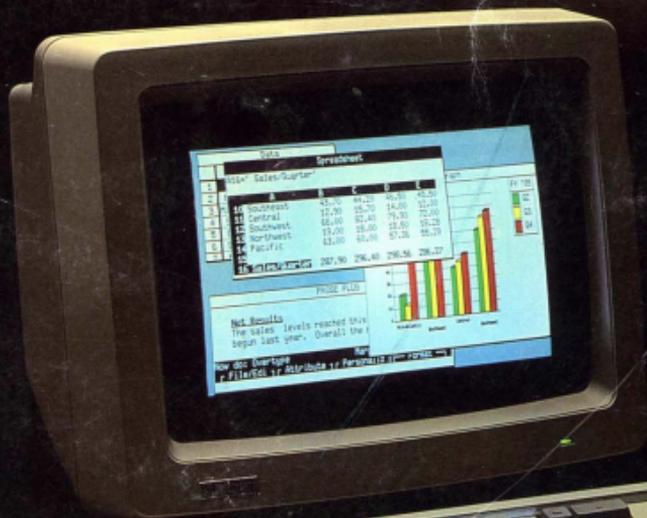


digital

Professional Series™

Handbook

digital VAX II 782



Professional Series™
Handbook

digital

*Professional*TM
Series Handbook

The information in this document is subject to change without notice and should not be construed as a commitment by Digital Equipment Corporation. Digital Equipment Corporation assumes no responsibility for any errors that may appear in this document.

The following are trademarks of Digital Equipment Corporation:

DIGITAL LOGO

ALL-IN-1
COS-310
CTS-300
DATATRIEVE
DEC
DECdirect
DECLander
DECmail
DECMate
DECnet
DECSERVICE
DECSUPPORT
DECSYSTEM-10
DECSYSTEM-20
DECTOUCH
DECUS
DIBOL
IVIS
LA50
LA100
Letterprinter 100
LQP02
PDP-11
P/OS
PRO/Applications Starter Kit
PRO/BASIC
PRO/Communications
PRO/DataManager
PRO/Graph
PRO/NAPLPS
PRO/Office Workstation
PROSE
PRO/Spreadsheet
PRO/Tool Kit

Professional 325

Professional 350

Professional 380

Professional Host Tool Kit

Professional Series

Rainbow

RSTS

RSX

RT-11

SIGHT

VAX

VMS

VT100

VT102

VT180

WPS

ADR/DATA is a trademark of Applied Data Research, Inc.

AMS Realstar is a trademark of AMS Realstar, Inc.

Apple is a trademark of Apple Computer, Inc.

APS is a trademark of Arrix Logic Systems, Inc.

AT&T, Calling Card, and Touch-Tone are trademarks of American Telephone & Telegraph Company.

ATHENA/graph, Company Chart Set, and Product Chart Set are trademarks of Ship Analytics, Inc.

AVID is a trademark of Advanced Interactive Systems, Inc.

BASIC-80, BASIC Compiler, COBOL-80, FORTRAN-80, Microsoft, MS, MultiPlan, and XENIX are trademarks of Microsoft Corporation.

BLAST is a trademark of Communications Research Group, Inc.

C-CALC is a trademark of Digitec Corporation.

CALC-11 is a registered trademark of Computer Systems Corporation.

CalcStar, DataStar, MailMerge MicroPro, SpellStar, SuperSort, and WordStar are registered trademarks of MicroPro International Corporation.

CBASIC, CP/M, and CP/M-80 are registered trademarks of Digital Research, Inc.

CIS COBOL and PL/1-80 are trademarks of Digital Research, Inc.

CLIN TEAMS is a registered trademark of Technical Evaluation and Management Systems, Inc.

COBOL-PLUS, RTSORT, and TSX-PLUS are trademarks of S&H Computer Systems, Inc.

Condor is a registered trademark of Condor Computer Corporation.

Compu-Share is a trademark of Compu-Share, Inc.

CompuServe is a registered trademark of CompuServe, Inc.

Cograph and Cortex are trademarks of Cortex Corporation.

CPA-11 is a trademark of Franklen Computer Systems, Inc.

CT*OS is a trademark of Compu-tome, Inc.

Daisy-Aids is a trademark of Escape Computer Software, Inc.

Data General is a registered trademark of Data General Corporation.

DataCalc is a trademark of Digital Business Computers.

dBase II is a registered trademark of ASHTON-TATE.

DBL is a trademark of Digital Information Systems, Inc.

DESIGN GRAPHIX is a registered trademark of Engineering Systems Corp.

DIF is a trademark of Software Arts Products Corp.

Dow Jones, Dow Jones News/Retrieval Service, Corporate Earnings Estimator, and Economic Update are trademarks of Dow Jones & Company, Inc.

EasyEntry and EasyEd are trademarks of Applied Information Systems, Inc.

FASTEXT, TSX-NET and VS/VT are trademarks of Glenn A. Barber & Associates, Inc.

FASTTEST and PSYCHSYSTEMS are trademarks of PSYCHSYSTEMS.

FinalWord, Mince, and Scribble are trademarks of Mark of the Unicorn.

Fingraph is a trademark of Fingraph Corporation.

GeoPod 124 and GeoTrack IMS are trademarks of Hollis Geosystems Corporation.

Horizon Spreadsheet and Horizon Word Processor are trademarks of Horizon Software Systems, Inc.

IBM is a registered trademark of International Business Machines Corporation.

IBM PC and Graphics Printer are trademarks of International Business Machines Corporation.

Idris is a trademark of Whitesmiths, Ltd.

INFORMIX is a trademark of Relational Database Systems.

InfoStar, ReportStar, StarIndex, and WordMaster are trademarks of MicroPro International Corporation.

INTELLECT-UL, MEDOFFICE, and NUTRI-CALC are trademarks of PCD Systems, Inc.

Legal Center Management System is a trademark of BETA Computer, Corporation.

Legal System Series I is a trademark of Cognition Corporation.

Leverage is a trademark of Urban Software Corporation.

LEX-11 is a trademark of EEC Systems, Inc.

MAPS/PRO is a trademark of Ross Systems, Inc.

MASS-11 is a trademark of Microsystems Engineering Corp.

MBSI and RealWorld are trademarks of RealWorld Corporation.

MCI is a trademark of MCI.

MDX is a trademark of Clinical Data Design.

microArt is a trademark of MicroArt Corporation.

microMagic is a trademark of Intelligent Industrial Systems, Inc.

MJA Accounting is a trademark of PRODATA, Inc.

MMS-1 Materials Management System is a trademark of RGTI Systems Software, Inc.

Motorola is a registered trademark of Motorola, Inc.

MX80 is a trademark of Epson America, Inc.

NPL is a trademark of DeskTop Software Corp.

Official Airline Guide Electronic Edition and OAG are trademarks of Official Airline Guide, Inc.

On-Line Accounting is a trademark of Applied Software Development, Corporation.

p-System is a trademark of SofTech Microsystems, Inc.

Palette is a trademark of Palette Systems, Inc.

Pascal-2 is a trademark of Oregon Software.

Pascal/M and Spellguard are trademarks of Sorcim/IUS Micro Software.

PC-BRIDGE and Phonelink are trademarks of Virtual Microsystems, Inc.

Perfect Calc, Perfect Filer, Perfect Speller, and Perfect Writer are trademarks of Perfect Software.

Pertmaster is a trademark of Westminster Software.

Polaroid is a registered trademark of Polaroid Corporation.

poly-XFR is a trademark of polygon associates, inc.

PRISM is a trademark of Advanced System Concepts, Inc.

PRO-Accountant is a trademark of decComp Corporation.

PRO/DIGICALC is a trademark of WHY Systems, Inc.

Propel is a trademark of Pro Computing, Inc.

ProtoCall is a trademark of Software Insights, Inc.

Q'TEXT is a trademark of Queens University.

Quickcode is a trademark of Fox & Geller Associates.

R:BASE 4000 is a trademark of MicroRIM.

RAD is a trademark of Interactive Technologies, Inc.

RM/COBOL is a trademark of Ryan-McFarland Corporation.

RS/1 is a trademark of Bolt, Beranek and Newman, Inc.

RFILE is a registered trademark of Contel Information Systems, Inc.

SATURN-CALC, SATURN-DIARY, SATURN-GRAPH, and SATURN-WP are trademarks of Saturn Systems, Inc.

SCADA is a trademark of American Computers & Engineers.

SDM is a trademark of CADMATICS.

SHARE-11 is a trademark of HAMMOND Software.

SPELL is a trademark of Creative System Designs, Inc.

Spellbinder is a trademark of Lexisoft.

SPRINT is a registered trademark of GTE Corporation.

SPSS is a trademark of SPSS, Inc.

Statpak is a trademark of Northwest Analytical.

Super Calc is a registered trademark of Sorcim/IUS Micro Software.

Supercomp-Twenty is a trademark of Access Technology, Inc.

T/Maker is a trademark of T/Maker, Inc.

TaskMaster is a trademark of Dawn Computer Corporation.

Tektronix is a registered trademark of Tektronix, Inc.

Telenet is a registered trademark of GTE Telenet Communications.

Textwriter is a trademark of Organic Software, Inc.

The Accounting Partner is a registered trademark of Star Software Systems.

THE BOSS is a trademark of Balcones Corporation.

The Office Menu Tool is a trademark of Unisource Software Corp.

The Source is a trademark of Source Telecomputing Corporation.

TK!Solver is a trademark of Software Arts, Inc.

Tymnet is a registered trademark of Tymshare, Inc.

UCSD and UCSD Pascal are registered trademarks of the Regents of the University of California.

UMD is a trademark of Boston Systems Office, Inc.

UNIPLEX is a trademark of Redwood Bureau Services, Ltd.

UNIX is a trademark of AT&T Bell Laboratories.

VDS is a trademark of St. Mary's Hospital Medical School.

VENIX is a trademark of VenturCom, Inc.

Viewcomp is a trademark of Unicorp Software, Inc.

WORD-11 is a trademark of Data Processing Design, Inc.

WordMARC is a trademark of MARC Software International, Inc.

WPS80 is a trademark of Exceptional Business Solutions.

XOREN IPL-11 is a trademark of Xoren Computing Ltd.

Z80 is a trademark of Zilog, Inc.

Contents

Overview

Chapter 1

An Introduction to the Professional Series 1-1

Chapter 2

A Closer Look at the Professional Series 2-1

Chapter 3

Application Development and the Professional 3-1

Chapter 4

The Professional Environment 4-1

Chapter 5

Service For Your Professional Series Computer 5-1

Chapter 6

Professional 300 Series Hardware Specifications 6-1

Chapter 7

Printers for the Professional 7-1

Chapter 8

Operating Systems for the Professional 8-1

Chapter 9

Professional Software Catalog 9-1

Chapter 10

Professional Development Tools and Languages 10-1

Appendices

Appendix I

IVIS—Digital's Interactive Video Information System I-1

Appendix II

The Professional as a Technical and
Commercial OEM Computer. II-1

Chapter Overviews

Chapter 1

An Introduction to the Professional Series

The Professional Series offers a versatile combination of minicomputer power and personal computer friendliness. This chapter outlines how the Professional provides ease-of-use as it works as a distributed workstation, a communications tool, and an application development computer.

Chapter 2

A Closer Look at the Professional Series

This chapter highlights the Professional's ease-of-use features, its numerous software offerings, and its compatibility with Digital's other PDP-11s. It provides an overview of the Professional's extensive communications and graphics capabilities.

Chapter 3

Application Development and the Professional

This chapter discusses application development both on and for the Professional. It introduces the development packages available on the Professional itself, and discusses how the Professional fits into a distributed development environment. The chapter also covers using Digital's VAX or PDP-11 computers to develop for the Professional, and addresses how to move existing software to the Professional environment.

Chapter 4

The Professional Environment

This chapter uses real-life scenarios to illustrate how the Professional can be used in a variety of working environments. The scenarios describe: realtime data collection and analysis in a research laboratory; a UNIX-based college computer center; using videotex as a sales aid; computer-aided aerospace design; and coordinating purchasing, production, and quality control in a large manufacturing company.

Chapter 5

Service For Your Professional Series Computer

Service and support are important factors in a computer purchase. This chapter describes Digital's service and support for the Professional, including Customer Services, Digital Classified Software, Educational Services, and DECUS.

Chapter 6

Professional 300 Series Hardware Specifications

This chapter begins with an overview of the Professional's hardware systems and options, then goes on to provide descriptions and ordering information for each component. You will find full descriptions of the System Units; Keyboard Country Kits (including Gold Key and Foreign Language); Monochrome and Color Monitors; Extended Bit-Map Graphics Option; 5-, 10-, and 33-Mbyte Hard Disk Systems; 256- and 512-Kbyte Memory Options; Telephone Management System; Mini-Exchange; DECNA Ethernet Controller; DELNI Local Network Interconnect; H4000 Ethernet Transceiver; CP/M-80 Operating System Option; PC-Bridge MS-DOS for the Professional; Realtime Interface; Analog Data Module; Professional 325 to 350 Upgrade Kit; Professional 350 to 380 Upgrade Kit; and Floorstand.

Chapter 7

Printers for the Professional

This chapter describes the printers and the graphics plotter available for the Professional: LA50 Personal Printer, LA210 Letterprinter, LQP02 Letter-Quality Printer, LQP03 Letter-Quality Printer, and LVP16 Six-Pen Graphics Plotter.

Chapter 8

Operating Systems for the Professional.

The Professional lets you decide which operating system(s) best suits your needs. Chapter 8 catalogs: Professional Operating System (P/OS), PRO/VENIX, RT-11, CTS-300, MS-DOS, CP/M-80, p-System, STANDARD MICRO MUMPS 300, TSX-Plus, XENIX, and Idris.

Chapter 9

Professional Software Catalog

This chapter describes software packages available for the Professional, including Digital as well as third-party products. Within the P/OS Software Library, products are grouped into the following categories: Accounting, Communications, Data Management, Decision Support and Spreadsheets, Education and Training, Engineering and Scientific, Graphics, Office Productivity, Personal Productivity, Word Processing, and Vertical Market Software.

The chapter also includes alternative operating system Software Libraries.

Chapter 10

Professional Development Tools and Languages

This chapter catalogs the tools available to develop both on and for the Professional Series computers. Described are: PRO/Tool Kit, Professional Host Tool Kit, Tool Kit FORTRAN-77, Tool Kit FORTRAN-77 DEBUG, Tool Kit Pascal, Tool Kit COBOL-81, Tool Kit DIBOL, Tool Kit BASIC-PLUS-2, Professional Realtime Interface Libraries, Whitesmiths C for Professional Tool Kits, PRO/BASIC, FORTRAN-77 for p-System, UCSD Pascal, PRO-IV, PRO/FORTRAN IV (RT-11), FORTRAN-77 for RT-11 on the Professional, PRO/BASIC-11 (RT-11), COBOL-PLUS for RT-11, Pascal-2 for RT-11, Development Tools for PRO/VENIX, for XENIX, for Idris, and for STANDARD MICRO MUMPS.

Appendices

Appendix I

ivis—Digital's Interactive Video Information System

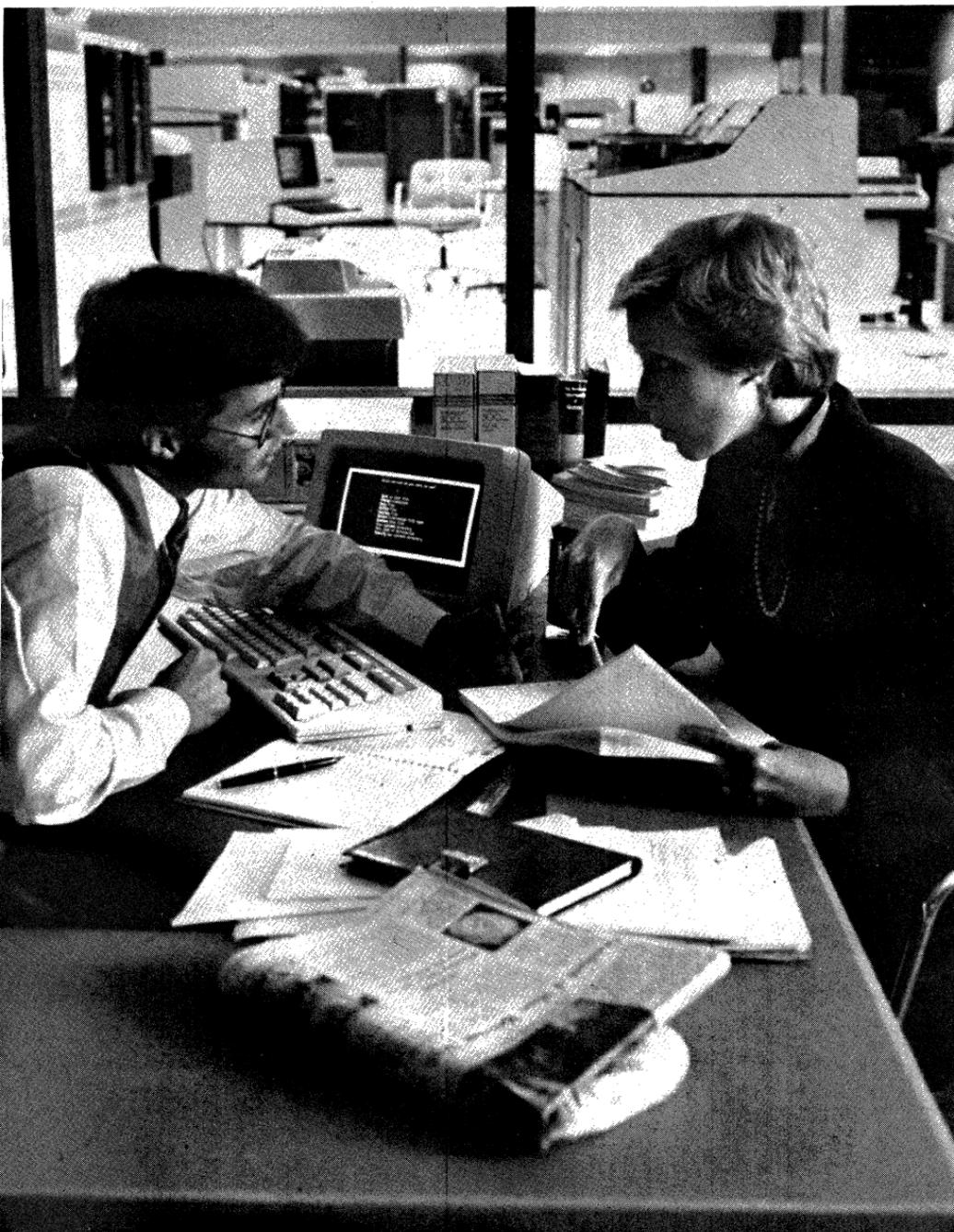
This appendix describes ivis, its applications, and Digital's support programs for ivis System-Based Education programs.

Appendix II

**The Professional as a Technical and Commercial OEM
Computer**

This appendix outlines the features and capabilities that make the Professional the perfect computer for Digital's Original Equipment Manufacturers. It includes licensing information for the Professional's CTI bus.

Chapter 1 • An Introduction to the Professional Series



The Professional is for individuals and organizations that have outgrown the capabilities of conventional personal computers.

It is for the manager who would like to use remote files and data in his own desktop applications; for the lab technician who must collect, process, and analyze an ever-increasing amount of data; for the MIS department planning Local Area Networks and desktop/minicomputer/mainframe communication links; for the developer who must produce increasingly sophisticated, but increasingly user-friendly applications.

The Professional answers these needs in a way no personal computer can: with minicomputer processing power, large-system compatibility, state-of-the-art networking options, and sophisticated development tools.

Yet the Professional is easy to learn and easy to use. It is compact and completely user-installable. It can even run many popular MSTM-DOS and CP/M[®] personal computer applications. But the Professional is not a personal computer: it is a desktop version of Digital's most popular minicomputer, the PDP-11.

The Professional offers multitasking operating systems, a rich portfolio of minicomputer applications, Ethernet networking capability, an advanced graphics architecture and many other large-system features. It is capable of running the most demanding standalone applications, or providing the desktop link in a fully distributed data processing environment. The Professional is even powerful enough to support a variety of multiuser configurations.

In short, the Professional combines the best qualities of a personal computer with the power and capabilities of a true minicomputer.

As Versatile as It Is Powerful.

The Professional is a valuable tool for managers, scientists, technicians, engineers, programmers—anyone whose work depends on fast, reliable computer support.

There are three members of the Professional Series family, each representing a distinct level of price, performance, and expandability. The Professional 325 is a low-cost, diskette-based system for standalone minicomputer applications. The Professional 350 adds hard-disk storage, networking, and other system expansion possibilities for sophisticated database management and communication capabilities. The Professional 380 incorporates a higher-performance microprocessor, higher-resolution graphics, and even greater expansion possibilities. It is ideal where additional speed, power, and graphics performance are needed.

Each Professional computer comes standard with 512 Kbytes of RAM memory, floating-point processor, dual 400-Kbyte diskette drives, bit-mapped graphics, printer port, communications port, and a network interconnect port. Each provides a platform from which you can build the system you need for the job you have to accomplish.

Because no single operating system is right for everyone, the Professional gives you a choice. For distributed processing applications, there is the user-friendly Professional Operating System (P/OS). P/OS is highly compatible with Digital's RSX-II-M-PLUS and VMS operating systems, and supports many PDP-11 and VAX applications.

Alternatively, you can choose PRO/VENIX™ or one of two other UNIX™-based operating systems; Digital's compact RT-11 operating system; STANDARD MICRO MUMPS 300™ UCSD® p-System™—



even CP/M-80 and MS-DOS. These and other available operating systems make the Professional equally at home in an office, in a lab, in a classroom, or in an R&D center.

A long list of hardware features and options let you tailor the Professional to your specific needs. Standard monitors include a 12-inch monochrome monitor or 13-inch color monitor. Monochrome monitors are available with white, green or amber screen displays. Memory options let you increase the Professional's main memory to over one Mbyte (two Mbytes for the Professional 380). Internal hard-disk mass storage of 5-, 10-, or 33-Mbytes is available for the Professional 350 and 380.

The Professional offers better and faster ways to communicate with other people and other computers. Networking solutions range from the low-cost Mini-Exchange switching device to a full implementation of Digital's DECnet Ethernet network. A unique telephone management system with integral modem can simplify voice, text, and data communications.

The Professional even works the same way you do—on several jobs at a time. The P/OS and other operating systems can direct a number of operations simultaneously. This multitasking capability lets you print a document, transmit a lengthy report, receive mail, and draft a memo all at the same time.

Think of It As Your "Personal PDP-11."

The Professional's extraordinary power and versatility is made possible by its 16-bit PDP-11 microprocessor. Hundreds of thousands of PDP-11s are in use today, making it one of the most popular 16-bit minicomputers in the world. The Professional Series is built on this rich PDP-11 tradition.

The continuing success of the PDP-11 family is easy to understand. PDP-11s offer across-the-board compatibility, from the single-user Professional Series to the largest multiuser systems. There are literally thousands of PDP-11 application software packages available, most of which can be easily moved from one PDP-11 to the next.

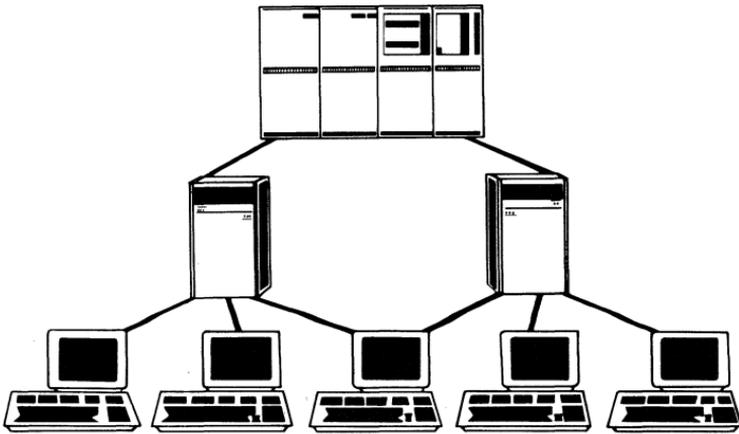
The Professional offers all the advantages of larger PDP-11s—a proven architecture, powerful applications, large-system development tools, a logical growth path—at a much lower cost. Like any PDP-11, the Professional will protect your hardware and software investment for years to come.

But perhaps most important is the fact that the Professional is one of the few desktop computers that is truly part of a larger system architecture. The fact that the Professional can run many programs written for larger PDP-11 and VAX computers with little or no modification is solid testimony to its compatibility.

The Desktop Link in Distributed Data Processing.

Personal computers are fine for *personal* productivity. They handle routine text editing chores, spreadsheet calculations, and other standalone applications. But they perform these tasks in relative, if not total, isolation. Personal computers are limited in their ability to communicate with other computers and other individuals. The Professional Series offers a better approach.

The Professional was designed to be part of a fully distributed data processing system. A Professional running P/OS, for example, shares common file structures, utilities, languages—even applications—with larger Digital computers.



The Professional is designed to be part of a fully distributed data processing system.

Tied to Digital's larger PDP-11 and VAX computers, the Professional lets you access and process information in many new ways. You can access data from larger systems to use with your own applications. You can process your data locally or send it to a remote system for processing. You can even transfer data from one Professional, process it on another, then forward it to still another Professional or remote host. And you can do it all quickly and easily.

The Professional can also help you standardize applications throughout your organization. Standardized applications give you consistent formats to simplify data entry and transfer; consistent analysis of data to eliminate unexpected variations in results; and consistent output to help you interpret data more quickly and more accurately.

A spreadsheet application such as Supercomp-Twenty,TM for example, is available for VAX, multiuser PDP-11, and Professional Series computers. A spreadsheet model developed in one office could be applied in other offices, in other departments, or at any other level of the organization. The model could be executed on any computer from the desktop model to the minicomputer cluster. And the Professional doesn't limit you to standardized spreadsheet analysis. Distributed applications for the Professional range from word processing and accounting to scientific analysis, database management, and graphics.

A Solutions-Oriented Approach to Software.

The Professional Series offers a broad cross-section of software geared specifically for the performance-oriented technical professional. Many applications have been transported from larger Digital computers, others have been developed specifically for the Professional. Most importantly, the Professional offers *complete* software solutions in areas from research, data analysis, and database management to office automation and graphics.

Distributed Applications

P/OS—RSX-11M—VMS

Function	Product*	P/OS	RSX-11M	VMS
Accounting	Compu-Share	X	X	X
	Multi-Journal Accounting	X	X	X
Communications	PRO/DECnet	X	X	X
Database Management	PRO/DATATRIEVE	X	X	X
	RDM 300	X	X	X
Decision Support	MAPS/PRO Fin'l Modeling	X		X
	PRO/DIGICALC	X	X	X
	SUPERCOMP-TWENTY	X	X	X
Development Tools	Tool Kit & Languages	X	X	X
Graphics	ATHENA/Graph	X	X	
	Design Graphix/Executive	X	X	X
	Fingraph	X		X
	MAPS/PRO Graphics	X		X
Manufacturing	MMS-1	X		X
Office Automation	PRO/Office Workstation	X		X
Scientific/Eng.	RS/1	X	X	X
	SPSS	X	X	X
Videotex	PRO/NAPLPS	X		X
Word Processing	CT*OS	X	X	X
	LEX-11	X	X	X
	TaskMaster	X	X	

*Actual product names may vary from operating system to operating system.

For example, a scientist using RS/1,TM the sophisticated data analysis package, will find the scientific character set contained in CT*OSTM word processing useful as well.

A telemarketing manager in a large corporation can use distributed PRO/DATATRIEVE to access customer profiles from the corporate DATATRIEVE database. At the same time, he can be fully tied into the corporate ALL-IN-1 office automation system with PRO/Office Workstation.

A financial analyst in a regional office can use Supercomp-Twenty to produce spreadsheets that are fully compatible with a VAX-based Supercomp-Twenty application at corporate headquarters. The analyst has similar compatibility with other financial tools such as MAPS/PROTM Financial Modeling and MAPS/PRO Graphics.

You Choose the Operating System That's Right for You.

The Professional's power and compatibility make it well suited to many environments: scientific, decision support, office automation, engineering, and applications development. A broad choice of standard operating systems let you tailor your Professional to the environment you'll be working in.

The Professional Operating System (P/OS) is based on Digital's RSX-11M-PLUS—a standard PDP-11 operating system. P/OS adds menu systems and other user-friendly features to what is already a highly versatile multitasking operating system. P/OS is ideal for distributed workstation applications since many RSX-11 and VAX/VMS applications can be easily migrated to the Professional.

For those who require a UNIX-based system, there is PRO/VENIX, developed by VenturCom, Inc. PRO/VENIX carries an AT&TTM System V binary license and offers several of the more popular

Berkeley extensions, including the *vi* screen editor and C shell as well as the Bourne shell. PRO/UNIX is also capable of supporting several users, providing the platform for a multiuser Professional.

For engineering and scientific applications, the Professional can be equipped with Digital's popular RT-11 operating system. This powerful operating system can perform both realtime and data processing. It offers a full range of system utilities to make interactive program development fast and easy.

For users who have moved from CP/M- or MS-DOS-based systems, versions of these operating systems are also available for the Professional. This allows you to continue to use your existing applications as you move into the powerful multi-tasking P/OS environment.

Several other special purpose operating systems are also available. For complete information, see Chapter 8.

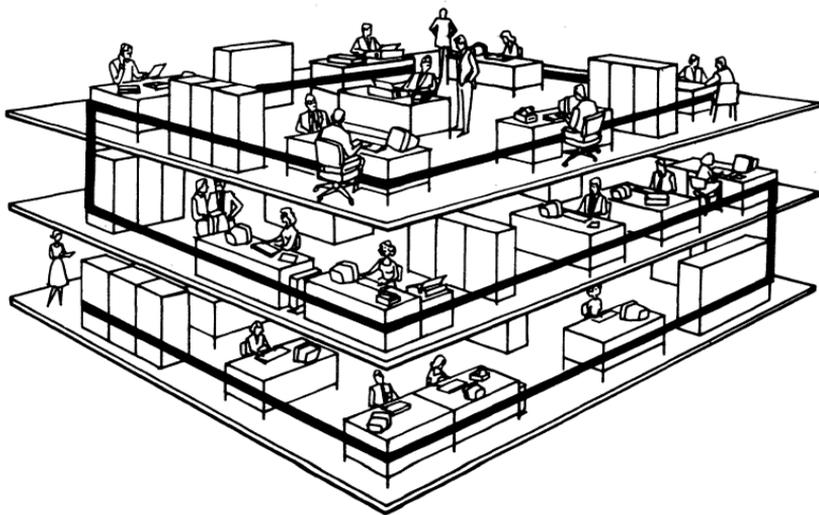
Breaking the Desktop Communications Barrier.

The Professional has the tools you need for data, text, voice, and graphics communications.

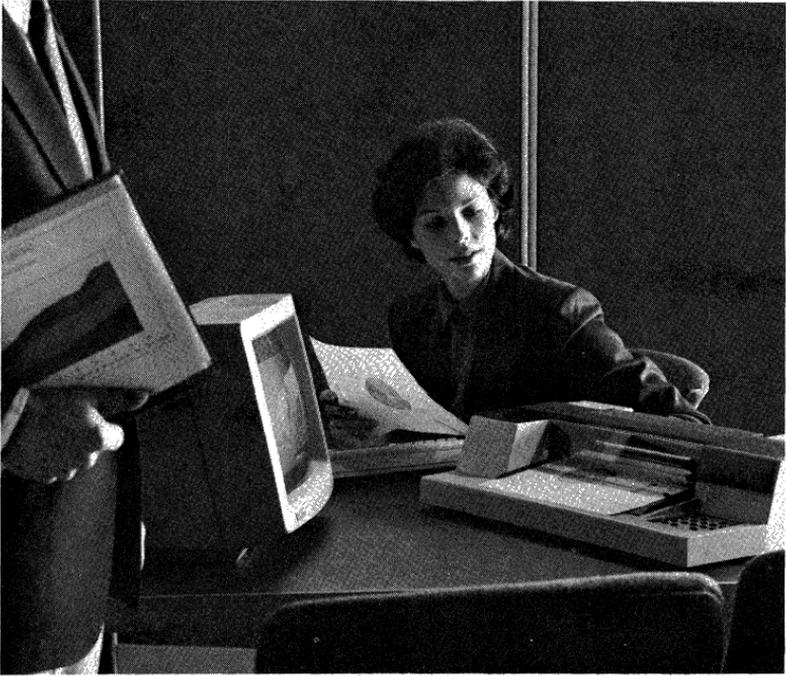
PRO/DECnet provides the desktop link in a high-speed Local Area Network (LAN) that could support over 1000 computers. A DECnet network might include Professionals, larger PDP-11s, VAXes, even DECSYSTEM-10 and DECSYSTEM-20 mainframe computers. Other computers can be reached via gateways and packet-switching networks. Using PRO/DECnet, there is virtually no limit to the Professional's communication capabilities.

Other communications software for the Professional supports many types of terminal emulation, file transfer operations, telephone management, even videotex decoding. A variety of software packages also allow you to integrate your Professional into an IBM environment.

The Professional is a powerful, capable communicator. Yet it requires no special knowledge or extensive training to use. Many communication and transfer operations involving remote systems are virtually transparent to the user. Making a communications connection can be as simple as selecting a host system from a menu list and pressing the "DO" key.



*The PRO/DECnet connection:
fast, efficient local area networking.*



Options Tailor Your Professional to the Job at Hand.

A variety of hardware options are available for the Professional Series, ranging from additional memory and internal mass storage systems to color graphics and communications options. The Telephone Management System offers new time-saving ways to handle voice, text, and data communications. Its integral modem and voice recording and playback capability make it ideal for anyone who does a lot of telephone work.

A Realtime Interface Option turns the Professional into a powerful laboratory workstation. It contains three of the most widely

used I/O interfaces: an IEEE-488 general purpose interface bus, two EIA RS232C/423C-compatible serial asynchronous ports, and a 24-line bidirectional parallel I/O port interface.

The Professional's color graphics are among the finest available on a desktop computer. The Extended Bit-Map Graphics Option and color monitor produce precise color graphics that make any presentation more clear, more dramatic, and more persuasive. Hardcopies of your color graphics can be produced on Digital's LVP16 six-pen color plotter.

For more complete information on hardware and system options, see Chapter 6.

Minicomputer Power, Personal Computer Friendliness.

Increased performance doesn't have to mean increased complexity. The computer-based instruction program provided with each Professional quickly teaches you all the basics of operation: file services, diskette services, print operations and more.

The P/OS menu tree guides you quickly and efficiently through any computer operation. There's no need to learn complex command languages or memorize command keystroke sequences. To execute a command, simply move the cursor to the appropriate menu command, and press DO.

The special-function keys on the Professional keyboard are clearly labeled in English. These put options such as EXIT, RESUME, CANCEL, MAIN SCREEN, and PRINT SCREEN right at your fingertips. If you do happen to get stuck, pressing HELP gives you instant online help.

P/OS also offers an "expert mode" based on the popular Digital Command Language (DCL).



Help is always available thanks to extensive HELP menus.

Custom Applications Quickly, Reliably, Inexpensively.

The Professional offers sophisticated application development tools that let you develop programs not only for the Professional, but for other compatible Digital computers as well. These tools let you create, or modify, applications that will run throughout a distributed Digital system.

Two developer's tool kits are available for developing applications under P/OS. The PRO/Tool Kit allows you to work directly on the Professional. The Professional Host Tool Kit is used on a Digital PDP-11 or VAX computer. Each offers a true minicomputer development environment for a fraction of the cost normally associated with custom application development.

Both tool kits let you take full advantage of the Professional's hardware and system software features. They contain mature RSX development utilities, installation and menu development tools, program debuggers—everything you need for trouble-free application development. Available languages include MACRO-11, FORTRAN-77, Pascal, COBOL-81, DIBOL, BASIC-PLUS-2, and Whitesmiths C.



The Professional brings large-system development tools to the desktop.

A Desktop Computer for Professionals, from Professionals.

A final impressive feature of the Professional Series is its manufacturer: Digital Equipment Corporation. Digital has over 25 years of

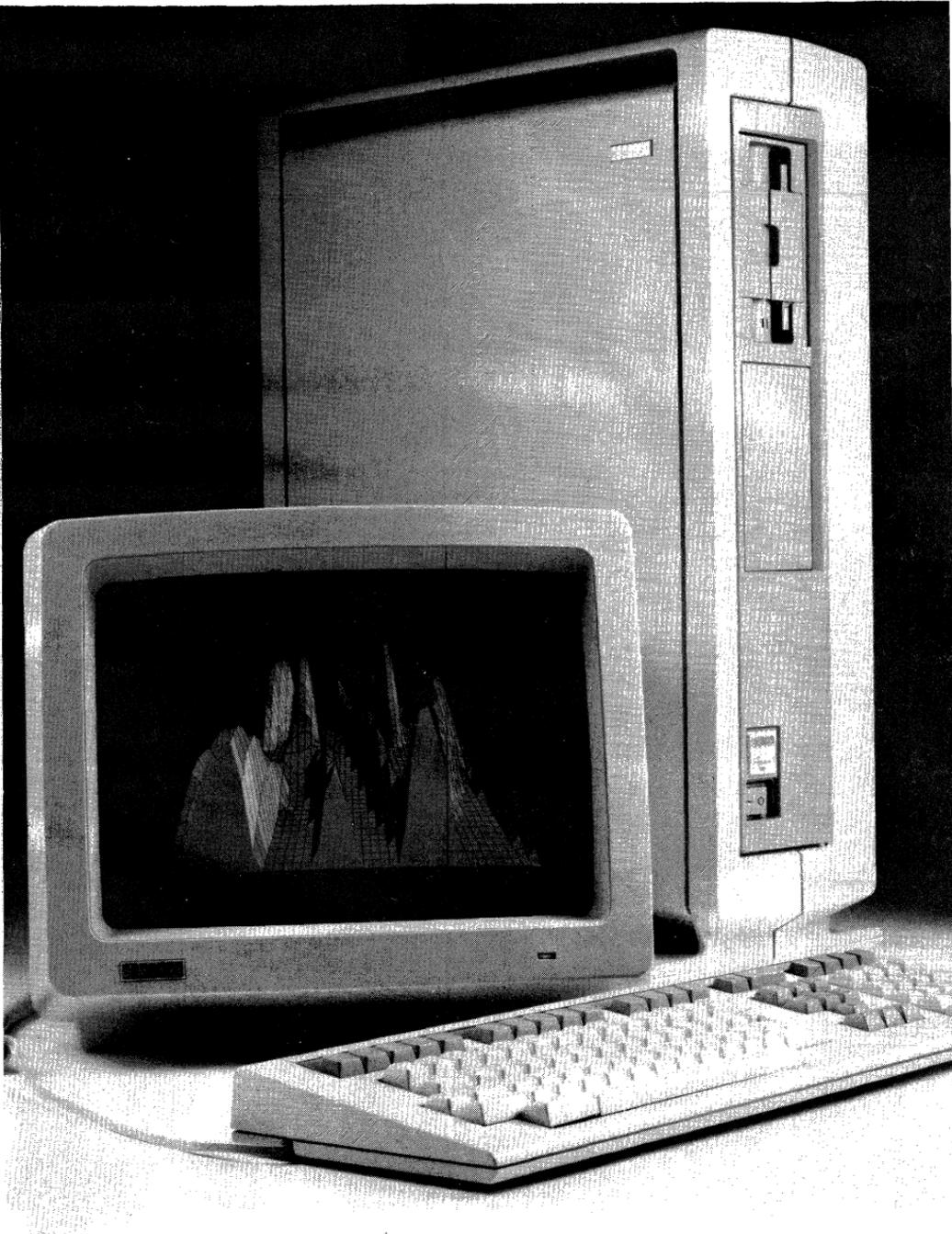


experience designing and building interactive, user-oriented computers. Digital manufactures all of its own computer products—from mainframes to microcomputers. And Digital's standards are among the highest in the industry.

To help you make the most of your Digital computer, support programs are broad and diverse. There is Customer Services for hardware and software support, Field Service for your maintenance needs, Educational Services for courses and seminars, and DECUS, the Digital user organization. In addition, the Professional is covered by a comprehensive warranty that's one of the best in the industry.

Today, Digital is the world's second-largest computer manufacturer. Hundreds of thousands of businesses, organizations, and individuals count on Digital for quality products and service. You can, too.

Chapter 2 • A Closer Look at the Professional Series



The Professional is more than a single computer—it is a family of systems and options known collectively as the Professional 300 Series. The Professional Series offers a broad range of hardware and software products to provide the best desktop solutions in distributed processing, networking and communications, graphics, and program development.

The series consists of three basic models: the Professional 325, the Professional 350, and the Professional 380. All models include 512 Kbytes of memory, a dual 5¼-inch diskette drive with 800 Kbytes of formatted storage, a 12-inch monochrome or 13-inch color monitor, and a choice of 16 country-specific keyboards.

Each model is characterized by several basic features: storage capacity, expansion capacity, processing speed, and graphics capability. Each is optimized for specific tasks and applications. And finally, each offers a distinct level of price and performance.

The Professional 325 and 350 incorporate the F-11 (PDP-11/23) chip set, floating-point processor, and standard bit-mapped graphics for sharp text and graphic displays.

The Professional 325 is a diskette-based system offering one slot for user-installable options. Available options include additional memory, color capability, or one of several data collection or communication devices. The Professional 325 runs diskette-based versions of P/OS, RT-11, CTS-300, C/PM, and STANDARD MICRO MUMPS 300. It has the distinction of being the lowest-cost PDP-11 system ever produced.

The Professional 350 has three available option slots, and will accept an internally mounted 5-, 10-, or 33-Mbyte hard-disk storage system in addition to its standard dual-diskette drive. The Professional 350 also offers Ethernet Local Area Network capability using PRO/DECnet software.

The Professional 350 is ideal for data management applications requiring fast, large-capacity mass storage; where Local Area Networks are planned or in place; and where multiple system options are required. The Professional 350 (and 380) run all available operating systems, including the UNIX-based products.

The Professional 380 offers the powerful J-11 (PDP-11/70) chip set, state-of-the-art CMOS gate arrays, and a higher degree of system board integration. The result is increased processing speed, faster response and quicker display rates. The Professional 380 also offers a higher-resolution “interlaced” graphics mode to provide twice the vertical resolution of other Professional models. Finally, the 380 has five available option slots for system expansion, and will run every available system option.

The Professional 380 delivers real performance gains in a number of applications: a multiuser Professional running PRO/VENIX, CPU-intensive scientific and engineering applications, or large database management systems. The 380’s higher-resolution graphics also provide the basis for a powerful low-end CAD workstation.

Up and Running in Less Than an Hour.

Whichever model you choose, the Professional comes as a complete, ready-to-use system. It can be set up and operational—from box to desk—in less than an hour. No special tools are needed.

Each Professional has three basic parts: a keyboard, a monitor and a system unit. Connecting the components is simple: the keyboard plugs into the back of the monitor, the monitor plugs into the back of the system unit, and the system unit plugs into a standard electrical outlet.

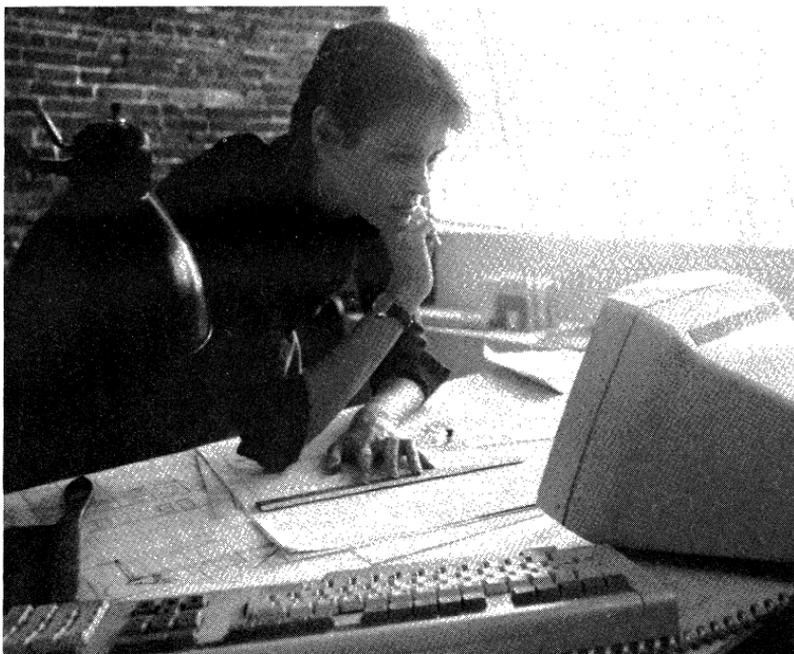
This simple, modular design gives you many arrangement possibilities. For example, you can stack the monitor on top of the system unit, and place the keyboard in front of it. Or, you can place

the system unit on a separate table, keeping just the keyboard and monitor on your desk. If desktop space is really at a premium, you can position the system unit vertically under your desk in the optional floorstand.

Clear, easy-to-follow installation guides are provided with the system itself as well as with any hardware options, operating systems, and application software you may install.

You'll Feel Comfortable From the Very Start.

The best way to acquaint yourself with the Professional's features is to simply sit down and try it. Your Digital sales representative will be happy to arrange a demonstration. And you'll be surprised what you can learn in just a few minutes.



First, take a moment to study a few of the Professional's design details. The sleek, sculpted look has probably already caught your eye. But as you will see, the Professional looks the way it does for some very practical reasons.

Notice how compact the monitor is in relation to the size of its screen. The Professional's monochrome monitor is the smallest 12-inch monitor made for any computer.

The monitor has brightness and contrast controls to let you adjust to any lighting situation. You will also find that you can adjust the tilt of the screen to eliminate glare or to provide a more comfortable viewing angle.

Next, pick up the keyboard. It is light, but has a solid, durable feel about it. On the underside of the keyboard, you'll notice that the connecting cable can be routed to either side of the keyboard. So no matter where you position the keyboard on your desk, the cable can be routed out of your way.

Digital's award-winning keyboard combines striking good looks with a common sense approach to design. Its low profile makes it exceptionally comfortable to type on. The keys are comfortably spaced and offer a firm, positive response to the touch. The layout is sensible, too.

The keyboard is divided into four areas: typing keys, editing keys, a numeric keypad, and special-function keys. The typing keys are just like a conventional typewriter, the numeric keypad is laid out like a calculator, the editing and special-function keys are thoughtfully positioned and clearly identified. Simple English command keys save you time and the bother of memorizing unusual keystroke sequences.



The **HELP** key will guide you through any procedure or operation at any time. The **RESUME** key returns you to the activity in progress. If you accidentally press the wrong key, just press **CANCEL**. The **MAIN SCREEN** key will take you directly to the main menu, where you can choose a new activity or application.

A hinged plastic window runs across the top of the keyboard. The window holds a removable legend strip that identifies the special-function keys. Most applications use the same special-function keys for the same purpose. Applications that redefine the special function keys often provide a replacement legend strip. By changing the legend strip when you change applications, your special-function keys will always be appropriately labeled.

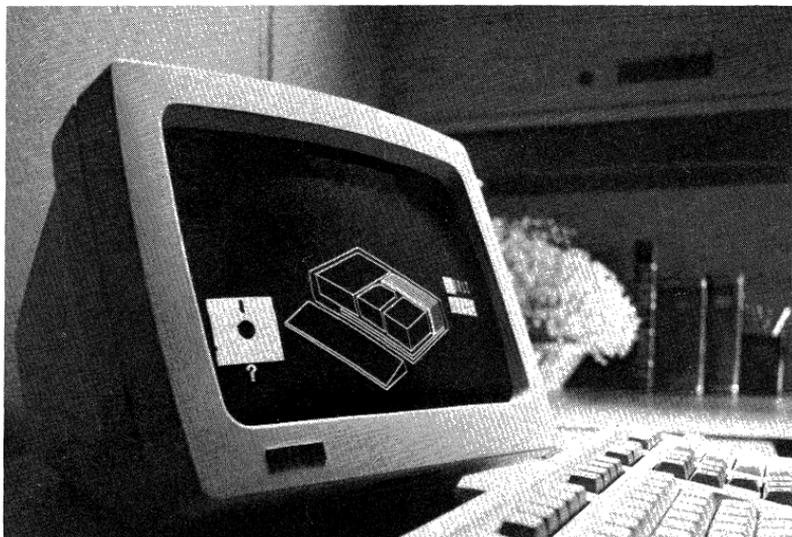
Finally, there is the Professional System Unit. A quick visual inspection reveals many unique features. The front panel contains one of the industry's most compact 5¼-inch diskette drives. Digital has engineered two drives onto a single spindle, creating the so-called "dual-diskette" drive. The dual-diskette system offers a fast way to "back up" data from one diskette to another, and provides 400 Kbytes of storage capacity per drive.

The back panel of the system unit contains an extraordinary number of other standard features: a communications port, a printer port, a network interconnect port, a switchable power supply (115v/220v), and a series of diagnostic LED displays. There is also a slide-out panel for the Professional's Telephone Management System interface. As you can see, the Professional was designed with flexibility and expansion in mind.

These and other design features add up to a desktop system that fits into *your* environment rather than the other way around. The result is a computer that is flexible, comfortable and easy-to-use.

To Test the System, Just Turn It On.

Each time you turn the Professional on, it conducts its own system test. A built-in self-diagnostic routine tests all system components as well as any options that are present. If the system is operating properly, a message will appear on the screen telling you so.



Built-in system diagnostics tell you if you have a problem.

In the unlikely event that a problem should occur, the Professional will draw a diagram of the system, highlighting the problem area. A number code also appears on the screen to help you determine which component is malfunctioning.

Once the self-test is complete, you are ready to begin.

The Professional Teaches You What You Need to Know.

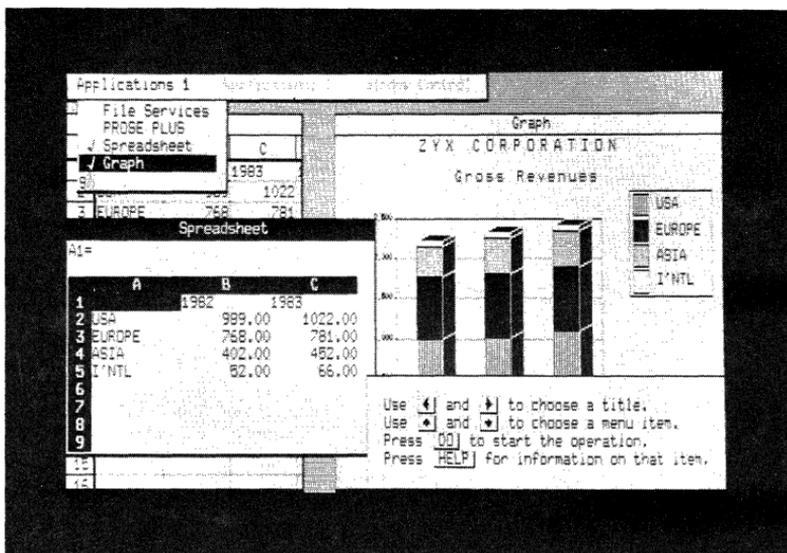
You can learn to use your Professional at your own pace thanks to extensive Computer-Based Instruction (CBI). These hands-on tutorials come with the Professional, its operating systems, and many of the software applications you will be running. They cover all the basics, as well many more advanced features and capabilities.

You will learn about file services, disk services, communications, loading applications and more. Better yet, you will actually perform these and other operations on your Professional as you move through the course.

In addition, the Professional comes with a series of guides and manuals that document every aspect of the Professional's operation. For those who would like more detailed information on the system and its operation, a number of technical documents are available from Digital.



Computer-based instruction programs provide fast, easy training.



Synergy: A State-of-the-Art Approach to Personal Productivity.

Chances are, you already have some specific applications in mind for your Professional. After all, there are thousands of powerful minicomputer programs written for other PDP-11s that will run on the Professional with little or no modification. But what about your day-to-day planning, administrative, and managerial chores? Consider Synergy.

Synergy brings four of the most popular types of productivity packages—a text and graphics editor, spreadsheet, database manager, and business graphics—into an integrated, windowing environment. Synergy also includes a versatile programmable calculator, a communications package, and file service utilities.

Synergy lets you view any or all of the applications simultaneously through windows on the Professional's screen. You control the size and dimensions of the windows. Any single application can be active at any time. Switching from one application to another is a matter of a few simple keystrokes.

PROSE PLUS, Synergy's text and graphics editor, lets you create, edit, and manipulate both words and pictures. Besides having many standard word processing features, PROSE PLUS lets you add diagrams, illustrations, headers and stylized text to your documents using its full screen graphics editor.

Synergy's spreadsheet module is an easy-to-use planning, budgeting, and forecasting tool. Calculations and recalculations that would take hours by hand can be accomplished in seconds.

Synergy's datamanager module maintains any type of list, from telephone directories to inventories. It can store, find, sort—even create reports—from data you have entered.

Synergy's graph module takes the data and information you have generated in the Synergy spreadsheet or Synergy datamanager and turns it into easy-to-understand graphs or charts. The graphics you produce can then be incorporated into PROSE PLUS documents.

Finally, Synergy's calculator combines powerful programmable features with the simplicity and ease of use of a pocket calculator. It also provides an on-screen printout to keep track of running calculations.

Synergy makes sense for anyone looking for a broad set of applications in an integrated, easy-to-use windowing environment.



High Performance Applications for a High-Performance System.

Many of the applications available for the Professional have been adapted directly from Digital's PDP-11 and VAX software portfolios. These are powerful, mature applications that have been thoroughly proven in demanding environments. In most cases, these applications have been carefully modified to take full advantage of the Professional's menu system and HELP key.

Other applications have been specifically developed to take advantage of the Professional's unique graphics, communications, and application development capabilities. You'll find videotex, networking, telephone management and distributed office automation applications that other desktop computers simply could not run.

In all, hundreds of applications are available for the Professional. Many are described in detail in this book. The categories you will find include scientific and engineering, business and accounting, word processing and office automation, decision support, graphics, education and application development.

Professional Communications: Your Window to a World of Information.

Every aspect of the Professional's design promotes faster and more efficient communication—both within and outside the Digital environment.

Files, data—even applications—are highly transportable to and from larger Digital systems, thanks to the Professional's common architecture. Multitasking operating systems let you keep working while lengthy communication tasks are taking place in "background" mode. There is even a built-in network port capable of supporting communications at 10 Mbits per second, and provision for an integral modem and telephone jacks.

The Professional builds on its basic communication capabilities with a list of hardware and software products designed to meet the communication needs of virtually any professional working in a Digital, IBM or any other environment.

PRO/Communications: The Vital Link.

PRO/Communications is the key to a number of communications operations under the Professional Operating System (P/OS). This versatile software allows you to perform a variety of communications tasks, from file transfers to terminal emulation, quickly and easily.

When you install PRO/Communications, the menu system will guide you through the necessary communications set-up routines.

Then simply choose a task from the communications menu—terminal emulation, file transfer, phone book services, call services, or file conversion services—and press the “DO” key.

PRO/Communications performs file transfers with other Professionals, with Digital’s DECmate II word processors, and with multiuser PDP-11 and VAX computers running appropriate communications software. PRO/Communications also supports file transfer and other operations over Digital’s Mini-Exchange personal computer interconnect device.

PRO/Communications allows your Professional to emulate a standard ASCII video terminal as well as Digital’s VT52, VT102, VT125, VT240/241 and VR201 terminals. In terminal emulation mode, the Professional can perform a number of data transfers, give you access to languages and programs on host systems, and connect you to remote databases and information services.

PRO/Communications also provides a phone book and call services feature that can store and update frequently used telephone numbers. It will even dial those numbers for you with an optional autodial modem or the Professional’s Telephone Management System.

The Professional is a Tool for Telephone Management.

Anyone who spends time on the telephone—selling, researching, problem-solving, even transmitting or receiving data—will appreciate the Professional’s Telephone Management System.

A TMS-equipped Professional redefines the notion of the executive workstation. TMS not only simplifies the telephone and data communication jobs you already do, it opens the door to many new voice and data communication applications.



TMS can simplify your everyday telephone and data communication tasks.

TMS can virtually replace the conventional telephones, modems, speed dialers, Rolodex, speaker phones, answering machines and other telephone tools you now use. In their place is an integrated desktop communication system that fully complements the Professional's communication, graphics and multitasking capabilities.

You can start by using TMS for tasks as routine as file transfers, telephone directory services and automatic call dialing. You'll find that TMS helps you perform these basic but time-consuming tasks faster and more efficiently than ever before.

As your needs grow, TMS grows with you. TMS brings you closer to the home office, the corporate database, or any other information sources you use. You can connect to services such as Dow Jones™ or The Source™ or other host computers with a few simple keystrokes. TMS can be a “smart” telephone directory that can keep track of calls and billing, maintain client profiles—even remind you when to return a call. TMS can record and deliver telephone messages, respond to Touch-Tone™ prompts, and perform other “intelligent” telephone and voice management tasks.

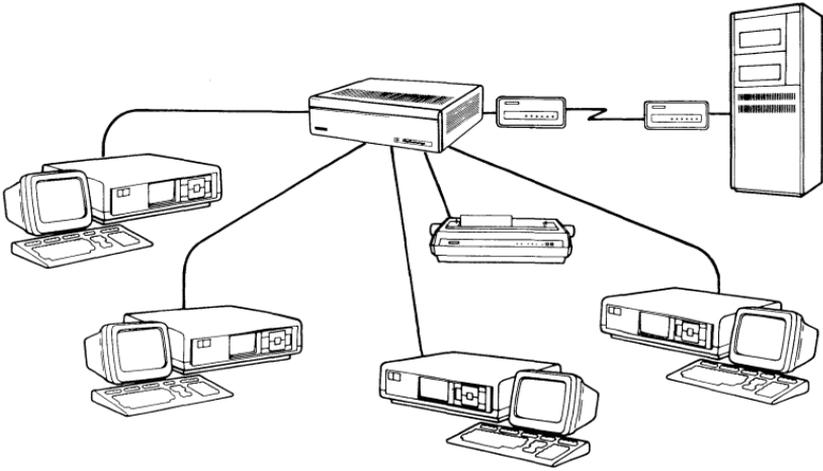
That’s TMS today. Now consider TMS tomorrow. Using its advanced voice capabilities, TMS could be the basis for a text editing device that would allow you to “speak” your corrections into a document for processing by your secretary. Using the Professional’s built-in clock, TMS could perform unattended data transfers at night, when telephone rates are lower.

TMS features an integral full-duplex autodial/autoanswer 300/1200 baud modem that supports two telephone lines. Also included is all the hardware necessary for voice recording and playback using the Professional’s hard disk. TMS options include a desktop keypad and voice unit speaker phone, headphones, microphone and footpedal switch.

Perhaps most remarkable is the fact that the basic TMS hardware costs no more than a good-quality 1200-baud modem.

The Professional Provides Cost-Effective Solutions for Office Communications.

Where several standalone personal computers exist, the Professional offers a simple, inexpensive communication solution: Mini-Exchange. Mini-Exchange allows Professional and other desktop computer users to share information, share resources—in short, to work as a team rather than as a group of individuals.



Digital's Mini-Exchange provides local communications, common access to shared devices, and common access to remote computers via a modem.

Mini-Exchange offers a sensible way to share expensive devices such as letter-quality printers, modems and multiplexers. In fact, Mini-Exchange will support most devices using RS232 connections in an asynchronous environment. Mini-Exchange can also be used to perform file and document transfers between Digital or non-Digital personal computers.

Most importantly, Mini-Exchange gives you powerful and versatile local communication capability for a fraction of the cost of telecommunications-based systems. And since it allows groups of personal computers to share peripheral devices, it can dramatically reduce per-system configuration costs in a small office.

Eight personal computers or other devices can be connected to a single Mini-Exchange at a range of up to 200 feet. A Mini-Exchange network can handle four communication connections simultaneously, and will automatically queue requests for shared devices such as a printer. Operating speeds range from 300 to 19,200 baud.

Using PRO/Communications, the Mini-Exchange allows file transfers from a Professional to a Digital host; from Professional to Professional; from a Professional to Digital's DECmate II word processor; and from a Professional to a printer or modem. Communication software is required for any computer participating in the Mini-Exchange.

Software is also available to allow Digital's Rainbow and other major brands of personal computers to join a Mini-Exchange network.

PRO/DECnet: Local Area Networking Networking for the Professional.

The Professional offers one of the most sophisticated Local Area Network (LAN) options available on any computer, let alone a desktop computer. PRO/DECnet provides an extremely fast method of exchanging information; gives you access to program libraries and storage space on larger computers; allows you to share expensive devices such as plotters and lineprinters; and opens the door to many new communication tools.

PRO/DECnet is a fully functional member of Digital's DECnet family of networking software, providing many large-system communications utilities and applications. With PRO/DECnet, you can tie groups of Professionals or other Digital systems into small Local Area Networks, or integrate the Professional into larger existing DECnet networks.

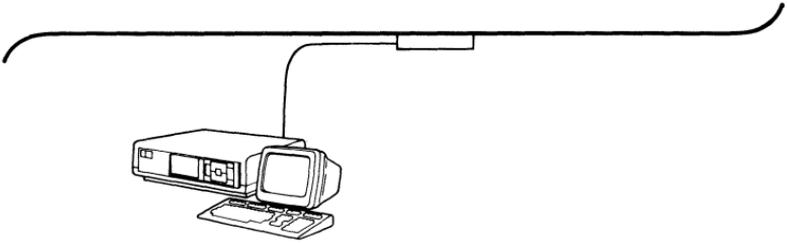
PRO/DECnet supports file transfer, remote file access, terminal emulation and task-to-task communications at speeds of 10 Mbits per second. You can also create multiple links between your Professional and other systems on the network. This lets you perform one operation such as a file transfer with one system as you perform another operation, such as accessing a database, with another system.

PRO/DECnet not only allows *computers* to communicate more efficiently, it also provides useful ways for *users* to communicate. The PRO/DECnet PHONE utility offers a realtime, interactive communication system. Two users literally type their conversation on a split screen. The PRO/DECnet MAIL utility allows users to send and receive messages and memos across the network.

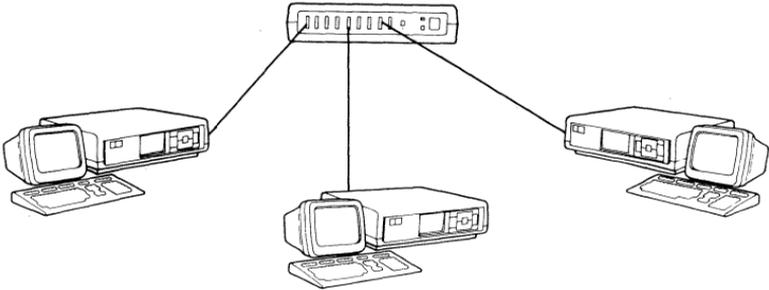
PRO/DECnet is implemented through Ethernet, a standard method of handling local area networking. PRO/DECnet is user-installable, and includes an easy-to-use system of network management and maintenance.

You can start with a network configuration as simple as linking several Professionals in an office. A network connecting device known as a DELNI will support up to eight Professionals or other Digital computers over an area of up to 100 meters. The hardware and software investment is modest, yet the potential for growth and expansion is practically unlimited.

