DIGITAL RESEARCH NEWS

FOR DIGITAL RESEARCH USERS EVERYWHERE — THIRD QUARTER VOLUME 2, NO. 3

CP/M 3.0, the latest version of CP/M, will be introduced this fall by Digital Research following final preparations by 3.0 team (left to right) Dave Brown, Doug Huskey and Kathy Strutynski.

INSIDE DIGITAL RESEARCH

CP/M®3.0 receives last touches as 2.2 is at peak

At the same time that CP/M 3.0 receives final touches before introduction this fall, CP/M 2.2 sales have reached an all-time high. According to Digital Research Chief Operating Officer John Rowley, "Just when our 2.2 orders have reached a peak, we are approaching the introduction of our latest version of CP/M — CP/M 3.0. We expect immediate acceptance of the new 3.0 version by OEMs when it is released."

With 8-bit hardware sales running strong, Digital Research's industry-standard CP/M 2.2 operating system continues its sweep of the 8-bit field. More than 700 OEMs are using CP/M 2.2 and more than 3000 application programs have been written for the operating system. Industry experts estimate that some 700,000 microcomputer users are taking advantage of CP/M 2.2 capabilities at the present time.

The appearance of National Semiconductor CMOS Z-80 equivalent devices, the Zilog Z800, and the 10 mHz Intel 8085, plus the trend toward larger memory in 8-bit hardware, indicate that the 8-bit microprocessor will remain strong through the 1980s, Rowley commented.

More memory

Explaining Digital Research's commitment to 3.0 during a period of continuing 2.2 success, Kathy Strutynski of DRI's Operating Systems Strategic Business Center said, "We recognize that there is hardware out there now that can do more. Lots of companies are offering more than 64K, and we wanted to give them the performance that is possible with more memory."

CP/M 3.0 will be fully upward-compatible with CP/M 2.2 at the functional level. Application software will

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Field operations gear up for sales and service

The pieces of the Digital Research field organization are falling into place with the establishment of a field operations headquarters office in Palo Alto, Calif.; an eastern regional office in Boston, Mass.; a southwest regional office in Los Angeles, supported by a Sierra Madre, Calif. group; and new developments in European sales support.

Stephen Maysonave, director of field operations, gives an overview of the new efforts: "We are putting in place a field organization that can respond quickly to OEM sales opportunities, provide technical support and educational services, and also provide services to our distributors."

U.S. sales offices

The U.S. sales headquarters are locataed at 1860 Embarcadero Road, Suite 215, Palo Alto, CA 94303; phone (415)856-4343. The office will include a demonstration center and will provide full sales and support services

At this time, most Northern California regional sales are handled by Bill Haufe, with Northwest regional sales efforts headed by Mike Smith, who are both working out of the Palo Alto office. Jim Tillinghast, in charge of North American distributor support, and Dan Simchuk, DRI national technical support manager, also are at the Palo Alto location. (For more on DRI's distributor network, see the related story in this issue.)

On the East Coast, Bruce Cohen heads up the field sales and support group, now located at 6 New England Executive Park, Burlington, Mass. 01803. The office will move next door to 8 New England Executive Park by Oct. 15. The eastern regional office phone number is (617)229-6222.

The new eastern office will serve

See Field operations, page 6

Packaging and documentation are redesigned

"In line with our recent moves to expand our marketing efforts, we have redesigned our product packaging and documentation," Rick Magnuson says. Magnuson, Digital Research's retail marketing manager, emphasizes that the new merchandising effort is not merely cosmetic, but is part of a total effort to better serve Digital Research customers.

Setting up the retail marketing effort — which is closely coordinated with new distributor networks — begins with making sure that the most appropriate Digital Research products are placed on the shelves of the retail stores. Support programs for retailers are important, including training retail salespeople about Digital Research products and how they work. But packaging and documentation are the first examples of Digital Research's orientation toward the vertical market.

Packaging designed for presence

"Packaging must be designed to have 'presence' in the store; it has to be seen and recognized," Magnuson commented. "At the same time, we want to reflect the quality and professionalism of Digital Research —we want to look like the industry leader we are." Furthermore, the packaging has to be attractive and appropriate for placement in professional and end-user settings as well. "It should look good on the job as well as in the store," he added.

A California-based design group has been involved in the packaging redesign. Documentation, too, has been upgraded, with typeset manuals and other product information to become standard. Documentation also will make use of the visual impact of two-color printing, with second colors used to highlight important information.

Products are interrelated

"The entire redesign effort is driven by the concept of the CP/M Library," Magnuson said. "The CP/M Library idea conveys the message that our

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Digital Research products, as part of the CP/M Library, will have a new look, explains DRI Retail Marketing Manager Rick Magnuson.

Digital Research broadens distributor network

"We're developing a set of strategies to improve access to dealers, open channels to end-users and help ISVs by creating a draw at the retail level for CP/M applications," Jim Tillinghast explains. "To do all that we need a strong distributor network across the United States and abroad, and a complementary retail marketing effort."

Tillinghast, Digital Research's North American distribution manager, recently took time out to explain the move toward broadened distribution of Digital Research products. "Right now we're selecting distributors for our products very carefully, making judgements on the basis of a distributor's proven stability, its geographical area, the number of retail outlets it can serve, its commitment to Digital Research products and other factors. We want to make sure that retailers will receive the kind of support from distributors that reflects our quality image in the software industry."

The Digital Research products that will be carried by distributors, who in turn place them in retail computer stores, will include Concurrent CP/M-86™ for the IBM PC and CP/M-86™ for the Displaywriter; languages such as CBASIC®, the CIS and Level II COBOLs™, and Pascal/MT+; development tools, such as Access Manager™ and Display Manager™; and the new graphics packages, GSS-KERNEL, GSS-PLOT and GSS-4010 which also have end-user and programmer appeal.

"End-users want our operating systems because there's an application or set of applications out there they want to take advantage of," Tillinghast said. "They want our language and programming tools to write applications, and they'll want our graphics software to help make applications easier to use and more interesting."

Distributor and dealer programs

Digital Research plans to institute a large-scale educational effort to train distributors and their staffs on the hows and whys of CP/M-related products. In addition, sales and technical support will be strengthened, and new efforts to help retailers directly also will be started.

Dealer support services are now being planned, according to Retail Marketing Manager Rick Magnuson. "We're coordinating our efforts with the distributor-related effort," Magnuson explained. "We are choosing the products we think are best for the retail shelves; we're making sure they are packaged and documented appropriately for the end-user; and we're establishing programs that support the dealer either directly or through distributors — such as presenting dealer training courses and providing display cases for our products and other point-of-purchase materials." One major part of the retail marketing efforts is the redesign of all Digital Research packaging and documentation.

