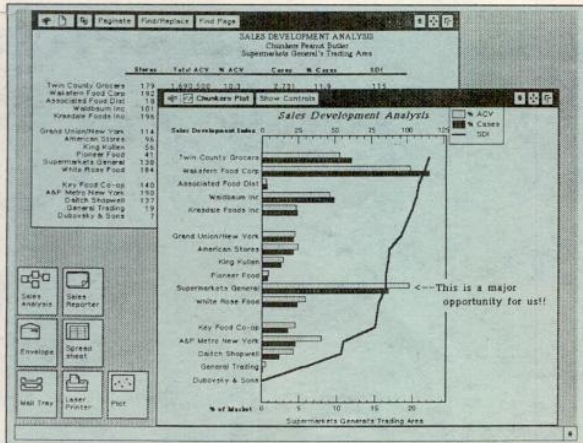


PRODUCT COMPARISONS
FAX BOARDS
ACCOUNTING SOFTWARE



IBM plans to use the Metaphor data analysis system as the front end to SQL databases running under its OS/2 Extended Edition.

IBM Licenses Interface For OS/2 SQL Databases Metaphor to Serve as Front End

By Rachel Parker

Further tailoring OS/2 Extended Edition for corporate users, IBM announced last week plans to offer a highly graphical front end to SQL databases that will run on 80386-based PS/2s using the Extended Edition. Through a three-part technology agreement and equity investment plan, IBM and Metaphor Computer Systems Inc. plan to develop a version of Metaphor's data interpretation

system and interface that will require IBM's OS/2 Extended Edition and the speed of an 80386-based PS/2. Currently, Metaphor sells a 68000-based data analysis system that combines a relational database with a graphic, icon-oriented interface. The system is used in market research groups of large companies such as Proctor and Gamble.

See IBM, Page 93

Fox Steps Up Competition With Faster Foxbase, Version for Mac

By Scott Mace

Fox Software plans to leapfrog past Ashton-Tate in the database speed race by releasing this fall a Dbase IV-compatible version of Foxbase Plus that is said to perform two to three times faster than Foxbase Plus 2.1, the intermediary upgrade scheduled to ship next month. Ashton-Tate describes Dbase IV, due out in July, as 80 percent as fast as the current release

of Foxbase Plus 2.0, which is targeted for developers who want to speed up their Dbase III Plus applications. Release 2.1 will be 5 percent faster than 2.0, but a major rewrite of Foxbase Plus for DOS, due out in October, will dramatically boost its speed and add Dbase IV language compatibility and a new report writer, said Richard

See Fox, Page 8

Tandy to Ship MCA-Based PC in July; Dell, Olivetti Aim for Fourth Quarter

Vendors Say Licensing Is Not a Problem

By Carole Patton and Paula S. Stone

Last week was a momentous one in the history of IBM's Micro Channel Architecture as Tandy, Dell Computer Corp., and Olivetti all announced their intention to produce MCA-compatible systems. Tandy expects to begin volume shipments of its Model 80-compatible system in July. Dell and Olivetti both said that their Micro Channel systems would be shipped by the end of the year. The 80386-based Tandy 5000 MC is priced at \$4,999



The basic 386-based Tandy 5000 MC will sell for \$4,999.

Users' Reaction To PS/2 Clones Is Lukewarm

By Alice LaPlante and Paula S. Stone

Although Tandy and Dell last week successfully upstaged other PC vendors with their PS/2 clone announcements, they may have a harder time finding customers to buy the machines. "There would have to be a very significant advantage for us to buy PS/2 clones," said John Konvalinka, managing partner and chief information officer at Arthur Andersen & Co., in Chicago. Many large corporations have yet to commit to true-blue

without a hard disk. Tandy president and CEO John V. Roach said the Tandy 5000 MC was covered by cross-licensing agreements with IBM. "We are not currently aware of any issued patent that applies to this product except those we've been licensed to use," Roach said. However, he added that