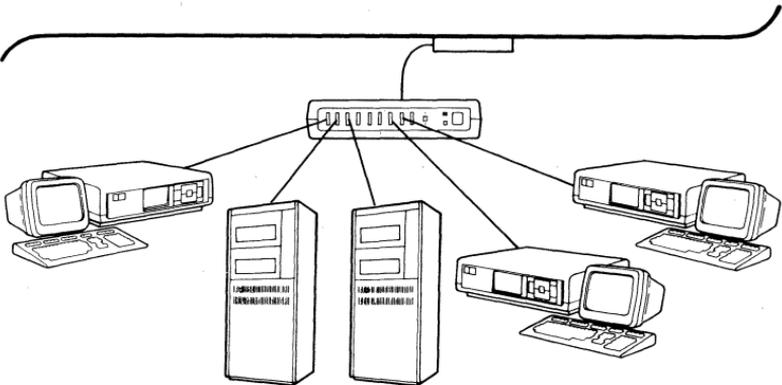
Because PRO/DECnet is part of the Digital Network Architecture (DNA), the Professional can be easily integrated into DECnet networks of any size or configuration. By simply connecting to existing coaxial cable, Professionals can be tied to larger PDP-11s, VAXes, or DECSYSTEM-10 and -20 mainframes. A DECnet network can communicate with IBM and other non-Digital systems using gateways and packet-switching networks.



Using PRO/DECnet software, the DECNA Ethernet Controller, and an H4000 Ethernet Transceiver, Professionals can tie into existing Ethernet networks.



The DELNI Local Network Interconnect offers low-cost, high-performance Ethernet networking.



A DELNI may also be used in larger Ethernet networks.

The Professional is at Home in an IBM Environment.

Where large networks and gateways are impractical, a variety of communication software is available to allow the Professional to operate effectively in any environment using IBM system protocols. Two basic types of applications are available: those that transfer files to and from an IBM computer, and those that let the Professional copy the functions of an IBM terminal.

Software support is available for both of the commonly used IBM protocols, Binary Synchronous (BSC) and the Systems Network Architecture (SNA). PRISM™ and PRO 2780/3780 allow a Professional to communicate with other devices as binary synchronous devices. Using PRISM, the Professional can emulate an IBM 3276 Model 2 cluster controller and a 3278 Model 2 terminal. Using PRO 2780/3780, the Professional will behave like a 2780/3780 Remote Job Entry Station.

The PRO/SNA Terminal and Printer Emulator allows you to use your Professional as an IBM 3270 terminal within an SNA environment. Using PRO/SNA Remote Job Entry, you can use your Professional as a 3770 Remote Job Entry (RJE) Station.

Professional Graphics: A New Standard in Standard Equipment.

Sophisticated graphics capability is not an option on the Professional. It is standard. The Professional features bit-mapped graphics, which makes every point (or pixel) on the screen addressable from a program. The result is crisp resolution and far greater flexibility in producing graphic displays.



PROSE-PLUS brings fully integrated text and graphics to the Professional.

Most desktop computers use a form of “character cell graphics” that address a block of pixels rather than each point. Character cell graphics produce adequate text, boxes and lines, but are not capable of drawing precise curves or intricate patterns. So while many computers offer only primitive “line graphics”—and often only as an option—the Professional lets you create sophisticated graphics right from the start.

All models of the Professional Series provide a standard screen resolution of 960 by 240 pixels. The Professional 380 offers a second, higher-resolution “interlaced mode,” which provides twice the vertical screen resolution (960 by 480 pixels). The

interlaced mode provides an exceptionally high level of detail—especially important for design and technical graphics.

Other video enhancements on the Professional 380 include a four-page video memory. This allows the 380 to store up to four full “screens” of information at once for a significantly faster video display rate.

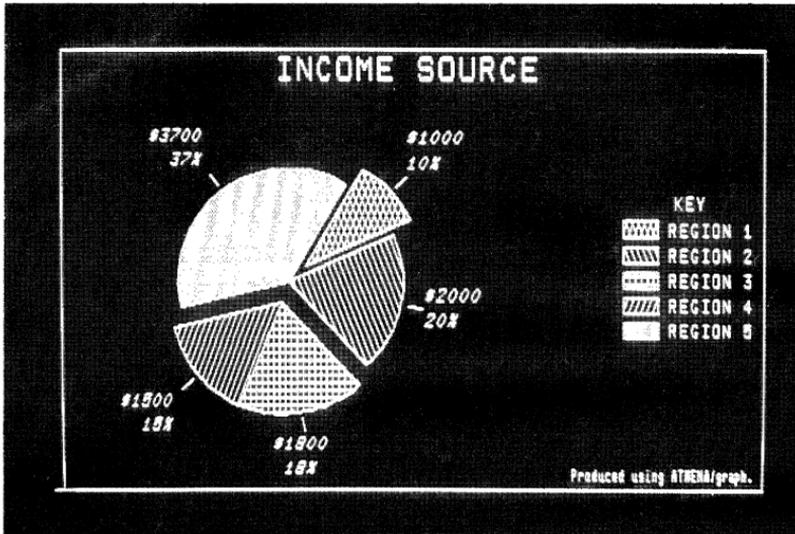
Color capability is easily added to any member of the Professional Series. The Extended Bit-Map Graphics Option (EBO) produces three bit-mapped planes that support the red, green and blue planes of Digital’s 13-inch color monitor. On the Professional 325 and 350, the EBO is a module card that occupies one option slot. On the Professional 380, the EBO is a daughter card that attaches directly to the system board.

The Professional can display eight colors simultaneously from a palette of 256. And unlike many personal computer systems, the Professional’s color system is sharp enough to be used for text as well as graphics. Hardcopies of your graphics can be produced on Digital’s LA50 or LA100 dot-matrix printers, or on the LVP16 six-pen color plotter.

Software Completes the Graphics Picture.

Anyone who uses the Professional can take advantage of its graphics capabilities. Graphics applications range from decision support to lab and scientific applications to merchandising and training.

Business graphics packages include Fingraph,[™] ATHENA/Graph,[™] Maps/Pro Graphics, and PRO/Graph. These applications let you draw from data produced in other applications such as spreadsheets or databases to create dynamic, easy-to-understand graphic presentations.



*Business graphics by ATHENA/
graph*

Data analysis packages like RS/1 also take full advantage of the Professional's graphics capabilities. Using simple English commands, RS/1 lets you create scatter plots, line graphs, histograms, bar graphs, pie charts and three-dimensional plots.

Design/Graphix™ turns the Professional into a low-end CAD workstation, with full three-dimensional drafting capabilities and compatibility with large-system CAD applications.

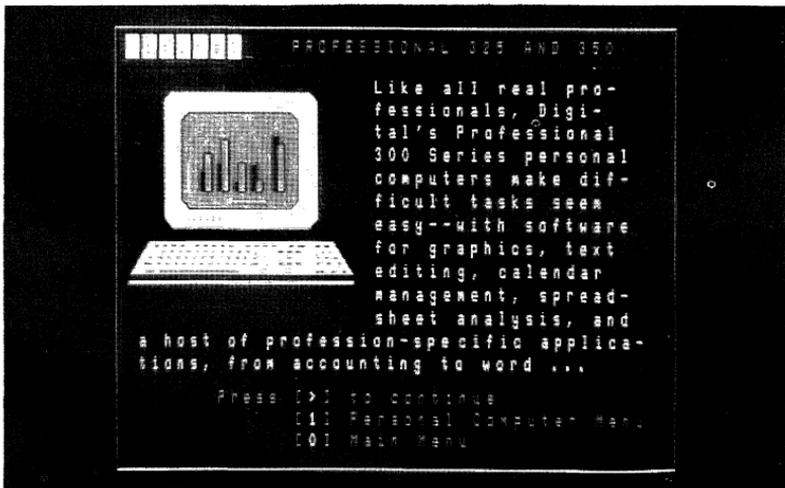
For the graphics arts professional or presentation manager, there is SIGHT,™ a full-function, object-oriented drawing package. SIGHT is menu-driven, uses simple English language commands, and supports a variety of alternate input devices including a mouse or drawing tablet.

The Professional can also capture and present graphics from many remote sources. In fact, the Professional provides terminal emulation capability in three of the most commonly-used graphics protocols.

The Professional emulates Digital's standard graphics terminals such as the VT125 with full support of the ReGIS (Remote Graphic Instruction Set) protocol.

The PC4014 Tektronix™ terminal emulator lets your Professional display graphics produced on non-Digital remote host systems using the industry-standard Tektronix 4014 graphics language.

PRO/NAPLPS allows the Professional to access remote videotex databases using the standard North American videotex protocol.



PRO/NAPLPS lets you access any Videotex database for dynamic, visually-oriented information.

The growing list of commercial videotex databases provide timely travel, financial and product/merchandise information in dynamic graphic form.

For more complete information on graphics applications for the Professional, see Chapter 9.

Graphic Information Systems: IVIS and PRO/Videotex.

The Professional provides the computer power behind two remarkable graphic communication systems: IVIS, Digital's Interactive Video Information System; and PRO/Videotex, a self-contained videotex database system.

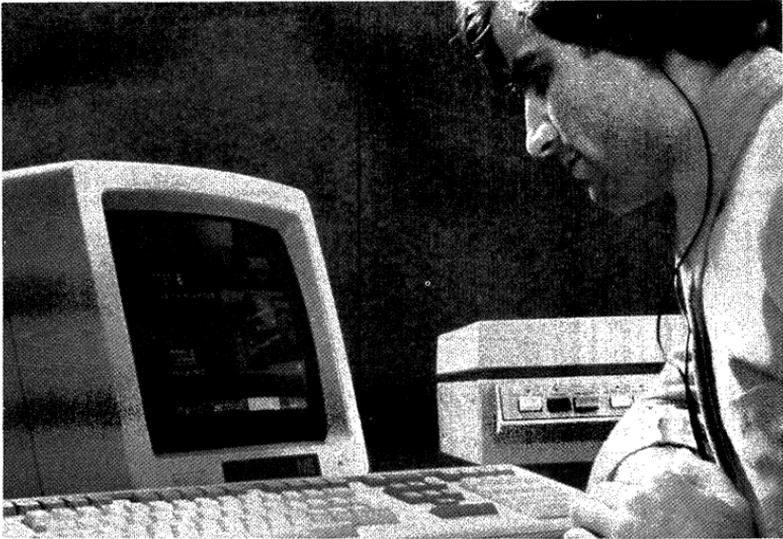
IVIS uses the Professional, a laser videodisc system, high-fidelity sound and touchscreen technology to create a powerful, "live-action" information station.

IVIS presents video sequences, color graphics, text and narrative in a way even the complete computer novice can control. Applications for IVIS include point-of-sale displays, tourism or consumer information stands, simulation, video games, factory automation monitoring—and especially training.

Using currently available or custom developed "courseware," IVIS can train personnel in even the most intricate subjects. It combines the immediacy of a "live" teaching situation with the consistency and impact of a high-quality audio/visual presentation.

In addition to the IVIS hardware and standard library of courses, Digital offers educational consulting services, custom courseware development and development tools for those who wish to produce their own courses.

PRO/Videotex takes the Professional beyond videotex terminal emulation to create a self-contained videotex system capable of storing, retrieving and maintaining graphic information.



IVIS combines text, graphics, live video and high-fidelity sound for training, merchandising and other applications.

As a videotex workstation, the Professional has many applications in sales and marketing, public relations, MIS, customer service, employee training—anywhere timely, easily understandable information must be widely distributed.

State-of-the-art Graphics for Your Own Applications.

Today's software developers need a modern, accessible graphics architecture to produce state-of-the-art graphics applications. The Professional gives developers the tools to create graphics applications that really stand out. Whether you are creating graphics for

your own use, for end-users in your organization, or for the workstation market in general, the Professional lets you get the job done faster and easier.

The Professional provides high- and low-level access to its graphics subsystem. The high-level CORE Graphics Library (CGL) and low-level PRO/GIDIS (General Image Display Instruction Set) are both device-independent graphics libraries for graphics software development. They include routines for drawing lines, curves, and polygons; setting colors and viewports; and displaying text in various font styles. Both support the Professional's high-resolution monochrome and color bit-map display, Digital's LA50 and LA100 dot-matrix printers, and the six-pen LVP16 color plotter.

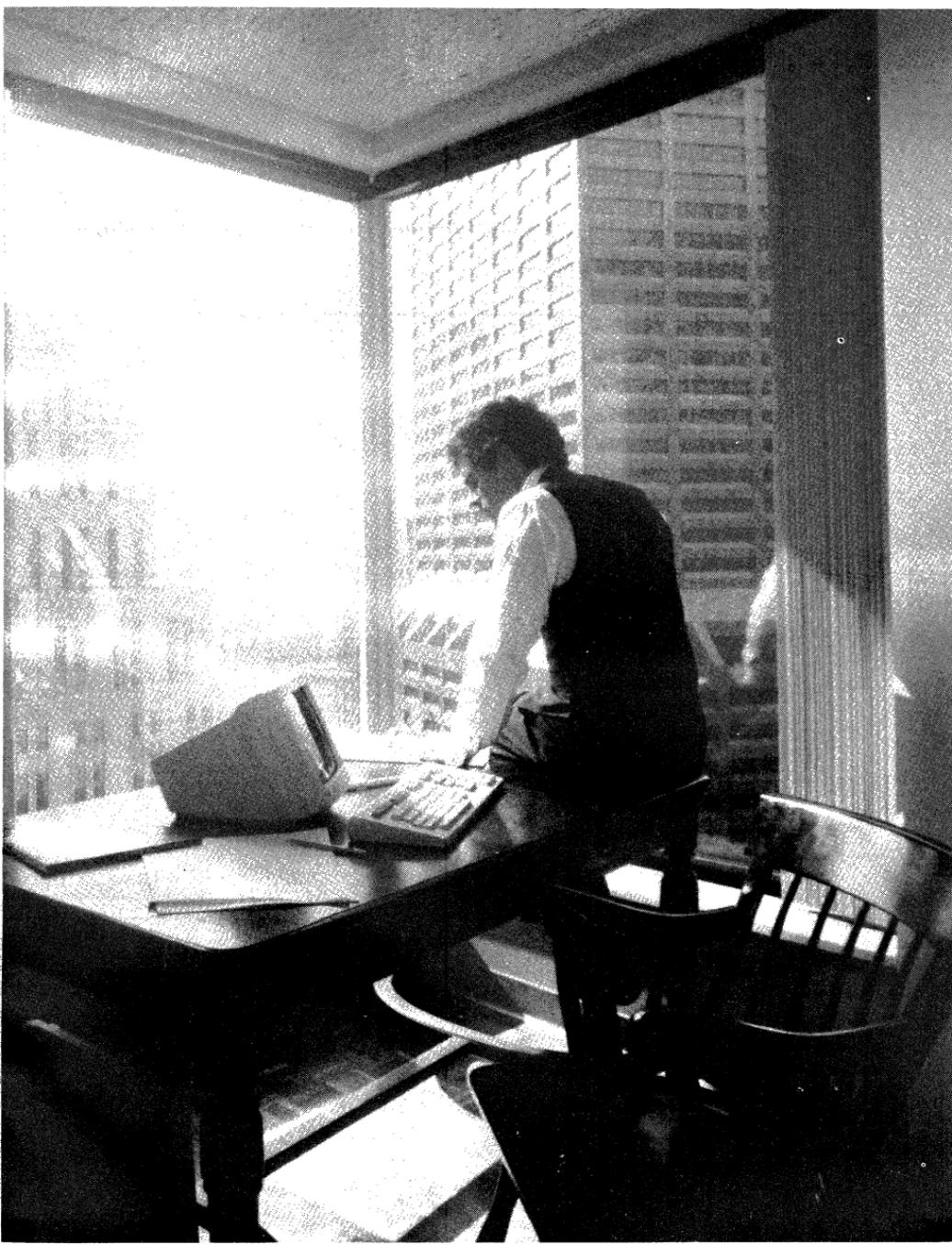
For more details on graphics application development, see Chapter 3.

The Professional For Developers and Original Equipment Manufacturers.

The Professional's PDP-11 architecture, wide choice of operating systems, communication tools and graphics capabilities make it an excellent base machine for developers and OEMs. Digital offers a number of programs and incentives to allow individuals and companies to take full advantage of the Professional's capabilities.

First, there are extensive application development tools, which can be used with a host system or directly on the Professional. These versatile tools are described in detail in the next chapter.

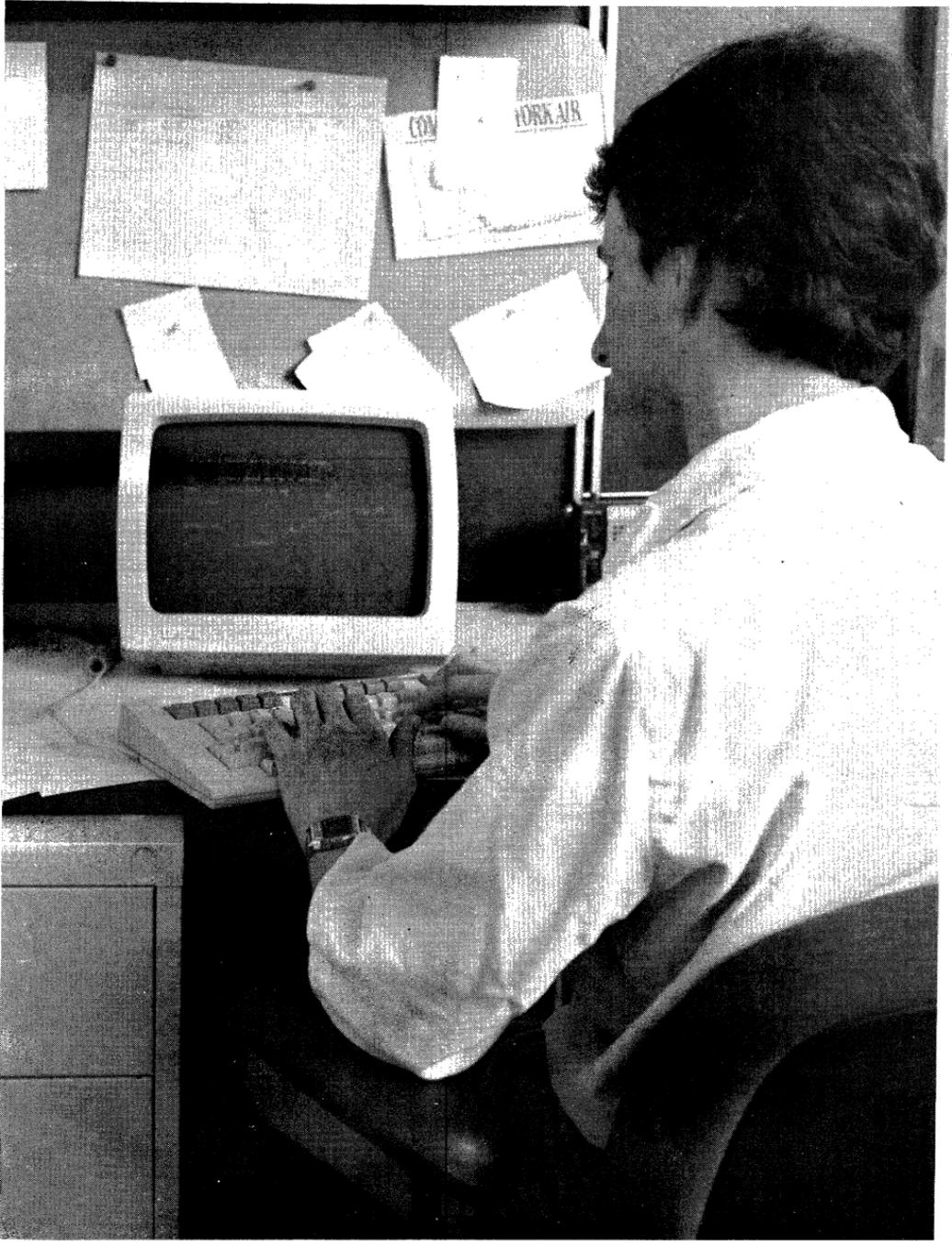
Second is Digital's licensed bus policy for the Professional. Any third-party developer can design, manufacture and sell hardware options that can plug directly into the option slots on the



Professional. Third-party developers must obtain a license and sign a nondisclosure agreement to obtain the proprietary bus specs, but there are no fees or royalties. Details of the bus licensing arrangement are in Appendix 2.

Third, developers and OEMs can count on Digital's solid technical support and documentation. A complete library of technical literature and specifications for the Professional is available. Ongoing support and service is also available. Digital's broad experience with developers and OEMs helps us anticipate questions and needs.

CHAPTER 3 • Application Development and the Professional



The Professional may look like a personal computer, but it has the heart of a development machine. Several packages are available to transform the Professional into a full-scale low-cost PDP-11 development environment for your desktop. And with the choice of the Professional 325, 350, or 380, you can select the Professional model best suited to the volume and complexity of your development schedule.

Whether you are a novice programmer or a professional developer, the Professional supports a development environment suited to your needs. Development packages range from easy-to-use interpreters and fourth-generation languages to sophisticated libraries, compilers, and other application design tools. The Professional's high-resolution graphics capabilities, its support for Digital's DECnet networking, and its advanced hardware options such as the Realtime Interface (RTI)—all offer opportunities to design innovative, state-of-the-art applications. The Professional's no-cost bus license even lets you integrate your own devices, and the necessary device drivers, directly into the system. See Appendix II for more information on this licensed bus policy.

The Professional's support for and compatibility with several of Digital's operating systems and languages mean that you can easily move your existing software to the Professional environment. Many PDP-11 and VAX applications move to the Professional with little or no modification. In fact, with some programs you don't even have to recompile source code.

• **Choosing Your Development Environment.**

The Professional supports development approaches and levels diverse enough to suit virtually any preference. Several packages, most notably the PRO/Tool Kit, enable you to complete the entire development cycle directly on a Professional. If you prefer, you can

• Development Environments Supported by Professional Models

Environment	325	350	380
P/OS and PRO/Tool Kit, with Optional Languages		x	x
P/OS and Professional Host Tool Kit Components, with Optional Languages		x	x
P/OS and PRO/BASIC	x	x	x
P/OS and PRO-IV		x	x
RT-11 and Optional Languages	x	x	x
P/OS and p-System with Optional Languages	x	x	x
PRO/UNIX (Languages Included)		x	x
XENIX (Choice of Included and Optional Languages)		x	x
Idris (Choice of Included and Optional Languages)		x	x
MUMPS with Optional Language	x	x	x

Note: See Chapter 10 for descriptions of the languages available for these environments.

use the Professional Host Tool Kit on Digital's VAX/VMS or RSX-11M/M-PLUS systems to develop software that will execute under the Professional Operating System (P/OS) on the Professional.

All of the operating systems available for the Professional support complete application development facilities. P/OS, in particular, supports several extensive development opportunities. Its primary development environment is the PRO/Tool Kit, which takes advantage of the P/OS Files-11 file structure and system resources such as the Help frames and menu system. P/OS also supports application development with the PRO/BASIC interpreter and the p-System layered operating system. The PRO/BASIC interpreter is a friendly package that is especially well-suited to novice or casual programmers; p-System lets you develop for the "universal micro."

Development opportunities are also available for the Professional's other operating systems. RT-11 Native on the Professional brings the full complement of powerful RT-11 development resources to the personal PDP-11 workstation. CTS-300, which is a special packaging of RT-11 with DIBOL, is designed specifically for developing business applications. The PRO/UNIX, XENIX,TM and IdrisTM implementations of the popular UNIX operating system bring the world of UNIX development to your desktop. And STANDARD MICRO MUMPS 300 opens the door to interesting development possibilities in the medical and database management fields.

• **The PRO/Tool Kit—Native Development Under P/OS.**

The PRO/Tool Kit transforms your Professional 350 or 380 into a dedicated, low-cost PDP-11 development environment. This self-sufficient development package lets you complete the full development cycle from creating the source file to building the application diskettes for distribution to end-users.

The PRO/Tool Kit gives you an inexpensive workstation that lets you develop for several target environments. Naturally you can use the PRO/Tool Kit to develop for the P/OS-based Professional. With this approach, all you ever need are Professionals. Or work with the *Differences Between RSX/VMS and P/OS* guide to develop for Digital's larger VAX/VMS and RSX-11M/M-PLUS computers. This development scheme gives developers the benefits of a dedicated workstation, while it frees the larger computers for tasks that require their more extensive processing power and storage resources. Since you can use the PRO/Tool Kit to develop for each of these environments, it follows that you can use it to develop fully distributed applications for all of these environments. The PRO/Tool Kit is an efficient, cost-effective way to develop an application that will run and share information across Digital's family of computers—Professionals, PDP-11s, and VAXes.

P/OS and the PRO/Tool Kit also protect your development investment by making it easy to move your existing VAX/VMS and RSX-11M/M-PLUS software to the P/OS environment. And because PRO/Tool Kit resources are so highly compatible with the VMS and RSX-11M/M-PLUS development tools, all of this development can start immediately, with developers feeling right at home with their familiar Digital resources.

What's in the PRO/Tool Kit?

The PRO/Tool Kit contains both mature RSX development resources and newer, P/OS-specific facilities. Experienced RSX developers will be immediately at home with the Professional's versions of the Record Management Services (RMS), File Control Services (FCS), Professional Application Builder (PAB), and Forms Management System (FMS).

Perhaps the most notable Professional-specific tool is the Frame Development Tool (FDT). FDT makes it easy for you to create the menus and help messages that make your applications easy for users to work with. The utility also lets you quickly tailor your applications to take advantage of Digital's award-winning keyboard design. Moreover, Digital used FDT to create the friendly P/OS human interface, so you can use FDT to design applications that blend transparently into the P/OS menu environment. Users will move easily between your application and such system tasks as backup, since both use the same menu interface and system services.

Yet another advantage to FDT is that it maintains screen displays separately from code. The efficiency of this design is evident to anyone who has ever had to recompile and relink an application because of a typo on a screen display, but it is particularly important in an international market. Consider the time you can save when you can prepare your application for a different country simply by translating the screen display's text files.

```
COURSE: GEOGRAPHY OF NORTH AMERICA

This course covers rivers, lakes, and mountains. The first topic is mountains.
The mountains listed below are located in different parts of the world. Select
all the mountains located in North America:

-> MT. RUSHMORE
-> MT. WASHINGTON
-> MT. HOOD
-> GRAND TETON
-> MT. RAINIER
   MT. FUJI
-> KILIMANJARO
-> MT. ST. HELENS
->> MT. MCKINLEY

Choose one or more options with the SELECT key and press the DO key:

Kilimanjaro is not in North America. It is in Tanzania, Africa.
At 19,340 feet, it is the highest point in Africa.
```

The Frame Development Tool lets you maintain screen text separately from code, so text changes do not require program modification.

You work with the PRO/Tool Kit using an extended subset of the Digital Command Language (DCL) used on VMS and RSX-11M/M-PLUS systems. The PRO/Tool Kit subset includes commands for file manipulation and logical name assignment, the SHOW command for debugging, and the new single-line editor. These commands let you write, compile, taskbuild, execute, and debug your applications—all without menus.

The PRO/Tool Kit rounds out your development environment with invaluable file utilities generally found only on larger systems. These mature tools include the File Compare Utility

(CMP), File Dump Utility (DMP), Librarian (LBR), Resource Monitor Display (RMD), Task/File Patch Program (ZAP), and Source Language Input Program (SLP).

PRO/Tool Kit Supports Industry-Standard Languages.

The PRO/Tool Kit supports several compilers to suit a wide range of language requirements. The MACRO-11 assembly language is a standard Tool Kit component; you can order other languages separately. Optional PRO/Tool Kit languages include industry-standard compilers for FORTRAN-77 (with optional debugger), Pascal, COBOL-81, DIBOL, and BASIC-PLUS-2. These PRO/Tool Kit implementations contain enhancements, such as graphics library extensions, engineered specifically for P/OS. The languages include the option to support an additional terminal during debugging, so you can interact with the debugger without disrupting your application's menu and message displays. Whitesmiths C, an optional language available from Whitesmiths, Ltd. of Concord, MA, is also available for the PRO/Tool Kit environment.



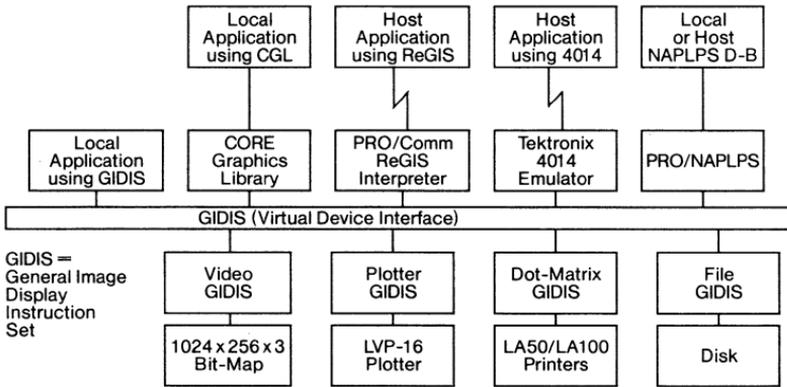
PRO/Tool Kit Specialities.

The fact that the PRO/Tool Kit runs on a small computer doesn't mean that it can produce only limited applications. The PRO/Tool Kit includes facilities that help you create sophisticated graphics, networking, and realtime programs. Develop applications with large data storage requirements: the Professional 350 or 380 configured with the 33-Mbyte hard disk can handle the load. And if processor speed is a concern, target the Professional 380, with its powerful PDP-11/70 chip set.

Draw on P/OS Graphics Capabilities.

The PRO/Tool Kit provides access to the P/OS facilities that help you take full advantage of the Professional's sophisticated graphics capabilities. Depending on the complexity and intended use of your application, you can choose from CORE Graphics Library (CGL), Professional General Image Display Instruction Set (PRO/GIDIS), or direct access to the video bit-map.

If you are looking for industry-standard graphics and ease-of-programming, CGL is the library for you. Based on the 1979 ACM SIGGRAPH CORE standard, CGL lets you generate output primitives (lines, curves, and text), specify attributes (colors, styles, modes, and fonts), and control viewing transformations and scaling (using viewports and windows). All PRO/Tool Kit languages include standard CGL calls that create bit-map graphics for both the video screen and the LVP16 six-pen plotter. You don't even have to learn a separate plotter protocol: the same line of CGL code generates graphics on both the plotter and the video display. (For information on the pen plotter, see Chapter 7.) The *CORE Graphics Library Manual* and the individual language manuals provide detailed information on how to access CGL.



P/OS offers several graphics libraries and protocols to support your graphics development.

PRO/GIDIS is the appropriate library to use if you are implementing specialized graphics applications such as terminal emulators and interactive line drawers. The lowest virtual device interface to the Professional's graphics subsystem, PRO/GIDIS is a collection of device-independent graphics primitives used to draw lines and arcs, specify colors and patterns, perform viewing transformations, and produce text. It also lets you store pictures by describing the images with geometric entities such as lines, arcs, and uniform areas. You can use PRO/GIDIS to write your own application-specific routines and to develop protocol emulators for other devices and for graphics utilities libraries like CORE and Graphics Kernel Systems (GKS). The PRO/Tool Kit gives you access to PRO/GIDIS through MACRO-11 and all of its high-level languages except DIBOL. PRO/GIDIS documentation accompanies both the PRO/Tool Kit and the Professional Host Tool Kit.

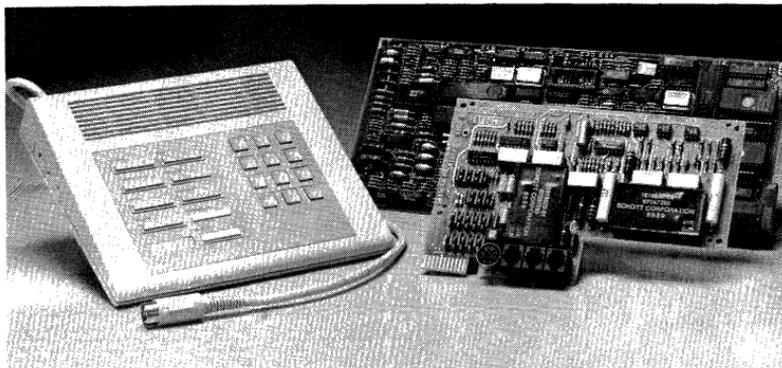
For complex projects such as game programs, realtime data display packages, and the display of digitized photographs, you can use the P/OS special mapping mode that gives you direct access to the video bit-map. The MACRO-11 assembly language that is standard with both Tool Kits gives you this level of control. For detailed information on the Professional's video hardware and its I/O registers, see the *Professional Series Technical Manual*.

Connect Your Applications to the World with PRO/DECnet.

The PRO/Tool Kit helps you develop fully distributed applications for the PRO/DECnet environment. With the Professional running the same application that is running on your larger VAX and PDP-11 computers, all levels of your organization can be running the same programs and sharing information. The PRO/Tool Kit even supports routines that let you create P/OS applications that access files on remote DECnet systems and perform task-to-task communication—and all transparently to the end-user. What's more, you can write applications that interface with a non-Digital system on the Ethernet, because PRO/DECnet lets you bypass the higher-level DECnet protocol to gain direct access to the Ethernet circuit. To facilitate your development efforts, the PRO/Tool Kit provides transparent network file access for several DCL commands, including COPY, CREATE, DIRECTORY, and TYPE.

Develop for the Professional's Hardware Options.

In addition to its support for PRO/DECnet development, the PRO/Tool Kit supports libraries designed to help you develop applications for the Professional's other sophisticated hardware options. The optional Professional Realtime Interface Library (PRTIL) lets you easily develop device control and realtime data acquisition applications for your Professional workstation. The PRO/Tool Kit's callable routines for the Telephone Management System (TMS) speed your development of innovative applications that integrate the human voice into the more traditional text and graphics communications. And with the Professional's no-cost



licensed bus policy, you are free to use the PRO/Tool Kit to integrate your own hardware—and device drivers—into the system. See Appendix II for more information on this licensed bus policy.

Move Existing Applications to the Professional.

The PRO/Tool Kit and the *Differences Between RSX/VMS and P/OS* guide help you protect the investment you have already made in VAX and PDP-11 development. They combine to provide the facilities and information you need to move your existing VMS and RSX applications to the P/OS-based Professional.

In most cases, moving an application to P/OS is a simple matter of recompiling and re-taskbuilding the code. But if a program accesses a feature not supported in the P/OS environment, the *Differences* guide helps you rework the program to take advantage of a similar P/OS facility. With a minimum of development effort and expense, you have a new environment for your application, and a new application for your Professional. The guide also helps you use the PRO/Tool Kit to develop applications for Digital's larger VAX and PDP-11 computers.

Distribute Your Development to Professional Workstations.

The PRO/Tool Kit lets you distribute your development efforts to make the most efficient use of your resources. The distributed approach means developers aren't hampered by slow response time, and larger systems aren't overloaded by tasks that don't make full use of their powerful resources.

Each programmer in a distributed development environment creates a module on a dedicated development Professional, then



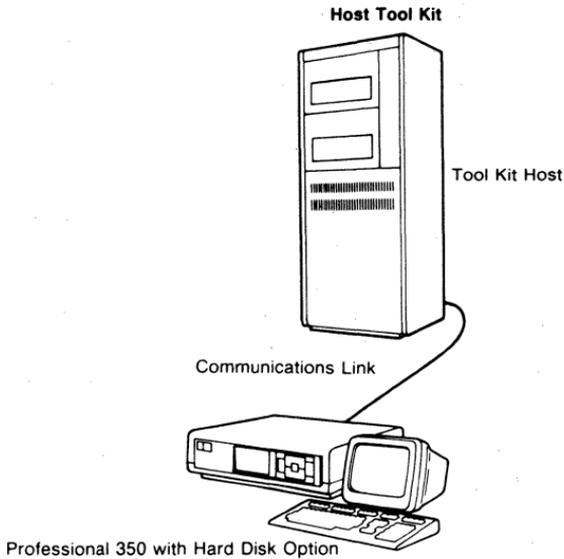
transfers it to the large machine. A developer on the large computer taskbuilds the modules into one application. You can even distribute 32-bit VAX development to the 16-bit PRO/Tool Kit environment. Simply create the source files on the Professional then move them to the VAX for compilation and taskbuilding.

PRO/Communications is a vital link in the distributed development chain. The File Transfer Facility that is part of PRO/Communications supplies you with an easy, efficient means of transferring text files between the Professional and your other development machines. The Professional File Transfer (PFT) package (available as a separate package or as a standard part of the Professional Host Tool Kit) runs on the VAX or RSX-based host system to enable you to transfer binary files between the host computer and the Professional.

Digital developed special support and training packages for developers using the PRO/Tool Kit. See Chapter 5 for an outline of these policies. See Chapter 10 for more detailed information on the PRO/Tool Kit.

• **Use Larger VAX and PDP-11 Computers to Develop for P/OS.**

The Professional Host Tool Kit lets you use a properly equipped VAX or PDP-11 computer to develop applications tailored to the P/OS environment. You have the same graphics, networking, and realtime development opportunities that are offered by the PRO/Tool Kit, but now you complete most of the development cycle on the larger machine. Host Tool Kit facilities residing on a Professional 350 or 380 with a hard disk enable you to test and debug your application, then build the application diskettes for distribution to end-users.



The Professional Host Tool Kit is divided between the host computer and the Professional 350 or 380.

The Professional Host Tool Kit operates under the RSX-11M/M-PLUS operating system or a VMS system that is running VAX-11 RSX. (VAX-11 RSX runs under VMS to emulate a PDP-11 running RSX.) This arrangement allows you to take advantage of the sophisticated development resources on the larger computers. Rather than duplicate the facilities already on the host system, the Host Tool Kit includes only P/OS-specific resources such as the Frame Development Tool, the Application Diskette Builder, and the Fast Install utility that gives you an easy way to add your application to a P/OS menu for testing and debugging. The Host Tool Kit also offers the Host File Transfer Facility to let you transfer text and binary files from the host to the Professional.

Digital established special support and training opportunities for developers using the Professional Host Tool Kit. See Chapter 5 for information on these offerings. See Chapter 10 for more information on the Professional Host Tool Kit.

- **PRO/BASIC Under P/OS for Casual Programming.**

If your interest in development is more casual than professional, you may be most comfortable with PRO/BASIC. The PRO/BASIC interpreter provides a simple, highly interactive environment in which to create useful programs. And PRO/BASIC even gives you access to a full range of graphics functions. See Chapter 10 for a full description of PRO/BASIC.

- **Use p-System Tools to Develop for the “Universal Micro.”**

UCSD p-System runs under P/OS to let you develop applications for the general microcomputer market. p-System runs on a wide range of microcomputers to simulate a “universal micro” environment. Each computer has a p-code emulator that is the interface between that specific computer and the application. Both FORTRAN-77 and UCSD Pascal are available for you to develop portable applications that will run on any computer equipped with p-System and a p-code emulator. See Chapter 8 for a description of p-System; see Chapter 10 for descriptions of the languages available to run under it.

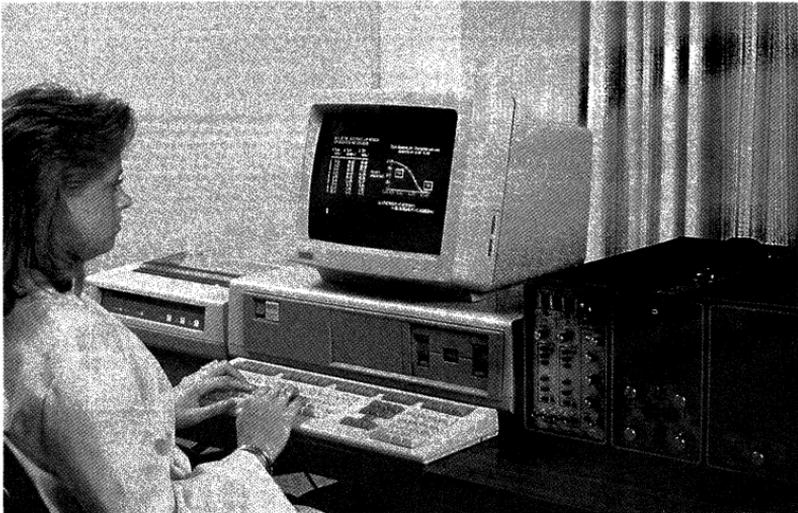
- **Take Advantage of RT-11’s Size and Simplicity.**

RT-11 on the Professional, as on Digital’s larger PDP-11 computers, provides the basic development tools and services you need and then gives you the room to work with them. The mature utilities and libraries that characterize RT-11 development, plus the new VTCOM file transfer utility, are part of the RT-11 operating system on the Professional. And RT-11 is so compact, you can fit an entire development environment—RT-11 and an optional language—on one 400-Kbyte diskette. On a Professional 325, you have the entire

second diskette free for the application you are developing. On a Professional 350 or 380 with a hard disk, you can install RT-11 on the hard disk for even faster response time and have the rest of the disk and the diskettes for your development work space.

RT-11 on the Professional supports a broad range of development languages similar to those supported by RT-11 on other computers. Among these languages are MACRO-11 (included with RT-11), FORTRAN IV, FORTRAN-77, BASIC-11, Oregon Software's Pascal-2™, and S&H Computer System's COBOL-PLUS™. CTS-300 offers a special packaging of RT-11 with DIBOL. See Chapter 10 for descriptions of these languages.

With the exception of different device drivers to accommodate the Professional hardware, RT-11 on the Professional is virtually identical to RT-11 on any other PDP-11. This similarity means that



existing RT-11 applications move easily to the Professional environment, and that applications developed on the Professional move easily to other RT-11 environments. In most cases, you can move applications that are 16 Kbytes or smaller directly to the Professional with no modification.

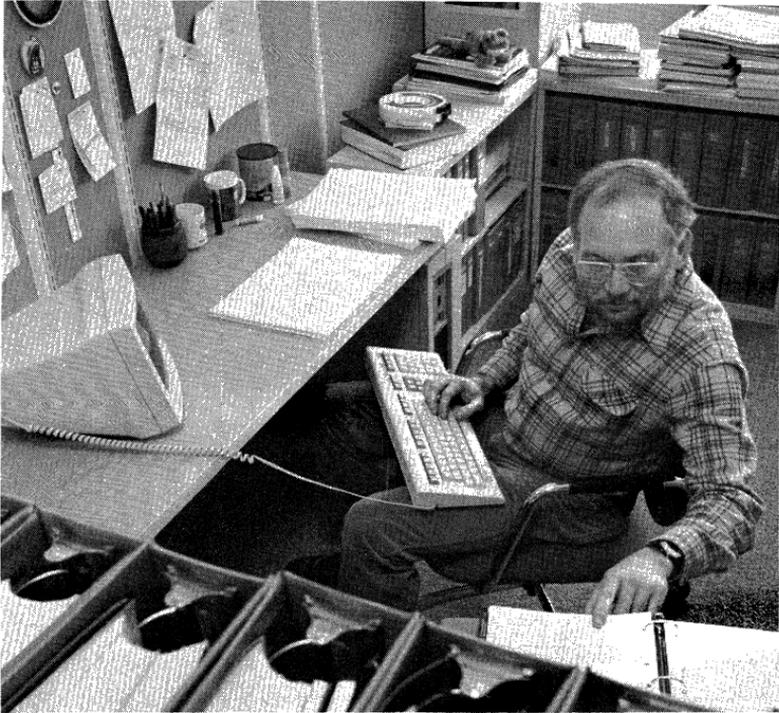
You interface with the system using the familiar DCL, CCL, and UCL command languages. You have access to the mature libraries, editors, linker, debuggers, and additional utilities that are standard RT-11 components. And since RT-11 on the Professional includes the handlers for the unique Professional devices, you don't have to add device-specific routines to your applications.

The RT-11 Virtual Terminal Communications Package (VTCOM) enables you to transfer applications between RT-11 systems. With VTCOM's ASCII file transfer facility, you can bring text files down to the Professional and move Professional text files up to the larger systems. With the TRANSF utility installed on the host system, you can also use VTCOM to transfer binary files between the Professional and host systems.

See Chapter 8 for more detailed descriptions of RT-11 and CTS-300 on the Professional.

• **PRO/UNIX Offers Graphics, Realtime, and Multiuser Opportunities.**

PRO/UNIX takes advantage of the Professional's graphics capabilities and realtime processing power to provide an enhanced multiuser UNIX workstation on your Professional. The PRO/UNIX integrated graphics facilities include an extended set of graphics subroutines that offer such features as interior floods, multiple writing modes, and window specifications. Unlike other UNIX systems, PRO/UNIX on the Professional supports and lets you



develop realtime applications. The operating system includes asynchronous I/O and preemptive priorities so that you can develop realtime applications that do not rely heavily on extensive hardware support.

PRO/UNIX gives you a multiuser Professional. With a second terminal attached directly to the Professional's communications port or via a modem, you can offer a multiuser application in a personal workstation package. The system includes features such as password protection that enable you to assure users that their data is protected against unauthorized access.

PRO/UNIX includes C, FORTRAN-77, and Pascal compilers, a RATFOR preprocessor, a BASIC interpreter, and an assembler. It also offers the *lint* C-program checker and the language development tools *yaac* and *lex*. Its code mapping feature quickly and automatically maps portions of your program in and out of memory as necessary. This improvement on traditional overlaying requires no development effort from you, and no intervention by the users.

See Chapter 8 for a description of the PRO/UNIX operating system.

- **Use the XENIX Software Development System.**

XENIX offers the powerful Software Development System to let you develop full-scale applications for this multiuser UNIX-based environment. The package includes a C compiler, a linker, and a large collection of utilities and subroutine libraries. Optional languages are also available.

The XENIX memory-mapping overlay technique lets you write and run much larger programs than are possible with many other UNIX implementations. XENIX also encourages you to take advantage of its tree-structured file system, device-independent I/O, shared data areas, and interprocess communication capabilities. During the development cycle, the Source Code Control System (SCCS) helps you keep track of the status of each file associated with a project.

See Chapter 8 for a description of the XENIX operating system.

- **Choose From Two Idris Development Packages.**

Idris is the logical choice if you are looking for a UNIX-like system that lets you develop applications for the microcomputer community. Idris is compatible across a broad range of architectures; applications you create under Idris can be moved easily to other UNIX-based and even UNIX systems.

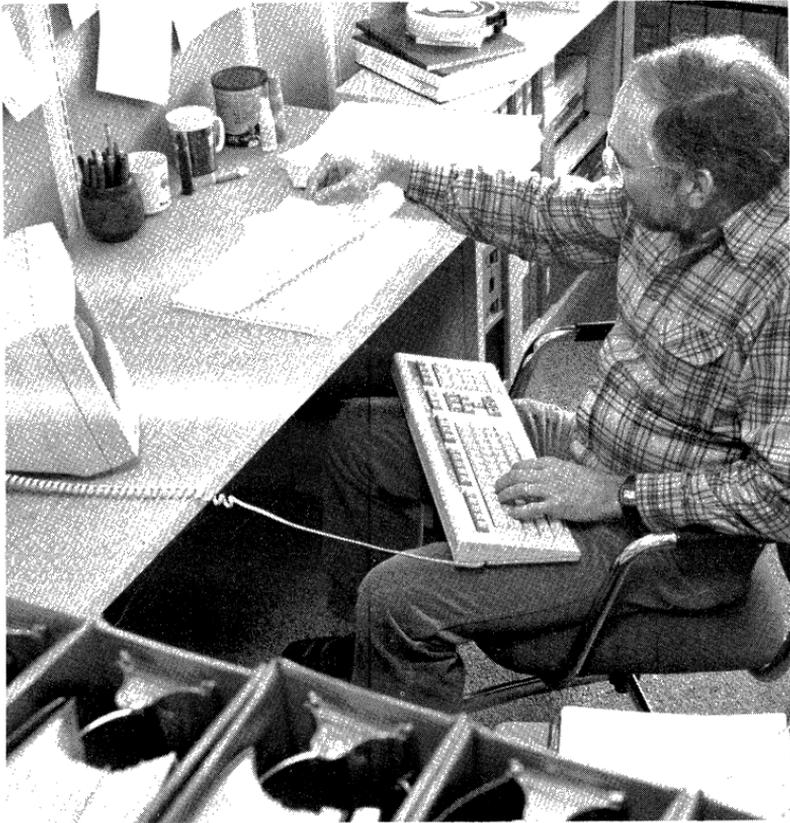
Idris offers two development environments: Idris with C and Idris with Pascal Native Compiler. Both environments include the full complement of Idris utilities and the C compiler; Idris with Pascal also includes the Pascal translator and the Pascal support library. The *Idris Programmer's Manual* comes with the Idris system to explain the finer points of the Idris development environment.

See Chapter 8 for more information on the Idris operating system.

• **Specialize in Medical Applications with MUMPS.**

If you develop applications for the medical world, STANDARD MICRO MUMPS 300 on the Professional could be the best system for you. This implementation of the Massachusetts General Hospital Utility Multi-Programming System is well-suited for developing applications in the medical, financial management, process control, order entry, and general business fields.





STANDARD MICRO MUMPS 300 includes the SMM 300 ANSI-standard high-level language. This interpretive language is a simple development tool that eliminates the need for text editors, compilers, linkers, and loaders. The development environment also includes interactive debugging routines that detect errors in your program and help you modify and rerun the program.

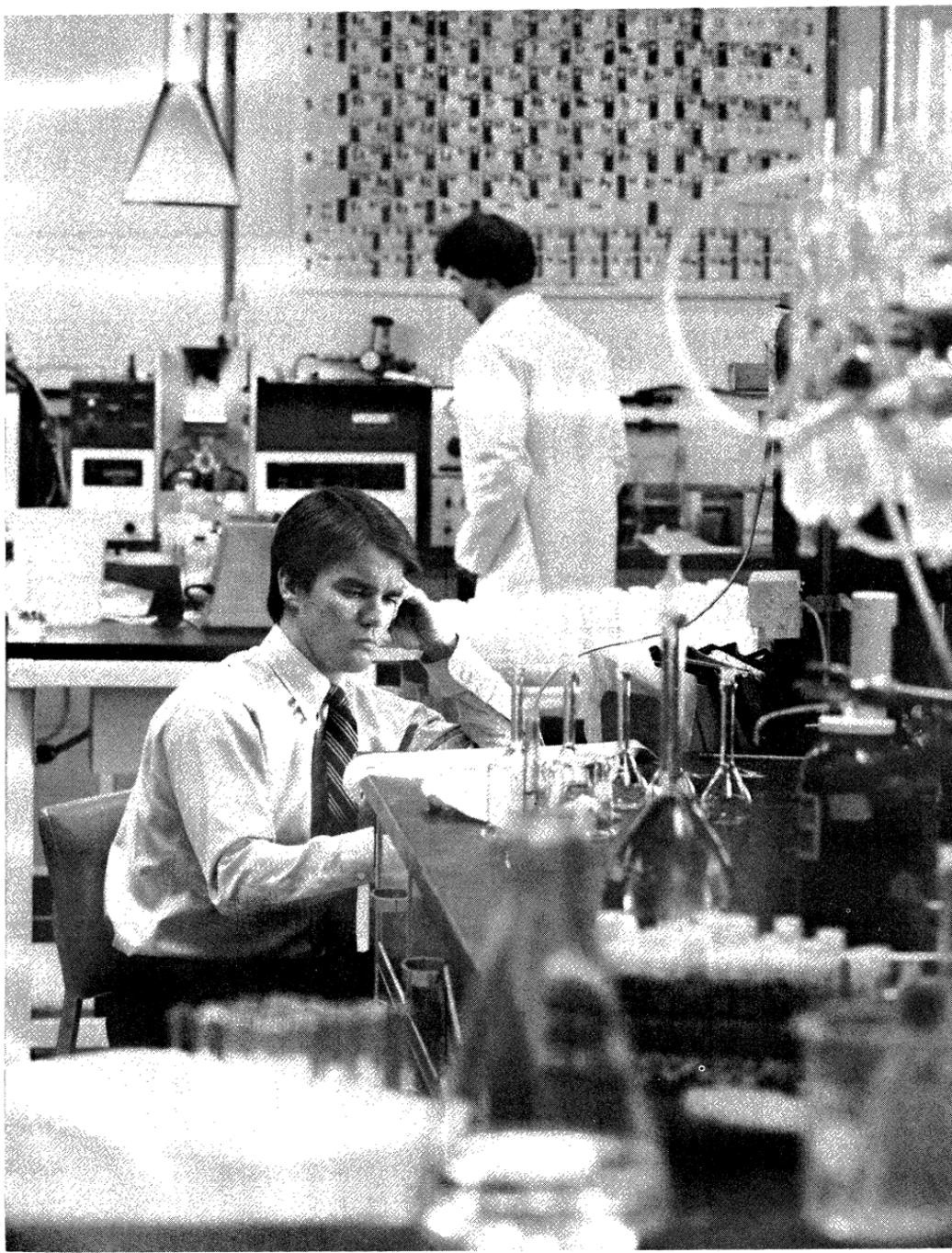
See Chapter 8 for a description of STANDARD MICRO MUMPS 300 operating system.

• **The Professional—A Full-Scale Development Computer.**

The Professional offers all of the development opportunities you expect from a member of the PDP-11 family—and then some. It supports a wide selection of operating environments and development packages so that you can use the tools best suited to your task. It gives you resources to let you take advantage of the Professional's extensive graphics capabilities and such advanced hardware options as the Realtime Interface and the Telephone Management System. And it fits into your development cycle as a standalone system or as a full partner in a distributed development environment.

Don't let its elegant, compact design mislead you: the Professional is a full-fledged PDP-11 development computer.

CHAPTER 4 • The Professional Environment



• **Multifunction Laboratory Equipment.**

Gary is a research chemist in the Hot Melt Adhesives Development Group for a large petrochemical company. He has his own laboratory and office in a building complex that houses several analytical and physical testing laboratories and their administrative support people. The facility is located near the manufacturing plant and is fifty miles from corporate headquarters.

Gary and his fellow research chemists have the latest in laboratory equipment. The most recent additions to their laboratory tools are personal workstations that are connected together into a stand-alone local area network. Before the workstations arrived, all researchers shared the resources of a minicomputer located in a computer room in Gary's building. Each building in the complex had a terminal room where researchers were scheduled limited blocks of time to do their computer-based work.

With the new workstations, each scientist enjoys the advantages of a dedicated computer, yet each can share information and devices easily with other researchers in the complex. Several additional workstations are used for realtime data acquisition and process control. The workstations also have communications capabilities that give the researchers access to databases stored on the large superminicomputers at corporate headquarters.

Gary is nearing the end of a year-long feasibility study for an adhesive to replace the metal staples in a packing box designed for shipping heavy plastic objects. Following his experimental plan, Gary has been creating the polymer with differing amounts of ethylene, propylene, and diene and varying the temperature, catalyst, and stirring. Gary and his research assistant, Shirley, as well as technicians in other laboratories, run tests to determine the polymer's composition and physical properties such as stickiness, flow, color, and resistance to aging. The first phase of the study was not very encouraging, but Gary has recently starting working with a different catalyst that he thinks will make the process more viable.

A Realtime Data Acquisition Workstation.

On his way to his office this morning, Gary stops in his laboratory. Shirley has just started the spectroscopy for the latest trial batch of adhesive. This test uses a spectrophotometer to determine the composition of the adhesive, providing specific information on the amount of ethylene and propylene in the substance.

The data from the spectrophotometer is captured by a workstation just like the one Gary has, except that it is equipped with a realtime data acquisition interface. Sophisticated software developed by graduate students at the state university does peak analysis of the data and stores the relevant information in a designated file on the hard disk.

Before they got the workstations, Gary and Shirley devoted three full days to the data collection and analysis for each batch of adhesive tested. Now Shirley will handle all the spectroscopy herself in less than a day. The results are consistent, too, and extremely accurate. While the computer collects the information and performs the initial data analysis, Shirley prepares the next sample. After discussing their schedule for the next couple of days, Gary continues down the hall to his office.

Part of a Local Area Network.

This morning Gary is expecting results from both the iodine titration tests that were conducted in the analytical laboratory in the next building and the physical properties testing performed in the laboratory down the hall. He turns on his workstation and selects File Services from the main menu. The technicians always put Gary's titration results in a file that he has sufficient privilege to read and copy, but cannot write to or delete. He copies that file from the hard disk on the technicians' workstation to the hard disk on his workstation. He has a similar arrangement with the physical testing laboratory, so next he collects the appropriate file from the workstation in the physical testing laboratory. Then he

returns to the main menu, selects Print Services, and in a few keystrokes is printing the titration and physical testing results on his dot-matrix printer.

While the results are printing, Gary selects the Mail utility from his workstation's main menu and sends the lead technicians in both groups a message thanking them for the quick turnaround and telling them to expect more samples late this afternoon. Now that the technicians record their results directly on workstations that are part of the local area network, they spend much less time on administrative details and far more time on testing. The arrangement is also perfect for the researchers, because they can begin their analysis as soon as the results are available, instead of losing valuable time waiting for assistants to type the information into the database on the minicomputer.

A Powerful Tool for Data Analysis.

A quick look at the results tells Gary that the latest experiment may well confirm his hypothesis about the new catalyst. He selects his data analysis program from the main menu, and in a few minutes he is looking at tables correlating the spectroscopy information he already had with the new titration values and physical test results for the batch. A few more keystrokes and he has a graph that clearly shows that—just as he expected—the different catalyst minimized the unusable by-product of the reaction, but had a somewhat negative impact on the adhesive's stickiness. This immediate response is invaluable to Gary; before getting the workstation, he had to wait to analyze his data until his scheduled computer time and couldn't do immediate analysis on new data.

Gary decides to vary the temperature at which the reaction takes place to see how that will affect stickiness. He remembers that Eileen, a research chemist for another group, did some work with this catalyst a short time ago. He calls her, and she tells him where he can find the information he needs in the large database stored on one of the corporate minicomputers.

Simple Access to Corporate Databases.

With a few keystrokes, Gary selects Communications from his workstation's main menu and specifies terminal emulation mode. Seconds later he is logged in as a user on the corporate minicomputer that stores several large scientific databases. He goes immediately to a data analysis program that demonstrates the correlation of temperature with the type of catalyst. Gary feels right at home with this program on the larger computer because he is using the same data analysis on the large machine that he uses on his personal workstation.

He selects the option to graph the data he's interested in, and transfers the graph from the minicomputer to the hard disk on his workstation. Before logging off the large system, Gary uses the mail utility to send a brief memo to his manager, who works at corporate headquarters and uses one of the other corporate minicomputers. When he's finished, he logs off the minicomputer and returns to the main menu on his workstation.

By this time, Shirley has mailed Gary the results from the spectroscopy for the first set of samples for the day. He takes a quick look at the results, then files them so that he can use them later with the data analysis program.

Equipped for Administrative Tasks.

After lunch, Gary settles down to work on his status report for the monthly staff meeting. He selects a scientific word processor from the main menu, and edits a progress report he started earlier in the week. He includes the results table from the data acquisition package. Based on today's results on the different catalyst, and due largely to the time the workstations save in both research and data analysis, Gary is confident that he and Shirley can bring the project in on time and under budget.

He files the document, then selects Mail and sends the document to the group's secretary, along with a request to run the document through the spelling checker, print it on her letter-quality printer, and make several copies for distribution at his meeting with the Marketing staff the next day. Until the workstations arrived, the secretary had to work from Gary's handwritten drafts—an unenviable task, even Gary admits.

With the administrative chores out of the way, and armed with the tables and graphs from his own experiments and from the corporate database, Gary is free to spend the rest of the afternoon on his favorite part of the job—planning explicit procedures for creating the polymer, then working in the lab.

The Laboratory Workstations.

The workstation Gary and his fellow researchers use is Digital's Professional 380 configured with a 33-Mbyte hard disk. He also has an LA210 dot-matrix printer that enables him to print both text and graphs. Gary's Professional is connected to the other Professionals in the laboratory complex via H4000 transceivers tapping an Ethernet cable. All of the Professionals in this local area network are running P/OS Version 2.0 and PRO/DECnet. Gary's Professional is also running PRO/Communications software to give him access to the several VAX-11/780s and VAX-11/750s at corporate headquarters.

The Professional Shirley uses in the laboratory is equipped with the Realtime Interface that lets it handle the realtime data acquisition from the spectrophotometer. (The spectrophotometer has an integral A/D converter). The peak analysis software is a custom package designed and written by computer science graduate students from the state university while they were interns at the company. The students worked on a Professional 380 running the PRO/Tool Kit development environment, and wrote their

FORTRAN-77 code to take advantage of the subroutines provided in the Professional Realtime Interface Library (PRTIL). Professional computers in other laboratories use a single RTI to control both balances and LVP16 Six-Pen Plotters.

The data analysis software on Gary's workstation and on the corporate VAX is the powerful RS/1 laboratory notebook application. This invaluable research tool helps Gary see quickly and clearly the correlations between his process variables. Gary also has CT*OS, a word processor that includes the scientific character set he needs for his reports.

The corporation chose the Professional 380 after several months of intensive research on workstations suitable for the laboratory environment. A primary consideration was processing power: Gary and his fellow researchers like the idea of having a personal PDP-11. Another reason for selecting the Professional was its extensive networking and communications capabilities, including electronic mail and file transfer. The decision was further swayed by the Professional's graphics capabilities, which met and surpassed Gary's high-resolution requirements. The availability of RS/1 was also important. But the deciding factor in the purchase decision was Digital's reputation for quality—in both its products and service.



• A UNIX-Based College Computer Center.

Bruce is a professor in a growing Computer Science Department at a four-year college with an enrollment just over 1700. Besides teaching three computer science courses, he is chairman of the Computing Resource Committee (CRC) that monitors the college's computing requirements, researches available products, and presents recommendations to the Board of Trustees.

The college is almost a year into the program the CRC implemented to improve the efficiency and quality of the institution's computer use. Like many colleges and universities, the school had been using a UNIX-based minicomputer for a couple of years. Students worked at terminals in the Computer Center and at a few locations around campus. With the computer science department growing, though, and with increasing interest in computing from faculty and students outside the computer science department, the existing scheme of a central minicomputer with several local and remote terminals was no longer sufficient.

Bruce and his CRC colleagues designed a distributed computing environment that replaces the existing terminals with 50 stand-alone workstations in the computing center and 25 additional workstations in both faculty offices and department work areas. The workstations are UNIX-based, standalone computers with minicomputer processing power, extensive communications capabilities, and outstanding graphics facilities. All provide access to the databases on the school's central minicomputer, but users are no longer competing for this single resource. Many of the workstations in the department work areas are equipped with an additional terminal so that more than one person can use the computer at a time.

A Realistic Environment for Computer Science Students.

Bruce is in his office early this morning, grading assignments from his Application Design class. The assignment's objective is to develop a C program to extract regional rainfall statistics from a National Weather Bureau database on the host system, bring the

information down to the workstation's hard disk for trend analysis, make projections based on available data, and plot those projections.

The tools and processing power needed for this project are well beyond the capabilities of a personal computer. The UNIX-based operating system on the workstation comes with a full development environment that includes C, Pascal, and FORTRAN-77 compilers, as well as a BASIC interpreter. Students have a choice of editors, callable system routines, and powerful utilities. Moreover, they are working with minicomputer development tools they are likely to use in their jobs after graduation.

Personal Productivity Increases Team Productivity.