The new distributor and dealer programs are part of the overall Digital Research reorganization plan that includes the establishment of a field operations organization directed by Stephen Maysonave. A series of regional field offices are being set up, with the U.S. field operations headquarters in Palo Alto, Calif., a southwest regional office in Los Angeles headed by Mark Plinneke and an Eastern regional office in the Boston area already in operation with Bruce Cohen in charge. Four other field offices will be set up by the end of 1982. A European office also is planned that will work closely with Vector International.

The field offices will support distributor and dealer programs with on-the-spot support and service, including educational and training programs as well as pre- and post-sales support to large end-users. Field offices will have on board distributor specialists to handle these responsibilities. Currently, Van Crandall in the Palo Alto office and Mike McCarthy in the Boston office are providing specific distributor services.

Support for distributors

Dan Simchuk, national technical support manager who is based in the Palo Alto U.S. headquarters, is responsible for selecting and placing technical support specialists in all the field offices. "We are establishing a team selling approach," Simchuk said, "by matching every sales person with a technical person. They will make joint sales calls to OEMs and distributors, and discuss the implementation of our software on user systems."

Currently, Andy Glick is the technical support specialist in the Los Angeles office; Bill Schwegler is based in Palo Alto and Bruce Arwine, Mike Segroves, and Dan DeVitt are based in the Boston field office.

Distributors, retail stores join team

According to Bill Smale, distributor support coordinator, a number of large distributors as well as the largest chain of retail stores have already joined the Digital Research team. Distributors which have signed agreements with Digital Research include Hamilton-Avnet, Torrance, Calif.; FMG Distribution, Fort Worth, Texas; Veritas Technology, San Jose, Calif.; Kurka Corporation, Walpole, Mass.; Processing Enterprises, Houston, Texas; and Blue Chip Software, Victoria, B.C., Canada. Veritas, Kurka, and Processing Enterprises are heavily engaged in distributing IBM PC and Displaywriter-related products, for which Blue Chip Software offers a variety of DEC-related software.

ComputerLand agreement

In a recent development, Digital Research and ComputerLand also have reached an agreement under which this large chain of computer stores will carry Digital Research products.

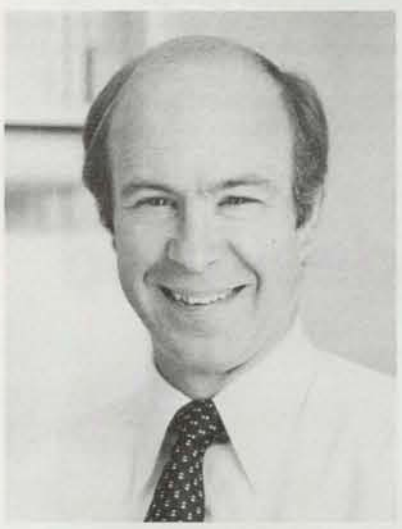
In Pacific Grove office

Five new DRI managers are named

Digital Research Inc. has welcomed several new managers recently in the Pacific Grove office.

As chief financial officer for Digital Research **Stan McKee** will bring a financial perspective to the company's management team. He is responsible for all internal and external financial matters as well as data processing, personnel and facilities.

Before accepting the newly created position at Digital Research, McKee was president and chief financial officer of Food Horizons, Inc., a venture backed company he founded in 1977 and sold recently. From 1970 to 1977 he was a manager in the management information consulting division of Arthur Andersen and Company.



Stan McKee
Chief Financial Officer

McKee holds an M.B.A. from Stanford University and is a C.P.A. in the state of California.

Greg Walberg has been appointed director of Manufacturing Operations. He comes to DRI with five years experience as manager of manufacturing and quality assurance at Memorex Corporation and two years as manager of production and quality control at Finnigan Corporation.

Walberg attended the University of Santa Clara and has B.S. degrees in mathematics and chemistry.

Greg Walberg
Director of Manufacturing Operations

Explaining the two divisions within the Digital Research Manufacturing Operations, Walberg said, "The materials group procures all the materials needed to make our products, and coordinates and schedules production and inventory control. The production group does the actual production, including software duplication onto disks, the packaging and shipping."

Walberg said he plans to consolidate the manufacturing stages into one facility and he expects the manufacturing group to double in size rapidly.

Customer Support Manager **Juli Harvey** says, "In view of Digital Research's stated commitment toward tightening, strengthening and professionalizing its management team, I find it exciting to be a contributing part of that initial growth and framework." At DRI she is coordinating and managing four departments: Legal Services, Sales Support, Customer Services and Order Processing.

Harvey lived and worked in Europe for eight years. She was a senior corporate sales representative and regional sales manager for TWA, regional sales manager and director of sales and marketing for Odyssey Enterprises, and worked in public relations and advertising for Rockford Marketing.

She has a B.A. in business administration in international marketing and sales management, has done graduate work at Wharton School of Business and USC, and is working toward a masters in business administration in international marketing. Her professional background also includes finance, marketing research, economics and law. She leads a number of seminars on topics such as women in business, market research and management training.

Juli Harvey
Customer Support Manager

Named manager of Data Processing at Digital Research Inc. is **Ralph Seifert.** Previous to this appointment he was principal programmer analyst at Icot Corporation. He also has been software manager for Digital Equipment Corporation, systems analyst at Daconics/Xerox Corporation, and development software engineer at Measurex. Seifert, who received a B.S. degree at the University of Notre Dame, also worked at Rockwell International for four years.

Seifert is responsible for running the computer center at Digital Research. "As the company grows, Data Processing's functions will increase," Seifert predicts. He expects rapid growth in the Data Processing department.

Ralph Seifert
Data Processing Manager

"Microcomputers are the most exciting part of this industry," stated **Kevin Wandryk**, Digital Research's newly appointed product marketing manager for operating systems, "and Digital Research has the leading edge in the market."

Wandryk, DRI manager of the 8086 operating systems and for the packaged operating systems, will serve as a liason between the MARCOM department and the Operating Systems SBC systems will look for long-

See Managers, Page 6

Kevin Wandryk
OS Product Marketing Manager

Development and marketing of graphic products for programmers and non-programmers is the responsibility of the Graphic Strategic Business Center team of (left to right) Rita Kan, Toni Li, Russell Weeks, Jason Loveman, Susan Miller and Fred Langhorst.

Graphics group formed into strategic business center; Langhorst is director

Headlining the last issue of *Digital Research News* was a story on Digital Research's new thrust into the graphic software field and the joint development and marketing agreement with Graphic Software Systems.

