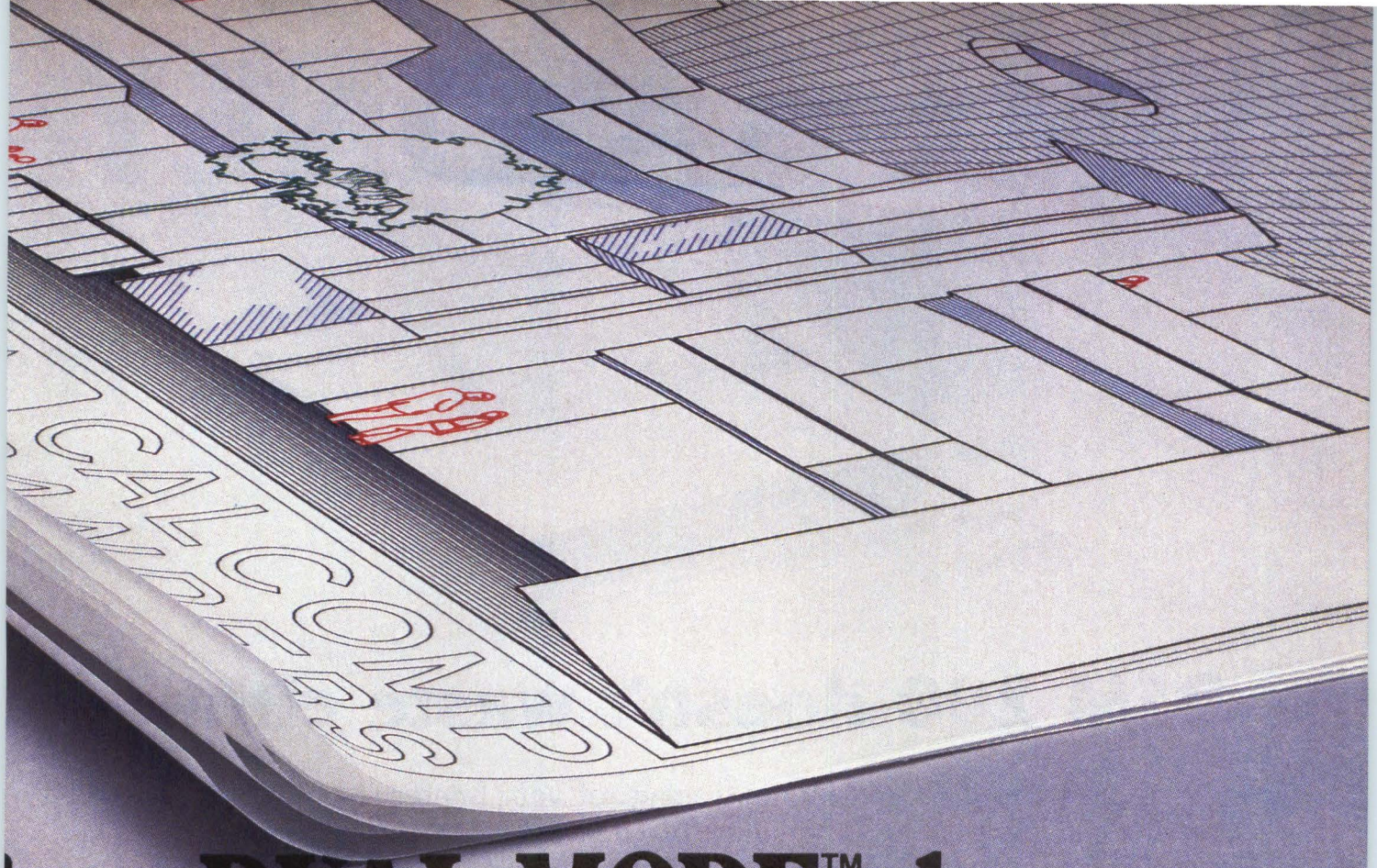


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The OEM 200 has other outstanding features like an optional SoftSwitch™ front panel keypad and a fast and impressive near letter quality mode. Our exclusive applications packages (AP-PAKS), providing enhanced graphics printing along with a vast selection of decorative type styles, are available for selected microcomputers.

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Model shown with optional SoftSwitch™ keypad

The Printer People
mpi

**Micro Peripherals, Inc.**
**4426 South Century Drive**
**Salt Lake City, Utah 84123**
**(801) 263-3081**



CIRCLE NO. 66 ON INQUIRY CARD

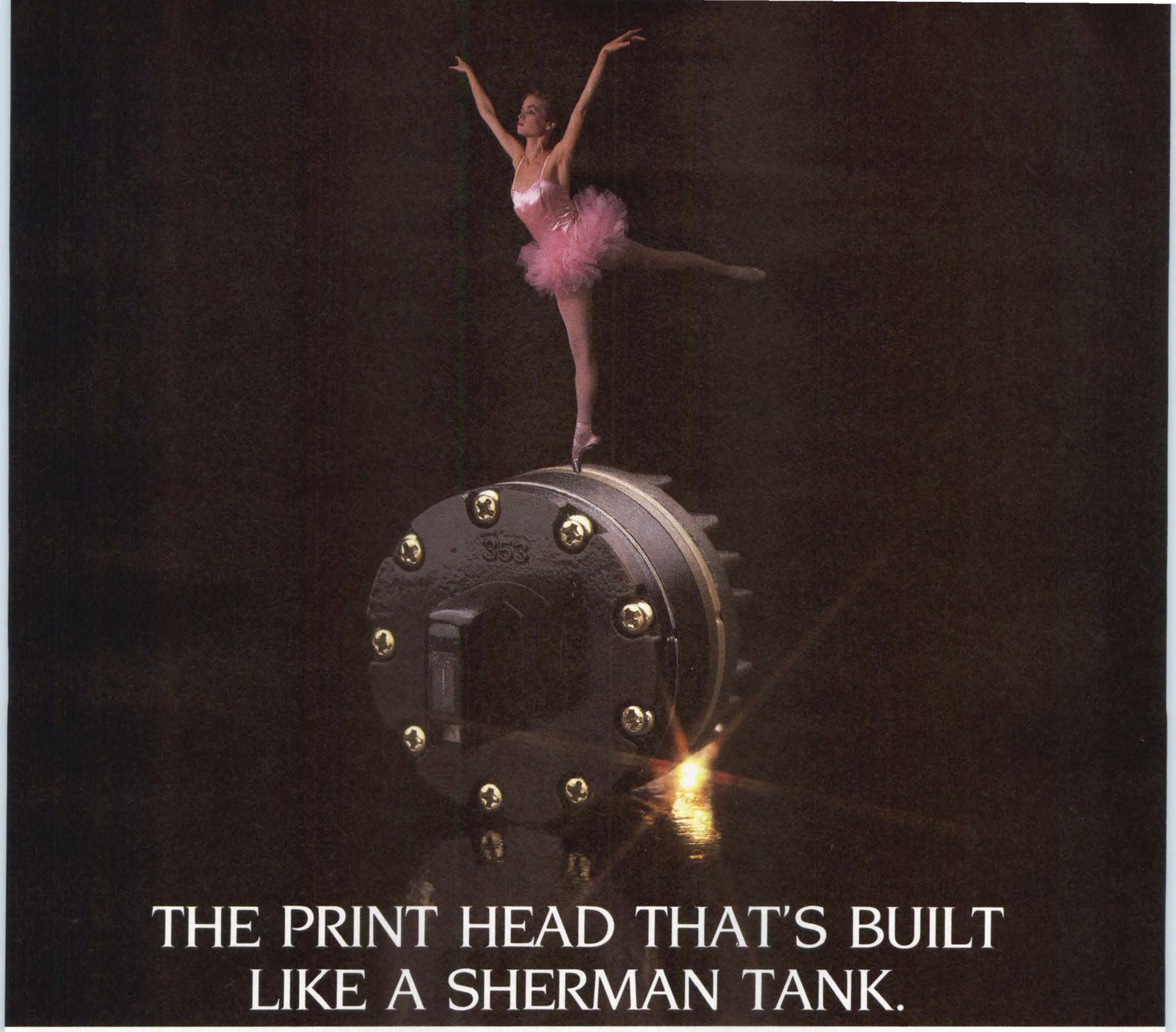
## MATRIX CHARACTER PRINTERS (including Teleprinters)

| Company Model | Print (method matrix size) | Printing speed (cps) | Chars./line | Interface (protocol) | Price ($) | Notes, features, options |
|---|---|---|---|---|---|---|
| 7040 | impact (4x5, 9x7 24x18) | 37.5, 75, 150, 180 | 256, programmable | RS232C, Centronics, current loop (300–19,200 bps, X-on/X-off, STX/ACK, DTR) | 1,795 | Diablo 630 emulation, bit-mapped graphics; opt. bar code emulation |
| 7065 | impact | 65, 150, 300 | 256, programmable | RS232C, Centronics, current loop (300–19,200 bps, X-on/X-off, STX/ACK, DTR) | 1,995 | bit-mapped graphics, bar code standard |
| **QWINT SYSTEMS INC.** | | | | | | |
| RO740 | impact (7x5) | 60 | 69–132, programmable | P.S.T.N., RS232C, V.24, current loop (1200 bps, ANSI) | 795(Q1); 676(Q100) | 12.5 lbs., bit-mapped graphics; opt. teleprinter with built-in 300 bps modem |
| KSR 740 | impact | 60 | 69–132, programmable | P.S.T.N., Telex, RS232C, V.24, current loop (1200 bps, ANSI, CCITT) | 995(Q1); 846(Q100) | bit-mapped graphics, 12.5 lbs.; opt. teleprinter with built-in 300 bps modem |
| MSR740 | impact | 60 | 69–132, programmable | P.S.T.N., Telex, RS232C, current loop (1200 bps, ANSI, CCITT) | 1,095(Q1); 931(Q100) | bit-mapped graphics, message editing; opt. teleprinter with 300 bps modem |
| **RADIO SHACK** | | | | | | |
| DMP110 | impact (5x7) | 25, 50 | 80 | | 399 | 64 Int'l. character sets |
| DMP200 | impact (Nx9) | 120 | 132 | | | 64 Int'l. character sets |
| DMP420 | impact (Nx9) | 140 | 132 | | | 64 Int'l. character sets |
| DMP500 | impact (Nx9) | 220 | 132 | | 1,795 | 64 Int'l. character sets |
| DMP2100 | impact (16x11) | 160 | 136 | | 1,995 | 64 Int'l. character sets |
| **SANTEC** | | | | | | |
| S700 VARIFLEX | impact | 32–390 | 236 | RS232C, Centronics (9600 bps, X-on/X-off) | 3,600 | bit-mapped graphics, NLQ |
| **SCI SYSTEMS INC.** | | | | | | |
| 1110 | electrostatic (5x11) | 2200 | 136 | RS232C, Centronics (300–19,200 bps, X-on/X-off) | 890(Q100) | ticket printer, cutter, electro-sensitive paper |
| 1180 | electrostatic (5x11) | 1100 | 136 | RS232C, Centronics (300–19,200 bps, X-on/X-off) | 1,005(Q100) | ticket printer |
| **SIEMENS COMMUNICATIONS SYSTEMS INC.** | | | | | | |
| PT88T2 | ink jet | 150 | 80 | RS232C, current loop, Centronics (9600 bps, X-on/X-off, DTR, ETX/ACK) | 895(Q1); 581(Q100) | noise level less than 50dBA, bit-mapped graphics |
| PT89T2 | ink jet | 150 | 132 | RS232C, current loop, Centronics (9600 bps, X-on/X-off, DTR, ETX/ACK) | 995 | noise level less than 50dBA, bit-mapped graphics |
| 2712 M203 | ink jet | 270 | 132 | RS232C, current loop, Centronics (9600 bps, X-on/X-off, DTR, ETX/ACK) | 2,250(Q1); 1,462(Q100) | noise level less than 55dBA, bit-mapped scanner graphics |
| 2712 M202 | ink jet | 270 | 80 | RS232C, current loop, Centronics (9600 bps, X-on/X-off, DTR, ETX/ACK) | 2,025(Q1); 1,316(Q100) | noise level less than 54dBA, bit-mapped scanner graphics |
| **SINGER DATA PRODUCTS** | | | | | | |
| 5010 | impact | 100 | 34 | RS232C, current loop (50–9600 bps) | 1,075(Q1); 862(Q100) | 2-color ribbon; opt. tractor, auto line feed |
| 5010-463 | impact | 100 | 26 | RS232C, current loop | 1,200 | 2-color ribbon; opt. auto line feed |
| 5080 | impact (5x7, 10x7) | 100 | 80 | parallel, RS232C, current loop, IEEE-488 | 395 | dot-addressable graphics |
| **SMITH-CORONA** | | | | | | |
| D-100 | impact | 120 | 80 | Centronics; opt. serial | 395 | bit-mapped graphics, NLQ, proportional spacing, Int'l. character sets, bidirectional printing |

# MATRIX CHARACTER PRINTERS
## (including Teleprinters)



| Company Model | Print (method matrix size) | Printing speed (cps) | Chars/line | Interface (protocol) | Price ($) | Notes, features, options |
|---|---|---|---|---|---|---|
| D-200 | impact | 120 | 80 | serial, parallel (110–9600 bps, X-on/X-off, ETX/ACK) | 595 | bit-mapped graphics, NLQ, proportional spacing, Int'l. character sets, bidirectional printing |
| D-300 | impact | 140 | 132 | serial, parallel (110–9600 bps, X-on/X-off, ETX/ACK) | 795 | bit-mapped graphics, NLQ, proportional spacing, Int'l. character sets, bidirectional printing |
| **SPERRY CORP.** | | | | | | |
| 0797 | impact (7x9) | 80 | 80 | RS232C, CCITTV24 (Univac) | 1,500 | controller included |
| **STAR MICRONICS INC.** | | | | | | |
| RADIX 10 | impact | 50, 200 | 80, 96, 136 | RS232C, Centronics (110–9600 bps, X-on/X-off, BUSY/ACK) | 849 | continuous underline, automatic sheet insertion, bit-mapped and block graphics, WordStar compatible |
| RADIX 15 | 50, 200 | 50, 200 | 136, 163, 233 | RS232C, Centronics (110–9600 bps, X-on/X-off, BUSY/ACK) | 995 | continuous underline, automatic sheet insertion, bit-mapped and block graphics, WordStar compatible |
| DELTA 10 | impact (9x9) | 160 | 80, 96, 136 | serial, parallel (110–9600 bps, BUSY/ACK, X-on/X-off) | 549 | downloadable character set; block, scan, bit-mapped graphics, WordStar compatible |
| DELTA 15 | impact (9x9) | 160 | 136, 164, 232 | serial, parallel (110–9600 bps, BUSY/ACK, X-on/X-off) | 699 | downloadable character set; block, scan, bit-mapped graphics, WordStar compatible |
| STX80 | thermal (5x9) | 60 | 40, 80 | parallel (110–9600 bps, BUSY/ACK) | 199 | WordStar compatible, scan, bit, image and block graphics, bidirectional logic-seeking printing |
| GEMINI 10X | impact (9x9) | 120 | 40–136 | parallel, serial (110–9600 bps, BUSY/ACK) | 399 | WordStar compatible, scan, bit, image and block graphics, bidirectional logic-seeking printing |
| GEMINI 15X | impact (9x9) | 120 | 68–132 | parallel, serial (110–9600 bps, BUSY/ACK) | 549 | WordStar compatible, scan, bit, image and block graphics, bidirectional logic-seeking printing |
| **TELETYPE CORP.** | | | | | | |
| 43 | thermal (7x9) | 30 | 132 | | 1,388 | |
| AP200 | impact (7x7) | 340 | 132 | | 3,868 | |
| **TELPAR INC.** | | | | | | |
| PL20E | thermal | 50 | 20 | current loop, Centronics | 297(Q1); 249(Q100) | |
| PL20EX | thermal | 40 | 20 | RS232C, current loop, Centronics (19,200 bps) | 297(Q1); 249(Q100) | |
| PL20RM | thermal | 40 | 20 | RS232C, current loop, Centronics (600 bps) | 575(Q1); 460(Q100) | |
| **TEXAS INSTRUMENTS INC.** | | | | | | |
| 855 | impact (9x9) | 35, 150 | | serial, parallel (300–9600 bps, DC1/DC3) | 935 | NLQ, font modules include: courier, gothic, prestige, elite, italics and orator |
| 820 | impact | | | serial (110–9600 bps, DC1/DC3) | 1,595 | |
| 810 RO | impact (9x7) | 150 | 132 | serial (200–9600 bps; opt. DC1/DC3) | 1,645 | |
| 850 RO | impact (32x18) | 150 | 134 | serial, parallel (200–9600 bps, DC1/DC3) | | NLQ, 7 font modules |
| ENHANCED 810 RO | impact (23x28) | 225 | | serial; opt. parallel (200–9600 bps, DC1/DC3) | 2,295 | word processing capabilities |
| 707 TELEPRINTER | thermal | 45 | 80, 132 | | 695 | teleprinter, full-size QWERY keyboard, acoustic coupler, portable; opt. battery back |
| **3M BUSINESS COMMUNICATION PRODUCTS DIVISION** | | | | | | |
| Model "C" Whisper Writer | thermal | 40 | 80 | Telex (300 bps) | 1,145 | |

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Choose a printer that won't crack under pressure. Our secret weapon? Okidata's stored-energy, non-ballistic print head. It has one moving part instead of three which means a smaller heat sink, less maintenance, and ultimately, an extremely low cost of ownership. For added durability, its armature is laser welded, not soldered. And its tough tungsten pins crank out 200,000,000 characters with ruthless precision.

But, a virtually invincible print head isn't the only reason our nationwide network of service people get so few calls. Okidata printers have exceptional MTBF and MTTR ratings; up to 4000 hours and as little as fifteen minutes, respectively. And no duty cycle limitations.

Yet, all this rugged reliability is delivered with the speed and grace of a prima ballerina. Inside their stamped steel bodies, our fastest models perform at up to 350 cps bi-directionally, with short line seeking logic and fast horizontal and vertical slew. As for style, our correspondence quality truly rivals a daisy-wheel's at speeds up to 85 cps. All models boast superior talents for their modest prices. Most, for instance, accept downline loadable character sets.

Plus, Okidata's compatibility is unlimited, and our technical staff can make alterations to fit your special OEM needs. Our innovations get standing ovations. For our latest product specification sheets, call 1-800-OKIDATA. In New Jersey, (609) 235-2600. Okidata, Mt. Laurel, NJ 08054.


**OKIDATA**

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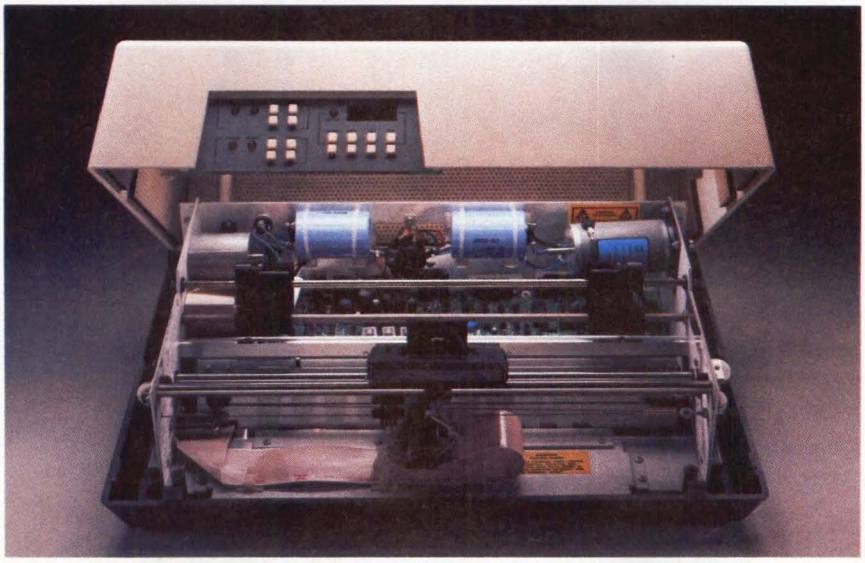
**CIRCLE NO. 67 ON INQUIRY CARD**

# MATRIX CHARACTER PRINTERS
## (including Teleprinters)

| Company Model | Print (method matrix size) | Printing speed (cps) | Chars. line | Interface (protocol) | Price ($) | Notes, features, options |
|---|---|---|---|---|---|---|
| **TRANS-LUX CORP.** | | | | | | |
| Connection | impact | 80 | 80, programmable | Telex, TWX (50–300 bps, X-on/X-off) | 3,695 | teleprinter with 50, 110, 330 baud modem, Teletype 32/33 compatible |
| TL-300 | impact | 30 | 80, programmable | TWX (110, 300 bps, X-on/X-off) | 2,565(Q1); 2,345(Q100) | teleprinter with 110, 330 baud modem, Teletype 32/33 compatible, 16K-byte memory |
| TLT | impact | 30 | 69 | current loop, Telex (50 bps) | 2,195–2,395(Q1); 1,975–2,195(Q100) | teleprinter with 50 baud modem, Teletype 32 compatible, pulse dialing, 4–16K-byte memory |
| **TRIFORMATION SYSTEMS INC.** | | | | | | |
| LED–120 | impact (2x3) | 120 | 40 | ASCII, Async | 14,500 | Braille, 220VAC operation; opt. Bell 202C modem, auto print |
| **VIVITAR COMPUTER PRODUCTS INC.** | | | | | | |
| TRANSTAR 315 | impact | 50 | 90, 120 | RS232C, Apple II, IIe; IBM PC | 599 | 4-color printing, contains drivers for use with Lotus 1-2-3 graphics, 2K-byte buffer |
| **WANG LABORATORIES INC.** | | | | | | |
| 5533-1 | impact (9x7, 9x9) | 120 | 158 | Wang serial | 3,500 | |
| 5535-1 | impact (9x7, 9x9) | 180, 220 | 158 | Wang serial | 4,500 | |
| 5577 | impact (48x16, 96x32) | 40–192 | | | 5,975 | bit-mapped graphics |
| 2233 | impact | 100, 120 | 132, 158 | parallel | 2,500 | |
| 2235-1 | impact | 181, 222 | 132, 158 | parallel | 3,500 | |
| **WENGER DATENTECHNIK** | | | | | | |
| Print Swiss | impact | 80, 160 | 80, 132, programmable | RS232C, current loop, Centronics (110–9600 bps, X-on/X-off, DTR, ETX/ENQ/ACK) | 1,100(Q1); 900(Q100) | IBM, Sperry, Burroughs compatible; bit-mapped, vector, mosaic graphics; bar code |
| Print Swiss | impact | 160 | 80, 132, programmable | RS232C, current loop, Centronics (110–9600 bps, X-on/X-off, DTR, ETX/ENQ/ACK) | 1,400(Q1); 1,100(Q100) | bit-mapped, vector, mosaic graphics |
| Wenger 4/1 | impact | 130, 400 | 136–315, programmable | RS232C/422, current loop, Centronics (110–19,200 bps, X-on/X-off, DTR, ETX/ENQ/ACK) | 3,900(Q1); 2,100(Q100) | 4-color ribbon, bit-mapped, mosaic graphics |
| **WESTREX OEM PRODUCTS** | | | | | | |
| 80802 | impact | 145 | 80 | RS232C, Centronics, IEEE-488 (110–9600 bps, X-on/X-off) | under 400 | for PC market; italics, NLQ, 12 Int'l. fonts, 8K RAM |

# HIGH PERFORMANCE

## IT'S WHAT'S UNDER THE HOOD THAT COUNTS



Take a close look under the hood of a Datasouth printer. Inspect for loose parts, cheap fittings. Search for things that show more concern for speed on the assembly line than the communications line.

You won't find them. Instead you'll find the source of the Datasouth reputation: design, engineering and materials dedicated exclusively to *high performance* value.

Now look closer.

### MORE THAN THE HUM OF ITS PARTS

Count the moving parts in a Datasouth printer. You won't find many. Most of those are dedicated to transporting the printhead and the paper from point to point with optimum speed and accuracy, while the rest of the printer sits quietly with the motionless authority of a Stonehenge.

And thinks.

Under the hood of every Datasouth printer is a highly intelligent microprocessor. Its sophisticated brainwork eliminates the need for many parts still common in other printers, and optimizes carriage and paper travel so the printhead intelligently follows the shortest path from one printable character to the next. So more work gets done with less strain on the machinery.

### MODULAR MAINTENANCE

Datasouth design simplicity assures easy maintenance. All control electronics are on a single printed circuit board. The 9 wire printhead is rated at over 500 million characters, and is easily replaced in minutes.

Everything that matters is easy to reach, right there under the hood. Even the cartridge ribbon, rated at 3 to 4 million characters, snaps into place in seconds.

### JUST TURN THE KEY

Datasouth printers are easily driven by virtually any mini or microcomputer. The fully instrumented dashboard allows the user to program up to 50 different applications features at the touch of a few buttons. Meanwhile, the digital readout shows everything from programming prompts to line count.

### TAKE YOUR CHOICE

Datasouth reliability comes in two high performance models. The DS180 is a legendary workhorse that delivers crisp data quality printing at 180 CPS. The new multimode DS220 cruises at 220 CPS for high speed data printing and at 40 CPS for letter quality word processing. Both models print precision dot-addressable graphics.

If you have a high performance printing need, Datasouth has a high performance printer to fill it.

### DRIVE ONE TO WORK TODAY

Both the DS180 and the DS220 are on display at more dealer showrooms every day, including one near you. So go take a hard look at the kind of hard copy you get from high performance Datasouth printers.

See what *really* counts when you compare printers.

**CIRCLE NO. 68 ON INQUIRY CARD**

**datasouth**

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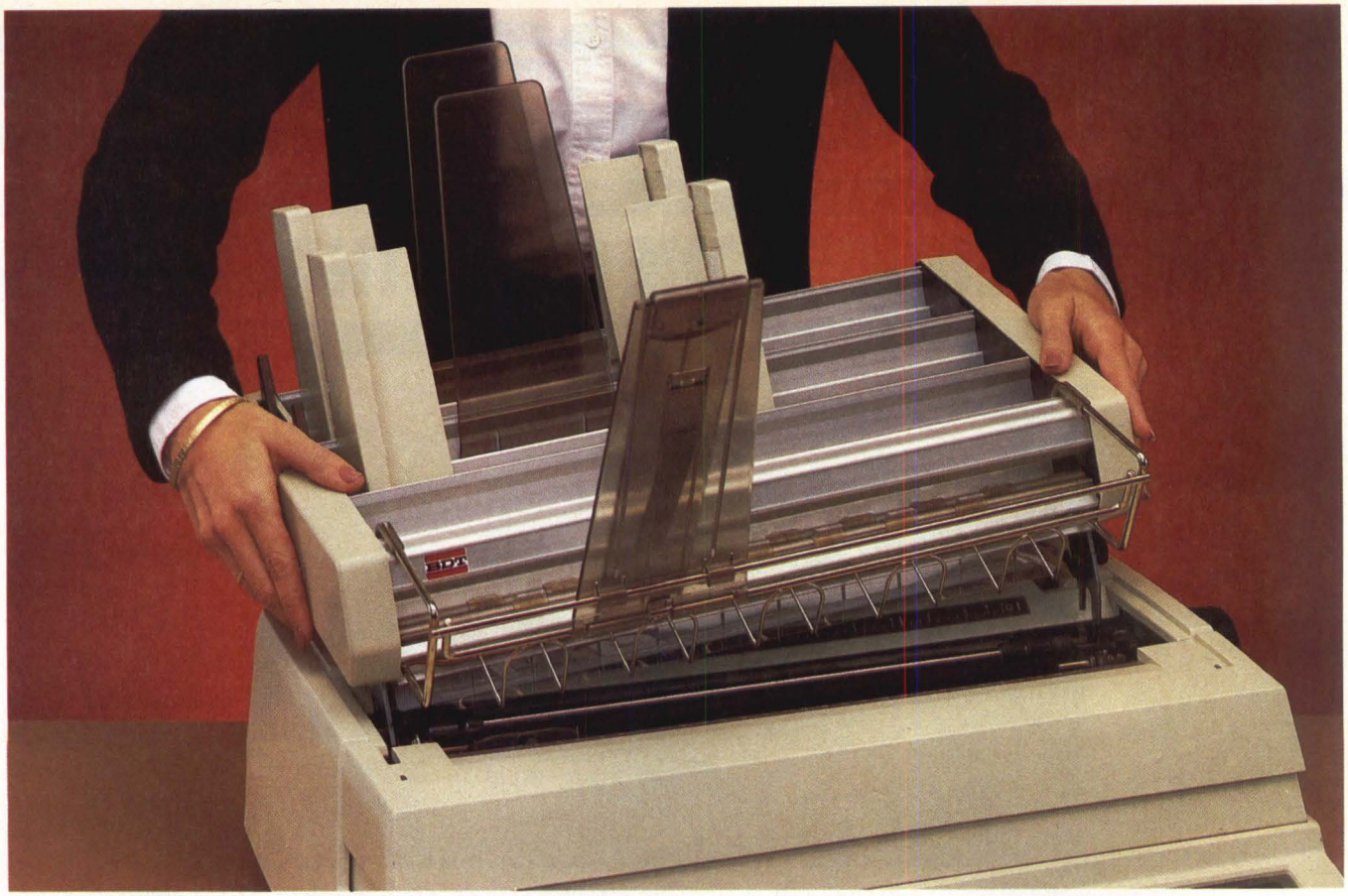

*The dual tray ASF 522, like most BDT sheet feeders, installs in seconds.*

# You must be putting us on

A BDT sheet feeder belongs on every office automation system you make.

Simply, because your customers demand it.

BDT sheet feeders are the largest selling sheet feeders in the world, with more models, for more printers, than any other manufacturer.

Our line includes models with single and dual bins, as well as a triple unit with envelope capability.

And best of all, BDT sheet feeders are designed for easy integration into virtually any office automation system.

**Reliability through simple design**

People who buy office automation systems want reliability.

When you put on a BDT sheet feeder, you're installing the most reliable sheet feeder ever made.

Its tested mean time to failure of 5,000 hours, and misfeed rate of less than 1 in 1,000 sheets, are the best in the history of the industry.

Through twenty-five years of design innovation in paper handling technology, we've continuously sought to create products praised for reliability, with no limit to their useful life.

**Lowest Cost**

Some people find it hard to believe that the most reliable sheet feeders are also the least expensive.

That is, until they talk with us, and find out how inexpensive a sheet feeder can be.

And that makes your systems just that much more profitable.

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***Nothing tops a printer like a BDT sheet feeder***

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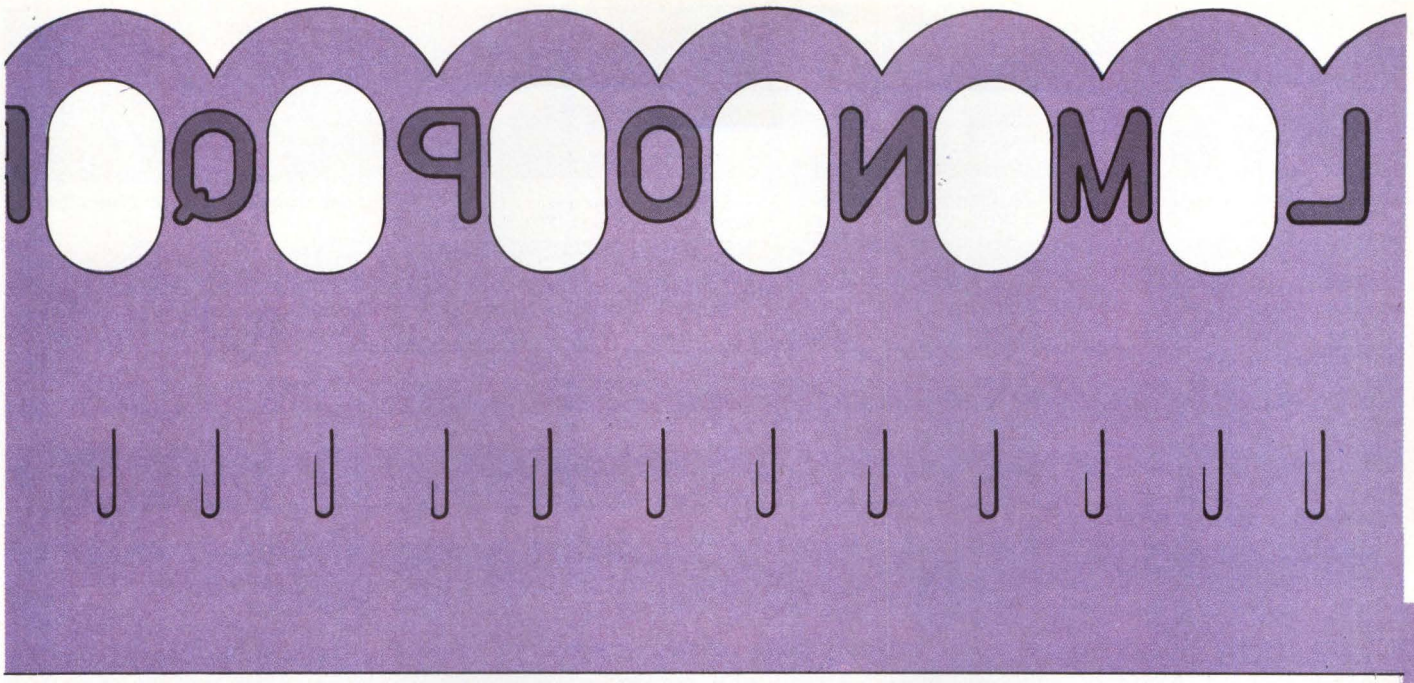
CIRCLE NO. 69 ON INQUIRY CARD





| Company Model | Print method | Print speed (lpm) | Chars./line | Simul. copies | Forms width (inches) | Interfaces (protocols) | Price ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|---|
| **ALPHACOM INC.** | | | | | | | | |
| 1842 | thermal matrix | 120 | 40 | | 4.33 | Atari, Commodore, TI, RS232C, Centronics, IEEE-488 (110–9600 bps) | 160 | bit-mapped graphics, intelligent interface module |
| **AMERICAN COMPUTER HARDWARE CORP.** | | | | | | | | |
| AC-2230 | drum | 300 | 132–136 | 6 | 4–16.75 | RS232C, Dataproducts, Centronics (X-on/X-off, DTR) | | paper basket; opt. TCVFU, DAVFU, acoustic cabinet, self-test |
| AC-2260 | drum | 600 | 132–136 | 6 | 4–16.75 | RS232C, Dataproducts, Centronics (X-on/X-off, DTR) | | paper basket; opt. TCVFU, DAVFU, acoustic cabinet, stacker, self-test, static eliminator |
| AC-2290 | drum | 900 | 132–136 | 6 | 4–16.75 | RS232C, Dataproducts, Centronics (X-on/X-off, DTR) | | acoustic cabinet, static eliminator; opt. TCVFU, DAVFU, self-test, stacker |
| AC-2440 | drum | 900–1200 | 132, 120, 136 | 6 | 5.125–19 | RS232C, Dataproducts, Centronics (X-on/X-off, DTR) | | self-test, static eliminator, stacker, TCVFU |
| AC-2470 | drum | 1200–1800 | 132, 120, 136 | 6 | 5.125–19 | RS232C, Dataproducts, Centronics (X-on/X-off, DTR) | | self-test, static eliminator, stacker, TCVFU |
| AC-2550 | chain | 1500 | 132, 136 | 6 | 5–18.75 | RS232C, Dataproducts, Centronics (X-on/X-off, DTR) | | self-test, static eliminator, stacker, TCVFU |
| ACB-300 | band | 300 | 132–136 | 6 | 3–16 | RS232C, Dataproducts, Centronics, IBM (X-on/X-off, DTR) | | static eliminator, self-test; opt. TCVFU, DAVFU, acoustic cabinet |
| ACB-600 | band | 600 | 132–136 | 6 | 3–16 | RS232C, Dataproducts, Centronics, IBM (X-on/X-off, DTR) | | static eliminator, diagnostic display, self-test; opt. TCVFU, DAVFU, acoustic cabinet |
| ACB-1000 | band | 1000 | 132–136 | 6 | 3–16 | RS232C, Dataproducts, Centronics, IBM (X-on/X-off, DTR) | | acoustic cabinet, self-test, stacker, static eliminator; opt. TCVFU, DAVFU |
| ACBP-1500 | band | 1200 | 132–136 | 6 | 3.5–18.75 | RS232C, Dataproducts, Centronics (X-on/X-off, DTR) | | self-test, paper puller, status display, DAVFU |
| ACBP-2000 | band | 1650 | 132–136 | 6 | 3.5–18.75 | RS232C, Dataproducts, Centronics (X-on/X-off, DTR) | | self-test, paper puller, DAVFU |
| ACCI-300 | impact matrix | 300 | up to 220 | 6 | 3.5–16 | RS232C, Centronics, Dataproducts | | bar coding, reverse image, superscript |
| ACCI-600 | impact matrix | 600 | 220, 96 | 6 | 3.5–16 | RS232C, Centronics, Dataproducts | | bar coding, reverse image, superscript |
| ACM-100 | impact matrix | 86 | program-mable | 6 | 3–16 | RS232C, Dataproducts, Centronics (X-on/X-off, DTR) | | bar codes, block letters, x-y plots, self-test, static eliminator |

# LINE PRINTERS

| Company Model | Print method | Print speed (lpm) | Chars./line | Simul. copies | Forms width (inches) | Interfaces (protocols) | Price ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|---|
| ACM-120 | impact matrix | 120 | 66, 132, 220 | 6 | 3–16 | RS232C, Dataproducts, Centronics (X-on/X-off, DTR) | | self-test, static eliminator; opt. TCVFU, DAVFU |
| ACM-200 | impact matrix | 200 | 66, 132, 220 | 6 | 3–16 | RS232C, Dataproducts, Centronics (X-on/X-off, DTR) | | self-test, static eliminator; opt. TCVFU, DAVFU, stacker |
| ACV-500 | impact matrix | 45–180 | program-mable | 6 | 3–16 | RS232C, Centronics | | 4-color ribbon, graphics, non-volatile format, proportional spacing, envelope feeder |
| **BURROUGHS CORP.** | | | | | | | | |
| B-9246-1413 | band | 300, 750 | 132, 136 | | | | 42,500 | |
| B-9246-20 | band | 300, 750 | 132, 136 | | | | 69,300 | |
| B-9246-6 | train | 1200 | 132 | | | | 14,700 | |
| B-9249-375 | train | 1600 | 132 | | | | 8,915 | |
| **CENTRONICS DATA COMPUTER CORP.** | | | | | | | | |
| E-Series Model-I | band | 1130 | 48–128 | 6 | 4–16 | Dataproducts | | towel ribbon; opt. acoustic cabinet, noise level less than 60 dBA |
| E-Series Model-II | band | 1440 | 48–128 | 6 | 4–16 | Dataproducts | | towel ribbon; opt. acoustic cabinet, noise level less than 60 dBA |
| E-Series Model-III | band | 1800 | 48–128 | 6 | 4–16 | Dataproducts | | towel ribbon; opt. acoustic cabinet, noise level less than 60 dBA |
| Linewriter 400 | band | 400 | 48–128 | 6 | 4–15 | RS232C, RS422, RS423, Dataproducts, Centronics (19.2K bps, X-on/X-off, DTR, ETX/ACK) | | block graphics; opt. noise levels of 62, 55 dBA |
| **CII HONEYWELL BULL** | | | | | | | | |
| PR54 | band | 940, 1200, 1500 | 136 | 6 | 4–19 | Dataproducts | | extensive off-line testing, Int'l character sets, system diagnostics; opt. quietized cabinet |
| **DATA PRINTER CORP.** | | | | | | | | |
| 1200 | chain | 1200 | 132 | 6 | | | 19,390 | |
| 1210 | chain | 1000 | 132 | 6 | | | 16,673 | |
| 1260 | chain | 600 | 132 | 6 | | | 11,210 | |
| 3101 | band | 1000 | 132 | 6 | | | 10,875 | |
| 3121 | band | 1200 | 132 | 6 | | | 13,350 | |
| 3601 | band | 600 | 132 | 6 | | | 7,855 | |
| 3751 | band | 750 | 132 | 6 | | | 9,385 | |
| BT1500 | band | 1500 | 132 | 6 | | | 19,500 | |
| **DATAPOINT CORP.** | | | | | | | | |
| 9257 | band | 300 | 132 | 4 | 4–16 | serial, parallel | 8,500(Q1); 7,225(Q100) | |
| 9258 | band | 600 | 132 | 4 | 4–16 | serial, parallel | 11,950(Q1); 10,150(Q100) | |
| **DATAPRODUCTS CORP.** | | | | | | | | |
| B-300 | band | 300 | 132, 136 | 6 | 3–16 | Dataproducts, RS232C, Centronics (19.2K bps, X-on/X-off, ETX/ACK, ACK/NAK, DTR) | 6,800 | self-test, diagnostic status display, static eliminator; opt. 60 dBA acoustic cabinet, universal power supply, second Dataproducts parallel interface |
| B-600 | band | 600 | 132, 136 | 6 | 3–16 | Dataproducts, RS232C, Centronics (19.2K bps, X-on/X-off, ETX/ACK, ACK/NAK, DTR) | 8,600 | diagnostic status display, self-test, static eliminator; opt. 60 dBA acoustic cabinet, universal power supply |
| BP-1500 | band | 1500 | 132, 136 | 6 | 3.5–18.75 | Dataproducts, RS232C, current loop (19.2K bps) | 23,000 | universal power supply, four forms tractors, vertical format unit, self-test, diagnostic status display |
| BP-2000 | band | 2000 | 132, 136 | 6 | 3.5–18.75 | Dataproducts, RS232C, current loop (19.2K bps) | 30,000 | universal power supply, four forms tractors, vertical format, self-test, diagnostic status display |
| B-1000 | band | 1000 | 132, 136 | 6 | 3–16 | Dataproducts, RS232C, Centronics (19.2K bps, X-on/X-off, ETX/ACK, ACK/NAK, DTR) | 12,800 | acoustic cabinet with noise level less than 60 dBA, self-test; opt. vertical format unit, universal power supply |

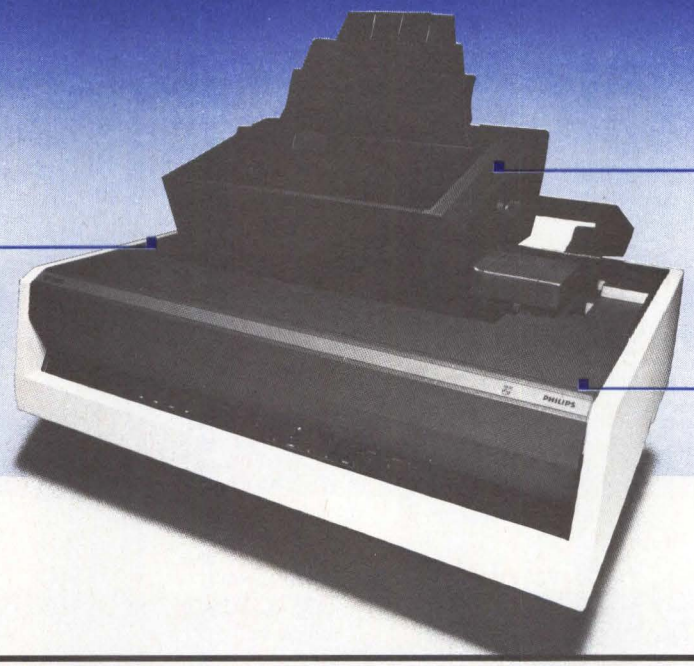
# WORLD CLASS

## PHILIPS GP 300 PRINTERS

GP 300, GP 300L

High speed (300 cps) output for drafting, and 120 cps for high resolution letter quality.