Students mail their assignments to Bruce's account on the host minicomputer; he simply transfers their files to his workstation's hard disk for grading. As Bruce works through the assignments, running the programs and reading the internal documentation, he gets a message that he has received mail. He goes into the mail utility and reads a message from Barbara, the department secretary. Barbara needs the names of the files Bruce asked her to format for his presentation at the next meeting of the Board of Trustees. Gary created these files with a protection level so that Barbara has the privilege to copy them from his hard disk to the hard disk on her workstation. Barbara works on a terminal connected to the department chairman's workstation. Gary replies to the message, giving her the names of the files and asking her to edit a file containing a few letters he drafted the day before.

Bruce finishes grading the assignments and adds the marks to a file listing the class grades. A simple command produces a graph showing the distribution of grades. Bruce is pleased: the class did considerably better than average. He logs back onto the host system and mails the individual grades and his comments to the students.

A Cooperative Effort.

Now it's time for Bruce's favorite class of the week. It's an independent study designed to give advanced students a taste for not only system development but also the cooperation and scheduling they face in a professional environment. The computer science students are writing a driver for a data acquisition device that students in mechanical engineering are building for students in the microbiology department. The microbiology students need a device to do realtime data collection for an experiment they designed to gather information about a particular enzyme.

Today the two computer science students have a few questions on the finer points of their code, but they are primarily concerned with the fact that they lost a couple of days' work when the engineering students found they had to make several minor changes in their design. They still think they can meet their project deadline, but they're going to have to work several more hours a week than they'd planned.

A Distributed System for All Types of Users.

After a late lunch, Bruce is off to a meeting with the faculty of the Linguistics Department. This is one of a series of meetings Bruce is having with all of the departments, to see how the faculty and students in each discipline are using the computer center resources and to ask how the center could better serve their needs.

The meeting is congenial: Faculty members are excited about how well the workstations answer their research needs. They are also pleased that their students are gaining hands-on experience with the systems, since computers are playing an increasing role in the Linguistics field.

In their lexical analysis, these users deal primarily with strings. The workstation's extensive set of string manipulation utilities lets them create routines that search files for a particular pattern, extract the appropriate sections, then pass the information to another utility for sorting according to various criteria. In addition, they like the fact that they can easily access the large databases on the host system, while also storing their own information locally. They appreciate the fact that they use the same commands on the host system as they use on their workstations.

The chairman expresses an interest in investing in several more workstations. Bruce sees no problem with this request because, unlike the situation before they installed the distributed workstations, additional equipment will not significantly affect the college's other computing resources. He agrees to sponsor the request at the CRC meeting the following week.

A Powerful Computing Resource for Everyone.

The CRC's UNIX-based computing environment is an integrated system of Digital products. The workstations that handle the bulk of the student and faculty needs are Professional 380s configured with 10- or 33-Mbyte hard disks. All of the workstations run the PRO/VENIX operating system. At the heart of the computing system is the VAX-11/750 that the school has had for a few years. This minicomputer runs the ULTRIX-32 operating system and acts primarily as a file server to the distributed workstations.

The 50 Professional computers in the computing center use switches to access the host, while the workstations around the campus use modems to communicate. Several departments connect an additional terminal to the Professional to achieve an even

lower cost per user. Through the host, all machines have shared access to several of Digital's LA210 dot-matrix printers, LQP02 or LQP03 letter-quality printers, an LVP16 six-pen plotter, and a high-volume Digital lineprinter. Most departments have their own printers as well.

The CRC decided against personal computers early in their research: personal computers don't offer the powerful capabilities a desktop minicomputer can. The committee recommended Professional 380s because these systems offer the processing power, the communications facilities, and the graphics capabilities that the users at the college need. The college's high satisfaction with the equipment and service they already have from Digital also made a Digital product the logical selection.

The committee selected PRO/VENIX because it offered everything they needed in a UNIX-based operating system. It is based on AT&T UNIX and includes several important Berkeley extensions. It provides a full set of application development languages and tools, data manipulation utilities, graphics utilities, and editors so that several user groups at the college can take advantage of the same system for a variety of uses. It incorporates powerful communication capabilities, including electronic mail and file transfer. And it was designed specifically to take advantage of such Professional features as bit-mapped graphics and minicomputer processing power.

• **An Electronic Architect Sells Homes.**

Kate is a Customer Service Representative for a major national manufacturer of prefabricated homes. She works in one of more than 500 franchise locations throughout the nation. Her company offers a line of nearly 50 home models, each of which is available with a number of floor plans and options.

Kate's company has introduced a revolutionary new tool to franchise offices. It provides her with up-to-date product and price lists, a simple method of configuring homes, order processing and accounting functions, and most importantly, a dynamic sales presentation tool. Kate's new tool is a workstation that runs a custom program developed specifically for Kate's company by the computer manufacturer.

This morning Kate is meeting with a couple who are interested in a three-bedroom split-level ranch. After talking in general about the family's tastes and budget, Kate turns to her workstation and selects the Building Configurator Program from the menu.

Building a Home on the Screen.

The Building Configurator begins with a menu listing the general categories of homes offered by Kate's company. Kate selects "Split Level Ranch" and the computer produces a second menu of 12 available models. On the basis of the summary description displayed for each home, the couple pick three that pique their interest.

With a few keystrokes, Kate selects the first of their choices from the menu. The couple are more than impressed when the house—including a landscaped lot—appears on the screen. Flattering detail shows the style and feel of the house. Another keystroke and the screen displays a plan diagram of the living areas, bedrooms, kitchen, entry, and garage. Attractive text highlights the surprisingly clear pictures to create a complete image of the home.



Kate goes on to show the couple the two other houses they liked, until, a few minutes later, they decide to focus on their preference. Kate returns to the picture of their favorite model and begins to discuss specifics. To clarify her words, Kate calls up detail screens that list the price of the home, typical construction costs, and available options. While describing the option modules, Kate notices that the couple seem particularly excited at the prospect of having a solar greenhouse off the living room. She quickly responds to this interest by redisplaying the house, this time with the greenhouse added.

Producing a Proposal with a Personal Touch.

While they have not reached a final decision, the couple have decided which house they like best. Kate uses her Cost and Payments module to calculate the cost of the house as they have defined it. To do this manually, Kate might have spent several hours pouring over catalogs, price lists, finance tables and other documents. Today, she will do it in a matter of minutes.

When the couple leave, they take with them a three-page printout showing a line sketch of the home, a company statement of terms and conditions of delivery, and the estimated down payment, mortgage, and taxes the family would have to pay. Kate has provided the couple with everything they need to make a purchase decision in a neat, personalized document. A copy of her final proposal is automatically stored in the Prospects Database on her workstation.

Closing a Sale on the Spot.

Later in the day, Kate meets with a customer who is close to buying one of the homes Kate showed him the previous week. In the intervening days, the prospect received a mailing from the corporate headquarters. It included a full-color brochure of the

house he had been shown, a brochure on the track record of the company, and a personal letter from the company president expressing his hope that the company can be of service.

Kate realizes that the man is concerned about financing, so she shows him a series of financing alternatives. Using her workstation, she is able to calculate the possibilities in a matter of minutes. She arrives at a plan that offers a longer than usual mortgage with a slightly lower monthly payment. Nudged off the fence, the man decides to close on the house.

Kate enters the final configuration of the house with the Order Entry module. The configuration she used to develop the quoted price becomes the order, eliminating the need for reentry of information, the shuffling of massive catalogs for price information, and the inevitable errors that creep into so involved a process. Automatically the complete list of components and materials is generated. The customer gives Kate the down payment and Kate activates the account. When the mortgage is approved, Kate will enter the appropriate information and the system's automatic interface with the company's Deliveries division will generate the necessary inventory, shipping, and billing information.

A Workstation for Personalized Selling.

Kate's workstation is a Professional 350 with a 10-Mbyte hard disk system. The system includes the Extended Bit-Map Graphics Option (EBO) to support her color monitor. The Professional is linked by modem to a Digital VAX 11/780 located at the corporate headquarters. Her Professional runs an integrated merchandising, configuration, order entry, and inventory system developed under contract by Digital's Software Services organization. The system combines: a videotex database including color sketches of all standard house models and selected optional configurations; an

accompanying database of detailed configuration descriptions; a Supercomp-Twenty spreadsheet template allowing easy entry of variables (interest rate, down payment, property taxes, and so on) for estimation of monthly property carrying costs; and FLOW (a command string formulation program) and XNET (an automatic communications package) for communicating with the VAX host. Kate's system also includes Digital's LA210 dot-matrix printer for fast, high-quality customer printouts and routine office needs.

The Professional/VAX-based videotex system has transformed the marketing, configuration, and administration of the company's prefabricated house business. As a sales tool, videotex helps the customer visualize the house, seeing how certain options will affect its appearance. It gives Kate's prospects the feeling of building their own house. At the same time, it helps Kate's company avoid confusion and error by controlling the content of sales presentations. And the company can be confident that each franchise has current product and price information.

The system also cuts the time required for processing each order to a fraction of that previously required. From the initial configuration of the house with the client, all aspects of the process are automated, resulting in time savings from the showroom to the factory and warehouse. Order processing has changed from an administrative nightmare to an orderly system that provides a wide range of useful marketing information.

The Ideal Videotex Workstation.

The Professional is the ideal videotex workstation. Its graphics are superb. It offers storage capacity large enough to maintain a local videotex database rather than having to rely on expensive on-line links to a host computer. This not only provides much faster access to videotex graphics, it drastically cuts communications costs.

Communication between the Professional and the host system can take place at night when rates are lower. During a single communications operation, the Professional receives price, product, and picture updates for the database as well as routine company communications. The Professional can also transfer new orders and the names and addresses of prospects to headquarters. This allows the main office to follow up promising leads immediately.

The Professional is capable of taking full advantage of videotex applications. Large-system compatibility, applications software, and outstanding graphics hardware make the Professional, Digital, and videotex an ideal combination for the broadest range of merchandising applications.



• **Streamlining Aerospace Design.**

Scott is a Design Engineer for a major aerospace contractor. He and the other engineers in his group are part of a design team that is working on the guidance system for a new missile. More specifically, the group is developing a subassembly for a sensor that will be located among other guidance components in the nose of the missile.

The group's task has been complicated by a late design modification: the space available for the sensor mount has been changed.

Designing with Distributed Graphics.

Scott's first step is to assess the extent of the problem. From his office workstation, he accesses the engineering department's superminicomputer computer-aided design (CAD) system and downloads the team's current drawings to his workstation. The compatible low-end program on his workstation provides the design tools he needs to experiment with the existing drawings. The workstation's high-resolution graphics are ideally suited to this application. Scott can devote time and attention to the problem without tying up the department's main computer resources.

First, Scott decides to explore the possibility of modifying the existing design. He begins by examining a number of variations on the now-impossible design. The two-dimensional CAD package that runs on Scott's workstation helps him conceptualize and flesh-out rough ideas. Through simple experimentation, Scott is able to evaluate a number of options in a very short period of time.

Realizing that a new design may be required, Scott wonders if mounts conceived for other missiles might not provide a good starting point. Returning to the superminicomputer host system, he searches for other mounting designs, looking for one that features the small size and installation angles he needs. At last, in a plan for a missile that never reached production, Scott locates a sensor mount that looks very close.

Downloading the sketches to his workstation CAD package, Scott works up specifications for the new mount. When he is completely satisfied, he combines his sketches with a detailed list of dimensions and tolerances for the part. Scott then stores the information for reference and, using the department's electronic mail system, sends it to his Group Engineer and to the CAD draftsman who supports his project.

Keeping the Department Up-to-Date.

Scott realizes that it is time to bring the other designers in his group up to date on the design modifications he has made. Using his word processing program, he writes a brief memo outlining his proposal and the effect it will have on the other members' work. By selecting a "group" distribution list in his electronic mail program, he is able to send the memo simultaneously to all members of his group. Scott tells his colleagues that if they need more detailed information on his design change, they can access the plans directly from his workstation and transfer them to their own computers.

Meanwhile, the CAD draftsman for Scott's group is working at a dedicated CAD minicomputer terminal. He receives Scott's project and gets to work modifying the old design to meet Scott's new specifications. The draftsman's work involves detailing geometric characteristics of the part including its center of gravity, rotational inertia, and other technical characteristics.

At one time, Scott and the other design engineers would have been responsible for this work. Typically, this meant waiting in line to use the dedicated terminal, which was shared among members of his group. Today, since designers can do most high-level engineering directly on their workstations, the follow-up work can be done by a full-time senior draftsman who supports the entire group.

Controlling Materials, Manufacturing and Production.

When Scott gets back to his office after lunch, the draftsman has returned the new drawing and specifications through electronic mail. The draftsman has pointed out that, as Scott suspected, the alloy used in the original part will not meet design standards.

Scott turns to a FORTRAN analysis program originally developed for one of the company's larger minicomputers, but now modified to run on Scott's workstation. Scott's workstation has a minicomputer architecture that allows it to run many existing minicomputer applications with little or no modification. For Scott's company, the fact that the workstations could run much of the company's existing software was a major cost saver.

Scott uses the program to perform an analysis of alternative material properties and the resulting fabrication process. He analyzes the weight, dynamics and other underlying mathematical foundations for the new part. Finally he arrives at new materials specifications for review by the rest of the design team.

To support his proposed solution, Scott needs production data for the new part. He returns to the superminicomputer to call up the production plan for the part he has just modified. Downloading the plan to his workstation, Scott examines the production budget spreadsheet to estimate new materials and manufacturing requirements for the part. By altering just a few figures on the spreadsheets, Scott can determine the impact his material changes will have on the production of the part. By plugging these figures into the production plan for the entire sensor assembly, Scott can also determine the impact his changes will have on the project as a whole.

As he adds his information to the subassembly production spreadsheet, Scott sees that a number of other design engineers have

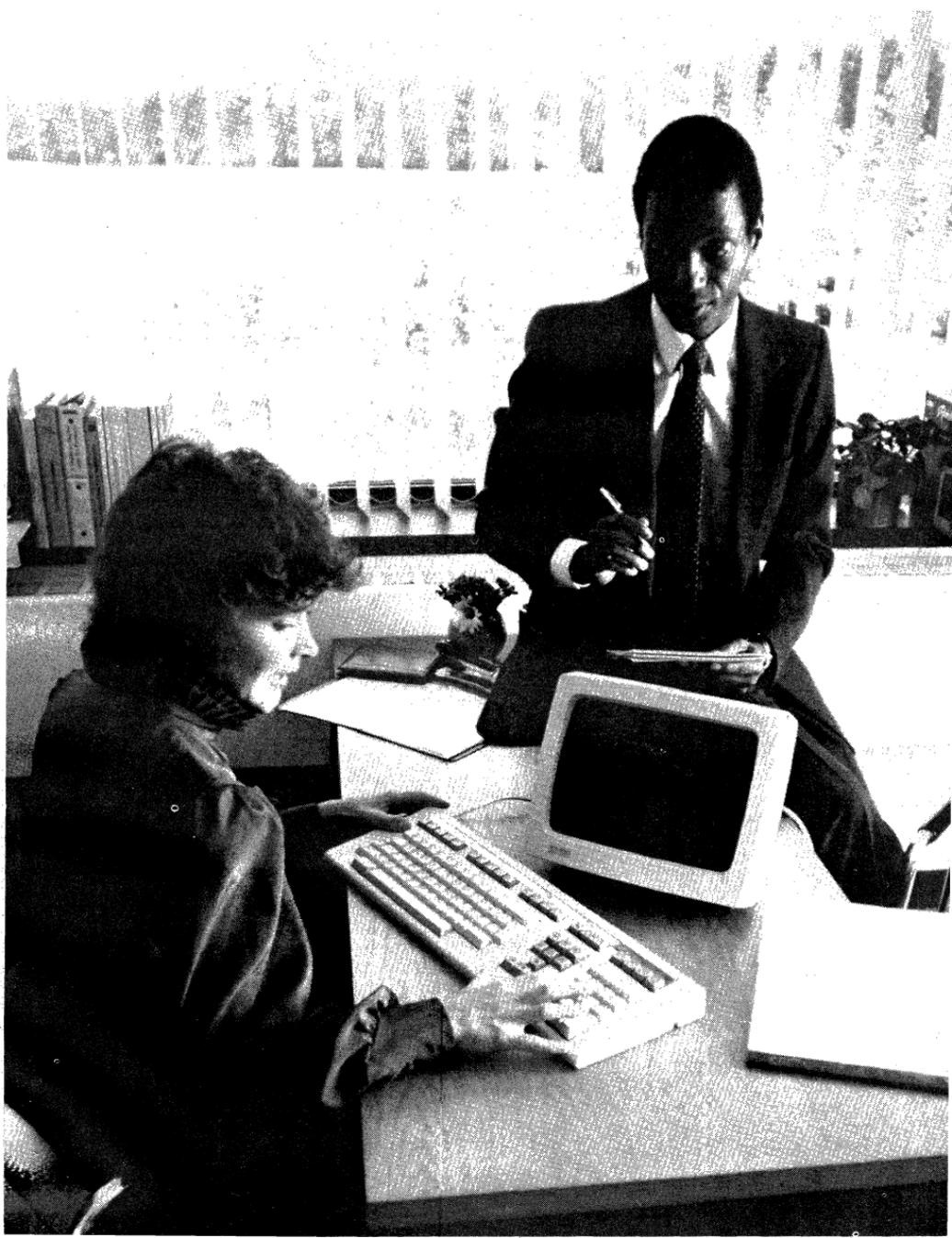
begun to update their own projects based on his modifications. It seems that the group's design efficiencies and open lines of communication have paid off again.

The Engineer's Workstation.

Scott's workstation is Digital's Professional 350 with a 5-Mbyte hard disk, and the Extended Bit-Map Graphics Option. His software includes a materials analysis FORTRAN program written a few years earlier for his department's larger PDP-11. The program now runs on the department's Professionals. Scott also uses DESIGN GRAPHIX/Executive, a low-end two-dimensional CAD package with a compatible three-dimensional superminicomputer implementation. For record keeping, reporting, and routine office chores, Scott uses a number of popular software tools. Among them are CT*OS, a word processing program with a full scientific character set; Supercomp-Twenty, a powerful spreadsheet which runs on the company's host computer as well as the Professional; PRO/Office Workstation, for electronic mail and other office automation functions; and PRO/Communications, for host communications and file transfers.

The company's host computer is Digital's VAX 11/780, running the full three-dimensional DESIGN GRAPHIX package; host communications software; and VAX ALL-IN-1, which supports PRO/Office Workstation's electronic mail and other office automation functions.

Scott sees two major benefits of the system his company uses. The Professional's large-system compatibility and advanced communications capability have vastly improved his group's project control and coordination. Just as important, the system has relieved Scott of many time-consuming secondary tasks. Scott is free to concentrate on the work he is paid to do: high-level design and engineering.



• **Managing Manufacturing: Purchasing, Production and Quality Control.**

All types of businesses take advantage of computerization and automation, but few test the limits of a given system further than a major manufacturing company. The scene is a common one: an organization that has strained its computer resources to the limit. It is a problem that is often compounded by a growing list of requests for additional computer support from virtually every department.

One such company's response to the problem has been to distribute selected computing functions to fully integrated desktop workstations. The company realized that the workstations they chose would have to provide powerful local processing capability as well as the ability to communicate with IBM, Digital and other host systems. They have focused on three areas: purchasing, production, and quality control.

Making a More Informed Purchase Decision.

Ray is the Purchasing Manager for the company's primary manufacturing facility. He and his staff of purchasing agents are responsible for acquiring raw materials for dozens of products in the company line.

Ray's day begins with a priority requisition for 125,000 capacitors for one of the company's appliance control modules. His first step is to evaluate potential vendors. Ray turns to his workstation and calls up a database containing a list of company-approved vendors. He selects "electrical components" from the available menu choices. Ray's simple command invokes a search of the company's primary source of vendor information, the centralized corporate vendor database. The appropriate section of the database is transferred to Ray's workstation. He is now free of the overworked, and consequently very slow, corporate mainframe.

Asking for summary listings of the firms supplying capacitors, Ray finds six candidates. Based on the information supplied by the database, he can eliminate three at once: one is simply too small for the job; a second had a high reject rate on two previous shipments; and he sees from yesterday's Vendor Status Update that the third firm is a month late delivering a similar electrical component to another division of the company.

Having narrowed the field of contenders, Ray draws up his requests for bids which will go out to the companies. He uses a word processing program to combine the standard language of the form, which is stored on his workstation, with the specifications of the capacitors required. Finally he drafts the cover letter and prints several sets of the documents on his office printer. An hour after sitting down to work, Ray has the bid letters out to the courier. The priority requisition got priority treatment—and Ray is on to his next project.

Now Ray needs to prepare a purchase order for a contract which is to be awarded to another supplier. The winning bidder was chosen in an earlier meeting with the production manager and his staff. All that remains is for Ray to attend to the details of the contract.

Ray begins by calling up a forms generator on his screen. Selecting the Purchase Order option, Ray spells out the specifications, delivery date, and other requirements of the contract based on his meetings with the production manager. As he fashions the specific terms of the contract, he enters them onto the form. To this he will add the standard boilerplate that is required on all such orders. Luckily, most of the standard text is already stored on Ray's workstation. Rather than reentering this information each time he creates a form, Ray can simply "cut and paste" the copy into the new form. When this is done, Ray selects the Execute Purchase Order option. His workstation combines the specifications for the contract with the standard terms and conditions.

Having completed the purchase order, Ray sends it via electronic mail to the production manager for final approval. It will be approved, printed, and in the mail well before the day is out.

The Purchasing Manager's Workstation.

Ray and his staff use Digital's Professional 350. Their MIS Manager developed the Vendor Database Information program, which accesses the corporate vendor database. Since that database resides on an IBM mainframe, this program automatically invokes PRISM, a Professional/IBM communications software package, to download the required information to workstations in Purchasing. Once transferred to the Professional, data is formatted for screen and printed reports such as the Vendor Status Update report.

Ray's workstation also runs PRO/Office Workstation, an office automation software package that includes his word processing program and, when linked to Digital's VAX computers running ALL-IN-1, electronic mail throughout the company. Boilerplate functions streamline production of standardized forms and letters while still allowing customized content.

Finally, Ray uses Digital's LQP02 Letter-Quality Printer to produce crisp forms and letters in a variety of type styles.

A Plan For Keeping Production on Track.

Peter is a Production Planner who is currently developing his production schedule for the upcoming quarter. Like his counterpart in purchasing, he will begin by accessing the information he needs on a remote host, then transferring it to his workstation for processing. In this case, the host is a superminicomputer that houses the corporate Manufacturing Resource Planning (MRP II) system. The MRP system coordinates all production activity, allocating production resources, tracking raw materials inventory, and assigning output requirements.

Peter downloads the output quotas assigned to his production teams for the quarter to his workstation. Having stored the data on his workstation's hard disk, Peter calls up his Production Planning program. First he selects the graphing option to turn the data from the MRP II system directly into line charts. The charts show each of his team's production resources plotted against their respective production targets. Looking at the charts on his terminal, Peter sees at a glance that for most of the quarter, the demands on his production teams will be high, but manageable. There is, however, one potentially large problem.

During the third month of the quarter, a new production requirement will necessitate a two-to-three week shutdown for retooling for nearly half his teams. Peter can see that production goals will require excessive production quotas for the six weeks following the retooling. Peter wonders whether he might not be able to shift to moderately higher production of the current products to allow earlier retooling and a more realistic production schedule for the new component. He considers upcoming vacations, overtime, and juggling of team assignments, finally arriving at what seems to be a better arrangement. Though it will involve stockpiling some inventory, the savings in overtime in the long run and the increased likelihood of meeting long-term production goals make it worthwhile.

Peter queues his revised charts on a six-pen plotting printer which he shares with several colleagues. When the charts are printed he will distribute them to each of his teams to keep them informed about upcoming requirements. He also compiles his data in a memo, which he will send along with copies of his charts to the MRP management staff.

The Production Planner's Workstation.

Peter uses a Professional 380 with a 33-Mbyte hard disk. The corporate MRP II system runs on a Digital's VAX 11/780. The heart of Peter's system is the distributed Production Planning system developed by his company's MIS department. It combines PRO/DATATRIEVE, to access and manipulate data in the MRP II database; an adaptation of ATHENA/Graph, to convert MRP data into graphics for Peter's production teams; and some custom resource allocation and analysis tools developed using the PRO/Tool Kit. Peter and his colleagues share the Digital LVP16 Six-Pen Plotter through the Mini-Exchange, a switching and queuing box that has eight ports for input and output communications. All communications activity among the Professionals and between the Professionals and the host computer are controlled by PRO/Communications. Finally, PRO/Office Workstation links Peter to the company with electronic mail and word processing.

Peter's workstation gives him immediate access to the MRP system, resulting in new efficiencies in planning and allocation. The graphics module is one of the biggest time-savers for both Peter and others who must interpret the information Peter produces.

Desktop Detective Work Improves Quality Control.

A recent corporate mandate for improved quality control has led to some new analysis techniques for Kay, a Quality Assurance Engineer. Kay's job is to apply advanced statistical analysis to quality control problems, to search for answers and explanations, and to communicate those issues to the appropriate parties such as purchasing or production.

Today Kay is analyzing a seemingly random, yet critical drilling machine failure that has been plaguing one of the company's product lines. She begins by collecting data that was originally provided by terminals located on the shop floor. This data is stored

on a minicomputer that serves the data collection terminals. By communicating directly with the minicomputer, Kay is able to select every type of information relevant to the problem, including when and where failures have occurred, process temperatures, raw material vendors and batch numbers, shipping contractors, and manufacturing personnel involved.

Having downloaded the required data, Kay turns to a powerful statistical analysis program which runs on her workstation. The program includes a database manager, analysis tools including numerous built-in statistical functions, graphics, and modeling capabilities. A mountain of data with no clear clues makes the analysis a painstaking process of trial and error, with each cycle involving extensive variance and regression analysis of the information at hand.

At last Kay's hunches begin to pay off. Though her findings are not conclusive, they indicate a correlation between the drilling failures and batches of steel from two particular plants of one supplier.

With this information in hand, Kay prepares a Quality Control Alert Notice on her findings. She includes a drawing of the part in question, produced using a simple graphics package on her workstation. Having completed her notice, Kay clears it with her supervisor and sends it via the company's electronic mail system to other quality assurance engineers, Purchasing, the involved Production Planners, and the company's Field Service staff for comments and other input.

A Workstation for Quality Control.

Kay uses Digital's Professional 380 with a 33-Mbyte hard disk and RS/1, a statistical analysis package originally developed for use on larger minicomputers. She downloads production information

from a VAX-based MRP II system using her PRO/Communications software package. The distribution of her results is accomplished via PRO/Office Workstation and another VAX running VAX ALL-IN-1. Her graphics software is DESIGN GRAPHIX/Executive, a two-dimensional computer-aided design system that lets her sketch out the part in question for quicker identification in the field.

Chapter 5 • Service, Support, and Educational Programs



Digital makes every effort to make your computing simpler, more productive, and more efficient. That commitment is reflected in the design of Digital's products, as well as in the size and scope of Digital's service and support programs.

Programs and services of every type are available to Digital users. They range from planning and consulting services to local and regional repair centers and telephone advisory services, from seminars and training sessions, to books and clubs for Digital computer users.

For more information on any of the services outlined in this chapter, call 1-800-DIGITAL.

• **Customer Service**

There are two components to Digital's service program for the Professional Series. First, Digital provides a comprehensive 90-Day warranty with every Professional computer. Second, a number of post-warranty service plans are available to allow you to continue the level of service you desire.

The First 90 Days

Your Professional computer is covered by a comprehensive warranty program featuring the following:

- *90-Day On-Site Hardware Warranty.* Digital will provide limited warranty service including repair and replacement of defective parts. Service is performed at your site—wherever your computer is located in the continental U.S.
- *Software Warranty.* Software is warranted as stated in the applicable Digital Software Product Description (SPD). Digital's Application Advisory Service is also provided for Digital-supported software (as indicated in the support category of the SPD).

- *On-Site Options Warranty.* If you purchase any system options (including printers) along with your Professional computer, these options will be covered by your 90-Day Hardware Warranty. Options purchased after the time of the system sales are covered for 90 days on a carry-in or return-to-factory basis.
 - *Newsletter Subscription.* Digital's *Perspective* provides information on products, services, courses, and training schedules as well as helpful hints on how to use your Professional more efficiently.
- For more specific information, consult your Digital sales representative.

After the Warranty

Digital service and support need not end with your warranty. A complete range of on-site and off-site service programs are available to meet your needs.



Digital's *Full System Service* gives you the most complete service coverage. All parts and labor are included in the contract price. A toll-free advisory service serves as your source for fast answers to questions about hardware, operating systems or Digital Classified Software. You will also continue to receive your subscription to *Perspective*.

The following is a summary of the service plans offered by Digital. Your Digital sales representative can help you choose the plan that's best for you.

-
- *Full System DECSERVICE*. Full System DECSERVICE features committed response times including a four-hour, on-site response if your system is located within 100 miles of a Digital location. Coverage includes all parts and labor performed during contracted hours. Service is available up to 24 hours a day, seven days a week.

 - *Full System Basic Service*. This service offers fast, on-site response as well as all other Full System Service benefits. Service coverage is available during standard business hours—8 A.M. to 5 P.M., Monday through Friday.

 - *Full System Carry-in Service*. A convenient, low-cost service option. This program offers all the benefits of a complete system support program, with one exception. If hardware repairs are necessary, you simply carry the faulty part into any of the 150 Digital Servicenters around the country. Your system will be repaired and ready for pick-up within 48 hours.

 - *Per Call Support*. If you prefer service on a noncontract basis, Per Call Support is available on both a carry-in and on-site basis. Per Call support is available for system hardware only. Charges are assessed for applicable mileage, parts, and labor.
-

- *DECmailer Service.* This alternative is intended for more technically oriented customers. The user typically isolates the faulty component using system diagnostics, removes the part, and mails it to the Customer Return Center (CRC). Within five days of receipt, the CRC will ship a replacement component. DECmailer Service provides free return shipping, a 90-day warranty, optional 24-hour emergency service, monthly billing, and quarterly activity reports.
-

Special Service for Application Developers

Digital offers the tools as well as the support needed to ensure successful application development. Whether you use the PRO/Tool Kit or the Professional Host Tool Kit, Digital provides the technical resources and system software enhancements to keep you up-to-date and productive.

Services for the Professional Host Tool Kit include:

- *DECstart Services.* Digital offers a three day of start-up service, either at your site or at a convenient Digital Field Computer Center. Start-up services focus on how to use the Professional Host Tool Kit and host computer to develop applications for the Professional.
 - *DECsupport Service.* The highest level of software support, including on-site software service, telephone hotline support, appropriate product updates and newsletters.
 - *Basic Support.* This service provides appropriate product updates, telephone hotline support and periodic newsletters.
 - *Self-Maintenance Service.* This option provides appropriate product updates and newsletters.
-

- *Optional Services.* Additional consulting, training programs and other services are available from Digital. Consult your Digital sales representative for complete information.

Service and support for the PRO/Tool Kit include:

- *Telephone Support.* Digital's customer support center keeps a toll-free hotline open from 8 A.M. to 5 P.M., five days a week. Dedicated teams of personal computer specialists and software specialists are available to resolve problems quickly.
- *Software Product and Documentation Updates.* While under warranty or service contract, you will automatically receive software product and documentation updates for your PRO/Tool Kit, and for any of Digital's Tool Kit-dependent languages for which you are licensed.



- **Digital Classified Software**

The Digital Classified Software "Seal of Approval" is your assurance that the software you purchase will meet your standards and expectations. Consider the advantages of Digital Classified Software:

A Better Selection

The Digital Classified Software (DCS) library includes over 70 programs that have met our standards for the Professional Series. More are arriving every day. DCS software products include operating systems; communications packages; languages and utilities; scientific, manufacturing and engineering applications; plus word processing, spreadsheet, database-management and accounting packages.

DCS offers Digital-developed software as well as a number of products created by third-party software developers. These include Access Technology, Bolt Beranek and Newman, DeskTop Software, Fingraph, Ross Systems, Ship Analytics, Inc., Softech Microsystems, Software Arts, Software Insights and others.

Consistent Quality

All DCS software must meet exacting engineering standards based on the following criteria:

- *Documentation.* Manuals must be clear and complete, must list and explain all error messages, and must include examples of program operation, tables of contents, and page numbers.
- *Installation.* The process must be straightforward and within the abilities of the inexperienced user.
- *Demonstration.* All program commands must perform as documented, without ambiguities.
- *Operation.* The program must be easy for the inexperienced user to master, and must demonstrate reliability during testing.

Availability

The Digital Classified Software system offers a centralized source for quality software. Digital Classified Software is available through Digital Business Centers, Authorized Digital Dealers, or from Digital's direct sales force.

The Digital Classified Software system helps users locate and choose the best current software products for their computers.

Outstanding Support

Digital's toll-free Telephone Advisory Service puts you in touch with a Digital support team who can help you with any questions you may have. The Telephone Advisory Service is available in combination with other hardware and software support services, or alone for a modest monthly fee.

Digital also offers a variety of courses on a range of subjects aimed at improving your computer productivity.

• Educational Services

Digital's Educational Services provides one of the largest and most diversified computer education programs available in the industry. Worldwide, these resources include 27 educational centers, a staff of over 1,700 professionals, and a curriculum of more than 500 courses.

All courses—from the Computer-Based Instruction included with your Professional to traditional lecture and lab instruction, on-site classes, self-paced courses, and management seminars—are aimed at helping you make the most of your Digital computer.

Computer-Based Instruction for the Professional Series

- *Professional 300 System Overview.* This computer-based instruction program is supplied with all Professional computer systems. The course provides an overview of hardware components, emphasizing special features and capabilities.
 - *How to Use PRO/Communications.* Covers basic principles of computer communications, set-up characteristics, file transfers, and using the Professional as a terminal.
-



- *How to Use TK!Solver.* Discusses and defines the basic *sheets* available with TK!Solver, entering data into various *sheets*, storing and retrieving TK!Solver modules, maneuvering between *sheets*, and basic TK!Solver commands.

- *How to Use Supercomp-Twenty.* Covers basic parts of the Supercomp-Twenty spreadsheet, entering labels and values, storing and retrieving data, and manipulating portions of the spreadsheet.

- *How to Use PRO/DATATRIEVE.* Covers retrieving, sorting and displaying records, creating simple reports, using simple values, Boolean and record expressions, and domains.

- *Professional Series Beginner's Guide to Repairs.* Teaches users to isolate hardware malfunctions on the Professional Series and make repairs by replacing boards.

Lecture/Lab Courses for the Professional Series

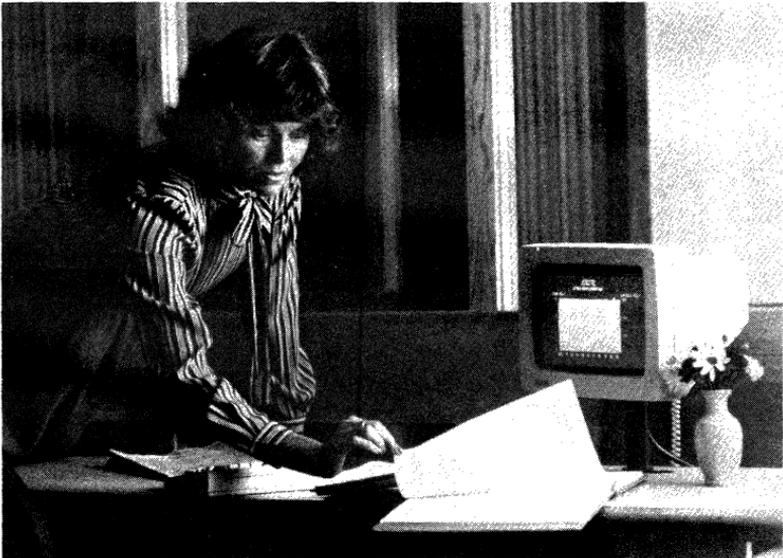
- *Getting Started on Your Professional.* Prepares the first-time user for an immediate and effective start in computing on the Professional. One day.
- *Basic User Operations for the Professional.* Covers use of the PROSE text editor, using files and directories, disk/diskette services and more. One day.
- *Using the P/OS Operating System.* Teaches Professional users the fundamentals of P/OS. One day.
- *Using Communications with the Professional.* Covers communications interfaces and set-up options, terminal emulation, and file transfer between the Professional and VAX/VMS systems, or between two Professionals. One day.
- *Using the CP/M Operating System.* Gives new users hands-on knowledge of CP/M. One day.
- *PRO/DATATRIEVE.* An introduction to database management for new users of DATATRIEVE on the Professional. One day.
- *PRO/DATATRIEVE Application Design.* This seminar examines how PRO/DATATRIEVE, the layered application facility, networking, ATHENA/Graph and other products can be combined to provide a powerful workstation environment. Three days.
- *Supercomp-Twenty for the Professional.* Gives new users of Supercomp-Twenty an introduction to spreadsheets and hands-on training developing spreadsheets using selected examples. One day.
- *Advanced Supercomp-Twenty.* Covers option setting, importing and exporting data files, inserting text files, creating a command file, utilizing bar graph notation, graph formatting and other advanced functions. One day.
- *ATHENA/Graph for the Professional Series.* How to plan, create and print effective business graphics on the Professional using ATHENA/Graph. One day.

- *Cortex Desk Set for the Professional.* Covers recording and tracking of appointments, commitments, phone numbers, memos and expenses as well as performing basic calculations. One day.

- *Professional Developer's Tool Kit User.* Prepares users, applications programmers, and system programmers to develop applications on RSX-11M, RSX-11M-PLUS, or VAX/VMS systems for the Professional. Five days.

- *P/OS System Concepts.* A two-day seminar for technical professionals involved in the design and programming of applications for the Professional.

- *Professional 300 Series Application Design.* A three-day seminar for software specialists who are designing and programming applications to run on the Professional. Requires P/OS System Concepts as a prerequisite.



Management Seminars

- *The Computer as a Management Tool.* Learn how the computer can be used as a management tool during this five-day, hands-on seminar. Applications such as electronic mail, spreadsheet calculation, text editing, and graphics are covered in depth. Participants will have the opportunity to develop applications during the course of the week.

- *Effective Management with Personal Computers.* A three-day seminar for novice personal computer users. The program is ideal for managers involved in complex analysis and decision support.

- *Executive Computing.* A three-day course that teaches managers to meet business goals using the BASIC computer language. Participants solve problems in a wide range of management applications.

- *Local Area Networks—A Practical Approach.* This three-day course includes both a practical and technical discussion of the key design issues involved in the selection and/or implementation of a Local Area Network (LAN).

- A listing of Educational Services' courses and locations is published quarterly in *Digest*, a publication designed to help customers plan and schedule training programs. Contact the Digital Training Center nearest you for further information about the prices and availability of the courses listed here.

Educational Services Training Centers**Boston**

12 Crosby Drive
Bedford, Massachusetts 01730
(617) 276-4380

Chicago

5600 Apollo Drive
Rolling Meadows, Illinois 60008
(312) 640-5520

Dallas

12100 Ford Road, Suite 110
Dallas, Texas 75234
(214) 620-2051 x301

Denver

8800 East Arapahoe Road
Englewood, Colorado 80112
(303) 773-6535

Los Angeles

4311 Wilshire Boulevard, Suite 400
Los Angeles, California 90010
(213) 937-3870

New York

One Penn Plaza
New York, New York 10119
(212) 971-3545

Santa Clara

2525 Augustine Drive
Santa Clara, California 95051
(408) 748-4048

Washington, D.C.

8100 Corporate Drive
Landover, Maryland 20785
(301) 577-4300

DECUS—Digital Equipment Computer User's Society

Digital has its own computer society, DECUS. DECUS is one of the largest and most active computer users' groups in the world. Through DECUS you will be able to meet many other users of Digital's computers to exchange ideas and information. DECUS sponsors local, regional, national, and international meetings and symposia for its members. It also maintains a library of more than 1,500 software packages written and submitted by DECUS members for the use of other members.

Chapter 6 • Professional Series Systems and Options



The Professional Series consists of three models: the Professional 325, the Professional 350, and the Professional 380. All feature Digital's highly acclaimed keyboard, a high-resolution monochrome or color monitor, a PDP-11-based CPU with floating-point processor, bit-mapped graphics, 512 Kbytes of main memory, an 800-Kbyte dual-diskette drive, and communications, printer, and network interconnect ports.

While all Professionals share many common components, each has a number of distinguishing features and characteristics.

The Professional 325 is a diskette-based system offering PDP-11 performance in a low-cost, desktop package. The Professional 325 features the F-11 (PDP-11/23) microprocessor with floating-point processor, and one expansion slot for user-installable options. Available options include additional memory, color capability, or any one of several data collection or communication devices. The Professional 325 runs diskette versions of P/OS, RT-11, CTS-300, STANDARD MICRO MUMPS 300, CP/M-80 and p-System operating systems. It has the distinction of being the lowest-cost PDP-11 system ever produced.

The Professional 350 is also based on the F-11 microprocessor, but has three available option slots, and will accept an internally mounted 5-, 10-, or 33-Mbyte hard-disk storage system in addition to its standard diskette drive. Available operating systems (which may require hard disk storage) include P/OS, PRO/VENIX, XENIX, Idris, RT-11, CTS-300, STANDARD MICRO MUMPS 300, CP/M-80, MS-DOS and p-System. The Professional 350 also offers local area networking capability using PRO/DECnet software. The Professional 350 is best-suited for applications where fast, large-capacity mass storage is required; where local area networks are planned or already in place; and where multiple system options are required.

The Professional 380 offers the powerful J-11 (PDP-11/70) chip set with integral floating-point processor and extended instruction set, state-of-the-art CMOS gate arrays, and a higher degree of system board integration. The result is two- to three-times the processing speed, faster memory access, faster video response, and greater expansion possibilities. The Professional 380 also offers a higher-resolution "interlaced" graphics mode to provide twice the vertical resolution of other Professional models. The 380 has five available option slots for system expansion, and will accept every available system option.

The Professional 380 is designed for performance-critical applications: a multiuser Professional running PRO/VENIX, CPU-intensive scientific and engineering applications, or large database management systems. The 380's higher-resolution graphics and faster display rate also provide the basis for a powerful low-end CAD workstation.

The Professional Series at a Glance

Model	325	350	380
CPU	F-11 (PDP-11/23)	F-11 (PDP-11/23)	J-11 (PDP-11/70)
Floating Point	Yes	Yes	Yes
Main Memory	512 Kbytes	512 Kbytes	512 Kbytes
Diskettes	2 X 400 Kbytes	2 X 400 Kbytes	2 X 400 Kbytes
Printer Port	Serial RS232	Serial RS232	Serial RS232
Comm Port	Async/sync RS232	Async/sync RS232	Async/sync RS232
Video Memory	1 page/plane	1 page/plane	4 pages/plane
Clock	Yes	Yes	Yes
Bus Slots	4	6	6
-Allocated Slots	3	3	1
-Available Slots	1	3	5
Upgrade Kit	Yes (325 to 350)	Yes (350 to 380)	N/A

Memory/Storage Options

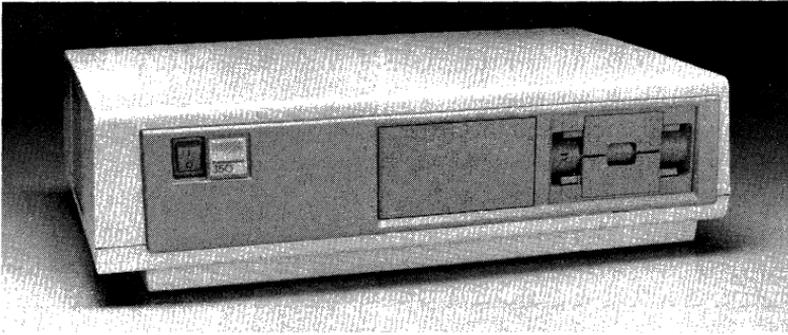
256-Kbyte Memory	Yes	Yes	Yes
512-Kbyte Memory	No	No	Yes
5-Mbyte Hard Disk	No	Yes	Yes
10-Mbyte Hard Disk	No	Yes	Yes
33-Mbyte Hard Disk	No	Yes	Yes

Keyboard

-
- Low-profile, detachable keyboard
 - Six-foot (1.9 m) coiled connecting cord
 - 105 matte-textured keys
 - Four separate keypads: typing, editing, numeric and function keys
 - Compose key supporting multinational character set
-

Monochrome Monitor

-
- Choice of white, green, or amber screen
 - 12-inch (diagonal) screen
 - Glare-resistant coating
 - Tilt adjustment: + 5 to -25 degrees from horizontal
 - Standard RS170 composite video input, terminated
-



• **Professional System Unit (USA)**

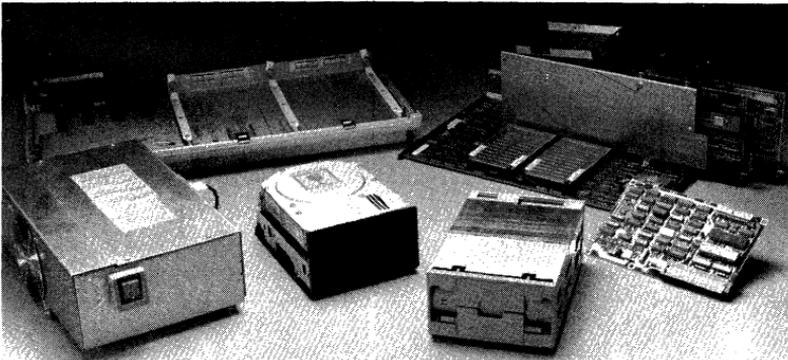
Order Codes: PC325-D2 (Professional 325)

PC350-D2 (Professional 350)

PC325-AA (Professional 380)

The Professional's system unit houses all working components except the keyboard and monitor. It can be placed horizontally on a desktop or vertically in the optional floorstand (PCXXF-AA).

There are four system unit subassemblies: the main logic module, a dual-diskette drive, the power supply, and the system enclosure.

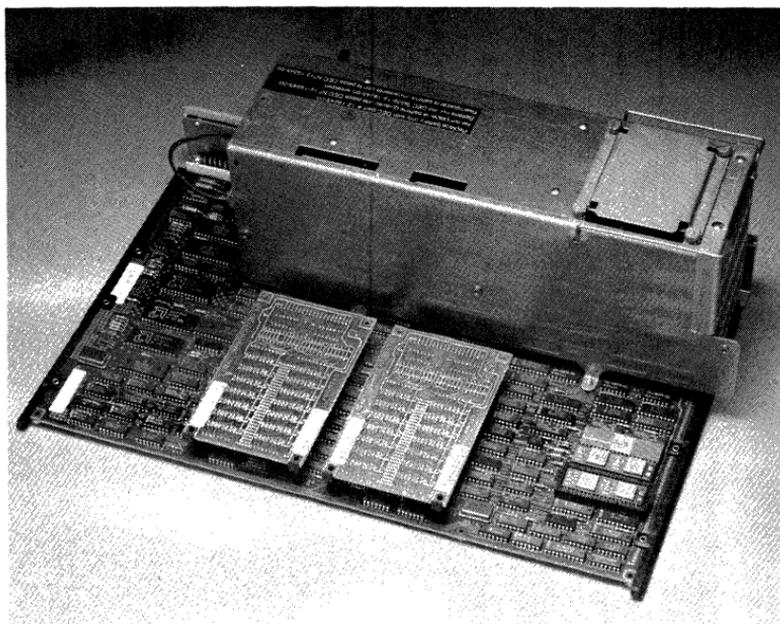


The Professional's modular design makes it easy to upgrade and service. In fact, the entire system unit can be disassembled in minutes, using nothing more than a ball-point pen. Any subassembly can be removed for inspection, repair, or replacement, and all system options are user-installable.

Main Logic Module

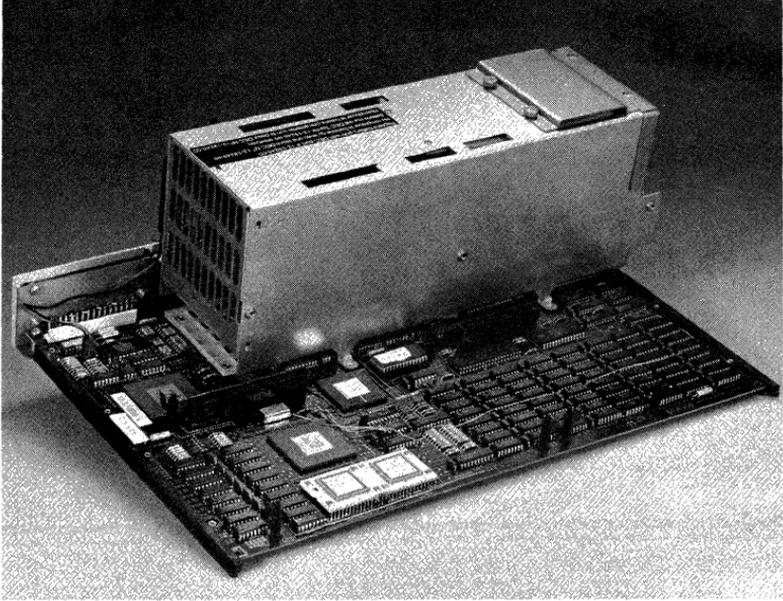
The main logic module is mounted flat across the bottom of the system unit enclosure. A panel at one end of the module serves as the back of the system enclosure. This panel houses a communications port, a printer port, a monitor port, a network interconnect port, and diagnostic LEDs. The main logic module also contains:

- *F-11 microprocessor (Professional 325/350)*. All members of the Professional family contain a Digital-developed 16-bit PDP-11 processor. The Professional 325 and 350 contain the F-11 microprocessor, which is the functional equivalent of a PDP-11/23-PLUS. Features include 16 bit-word or 8-bit byte addressing, eight internal registers, stack processing, programmable vector interrupts, and 16-bit ODT console emulator.
- *J-11 microprocessor (Professional 380)*. The Professional 380 contains a J-11 microprocessor, which supports most features of the F-11 as well as offering the larger PDP-11/70 instruction set (87 instructions and eight addressing modes). The J-11 also features an integral floating-point processor, 22-bit ODT console emulator, supervisor mode, and split I & D space.
- *Floating-point processor*. A floating-point processor supplements the integer arithmetic instruction set in both the F-11 and J-11 processors. It adds a number of microcoded instructions that perform arithmetic, logical, and conversion operations. Executing these operations in microcode rather than software increases processing speed and saves memory space. Instructions operate with 32-bit single-precision and 64-bit double-precision data, which is equivalent to 7- and 17-digit accuracy, respectively.



Professional 350 Main Logic Module.

- *Memory management unit.* PDP-11 computers work with 16-bit addresses providing for 64 Kbytes of logical address space. By constructing 22-bit addresses, the memory management unit allows for physical memory addressing of up to four Mbytes.
- *512 Kbytes RAM memory.* In the Professional 325 and 350, half of the memory resides on two 128-Kbyte daughter modules that attach directly to the system board. The additional 256 Kbytes of standard memory is housed in a backplane module. Memory is expanded on the Professional 325/350 by adding backplane modules in increments of 256 Kbytes.

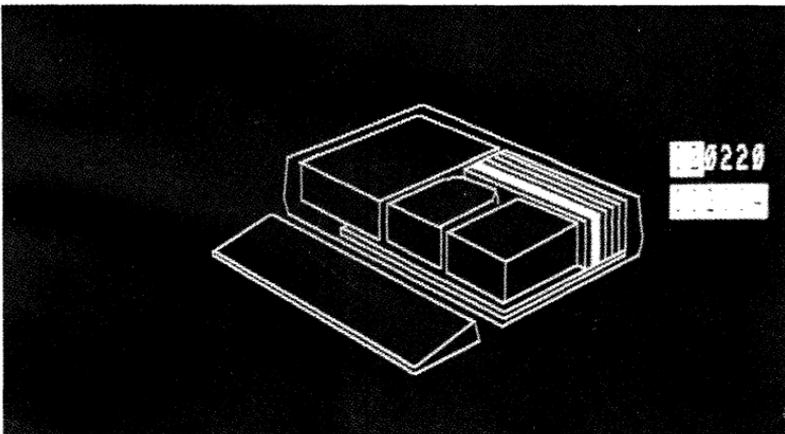


Professional 380 Main Logic Module.

In the Professional 380, all 512 Kbytes of standard memory is located on the system board. An optional 512-Kbyte daughter module can also be added to the system board, giving the Professional 380 a full Mbyte of RAM without using any expansion slots.

Professional 380 memory is also more tightly coupled to the processor, improving memory access time by approximately 20 percent.

-
- *16 Kbytes diagnostic and bootstrapping ROM.* Each time the system is turned on, the Professional runs a diagnostic test of the system and all installed options. The diagnostics for the main system logic module run first. After this test is complete, the system detects which options are installed based on an option-present signal. Each option module carries its own diagnostic test in on-board ROM. Each test is transferred to RAM and run by the CPU. Faults detected in any of the modules are reported by means of a monitor display. If the video is not working, faults are indicated by a pattern displayed on four light-emitting diodes (LEDS) at the rear of the system unit.
 - *Nonvolatile clock and RAM.* The Professional features an automatic day, date, and time display. The nonvolatile clock and nonvolatile RAM keep track of the date and time when the system is off. They are powered by a NiCD battery, which is continuously charging when the system is plugged in. When no line power is available, the battery supplies power to the clock. A completely charged battery will maintain the clock and RAM for 14 days. The battery is completely charged after 48 hours of continuous system power.
-

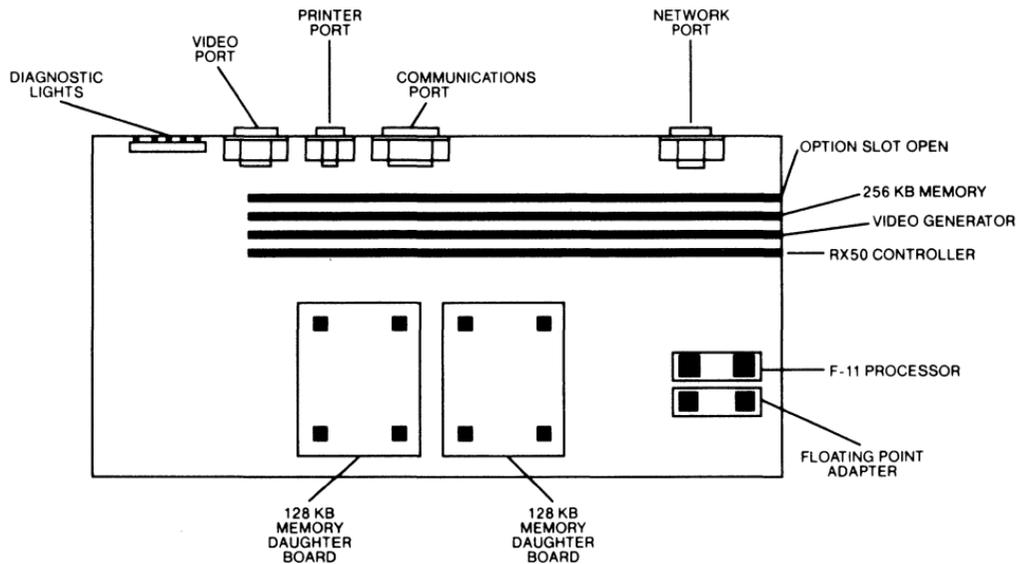


- *Bit-map video controller (Professional 325/350).* The Professional 325/350 bit-map video controller is a backplane module that generates a single-plane video map of 1024 by 256 pixels (960 by 240 displayable). The controller sends a composite video signal to the monitor, which forms characters by “turning on” the appropriate pixels. The information required to define characters is stored in a font table in the system memory. Three-plane color video is possible with the addition of the Extended Bit-Map Option Module (vc241-A).
- *Bit-map video controller (Professional 380).* A complete, single-plane bit-map controller is integrated into the system board of the Professional 380. It serves the same purpose as the 325/350 controller, with several important enhancements.

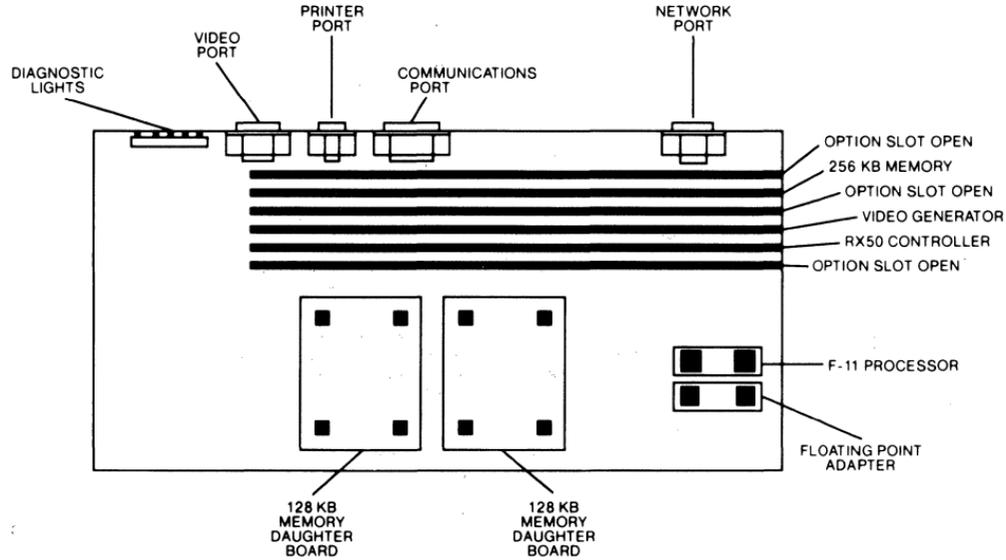
First, it supports an enhanced resolution mode (960 by 480) in addition to the standard resolution mode (960 by 240). The 380’s “interlaced” mode is selectable from the operating system SET UP utility. *NOTE: The Professional 380’s enhanced resolution mode requires a slow phosphor monitor. For monochrome applications, Digital’s amber monochrome monitor (VR201-C) may be used. For color applications, certain third-party monitors should be used. Guidelines for selecting a third-party color monitor are provided in the monitors section of this chapter.*

Second, the Professional 380 video controller can simultaneously store up to four pages of video rather than one page, which is standard on the 325/350. The result is faster video response and display rates.

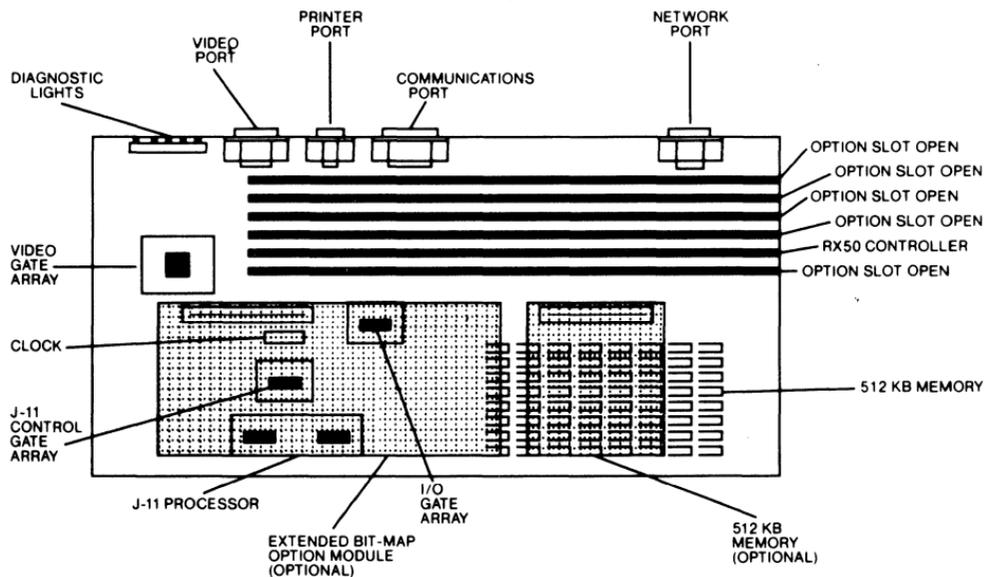
With the addition of the Extended Bit-Map Option (vc241-B), the Professional 380 supports three-plane color video as well as the enhanced-resolution “interlaced” mode. *NOTE: The Professional 325/350 and 380 Extended Bit-Map Options are different parts. See descriptions later in this chapter.*



Professional 325 System Module Layout



Professional 350 System Module Layout



Professional 380 System Module Layout

- *Printer port.* The printer port is a general purpose EIA RS232/423 asynchronous port. It has a nine-pin male connector that accepts a direct connection to all of Digital's serial printers. Depending on the model, these printers offer various speeds, numerous type sizes and fonts, draft- or letter-quality print, and graphics printing capability.

- *Communications port.* The Professional system unit includes a single serial communications interface. Program-selectable communications can be set by software to operate in asynchronous, byte synchronous, and bit synchronous modes. The Professional communications port also supports full- or half-duplex communication mode, and features a full set of modem controls for operation in the U.S. as well as in Europe (EIA RS232-C/CCITT v.24).

- *Network interconnect port.* The network interconnect port provides a simple means of connecting the Professional to an Ethernet local area network. The port provides the internal connection to the DECNA Ethernet Controller, and accepts standard PVC transceiver cables, allowing the Professional to be connected to a number of DECnet/Ethernet configurations. The port is a 15-pin female D-sub miniature and is pinned in accordance with the Ethernet specifications.

- *CTI Bus.* The Professional Series has a unique system bus called the CTI, or Computing Terminal Interface bus. The bus features many new, mechanically simple features that eliminate the need for jumpers and switches. Like the Q-bus, the CTI bus has 22-bit addressing (four Mbytes). It multiplexes addresses and data, combining 16-bit data signals with the 22-bit address signals on 22 signal lines.

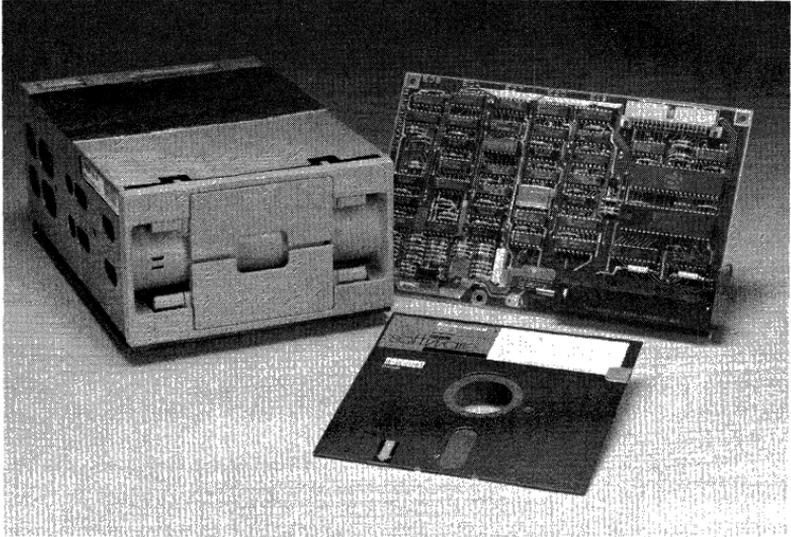
- *Backplane module slots.* Backplane module slots provide direct access to the CTI bus. The modules slots house various hardware subsystems, and can accept user-installed options. The Professional 325 has four slots, the Professional 350 and 380 have six slots.