In the latest graphics move, Digital Research Chief Operating Officer John Rowley has announced that the fledgling graphics development group has been elevated to the status of a strategic business center, on a par with the Operating Systems and Languages SBCs. (An SBC is responsible for its own product development and marketing. This structure gives SBCs the opporunity to plan and operate independently of each other for greater responsiveness in a dynamic market.)

"Fred Langhorst will be at the helm of the new Graphics SBC," Rowley said. "His title will be director of graphic products. We feel that graphics will represent the highest growth-rate product line for us as early as next year."

The new Graphic SBC is engaged in building up its ranks at the moment, with a product marketing manager, administrative assistant and three software engineers already on board.

According to Russ Weeks, product marketing manager, the new SBC is "responsible for development and marketing of graphic products for both programmers and non-programmers. All our graphic products are implemented through extensions to operating systems. We have had amazing response to our initial offerings at NCC and NCGA trade shows in June, and at SIGGRAPH in Boston during July. A number of large OEMs are opening negotiations with Digital Research for use of the graphic software products."

Graphics products available

Initial product offerings for programmers include GSS-KERNEL, a 2-D graphic subroutine library that is consistent with the emerging ISO graphic standard, GKS (Graphical Kernel System); GSS-PLOT, a subroutine library with higher level functions for developing application packages with bar, pie and line graphs and charts; and GSS-4010, a product that provides Tektronix 4010 terminal emulation for desktop computer systems with graphic hardware. A set of graphic extensions to the CP/M family of operating systems, called GSX, will provide the device independence desired by programmers to make graphic applications portable.

"An important part of our strategy is the push toward standardization," said Langhorst. "This is consistent with the history of Digital Research and the evolution of our operating systems and languages. CP/M has become an industry standard that contributed greatly to the growth of the microcomputer software business. Now we're working to make GSX and GKS the standards on which to base microcomputer graphic applications."

The graphic products, produced in conjunction with Graphic Software Systems and exclusively marketed by Digital Research, can be used with a large number of popular microcomputers and peripherals, including graphic terminals and pen plotters.

Dual processors run 8- and 16-bit software

Dual processors, a new trend in hardware design, is making it possible for CP/M users to run present 8-bit application software side-by-side with the new 16-bit software. Dual processors, thus, are solving the software shortage problem encountered by some 16-bit users.

The new generation 16-bit chips are appearing in increasing numbers in small computer systems. Digital Research founder and President Gary Kildall predicts they will "provide a base for application software that will rival most minicomputers and mainframe offerings in the years to come."

But the new computers, although they offer more speed and processing power than traditional 8-bit machines, currently suffer from a lack of commercial-grade application software. In contrast, there are thousands of application programs available for today's 8-bit microcomputers.

Low cost of chips

Several desktop computer manufacturers are taking advantage of the low cost of microprocessor chips by putting two of them in their computers. These machines are called "dual processors." The new machines run both 8-bit and 16-bit software without intervention by the operator.

There are advantages, from a programmer's viewpoint, that sometimes make 8-bit processors more suitable to a particular application, and other advantages that make 16-bit processors preferable at other times. Now, with dual processors, programmers can select which processor they want to use, in the same machine.

Upward compatibility is important

The upward compatibility of the 8-bit CP/M operating system with the 16-bit CP/M-86 operating system makes dual processor computers particularly useful. "Upward compatibility is the important issue," said Kildall. "The software writer has to deal with file formats, data formats and machine instructions when moving into the 16-bit world. The CP/M environment is built specifically so that only the machine instructions need change when software moves to the 8086 chip."

File format compatibility means that a diskette can be used for both CP/M and CP/M-86 without change. Word processing text files in CP/M can be read using CP/M-86, or mail list programs in CP/M can be processed without change under CP/M-86. "We don't force the programmer to choose, as do other 16-bit operating system manufacturers," Kildall explained.

Data formats also are identical for CP/M and CP/M-86, an important advantage to the software writer, though not so critical to the consumer. The software vendor can convert application software from the 8-bit to the 16-bit operating system much more easily, and with less error, because data area definitions are the same for both operating systems.

For the 16-bit world

"File format compatibility means that all fixed and removable storage devices are shared between both processors. Data format compatibility means that CP/M-86 may replace CP/M so that only one operating system is needed to support both processors. CP/M-86 is the only operating system that provides this integrated application environment for dual processor computers," said Kildall.

Digital Research currently is supporting OEM dual processor development through its OEM System Engineering Group.

"Media Quotes"

Digital Research continues to make news in the industry and general press. Following are excerpts from articles which have appeared recently.

"Almost any kind of computer you buy these days will be compatible with CP/M, and almost any kind of software will come in CP/M versions. To put it another way, you should be wary of any machine or any program that won't run CP/M."

Atlantic Monthly, July 1982

"You can begin looking for CP/M-68K -- a 68000 version of the widely used operating system from Digital Research . . . In an agreement with Hitachi Ltd (Tokyo), Digital Research will offer the operating system along with several languages . . . Reportedly, the implementation is for a Hitachi 68000-based desktop system that should be introduced around the same time."

EDN, March 31, 1982

"Digital Research has struck a blow at . . . criticism of its CP/M-86 operating system by unveiling two new versions, one for the Intel 8086 and one for the Motorola 68000 . . . The Digital Research-Hitachi agreement will bring CP/M on the 68000 onto the marketplace by this autumn . . . ."

Computing (London, England), March 18, 1982

"There exists a gaggle of applications programs that run under the highly popular CP/M operating system out of Digital Research. That popularity stems primarily from the fact that CP/M runs on the Intel 8080 microprocessor and the Zilog Z80, which is upwardly compatible with the 8080, and those two chips dominate the 8-bit world. Some of the uniformity is also being anticipated with 16-bit processors."

Datamation, June 1982

"CP/M has been sine qua non for the top of the microcomputer market since day one, and its adaptation to the (IBM) pc just continues the trend that no machine can be a viable marketplace competitor without providing CP/M compatibility."

Softalk, July 1982

"CB-80 is a useful and well conceived product which has already gained acceptance amongst many demanding users for development of complex applications. Most CBASIC programs can be transported easily, and CB-80 is fast! . . . I highly recommend CB-80 to any prospective user . . ."

Lifelines, March 1982

"That appears to leave a big opening for Digital Research's Concurrent CP/M-86. The importance of concurrency cannot be overstated. Two years from now, all 16-bit microcomputers will have concurrency . . . CP/M-86 will increase speed and add error-handling capabilities. CP/M-86 already provides an upgrade path to MP/M-86 . . . Digital Research's Concurrent CP/M-86 will give people a means of getting more work out of their computers."