Text: 9 x 9 matrix: Letter quality: 18 x 25 matrix. High resolution graphics, dot addressable.



Fully integrated paper handling provides letterhead, second sheet and envelope printing; features both tractor and front feed.

The GP 300L prints colors, graphics and over 95 type fonts available; 144 x 144 dots per inch resolution.

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Philips GP 300 printers. World-class quality and performance. The products of innovative German engineering and craftsmanship. The first true multi-speed, multi-function, integrated letter quality and graphics printers available in the USA.

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PHILIPS



CIRCLE NO. 70 ON INQUIRY CARD

# LINE PRINTERS

| Company Model | Print method | Print speed (lpm) | Chars./line | Simul. copies | Forms width (inches) | Interfaces (protocols) | Price ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|---|
| **DECISION DATA COMPUTER CORP.** | | | | | | | | |
| 6610 | drum | 1000 | 132 | 5 | | | 17,600 | power paper puller, sound-proof cabinet |
| 6665 | drum | 650 | 132 | 5 | | | 13,600 | power paper puller, forms motion sensor |
| 6680 | drum | 800 | 132 | 5 | | | 15,200 | fine vertical/horizontal adjustment, lighted print area |
| 6703-25 | impact matrix | 300 | 132 | 4 | | | 6,188 | coarse/fine vertical/horizontal adjustment, lighted print area |
| 6807 | band | 700 | 132 | 6 | | | 12,100 | vertical/horizontal adjustment, forms motion sensor, front/rear operation panel |
| 6811 | band | 1100 | 132 | 6 | | | 17,000 | power paper puller, rear operation panel, remote visible alarm, LED display |
| 6814 | band | 1400 | 132 | 6 | | | 23,000 | power paper puller, rear operation panel, remote visible alarm, LED display |
| **DIGITAL ASSOCIATES CORP.** | | | | | | | | |
| 1200 | chain | 1200 | 132, 136 | 6 | 3.5–19.5 | RS232C, Centronics, Dataproducts (up to 9600 bps, X-on/X-off, DTR, ENQ/NAK) | | fully enclosed sound-deadening cabinet, towel ribbon, 12-channel paper-tape VFU |
| 1210 | chain | 1000 | 132, 136 | 6 | 3.5–19.5 | RS232C, Centronics, Dataproducts (up to 9600 bps, X-on/X-off, DTR, ENQ/NAK) | | fully enclosed sound-deadening cabinet, towel ribbon, 12-channel paper-tape VFU |
| 1260 | chain | 600 | 132, 136 | 6 | 3.5–19.5 | RS232C, Centronics, Dataproducts (up to 9600 bps, X-on/X-off, DTR, ENQ/NAK) | | fully enclosed sound-deadening cabinet, towel ribbon, 12-channel paper-tape VFU |
| 6203 | band | 1250 | 132 | 6 | 4–7 | IBM | | towel ribbon, 12-channel FCB, fully enclosed cabinet, compatible with IBM 4245 printer |
| 9386E | band | 600 | 132, 136 | 6 | 4–16.25 | RS232C, Centronics, Dataproducts (up to 9600 bps, X-on/X-off, DTR, ENQ/NAK) | | quietized cabinet, towel ribbon, static eliminator |
| B-300 | band | 300 | 132, 136 | 6 | 3–16 | RS232C, Centronics, Dataproducts (up to 9600 bps, X-on/X-off, DTR, ENQ/NAK) | | forms-length selector switch, LED status display; opt. quietized cabinet with noise level less than 60 dBA |
| B-600 | band | 600 | 132, 136 | 6 | 3–16 | RS232C, Centronics, Dataproducts (up to 9600 bps, X-on/X-off, DTR, ENQ/NAK) | | LED status display, forms length selector switch; opt. quietized cabinet with noise level less than 60 dBA |
| B-1000 | band | 1000 | 132, 136 | 6 | 3–16 | RS232C, Centronics, Dataproducts (up to 9600 bps, X-on/X-off, DTR, ENQ/NAK) | | LED status display, forms length selector switch; quietized cabinet with noise level less than 60 dBA |
| BP-1500 | band | 1200 | 132, 136 | 6 | 3.5–18.75 | RS232C, Centronics, Dataproducts (up to 9600 bps, X-on/X-off, DTR, ENQ/NAK) | | 2 sets of tractors, paper puller; opt. power paper stacker |
| BP-2000 | band | 1650 | 132, 136 | 6 | 3.5–18.75 | RS232C, Centronics, Dataproducts (up to 9600 bps, X-on/X-off, DTR, ENQ/NAK) | | 2 sets of tractors, paper puller; opt. power paper stacker |
| E Series Model II | band | 1200 | 132, 136 | 6 | 4–16.25 | RS232C, Centronics, Dataproducts (up to 9600 bps, X-on/X-off, DTR, ENQ/NAK) | | quietized cabinet, towel ribbon, LED status display, static eliminator |
| E Series Model III | band | 1800 | 132, 136 | 6 | 4–16.25 | RS232C, Centronics, Dataproducts (up to 9600 bps, X-on/X-off, DTR, ENQ/NAK) | | quietized cabinet, towel ribbon, power paper stacker, LED status display |
| L-400 | band | 400 | 132, 136 | 6 | 4–15 | RS232C, RS422, RS433, Centronics, Dataproducts (up to 9600 bps, X-on/X-off, DTR, ENQ/NAK) | | |

## LINE PRINTERS

| Company Model | Print method | Print speed (lpm) | Chars./line | Simul. copies | Forms width (inches) | Interfaces (protocols) | Price ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|---|
| Remote Line Printer System (RLPS) | band or chain | 1800 | 132, 136 | 6 | | Dataproducts, Centronics (up to 56K bps) | | ANSI X.25 level 2 compatible |
| **FUJITSU AMERICA INC.** | | | | | | | | |
| M304X Series | band | 300, 600, 900, 1200 | 132, 136 | 6 | 3–17 | RS232C, Centronics, Dataproducts (150–9600 bps) | | built-in acoustic cabinet; opt. power stacker, custom interface |
| **GENERAL BUSINESS TECHNOLOGY** | | | | | | | | |
| 3210LP | band | 360 | 132, 198 | 6 | 4–16.75 | IBM S/34, S/36, S/38 | 9,500 | self-test, acoustic cabinet; opt. line counter, power paper stacker |
| 3220LP | band | 720 | 132, 198 | 6 | 4–16.75 | IBM S/34, S/36, S/38 | 11,500 | self-test, acoustic cabinet; opt. line counter, power paper stacker |
| 3230LP | band | 1130 | 132 | 6 | 4–16.75 | IBM S/34, S/36, S/38 | 16,995 | acoustic cabinet, power paper stacker, self test; opt. line counter |
| 3240LP | band | 1440 | 132 | 6 | 4–16.75 | IBM S/34, S/36, S/38 | 19,995 | acoustic cabinet, power paper stacker; opt. line counter |
| **GENICOM CORP.** | | | | | | | | |
| 310 | belt | 240, 340, 425 | 132 | 6 | 3–15 | Centronics; opt. RS232C, current loop (9600 bps, X-on/X-off) | 4,170(Q1); 3,336(Q100) | |
| 340 | belt | 240, 340, 425 | 132 | 6 | 3–15 | Centronics; opt. RS232C, current loop (9600 bps, X-on/X-off) | 4,835(Q1); 3,868(Q100) | |
| 510 | belt | 240, 340, 425 | 132 | 6 | 3–15 | Centronics; opt. RS232C, current loop (9600 bps, X-on/X-off) | 6,080(Q1); 4,864(Q100) | optional dual automatic sheet feeder |
| 4030 | impact matrix | 75, 240, 300 | 132, 158, 175, programmable | 6 | 3–16.54 | RS232C, RS449, Centronics, Dataproducts, current loop (19.2K bps, X-on/X-off) | 5,500(Q1); 4,400(Q100) | bit-mapped mosaic graphics, 12-channel VFU, 20-ips paper slew, dual tractors |
| 4060 | impact matrix | 150, 465, 600 | 132, 158, 175, programmable | 6 | 3–16.54 | RS232C, RS449, Centronics, Dataproducts, current loop (19.2K bps, X-on/X-off) | 7,500(Q1); 6,000(Q100) | bit-mapped mosaic graphics, 12-channel VFU, 20-ips paper slew, dual tractors |
| **HARRIS CORP. (COMPUTER SYSTEMS DIV.)** | | | | | | | | |
| 4250 | chain | 730 | 132 | 6 | 3.5–19.5 | | 30,900 | electronic vertical format, electronic paper-width adjustment |
| 4260 | chain | 1200 | 132 | 6 | 3.5–19.5 | | 39,900 | electronic vertical format, electronic paper-width adjustment |
| 4320 | band | 300 | 132 | 6 | 3–16 | | 9,500 | digital display monitor |
| 4325 | band | 230 | 132 | 6 | 3–16 | | 9,500 | digital display monitor |
| 4416 | impact matrix | 65 | 132 | 6 | 4–17 | | 2,500 | bidirectional printing |
| **HEWLETT-PACKARD CO. (BOISE DIV.)** | | | | | | | | |
| 2563A | impact matrix | 300 | 66, 132, 220, programmable | 6 | 3–16.7 | RS232C, HP-IB, HP Multipoint, Centronics, Dataproducts (300–19.2K bps, X-on/X-off, ENQ/ACK, DTR) | 5,700 | raster graphics, programmable 16-channel VFC, self-test; opt. cabinet, stand, sound cover, passive stacker |
| 2608S | impact matrix | 400 | 66, 132, programmable | 6 | 3.75–16 | HP-IB, HP Multipoint (4800–19.2K bps) | 10,900 | raster graphics, programmable 16-channel VFC, self-test; opt. cabinet, stand, sound cover, passive stacker |
| **HONEYWELL INFORMATION SYSTEMS INC.** | | | | | | | | |
| 9619/20 | belt | 900, 1200 | 136 | 6 | 4–19 | RS232C; Honeywell OAS, DPS6 | 21,000; 34,000 | |
| 9626/27 | band | 300, 600 | 132, 136 | 6 | 3–15 | RS232C; Honeywell OAS, DPS6 | 12,050; 15,000 | |
| **KAYE INSTRUMENTS** | | | | | | | | |
| LP-1 | impact matrix | 137 | 137 | | 11 | RS232C, current loop (110–2400 bps) | 2,990 | industrial rack mount package, page count feature, internal 3000 character buffer |
| **MILTOPE CORP.** | | | | | | | | |
| HSP 3609-212A | impact matrix | 600 | 80, 132 | 4 | 9.325 | RS232C, parallel, MIL-STD-188C, Rolm, Norden, Honeywell, IBM, NTDS (9600 bps) | 20,000 | meets military specs, line addressable graphics |

## LINE PRINTERS

| Company Model | Print method | Print speed (lpm) | Chars./ line | Simul. copies | Forms width (inches) | Interfaces (protocols) | Price ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|---|
| LP 3036 | impact matrix | 300 | 36, 60 | 3 | 4.25 | RS232C, parallel, MIL-STD-188C, Rolm, Norden, Honeywell, IBM, NTDS (9600 bps) | 7,500 | meets military specs |
| TP 2000 | thermal matrix | 240 | 40, 66, 80 | 1 | 4.25 | RS232C, parallel, MIL-STD-188C, Rolm, Norden, Honeywell, IBM, NTDS (9600 bps) | 7,500 | line-addressable graphics, meets military specs, 1 page buffer, chart recorder |
| TP 3000 | thermal matrix | 1000 | 80, 132 | 1 | 9.325 | RS232C, parallel, MIL-STD-188C, Norden, Rolm, IBM, NTDS, Honeywell (9600 bps) | 15,800 | line-addressable graphics (200 dpi), meets military specs |
| **OPE PRINTERS** | | | | | | | | |
| JP 101 | dry ink jet | 50 | 80–147 | 1 | 8–9 | parallel, serial, current loop (300–9600 bps, X-on/X-off, DTR, ETX/ACK) | 400 | bit-mapped graphics |
| **PRINTER SYSTEMS CORP.** | | | | | | | | |
| BP-1500 | band | 1500 | 132 | 6 | 3.5–18.75 | Dataproducts; IBM 3270, S/34, S/36, S/38 | | |
| PSC-B300 | band | 300 | 132 | 6 | 3–16 | IBM 3270, S/34, S/36, S/38 | 11,500 | IBM compatible |
| PSC-B600 | band | 600 | 132 | 6 | 3–16 | IBM 3270, S/34, S/36, S/38 | 14,500 | IBM compatible |
| PSC-B1000 | band | 1000 | 132 | 6 | 3–16 | IBM 3270, S/34, S/36, S/38 | 9,500 | IBM compatible |
| **PRINTRONIX INC.** | | | | | | | | |
| 4160 | impact matrix | 130 | 136 | 5 | 3.5–16 | Centronics (X-on/X-off, DTR, ETX/ACK) | 5,380 | bit-mapped graphics, CAD/CAM applications, bar codes; opt. IGP-30 |
| DataPrinter 1200 Series | drum | 600–1200 | 132 | 6 | 3.5–19.5 | parallel, serial, TTL, DPC S-1003 Universal (X-on/X-off, ETX/ACK) | 11,210–19,390 | 12-channel VFU, forms-length selector, static eliminator, parity check, acoustic cabinet, I/O interface, paper puller |
| DataPrinter 3000 Series | band | 600–1200 | 132 | 6 | 3.5–17.5 | RS232C, DataPrinter, Dataproducts, Centronics, Control Data (X-on/X-off, ETX/ACK) | 7,855–13,350 | EVFU, acoustic cabinet, forms-length selector, parity check |
| MVP 150B | impact matrix | 180 | 132 | 6 | 3–16 | Centronics (X-on/X-off, ETX/ACK, DTR) | 3,745 | business graphics, IBM PC compatible |
| Standard MVP | impact matrix | 200 | 132 | 6 | 3–16 | Centronics, Dataproducts, RS232C (X-on/X-off, ETX/ACK, DTR) | 3,745 | business graphics, bar codes, multi-mode capability; opt. intelligent graphics processor |
| P300 | impact matrix | 300 | 132 | 6 | 3–16 | Centronics, Dataproducts, RS232C, current loop (X-on/X-off, ETX/ACK, DTR) | 5,400 | bar codes, business graphics, double-high chars.; opt. multi-mode capability, intelligent graphics |
| P300XQ | impact matrix | 400 | 132 | 6 | 3–16 | Centronics, Dataproducts, RS232C, current loop (X-on/X-off, ETX/ACK, DTR) | 6,450 | bar codes, business graphics, double-high chars., multi-mode capability; opt. intelligent graphics, acoustic cabinet |
| P600 | impact matrix | 600 | 132 | 6 | 3–16 | Centronics, Dataproducts, RS232C, current loop (X-on/X-off, ETX/ACK, DTR) | 7,500 | bar codes, business graphics, double-high chars.; opt. multi-mode capability, intelligent graphics |
| P600XQ | impact matrix | 800 | 132 | 6 | 3–16 | Centronics, Dataproducts, RS232C, current loop (X-on/X-off, ETX/ACK, DTR) | 8,550 | bar codes, business graphics, multi-mode capability; opt. intelligent graphics, acoustic cabinet |
| **RACAL MILGO** | | | | | | | | |
| 4295 | impact matrix | 300 | 132 | 6 | 4–15.8 | Centronics (IBM, Bell 8A1, Univac) | 3,599 | self-test, 2 buffers, bidirectional printing |
| **SOUTHERN SYSTEMS INC.** | | | | | | | | |
| M-100 | impact matrix | 100 | 132 | 6 | 3–16 | serial, parallel (up to 19.2K bps, IBM 2780/3780, Univac MTR, Burroughs, Honeywell VIP 7700) | 3,500 | IBM compatible, bar codes, bit-mapped graphics |
| M-200 | impact matrix | 200 | 132 | 6 | 3–16 | serial, parallel (up to 19.2K bps, IBM 2780/3780/3270, Univac MTR, Honeywell VIP 7700) | 3,500 | IBM compatible, self-test |

## LINE PRINTERS

| Company Model | Print method | Print speed (lpm) | Chars./line | Simul. copies | Forms width (inches) | Interfaces (protocols) | Price ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|---|
| QT 300 | band | 300 | 132 | 6 | 4–16.75 | serial, parallel (up to 19.2K bps, IBM 2780/3780, Univac MTR, Honeywell VIP 7700) | 7,000 | IBM compatible, bar codes, bit-mapped graphics, quiet cabinet |
| QT 600 | band | 600 | 132 | 6 | 4–16.75 | serial, parallel (up to 19.2K bps, IBM 2780/3780, Univac MTR, Honeywell VIP 7700) | 10,000 | IBM compatible, bar codes, bit-mapped graphics, quiet cabinet |
| QT 1000 | band | 1000 | 132 | 6 | 4–16.75 | serial, parallel (up to 19.2K bps, IBM 2780/3780/3720, Univac MTR, Honeywell VIP 7700) | 15,000 | IBM compatible, quiet cabinet, self-test |
| QT 1200 | band | 1200 | 132 | 6 | 4–16.75 | serial, parallel (up to 19.2K bps, IBM 2780/3780, Univac MTR, Honeywell VIP 7700) | 17,000 | IBM compatible, quiet cabinet, self-test |
| **STORAGE TECHNOLOGY (DOCUMATION)** | | | | | | | | |
| Impact 3000 | band | 3000 | 132 | 6 | 18.75 | | | automated elevator stacker, line counter, VFU, DAVFU |
| Univ. 1000 | band | 1600 | 132 | 6 | 18.75 | Dataproducts | 13,775 | automated elevator stacker, line counter, VFU, DAVFU |
| **SYNERGY PRINTER SYSTEMS INC.** | | | | | | | | |
| CB1200 | band | 1200 | 132, 136 | 6 | 4–16.25 | Dataproducts, Centronics, RS232C, HP-IB (19.2K bps, X-on/X-off, ETX/ACK, ENQ/ACK, IBM 2780/3780, Burroughs) | 16,950(Q1); 12,950(Q100) | 12-channel DVFU, acoustic cabinet; DEC, Wang, IBM, DG, HP compatible |
| CB1800 | band | 1800 | 132, 136 | 6 | 4–16.25 | Dataproducts, Centronics, RS232C, HP-IB (19.2K bps, X-on/X-off, ETX/ACK, ENQ/ACK, IBM 2780/3780, Burroughs) | 21,950(Q1); 16,950(Q100) | 12-channel DVFU, acoustic cabinet; DEC, Wang, IBM, DG, HP compatible |
| LW400 | band | 400 | 132, 136, 198, 204 | 6 | 4–15 | Dataproducts, Centronics, RS232C, HP-IB (19.2K bps, X-on/X-off, ETX/ACK, ENQ/ACK, IBM 2780/3780, Burroughs) | 5,950(Q1); 4,495(Q100) | 12-channel DVFU, acoustic cabinet; DEC, Wang, IBM, DG, HP compatible |
| LW800 | band | 800 | 132, 126 | 6 | 4–15 | Dataproducts, Centronics, RS232C, HP-IB (19.2K bps, X-on/X-off, ETX/ACK, ENQ/ACK, IBM 2780/3780, Burroughs) | 7,950(Q1); 5,995(Q100) | 12-channel DVFU, acoustic cabinet; DEC, Wang, IBM, DG, HP compatible |
| CI300 | impact matrix | 300 | 136, 160, 182, 227 | 6 | 3.5–16 | RS232C, Centronics, DPC (19.2K bps, X-on/X-off, ETX/ACK, ENQ/ACK, IBM 2780/3780, Burroughs) | 4,495(Q1); 3,495(Q100) | 12-channel DFVU, bit-mapped graphics, bar codes; DEC, Wang, IBM, DG, HP compatible |
| CI600 | impact matrix | 600 | 136, 160, 182, 227 | 6 | 3.5–16 | RS232C, Centronics, DPC (19.2K bps, X-on/X-off, ETX/ACK, ENQ/ACK, IBM 2780/3780, Burroughs) | 5,995(Q1); 4,695(Q100) | 12-channel DVFU, bit-mapped graphics, bar codes; DEC, Wang, IBM, DG, HP compatible |
| **TELETYPE CORP.** | | | | | | | | |
| 40 | belt | 300 | 80, 132 | 6 | | | 3,262 | input buffer |
| 4540 | belt | 300 | 80, 132 | 6 | | | 5,595 | input buffer, quiet floor cabinet |
| T-300 | belt | 300 | 132 | 6 | | serial, parallel | 4,400 | self diagnostics |
| **TRILOG INC.** | | | | | | | | |
| C60 Colorplot | impact matrix | 300 | 132, 220, programmable | 5 | 4–16 | Centronics, Dataproducts; opt. RS232C (110–9600 bps, X-on/X-off) | 11,500 | 256-color printing, bit-mapped graphics |
| C100 | impact matrix | 150–250 | 132, 220, programmable | 5 | 4–16 | Centronics, Dataproducts; opt. RS232C (110–9600 bps, X-on/X-off) | 11,500 | 256-color printing, bit-mapped graphics |
| C144 | impact matrix | 190 | 132 | 5 | 4–16 | Centronics, Dataproducts; opt. RS232C (110–9600 bps, X-on/X-off) | 11,500 | 256-color printing, bit-mapped graphics |
| T100 | impact matrix | 150–250 | 132, 220 | 5 | 4–16 | Centronics, Dataproducts; opt. RS232C (110–9600 bps, X-on/X-off) | 7,600 | 256-color printing, bit-mapped graphics |

| Company Model | Print method | Print speed (lpm) | Chars./line | Simul. copies | Forms width (inches) | Interfaces (protocols) | Price ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|---|
| TIP 150 | impact matrix | 38–150 | 132, 178, 220, programmable | 6 | 4–16 | RS232C, Centronics; opt. Dataproducts (110–19.2K bps, X-on/X-off, DTR) | 3,900 | static eliminator, compressed printing; opt. bar codes and bit-mapped graphics |
| TIP 300 | impact matrix | 78–300 | 132, 178, 220, programmable | 6 | 4–16 | RS232C, Centronics; opt. Dataproducts (110–19.2K bps, X-on/X-off, DTR) | 4,900 | raster graphics, nonstop and compressed printing, static eliminator; opt. bar codes and bit-mapped graphics |
| TIP 301 | impact matrix | 78–300 | 132, 178, 220, programmable | 6 | 4–16 | RS232C, Centronics; opt. Dataproducts (110–19.2K bps, X-on/X-off, DTR) | 5,900 | b & w graphics, nonstop and compressed printing, static eliminator; opt. bar codes and bit-mapped graphics |
| TIP 302 Colorplot II | impact matrix | 78–300 | 132, 178, 220, programmable | 5 | 4–16 | RS232C, Centronics; opt. Dataproducts (110–19.2K bps, X-on/X-off, DTR) | 6,900 | 256-color printing, bit-mapped graphics, nonstop printing |
| **WANG LABORATORIES INC.** | | | | | | | | |
| 5573 | band | 300 | 132 | 6 | 16 | proprietary | 9,000 | tractor feed, interchangeable bands, remote model available |
| 5574 | band | 600 | 132 | 6 | 3–16 | proprietary | 12,500 | tractor feed, interchangeable bands |
| 5575 | band | 1100 | 132 | 6 | 16 | proprietary | 28,500 | tractor feed, interchangeable bands |




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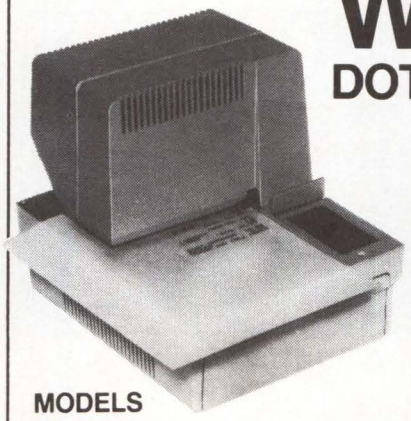

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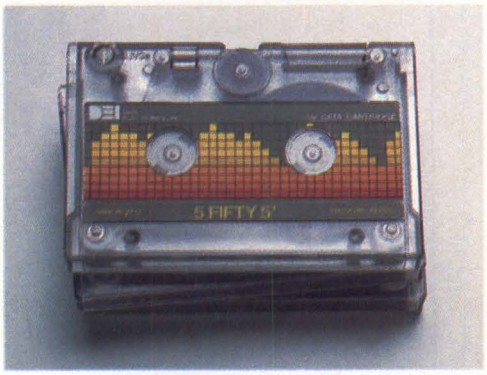


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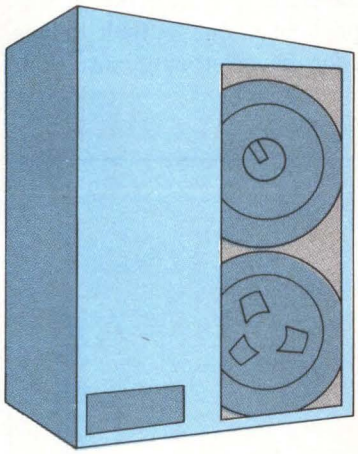


# Tape-drive market rebound moves to fast foward

*Quarter-inch cartridges control the medium-capacity backup market, ½-inch cartridges target the high end, and cassettes eye 3½-inch form factors*

**David Simpson**, Associate Editor

After nearly a decade of sagging sales, the magnetic-tape drive market is booming due to an unprecedented demand for inexpensive Winchester disk backup. However, its future remains unclear as floppy disk drives continue to vie for the leading backup role. Quarter-inch tape drives are holding their own, but the health of the tape-drive industry depends largely on the success of high-capacity, high-speed ½-inch tape drives and on inexpensive cassette drives.

### Quarter-inch cartridges command market

Shipments of ¼-inch tape drives will grow from 158,000 units last year to more than 547,000 in 1987 (Fig. 1), according to estimates by Freeman Associates, a Santa Barbara, Calif., management consulting and research company. Manufacturers of ¼-inch drives have overcome the standards controversy that is slowing the market for ½-inch tape-cartridge drives and, unlike cassette-drive manufacturers, are not waiting for yet-to-emerge markets. A look at recent introductions in the market for ¼-inch drives highlights the major trends.

For example, Data Electronics Inc.'s (DEI) MINI QIC-STREAM III, recently available in production quantities, is similar to the QIC-STREAM II, but offers 60M bytes in a half-height, 5¼-inch form factor. The QIC-STREAM III operates in streaming mode at 90 inches per second (ips) and is compatible with the de facto Quarter-Inch Cartridge (QIC)-02 interface standard and the QIC-24 data-format standard.

Another contender, Wangtek's half-height, 5¼-inch Series 5000 streaming-tape drive, holds 20M to 60M bytes on four- or nine-track tape using 8,000-bit-per-inch (bpi) recording. Wangtek's drive represents the trend toward compact packages. Another streamer, Archive Corp.'s Scorpion series, comes in half-height sizes, and most drive manufacturers plan to go from the 8-inch form factor to 5¼-inch drives, following the similar trend in Winchester disks.

Another recent introduction is North Atlantic Industries Qantex Division's Jet Stream 16, a streaming-tape drive that operates at a 400K byte-per-second data-transfer rate and 90 ips. Like most new units, the drive is compatible with QIC-02 and QIC-24. The Jet Stream 16 is the first streaming cartridge-tape unit that can read and write as a 9- or 16-track tape drive. The drive holds 99M bytes when used with a 555-foot cartridge tape.

Most manufacturers are moving away from start/stop drives toward streaming-tape drives (MMS, February, Page 225). More than one-fourth of the ¼-inch drives operate in streaming mode, and most of the drives scheduled for release over the next year are streamers or dual-mode drives. The leaders in shipments of ¼-inch start/stop drives are DEI, 3M and Kennedy Co. The leaders in the ¼-inch-streamer market include Archive with a 50 percent share, 3M with 16 percent, DEI with 13 percent and Cipher Data Products with 12 percent, according to Freeman Associates figures for 1983.

One solution is dual-mode drives, such as those from Comark Corp., Control Data Corp. (CDC), Digi-Data Corp., Kennedy and 3M. The trade-off is in price-performance levels. Dual-mode drives require complex

microcode, which increases costs.

Another major trend in ¼-inch tape drives is toward higher capacities and transfer rates. Cipher's Series 400 and 450 drives, for example, operate at 87K bytes per second and hold as much as 60M bytes of formatted data. Many manufacturers offer drives storing more than 45M bytes, including Archive, Cipher, CDC, Tandberg Data Inc. and 3M. In fact, Northern Telecom Inc.'s 6112 packs 100M bytes on a 600-foot cartridge using 10,000-bpi recording on 12 tracks. Formatted capacities depend on a variety of media and drive characteristics (Fig. 2).

Competing technologies at the low end of the ¼-inch tape-drive market include cassettes, minifloppy drives and floppy drives. Cartridge-tape drives usually are better backup devices than floppy drives when the application demands high capacity and low cost at the expense of speed, but floppy drives will cut tape-drive sales as diskette manufacturers increase capacities and lower prices.

Minicartridges, such as those from 3M and Irwin Magnetics Inc., offer the best alternative to cassettes because of competitive form factors. But Freeman Associates predicts that minicartridge sales will hover around 1 million units shipped each year from 1981 to 1987. Meanwhile, cassettes and minicassettes will go from 1.63 million units shipped in 1981 to more than 4 million in 1987. The major application area for minicartridges is 5¼-inch Winchester backup, which calls for higher transfer rates and capacities. At the high end, the primary competition is the emerging ½-inch tape drive with its high transfer rates and capacities. Quarter-inch drives, though, have the advantage in the 40M- to 100M-byte range because of their compact size and cost/performance superiority, but ½-inch drives should capture the market for drives storing more than 100M bytes.

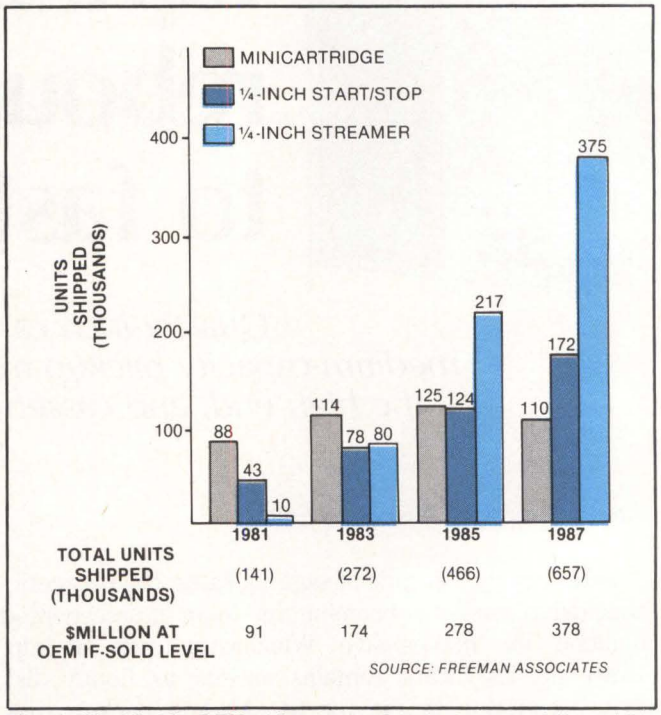



**Fig. 1. Worldwide OEM shipments of ¼-inch and minicartridge tape drives** *are expected to grow at a compound annual growth rate of 29 percent. Revenues will grow at a 27 percent compound annual growth rate. The market share of ¼-inch streamers will jump from 7 percent in 1981 to 57 percent in 1987; the minicartridge share will drop from 62 percent to 29 percent. Quarter-inch start/stop drives will maintain a 26 percent to 30 percent share.*

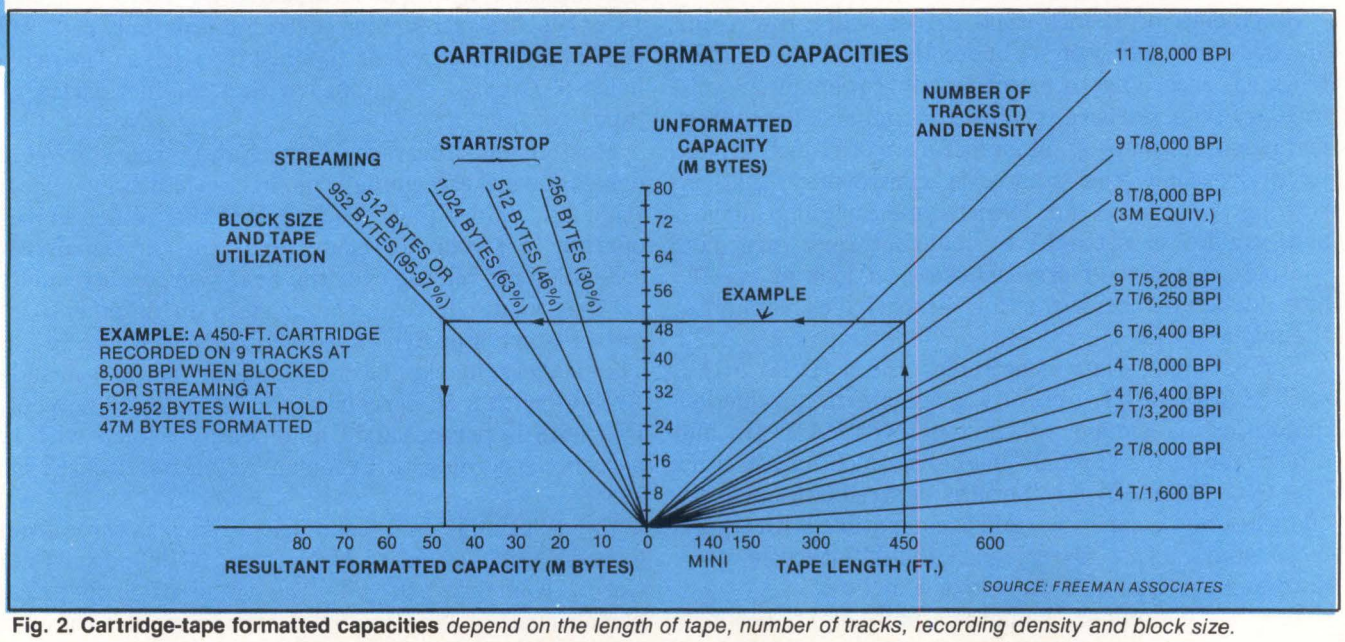
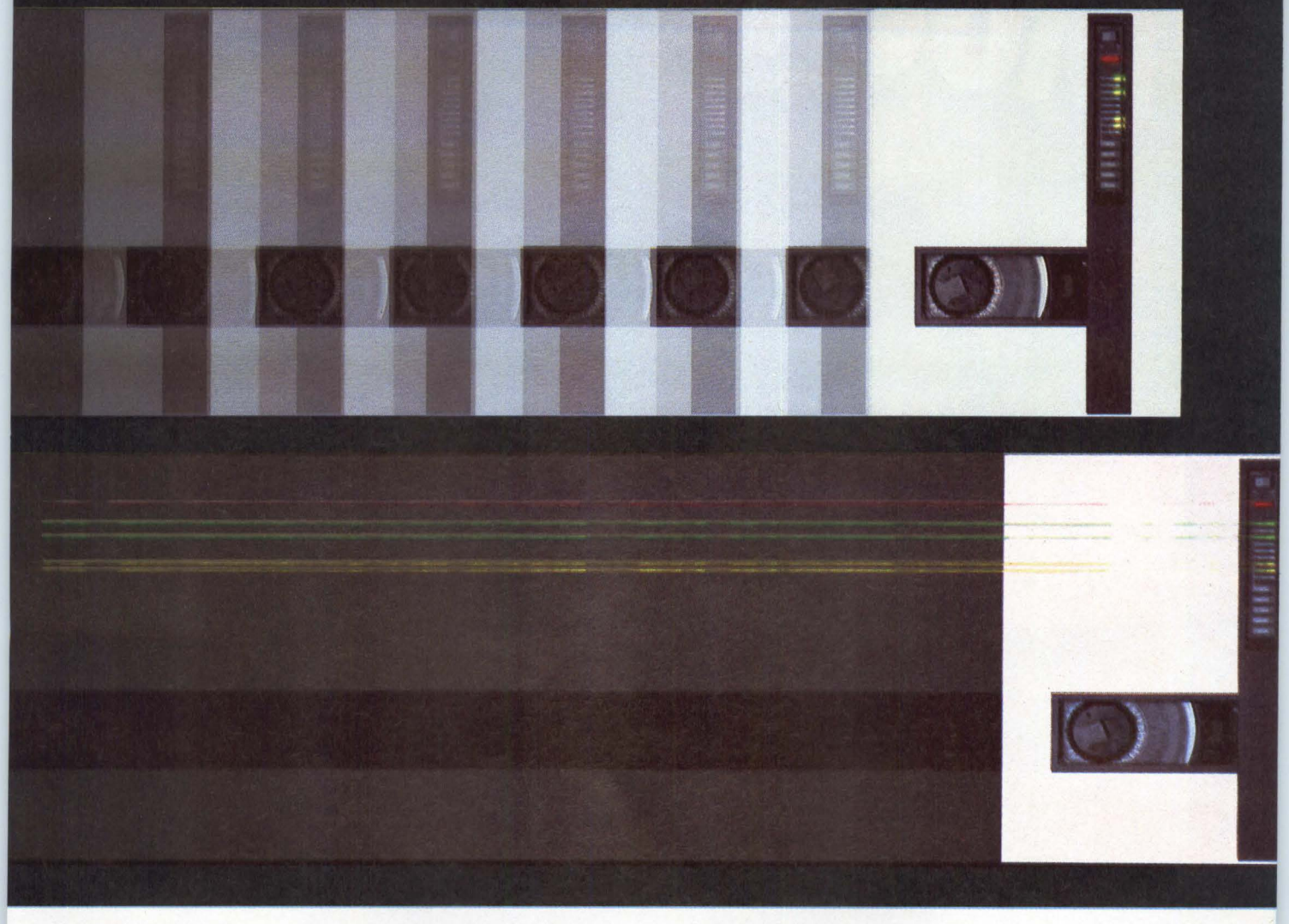



**Fig. 2. Cartridge-tape formatted capacities** *depend on the length of tape, number of tracks, recording density and block size.*

# Start/Stop or Streaming?



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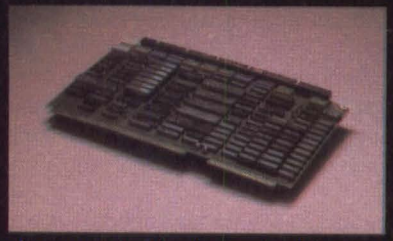

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CIRCLE NO. 75 ON INQUIRY CARD

### Half-inch cartridges enter the contest

MegaTape Corp. and Rosscomp Corp. are the only manufacturers shipping production quantities of ½-inch cartridge drives, but recent announcements from Digital Equipment Corp., 3M, DEI, Tandberg, Tandon Corp. Memorex Corp. and Electronic Processors Inc. (EPI) promise stiff competition by year-end. Market predictions are sketchy because of lack of standards, but *Computer Tape Outlook*, published by Freeman Associates, predicts that sales of ½-inch drives will go from $5.8 million last year to more than $590 million in 1987. The exact shape of the ½-inch tape-cartridge industry depends largely on whether a major introduction from IBM Corp. appears in the next few years. Rumors of IBM's ½-inch "Ocotillo" tape-cartridge drive have persisted for more than four years.