In all systems, one slot is occupied by the diskette drive controller. The Professional 325 and 350 also use module slots for the video controller and 256 Kbytes of RAM. Video control and memory are located on the system board in the Professional 380.

As a result, the Professional 325 has one slot for system expansion, the Professional 350 has three slots, and the Professional 380 has offers five expansion slots.

Each module slot features unique zero-insertion force connectors for simple and positive connections. All option modules are user installable. In most cases, option modules can be placed in any available option slot. Certain cabling requirements pose the only limitations.

When an option module is in place, an option-present signal is turned on so that the main system logic module knows an option is installed. Each option contains on-board ROM with identification information. This allows the system to poll the slot location and identify the installed option. Fixed addresses are then assigned to the bus slots, and the module assumes the address of the slot it occupies.



RX50 Dual-Diskette Drive

Digital's compact RX50 dual-diskette drive system slides into the front of the system unit base. It connects to the diskette drive controller, which occupies one slot in the option module cage.

Digital's dual-diskette system accommodates two 5¼-inch diskettes on either side of a single spindle. The RX50 offers twice the disk storage of a conventional single-disk drive in about the same amount of space. The diskette subsystem will store up to 819,000 bytes—or over 400 typewritten pages—of formatted data in fixed-length blocks.

The RX50 subsystem includes a separate single-board controller module, which performs many diskette operating tasks. System diagnostics provide continuous error checking during normal

operation by maintaining a running “dialog” with the CPU. Error messages alert the user to potential problems in the diskette system.

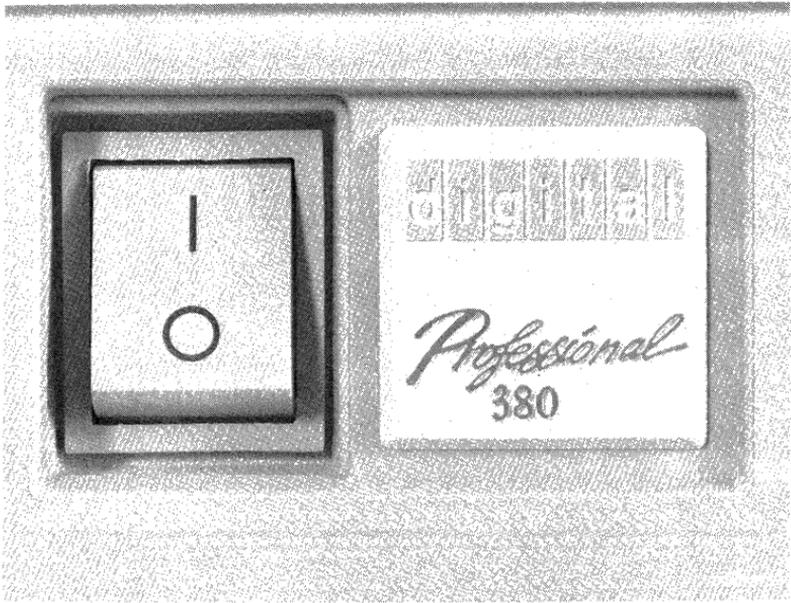
Dual-Diskette Drive Specifications

Height	8.3 cm (3.3 in)
Width	14.6 cm (5.8 in)
Depth	20.4 cm (8.5 in)
Weight	1.7 kg (3.8 lb)
Diskettes per Drive	2
Number of Recorded Surfaces	2 (1 per diskette)
Capacity	
Per Drive	819 Kbytes
Per Track	10 sectors
Per Sector	512 bytes
Transfer Rate	250 Kbits per second
Random Access Time	264 msec
Rotational Speed	300 rpm
Density	96 tracks per inch

Power Supply

The Professional’s power supply converts alternating current (ac) into the direct current (dc) the system requires. It also transforms the dc power into lower voltages for the system board, keyboard, monochrome monitor, and diskette drives. The standard system runs from a single power cord.

A voltage-select switch at the rear of the unit allows the system to run on either 115 or 230 volts of ac current.



The power supply unit includes circuit breakers, a 208-watt switching regulator module, an integral ac 70 CFM fan, and a 115/230 voltage-select switch.

System Enclosure

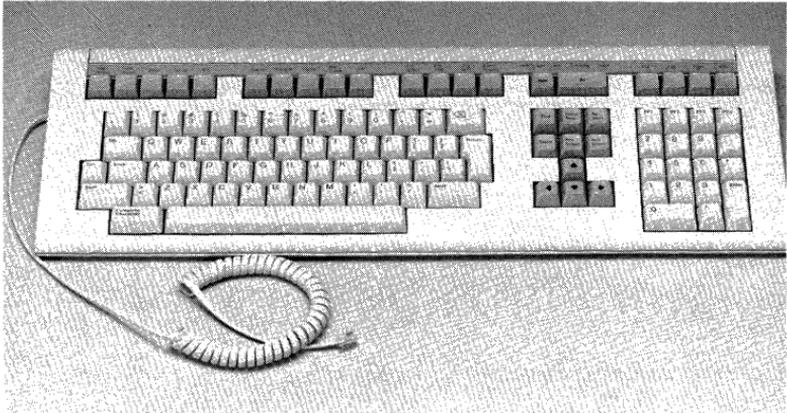
The modular components of the system unit mount onto the metal chassis of the two-piece system enclosure. All subassemblies slide easily in and out of the enclosure, but lock securely in place when installed. The enclosure also provides a slide mount for an optional hard disk drive.

General System Unit Specifications

Height	16.5 cm (6.5 in)
Width	36.3 cm (14.3 in)
Length	55.8 cm (22.0 in)
Weight	15.9 kg (35.0 lb)
Standard Memory	512 Kbytes
Clock	Nonvolatile RAM with rechargeable NiCD battery
Printer Port	Serial, rs232/423
Communications Port	Asynch/sync, up to 9600 baud with modem control
Storage	Dual-diskette drive (2 X 400 Kbytes)
Power Supply	Transistor, switch type AC to DC converter
Expansion Slots	1 on Professional 325
	3 on Professional 350
	5 on Professional 380

The Professional System Unit (PC325-D2, PC350-D2, or PC325-AA) includes:

- System unit
- Monochrome monitor cable
- 10-foot printer cable



• **Keyboard Country Kit**

Order Code: PC3K1-DA (USA and Canada)

Digital is an industry leader in ergonomic, “human-factor” design. Nowhere is this leadership more apparent than in Digital’s keyboards. The Professional’s keyboard design sets the standard by which other keyboards are measured.

The keys are sculptured to fit your fingers, have a nonslip surface for positive touch, and are comfortably spaced and arranged to eliminate errors and increase data entry speed.

The keyboard has a low profile to provide a more comfortable typing position. It attaches to the monitor by a six-foot coiled cord, so you can place the keyboard anywhere it’s most comfortable—even on your lap.

There are 105 keys divided into four areas: traditional typing keys, a numeric keypad for data entry, screen/cursor control keys for

editing, and special command and function keys. These areas are arranged for easy access to commonly used functions. And words, instead of codes, are used to label important editing and special function keys.

Traditional Typing Keys. The traditional typing keys provide the uppercase and lowercase alphabets, numbers, and punctuation. They are arranged exactly like the keys on a typewriter. For the most part, the function of these keys is identical to a conventional typewriter as well. So you won't spend time relearning the keyboard.

Two keys you won't find on a typewriter are the CONTROL (CTRL) key and the COMPOSE CHARACTER key. When used with certain other keys, the CTRL key performs special functions. Different applications may use CTRL for different purposes.

The COMPOSE CHARACTER key allows the user to create certain international characters and accents not normally found on a U.S. keyboard. A reference guide shows you the keystroke sequence required to create a certain character or accent. The Professional keyboard is available in 16 country-specific variations as well. A list of available Keyboard Country Kits appears at the end of this section.

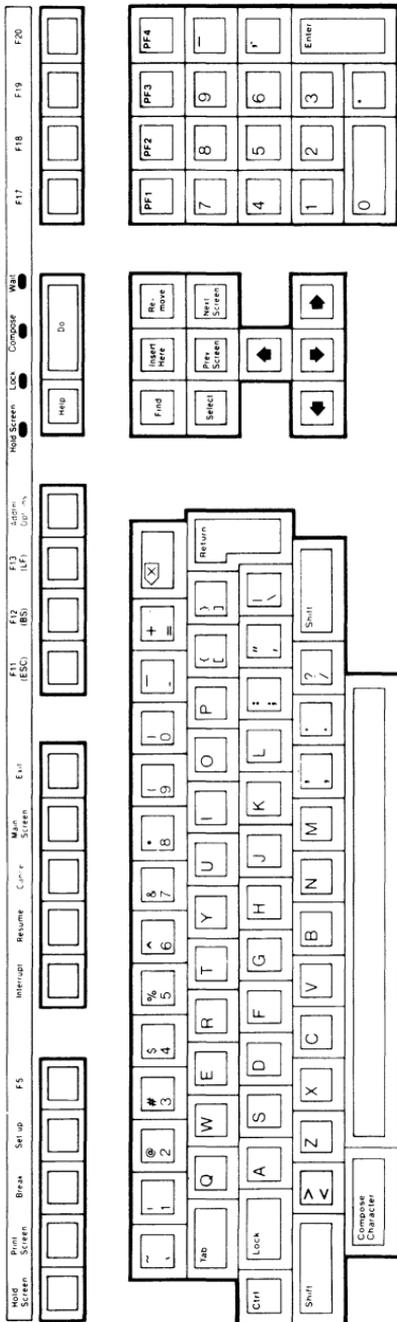
The Numeric Keypad. The data entry keypad on the far right is arranged like a calculator keypad to make number-handling or accounting programs easier to use. The numeric keys duplicate the functions of the corresponding numbers on the standard typewriter keyboard. All of the keys on the numeric keypad can also be redefined by application programs to perform special tasks unique to that program. Keys PF1 to PF4 are expressly designed to be special function keys for program use.



Screen/Cursor Control Keys. The location of the screen and cursor control keys allows fast, productive editing with the right hand, while the left hand remains in the typing area. The four keys that control cursor movement are arranged in a handy “inverted T” formation for fast cursor positioning with minimum finger motion. Each key is clearly labeled with an arrow.

Six editing keys activate the prime editing functions as well as important screen functions. They are also used in word processing and other applications.

6-23 • Keyboards



Special Function Keys. The special function keys include the row positioned horizontally across the top of the keyboard and the top four keys on the numeric keypad (PF1, PF2, PF3, PF4). These versatile, programmable keys can perform a variety of functions depending on the application. Functions can be defined by a program or by the user.

A special label strip included with the keyboard allows you to identify any special function keys associated with a particular program or operating system. When you change programs (or key functions), you can simply change the label strip at the same time. Extra label strips can be stored in a compartment in the keyboard when not in use.

The HELP and DO keys are positioned directly above the editing keys for easy reach. These keys are prelabeled because they are commonly used in all types of applications on the Professional. The HELP key is particularly important: it brings messages to the screen to get you out of difficulty by explaining your options at any point in a program. The DO key simply commands the computer to proceed with the instructions it has been given.

Indicator Lights. The small red indicators in the function key strip are labeled LOCK, HOLD SCREEN, COMPOSE, and WAIT. The LOCK light indicates that the uppercase alphabet lock is engaged. The HOLD SCREEN light indicates that the display has been temporarily “frozen” to allow you to read data that may have been scrolling by quickly. The COMPOSE light indicates that the computer expects a compose character sequence to be entered. The WAIT indicator lets you know that the program will not accept data entries from the keyboard until the light goes out.

Keyclick and Bell. A speaker is built into the keyboard to provide you with audible feedback: a slight keyclick when you press a key, and a bell tone when you when you reach the right-hand

margin. Certain programs may also use the bell to notify you if you press the wrong key. If you prefer, the bell and keyclick can be turned off.

• **Gold Key Keyboard Country Kit**

Order Code: PC3K1-EA (USA and Canada)

The Gold Key Keyboard is offered for systems that will be using PRO/Office Workstation in a distributed ALL-IN-1 office automation setting, or where users will be working with word processing packages such as CT*OS, which resemble the DECmate WPS system.

The Gold Key keyboard is identical to the standard Professional keyboard except that certain keys have been labeled and coded to take advantage of Digital's Gold Key editing and control system. The Gold Key keyboard can also be used as a standard Professional keyboard.

Keyboard Specifications

Height	1.25—4 cm (0.5—1.6 in)
Width	17.1 cm (6.75 in)
Length	53.3 cm (21.0 in)
Weight	2 kg (4.5 lb)
Home Row Key Height	3 cm (1.2 in) above desktop
Keys	105 keys with matte-textured finish and concave surface
	1.27 cm (.5 in) square
	1.9 cm (.75 in) center-to-center spacing between keys for single-width keys
	Wobble less than 0.5 mm (.020 in)

Keypad	Sculptured key array in 4 groups N-key rollover
Numeric Data Entry Keys	18 keys on far right
Function Keys	20 keys positioned across top
Typing Keys	57 keys
Screen/Cursor Control Keys	10 keys in the middle keypad
Cord to video monitor	1.9 m (6 ft), coiled 4-pin telephone-type modular connectors
Electronics	8-bit microprocessor 4 Kbytes of ROM 256 bytes of RAM 4 light-emitting diodes Speaker for audio feedback
Diagnostics	Power-up self-test, generates identification code upon passing test
Conformance	Meets European 30 mm home row requirement and provides clearance for diskette drive media insertion, without having to move keyboard away from system

The Keyboard Country Kit (PC3K1-DA) and Gold Key Keyboard Country Kit (PC3K1-EA) include:

- USA keyboard
- Keyboard/monitor connector cord
- Power cord
- Installation guide

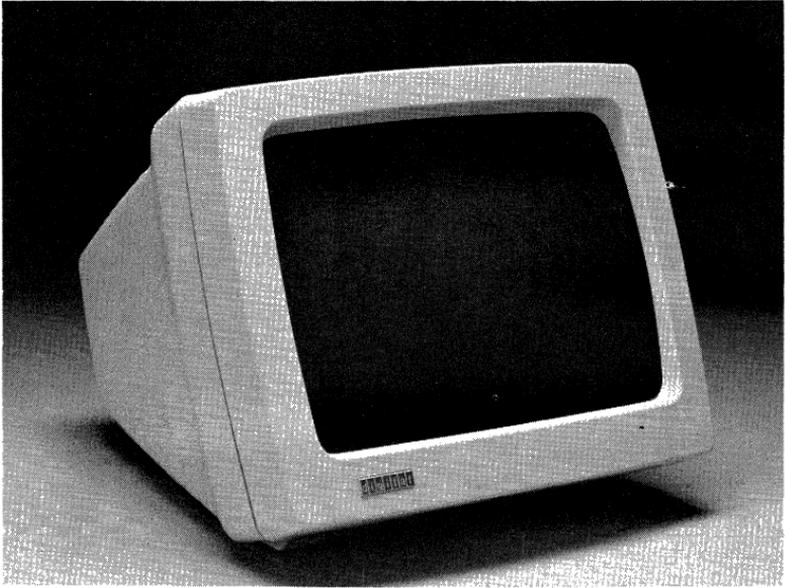
- Professional Owner's Manual
- System test diskette
- Label strip for keyboard function keys
- 2 Keyboard feet

• **Foreign Language Keyboard Country Kits**

In addition to the standard United States version, keyboards are available in 15 OTHER CONFIGURATIONS. Each kit contains the same basic components as the USA kit.

Order codes:

PC3K1-BB	Belgium (Flemish)
PC3K1-BC	Canada (French)
PC3K1-BD	Denmark
PC3K1-BE	United Kingdom
PC3K1-BF	Finland
PC3K1-BG	Germany
PC3K1-BH	Netherlands
PC3K1-BI	Italy
PC3K1-BK	Switzerland (French)
PC3K1-BL	Switzerland (German)
PC3K1-BM	Sweden
PC3K1-BN	Norway
PC3K1-BP	France
PC3K1-BS	Spain
PC3K1-BZ	Australia



• **Monochrome Video Monitor**

Order Code: VR201-A (white)

VR201-B (green)

VR201-C (amber)

The monochrome video monitor for the Professional combines functional styling with advanced video technology. The 12-inch (diagonal) screen is housed in a compact body that takes up surprisingly little space.

The Professional's monitor can be adapted to suit your work style. The tilt of the screen is adjustable at the touch of a button. Brightness and contrast are adjusted by dials at the rear of the monitor. And the Professional offers a choice of screen colors to suit your personal preference: white, green, or amber.

A special antiglare coating on the display screen reduces reflections and enhances character contrast. Screen flicker is minimized by a 60-image-per-second refresh rate that keeps characters steadily defined. The character display uses a 7-by-9 dot matrix. So whether you view light characters on a black screen or use reverse video to see dark characters against a light background, the definition is crisp, the characters easy to read.

The Professional supports all of the display characteristics of Digital's VT102 video terminal. Many other video features are possible under software control, including:

- *80- or 132-column display.* Adjustable column widths let you change the amount of information you see on a single screen display. A 132-column display is ideal for financial, accounting, and numerical analysis applications where viewing 12 months in a single display is desirable. Programmers can use this feature to view statements and comments on the screen simultaneously.
- *Text highlighting.* Bold, underline, blink, reverse-video, vertical lines, borders, and double-height and double-width characters let you add emphasis on a character-by-character basis. All highlights are shown on screen exactly as they will appear in printed text.
- *Horizontal, vertical, full- and split-screen scrolling.* These control features allow you to view the information the way you want to see it. The Professional supports both smooth and jump scrolling.

For the programmer, a variety of ANSI escape sequences are supported, including cursor addressing, polling, and screen erase.

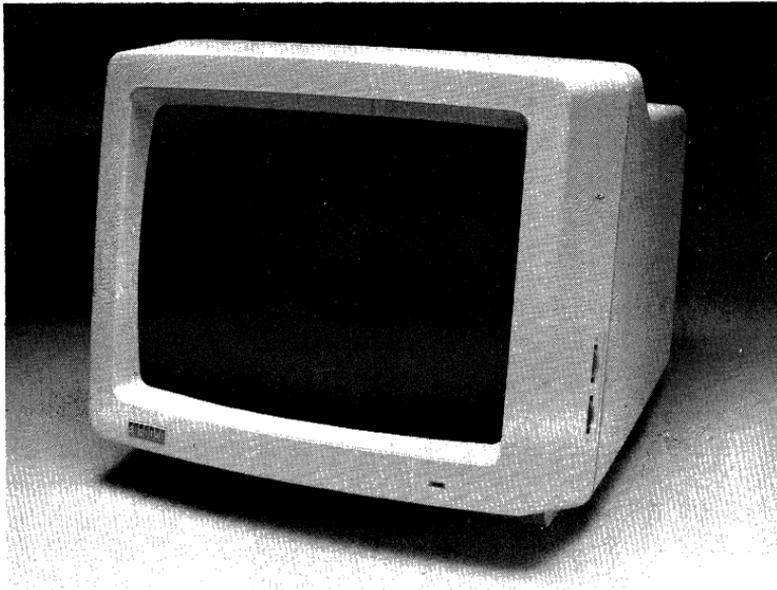
Graphics capability is standard with the Professional. The Professional's bit-mapped video is fully supported on the monochrome monitor. Graphic capabilities can be further enhanced with the optional Extended Bit-Map Graphics Module (Order Code: vc241-A for 325/350, vc241-B for 380), which allows you to produce gray scaling (up to eight distinct shades of gray) with the monochrome monitor.

Monochrome Monitor Specifications

Height	29.2 cm (11.5 in)
Width	34.9 cm (13.75 in)
Depth	31.1 cm (12.25 in)
Weight	6.4 kg (14 lb)
Adjustable Tilt	+ 5° to -25°
Standard Video Output	rs170 compatible, monochrome character cell video
Video Screen	12 in (diagonal) Antiglare filtering to reduce eye fatigue
Video Display	High-resolution monochrome with bold, underline, blink, and reverse-video split-screen capability 60-image-per-second refresh rate reduces screen flicker
Characters	7 X 9 dot matrix, including 2-dot descenders
Format	80 or 132 columns wide, selectable, by 24 lines for a total in excess of 3000 characters
Graphics	960 X 240 pixels 960 X 480 pixels (380 only)

Monochrome Video Monitor (VR201-A, -B, -C) includes:

- Monochrome Monitor (white, green, or amber)
- Screen Cleaner Kit



RGB Color Video Monitor

Order Code: VR241-AA

The RGB (red-green-blue) Color Video Monitor brings superb color graphics to the Professional. Color applications for the Professional include management-oriented charts and graphs, Videotex, data analysis and plotting, computer-aided design and drafting, computer-based training, and computer-generated presentations. Unlike many color monitors, Digital's RGB Color Monitor can display highly legible text as well as graphics. It is the ideal single monitor for high-performance color graphics and text.

The color monitor fits comfortably on a desktop in spite of its big, 13-inch (diagonal) display screen. Brightness and contrast are easily adjustable. The monitor's high-efficiency antiglare filter provides excellent contrast to help reduce eye fatigue under all normal lighting conditions.

The RGB Color Monitor produces a color image that is remarkably sharp—four to five times sharper than a conventional color television. Charts, graphs, and other visuals can be created using as many as eight colors simultaneously, from a palette of 256 colors (4096 colors for the 380). Text and graphics are easy to combine on the screen for additional emphasis.

Used for text, the color monitor provides the same high-quality display as the monochrome monitor, with white characters on a black background. A 60-image-per-second refresh rate reduces screen flicker, keeping characters steadily defined and easy to read. The high bandwidth of the monitor (18-20 MHz) allows the display of either 80 or 132 columns of text with no loss of character definition.

A number of sophisticated applications take full advantage of the Professional's color capability. These include Fingraph, ATHENA/Graph, MAPS/PRO Graphics, PRO/SIGHT, Synergy, and others. You can also create hardcopies of your color graphics with the optional LVP16 six-pen graphics plotter.

For the developer, the Professional offers a solid set of software tools to support the graphics hardware. For example, the CORE Graphics Library (CGL) can be accessed from any of the Professional Tool Kit's programming languages. CGL allows developers to access the Professional's graphics hardware in a portable, device-independent manner.

To create color graphics on your Professional, you need the Extended Bit-Map Graphics Option (EBO). On the Professional 325 and 350, the EBO is a backplane module that occupies one expansion slot (vc241-A). In the Professional 380, the EBO is a daughter module (vc241-B) that plugs directly onto the system board, and does not fill an expansion slot. The color monitor also requires its own power source. All color options are user-installable.

NOTE: The RGB Color Monitor does not support the Professional 380's high-resolution mode. Recommended color monitors are listed at the end of this section.

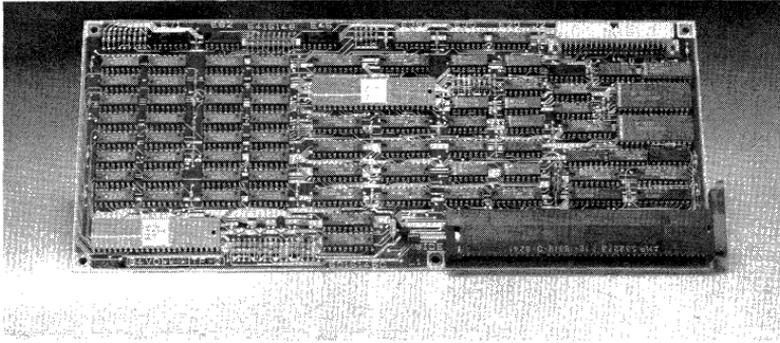
Color Monitor Specifications

Height	31.9 cm (12.8 in)
Width	36.3 cm (14.5 in)
Depth	43.2 cm (17.0 in)
Weight	16.6 kg (36.6 in)
Video Screen	13 in (diagonal) High-efficiency antiglare (HEA) coated bonded panel
Resolution	1024 X 256 pixels, 960 X 240 displayable
Palette	256 (4096 for 380) colors, 8 dis- playable simultaneously
Format	80 or 132 columns wide, select- able, by 24 lines 7 X 9 dot matrix, includes 2- dot descenders
Video Display	Bold, underline, blink, reverse- video, and split-screen capability

Active Raster Size	240 mm (W) X 150 mm (H)
Dot Pitch	.31 mm resolution (shadow-mask)
Degaussing	Built-in, automatic
Interface	Standard RS170 RGB (red-green-blue) cable connector with built-in line termination and selectable external sync
Power Supply	Universal, switch-selectable 90-120 V ac, 47-63 Hz or 185-256 V ac, 47-63 Hz
Hardware Prerequisite	Extended Bit-Map Graphics Module (vc241-A for Professional 325/350; vc241-B for Professional 380)

RGB Color Video Monitor (VR241-AA) package includes:

- Color monitor
- USA power cord
- Color monitor VR241-AA Installation/Owner's Guide



• **Extended Bit-Map Graphics Option
(Professional 325/250 only)**

Order code: VC241-A

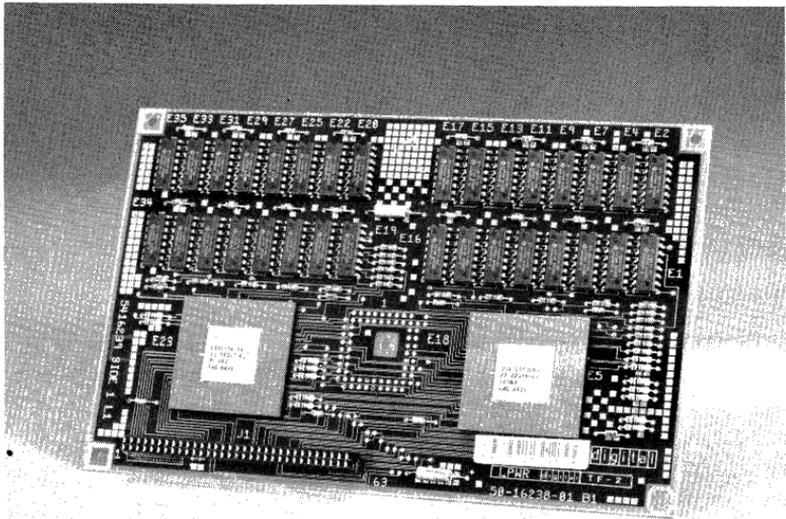
The Extended Bit-Map Graphics Option (EBO) lets you create sophisticated multicolored graphics with the optional RGB Color Monitor or multitone gray scaling on the standard Monochrome Monitor.

Essentially, the EBO expands the Professional's built-in bit-map video capabilities. The standard single plane of bit-mapped memory provides for text display and black-and-white graphics. The Extended Bit-Map Graphics Module adds two additional planes of bit-mapped screen memory. The three planes correspond to the red, green, and blue inputs to the color monitor. Each plane produces a screen display of 960 by 240 pixels.

The Extended Bit-Map Option and RGB Color Monitor combination allows the Professional to display up to eight colors simultaneously, from a palette of 256. On the monochrome monitor, you can display eight of a possible 16 shades of gray. The Extended Bit-Map Option is required for color capability on the Professional 325 and 350. The module occupies one slot in the system unit.

The Extended Bit-Map Option Module package (VC241-A) includes:

- Extended Bit-Map Option Module
- Color monitor cable
- Installation Guide



- **Extended Bit-Map Graphics Option
(Professional 380 only)**

Order Code: vc241-B

The Professional 380 Extended Bit-Map Option has the same function as the Professional 325/350 EBO—that is, providing color capability—but adds several new features.

First, it supports for the Professional 380's enhanced resolution mode (960 by 480) as well as the standard (960 by 240) display mode.

NOTE: Color capability in enhanced-resolution "interlaced" mode requires a slow-phosphor monitor. A list of specifications and suppliers of long-persistence (slow-phosphor) color monitors follows. For monochrome enhanced resolution mode, Digital's amber monochrome monitor (VR201-C) is recommended.

Second, the 380 EBO supports the Professional 380's 4 page video memory. Using color, this means that the Professional can store four "screens" of display for each of the three color planes.

The Professional 380 also offers a color palette of 4096 colors—a substantial increase over the 325/350, which offers a palette of 256.

The 380 EBO is a daughter card that attaches directly to the system board, rather than occupying a backplane module slot. This allows you to have color capability without using expansion slots.

Specifications and Suppliers for Color Long-Persistence Monitors

The following color monitors have specifications that indicate they should perform adequately with the Professional 380 in enhanced-resolution mode.*

**Digital lists these monitors for your information only. Digital does not endorse or guarantee their use in any way. Additionally, the list above is not exhaustive. Since graphic quality is an aesthetic judgment, it is a good idea to preview any monitor before purchase.*

Manufacturer	Model	Style
BARCO	CD 233-LP/D	13-inch RGB w/LP phosphor
	CD 351-LP/D	19-inch RGB w/LP phosphor
Aydin	8810	13-inch RGB w/LP phosphor
	8830	19-inch RGB w/LP phosphor
Gigatek	CCD 1331-CAB-LP	13-inch RGB w/LP phosphor
Amtron		19-inch RGB w/LP phosphor

In all cases, monitors should be ordered with the aspect ratio set at 8 (horizontal) to 5 (vertical). Long-persistence phosphor should be specified.

To determine if other color monitors will function in Professional 380 enhanced-resolution mode, use the following specifications as a guideline:

- RGB signal, synchronized on green
- Synchronization at 15.75 KHz scan frequency
- Bandwidth of 18 MHz or better
- Dot pitch at .31 mm or better

• **5-Mbyte Hard Disk System (Professional 350/380 only)**

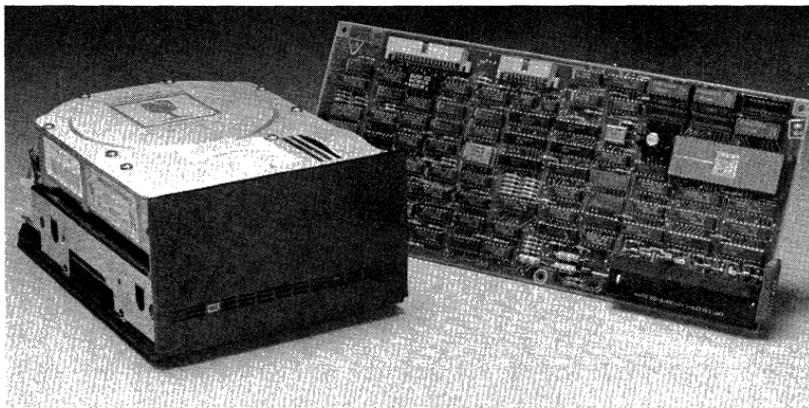
Order Code: RCD50-A

Digital's 5-Mbyte hard disk drive system is mounted within the system unit of the Professional 350 or 380, providing 5,000,000 bytes (about 3400 typed pages) of formatted, fixed internal storage. It offers a quiet, space-efficient mass storage solution for the Professional 350 and 380.

The hard disk subsystem seeks out and transfers information much faster than diskette drives. The large storage capacity of the hard disk system eliminates the need to switch diskettes constantly. The extra storage capacity also allows you to transfer your applications directly to the hard disk, making program access faster than ever.

The hard disk subsystem uses a 5¼-inch fixed (metal oxide) hard disk. The hard disk slides into the system unit next to the diskette drive. A controller module links the disk system and the system bus. The controller module requires one expansion slot.

The hard disk system is virtually maintenance free. No routine field adjustments are necessary. In fact, the head disk assemblies (HDAs) are hermetically sealed to prevent tampering or damage to the disk. The entire system is user-installable.



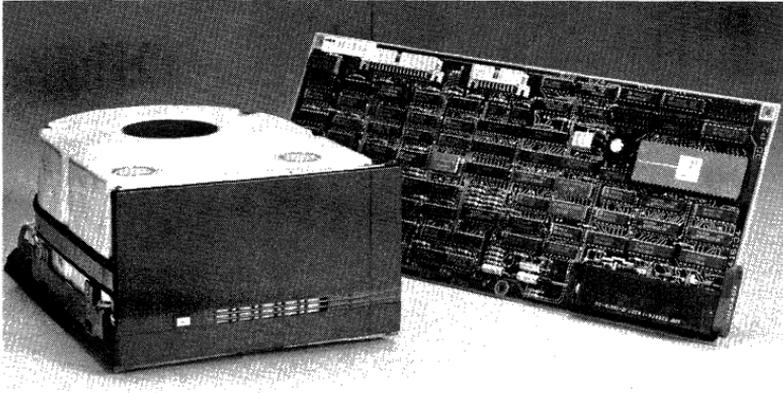
• **10-Mbyte Hard Disk (Professional 350/380 only)**

Order code: RCD51-A

Digital's 10-Mbyte hard disk system offers the same rugged construction and advanced design features as the 5-Mbyte system, adding increased performance and storage capacity. The 10-Mbyte hard disk system gives you 25 times the storage capacity of a single diskette, or about 6800 typewritten pages.

The 10-Mbyte hard disk improves system performance as well as storage capacity over the 5-Mbyte hard disk system. For example, average access time with the 10-Mbyte disk is 85 milliseconds, compared to an average access time of 170 milliseconds for the 5-Mbyte hard disk.

The 10-Mbyte hard disk system is recommended for application development, or where several applications will be used regularly. It includes a hard disk controller module that occupies one expansion slot.



• **33-Mbyte Hard Disk (Professional 350/380 only)**

Order Code: RCD52-A

The Professional's 33-Mbyte hard disk system can satisfy the storage requirements for almost any single-user database application. It provides five times the available storage space of the 10-Mbyte system (given equal overhead for operating system, tool kit, etc.), a significant performance increase, and a substantially reduced cost per Mbyte of storage.

Hard Disk Specifications

Capacity	5 Mbytes	10 Mbytes	33 Mbytes
----------	----------	-----------	-----------

Dimensions

Height	8.3 cm (3.3 in)	8.3 cm (3.3 in)	8.3 cm (3.3 in)
Width	14.6 cm (5.8 in)	14.6 cm (5.8 in)	14.6 cm (5.8 in)
Depth	20.4 cm (8.5 in)	20.4 cm (8.5 in)	20.4 cm (8.5 in)
Weight	2.3 kg (4.5 lb)	2.3 kg (4.5 lb)	2.3 kg (4.5 lb)

Performance

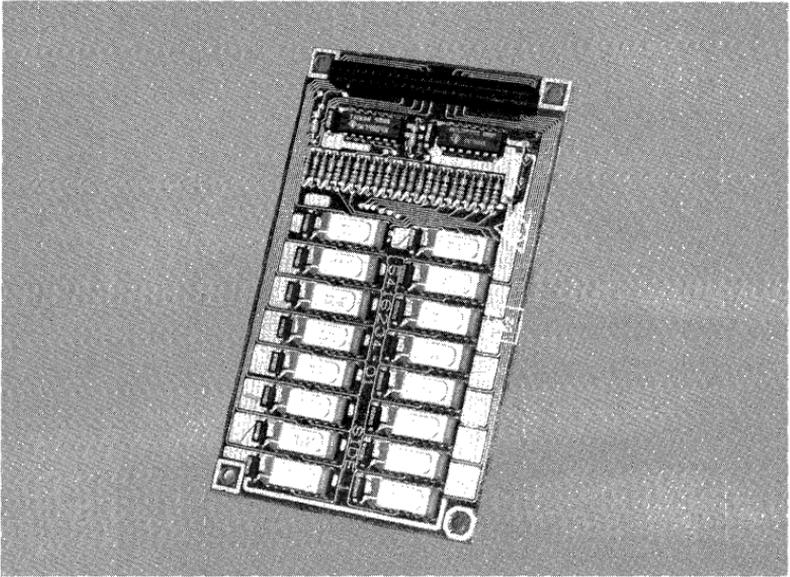
Transfer Rate	5 Mbits/second	5 Mbits/second	5 Mbits/second
Rotational Latency	8.33 msec	8.33 msec	8.33 msec
Average Access Time	170 msec	85 msec	57.5 msec

Media Characteristics

Recording Method	MFM	MFM	MFM
Start Time	15 seconds	15 seconds	30 seconds
Stop Time	20 seconds	20 seconds	20 seconds
Rotational Speed	3600 rpm	3600 rpm	3600 rpm

The 5-Mbyte (RCD50-A), 10-Mbyte (RCD51-A) and 33-Mbyte (RCD52-A) hard disk drive options include:

- Hard disk drive unit
- Controller module
- Documentation kit
- Installation guide
- System test diskette



• **512-Kbyte Memory Option (Professional 380 only)**

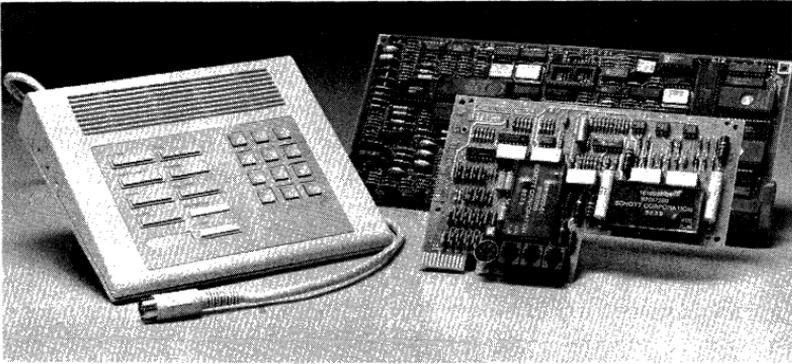
Order Code: MSC11-B

The 512-Kbyte Memory Option allows you to double the standard memory on the Professional 380 without using backplane module slots. The memory is housed on a daughter module that snaps into place over the standard memory on the Professional 380 system board, providing a total of one Mbyte of RAM.

By combining the two available memory options (512-Kbyte daughter card and 256-Kbyte modules) the Professional 380 can be configured with up to two Mbytes of RAM.

The 512-Kbyte Memory Option (MSC11-B) includes:

- 512-Kbyte daughter card
 - Installation guide
-



• **Telephone Management System (TMS)**

Order Codes: DTC11-A (Telephone Management Module)

DTC11-B (Telephone Management Voice Unit)

Anyone who spends time on the telephone—selling, researching, problem-solving, even transmitting or receiving data—will appreciate the Professional's Telephone Management System.

TMS can virtually replace the conventional telephones, modems, speed dialers, Rolodex, speaker phones, and other telephone tools you now use. In their place is an integrated desktop communication system that fully complements the Professional's advanced communication, graphics, and multitasking capabilities. TMS not only simplifies the telephone and data communication jobs you already do, it opens the door to many new voice and data communication applications.

You can start by using TMS for tasks as routine as file transfers, telephone directory services, or automatic call dialing. You'll find that TMS helps you perform these basic but time-consuming tasks faster and more efficiently than ever before.

As your needs grow, TMS grows with you. TMS brings you closer to the home office, the corporate database, or any other information sources you use. You can connect to services such as Dow Jones™ or The Source™ or other host computers with a few simple keystrokes. Available software turns TMS into a “smart” telephone and directory that can keep track of calls and billing, maintain client profiles—even remind you when to return a call.

That’s TMS today. Now consider TMS tomorrow. Using its advanced voice capabilities, TMS could be the basis for an intelligent answering machine, an automated telephone order processing system, telephone information services or bulletin boards, and more. Since TMS can understand and respond to Touch-Tone™ commands, any telephone could literally become a remote terminal to your Professional.

A TMS-based text editor could allow you to speak corrections into a written document. Your secretary could process those corrections at a later time. Using the Professional’s built-in clock, TMS could perform automatic and unattended data transfers at night, when telephone rates are lower.

Perhaps most remarkable is the fact that the TMS hardware costs no more than a good-quality 1200-baud modem. Standard TMS capabilities include:

- *Data communications.* TMS includes an integral full-duplex 300/1200-baud modem for asynchronous communications. Autodial and autoanswer features are standard.

Once TMS has been installed (and TMS is completely user-installable), you simply plug one or two standard telephone lines directly into the back of the Professional system unit. Already, you have eliminated a desktop modem, cables, and all the associated clutter and inconvenience.

Using the Professional's standard asynchronous communications package, you can perform data transfers or terminal emulation by simply selecting the target system from a menu and pressing the DO key. TMS adjusts your preselected set-up characteristics, dials the call, and prompts you when the connection has been made.

- *Telephone call handling.* TMS hardware and software team up to totally automate your personal business telephone: filing and cataloging phone numbers, automatically dialing the number you choose from the screen, automatically answering your calls, and more.

TMS will dial numbers up to 48 digits long and supports both tone and pulse dialing. TMS also has a "wait for dialtone" feature that can dial an access number, wait for a second dialtone, then dial a second number. These features guarantee easy access to PBX systems, to international numbers, and to services such as Sprint and MCI.

TMS allows you to connect two telephone lines to your Professional. The lines can be used individually for voice or data, or simultaneously for concurrent voice and data communications. Imagine reviewing text or data on the screen as you discuss it over the telephone. It's possible with TMS.

- *Voice input and output.* Providing voice storage and playback capability is one thing; providing natural, undistorted voice quality is another. TMS digitizes voice, stores it on the Professional's hard disk, and plays it back with remarkable accuracy.

TMS voice capability can be compared to any high-quality recording, with one very important exception: TMS gives you totally random access to voice files. You can access, insert, or delete any message or voice instantly.

Today, voice technology and voice applications are in their infancy. Yet TMS lays the groundwork for many advanced applications, especially where natural voice and low cost are primary considerations.

- *Applications for individual productivity.* Optional TMS software packages include PRO/Communications, which is the standard asynchronous communications package for the Professional, the ProtoCall family of telephone management software, and Propel,TM an integrated office management system.

PRO/Communications provides data transfer capability and basic telephone directory services. Setting up a data transfer is as simple as choosing the host name from your directory menu and pressing the DO key. Preset modem characteristics are automatically adjusted, the call is automatically dialed, and you are ready to begin.

ProtoCall, on the other hand, applies sophisticated data management techniques to your personal telephone file. Two versions of ProtoCall are available: ProtoCall 350 and ProtoCall 1000.

Using either package, you begin by simply entering names, addresses, and numbers of clients or customers you contact frequently. Now, whenever you wish to place a call, just type the person's name, and TMS will place the call automatically.

If you can't remember the person's name, ProtoCall 350 can sort and search the data by a number of designated groupings. ProtoCall 350 also lets you file and retrieve information about each person in your directory. You can even leave notes to yourself about calls to be returned. ProtoCall will prompt you to return the call on the appropriate date.

ProtoCall 1000 does even more. You can create customer or client profiles using a free-form information entry screen that you design yourself. When you retrieve information you can do it by any number of key words: last name, surname, nickname, company name, for example. ProtoCall 1000 also logs all of your telephone time by customer or client, and can bill your professional telephone time if desired.

A number of options are available to let you customize your TMS to suit your particular needs. These include an integrated keypad and

speaker phone, headphones, a footpedal switch, microphone, and a keyset adapter to support multiline phones.

- *Simple installation.* TMS can be installed on any properly configured Professional with a 5-, 10-, or 33-Mbyte hard disk and P/OS Version 1.7 or later. The TMS Controller Module requires one expansion slot. All TMS systems and options are user-installable.

Telephone Management System Specifications

TMS Controller and Telephone Interface

Modem	Integral 300 baud (Bell 103j), 1200 baud (Bell 212A) full duplex, asynchronous Software-selectable characteristics
Voice	CODEC for voice recording and playback from memory 32 Kbits per second CVSD encoding Software-selectable silence compression
Call Handling	Up to 48-digit telephone numbers “Wait for dialtone” command to detect intermediate dialtones For use over public switched networks plus most PBXs 2 RJ11 modular telephone jacks DTMF (Touch-Tone) transceiver 10 pulse/sec or 20 pulse/sec dialing Autodial, autoanswer of voice and data calls

Voice Unit

- Hands-free speakerphone
- Jacks for optional headphone, microphone, footpedal
- Pushbutton dial pad
- 9 software programmable special function keys with LEDs

The TMS Option Module (DTC11-A) includes:

- Controller module
- Telephone line interface board
- 1 modular jack phone cord
- Owner's guide
- Installation guide
- Maintenance diskette

The TMS Voice Unit (DTC11-B) includes:

- Voice Unit with integral keypad
- Installation guide

Additional Optional Equipment for TMS:

- **Keypad adapter for multiline telephones**

Order Code: DTC11-XK

- **Optional footpedal (requires DTC11-B)**

Order code: DTC11-XF

- **Optional external headphones (requires DTC11-B)**

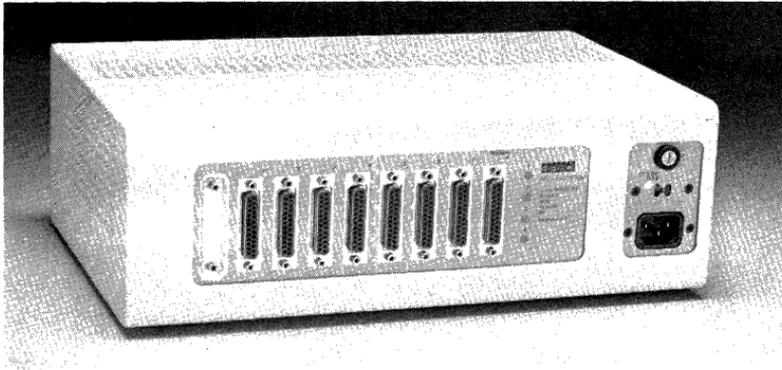
Order Code: DTC11-XH

• **Optional external microphone (requires DTC11-B)**

Order Code: DTC11-XM

• **TMS Programmer's Guide**

Order Code: AA-AD34A-TH



• **Mini-Exchange**

Order Code: DFMSA-AA

Mini-Exchange bridges the gap between personal productivity and office productivity. It helps small groups of personal computer users to share information, share resources—in short, to work as a team rather than as a group of individuals.

Mini-Exchange offers a sensible way to share expensive devices such as letter-quality printers, modems, and multiplexers. It supports most devices using RS232C connections in an asynchronous environment. With appropriate software, Mini-Exchange can also be used to perform file and document transfers between Digital or non-Digital personal computers.

Most importantly, Mini-Exchange gives you powerful and versatile local communication capabilities for a fraction of the cost of telecommunications-based systems. And since it allows groups of personal computers to share peripheral devices on a sequential basis, it can dramatically reduce per-system configuration costs. If you are used to telephone-based communications, Mini-Exchange will provide a pleasant surprise. It operates at speeds of up to 19,200 baud—a full 16 times faster than a 1200-baud modem.

Eight personal computers or other devices can be connected to a single Mini-Exchange at a range of up to 200 feet. Other than the Mini-Exchange itself and connecting cables, no additional hardware is required. The system is completely user-installable, is compact enough to fit easily on a desktop, and requires nothing more than a conventional power outlet to operate.

Mini-Exchange contains a built-in microprocessor to control circuit switching and port selection. This allows Mini-Exchange to support as many as four communication connections simultaneously. These connections can be made manually in terminal mode, or automatically under software control. The process is simple to learn and faster than dialing a telephone connection. When a printer or modem is included in the network, Mini-Exchange will automatically allocate and queue for the device.

The eighth port of the Mini-Exchange has been equipped with full modem control. By attaching an autodial/autoanswer modem to “Port 8,” you can easily communicate with other Mini-Exchanges or remote computers. A modem adapter cable is included with Mini-Exchange for this purpose. Recommended modems include Digital’s DF112-AA and DF03-AC.

Each Mini-Exchange also includes an external loopback tester, which allows the user to test each Mini-Exchange port individually. If there is a malfunction in any port, the problem will be highlighted by a series of LEDs on the front panel of the Mini-Exchange.

Mini-Exchange is supported by the standard asynchronous communication software available for the Professional as well as for Digital's DECmate II and III. Software support is also available for the Digital Rainbow and other non-Digital personal computers. The capabilities of the Mini-Exchange depend on the Digital computer and software you are planning to use in your network. PRO/Communications, the standard communications software for the Professional, supports the following operations:

- automatic port connection through Call Services and Professional Phonebook
- access to group printer (Digital LA50, LA100, LA210 and LQP02)
- Professional-to-Professional file transfer
- Professional-to-DECmate file transfer (DX)
- DECmate file conversion services (WPS to ASCII and ASCII to WPS)

For additional information on using Mini-Exchange with other computers, contact your Digital sales representative.

Mini-Exchange Specifications

Dimensions

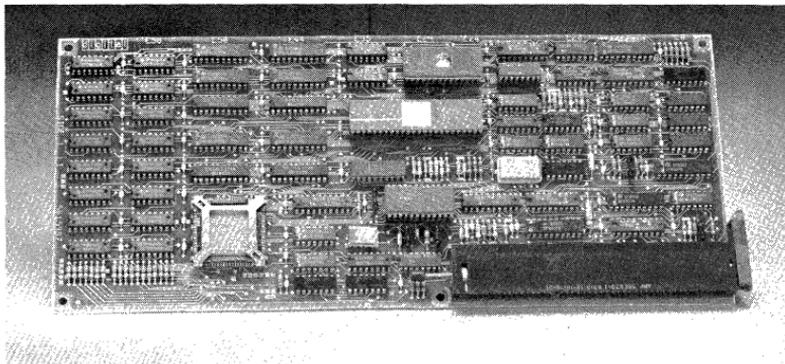
Height	10.2 cm (4 in)
Width	31.8 cm (12.5 in)
Depth	22.9 cm (9 in)
Weight	2.7 kg (6 lbs)

Components

Processor	12.0 MHz 8031 single chip microprocessor 128 X 8 read/write memory Two 16-bit counters Full Duplex UART with 8 Kbytes of programmable memory
Ports	8 serial ports, RS232/423 compliant
Power Supply	110/220, switched
Connectors	EIA RS232/423
Cabling	BCC04, BCC14, BC22E, or BC22F
Performance	
Range	60 m (200 ft) from system unit
Speed	From 300 baud to 19.2 kb/second

Mini-Exchange (DFMSA-AA) includes:

- System unit
- Power cord
- Modem cable
- Loopback cable (for testing)
- Installation/Owner's Guide

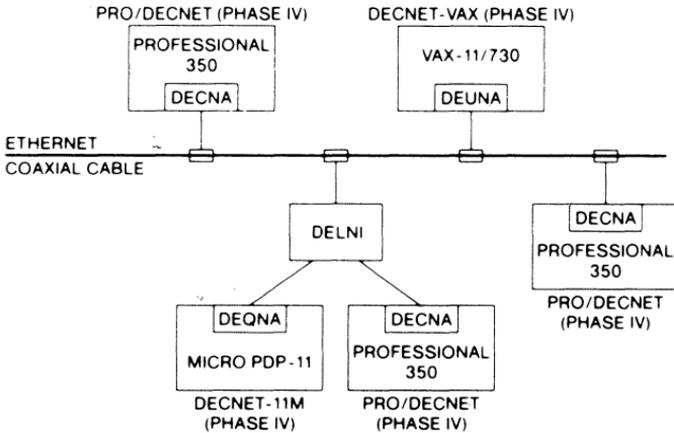


• **DECNA Ethernet Controller (for Professional 350/380 only)**

Order Code: DECNA-K

The DECNA Ethernet Controller provides the hardware interface between the Professional and an Ethernet local area network. The DECNA and PRO/DECnet software allow you to create—or tie into—DECnet communications networks of nearly any size or configuration. A DECnet network can include anything from a small group of Professionals to a fully distributed system made up of Professionals, larger PDP-11s, VAXes, and DECSYSTEM-10 and DECSYSTEM-20 mainframes.

The DECNA is a standard option module that occupies one expansion slot. A 15-pin, D-sub Ethernet connector labeled “NET 1” is already installed on the back panel of the Professional. The connection between the DECNA module and the “NET 1” port is already in place. No internal cabling is required and the module is completely user-installable.



The DECNA Ethernet Controller allows the Professional to connect directly to Ethernet coaxial cable (via an H4000 Transceiver) or to a Local Network Interconnect (DELNI) device.

The DECNA also includes a 5-meter length of PVC transceiver cable to connect the Professional to either an H4000 Ethernet transceiver or to a Local Network Interconnect (DELNI) star coupler. The device you connect to will depend on the configuration of your DECnet network: If you want to create a smaller, low-cost network, the DELNI will allow you to connect up to eight Professionals or other Digital systems within a limited geographic area; In larger networks, the H4000 Ethernet Transceiver can tie you directly to a conventional Ethernet coaxial cable.

The DECNA uses an Ethernet microcontroller that performs data encapsulation and decapsulation, data link management, and all channel access functions. It also allows downline loading and bootstrapping of a Professional from another network node.

The DECNA provides on-board self-diagnostics to simplify fault isolation and reduce maintenance costs. It provides status information and remote loopback of maintenance messages for easy network management. Because the DECNA takes care of most network management chores, DECnet does not exert a heavy load on the Professional's CPU.

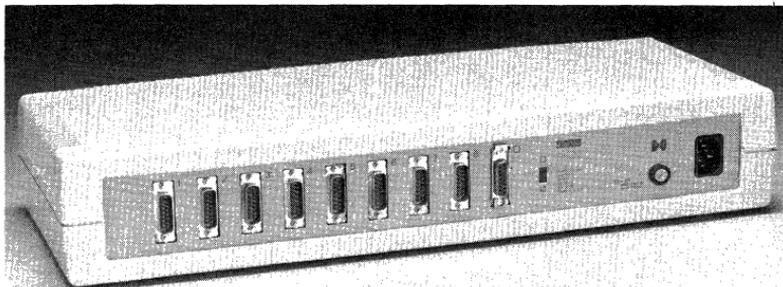
The DECNA module also contains 128 Kbytes of memory, which saves valuable space in the Professional's main memory. Normally, the memory is used as a buffer space for Ethernet packets or to execute network software. But since it is dual-ported, the memory can be accessed by the CPU and used for other purposes as well.

To participate in a DECnet Local Area Network, a Professional 350 or 380 must be equipped with a 5-, 10-, or 33-Mbyte hard disk, the DECNA Ethernet Controller, PRO/DECnet software, and P/OS Version 2.0 or later.

A properly configured Professional may then be connected to a Local Network Interconnect (DELNI) or an H4000 Ethernet Transceiver and Ethernet coaxial cable. These devices are described in the following sections.

The DECNA Controller (DECNA-K) includes:

- Ethernet controller module
- 5-meter transceiver cable
- Loopback cable (for testing)
- Installation/Owner's Manual
- PRO/DECnet binaries license
- 90-day warranty



• **DELNI**

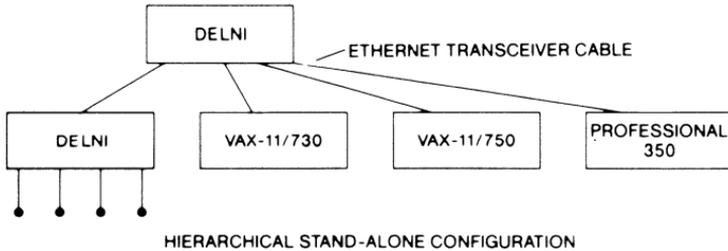
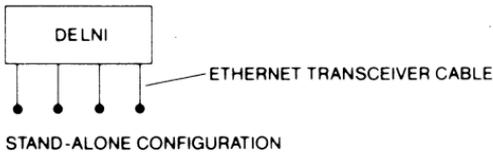
Order code: DELNI-AA (U.S.)

DELNI-AB (non-U.S.)

The DELNI (Digital Equipment Local Network Interconnect) is essentially a low-cost Ethernet device. It is a user-installable unit that allows up to eight Professionals or other Digital systems to be tied into a small Ethernet local area network controlled by DECnet software.

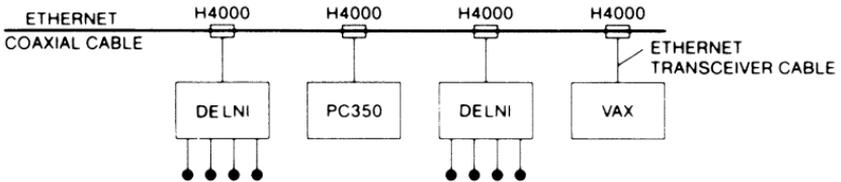
The DELNI unit is actually a short section of coaxial cable containing eight transceivers. Each transceiver supplies a port for one system on the network. A ninth port allows the DELNI to be connected to another DELNI or to a larger Ethernet network.

The DELNI is a compact, tabletop unit with a self-contained power supply. Professionals or other computers are tied into the DELNI using Ethernet transceiver cables. In the case of the Professional, the required cable is supplied with the DECNA Ethernet Controller (DECNA-K).



● = SYSTEMS, NOT TERMINALS

The DELNI may be used in a stand-alone configuration, with other DELNIs in a hierarchical configuration, or (below) connected to Ethernet coaxial cable in a larger network.



● = SYSTEMS, NOT TERMINALS

Although the DELNI is limited to a range of 100 meters, a DELNI local area network can be expanded by connecting to a second DELNI or to a larger Ethernet network.

To tie into a DELNI-based Ethernet, a Professional must be equipped with a 5-, 10-, or 33-Mbyte hard disk, the DECNA Ethernet controller, PRO/DECnet software, and P/OS Version 2.0 or later.

DELNI Specifications

Dimensions

Length	48.2 cm (19 in)
Width	17.8 cm (7 in)
Height	6.4 cm (2.5 in)

Operating

Data rate	10 Mbits per second
Number of Lines	8 device ports plus 1 connector for the H4000 transceiver cable.

Electrical

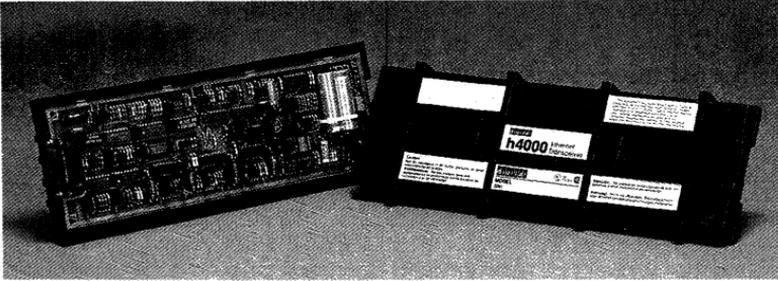
Switch-Selectable	110 V ac @ 60 Hz and 220 V ac @ 50 Hz
-------------------	---------------------------------------

Environmental

Temperature Range	5 to 50°C (41 to 122°F)
Relative Humidity	10% to 90% (no condensation)
Hardware Requirements	DECNA Controller for each node, H4000 Transceiver and transceiver cable required for connected configurations.

The DELNI (DELNI-AA, DELNI-AB) includes:

- DELNI unit
- Power cord
- Installation/User's Guide



• H4000 Ethernet Transceiver

Order Code: H4000

The H4000 Ethernet Transceiver provides the interface between an Ethernet coaxial cable and the Professional. It is the means by which a Professional or other system can tap into an Ethernet/DECnet local area network.

The H4000 transmits signals onto and receives signals from the cable, and detects any message collisions that may occur. It also provides electrical isolation and high impedance to the coaxial cable.

The transceiver consists of a small printed circuit board contained in a rugged plastic housing. The plastic housing contains a nonintrusive cable tapping assembly that is used for making the physical connection to the Ethernet coaxial cable.

To connect a Professional into Ethernet, the system requires a 5-, 10-, or 33-Mbyte hard disk, the DECNA Ethernet Controller, PRO/DECnet software, and P/OS Version 2.0 or later.

For complete information on cabling and other requirements for Ethernet local area networks, see your Digital Sales Representative.

H4000 Ethernet Transceiver Specifications

Dimensions

Length	30.2 cm (11.9 in)
Width	9.5 cm (3.74 in)
Height	9.0 cm (3.54 in)
Weight	1.1 kg (2.5 lb)

Operating Capabilities

Data Rate	10 Mbits per second
Operating mode	Capable of simultaneous transmission and reception
Configuration	100 nodes per 500 meter segment, 1023 nodes maximum

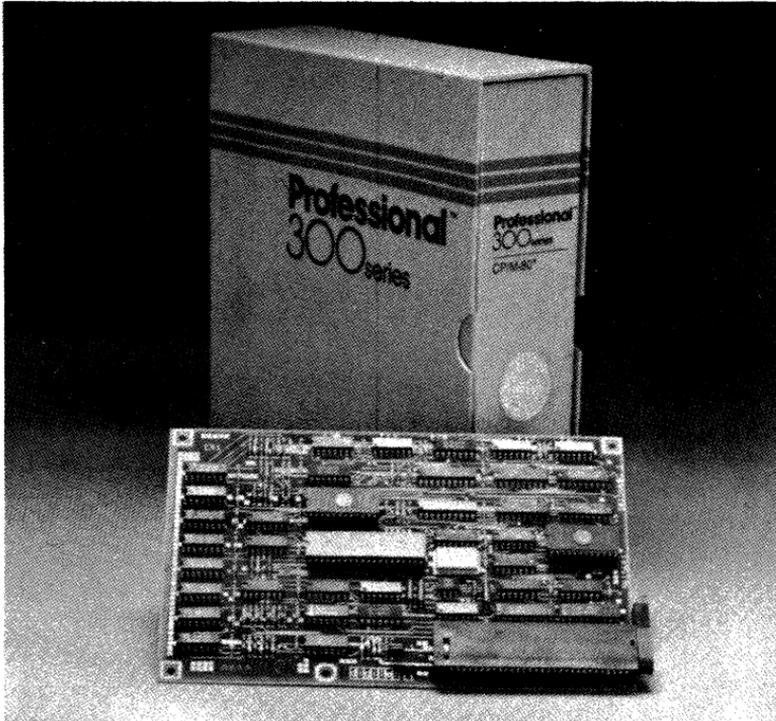
Electrical Requirements

Power required at transceiver	11.4 to 15.75 V dc through 4 ohm maximum distribution impedance
Current (max)	0.5 A
Typical Current	0.35 A

Environmental Requirements

Temperature Range	5 to 50°C (41 to 122°F)
Relative Humidity	10% to 90% (no condensation)
Conformance	U.L. approved for installation in environmental airspace without conduit. State and local regulations always take precedence.

For more information on site planning for Ethernet, consult *Digital's Ethernet Installation Guide* (Order Code: EK-ETHER-IN-001).



• **CP/M-80 Operating System Option**

Order Code: PC3XS-AA

The CP/M-80 option provides a useful “bridge” for CP/M users who have traded up to the Professional 300 Series. In most cases, it allows the user to continue using their existing library of CP/M software while gradually moving up into the more powerful P/OS environment. The CP/M option is also useful for running applications that are not available on other Professional operating systems.

The CP/M-80 option is layered on P/OS and uses the Professional menu system. To enter a CP/M application, simply select “CP/M” from the Professional’s main menu, then load the application.

Because the Professional is capable of multitasking, you can perform several jobs while simultaneously working on a CP/M application. For example, you could print a document while processing a CP/M spreadsheet. When you have finished, you simply exit CP/M and return to the standard Professional menu. You are now ready to select any other menu command.

Either of the diskette drives in the Professional can be used to read and write CP/M-format diskettes (96 tracks per inch). CP/M diskettes formatted at 48 tracks per inch can be read only. You can also read and write P/OS sequential files from a CP/M application, allowing data exchange between P/OS and CP/M applications. Virtual diskettes can be created on the optional hard disk system for added capacity and speed.

The CP/M option also allows the Professional to run CP/M-80 Version 2.2 applications developed for Digital's Rainbow and DECmate II personal computers. No modification is required, as long as the applications do not directly access hardware devices. Most CP/M applications will operate correctly. However, since the CP/M option does not have access to the Professional's hardware registers, CP/M applications (such as graphics) that have been written for specific I/O devices will not run.