See Tandy, Page 93

13 Vendors Turn to Motorola's 88000 to Build RISC Systems

By Carole Patton

NEW YORK — Last week 13 major computer manufacturers opted to build reduced instruction set computers (RISC) with chips from Motorola's 88000 family — a move expected to challenge the dominance of Sun Microsystems' SPARC design. The announcement came during the official debut of Motorola's 88000 family here

last week. Additionally, some two dozen software vendors announced operating system, language, and development tool support for the 88000 RISC series. Moreover, Data General and Motorola announced a joint development pact to build a 100-MIPS computer using a version of the 88000. The pro-



Motorola introduced the 88100 RISC chip and two 88200 cache/memory management units.

ject will be completed by 1991, said Data General president Edson D. de Castro. Besides Data General, hard-

See Motorola, Page 8

THIS WEEK FROM THE INFOWORLD TEST CENTER

This week, *InfoWorld* looks at the old and the new: Facsimile boards are emerging as an inexpensive way to transfer text and graphics from one computer to another. The *InfoWorld* Test Center looks at seven PC fax boards.

High-end accounting systems have been around for some time, and they offer a surprising amount of power and flexibility. We look at 11 powerful packages.

AT DEADLINE

PS/2 Model 80 Clones Based on Intel Chip Set

Samples of Intel's PS/2 Model 80-compatible chip set are now shipping to "trend setting customers" and were used in the prototype Model 80 clones demonstrated last week by Dell Computer and Tandy, Intel confirmed. "We are working closely with these early customers to ensure that their 1988 requirements are met, and we are now initiating a sampling program to support our customers who are targeting production requirements for 1989," said Paul Otellini, general manager of Intel's Folsom Microcomputer Division (FMD), in Folsom, California. "We will be ramping up production throughout this year," said an Intel spokeswoman who declined to name a specific

Continued on Page 3

Clones

Continued From Page 1

PS/2s from IBM itself, much less take a chance on machines from Tandy or Dell.

Although some corporate managers have said they would like to see a second source of Micro Channel machines, few seemed to change their position on PS/2s because of last week's announcements. "We're not convinced that even IBM's own PS/2 machines are going to succeed," said Alex Kask, microcomputer manager for Ernst & Whinney, in New York. "Presumably, clones will offer all the disadvantages of the original machines."

One key factor determining whether managers will even look at the machines is price: If PC vendors can offer significant savings over IBM's prices, that would be a major plus.

However, at first glance, the Dell and Tandy PS/2 clones offer little price advantage once corporate volume discounts are taken into account. This is especially true now, when PS/2 discounting is rampant throughout the dealer channel. (See "Low Profit Margins on PS/2s May Force Dealers to Push Other Lines," April 18.)

"At our discount level, IBM PS/2s will probably be cheaper than either Dell or Tandy machines," said Richard Werbin, PC support manager at Chase Manhattan Bank, in New York. "We get a 35 percent discount on IBM PS/2s from a local dealer."

Both Dell and Tandy are de-emphasizing the price issue in favor of proclaiming the superior performance and functional-

ity of their machines.

"Not only is the Tandy 5000 MC the most powerful PC we've offered, it's also a very unique product containing a combination of features never offered before in a compact desktop computer by a major manufacturer," said John Roach, president, chairman of the board, and CEO of Tandy Corp.

Dell also claims its machines outperform IBM's. "The System 400 will be twice as fast as the Model 60, looking at clock speed, processor speed, and operating speed," said Michael Dell, chairman and CEO.

Most PC professionals contacted by *InfoWorld* said the clones would need to pass an "informal" cost/performance evaluation. Only then would they be brought in-house for further testing.

"Before we begin that kind of testing and evaluation, we want to make sure we're going to get some substantial benefit from the machines," said Chase Manhattan's Werbin. "We'd need [a PS/2 clone] to be at least 20 percent or 30 percent cheaper than IBM before we'd be interested."

The issues involved in buying clones are compatibility, maintainability, and upgradability, said Konvalinka, who added that his firm is "very leery" of clones.

Interestingly, most PC managers said they would seriously consider a PS/2 clone if — and only if — Compaq came out with one. And at Microage's annual convention several months ago, an informal poll of authorized IBM dealers produced the same results: Yes, they would carry a Compaq MCA clone, but thumbs down on any other vendor's machines.