Rosscomp's Series 50 and Series 80 ½-inch drives can back up 160M bytes in 20 minutes at a transfer rate of 130K bytes per second. The drives achieve this capacity with 8,000-bpi density on 24-track, serpentine-recorded tape. MegaTape recently raised the ante in the capacity game with its 500M-byte MT-2210 and MT-2220 cartridge drives. The new drives use 1,500-foot tape that runs at 200 ips with 1,200 flux changes per inch (fcpi). Tandon's TM951 will reach production quantities later this year. The drive holds 50M bytes, and data-transfer rate is 31.25K bytes per second.

*Shipments of ¼-inch tape drives are expected to grow from 158,000 units last year to more than 547,000 in 1987.*

On the debit side, though, all the ½-inch tape drives have different form factors and interfaces (see "Sorting out the interfaces," below). MegaTape supports the

### Sorting out the interfaces

The four major interfaces in the ¼- and ½-inch tape-cartridge drive market are the nine-track or Pertec-compatible interface, the basic streaming-tape interface (BSTI), the quarter-inch cartridge (QIC)-02 interface and the small computer systems interface (SCSI). Most OEM drives support one or more of these interfaces. Some companies, such as 3M, also support proprietary interfaces. Some industry analysts predict that SCSI will become the interface of choice among OEMs and system integrators.

Pertec Computer Corp. developed the nine-track interface in the late 1960s to support IBM Corp.'s nine-track tape format. Pertec used the interface on its 10½-inch reel-to-reel drives that used IBM-formatted tape and later incorporated it into smaller drives. Because Pertec was an early entrant into the market, the interface became a de facto standard.

The Pertec interface can also be used with other track formats. For example, MegaTape Corp. and Rosscomp Corp. support the nine-track interface on their ½-inch, 24-track tape drives. A major advantage of the Pertec interface is that OEMs and system integrators can replace large nine-track rack-mounted units with the smaller ½-inch cartridge-tape drives without writing new software. The Pertec-compatible ½-inch tape drives cost less and have capacities and transfer rates that compete with the older rack-mounted units.

Archive Corp. developed the BSTI primarily for ¼-inch cartridge-tape drives that do not include a formatter board; that is, non-intelligent drives. Rosscomp and Wangtek support the interface, and Adaptive Data & Energy Systems, a manufacturer of controllers and formatters, supplies it. Most manufacturers have abandoned the BSTI and adopted the QIC-02 interface.

A committee of 29 companies developed and adopted the QIC-02 interface in mid-1982. The formal members of the QIC group include Archive, Cipher Data Products, Data Electronics Inc., Irwin Magnetics Inc., the Qantex Division of North American Atlantic Industries, Sankyo Seiki Manufacturing Co. Ltd., Tandberg Data Inc. and Wangtek. Joining as observers were 21 other companies. An American National Standards Committee is reviewing the proposed standard. Meanwhile, more than 10 companies have released tape drives that support QIC-02, making it the de facto standard among intelligent ¼-inch tape drives.

Like QIC-02, SCSI is designed for intelligent drives with formatter boards. SCSI is a universal peripheral bus interface that can be used with hard disk drives, floppy drives, printers, and tape drives. The interface allows peripherals to communicate with each other without the assistance of a host computer.

Shugart Corp. developed SCSI in late 1982 as a superset of the Shugart Associates standard interface (SASI). Because it is more versatile than QIC-02, SCSI may eclipse the QIC interface and become the standard within the next five years. Tape drive manufacturers with products that support SCSI include Rosscomp and 3M. 3M introduced the SCSI-compatible interface controller board for the HCD-75 cartridge drive in 1983.

In the realm of cassette-drive interfaces, the Working Group for Data Cassette Compatibility (D/CAS), a committee of 10 manufacturers, recently approved a proposed standard for an intelligent device interface. The interface, dubbed D/CAS-5, is based on the QIC-02 interface. It will enable connection of D/CAS-compatible drives to QIC-02-compatible controllers. The D/CAS-5 proposal has been submitted to an ANSI committee for consideration as a formal standard. Further information on the QIC or D/CAS groups is available from Freeman Associates, 311 E. Carrillo St., Santa Barbara, Calif., 93101.

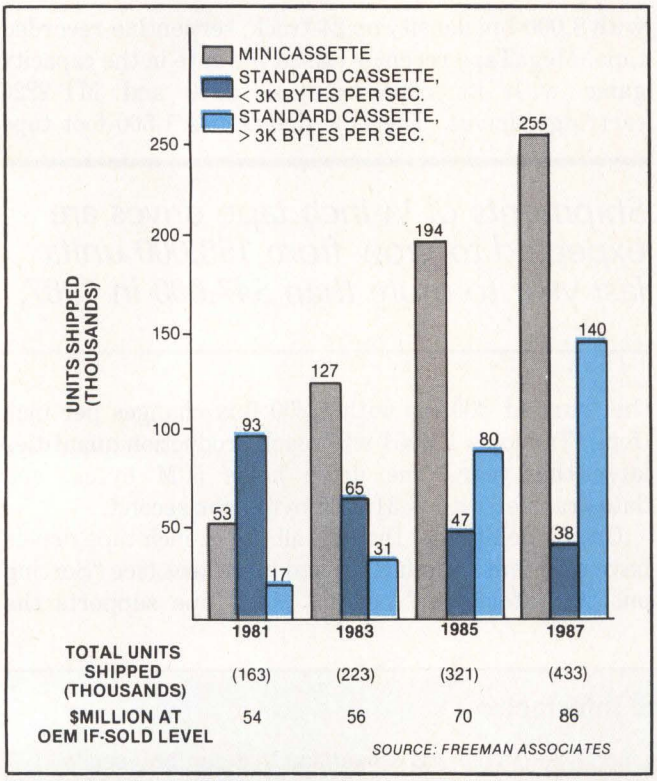


**Fig. 3. Worldwide OEM shipments of cassette-tape drives** *are expected to increase at an 18 percent compound annual growth rate. The market share of minicassettes will jump from 33 percent in 1981 to 59 percent in 1987; standard cassettes with data-transfer rates lower than 3K bytes per second will drop from a 57 percent market share to 9 percent. Drives operating at data-transfer rates higher than 3K bytes per second will go from a 10 percent share to a 32 percent share.*

Pertec-compatible drive-level interface, and Tandon uses interfaces that are similar to the standards for 5¼-inch floppy and Winchester drives. Rosscomp supports the Pertec interface, the basic streaming-tape interface (BSTI), small computer systems interface (SCSI) and QIC-02.

Memorex and EPI recently signed an agreement whereby Memorex obtained a manufacturing license for EPI's ½-inch, 130M-byte STR-STREAM II drive. EPI will begin production-quantity shipments in July, and Memorex will begin manufacturing its model 1110 late this year. The 1110 is a dual-mode unit that operates at 75 ips with a transfer rate of 225K bytes per second. Deviating from the interface trends, the unit incorporates the enhanced small tape interface (ESTI), a compatible subset of the enhanced small disk interface (ESDI). This interface allows tape drives and disk drives to share a controller; most other systems require separate controllers.

Another development in the tape industry is a ¼-inch cartridge drive that accepts ½-inch tape. DEI and Tandberg recently announced an agreement whereby DEI will manufacture a ½-inch tape cartridge, and the two companies will jointly develop a drive that will accept ¼- and ½-inch tape. The companies showed a prototype of the system, called the Magnum, at last year's fall Comdex and expect to ship it in large quantities by year-end. The drive is QIC-02-compatible and will allow companies with a library of ¼-inch tapes to upgrade to drives that accept both tape sizes.

### Cassettes aim at 3½-inch form factors

At the other end of the performance spectrum, cassette-tape drives are falling into a precarious market position. Traditionally targeted at low-end (less-than-10M-bytes) backup applications, they are facing fierce competition from floppy, minifloppy and ¼-inch drives. Cassette drives boast low cost and compactness, but most can't handle more than 5M bytes, which virtually excludes them from Winchester disk backup applications. Memtec Corp.'s 40M-byte, half-height minicassette 440, however, is an exception. It backs up 40M bytes in 27 minutes and uses four-track, 0.15-inch tape. Likewise, Teac Corp.'s MT-1ST can back up 20M bytes in 4 minutes at a data-transfer rate of 87K bytes per second. The streaming drive operates at 90 ips and can handle as many as 10,000 fcpi on four-track serpentine-recording tape.

*All the ½-inch tape cartridge drives have different form factors and interfaces.*

According to *Computer Tape Outlook*, sales of cassette drives that transfer data slower than 3K bytes per second will drop steadily from 1981 to 1987, while drives and minicassettes with higher data-transfer speeds will gain significant market shares (Fig. 3). Cassettes with high transfer rates and capacities, such as those from Memtec and Raymond Engineering Inc., can compete effectively with floppies and low-end ¼-inch cartridge drives. The major opportunity for high transfer cassettes lies in backing up 10M- to 20M-byte Winchesters in personal computers and small business computers.

Minicassettes might find a niche in the yet-to-emerge market for 3½-inch form factors. Manufacturers that produce minicassettes include Memtec, Raymond Engineering and Saylor Electronics International Inc. Because they use 0.15-inch tape, these drives will be small enough to fit into the space typically occupied by a 3½-inch Winchester or floppy drive. Freeman Associates expects this market to jump from $8 million in 1981 to more than $30 million in 1987. □

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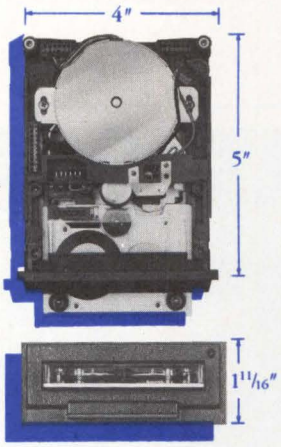


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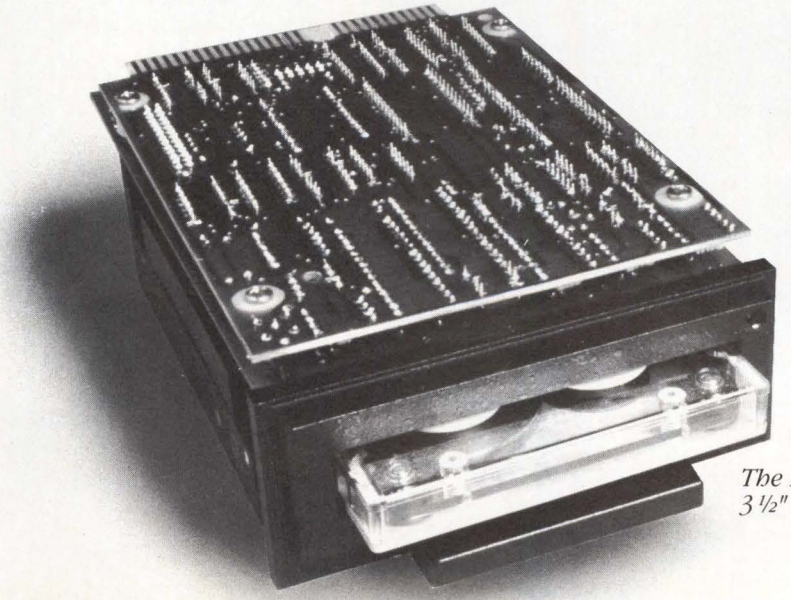
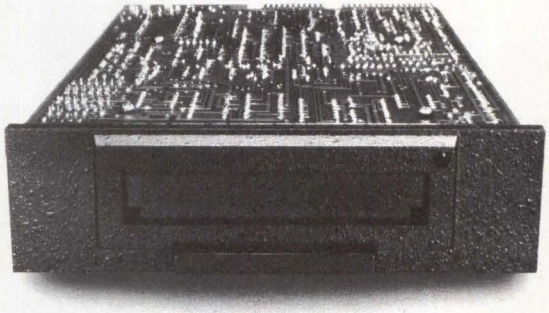


*The Irwin 210 3½" tape drive*



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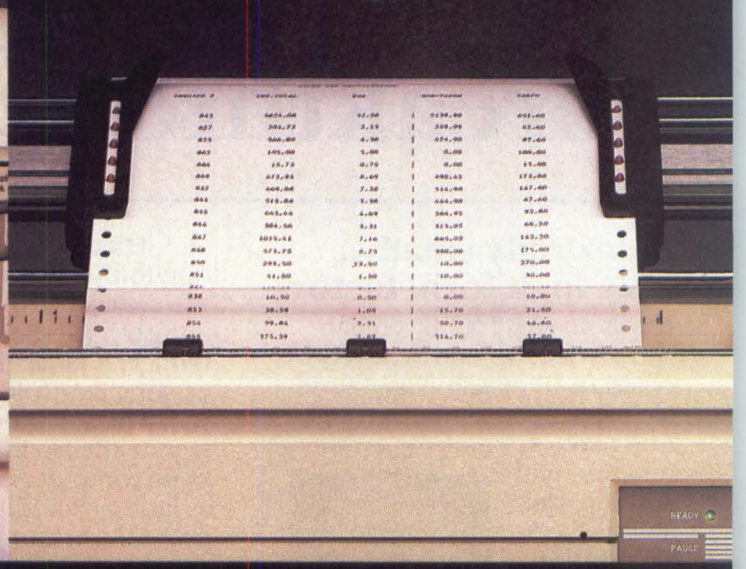

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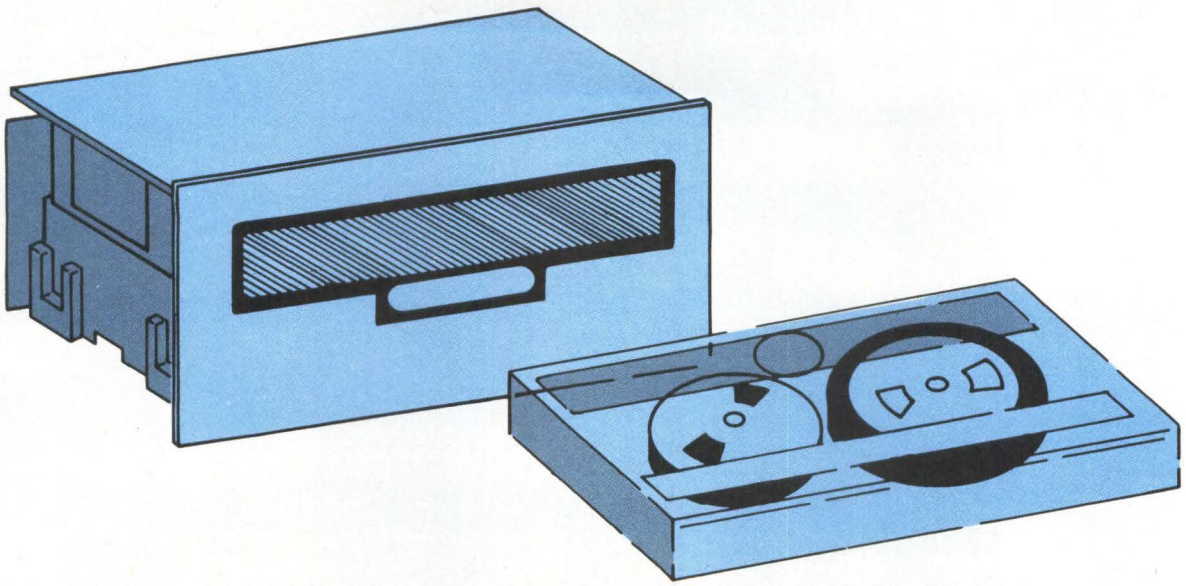

| Company Model | Drive type | Tape size (inches) | Operating mode | Storage capacity (in M bytes) | No. of tracks | Recording density (bpi) | Tape speed (ips) | Data transfer rate (K bytes/sec.) | Interfaces | Dimensions (HxWxD in.) | Unit price ($) | Notes, features, options |
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| 500 series | cartridge subsystem | .25 | start/stop | 67.1,134.2 (formatted) | 16,32 | 10000 | 60,120 | 35,70 | RS232C, RS422, IEEE-488, SCSI, IBM PC, DEC Q-bus, S-100 bus, multibus | 12x6x16 (standalone) | 2,900(Q1); 2,300 (Q500) | |
| **ALGO INC.** | | | | | | | | | | | | |
| 1200S | cartridge subsystem | .25 | start/stop | 5.3 (formatted) | 4 | 1600 | 30 | 19.2 | RS232C | 5.5x7.25x14 (standalone) | 2,245(Q1); 1796 (Q50) | optional custom interfaces |
| 12001 | cartridge subsystem | .25 | start/stop | 5.3 (formatted) | 4 | 1600 | 30 | 200 | IEEE-488,HPIB | 5.5x7.25x14 (standalone) | 2,345(Q1); 1867 (Q50) | optional RS232C, custom interfaces |
| **ALLOY COMPUTER PRODUCTS INC.** | | | | | | | | | | | | |
| D280 B/C | cartridge subsystem | .25 | start/stop | 16.5 (formatted) | 4 | 6400 | 30 | 11.67 | Intertec Compustar model 30 or 40 | 5x8.5x16 (standalone) | 2,295 | includes controller board, TIP software; operates under CP/M |
| IDXS-100 | cartridge subsystem | .25 | start/stop | 16.5 (formatted) | 4 | 6400 | 30 | 15 | S-100 bus | 5x8.5x16 (standalone) | 2,295 | includes controller board, TIP software; operates under CP/M or MS-DDS |
| **ALTOS COMPUTER SYSTEMS** | | | | | | | | | | | | |
| MTV 4, MTV 6 | cassette | .25 | start/stop | 17 (formatted) | 4 | 6400 | 30 | 24 | | 6x16.875x18 (external) | 2,995 | model MTV 4 works with 16-bit computers, model MTV 6 works with 8-bit computers |
| PC Back-up | cartridge subsystem | .25 | start/stop | 16.5 (formatted) | 4 | 6400 | 30 | 15 | IBM-PC and compatibles | 5x8.5x16 (standalone) | 2,195 | includes controller board, TIP software; operates under PC-DOS or CP/M-86 |
| **ANALOG & DIGITAL PERIPHERALS INC.** | | | | | | | | | | | | |
| model 1 | cartridge | .25 | start/stop | .158 | 1 | 800 | 30 | | TTL serial | 2.5x4x6 | 210(Q100) | |
| model 2 | cartridge | .25 | start/stop | 0.5 | 2 | 1600 | 30 | | TTL serial | 2.5x4x6 | 305(Q100) | |
| Byte Bucket | cassette | .25 | start/stop | .5 | 1 | 800 | 15 | 1.5 | RS232C, IEEE-488 NCR | 6x4.5x9 | 780(Q100) | |

## CASSETTE/CARTRIDGE TAPE DRIVES

Cassette/cartridge tape drives

| Company Model | Drive type | Tape size (inches) | Operating mode | Storage capacity (in M bytes) | No. of tracks | Recording density (bpi) | Tape speed (ips) | Data transfer rate (K bytes/sec.) | Interfaces | Dimensions (HxWxD in.) | Unit price ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Megabyte Bucket | cassette | .25 | start/stop | 1 | 2 | 1600 | 15 | 3 | RS232C | 6x4.5x9 | 795(Q100) | |
| Cassette System I | cassette | .25 | start/stop | .5 | 2 | 800 | 5 | .5 | RS232C, 8-bit parallel | 4x8.5x9.5 | 723(Q100) | |
| Cassette System II | cassette | .25 | start/stop | 1 | 2 | 1600 | 5 | 1 | RS232C, 8-bit parallel | 4x8.5x9.5 | 873(Q100) | |
| DC 300 | cartridge | .25 | start/stop | 12 | 4 | 6400 | 30 | 6 | TTL serial | 8x7x8 | 985(Q100) | |
| Feedback 340 | cartridge | .25 | start/stop | 4 | 4 | 1600 | 30 | 6 | RS232C, RS422 | | 2,195 (Q100) | |
| Feedback 344 | cartridge | .25 | start/stop | 12 | 4 | 6400 | 30 | 24 | RS232C, RS422 | 8x8x13 | 2,250 (Q100) | |
| L61 | cassette | .25 | start/stop | .1 | 1 | | 18 | .75 | RS232C, 8-bit parallel | 3.5x3x6 | 388(Q100) | |
| L62 | cassette | .25 | start/stop | .2 | 1 | | 18 | 1.2 | RS232C, 8-bit parallel | 3.5x3x6 | 438(Q100) | |
| MDCR1 | cassette | .25 | start/stop | .1 | 1 | 330–560 | 18 | .75 | TTL serial | 3x3.5x3 | 156(Q100) | |
| MDCR2 | cassette | .25 | start/stop | .2 | 2 | 330–560 | 18 | 1.2 | TTL serial | 3x3.5x3 | 175(Q100) | |
| Mini DC 1 | cartridge | .25 | start/stop | .25 | 2 | 800 | 30 | 24 | RS232C, 8-bit parallel | 6x5.5x7 | 620(Q100) | |
| Mini DC 2 | cassette | .25 | start/stop | .5 | 2 | 1600 | 30 | 48 | RS232C, 8-bit parallel | 6x5.5x7 | 720(Q100) | |
| Portable Mini L6-P | cassette | .25 | start/stop | .1 | 1 | | 18 | .75 | RS232C | 5x7.75x9.5 | 640(Q100) | |
| **ARCHIVE CORP.** | | | | | | | | | | | | |
| Scorpion 45MB | cartridge | .25 | streaming | 48.6 | 9 | 8000 | 90 | 90 | QIC-02 | 1.625x5.75x8 | 1,750 | half-height |
| Scorpion 20MB | cartridge | .25 | streaming | 21.6 | 4 | 8000 | 30,90 | 30,90 | QIC-02 | 1.625x5.75x8 | 1,400 | half-height |
| Sidewinder | cartridge | .25 | streaming | 21.6 | 4 | 8000 | 30,90 | 30,90 | QIC-02 | 4.5x8.55x10 | 1,400 | |
| Super Sidewinder | cartridge | .25 | streaming | 48.6 | 9 | 8000 | 90 | 90 | QIC-02 | 4.5x8.55x10 | 1,750 | |
| **AVIV CORP.** | | | | | | | | | | | | |
| TFS 903 | cartridge subsystem | .25 | start/stop | 21 (formatted) | 4 | 6400 | 30 | 24 | LSI-11, | Q-bus | 5.25x19x8 | 3,900 |
| **BRAEMAR COMPUTER DEVICES INC.** | | | | | | | | | | | | |
| CD 200 | cassette | .15 | start/stop | 5.76 | 2 | 800 | 10,20 | | 8-bit parallel | 4.65x4.9x3.5 | 385(Q1) | ANSI/ECMA compatible, "Accu-Rate" tape speed control |
| CS 400 | cassette | .15 | start/stop | 5.76 | 2 | 800 | 10,20 | | 8-bit parallel | 4.65x4.9x5.3 | 715 | "Auto-Sync" decoding scheme—recovers data previously lost, phase encoding and decoding circuitry |
| CM 600 | cassette | .15 | start/stop | .145 | 2 | 800 | 3 | | 8-bit parallel | 3.5x3.5x2.5 | 200 | read-after-write optional |
| LTD 800 | cassette | .15 | start/stop | 1.44 | 2 | 800 | .75 (standard); | | 8-bit parallel | 4.5x3.5x1.5 | 325(Q1) | optional recording densities; .375, .080, .040 |
| MTL II | cassette | .15 | start/stop | | 2 | 800 | 3 | | RS232C | 9.5x12.5x5 | 550 | |
| CTL 1000 | cassette | .15 | start/stop | | 2 | 800 | .75 (standard); | | 8-bit parallel | 9.5x12.5x5 | 1,140 | optional recording densities; .375, .080, .040 |
| CM600-HD | cassette | .15 | read/write forward search forward rewind | | 4 | 1600 | 6.6 | | 8-bit parallel | 4.5x3x2.5 | 250(Q1) | includes encode/decode, read/write amplifiers; ½ M-byte storage capacity |

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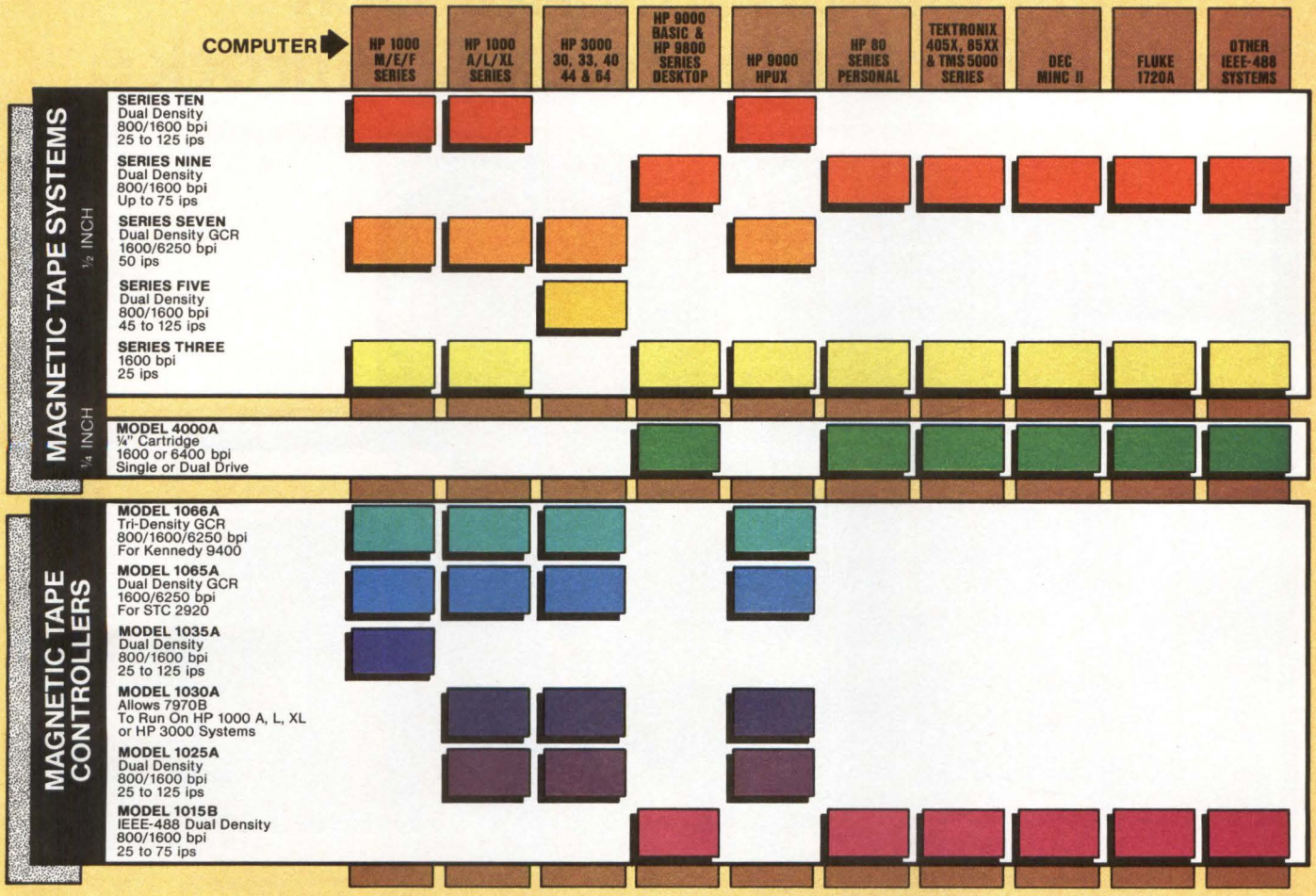


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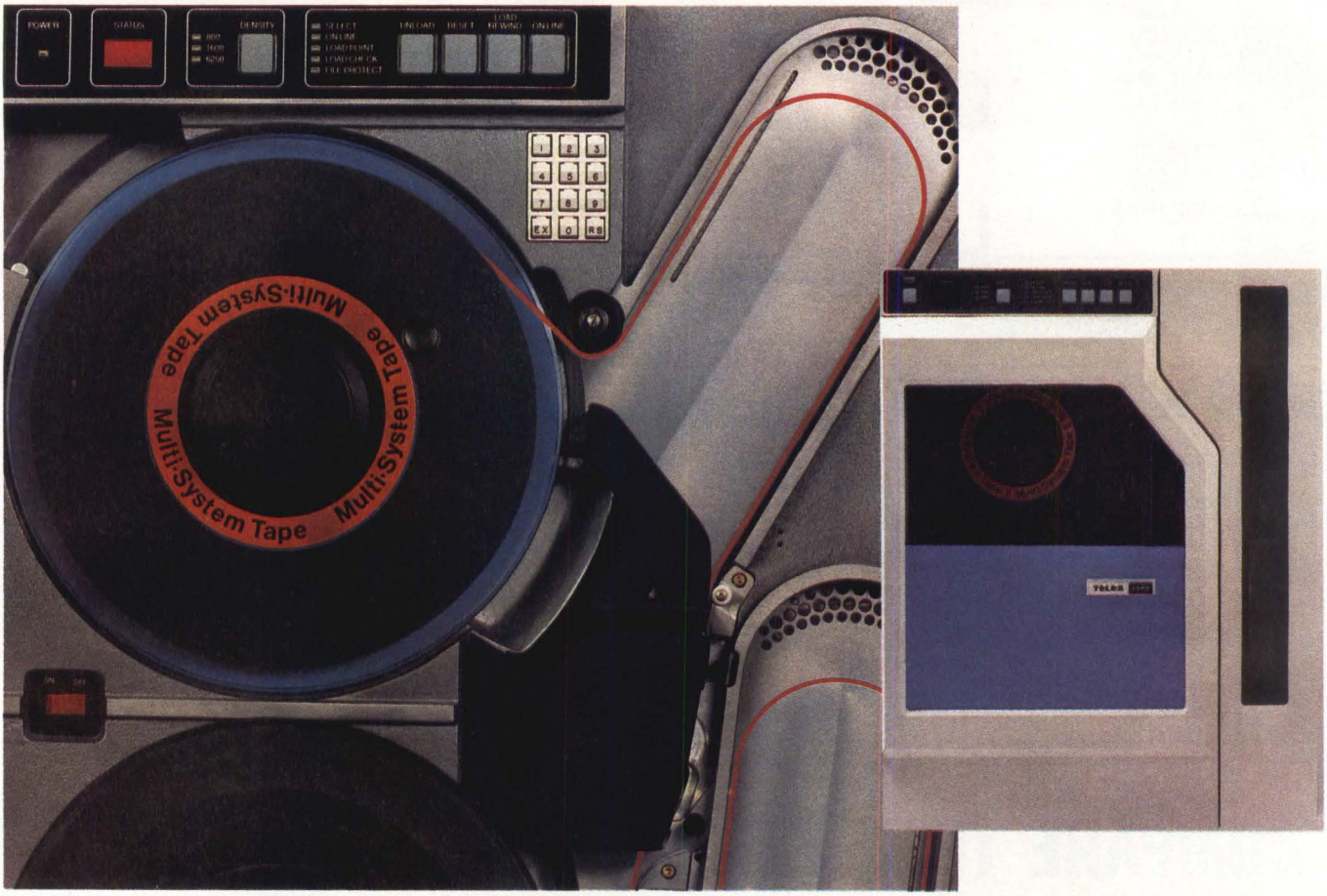


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- Low maintenance

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**CIRCLE NO. 79 ON INQUIRY CARD**

## CASSETTE/CARTRIDGE TAPE DRIVES

| Company Model | Drive type | Tape size (inches) | Operating mode | Storage capacity (in M bytes) | No. of tracks | Recording density (bpi) | Tape speed (ips) | Data transfer rate (K bytes/sec.) | Interfaces | Dimensions (HxWxD in.) | Unit price ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CIPHER DATA PRODUCTS INC.** | | | | | | | | | | | | |
| F880 Micro-streamer | reel-to-reel | .5 | streaming | 46,92 | 9 | 1600; 3200 | 25,100 | 160,380 | | 8.75x17x22 | 4,000(Q1); 2,325 (Q100) | ANSI and IBM compatible, auto front loading and threading |
| M890 Cache-Tape, M891 CacheTape | reel-to-reel | .5 | start/stop, streaming | 46,92 | 9 | 1600; 3200 | 75,240 | 20–120, 72–384 | | 8.75x17x22 | 5,100(Q1); 2820(Q100) | ANSI and IBM compatible, emulates start/stop drives, auto front loading and threading |
| 525 Floppy-Tape | cartridge | .25 | start/stop | 32 | 6 | 6400 | 78 | 62.5 | SA450, SA850 | 3.25x5.75x8 | 390(Q500) | emulates floppy disk performance |
| series 540 | cartridge | .25 | streaming | 60 (formatted) | 9 | 10000 | 90 | 87 | QIC-02 | 3.25x5.75x8 | 1,500(Q1); 890(Q500) | QIC-24 format, front-loading, opt. 8-in. form factor |
| series 400 | cartridge | .25 | streaming | 20 (formatted) | 4 | 10000 | 30,90 | 28.9, 86.7 | QIC-02 | 4.5x8.55x14 | 900(Q1); 630(Q500) | QIC-24 format transparent error detection correction |
| **COLUMBIA DATA PRODUCTS INC.** | | | | | | | | | | | | |
| 300C | cartridge | .25 | | 1.5,2.25 | 4 | 1600 | 30 | 19.2 | RS232C | 5.2x7x14 | 2,695 | |
| 300D | cartridge | .25 | start/stop | 2.57,3.86 | 4 | 1600 | 30 | 19.2 | RS232C | 5.2x7x14 | 2,895 | |
| **COMARK CORP.** | | | | | | | | | | | | |
| MT85 Funnel | cartridge subsystem | .25 | start/stop, streaming | 17 | 4 | 6400 | 30 | 24 | Multibus | 4.62x8.55x14.25 | 2,950 | includes CP/M, MS-DOS drivers and diagnostics on 8-in. floppy disk |
| **CONTROL DATA CORP.** | | | | | | | | | | | | |
| CDC 92190 | cartridge | .25 | streaming | 50 (formatted) | 11 | 8000 | 55 | 55 | RS232C | 4.6x8.5x14.06 | 940(Q1); 895(Q500) | integrated formatter, Winchester disk backup |
| CDC 92192 | cartridge | .25 | streaming | 70 (formatted) | 11 | 8000 | 55 | 55 | serial data | 4.6x8.5x14.06 | 1,020(Q1); 940(Q500) | integrated formatter, Winchester disk backup |
| **CORVUS SYSTEMS INC.** | | | | | | | | | | | | |
| The Bank | cartridge subsystem | .5 | | 103.4 (formatted) | 101 | 4620 | 216 | 125 | omninet | 5.75x12x16 | 2,195 | |
| **DATA ELECTRONICS INC.** | | | | | | | | | | | | |
| Streaker | cartridge | .25 | streaming | 26.6 (formatted) | 4 | 8000 | 30,90 | | SCSI, SASI | 4.5x8.5x6.4 | 1,035(Q1); 685(Q500) | |
| 1600 BPI serial | cartridge subsystem | .25 | start/stop | 5.3 | 4 | 1600 | 30 | 6 | DEC LSI-11, DG Nova, Interdata | 4.25x6.96x5.72 (internal) | 2,171(Q1); 1,354 (Q500) | 1600 BPI Parallel model available |
| EL5/SL5 | cartridge subsystem | .25 | start/stop | 21.3 | 4 | 6400 | 30 | 24 | RS232C, S-100 bus, DG Nova; DEC PDP-11, LSI-11 | 3.25x5.75x8 | 1,125(Q1); 775(Q500) | |
| EL6 SL6 | cartridge subsystem | .25 | start/stop, streaming | 21.3 | 4 | 6400 | 30 | 24 | DEC LSI-11, Q-bus | 3.25x5.75x8 | 1.180(Q1); 830(Q500) | |
| Funnel | cartridge subsystem | .25 | start/stop | 21.3 | 4 | 6400 | 30 | 24 | RS232C, DG Nova, S-100 bus; DEC PDP-11, LSI-11 | 4.25x6.96x5.72 | 1,495(Q1); 980(Q500) | |
| Serpentine Funnel | cartridge subsystem | .25 | start/stop | 21.3 | 4 | 6400 | 30 | 24 | DEC LSI-11, Q-Bus | 4.25x6.96x5.72 | 1,590(Q1); 1040(Q500) | |
| Super Funnel | cartridge subsystem | .25 | start/stop | 50 | 7 | 6400; 8533 | 37.5 | 30,40 | RS232C, S-100 bus, DG Nova; DEC PDP-11, LSI-11 | 4.25x6.9x5.75 | 1.750(Q1); 1148(Q500) | |
| Mini-QIC Stream III | cartridge | .25 | streaming | 60 (formatted) | 4–9 | 8000 | 45,90 | 43,86 | QIC-02 | 1.62x5.75x8 | 1,595(Q1); 980(Q500) | half-height tape drive |
| **DAVONG SYSTEMS INC.** | | | | | | | | | | | | |
| 10016-020 | cartridge subsystem | .25 | streaming | 18 (formatted) | 4 | 3200; 8000 | 90 | 28.9 | IBM PC, XT; Apple II, IIe, III | 6.25x16.5x7.5 (standalone) | 1,795(Q1); 1419(Q500) | |