The CP/M option includes all necessary hardware and software. The option module itself contains an 8-bit z80A™ microprocessor, 64 Kbytes of RAM, four Kbytes of ROM, and interface hardware to the CTI bus. It occupies one expansion slot.

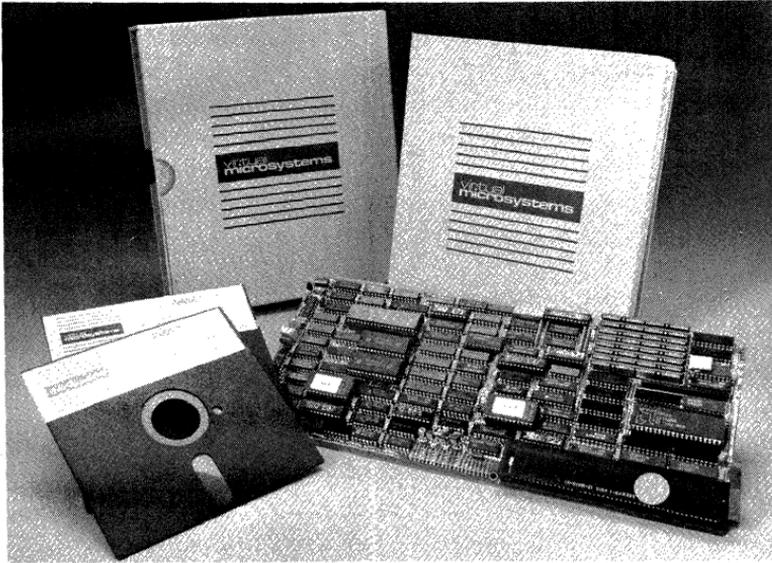
The CP/M Option Module (PC3XS-AA) includes:

-
- CP/M hardware option module (requires one option slot)

 - CP/M-80 operating system

 - Supporting P/OS application

 - User documentation



• **PC-Bridge™**
MS-DOS for the Professional

Available from: Virtual Microsystems, Inc.
2150 Shatuck Ave.
Suite 720
Berkeley, CA 94704
(415) 841-9594

pc-Bridge, created by Virtual Microsystems, Inc., is a hardware and software package that lets the Professional computer run dozens of popular MS-DOS applications. As a result, you no longer have to choose between the performance of the Professional and software applications available only in the MS-DOS environment.

PC-Bridge is an ideal solution for those who need the power and communications capabilities of the Professional, but also must run one or more MS-DOS applications. These applications might include an organization's in-house MS-DOS programs, or a commercially available application that is simply a personal favorite.

Besides letting you run many popular MS-DOS applications, PC-Bridge gives you many capabilities you won't find on other MS-DOS systems. You can use the FileLink utility (included with PC-Bridge) to transfer files from the MS-DOS environment to the P/OS environment. This allows you to use data generated from an MS-DOS application in compatible Professional applications. Using PRO/DECnet, you have high-speed Ethernet capability for MS-DOS files and data.

PC-Bridge creates a "virtual computer" within the Professional. This virtual computer consists of system software and an option module that occupies one expansion slot. All required software and licenses are included.

The option module contains an Intel 8086 processor, 256 Kbytes of RAM, an optional 8087 floating-point processor, and IBM PC bit-mapped video emulation circuitry. At eight megahertz, the 8086 is faster than the IBM PC/XT, and, unlike the IBM, uses the complete 16-bit data path, further speeding program execution.

PC-Bridge runs as an application under P/OS and stores applications and data on a segmented hard disk. Part of the disk is set aside for MS-DOS, with the balance reserved for P/OS and the other applications residing on your Professional. MS-DOS storage is divided into "virtual floppies" that appear as single directory entries on the P/OS directory. Each virtual floppy consists of multiple files internally and can grow to a user-defined limit of up to 4 Mbytes.

There are two basic ways to move MS-DOS software to your Professional to run on the PC-Bridge. The principle objective of these two approaches is to transfer diskette information from the 48-tpi (track per inch) MS-DOS format, used by IBM PCs and compatible systems, to the Professional's RX50, 96-tpi format. Limitations on software compatibility are detailed below.

Your first option is to purchase any of the dozens of MS-DOS applications available in RX50 format from a third-party supplier, leaving reformatting to these vendors. A list of these applications is in Chapter 9.

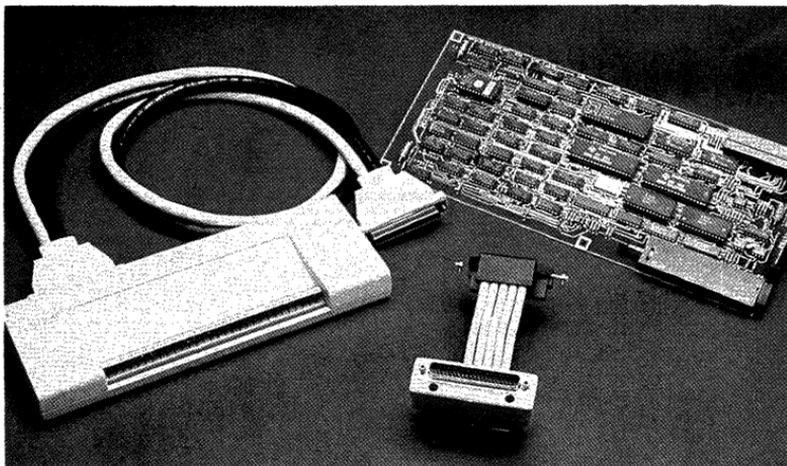
Your second alternative is to transfer your own proprietary or other nonlicensed software directly from the MS-DOS machine to the Professional. The simplest transfer procedure is to take advantage of the PC-Bridge-equipped Professional's ability to read single-sided MS-DOS diskettes. This requires that a special control chip, included with the PC-Bridge system, be installed on the Professional's RX50 controller board. Installation is offered by Digital Field Service for a nominal charge.

Once the control chip is installed, the Professional reads the application and stores it in RX50 format on diskette or hard disk. For MS-DOS applications that reside on two-sided MS-DOS diskettes, conversion utilities can be used to change them to single-sided disk format.

You can also transfer nonlicensed software via a modem or the RS232 serial interface. This transfer requires that both machines run VMI's PhoneLink communications program (available separately). Since the Professional writes the received information in its own RX50 format, the disk format of the source machine is unimportant.

Certain limitations should be considered when using PC-Bridge. Because the Professional does not have IBM PC option slots, no MS-DOS software packages that access optional devices on the IPC bus will run on the Professional. Similarly, IBM's proprietary BASICA is not implemented on PC-Bridge. Finally, some communications programs (those that do not use ROM calls) and certain copy-protected applications will not run on PC-Bridge.

PC-Bridge is sold and supported by Virtual Microsystems, Inc. It will run on any Professional 350 or 380 equipped with P/OS and hard disk storage.



• **Realtime Interface**

Order Codes: PC3XX-AA (RTI Module)

PC3XX-AB (RTI Connector Pod)

BCC11-03 (IEEE Connector Cable)

BCC10-03 (Serial Y-Cable)

BCC12-03 (Parallel I/O Cable)

The Realtime Interface turns the Professional into a personal workstation for the laboratory. The RTI Module combines three of the most widely used I/O interfaces on a single backplane module. The RTI connector pod provides connectors for all three interfaces. These include an IEEE-488 general purpose interface bus port, two EIA RS232/423-compatible serial asynchronous ports, and one 24-line bidirectional parallel I/O port. The three interface types can be used individually, in combination, or all three at the same time.

Internal cabling and a 62-pin connector for the Professional's back panel are standard with the RTI Module. For users who plan to work with only one RTI function at a time, there are three single-function cables that connect directly to the 62-pin connector at the back of the Professional. These include:

An IEEE-488 cable/connector (Order Code: BCC11-03). This cable/connector supports only IEEE-488 operations. The IEEE-488 bus allows the Professional to act as a master or a slave and control up to 14 external devices. It contains two complete bus ports: one for interfacing and one for handshaking and verifying correct operations.

- *A serial Y-cable with two 25-pin cinch D male connectors (Order Code: BCC10-03).* This cable supports use of both RTI serial lines. The two EIA RS232/423 serial asynchronous ports are independent and can be used simultaneously. Transmission rates (50 to 9600 baud) and word formats (data word length, number of stop bits, parity) are software selectable.
 - *A parallel digital cable with a 37-pin cinch D male connector (Order Code: BCC12-03).* This cable supports the use of the parallel digital interface only. The 24-line bidirectional parallel port can be configured by the user to transfer one-, two-, or three-byte values with or without hardware handshaking. It uses TTL-compatible logic levels.
-

Users who require more than one type of I/O at a time, or would like to maintain several connections at once, will need the RTI Connector Pod (PC3XX-AB). The pod connects to the back panel of the Professional and offers two 25-pin cinch D male connectors, a standard IEEE-488 connector, and a terminal strip for parallel I/O.

Programming the Realtime Interface for a specific instrumentation application requires the Professional Host Tool Kit or PRO/Tool Kit. While it is possible to program the RTI using tool kit MACRO-11, you can also take advantage of the high-level support provided in the optional Professional Realtime Interface Library (PRTIL) for the Host Tool Kit or in the PRO/Tool Kit Realtime Interface Library that runs under the native PRO/Tool Kit. These packages include a set of subroutines callable from Tool Kit FORTRAN-77 or BASIC-PLUS-2 that provide access to a P/OS driver for the RTI. Once an application has been developed and built onto a diskette, it can be used with any Professional 350 or 380 running P/OS Hard Disk and equipped with the Realtime Interface.

The RTI Option Module occupies one slot in the Professional system unit. All RTI options are user installable.

The RTI Option Module (PC3XX-AA) includes:

-
- RTI module
 - Internal "S" cable with back panel connector
 - Installation/User's Guide
-

The RTI Connector Pod (PC3XX-AB) includes:

-
- Connector box and cable for interfacing to back panel connector
 - Installation Guide
-

NOTE: The RTI serial Y-cable (BCC10-03), IEEE connector cable (BCC11-03), and parallel I/O Cable (BCC12-03) are ordered separately. These options are not needed if the connector pod (PC3XX-AB) is used. The Professional Realtime Interface Library and Tool Kits are also ordered separately.

• **Analog Data Module**

Order Code: ADMPC-AA

The Analog Data Module adds high-accuracy analog data acquisition to the Professional's realtime I/O capabilities. It is specifically designed for interfacing to analytical instruments.

The ADM can acquire voltage values ranging from a few microvolts to five volts. Digital input and output signals let you control experimental devices and allow recording of sample numbers and related information for automated testing. Sampling can be triggered by an external signal or synchronized with the on-board realtime clock.

The ADM connects to the Professional via the Realtime Interface (RTI) parallel digital port. The RTI's two serial asynchronous ports and IEEE-488 bus interface can also be used at the same time. The ADM includes connectors for these ports as well as its own.

The ADM offers features and capabilities to streamline many data acquisition and analysis tasks, including:

- *Analog inputs.* The ADM's eight analog input channels are multiplexed to a 16-bit analog-to-digital converter for high-accuracy data conversion. Prior to conversion, the signal can be amplified by a programmable gain amplifier with gain settings of 1, 4, 16, and 64 to aid in measuring low-level signals. The ADM's analog front-end also includes an autozero circuit to reduce the effects of system offset errors.
-

- *Digital I/O.* In addition to analog input channels, the ADM includes an 8-bit parallel digital input port and an 8-bit output port to facilitate handshaking with instruments and allow digital data transfers. Each bit on the input port can be used independently to trigger one of the analog input channels. Pulses on the digital input port can also be used instead of the ADM realtime clock to synchronize data acquisition.

- *Realtime clock.* An on-board programmable realtime clock provides precise trigger signals for analog and digital inputs. The user specifies in the software the desired sampling frequency.

- *Buffer memory.* An on-board first-in, first-out (FIFO) memory provides buffer space for analog inputs. The FIFO memory allows data acquisition to continue without lost samples while the Professional performs other operations. If the FIFO memory is overrun, an error message is returned.

- *Realtime interface ports.* The Professional communicates with the ADM over the parallel digital port of the Professional Realtime Interface (PC3XX-AA). When the ADM is in use, the RTI's parallel port cannot be used for other tasks. The RTI's two serial asynchronous ports and IEEE-488 bus port can be used concurrently. The ADM includes connectors for these ports.

- *Software support.* High-level software support for the ADM and RTI is provided in the Professional Real Time Interface Library (PRTL), a set of subroutines callable from user-written FORTRAN, BASIC-PLUS-2, or PASCAL programs. ADM support routines allow you to:

- acquire analog data and store values in memory or directly on disk

- set data acquisition parameters such as sampling frequency, type of trigger signal, and data format

- acquire or send digital data over the ADM parallel ports

- plot data

- check acquisition status
-
- perform utility operations such as converting voltages to other physical units; checking, setting, and clearing bits in data values; changing the method of representation from integer to floating point or from BCD to integer and the reverse; and others
-

PRTIL also includes an example program designed for interactive analog data acquisition applications. Programming is not required, which means you can request all parameter settings interactively.

The ADM requires the Realtime Interface option (PC3XX-AA). RTI external cables and connectors are not required. The RTI option occupies one expansion slot.

Programming the RTI requires the Professional Host Tool Kit or PRO/Tool Kit. The RTI and ADM can be programmed with tool kit MACRO-11, or with PRTIL, which requires a tool kit and all its prerequisites. PRTIL subroutines can be called from tool kit FORTRAN-77, BASIC-PLUS-2, or PASCAL.

The Analog Data Module (Order Code: ADMPC-AA) includes:

- Analog Data Module
-
- Interface cable to RTI
-
- Power cord
-
- Analog connectors and cable
-
- User's guide
-

• **Professional 325 to 350 Upgrade Kit**

Order Code: PC325-UG

The Professional 325 can easily be upgraded to take advantage of the extra storage and option capabilities of the Professional 350. The upgrade requires a new system board, which is easily installed into the 325 system unit enclosure. The system board that you remove from your 325 can be returned to Digital for credit.

Once upgraded, your Professional will have three option slots instead of one, and will accept a hard disk mass storage system and other “350 only” system options.

The Professional 325 to 350 Upgrade Kit (PC325-UG) includes:

- Main system logic module with option card cage
 - Installation guide
-

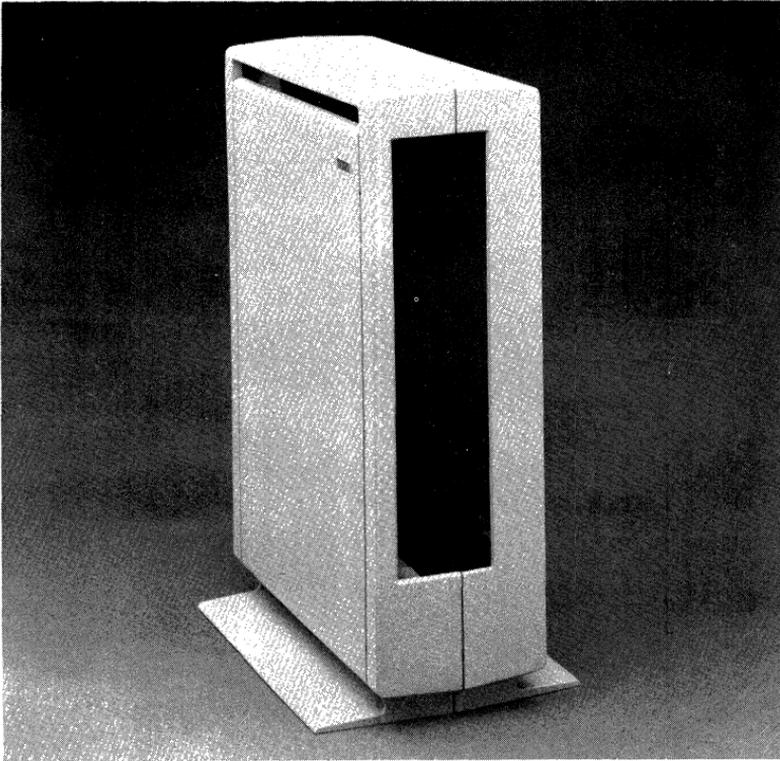
• **Professional 350 to 380 Upgrade Kit**

Order Code: PC350-UG

An upgrade kit is also available for Professional 350 owners who would like to trade up to the Professional 380. Because of the many design differences between the 350 and 380, the upgrade requires swapping the entire system unit. Basically, the procedure involves removing all options from the 350 system unit (controllers, mass storage, etc.) and returning the 350 system unit for a 380 system unit. NOTE: Certain 350 components and options such as the EBO will not work on the Professional 380.

The Professional 350 to 380 Upgrade Kit (PC350-UG) includes:

- Professional 380 System Unit
 - Installation guide
-



• **Floorstand for Professional 300 Series System Unit**

Order Code: PCXXF-AA

The floorstand offers a practical way to arrange your Professional without resorting to expensive custom office furniture. It lets you put the Professional's system unit beside or underneath your desk, so it doesn't occupy valuable space on top of it.

The system unit is held vertically in the stand, positioning the diskette drive within easy reach. A door at the rear of the unit offers ready access to all cables and connections.

The Floorstand (PCXXF-AA) includes:

-
- One-piece floor stand
 - Installation Guide
-



• **Robinson Nugent Designer's Kit for the Professional 300 Series CTI Bus**

Available from: Robinson Nugent
800 East Eighth Street
New Albany, Indiana 47150
(812) 945-0211
Telex: 810-540-4082

The Robinson Nugent Company has developed a complete hardware development package for the Professional Series and its CTI bus. The Designer's Kit offers a complete prototype development system that lets you design, build, and test hardware modules more quickly and reliably than traditional breadboarding methods.

Typical applications for Professional hardware modules include device controllers, communications options, I/O interfaces, process control, artificial intelligence, and graphics boards. Many other specialized applications exist within the Professional's user base, including the scientific, manufacturing, educational, office automation, small business, and OEM markets.

The Designer's Kit features a customized Collage Module prototype board that interfaces directly to the Professional's CTI bus. The Collage Module contains Robinson Nugent sockets and terminals and accepts all standard chips and components, without any need for soldering.

Using the unique Quick/Connect wiring system, prototypes can be assembled in a fraction of the time required by wire wrap techniques. Quick/Connect provides highly reliable, gastight connections which are very easy to modify. In addition, the low-profile wiring plane allows assemblies to be inserted directly into the Professional's card cage, taking up little more room than production boards.

To complete the package, a specially designed CTI Bus Extender Board and support bracket allows you to debug, test, and service modules on a running Professional. If additional Collage Modules and components are required, they can be ordered separately.

The physical and electrical characteristics of the Professional workstation and the CTI bus offer a powerful, integrated system for hardware developers and users. Unlike larger PDP-11s, Professional Series hardware options can easily be installed by even the most non-technical users.

No hardware switches or address jumpers are necessary for CTI bus modules, minimizing the risk of damage or error during installation. Options are slot-position independent, and the system is self-configuring at power-up, eliminating the need for complicated configuration instructions. Finally, power-up diagnostics are done automatically, with fault-isolation to the module level, so that the system can be maintained by non-technical users.

Hardware developers can obtain a license from Digital to design, manufacture and sell option modules for the CTI bus. Licenses must be signed by developers before they can receive Digital's proprietary specifications and other information on a non-disclosure basis. No fees or royalties are charged.

A variety of documentation is available to licensees, including a CTI Bus Technical Manual, Professional 300 Series Technical Manuals, and Design Guidelines for Professional 300 Series Options. Telephone support is also available for licensing procedures and technical questions. For licensing requests and information, call the Digital CTI Bus Support Group at (617) 493-3567.

Chapter 7 • Printers for the Professional



The Professional computer is designed to support a variety of Digital printers as well as Digital's six-pen graphics plotter. You can choose between the compact, economical LA50 Personal Printer; the versatile Letterprinter 210; the precision LQP02 Letter-Quality Printer; the low-cost LQP03 Letter-Quality Printer; and Digital's Six-Pen Plotter. No matter what type of hardcopy you need to produce—reports, memos, correspondence, or multicolored graphics and transparencies—one of these products is up to the task.

On the following pages are detailed descriptions of each of the printers and the plotter. Note that your ability to use the capabilities described depends on the software you run on your Professional.

Printers Overview

LA50 Personal Printer	<hr/> Dot matrix <hr/> 100 characters per second, draft quality <hr/> 50 characters per second, memo quality <hr/> Full bit-mapped graphics <hr/> 40 to 132 columns <hr/> Variable character widths, pitch, and line spacing <hr/> 250 characters including line drawing and multinational characters <hr/> User-installable <hr/>
LA210 Letterprinter	<hr/> Dot matrix <hr/> 240 characters per second, draft quality <hr/> 40 characters per second, letter quality <hr/> 80 characters per second, optional memo quality <hr/>

	IBM PC compatibility
	Full bit-mapped graphics
	Multiple fonts and customized character sets available
	Multinational and line drawing characters standard
	Low profile styling
	15-inch platen
	User-installable
LQP02 Letter-Quality Printer	Daisywheel
	32 characters per second, letter quality
	10 or 12 character pitch, variable line spacing
	Wide platen
	Print wheels available in various fonts and character sets
	Optional tractor or two-tray sheet feeder
	User-installable
LQP03 Letter-Quality Printer	Daisywheel
	25 or 34 characters per second, letter quality
	10, 12, or 15 pitch, variable line spacing
	Expanded 130-petal daisywheel
	Push button paper feed
	Optional sheet feeder or tractor
	User-installable

**LVP16 Six-Pen
Graphics Plotter**

Plotter, 6 pen

Plots on paper or transparencies

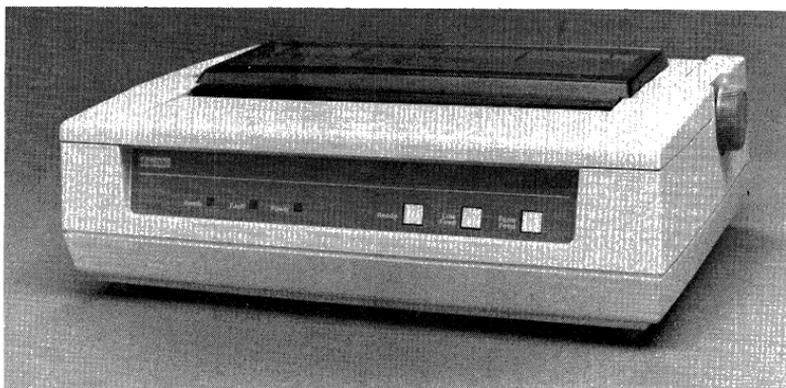
Choice of 10 colors available (7 for
transparencies)

2 nib sizes

Accuracy to 0.001 inch

15 inches per second

User-installable



LA50 Personal Printer

Order Code: LA50-RA (120 volt)

LA50-RB (220 volt)

LA50-RC (240 volt)

LA50-RD (100 volt)

The LA50 Personal Printer is a compact dot-matrix printer that adds versatile and inexpensive printing to your Professional Series system.

Because the LA50 has its own microprocessor logic, it can change gears with you as you shift from one job to the next. You can use the 100-characters-per-second bidirectional print setting to make a quick, draft-quality copy of an outline you need for a meeting. Next, slip in your own letterhead stationery and switch to the 50-character-per-second memo quality setting to print a letter to an associate. The memo mode's enhanced printing creates crisper, darker, more fully formed characters.

The LA50 underlines, bolds, and prints double-width characters for headings and emphasis. True descenders (the "tails" on letters like g, j, p, and q) make text easily readable. To print a spreadsheet with twelve full months and a totals column on standard 8½-by-11-inch paper, you can switch to the LA50's compressed print for a full 132-character line. The LA50 also prints quality bit-mapped graphics. You can plot graphs and draw pictures with shading and curved lines. All of these characteristics can be changed quickly and easily under program control.

Design flexibility is a plus, too. You can choose the number of characters per inch or the number of lines per inch for each document. Print ten characters per inch, 80 characters per line for pica, then 12 characters per inch, 96 characters per line for elite. For printing 132 columns on an 8½-inch-wide page, the LA50 prints 16.5 compressed characters per inch. Tabs are spaced eight columns apart, and you can adjust the forms length setting. A multinational character set stored in read-only memory is standard with the LA50, so you don't have to load special character sets or change print mechanisms to change languages.

The LA50 printer accommodates office stationery, labels, fanfold computer paper, and multipart forms up to a maximum thickness of 0.02 inch. Automatic form feed and line feed make aligning the paper easy. The LA50 is ready to take on the jobs you need done, the way you need them done.

The LA50 Personal Printer comes with a standard RS232/RS423 serial interface for direct connection to your Professional. It's also small and designed to be placed within easy reach of your computer.

You can install the LA50 yourself—all of the connections are easy and straightforward. Maintenance is just as easy. Without using tools you can replace your own snap-in cartridge ribbons and change the printhead.

Whenever the power is turned on, the printer performs a number of diagnostic operational checks. Any failure is signaled by control panel indicator lights. You can initiate a printing self-test (swirl pattern) using a button on the front panel.

The LA50 offers reliability and good performance at a reasonable price. For many users, it is an excellent choice to round out their Professional system.

LA50 Options	Order Codes
Starter Kit:	PCX50-SU
LA50 ribbons (box of five)	
5¼-in diskettes (box of ten)	
LA50 dust cover	
Screen cleaning kit	
Word processing paper	
Printer stand (brown base)	PCXXF-CJ
Printer stand (gray base)	PCXXF-DH
Desk stand	PCXXF-CF
Dust cover	H9850-HN
Ribbon cartridges (box of 6)	LA50R-06
Acoustic cover	LA50X-FD
Paper catcher	LA50X-FF

LA50 Personal Printer

Professional Features at Low Cost

Digital's LA50 Personal Printer works beautifully. And this versatile dot-matrix printer fits right on your desk.

VARIABLE PRINT STYLES

Memo Quality - 50 cps for correspondence

The standard 10 cpi for Pica

Printing at 12 cpi in Elite

Compressed print for printing 132 columns on 8 1/2 x 11" paper

Double Width (5 cpi) for headings

Bold printing for emphasis

Draft Quality - 100 cps bidirectional

The standard 10 cpi for Pica

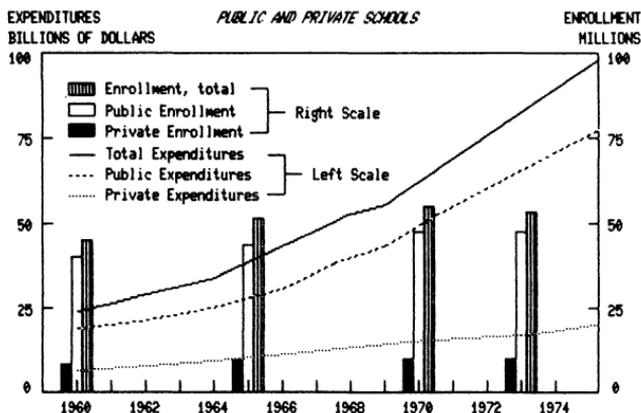
Printing at 12 cpi in Elite

Compressed print (16 cpi) for printing 132 columns on 8 1/2 x 11" paper

Double Width (6 cpi) for headings

Bold printing for emphasis

Bit Map Dot-Addressable Graphics



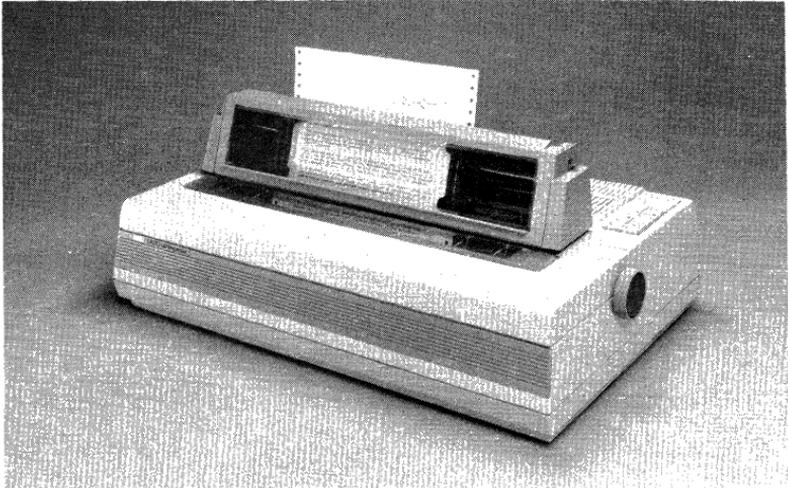
LA50 Personal Printer Specifications	
Height	14.2 cm (5.6 in)
Width	40 cm (16 in)
Depth	29.5 cm (11.8 in)
Weight	8.5 kg (18.7 lb)
Printing area	22.5 cm (9 in) wide
Printing speeds	100 characters per second (draft quality)
	50 characters per second (memo quality)
Print density	7 x 9 dots per inch (draft quality)
	13 x 9 dots per inch (memo quality)
	144 x 72 or 180 x 72 dots per inch (graphics mode)
Print format	10 (pica), 12 (elite), or 16.5 characters per inch; 5, 6, 8, 25 for double-width characters (horizontal pitch)
	2, 3, 4, 6, 8, or 12 lines per inch (vertical pitch)
	40, 48, 66, 80, 96, or 132 print columns
Character sets	250 printable characters, including 94 ASCII, 81 international characters, 63 Japanese Katakana, and 27 line drawing characters
Buffer capacity	2,047 characters
Baud rates	110 to 4,800 bits per second
Interface	EIA, serial RS232/RS423
Parity	Odd, even, mark, or space with 7 data bits per character, selectable
	Odd, even, or none with 8 data bits per character, selectable

Paper	Cut-sheet office stationery and fan-fold 10 in (25.4 cm) maximum width 0.020 in maximum thickness
Power consumption	180 W (maximum printing)
Voltage	120 V nominal (90 to 128 Vac)
Frequency range	47 to 63 Hz
Phase	Single
Diagnostics	Power-up electronics self-test User-initiated printing self-test
Power cord length	2 m (6.3 ft)
Universal power supply	Not available

The LA50 Personal Printer (LA50-RA) includes:

- LA50 Personal Printer
- Power cord
- Ribbon
- Pinfeed paper
- *Installing and Using the LA50 Printer*
- *LA50 Printer Programmer Reference Manual*

Note: Connecting the LA50 to the Professional requires a BCC05 cable that must be purchased separately. The BCC05 is available in 10-, 25-, 50- and 100-foot lengths.



LA210 Letterprinter

Order Code: LA210-AA (U.S. version)

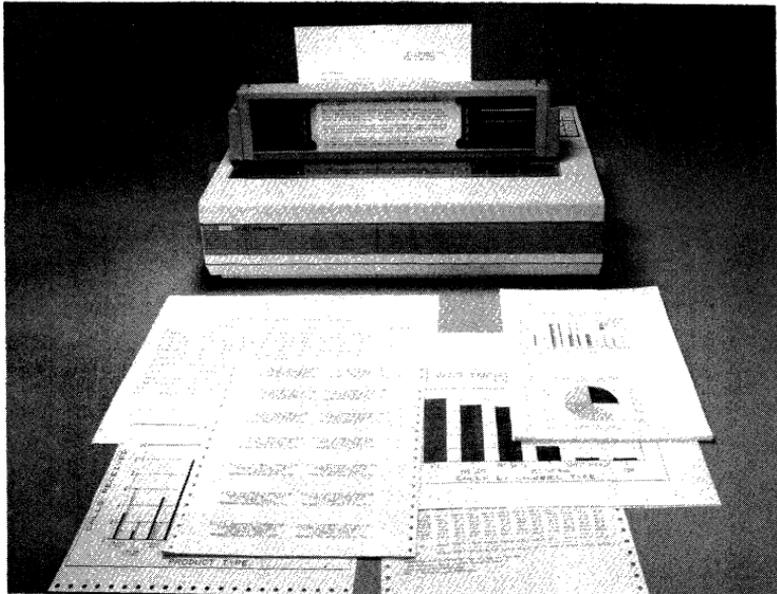
The LA210 Letterprinter is Digital's top-of-the-line dot-matrix impact printer for the Professional. It's about the size of a typewriter, but the microprocessor-controlled LA210 packs enormous versatility into that modest amount of space. You get a draft printer, near letter-quality printer, and graphics printer all in one unit. You also get added value and flexibility since the LA210 supports the IBM PC as well as your Professional.

The LA210 printer can produce text in three different print qualities: draft quality, near letter quality, and optional memo (intermediate) quality. The LA210 produces fast, clean draft-quality copy at 240 characters per second using a 7-by-9 dot-matrix

bidirectional technique. It overlaps two sets of dots (33-by-18 dot matrix) to produce crisp, near letter-quality text at 40 characters per second. For optional memo quality, it prints an intermediate dot pattern (33-by-9 dot matrix) at 80 characters per second.

The LA210 handles graphics beautifully. Its bit-map dot-addressable graphics capability will faithfully reproduce charts, designs, and pictures you've created on the Professional's video monitor. You can even combine text with graphics on the same page to add clarity and impact.

With the LA210 Letterprinter, you can design documents that effectively communicate your ideas. You can tell it how many characters per inch and lines per inch you need. You can change the margins, tabs, and form length just as easily as you switch speeds.



The LA210 will store all of these format characteristics, making the set-up for a series of documents a one-time job. The LA210 also prints double-width characters for greater effect in labels, headlines, and presentation materials.

For maximum print versatility, the LA210 can accommodate various character sets and font styles. You can have up to five character set ROMs (read-only memory) installed at one time. The Letterprinter's resident capability includes the Courier-10 font, Digital multinational character set, and the special (VT100) line drawing character set, utilizing three ROMs. The Letterprinter 210 comes standard with a multifont adapter so you can add one or two optional ROM font cartridges externally for even greater flexibility. Your choice of optional fonts includes Courier 12, Courier Italic, Gothic 10, Gothic 12, and Orator 10 in 10 languages and three densities. Additional character sets include symbols, APL, scientific, and technical, or even customized fonts for your company logo or other special purposes.

When the typeface variety offered by the font options is combined with expanded or compressed character widths and graphics printing, you can easily create many different styles. And any combination of styles can be contained within a report, page, line, or even a single word.

The LA210 Letterprinter also provides IBM PC compatibility. The external parallel interface option allows you to connect the LA210 to an IBM PC. Special font cartridges let the LA210 emulate the EPSON MX80 printer, the EPSON MX80 Grafrax printer, and the IBM Graphics Printer.

The LA210 Letterprinter accommodates office stationery, fanfold computer paper, and multipart forms. Its big, 15-inch carriage is wide enough for spreadsheet work or accounting applications. You can insert single sheets as easily as you would feed a typewriter. An adjustable width tractor feed is standard.

A standard EIA interface allows local connection to your Professional. The LA210 can be connected remotely through modems, and baud rates are switch-selectable.

The LA210 Letterprinter is fully modular and contains only four subassemblies. Installation of the printer is very straightforward. When power is turned on, the power-up diagnostic test of the printer's microprocessor checks random access memory (RAM), read-only memory (ROM), and the nonvolatile memory for operation, signaled by control panel indicator lights. The self-test modes permit rapid operational tests. Bell tone indicators let you know when a buffer overflow or head jam occurs. You can replace the ribbon cartridge in seconds. The snap-in printhead is also user-replaceable.

The LA210 Letterprinter provides a powerful combination of speed, print quality, flexibility, and reliability. It is an excellent choice for uncompromising users whose first priority is performance.

The LA210 is available in configurations for dozens of countries worldwide. Contact your Digital Sales Representative for the appropriate order code for a given nation and language.

LA210 Options	Order Codes
Printer stand (brown base)	PCXXF-CK
Printer stand (gray base)	PCXXF-DF
Ribbon cartridges (6 per box)	LA10R-06
External parallel interface	LA10X-EP
Single tray sheet feeder	LA21X-SF
Bidirectional tractor (full page reverse)	LA21X-BT

Plug-in ROM Font Cartridges

(Below is a selection from more than 35 available font cartridges.)

Courier 12 (English)	LA10X-AB
Gothic 10 (English)	LA10X-AF
Gothic 12 (English)	LA10X-AC
Orator 10 (English)	LA10X-AD
Symbol 10 (English)	LA10X-AE
Courier 10 (Italics)	LA10X-AP
Courier 10 (memo-quality English)	LA10X-AH
Orator 10 (memo-quality English)	LA10X-AJ
IBM Line Drawing ROM Cartridge	LA10X-LA
IBM Foreign Style ROM Cartridge	LA10X-LD

Letterprinter 210 Specifications

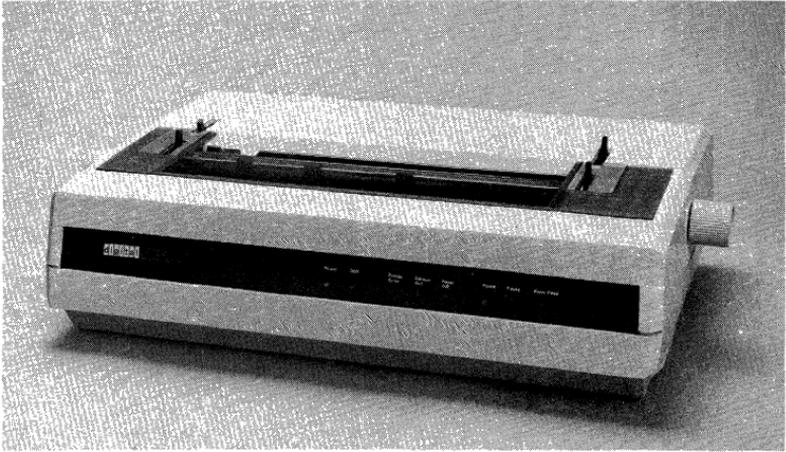
Height	12.7 cm (5 in)
Width	54.6 cm (21.5 in)
Depth	34.3 cm (13.5 in)
Weight	12.3 kg (27 lbs)
Printing speeds	240 characters per second (draft quality) 40 characters per second (near letter quality) 80 characters per second (optional memo quality)
Print density	7 x 9 dots per in (draft quality) 33 x 18 dots per in (near letter quality) 33 x 9 dots per in (optional memo quality) 72 vertical by 74-330 horizontal dots per in
Aspect ratio	Variable — 1.02, 1.12, 1.30, 1.53, 1.83, 2.29, 3.04, or 4.58
Print format	5, 6, 6.6, 8.25, 10, 12, 13.2, or 16.5 characters per in (draft mode) 5, 6, 10, 12 characters per in (near letter quality mode) 66 to 217 print columns 2, 3, 4, 6, 8, or 12 lines per in Prints descenders and underlines in all modes
Character sets	Courier 10, multinational character set, and line drawing character set standard Other fonts and character sets optional

Printhead	9-wire, user-replaceable
Buffer capacity	2K characters
Baud rate	50 to 9600 bits per second Split speeds are available
Interface	EIA, serial RS232 External parallel interface optional
Parity	Odd, even, mark, or space 7 or 8 bits per character, selectable
Paper	Office stationery and fanfold 37.8 cm (14.9 in) maximum width 7.6 cm (3 in) minimum width 0.05 cm (.020 in) maximum thickness
Power consumption	120 W (maximum printing)
Voltage	120 V nominal (87-128 Vac range) or 240 V nominal (191-256 Vac range), switch-selectable
Frequency range	47 to 63 Hz
Diagnostics	Automatic power-up self-test Self-test mode (for additional printer and communications functions)
Power cord length	2.4 m (8 ft)
Universal power supply	Standard, switch-selectable (factory set at 120V or 240V depending on country of sale)

The Letterprinter 210 includes:

- LA210 printer
- Power cord
- Ribbon
- Installation Guide
- User Guide
- Programmer's Reference Manual
- Operator and Programmer Reference Card
- Emulation Modes Reference Guide

Note: Connecting the LA210 to the Professional requires a BCC05 cable that must be purchased separately. The BCC05 is available in 10-, 25-, 50-, and 100-foot lengths.



LQP02 Letter-Quality Printer

Order Code: LQP02-AA (120 V)

LQP02-AD (240 V)

The LQP02 Letter-Quality Printer is a versatile desktop daisywheel printer. It is ideal for word processing applications or for any job you do on your Professional 300 Series computer that demands premium-quality copy.

The LQP02 gives you the print quality you expect from the best office typewriters. It prints fully formed characters to produce letter-quality type. Uppercase and lowercase letters, underlining, bolding, symbols, and adjustable settings for margins, tabs, and length are all standard. You can also select the spacing between lines (vertical pitch) and the amount of space that each character occupies (horizontal pitch).

The LQP02 produces bold characters with a technique called "shadow bolding." Each character is struck twice, as in normal bolding. But unlike normal bolding, the second strike is slightly offset from the first. This makes bold print much more visible, creating added impact even on photocopies.

The LQP02 prints at a rate of 32 characters per second and uses a bidirectional printing technique that skips over white space to save time.

The LQP02's wide platen accommodates office stationery, multi-part forms, and labels up to a maximum print width of 13.5 inches. The sheet feeder option handles letterhead stationery and envelopes automatically. The bidirectional forms tractor permits the use of fanfold paper and forms. Both feeder options will trigger the LQP02's visual and audible paper-out indicator.

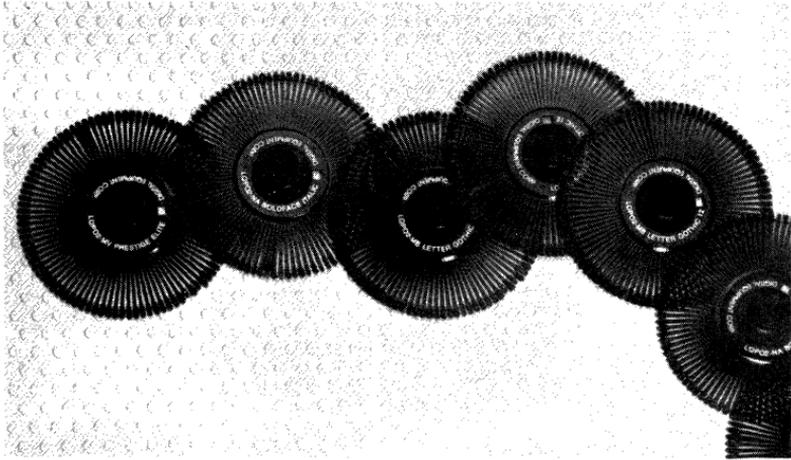
You can change printwheels as easily as you change paper. Daisywheels are inexpensive, easily interchangeable, and available in dozens of type styles and special purpose fonts.

An EIA interface allows local connection of the LQP02 printer to your computer. The Professional can communicate remotely with the LQP02 through modems; baud rates are switch-selectable.

You can install the LQP02 yourself and easily perform maintenance such as replacing the ribbon cartridge and printwheel. The printer is modular in design, which makes service, if necessary, easy to perform. Whenever the power is turned on, the printer performs a number of operational checks. The LQP02 has self-test for line feed and all characters on the printwheel.

All of this adds up to design flexibility and superior document quality in a printer that enhances your Professional Series system. A full set of options is available, so you can tailor the LQP02 Letter Quality Printer to suit your needs.

LQP02 Options	Order Codes
Starter Kit:	PCX02-SU
Multistrike film ribbon cartridges (box of 6)	
Box of 6 assorted printwheels:	
WP Courier 10	
WP Pica 10	
WP Prestige Elite 12	
WP Orator 90/10	
WP Letter Gothic 12	
WP Dual Courier 10	
Word processing paper (540 sheets)	
5¼-inch diskettes (box of 10)	
Screen cleaning kit	
LQP02 dust cover	
Printer stand (30 in W x 24 in D x 26 in H)	PCXXF-CL
Dust cover	H9850-HM
Acoustic cover	LQPX2-FB
Nylon ribbons (box of 6)	LQP02-KB
Multi-strike film ribbons (box of 6)	LQP02-KA
Dual-tray cut sheet feeder	LQPC2-SF
Bidirectional forms tractor	LQPX2-AA
Mobile paper catcher	H9850-MS
Printwheel case	LQPX2-PC



LQP02 Printwheels

LQP02 Printwheels

LQP02-MB	UKN Letter Gothic 12	ABCDE abcde 12345
LQP02-MD	WP Courier 10	ABC abc123--=° []
LQP02-ME	WP Pica 10	ABC abc123--=° []
LQP02-MF	WP Prestige Elite 12	ABC abc123--=° []
LQP02-MH	Bilingual Courier 10	ABC abc123--=° []
LQP02-MJ	Bilingual Prestige Elite	ABC abc123--=° []
LQP02-MK	WP Orator 90% 10	ABC ABC 123--=° []
LQP02-ML	ANSI OCR-B.10	ABC abc123--=° []
LQP02-MN	England Pica 10	ABC abc123--=° []
LQP02-MP	England Courier 10	ABCDE abcde 12345
LQP02-MR	England Prestige Elite 12	ABC abc123--=° []

LQP02-MS	WP Letter Gothic 12	ABC abc 123 - = ° []
LQP02-MT	WP Gothic 15	ABCDEFGHI abcdefghi 12
LQP02-MV	ASC 1196 Prestige Elite 12	ABC abc 123 - = ` []
LQP02-MW	WPS Boldface PS	ABCD abcd 1234 -
LQP02-MX	WPS Title PS	ABCD abcd 1234 -
LQP02-MY	WPS Thesis PS	ABCD abcd 1234 -
LQP02-MZ	Nederland Prestige Elite 12	ABC abc 123 - = ` []
LQP02-NA	WPS Boldface Italic PS	ABCD abcd 1234 -
LQP02-NB	Nederland Pica 10	ABC abc 123 - = ` []
LQP02-NC	Dual Courier 10	ABCabc 123 - = ` []
LQP02-ND	European Courier 10	ABCabc 123 - = ` β ;
LQP02-NE	Greek/Math	∇ ∞ ψ ∥ α β ψ 1 2 3 ∞ π ο {

LQP02 Specifications

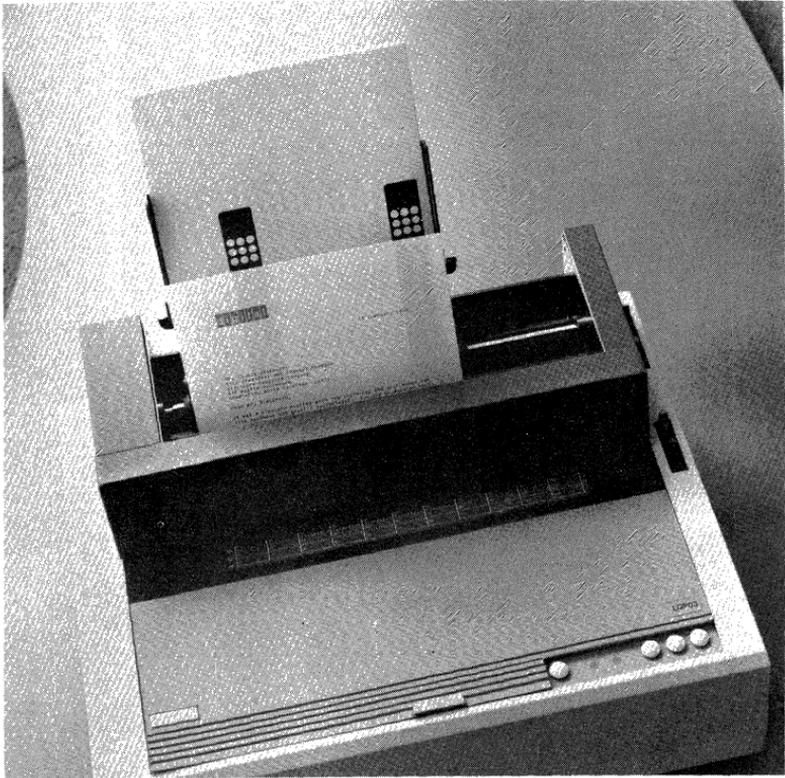
Height	17.8 cm (7 in)
Width	63.5 cm (25 in)
Depth	40.6 cm (16 in)
Weight	21.8 kg (48 lbs)
Printing speed	32 characters per second (letter quality)
Print format	10 or 12 characters per in, software-selectable
	2, 3, 4, 6, or 8 lines per in, software-selectable
	132 print columns at 10 characters per in
	158 print columns at 12 characters per in
Character sets	Shannon Text standard
	International, scientific, APL, and barcode character sets available with optional printwheels

Buffer capacity	256 characters
Baud rates	75 to 9600 bits per second Split speeds are also available
Interface	EIA, serial RS232
Parity	Odd, even, mark, or space 7 bits per character, selectable
Paper	Office stationery 39.1 cm (15 in) maximum width 0.06 cm (0.025 in) maximum thickness
Power consumption	120 W (average)
Voltage	120 or 240 Vac nominal, switch-selectable
Frequency	60 Hz (range 47 to 63 Hz)
Diagnostics	Power-up self-test
Power cord length	2 m (6.3 ft)
Universal power supply	Standard, switch-selectable

The LQP02 Letter Quality Printer (LQP02-AA) includes:

- LQP02 Letter Quality Printer (with power cord)
- 1 printwheel (Dual Courier)
- 1 ribbon cartridge
- *Installing and Using the LQP02*

Note: Connecting the LQP02 to the Professional requires a BCC05 cable which must be purchased separately. The BCC05 is available in 10-, 25-, 50-, and 100-foot lengths.



LQP03 Letter-Quality Printer

Order Code: LQP03-A (120 V)

LQP03-B (240 V)

If you need low-cost, letter-quality printing for your Professional computer, you need Digital's new LQP03. The LQP03 combines outstanding print quality, moderate speed, a newly expanded 130-

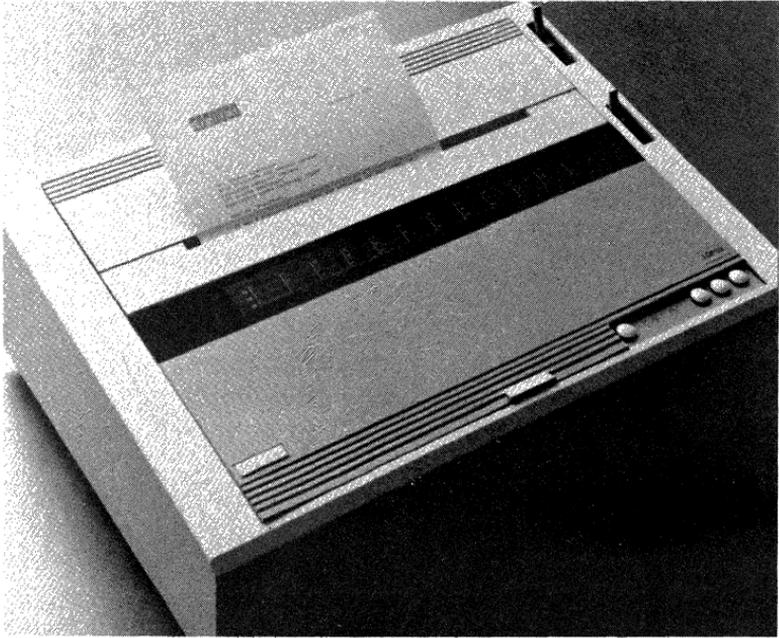
character print wheel, and a full array of options that let you tailor your printer to your own requirements. And it delivers these benefits for about half the cost of its predecessors.

The LQP03 produces optimum quality print. Each character is sharp and fully formed, like those of the best electric typewriters. And the LQP03 has the eye-catching print capabilities you've come to expect, including shadow bolding, underscoring, superscripts and subscripts, and proportional spacing. You can select from many popular printwheels (Prestige Elite 12 comes with the machine), many of which are available in 10, 12, and 15 pitch and proportional spacing.

The LQP03 also gives you the flexibility to print the specific characters you need without the inconvenience of changing print wheels. Its new 130-petal printwheel provides Digital's multinational characters and scientific, mathematic, or special characters—like registered trademarks, fractions, and paragraph symbols—on one wheel. With program-controlled overstriking, you can even create composite characters that allow the daisywheel to print over 200 different characters.

Another advantage of the new printwheel design is that each petal has only one character, so the carriage doesn't shift up and down for upper and lower case characters. This reduces wear and misalignment of characters, and minimizes service requirements.

The LQP03 produces top-quality copy at 25 characters per second in 10-pitch Shannon text or 34 characters per second in 12-pitch triple-A text. This level of performance is accompanied by relatively quiet operation, less than 58 decibels, considerably less than many daisy wheel printers. Add the optional acoustic cover, which includes a built-in cooling fan, and noise is reduced to about 44 decibels.



Operating the LQP03 is simple, with ease-of-use features unavailable on other daisywheel printers. You load or adjust paper by pressing the soft-touch pushbutton controls on the top front of the printer; rolling platen knobs and lining up paper are things of the past. In addition, you'll appreciate no-mess cartridge ribbons that snap in and out for quick, clean ribbon changes.

The LQP03 handles paper and forms with ease and flexibility. Standard 8½-by-11-inch paper can be used vertically or horizontally. Two paper feed options tailor your LQP03 to the output you require. The bidirectional forms tractor handles fanfold paper, including continuous, preprinted, and multipart forms (an original and three copies). It allows backward and forward paper

scrolling during printing. The adjustable single-tray cutsheet feeder option is designed to feed precut paper automatically. Paper can range from 8 to 12 inches in width (20.3 to 30.5 centimeters) and from 8 to 14 inches in length (20.3 to 35.6 centimeters). You can install either of these optional feeders yourself, and both can be used simultaneously with the acoustic cover.

The LQP03 connects to the Professional's standard serial interface port. It is also plug compatible with Digital's VAX and PDP-11 minicomputers, offering added efficiency and flexibility. An optional selector switch allows you to share a single LQP03 between one or more Professionals or other Digital computers, while another switch lets you connect two printers to your Professional for high document output.

The LQP03 is available in configurations for dozens of countries worldwide. Contact your Digital Sales Representative for the appropriate order code for a given nation and language.

LQP03 Options	Order Codes
Acoustic Cover	LQPX3-AC
Bidirectional forms tractor	LQPX3-FT
Single-tray Cutsheet Feeder	LQPX3-SF
Printer Stand (brown base)	PCXXF-CK
Printer Stand (gray base)	PCXXF-DF
Dust Cover	LQP03-DC
Multistrike film ribbons (box of six)	LQP03-KA
Mobile paper catcher	H9850-MS
Printwheel case	LQPX2-PD
Serial switch (for connecting two printers to one Professional)	LQPX2-SW
Serial Switch (for sharing a printer between two Professionals)	PCXXF-CZ

LQP03 Printwheels

Prestige Elite 12 (DEC multinational)	LQP03-MA
Courier 10 (DEC multinational)	LQP03-MB
Pica 10	LQP03-MC
Letter Gothic 12	LQP03-MD
Bold Face PS	LQP03-ME
Orator 90%	LQP03-MF
Gothic 15	LQP03-MH
Dual Font (boldface/boldface italic)	LQP03-MJ
Applied Math	LQP03-MK

LQP03 Specifications

Height	19.7 cm (7.75 in)
Width	52.7 cm (20.75 in)
Depth	38.7 cm (15.25 in)
Weight	12.7 Kg (28 lb)
Printing Speed	25 characters per second (Shannon text at 10 characters per inch) 34 character per second (triple-A text at 12 character per inch)
Print format	Printwheels available in 10, 12, and 15 pitch Variable lines per inch Variable, software-selectable vertical and horizontal pitch 110 columns at 10 pitch 132 columns at 12 pitch 165 columns at 15 pitch

Paper	U.S.: 21.6 by 27.9 cm (8.5 by 11 in); A4: 21.1 by 29.7 cm (8.3 by 11.7 in); Both either vertical or horizontal
Paper Feed	Friction feed (standard) Adjustable single tray cutsheet feeder (optional) Bidirectional forms tractor (optional)
Character Sets	ASCII, English/U.K., French, French Canadian, German, Spanish, Italian, Swedish, Finnish, Danish, Norwegian, JIS Roman, Multinational
Margins	Left, right, top, bottom
Tabs	256 contiguous horizontal, 168 contiguous vertical
Character Code	7-bit and 8-bit ASCII, switch-selectable
Resolution	Vertical, 48 increments per in Horizontal, 120 increments per in
Buffer	256 characters capacity, xon/xoff control
Baud Rates	110, 150, 300, 600, 1200, 2400, 4800, 9600
Interface	Serial, EIA RS232C, standard
Parity	Odd, even, none, mark, or space, switch-selectable
Transmission Rates	Full-duplex, from 110 to 9600 baud (bits per second)
Power Consumption	Less than 100 W, average RMS
Voltage	90-132 V (57 to 63 Hz) 180-264 V (47 to 53 Hz)

The LQP03 includes:

-
- LQP03 Letter-Quality Printer

 - power cord

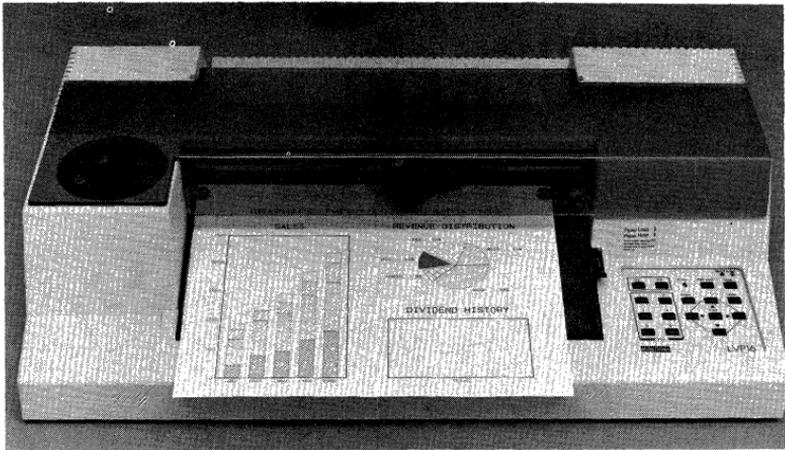
 - ribbon

 - 1 printwheel (Courier 10)

 - *Installing and Using the LQP03*

 - *Programmers Reference Manual*

Note: Connecting the LQP03 to the Professional requires a BCC05 cable that must be purchased separately. The BCC05 is available in 10-, 25-, 50-, and 100-foot lengths.



LVP16 Six-Pen Graphics Plotter

Order Code: LVP16-AA

Graphics help communicate your ideas more effectively. The Professional is ideal for generating a broad range of graphics, and the LVP16 Six-Pen Graphics Plotter is ideal for getting those

graphics down on paper or transparencies. Together, the LVP16 and the Professional can greatly enhance your written and oral presentations.

The LVP16 is an inexpensive, high-performance six-color graphics pen plotter. It features high-speed graph production—15 inches per second—and outstanding quality—accuracy to 0.001 inch. You get consistent, high-quality lines because the LVP16 includes built-in automatic pen capping and pen damping. The pens are housed in an easy-to-load six-pen carousel, from which pens are selected, returned to place and capped after use. For graphs in which less than six colors are used, the LVP16 lets you include the same color pens of different widths in the same graph (thick pens for headlines, thin pens for detail).

The LVP16 weighs only 16 pounds and has a compact design for desktop use. It prints on transparencies or paper, and allows selection from 10 different colors (seven for transparencies). In addition, the LVP16 features an “eavesdrop” capability that lets you hook the Professional to a printer and to the LVP16 plotter simultaneously. This eliminates grappling with cables to switch from printing text to plotting graphics.

Using the LVP16 is simple. A guide control makes loading paper or transparency material easy, while a light indicates the paper size for which the plotter is set. From the front panel you can push a special “view” button; the graph comes to the front of the plotter so you can see what you have plotted. Press the button a second time and the plotting continues exactly where it was interrupted.

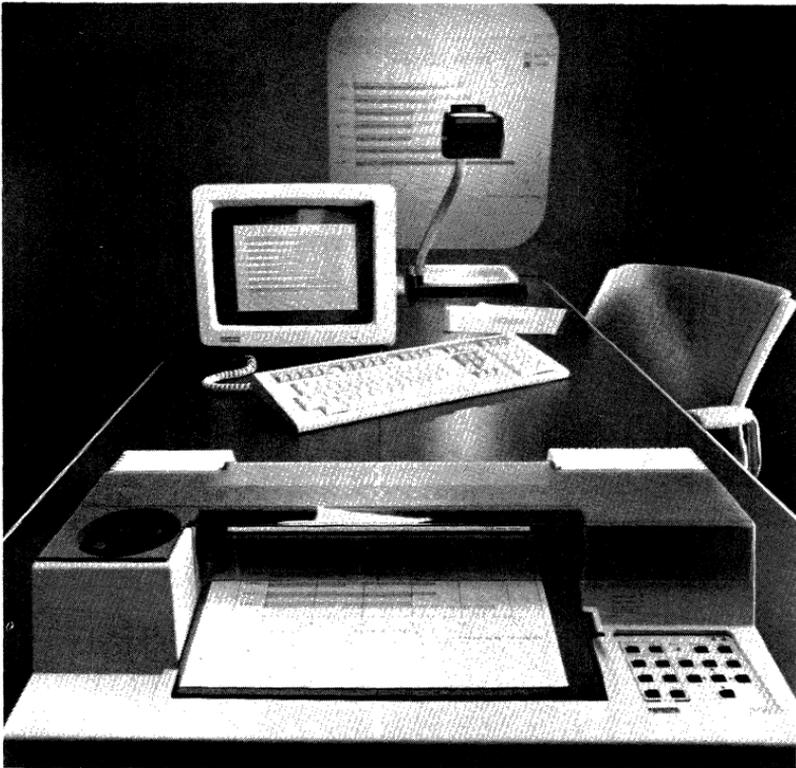
The LVP16 accepts graphic output from three of the Professional’s outstanding graphics packages, ATHENA/Graph, PRO/Graph, and RS/1. These off-the-shelf application packages produce business and scientific graphics of the highest quality, adding impact and clarity to the information you are presenting.

In addition, it is easy to add support of the LVP16 Graphics Plotter to the applications you develop on the Professional. Such support is accomplished via the subroutines in the CORE Graphics Library (CGL) without any protocol beyond that required for an ordinary video display.

You access the applications development support for the LVP16 through the PRO/Tool Kit or the Professional Host Tool Kit. The CGL subroutines are accessible from any of the Tool Kit's programming languages, including FORTRAN, PASCAL, Whitesmith's 'C,' BASIC-PLUS-2, COBOL, DIBOL, and MACRO. A single stream of CGL code can be used to generate graphics on both the plotter and the video display.

The LVP16 is completely customer installable and is designed for high reliability. If maintenance is required, the LVP16 can be diagnosed and repaired quickly, generally in less than one hour.

The LVP16 lets you transfer the Professional's outstanding color graphics from the screen to hard copy, enhancing your ability to present ideas and facts effectively. As you would expect from a Digital product, the LVP16 plotter offers an impressive combination of reasonable cost and outstanding performance.