Tandy

Continued From Page 1

Micro Channel-related patents that IBM might receive in the future would not be covered by the current agreements.

The Tandy 5000 MC uses an Intel 80386 with an attached 82385 cache memory controller and 32K of static RAM, plus an 80387 math coprocessor running at a 20-MHz clock speed.

The 5000 MC comes with 2 megabytes of RAM, expandable to 16 megabytes through dedicated memory sockets on its 32-bit, 20-MHz memory bus. The system has five IBM Micro Channel-compatible expansion slots — two 32-bit and three 16-bit. These are in addition to two 32-bit proprietary memory expansion slots. VGA capability is integrated on the main logic board, providing CGA, EGA, MCGA, and VGA compatibility. Serial and parallel ports, a dedicated mouse port, and a real-time clock are standard, as is a 3½-inch, 1.44-megabyte floppy disk drive.

Tandy plans to sell the PC through Radio Shack stores, VARs, and its direct sales force — including about 150 salespersons from recently acquired Grid Systems. The system will cost \$4,999 without a hard drive, \$6,499 with a 40-megabyte hard drive, and \$6,999 with an 84-megabyte hard drive, an Adaptec controller, and 15-millisecond access time. Samples should be available in June, with volume shipments slated for July.

Two working prototypes of personal computers compatible with MCA were shown last week by Dell.

Record-and-Erase Technology

Tandy last week announced an optical disc record-and-erase technology that is fully compatible with existing CD audio and CD ROM players.

The new Tandy THOR-CD (Tandy High-Intensity Optical Recording) can repeatedly record, play, store, and erase music, video, or digital data. THOR-CDs use a laser beam to read data by reflecting a series of microscopic pits, so existing CD hardware can play but not record on them, Tandy said.

THOR recordings, while stable, can be erased for repeated editing and recording. Tandy has not yet determined how many times a disc can be erased, a company spokesman said. CD pioneers, such as Fujitsu and Hitachi, are known to be working on similar erasable optical technologies.

"The long-term implications of this announcement are tremendous," said Lise Buyer, a senior analyst with Prudential-Bache Securities, in New York.

Tandy expects the THOR-CD to provide high-density data storage, accommodating hundreds of megabytes per 5-inch disc and access times comparable to existing CD technology, but the first commercial use, expected in 18 to 24 months, will probably be audio.

"CD audio is also the least demanding on the hardware and the media," said Robert McClure, president of Tandy Electronics Manufacturing. He predicted early CD recorders will cost less than \$500. "The additional cost in electronics and drive mechanisms should permit play-and-record decks to be offered in the early years of development for under \$500." He expects THOR-CDs to cost less than other digital-audio formats, including digital-audio tape (DAT).

Tandy is licensing the erasable optical disc technique to developers as the vendor licenses its Deskmate graphical interface for use on PC compatibles. 3Com Corp. is the latest Deskmate licensee.

The System 400 is an 80286-based computer comparable to IBM's PS/2 Model 60. The 80386-based System 500 is comparable to the PS/2 Model 80.

The 20-MHz System 500 will use the Intel 82385 cache memory controller. Standard are 2 megabytes of RAM expandable to 16 megabytes, five 16-bit and three 32-bit expansion slots, and a 3½-inch disk drive. The system will support 20-MHz 80387 or Weitek math coprocessors. A choice of 40-, 90-, 150-, 322-, or 610-megabyte hard disks and tape backups will be available. The System 500 will accept all Model 80 hardware adapters, according to Dell Computer.

The System 400 will run at 20 MHz and come equipped with 1 megabyte of memory expandable to 16 megabytes; a 3½-inch, 1.44-megabyte floppy disk drive; and a disk cache utility. The machine will use a Chips and Technologies chip set; come in 40-, 80-, or 150-megabyte hard disk configurations; and accept all hardware adapters for the IBM Models 50 and 60.