# CASSETTE/CARTRIDGE TAPE DRIVES

| Company Model | Drive type | Tape size (inches) | Operating mode | Storage capacity (in M bytes) | No. of tracks | Recording density (bpi) | Tape speed (ips) | Data transfer rate (K bytes/sec.) | Interfaces | Dimensions (HxWxD in.) | Unit price ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **DICOM INDUSTRIES INC.** | | | | | | | | | | | | |
| 374 | cassette | .125 | start/stop | .75 | 2 | 518;800 | 10,20 | 2.4,5.0 | RS232C, 8-bit parallel | 5.25x19x24 | 5.850 | |
| **DIGI-DATA CORP.** | | | | | | | | | | | | |
| 6400 | cartridge | .25 | start/stop, streaming | 21 | 4 | 6400 | 30 | 24 | Funnel | 3.25x6.9x5.75 | 1,190 | serpentine or standard head configurations |
| 8300 | cartridge | .25 | start/stop, streaming | 30 | 4 | 8333 | 37.5 | 30 | Funnel | 3.25x6.9x5.75 | 1,390 | serpentine or standard head configurations |
| 70 | cartridge subsystem | .25 | start/stop | 21,30 | 4 | 6400; 8333 | 30,37.5 | 24,30 | RS232C; S-100 bus, Multibus, Q-bus | 5.25x9x15.25 | 1,990-2,790 | |
| **ELECTRONIC PROCESSORS INC.** | | | | | | | | | | | | |
| STR-610A | cartridge | .125 | start/stop | .305 (formatted) | 2 | 800 | 18,60 | 1.8 | 8-bit parallel | 3.2x4.8x3.75 | 471(Q1); 381(Q500) | |
| STR-Link III | cartridge | .125 | start/stop | .305 (formatted) | 2 | 800 | 18,60 | 1.8 | RS232C | 6x14x18 | 1,760 | |
| STR-812 | cartridge | .25 | start/stop | 3.4 (formatted) | 4 | 1600 | 30,90 | 6 | RS422 | 4x7x12 | 1,328(Q1); 996(Q500) | |
| STR-Stream | cartridge | .25 | start/stop | 17.1 | 4 | 6400 | 30,90 | 24 | ST506, SA1000, Priam .5-in. tape | 4.15x7x13.25 | 1,585(Q1); 1190(Q500) | |
| STR-Stream II | cartridge | .5 | start/stop, streaming | 130 | 20 | 20000 | 50, 75, 150 | 225 | ESDI | 3.25x5.75x8 | 1,500(Q1); 1,140 (Q500) | |
| **FEEDBACK DATA LTD.** | | | | | | | | | | | | |
| 330 | cartridge | .25 | start/stop | 4.31 | 4 | 1600 | 30,90 | 48 | TTL serial, CMOS serial | 5.9x7.7x6.4 | | |
| 334 | cartridge | .25 | start/stop | 17.25 | 4 | 6400 | 30,90 | 192 | RS232C | 5.9x7.7x6.4 | | |
| 351 | cartridge | .25 | start/stop | 4.31 | 4 | 1600 | 30,90 | 48 | RS232C | 7x8.6x17.8 | | dual-drive version available, rackmount or free standing |
| 340 | cartridge | .25 | start/stop | 4.31 | 4 | 1600 | 30,90 | 48 | RS232C | 7x8.6x17.8 | | local control or command protocol, DC power options |
| 344 | cartridge | .25 | start/stop | 17.25 | 4 | 6400 | 30,90 | 192 | RS232C | 7x8.6x17.8 | | local control or command protocol, DC power options |
| **GENISCO MEMORY PRODUCTS CORP.** | | | | | | | | | | | | |
| ECR-10 | cartridge subsystem | .5 | start/stop | 4.3 | 9 | 800 | 15,25 | 12,20 | 9-bit parallel, Rolm, Pertec, DEC PDP series, DG, Norden | 8.7x3.7x12.7 | 14,800(Q1); 12,000 (Q500) | ruggedized Mil-spec drive |
| ECR-40 | cartridge subsystem | .5 | start/stop | 50 | 9 | 6400 | 11.25, 31.25 | 72,200 | 9-bit parallel, Rolm, Pertec, DEC PDP series, DG, Norden | 8.8x5.4x19.5 | 21,300(Q1); 18,250 (Q500) | ruggedized Mil-spec drive |
| **INNOVATIVE DATA TECHNOLOGY** | | | | | | | | | | | | |
| TC 3000 | cartridge subsystem | .25 | start/stop | 23 | 4 | 1600 | 30 | 6 | bit serial, 8-bit parallel, RS232C, IEEE-488; DEC PDP-11, LSI-11; DG Nova Eclipse | 8.25x5.25x15.8 | | |
| **IRWIN MAGNETICS** | | | | | | | | | | | | |
| 110 | cartridge | .15 | start/stop, streaming | 10 (formatted) | 8 | 6400 | 40 | 41.25 | SA450 | 1.625x5.650x8 | 500(Q1); 275(Q500) | |
| 210 | cartridge | .15 | start/stop, streaming | 10 (formatted) | 8 | 6400 | 40 | 41.25 | SA450 | 1.625x4x4.96 | 500(Q1); 275(Q500) | |
| **KENNEDY CO.** | | | | | | | | | | | | |
| 6455 | cartridge | .25 | start/stop | 23 | 4 | 6400 | 30 | 24 | Pico Bus, Pertec .5-in. tape | 4.5x8.5x14 | 1,700(Q1); 1190(Q500) | emulates .5-in. tape drives without software changes to system; optional front panel |

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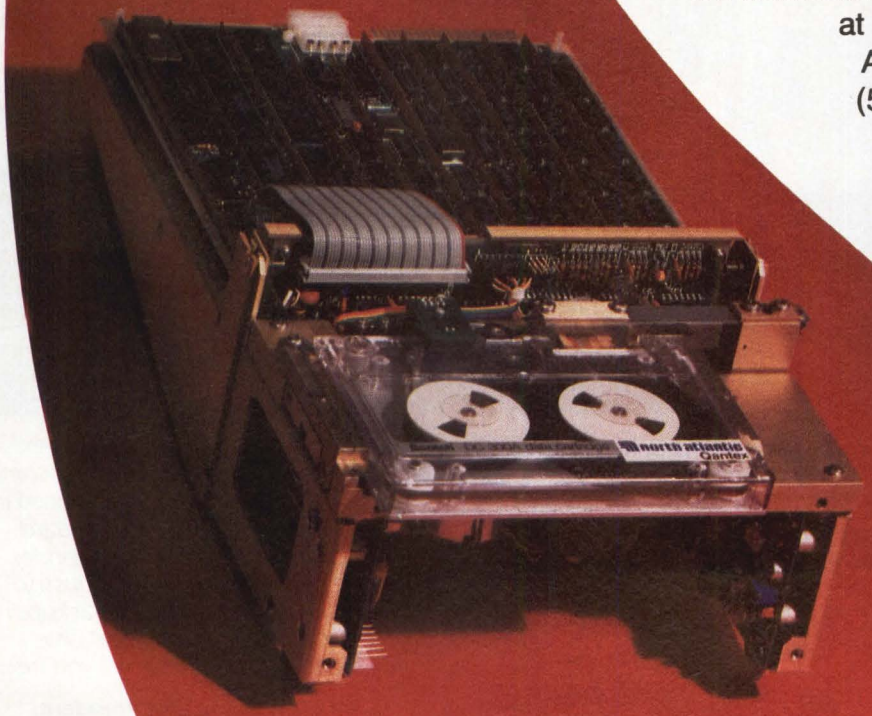


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|---|---|---|
| | The Reel Problem | The MegaTape Solution |
| Time: | 90 minutes | 24 minutes |
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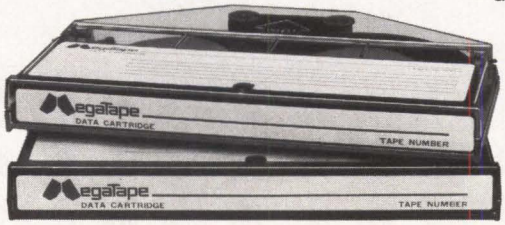
| Media cost: | $120.00 | Under $80.00 |

330 MB in each book-size cartridge

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## CASSETTE/CARTRIDGE TAPE DRIVES

| Company Model | Drive type | Tape size (inches) | Operating mode | Storage capacity (in M bytes) | No. of tracks | Recording density (bpi) | Tape speed (ips) | Data transfer rate (K bytes/sec.) | Interfaces | Dimensions (HxWxD in.) | Unit price ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6470 | cartridge | .25 | start/stop | 57.6 | 10 | 6400 | 37.5 | 30 | Pico Bus, industry-standard .5-in. tape | 4.5x8.5x14 | 1,900(Q1); 1,300 (Q500) | emulates .5-in. tape drives, reads 4-track tapes, optional front panel |
| **MEGALOGIC CORP.** | | | | | | | | | | | | |
| QIM-4/RM | cartridge subsystem | .25 | start/stop | 3 | 4 | 1600 | 30 | 6 | Multibus | 3.5x7x10 | 3,795(Q1); 3035(Q500) | rackmount |
| PIM-4RM | cartridge subsystem | .25 | start/stop | 3 | 4 | 1600 | 30 | 6 | Multibus | 3.5x7x10 | 3,795(Q1); 3035(Q500) | rackmount |
| **MEGATAPE CORP.** | | | | | | | | | | | | |
| MT-300 | cartridge | .5 | start/stop, streaming | 330 | 24 | 9600 | 50,200 | 240 | Pertec/Cipher | 8.75x19x17.5 | 4,700 | track select, microprocessor-controlled formatter |
| MT-1210 | cartridge | .5 | start/stop, streaming | 330 | 24 | 9600 | 50,200 | 240 | Pertec/Cipher | 8.75x19x17.5 | track select, scheduled delivery: June, 1984 | |
| MT-1220 | cartridge | .5 | start/stop, streaming | 330 | 24 | 9600 | 50,200 | 240 | Pertec/Cipher | 10.2x8.4x29 (standalone) | 4,950 | compatible with CDC 9715 FSD drive |
| MT-2210 | cartridge | .5 | streaming | 500 | 24 | 9600 | 50,200 | 240 | Pertec/Cipher | 8.75x19x17.5 (standalone) | | microcomputer-controlled formatter and diagnostics, scheduled delivery: June, 1984 |
| MT-2220 | cartridge | .5 | streaming | 500 | 24 | 9600 | 50,200 | 240 | Pertec/Cipher | 10.2x8.4x29 (standalone) | | compatible with CDC FSD drive, scheduled delivery: June, 1984 |
| **MEMODYNE CORP.** | | | | | | | | | | | | |
| M-80 | cassette | .10 | start/stop | .5 | 2 | 800 | 20 | 1.2 | RS232C | 5x5x8.5 | 1,845 | |
| **MEMOREX CORP.** | | | | | | | | | | | | |
| 1110 | cartridge | .5 | start/stop, streaming | 83,130 (formatted) | 20 | 12000 | 50,75 | 225 | ESTI | 3.25x5.75x8 | 1,060 (Q1,000) | |
| **MEMTEC** | | | | | | | | | | | | |
| 420 | cassette | .15 | streaming | 19.5 | 4 | | 30, 90 | 37.5, 112.5 | QIC-02 | 1.625x5.75x7.6 | 400(DEM) | |
| 440 | cassette | .15 | streaming | 43.9 | 4 | | 30, 90 | 37.5, 112.5 | QIC-02 | 1.625x5.75x7.6 | 500(OEM) | |
| 510 | cassette | .15 | streaming | 12.4 | 4 | | 30, 90 | | QIC-02 | 3.25x5.75x7.6 | 375(OEM) | |
| 520 | cassette | .15 | streaming | 19.5 | 4 | | 30, 90 | 37.5, 112.5 | QIC-02 | 3.25x5.75x7.6 | 400(OEM) | |
| **MILTOPE CORP.** | | | | | | | | | | | | |
| CR600 | reel-to-reel subsystem | .5 | start/stop | 6 | 7,9 | 800 | 25 | 20 | 8-bit parallel, TTL compatible, IBM, Rolm, Norden, DEC PDP-11 | 6.3x17.5x15 | 12,500 | meets MIL-E-16400, MIL-E-5400 and MIL-E-4158 standards |
| CR300 | cartridge subsystem | .25 | start/stop | 2.875 | 4 | 1600 | 30 | 24 | RS232C, TTL parallel, Rolm, Norden, NTDS | 4.87x7.63x12.63 | 9,900 | meets MIL-E-16400, MIL-E-5400 and MIL-E-4158 standards |
| CR400 | cartridge subsystem | .25 | start/stop | 2.4 | 4 | 1600; 3200 | 30 | 24,48 | RS232C, TTL parallel, Rolm, Norden, NTDS | 4x6x1 (standalone) | 4,000 | meets MIL-E-16400, MIL-E-5400 and MIL-E-4158 standards |
| **MOYA CORP.** | | | | | | | | | | | | |
| 120 | cartridge | .15 | start/stop, streaming | .672 | 2 | | 30,90 | 96 | RS232C, SASI | 3x3.625x2.625 | 261 | drive mechanics only |
| 121 | cartridge | .15 | start/stop, streaming | .672 | 2 | | 30,90 | 96 | RS232C, SASI | 3x3.625x2.625 (standalone) | 346 | |
| **NORTHERN TELECOM INC.** | | | | | | | | | | | | |
| MCT/6109 | cartridge | .25 | streaming | 48–81 | 9 | 8000; 10000 | 30,90 | 30,90 | QIC-02 | 3.9x7.7x5.7 (internal) | 1,400(Q1); 936(Q500) | |
| MCT/6112 | cartridge | .25 | streaming | 64–108 | 12 | 8000; 10000 | 90 | 90 | QIC-02 | 3.9x7.7x5.7 | 1,550(Q1); 1,030 (Q500) | |

## CASSETTE/CARTRIDGE TAPE DRIVES

| Company Model | Drive type | Tape size (inches) | Operating mode | Storage capacity (in M bytes) | No. of tracks | Recording density (bpi) | Tape speed (ips) | Data transfer rate (K bytes/sec.) | Interfaces | Dimensions (HxWxD in.) | Unit price ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **PEREX LTD.** | | | | | | | | | | | | |
| HD6400 | cartridge | .25 | start/stop | 17 | 4 | 6400 | 30 | 24 | | 4.25x6.9x5.7 | | |
| 4510 | cartridge subsystem | .25 | start/stop | | 4 | 6400 | 30 | 24 | Apple III, IBM PC, XT; S-100 bus, Multibus | 5.9x8.7x14.6 | | file-structured software packages for PC-DOS CP/M, APPLE SOS available |
| 8000 | cartridge | .25 | start/stop | 3 (formatted) | 4 | 1600 | 30 | 2 | RS232C, 8-bit parallel, IEEE-488 | 5.6x11.2x15.6 (standalone) | | |
| 9000 | cartridge | .25 | start/stop | 17 | 4 | 6400 | 30 | 19.2 | RS232C, HDLC | 5.2x8.3x16.3 (standalone) | | |
| **PERIPHERAL TECHNOLOGY INC.** | | | | | | | | | | | | |
| 300 | cartridge | .25 | start/stop | 2.6 | 4 | 1600 | 25 | 40 | TTL | 4.75x8x6.5 | 930(Q1); 825(Q500) | |
| 301 | cartridge | .25 | start/stop | 2.6 | 4 | 1600 | 25 | 40 | TTL | 6.5x4.7x8.6 | 900(Q1); 800(Q500) | |
| **PHI TECHNOLOGIES INC.** | | | | | | | | | | | | |
| fixed speed | cassette | .15 | start/stop | 2 | 4 | 800 | .937–6 | .6 | custom | 2.55x5.4x6.2 (internal) | 217(Q1); 108(Q500) | |
| OPTO-TACH | cassette | .15 | start/stop | 2 | 4 | 800 | .25–20 | 2 | custom | 2.55x5.4x6.2 | 231(Q1); 115(Q500) | mechanical drive only |
| AC DECK | cassette | .15 | start/stop | 2 | 4 | 800 | .937–10 | 1 | custom | 2.55x5.4x6.2 | 335(Q1); 167(Q500) | mechanical drive only |
| SELECTO-SYNC | cassette | .15 | start/stop | 2 | 4 | 800 | .2–30 | 3 | custom | 2.55x5.4x6.2 | 411(Q1); 205(Q500) | |
| **PLESSEY PERIPHERAL SYSTEMS** | | | | | | | | | | | | |
| 650 | cartridge subsystem | .25 | streaming | 20 | 9 | 8000 | 90 | 90 | DEC Q-bus | 5.25x19x27 (standalone) | 4,280 | |
| **PRIME COMPUTER INC.** | | | | | | | | | | | | |
| 4581 | cartridge subsystem | .25 | start/stop | 15 (formatted) | 4 | 6400 | 30 | 24 | Prime 50 series | 10.5x19x7.75 (for 2 drives) | 7,000 | |
| 4582 | cartridge subsystem | .25 | start/stop | 15 (formatted) | 4 | 6400 | 30 | 24 | Prime 50 series | 10.5x19x7.75 (for 2 drives) | 4,500 | |
| 4651-2250 | cartridge subsystem | .25 | start/stop | 15 (formatted) | 4 | 6400 | 30 | 24 | Prime 2250 series | 10.5x19x7.75 (for 2 drives) | 4,500 | |
| **PROMED TECHNOLOGIES INC.** | | | | | | | | | | | | |
| dcr/10 | cassette | .25 | start/stop | 1 | 2 | 800 | 10 | 1.2,9.6 | RS232C, IEEE-488, RS449 | 6.44x8.5x9.25 (standalone) | 2,475 | portable unit available |
| **QANTEX DIV. OF NORTH ATLANTIC INDUSTRIES** | | | | | | | | | | | | |
| 451 | cartridge subsystem | .25 | start/stop | 17.2 | 4 | 6400 | 90 | 19.2 | RS232C, S-100, GPP, Multibus | 4.25x7x5.75 | 1,450(Q1); 900(Q500) | |
| 650A | cartridge subsystem | .25 | start/stop | 4.3 | 4 | 1600 | 90 | 48 | RS232C, DEC PDP-11, LSI-11, DG Nova; Rolm | 3.125x7x10 | 1,268(Q1); 1020(Q500) | |
| Jet Stream 16 | cartridge | .25 | streaming | 99 | 9,16 | 8500 | 90 | 400 | QIC-02 | 4.62x8.51x14 | 1,450(Q1); 925(Q500) | reads and writes 9- or 16-track tape |
| 200 mini-drive | cartridge | .25 | start/stop | .7 | 2 | 800; 1600 | 90 | 2.4 | RS232C | 3x4x4 | 385(Q1); 330(Q500) | |
| **RAIR MICROCOMPUTER CORP.** | | | | | | | | | | | | |
| Cartridge tape drive | cartridge subsystem | .25 | streaming | 20 (formatted) | 4 | 9242 | 90 | 90 | SASI | 6x8x14 (standalone) | | |
| **RAYMOND ENGINEERING INC., RAYCORDER PRODUCTS DIV.** | | | | | | | | | | | | |
| 6409 | cassette | .15 | start/stop | .1 (formatted) | 2 | 800 | 3,20 | .3 | 8-bit parallel | 3x3x1.8 | 500(Q1); 365(Q500) | unidirectional or bidirectional, single or dual channel |
| 6440 | cassette | .15 | start/stop | 2.2 | 2 | 800; 1600 | 30, 60, 90 | 3,6 | 8-bit parallel, RS232C, IEEE-488 | 4.5x5.5x3.75 | 625(Q1); 465(Q500) | remote or local control |
| 6449 | cartridge | .25 | start/stop | 5.3 | 4 | 1600 | 30,90 | 6 | 8-bit parallel, RS232C, IEEE-488 | 4.5x7.2x9.6 | 995(Q1); 465(Q500) | |
| WR-100 | cassette | .15 | streaming | 13.4 | 4 | 6400 | 30,90 | 19.2 | QIC-02,SCSI | 3.24x5.75x8 | 1,175(Q1); 535(Q500) | |

## CASSETTE/CARTRIDGE TAPE DRIVES

| Company Model | Drive type | Tape size (inches) | Operating mode | Storage capacity (in M bytes) | No. of tracks | Recording density (bpi) | Tape speed (ips) | Data transfer rate (K bytes/sec.) | Interfaces | Dimensions (HxWxD in.) | Unit price ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WR-200 | cassette | .15 | streaming | 20.9 | 4 | 10000 | 30 | 30 | QIC-02, SCSI | 3.25x5.75x8 | 1,295(Q1); 590(Q500) | |
| 6801 | cassette | .15 | start/stop | .6 | 2 | 800 | 30 | 3 | RS232C | 7x17x14.5 (standalone) | 3,150 | TI-700 format, single or dual drives |
| **ROSSCOMP CORP.** | | | | | | | | | | | | |
| Series 50 | cartridge | .5 | start/stop, streaming | 160 | 24 | 8000 | 90,130 | 90,130 | BST1, QIC-02, SCSI | 3.25x5.75x8 | 995(Q1); 600(Q500) | embedded formatter, backs up 160M bytes in 20 min. at 130 ips. |
| Series 80 | cartridge | .5 | start/stop, streaming | 160 | 24 | 8000 | 90,130 | 90,130 | BST1, QIC-02, 9-track | 4.62x8.55x11 | 1,495(Q1); 900(Q500) | embedded formatter, 9-track software compatible; backs up 160M bytes in 20 min. at 130 ips. |
| Series 70 | cartridge subsystem | .5 | start/stop, streaming | 160 | 24 | 8000 | 90,130 | 90,130 | SCSI, QIC-02, 9-track | 6.15x18.6x18.83 (standalone) | 2,995(Q1); 1995(Q500) | desktop or rack-mount, integral power supply, backs up 160M bytes in 20 min. at 130 ips. |
| **SAYLOR ELECTRONICS INTERNATIONAL INC.** | | | | | | | | | | | | |
| 4240 | cassette | .15 | start/stop, streaming | 6 | 4 | 3200 | 30,60, 120 | 12 | | 6x5x7 (standalone) | 1,550 | tape drive only, contains tape control, read/write electronics |
| 4000-400 | cassette subsystem | .15 | start/stop | .75 (formatted) | 2 | 2200 | 30,60, 120 | 8.2 | RS232C, TTL, 8-bit parallel; HP 98XX, DEC VAX series, Rolm | 18x12x9 | 4,875 | |
| 4000-500 | cartridge subsystem | .15 | start/stop | 5 (formatted) | 4 | 3200 | 30,60, 120 | 8.2 | RS232C, TTL, 8-bit parallel, HP 98XX, DEC VAX series, Rolm | 18x12x9 | 6,450 | |
| **SCIENTIFIC MICRO SYSTEMS INC.** | | | | | | | | | | | | |
| DSX-11 | cartridge subsystem | .25 | start/stop | 21.6 | 4 | 6400 | 30 | 19.2 | DEC LSI-11, PDP-11 | | 10,000–15,000 | |
| FWT-11 | cartridge subsystem | .25 | start/stop | 21.6 | 4 | 6400 | 30 | 19.2 | DEC LSI-11, PDP-11 | | 4,500 | |
| **TANDBERG DATA INC.** | | | | | | | | | | | | |
| TDC 3200 | cartridge | .25 | streaming | 62 | 4 | 8000 | 45,90 | 88.3 | QIC-02 | 4.6x7.8x10.3 (standalone) | 1,525 | |
| TDC 3300 | cartridge | .25 | streaming | 62 | 9 | 8000 | 45,90 | 88.3 | QIC-02 | 1.69x5.76x8 (standalone) | 1,575 | |
| **TANDON CORP.** | | | | | | | | | | | | |
| TM951 | cartridge | .5 | streaming | 50 | 20 | 5000 | 50 | 31.25 | | 3.38x5.88x8 | | |
| **TEAC CORP. OF AMERICA** | | | | | | | | | | | | |
| MT2-ST | cassette | .25 | streaming | 20 (formatted) | 4 | 10000 | 90 | 87.44 | QIC-02 | 1.625x5.75x8 | 895(Q1), 700(Q500) | |
| **TECHTRAN INDUSTRIES** | | | | | | | | | | | | |
| 800 series | cassette | .25 | start/stop | .145 (formatted) | 2 | 960 | 20 | .11–9.6 | RS232C/CCITT | 5x7.25x11 | 1,145 | rackmount, battery power |
| 9600PRL | cassette | .25 | start/stop | .22 (formatted) | 2 | 960 | 20 | .11–9.6 | RS232C/CCITT | 6.5x.2x8 | 1,755 | optional rechargeable battery |
| 822 | cassette | .25 | start/stop | .44 (formatted) | 2 | 960 | 20 | .11–9.6 | RS232C/CCITT | 6.25x11.25x12.25 | 2,445 | tape editor, variable file length |
| **TECHTRAN SYSTEMS CORP.** | | | | | | | | | | | | |
| TR-4 | cassette | .25 | start/stop | .145 (formatted) | 2 | 960 | 20 | .11–2.4 | RS232C/CCITT | 5x7.25x11 | 1,125 | remote and manual control, automatic online/offline mode select |
| **3M DATA RECORDING PRODUCTS DIV.** | | | | | | | | | | | | |
| HCD-75/30 | cartridge | .25 | start/stop, streaming | 67 (formatted) | 16 | 10000 | 30 | 17.5 | parallel 16-bits, 8-bit bidirectional or unidirectional | 4.6x6.8x17.6 | 874(Q100) | |

## CASSETTE/CARTRIDGE TAPE DRIVES

| Company Model | Drive type | Tape size (inches) | Operating mode | Storage capacity (in M bytes) | No. of tracks | Recording density (bpi) | Tape speed (ips) | Data transfer rate (K bytes/sec.) | Interfaces | Dimensions (HxWxD in.) | Unit price ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HCD-75/60 | cartridge | .25 | start/stop, streaming | 67 | 16 | 10000 | 60 | 35 | parallel 16-bits, 8-bit unidirectional or bidirectional | 4.6x6.8x17.6 | 874(Q100) | |
| DCD-1 | cartridge | .015 | start/stop, streaming | .2 | 1 | 800 | 30 | 2.4 | TTL | 3.9x5.7x3.8 | 534(Q100) | |
| DCD-2 | cartridge | .015 | start/stop, streaming | .7 | 2 | 1600 | 30 | 4.8 | TTL | 4.2x5.7x4.8 | 426(Q100) | |
| DCD-3 | cartridge | .25 | start/stop, streaming | 4.3 | 4 | 1600 | 30 | 6 | TTL | 6.9x8.7x9.4 | 886(Q100) | |
| **WANGTEK INC.** | | | | | | | | | | | | |
| Series 5000 | cartridge | .25 | streaming | 20–60 (formatted) | 4,9 | 8000 | 90 | 90 | QIC-02 | 3.25x5.25x8 (standalone) | 950–1,600 | |
| **THORN EMI TECHNOLOGIES INC.** | | | | | | | | | | | | |
| 9800 | reel-to-reel subsystem | .5 | streaming | 17.25,34.5 | 9 | 1600; 3200 | 100 | 160 | RS232C, Centronics; IBM PC and S/34 | 8.5x8.9x15.2 (standalone) | 2,950(Q1) | world's smallest open reel-to-reel tape drive |
| 9900 | cassette subsystem | .5 | streaming | 69,138 | 9 | 1600; 3200 | 100 | 160 | RS232C, Centronics; IBM PC and S/34 | 8.7x19x22.25 (standalone) | 3,950(Q1) | built-in formatter |
| **UNITRONIX CORP.** | | | | | | | | | | | | |
| DMT 730 | cassette subsystem | .25 | start/stop, streaming | 38 | 8 | 700 | 30,90 | 28,86 | DEC PDP-11 series, VAX series | 4.5x5x3.5 | 1,900 | |
| DMT 2000 | cartridge subsystem | .5 | start/stop, streaming | 80 | 9 | 1600 | 25,100 | 36,72 | DEC PDP-11 series, VAX series | 9.5x19x24 | 4,800 | |


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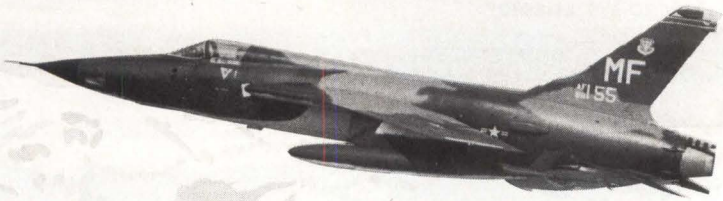


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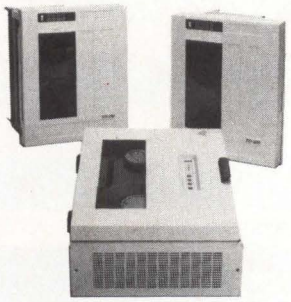

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# Alphanumeric terminal market gets pressure from low and high ends

*Terminal manufacturers are feeling the heat from intense competition in low-cost terminals and the entry of microcomputers onto terminal turf*

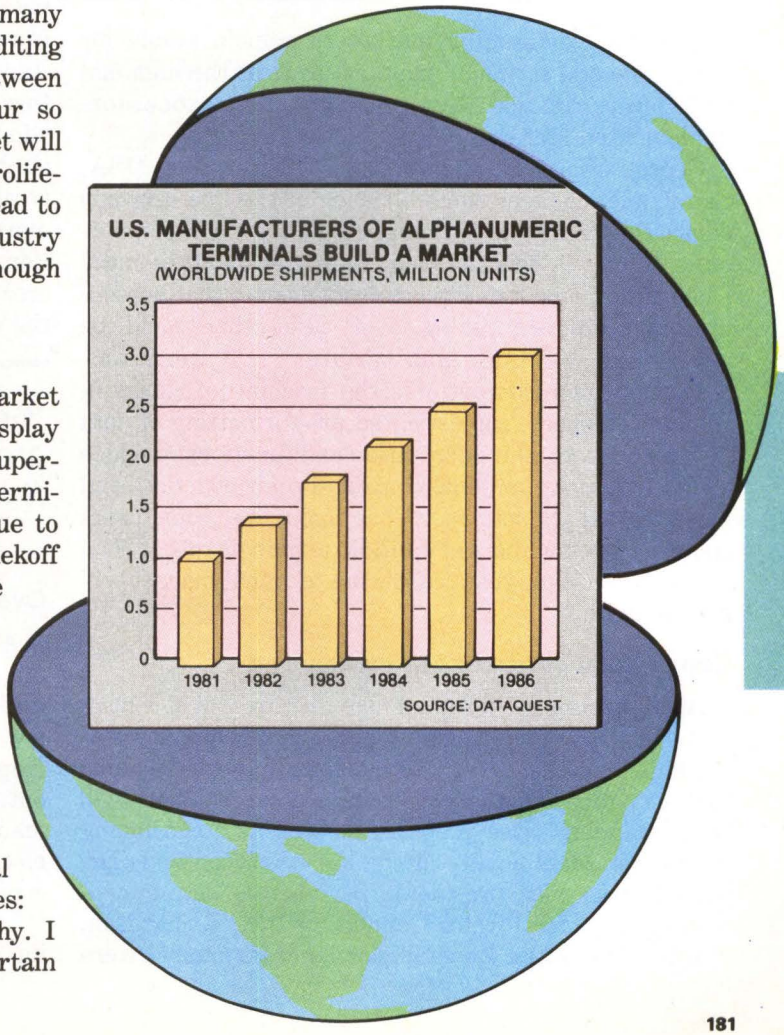
**Tom Moran** and **Jesse Victor,** Associate Editors

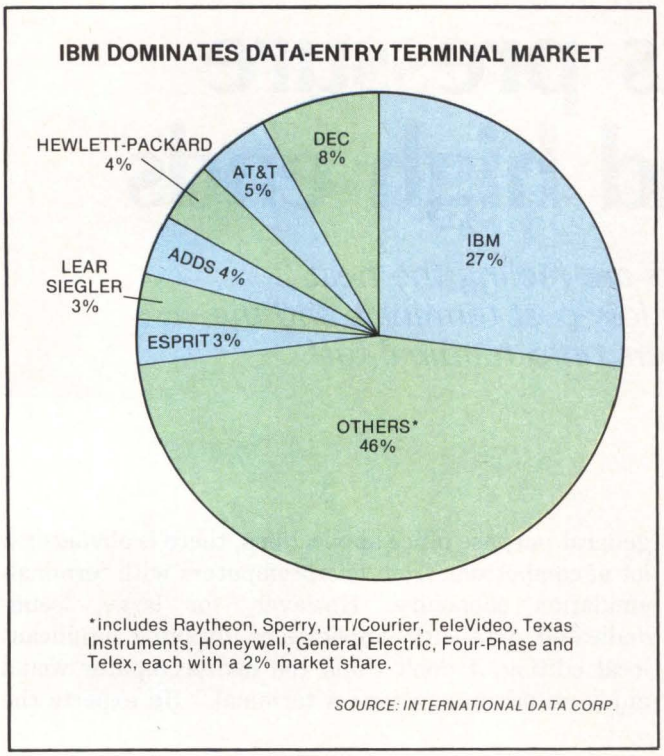
Significant competition at the high and low ends of the terminal market is pressuring terminal manufacturers. Terminals in general and high-end terminals in particular are gaining computing power as microcomputers are adding terminal-emulation capabilities. Lower-end, lower-cost terminals are rapidly assuming many of the features provided by their higher-priced, editing and intelligent cousins. Will the distinction between alphanumeric terminals and microcomputers blur so much that the high end of the alphanumeric market will disappear? Will excessive price cutting and the proliferation of features at the low end of the market lead to "spec-sheet wars" and "disposable" terminals? Industry analysts consider these scenarios unlikely, although they haunt some terminal manufacturers.

### Will the terminal market disappear?

"We don't see the alphanumeric terminal market disappearing," says Bob Sanekoff, director of display terminals industry service for Dataquest Inc., Cupertino, Calif. "The alphanumeric general-purpose terminal market is in a solid position and will continue to show growth over the next four to five years." Sanekoff points out that most non-emulating terminals are used primarily for data-entry, information-retrieval, database-updating and other I/O-oriented applications. "They're simple applications, and they require simple solutions. The personal computer attached to the mainframe is [going to] a new market. The new alternative devices are looking at new markets and new opportunities."

Tom Elliott, director of research at International Data Corp. (IDC), Framingham, Mass., agrees: "The terminal market as a whole is pretty healthy. I don't see the high end disappearing. For certain general-purpose office applications, there is obviously a lot of competition from microcomputers with terminal-emulation capability. However, for large, 'semi-dedicated' data-entry applications involving significant local editing, I don't think the microcomputer would enjoy an advantage over a terminal." He expects the






high-volume data-entry market to remain stable for some time and terminal manufacturers at the high end to counterattack by adding microprocessor-implemented features.

George Chao, president of Liberty Electronics USA, San Francisco, sees some blurring of the line between smart terminals and terminal-emulating microcomputers. "Where is this personal computer really going?" Chao asks. Some industry analysts answer that personal computers are taking over tasks that could be performed by high-end terminals. A terminal-emulating microcomputer is the machine of choice in remote job entry, sophisticated pre-formatting of data for spreadsheet-like information and functions in which executives want personal control of their own data and database. At the low end, Chao maintains, some users require large numbers of multiple terminals rather than features, "and for that reason the terminal market will always exist."

### Competition intensifies at the low end

As alphanumeric terminal manufacturers will continue to feel the competition from personal computers at the high end, the low end of the alphanumeric terminal market will also feel competitive pressures. There will be "continuing price pressure as well as a continuing increase in functionality at the low end," contends Dr. John Hoper, vice president, peripherals and components group, for Future Computing Inc., Richardson, Texas. "The initial Lear-Siegler [Inc. terminals] were very low in functionality. Price pressure has driven the prices down, and there's a significant increase in functionality at comparably low price points."

Many of today's low-cost (less than $1,000) terminals do provide a significant increase in functionality, offering impressive performance in data-transmission rates, editing and graphics (MMS, November 1983, Page 141). Liberty's $745 Freedom 200, for example, furnishes transmission at 50 to 19.2K baud with block, conversion, monitor and local communication modes; programmable handshaking protocol; an 80-column-by-24-line-display; double-height, double-width characters; 86 extended graphics characters including math and Greek; 10 programmable function keys; and eight foreign-character sets. Several terminals selling for less than $1,000 now offer color displays. Esprit Systems Inc.'s Esprit III is typical of these units. It provides eight colors, 11 programmable function keys, line graphics, character/line editing and as many as four pages of screen memory.