LVP16 Options

Four pens, 0.3 mm,
Blk/Red/Grn/Blu

LVPXX-AL

Four pens, 0.7 mm,
Blk/Red/Grn/Blu

LVPXX-AM

Six pens, 0.3 mm,
Org/Lime/Vlt/Turq/Brn/Gld

LVPXX-AN

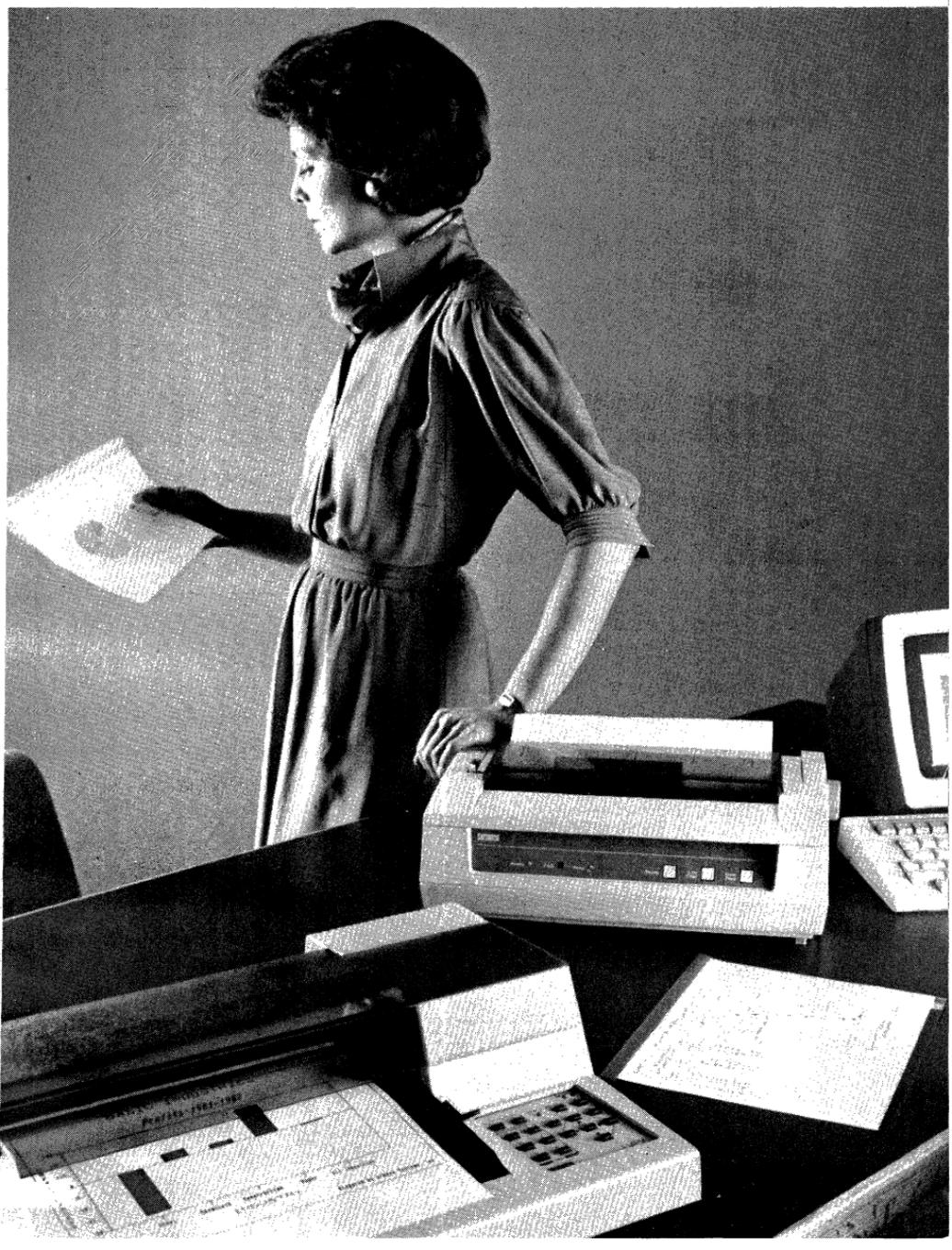
Six pens, 0.7 mm,
Org/Lime/Vlt/Turq/Brn/Gld

LVPXX-AP

Four transparencies pens, 0.3 mm, Blk/Red/Grn/Blu	LVPXX-AR
Four transparencies pens, 0.6 mm, Blk/Red/Grn/Blu	LVPXX-AS
Four transparencies pens, 0.3 mm, Blk/Org/Vlt/Brn	LVPXX-AT
Four transparencies pens, 0.6 mm, Blk/Org/Vlt/Brn	LVPXX-AU
Four black pens, 0.7 mm	LVPXX-AV
11-by-17-in paper - 50 sheets	LVPXX-AC
- 300 sheets	LVPXX-AD
A3 Paper - 50 sheets	LVPXX-AA
- 300 sheets	LVPXX-AB
A4 Paper - 50 sheets	LVPXX-AE
- 300 sheets	LVPXX-AF
A3 Transparencies - 50 sheets	LVPXX-AH
A4 Transparencies - 50 sheets	LVPXX-AJ
Carousel, six pen	LVPXX-AK

LVP16 Specifications

Height	127 mm (5 in)
Width	568 mm (22.4 in)
Depth	367 mm (14.5 in)
Weight	7 kg (16 lb)
Speed	15 in per second (maximum)
Noise level	55 dB average (front bystander position)
Media support	Four sizes: 11 in by 17 in, 8½ in by 11 in European A3 (297 mm by 420 mm) and A4 (210 mm by 297 mm)



Character sets	ANSI ASCII and 17 international character sets
Voltage	120 V
Frequency range	48 to 66 Hz
Power consumption	35 W (maximum)

The LVP16 Six-Pen Plotter includes:

- LVP16 Plotter (configured for 120 volts)
- NEMA 5-15P power cord
- One package (50 sheets) 8½-by-11-in graph paper
- One package (50 sheets) 11-by-17-in graph paper
- One six-pen carousel
- Pen selection: ten narrow width (0.3 mm) fiber tip pens of assorted colors; five wide width fiber tip pens (0.7 mm), black.
- *Owner's Manual*
- *Programmer's Reference Manual*
- *Reference Card*

Note: Connecting the LVP16 to the Professional requires one of two cables: for direct connection to the Professional's printer port, order the BCC20-10 printer cable; for "eavesdrop" connection on a plotter and printer simultaneously, order the BCC24-05 cable.

Chapter 8 • Operating Systems for the Professional



Because of its minicomputer lineage, the Professional computer has a mature family of proven and powerful operating systems. And since no operating system is mandatory when you purchase your Professional, you can choose from the Professional implementations of RSX-11M-PLUS, RT-11, CTS-300, UNIX, MUMPS, and other systems. This selection lets you tailor the power and speed of the Professional computer to your specific requirements, building on the special strengths of your choice to create the ideal configuration for your needs.

Depending on the operating system selected, the Professional can meet the needs of many types of users, from veteran programmers who live and breathe traditional Digital minicomputer operating systems, to those looking for state-of-the-art operating system compatibilities, to the beginner whose foremost concerns are user friendliness and future expandability.

The operating systems available provide a series of important advantages for companies and individuals using the Professional.

First, each of the Professional's principal systems has been customized to take advantage of the special strengths of the machine. These are not just subsets of RSX-11M-PLUS, UNIX, etc. They are enhanced implementations that build on the Professional's graphics, communications, and processing power.

Second, there is the obvious applications flexibility made possible by this range of available operating systems. The Professional runs hundreds of off-the-shelf software packages, from specialized vertical market applications to an outstanding selection of general purpose programs, to meet the needs of users at any level.

Third, the Professional's selection of operating systems means a developer can use one machine to create applications in any of several different environments.

Fourth, since most of the Professional's operating systems are derived from popular minicomputer systems, organizations can capitalize on existing investments in software and in programming personnel. Operating system compatibility means that many of the thousands of applications developed for Digital's PDP-11s and VAXes over the course of the last decade can now be moved to the Professional for stand-alone and distributed processing. This operating system and software compatibility also protects an organization's investment in programming expertise. Developers who know their way around the traditional operating-system workhorses of the minicomputer world will find the Professional a familiar and powerful partner.

Finally, the availability of minicomputer operating systems lies at the heart of the Professional's unique position in Digital's desktop-to-mainframe networking strategy. With packages like PRO/DECnet and PRO/Office Workstation, the Professional's networking capabilities open new possibilities in distributed processing, office automation, and communications.

The table that follows provides general comparisons of the Professional computer's eleven available operating systems. Detailed descriptions of each system are found in the rest of this chapter.

• P/OS

Order Codes: QBA13-H3 (diskette-based)

QBA02-H3 (hard disk)

The Digital approach to computing is based on providing successive generations of compatible systems, allowing superior integration and networking among Digital computers today and a protected investment as new machines are introduced. The Professional Operating System, P/OS, gives the Professional computer a

Professional 300 Series Operating Systems

This table provides an overall comparison of operating systems available for Professional 300 Series computers. The categorizations used here are not absolute; they are intended rather as a general guide to differentiating between these systems. See the notes below and the descriptions on the following pages for additional information about the systems in which you are interested.

	System	Features														Configurations Supported		
		DCS	Multitasking	Real-time processing	Extended bit-map graphics	DECnet support	Ethernet support	VAX/VMS compatibility	Industry standard	Application portability	Operating system customization	Multiuser support	Menus plus command interface	Windows	Extensive development environment		Diskette-based development environment	UNIX-derived
Primary	P/OS	●	●	●	●	●	●					●	●	●			●	●
	PRO/VENIX	●	●	●	●		●	●			●			●		●		●
	RT-11	●	●	●	●					●				●	●		●	●
	CTS-300	●	●		●					●				●				●

strong position in that strategy. It is through P/OS that the Professional can be most closely integrated into existing Digital computer environments.

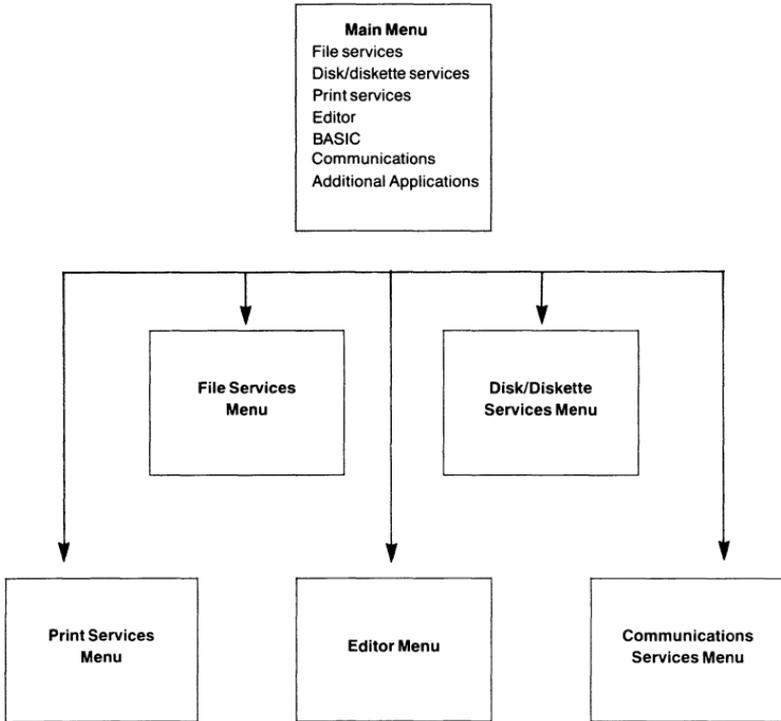
In addition, since P/OS was developed especially for the Professional, it is tailored to support the machine's unique capabilities. Support for these special strengths makes P/OS the right choice for a broad range of software development, graphics, distributed processing, and general purpose applications.

P/OS is an enhanced subset of Digital's well-known RSX-11M-PLUS minicomputer operating system. It is a multitasking, realtime system with VAX/VMS and PDP-11/RSX file structure compatibility. P/OS also provides support for PRO/DECnet, which connects the Professional via Ethernet to Digital's advanced communications network.

With its RSX-11M-PLUS foundation, the P/OS operating system gives the Professional a unique role in organizations already using Digital computers. Now a desktop computer can share the programs, files, storage, and peripherals of central multi-user computers; at the same time, it actually reduces the central computer's workload by transferring most work to its local minicomputer processor. Another P/OS advantage in Digital computer environments is that programs developed for PDP-11 and VAX minicomputers can run on a personal distributed workstation, often with only slight modifications. And as it delivers these unique advantages, your Professional retains all the attributes you value in a stand-alone desktop computer.

An Interface For Every User

In recognition of the different needs of Professional users, P/OS offers a choice of two user interfaces.



The P/OS menu system guides the inexperienced user through his work. DCL is available for users who prefer to bypass the menus.

One is the P/OS menu system, which brings an unexpected level of user friendliness to this powerful computer. The P/OS main menu lists all installed applications and submenus, each of which can be called up directly. On-screen prompts and abundant in-context help files guide less experienced users through each operation. This interface can be used consistently throughout P/OS utilities and is embedded in many P/OS application programs. It is also available to application developers through the PRO/Tool Kit and Professional Host Tool Kit.

The second interface is a subset of the traditional Digital Command Language, DCL, giving technical users the feel they expect from a PDP-11 machine. DCL mode streamlines P/OS operation by eliminating intermediate menus and prompts. This cuts out steps that veterans find unnecessary, while retaining the other advantages of P/OS. Directly supported DCL commands include *append*, *copy*, *create*, *delete*, *directory*, *edit*, *exit*, *purge*, *rename*, *set*, *show*, *type*, and *unlock*.

Applications Compatibility: The Key to Distributed Processing

If your personal workstation is not compatible with the other computing resources in your organization, you are isolated, and your contribution is limited. P/OS gives the Professional a high level of compatibility with the rest of Digital's computers and operating systems. This compatibility includes Files-11 file structure, RMS record management, the DCL command language, and the familiar EDT editor, all of which are common to VMS- and RSX-based systems.

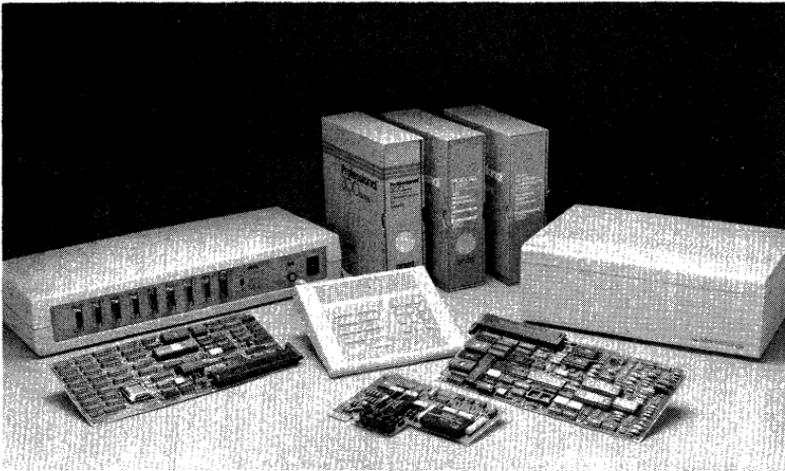
As a result, you can transfer the processing involved in virtually any task from larger computers to your own Professional workstation. There you control your own data and applications, simultaneously freeing you from dependence on central systems, reducing central system workload, and maintaining the critical link between you

and your organization. Meanwhile, you get to work with true minicomputer software, mature compatible products like PRO/Office Workstation, PRO/DATATRIEVE, Supercomp-Twenty, and other applications layered on the P/OS operating system. These can, of course, include customized applications developed for unique requirements with the PRO/Tool Kit or Professional Host Tool Kit.

Communications: DECnet and Much More

The networking and communications capabilities of P/OS are outstanding. Foremost among these is the support within P/OS for DECnet, Digital's advanced networking strategy that links the Digital product family for maximum integration of computing resources.

Specifically, when P/OS is used with a Professional that includes the DECNA hardware option and PRO/DECnet software, the Professional becomes a desktop end node in a DECnet Local Area Network (LAN). This means that your Professional will be fully



integrated into a high-speed network that can include Digital's PDP-11 and VAX minicomputers as well as DECSYSTEM-10 and DECSYSTEM-20 mainframes. This gives your Professional instantaneous access to the resources of any machine on the network; communications capabilities including electronic mail; VT100 terminal emulation; an optional DECnet security password; menu-driven services for remote file transfer, copy, display, and delete; a node name and node number; remote task-to-task communication; and a full range of file and disk utilities.

Most of the Professional's other communications software packages are also layered on P/OS. These include PRO/Communications, the Professional's standard asynchronous communications package that provides terminal emulation and file transfer capabilities, and a broad variety of products linking the Professional to IBM and IBM-compatible environments.

P/OS also includes integrated support for several functions of Digital's Mini-Exchange, allowing local connection of several computers and shared printers (PRO/Communications is also required for file transfers, terminal emulation, and the use of modems through the Mini-Exchange). Another peripheral device supported by P/OS is the Professional Presentation System, an instant slide-making system sold by Polaroid.®

Strong Support for Applications Development

P/OS system services play a central role when the Professional is used for applications development, especially when you are using the PRO/Tool Kit. Together, P/OS and the PRO/Tool Kit provide a strong development environment with mature, high-performance languages and a number of standard facilities to reduce applications development time.

P/OS also includes tools that help give your applications a consistent user interface. These tools help you integrate menus and forms into your applications and employ standard P/OS "help" and "messages" conventions. If you prefer, you can also develop non-menu applications that use standard VMS/RSX user-interface tools such as the Forms Management System (FMS). This approach will make it easier to transport your applications to PDP-11 and VAX environments.

New features in P/OS and the PRO/Tool Kit include the above-mentioned DECnet support as well as support for privileged applications and user-developed, loadable I/O drivers. Additional help for developing device drivers is in a new publication, Digital's *Guide to Writing a P/OS I/O Driver And Advanced Programming Notes*. This manual documents a variety of sophisticated programming options.

A Host of Familiar RSX Programming Resources

P/OS is based on RSX-11M-PLUS, and it has many similarities to that well-known standard. Unlike traditional RSX, however, P/OS requires no system generation; it is "pregenned," making it easy to install.

A full set of the major RSX tools, and more, is available to the software developer using P/OS. These include 22-bit addressing support, on-line debugging tools, logical name support, shared and cluster libraries, memory management and disk overlay functions, PDP-11 R5 calling convention, checkpointing, and a full-duplex terminal driver. Also included are system directives including task and system information directives, time directives, significant events and event-flag support, QIO functions, parent/offspring task directives, task-to-task communication directives, memory management directives, logical name functions, and exit (with or without status).

Finally, P/OS includes two editors, EDT and PROSE.

P/OS and the Visual Image

P/OS is designed specifically to support the Professional computer's outstanding graphics capabilities. P/OS includes the CORE Graphics Library and PRO/GIDIS. The CORE Graphics Library, a package of high-level runtime graphics subroutines, dramatically reduces programming time. PRO/GIDIS, a collection of graphics primitives, offers high performance in applications and added developer flexibility. In addition, P/OS supports the PRO/Tool Kit, which provides direct access to the video I/O registers and the Professional video bit map.

P/OS also supports the Virtual Device Metafile (VDM) facility. VDM supports applications like PROSE PLUS that combine text and graphics in the same file. Like any other file, a text/graphics file can be transmitted to other systems over networks or other communications lines, displayed on the screen, or printed locally.

Support for Alternative Operating Systems

P/OS serves as the foundation upon which three of the Professional's alternative operating systems—MS-DOS, CP/M-80, and UCSD p-System—are layered. Each runs on P/OS as an application selected from the main menu.

Getting the Most from Your Desktop Professional

Digital created the Professional Operating System to bring out the best in your "personal PDP-11." It does just that, supporting the hardware features and system compatibility that make the Professional computer a distributed workstation of unequalled capability.

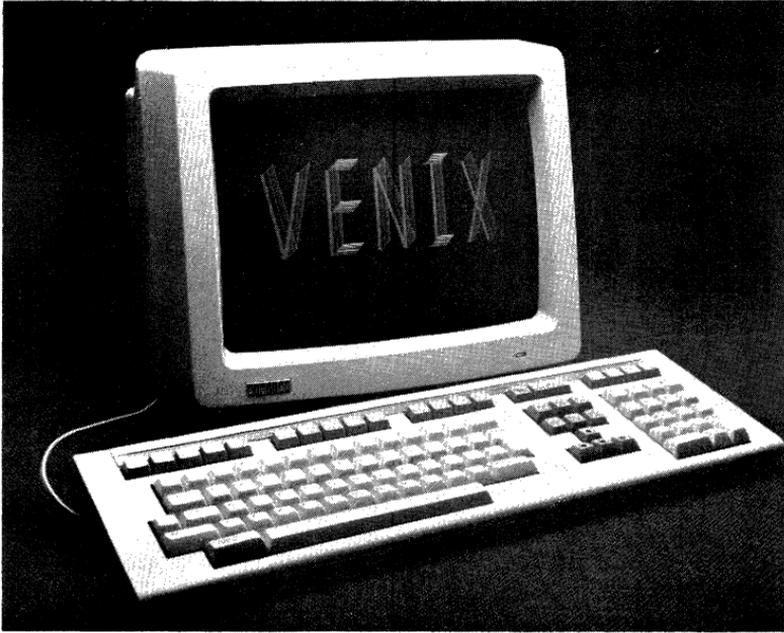
Minimum System Requirements

For P/OS Hard Disk:

- Professional 350 or 380 system
- 5-, 10-, or 33-Mbyte hard disk

For P/OS Diskette:

- A Professional 325 or 350 system



• **PRO/VENIX**

Order Code: QA718-C3

PRO/VENIX is a genuine UNIX-derived operating system developed specifically for the Professional 300 Series by VenturCom, Inc. It is based on Version 7 UNIX and incorporates several of the popular University of California at Berkeley extensions, including the *vi* screen editor and C shell. PRO/VENIX carries an AT&T System V binary license.

PRO/VENIX is more than simply a portable UNIX system that runs on the Professional 300 Series. Like other UNIX systems, it offers the advantages of transportability, streamlined development tools, industry standard architecture, powerful communications,

hierarchical file structure, and the Bourne shell. But unlike other UNIX systems, PRO/VENIX features special enhancements including code mapping, for ease of software development, improved realtime processing, and support for the Professional's special graphics capabilities.

In addition to its standalone capabilities, PRO/VENIX offers a distributed UNIX workstation capability in the VAX/ULTRIX environment.

Finally, PRO/VENIX adds another dimension to the Professional: a way of adding a terminal in a multiuser configuration.

In short, PRO/VENIX offers a combination of advantages that shed a new light on what a desktop UNIX system can be.

A Low-Cost, High-Performance UNIX Workstation

PRO/VENIX on the Professional 350 or 380 combines the flexibility of the UNIX operating system and the power of the Professional's PDP-11 processor. With an improved terminal driver, optimized disk I/O, and the code mapping feature that transparently enables the Professional to execute applications that are larger than 64 Kbytes, PRO/VENIX provides an efficient runtime environment for applications. Intertask communication and intelligent swapping routines further speed program execution. Add the Professional's minicomputer processing capabilities, and you've got an outstanding low-end UNIX workstation.

PRO/VENIX on a Professional 350 or 380 performs well as an independent personal processor or as a workstation in a distributed environment. A stand-alone PRO/VENIX system offers all the resources you need to handle the development opportunities and sophisticated applications available for UNIX systems. In an ULTRIX

environment, in which UNIX is running on a VAX, PRO/UNIX on the Professional provides a distributed workstation using such UNIX-to-UNIX communications features as file transfer and terminal emulation.

A Multiuser Professional

PRO/UNIX can transform the Professional 350 or 380 into a multiuser computer with password protection for each user. The second terminal is a Digital VT100 or VT52 terminal connected either directly or via a modem to the Professional's communications or printer port. Each user has full access to all system resources and applications.

A two-user license is standard with PRO/UNIX. More than two users requires special licensing arrangements.

Both users can take advantage of PRO/UNIX's multitasking capabilities. Using simple commands, they can start background tasks that do not require user intervention. While the system works on the background operation, each user is free to continue with interactive work such as text editing.

The result is a powerful, multiuser, multitasking UNIX system with an attractively low cost-per-user.

Impressive Graphics Support

A selection of utilities are included with PRO/UNIX that take advantage of the Professional's high-resolution bit-map graphics. Simple PRO/UNIX commands let you create bar, pie, line, and even combination charts. You have full control over window size, fill patterns, and color. PRO/UNIX also includes an enhanced and extended set of UNIX graphics subroutines for incorporating graphics into applications.

You can get a hard copy of your graphic image by printing it out on Digital's LA50, LA100, or LA210 dot matrix printers or the LVP16 six-pen plotter.

A Powerful Communications Tool

PRO/VENIX is a strong communications system, with facilities for exchanging data and information with other UNIX systems and with other users on the Professional. Facilities include UNIX-to-UNIX communication (uucp), electronic mail, communication between users on the PRO/VENIX system (including screen-to-screen "conversations" and mail), and virtual terminal and file transfer facilities. The UNIX-to-UNIX facility lets you use the Professional and PRO/VENIX as a distributed workstation for a larger UNIX system, such as Digital's ULTRIX.

A Logical Hierarchical File System

The hierarchical, or tree, file structure is another hallmark of UNIX systems and, therefore, of PRO/VENIX. In this scheme of organizing files, directories contain both files and other directories. This system makes it easier to keep track of your files, and allows you to keep several files with the same name, as long as they are in different directories.

PRO/VENIX also provides facilities to let you find, create, delete, and analyze your directories and files. These facilities include commands that locate particular strings or a combination of strings in files, compare two files and report the differences, and sort or merge files based on selected fields.

A Flexible Development Environment

PRO/VENIX supports the flexible environment that makes UNIX systems so attractive to application developers. The packaged system includes C, FORTRAN-77, and Pascal compilers; a RATFOR preprocessor; a BASIC interpreter; and an assembler. For more information on PRO/VENIX development environments, see Chapter 10.

Support for Realtime Processing

One of the traditional shortcomings of UNIX systems has been that they do not support realtime processing. To fill the need for high-speed data acquisition, PRO/VENIX adds two enhancements to the UNIX system. The first, asynchronous I/O, allows a user to overlap CPU processing with any I/O that uses DMA to transfer data between the device and the user's buffer. The second feature, preemptive priorities, makes all system resources exclusively available to a given process, thus enabling a realtime process to run with no risk of interruption by a competing process.

These features, combined with interprocess communication, shared data segments, semaphores, and process timing, give PRO/VENIX realtime processing capabilities that do not rely upon extensive hardware support.

The Enhanced UNIX Workstation

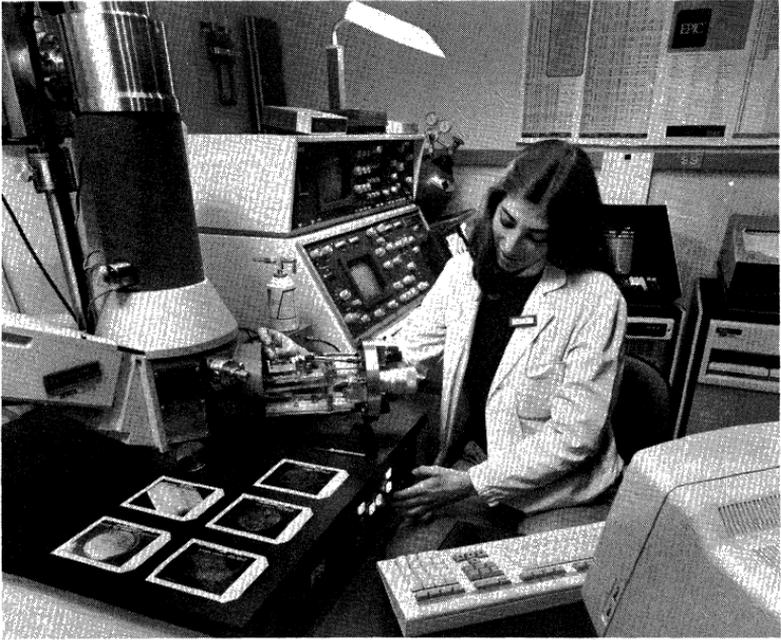
PRO/VENIX combines the strengths of the UNIX system with the power of the Professional processor to provide a versatile UNIX workstation. With its extensive graphics, communications, development, and realtime processing capabilities, PRO/VENIX stands out as a leader among low-end UNIX systems.

Minimum System Requirements

- Professional 350 or 380 system
- 10- or 33-Mbyte hard disk

System Options

- Extended Bit-Map Module and RGB color monitor for color graphics
- VT100 or VT52 terminals
- LA50, LA100, LA210, LQP02, LQP03, or LVP16 printer
- DF02 or DF03 modem



• **RT-11**

Order Code: QBA39-H3

RT-11, the classic real-time operating system for PDP-11 minicomputers, is available in native mode on the Professional computer. Long a favorite in the PDP-11 minicomputer environment, RT-11 has some 100,000 users and more than 2,000 existing software applications in the field.

RT-11 on the Professional is nearly identical to the traditional RT-11 system. It features the same compact size, speed, and simplicity of use that have made RT so popular. This means that now a full RT

development environment, with no tool kit required, is available on a personal PDP-11 workstation. You can even run RT-11 on a floppy-disk-based Professional system, still without sacrificing the tools you expect to find on a minicomputer.

In addition to the availability of an inexpensive RT-11 development environment, RT-11 on the Professional lets you run hundreds of mature RT-11 software applications, generally with little or no modification.

Enhancements in RT-11 Version 5.1 allow users to take advantage of the Professional hardware design, including the video bit map. Other enhancements include a communications option, VTCOM, that lets your Professional computer emulate a VT100 terminal for file transfers and other communication between RT-11 and host systems, including VAXes. Version 5.1 also includes features that simplify print spooling and provide a set-up utility that allows manipulation of the video terminal and keyboard as if they were a VT100 terminal.

If you are a current RT-11 user, you can transport your RT applications to the Professional with little effort. The self-contained development environment allows you to create applications that run on the Professional or any other PDP-11. And your investment in RT-11, as always, will be protected by reliable service, support, and maintenance from Digital.

RT-11: Giving Simplicity a Good Name

RT-11 on the Professional is a single-user, multitasking operating system. It is very small, fast, and efficient. Capable of both realtime and data processing, the RT-11 operating system offers a full range of system utilities for simplified program development.

The efficient design of RT-11 means it can be run easily on a floppy-based Professional 325 or 350 computer. The operating system, assorted utilities, and a high-level language like FORTRAN-77 or BASIC-11 can all reside on a single diskette, leaving the other diskette free for your programs and data.

In spite of its small size, the RT-11 operating system includes a rich command language that gives you flexibility without complexity. Because it is command-driven and does not have the system overhead associated with menu-driven systems, all RT-11's resources are dedicated to specific capabilities. As a result, RT-11 is packed with flexibility. For example, while some operating systems offer a few options for copying files, RT-11 offers three dozen, allowing sophisticated, selective file manipulations.

Learning and Using RT-11: Simplicity Pays Off

RT-11 is easy to use. It features award-winning documentation, straightforward operation, and English-language keyboard commands. This adds up to a short learning curve and higher programmer productivity.

RT-11 also features an automated installation procedure. An interactive dialog leads you through the simple steps of the installation process.

In addition, RT-11 includes a VMS-compatible command interface, including DCL (Digital Command Language) and user-definable commands (UCL). Built-in device-handler subroutines, a single-line command editor, and stored retrievable command sequences streamline programming and operation.

Versatility and Power

RT-11 on the Professional gives you flexible power for your applications requirements. You can take advantage of such features as multitasking (up to eight jobs simultaneously); 22-bit memory addressing; multiple logical disks on one physical disk; a choice of line or screen editors; and the availability of optional languages, such as BASIC, FORTRAN IV, FORTRAN-77, and DIBOL (bundled with RT-11 in CTS-300). In addition, PASCAL, C, and COBOL are available from third-party vendors.

Like its predecessors, RT-11 on the Professional is fast and efficient. It is optimized for realtime response and includes a contiguous file structure for quick data access and file management. RT-11 also features low overhead, to provide more usable memory. Its modular structure enables the swapping of some monitor components if additional memory is required. A backup utility program provides an easy-to-use procedure for quick storage, intermedium transfer, and restoration of data, whether you are working with a single, large data file or an entire volume.

RT-11 Version 5.1 Enhancements: VTCOM, SPOOL, and SETUP

In addition to all the features of earlier versions, RT-11 on the Professional includes important enhancements in RT-11 Version 5.1. These include a Virtual Terminal Communications Package (VTCOM), which allows you to communicate with a host system while running RT-11. You can use your Professional computer as a local terminal to draw on such resources as electronic mail and programming languages resident on the host. VTCOM transfers ASCII files between the host and a stand-alone RT-11 system. Binary files can also be transferred through the VTCOM utility if a TRANSF utility is installed on the host system.

Another enhancement in Version 5.1 is the Transparent Spooling Package (SPOOL). With SPOOL, you can direct output to printers or other RT-11 serial devices while you are engaged in other RT-11 operations. After spooling a file to the printer, you can continue running other jobs without interrupting your work for additional SPOOL commands. SPOOL is offered in addition to QUEUE, which sends files to any RT-11 device and is particularly useful for queuing large files for printing. QUEUE requires direct operator control to manipulate print actions.

SETUP, another Version 5.1 enhancement, uses simple English commands to set video characteristics. It is included in start-up indirect command files or IND control files. Among other things, it lets application developers manipulate video characteristics during program execution.

Transferring RT-11 Resources to the Professional

RT-11 has been modified for the Professional to handle video and keyboard interfaces transparently. Therefore, all RT-11 non-system-dependent layered products should be able to be transported to the Professional without modification.

If you want to transfer existing files from larger systems to the floppy diskettes on your Professional, a simple, inexpensive approach is available. The RT-11 serial line communications programs, VTCOM and TRANSF, can be used to transfer binary or ASCII files between RT-11, RSTS/E, and RTEM (running under RSX or VMS, TSX-Plus, and RT-11). To use this file transfer procedure, you buy two binary kits, one on RX50 floppy diskette for your Professional and one on the medium of choice for your PDP-11 RT-11 system. You will use the kits to install VTCOM on one system and TRANSF on the other. Through a serial line, the VTCOM system serves as a console terminal for the TRANSF system, as in a binary file transfer. RT-11 documentation details a reliable procedure for this process.

A Full Member of the Digital Family

RT-11 on the Professional is designed to complement the PDP-11 family architecture. It shares the DCL command language with other operating systems (P/OS, VMS, RSX, and RSTS/E) and includes user-definable commands similar to those in the VMS system. An RT-11 emulator, RTEM-11, is available on RSX and VMS for compatible development on PDP-11s and VAXes. In addition, an RT-11 Runtime Subset is available on RSTS.

The Old Favorite Stands Alone

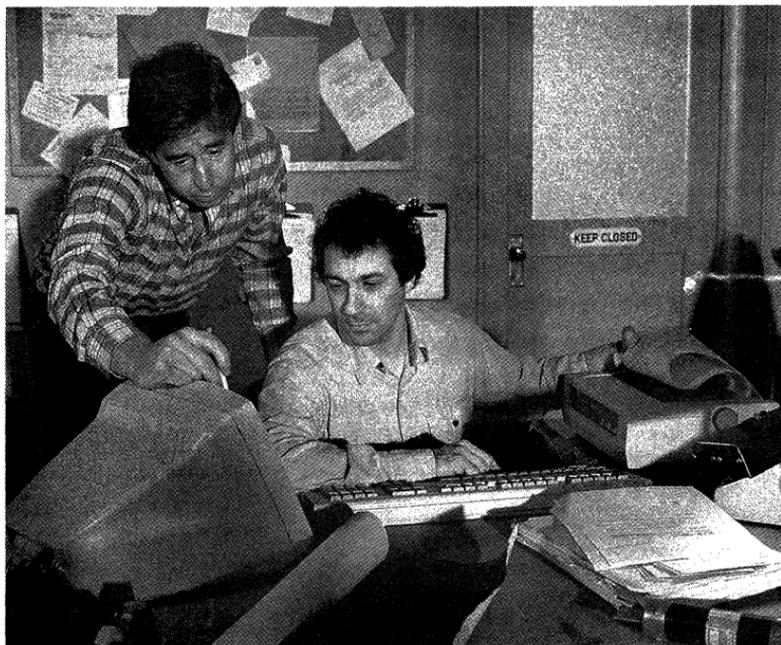
The availability of RT-11 on the Professional means that this ever-popular operating system now has a home on a stand-alone, distributed workstation. You get the lowest-cost RT-11 environment on the market, true RT-11 performance, compatibility with other RT-11 systems, and the advantages of a self-contained, locally controlled system.

Minimum System Requirements

- Professional 325, 350, or 380 system
- 34 Kbytes allocated for Extended Memory (XM)

System Options

- Extended Bit-Map Option
- 5-, 10-, or 33-Mbyte hard disk
- 256-Kbyte Memory Option
- Color monitor (in 7-bit mode only)



• **PROFESSIONAL CTS-300**

Order Code: QB354-H3

Professional CTS-300 is a commercial operating system especially configured for the data processing needs of small and medium-sized businesses and government agencies. The system bundles RT-11 with DIBOL-83 in a disk-based, single-user, multitasking system.

In addition to serving as an applications development environment, Professional CTS-300 allows applications from PDP-11-based CTS-300 or DMS RSTS/E DIBOL systems to migrate easily to a single-user, hard disk Professional workstation.

The Professional CTS-300 package consists of the RT-11 operating system, two DIBOL runtime systems, and a number of utilities. Since the RT-11 operating system is included, Professional CTS-300 licensees can order any RT-11 application without having to reorder a specific license for RT-11.

The CTS-300 Programming Language

The Professional CTS-300 programming language, DIBOL-83, is a high-level procedural language designed specifically for interactive business data processing. It is based on the DIBOL Standards Organization's definition of the language. It is highly compatible with DIBOL-83 implementations running on other operating systems, including VMS, RSX-11M-PLUS, RSTS/E, and P/OS.

DIBOL-83 supports a set of language statements commonly referred to as structured constructs. These statements are designed to complement and facilitate desirable programming practices.

The DIBOL compiler reads a source program and produces an object module. The compiler is capable of producing a source listing with embedded diagnostics.

Two valuable libraries are included with CTS-300 DIBOL-83. The Universal External Subroutine Library contains external subroutines that perform the same functions on all DIBOL-83 implementations. The Operating System Specific Library contains external subroutines that perform similar functions on one or more of the DIBOL-83 implementations.

A Choice of Run-Time Systems

The runtime systems included with Professional CTS-300 include XMTSD and SUD. XMTSD, or Extended Memory Time Shared DIBOL, allows one to eight DIBOL jobs to run simultaneously. File sharing facilities at the record level permit programs to share and update the same data files. XMTSD controls loading of DIBOL programs,

program scheduling, detached programs, file sharing, record I/O, intertask communication, and other less-visible functions. A DIBOL lineprinter spooler also runs in the XMTSD environment. Program completion, or the detaching of a program, returns control to the XMTSD executive. Timeslicing and scheduling are governed by the clock. XMTSD will make use of up to 320 Kbytes of memory on the Professional.

SUD, the single-user DIBOL runtime system, allows one DIBOL user or job to be run on a system. It is included on the Professional computer primarily as a system generator for the CTS system, but is available for other purposes as well. Control returns to the monitor upon completion of the SUD program.

Portable Applications

Like CTS-300 and RSTS/E DIBOL, Professional CTS-300 uses the DMS file system. This allows sequential files with sequential and random access, and single-key ISAM files which allow random access by key. The most important advantage of the DMS file system, however, is that it allows easy program migration from other PDP-11-based CTS-300 or RSTS/E DIBOL systems. For the many users who have developed applications for these other PDP-11-based systems, this means that their existing software and files can now be transferred easily to the Professional with the Professional CTS-300 operating system. The result is a familiar operating environment; reduced transition and hardware costs; and the advantages of using a stand-alone, distributed workstation.

A Generous Supply of Utilities

Utilities in the Professional CTS-300 system include CTSGEN, the CTS-300 generator program; DDT, the DIBOL Debugging Technique; DECFORM, a data entry utility; DICOMP, the DIBOL-83 compiler; DMS-300, data management services; ISMUTL, for creating and maintaining indexed sequential files; SORT, a MACRO sort

with merge capability; LPTSPL, a lineprinter spooler utility; SORTG/SORTM, a sort/merge utility; and STATUS, the job and system status program.

Getting Down to Business

Professional CTS-300 brings together a package of mature, proven resources for your personal PDP-11. Business users will discover that the Professional CTS-300 operating system on their Professional computer results in an enviable price/performance combination.

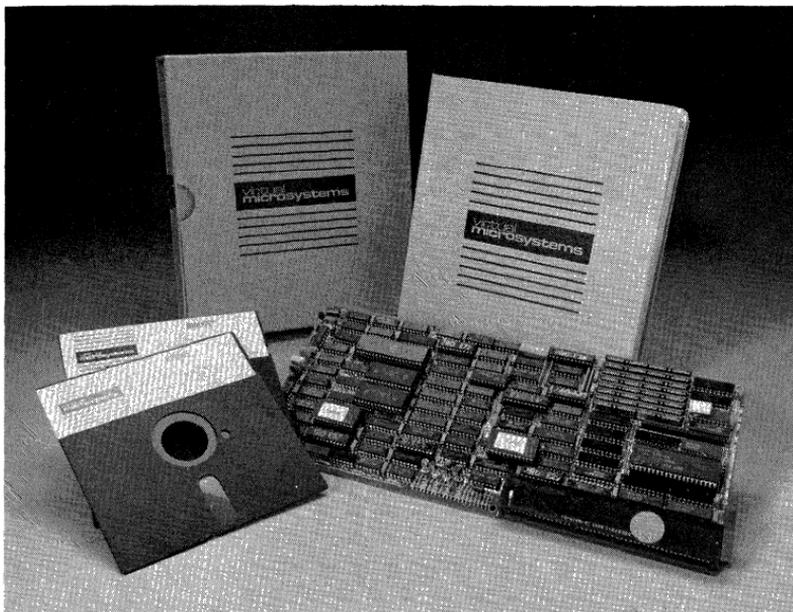
Minimum System Requirements

- Professional 350 or 380 system
- 5-, 10-, or 33-Mbyte hard disk

• PC-Bridge

Available from: Virtual Microsystems, Inc.
2150 Shattuck Ave.
Suite 720
Berkeley, CA 94704
(415) 841-9594

The generous selection of operating systems for Professional Series computers has a new addition: the MS-DOS operating system. PC-Bridge is a hardware and software package that lets your Professional computer run dozens of popular MS-DOS applications. As a result, in many cases you no longer have to choose between the performance of the Professional and software applications available only in the MS-DOS environment.



PC-Bridge, developed and sold by Virtual Microsystems, Inc. (VMI), lets you use selected MS-DOS applications on any hard-disk Professional computer running the P/OS operating system. PC-Bridge provides an ideal solution for people who need the Professional for its outstanding communications, graphics, and minicomputer software portfolio, and who also must run one or more MS-DOS applications. The latter might include an organization's inhouse MS-DOS application, systems built around one or more standard MS-DOS packages, or an application that is a personal favorite with which considerable work has already been done.

But PC-Bridge means more than the simple availability of MS-DOS software. It lets you transfer your data and files from the MS-DOS environment to the powerful multitasking P/OS operating system and its layered applications. This gateway to the Digital product

family means that MS-DOS applications can be enhanced through the unique capabilities of the Professional. First and foremost, this enhancement includes access to DECnet, Digital's unmatched networking system for high-speed Ethernet communications between PC-Bridge MS-DOS systems. It also allows you to use data generated from an MS-DOS application with compatible Professional applications.

A PC Within Your Professional

PC-Bridge creates a "virtual computer" within the Professional. This virtual computer consists of system software and a module card for one of the Professional's option slots. MS-DOS and an MS-DOS license are included.

The option card contains an Intel 8086 processor, 256 Kbytes of RAM, an optional 8087 floating point processor, and IBM PC bit-mapped video emulation circuitry. At 8 megahertz, the 8086 is faster than the IBM PC XT, and, again unlike the IBM, uses the complete 16-bit data path, further speeding program execution. A more thorough description of the option card appears in Chapter 6.

PC-Bridge runs as an application under P/OS. It stores applications and data on a segmented hard disk. Part of the disk is set aside for MS-DOS, with the balance reserved for P/OS and the other applications residing on your Professional. MS-DOS storage is divided into "virtual floppies" that appear as single directory entries on the P/OS directory. Each virtual floppy consists of multiple files and can grow to a user-defined limit of up to 4 Mbytes.

Flexible Requirements for Applications Transfer

There are two basic ways to move MS-DOS software to your Professional to run on the PC-Bridge. The principal objective of

these two approaches is to transfer disk information from the 48 tracks-per-inch MS-DOS format used by IBM PCs and compatible systems to the Professional's RX50, 96 tracks-per-inch format. Limitations on software compatibility are detailed below.

Your first option is to purchase any of the dozens of MS-DOS applications available in RX50 format from a third party supplier, leaving reformatting to these vendors. In Chapter 9 is an MS-DOS software library of more than 60 such packages available from VMI, creators of the PC-Bridge system. Each product on this growing list of applications is a fully licensed version that carries the original (preconversion) serial number.

Your second alternative is to transfer your own proprietary or public domain software directly from the MS-DOS machine to the Professional. The simplest transfer procedure is to take advantage of the PC-Bridge-equipped Professional's ability to read single-sided MS-DOS diskettes. This requires that a special control chip, included with the PC-Bridge system, be installed on the Professional's RX50 controller board by Digital Field Service (for a nominal charge). Your Professional reads the application and stores it in RX50 format on its floppy or hard disk. For MS-DOS applications that reside on two-sided MS-DOS diskettes, conversion utilities can be used to change them to single-sided disk format.

You can also transfer proprietary or public domain software via a modem or the RS232 serial interface. This transfer requires that both machines run VMI's PhoneLink communications program (available separately). Because the Professional writes the received information in its own RX50 96 tracks-per-inch format, the disk format of the source machine is unimportant.

Since the Professional computer's architecture is quite different from that of an IBM PC, there are some limitations when using PC-Bridge. Because the Professional does not have IBM PC option slots, MS-DOS software packages that require accessing optional devices on the IPC bus will not run on the Professional. Similarly, IBM's proprietary BASICA is not implemented on PC-Bridge. Finally, some communications programs (those that do not use ROM calls) and certain copy-protected applications will not run on PC-Bridge.

Enhancing MS-DOS Applications Through P/OS

Besides applications transfer, PC-Bridge lets you transfer files and data from an MS-DOS machine (including the virtual MS-DOS computer within the Professional) to the P/OS environment.

For transfers from external MS-DOS machines, you simply employ the application transfer procedures described above to move your existing MS-DOS data and files directly to PC-Bridge on the Professional. As with PC-Bridge files created internally, these files reside on a portion of the Professional's hard disk that is allocated to MS-DOS.

Once data resides on the hard disk of your Professional, you can use the FileLink utility (included with PC-Bridge) to transfer these files to the P/OS environment. This results in important enhancements of traditional MS-DOS capabilities.

As noted above, the most important of these is the access provided to Digital's DECnet network architecture. This would allow you to write a document using WordStar[®], for example, and, via P/OS, send it over DECnet to a colleague on another PC-Bridge system. Your colleague could edit and return the document just as easily.

In addition, data generated in an MS-DOS application and moved to the P/OS environment can be used in P/OS applications. This allows you, for example, to move data from an MS-DOS Multiplan™ spreadsheet to Supercomp-Twenty.

Finally, your MS-DOS files can be transferred to P/OS for processing with P/OS utilities or for redirection to system peripherals such as printers, plotters, and other P/OS-supported devices.

The Benefits of Both Worlds

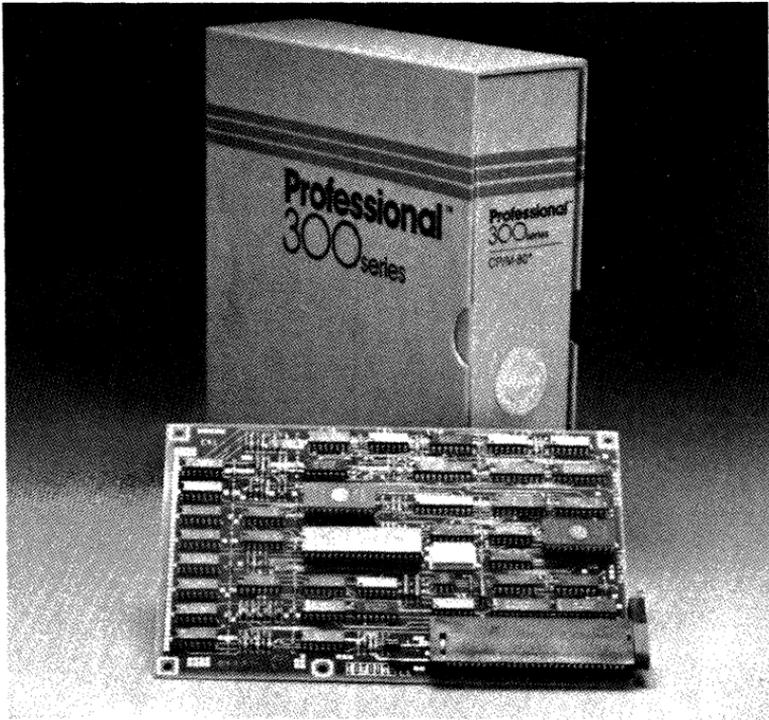
PC-Bridge meets the needs of people who want to retain the advanced capabilities of the Professional while being able to use selected MS-DOS software. As the MS-DOS Software Library in Chapter 9 indicates, the collection of popular MS-DOS titles that runs on the Professional using PC-Bridge is extensive. If your needs are met by these packages, or if your own software can be transferred, PC-Bridge is an excellent way to enjoy the advantages of two quite different, yet powerful, computer environments.

Minimum System Requirements

- Professional 350 or 380 system
- PC-Bridge (sold and supported by Virtual Microsystems, Inc.)
- 5-, 10-, or 33-Mbyte hard disk
- P/OS Hard Disk

System Options

- PhoneLink (VMI's optional serial communications program)
- PRO/DECnet (for MS-DOS access to Digital's high-speed communications architecture)
- VMI MS-DOS Software applications (see Chapter 9)



• PRO/CP/M-80

Order Code: PC3XS-AA

CP/M is one of the most widely used personal computer operating systems, with literally tens of thousands of software products available that span the full range of microcomputer applications. Now the CP/M-80 operating system is available on the Professional, giving you two important advantages.

First, you can use the CP/M-80 option as a bridge to let you keep working with many of the CP/M programs you are using now while gradually moving up into the P/OS environment. Second, you can run many applications packages that are available only on CP/M.

Configuration

The CP/M option consists of a customer-installable Z-80A processor (see Chapter 6) and the CP/M-80 interface software. Together, these components let you run your choice of scores of CP/M-80 programs while remaining fully integrated into the Professional's P/OS operating system. This integration goes so far as to allow file transfers back and forth between P/OS and CP/M. You can also access PRO/Communications for a range of asynchronous communications with other systems.

To run a CP/M application, you simply select "CP/M" from the Professional's standard menu as you would select any other application. During start-up, CP/M devices are logically assigned to the physical Professional devices. CP/M is then booted into the CP/M option module, and the selected CP/M program is run as usual, appearing just like "normal" CP/M software. The Professional's own processor acts as the I/O processor between CP/M and P/OS. When you are through with the CP/M application, you exit CP/M and are returned to the standard Professional menu.

Technical Description

The CP/M option is based on DRI's CP/M-80 Version 2.2 software modified to run on the Professional. A list of available software is included in Chapter 9. The option lets CP/M-80 Version 2.2 applications developed on Digital's Rainbow and DECmate personal computers run on the Professional without modification, as long as they do not directly access hardware devices. All I/O operations must be performed through CP/M.

Both of the Professional's floppy diskette drives can be used to read and write CP/M format diskettes, applications, and data. Virtual floppies on the hard disk perform the same functions, though with the added performance of high speed disk access and large memory capacity. Up to four CP/M virtual floppy diskettes can be physically located on the hard disk.

The Professional's P/OS multitasking capability lets you perform concurrent processing even while within CP/M-80 applications. For example, you can print a document while running another CP/M program.

Summary

The CP/M-80 option for the Professional brings added applications flexibility to a machine that will be used primarily for more sophisticated, higher-level applications. It enables the Professional to deliver powerful "desktop mini" capabilities plus the broad application flexibility of 8-bit CP/M-80 software.

Minimum System Requirements

- Professional 325, 350, or 380 system
- P/OS Operating System

• UCSD p-System

Order Codes: p-System and Pascal—Hard Disk, QA111-C3

p-System Version 4.13—Hard Disk, QA112-C3

p-System Version 4.13—Diskette, QA579-C3

The University of California—San Diego (UCSD) p-System provides a portable environment for developing and executing application software. A p-System application program written for one microcomputer can run on another without recompilation. The p-system source programs are compiled into p-code for the

<p><i>p-code for applications</i></p> <p>Written in UCSD Pascal or FORTRAN-77, compiled into p-code.</p> <p>Same from computer to computer.</p>
<p><i>p-System Operating System</i></p> <p>Same from computer to computer.</p>
<p><i>p-code Emulator</i></p> <p>Varies with the computer.</p>
<p><i>BIOS</i></p> <p>Varies with the peripherals.</p>

p-System creates a "universal micro" environment so that applications compiled into p-code will run on any computer that has a p-code emulator.

“p-machine,” a pseudomachine or idealized version of a microcomputer. The p-code is then executed by the p-machine emulator written in the native language of the microcomputer. You can write source programs in a variety of high-level languages, three of which are offered by Digital: UCSD Pascal, FORTRAN-77, and BASIC. In addition, UCSD p-System includes the LSI-11 Assembler, which produces “native” subroutines for use by p-code programs.

The p-System architecture isolates application programs and system components from specific host computer operations and simplifies adaptation to new host configurations. The architecture consists of three modules: the operating system, the p-machine emulator, and the basic I/O system. The operating system and utilities are written in Pascal. Pascal statements are translated into binary machine code (p-code) for the standardized p-machine. The operating system is then transported to the microprocessor via the p-machine emulator written in native code.

Because of its unique structure, p-System offers users a wider choice of quality applications and an ensured software investment.

The UCSD p-System software package includes an interactive operating system, a screen-oriented editor, a file handler, a p-machine emulator, and a dynamic runtime binding facility for all separately compiled or linked program modules.

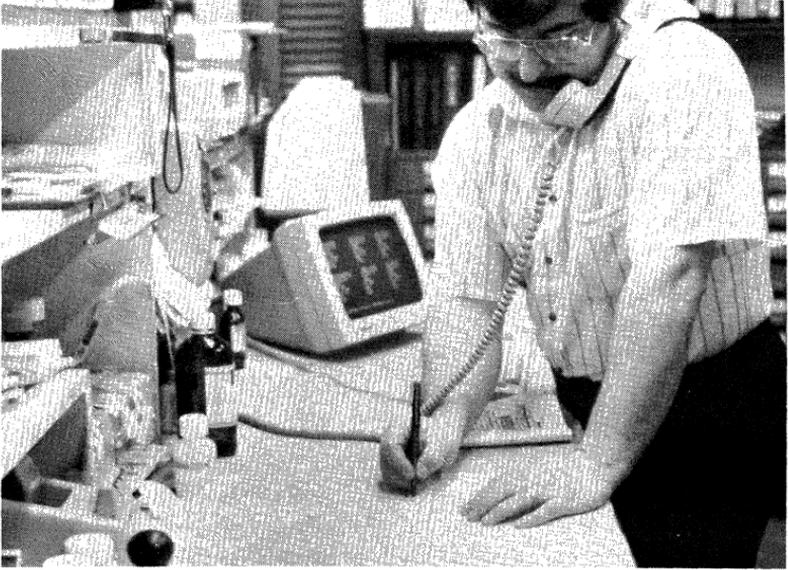
Minimum System Requirements

For hard disk versions (QA111-C3 or QA112-C3):

- Professional 350 or 380 system
- 5-, 10-, or 33-Mbyte hard disk
- P/OS Hard Disk

For diskette version (QA579-C3):

- Professional 325 or 350 system
- P/OS Diskette



• **STANDARD MICRO MUMPS 300**

Available from: Creative Socio-Medics Corporation
16 East 32nd Street
New York, NY 10016
(212) 696-3500

The Professional is designed as a personal workstation. But its minicomputer processor and architecture give it the potential to serve as a host for multiple terminals. The STANDARD MICRO MUMPS 300 (SMM 300) operating system takes advantage of this capability to create one of the lowest cost multiuser database management systems on the market.

Developed by Structured Data Systems, Inc., the SMM 300 system allows up to seven simultaneous users on a Professional computer.

The SMM 300 system combines the well-known MUMPS operating system, a transparent database management system, and an ANSI standard high-level language. This configuration makes possible a broad range of applications, including medical, financial management, process control, order entry, and other general business uses. Many of these specific applications are already available. In addition, CSM offers off-the-shelf word processing, spreadsheet and graphics programs for SMM 300 systems.

Up To Seven Users on a Single Professional

With the SMM 300 system, you can connect one terminal to the printer port, one to the communications port, and two each to a pair of Realtime Interface modules. This means a total of six terminals and the system console can therefore be used in SMM 300 applications.

The system can run on the Professional 325, 350, or 380. With the 325, you have 0.8 Mbytes of data storage available on two floppy disks. With the 350 or 380, the available hard-disk options allow 5, 10, or 33 Mbytes of additional data storage.

System Background

SMM 300 is a version of STANDARD MUMPS, an extension of the Massachusetts General Hospital Utility Multi-Programming System. STANDARD MUMPS is a superset of the American Standard specification x11.1-1977. As supplied, the system has eight 8-Kbyte partitions available, allowing eight tasks to be run simultaneously. Disk buffering shifts data files between storage and buffers, greatly increasing the efficiency of the system.

As an interpretive language, SMM 300 speeds development by eliminating the need for text editors, compilers, linkers, or loaders. Syntactically correct code can be entered and executed in a

minimum of time. In addition, powerful interactive debugging routines detect errors in a program and facilitate modification and rerun.

SMM 300 can be purchased separately or as part of a turnkey package including hardware and/or CSM software applications.

Minimum System Requirements

- Professional 325, 350, or 380 system

- **TSX-Plus**

Available from: s&H Computer Systems, Inc.
1027 17th Avenue South
Nashville, TN 37212
(615) 327-3670

TSX-Plus is a multiuser, multitasking general purpose operating system for Professionals running RT-11. TSX-Plus makes the RT-11 environment available to multiple users on a timesharing basis. Both RT-11 and TSX-Plus are engineered for ease of use, making the system accessible to the novice as well as the experienced user.

Most programs that run with RT-11 will run with TSX-Plus without modification. TSX-Plus interfaces with standard RT-11 device handlers (XM version) and supports RT-11 utility programs. Logical disk subsetting has been implemented in the TSX-Plus kernel. The TSX-Plus keyboard commands include most of those provided by the RT-11XM monitor, with the addition of significant enhancements. TSX-Plus system service calls (EMTs) are compatible with those provided by RT-11XM. The RT-11 multiterminal EMTs and BATCH, FORMAT, and single line editor utilities are not supported.

TSX-Plus allows the same machine to simultaneously support production use, program development, and realtime control. Through the virtual line and detached job features, individual users have concurrent control over multiple jobs.

Machines lacking sufficient memory to hold all active jobs benefit from the job-swapping facility. With job-swapping selected, idle jobs are swapped to disk. The job-swapping algorithm has been developed to improve overall throughput with minimum impact on system response.

The list of commercially available software packages compatible with TSX-Plus grows continually. s&H's Compatible Software Products List currently includes over ten word processing packages, eight sources of networking and file transfer packages, six spreadsheet and financial modeling packages, five sources of cross assemblers, eight DBMSs, four editors, 25 utilities, 30 sources of vertical applications—over 100 packages in all. A copy of this list is available from s&H at the address noted above.

In order to timeshare with TSX-Plus, you boot to a base line or single-job RT-11 monitor and then type the command "RTSX." Within a few seconds, your Professional is under the control of the TSX-Plus multiuser, multitasking monitor.

Compiling and linking programs under TSX-Plus can take a fraction of the time it would under other operating systems. Editors supported include KED, K52, TECO, and others, while available languages include MACRO-11, C, COBOL-Plus, FORTRAN, PASCAL 2, DBL, APL, and BASIC.

TSX-Plus addresses all the available memory on the Professional. Up to 30 jobs can be in memory at the same time, allowing rapid switching between jobs.

Other important features of TSX-Plus include: data and directory caching facilities, overlapping terminal interaction, optional log-on facility, security numbers and passwords, a transparent printer spooling facility, and a dynamic system display utility program (SYSMON) to assist in optimization of system resources.

Minimum System Requirements

- Professional 350 or 380 system
- 5-, 10-, or 33-Mbyte hard disk (2.5-Mbytes disk space required for timesharing applications)
- RT-11 operating system

• **XENIX**

Available from: The Santa Cruz Operation
500 Chestnut Street
Box 1900
Santa Cruz, CA 95061
(408) 425-7222

XENIX on the Professional is a UNIX-derived operating system that provides all the portability, flexibility, modularity, and power of UNIX. It is a multitasking, multiuser implementation of AT&T UNIX with Berkeley enhancements. It is also available for popular microcomputers including the Apple™ Lisa™ and IBM's PC, XT, and AT.

XENIX enhancements to UNIX include file and record locking, improved system administration facilities, and comprehensive documentation. The XENIX system is available in three packages.

The XENIX Operating System package contains the operating system kernel and over 100 utility programs including the *vi* screen-oriented text editor. The fundamental package of the XENIX System, it is the basic building block for all of the other packages.

The XENIX Software Development System package includes the c compiler, the linker, the source code control system, the c libraries, and other utilities useful for software development. This package provides a complete environment for developing XENIX applications.

The XENIX Text Processing System package contains text formatters for letter-quality printers, dot-matrix printers, lineprinters, and phototypesetters. It also includes formatters for mathematical equations and tables, a spelling checker, and other text processing utilities.

XENIX on the Professional supports more than a single user. Each user can perform several tasks simultaneously and independently. Additionally, more than one user can review and update the same data file at the same time. Communications between users and electronic mail facilities are built in.

Minimum System Requirements

- Professional 350 or 380 system
- 10- or 33-Mbyte hard disk

• **Idris**

Available from: Whitesmiths, Ltd.
97 Lowell Road
Concord, MA 01742
(617) 369-8499

Idris is a fast, compact, multitasking, multiuser rewrite of the UNIX operating system. It is specifically designed for use on microcomputers, being half the size of conventional UNIX systems.

Occupying less than one Mbyte of disk space, and supporting up to three users, Idris provides an alternative development environment for UNIX-oriented programmers. The operating system lets the Professional run three terminals simultaneously.

Idris supports file system and object file formats compatible with UNIX Version 6 and accepts all standard UNIX system calls.

Minimum System Requirements

- Professional 350 or 380 system
- 5-, 10-, or 33-Mbyte hard disk

Chapter 9 • Professional Software Catalog



This chapter contains descriptions of application software available for Digital's Professional 300 Series computers. Operating systems are listed separately in the preceding chapter, while programming tools such as languages and compilers are listed in the following chapter.

Software in this chapter is organized by operating system. Within each operating system section, applications are listed by function. Use the headings at the top of each right-facing page as a quick guide to your location within the chapter.

If you are looking for software for a certain purpose regardless of operating system, consult the index. There you will find entries such as "accounting software" that will guide you to appropriate page numbers throughout this chapter.

Many of the products listed here are sold and supported by Digital. These products carry the Digital Classified Software (DCS) Seal. The DCS Seal is your assurance that you are buying a quality product that has been fully tested and approved by Digital Equipment Corporation. Digital Classified Software packages are top performers that take advantage of the Professional's special capabilities. DCS software is available through Digital's sales force and other distribution channels. Obtaining DCS software is as easy as noting the order code listed at the beginning of each product description and contacting your sales representative. Your representative can also give you additional technical specifications for any DCS product.