BYTE, July 1982

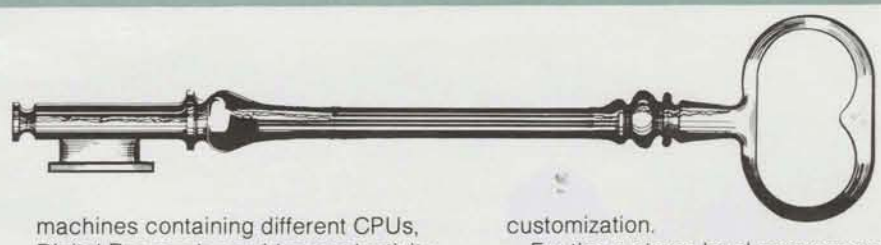
Where are we?

Main Switchboard
(408)649-3896

Customer Service
(408)649-5500

Support Center
(408)375-6262

COMPATIBILITY:
The Key to CP/M



By Michael Lehman

The key to the success of CP/M as a widely accepted operating system is compatibility. This compatibility ranges from hardware compatibility, data interchange and flexible operating system options to a vast array of compatible software.

The CP/M operating system's primary feature is its ability to support the concept of "Object Code Transportability." This means that a program which works on one CP/M system will work on another CP/M system even if the CPU, disk, terminal and printer are all different. One system could have an 8080, a mini-floppy, a teletype and a matrix printer while another could have a Z80, a hard disk, an intelligent terminal and a letter quality printer. The user software interacts with these devices via CP/M which hides the differences so that each application program perceives the system to have the same basic capabilities.

CP/M also supports compatibility by defining a standard for data interchange. Application programs can operate on a data file and that file can be moved to another system. Because of the standard CP/M format, the other system may contain a different type of CPU (e.g. 8080/Z80 disk moved to an 8086/8088), or a single system could contain two CPUs simultaneously and a single data file could be manipulated by programs running on either CPU.

In addition to hardware and data compatibility, the CP/M family of operating systems ranges from single-user, single-tasking (CP/M) through networked (CP/NET®) and single-user, multi-tasking (Concurrent CP/M) to multi-user, multi-tasking (MP/M™). Applications programs which adhere to the CP/M standard interface can run on all of these compatible operating systems. This provides the user with an upgrade path as requirements and hardware grow. No other microcomputer operating system family provides such a broad range of operating systems while still maintaining object code transportability.

Just as CP/M provides object code transportability, Digital Research provides source code transportability using our line of quality languages. Programs written in a Digital Research language run virtually unmodified across the entire range of CPUs on which CP/M is running (8080, 8086/8088 and 68000).

This provides the software writer the opportunity to write an application program once and distribute it to a wide audience of computer owners with different hardware configurations and different CPUs. The program maintenance and improvement costs are significantly lower which means that the software writers can provide improved functionality to all of their users simultaneously.

In addition to compatibility between machines containing different CPUs, Digital Research provides productivity tools which provide compatibility between programs written in different languages and between programmers.

Access Manager™ provides a common data file format between programs written in different languages just as CP/M provides a common disk format between different configurations and CPUs. Programmers now can write applications which create indexed data files and manipulate the file in whatever language is convenient.

No longer is a user required to use the language the software was written in, but may use the language the user is most comfortable with. This greatly increases the flexibility of an application program for both the user and the software writer.

Display Manager™ provides a portable interface to display devices. Screen oriented programs can now be written which need not be manually reconfigured for each terminal device. A software writer can use such features as highlighting and underscoring and if the user's terminal does not have these features, Display Manager will automatically adapt to the user's hardware. This will increase the availability of software which uses display devices efficiently. It also will provide a method for owners of less capable terminals to use the software without customization.

For the systems level programmer, the Symbolic Instruction Debugger (SID™)is a tool which is compatible with Digital Research languages. The linkers which accompany the language products can produce a .SYM file containing information regarding the location of variables and subroutines in the compiled and linked program. The user then can set breakpoints, display and modify memory using symbolic names. This provides the programmer the ability to debug without remembering where the linker located each item in the computer's memory.

Also for the systems programmer is XLT86™ which will convert assembly language programs for the 8080 into their equivalent program for the 8086/8088. Unlike other converters, XLT86 actually compiles the 8080 assembly language into 8086/8088 assembly language, keeping track of register and flag usage so that the resulting code is a true optimized translation and not just a transliteration.

In summary, Digital Research provides a family of compatible operating systems, compatible languages and compatible productivity tools which allow users and software writers to take advantage of a wide range of hardware including computers with different CPUs. Continue to look to Digital Research for compatible solutions to the software challenge.

Catalog lists 8-and 16-bit software applications

More than 350 companies and their CP/M compatible applications software are listed in the 1982 catalog now available from Digital Research. Plans are underway for the next annual edition of this publication and anyone who wishes to be included may request an application form from DRI.

The 1982 edition of the CP/M Compatible Software Catalog is now being distributed by Digital Research, computer retailers, distributors, system houses and microcomputer manufacturers.

The Digital Research publication includes descriptions of more than 350 companies and their products that are compatible with the CP/M family of operating systems and languages. Special features of the current edition are listings of 8- and 16-bit applications, international listings, an application cross reference, listings by companies and products, and reference by language. In an entirely new second section, products are described and listed by language capability: CBASIC, CBASIC-86™ and CB-80™; Pascal/MT+; and PL/I-80™.

Price of the two-color, 100 page publication is $10 per copy. Contact Digital Research Customer Service at (408)649-5500, P.O. Box 579, Pacific Grove, CA 93950, for more information.

Plans are underway for the 1983 catalog. Applications for inclusion in that edition will be mailed this fall. Any company that wishes to be listed in the CP/M Compatible Software Catalog may request an application form from Catalog Coordinator Nan Bomberger, Digital Research Inc., P.O. Box 579, Pacific Grove, CA 93950.

The CP/M Compatible Software Catalog is published annually by Digital Research to keep its customers informed of the number and variety of compatible application software packages produced by independent vendors. "The CP/M Compatible Software Catalog is a necessary tool for everyone operating in the software market — vendors, end-users, dealers and OEMs," said Gordon Eubanks Jr., Language Division vice president for Digital Research.

SUPPORT CENTER FORUM: Here are the answers to some of the questions asked most frequently at Digital Research Support Center

In this and subsequent issues of the *Digital Research News*, we will feature frequent user inquiries with solutions determined by Technical Support department analysts.

Q. How can I use PIP to transfer data between two computers?

A. PIP must be modified to perform this function. This involves creating machine language I/O routines and patching them into PIP, so that you may use PIP's INP: and OUT: functions. The patches and instructions for using them are available through the CP/M USERS GROUP, 1651 Third Ave., New York, NY 10028.

Q. When using CBASIC 2 I have OM errors, but when I execute a FRE function it shows that there is plenty of free space. Why?