Although color capability is not widespread among alphanumeric terminals, IDC's Elliott sees it as a significant trend. "Color is gaining in popularity," he notes. "There are a lot of display applications where it is a real advantage." Esprit vice president of marketing Aaron Morrow agrees—with reservations. Manufacturers, he asserts, must become more responsive to what end users want to use color for in their applications. "For the most part," he says, "we are treating color as [just] another feature. But it's really more than that. It's another way of conveying information. Manufacturers will have to do some work in creating a color terminal that is a bit more directed at the user's needs."

*'Color is gaining in popularity; there are a lot of display applications where it is a real advantage.'*

### Overcoming volume production problems

As competition intensifies and terminal manufacturers aim at increasing market share, will they have difficulty in producing large quantities of relatively low-cost, full-featured terminals? Future Computing's Hoper doesn't think so. The functionality, he points out, is "just additional firmware over which [the manufacturers] have a lot of controls. So, as the cost of electronics continues to come down, there will be a continuing increase in functionality."

Liberty's Chao also foresees no difficulty in producing large quantities of full-featured, relatively low-cost

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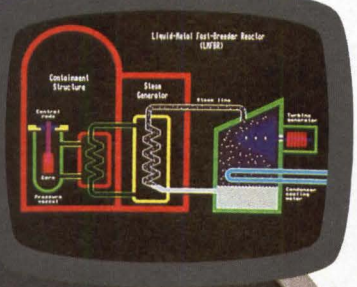



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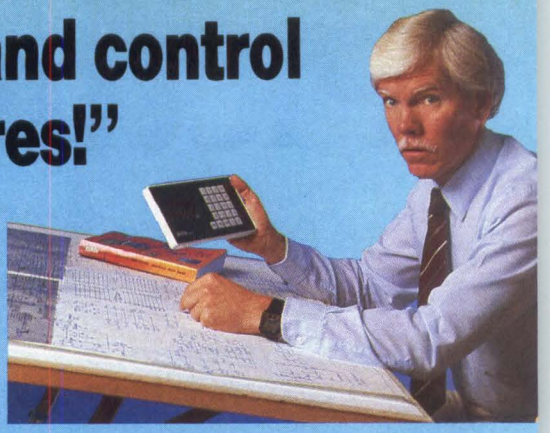

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**CIRCLE NO. 84 ON INQUIRY CARD**

terminals. "We are more than capable of meeting [any] demand," he says. "As production quantities increase, we are getting more and more commodity oriented. As you enter a commodity marketplace, you depend on volume because you are cutting your margins. You have to be able to produce large quantities. That's the fundamental challenge."

*There will be 'continuing price pressure as well as a continuing increase in functionality at the low end.'*

Liberty keeps its production costs down, Chao emphasizes, by purchasing basic materials at reasonable rates and implementing design and manufacturing efficiency. The company keeps a tight rein on quality, Chao maintains, by having its own manufacturing facilities, becoming "highly involved in the manufacturing process" and having a quality director who works with the manufacturing line on all phases of quality control. However, Chao sees potential problems in quality control at high production volumes for companies that don't own their own manufacturing facilities. "Whenever you go out and contract anything, there is always the element of risk. For those who have their own manufacturing facilities or—as in our case—have the manufacturing done by an affiliated company, the problems are considerably fewer."

Most industry analysts expect a continuing drop in prices at the very low end of the market. Several alphanumeric terminals have already broken the $500 barrier, and quantity discounts bring their prices even lower. At last month's introduction of Liberty's Freedom 110, Chao predicted that, within a few years, "terminals of this flavor [will sell] for $300 and possibly less." An ergonomic upgrade of Liberty's popular Freedom 100, the 110 has the same programmable function keys and keyboard as the company's high-end Freedom 200, plus non-volatile screen setup, a screen-saver feature, 15 business graphics characters and a 12-inch, 80-column-by-25-line display (MMS, April, Page 48).

### Users will reject the 'disposable' terminal

Even though terminal prices will continue to fall, end users are not looking for "disposable" terminals, picking the lowest cost-per-function unit they can find, says Mark L. Siegel, executive vice president and general manager of TeleVideo Systems Inc.'s terminals division. "We're still not in the era of "throwaway" terminals, and I doubt very much that we will be, anymore than we're in an era of throwaway black-and-white TV sets. You can get terminals from the Far East in large quantities that are very very low in original price. But the overall cost of owning them would be significantly higher because the companies providing those terminals don't even pretend to offer any support. If the [terminals] break, don't call the [companies]. If you have service or performance problems, don't call them."

Siegel sees some "specsmanship" occurring, particularly at the low end. There, manufacturers promote their terminals as offering more features or functions for the same or lower price than those offered by other manufacturers. But, Siegel adds, "I think users are still looking for total value received. What's the total cost of buying the product, whether it is a terminal or some other product? After the sale, you must believe that service, reliability, warranty, technical help and the company will be there when you need them."

TeleVideo got started, Siegel observes, by offering "smart-terminal capability for dumb-terminal pricing. That's how we gained entry into the volume marketplace, and now there are any number of new competitors that have cropped up from the Far East, Europe and domestically that are taking the same kind of lead and saying more features, more functions for the same price or lower price. However, our observation of the requirements of [end] users [includes] specs, but it goes further than just dollars and cents per function. It also includes [questions like] 'Does the product work?' 'What's the reliability?' 'What's the delivery [time]?' 'What's the reputation of the company?' 'What's the support?'"

*Most non-emulating terminals are used primarily for data-entry, information-retrieval, database-updating and other I/O-oriented applications.*

Siegel adds, "In a number of cases, our second-generation products like the 925 and 950, which are basically the industry standard for performance, are still commanding a premium in price over competitors who have come in with 925 and 950 emulations. And the customers stay with our 925 and 950 terminals because they know they'll get them on time, they know they'll work, they know that we operate out of inventory so they don't have to wait, and they know that we'll back them up."

### Ergonomics comes to the fore

Siegel and other industry observers emphasize the importance of ergonomic features, such as tilt-and-swivel screens; Deutsches Institut für Normung-(DIN)-standard, low-profile, sculpted keyboards and visual attributes that increase operator productivity. Says Siegel, "They are the kinds of things that let somebody sit in front of one of these products for eight hours a day and not fall over from fatigue. There are more improvements all the time." Esprit's Morrow agrees: "Ergonomics is the ticket of admission if you want to play in the terminal game."

*Even though terminal prices will continue to fall, end users are not looking for 'disposable' terminals.*

American terminal manufacturers looking to increase their share in foreign markets, Morrow emphasizes, must be particularly aware of ergonomic considerations. "You won't be able to see a terminal in the German market after Jan. 1, 1985," he points out, "unless it conforms [to the DIN ergonomic specifications]. There is a history of these things propagating throughout the European community and then to the United States as well." Morrow expects high-end terminals to be increasingly characterized as "ANSI-type products with 132-column capability and color displays." IDC's Elliott also sees a significant trend toward alternative interfacing devices, including mice, touch screens and data tablets. "I think a lot of it is probably hype," he says. "You don't need them for all applications. But there will be some innovation along those lines."

TeleVideo's Siegel, however, sounds a note of warning to terminal manufacturers that see new technology as a way of multiplying their products' features. Many end users, he contends, are not taking advantage of the features afforded by today's technology. "Users have to be educated," he asserts. "They have to want to use the features. [Available] technology, such as microcode, continues to [run] ahead of the real need for memory, speed and editing features. All the power that's in this equipment is still not being used." □


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CIRCLE NO. 85 ON INQUIRY CARD

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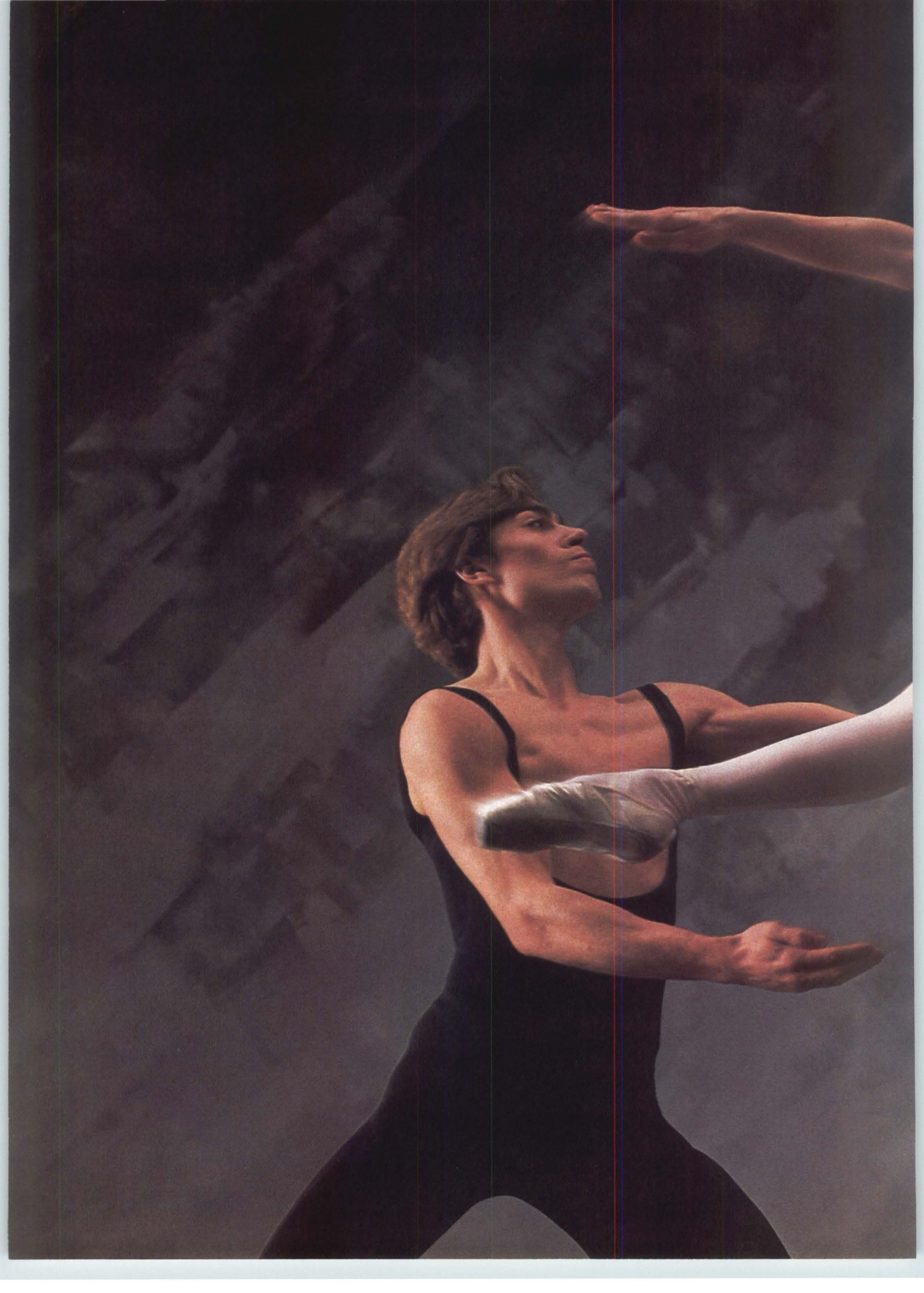

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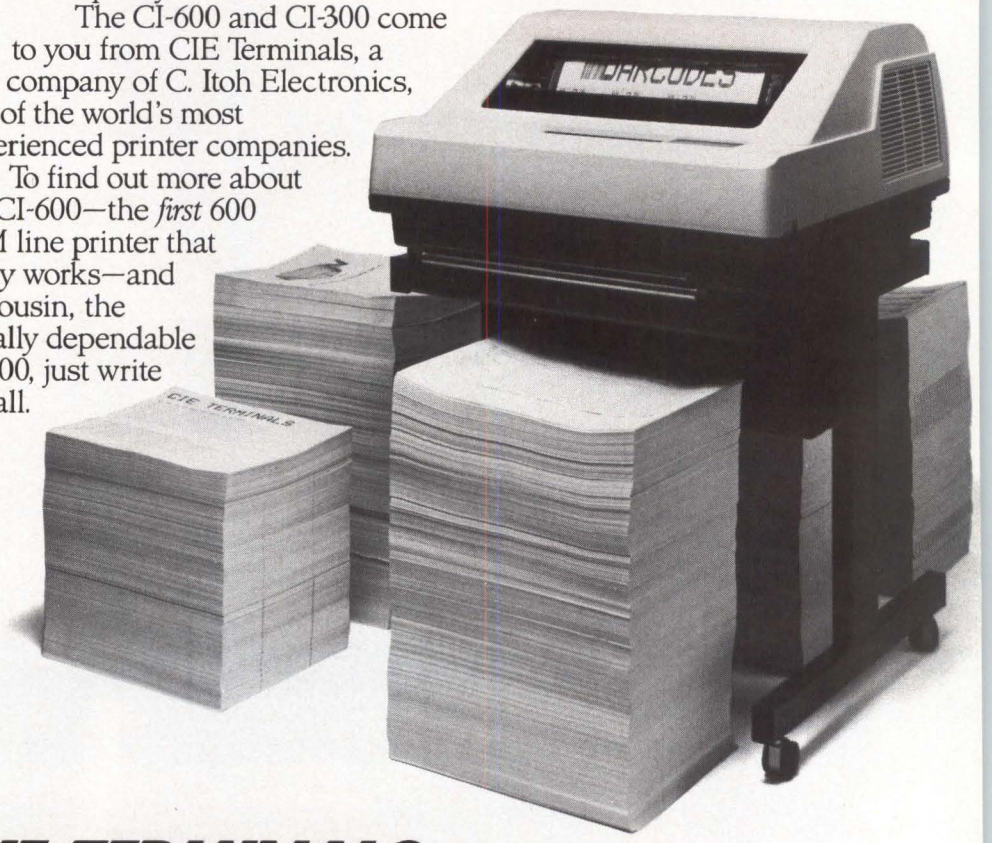


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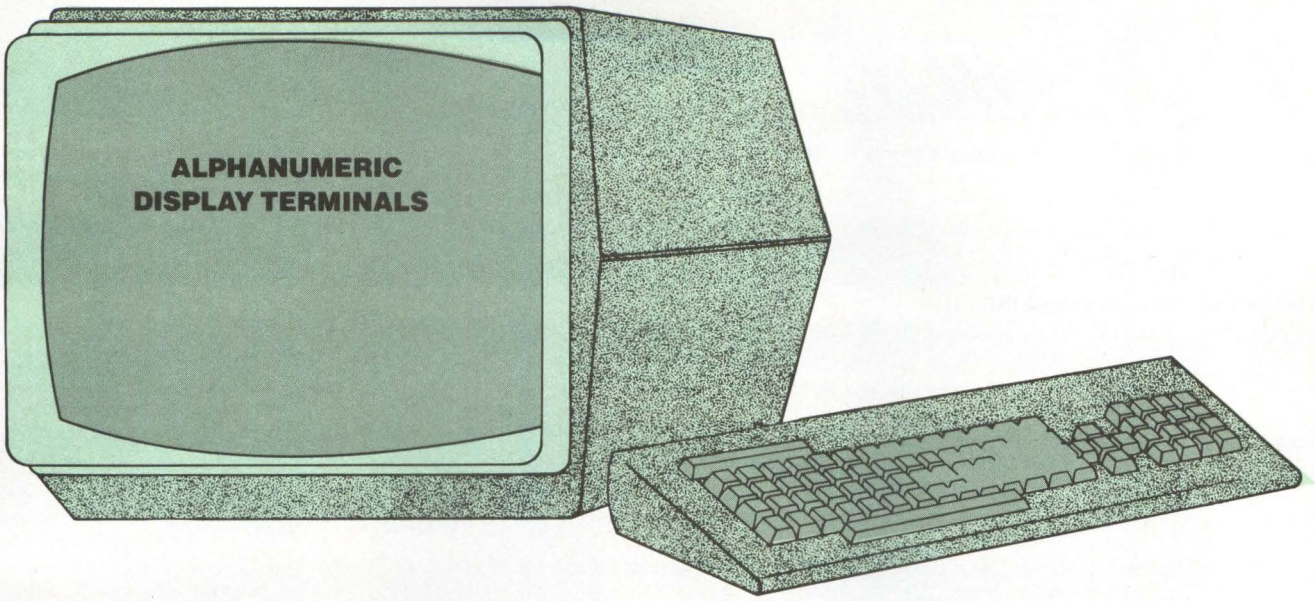



| Company Model | Terminal type | Display (diagonal inches) | Screen format (col. x lines) | Interfaces (protocols) | Emulations | Prices ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|
| **ALTOS** | | | | | | | |
| ALTOS 2 | editing | 14-inch, green, black | 132 x 25 | RS232C | | 1,195 | 32 function keys, split screen, business graphics, 128 graphics chars., non-volatile set-up modes |
| **AMALGAMATED WIRELESS LTD.** | | | | | | | |
| AWA 8602 | intelligent/ graphics | 14-inch, green, amber, white, 8-color | 80 x 25 | RS232C, RS422, current loop, parallel | DEC VT100 | | 24 programmable function keys, 16 pages of memory, video output, floppies/Winchester |
| **AMPEX** | | | | | | | |
| 4000 | intelligent | 12-inch, green | 80 x 25 | RS232C (Burroughs, Honeywell, IBM) | Burroughs TD 830; Honeywell VIP 7700, 7801, 7804; IBM 3270, Univac U200; NCR 501 | 1,300 | 16 function keys, up to 7 pages of memory, graphics character set, serial or parallel print |
| 4100 | intelligent | 12-inch, green | 80 x 25 | RS232C (Burroughs, Honeywell, IBM) | Burroughs TD 830; Honeywell VIP 7700, 7801, 7804; IBM 3270; Univac U200; NCR 501 | 1,600 | 16 function keys, up to 7 pages of memory, graphics character set, serial or parallel print |
| D175 | intelligent | 12-inch, green, amber | 80 x 25 | RS232C, current loop (X-on/X-off) | 20 different emulations | 869 | 20 programmable function keys, 2 pages of memory, line and block graphics, 8 Int'l character sets |
| D125 | editing | 12-inch, green, amber | 80 x 25 | RS232C, current loop (X-on/X-off) | 18 different emulations including TeleVideo 925, 950 | 679 | 12 function keys, non-volatile set-up modes, 8 Int'l char. sets, slot for extra board |
| D150 | intelligent | 12-inch, green, amber | 80 x 25 | RS232C, current loop (X-on/X-off) | 20 different emulations including TeleVideo 925, 950 | 845 | 20 prog. function keys, 2 pages of memory, split screen, line and block graphics |
| **ANDERSON JACOBSEN INC.** | | | | | | | |
| 510 | editing/ graphics | 15-inch, green | 80 x 24 | CCITT | | 1,995 | graphics and APL character set |
| 520 | intelligent/ graphics | 15-inch, green, amber | 132 x 24 | CCITT (X-on/X-off, DTR) | DEC VT100 | 2,395 | 12 programmable function keys, proprietary graphics set, 32K-bytes of memory, 4 set-up menus |
| **ANN ARBOR TERMINALS** | | | | | | | |
| AMBASSADOR | editing | 15-inch, green | 80 x 60 | RS232C, RS422, opt. current loop (X-on/X-off) | opt. DEC mode | 1,595 | 38 programmable keys, non-volatile set-up modes, 2.5 pages of memory; opt. graphics and rack-mount |
| GENIE | editing | 15-inch, white | 80 x 30 | RS232C, RS422, opt. current loop (X-on/X-off) | | 1,195 | 26 programmable keys, rack panel, non-volatile set-up modes; opt. 2 pages of memory |

## ALPHANUMERIC DISPLAY TERMINALS

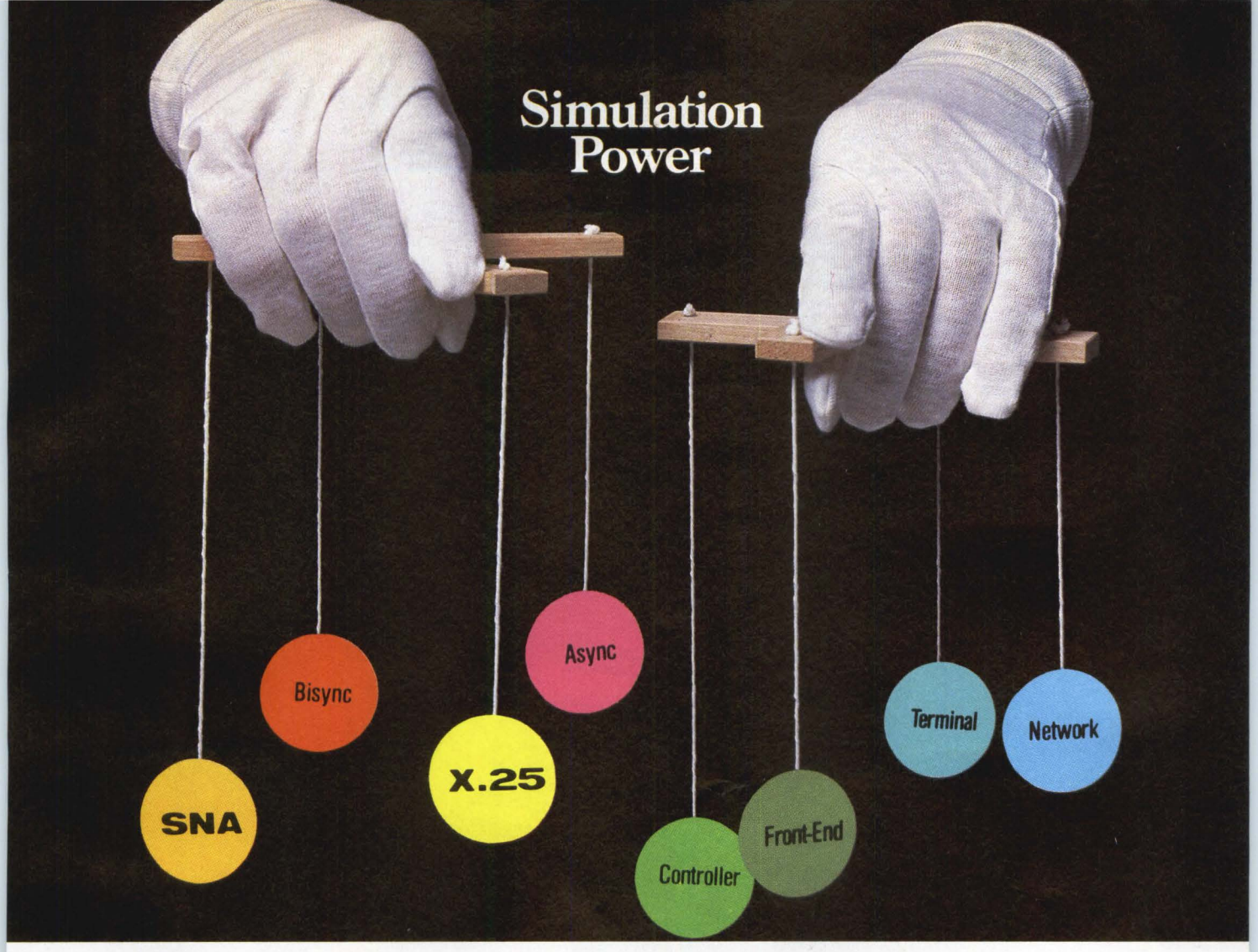
| Company Model | Terminal type | Display (diagonal inches) | Screen format (col. x lines) | Interfaces (protocols) | Emulations | Prices ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|
| GENIE + PLUS | editing | 15-inch, white | 80 x 30 | RS232C, RS422, opt. current loop (X-on/X-off) | | 1,395 | 38 function keys on 60 levels, 2 pages of memory, split screen, non-volatile set-up modes |
| GURU | editing | 15-inch, green | 170 x 66 | RS232C, RS422, opt. current loop (X-on/X-off) | opt. DEC mode | 2,395 | 38 programmable keys, 15 pages of memory, split-screen, non-volatile set-up modes |
| **APPLIED DIGITAL DATA SYSTEMS INC.** | | | | | | | |
| ADDS/EPIC 14E | editing | 12-inch, green, amber, white | 80 x 24 | RS232C, opt. current loop | TeleVideo 925 | 895 | fine line business graphics, status line can be disabled from keyboard or CPU |
| Viewpoint/Color | editing | 13-inch, 64-color | 80 x 24 | RS232C, opt. current loop | | 1,295 | fine line business graphics, status line can be disabled from keyboard or CPU |
| Viewpoint/60 | editing | 12-inch, green, amber, white | 80 x 25 | RS232C, opt. current loop | | 895 | fine line business graphics, status line can be disabled from the keyboard or CPU |
| Viewpoint/90 (OEM) | intelligent | 12-inch, green, amber, white | 80 x 25 | RS232C, opt. current loop | | 1,195 | business line graphics, 256 user-defined graphics symbols |
| Viewpoint/A1A2 | dumb | 12-inch, green, amber, white | 80 x 24 | RS232C, opt. current loop | | 650 | fine line business graphics, status line can be disabled from the keyboard or CPU |
| Viewpoint/3A + | dumb | 12-inch, green, amber, white | 80 x 24 | RS232C, opt. current loop | Lear Siegler ADM-3A | 650 | fine line business graphics, status line can be disabled from keyboard or CPU |
| Viewpoint/78 | dumb | 12-inch, green, amber, white | 80 x 24 | RS232C, opt. RS422, current loop (IBM via converter) | | 1,095 | fine line business graphics, status line can be disabled from the keyboard or CPU |
| Viewpoint/78-color | dumb | 12-inch, 4-color | 80 x 24 | RS232C, opt. current loop | | 1,995 | fine line business graphics, black background on monitor, status line can be disabled from keyboard or CPU |
| **ARTS COMPUTER PRODUCTS INC.** | | | | | | | |
| COMBO | dumb | monitor-dependent | | RS232C | | 7,200 | monitor sold separately, synthetic speech and adjustable print |
| EXPAND-A-VUE | dumb | monitor-dependent | | RS232C | | 5,300 | adjustable print size, monitors sold separately |
| ORATOR | dumb | monitor-dependent | | RS232C | | 4,400 | speech synthesis, monitors sold separately |
| **ASTRONAUTICS CORP. OF AMERICA** | | | | | | | |
| KVDT | intelligent | 15-inch, b&w | 80 x 25 | RS232C | | 26,000 | 16 programmable function keys |
| **BASIC TELECOMMUNICATIONS** | | | | | | | |
| DataVoice 20 | intelligent | 9-inch, green | 80 x 24 | RS232C (X-on/X-off, DTR) | DEC VT100, IBM 3278 | 1,995 | 2 pages of memory, cassette tape drive |
| DataVoice 10 | intelligent | 9-inch, green | 80 x 24 | RS232C (X-on/X-off, DTR) | DEC VT100, IBM 3278 | 1,295 | 2 pages of memory |
| **BEEHIVE INTERNATIONAL** | | | | | | | |
| ATL-004 | editing | 14-inch, green | 132 x 27 | RS232C, RS422, current loop (pole-select) | DEC VT52, VT100 | | 8 function keys, line graphics, 2K-bytes RAM, 32K-bytes ROM |
| ATL-008 | editing | 14-inch, green | 132 x 24 | RS232C, RS422, current loop | DEC VT52, VT100 | | 8 function keys, up to 12 pages of memory, line graphics, multiple windows |
| ATL3270 | intelligent | 14-inch, green | 80 x 24 | RS232C (bisync, SNA/SDLC) | IBM 3270 via protocol converter | | 24 programmable function keys, 2-device cluster controller, aux. printer port |
| ATL78 | intelligent | 14-inch, green | 80 x 24 | RS232C | IBM 3278 via protocol converter | | 24 programmable function keys, supports IBM status file report via Beehive cluster controller |
| ATL83 | editing | 14-inch, green | 80 x 24 | Burroughs TD7; 2 RS232C ports (bisync) | Burroughs TD830, MT983 | | up to 9 pages of memory |
| TOPPER | editing | 14-inch, green | 80 x 24 | 2 RS232C ports (pole-select, bisync) | IBM 3270 VIA CC76 cluster controller | 2,995 | 2 communications ports, can transfer files to host without program change with WSL |
| TOPPER 2 | intelligent | 14-inch, green | 80 x 24 | 2 RS232C ports (pole-select, bisync) | IBM 3270 VIA CC76 cluster controller | 3,595 | 2 5.25 floppy diskettes on side unit for file storage and limited CPM |
| **THE BRAEGEN CORPORATION** | | | | | | | |
| 8523 Display Station | editing | 15-inch, green | 80 x 43 | RS232C (X-on/X-off, bisync, SNA/SDLC) | IBM 3278-2, -3, -4 | | multi-format screens, split screen opt. |

# ALPHANUMERIC DISPLAY TERMINALS

| Company Model | Terminal type | Display (diagonal inches) | Screen format (col. x lines) | Interfaces (protocols) | Emulations | Prices ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|
| 8521 | editing | 15-inch, green | 80 x 24 | RS232C (SNA/SDLC, bisync) | IBM 3278-2 | | multi-format screens, 24 programmable function keys, soft key security |
| 8522 | editing | 15-inch, green | 80 x 24 | RS232C (SNA/SDLC) | IBM 3278-2, -5 | | keyboard video controls, removable monitor |
| **BURROUGHS CORP.** | | | | | | | |
| ET 1100 | editing | 14-inch, green | 80 x 26 | RS232C, TDI | | 1,895 | 10 pages of memory, multipoint operation |
| MT 985 | editing | 12-inch, green | 80 x 26 | RS232C | | 2,395 | |
| SR 110 | intelligent | 12-inch, white | 80 x 25 | RS232C | | 1,695 | 16 programmable function keys |
| ET 2130 | intelligent/ graphics | 14-inch, green | | | | 4,395 | split screen; opt. plotter |
| ET 2230 | intelligent/ graphics | 14-inch, color | | | | 5,495 | split screen; opt. plotter |
| **CARTERFONE COMMUNICATIONS CORP.** | | | | | | | |
| 7276 | intelligent | 12-inch, white | 80 x 25 | RS232C (bisync) | IBM 3276 | 2,995 | 24 function keys, multipoint capability |
| 7276 SNA | intelligent | 12-inch, white | 80 x 25 | RS232C (SNA/SDLC) | IBM 3276 | 2,995 | 24 function keys, point-to-point or multipoint capabilities |
| 7700 | intelligent | 12-inch, green | 64 x 25 | RJ45, RS232C (TWX, TLX, DDD) | | 5,000 | up to 4 ports |
| 7800 | editing | 12-inch, white | 80 x 24 | RS232C (83B3, 8A1, 85A1, TWX) | | 3,780 | 32K RAM |
| **CHROMATICS INC.** | | | | | | | |
| CT 4100 | intelligent/ graphics | 13-inch, 8-color | 80 x 48 | RS232C, parallel (X-on/X-off) | ISC 80016, Lear Siegler ADM-3; DEC VT52, VT100 | 2,995 | 4 pages of memory, split screen, 640 x 384 resolution; opt. light pen |
| **CIE TERMINALS** | | | | | | | |
| CIT-80 | dumb | 12-inch, b&w, green, amber | 80 x 24 | RS232C, current loop (X-on/X-off) | DEC VT52 | | line graphics, printer port, non-volatile set-up mode |
| CIT-101 | dumb/ graphics | 12-inch, b&w, green, amber | 132 x 24 | RS232C, current loop (X-on/X-off, RTS/CTS) | DEC VT100 | | non-volatile set-up mode, split screen, printer port |
| CIT-500 | editing | 15-inch, b&w, green, amber | 80 x 64 | RS232C, current loop (X-on/X-off, RTS/CTS) | DEC VT100 | | 41 programmable function keys, programmable printer port |
| CIT-101e | dumb | 14-inch, b&w, green, amber | 132 x 24 | RS232C, current loop (X-on/X-off, RTS/CTS) | DEC VT102 | | non-volatile set-up mode, split screen, serial printer port |
| CIT-161 | dumb/ graphics | 12-inch, 8-color | 132 x 24 | RS232C, current loop (X-on/X-off, RTS/CTS) | DEC VT100 | | non-volatile set-up mode, split screen, serial printer port |
| **CIFER PLC** | | | | | | | |
| 2605 | dumb | 12-inch, white, green, orange | 80 x 25 | two RS232C (X-on/X-off, DTR/CTS) | opt. DEC VT52, DG 6053 | | 10 programmable function keys; opt. video output |
| 2834 | editing | 12-inch, green, orange | 132 x 31 | two RS232C (X-on/X-off, DTR/CTS) | Tektronix 4010; opt. Telex | | 40 programmable function keys; opt. graphics, video output |
| 2880 | intelligent | 12-inch, green, orange | 132 x 31 | three RS232C, Centronics, IEEE-488 (X-on/X-off, DTR/CTS) | Tektronix 4010 | | 40 programmable function keys; opt. graphics, video output and disk subsystem for UNIX, CP/M |
| 2883 | intelligent | 12-inch, green, orange | 132 x 30 | three RS232C/V24, parallel, IEEE-488 | | | 40 programmable function keys; opt. disk drives, graphics |
| 3834 | editing | 15-inch, green, orange | 132 x 31 | two RS232C (X-on/X-off, DTR/CTS) | | | 60 programmable function keys; opt. video output |
| 3842 | intelligent/ graphics | 15-inch, green, orange | 132 x 30 | two RS232C ports | DEC VT100, Tektronix 4014 | | 60 programmable function keys, non-volatile storage; opt. video output |
| **COBAR** | | | | | | | |
| 3132 | editing/ graphics | 15-inch, white, amber, green | 132 x 24 | RS232C, opt. current loop (X-on/X-off) | DEC VT100, VT101, VT102 | 1,495 | 18 programmable keys, business graphics, printer port; opt. 8 pages of memory, graphics board |
| 3100 | editing/ graphics | 12-inch, white, amber, green | 132 x 24 | RS232C, opt. current loop (X-on/X-off) | DEC VT100, VT101, VT102 | 1,195 | 18 programmable keys, business graphics, printer port; opt. 8 pages of memory, graphics board |
| **CODEX CORP.** | | | | | | | |
| 268 | editing | 15-inch, green, amber | 80 x 25 | RS232C, RS432 (IBM 3277, 3278) | | | 12 programmable function keys, line drawing, auxiliary-printer |

# ALPHANUMERIC DISPLAY TERMINALS

| Company Model | Terminal type | Display (diagonal inches) | Screen format (col. x lines) | Interfaces (protocols) | Emulations | Prices ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|
| **COMPUTEK INC.** | | | | | | | |
| DISPLAY 8-25 | intelligent | 12-inch, green&white, b&w | 80 x 25 | RS232C, RS422, parallel (X-on/X-off) | DEC VT100 | 4,000 | unlimited programmable function keys, floppy and Winchester disk drives |
| DISPLAY 8-20 | intelligent | 12-inch, green&white, b&w | 80 x 25 | RS232C, RS422, parallel (X-on/X-off) | DEC VT100 | 2,700 | unlimited programmable function keys |
| **CONTROL CONCEPTS** | | | | | | | |
| CC-3276 | editing | 12-inch, green | 80 x 25 | RS232C (SDLC, X-on/X-off) | IBM 3276-12 | | integral 2400-baud modem, composite video output, printer buffer; opt. b&w monitor |
| EM-3275 | editing | 12-inch, green | 80 x 25 | RS232C (BSC, X-on/X-off) | IBM 3275-2 | | integral 2400-baud modem, composite video output, printer buffer; opt. b&w monitor |
| EM-3276 | editing | 12-inch, green | 80 x 25 | RS232C (BSC, X-on/X-off) | IBM 3276-2 | | integral 2400-baud modem, composite video output, printer buffer; opt. b&w monitor |
| EM-3276K | editing | 12-inch, green | 80 x 25 | RS232C (BSC, X-on/X-off) | IBM 3276-2 | | integral 2400-baud modem, composite video output, printer buffer; opt. b&w monitor |
| **CYBEREX LTD.** | | | | | | | |
| XM 3270 | intelligent | 14-inch, green | 80 x 24 | two RS232C, parallel (X-on/X-off) | IBM 3178, 3278-2 | 1,295 | 24 programmable function keys, 1 page of memory, used with protocol converters |
| MDL Series | intelligent | 14-inch, green | 80 x 24 | two RS232C ports, current loop, parallel printer ports | | 1,345 | 16 programmable function keys, 6 pages of memory; opt. touch screen, 32 virtual screens |
| XL-87M | intelligent/ graphics | 14-inch, green | 80 x 24 | RS232C, current loop, serial port (X-on/X-off) | | 985 | 3 programmable function keys; block, line graphics; opt. graphics |
| XL-87H | editing/ graphics | 14-inch, green | 80 x 24 | RS232C, current loop (X-on/X-off) | Hazeltine 1410, 1420, 1510 | 985 | 3 function keys; block, line graphics |
| XL-B4E | intelligent | 14-inch, green | 80 x 24 | dual RS232C, current loop (ASCII) | MAI Basic Four 7230, 7240, 7250, 7260 | 1,295 | |
| XL-D200 | intelligent/ graphics | 14-inch, green | 80 x 24 | RS232C, current loop, Centronics (ASCII) | DG Dasher 6052, 6053, D100, D200 | 1,295 | 20 function keys; block, line graphics |
| XL-87D | editing/ graphics | 14-inch, green | 80 x 24 | RS232C, current loop (X-on/X-off) | DEC VT52 | 985 | 3 programmable function keys; block, line graphics |
| XL-84 | dumb/ graphics | 14-inch, green | 80 x 24 | RS232C, current loop (X-on/X-off) | Lear Siegler ADM-3, -3A; Hazeltine 1400, 1410; ADDS consul 520, 580, Regent 20, 25 | 895 | block, line graphics, French character set; 5 opt. programmable function keys; non-volatile set-up modes |
| SA7800 | intelligent | 14-inch, green | 80 x 24 | RS232C ports (Honeywell) | Honeywell 7801, 7802, 7804, 7805, 7814 | 1,795 | 12 function keys, 11 graphics symbols, 16K print buffer, multipoint capability |
| SA-830 | intelligent/ graphics | 14-inch, green | 80 x 24 | two RS232C, TDI (Burroughs) | Burroughs, PD830, MT983, ET1000 | 1,695 | 16 pages of memory, 10 programmable function keys, multipoint operation; block, line graphics |
| APL 100 | intelligent/ graphics | 14-inch, green | 80 x 24 | two RS232C ports, current loop, Centronics | | 1,345 | ASCII or APL mode select; block, line graphics |
| **DAEWOO TELECOM CO.** | | | | | | | |
| TH7 | editing | 12-inch, green, amber | 80 x 25 | RS232C; opt. RS422, current loop (X-on/X-off) | TeleVideo 925 | | 22 programmable function keys, 2 pages of memory, self-diagnostics, bidirectional printer port |
| TH3 | dumb | 12-inch, green, amber | 80 x 24 | RS232C (X-on/X-off) | ADDS View Point, Lear Siegler ADM-3A | | 4 programmable function keys, self-diagnostics, transparent printer port, three foreign languages |
| TH9100 | editing | 12-inch, green, amber | 132 x 25 | RS232C, current loop (X-on/X-off) | DEC VT100, VT131 | | 4 programmable function keys, 2 pages of memory, self-diagnostics, bidirectional printer port |
| TH9790 | editing | 12-inch, green, amber | 132 x 25 | RS232C | NCR 7900 Model 3 | | 16 function keys, 2 pages of memory, self-diagnostics, bidirectional printer port |
| **DATA GENERAL CORP.** | | | | | | | |
| D210 | editing | 12-inch, green, amber | 80 x 24 | RS232C | | 995 | ANSI X 3.64 compatible |

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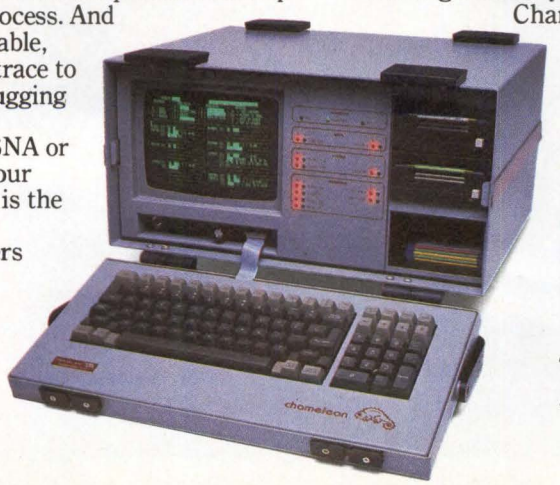
Chameleon makes it very easy to put simulation power at your fingertips. Call us today at (213) 829-7305 and we'll arrange a demonstration to show you just how easy. Or write today for further information.