Other software products listed in this chapter are distributed by independent software vendors. These products and the addresses of each distributor are listed here for your information and convenience. Descriptions of these products are based upon information provided by these vendors. Digital Equipment Corporation assumes no responsibility for the accuracy of these descriptions, nor for the quality or performance of these products. For additional information on any of these products, please contact the vendor directly.

Professional Operating System (P/OS) Software Library

- **Accounting**
- **Compu-Share General Accounting**



Order Codes:

General Ledger (GL-11) QA538-C3

Accounts Receivable (AR-11) QA566-C3

Accounts Payable (AP-11) QA567-C3

Compu-Share™ General Accounting brings the power of true minicomputer accounting to the single-user Professional. The product offering for the Professional is an implementation of Compu-Share's programs that run on VAX superminicomputers and PDP-11 minicomputers. The four available modules for the Professional are: GL-11 General Ledger, AR-11 Accounts Receivable, AP-11 Accounts Payable, and PY-11 Payroll. (PY-11 Payroll is available directly from Compu-Share; see module description below.) Compu-Share modules can be run independently as standalone applications or together as a completely integrated accounting system.

Compu-Share General Accounting is designed for small to medium-sized businesses that are looking for sophisticated features and ease of use. The packages are also ideal for divisional or departmental accounting in large companies.

Compu-Share's capabilities are often best appreciated by companies that are already automated and are now looking to advance from less powerful accounting systems.

P/OS Software Comparison—Accounting

Package	Features	Requirements		
Compu-Share	Integrated modules available separately Targeted at smaller businesses or corp. departments Targeted at larger businesses or corp. departments Targeted for professional accountants Employs P/OS interface Custom output for pre-printed forms Spreadsheet interface built in Supports distributed accounting in VAX environments 5-Mbytes in less than RMS file structure User password security 350/380	●	●	●
MJA	Integrated modules available separately Targeted at smaller businesses or corp. departments Targeted at larger businesses or corp. departments Targeted for professional accountants Employs P/OS interface Custom output for pre-printed forms Spreadsheet interface built in Supports distributed accounting in VAX environments 5-Mbytes in less than RMS file structure User password security 350/380 5-Mbyte hard disk 10-Mbyte hard disk	●	●	●
Pro-Accountant	Integrated modules available separately Targeted at smaller businesses or corp. departments Targeted at larger businesses or corp. departments Targeted for professional accountants Employs P/OS interface Custom output for pre-printed forms Spreadsheet interface built in Supports distributed accounting in VAX environments 5-Mbytes in less than RMS file structure User password security 350/380 5-Mbyte hard disk 10-Mbyte hard disk	●	●	●

Notes: The available Compu-Share General Accounting modules are General Ledger, Accounts Receivable, Accounts Payable, and Payroll. “Distributed accounting” systems can employ Professional workstations to offload VAX Compu-Share systems.

Multi-Journal Accounting (MJA) modules available are General Ledger, Accounts Receivable, Accounts Payable, Payroll and Personnel, and Order Entry/Inventory.

Pro-Accountant modules available are General Ledger, Accounts Payable, and Inventory.

Smaller businesses are defined as those with less than 10 million dollars in annual sales and less than 100 employees.

RMS file structure allows PRO/DATATRIEVE file access.

Compu-Share General Accounting on the Professional includes an important innovation in accounting software. Compu-Share integrated an interface to the Supercomp-Twenty spreadsheet program into the GL-11 General Ledger module. This interface gives you a complete spreadsheet model of accounting information by extracting raw financial data and account descriptions and creating the statement formulas that correspond to the financial statement being generated. This innovation expands the analytical capabilities of Compu-Share's GL-11 General Ledger to include those of a powerful minicomputer spreadsheet.

Compu-Share's availability on VAX and PDP-11-based systems has important implications for users running General Accounting on the Professional. Compu-Share can serve as an overall distributed accounting solution. In this configuration, the Professional serves as a VAX-linked workstation, offloading all screen I/O, editing, and file validation functions from the host system. Such a distributed accounting option provides immense flexibility in meeting company-wide accounting requirements. In addition, because the Professional shares the Record Management System (RMS) file structure with larger Digital computers, files can be accessed with PRO/DATATRIEVE, Digital's popular database management language.

Module Features

All Compu-Share modules share a number of powerful features that set them apart from other accounting systems. Among these is full restartability, which in the case of power loss or other problems allows the module to restart the operation last in process without need for technical assistance.

A special Compu-Share feature is the preprinted forms generator. This facility lets you model system output for your existing preprinted forms, such as customer invoices, statements, payables and payroll checks, and other preprinted forms.

Each Compu-Share module features full interactive editing; reports sent to screen, disk, or printer; automatic file creation and expansion; variable date formats; thorough, clear documentation; a repaint screen function; tailorable postal code format (supporting the new nine-digit zip codes); and general ledger posting from subsidiary systems in detail or summary on an account-by-account basis.

Below is a description of the highlights of each module.

General Ledger. In addition to the integration with the Supercomp-Twenty spreadsheet described above, the GL-11 General Ledger module boasts a number of distinguishing features. A financial statements design facility supports income statement, balance sheet, cash-flow analysis, departmental expense statement, ratio analysis, loan analysis, cost of sales report, changes in financial position, and other statements. General Ledger also allows for user-defined account number formats using from 2 to 12 digits, open-date posting and reporting, and wild-card reporting on account numbers. When integrated with the other Compu-Share modules, General Ledger accepts automated posting from Accounts Receivable, Accounts Payable, and Payroll.

Accounts Receivable. AR-11 Accounts Receivable includes comprehensive customer master file information. You can generate reports using your own customer classifications and set up automatic service charges according to your own parameters. The module supports open item and balance forward by customer, interactive cash application, unapplied credits, and recurring accounts receivable. Powerful reporting options include complete commission reporting and integral sales analysis reports by item, customer, salesperson, department, and date range.

Accounts Payable. AP-11 Accounts Payable is a highly parameter-driven system that features a flexible cash disbursement process and unlimited expense distributions. It supports recurring accounts payable and multiple check formats. The system can also generate and track 1099 information. Its reporting capabilities include aged payables analysis and cash requirements reporting.

Payroll. The PY-11 Payroll module features interactive payroll entry for U.S. as well as Canadian payroll requirements. It includes automatic calculation of earned income credits and tip compensation. It supports piece-rate payrolls, multiple pay frequencies, recurring entries, special deductions and earnings codes, and flexible pay codes for multiple types of pay and general ledger distribution. Payroll also includes comprehensive tax reporting and extensive reporting for support of management decision-making. The PY-11 module is available only from Compu-Share, Inc., 3824-50th Street, Lubbock, TX, 79413, (806) 792-3785. PY-11 is not at this time sold or supported by Digital.

Minimum System Requirements

- Professional 350 or 380 system
- 10- or 33-Mbyte hard disk (10-Mbyte supports up to three Compu-Share modules)
- P/os Hard Disk, Version 1.7a or later

System Options

- LA50, LA100, LA210, LQP02, or LQP03 printers



• Multi-Journal Accounting (MJA)

Order Codes:

MJA General Ledger QA384-C3

MJA Accounts Receivable QA386-C3

MJA Accounts Payable QA387-C3

MJA Payroll and Personnel QA385-C3

MJA Order Entry/Inventory QA388-C3

PRODATA's Multi-Journal Accounting™ (MJA) products are general purpose, fully functional accounting applications targeted for use by small business. Each of the five available modules can be run as a standalone subsidiary ledger or in systems that are fully integrated with the General Ledger module. When run independently, each module provides complete transactional summary reports for posting to manual bookkeeping systems. When integrated with the General Ledger module, all subsidiary systems post transactional summaries automatically to the General Ledger, eliminating manual posting processes.

All MJA modules are menu-driven with a strong emphasis on ease of use. The menus show all available selections at a glance, while each data entry screen is formatted with easy-to-understand prompts. Full online error reporting helps ensure the accuracy of data as it is entered. A fully illustrated user's manual, which assumes no previous computer experience, includes sample data entry screens, systems reports, and tutorial examples.

The MJA system was originally developed on Digital's PDP-11 computers running the RT-11 operating system. In the years since, MJA has been adapted to run under VMS, RSTS, and P/OS operating

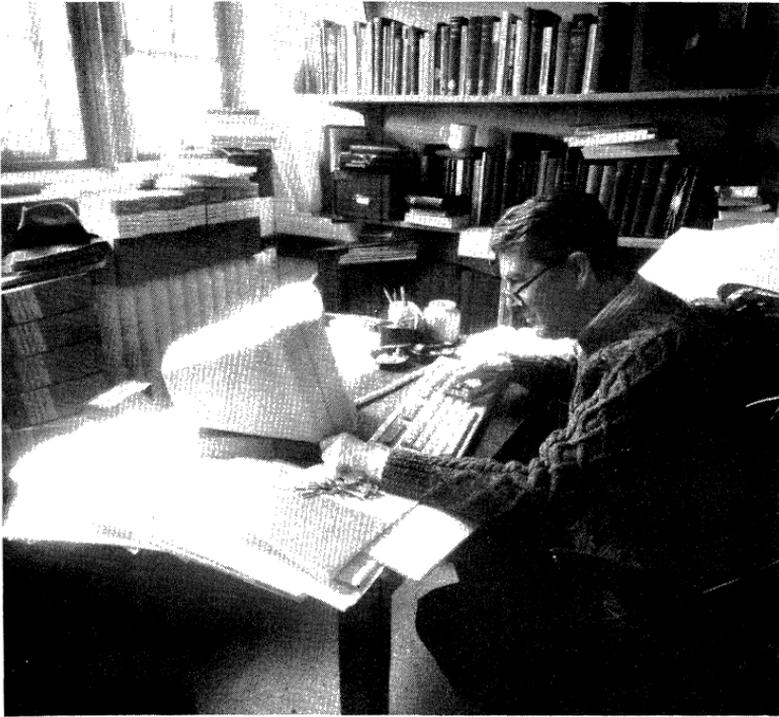
systems, giving MJA broad availability across the Digital product line. This means that MJA can be used in environments where transfer of financial files is desired for consolidation purposes.

MJA modules support multiple companies and departments. Optional password security helps restrict access to financial information to authorized personnel. All reports from system modules can be viewed on screen or printed out on hardcopy.

Below are descriptions of the highlights of each module in the MJA system.

MJA General Ledger provides the capability to generate complete up-to-date financial statements through default formats provided with the package or through user-defined formats created using the financial statement design facility. MJA General Ledger supports multiple companies and multiple departments. Financial statements can be run by department or consolidated at the company level. Automatic posting from the other MJA system modules ensures that the General Ledger truly reflects the current status of the company's financial condition.

MJA Accounts Receivable supports both open item and balance forward customer accounts. Customer master information is tracked with invoice and payment history for accurate account analysis. The module can generate customer statements with aging analysis and credit limits, and accepts both accounts receivable and non-accounts receivable cash receipts. Other features include immediate invoice entry, accumulation of sales commissions, and a dozen standard reports for improved accounts receivable analysis.



MJA Accounts Payable helps you control cash resources by taking maximum advantage of vendor terms and discounts. Vendor activity can be monitored via master reports or online inquiries. The *MJA Accounts Payable* cash disbursement facility provides for partial payments and automatic calculation of discounts. This module includes seven standard reports including check writing and file maintenance.

MJA Payroll and Personnel helps you maintain a complete roster of active and inactive employee records with associated payroll expenses broken out by department or job code. Federal and state taxes are calculated automatically from user-maintainable tables.

This module supports automatic preparation of payroll checks as well as recording of manually issued or voided checks. Overridable miscellaneous employee deductions are retrieved automatically. Nine reports are available, including W-2 forms, 941 reports, and MTD/QTD/YTD totals.

MJA Order Entry/Inventory provides for tracking of customer orders, proper maintenance of inventory levels, and automatic generation of customer invoices. Each module is integrated so that customer orders commit specific items in inventory, invoices are posted to Accounts Receivable and appear in its Sales Journal, and inventory receipts are posted to Accounts Payable and appear in its Purchases Journal. Reports reflect on-hand quantities as well as quantities committed to open orders.

Additional features include sorted picking tickets and printed packing slips. Eleven reports available include Inventory Aging, Sales Performance, and Back Order by Customer.

Minimum System Requirements

- Professional 350 or 380 system
- 5-, 10-, or 33-Mbyte hard disk
- P/os Hard Disk, Version 1.7 or later

System Options

- LA50, LA100, or LA210 dot-matrix printer

• **PRO-Accountant**

Available from: decComp
14752 Sinclair Circle
Tustin, CA 92680
(714) 730-5116

PRO-Accountant™ is a three-module system designed to help professional accountants perform a variety of account services. You can use the General Ledger, Accounts Payable, and Inventory Control as standalone packages or you can combine two or three modules into an integrated system.

PRO-Accountant takes advantage of many of the Professional Operating System's capabilities. Perhaps most important, the PRO-Accountant packages use P/OS's multitasking capabilities to generate, queue, and print reports as background tasks. This lets you continue uninterrupted with your work instead of making you wait every time you request a report. PRO-Accountant uses the P/OS menu structure to present a consistent, easy-to-use interface for less technical users. In addition, the packages support several of the Professional's special keys, including the HELP, DO and EXIT keys.

PRO-Accountant General Ledger

PRO-Accountant General Ledger is tailored for professional accountants who provide service either to multiple clients with different reporting requirements or to single companies with extensive consolidations and multiple company allocations and fund transfers. The chart of accounts supports up to 46,456 departments with department names such as 1AA OR 02F. Wild-card selection, such as 1??, generates financial reports for a range of departments, in this case all departments between 100 and 1zz.

The system maintains two years of financial account balances with one year of budgets. Comparative balance sheets and income statements can compare any range of fiscal periods or budget amounts with computed variance.

You can enter journals for any fiscal period. The journals support three independent control and batch totals to minimize entry errors. The system automatically keeps track of the sign of each journal entry, thus eliminating the need to know whether the entry is a debit or credit account. Only balanced journals can be posted, so your General Ledger is always in balance. General Ledger posting automatically restarts after a power failure, so even a power failure during posting will not corrupt your data files.

The profit account is computed automatically when a report is generated, allowing the contribution to income to be shown by department, division, or all departments.

A unique “alternate company” feature enables the system to maintain complex consolidations without changing data. You can specify your financial data as any set of companies in any order you require.

You can create specialized financial reports using the special report parameter database. This database can control supporting schedules, compress detail accounts, define footnotes, and create additional notes to appear either before or after specific accounts. You can print the report with or without the special information.

The system optionally maintains time and billing information by either entry clerk or company. If you are also running PRO-Accountant Accounts Receivable, you can convert this output into customer invoices.

All reports and posting processes are generated by background tasks so you don't have to stop working while they are processing. Utilities are available to backup or restore selective information, query on the status of background jobs, and display reports on the screen.

PRO-Accountant Accounts Payable

The PRO-Accountant Accounts Payable (A/P) module is a flexible system that allows you to keep a record of purchases, analyze cash requirements, create audit trails, and print checks. The system is tailored to multicompany, multidivision operations in either a service or manufacturing environment.

The system supports invoices with up to 99 line items and up to 99 releases per line item. Requisitions can be input as either purchase orders or vouchers. To support purchase orders, the system prints the orders, generates receiving reports, and, when you receive the merchandise, optionally records shippers' invoices. You can process any vendor with either purchase orders or vouchers or both.

A/P provides full reporting of future cash flow requirements as well as standard reports showing items ordered, items received, and other accounts payable information. The system automatically ages payables every time it generates a report. You can generate an aging report for any valid date, sequenced by date or vendor order and aged by due date, receive date, or invoice date. You can also select reports with or without vendor terms and lead/offset dates, and can request a discount report for a given date.

If you like, the system will keep a full purchasing history both by vendor and department code. History transactions can be summarized to minimize use of disk space; an additional identifier lets you tag purchases to specific departments or jobs to provide cost summaries.

The A/P system makes managing 1099 vendors easier by printing IRS 1099 forms with all pertinent information at year end.

The A/P system is fully integrated with both the PRO-Accountant General Ledger and Inventory packages. A/P automatically creates G/L journals when you create vouchers, and assigns individual expense accounts by line item. It also creates journals during both automatic and manual check generation. Transactions can be sent to other Professionals or to VAX systems for distributed accounting applications. If you set it up to interface with the Inventory package, A/P validates part numbers, supplies automatic pricing information, and creates inventory quantity balances and transactions during voucher entry.

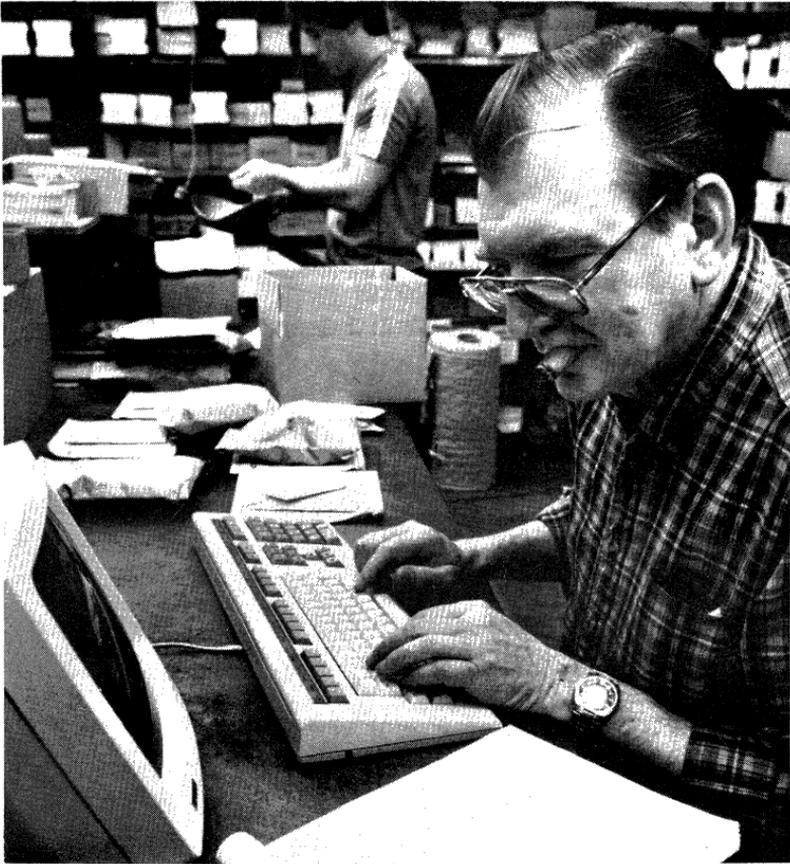
The system is compatible with MAPS/PRO Financial Modeling, allowing you to perform full financial modeling based on current data without the need to translate accounting information into spreadsheet formats.

PRO-Accountant Inventory

The PRO-Accountant Inventory System helps you track raw materials, work in progress, or finished goods inventory. The Inventory module is tailored to services or manufacturing environments and works either as a standalone system or in conjunction with PRO-Accountant Accounts Payable.

The Inventory System maintains descriptions, balance fields, and up to three different prices for each part. The part identification code consists of up to 12 characters of part identification and four characters of product line.

The system supports both online and transaction-driven inventory control. Balance fields are updated immediately, and complete transactions provide an audit trail. If you set up the Inventory



System to interface with Accounts Payable, A/P automatically updates balances and writes transactions on receipts.

Inventory supports most accepted valuation methods, including standard cost, average cost, LIFO price, and FIFO price. You can observe the effect of different pricing algorithms by doing the valuation several times.

The Inventory System's extensive reporting capabilities let you accumulate both purchase and sales history information and determine economic order quantities. The system can generate reports for a range of parts or product lines. To facilitate physical inventories, the system can generate inventory tags and control sheets.

Minimum System Requirements

- Professional 350 or 380 system
- 10- or 33-Mbyte hard disk
- P/OS Hard Disk, Version 1.7 or later

System Options

- LA50, LA100, or LA210 Printer
- MAPS/PRO Financial Modeling
- MAPS/PRO Graphics
- MULTIPLAN

- **MBSI RealWorld Accounting**

MBSI RealWorld™ accounting software runs on the Professional under the RT-11 operating system. A description of the available packages can be found later in this chapter in the RT-11 Software Library.

- **CPA Time and Billing System**

Available from: BETA Computer Corporation
221 Parkway North
Waterford, CT 06385
(203) 442-8775

The CPA system is a time and billing program designed to meet the needs of small to medium-sized accounting firms. The system posts time, cost, and cash receipts for each client. It also produces invoices, work in progress reports, and accounts-receivable aging analysis for selected clients. The system also provides a variety of income analysis, employee productivity, and firm time reports.

• **On-Line Accounting**

Available from: Applied Software Development Corporation
Route 1, Box 328
Parkin, AK 72373
(501) 755-3908

On-Line Accounting™ contains General Ledger, Accounts Payable, and Payroll/Accounts Receivable modules. Features include online transactions for the entire year, departmental or project tracking, and support for government forms 501 and 511.

• **Computer-On Accounting System**

Available from: Computer-On
1360 Ocean Parkway
Brooklyn, NY 11230
(212) 645-6233

The Computer-On Accounting System is a comprehensive accounting package for small businesses that can be customized to your company's special business and accounting needs. It is also available on MicroPDP-11 and PDP-11 systems.

Each module includes password protection, extensive data file integrity-checking, and back-up/restore facilities. Modules can be used separately for stand-alone applications, or interfaced with the General Ledger.

The General Ledger supports multiple profit centers and journalized transaction posting and editing. It allows online account detail inquiry, trial balance reporting, and flexible year-end closing procedures.

Accounts Receivable handles both open item and balance forward customers and provides maintenance of both the salesperson and customer files. It generates aging reports and statements, sales commissions reports, and automatically calculates and posts finance charges.

Accounts Payable handles new payables, adjustments and cancellations, and provides cash requirements and vendor analysis reporting. It allows flexible payment selection, including partial payments, with pre-check-writing reports.

- **Communications**



- **PRO/DECnet**

Order Code: QBA44-H3

DECnet is the family of software that allows Digital computers to form high-speed communication networks. DECnet provides the organization and management tools for a network, as well as many specific utilities and applications. It also provides the foundation for many layered network applications in office automation, database management, communications, and other areas.

PRO/DECnet ties the Professional into the larger Digital Network Architecture. This architecture allows full compatibility between Professional, larger PDP-11, VAX, and DECSYSTEM-10 and DECSYSTEM-20 mainframe systems. PRO/DECnet is implemented through Ethernet, a common local area network (LAN) protocol.

Using PRO/DECnet, you can create small local area networks of Professionals and other Digital computers or tie into existing DECnet networks of any size. In either case, the Professional becomes a fully functional end node in the network.

Fast, Efficient Communication

Whatever the size or configuration of the DECnet network, the function remains the same: to communicate faster, more easily, and more efficiently. Communication takes place at 10 Mbits per second over the Ethernet link. And DECnet not only increases communication speed, it can perform multiple background tasks at the same time it is performing a foreground task.

PRO/DECnet supports a wide variety of sophisticated communication functions, both user-to-user and computer-to-computer. The PRO/DECnet Phone utility provides realtime, “terminal-to-terminal” communications between users on DECnet nodes. Two users can literally “type” a conversation using keyboard and screen. The system also has a mail utility that allows the user to send and receive mail across the network.

PRO/DECnet software provides virtual terminal emulation—without modem dial-ups or communication set-ups. A Professional can act as a local terminal to any node in the network (except another Professional).

In a local area network, PRO/DECnet allows you to access files and directories on remote systems. It allows you to execute programs on remote systems. It even allows simultaneous links between a Professional and one or more remote nodes. For example, you could transfer files from one node and use the database of another node at the same time. The system also supports program-to-program communication over multiple, simultaneous logical links. Users who wish to develop distributed applications using PRO/DECnet’s task-to-task capability will need to purchase the optional PRO/Tool Kit.

Besides providing utilities and applications for high-speed communications, PRO/DECnet provides the tools for network management. These utilities have been designed for users with no formal training or experience in data communication. They make use of a menu and forms-driven user interface and extensive online help.

Like all DECnet products, PRO/DECnet includes a Network Management Listener (NML). This can be used by a network administrator for routine maintenance, fault isolation, or performance evaluation purposes. A File Access Listener (FAL) allows a properly

authorized individual at a remote terminal to copy a file to or from the Professional. It also can be used to open a file remotely and to access records on the Professional.

Creating a Network

PRO/DECnet uses a combination of hardware and software to create DECnet networks. Once connected, the Professional will be defined as a Phase IV Ethernet end node. This allows it to communicate with any other Digital computer in a Phase IV implementation of DECnet. It also allows a Professional to communicate with Phase III DECnet nodes through a communications server router or through a VAX/VMS or PDP-11/RSX host routing node.

There are two basic ways to network a Professional. Both require the Ethernet Controller Module, which occupies one option slot on the Professional, and DECnet software.

Where Ethernet coaxial cabling is already supporting a DECnet network, the Professional can tie in using an H4000 Ethernet transceiver.

Where no network exists, up to eight Professionals (or other Digital systems) can be connected to a DELNI to create a network. (See Chapter 6 for a description of the DELNI hardware option.) The DELNI, which is in effect a short-range Ethernet system, can in turn be connected to a larger DECnet network. In this way, a small local area network can be connected to a larger local area network (LAN) or even wide area networks (WAN).

Once integrated into a large DECnet network, there is practically no limit to the Professional's communications capabilities—even with IBM and other non-Digital systems via gateways and packet switching.

PRO/DECnet is the first DECnet product that is customer-installable. Hardware installation involves sliding the DECNA Ethernet Controller Module into the Professional option cage and connecting the Professional to an Ethernet coaxial cable or DELNI. Software installation simply involves copying the PRO/DECnet software from diskette to hard disk, running a setup utility to define a few variables, and running an installation verification test. No special tools, training, or networking experience are required.

Minimum System Requirements

- Professional 350 or 380 system
 - 5-, 10-, or 33-Mbyte hard disk
 - P/OS Hard Disk, Version 2.0 or later
 - DECNA Ethernet Controller Module
 - DELNI Local Area Network
- or
- H4000 Ethernet Transceiver (for existing networks)



PRO/Communications

Order Code: QBA05 (Hard Disk)
 QBE05 (Hard Disk, Europe)
 QBA45 (Diskette-based Professional 350/380)
 QBE45 (Diskette-based Professional 350/380,
 Europe)

PRO/Communications is the primary communications package for the Professional, performing a wide range of asynchronous communications functions. While many computers prominently feature communications capabilities, few can match the combination of multiple terminal emulations, file conversion services, file transfer capabilities (usually with full error checking), and support for voice/data communications offered by PRO/Communications. And in this version of PRO/Communications, you will find new support for such Digital hardware innovations as the Mini-Exchange and the Telephone Management System.

Terminal Emulation

Pro/Communications terminal emulation mode allows the Professional to emulate a standard ASCII video terminal in communicating with any other system capable of supporting asynchronous terminal communications. This lets you use your Professional in any of the applications described below. (Additional terminal emulation capabilities are available with other communications software packages described later in this section.)

First, PRO/Communications terminal emulation capabilities allow you to access applications software or programming languages residing on a host system.

In addition, terminal emulation allows you to access and exchange information with remote databases. The Professional can transmit an ASCII file or document from a local disk or diskette to a host database or database network. Conversely, the Professional can store ASCII information viewed on the VR201 display to a local disk or diskette. Sources of such information could include data services such as CompuServe,TM Dow Jones News/Retrieval, and The Source.

PRO/Communications gives the Professional access to x.25 public data networks. Such networks, which provide low-cost data transfer through high-speed switching computers, can be accessed by dialing into a "Packet Assembler and Disassembler" (or PAD) as an asynchronous terminal.

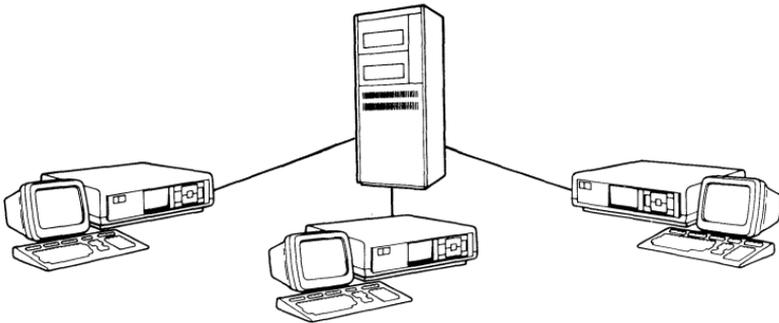
Your Professional with PRO/Communications can also perform REGIS Graphics Emulation. REGIS is the Remote Graphics Instruction Set, a Digital host system graphics program. Pro/Communications emulates a Digital VT125 Graphics Terminal by interpreting REGIS Graphics commands transmitted by a remote system. VT125 emulation and REGIS interpretation mean access to the advanced graphics capabilities of much larger computers.

Finally, PRO/Communications will let you develop Professional applications on host computers using the Professional Host Tool Kit for either VAX/VMS or RSX-11M/M-PLUS systems.

File Transfers with PRO/Communications

The Professional File Transfer utility gives Professional users new flexibility in moving files between machines. The Professional-to-Professional file transfer capability allows two or more Professionals to exchange ASCII, binary, or RMS file structures directly, independent of a host system.

Other file transfer capabilities allow you to use the larger file storage capacity of an RSX-11M/M-PLUS or VAX/VMS host, while retaining the convenience of having your own personal workstation. The PRO/Communications host file transfer capability allows complex ASCII, binary, or RMS files to be transferred from



PRO/Communications provides many communications capabilities, including file transfer between Professionals and VAXes.

the Professional to either a PDP-11 or VAX-11 host system running Professional Host Communications software. Both of the above file transfer operations take advantage of Digital's error-correcting protocol.

Text-file transfer lets you transfer ASCII and text files to or from a remote system, another Professional, or another personal computer that does not share the Professional File Transfer utility.

Taking advantage of the Professional multitasking capabilities, unattended DECmate document transfer (DX) is supported through PRO/Communications in background mode. Meanwhile, the Professional can run word processing or other tasks in foreground mode.

File Conversion Services

PRO/Communications includes a number of useful file conversion routines. ASCII and WPS conversion utilities are provided to translate incoming WPS files (from DECmates or other Digital systems) to ASCII character format, allowing the editing of WPS files with PROSE or any other word processing editor installed on the Professional. You can then print files locally on your Professional's printer.

Another conversion routine allows you to convert the Professional files for transferral to DECmates, while a third converts files into the National Replacement Character Set for several languages.

Professional Phone Book and Call Services

PRO/Communications includes an intelligent phone directory system, the Professional Communications Phonebook, which allows you to store, edit, or delete your most frequently called names, phone numbers, and addresses. The Phonebook can store phone numbers with up to 32 digits, allowing international dialing and access to long distance telephone services.

The Phonebook can also be used to store the name of a host computer and associated communications port setup information. You won't have to set up line and device characteristics each time you establish a telephone connection.

Using Call Services and either the Telephone Management System (TMS) or an intelligent modem, you can automatically dial phone numbers stored in the Professional Phonebook. When used with PRO/Communications, TMS (described in Chapter 6) can originate or automatically answer voice or data calls on either of its two additional TMS phone lines. All Pro/Communications functions are supported over TMS communications lines.

PRO/Communications also supports the Mini-Exchange hardware option (also described in Chapter 6), a communications tool that provides automatic port-selection capabilities for the purposes of file transfer and shared device access among microcomputers.

Digital offers Computer Based Instruction (CBI) to help you learn how to use PRO/Communications while working directly on your Professional. You move at your own pace, taking the course whenever you like, as often as you like. See the System Options section below for the names and order numbers for PRO/Communications CBI.

Minimum System Requirements

- Professional 325, 350, or 380 system
- 5-, 10-, or 33-Mbyte hard disk (required for Pro/Communications Hard Disk only)
- P/OS Diskette or P/OS Hard Disk

Cables and hardware required depend on applications and sites:

- Modem cable for modem connection
 - Null modem cable for local host connection
 - Multiple computers or other devices—Intelligent Communication Processor or other multiplexers or the Mini-Exchange
 - Remote telephone connection using either
 - DF02-AC, or DF03-ac intelligent modem (or equivalent) capable of autodial and autoanswer; and Digital cable BCC04-D or standard EIA RS232 cables and connectors.
 - Mini-Exchange option. To use an external modem for autodial and autoanswer operations to a remote host, a DF adapter cable is provided with the Mini-Exchange option.
- Note: Pro/Communications for Hard Disk Version 1.8 is not compatible with P/OS Hard Disk versions prior to Version 1.7.

System Options

- Professional Host Communications, Version 1.7, available for VAX/VMS and RSX-11M and RSX-11M-PLUS systems
- Extended Bit Map (Required for VT125 graphics emulation)
- DF02-AC, DF03-AC Modem (Optional for use with Professional Phonebook and Call Services)
- Telephone Management System (Optional for use with Professional Phonebook and Call Services)
- Mini-Exchange (DFMSA-AA)
- Computer Based Instruction (CBI) courses: *How to Use PRO/Communications for Hard Disk System* (order number EY-1975E-CS) and *How to Use PRO/Communications for Diskette System* (order number EY-1976E-CS)

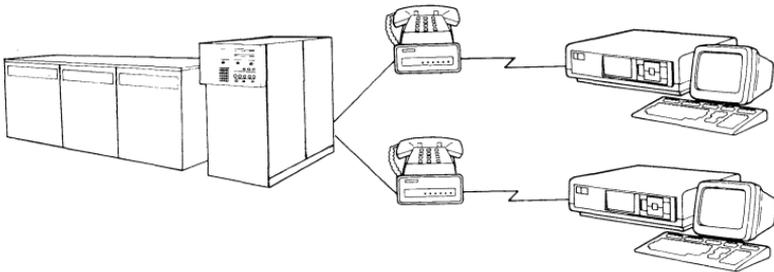


• PRO 2780/3780

Order Code: QBA47-A3

The PRO 2780/3780 communications facility enables a Professional 300 Series workstation to communicate with other devices operating within International Business Machine (IBM) Binary Synchronous Data Link (BSC) protocol environments. This brings a range of communications capabilities to your Professional. The PRO 2780/3780-equipped Professional can work as a 2780/3780 Remote Job Entry station, use local Digital printers to emulate IBM 3287 printers, and exchange information with other computers that have 2780/3780 communications capabilities, including other Professionals running this package.

Digital has designed this software according to the specifications for IBM 2780 and 3780 data transmission terminals as defined in IBM documents GA27-3005 and GA27-3063, respectively. Any computer with software designed according to those specifications should be a satisfactory remote host.



The Professional supports several packages that enable it to communicate with IBM computers.

PRO 2780/3780 was developed to aid the user in sharing information among a Professional and a variety of host machines. Although not a formal industry standard, the 2780/3780 protocol has great acceptance and usage in the data processing community. With PRO-2780/3780, your Professional can communicate with that same broad range of computers.

PRO 2780/3780 is designed to offer simple and reliable access to these machines. It features customer installation, online computer-based instruction, and online diagnostics and error logging. A hierarchy of straightforward menus and forms guides you through system setup and operation. The product includes an introductory overview and onscreen "help" information, which is available at any time.

System Functions

PRO 2780/3780 works under the P/OS operating system and can be accessed through the Professional's system of menus. The P/OS-to-IBM data format conversion is transparent to the user and handled entirely by the software.

PRO 2780/3780 allows your Professional to perform batch or segmented batch transmissions. The BSC protocol with its basic data link control provides transmission checking and a choice of transmission codes, either EBCDIC (Extended Binary Coded Decimal Interchange Code) or US ASCII. The system affords added flexibility by allowing you to hold files in any part of the Professional's file system.

Other features of PRO 2780/3780 include a 2780 multiple record transmission option, allowing the selection of print and punch components on receive.

PRO 2780/3780 supports vertical and horizontal forms control. The former permits the formatting of printed data under the control of the carriage-control tape and carriage-control commands. The horizontal forms control provides an electronic tab function identical in operation to that of a standard typewriter.

PRO 2780/3780 also provides IBM model 3287 printer emulation. In this mode, a Digital LA50, LA100, LA210, LQP02, or LQP03 printer locally attached to your Professional can operate as an IBM 3287 printer.

While these functions are taking place, the Professional multitasking capability will allow you to get on to the other projects at hand. Once communication with the host computer has been established, a Professional with a hard disk and the 2780/3780 option can send or receive files unattended.

3780 Enhancements

The 3780 protocol is a second-generation refinement of the older 2780 protocol. As such, it includes a number of enhancements over its predecessor. The Professional will support a number of these features.

The 3780 protocol allows binary data file transfer with EBCDIC Transparency. The protocol also supports space compression and expansion. This removes spaces from transmitted data and inserts spaces in received data, reducing transmission time by eliminating the transmission of contiguous spaces.

Communications

PRO 2780/3780 allows communications to BSC networks over a wide range of communications links. The product operates using

a single point-to-point communications line. This line can be half- or full-duplex, and transmission speeds of up to 9600 bits per second can be achieved on an otherwise idle system. The system works through the Professional EIA RS232-C interface.

Communications characteristics for your particular configuration are defined through a series of questions in the software set-up routine. If the communications characteristics change (for example, because of changes in the host computer or in your own information requirements) they can be easily modified.

Minimum System Requirements

- Professional 350 or 380 system
- 5-, 10-, or 33-Mbyte hard disk
- P/OS Hard Disk, Version 1.7 or later
- BCC04-xx modem cable and one of the following modems (or equivalent): Bell System 201C, 208A, 209A, or approved PTT-supplied modems (the latter outside US).



• **PRISM**

Order Code: QA176-C3 (hard disk)
QA753-C3 (diskette version)

The Professional Inter-System Management package, or PRISM, is a Professional/IBM communications product developed by Advanced Systems Concepts, Inc., of Hoboken, New Jersey.

It has two main facilities.

The Virtual Terminal Emulator (VTE) allows your Professional to emulate an IBM 3276 Model 2 Cluster Controller and a 3278 Model 2 terminal. VTE uses the 3270 subset of IBM's Binary Synchronous (BSC) protocol. While in terminal emulation mode, your Professional can be addressed by the BSC network as a 3270 BSC device. If

your Professional has an attached printer, VTE will provide 3287 printer emulation as well, allowing you to print what appears on the screen or to drive the printer from the IBM host system.

A second mode of PRISM operation, the Intertask Communication Facility, allows you to write programs that communicate with the IBM system. A set of callable routines (MACRO library definitions and an object library) is provided, allowing you to write programs that read and write data across the 3270 link. With this facility, a task can be written to transfer files or to share resources between the Professional and IBM systems. Digital's Professional Developers' Tool Kit is necessary for creating these intertask programs.

The PRISM software package also includes a computer-based instruction course called TUTOR, which teaches you how to set up and use PRISM. TUTOR guides even inexperienced users through PRISM's installation, connection of a modem, PRISM menu displays, and overall PRISM operation. It also describes the software requirements for the IBM system.

Communications

PRISM allows communications to BSC networks over a wide range of communications links. Using the Professional's communication port, PRISM supports local hardwired connection and remote modem access at up to 9600 baud. Point-to-point modem links support half-duplex operations, external clocking, communications statistics accumulation, and constant request to send (RTS).

Several Professionals and IBM 327x controllers can share a single hardwired communications line to the IBM system through the multidrop or multipoint capability of the 3270 protocol.

System Operation

Since the Professional keypad is substantially different from that of the IBM 3278, VTE changes the functions of some Professional keys

to emulate the IBM keypads. As a result, all of the special function keys available on an IBM 3278 Model 2 terminal are emulated on your Professional. In addition, PRISM provides special keys to assist you during terminal emulation mode. These include the Copy key, for making hardcopy printouts of the current screen; the Status key, which informs you of current terminal conditions and displays error messages; the Refresh key, to redisplay the current screen; and the Professional's standard Help, Exit, and Main-Screen keys.

If you have an optional printer on your Professional, PRISM will provide IBM 3287 printer emulation support. The IBM output can be directed straight to the printer or to an intermediate file for subsequent printing.

Intertask Communication Facility

The PRISM Intertask Communication Facility allows P/OS application developers, using the PRO/Tool Kit or the Professional Host Tool Kit, to create applications that share resources or transfer data to and from the host system. This facility includes routines for simplifying the process of writing a program to communicate with an IBM task. Programs written with the Intertask Communication Facility can be written in any language supported by the Professional Tool Kits.

Minimum System Requirements

- Professional 325, 350, or 380 system
- P/OS Operating System

System Options

- Synchronous Modem. Bell 212-A (212-A synchronous mode only), 201-C, 208-B or compatible model required for switched operations.
- Professional Tool Kits (for Intertask Communication Facility)



• PRO/SNA Terminal and Printer Emulator (PRO/SNA/TE)

Order Code: QBA49-A3

The PRO/SNA Terminal and Printer Emulator, PRO/SNA/TE, lets you use your Professional as you would an IBM 3270 terminal—to perform interactive data entry, program development, and inquiry, updating, and transaction processing of the host computer's central database. When using the PRO/SNA/TE emulation package, the Professional's keyboard is mapped out to duplicate the 3270 keyboard functions.

The integrated printer emulation feature lets you print out IBM files, emulating an IBM 3287 printer with your Digital LA50, LA100, LA210, LQP02, or LQP03 printer. The IBM output can be directed to the printer or to a file for printing at a later time.

Designed for easy access to large IBM mainframes operating in the SNA environment, the PRO/SNA/TE emulation package features online help screens and computer-based instruction to guide you through system operation. Product documentation also includes information that you and the IBM system manager will use to set up the specific line characteristics needed to communicate with your IBM host system. These and other features make the PRO/SNA/TE package completely customer-installable. Online diagnostics and error logging add reliability to the system.

PRO/SNA/TE provides 3278 (Model 1 and 2) terminal emulation capabilities. While in terminal emulation mode the Professional can be addressed by the SNA network as an SNA Logical Unit (LU) Type 2 control unit.

The Copy-Screen and Print-Screen function keys used in terminal emulation mode will allow a Professional, emulating a 3278 Information Display Screen, to copy the contents of a currently displayed screen to a local disk file residing on the Professional system. Or you can print the current contents of a screen on a printer locally attached to the Professional.

The PRO/SNA/TE printer emulator will support both SNA LU type 1 SNA Character Stream (SCS) format and SNA LU Type 3 3270 Data Stream Compatibility (DSC) format.

The communications link for the PRO/SNA/TE emulation package is to an IBM 37xx Communications Controller through the standard communications port running in synchronous mode on the following communications links: half-duplex, switched or nonswitched point-to-point; full-duplex, nonswitched point-to-point; or half-duplex, nonswitched multipoint. The single communications line can operate at up to 9600 bits per second. The multipoint line support allows the Professional to coexist on a line with any SDLC or SDLC-compatible devices (for example, other Professionals). However, PRO/SNA does not work on a line operating in non-return-to-zero-inverted (NRZI) mode and does not support SDLC loop connections.

The PRO/SNA/TE package can be run simultaneously with the PRO/SNA/RJE package.

Minimum System Requirements

- Professional 350 or 380 system
- 5-, 10-, or 33-Mbyte hard disk
- P/os Hard Disk, Version 1.7 or later
- BCC04-xx modem cables and one of the following modems or its equivalent: Bell System 201C, 208A, 209A, or appropriate PTT-supplied modems (the latter for use outside the U.S.).



• **PRO/SNA Remote Job Entry (PRO/SNA/RJE)**

Order Code: QBA48-A3

The PRO/SNA Remote Job Entry (PRO/SNA/RJE) system lets you use the Professional as an IBM 3770 RJE workstation. While in this mode, your Professional can submit batch requests to an IBM mainframe operating in an SNA environment supporting Job Entry System (JES) I and II. You can initiate an RJE session from your Professional, or it can be initiated by an IBM host computer.

Instead of using a cardpunch to create a batch job, you use an editor to write a set of instructions that process data residing in the host computer. When this information is processed, it can be printed locally on your Professional's printer or stored as a file for printing at a later time.

Because the PRO/SNA/RJE system works by emulating a 3276 model 12 cluster controller, your Professional has the ability to emulate up to six SNA logical units (LUs). The system will allow submission of up to 12 files to a remote host. Multiple Dataset print/punch output is supported.

The SNA/RJE system also allows your Professional to check the status of jobs on the IBM system for you. In addition, PRO/SNA/RJE protocol emulation can run in the background mode while you work on other tasks.

Designed for easy access to large IBM mainframes operating in the SNA environment, the PRO/SNA/RJE package features online help screens and computer-based instruction to guide you through system operation. Product documentation also includes information that you and the IBM system manager will use to set up the specific line characteristics needed to communicate with your IBM host system. These and other features make the PRO/SNA/TE package completely customer-installable. Online diagnostics and error logging add reliability to the system.

The communications link for the PRO/SNA/RJE package is to an IBM 37xx Communications Controller through the standard communications port running in synchronous mode on the following communications links: half-duplex, switched or non-switched point-to-point; full-duplex, nonswitched point-to-point; or half-duplex, nonswitched multipoint. The single communications line can operate at up to 9600 bits per second. The multipoint line support allows the Professional to coexist on a line with any SDLC or SDLC-compatible devices (for example, other Professionals). However, PRO/SNA does not work on a line operating in non-return-to-zero-inverted (NRZI) mode and does not support SDLC loop connections.

The PRO/SNA/RJE system can be run simultaneously with the PRO/SNA/TE system.

Minimum System Requirements

- Professional 350 or 380 system
- 5-, 10-, or 33-Mbyte hard disk
- P/OS Hard Disk, Version 1.7 or later
- Synchronous Modem: Bell 212-A synchronous mode only, 201-C, 208-B, or compatible modem required for switched operations. For leased line connection, one of the following modems or its equivalent: Bell System 201C, 208A, or 209A. A BCC04-xx modem cable is required for either modem. For users outside the United States, any PTT-supplied modem is suitable.

BURCOM-11

Available from: Applied Information Systems
500 Eastowne Drive
Chapel Hill, NC 27514

BURCOM-11 allows the Professional to communicate with Burroughs computers using synchronous or asynchronous protocols.

• **DIGImail**

Available from: ATS Data Processing, Inc.
1101 North 9th Avenue
Pensacola, FL 32501
(904) 433-7578

DIGImail is an electronic mail system for Professionals and PDP-11 and VAX networks. It can be integrated into DIGIText word processing systems.

• **PhoneLink**

Available from: Virtual Microsystems
2150 Shattuck Ave., Suite 720
Berkeley, CA 94704
(415) 841-9594

PhoneLink is a communications program designed to provide file transfer between the Professional and minicomputers and microcomputers running the CP/M, MS-DOS, RT-11, UNIX, or VMS operating systems.

• **poly-XFR**

Available from: Polygon Associates
Nine American Industrial
St. Louis, MO 63043
(314) 576-7709

The poly-XFR™ program is an asynchronous communications package that allows Professional users to transfer files to and from other personal computers, minicomputers, and mainframes that also have poly-XFR software.

• **PRO-Kermit**

Available from: DECUS
249 Northboro Road, BPO2
Marlboro, MA 01752
(617) 480-3422

PRO-Kermit permits communications over terminal lines between a Professional and other computer systems, including PDP-11, VAX, DECSYSTEM-10 and DECSYSTEM-20, IBM 370, IBM PC, Apple,TM and CP/M systems.

• **TELTEX-11**

Available from: ATS Data Processing, Inc.
1101 North 9th Avenue
Pensacola, FL 32501
(904) 433-7578

TELTEX-11 is an auxiliary subsystem that enables a Professional running the DIGitext word processing system to communicate worldwide through the commercial telegraph system.

• **XOREN IPL-11 File Transfer Package**

Available from: Midcom Corporation
1940 N. Tustin, Suite 101
Orange, CA 92665
(714) 998-6041

XOREN IPL-11TM allows file transfer between a Professional and Professional, PDP-11, LSI-11, and VAX systems, even when they have different operating systems.



• Data Management

• PRO/DATATRIEVE

Order Code: QBA43-A3

DATATRIEVE is Digital's most popular minicomputer-based database management system. For most desktop computers, running such powerful software is out of the question. But the Professional's PDP-11 architecture makes DATATRIEVE a natural member of the "personal PDP-11's" software portfolio. In addition, PRO/DATATRIEVE is compatible with VAX DATATRIEVE and DATATRIEVE-11, allowing the development of true distributed PRO/DATATRIEVE applications specifically tailored to your own requirements.

Two software products constitute the implementation of DATATRIEVE and its accompanying tools on the Professional: PRO/DATATRIEVE, an interactive language for database development, queries, and reporting; and PRO/RDT, a software product allowing the Professional to extract selected information from domains on a remote host. PRO/RDT is described in the next software product description in this chapter.

Purchasers of PRO/DATATRIEVE can also buy the documentation-only option, Tool Kit PRO/DATATRIEVE. Tool Kit PRO/DATATRIEVE shows programmers how to develop distributed and layered DATATRIEVE applications on the Professional. The Tool Kit PRO/DATATRIEVE option is described later in this software description.

PRO/DATATRIEVE—The Foundation for Professional DATATRIEVE Capabilities

PRO/DATATRIEVE brings the power of DATATRIEVE to the Professional computer. It offers a combination of ease of use, applications development flexibility, and performance unmatched by microcomputer database systems.

ADR/DATA							•					•	•	•		
PRO/Smart Mailer											•	•			•	•
PRO/Synergy Data Manager					•	•	•					•			•	•

Notes: PRO/RDT is a DATATRIEVE product designed to extract information from DATATRIEVE domains on remote host systems for local analysis and report generation.

“Distributed data management applications” are defined as those in which the Professional workstation can share, manipulate, and upload database files located on remote host systems.

Advanced application development capabilities for PRO/DATATRIEVE are found in Tool Kit PRO/DATATRIEVE, a documentation option that shows you how to create applications that can be added to the P/OS menu, that can be called from any PRO Tool Kit language, or that offer complete distributed processing on your Professional workstation.

EasyEntry is a product designed specifically for the development of powerful data entry systems. The compatible implementations noted for VAX and MicroPDP-11 systems are available from Applied Information Systems, Inc., Chapel Hill, NC (919) 942-7801.

```

#32,918 TASHKENT  TRAINEE  LITERATURE

DTR> PRINT SALARY,L-NAME,STATUS,DEPT OF EMPLOYEES WITH SALARY LT
[Looking for a value expression]
CDN> 25000 OR STATUS CONT "TRAINEE" SORTED BY SALARY

```

SALARY	LAST NAME	STATUS	DEPT
\$2,000	BOOLE	EXPERIENCED	MATHEMATICS
\$4,000	WHITE	EXPERIENCED	MATHEMATICS
\$14,000	BOOLE	EXPERIENCED	ASTRONOMY
\$20,000	SMITH	TRAINEE	MATHEMATICS
\$20,000	JONES	TRAINEE	MATHEMATICS
\$20,000	BOOLE	TRAINEE	ASTRONOMY
\$21,000	BOOLE	EXPERIENCED	ASTRONOMY
\$21,000	CARON	TRAINEE	GEOGRAPHY
\$23,000	DIDN	TRAINEE	MATHEMATICS
\$23,908	FREIBURG	EXPERIENCED	LITERATURE
\$24,802	CHONTZ	TRAINEE	ASTRONOMY
\$25,023	WITTGEN	TRAINEE	PSYCHOLOGY
\$25,392	HAMMER	TRAINEE	PHILOSOPHY
\$25,723	SCHWEIK	TRAINEE	AGRICULTURE
\$50,000	MORRISON	TRAINEE	PHILOSOPHY

PRO/DATATRIEVE is an interactive query, report, and data maintenance system. Even without programming expertise, you can use PRO/DATATRIEVE to work efficiently with your organization's information. Then, using the PRO/DATATRIEVE Report Writer, you can produce detailed reports and statistical breakdowns of this information.

Minicomputer Power, Microcomputer Ease Of Use

PRO/DATATRIEVE is a full implementation of the DATATRIEVE-11 system available on PDP-11 systems. This yields two immediate benefits. First, you can transfer existing DATATRIEVE-11 applications to the Professional, subject to available disk space, with a minimum of reformatting. And second, users familiar with DATATRIEVE on PDP-11 systems will be familiar with PRO/DATATRIEVE without additional training.

PRO/DATATRIEVE's power does not mean it is inappropriate for less experienced users. Without any special programming knowledge, you can quickly learn to store, retrieve, update, format, and sort your data to meet relatively sophisticated information management needs.

You use English-like commands to direct data retrieval, modification, and display. PRO/DATATRIEVE recognizes many of the standard Professional keys, including Help, Exit, Main Screen, Do, Cancel, and Interrupt. The system automatically prompts for both command and data entry. An online help facility is always available, as is PRO/DATATRIEVE's Guide Mode. Guide Mode leads you through PRO/DATATRIEVE sessions by giving additional prompts and information as you type in commands.

Digital offers a variety of instructional aids to help you learn how to use PRO/DATATRIEVE. These include a tutorial manual—*PRO/DATATRIEVE for Beginners*—and a Computer Based Instruction program (purchased separately) that provides onscreen self-paced learning.

PRO/DATATRIEVE also includes tools that simplify application development for less experienced users. The Application Design Tool (ADT), for example, quickly guides you through the design of your database. Through ADT's interactive dialog, you can specify the way you want records stored in your database without investing in programming resources or having special knowledge of COBOL or other high-level languages.

Manage And Retrieve Information Effectively

One of the most important tests of a database management system is how well it allows you to access the information it contains. As an interactive query language, PRO/DATATRIEVE lets you find information quickly and retrieve it in nearly any format you require.

Many PRO/DATATRIEVE commands for retrieval have both simple and advanced forms. By using simple command forms, beginning users can find, update, sort, and display records easily. The more advanced forms of these commands let you perform more complex functions.

PRO/DATATRIEVE includes a number of other data retrieval features. A data formatting capability is available for storing a variety of numeric, date, and alphabetic data. Built-in statistical functions include TOTAL, AVERAGE, MAX, MIN, and COUNT.

Reports: The Information You Need, the Form You Want

With the PRO/DATATRIEVE Report Writer you can organize and summarize information contained in your database in clear, easy-to-read, meaningful reports. You can display a report on your Professional screen, print it, or write it to a file for subsequent editing or printing. You can control the format of a report or allow the Report Writer to do some or all of the formatting automatically.

The simplest form of a report specification consists of the commands REPORT, PRINT, and END_REPORT. You can create more detailed and complex reports by controlling the sort order, specifying control breaks to create report sections, creating title pages, using statistical functions to create summary lines and pages, and formatting report columns.

A Dictionary for Your Database

The “data dictionary” contains information that helps you with query, update, and reporting operations. It contains record definitions, which describe the format of records in a file, and domain definitions, which link record definitions with data files. These definitions allow substantial data and program independence because record definitions can cross file boundaries. This means you can use one record definition to access information in several different data files.

The data dictionary also lets you store PRO/DATATRIEVE procedures, tables, and views. A procedure is a group of frequently used statements or commands that you have created and named. In effect, procedures are PRO/DATATRIEVE programs that allow you to store and execute whole sets of often-used PRO/DATATRIEVE commands. Once stored in a data dictionary, the procedure can be executed simply by entering the procedure name. Tables contain code and translation pairs that allow you to store small bits of data in files, but to display the longer translations. You can also use tables to validate information as it is entered into a database. A view allows you to create a new record definition to look at fields and records from one or more domains.

You can create a data dictionary for each database or you can store information about all your databases in the data dictionary provided with PRO/DATATRIEVE.

Tool Kit PRO/DATATRIEVE—Documentation for Advanced Applications Development

Tool Kit PRO/DATATRIEVE is a documentation-only PRO/DATATRIEVE option that explains how to develop advanced applications using PRO/DATATRIEVE and the PRO/Tool Kit or Professional Host Tool Kit. It supersedes the previously available PRO/DATATRIEVE LAF (Layered Application Facility).

Tool Kit PRO/DATATRIEVE lets you develop applications that fit your own specific requirements. The options described in Tool Kit PRO/DATATRIEVE include writing layered PRO/DATATRIEVE applications that can be selected from the P/OS Main Menu; using callable PRO/DATATRIEVE from any Tool Kit programming language; and developing distributed applications that use DATATRIEVE information residing on one or more PDP-11, VAX DATATRIEVE, or DTR-20 systems.

Tool Kit PRO/DATATRIEVE is designed for programmers familiar with the P/OS operating system and user interface who are working with the PRO/Tool Kit or Professional Host Tool Kit. In addition to documenting the application development options listed above, these materials include a sample application that demonstrates many PRO/DATATRIEVE features.

Layered PRO/DATATRIEVE Applications

Tool Kit PRO/DATATRIEVE shows developers how to write an installation file that allows layered PRO/DATATRIEVE applications to be selected and run from the P/OS menu like any other P/OS application. This simplified execution of PRO/DATATRIEVE systems is of particular value to less experienced end users.

Tool Kit PRO/DATATRIEVE also outlines the rest of the development process, including writing application files, using logical names to identify application files and devices, installing applications on the P/OS menu, executing and debugging programs on the Professional, and compressing the application dictionary.

Calling PRO/DATATRIEVE

PRO/DATATRIEVE Version 2.0 includes a new facility, PRO-CALDTR.TSK, that lets you call PRO/DATATRIEVE from applications developed using any PRO/Tool Kit or Professional Host Tool Kit language. As with layered PRO/DATATRIEVE applications, these programs can be listed on the P/OS Main Menu by application name, ready for use by less experienced personnel. The Tool Kit PRO/DATATRIEVE documentation set explains how to use these new capabilities.

Distributed DATATRIEVE on the Professional

Tool Kit PRO/DATATRIEVE also shows developers how to create distributed DATATRIEVE applications on the Professional. This capability allows the Professional to extract, manipulate, update,

and return data files in DATATRIEVE domains on remote Professional, PDP-11, VAX, or DECSYSTEM-20 systems. Besides reducing the processing load on overburdened multiuser systems, this provides distributed reporting capabilities and added convenience for users.

Distributed DATATRIEVE applications use the PRO/DATATRIEVE Remote Call Interface and routines in the object module library, DTCLIB.OLB, which is included in the PRO/Tool Kit. These facilities allow applications on the Professional to communicate with the Distributed Data Management Facility (DDMF) on a remote VAX, PDP-11, DECSYSTEM-20, or Professional system running DATATRIEVE or PRO/DATATRIEVE. The Professional DDMF facility is included with PRO/RDT (see following software description).

Get the Most out of PRO/DATATRIEVE

The Tool Kit PRO/DATATRIEVE documentation set gives programmers the information they need to take full advantage of the capabilities of DATATRIEVE and the Professional. The resulting applications can meet sophisticated information management requirements with systems that end users find simple, flexible, and effective.

Minimum System Requirements

- Professional 350 or 380 system
- 5-, 10-, or 33-Mbyte hard disk
- P/OS Hard Disk, Version 2.0

System Options

- Tool Kit PRO/DATATRIEVE documentation-only option (Order number QB011-GZ)
- PRO/RDT (includes the DDMF facility, allowing your Professional to serve as a host for another program)

- PRO/DECnet (required for distributed applications)
- PRO/Tool Kit or Professional Host Tool Kit Version 2.0
- PRO/DATATRIEVE Computer Based Instruction course, *How to Use PRO/DATATRIEVE* (hard disk version, EY-1892E-CS; diskette version, EY-1942E-CS).



• PRO/RDT

Order Code: QBA71-A3

PRO/RDT is an information management tool for the Professional computer that lets you extract selected information from a DATATRIEVE domain on a remote host. Then you can select PRO/DATATRIEVE (purchased and installed separately) from the PRO/RDT or P/OS Main Menu to manipulate the extracted information and create reports locally on your Professional.

The remote host for PRO/RDT can be another Professional or a VAX, DECSYSTEM-20, or PDP-11 system. The remote host must have DECnet or PRO/DECnet and a DATATRIEVE Distributed Data Management Facility (DDMF) task installed. PRO/RDT includes PRO/DDMF, which lets your Professional serve as a remote host for other Professional systems or for VAX, DECSYSTEM-20, or PDP-11 systems. PRO/RDT uses DECnet as the transfer medium. DATATRIEVE and its protocols control the information transfer.

For typical reporting requirements, you may need to extract the same information on a regular basis. PRO/RDT lets you save your extract descriptions, simplifying subsequent reporting.

How PRO/RDT Works

You work with PRO/RDT by defining and processing an extraction definition, or *extract*, that identifies the computer system you want to access and the DATATRIEVE data to be retrieved. PRO/RDT menus

ask you for the remote system node name, user name, password, dictionary, and domain name for the data you want. Menus also ask you for the name of the dictionary, domain, and data file where the extracted information will be stored on your Professional.

Through a series of submenus, you can also establish various selection criteria. For example, you can specify the records and fields to be extracted, a sort sequence, or index keys for the extracted data file. In this way, you control which data from the remote domain will be transferred to your Professional and how it will be stored.

When PRO/RDT processes an *extract*, it retrieves and stores the specified information in a file on your Professional. The domain and record definitions for the extracted information are stored in a PRO/DATATRIEVE dictionary. A message appears on your P/OS message/status board, which you can view directly from the PRO/RDT menu, telling you how many records were retrieved.

You can then select PRO/DATATRIEVE from the PRO/RDT or P/OS main menus to manipulate the information, create reports, and perform other PRO/DATATRIEVE functions.

PRO/RDT also lets you save, modify, or retrieve *extracts* using extraction description files (EDFs). You can process the same extract or a modified version of the extract with a few keystrokes.

PRO/RDT offers easy operation, streamlines reporting tasks, and makes the Professional computer a cost-effective workstation in virtually any DATATRIEVE environment. Through the PRO/DDMF facility, it also allows other DATATRIEVE users to draw on your work to meet database management needs throughout your organization.

Taking advantage of the Professional computer's unique communications capabilities, its minicomputer compatibility, and its overall power and ease of use, PRO/RDT provides new flexibility and performance for your desktop Professional.

Minimum System Requirements

- Professional 350 or 380 system
- 5-, 10-, or 33-Mbyte hard disk
- P/OS Hard Disk
- PRO/DECnet
- DECNA hardware option (Ethernet interface)
- PRO/DATATRIEVE Version 2.0.

• **NPL Information Management System**



Order Code: QA117-C3

The NPL™ Information Management System brings a sophisticated yet simple data management capability to the Professional 350 or 380 computer. Developed by DeskTop Software Corporation, NPL meets the requirements of corporate executives, managers, professionals, and business owners who need to store and retrieve information but don't want to deal with the complexities of conventional programming.

In virtually any database situation, you will appreciate the special strengths of the NPL system. It provides unusual flexibility and power in data entry, database searches and queries, editing of existing data, and report writing. And, because NPL is a "fourth generation" language, you can customize your own information systems without conventional programming. Using a flexible English-like syntax, you can use NPL to format data for a wide variety of reports.

NPL also adjusts to your level of experience. It can operate in a friendly menu-oriented mode as you learn the system. Then, once you are familiar with NPL, you can streamline its operation by using a direct command mode. In either case, on-screen help is always available.

Develop Applications—Without Computer Expertise

With NPL you can develop your own information management system without complex BASIC or COBOL programming. You can tailor the format of data entry screens to the way you want to organize information. You can design a sequence of on-screen prompts to make sure that operators enter the right information in the right order. NPL also lets you establish criteria for data verification, ensuring, for example, that numerical data in the appropriate range is entered where required.