Both systems will come standard with a VGA display adapter, a floppy disk controller, a serial port, and a parallel port — all on the motherboard. Pricing on Dell's two MCA-compatible systems is expected to be 30 percent higher than the company's comparable AT-bus PCs. Final pricing, benchmarks, and perhaps additional features will be announced in August, with shipments expected in the fourth quarter, according to Michael S. Dell, chief executive officer and chairman of the board.

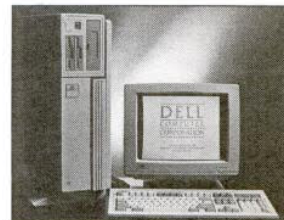
"IBM has assured us that a

license will be available which grants us license rights under their patents for use in our products," Dell said. "We are currently reviewing the terms and conditions of the patent license agreement and expect to complete a licensing agreement in the very near future." The license will include both present PS/2 patents and anticipated patents on Micro Channel technology, the company said.

Olivetti also intends to roll out a series of Micro Channel clones, according to Bob Garrett, the company's marketing manager in the United Kingdom. "We will ship Micro Channel in volume this year. Olivetti is committed to the architecture," Garrett said, speaking at the European introduction of a family of AT-compatible systems.

"There are no problems from IBM," added Filippo Demonte, vice president of Olivetti PCs, "because we have a licensing agreement which covers more than just the Micro Channel." Olivetti has been in discussions with Phoenix and Chips and Technologies regarding making MCA clones.

— *PC Business Week* staffer Paul Saunders and *InfoWorld* Hardware Editor Tom Moran contributed to this report.



Dell's System 500 is comparable to IBM's PS/2 Model 80.

IBM

Continued From Page 1

"This is the basis for what we see as being a beneficial long-term agreement," said Joseph Guglielmi, president of IBM's Applications Systems Division. IBM will market the new version of the system, but details of the specification and shipping dates were not available.

IBM's hardware will serve as the database server in the system, with the Metaphor software providing the front end to corporate databases, said David E. Liddle, chairman of Metaphor. "With the new offering, we will be able to access DB2, SQL, and the database manager in OS/2 Extended Edition."

IBM and Metaphor will also share their technologies, allowing IBM to incorporate Metaphor's user interface and icon innovation in future products. "We foresee other uses for the technology," Guglielmi said.

In addition to adding the graphic interface and tapping the database and communication functions of OS/2 Extended

Edition, the Metaphor project appears to be the first to take advantage of the Micro Channel Architecture of the PS/2.

"We plan to use all the facilities of the PS/2, including the Micro Channel, to run as fast as we can," said Liddle. "The Micro Channel will make performance high for certain tasks," such as transferring data, moving graphics on the screen, and performing analyses, he said. While non-Micro Channel machines could handle the tasks Metaphor handles, they would be noticeably slower, he said.

As the announcement was made, many observers speculated whether IBM will replace Presentation Manager with Metaphor's interface, in light of Apple's recent suit against Microsoft. Because the Metaphor system was commercially available before the Mac and is substantially different in its use of icons, it is a "clean" approach to windowing, said Liddle.

But IBM denied it is considering replacing Presentation Manager with the Metaphor interface. "The Metaphor interface can be constructed using Presentation Manager and other

interface facilities in the system," said Guglielmi. "Presentation Manager is a set of services used to construct an end-user interface. Metaphor will be a perfect example of Presentation Manager exploitation." The IBM version of Metaphor will support SAA.

Far from being a reaction to the Apple suit, IBM has been talking with Metaphor for nearly a year about working together, Guglielmi said.

Capping the deal, IBM has made a \$10 million investment in the privately held Metaphor. "This highlights the strategic element of the relationship we are forming," Guglielmi said. "It is a very comprehensive set of relationships."

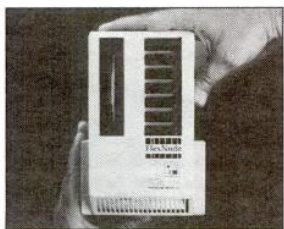
Metaphor will also receive payments and royalties on the products the joint technology agreement generates. Those payments bring the total value of the deal up to \$15 million, analysts said.

Metaphor, which canceled its plans for a stock offering after the stock market crashed last fall, will continue to sell its 68000-based systems under its own name.