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CIRCLE NO. 88 ON INQUIRY CARD


ADM 24E
ADM 31

# Lear Siegler

# Quality and Reliability You Trust. High Touch™ Style You'll Prefer.

This new generation of Lear Siegler video display terminals brings elegant High Touch™ style to our American Dream Machine (ADM™) tradition. The family features three new ergonomic terminals designed to meet the needs of OEMs and end users alike: the ADM 11, the ADM 12 and the ADM 24E.

Here is a whole new way for terminals to relate to people. Dozens of little touches add up to the convenience and comfort of High Touch.

For example, we put the power "on/off" switch and contrast control knob in front where they're easy to reach.

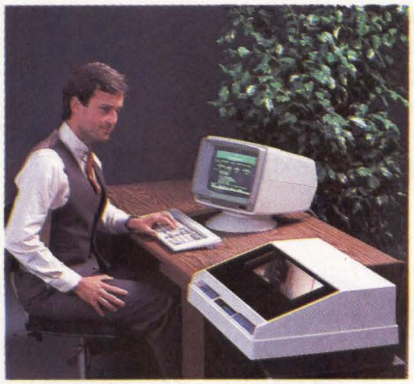
The monitor not only tilts and swivels, it stops positively in almost any position.

The clean, crisp display features a large character matrix on an easy-to-read green or amber non-glare screen – made even easier to read by the hooded bezel. Screens are available in 12″ or 14″ sizes.

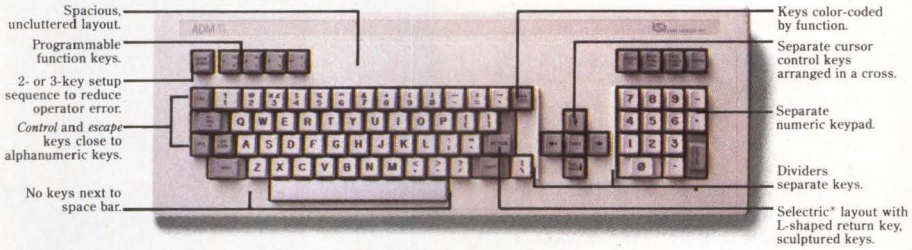
You get the best in style and ergonomics, plus all the outstanding performance features you'd expect from Lear Siegler (see chart).

Lear Siegler High Touch terminals are backed by the broadest network of full service centers anywhere, serving 3000 cities nationwide. And they're made in America – designed, engineered, manufactured and shipped from Anaheim, California to provide you with the best local support.

Place your order today by calling your local Authorized Distributor or, for quantities in excess of 500 units, your Regional OEM Sales Office.



Lear Siegler's new VersaPrint™ 500 Series printers combine with Lear Siegler video display terminals for hard copy output.




Low-profile, tapered, DIN-standard keyboards with Selectric layout feature logical key groupings and adjustable tilt for comfort and efficiency. ADM 11 shown above.

| | **ADM 11** Conversational | **ADM 12** Editing | **ADM 24E** Host Programmable |
|---|---|---|---|
| Programmable Function Keys | 4 (Shiftable to 8) | 16 (Shiftable to 32) | 16 (Shiftable to 32) |
| Non-Volatile Function Keys | Optional | Standard | Standard |
| Function Key Legends on 25th Line | From Host | From Host | Standard Non-Volatile |
| No. of Pages of Display Memory | 1 | 2 | 4 |
| Display Memory Configurations (Plus 25th Message/Status Line) | 24 Lines by 80 Characters | (2) 24 x 80 or (1) 48 x 80 or (1) 24 x 158 | User Definable up to 96 x 80 |
| Scrolling | Standard Scrolling | Smooth, Jump or Horizontal Scrolling Split Screen | Smooth or Jump Scroll Split Screen |
| Transmission Mode | Conversation Mode | Conversation or Block Mode | Conversation or Block Mode |
| Editing | Limited | Full Editing & Protected Fields | Full Editing & Protected Fields |
| Visual Attributes: Reduced Intensity, Blink, Blank and Reverse Video. Underline also on ADM 12 and ADM 24E | 3 Embedded 1 Non-Embedded | 4 Embedded, 1 Non-Embedded or All Non-Embedded, plus Full Screen Reverse Video | 5 Embedded, 1 Non-Embedded or All Non-Embedded, plus Full Screen Reverse Video and Highlight |
| OEM Flexibility | Modifiable Set-Up Characteristics | Modifiable Set-Up Characteristics & Personality | Modifiable Set-Up Characteristics. Add to Program in ROM or Down-Line Load in RAM (56K ROM or RAM. Up to 22K Display Available) Room for additional Logic Boards. |
| Terminal Compatibility | ADM 3A, ADM 5, ADDS Viewpoint & Regent 25, Hazeltine 1400, 1420 & 1500, DEC VT-52 | ADM 3A, ADM 5, ADM 31, ADM 32 | ADM 3A, ADM 5, ADM 31, ADM, 32, ADM 42 |

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**LEAR SIEGLER, INC.**
**DATA PRODUCTS DIVISION**

901 E. Ball Road, Anaheim, CA 92805 (714) 774-1010

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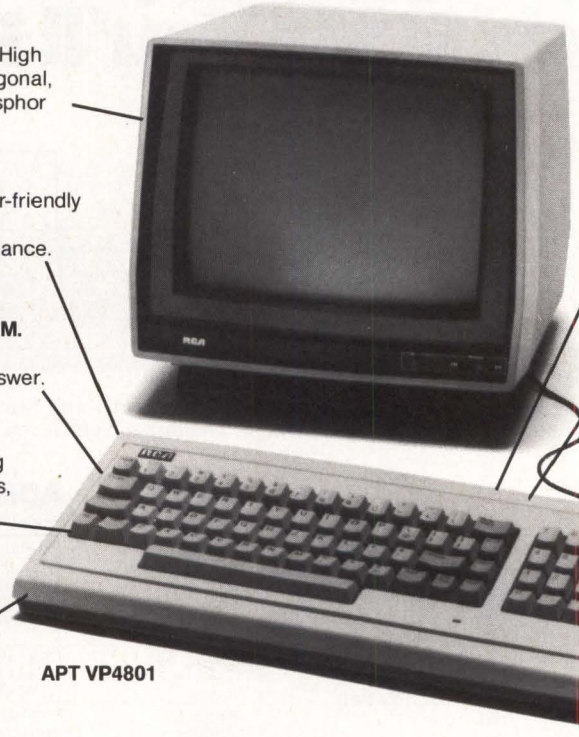
**CIRCLE NO. 89 ON INQUIRY CARD**

# You don't need a computer to talk to another computer.



**DISPLAY (VP3012D).** High performance, 12" diagonal, non-glare, green phosphor screen.

**RESIDENT MENUS.** User-friendly terminal set-up and phone directory maintenance.

**DIRECT CONNECT MODEM.** Built-in, 300 baud, originate/answer/auto answer.

**AUTO DIAL.** Tone or pulse dialing of up to 26 stored phone numbers, voice or data base calls.

**AUTO-LOG-ON.** Enters information automatically after auto dialing.

**VIDEO OUTPUT.** Selectable 80 or 40 characters x 24 lines on standard monitor.

**TV OUTPUT.** Displays 40 characters x 24 lines on Ch. 3/Ch. 4 of standard TV set.

**MEMORY BACKUP.** Minimum 48-hour storage of directory, log-on and other parameters without plug-in power. No batteries required.

**FUNCTION KEYS.** User programmable or downloadable from host computer.

**APT VP4801**

## The new RCA APT (All Purpose Terminal) expands your data communications capabilities for a lot less money.

For business, professional and personal data communications, you'll find more user-friendly features and greater communications capabilities in the RCA APT than in other terminals selling for up to three times the price.

The new APT terminals are ideally suited to multi-data base time sharing and dedicated, direct computer-connected applications. They feature menu-controlled operation and a programmable "personality" to match specific communications requirements for your data bases.

A single keypress can dial a stored number, send the log-on sequence on the host computer, and return terminal control to the user. Password protection prevents unauthorized access to designated numbers. APT can also be used as an auto-dialer for voice communications.

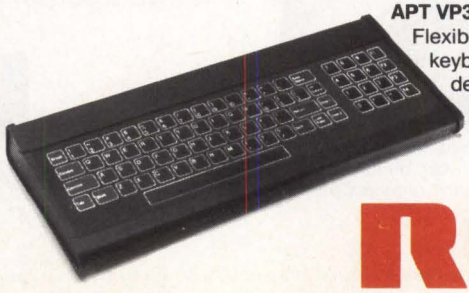
Quite simply, matching features with price, there is no other professional quality terminal available today that can do as much at such low cost.

APT terminals list for $498, in your choice of full stroke or membrane keyboard versions. Either style is also available with a display monitor for $697 list. The data display monitor alone, VP3012D, $199 list.

For more information—or to order—call 800-722-0094. In Penna., call 717-295-6922. Or write for fully descriptive brochure to RCA Data Communications Products, New Holland Avenue, Lancaster, PA 17604. OEM and dealer pricing available. The new RCA APT. Expansive. Not expensive.

**OTHER FEATURES**

**RS232C port for direct computer connections at data rates to 9600 baud, or for connecting high speed modems and other accessories. Parallel printer port for hard copy. Numeric keypad, can dial phone numbers not in terminal directory. Built-in speaker with adjustable volume control for audio monitoring of phone line. Smooth scroll display. Automatic screen blanking to reduce possibility of burn. Briefcase size: 17" x 7" x 2". Weight: under 4 lbs.**



**APT VP3801.** Flexible membrane keyboard version designed for travel and hostile environments.

RCA



CIRCLE NO. 90 ON INQUIRY CARD

## ALPHANUMERIC DISPLAY TERMINALS

| Company Model | Terminal type | Display (diagonal inches) | Screen format (col. x lines) | Interfaces (protocols) | Emulations | Prices ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|
| D211 | editing | 12-inch, green, amber | 80 x 24 | RS232C, RS422, current loop | | 1,195 | 13 foreign language versions, ANSI X 3.41/3.64 compatible |
| D410 | intelligent | 12-inch, green, amber | 135 x 24 | RS232C, RS422, current loop | | 1,635 | 13 foreign language versions, ANSI X 3.41/3.64 compatible |
| D460 | intelligent/ graphics | 12-inch, green, amber | 135 x 24 | RS232C, RS422, current loop | | 1,785 | 13 foreign language versions, ANSI X 3.41/3.64 compatible |
| **DATAMEDIA CORP.** | | | | | | | |
| Colorscan 10 | editing | 12-inch, 8-color | 132 x 24 | RS232C, CCITT V.24, opt. current loop (X-on/X-off) | DEC VT52, VT100 | 2,795 | 12 function keys, 1 page of memory, split screen, regional scroll, non-volatile set-up modes |
| Colorscan 30 | editing | 12-inch, 8-color | 132 x 24 | RS232C, CCITT V.24, opt. current loop | Lear Siegler ADM-3A, Hazeltine 1420, ADDS Regent 25 | 2,795 | 8 function keys, 1 page of memory, split screen, regional scroll, non-volatile set-up modes |
| Excel 90 | editing | 12-inch, b&w | 132 x 24 | RS232C, CCITT V.24, opt. current loop (X-on/X-off) | Lear Siegler ADM-3A, ADDS Regent 25 | 1,410 | 1 page of memory, split screen, regional scroll, non-volatile set-up modes, 5 simultaneous screen windows, English menu set-up; opt. green, amber, and 14-inch screen |
| Excel 60+ | intelligent | 12-inch, b&w | 132 x 24 | RS232C, CCITT V.24, opt. current loop (X-on/X-off) | DEC VT52, VT100, VT131, VT132 | 1,160 | 16 programmable function keys, split screen, regional scroll, non-volatile set-up modes; opt. green, amber and 14-inch screen |
| Excel 70 | intelligent | 12-inch, b&w | 132 x 24 | RS232C, CCITT V.24, opt. current loop | DG 6052, 6053, Dasher 100, 200 | 1,395 | 16 programmable function keys, split screen, regional scroll, non-volatile set-up modes; opt. green, amber, and 14-inch screen |
| Excel 10 | editing | 12-inch, b&w | 132 x 24 | RS232C, CCITT V.24, opt. current loop (X-on/X-off) | DEC VT100, VT52 | 1,410 | 4 function keys, 1 page of memory, split screen, regional scroll, non-volatile set-up modes; opt. green, amber, and 14-inch screen |
| Excel 20 | editing | 12-inch, b&w | 132 x 24 | RS232C, CCITT V.24, opt. current loop (X-on/X-off) | DEC VT100, VT52 | 1,120 | 4 function keys, 1 page of memory, split screen, regional scroll, non-volatile set-up modes; opt. green, amber and 14-inch screen |
| Excel 30 | editing | 12-inch, b&w | 132 x 24 | RS232C, CCITT V.24 | Hazeltine 1420, ADDS Regent 25, Lear Siegler ADM-3A | 1,215 | 1 page of memory, split screen, regional scroll, non-volatile set-up modes; opt. green, amber, and 14-inch screen |
| Excel 40+ | intelligent | 12-inch, b&w | 80 x 24 | RS232C, CCITT V.24 (X-on/X-off) | Lear Siegler ADM-31, TeleVideo 950 | 1,065 | 16 programmable function keys, 2 pages of memory, non-volatile set-up modes; opt. green, amber, and 14-inch screen |
| Colorscan 60 | editing | 12-inch, 8-color | 132 x 24 | RS232C, CCITT V.24, opt. current loop (X-on/X-off) | DEC VT52, VT100, VT131, VT132 | 2,995 | 12 function keys, 1 page of memory, split screen, regional scroll, insert/delete functions, non-volatile set-up modes |
| Colorscan 70 | dumb | 12-inch, 8-color | 132 x 24 | RS232C, CCITT V.24, opt. current loop | DG 6052, 6053, Dasher 100, 200 | 2,795 | 1 page of memory, split screen, regional scroll, non-volatile set-up modes |
| **DATAMAXX** | | | | | | | |
| Maxxima | intelligent | 12-, 14-inch, gray, green, amber | 80 x 24 | RS232C, TDI (IBM bisync, NCR polling) | Burroughs, Honeywell, IBM, NCR | 1,895 | 24 function keys, 10 pages of memory, split screen, IBM PC compatible (with upgrade) |
| **DATAPOINT CORP.** | | | | | | | |
| 8220 | editing | 12-inch, amber | 80 x 24 | RS232C | IBM 3741, 3770, 3780; Honeywell VIP; Burroughs RJE 6700, 7700 via multilink | 1,895 | 5 programmable function keys, subscreen mode |
| **DATASTREAM COMMUNICATIONS INC.** | | | | | | | |
| 178-02 | editing | 12-inch, green | 80 x 25 | RS232C (X-on/X-off) | DEC VT100, IBM 3178, 3278/2 via cluster controller | 975 | 24 programmable function keys, portable, printer; opt. amber monitor |
| **DTI INC.** | | | | | | | |
| 1510+ | editing/ graphics | 12-inch, b&w, green, amber | 80 x 24 | RS232C, current loop (X-on/X-off, DTR) | Hazeltine 1510+ | 995 | 2 pages of memory, business graphics, can combine 2 terminals into 1 via 2 operating systems |
| 6053 | editing/ graphics | 12-inch, b&w, green, amber | 80 x 24 | RS232C, current loop (X-on/X-off, DTR) | DG 6053 | 995 | 2 pages of memory, business graphics, can combine 2 terminals into 1 via 2 operating systems |

## ALPHANUMERIC DISPLAY TERMINALS

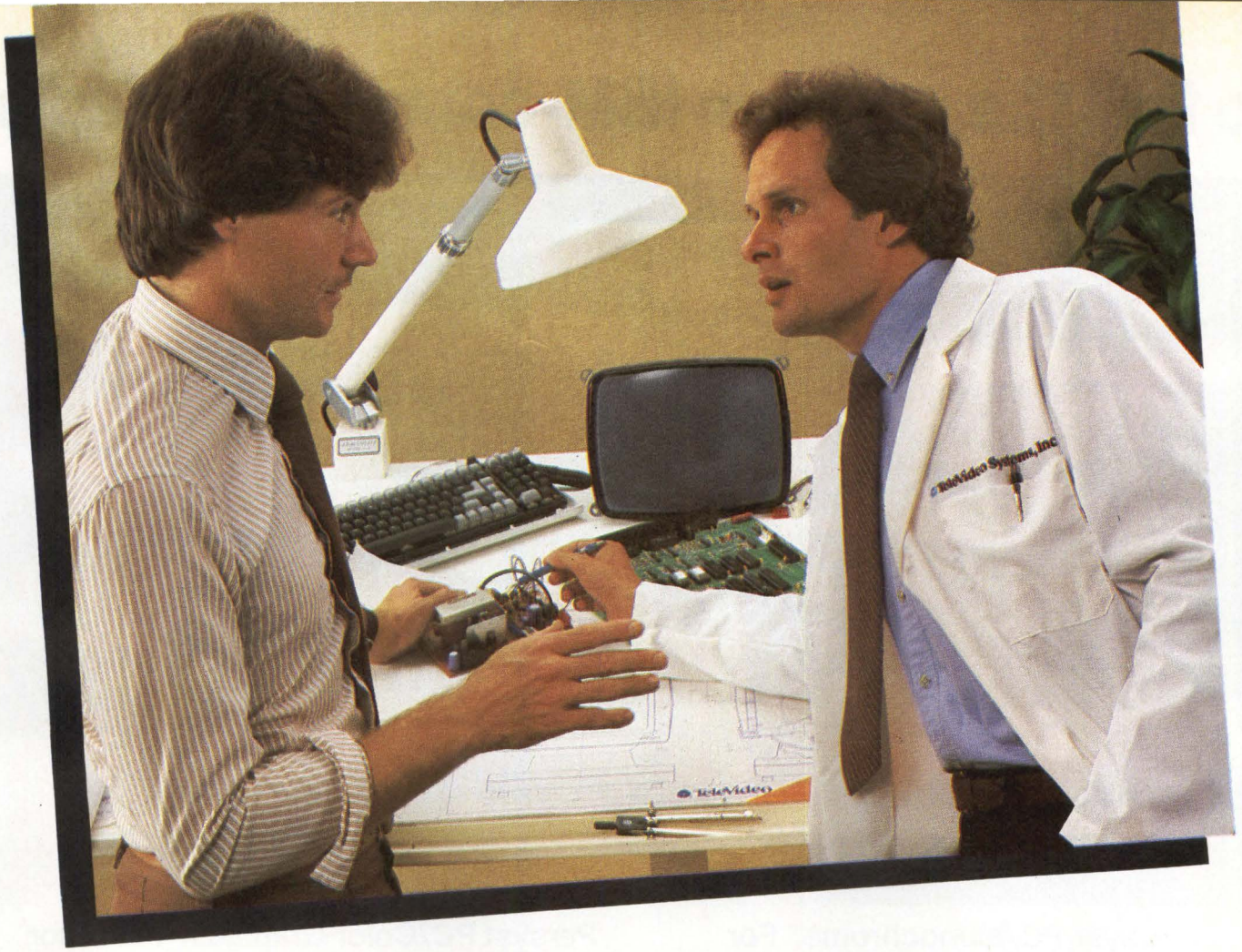
| Company Model | Terminal type | Display (diagonal inches) | Screen format (col. x lines) | Interfaces [protocols] | Emulations | Prices ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|
| Basic IV | editing/ graphics | 12-inch, b&w, green, amber | 80 x 24 | RS232C, current loop (X-on/X-off, DTR) | | 995 | 2 pages of memory, business graphics, can combine 2 terminals into 1 via 2 operating systems |
| DTI 200 | editing/ graphics | 12-inch, b&w, green, amber | 80 x 24 | RS232C, current loop (X-on/X-off, DTR) | Data General | 995 | 2 pages of memory, business graphics, can combine 2 terminals into 1 via 2 operating systems |
| E52 | editing/ graphics | 12-inch, b&w, green, amber | 80 x 24 | RS232C, current loop (X-on/X-off) | DEC VT52 | 995 | 2 pages of memory, business graphics, can combine 2 terminals into 1 via 2 operating systems |
| Editor | editing/ graphics | 12-inch, b&w, green, amber | 80 x 24 | RS232C, current loop (X-on/X-off, DTR) | DEC VT100 | 995 | business graphics, can combine 2 terminals into 1 via 2 operating systems |
| FALS 200 | editing/ graphics | 12-inch, b&w, green, amber | 80 x 24 | RS232C, current loop (X-on/X-off, DTR) | Lear Siegler | 995 | 2 pages of memory, business graphics, can combine 2 terminals into 1 via 2 operating systems |
| Genius | editing/ graphics | 12-inch, b&w, green, amber | 80 x 24 | RS232C, current loop (X-on/X-off, DTR) | Lear Siegler | 995 | 2 pages of memory, business graphics, can combine 2 terminals into 1 via 2 operating systems |
| Prism | editing/ graphics | 12-inch, b&w, green, amber | 80 x 24 | RS232C, DTR (X-on/X-off, DTR) | Microdata Prism | 995 | 2 pages of memory, business graphics, can combine 2 terminals into 1 via 2 operating systems |
| PT 80 | editing/ graphics | 12-inch, b&w, green, amber | 80 x 24 | RS232C, current loop (X-on/X-off, DTR) | DEC VT100 | 995 | business graphics, can combine 2 terminals into 1 via 2 operating systems |
| **DECISION DATA COMPUTER CORP.** | | | | | | | |
| 3751-11 | editing | 15-inch, green | 80 x 25 | IBM S/34, S/36, S/38 (SNA/SDLC) | IBM 5251-11, 5291-01, 5292 | 2,175 | |
| 3791-01 | editing | 12-inch, green | 80 x 25 | IBM S/34, S/36, S/38 (SNA/SDLC) | IBM 5251-11, 5291, 5292 | 1,810 | |
| **DENTRONIX SYSTEMS INC.** | | | | | | | |
| 200 | editing/ graphics | 12-inch, white, green, amber | 80 x 25 | RS232C, current loop | DG D200 | 1,250 | 15-inch screen available, 60 programmable function keys, 1 page of memory |
| 400 | intelligent | 12-inch, white, green, amber | 135 x 25 | RS232C, current loop | DG 400, 450 | 1,450 | 60 programmable function keys, 2 pages of memory |
| 209 | editing | 12-inch, white, green, amber | 80 x 25 | RS232C | DG D200 | 895 | 15-inch screen available, 60 programmable function keys, 1 page of memory |
| **DIGICO LTD.** | | | | | | | |
| Prince 3807 | intelligent/ graphics | 15-inch, b&w, green, amber | 80 x 25 | RS232C, RS422, current loop, Centronics (X-on/X-off, ETX/ACK) | IBM 3270, 3780, 2780; ICL C03, Honeywell VIP | | 32 programmable function keys, video output, 64K RAM, 64K ROM; opt. floppy or Winchester drives |
| **DIGITAL EQUIPMENT CORP.** | | | | | | | |
| VT100 | dumb/ graphics | 12-inch, b&w | 132 x 24 | RS232C | DEC VT52 | 1,945 | business graphics |
| VT101 | dumb/ graphics | 12-inch, b&w | 132 x 24 | RS232C | DEC VT52 | 1,350 | business graphics |
| VT102 | dumb | 12-inch, b&w | 132 x 24 | RS232C | DEC VT52 | 1,945 | printer port, advanced video option |
| VT125 | dumb/ graphics | 12-inch, b&w | 132 x 24 | RS232C | DEC VT52 | 3,800 | printer port, bit-mapped graphics |
| VT131 | editing | 12-inch, b&w | 132 x 24 | RS232C | | 1,985 | local editing with block transmission mode |
| RT100 | dumb | 12-inch, b&w | 132 x 24 | RS232C | DEC VT100 | 3,900 | ruggedized version of DEC VT100, membrane keyboard |
| RT102 | dumb | 12-inch, b&w | 132 x 24 | RS232C | DEC VT100 | 4,000 | ruggedized version of VT100, membrane keyboard |
| RT137 | dumb | 12-inch, b&w | 132 x 24 | RS232C | DEC VT100 | 5,300 | bar code reader, membrane keyboard |
| VT220 | editing | b&w | | RS232C | DEC VT100 | 1,295 | non-volatile set-up modes, French, German, English versions available |
| VT240 | graphics | b&w | | | DEC VT100, VT52 | 2,195 | bit mapped graphics; opt. color version $3,195 |
| **DIRECT INC.** | | | | | | | |
| 820 | intelligent/ graphics | 12-inch, b&w | 80 x 24 | RS232C (X-on/X-off, TTY, ENQ/ACK) | HP 2622 A, HP 2645 A | 1,395 | 8 programmable function keys, 4K display memory, split screen |

## ALPHANUMERIC DISPLAY TERMINALS

| Company Model | Terminal type | Display (diagonal inches) | Screen format (col. x lines) | Interfaces (protocols) | Emulations | Prices ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|
| 825 | intelligent/ graphics | 12-inch, b&w, green | 132 x 24 | two RS232C ports (X-on/X-off, TTY, ENQ/ACK) | HP 2622 A, HP 2645 A | 1,890 (16K) 2,290 (32K) | 8 programmable function keys, 16K display memory (with 32K option), split screen; opt. graphics, integral modem |
| 828 | intelligent/ graphics | 12-inch, b&w, green | 132 x 28 | RS232C (X-on/X-off, TTY, ENQ/ACK) | DEC VT131, VT52; HP 2622 A, 2645 A | 1,995 | 16 function keys, 32K display memory, printer port; opt. graphics, integral modem |
| 831 | intelligent/ graphics | 12-inch, b&w, green | 132 x 28 | RS232C (X-on/X-off, TTY, ENQ/ACK) | DEC VT131, VT52 | 1,395 | 16 function keys, 16K display memory, printer port; opt. graphics, integral modem |
| **ELECTRO MECHANICAL SYSTEMS INC.** | | | | | | | |
| TID | dumb | 12-inch, amber | 80 x 24 | RS232C | Lear Siegler ADM-3A | 1,400 | 32 graphics symbols, portable touch-activated display |
| **ERICSSON RADIO SYSTEMS AB** | | | | | | | |
| SRA-11 | editing | 15-inch, amber | 80 x 26 | TWINAX for IBM S/34, S/36, S/38 | IBM 5291 | | opt. printer |
| **ESPRIT SYSTEMS INC. (HAZELTINE TERMINALS DIVISION)** | | | | | | | |
| ESP 6310 | editing | 14-inch, green | 80 x 25 | RS232C, current loop (X-on/X-off, DTR) | TeleVideo 910+, 925; ADDS Viewpoint, Regent 25; Hazeltine 1500, Esprit II | 695 | 11 programmable function keys, 4 pages of memory, line graphics, 6 Int'l character sets |
| ESP 6110 | editing | 14-inch, green | 80 x 24 | RS232C (X-on/X-off) | ADDS Viewpoint, Regent 25; Lear Siegler ADM-3A, Esprit II | | non-volatile set-up mode, bidirectional auxiliary port, foreign character sets |
| ESPRIT I | editing | 12-inch, green | 80 x 24 | RS232C, current loop | Lear Siegler ADM-3A, Hazeltine 1500, ADDS Regent 25 | 595 | 1 page of memory, auxiliary bidirectional port, foreign character sets |
| ESPRIT II | editing | 12-inch, green | 80 x 24 | RS232C, current loop (X-on/X-off) | Hazeltine 1500, 1510; ADM-3A, ADDS Regent 25, Esprit I | 645 | 1 page of memory, foreign character sets, auxiliary bidirectional port, self-diagnostics |
| ESPRIT III | editing | 12-inch, green | 80 x 25 | RS232C, current loop (X-on/X-off, DTR) | TeleVideo 950 | 895 | 11 programmable function keys, split screen, 4 pages of memory, line graphics; opt. foreign character sets |
| ESPIRT III color | editing | 13-inch, green or 8-color | 80 x 25 | RS232C, current loop (X-on/X-off, DTR) | TeleVideo 950 | 995 | 11 programmable function keys, split screen, 4 pages of memory, line graphics; opt. foreign character sets |
| Executive 10 | editing | 12-inch, green | 80 x 25 | RS232C, current loop (X-on/X-off) | Hazeltine 1500 | 1,195 | 8 programmable function keys, split screen, line graphics, self-diagnostics, foreign character sets |
| Executive 10/25 | editing | 12-inch, green | 132 x 25 | RS232C, current loop (X-on/X-off) | Executive 80, 20E | 1,045 | 16 programmable function keys, line graphics, non-volatile set-up mode, foreign character sets |
| Executive 10/102 | editing | 14-inch, green | 132 x 25 | RS232C, current loop (X-on/X-off) | DEC VT100, VT131 | 995 | 4 function keys, printer buffer, line & bit-mapped graphics; opt. advanced graphics, foreign character sets |
| Executive 10/51 | editing | 12-inch, green | 80 x 25 | RS232C, current loop (X-on/X-off) | IBM 5251 via protocol converter | 1,150 | 12 programmable keys, graphics symbols, printer buffer, split screen; opt. foreign character sets |
| Executive 10/78 | editing | 12-inch, green | 80 x 25 | RS232C, current loop (X-on/X-off) | IBM 3278 via protocol converter | 1,095 | 12 programmable keys, graphics symbols, printer buffer, non-volatile set-up modes, split screen |
| **FALCO DATA PRODUCTS** | | | | | | | |
| Fame 100 | editing | 12-inch, green | 132 x 24 | RS232C; opt. RS422, current loop (X-on/X-off) | DEC VT100, VT52; opt. Tektronix 4010, 4014 | 1,195 | 18 programmable function keys, 16K display memory; opt. 14-inch amber display |
| Fame 2 | editing/ graphics | 12-inch, green | 132 x 24 | RS232C; opt. RS422, current loop (X-on/X-off) | DEC VT100, VT52; Lear Siegler ADM-31 | 795 | 22 function keys, split screen; opt. 14-inch amber display |
| Fame 3 | editing | 12-inch, green | 80 x 24 | RS232C (X-on/X-off) | | 640 | 12 function keys; opt. 14-inch amber display |
| Fame 78 | dumb | 12-inch, green | 132 x 24 | RS232C; opt. RS422, current loop (X-on/X-off) | Beehive DM78 | 995 | opt. 14-inch amber display |

# ALPHANUMERIC DISPLAY TERMINALS

| Company Model | Terminal type | Display (diagonal inches) | Screen format (col. x lines) | Interfaces (protocols) | Emulations | Prices ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|
| **GENERAL DIGITAL CORP.** | | | | | | | |
| VuePoint | intelligent | 10-inch, orange | 40 x 12 | RS232C | | 2,500 (Q100) | 20 x 12 touch screen matrix, 48 page memory, printer port, rack-mount |
| VuePoint II | intelligent/ portable | 10-inch, orange | 40 x 12 | RS232C, RS422, RS423, RS449, RS485, current loop | | 1,800 (Q100) | 20 x 12 touch screen matrix, 48 page memory, portable printer port, rack-mount |
| **GENERAL TERMINAL** | | | | | | | |
| SW-10 | intelligent | 12-inch, green | 80 x 25 | RS232C, current loop (X-on/X-off) | DEC VT100 | 1,110 | 8 function keys; opt. white screen, 11 Int'l keyboards |
| SW-80 | editing | 12-inch, white, green, amber | 80 x 25 | RS232C, current loop (X-on/X-off) | | 1,350 | 24 function keys, 4 pages of memory per 1K or RAM; opt. 17K RAM, plug-in graphics capability |
| **GRAPHON** | | | | | | | |
| GO-100 | editing | 12-inch, green | 132 x 25 | RS232C (X-on/X-off, DTR) | DEC VT100 | 1,095 | 16 programmable function keys, 1 page of memory, split screen |
| **HARRIS CORP. COMPUTER SYSTEMS DIVISION** | | | | | | | |
| Harris 8675 | editing | 12-inch, green | 80 x 24 | RS232C | | 1,195 (Q1) 1,004 (Q100) | 6 function keys, self-diagnostics |
| Harris 8685 | intelligent | 12-inch, green | 80 x 25 | RS232C, RS422 | | 1,950 (Q1) 1,638 (Q100) | 20 programmable function keys, line graphics, 11 graphics symbols, self-diagnostics |
| Harris 8686 | intelligent | 12-inch, green | 80 x 25 | RS232C, RS422 | | 1,950 | 20 programmable function keys, self-diagnostics, printer port |
| **HEWLETT PACKARD CO.** | | | | | | | |
| 2625A | editing/ graphics | 12-inch, green, amber, white | 80 x 24 | RS232C, RS422, current loop (X-on/X-off) | Tektronix 4014, IBM 3276, 3278 models 2, 3, 4 | 3,495 | 6 pages of memory, 11 languages, opt. built-in printer |
| 2628A | editing/ graphics | 12-inch, green, amber, white | 80 x 24 | RS232C, RS422, current loop (X-on/X-off, bisync) | Tektronix 4014 | 3,195 | 6 pages of memory, 11 languages |
| **HMW DATA SYSTEM GMBH** | | | | | | | |
| 1000 | intelligent | 14-inch, 27-color | 80 x 48 | RS232C, current loop, Centronics (X-on/X-off) | DEC VT100 | | 25 pages of memory, video output, rack-mount, diagnostics; 19-inch screen available |
| 4000 | editing/ graphics | 14-inch, 27-color | 80 x 48 | RS232C, current loop, 16-bit parallel | | | 32 function keys, 3 pages of memory, rack-mount, video output; 19-inch screen available |
| **HONEYWELL INFORMATION SYSTEMS** | | | | | | | |
| VIP7201 | editing/ graphics | 12-inch, green | 80 x 24 | RS232C, RS422A (X-on/X-off) | | | line drawing and mosaic graphics, portable, aux. RS232/422A port |
| VIP7305 series | | 12-inch, green | 80 x 24 | RS232C, RS422, current loop | | | 12 function keys, compatible with VIP7301-3-7 Series |
| VIP7813/23 | dumb | 12-inch, green | 80 x 24 | RS232C, RS422 | | | VIP7801, 7803, compatible |
| VIP7814 | editing | 12-inch, green | 80 x 25 | RS232C (Honeywell VIP pole/select) | | | buffered printer adapter, line graphics |
| VIP7307 | dumb | 12-inch, green | | RS232C, RS422, current loop MIL-STD 188-C | | | |
| VIP7303 series | editing | 12-inch, green | 80 x 24 | RS232C, RS422, current loop MIL STD 188-C | | | interfaces vary with each model |
| VIP7301 series | editing | 12-inch, green | 80 x 25 | RS232C, RS422, MIL-STD 188-C, current loop | | | 12 function keys, vertical and horizontal graphics, interfaces differ with model |
| **HUMAN DESIGN SYSTEMS INC.** | | | | | | | |
| CONCEPT AVT+ | intelligent/ graphics | 12-inch, amber | 132 x 25 | RS232C, opt. current loop (X-on/X-off, CTS/RTS) | DEC VT100, VT52 | 1,295 | programmable keys, 8 pages of memory (4 standard, 4 opt.), VT100 special and concept block graphics, self-test, multiple host configuration, multiple windows; opt. video output |
| CONCEPT AVT-APL+ | intelligent/ graphics | 12-inch, amber | 132 x 25 | RS232C, opt. current loop (X-on/X-off, CTS/RTS) | DEC VT100, VT52 | 1,495 | 43 programmable function keys, 8 pages of memory (4 standard, 4 opt.), multiple host configuration, non-volatile set-up modes; opt. video output |

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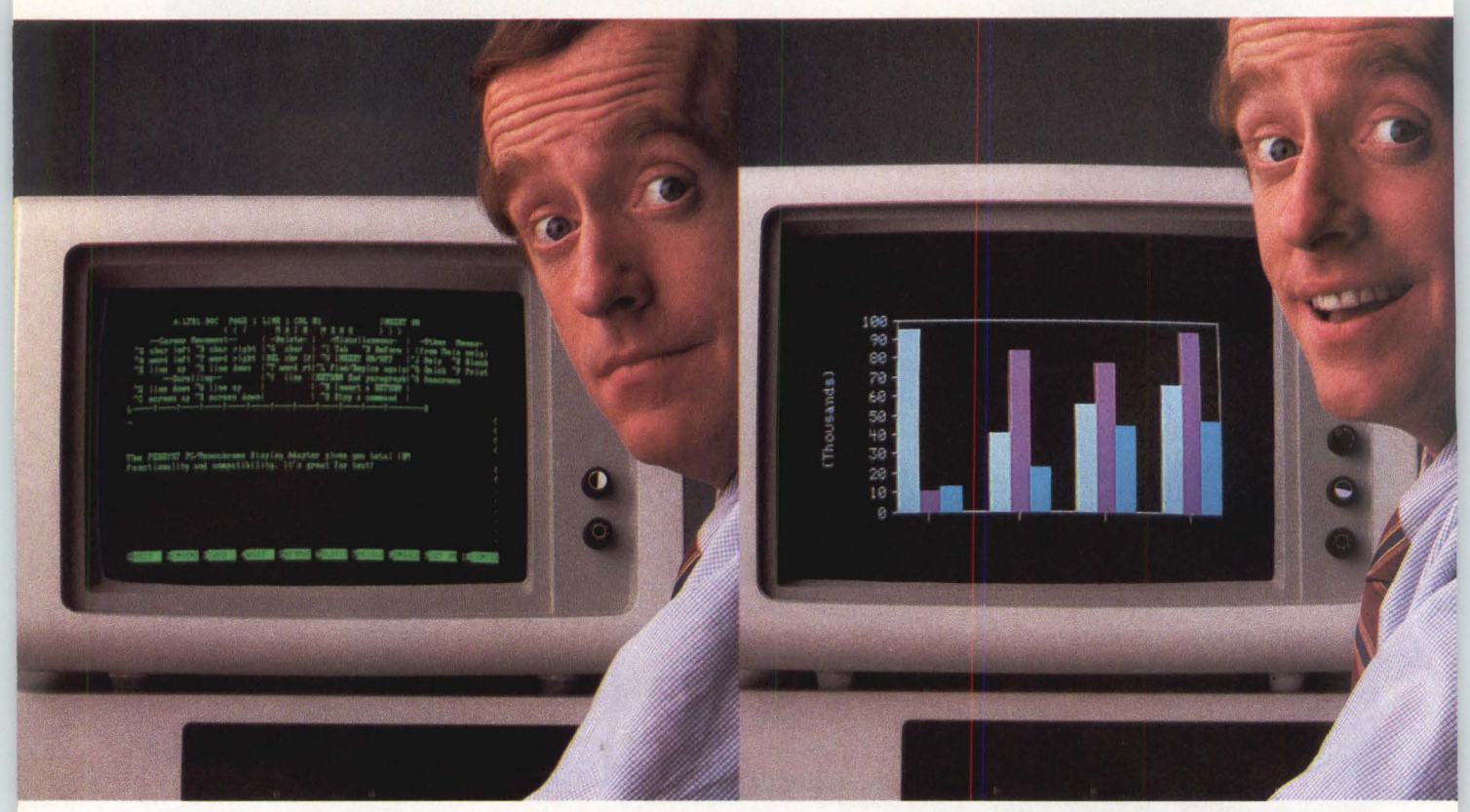