A. CBASIC allocates and frees storage for string variables dynamically. When it frees storage it combines the freed adjacent storage into one contiguous area, but does not combine non-adjacent areas. It could happen that there would be fragments of free space all through storage, but not enough contiguous space to meet the current need. There are two main ways that a programmer can minimize the fragmentation of storage.

1.) INITIALIZE STRINGS TO THE MAXIMUM LENGTH THAT THEY WILL ENCOUNTER, e.g. NAME$ = LEFT$ (BLANK$, MAXNAME$). CBASIC will attempt to use the same space each time NAME$ is changed. Since subsequent strings will be less than or equal in length to the original string, the old space will always be used over again.

2.) 'CHAIN' A PROGRAM TO ITSELF. Each time a program executes a CHAIN statement all string variables not in COMMON are set to null strings and the available space is grouped into the largest possible contiguous blocks of memory. REMEMBER that any arrays that are not in common will be lost when you chain.

Q. When using MP/M II, I cannot save a file after editing it under RDT or DDT. The "Wnnnn" command returns a "?".

A. You need to do an "I file spec" command just before doing the "Wnnnn" command in order to give the debugger a file name to write out to.

Q. When using PLI-80 I cannot sucessfully reopen a file after I have closed it after reaching the end of file. What is wrong?

A. You probably are trying to close the file in a BEGIN block following an ON ENDFILE . . . statement. As mentioned on page 52 of the Language Manual, this cannot be done. You can exit from the BEGIN block by using a non-local GO TO, and then close the file. You should then be able to reopen the file.

Q. When I use the COPYDISK utility to make back-ups of my CP/M-86 DisplayWriter system disk I either 1) hang the system between read and write errors or 2) get read or write errors when I try to use the back-up disk generated by COPYDISK.

A. Maintenance release 1.10 of CP/M-86 for the IBM DisplayWriter contains a corrected COPYDISK utility. It is being mailed to all registered users (those who have sent in their cards).

Q. When I try to link the PASCAL demonstration program, CALC, the linker crashes or gives the error message 'Incompatible relocatable file' when processing one of the .ERL files. I am running with 8" double density or 5&1/4" double density diskettes.

A. When running with other than 8" single density diskettes, the PASCAL .ERL files are corrupted if the CBIOS blocking/deblocking algorithm is not correct, or if the Download program is not correct. CP/M 2.2 patch #01 (available by writing to TECHNICAL SUPPORT, P.O. Box 579, Pacific Grove, CA 93950) can be used to correct the CBIOS blocking/deblocking algorithm. If the patch is applied and the problem persists, consult the author of the Download program.

CP/M'83 is scheduled in San Francisco, Jan. 21-23

Digital Research Inc. will sponsor CP/M '83 — an international conference and exposition for end-users, developers, distributors and retailers of CP/M software — Jan. 21-23 in Moscone Center, San Francisco. The show will be produced by Northeast Expositions Inc., a major producer of public computer shows.

CP/M '83 will feature hundreds of exhibits that will showcase the full spectrum of application packages, development aids, peripherals, accessories, publications and services available to microcomputer software users. In addition, dozens of workshops, led by world authorities on CP/M, including representatives from Digital Research, will help those who attend the show understand, use, develop and market CP/M software.

Thousands of people are expected to fill Moscone Center for the event next January. A large scale advertising and promotion effort, with advertisements in the major computer magazines, as well as displays and literature at distributorships and retailers, is aimed at attracting attendees. A direct mail campaign also is targeted at some 700,000 CP/M users.

Northeast Expositions, which is working directly with Digital Research in the production of CP/M '83, has produced other major computer expositions and conferences, including National Computer Shows and Applefests in major cities around the country.

Further information on CP/M '83 is available from Northeast Expositions Inc., 824 Boylston St., Chestnut Hill, MA 02167; (617)739-2000.

Following CP/M '83, Digital Research will present a seminar, Jan. 24-28, for ISVs in Pacific Grove, Calif. Details may be obtained from Seminar Coordinator Peggy Anderson, P.O. Box 579, Pacific Grove, CA 93950; telephone (408)646-6012.

Educational support

Graphics and Operating Systems Seminars planned

A graphics seminar has been added to the support program provided by Digital Research Inc. The new educational offering will be presented Nov. 17-19 on the Monterey Peninsula to introduce Digital Research graphics products and personnel. Preliminary plans include oral presentations combined with demonstrations and "hands-on" experience.

Digital Research entered the graphics field early this summer following a joint development and marketing agreement with Graphic Software Systems, Inc. Since that time the graphics group at Digital Research has been elevated to a strategic business center, on a level with DRI Languages and Operating Systems SBCs. Company officials have pledged to push toward standardization in graphics comparable to the standardization achieved in languages and operating systems. (See related article in this issue of *DR News*.)

Brochures announcing the program and other information on the Graphics Seminar are available from Seminar Coordinator Peggy Anderson, P.O. Box 579, Pacific Grove, CA 93950.

OS Seminar scheduled

The three-day Operating Systems Seminar for Original Equipment Manufacturers will be presented Sept. 22-24 at Asilomar Conference Center in Pacific Grove, Calif. Late registration information is available from the Digital Research Seminar Coordinator.