WORLD



Miami's United Trust Fund installed a LAN to break its information bottleneck.....12



ALR's 20-MHz 286 and 386 systems are designed for use as small-footprint network nodes.23



Steve Hildago of Pacific Bell says customization is why his firm chose classroom PC training...38

AT DEADLINE *Continued From Page 1*

volume shipment date. One source inside the company also said that Intel is working on chips for cloning the other Micro Channel members of the PS/2 line.

However, John Flood, marketing communications manager for FMD, said "The 310 chip set is the only chip set we offer at this point in time." The new chip set is "100 percent compatible" with the Model 80, according to Flood.

Intel is confident that licensing Micro Channel technology from IBM will not be a problem. "If (IBM is) issued additional patents, we will determine the need, if any, for extending our existing broad cross-licensing agreements with IBM," the Intel representative noted. The new chips were built using ASIC and gate array libraries obtained from IBM in the fall of 1986 in exchange for the rights to manufacture Intel's 80386 processor.

The 82310 family includes five peripheral control components, including a VGA chip. Intel will announce pricing and the date of volume shipments later this year.

— Tom Moran

House Votes for Limited Ban on Toshiba

The House of Representatives last Thursday passed a modified trade bill providing for limited punishment of Toshiba Corp. for its sale of sensitive technology to the Soviet Union. By a vote of 312 to 107, the House imposed on Toshiba a three-year ban on doing business with the U.S. government, but the bill permits government purchases of Toshiba-made products sold under American companies' brand names. The Senate is expected to vote on the bill this week, but administration officials say President Reagan is likely to veto the bill if an amendment requiring firms to give workers notice of plant closings or layoffs is not stricken from it.

— Scott Mace

Apollo Slashes Series 4000 Prices by 35%

Apollo Computer slashed the prices of its 68020-based Series 4000 Personal Super Workstations, a move the company said brings a 4-MIPS workstation into the under-\$10,000 price range for the first time. The steepest reduction was 35 percent for the monochrome system, bringing the machine down to \$8,990; the color configuration was cut 26 percent to \$13,990. Apollo also introduced a \$3,500 floating-point accelerator board, based on Weitek's 3164 floating-point processor chip, that can boost speed by up to 300 percent.

— Martin Marshall

Xerox to Ship Update to Ventura Publisher

Xerox Corp. is scheduled to ship this week a minor update of its Ventura Publisher desktop publishing program that helps users import graphics files from Microsoft Windows applications. The update, called Version 1.12, contains a Windows metafile converter and will be automatically shipped to all registered Ventura users, said John H. Meyer, president of Ventura Software Inc. Meyer said the update will be formally announced at spring Comdex, adding that this does not mean that the major new version of Ventura Publisher — rumored to be out sometime this spring — has been significantly delayed.

— Eric Lach

HP's PCL Will Not Compete With Postscript

Hewlett-Packard Co. said last week that future versions of PCL, the printer language used in HP's highly successful Laserjet laser printer line, will not be positioned as a competitor to Adobe's Postscript language. "We don't intend to have PCL go up directly against Postscript," said Bill McGlynn, an HP marketing manager. Instead, the next version of PCL — called Level 5 — will mimic some of the "more popular elements" of Postscript but will fall far short of Postscript's high-end functionality, McGlynn said. Level 5 will ship this fall, he said.

— Eric Lach

NEWS

Corporate acceptance of OS/2 will depend in large part on the success of the Extended Edition..... 5

Intel has confirmed a bug in its 80386 chip running 32-bit versions of Unix with an 80387 coprocessor..... 5

Electronic Form Systems will show a 286-based laptop that comes with a printer, modem, and telephone... 5

A recently released compiler converts worksheets into C language source code for stand-alone use..... 6

Compaq's first-quarter sales more than doubled last year's for the quarter..... 6

Lasermaster is developing a 1,200-dot-per-inch laser typesetter that can be upgraded to 2,400 dpi..... 6

Licensees of Microsoft's LAN Manager are still unsure of how to differentiate their products..... 8