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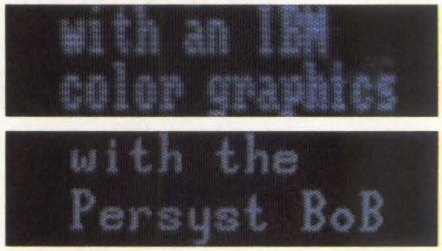


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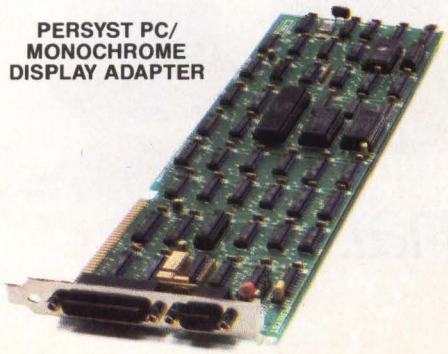

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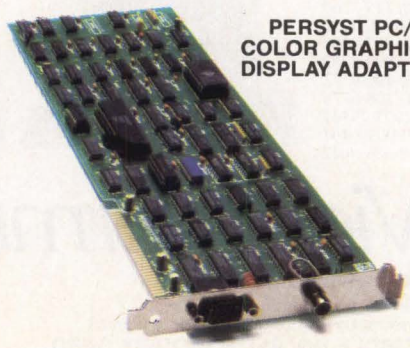
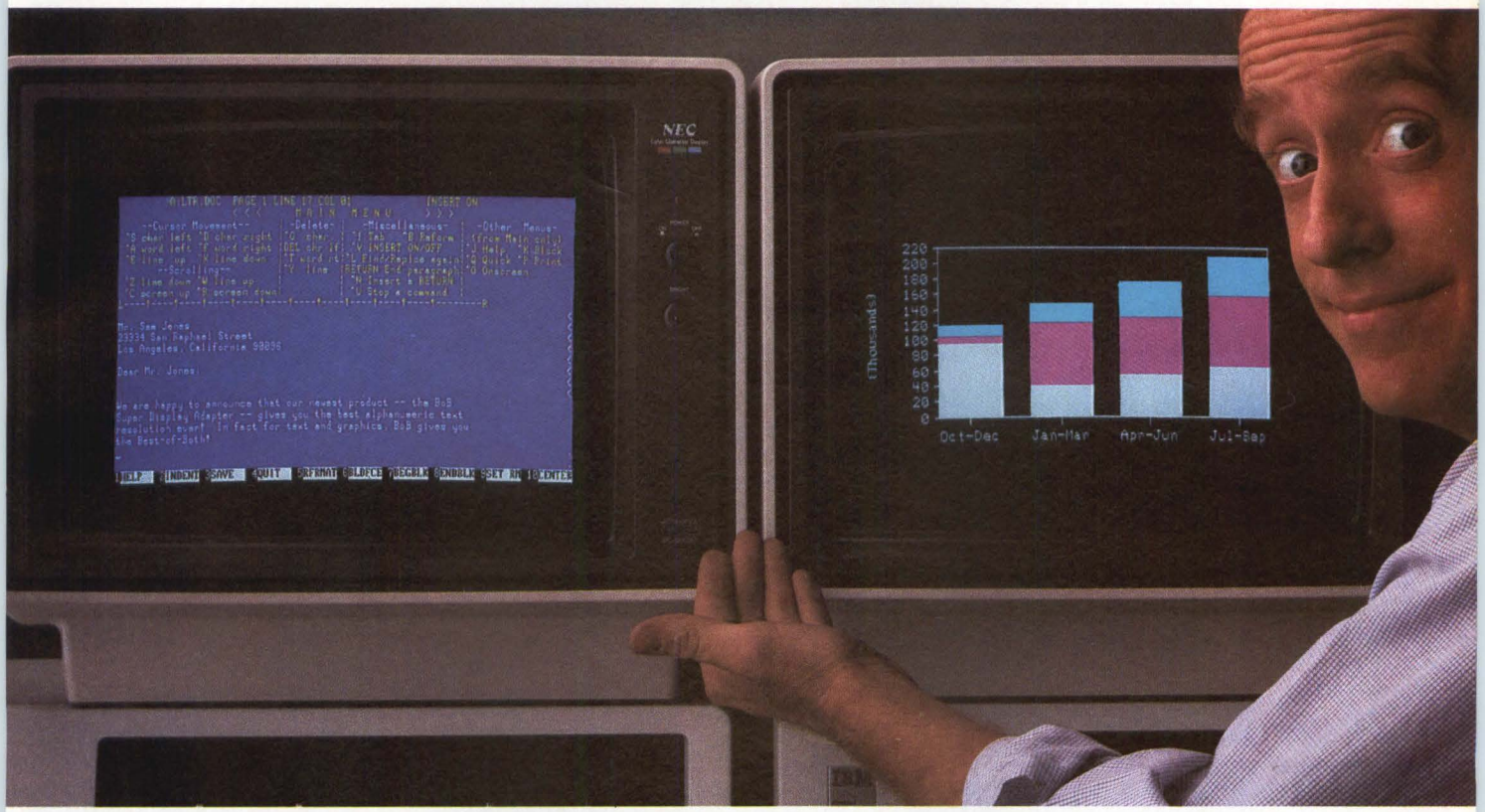


# ıdapters, you have to look beyond IBM.

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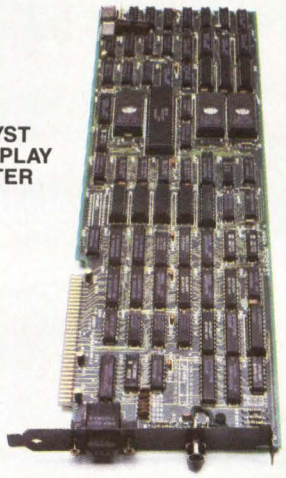

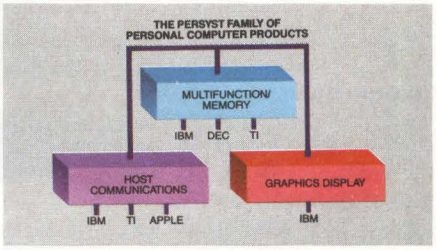


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CIRCLE NO. 92 ON INQUIRY CARD

## ALPHANUMERIC DISPLAY TERMINALS

| Company Model | Terminal type | Display (diagonal inches) | Screen format (col. x lines) | Interfaces (protocols) | Emulations | Prices ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|
| CONCEPT 108 | intelligent | 12-inch, white | 132 x 25 | RS232C, opt. current loop (X-on/X-off, CTS/RTS) | DEC VT52, Tektronix 4010 | 1,395 | 8 programmable function keys, 8 pages of memory (4 standard, 4 opt.), self-test, non-volatile memory, line graphics; opt. 11 additional function keys, block and vector graphics, video output, green or amber screen |
| CONCEPT APL8 | intelligent | 12-inch, white | 132 x 25 | RS232C, opt. current loop (X-on/X-off, CTS/RTS) | DEC VT52, Tektronix 4010, 4013 | 1,595 | 8 programmable function keys, 8 pages of memory (4 standard, 4 opt.), non-volatile memory; opt. 11 additional function keys, vector and block graphics, green or amber screen |
| **ICOT** | | | | | | | |
| 700 | dumb | 12-inch, green | 80 x 25 | RS232C, current loop (X-on/X-off) | DEC VT100 | 1,095 | IBM/Univac host-compatible via ICOT controller, calculator mode, 14-inch screen available |
| 701 | dumb | 12-inch, green | | RS232C, current loop PROS | | 1,750 | calculator mode, 14-inch screen available |
| 757, 767, 768 | editing | 12-inch, green | 132 x 43 | RS232C, RS422 PARS | IBM PC | 1,750 | |
| **ID SYSTEMS CORP.** | | | | | | | |
| ID-200 ALPHA | intelligent | 14-inch, 8-color | 132 x 24 | RS232C, current loop, TTL levels (X-on/X-off, CTS) | DEC VT100, enhanced VT100; opt. DEC VT132 | 2,650 | 4 function keys, character graphics, non-volatile set-up modes; opt. 19-inch, 16-color screen |
| ID-100 ALPHA | editing | 12-inch, 8-color | 132 x 24 | RS232C, current loop, RS170, TTL levels (X-on/X-off, CTS) | DEC VT100 | 3,895 | 4 function keys, character graphics, non-volatile set-up modes |
| **IMS INTERNATIONAL** | | | | | | | |
| Ultima 2 | intelligent | 12-inch, green | 80 x 25 | RS232C, RS422, Centronics (X-on/X-off, DTR/CTS) | TeleVideo 950, 925, 920, DEC VT52 | 975 | 72 programmable function keys, business graphics, 256 graphics symbols, 2 pages of memory |
| **INTECOLOR** | | | | | | | |
| 2405 | editing/ graphics | 13-inch, 8-color | 80 x 24 | RS232C, opt. current loop | DEC VT100 | 1,295 (Q1) 995 (Q100) | 12 programmable function keys |
| E8001 | editing | 19-inch, 8-color | 80 x 48 | RS232C, opt. current loop | | 2,395 (Q1) 1,795 (Q100) | |
| **ITT TERMINALS** | | | | | | | |
| 2700-13, -14, -15, -16 | editing | 15-inch, monochrome | 132 x 27 | RS232C (bisync, SNA/SDLC) | IBM 3178-2 | 2,400–3,200 | 24 programmable function keys, light pen, magnetic card reader |
| 1700-21, 22 | editing | 12-inch, green | 80 x 25 | RS232C (bisync, SNA/SDLC) | IBM 3178 | 1,450 | 24 programmable function keys, detachable numeric keypad |
| 2790 4A | editing | 14-inch, 7-color | 80 x 43 | RS232C (bisync, SNA/SDLC) | IBM 3279-S2A | 3,350 | 24 programmable function keys |
| 2790-3A | editing | 14-inch, 7-color | 80 x 43 | RS232C (bisync, SNA/SDLC) | IBM 3279-S2A | 3,200 | 24 programmable function keys |
| 2790-2A | editing | 14-inch, 7-color | 80 x 32 | RS232C (bisync, SNA/SDLC) | IBM 3279-S2A | 3,100 | 24 programmable function keys |
| **KIMTRON CORP.** | | | | | | | |
| KT-7 | intelligent | 12-inch, green, amber | 80 x 25 | RS232C (X-on/X-off, DTR) | TeleVideo 920, 925, 950; DG D100, 200; DEC VT100 | 595 | 20 programmable function keys, line graphics, 3 Int'l character sets, 20 special & math symbols |
| **LANPAR TECHNOLOGIES INC.** | | | | | | | |
| Vision 830 | editing | 12-inch, green | 132 x 25 | | Burroughs TD830 | | 6 function keys, 4 pages of memory, opt. amber screen |
| Vision 1000 | editing | 12-inch, green | 132 x 25 | RS232C, opt. current loop (X-on/X-off) | DEC VT100, VT52 | 995 | 4 function keys, 2 pages of memory (in 80 column mode), opt. Plot 10 graphics $695 |
| Vision 2000+ | editing | 12-inch, green | 132 x 26 | RS232C, opt. current loop (X-on/X-off) | DEC VT100 | 1,295 | 16 function keys, split screen, non-volatile setup modes, opt. 15-inch screen, auxiliary port |

## ALPHANUMERIC DISPLAY TERMINALS

| Company Model | Terminal type | Display (diagonal inches) | Screen format (col. x lines) | Interfaces (protocols) | Emulations | Prices ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|
| **LEAR SIEGLER INC./DATA PRODUCTS DIV.** | | | | | | | |
| ADM-3A | dumb | 12-inch, green, b&w, amber | 80 x 24 | RS232C, opt. current loop | | 695 | |
| ADM-5 | dumb | 12-inch, green, b&w, amber | 80 x 24 | RS232C, opt. current loop | Lear Siegler ADM-3A | 745 | |
| ADM-11 | editing/ graphics | 12-inch, green, amber | 80 x 24 | RS232C, opt. current loop, RS422 (X-on/X-off, DTR) | Lear Siegler ADM-3A, 5; ADDS Viewpoint, Regent 25; Hazeltine 1400, 1420, 1500; DEC VT52 | 695 | mosaic graphics, opt. 14-inch screen, 8 Int'l character sets |
| ADM-12 | editing/ graphics | 12-inch, green, amber | 80 x 24 | RS232C, opt. current loop, RS422 (X-on/X-off, DTR) | ADM-3A, -5, -31, -32 | 895 | mosaic graphics, 8 Int'l character sets, opt. 14-inch screen |
| ADM-22 | editing | 12-inch, green | 80 x 24 | RS232C, current loop (X-on/X-off) | Hazeltine 1500, ADDS Regent 25, Lear Siegler ADM-3A | 695 | 7 function keys, mosaic graphics, serial printer port, non-volatile setup mode |
| ADM-23 | editing/ graphics | 12-inch, green, white | 80 x 24 | RS232C; opt. current loop (X-on/X-off, DTR) | | 695 | 2 pages of memory, 2K-byte input buffer, mosaic graphics |
| ADM-24 | intelligent/ graphics | 12-inch, green, amber | 80 x 24 | RS232C, opt. current loop, RS422 (X-on/X-off, DTR) | | 1,195 | 16 programmable function keys, mosaic graphics, 8 Int'l character sets, split screen |
| ADM-24E | intelligent | 12-inch, green, amber | 80 x 24 | RS232C, opt. current loop, RS422 (X-on/X-off, DTR) | | 1,250 | 32 program function keys, 8 Int'l character sets, 22K-bytes display memory; opt. 14-inch screen |
| ADM-32 | editing | 12-inch, green, white | 80 x 25 | RS232C, opt. current loop, Burroughs (X-on/X-off, DTR) | Lear Siegler ADM-1 | 1,295 | 2 pages of memory; opt. line graphics, serial printer port, extension port, integral modem |
| ADM-42 | editing | 15-inch, white | 80 x 24 | RS232C, opt. current loop, Burroughs interface | | 2,195 | 32 program function keys, 8 pages of memory, serial printer port, polling; opt. green screen, line graphics |
| **LEE DATA CORP.** | | | | | | | |
| 1216 | dumb | 14-inch, green | 80 x 24 | opt. Centronics (bisync, X-on/X-off) | IBM 3178 | | self-diagnostics; opt. printer |
| 1230 | dumb | 15-inch, 4-color | 80 x 24 | opt. Centronics (bisync, X-on/X-off) | IBM 3279 | | self-diagnostics; opt. printer |
| 1218 | dumb | 15-inch, green | 80 x 24 | opt. Centronics (bisync, X-on/X-off) | IBM 3278-2; DEC VT52, VT100, VT132, HP 2624 | | self-diagnostics; opt. printer |
| 1220 | editing | 15-inch, green | 132 x 43 | opt. Centronics (bisync, X-on/X-off) | IBM 3278-2, 3, 4, 5; DEC VT52, VT100/VT132, HP 2624 | | self-diagnostics; opt. printer, 12 keyboard styles |
| **LEENSHIRE** | | | | | | | |
| VCT 6930 | editing/ graphics | 14-inch, color | 80 x 24 | two RS232C (X-on/X-off, RTS) | | | opt. graphics, 20 mA loop interface, Winchester disk drive, integral modem |
| **LIBERTY ELECTRONICS USA** | | | | | | | |
| Freedom 100 | editing/ graphics | 12-inch, green | 80 x 25 | RS232C, current loop (X-on/X-off, DTR) | TeleVideo 910, Lear Siegler ADM-3A/5, ADDS Regent 25, Hazeltine 1420 | 495 | 10 function keys, character graphics, auxiliary buffered RS232 port, Int'l character sets |
| Freedom 110 | editing/ graphics | 12-inch, green | 80 x 25 | RS232C, current loop (X-on/X-off, DTR) | TeleVideo 910, Lear Siegler ADM-3A/5, ADDS Regent 25, Hazeltine 1420 | 545 | 10 programmable function keys, non-volatile set-up modes |
| Freedom 200 | editing/ graphics | 12-inch, green | 80 x 25 | RS232C (X-on/X-off, DTR) | Lear Siegler ADM-31, TeleVideo 950 | 745 | 10 programmable function keys, 2 pages of memory, block graphics, Int'l character sets |
| **MATROX ELECTRONIC SYSTEMS LTD.** | | | | | | | |
| CTM-300 | intelligent | 12-inch, 8-color | 132 x 50 | RS232C (X-on/X-off) | DEC VT100 | 3,240 | 2K RAM, 32 graphics characters, TTL and analog RGB video output |
| CTM-300R | intelligent | 12-inch, 8-color | 132 x 50 | RS232C (X-on/X-off) | DEC VT100 | 1,260 | 32 graphics characters, rack mount, 2K-byte RAM, TTL and analog RGB video output |
| **MDS TRIVEX** | | | | | | | |
| 8078-2 | editing | 15-inch | 132 x 24 | | IBM 3278-2 | 1,500 | opt. light pen |
| 8078-3 | editing | 15-inch | 132 x 32 | | IBM 3278-3 | 1,600 | opt. light pen |
| 8078-4 | editing | 15-inch | 132 x 32 | | IBM 3278-4 | 1,600 | opt. light pen |

## ALPHANUMERIC DISPLAY TERMINALS

| Company Model | Terminal type | Display (diagonal inches) | Screen format (col. x lines) | Interfaces (protocols) | Emulations | Prices ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|
| 8078-5 | editing | 15-inch | 132 x 27 | | IBM 3278 | 2,350 | switch-selectable graphics; opt. light pen |
| **MEGADATA CORP.** | | | | | | | |
| 8150 | intelligent | 15-inch, b&w, green, amber, red | 80 x 25 | RS232C, IEEE 488, parallel | | 2,420 (Q100) | as many as 100 function keys, split screen, line drawing graphics, self-diagnostics |
| 8188-1 | intelligent | 15-inch, b&w, green, amber, red | 80 x 25 | RS232C, RS422 | | 2,550 (Q100) | as many as 100 programmable function keys, 256 K-byte RAM, line drawing graphics |
| 8188-2 | intelligent | 15-inch, b&w, green, amber, red | 132 x 29 | RS232C | | 2,850 (Q100) | 16 programmable function keys, 32K-byte text memory, line drawing, graphics |
| 8188-3 | intelligent | 15-inch, b&w, green, amber, red | 80 x 25 | RS232C (bisync) | Sperry UTS 40, 400; IBM 3271, 3275, 3277 | 2,950 (Q100) | as many as 90 programmable function keys, line drawing graphics |
| 8188-4 | intelligent | 15-inch, b&w, green, amber, red | 132 x 24 | RS232C, RS423 | | 2,750 (Q100) | as many as 84 function keys, horiz./vert. split screen, 128K-byte text buffer |
| 8188-5 | intelligent | 15-inch, b&w, green, amber, red | 80 x 25 | RS232C, RS422 | | 2,800 (Q100) | |
| 8188-6 | intelligent | 15-inch, b&w, green, amber, red | 135 x 28 | RS232C, RS422 | DG 410, 460 | 2,700 (Q100) | 16 programmable function keys; opt. touch screen |
| **MEMOREX CORP.** | | | | | | | |
| 2051 | dumb | monochrome | 80 x 24 | | IBM 5251 | | |
| 2078 | dumb | 15-inch, monochrome | 132 x 27 | RS232C (SNA/SDLC, bisync) | IBM 3278 | 1,840 | opt. program symbols, APL text and other character sets |
| **MICRODATA CORP.** | | | | | | | |
| Prism IV | editing | 12-inch, green & black | 80 x 25 | RS232C | | 1,495 | 8 function keys, dual I/O speeds, printer interface |
| **MICRO DISPLAY SYSTEMS INC.** | | | | | | | |
| 202 | editing | 15-inch, green, amber, b&w, white | 80 x 57 | RS232C | | 2,195 | 10 programmable function keys, 3 Int'l character sets |
| 212 | editing | 15-inch, green, amber, b&w, white | 80 x 57 | RS232C | DEC VT100 | 2,195 | 4 programmable function keys, 3 Int'l character sets |
| **MICRO PRODUCTS CO.** | | | | | | | |
| MPC 1100 | intelligent | 14-inch, green, amber, b&w | 132 x 25 | RS232C, opt. current loop | Perkin Elmer 1251 | 1,495 | 32 programmable function keys, 8 pages of memory; opt. Int'l character sets |
| MPC 1200 | intelligent | 14-inch, green, b&w, amber | 132 x 25 | RS232C, opt. current loop | DEC VT131, VT132 | 1,695 | 24 programmable function keys, 6 pages of memory, split screen, self-diagnostics, opt. bit-mapped graphics |
| MPC 2100 | intelligent/ graphics | 14-inch, 8-color | 80 x 48 | RS232C, opt. current loop | ISC 8301G | 2,995 | 12 programmable function keys, 8 pages of memory, split screen, self-test diagnostics |
| **MICRO-TERM INC.** | | | | | | | |
| ERGO-201 | intelligent | 12-inch, green, amber | 80 x 25 | RS232C, current loop (X-on/X-off, DTR) | DEC VT52, Lear Siegler ADM-3A, Hazeltine, ADDS, TeleVideo 925, Micro-Term Act-5A | 795 | 32 programmable function keys, 2 pages of memory, split screen, opt. Plot 10, Regis graphics |
| Mime-2A | editing | 12-inch, b&w, green | 80 x 24 | RS232C, current loop (X-on/X-off, DTR) | DEC VT52, Hazeltine 1500 | 1,045 | |
| Act-5A | editing | 12-inch, b&w, green | 80 x 24 | RS232C, current loop (X-on/X-off, DTR) | | 995 | split screen, 8 function keys |
| Mime-340 | editing | 12-inch, green | 80 x 24 | RS232C, current loop (X-on/X-off, DTR) | DEC VT52, Hazeltine 1410, Lear Siegler ADM-3A | 750 | |
| Twist | intelligent | 15-inch, b&w, green, amber | 80 x 72 | RS232C, current loop (X-on/X-off, DTR) | DEC VT52 | 1,895 | 30 programmable function keys, non-volatile setup modes |
| ERGO-301 | intelligent | 12-inch, green, amber | 132 x 25 | RS232C, current loop (X-on/X-off, DTR) | DEC VT52, VT100 | 895 | 8 programmable function keys, 2 pages of memory, split screen, video output; opt. Plot 10, Regis graphics |
| ERGO-4000 | editing | 15-inch, green | 80 x 66 | RS232C, current loop | DEC VT52, Lear Siegler ADM-3A | 1,195 | 30 programmable function keys, non-volatile setup modes |

## ALPHANUMERIC DISPLAY TERMINALS

| Company Model | Terminal type | Display (diagonal inches) | Screen format (col. x lines) | Interfaces (protocols) | Emulations | Prices ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|
| **MILTOPE CORP.** | | | | | | | |
| MIL-Term-280 | editing | 9-inch, neon orange | 80 x 25 | RS232C, MIL-STD-188C, 8-bit parallel, RS422 | DEC VT100 | 15,800 | 16 function keys, plasma panel, split screen; opt. dot/line graphics |
| TER-100 | editing | neon orange | 80 x 25 | RS232C, MIL-STD-188C, RS422 | DEC VT100 | 27,000 | 16 function keys, plasma panel; opt. dot/line graphics, modem |
| **MOTOROLA INC.** | | | | | | | |
| Exoterm 155A | intelligent | 12-inch, b&w | 80 x 24 | RS232C | | 2,590 | 12 programmable function keys, split screen, for use with Motorola EXORciser, EXORmacs, MDS-400, VMC68/2 |
| **NCR CORP.** | | | | | | | |
| 7900-1 | dumb | 12-inch, amber | 80 x 24 | RS232C | NCR-1 | 1,500 | buffered serial printer port |
| 7901 | dumb | 12-inch, green | 80 x 24 | RS232C | NCR-1 | 850 | |
| 7910 | editing | 15-inch, amber | 132 x 25 | RS232C | NCR-1, NCR-4 | 1,995 | 20 programmable function keys, 4 pages of memory, split screen, buffered serial and parallel interfaces |
| **NORTHERN TELECOM INC.** | | | | | | | |
| Displayphone | intelligent | 7-inch, b&w | 80 x 25 | RS232C, Centronics (X-on/X-off, bisync) | IBM 3101, DEC VT52 | 1,295 | internal modem, handset, terminal is a telephone |
| **NOVATION** | | | | | | | |
| Infone Executive | editing/ portable | b&w | 40 x 1 | RS232C | | 945 | LCD, 2K-bytes RAM, integral modems, audio package, serial port |
| Infone Maxi | editing/ portable | b&w | 40 x 1 | RS232C | | 1,150 | LCD, 6K-bytes RAM, integral modems, acoustic adapter, serial port, programmable directory |
| **ONYX SYSTEMS INC.** | | | | | | | |
| The Onyx Terminal | intelligent | 14-inch, green | 80 x 24 | RS232C (X-on/X-off) | DEC VT52, VT100 | 895 | 28 function keys, 3 keypads, serial printer port |
| **PARADYNE CORP.** | | | | | | | |
| PDS 270 | intelligent | 15-inch, green | 80 x 25 | RS232C, CCITT V.24, current loop (SDLC) | IBM 3270 | 3,000 | programmable function keys, opt. light pen |
| **PDS TECHNOLOGIES INC.** | | | | | | | |
| 1150 | editing | 15-inch, green | 80 x 24 | RS232C, RS422, current loop, IEEE 488 | DEC VT100, VT52; Lear Siegler ADM-3A | 3,300 | ruggedized for industrial environments |
| **PERIPHERAL TECHNOLOGY INC.** | | | | | | | |
| SCAT 10 | intelligent | 14-inch, green | 80 x 25 | RS232C, RS422 (3270 bisync/SNA) | IBM 3278-2 | 1,295 | printer port |
| **PERRY DATA SYSTEMS INC.** | | | | | | | |
| 9200 | dumb | 9-inch, green | 80 x 24 | RS232C, RS422 | Lear Siegler ADM-3A | 1,525 | |
| 9310 | dumb | 12-inch, green | 80 x 24 | RS232C, RS422 | HP-3000, ADDS Regent 25 | 3,500 | internal 80-column printer, auxiliary RS232C port |
| 9370 | dumb | 9-inch, green | 80 x 24 | RS232C, RS422 | IBM 3101 | 4,500 | internal 40 column printer; opt. auxiliary RS232C port |
| 9460 | dumb | 12-inch, green | 80 x 24 | RS232C, RS422 | ADDS Regent 25, IBM 3101, DG D200, Datapoint 8200 | 3,500 | internal 40 column printer; opt. auxiliary RS232C port |
| **PHAZE INFORMATION MACHINES CORP.** | | | | | | | |
| P3278 | editing | 12-inch, green | 80 x 25 | Centronics, IBM 3274, 3276 | IBM 3278-2 | 1,545 | 24 function keys, choice of keyboards; opt. light pen |
| **PINZONE & ASSOCIATES** | | | | | | | |
| EMULOG 200 | dumb | 12-inch, green | 80 x 24 | RS232C, current loop | Data General 6052, 6053, Dasher 100, 200, 210, 410 | 849 (Q1) 595 (Q100) | |
| **PLESSEY PERIPHERAL SYSTEMS** | | | | | | | |
| PT-100B | intelligent | 12-inch, b&w, green, amber | 132 x 24 | RS232C, current loop (X-on/X-off, RTS/CTS) | DEC VT100, C. Itoh CIT-101 | | opt. graphics and voice input |
| **PROTOCOL COMPUTERS INC.** | | | | | | | |
| 51 | dumb | 12-inch, green | 80 x 25 | RS232C (X-on/X-off) | Hazeltine 1420 | 995 | auxiliary printer port |

## ALPHANUMERIC DISPLAY TERMINALS

| Company Model | Terminal type | Display (diagonal inches) | Screen format (col. x lines) | Interfaces (protocols) | Emulations | Prices ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|
| 78 | dumb | 12-inch, green | 80 x 25 | RS232C (X-on/X-off) | Hazeltine 1420 | 995 | auxiliary printer port |
| **QUME CORP.** | | | | | | | |
| QVT 102 | intelligent | 12-inch, green, amber | 80 x 24 | RS232C, opt. current loop (X-on/X-off) | TeleVideo 910, Hazeltine 1500, Lear Siegler ADM-3A, ADM-5A | 695 | 16 graphics symbols; opt. 14-inch display |
| QVT 103 | intelligent | 14-inch, green, amber | 132 x 24 | RS232C, opt. current loop (X-on/X-off) | DEC VT100, VT131 | 1,095 | 16 graphics symbols |
| QVT 108 | intelligent | 12-inch, green, amber | 80 x 24 | RS232C, opt. current loop (X-on/X-off) | TeleVideo 912, 920, 925 | 895 | 16 graphics symbols; opt. 14-inch display |
| **RACAL-MILGO** | | | | | | | |
| 4010 | editing | 15-inch, green | 80 x 24 | RS232C | Bell Dataspeed 40/3, BA | 3,555 | 6 programmable function keys, 8 pages of memory |
| 4015 Comm. Terminal | editing | 15-inch, green | 80 x 25 | RS232C (bisync) | Bell 8A | 4,155 | 6 programmable function keys, 8 pages of memory, printer buffer |
| 4220/U200 Comm. systems | editing | 15-inch, green | 80 x 25 | RS232C | Univac U100/U200 | 3,370 | 4 programmable function keys |
| 4220/UTS20 Comm. systems | editing | 15-inch, green | 80 x 25 | RS232C | | 3,370 | 22 programmable function keys |
| 4276 | editing | 15-inch, green | 80 x 25 | RS232C (bisync) | IBM 3270, 3275, 3276 | 3,550 | 24 programmable function keys |
| 8278-2 | editing | 15-inch, green | 80 x 25 | RS232C (SNA) | IBM 3278-2 | 1,640 (Q1) 1,492 (Q99) | 24 programmable function keys, screen protect feature |
| 8278-3 | editing | 15-inch, green | 80 x 33 | RS232C (SNA) | IBM 3278-3 | 2,333 (Q1) 2,100 (Q99) | 24 programmable function keys, screen protect feature |
| 8278-4 | editing | 15-inch, green | 80 x 44 | RS232C (SNA) | IBM 3278-4 | 2,333 (Q1) 2,100 (Q99) | 24 programmable function keys, screen protect feature |
| 8278-5 | editing | 15-inch, green | 132 x 28 | RS232C (SNA) | IBM 3278-5 | 2,556 (Q1) 2,300 (Q99) | 24 programmable function keys, screen protect feature |
| **RADIO SHACK (Div. of Tandy Corp.)** | | | | | | | |
| TRS-80, DT-1 | dumb | | 80 x 24 | RS232C, CCITT V.24, parallel | ADDS Regent 25, TeleVideo 910, Hazeltine 1410 | 699 | |
| **RCA MICRO COMPUTER PRODUCTS** | | | | | | | |
| VP-3801 | intelligent/ portable | 12-inch, b&w | 80 x 24 | RS232C, Centronics parallel (X-on/X-off) | | 399 | limited graphics, weighs 6 lbs., dimensions: 2 x 17 x 7 (H x W x D in inches) |
| VP-4801 | intelligent/ portable | 12-inch, b&w | 80 x 24 | RS232C, Centronics parallel (X-on/X-off) | | 399 | limited graphics, weighs 6 lbs., dimensions: 2 x 17 x 7 (H x W x D in inches) |
| **RENEX CORP.** | | | | | | | |
| R378 | editing | 12-inch, b&w | 80 x 25 | RS232C (X-on/X-off) | IBM 3278 | 990 | 24 function keys |
| R379 | editing | 14-inch, 8-color | 80 x 25 | RS232C (X-on/X-off) | IBM 3279 | 3,490 | 24 function keys |
| **SCOTT SYSTEMS** | | | | | | | |
| 5500 | intelligent | 14-inch, green, amber | 80 x 25 | RS232C, current loop (3270 bisync, SNA) | DEV VT100; Data General 53, 60 | 1,405 | 24 programmable function keys, magnetic card readers, split screen |
| **SOROC TECHNOLOGY INC.** | | | | | | | |
| B-4 | editing | 12-inch, green | 80 x 25 | RS232C (X-on/X-off) | MAI BASIC-Four 7270 | 895 | 14 function keys, line graphics; opt. integral modem |
| Challenger 525 | editing | 12-inch, green | 80 x 25 | RS232C (X-on/X-off) | TeleVideo 925 | 895 | 11 programmable function keys, line graphics; opt. integral modem |
| C530 | editing | 12-inch, green | 80 x 24 | RS232C (X-on/X-off) | Lear Siegler ADM-1, -2, -3 | 695 | line graphics; opt. integral modem |
| C540 | editing | 12-inch, green | 80 x 24 | RS232C (X-on/X-off) | Lear Siegler ADM-1, -2, -3; Tandem 6510 | 995 | 9 programmable function keys, line graphics; opt. integral modem |

## ALPHANUMERIC DISPLAY TERMINALS

| Company Model | Terminal type | Display (diagonal inches) | Screen format (col. x lines) | Interfaces (protocols) | Emulations | Prices ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|
| Challenger 540 AM | editing | 12-inch, green | 80 x 25 | RS232C (X-on/X-off) | Lear Siegler ADM-3, Alpha Micro AM60 | 895 | 16 function keys, line graphics; opt. integral modem |
| C550 | editing | 12-inch, green | 80 x 25 | RS232C (X-on/X-off) | Lear Siegler ADM-1, -2, -3 | 1,250 | 16 programmable function keys, line graphics; opt. integral modem |
| **SOUTHWEST TECHNICAL PRODUCTS CORP.** | | | | | | | |
| EM82 | dumb | 12-inch, green | 80 x 24 | RS232C (X-on/X-off) | TeleVideo | 895 | |
| X12 | intelligent | 12-inch, green | 128 x 25 | RS232C (X-on/X-off) | emulates any dumb terminal | 1,495 | 16 programmable function keys, 19K RAM |
| **SPERRY COMPUTER SYSTEMS** | | | | | | | |
| UTS 30 | intelligent/ graphics | 12-inch, green | 80 x 25 | RS232C (UNISCOPE SYNC., TTY ASYNC., X.21) | TTY KSR 33 | 3,235 | 22 function keys, 128K-bytes RAM; opt. 5¼-inch diskettes, printers, 256K-bytes RAM, Int'l character sets |
| UTS 40 | intelligent | 12-inch, green | 80 x 24 | RS232C | | 3,266 | 128K-bytes RAM; opt. 8-inch diskette drives |
| **TAB PRODUCTS CO.** | | | | | | | |
| TAB 132/15 | editing | 15-inch, b&w, green, amber | 132 x 24 | RS232C, current loop (X-on/X-off) | Prime, DEC VT52, VT100, VT132; opt. Tektronix 4010 | 1,795 | 8 programmable function keys, 4 pages of memory, split screen |
| TAB 132/15-H | editing | 15-inch, b&w, green, amber | 132 x 24 | RS232C, current loop | Honeywell VIP 7200, 7802, 7805 | 2,200 | 8 programmable function keys, non-volatile setup modes |
| **TANDEM COMPUTERS INC.** | | | | | | | |
| 6530 | | 15-inch, green | | RS232C, current loop (X-on/X-off) | | 2,575 | 16 function keys, 8 pages of memory, multi-point capability; opt. 9- or 12-inch screen, 7 Int'l language sets |
| **TANDBERG DATA INC.** | | | | | | | |
| TDV 2220S | editing/ graphics | 15-inch, b&w, green | 80 x 25 | RS232C, RS422, current loop (X-on/X-off) | Tektronix 4010, 4014 | 1,395 (Q1) 1,000 (Q100) | 16 programmable function keys; opt. 8 pages RAM, bit-mapped graphics, video output |
| **TEC INC.** | | | | | | | |
| TEC ET80B | editing | 15-inch, b&w | 80 x 25 | RS232C, opt. current loop, RS449 (X-on/X-off) | Lear Siegler ADM-3A | 1,785 | 18 function keys, 5 pages of memory, line graphics, printer buffer, split screen |
| TEC ET100B | editing | 15-inch, b&w | 80 x 25 | RS232C, opt. current loop, RS449 (X-on/X-off) | DEC VT52, VT100 | 1,785 | 16 function keys, 3 pages of memory, 1 page printer buffer, split screen; opt. rack mount |
| TEC ET108B | editing | 15-inch, b&w | 80 x 25 | RS232C, opt. current loop, RS449 (X-on/X-off) | IBM 3278 | 1,785 | 16 function keys, 13 pages of memory, line graphics, non-volatile set-up modes, opt. rack mount |
| **TELERAY** | | | | | | | |
| 7 N | intelligent/ graphics | 15-inch, green, amber, white | 80 x 25 | RS232C, RS422, current loop (X-on/X-off) | | 1,062 (Q100) | 32 programmable function keys, 2 pages of memory, non-volatile set-up modes, auxiliary ports, opt. 9- or 12-inch screen |
| 7-DDG | intelligent/ graphics | 15-inch, green, amber, white | 80 x 25 | RS232C, RS422, current loop (X-on/X-off) | DEC VT102, Data General D200 | 1,252 (Q100) | 32 programmable function keys, 2 pages of memory, opt. 9- or 12-inch screen, rack-mount, video output |
| 7-DEC | intelligent/ graphics | 15-inch, green, amber, white | 80 x 25 | RS232C, RS422, current loop (X-on/X-off) | DEC VT102 | 1,134 (Q100) | 32 programmable function keys, 2 pages of memory, non-volatile set-up modes, opt. 9- or 12-inch screen |
| 7-HNY | intelligent/ graphics | 15-inch, green, amber, white | 80 x 25 | RS232C, RS422, current loop (X-on/X-off) | DEC VT102, Honeywell 7303 | 1,431 (Q100) | 32 programmable function keys, 2 pages of memory, opt. 9- or 12-inch screen, rack-mount, video output |
| 16 | intelligent/ graphics | 15-inch, green, amber, white | 80 x 25 | RS232C, RS422, current loop (X-on/X-off) | | 1,205 (Q100) | 32 programmable function keys, buffered auxiliary port, calculator, opt. 8 pages of memory, rack-mount |
| 16-APL | intelligent/ graphics | 15-inch, green, amber, white | 80 x 25 | RS232C, RS422, current loop (X-on/X-off) | | 1,361 (Q100) | 32 programmable function keys, buffered auxiliary port, calculator, opt. 8 pages of memory, rack-mount |
| 16-HON | intelligent/ graphics | 15-inch, green, amber, white | 80 x 25 | RS232C, RS422, current loop (X-on/X-off) | Honeywell 7801 | 1,478 (Q100) | 32 programmable function keys, 4 pages of memory, 2K-byte input buffer, clock, calculator, opt. video output, rack-mount |