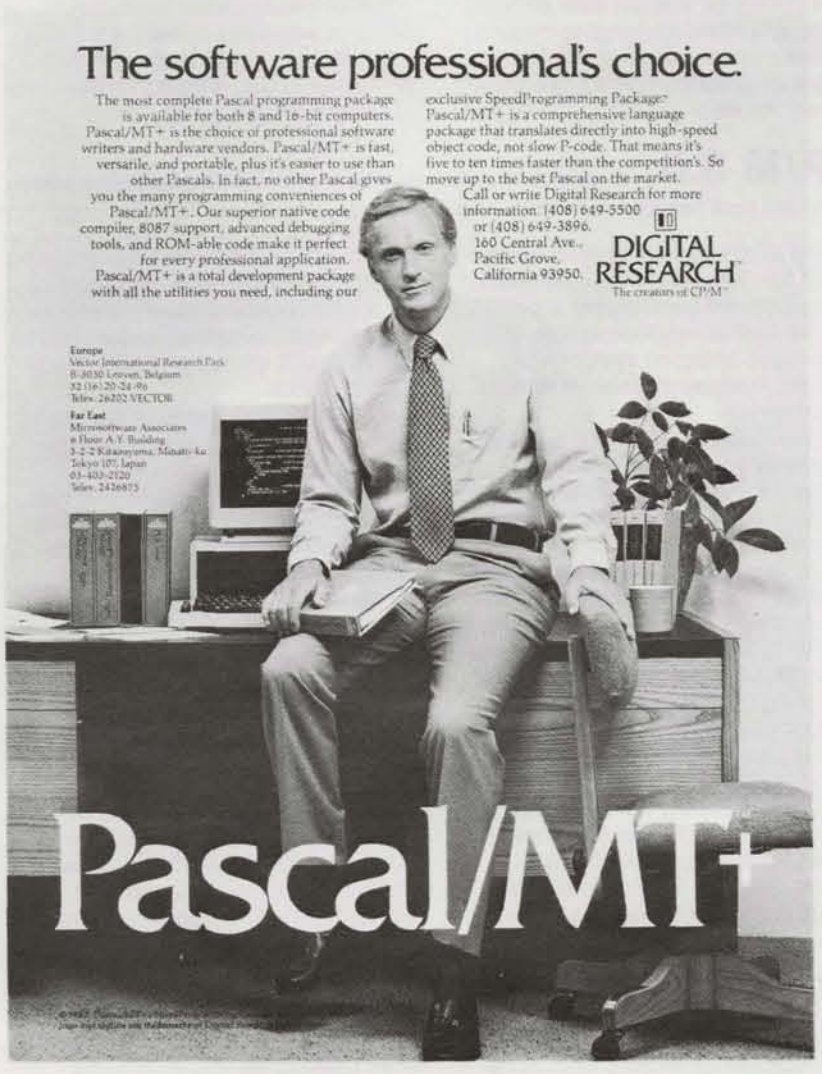
The OS Seminar is designed for OEMs or systems consultants who need more in-depth information to develop and support I/O systems and applications for DRI operating systems. Approximately half the seminar will be devoted to customization and debugging I/O systems. Working knowledge of the CP/M operating system is a prerequisite.

Participants may register for either the 8- or 16-bit systems implementation sessions. Topics include: structure and configuration of the hardware-dependent BIOS; preparation of a disk definition table for disk subsystems; disk file random access techniques; memory management; overview of CP/NET; implementation of CP/M-based CP/NET slaves and MP/M based CP/NET masters; overviews of MP/M II; and a new session on programming in a shared environment.

One evening will be devoted to a round table discussion during which attendees will be encouraged to express their expectations about operating systems. Digital Research uses this information to help develop its new products, policies, and licensing and support practices.

Cost of the Operating Systems Seminar is $500 which includes continental breakfast and lunch each day, an evening wine tasting, a notebook of speakers' materials and the appropriate documentation.

Additional seminars to be presented by Digital Research include an ISV conference in January and an operating systems workshop in February.



These Digital Research advertisements have appeared recently in industry publications.

CP/M Users Groups

California:

North Orange Computer Club
P.O. Box 3616
Orange, CA 92665

SMUG (Sacramento Micro-Computers Users Group)
Dave Minton
P.O. Box 161513
Sacramento, CA 95816

Valley Computer Club
Sy Lieberman
P.O. Box 6545
Burbank, CA 91510

PL/I-80 Users Group
c/o Monterey Computers
494 Alvarado, Suite A
Monterey, CA 93940
Attn: Jerry McConnell

Colorado:

Denver Amateur Computer Society
Jim Clark
P.O. Box 1235
Englewood, CO 80150

Connecticut:

Connecticut CP/M Users Group
110 Day Hill Rd.
Windsor, CT 06095

District of Columbia

Washington D.C. CP/M USER's GROUP
7315 Wisconsin Avenue
Washington, D.C. 20014

Illinois:

CACHE (Chicago Area Computer Hobbyists Exchange)
Jim Mills
824 Jordan Place
Rockford, IL 61108

C.A.C.H.E.
Chicago Area Computer Hobbyist Exchange
Box C-176
323 S. Franklin #804
Chicago, IL 60606

Oregon

CP/M User's Group Northwest
1346 N.E. 28th Street
Portland, OR 98323

Massachusetts:

Boston Computer Society
Jonathan Rotenberg
Three Center Plaza
Boston, MA 02108

New Jersey:

ACG-NJ (Amateur Computer Group)
Sol Libes
1776 Raritan Rd.
Scotch Plains, NJ 07076

SIG/M (Special Interest Group)
P.O. Box 97
Iselin, NJ. 08830

New York:

CP/MUG (CP/M Users Group)
Marcia Coltun
1651 Third Ave.
New York, NY. 10028

DIGIAC
175 Engineers Rd.
Smithtown, NY. 11787

CP/M User's Group
1661 Third Ave.
New York, NY 10028

R.A.M.A.S.
P.O. Box 90808
Rochester, NY 14609

Rhode Island:

Rhode Island Computer Hobbyists
Emilio Iannuccillo
P.O. Box 599
Bristol, RI 02809

Washington:

Seattle Area CP/M Users Group
c/o Northwest Computer Society
P.O. Box 4193
Seattle, WA 98104

The North west Osborne Users Club
c/o Donald B. Slaughter
19705 1st Avenue S.
Seattle, WA 98148

Boeing Employees Computer Club
P.O. Box 3999
MS 2A-59
Seattle, WA 98124

International

CP/Club c/o MSA
6th AY BLDG 3-2-2
Kita-Aoyama
Min ato-ku
Tokyo 107, Japan

CP/M Users Group (U.K.)
Mr. David Powys-Lybbe
11 Sun Street
Finsbury Square
London, EC2M 2QD

CP/M-Irelang
Gardner House
Ballsbridge
Dublin 4, Ireland 01-686441

Revised CP/M 2.2 manual released

Improved documentation for the industry-standard CP/M 2.2 operating system was released by Digital Research this summer. The revised CP/M Operating Systems Manual combines seven smaller manuals into one volume and is easier to reference. The manual also includes a glossary, a list of error messages and an index. Inquiries about the revised manual may be directed to Digital Research Customer Service.

Field Operations

continued from page 1

Digital Research customers — OEMs, distributors and dealers — in New England, Alabama, Tennessee, West Virginia and 11 states that touch the Atlantic Ocean. Staff already at work, include the regional manager, two sales staff, three technical support specialists and a secretary.

Customer support emphasized

"Our primary objective is to build a responsive sales and support organization for our region," Cohen said recently. "We will emphasize support for all our customers. We want to make it easy to do business with Digital Research, and we welcome calls for help."

The Southwest Regional office is located in Los Angeles, at 6033 West Century Blvd., Suite 400, Los Angeles, Calif., 90045; phone (213)410-0410. The office is headed by Mark Plinneke. An office in Sierra Madre, Calif. will provide field technical support, a demonstration center, and other services to the Southwest area. The Southwest region includes Arizona, Arkansas, southern California as far north as Bakersfield, Colorado, Louisiana, New Mexico, southern Nevada (Las Vegas), Oklahoma, Texas and Utah.