A series of IBM-sponsored conferences are examining the computing needs of various industries..... 8

A virus infecting Macs seeks the signatures of EDS software..... 8

NETWORKING

Enhancements will be made in July to a nationwide research and super-computer network..... 11

A Miami leasing firm opted for a LAN rather than minicomputers to solve its information problems..... 12

SOFTWARE

Symantec and Metier announced a link between their microcomputer project management packages..... 17

HARDWARE

Zenith introduced a line of high-power 286- and 386-based laptops. 23

Texas Instruments announced a floating-point chip that operates up to 600 times faster than the 80387. 28

MACINTOSH NEWS

A California firm is developing a low-cost Ethernet adapter for the Mac SE..... 29

UNIX

Sun Microsystems has released specifications for two Memory Management Units used in designing SPARC systems..... 31

INDUSTRY

The issues behind Apple's copyright infringement suit against Microsoft have been simmering for some time..... 33

MANAGEMENT

PC support managers say classroom-style instruction is the most effective way to teach computer users..... 38

PRODUCT COMPARISON

Full-featured accounting systems can handle all aspects of a company's books. In this product comparison we look at 11 high-end accounting packages..... 43

PC fax boards are becoming a limited alternative to stand-alone fax machines. This product comparison examines seven such boards..... 57

COLUMNS

Tech Street: John Gantz..... 36

Tech Talk: Steve Gibson..... 36

To the Editor..... 40

The Technology Show: George Morrow..... 42

First Look/Aldus Pagemaker 3.0: Michael J. Miller..... 71

Hardware Spotlight/UDS V.32 modem: Stephen Satchell..... 73

On the Horizon: William F. Zachmann..... 74

Notes From the Field: Robert X. Cringely..... 94

EDITORIAL, ADVERTISING, AND BUSINESS OFFICES: 1060 Marsh Road, Suite C-200, Menlo Park, CA 94025. (415) 328-4602. Telex: 176072 (InfoWorld MNP). CompuServe: 73267,1537. The Source: TCX939. MCI Mail: 259-4127. **POSTAL INFORMATION:** Second-class postage paid at Menlo Park, CA, and additional mailing offices. InfoWorld (ISSN 0199-6649) is published weekly by InfoWorld Publications Inc., 1060 Marsh Road, Suite C-200, Menlo Park, CA 94025, a subsidiary of IDG Communications Inc., 375 Cochituate Road, Framingham, MA 01701. **REPRINTS:** Copyright 1988 by InfoWorld Publications Inc. All rights reserved. Reproduction of material appearing in InfoWorld is forbidden without written permission. Send all reprint requests to Permissions Editor, InfoWorld, 1060 Marsh Road, Suite C-200, Menlo Park, CA 94025. **PHOTOCOPY RIGHTS:** Permission to photocopy for internal or personal use or the internal or personal use of specific clients is granted by InfoWorld for users through the Copyright Clearance Center (CCC), provided that the base fee of \$3.00 per copy of the article, plus \$.50 per page is paid directly to Copyright Clearance Center, 27 Congress Street,

Salem, MA 01970. Please specify: ISSN 0199-6649. Permission to photocopy does not extend to contributed articles followed by this symbol: †. InfoWorld can also be purchased on 35mm microfilm from University Microfilms, Periodical Entry Department, 300 N. Zeeb Road, Ann Arbor, MI 48106; (313) 761-4700. **SUBSCRIPTIONS:** Address subscription inquiries to InfoWorld, P.O. Box 5994, Pasadena, CA 91107, or call (818) 577-7233. InfoWorld is distributed free of charge to qualified buyers of microcomputers and related products. To all others, the one-year basic rate for the U.S. and Canada is \$100. For rates to other countries, please write the publisher. The single copy price is \$2.95. All subscriptions payable in U.S. funds only. Please allow four to six weeks for new subscriptions to begin. **CHANGE OF ADDRESS:** Please allow four to six weeks for change of address to take effect. **POSTMASTER:** Send change of address to InfoWorld, P.O. Box 5994, Pasadena, CA 91107. Macintosh is a trademark of Apple Computer Inc.