## ALPHANUMERIC DISPLAY TERMINALS

| Company Model | Terminal type | Display (diagonal inches) | Screen format (col. x lines) | Interfaces (protocols) | Emulations | Prices ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|
| **TELETYPE CORP.** | | | | | | | |
| 4420 | editing | 13-inch, b&w | 80 x 24 | RS232C, current loop | | 4,100 | buffered display |
| 4430 | editing | 13-inch, b&w | 80 x 24 | RS232C | | 4,245 | multi-point poll selectable |
| 4541 | editing | 13-inch, b&w | 80 x 25 | RS232C | IBM 3270 | | remote or local cluster configurations |
| 4543 | editing | 13-inch, b&w | 80 x 25 | RS232C | | 5,000 | |
| 5410 | dumb/ graphics | 12-inch, b&w | 132 x 24 | RS232C | | 1,054 | line graphics |
| 5420 | editing/ graphics | 12-inch, b&w | 132 x 24 | RS232C | | 1,462 | 9600-character display memory, windowing |
| 5540 | editing | 12-inch, b&w | | RS232C | IBM 3270 | | opt. 13-inch screen |
| 5620 | intelligent/ graphics | 15-inch, green | | RS232C | | 6,115 | 256K-bytes RAM, UNIX software |
| **TELEVIDEO SYSTEMS INC.** | | | | | | | |
| 910 | dumb | 12-inch, green | 80 x 24 | RS232C, opt. current loop (X-on/X-off, DTR) | Lear Siegler ADM-3A, -5, ADDS Regent 25, Hazeltine 1410 | 649 | self-test |
| 910+ | dumb | 12-inch, green | 80 x 24 | RS232C, opt. current loop (X-on/X-off, DTR) | | 699 | Int'l character sets, self-test |
| 914 | editing | 12-inch, green | 80 x 25 | RS232C, opt. current loop, RS422 (X-on/X-off, DTR) | ADDS Viewpoint A2, opt. Tektronix 4010, 4014 | 699 | 3 programmable function keys, non-volatile set-up modes; opt. graphics |
| 924 | intelligent | 12-inch, green | 80 x 25 | RS232C, opt. current loop, RS422 (X-on/X-off, DTR) | TeleVideo 925, 950; opt. Tektronix 4010, 4014 | 899 | 16 programmable function keys, non-volatile set-up modes; opt. graphics |
| 925 | editing | 12-inch, green | 80 x 25 | RS232C, opt. current loop (X-on/X-off, DTR) | TeleVideo 912, 920 | 995 | 11 function keys, 2 pages of memory, self-test, clock, Int'l character sets |
| 950 | intelligent | 12-inch, green | 80 x 25 | RS232C, opt. current loop (X-on/X-off, DTR) | | 1,195 | 11 programmable function keys; opt. 4 pages of memory, 15 line graphics chars. |
| 970 | intelligent | 14-inch, green | 132 x 25 | RS232C, opt. current loop, RS422 (X-on/X-off, DTR) | DEC VT52, VT100; opt. TeleVideo 950 | 1,495 | opt. graphics |
| Personal Terminal | editing/ portable | 9-inch, yellow, green | 80 x 24 | RS232C, RJ 11C (DTR, X-on/X-off) | | 499 | 2 integral modems available, 300 baud or 300/1200 baud |
| **TELETEX COMMUNICATION CORP.** | | | | | | | |
| TTX-3000 | intelligent/ graphics | 12-inch, green, amber | 80 x 25 | RS232C, opt. current loop (X-on/X-off) | TeleVideo 910+ | 599 | 10 function keys |
| TTX-3003 | intelligent/ graphics | 12-inch, green, amber | 80 x 25 | RS232C, opt. current loop (X-on/X-off) | | | 10 function keys, 2 pages of memory |
| **THOMAS ENGINEERING CO.** | | | | | | | |
| TE 780X | intelligent | 12-inch, green | 80 x 25 | RS232C, current loop | Honeywell 7800, DEC VT100 | 1,695 | 24 volatile function keys; 12 programmable keys, business graphics; opt. 14-inch screen |
| **VISUAL TECHNOLOGY** | | | | | | | |
| 50 | editing/ graphics | 12-inch, green, white | 80 x 25 | RS232C, opt. current loop (X-on/X-off, DTR) | DEC VT52, Lear Siegler ADM-3A, Hazeltine Esprit, ADDS Viewpoint | 695 | 3 function keys, business graphics, printer port |
| 55 | intelligent/ graphics | 12-inch, green, white | 80 x 25 | RS232C, opt. current loop (X-on/X-off, DTR) | DEC VT52, Lear Siegler ADM-3A, Hazeltine Esprit, ADDS Viewpoint, V210 | 895 | 3 function keys, business graphics, printer port |
| 102 | editing | 14-inch, green, white | 132 x 25 | RS232C, current loop (X-on/X-off, DTR) | DEC VT52, VT100 | 1,095 | separate alphanumeric and graphic memory, opt. Tektronix 4010, 4014 graphics |
| 300 | intelligent | 12-inch, green, white | 80 x 25 | RS232C, current loop | DEC VT52, VT100 | 995 | 12 programmable function keys, business graphics; opt. 8 pages of memory, 14-inch screen |
| 330 | intelligent/ graphics | 12-inch, green, white | 80 x 24 | RS232C, current loop (X-on/X-off, DTR) | DEC VT52, Lear Siegler ADM-3A, Hazeltine 1500, Data General Dasher 200 | 995 | business graphics |
| 383 | editing/ graphics | 14-inch, green, white | 80 x 24 | RS232C, Burroughs TDI (X-on/X-off, DTR) | Burroughs TE 830, ET 1100 | 1,695 | 6 pages of memory, business graphics |

## ALPHANUMERIC DISPLAY TERMINALS

| Company Model | Terminal type | Display (diagonal inches) | Screen format (col. x lines) | Interfaces (protocols) | Emulations | Prices ($) | Notes, features, options |
|---|---|---|---|---|---|---|---|
| **WESTINGHOUSE CANADA** | | | | | | | |
| W1643 | intelligent | 12-inch, green | 80 x 24 | RS232C, CCITT V.24 (SNA/SDLC, bisync) | IBM 3270 | | detached keyboard, IBM 3270 network capability available |
| W1640 | intelligent | 12-inch, green | 80 x 24 | RS232C (Honeywell) | Honeywell VIP 7700/7804 | | up to 32K-bytes RAM, 28K-bytes EPROM, high speed microprocessor |
| W1642 | intelligent | 12-inch, green | 80 x 24 | RS232C (Uniscope 100) | Univac U200 | 2,860 | supports 2 printers, back-up changeover switch, productivity package with tilt keyboard and monitor software |
| **WICAT SYSTEMS** | | | | | | | |
| MG 8000 | intelligent/ graphics | 12-inch, green, black | 80 x 24 | RS232C (X-on/X-off) | DEC VT52 | 2,360 | 4 programmable function keys, opt. touch panel |
| T 7000 | intelligent | 12-inch, green, black | 80 x 24 | RS232C (X-on/X-off) | DEC VT52 | 1,570 | 4 programmable function keys, opt. touch panel |
| **WYSE TECHNOLOGY** | | | | | | | |
| WY-100 | editing | 14-inch, green | 80 x 26 | RS232C (X-on/X-off) | Lear Siegler ADM-31 | 995 | special graphics characters, printer port |
| WY-300 | editing/ graphics | 12-inch, 8-color | 80 x 26 | RS232C (X-on/X-off) | Lear Siegler ADM-31, Wyse WY-100 | 1,295 | 16 special graphics characters; opt. bit-mapped graphics, printer port |
| WY-50 | editing | 14-inch, green | 132 x 26 | RS232C (X-on/X-off) | TeleVideo 910, 920, 925; ADDS Viewpoint, Hazeltine 1500, Wyse WY-100 | 695 | 16 programmable function keys, graphics characters, printer port, non-volatile set-up modes |
| WY-75 | editing | 14-inch, green | 132 x 26 | RS232C (X-on/X-off) | DEC VT100 | 795 | 16 programmable function keys, graphics characters, printer port, non-volatile set-up modes |
| **ZENITH DATA SYSTEMS** | | | | | | | |
| ZT-1 | editing/ graphics | 12-inch, green | 80 x 25 | RS232C, parallel | DEC VT52 | 449 | business graphics, integral modems, can be used as an electronic typewriter |
| Z-29 | 12-inch, green | | 80 x 25 (8 x 10) | RS232C (RTS) | Zenith Z-19, DEC VT52, Lear Siegler ADM-3A, Hazeltine 1500 | | 24-hour internal clock, extended character set-up for word processing |
| **ZENTEC** | | | | | | | |
| 1021 | intelligent | 12-inch | 80 x 24 | | Hazeltine 1500, Lear Siegler ADM-3, DEC VT52, ADDS Viewpoint, ANSI X3.64 | 399 (Q100) | 32 graphics characters |

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Sunnyvale, CA 94086
(408) 732-1060
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**DIGI-DATA CORP.**
8580 Dorsey Run Road
Jessup, MD 20794
(301) 498-0200
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**DIGICO COMPUTERS LTD.**
32 York Rd.
Leeds, Yorkshire, England
(0532) 486688
**Circle 548**

**DIGITAL ASSOCIATES CORP.**
1039 E. Main St.
Stamford, CT 06902
(203) 327-9210
**Circle 549**

**DIGITAL DEVELOPMENT CORP.**
8650 Balboa Ave.
San Diego, CA 92123
(714) 278-9920
**Circle 550**

**DIGITAL EQUIPMENT CORP.**
146 Main St.
Maynard, MA 01654
(617) 897-5111
**Circle 551**

**DIGITAL MATRIX CORP.**
96 West Dudleytown Rd.
Bloomfield, CT 06002
(203) 242-3040
**Circle 552**

**DIGITEC CORP.**
P.O. Box 458, 918 Woodley Rd.
Dayton, OH 45401
(513) 254-6251
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**DIRECT INC.**
4201 Burton Dr.
Santa Clara, CA 95054
(408) 980-1414
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**DISC TECH ONE INC.**
849 Ward Dr.
Santa Barbara, CA 93111
(805) 964-3535
**Circle 555**

**DISCTRON INC.**
1701 McCarthy Blvd.
Milpitas, CA 95035
(408) 946-6692
**Circle 556**

**DMA SYSTEMS CORP.**
601 Pine Ave.
Goleta, CA 93117
(805) 683-3811
**Circle 557**

**DRIVETEC INC.**
2140 Bering Dr.
San Jose, CA 95131
(408) 942-2222
**Circle 558**

**DTI INC.**
30 Uxbridge Rd., P.O. Box 207
Mendon, MA 01756
(617) 478-2136
**Circle 559**

**DURANGO SYSTEMS INC.**
3003 N. First St.
San Jose, CA 95134
(408) 946-5000
**Circle 560**

**EATON CORP.**
901 S. 12th St.
Watertown, WI 53094
(414) 261-4070
**Circle 561**

**EICON RESEARCH INC.**
2157 Park Blvd.
Box 60456
Palo Alto, CA 94306
(415) 326-2164
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**ELCOMATIC LTD.**
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Glasgow, Scotland
(041) 881-5825
**Circle 563**

**ELECTRO MECHANICAL SYSTEMS INC.**
801 W. Bradley Ave.
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(217) 359-7125
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**ELECTRONIC PROCESSORS INC.**
1265 W. Dartmouth Ave.
Englewood, CO 80110
(303) 761-8540
**Circle 565**

**EMULEX CORP.**
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P.O. Box 6725
Costa Mesa, CA 92626
(714) 662-5600
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**ENVISION**
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San Jose, CA 95134
(408) 946-9755
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**EPSON AMERICA INC.**
**OEM PRODUCTS DIV.**
23530 Hawthorne Blvd.
Torrance, CA 90505
(213) 373-9511
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**ERGOTRON INC.**
5637 Woodlawn Blvd.
Minneapolis, MN 55417
(612) 724-4952
**Circle 569**

**ERICSSON**
(for modems)
Box 420, S-135
24, Tyreso, Sweden
(468) 742-4000
**Circle 570**

**ERICSSON RADIO SYSTEMS AB**
Dept. A, S-16380
Stockholm, Sweden
(08) 7521000
**Circle 571**

**ESPRIT SYSTEMS INC.**
100 Marcus Dr.
Melville, NY 11747
(516) 293-5600
**Circle 572**

**EVOTEK CORP.**
1220 Page Ave.
Fremont, CA 94538
(415) 490-3100
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**EXTEL CORP.**
4000 Commercial Ave.
Northbrook, IL 60062
(312) 291-2500
**Circle 574**

**FACIT INC.**
235 Main Dunstable Rd.
Nashua, NH 03061
(603) 833-4157
**Circle 575**

**FALCO DATA PRODUCTS INC.**
1286 Lawrence Stations Rd.
Sunnyvale, CA 94089
(408) 745-7123
**Circle 576**

**FEEDBACK DATA LTD.**
Uckfield, East Sussex
TN722 1PT, England
0825-61411
**Circle 577**

**FLORIDA DATA CORP.**
6000 John Rodes Blvd.
Melbourne, FL 32935
(305) 259-4700
**Circle 578**

**FUJITSU AMERICA INC.**
3075 Oakmead Village Ct.
Santa Clara, CA 95051
(408) 988-8100
**Circle 579**

**FUJITSU AMERICA INC.**
(for printers)
3055 Orchard Dr.
San Jose, CA 95134
(408) 946-8777
**Circle 580**

**GANDALF DATA INC.**
1019 S. Noel Ave.
Wheeling, IL 60090
(312) 541-6060
**Circle 581**

**GENERAL BUSINESS TECHNOLOGY INC.**
1891 McGaw Ave.
Irvine, CA 92714
(714) 261-1891
**Circle 582**

**GENERAL DATACOMM INDUSTRIES INC.**
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Danbury, CT 06810
(203) 797-0711
**Circle 583**

**GENERAL DIGITAL CORP.**
700 Burnside Ave.
East Hartford, CT 06108
(203) 528-9041
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**GENERAL TERMINAL CORP.**
3001 South Daimler
Santa Ana, CA 92705
(714) 546-3551
**Circle 585**

**GENICOM CORP.**
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Waynesboro, VA 22980
(703) 949-1170
**Circle 586**

**GENIE COMPUTER CORP.**
31131 Via Colinas, Suite 607
Westlake Village, CA 92626
(213) 991-6210
**Circle 587**

**GENISCO COMPUTERS CORP.**
(for terminals)
3545 Cadillac Ave.
Costa Mesa, CA 92626
(714) 556-4916
**Circle 588**

**GENISCO MEMORY PRODUCTS CORP.**
(for tape drives)
10874 Hope St.
Cypress, CA 90630
(714) 220-0720
**Circle 589**

**GRAPHON CORP.**
2255 H. Martin Ave.
Santa Clara, CA 95050
(408) 980-8500
**Circle 590**

**GRINNELL SYSTEMS CORP.**
6410 Via Del Oro Dr.
San Jose, CA 95119
(408) 629-9191
**Circle 591**

**HARRIS CORP. COMPUTER SYSTEMS DIV.**
2101 Cypress Creek Rd.
Ft. Lauderdale, FL 33309
(305) 974-1700
**Circle 592**

**HAYES MICROCOMPUTER PRODUCTS INC.**
5923 Peachtree Industrial Blvd.
Norcross, GA, 30092
(404) 449-8791
**Circle 593**

**HAZELTINE CORP.** (see **ESPRIT**)

**HEATH DATA SYSTEMS**
Hilltop Rd.
St. Joseph, MI 49085
(616) 982-3200
**Circle 594**

**HEWLETT-PACKARD CO.**
(General Inquiries)
1820 Embarcadero Rd.
Palo Alto, CA 94303
(800) 367-4772
**Circle 595**

**HEWLETT-PACKARD CO.**
(for terminals)
8000 Foothills Blvd.
Roseville, CA 95678
(916) 786-8000
**Circle 596**

**HEWLETT-PACKARD CO.**
(for line printers)
P.O. Box 15
Boise, ID 83705
(208) 323-6000
**Circle 597**

**HEWLETT-PACKARD CO.**
(for floppy drives, 5¼-in. hard drives)
3404 E. Harmony Rd.
Ft. Collins, CO 80525
(303) 226-3800
**Circle 598**

**HEWLETT-PACKARD CO.**
(for character printers)
P.O. Box C-006
Vancouver, WA 98668-C006
(206) 254-8110
**Circle 599**

**HI-G PRINTERS CORP.**
(now **DIGITAL MATRIX CORP.**)

**HI-TECH PERIPHERALS CORP.**
15192 Triton Lane
Huntington Beach, CA 92649
(714) 891-0027
**Circle 600**

**HIGHTRACK COMPUTER TECHNIK GMBH**
Bundesallee 36/37
D-1000 Berlin 31,
Federal Republic of Germany
(030) 86 0507
**Circle 601**

**HITACHI AMERICA LTD.**
950 Elm Ave., Suite 100
San Bruno, CA 94066
(415) 872-1902
**Circle 602**

**HMW DATA SYSTEM GMBH**
Otto-Hahn Strasse 26
D-8012 Ottobrun
Federal Republic of Germany
089/609 70 74
**Circle 603**

**HMW ENTERPRISES INC.**
604 Salem Rd.
Etters, PA 17319
(717) 938-4691
**Circle 604**

**HONEYWELL INFORMATION SYSTEMS INC.**
200 Smith St.
Waltham, MA 02154
(617) 895-6000
**Circle 605**

**HUMAN DESIGNED SYSTEMS INC.**
3440 Market St.
Philadelphia, PA 19104
(215) 382-5000
**Circle 606**

**IBIS SYSTEMS INC.**
5775 W. Lindero Canyon Rd.
Westlake Village, CA 91361
(213) 706-2505
**Circle 607**

**IBM CORP.**
900 King St.
Rye Brook, NY 10573
(914) 934-4836
**Circle 608**

**ICOT CORP.**
830 Maude Ave.
P.O. Box 7248
Mountain View, CA 94039
(415) 964-4635
**Circle 609**

**ID SYSTEMS CORP.**
4089 Leap Rd.
Hilliard, OH 43026
(614) 876-1595
**Circle 610**

**IMLAC CORP.**
150 A St., New England Industrial Park
Needham, MA 02194
(617) 449-4600
**Circle 611**

**IMS INTERNATIONAL**
2800 Lockheed Way
Carson City, NV 89701
(702) 883-7611
**Circle 612**

**INCOMM**
115 N. Wolf Rd.
Wheeling, IL 60090
(312) 459-8881
**Circle 613**

**INDUSTRIAL DATA TERMINAL CORP.**
173 Heatherdown Dr.
Westerville, OH 43081
(614) 882-3282
**Circle 614**

**INFINET INC.**
6 Shattuck Rd.
Andover, MA 01810
(617) 681-0600
**Circle 615**

**INFOSCRIBE INC.**
2720 S. Croddy Way
Santa Ana, CA 92704
(714) 641-8595
**Circle 616**

**INFOTRON SYSTEMS CORP.**
Cherry Hill Ind. Ctr., 9 N. Olney Ave.
Cherry Hill, NJ 08003
(609) 424-9400
**Circle 617**

**INMAC, DATACOM DIV.**
2350 Zanker Rd.
San Jose, CA 95131
(408) 945-1800
**Circle 618**

**INNOTRONICS CORP.**
Brooks Rd.
Lincoln, MA 01773
(617) 259-0600
**Circle 619**

**INNOVATIVE DATA TECHNOLOGY**
4060 Morena Blvd.
San Diego, CA 92117
(619) 270-3990
**Circle 620**

**INSTOR CORP.**
175 Jefferson Dr.
Menlo Park, CA 94025
(415) 326-9830
**Circle 621**

**INTECOLOR CORP.(AN INTELLIGENT SYSTEMS CO.)**
225 Technology Pk.
Norcross, GA 30092
(404) 499-5961
**Circle 622**

**INTEGRATED DESIGN ENGINEERING INC.**
P.O. Box 16307
St. Louis, MO, 63125
(314) 343-0005
**Circle 623**

**INTELLIGENT SYSTEMS CORP.**
(see **INTECOLOR CORP.**)

**INTERFACE INC.**
7630 Alabama Ave. #6
Canoga Park, CA 91304
(213) 341-7914
**Circle 624**

**INTERFACE TECHNOLOGY INC.**
10500 Kahlmeyer Dr.
St. Louis, MO 63132
(314) 426-6880
**Circle 625**

**INTERGRAPH CORP.**
One Madison Industrial Pk.
Huntsville, AL 35801
(205) 772-2000
**Circle 626**

**INTERNATIONAL MEMORIES INC.**
10381 Bandley Dr.
Cupertino, CA 95014
(408) 446-9779
**Circle 627**

**INTERPHASE CORP.**
13667 Floyd Cir.
Dallas, TX 75243
(214) 350-9000
**Circle 628**

**INTERTEL INC.**
(See **INFINET INC**)

**IOMEGA CORP.**
4646 S. 1500 West
Odgen, UT 84405
(801) 392-2171
**Circle 629**

**IRWIN MAGNETICS**
2311 Green Rd.
Ann Arbor, MI 48105
(313) 996-3300
**Circle 630**

**IRWIN OLIVETTI, INC.**
(see **OPE PRINTERS, INC.**)

**ITHACA INTERSYSTEMS INC.**
1650 Hanshaw Rd.
Ithaca, NY, 14850
(607) 273-2500
**Circle 631**

**ITT COURIER TERMINAL SYSTEMS INC.**
1515 W. 14th St.
Tempe, AZ 82581
(602) 894-7000
**Circle 632**

**JANOME SEWING MACHINE CO.**
1-1- 3-Chome, Kyobashi,
Chuoku, Tokyo, 104, Japan
3-277-2270
**Circle 633**

**JAPAN COMPUTER CORP.**
Naito Bldg., Nihonbashi
Hamacho 2-25-1
Chuo-Ku, Tokyo, 103, Japan
(03) 669-3066
**Circle 634**

**JAPAN DIGITAL LABORATORY**
c/o Pacific Technology Service Inc.
332 Pine St., Suite 610
San Francisco, CA 94104
(415) 956-3926
**Circle 635**

**KAYE INSTRUMENTS**
15 De Angelo Dr.
Bedford, MA 01730
(617) 275-0300
**Circle 636**

**KEL INC.**
400 W. Cummings Park, Suite 5300
Woburn, MA 01801
(617) 933-7852
**Circle 637**

**KENNEDY CO.**
1600 S. Shamrock Ave.
Monrovia, CA 92714
(714) 261-0291
**Circle 638**

**KIMTRON CORP.**
2255 I Martin Ave.
Santa Clara, CA 95050
(408) 727-1510
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**KINEX CORP.**
6950 Bryan Dairy Rd.
Largo, FL 33543
(813) 541-6404
**Circle 640**

**LANPAR TECHNOLOGIES LTD.**
85 Torbay Rd.
Markham, Ontario, Canada
CD L3R 1G7
(416) 475-9123
**Circle 641**

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225 Turnpike St.
Canton, MA 02021
(617) 828-8150
**Circle 642**

**LEAR SIEGLER INC.**
**DATA PRODUCTS DIV.**
714 N. Brookhurst St.
Anaheim, CA 92803
(714) 774-1010
**Circle 643**

**LEE DATA CORP.**
7075 Flying Cloud Dr.
Minneapolis, MN 55344
(612) 828-0300
**Circle 644**

**LEENSHIRE LTD.**
Moorside Rd.
Winnall, Winchester,
Hants, S023 7RX, England
**Circle 645**

**LEXICON CORP.**
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1541 N.W. 65th Ave.
Ft. Lauderdale, FL 33313
(305) 792-4400
**Circle 646**

**LEXIDATA CORP.**
755 Middlesex Turnpike
Billerica, MA 01865
(617) 663-8550
**Circle 647**

**LIBERTY ELECTRONICS USA**
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San Francisco, CA 94107
(415) 543-7000
**Circle 648**

**LYNWOOD INTERNATIONAL**
Park House, The High Street
Alton, Hampshire,
GU34 1EN, England
(0420) 84888
**Circle 649**

**MANNESMAN TALLY INC.**
8301 S. 180th St.
Kent, WA 98032
(206) 251-5500
**Circle 650**

**MATCHLESS SYSTEMS**
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Gardena, CA 90248
(213) 327-1010
**Circle 651**

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**SYSTEMS LTD.**
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H4T 1H4, Canada
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**MAXTOR CORP.**
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(408) 942-1700
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**MDS**
(see **MOHAWK DATA SCIENCES**)

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Bohemia, NY 11716
(516) 589-6800
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**MEGALOGIC CORP.**
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(513) 883-5222
**Circle 655**

**MEGATAPE CORP.**
1041 Hamilton Rd., P.O. Box 317
Duarte, CA 91010-0317
(213) 357-9921
**Circle 656**

**MEGATEK CORP.**
9605 Scranton Rd.
San Diego, CA 92121
(619) 455-5590
**Circle 657**

**MEGAVAULT**
6431 Independence Ave.
Woodland Hills, CA 91367
(213) 884-7300
**Circle 658**

**MEMODYNE CORP.**
220 Reservoir St.
Needham Heights, MA 02194
(617) 444-7000
**Circle 659**

**MEMOREX CORP.**
**COMMUNICATIONS GROUP**
(for terminals, printers)
18922 Forge Dr.
Cupertino, CA 95014
(408) 996-9000
**Circle 660**

**MEMOREX CORP.**
(for disk drives)
San Tomas and Central Expwy.
Santa Clara, CA 95052
(408) 987-1000
**Circle 661**

**MEPCOM INTERNATIONAL INC.**
P.O. Box 610719
Dallas, TX 75261
(214) 641-6901
**Circle 662**

**MICOM SYSTEMS INC.**
20151 Nordhoff St.
Chatsworth, CA 91311
(213) 998-8844
**Circle 663**

**MICRO-BAUD SYSTEMS INC.**
3393 De La Cruz Blvd.
Santa Clara, CA 95050
(408) 727-5275
**Circle 664**

**MICRO DESIGN**
6301 Manchacha Rd.
Austin, TX 78745
(512) 441-7890
**Circle 665**

**MICRO DISPLAY SYSTEMS INC.**
1310 Vermillion St., P.O. Box 455
Hastings, MN 55033
(800) 328-9524
**Circle 666**

**MICRO MAINFRAME**
11325 Sunrise Gold Cir., Bldg. A
Rancho Cordova, CA 95670
(916) 635-3997
**Circle 667**

**MICRO PERIPHERALS INC.**
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9754 Deering Ave.
Chatsworth, CA 91311
(213) 709-4202
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**MICRO PERIPHERALS INC.**
(for printers)
4426 S. Century Dr.
Salt Lake City, UT 84123
(801) 263-3081
**Circle 669**

**MICRO PRODUCTS CO.**
**DIV. OF C3 INC.**
11425 Isaac Newton Square So.
Reston, VA 22091
(703) 471-6000
**Circle 670**

**MICRO-TERM INC.**
512 Rudder Rd.
St. Louis, MO 63026
(314) 343-6515
**Circle 671**

**MICROCOM**
1400A Providence Hwy.
Norwood, MA 02062
(617) 762-9310
**Circle 672**

**MICROCOMPUTER MEMORIES INC.**
7444 Valjean Ave.
Van Nuys, CA 91406
(818) 782-2222
**Circle 673**

**MICRODATA CORP.**
P.O. Box 19501
Irvine, CA 92708
(714) 250-1000
**Circle 674**

**MICROPLEX INC.**
1977 State College Rd.
Anaheim, CA 92806
(714) 634-1535
**Circle 675**

**MICROPOLIS CORP.**
21123 Nordhoff St.
Chatsworth, CA 91311
(213) 709-3306
**Circle 676**

**MICROSCI CORP.**
2158 So. Hathaway St.
Santa Ana, CA 92705
(714) 241-5600
**Circle 677**

**MICROSCIENCE INTERNATIONAL CORP.**
575 E. Middlefield Rd.
Mountain View, CA 94043
(415) 961-2212
**Circle 678**

**MILTOPE CORP.**
1770 Walt Whitman Rd.
Melville, NY 11747
(516) 420-0200
**Circle 679**

**MINISCRIBE CORP.**
1871 Lefthand Circle
Longmont, CO 80501
(303) 651-6000
**Circle 680**

**MITSUBISHI ELECTRONICS AMERICA INC.**
991 Knox St.
Torrance, CA 90502
(213) 515-3993
**Circle 681**

**MODULAR COMPUTER SYSTEMS (MODCOMP)**
P.O. Box 6099
Ft. Lauderdale, FL 33310
(305) 974-1380
**Circle 682**

**MORROW DESIGNS INC.**
600 McCormick St.
San Leandro, CA 94577
(415) 430-1970
**Circle 683**

**MOTOROLA MICROSYSTEMS**
(for disk drives, terminals)
2900 S. Diablo Way
Tempe, AZ 85282
(602) 829-3244
**Circle 684**

**MOUNTAIN COMPUTER**
300 El Pueblo Rd.
Scotts Valley, CA 95066
(418) 438-6650
**Circle 685**

**MOYA CORP.**
9001 Oso Ave
Chatsworth, CA 91311
(213) 700-1200
**Circle 686**

**MULTI-TECH SYSTEMS INC.**
82 2nd Ave. S.E.
New Brighton, MN 55112
(612) 631-3550
**Circle 687**

**MYARC**
P.O. Box 140
Basking Ridge, NJ 07920
(201) 766-1700
**Circle 688**

**NATIONAL MEMORY SYSTEMS CORP.**
355 Earhart Way
Livermore, CA 94550
(415) 443-1669
**Circle 689**

**NCR COMTEN INC.**
2700 Snelling Ave. No.
St. Paul, MN 55113
(612) 638-7391
**Circle 690**

**NCR CORP.**
1700 S. Patterson Blvd., USG 3
Dayton, OH 45479
(513) 445-5000
**Circle 691**

**NCR CORP.**
(for disk subsystems)
3718 N. Rock Rd.
Wichita, KS 67226
(316) 688-8510
**Circle 692**

**NEC AMERICA INC.**
(for modems)
1012 Stewart Dr.
Sunnyvale, CA 94086
(415) 737-7711
**Circle 693**

**NEC INFORMATION SYSTEMS INC.**
(for disks, printers)
1414 Massachusetts Ave.
Boxboro, MA 01719
(617) 264-8000
**Circle 694**

**NEW WORLD COMPUTER CO. INC.**
6624 Owens Dr.
Pleasanton, CA 94566
(415) 463-0330
**Circle 695**

**NEWBURY DATA RECORDING**
Hawthorne Rd., The Causeway
Staines, Middlesex,
TW18 3BJ, England
(0784) 61500
**Circle 696**

**NISSEI SANGYO AMERICA LTD.**
**(DIV. of TOKYO ELECTRIC CO.)**
825 Third Ave.
New York, NY 10022
(212) 755-2900
**Circle 697**

**NORTH ATLANTIC INDUSTRIES QANTEX DIV.**
60 Plant Ave.
Hauppauge, NY 11788
(516) 582-6060
**Circle 698**

**NORTHERN TECHNOLOGIES LTD.**
(see **LANPAR TECHNOLOGIES INC.**)

**NORTHERN TELECOM INC. MEMORY SYSTEMS DIV.**
100 Phoenix Dr., P.O. Box D
Ann Arbor, MI 48106
(313) 973-4600
**Circle 699**

**NORTHERN TELECOM INC.**
(for modems)
9705 Data Park, P.O. Box 1222
Minneapolis, MN 55440
(612) 932-8431
**Circle 700**

**NOVATION INC.**
20409 Prairie St., Box 2875
Chatsworth, CA 91311
(213) 996-5060
**Circle 701**

**OKIDATA CORP.**
532 Fellowship Rd.
Mount Laurel, NJ 08054
(609) 235-2600
**Circle 702**

**OLYMPIA USA**
Route 22, Box 22
Somerville, NJ 08876
(201) 722-7000
**Circle 703**

**OMNITEC DATA**
(now **DEVELCON ELECTRONICS**)

**ONTEL CORP.**
250 Crossways Park Dr.
Woodbury, NY 11797
(516) 364-2121
**Circle 704**

**ONYX SYSTEMS INC.**
25 E. Trimble Rd.
San Jose, CA 95131
(408) 946-6330
**Circle 705**

**OPE PRINTERS INC.**
505 White Plains Rd.
Tarrytown, NY 10591
(914) 631-3000
**Circle 706**

**PANASONIC INDUSTRIAL CO.**
1 Panasonic Way
Secaucus, NJ 07094
(201) 348-5337
**Circle 707**

**PARADYNE CORP.**
8550 Ulmerton Rd., Bldg. A.
Largo, FL 33540
(813) 530-2000
**Circle 708**

**PDS TECHNOLOGIES INC.**
2000 Black Rock Turnpike
Fairfield, CT 06430
(203) 366-4089
**Circle 709**

**PENRIL/DATACOMM**
207 Perry Pkwy.
Gaithersburg, MD 20877
(301) 921-8600
**Circle 710**

**PERCOM DATA CO. INC.**
11220 Page Mill Rd.
Dallas, TX 75243
(800) 527-1222
**Circle 711**

**PEREX LTD.**
9 Arkwright Rd.
Reading, Berkshire,
RG20EA, England
(0734) 751054
**Circle 712**

**PERIPHERAL TECHNOLOGY INC.**
(for tape drives)
1385 Industrial Blvd.
Southampton, PA 18966
(215) 364-1560
**Circle 713**

**PERIPHERAL TECHNOLOGY INC.**
(for terminals)
14784 N.E. 95th
Redmond, WA 98052
(206) 881-6691
**Circle 714**

**PERRY DATA SYSTEMS INC.**
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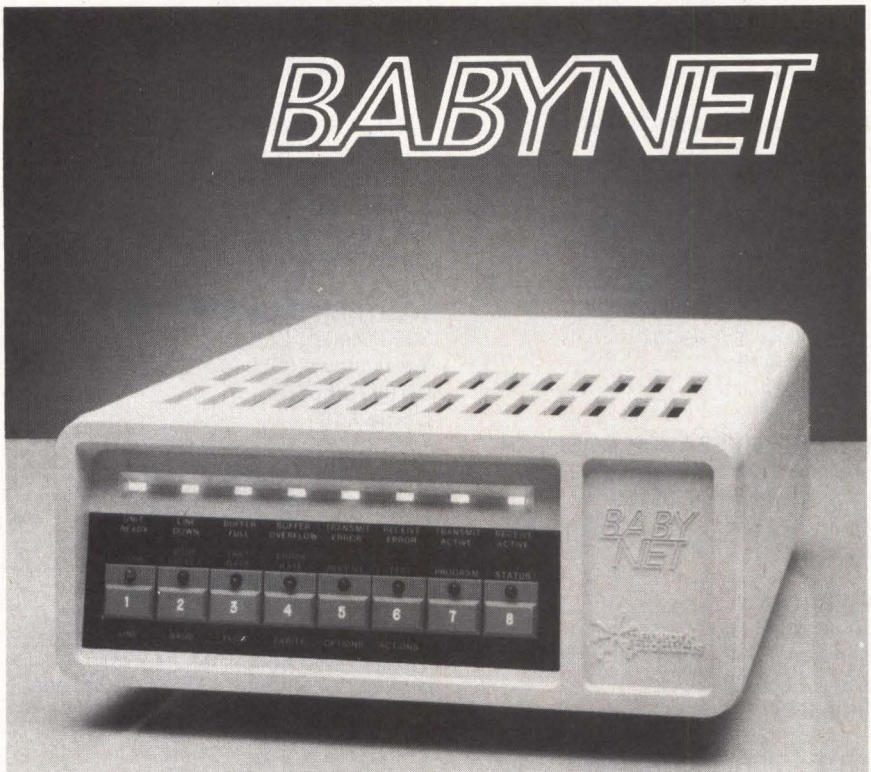


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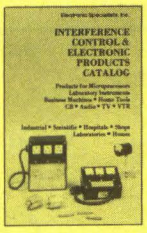


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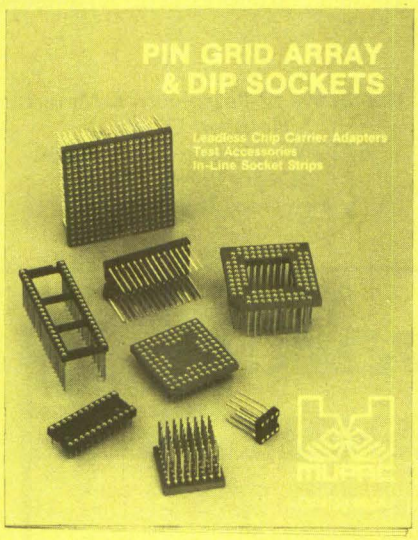


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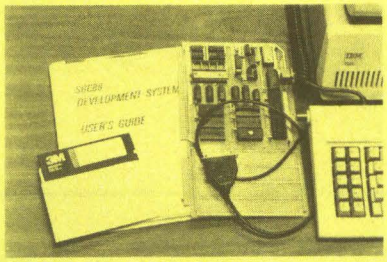

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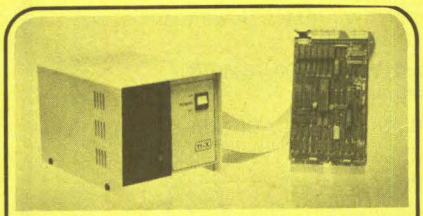

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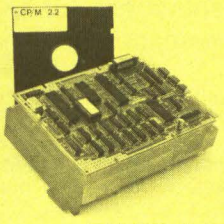


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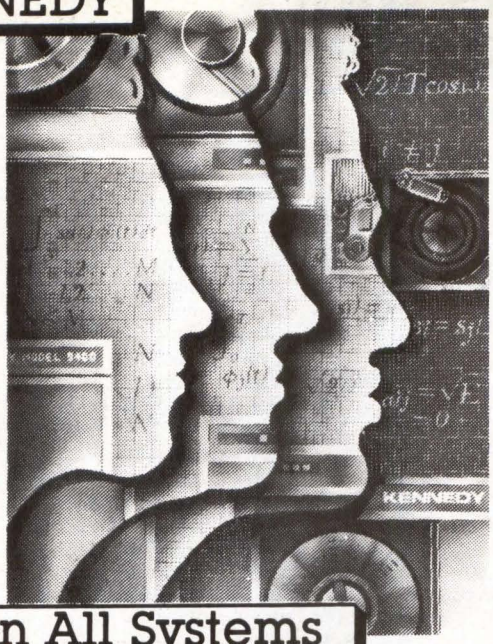

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