European field offices

The sales and support of Digital Research products in Europe continue to be handled by Vector International, the DRI European representative. A series of field offices are now being organized to give additional impetus to the marketing effort in Europe.

Paul Bailey, based in Amsterdam, is working now to establish a Digital Research European headquarters to be located in the United Kingdom. Field offices also will be established for the United Kingdom, Germany and France.

"We will augment Vector International's current capabilities," Bailey says, "and allow them to focus on new services for Digital Research customers. Vector is still the exclusive Digital Research representative in Europe, working to sign up more distributors for our products."

European field offices will supply essentially the same services as do the domestic field offices, including OEM sales, technical support and distributor support. Further developments on the European scene will be announced in upcoming issues of *Digital Research News*.

Japanese sales offices

Microcomputer Software Associates, based in Tokyo, is Digital Research's exclusive Far East representative. MSA recently established a separate sales office which will work closely with Digital Research U.S. headquarters to provide sales and support to DRI customers in Japan, China, Hong Kong, Korea, Philippines, Singapore, Taiwan and Southeast Asia.

Packaging

continued from page 1

products are interrelated. It's an opportunity to present them professionally, and it's a way to integrate a number of marketing approaches. For instance, we'll be designing and offering to dealers attractive, professional display cases for our products that take advantage of the new coordinated sizes and appearance."

Point-of-sale materials, such as printed literature, will also key off the CP/M Library concept.

Digital Research customers can expect to see the newly designed product packaging, documentation and dealer merchandising materials before the end of 1982, according to Magnuson. Digital Research has the resources and capability to do all of the packaging production internally. The company began developing printing and production capabilities for retail-quality packaging in 1981 with the agreement with IBM to produce a special version of the CP/M-86 operating system for the IBM PC.

"In the same way that our company is committed to standardization of operating systems and languages for the microcomputer market, we're also interested in standardizing our retail packaging," Magnuson explained.

Managers

continued from page 2

term strategies, and will work on marketing and merchandising strategies for current products. "I plan to work on long-term production strategies in particular," he said.

Before joining Digital Research, Wandryk was sales development engineer for two years at Hewlett-Packard. Wandryk's M.B.A. is from the University of California at Berkeley.

CP/M 3.0

continued from page 1

require no changes to execute under CP/M 3.0. Two versions of the operating system will be available: a smaller non-banked, or resident, system and a larger bank-switched system which provides increased space for application programs.

At the moment, CP/M 3.0 is being selectively beta-tested at a small number of sites with some large OEMs receiving early releases for informal evaluation.

"We've combined our years of experience with the CP/M product line and the valuable input we've received from our OEMs and end-users in our design of CP/M 3.0," said Kathy Strutynkski. "It's going to be a greatly improved product with better performance and greater user friendliness. Our major design objective was simplicity."

File system performance is improved through the use of directory hashing, record buffering and reduced disk selects. The use of these features is limited in the non-banked version because of memory requirements.

User friendly

The operators of business software will note a friendlier environment with such features as an auto-login allowing diskette replacement without a disk reset of CTRL-C; date and time stamping for file creation, access and update; a HELP facility; and a console input/output redirection facility which allows the input to be read from a file or output to be written to a file. In addition, the USER facility is enhanced to allow the operator to store commonly used transient programs under USER 0 and access these programs from any USER number.

Application environments are made possible through new operating system functions which allow the application program to determine free disk space, chain to another program and trap physical errors. Other enhancements included in CP/M 3.0 provide MP/M II compatibility and support of larger files and drives.

Hardware environments for both banked and non-banked systems must include an 8080, 8085 or Z80 CPU, disk devices (at least one floppy and at least two drives, one of which can be a hard disk), a console, and a printer is recommended. The banked version will require a minimum of two banks with the top region (4-32K) in common and the low region bank switched; the non-banked system requires approximately 4K more than CP/M 2.2.

Correction

In the last issue of Digital Research News CBASIC-86 was incorrectly included in a list of true compiler languages for which Digital Research has suspended run-time library fees. CBASIC-86 is a compiler/interpreter and remains covered by DRI current licensing agreements.

DIGITAL RESEARCH™ Products

Product Description	Media Formats 8" Diskettes: Single Density	Double Density	Diskette Only: Single Density	Double Density	Documentation Only Price	Documentation Description	Order Details All single density diskettes are IBM 3740 soft-sectored. All double density diskettes are Intel MDS 800.
Operating Systems and Utilities							
CP/M® 2.2	$150	$200	$135	$185	$25.00	Seven manual set includes: CP/M Alterations, Interface, Dynamic Debugging Tool, Context Editor, Assembler, Features & Facilities and User's Guides.	NA
CP/M SBC 80/20	$200	NA	$185	NA	$25.00	Same as CP/M 2.2 Documentation	System & Disk Only include ROM
CP/M-86™ 1.1	$250	NA	$220	NA	$40.00	Three manual set includes: CP/M-86 System, User's and Programmer's Guides.	PROM set available for $100.
MP/M II™ 2.1	$450	NA	$420	NA	$40.00	Five manual set includes: MP/M II User's, Programmer's and System Guides. LINK-80 Operator's Guide and MAC Language Manual and Applications Guide.	LINK-80 Guide and MAC manual included with system only.
MP/M-86™ 2.0	$650	NA	$610	NA	$50.00	Three manual set includes: MP/M-86 User's, Programmer's and System Guide.	NA
CP/NET™ 1.1	$200	NA	$195	NA	$15.00	CP/NET User's Guide.	NA
TEX 2.1	$100	$125	$ 95	$120	$10.00	TEX User's Guide.	NA
DESPOOL™ 2.0	$ 50	$ 75	$ 45	$ 70	$ 2.50	DESPOOL Operator's Guide.	NA
Languages and Programming Tools							
PL/I-80™ 1.3	$500	$500	$475	$475	$35.00	Five manual set includes: PL/I-80 Applications, Language and LINK-80 Operator's Guides. PL/I-80 Command Summary and MAC Language and Applications Guide.	MAC manual included with system only.
CBASIC® 2.8	$150	$150	$130	$130	$30.00	CBASIC Reference Guide.	NA
CBASIC-86™ 1.1	$325	$325	$305	$305	$30.00	CBASIC-86 Reference Manual.	NA
CBASIC Compiler, CB-80™ 1.3	$500	$500	$480	$480	$30.00	CB-80 Language Manual.	NA
Pascal/MT+™ 5.5	$350	NA	$335	NA	$30.00	Pascal/MT User's Guide.	NA
Speed-Programming Package™ 5.5	$200	NA	$195	NA	$10.00	SpeedProgramming Package User's Guide.	Requires Pascal/MT+ version 5.2 or greater.
Pascal/MT+ with Speed-Programming Package 5.5	$500	NA	$475	NA	$35.00	Two manual set includes: Pascal/MT+ User's Guide and SpeedProgramming Package User's Guide.	NA
MAC™ 2.0	$ 90	$115	$ 80	$105	$15.00	MAC Language & Applications Guide.	NA
RMAC™, LINKLIB & XREF 1.1	$200	NA	$185	NA	$25.00	Two manual set includes: LINK-80 Operator's Guide, MAC Language & Applications Guide.	NA
BT-80™ 1.0	$200	NA	$185	NA	$25.00	BT-80 Reference Guide.	NA
XLT86™ 1.0	$150	NA	$145	NA	$10.00	XLT86 User's Guide.	XLT86 is available in the VAX VMS version for $8000.00.
SID™ 1.4	$ 75	$100	$ 70	$ 95	$10.00	Two manual set includes: SID User's Guide and SID Command Summary.	NA
ZSID™ 1.4	$100	$125	$ 95	$120	$10.00	Two manual set includes: SID User's Guide and ZSID Command Summary.	NA
Pascal/MT+86™ 3.0	$600	NA	$580	NA	$30.00	Pascal/MT+86 Language Reference Manual and ASMT-86 Reference Manual.	NA
Speed-Programming Package™ 1.0	$250	NA	$245	NA	$10.00	SpeedProgramming Package User's Guide.	Requires Pascal/MT+86.
Pascal/MT+86 with Speed-Programming Package 3.0	$800	NA	$775	NA	$35.00	Pascal/MT+86 Language Reference Manual, ASMT-86 Reference Manual and SpeedProgramming Package User's Guide.	NA
SID-86™ 1.0	$150	NA	$145	NA	$10.00	SID-86 User's Guide.	NA
Display Manager™ 1.0	$400	NA	$380	NA	$30.00	Display Manager Programmer's Guide.	NA
Access Manager™	$300	NA	$280	NA	$30.00	Access Manager Programmer's Guide.	NA
CIS COBOL™ 4.5	$850	NA	NA	NA	NA	Two manual set includes the CIS COBOL Language Reference Manual and CIS COBOL Operator's Guide.	Please specify if for CP/M-80 or CP/M-86 Operating System.
Level II COBOL 1.1	$1600	NA	NA	NA	NA	Two manual set includes the Level II COBOL Language Reference Manual and Operator's Guide	CP/M-86 only
IBM Displaywriter™ Compatible Products							
CP/M-86 DW 1.0	$325	NA	NA	NA	$50.00	CP/M-86 DW documentation.	These products are designed for a Displaywriter with the following configuration: Electronic Module, Display, Disk Drive and Printwheel Printer.
CBASIC-86 DW 1.0	$325	NA	NA	NA	$30.00	CBASIC-86 Reference Manual.	
CP/M-86 DW & CBASIC-86 1.0	$600	NA	NA	NA	$80.00	Two manual set includes: CP/M-86 DW documentation and CBASIC-86 Reference Manual.	

CP/NOS allows networking in diskless environments

In some environments, such as industrial process control, intelligent terminals or single-board computers are used without attached disk drives. Now these computers without drives, and sometimes even without consoles, can run CP/M applications over a network, thanks to CP/NOS.

CP/NOS is a complement to CP/NET, Digital Research's networking operating system with a few important differences. In the usual CP/NET configuration, a "requester" (or slaves) running CP/M communicates with a "server" (or master) running MP/M across CP/NET. The CP/M requester is usually provided with its own disk drive and terminal. CP/NOS eliminates the need for a drive and console, yet allows the requester to take advantage of the resources of the server.

CP/NOS is described as a CP/M-compatible operating system designed to perform file I/O across a network. Since it is not a disk operating system, it can be placed on ROM, which means it can be run on low-cost hardware, or downloaded from a network server. CP/NOS requires no specific network configuration, and can be customized to run under any protocol, or used in tightly-coupled processor environments.

The low hardware cost of a ROM-able operating system is very effective in multiuser environments that require a high degree of interactivity or compute-bound processing, with a fairly small amount of disk I/O. Some typical applications, outside of harsh industrial settings, include intelligent terminals, word processing systems, electronic mail systems and data base query systems.

CP/NOS features full CP/M 2.2 compatibility across a network; local console and printer support if needed; network spooler support and electronic mail utilities. With CP/NOS, one server can support up to 16 requestors.

Hardware requirements for CP/NOS include an Intel 8080/8085 or Zilog Z80 microprocessor, 4K of ROM or boot ROM if downloading from a server, at least 16K RAM, and a MP/M II system with 48K of RAM. Further information on CP/NOS can be obtained from Digital Research Customer Service, 160 Central Ave., Pacific Grove, CA 93950; (408)649-5500.

DEC™ VT180 Compatible Products

CBASIC® DEC VT180 2.8	$150	NA	NA	NA	$30.00	CBASIC Reference Manual.	These products are designed for a DEC VT180 microcomputer.
CB-80™ DEC VT180 1.2	$500	NA	NA	NA	$30.00	CB-80 Language Manual.	"
PL/I-80™ DEC VT180 1.3	$500	NA	NA	NA	$35.00	Five manual set includes: PL/I-80 Applications, Language and LINK-80 Operator's Guides. PL/I-80 Command Summary and MAC™ Language & Applications Guide.	"
Pascal/MT+™ with SpeedProgramming Package™ DEC VT180 5.5	$500	NA	NA	NA	$35.00	Two manual set includes: Pascal/MT+ User's Guide and SpeedProgramming Package User's Guide.	"

DIGITAL RESEARCH™ Order Form

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CP/M® Compatible Software Catalog lists over 100 Independent Software Vendors (ISVs) who write CP/M compatible software. Your guide to accounting packages, word processors, languages, utilities and more.	$ 5.00
CBASIC® Software Directory. A listing of software vendors that market products written in CBASIC.	$ 7.50
OSBORNE CP/M User Guide by Hogan	$12.95
The CP/M Handbook with MP/M by Zaks	$13.95
The CP/M Primer by Murtha & Waite	$11.95
Using CP/M by Fernandez & Ashley	$ 8.95
Data Structures & PL/I Programming by Augenstein & Tenenbaum	$25.95
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The prices shown are USA domestic prices. International prices are 10% higher for systems, and 20% higher for documentation.

Note: All products are shipped in their current version.

FM 101-V2

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Digital Research News is published by Digital Research Inc. for customers everywhere.

Address all correspondence to Editor, *Digital Research News*, **P.O. Box 579, Pacific Grove, CA 93950.** (408) 649-3896.

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