NPL can accept data from a number of sources. These include other Professional applications like Supercomp-Twenty, data downloaded from VAX or PDP-11 systems, or even data from non-Digital equipment. NPL will quickly sort, format, and display the information for quick project turnaround.

The NPL user interface and syntax is similar to FOCUS, RAMIS, and NOMAD systems running on IBM 370 machines. If you have experience with these systems, you will feel thoroughly at home with NPL.

Searching, Sorting, and Reporting From Your Database

An information management system is only as good as its ability to access and present the information it stores. NPL offers power, flexibility, and simplicity in this vital area.

While traditional programming languages require detailed, precise procedures for accessing databases, NPL lets you use English-like commands to request specific information. For example, you

could create mailing labels for all customers residing within a certain sales territory or, using the same customer accounting records, you could list all customers with outstanding balances in any given range.

If you often use the same criteria in accessing your database—for example, in preparing regular reports—you can save these criteria in a command file for later use. Then, using the command file, you can produce the same report at any time without having to reenter the entire string of criteria. This storage of commands can be applied to entire report formats and can include data retrieval, sorting, and organization of data. In this way you can package your own powerful, customized applications. You can also create new systems from existing files, reformatting or rebuilding your data files quickly and easily.

NPL's sorting capabilities make access faster and more precise. Multikey sorting allows you to apply several search criteria to your database. A variety of logical conditional phrases can be used to extract the information you want. These can include sophisticated if/then/else phrases to find data that is greater than, less than, equal to, or containing any number or set of characters of your choice.

The NPL system also includes a range of built-in arithmetic functions. You can count the number of items in your data set, find averages, maximums, minimums, first, and last items, as well as sum up columns of figures. Calculations can be displayed as totals or subtotals.

Information Management for Today's Professional

NPL on the Professional computer offers a rare combination of sophistication, power, storage capacity, and ease of use in a desktop system. It is an excellent solution for professionals who need results but want to avoid the time and expense of programming.

Minimum System Requirements

- Professional 350 or 380 system
- 5-, 10-, or 33-Mbyte hard disk
- P/OS Hard Disk



• **RDM 300**

Order Code: QA700-C3

RDM 300,TM the Responsive Data Manager, is an interactive relational database system for Professional hard-disk systems. A complete database management system, RDM 300 lets users create data entry forms, enter data, modify records, query for records by fields or combinations of fields, and generate a broad range of reports. Users perform data entry and copy, query, and edit functions from the the system's single data entry screen. RDM 300 also allows data files to be merged, purged, extracted, and sorted.

RDM 300 allows for the development of customized systems through such features as user-defined help screens, commands, and menus; data security and password protection; and process generation within applications. Because of RDM's high-level structure, all these capabilities can be used without writing any program code.

Both inexperienced and sophisticated users can work effectively in RDM's flexible interactive environment. Menu-driven commands, interactive dialog or forms, and special function keys provide a friendly and easy-to-use interface that simplifies use of the system.

RDM 300 can be used for such functions as inventory control, employee and membership record keeping, resource management, and other business database applications.

Minimum System Requirements

- A Professional 350 or 380 system
- 5-, 10-, or 33-Mbyte hard disk
- p/os Hard Disk



• **EasyEntry**

Order Code: QA585-C3

EasyEntry™ is a user-oriented, full-screen forms management and data entry system. Developed by Applied Information Systems, Inc., EasyEntry is unusual in that it combines selected features of a database management system with its sophisticated data entry and forms management capabilities. This combination makes EasyEntry appropriate for tasks as simple as interactive record keeping and as sophisticated as the creation of transparent application front ends that have powerful logic, application calling, and computational capabilities.

In addition, because EasyEntry is available on MicroPDP-11, PDP-11, and VAX systems, Professional users can move forms designed on one system to any other supported system without modification.

EasyEntry includes features found on few other data entry systems. One of the most important is an operator statistics capability, available on the EasyEntry hard-disk version, that allows for objective evaluation of employee and application performance.

A Broad Range of Applications

EasyEntry can be used by both inexperienced and sophisticated computer users. Inexperienced users can turn to EasyEntry for such jobs as tracking sales prospects, keeping personnel records, and maintaining mailing lists. Because of EasyEntry's simple procedures for designing information storage screens, entering information, and searching for and modifying records, these tasks are well within the range of the typical executive.

At the same time, MIS departments and applications developers can create complete transaction processing systems or transparent user interfaces to sophisticated programs. For example, EasyEntry could be used to create the data entry module for a powerful database application. Its computational and logic capabilities could be used to preprocess data as it is entered. Then, using its ability to call and run other applications, EasyEntry could administer the advanced database and reporting capabilities of such software as PRO/DATATRIEVE.

Designing EasyEntry Data Forms

EasyEntry's data entry and forms management system allows onscreen design and implementation of data entry applications through EasyEd,TM its full-screen interactive editor.

EasyEd editing commands allow you to create data entry forms with variable field lengths, optional fields, and one-character response prompts. Input specifications let you define the data types allowed in each field, while simple commands allow you to specify display characteristics including boldface, underlining, blinking, and reverse video. You can store all completed forms in standard file formats in a forms library.

You can develop more sophisticated forms using the EasyEd Form Definition Language. This language lets you create help and error

messages and redefine data input specifications. The Form Definition language also lets you add range and validity checks, internal and external table look-ups, multiple file access, conditional resetting of fields, and arithmetic computations to your applications.

Entering, Searching For, and Modifying Data

Once the data entry screen has been designed with EasyEd and, if necessary, the Form Definition Language, EasyEntry lets operators enter information quickly and accurately. Because the system performs checks, computations, batch totals for specific fields, and logical operations, the efficiency of data entry increases substantially over keypunch and typical key-to-disk systems. Operators can enter information, modify existing records, and search for specific records.

With Professional configurations that include a hard disk, EasyEntry's optional statistics program can be used to produce management metric reports to evaluate the efficiency of data entry and program operation.

Communicating With Other Applications

EasyEntry can be used as a stand-alone recordkeeping and reference system. But it also is a standout performer when it serves as a front end to more powerful applications. Since EasyEntry data is stored as ASCII characters in standard sequential files, data can be transported to other systems or used as input to other programs.

Such intertask communication can be built into an EasyEntry system. For example, using EasyEntry's Spawn utility, you can create a file of PRO/DATATRIEVE commands that will be run transparently as part of your EasyEntry application. You could use similar command files to perform sophisticated statistical analysis and reporting using SPSS/PRO or to interact with applications developed with the PRO/Tool Kit.

Minimum System Requirements

- Professional 325, 350, or 380 system
- 5-, 10-, or 33-Mbyte hard disk (required for optional statistics program)
- P/os Operating System



• **ADR/DATA**

Order Code: QA564-C3

ADR/DATA,[™] developed by Applied Data Research, is a relational data management system designed to combine powerful database capabilities and simplified operation. It performs a full range of information storage, reporting, manipulation, and maintenance functions. This makes ADR/DATA suitable for such applications as budgeting, job costing, production analysis, wage/benefit analysis, inventory control, consolidations, sales analysis, general accounting, personnel reporting, and manpower studies.

Whether you are a novice or a more sophisticated user, you will find ADR/DATA easy to use. It is a menu-driven, fully prompted system; users are never faced with an empty screen. In addition to providing onscreen prompts and questions to guide you through program operations, ADR/DATA warns you of mistakes with error messages and beep tones. Other special safety features protect you from accidentally deleting your files and information. In addition, the Professional computer's help key is always available for more information about the function being used.

ADR/DATA streamlines your work with features that save time and effort. The system supports the numbered and labeled function keys on the Professional keyboard, speeding basic operations. ADR/DATA also lets you work with multiple files at the same time, allowing you to isolate confidential data or simultaneously review information from different sources. And, since ADR/DATA lets you create subsets of your database, operations are performed faster.

Data entry and update screens are designed by users and allow for simple data input. You can create logic files to specify calculations to be performed on the information being entered. When files are updated, you can rerun stored system logic to perform the required new calculations.

Your ADR/DATA system can contain up to 32,000 records per file with as many as 1,000 characters per record. Other system parameters allow report titles up to 10 lines long and as many as 10 logical equations of five operations each.

ADR/DATA features advanced sort capabilities. You can specify numeric or alphabetic sorting to reorder data quickly. You can also specify a sequence of sorts, for example, sorting first by department number, then by date of hire, then by date of last salary review. This is particularly useful in analysis and reporting.

ADR/DATA's flexible report writer allows you to display information as it was input or in formats you create. You can report on all or just selected parts of your data file. This allows different styles, content, and emphasis, depending on your requirements. If you want to change your display or report format, you simply create a new set of report specifications that can then be used at any time to generate the new output.

Another ADR convenience feature allows you to store report and logic specifications, reducing time spent in repetitive operations.

ADR/DATA output files can be transferred to other systems. You can output data in spreadsheet, free, and fixed format, improving data compatibility with other software.

If the time comes to reformat the information in your database, ADR/DATA lets you display and change file characteristics easily.

You can then change the entire structure of an existing data file without having to delete one file and create another.

ADR/DATA has the flexibility to perform a broad range of database functions, further enriching the software and applications options available on your Professional computer.

Minimum System Requirements

- Professional 325, 350, or 380 system
- Hard disk recommended for most applications
- P/OS Operating System



• **PRO/Smart Mailer**

Order Code: QBA42-A3

Few communications tools are more common or cost-effective than the mailing list. The ability to communicate systematically yet selectively with your most important contacts is vital to most enterprises.

Computerized mailing list management applies the power of the computer to what were once unpopular and time-consuming tasks: the organization and sorting of mailing lists and the preparation of mailing labels.

PRO/Smart Mailer brings sophisticated mailing list management and label generation to the Professional. Of course the system stores addresses, but it also lets you segment your lists in dozens of ways, produce labels in any format you require, and keep records of your remarks on individuals on the list. In addition, PRO/Smart Mailer gives you these capabilities in a friendly, menu-driven, easy-to-use system.

Creating your PRO/Smart Mailer mailing list is simple. A comprehensive installation guide, online in-context help, and a fully prompted procedure including standardized default replies make list creation simple. Each entry in your mailing list includes name, address, and other contact information, a line for remarks, and up to six categories of additional information for your own use in grouping individuals logically.

Once your list is established, you can use it to create sublists for specialized mailings. You select these sublists by defining up to 30 criteria. For example, you could create a sublist of employees hired since 1982 in the engineering division who live in the 01759 zip code area; or of alumni from the class of '64 who live in Cleveland and have not donated to the current fundraising drive. These criteria can be logically related by using AND and OR connectors. The possibilities are endless and are completely defined by your own requirements.

PRO/Smart Mailer can presort mailings by zip code. Such sorting is required to take advantage of reduced mailing rates available from the post office. A project that once took hours is now close to effortless with Smart Mailer.

Smart Mailer also includes a list processing interface with Digital word processing systems to mass produce "personalized" letters.

The Smart Mailer system can print on any form you load into the printer, including standard labels, file labels, or even address cards for a desktop file system. You can adjust the size of both the label itself and the address area on the label. A test printing feature simplifies lining up labels and paper, often an exasperating process with less sophisticated systems.

Smart Mailer also helps you keep track of your mailing lists. A Full Address Listing feature gives you a complete printout of your mailing list. At the end of the listing, the system prints the number of addresses in the file.

Minimum System Requirements

- Professional 350 or 380 system
- 5-, 10-, or 33-Mbyte hard disk
- P/OS Hard Disk, Version 1.7 or later
- LA50, LA100, LA210, LQP02, or LQP03 printer

• **DIGItrieve**

Available from: ATS Data Processing, Inc.
1101 North 9th Avenue
Pensacola, FL 32501

DIGItrieve is a document retrieval system that works with the DIGIText word processing system. It allows you to create user-defined filing systems for retrieving documents, memos, reports, and correspondence. Documents can be sorted and accessed by keywords entered by the user and by selected types of documents.

- **Decision Support and Spreadsheets**
- **Supercomp-Twenty**



Order Code: QA476-C3

Probably no software product in the history of computers has approached the impact and acceptance of the spreadsheet. Supercomp-Twenty, developed by Access Technology, Inc., delivers all the advantages of traditional spreadsheets to the Professional. But Supercomp-Twenty goes further, bringing spreadsheet capabilities previously seen only on minicomputers to your desktop Professional.

The most important of these capabilities is the transportability of Supercomp-Twenty spreadsheets among a whole family of mini- and microcomputers. Models and data created on the Professional can quickly be copied or consolidated on another Professional, on a PDP-11 running RSX-11M, RSX-11M-PLUS, RSTS/E, or RT-11, or on a VAX/VMS supermini. In addition, individual departments can use the Professional to selectively update models residing on these larger machines. One spreadsheet program running on a family of computers gives you capabilities standalone microcomputer spreadsheets can't offer.

Supercomp-Twenty has other advantages as well: a huge worksheet capacity; modeling techniques comparable to a financial planning language; operation that is as simple as most microcomputer calculation packages; the ability to perform such functions as insertion of rows and columns; and a general data interface that lets Supercomp-Twenty accept data files and other information from a broad range of database and graphics programs.

```

C6,6] F (OF) SUM(C2,3] + C2,4] + C2,5] + C2,6])
VALUE or / ;
NMU064400

/...0/...1/...2/...3/...4/...5/...6/...7/...8/...9/...10/...11
0 Sample Unit Forecasting Model -- Worksheet Linkage Example
1
2 Product A Units List Price
3 1981 28000 $150
4 1982 28000 $160
5 1983 32000 $170
6 1984 For. 36000 $180 121000
7
8 Product B Units List Price
9 1981 10000 $300
10 1982 11000 $250
11 1983 16000 $240
12 1984 For. 22000 $200
13
14 Product C Units List Price
15 1981 500 $1200
16 1982 800 $1600
17 1983 500 $1600
18 1984 For. 350 $2000
19
    
```

The Supercomp-Twenty Spreadsheet

Like other spreadsheets, Supercomp-Twenty lets you enter values, labels, and formulas directly into cells on the worksheet display. As you work through the model, the system records all of the relationships between values in computer memory. Change one value or assumption, as in “what if” analyses, and Supercomp-Twenty instantly recalculates all related values.

Unlike most spreadsheets, Supercomp-Twenty features a worksheet with up to 1,000 columns or 1,000 rows. Models can be as large as 64 Kbytes of workspace. You can specify column widths to suit your purpose from a single character to 126 characters. The worksheet is not limited to an accounting format. You can create a text label up to 200 characters in length, as long as the adjacent cells are blank, making long labels and spreadsheet annotation easy.

Labels can be right- or left-justified and repeated as needed. You can also design your screen display to include 80 columns or 132 columns in condensed character mode, even switching between the two as you work. And since Supercomp-Twenty supports the multinational character set, it can be used in almost every country in the world.

Powerful, Yet Simple Model Development

Supercomp-Twenty includes a number of features that make model development faster and easier. The system lets you specify relative or absolute cell references directly in your formula, rather than when you copy or move the formula. This step-saver is accompanied by a flexible cell-copying capability that allows noncontiguous cells to be chosen and copied into another area or to a whole new worksheet. You can also lock entire worksheets or individual cells to data entry. This makes it possible for you to create a model for use as a template for data input by less experienced personnel.

Developing powerful models is made easier through the inclusion of a generous selection of built-in program functions. The included functions are financial (present value, future value, internal rate of return, and depreciation); mathematical (logarithmic and exponential, integer, maximum and minimum, trigonometric, average, sum, modules, square root, and pi); conditional (if-then-else, lookup, select, sort, and index); statistical (average and sum, minimum and maximum, standard deviation, and linear regression); and time related (date, day, and month).

Consolidations and Reports

Once the spreadsheet is designed, the processing power of the Professional combines with the capacity and flexibility of Supercomp-Twenty to produce consolidations and reports of

nearly any scale or description. Consolidations can be made between worksheets even when formats are not identical; simply extract those portions of one sheet to be combined with a second, execute a simple command sequence, and the process is completed automatically.

For those consolidations you perform regularly, you can store a series of commands in a separate file and recall them at any time to perform the entire procedure. This command file capability greatly simplifies customized consolidations, summary reports, and other applications. The concept of integrated companywide planning takes on a new meaning and importance when you consider Supercomp-Twenty command file processing and trans-
portability.

```

11.813
VALUE or / : █          *** SUPERCOMP-TWENTY ***          NMU084008
/.....0/.....1/.....2/.....3/.....4/.....5/.....6/.....7/.....8
49          R & B PRODUCTS INC.
50          PROFIT AND LOSS PROJECTION FOR 1ST QUARTER '83
51          (000'S)
52
53          ACTUAL
54          1982  JAN.    FEB.    MAR.  QTR. 1  % of:
55          -----
56          % of:
57          1982  JAN.    FEB.    MAR.  QTR. 1  SALES  PROFIT
58          -----
59          -----
60          -----
61          -----
62          -----
63          -----
64          -----
65          -----
66          -----
67          -----
68          -----
69          -----
70          -----
71          -----
72          -----
73          -----
74          -----
75          -----
76          -----
77          -----
78          -----
79          -----
80          -----
81          -----
82          -----
83          -----
84          -----
85          -----
86          -----

```

	ACTUAL 1982	JAN.	FEB.	MAR.	QTR. 1	% of:	
						SALES	PROFIT
Beginning Inventory	875	945	967	967	875	8.1%	62%
Purchases	12443	1058	1036	1036	3130	66.4%	191%
TOTAL	13318	2003	2003	2003	6009		
Ending Inventory	945	967	967	967	967	18.8%	124%

The results indicate that it is unlikely that overall division performance will improve before spring. The current capital spending plans do not allow for more than a moderate increase in

Data Interchange

Supercomp-Twenty works with many existing database and graphics programs. It can exchange data with any program that can read or create files containing numbers in a tabular format. This "insert mode" is complemented by Supercomp-Twenty's "Data Import/Export" mode that allows it to read and write ASCII text files containing text and numbers with user-specified delimiters.

A Minicomputer Spreadsheet—on Your Personal PDP-11

Supercomp-Twenty is a high-performance electronic spreadsheet that gives professionals and their organizations the most sophisticated distributed planning capabilities. This includes transportability to minicomputers, information exchange with other programs and machines, and the kind of large-scale consolidation capacity that makes corporate spreadsheet projects manageable—even on a desktop machine.

Digital offers Computer Based Instruction (CBI) to help you learn how to use Supercomp-Twenty while working directly on the Professional. You can move through the material at your own pace and can take the course when you want, as often as you like. See the System Options section below for the names and part numbers for Supercomp-Twenty CBI.

Minimum System Requirements

- Professional 325, 350, or 380 system
- P/OS Diskette or P/OS Hard Disk, Version 1.7 or later

System Options

- Computer Based Instruction available: *How to Use Supercomp-Twenty*, hard disk version, part number EY-1822E-CS; diskette version, part number EY-1891E-CS.



• FASTPRO1

Order Code: QA765-C3

FASTPRO1 is a special combination of two highly compatible Professional software products that provides optimum performance for the most demanding financial professionals. It joins the powerful Supercomp-Twenty spreadsheet, also available on PDP-11 and VAX minicomputers, with the full-color presentation graphics of ATHENA/graph.

The result of this pairing is a top-quality software system that provides many of the advantages of a fully integrated package. When this streamlining is combined with the minicomputer compatibility and power of the Professional, it makes FASTPRO1 an ideal selection for a large segment of the financial community. In addition, the FASTPRO1 system is priced at a discount over the two packages purchased separately.

For additional information on the respective features of Supercomp-Twenty and ATHENA/graph, consult the descriptions of these products in this chapter.

Minimum System Requirements

- Professional 350 or 380 system
- 5-, 10-, or 33-Mbyte hard disk
- P/OS Hard Disk, Version 1.7 or later

• C-CALC

Available from: Digitec Corporation
12620 120th Avenue, NE
Kirkland, WA 98033
(206) 821-7507

C-CALC is a high-performance, easy-to-use electronic spreadsheet and modeling system. Written in the C language, C-CALC is a very

fast and efficient program. C-CALC data is fully transportable between most operating systems and different types of computers—a major advantage in multi-CPU environments.

The Professional version of C-CALC has all the capabilities and features of versions designed for larger computers. The program is especially designed for ease of use. All worksheet manipulation, such as renaming, consolidating, and deleting, is accomplished through menu selections. C-CALC also has extensive online help, detailed documentation, and a built-in training course. C-CALC is suitable for a range of financial applications, including tax forecasting, long-range strategic planning, asset management, econometric modeling, profit and loss analysis, budgeting, and financial forecasting.

• PRO/DIGICALC

Available from: WHY Systems, Inc.
16902 Redmond Way
Redmond, Washington 98052
(206) 881-2331

PRO/DIGICALC™ developed by WHY Systems, is a multitasking, minicomputer spreadsheet program that makes it possible for managers, accountants, and engineers with little computer experience to run complex calculations. PRO/DIGICALC uses menu-driven commands and offers an extensive help facility. PRO/DIGICALC offers consolidation of worksheets, extensive formatting capabilities, and financial modeling and loan analysis that is completely compatible with DIGICALC running on RSTS/E, VAX/VMS, and RSX-11M host computers.

PRO/DIGICALC's other features include three-dimensional consolidation; user-defined functions; functional nesting within formulas; sort by row and column (both alpha and numeric); move data

both out of and into the PRO/DIGICALC worksheet; insert, delete, and move commands; a line editor to edit cell data; cells, and ranges of cells, copying; cell data transfers within worksheets; and screen division into as many as four windows.

• **Business Modeller**

Available from: Logsys (USA) Inc.
116 John Street Suite 1408
New York, NY 10038
(212) 608-5310

Business Modeller is an integrated spreadsheet and graphics program for the Professional computer. It is also available on PDP-11 and VAX systems. The program supports the construction of worksheets of up to 255-by-255 cells that can be displayed in up to four windows on the screen. Worksheets can be stored, copied, and consolidated. In addition to all basic spreadsheet functions, a library of specialized functions is built-in. This library includes conditional sum, look up and choose, repeat, count, and trigonometrics. Single- and double-precision operands, online help, and password protection are available.

• **CALC-11**

Available from: Computer Systems Corporation
5540 Rock Hampton Court
Indianapolis, IN 46268
(317) 872-7200

CALC-11[®] is a powerful spreadsheet for financial planning and budgeting that is file-compatible with CALC-11 implementations on other PDP-11 and VAX systems. Three-dimensional spreadsheet matrices can be constructed of virtually unlimited size and with full matrix utilization. Other features include file encryption for protection of sensitive data; conditional, logical, and financial functions that can be infinitely nested; variable formatting; and ASCII file loading and transfer.

• **DataCalc**

Available from: Data Trend
395 Ironwood Drive
Salt Lake City, UT 84115
(801) 487-0531

DataCalc™ is an electronic spreadsheet designed for managers, financial analysts, budget officers, and accountants. The system allows development of customized spreadsheets for any purpose, from fiscal planning to corporate consolidations, depreciation and price schedules, or any assembly of numeric relationships. Calculations can be identified by number, description, or formula. A variety of functions is available, including editing and formatting functions for report generation.

• **DIGIsread**

Available from: ATS Data Processing, Inc.
1101 North 9th Avenue
Pensacola, FL 32501

DIGIsread is an electronic spreadsheet that is fully integrated into the DIGIText word processing system. DIGIsread can combine textual data from DIGIText with tabular data in one document. Spreadsheets can be created in three dimensions (6 columns by 20 rows by 300 pages) and can perform a variety of calculation functions.

• **MAPS/PRO Financial Modeling**

Order Code: QA431-C3

The spreadsheet has given rise to a new generation of financial analysis tools on personal computers. While these new software products continue to add new capabilities and features, most share an important shortcoming in the corporate environment. They are isolated from the organizational planning and reporting

process by their small capacity, limited consolidation capability, and incompatibility with larger systems. The result is a bottleneck between organizational planning levels that effectively eliminates integrated cooperation and efficiency.

MAPS/PRO Financial Modeling is different. It has all the features—and then some—of the latest financial modeling packages, and at the same time it is completely compatible with MAPS/Host Financial Modeling, the companion product that runs on VAX systems. This means that besides providing state-of-the-art modeling and decision support, MAPS/PRO creates a unified financial modeling environment for an entire organization. The result is the elimination of data redundancy, the reduction of workload on overworked host systems, and the complete integration of an organization's planning, budgeting, and forecasting.

Created especially for a Winchester-based Professional, MAPS/PRO includes an interactive command language and editor, a financial database subsystem, a procedural modeling language, a tabular report generator, and a financial function library.

Developing the MAPS Model

Developing a MAPS/PRO model is surprisingly simple. You define the worksheet area by responding to a series of interactive screen prompts. With online help available if you need it, you respond to each question to structure the layout and logic of the model. You have complete formatting control, including individual column widths, decimal places, floating dollar signs and commas, trailing percent signs, and multiple formats for negative numbers and column reordering.

Beginning users can use a “Novice” command environment for explanations and examples of model construction. After you learn the process, you can choose to by-pass the prompts and other help and enter commands directly.

MAPS/PRO includes the standard mathematical operators, as well as special functions, including CUM, for running totals; DEFLATE, for discounts and various depreciation schedules; EXPFIT, for geometric regression; GROW, for constant increase; NP3, for a series of cash flows; and ROI for internal rates of return on a stream of cash flows. Other MAPS modeling capabilities include 17-digit arithmetic precision, self-documenting logic (for example, $\text{NET.PROFIT} = \text{GROSS.PROFIT} - \text{TAXES}$), IF-THEN-ELSE conditional logic, automatic looping control, and user-written subroutines.

Data for the model can be entered manually, in response to row and column prompts, or from a database file. At the end of the model definition process, data from the current model can be placed into the database for use by other models.

Editing the MAPS Model

MAPS/PRO features unusual editing flexibility through its SCAN editor. You can select any window or view of the model for data input or editing. Editing commands include INSERT, FILL (for repeated entry of the same data), INCREASE BY (increasing values across a range of cells), and GROW BY (allowing growth of values by a specified percentage or value).

The Database

MAPS/PRO provides a database subsystem with its own management facility. Data in the MAPS/PRO database is organized in three-dimensions in rows, columns, and sets. You can enter the database directly to display or print the contents of any file. You can display just a range of rows or columns, or the entire set of data. You can even take a "slice" across departments to display a comparative set of information for unit-to-unit comparisons. This information can be consolidated in summary format. The COPY facility allows you to copy all or part of a database file into another database file.

Reports

As part of the process of creating models, you can define up to 40 reports for a single model by specifying headings, rows, and columns for each. When you want to generate a report, you type a single PRINT command. MAPS/PRO automatically reads in the required data, performs logic, and displays the information you request in any or all defined report formats. You can then test various assumptions and view the results.

Other analytical features include target seeking, through which you define outcomes and MAPS/PRO adjusts specific rows in response; and sensitivity analysis, allowing you to isolate critical assumptions to discover the range of inputs over which your solution is still correct.

Minimum System Requirements

- Professional 350 or 380 system
- 5-, 10-, or 33-Mbyte hard disk
- P/OS Hard Disk, Version 1.7 or later

System Options

- PRO/Communications (required for VAX system integration)
- Professional Host Communications (required for VAX system integration)
- MAPS/Host Financial Modeling (required for VAX system integration)
- LA50, LA100, LA210, LQP02, or LQP03 printer

- **FASTPRO2**

Order Code: QA766-C3

FASTPRO2 is a special software package for the Professional computer that joins MAPS/PRO Financial Modeling with MAPS/PRO Graphics. Like FASTPRO1 (which joins Supercomp-Twenty and



ATHENA/graph), this marriage of two highly compatible software products results in a top-quality financial software system that provides many of the advantages of a fully integrated package. When the streamlined interface between these two packages is combined with the minicomputer compatibility and power of the Professional, it makes FASTPRO2 an ideal selection for those in the financial community. In addition, the FASTPRO2 system is priced at a discount over the two packages purchased separately.

For additional information on the respective features of MAPS/PRO Financial Modeling and MAPS/PRO Graphics, consult the descriptions of these products in this chapter.

Minimum System Requirements

- Professional 350 or 380 system
- 5-, 10-, or 33-Mbyte hard disk
- P/os Hard Disk, Version 1.7 or later

• **TK!Solver**



Order Code: QA180-C3

TK!Solver processes equations. While this function sounds simple enough, it offers people who work with numbers a powerful new tool in their daily lives. It means that scientists, engineers, students, financial analysts, and others can work on configuring the problems they face, not on grinding out solutions. Instead of calculating, checking calculations, and hoping that they are relying on accurate results, these people can work with reliable solutions quickly, slashing the amount of pencil/paper/calculator drudgery in their professional routine.

Perhaps most important, using TK!Solver's impressive capabilities requires no programming or even computer experience.

How TK!Solver Works

The power of TK!Solver lies in its ability to evaluate most real number equations at the push of the “!” key of a Professional 350 or 380. The beauty of the program is that once you have defined a problem, as described below, you can solve the problem immediately and/or store your model for solutions with other values at any time in the future.

You begin by typing in the equation or set of equations you need to solve. The equation(s) could describe a problem as simple as profits from a lemonade stand or as complex as calculating the internal rate of return of a depreciating investment. You define your model through the creation of two or more “sheets” that are analogous to writing your problem down on pieces of paper. For advanced problems, you can use these sheets to define unit conversions, simple line graphs, table output specifications, your own special

```

(5i) Input: 25000                                     172/
===== VARIABLE SHEET =====
St Input  Name  Output  Unit  Comment
-----
150000    Price  $        purchase price of asset
25000     dpaymen $        down payment
          dp    16.666667 %    down payment as percent of price
          Loan 125000 $        beginning balance of loan
30        n      yr       term of loan
13        r      %/yr    nominal interest rate on loan
          A    1382.7494 $/mo    periodic loan payment amount
===== RULE SHEET =====
S Rule
-----
"Analysis of payment and loan balance in kth payment
* accum_i=A*(k-((1+r)^(k-n)/r)*(1-(1+r)^-k))
* rg_Loan=A*(1-(1+r)^(k-n))/r
* pk=A*((1+r)^(n-k)-(1+r)^(n-k+1))/r
* ik=A-pk
* E=Price-rg_Loan

```

functions, and other model characteristics that will be executed automatically by the program. Next you enter the value(s) of those variables you know. Finally, with a single stroke of the “!” key, TK!Solver solves for the unknown variable.

Flexible Number Crunching Power

TK!Solver’s equation processing power can be applied to a broad variety of problems. You can solve a series of simultaneous equations, with the first providing input for the second, and so on. Let’s say in another problem you want to solve for a range of values of a given variable. TK!Solver would solve for each value in the range, and could even list the relationship on a table. TK!Solver is also very flexible. It allows you to call for solution of any variable in the equations without reformatting the problem; TK!Solver will solve the problem regardless of the location of the variable.

TK!Solver also features a set of powerful built-in functions to streamline the formulation of complex equations. These include trigonometric, logarithmic, and financial functions, a total of 34 in all. You can also define and store your own functions. TK!Solver will then “speak your language,” understanding the functions you like to use rather than imposing a limited vocabulary on your problem solving needs.

Make Your Own Models

In spite of its sophisticated operation, TK!Solver is simple to use. Models are created using English-like statements. Just as important, it lets you establish the form of the equations you are working with, rather than requiring the use of arbitrary problem structures. If you do make a mistake in formulating a problem, TK!Solver tells you where you went wrong by generating an error message that flags the faulty rules in your model. Changing rules is made easy and quick through an editor mode that lets you correct or modify existing rules and data.

In addition, TK!Solver has an on-screen help capability to provide information on various commands and functions. Finally, TK!Solver comes with clear and complete documentation, including a handy card and poster that list TK!Solver's commands and built-in functions as well as procedures for calling up the sheets for your model.

Windows, Iterative Problem Solving, and Flexible Data Input

TK!Solver has a number of other features that break new ground for convenience and power. You can display two of the model sheets simultaneously, using screen windows, and see how changes on one sheet affect other parts of the model. You can also mix and augment sheets saved in memory to develop increasingly complex applications.

Another advanced TK!Solver feature is its iterative solver option. This allows approximation of results for those problems that cannot be solved directly. Starting with your best estimate, TK!Solver will converge on the answer through a series of iterative steps. This involves repeating a set of operations, each time more closely approximating the answer.

TK!Solver can also work with data from other programs that use the DIF™ file format. Also developed by Software Arts, the DIF format is used in MAPS PRO/Graphics, ATHENA/graph, and many other programs.

An Ideal Tool for Working With Numbers

In short, TK!Solver is a boon to those who work with numbers. It applies the full power of the Professional 350 or 380 to solving numeric problems without imposing a heavy burden of programming or computer training. It stores frequently used equations so

that solutions require only the entry of data and a single “!” keystroke. And it has the flexibility and friendliness to allow its use in the broadest variety of applications.

Digital offers Computer Based Instruction (CBI) to help you learn how to use TK!Solver while working directly on the Professional. You move through the material at your own pace and can take the course whenever you want, as often as you like. See the System Options section below for the names and part numbers for TK!Solver CBI.

Minimum System Requirements

- Professional 350 or 380 system
- 5-, 10-, or 33-Mbyte hard disk
- P/OS Hard Disk, Version 1.5 or later

System Options

- Computer Based Instruction courses available: *How to Use TK!Solver*; hard disk version, part number EY-1821E-CS; diskette version, part number EY-1890E-CS.

• **TK!SolverPacks**

TK!SolverPacks are add-on modules for TK!Solver that tailor the program's number-crunching power to the requirements of specific professions. Each TK!SolverPack contains all the equations, variables, conversion units, and functions required to model the most common problems in a given discipline. This eliminates the need to look up formulas and type lengthy equations. And just as with TK!Solver itself, TK!SolverPacks don't require you to learn to program. You can even modify TK!SolverPack models to fit your own requirements, and can store modified or additional formulas for later use.

The result is that the standard analytical problems of your particular field can be reduced to the simplicity of entering variable values and executing the one-key “!” command of TK!Solver.

TK!SolverPacks take advantage of such TK!Solver features as: online help, which provides information on various commands and functions; the editor mode, so you can change data easily; tabular or graphical output, for varied presentations; and a comprehensive library of functions.



• **Financial Management TK!SolverPack**

Order Code: QA434-C3

Compound Interest Calculations. Solves compound interest problems, including present and future values of lump sums and annuity streams. The model can compute values for any frequency of compounding, including continuous compounding.

Level Debt Service Analysis. Solves a variety of problems involving loans that are repaid by a stream of regular equal payments over the life of the loan. Each payment contains a return on principal and an interest component. Mortgages and installment sales obligations are the most common types of debt that use this payment structure, known as level debt service.

Net Present Value/Internal Rate of Return Analysis. Determines present and future values of a stream of cash flows of uneven amounts at an assumed discount rate. The analysis includes computation of internal rate of return. The model can also be used to analyze cash inflows, including the depreciation tax shield over time, and cash outflows, allowing for assumed rates of taxation and inflation.

Bond Swap Analysis: Anticipated Spread Swap. Computes bond yields and analyzes bond trading. The yield to maturity or the expected realized compound yield over a specified holding period can be computed for a bond. Proposed bond swaps can be evaluated based on assumptions about future interest rates.

Bond Swap Analysis: Yield Pickup. Analyzes pure yield pickup bond swaps. Such swaps are undertaken to improve current income, yield to maturity, or both.

Bond Refunding Decision. Determines whether a firm should refund an existing bond issue with a new one when interest rates drop below the coupon rate on the existing issue. Tax considerations are included.

Convertible Debt Analysis. Analyzes bond value and stock value of convertible debentures, including risk and return measures useful in determining the value of these securities.

Financial Statement Ratio Analysis. Computes a wide range of financial ratios that are used to analyze corporate financial statements. These ratios concern profitability, liquidity, leverage, and operating activity.

Analysis of Operating and Financial Leverage. Examines a firm's performance in terms of leverage, the degree to which a given change in sales affects profits. The model is also concerned with breakeven analysis using assumptions about a firm's production cost structure and capital structure.

Cost of Equity Capital: Capital Asset Pricing Model. Estimates a firm's cost of equity capital by relating the "beta coefficient," a measure of the systematic risk of the firm's equity capital, to the expected market return and the expected risk-free interest rate.

Cost of Equity Capital: Dividend Growth Model. Several applications for valuing the equity of a firm based on an expected perpetual dividend stream that grows at a constant rate. These applications include estimation of the firm's cost of equity capital, the fair market price of its common stock, the equilibrium price-earnings (p-e) ratio, and the weighted average cost of capital. Also, given a specified p-e ratio and stock price, either the cost of equity capital or the expected dividend growth rate can be calculated.

Black-Scholes Option Pricing. Determines the market value of a call or put option that entitles the holder to purchase (call option) or sell (put option) a particular common stock at a fixed price at some future date. It can also be used to calculate the hedge ratios for both types of options.

Option Investment Performance. Determines the maximum potential profit and return for option strategies that involve purchasing stock or selling it short in order to hedge the option position. Any strategy that involves buying stock and writing call options or shorting stock and writing put options can be analyzed by this model. Standard applications involve fully covered option writing, in which 100 shares of stock are bought or shorted for each option written; and ratio writing, in which a ratio of shares per option is bought or shorted to achieve an expected return approximating the risk-free interest rate.



• **Mechanical Engineering TK!SolverPack**

Order Code: QA442-C3

Elastic Bending: Two-point Supported Beam. Analyzes pure elastic bending of a two-point supported free-span beam.

Elastic Bending: Cantilever Beam. Analyzes pure elastic bending of a cantilever beam.

Elastic Torsion Beam. Analyzes pure elastic torsion of a cylindrical beam section.

Cylindrical Wall Heat Transfer. Analyzes heat transfer from a fluid through a one- or two-layered cylindrical wall to an outside fluid by means of convection, conduction, and radiation.

Planar Wall Heat Transfer. Analyzes heat transfers from a fluid through a two-layered wall to a second fluid via convection, conduction, and radiation.

Thermal Effectiveness of Fins. Evaluates the thermal effectiveness of plate and pin fins to aid in the design of these surfaces.

Fluid Flow in Pipes. Evaluates laminar and turbulent incompressible fluid flow in pipes.

Hydraulic System Analysis. Analyzes and aids in design of hydraulic piston/cylinder systems with linear mechanical output. The model also can simulate the flow of incompressible fluids in hydraulic supply and return lines.

Hydrostatic-Hatch Design. Helps analyze and design any completely submerged panel or hatch that is intended to restrain hydrostatic forces and pressures.

Area Moment of Inertia. Calculates the area moment of inertia of several common cross-sections including I-beams, T-beams, and angle beams, as well as conventional circular, triangular, and rectangular cross-sections.

Mohr's Circle. Analyzes a plane element subjected to both axial and shear stress.

Helical Spring. Designs dimensional and material characteristics of helical coil springs in tension or compression.

Natural Frequency of Vibration in Rotational Systems. Determines the natural frequencies of a rotational mechanical system composed of as many as three discs and two shafts.

• **FINAR (Financial Analysis and Reporting System)**

Available from: FINAR Systems Limited
6101 Southwest Freeway #406
Houston, TX 77057
(713) 664-1172

FINAR is a financial planning, modeling, and analysis system designed for business professionals. The system is used to automate budgets in which the detail is maintained at cost center level, then consolidated to several levels for reporting and analysis. It includes the standard financial functions, such as discounted cash flow, net present value, the full range of depreciation routines, and internal rate of return. Data can be accessed from an existing data base or another model.

• **Vertical Market Software—Education and Training**

• **IVIS**

The Professional serves as the hardware base for IVIS, a sophisticated interactive video training tool. IVIS is covered separately in Appendix I.

• **AVID**

Available from: Advanced Interactive Systems, Inc.
46 Darby Road
Paoli, Pennsylvania 19301
(215) 644-7721

AVID™, developed by Advanced Interactive Systems, Inc., is an advanced computer-based instruction system for academic, business, and industrial training, computer simulation and modeling, and information retrieval and file management.

AVID offers the author extensive lesson-authoring aids—without requiring programming experience. The author can incorporate charts, graphics, overlays, and animation in any lesson.

The trainee moves through AVID lessons at his own pace, responding in plain English in a dialog that is tailored to his specific needs. The system provides mechanisms for monitoring and evaluating trainee response, including both the trainee's answers to lesson questions and comments spontaneously generated by the trainee. AVID also keeps track of the total amount of time each trainee spends on the curriculum and can assist an instructor in the controlled administration of exams.

• **Engineering and Scientific**



• **RS/1**

Order Code: QA497-C3

In the past decade, the increasing availability of computers has revolutionized the research laboratory, allowing scientists and engineers to accomplish more than their predecessors could have imagined. Among the most important products to be developed for the scientist has been The Research System, or RS/1, a powerful program that integrates the four most important software capabilities for the lab: data management, statistical analysis, modeling, and graphics output.

In the past, many were willing to invest hundreds of thousands of dollars to develop a computer environment capable of running RS/1. Now, with the Professional and its minicomputer architecture, the RS/1 environment is available at a fraction of its previous cost.

RS/1 on the Professional is a full implementation of RS/1-Plus, which is also available on VAX and PDP-11 systems. RS/1 and the Professional configured with a hard disk and color monitor are an ideal combination for research scientists and engineers in a wide range of industries, including chemicals, pharmaceuticals, medicine, and manufacturing. Applications include product development, process design, environmental monitoring, and quality control. A full range of data-handling techniques gives researchers complete control of their data, using simple English-based commands. No programming skills are required.

Data can be entered into the rs/1 database through the keyboard or from existing files, local instrumentation interfaces, or an external host system running rs/1. The data is formatted into two-dimensional tables for display and analysis. Each table can contain thousands of rows and columns; the data from any number of tables can be combined or accessed at one time.

The tabular data can easily be sorted, merged, and transposed using a variety of standard arithmetic, logical, and relational analysis functions. A number of sophisticated statistical analysis procedures are also available.



Graphic plots of the data are created through a simple interactive dialog. Presentation-quality line graphs, scatter plots, bar graphs, histograms, or pie charts can be created with a single command. Default options are easily edited to include proportional scaling, logarithmic axes, shadings, and colors. Several different data tables can be combined on one graph, and text can be added to any portion of a graph for messages and labeling. RS/1 can output simple graphics to Digital's dot-matrix printers. To produce color plots and graphs, RS/1 can output to Digital's LVP16 Six-Pen Plotter.

RS/1 also allows you to investigate the fit of the experimental data to theoretical curves determined by a variety of analytical techniques. An extensive set of built-in statistical functions can be called up to determine variance, linear regression, multivariable tests, and statistical goodness-of-fit comparisons.

RS/1 tables can be combined to generate analytical models of complex systems. The data, equations, and statistical procedures defined in any one table can be combined with those in many other tables to create a model that provides complete analysis of large systems or processes.

Using the built-in Research Programming Language (RPL), RS/1 also allows you to develop customized processing routines to tailor the system to your various applications. RPL is fully integrated into the data management system, and provides additional table-handling functions, structured programming statements (such as IF-THEN-ELSE, DO WHILE, and indexed loops), and support for very large arrays. Because RS/1 commands, tables, and graphs are used with RPL, it is easy to develop specialized uses of the system.

Developed by scientists for scientists, RS/1 allows the Professional 350 or 380 to be used as an electronic laboratory notebook.

In addition to saving the researcher time, RS/1 offers a whole new range of capabilities, and lets the Professional function as a true distributed workstation in the research and development environment.

Minimum System Requirements

- Professional 350 or 380 system
- 5-, 10-, or 33-Mbyte hard disk (10- or 33-Mbyte recommended)
- P/OS Hard Disk

System Options

- Extended Bit-Map Option (required for color output)
- RGB Color Monitor
- LA50, LA100, LA210, LQP02, or LQP03 printer or LVP16 plotter

• **SPSS/Pro**

Available from: SPSS, Inc.
444 N. Michigan Avenue
Chicago, Illinois 60611
(312) 329-2400

SPSSTM/Pro is a complete information analysis system for the Professional 350 or 380. With SPSS/Pro, you can enter information into your Professional, analyze that information, produce tables and reports, and calculate statistics. The system performs advanced statistical functions, manages data files, and produces presentation-ready reports. It helps you keep track of the information that is vital to your business, whether in a commercial, educational, or research environment.

Like the powerful VAX, DECSYSTEM-10, DECSYSTEM-20, and PDP-11 versions of SPSS, SPSS/Pro lets the nonprogrammer organize, summarize, and display data with ease. SPSS uses menus similar to those of the P/OS operating system, and is integrated with the

PROSE text editor. The system responds to simple, English language commands. Learning SPSS is simplified with clear documentation and tutorial, introductory, and user's guides.

SPSS's ease of use should not be mistaken for lack of sophistication. The system performs statistical analysis using more than 25 available statistical procedures. It can manage large and small data files, generate custom-formatted reports, and handle file and data transformations with unusual flexibility.

System Features

SPSS/Pro includes a powerful array of built-in features. Its tables and charts, for example, help you understand and communicate the implications of information contained in the system. SPSS/Pro can generate frequency distribution tables, bar charts, and descriptive statistics. A typical application might be a table of mean scores for groups and subgroups. Tables can be fully annotated and labeled. SPSS can also produce analysis-quality bar charts and graphs that plot one item against another.

SPSS/Pro advanced statistical capabilities include multiway crosstabulations and measures of association for numeric data; Pearson, Spearman, and Kendall correlations and partials; analysis of variance and multiple classification analysis; multiple regression with calculation of residuals, paired, and independent sample t-tests; and nonparametric statistics.

SPSS/Pro file facilities let you save multiple system files and create system files containing dictionaries of labels and missing data information. The system features a file capacity of 250-500 variables.

The program's data management capabilities let you create new variables, recode items, select permanent and temporary case selections, weigh and sample cases, and output raw data.

SPSS/Pro reports are fully formatted and automatically generated, can be easily reformatted to suit your requirements, and can include the full range of summary statistics.

Minimum System Requirements

- Professional 350 or 380 system
- 5-, 10-, or 33-Mbyte hard disk (10- or 33-Mbyte recommended)
- P/OS Hard Disk, Version 1.7 or later

• **UMD (Universal Microprocessor Development Systems)**

Available from: Boston Systems Office
469 Moody Street
Waltham, MA 02154
(617) 894-7800

UMD™ is a microprocessor software development system for programming special-function chips for a wide range of products and processes. It contains the cross-assemblers, utilities, and symbolic debuggers for the following microprocessors: Intel 8086, 8085, 8048, and 8051; Motorola® 68000, 6809, 6805, and 6800 series; Zilog Z-80 and Z-8000; Rockwell 6502; and TI 9900 and 9989.

• **microMAGIC**

Available from: Intelligent Industrial Systems
One Harmon Plaza
Secaucus, New Jersey 07094
(201) 865-6550

micromAGIC™ is a system for microprocessor software development applications. You can use micromAGIC on the Professional to develop, debug, run, and download applications for a number of popular microprocessors.

The micromAGIC package includes the British standard RTL/2 programming language cross-compiler, an assembler, a linkage verifier, a downline loader, a test controller with debugging facilities, and a realtime multitasking executive. The system can be used with the following target microprocessors: Digital's LSI 11/2, 11/23, and SBC-11/21.

- **COMPOSBM**
- **ULTSCOL**
- **ACIBEAM**
- **TSLOPE/TSTAB**
- **COM624**

Available from: Design Professional Management Systems
Linbrook Office Park
10607 NE 38th Place
P.O. Box 2364
Kirkland, WA 98033
(206) 822-2872

COMPOSBM, ULTSCOL, ACIBEAM, TSLOPE/TSTAB, and COM624 are a series of separately sold engineering design support packages from Design Professional Management Systems. Below are brief summaries of each package.

COMPOSBM—Composite beam design and analysis for concrete deck and steel beam structures. Package includes AISC wide flange tables.

ULTSCOL—Ultimate strength design of circular, rectangular, or corner columns with biaxial bending moments. Three modules.

ACIBEAM—Ultimate strength design of multispan concrete beams. Interactive data generator module and execution module included.

TSLOPE/TSTAB—Slope stability of noncircular failure surfaces by either Bishop, Spencer, or Morganstern-Price methods (TSLOPE) and circular failure surfaces by either Bishop or Spencer methods (TSTAB).

COM624—Lateral analysis of pilings. Finite difference code yields moment, distribution, and stresses in laterally loaded (static or dynamic) pilings.

• **COGO**

Available from: Engineering Systems Corp.
2051 Silverside, Suite 100
Baton Rouge, LA 70808
(504) 769-2226

COGO is a coordinate geometry software package that can be used to solve geometric problems in engineering surveying and mapping, highway and waterway design, and structural and bridge design. It can be used to calculate such items as distances, bearing azimuths, angles, and tangents. It can be run independently to provide the user with geometric calculations or interfaced with DESIGN GRAPHIX CADD software to create drawings of the geometric objects and areas defined using COGO.

• **FEADAM and SHAKE**

Available from: Design Professionals Management Systems
Linbrook Office Park
10607 NE 38th Place
P. O. Box 2364
Kirkland, WA 98033
(206) 822-2872

FEADAM is a finite element analysis program used to analyze stresses and deformations in the incremental construction of an earth structure. The program includes nonlinear modeling of soil properties.

SHAKE is a program for modeling one-dimensional wave propagation of earthquake waves through a soil deposit. The system uses the Fast Fourier Transform method and has been tested with FFT sizes up to 1,024.

• **GeoTrak IMS**

Available from: Hollis Geosystems Corp.
11 Columbia Drive
Amherst, NH 03031
(603) 882-5017

GeoTrak IMS™ is a fully integrated data acquisition and management system for a variety of geophysical, meteorological, and process control applications. It allows field researchers to collect information using the GeoPod 124™ Data Acquisition Module, load that data into the Professional, and analyze and interpret it using GeoTrack IMS software and the RS/1 analytical environment.

The GeoPod 124 is an intelligent field recording system that can be configured with a wide variety of data sensors and instruments. The system can handle up to 14 channels of wide-ranging analog signals and 2 channels of event counting, with cassette data storage of 2.2 Mbytes. It is photovoltaic-powered and designed to survive hostile environments.

• **HEC-I**

Available from: Technical Information Systems
116 West Plume St.
Norfolk, VA 23510
(804) 622-1755

HEC-I performs a variety of runoff hydrograph computations, including manipulations of station and basin rainfall and snow data, calibration of rainfall/snowmelt/runoff models, and river routing models. The system also computes stream system flood

hydrographs and economic evaluations of basin modifications and structural effects. Input and output can be in either English or metric units.

• **Henderson and Bodwell Civil Engineering Applications**

Available from: Henderson and Bodwell
Consulting Engineers
Pedro Morales, D.P. Manager
120 Express Street
Plainview, NY 11803
(516) 935-8870

Henderson and Bodwell have developed a number of civil engineering applications designed especially for use on the Professional. Each comes with full documentation and requires the PRO/Tool Kit and Tool Kit FORTRAN-77.

Cogo is a problem-oriented system that enables civil engineers to solve coordinate geometry problems by stating them in familiar terminology. Up to 10,000 points per job can be solved and stored in the COGO Coordinate Table. Computations are performed with double precision, giving a high degree of accuracy.

Staking by azimuths or clockwise angles (e116) is designed to assist surveyors in staking jobs. It can be used with COGO to compute azimuths or clockwise angles and distances.

Earthwork (e112A) computes volumes of cut and fill from cross-sections, using the average-end-area method of volume computations.

Roadway earthwork (e113) computes cut and fill quantities along a roadway centerline using cross-section information for the original ground and a regular-shaped cut pavement box for the final surface.

Storm drain network (e120) computes design and cost information for inlet types, storm drains, and structures. It also helps compute pipe head losses.

Water distribution design (e126). Given any configuration of pipes, pipe characteristics, fixed-head inputs, fixed-flow inputs, pressure controls, and system draw-offs, this program routes the flows from points of consumption to points of supply and checks for balance. After completing the analysis, the program determines the pressure at each junction and compiles a cost estimate for the network.

Flood plain analysis (e128) determines water surface elevation at points upstream for a given-size flood, starting at a given point in a river or stream. It follows a procedure first proposed by H.R. Leach that results in computing realistic and consistent values of conveyance for cross-sections of irregular open-channel systems with nonuniform flow.

• **NETWK**

Available from: Prof. Roland W. Jeppson
Civil & Environmental Engineering Dept.
Utah State University
Logan, UT 84322
(801) 750-2943

NETWRK is a piping network steady-state analysis and design program. Though designed specifically for large, looped networks, such as municipal water distribution systems, NETWRK will also accommodate branched systems such as agricultural sprinkler systems. The program also helps users design or size network components such as pump heads and capacities or pipe diameters. Users can perform an engineering economic analysis of the network based on the specified conditions.

• **PETRO-PC**

Available from: Petroconsultants, Inc.
2 Houston Center, Suite P-330
Houston, TX 77010
(713) 658-0551

PETRO-PC is an advanced geophysical digitizing and mapping system that gives the interpretation geophysicist direct access and control over project mapping. Four packages are available.

Geotrieve digitizes cartographic maps, showing coastlines, rivers, boundaries, bathymetry, roads, and city perimeters, and identifies all features with proper attributes or labels.

Seistrieve is designed for the production of posted maps of seismic data, including shotpoint locations and horizon attributes. The program allows the geophysicist to digitize picked horizons from seismic sections and shotpoint locations from base maps. The user is then able to produce posted maps in time, depth, velocity, or intervals of those attributes.

Plot lets users plot maps generated by SEISTRIVE and GEOTRIEVE, either separately or in a combined plot.

Lexitrieve provides the user with DATATRIEVE-based access to Lexis database services.

• **PRO-CEBAS**

Available from: Canberra Industries, Inc.
One State Street
Meriden, CT 06450
(203) 238-2351

PRO-CEBAS is a nuclear instrumentation software package for performing rapid and accurate analysis of gamma spectra obtained

with germanium detectors. It is designed to be used with the Canberra Multichannel Analyzer (not included). The package also includes utility routines for energy calibration, efficiency calibration, library editing, and data display.

• **UCC/CAM-100**

Available from: University Computing Company
Manufacturing Systems Division
1930 Hi Line Drive
Dallas, TX 75207
(214) 655-8930

UCC/CAM-100 is a system for developing programs that drive numerically controlled parts-machining equipment. The system is offered in three modules. The first is a base module that provides an editor for creating and manipulating input programs, a set of utility routines to punch and verify machine tapes, a plot module, and a formatter/unformatter to create specific machine-control formats. Other modules, the Lathe and Mill Processors, are optional. They provide true computer-assisted programming for 2- and 3-axis machines. Each features direct programming of the cutting tool without describing the part's geometry.

• **Graphics**



• **PRO/SIGHT**

Order Code: QBA35-A3

PRO/SIGHT is a full-function, object-oriented drawing package that lets you take full advantage of the Professional computer's unique graphics capabilities. PRO/SIGHT's advanced features let graphic arts professionals and inexperienced users alike create striking and colorful graphics for documents and presentations.

PRO/SIGHT gives you control over all aspects of your picture. You can combine up to eight colors from the Professional 350's palette of 256 (or eight of 4,096 colors on the Professional 380) in a single drawing. You can mix your own colors by specifying small incremental changes in the color you see on screen, getting just the effect you want.

Drawing with PRO/SIGHT is a pleasure. Choose from a variety of pen types and thicknesses. Draw freehand or create precise shapes quickly using PRO/SIGHT's built-in functions for arcs, polygons, circles, or rectangles. You also have a choice of more than 60 different fill patterns to add the desired texture to your graphic.

In addition to its powerful drawing and color capabilities, PRO/SIGHT lets you add text to your graphics in any of several available fonts. Text positioning is simple and flexible; just put the cursor wherever you like and enter the text in the size and font you want.

Because PRO/SIGHT is object-oriented, you create shapes and graphic elements that are treated as objects and can be manipulated as a whole. Color adjustments affect the entire object. Any object you have created can be stretched in one or two dimensions or zoomed for overall enlargement. Repositioning the object is as easy as indicating a new location and making a single keystroke.

Previously created objects “underneath” a repositioned object remain in memory; they will reappear when they are uncovered and can even be replaced “in front of” other objects in the drawing.

Although PRO/SIGHT has power and flexibility, it is easy to use. All operations are menu-driven, with selections listed in simple, logical English-language commands. You can create graphics using the keyboard, a mouse, a drawing tablet, or DECTouch.

PRO/SIGHT stores the pictures you create as GIDIS files. You can merge these GIDIS files with text produced in other applications programs, such as PROSE PLUS, that use the Virtual Device Metafile (VDM) Interpreter. You can also print out your graphics on an LA50, LA100, or LA210 dot matrix printer, or on the LVP16 six-pen plotter. Another output option for your GIDIS PRO/SIGHT files is to create instant slides using Polaroid’s Professional Presentation System.

PRO/SIGHT offers advanced graphics capabilities, use of the Professional’s powerful graphics features, and clean, simple program operation. If you are interested in ease of use, creative flexibility, and graphics quality, you will definitely want to consider PRO/SIGHT on the Professional.

Minimum System Requirements

- Professional 350 or 380 system
- 5-, 10-, or 33-Mbyte hard disk
- P/OS Hard Disk

System Options

- Extended Bit-Map Option
- VR241 color monitor
- LA50, LA100, or LA210 dot-matrix printers
- LVP16, HP7470A or HP7475A plotters
- VRTS DECTouch monitor
- A wide range of supported mice and tablets
- Polaroid Professional Presentation System

P/OS Software Comparison—Graphics

Package

Features

Requirements

Package	Business Graphics	Drawing/CAD capabilities	Presentation graphics	Scientific graphics	Color graphics support	Free placement of text labels	Integrated word processing and graphics	Accepts mouse and/or tablet input	Accepts data from other programs	Supports plotter/transparency output	Supports graphics terminal emulation	Videotex application	Local videotex storage	Professional 350	Hard disk	EBO	PRO/Communications
PRO/SIGHT	•	•		•	•	•	•		•					•	•		
ATHENA/graph	•		•	•	•			•	•					•	•		
MAPS/PRO Graphics	•		•	•	•	•		•	•					•	•		
Fingraph	•			•				•						•	•		
CORGRAPH	•		•		•	•		•	•					•	•		
PROSE PLUS		•				•											



• **MAPS/PRO GRAPHICS**

Order Code: QA432-C3

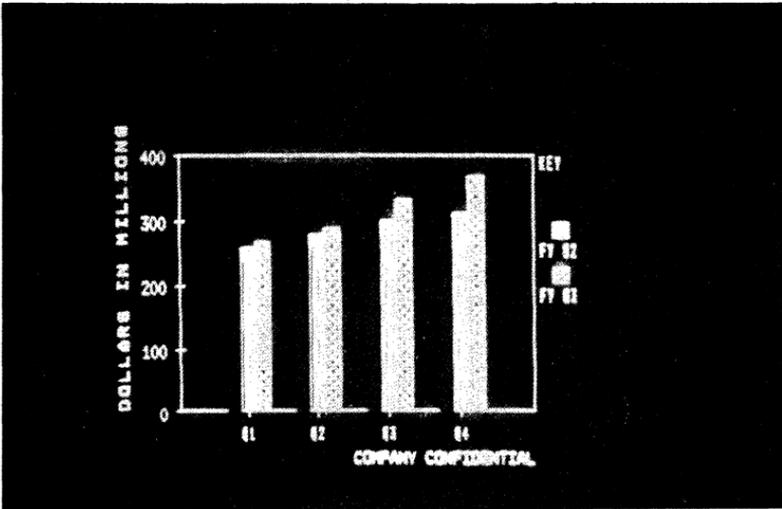
MAPS/PRO Graphics provides general presentation graphics capabilities for the Professional. It is an ideal graphics program for the nonprogramming professional who wants graphs that help convey sales, production, accounting, or other business information.

MAPS/PRO Graphics lets you generate any combination of custom stacked or clustered bar charts, free-form text, and table and line graphs. Screens can be displayed in eight different colors or in black and white using 15 unique filler patterns and a variety of line types.

The easy-to-use MAPS/PRO Graphics system offers great flexibility in developing charts and graphs. You are directed through the process by a series of questions as you create the chart. Online help is available to assist you in answering each question. The answers to these questions determine the size of the chart, labels, title and footnote information, character size, automatic or manual scaling, patterns or colors of bars and lines, legend and table format, and the source of input data. Each question comes with a default answer that is the most likely choice, but you are free to specify whatever changes are appropriate to the graph being created. This interrogative system lets anyone create informative, high-impact graphics easily.

MAPS/PRO can accept input for graphics from several sources. Data can be entered directly from the keyboard, or can be extracted from ASCII (NPL, Supercomp-Twenty, etc.), DIF (TK!Solver), or MAPS/PRO Financial Modeling data files.

MAPS/PRO also allows you to create text slides from any of six different-sized type fonts. You can use special charts to string these slides together for formal presentations.



The LA50, LA100, or LA210 dot-matrix printer can be used to generate black-and-white hardcopy of MAPS/PRO graphics.

Minimum System Requirements

- Professional 350 or 380 system
- 5-, 10-, or 33-Mbyte hard disk
- P/os Hard Disk, Version 1.7 or later

System Options

- Extended Bit-Map Option (required for color output)
- RGB Color Monitor
- LA50, LA100, or LA210 dot-matrix printer



• FINGRAPH

Order Code: QA435-c3

FINGRAPH is a sophisticated yet easy-to-use business graphics package. With five basic chart formats to start from, you can create graphic representations of business information to convey complex information quickly and clearly.

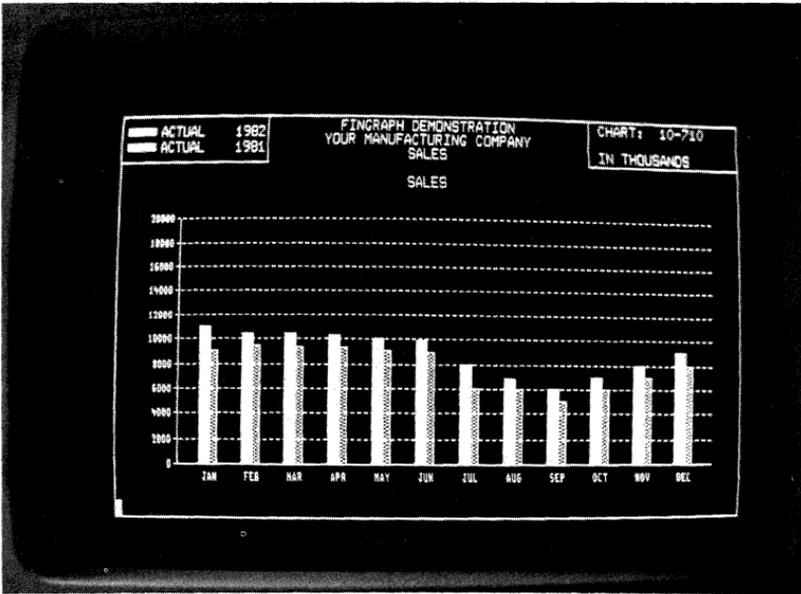
FINGRAPH is especially good at producing graphics in a standardized format from information that is frequently updated. FINGRAPH stores the structure of your graphs or series of graphs when you create them for the first time. Then, when updated data becomes available, FINGRAPH redraws the set of graphs quickly and easily. The result is up-to-the-minute, company-standard graphics understandable by individuals throughout the organization.

FINGRAPH has many applications. The system can present financial results, quality control performance data, spreadsheet analysis data, and many other types of business information.

You can also use other Professional applications software as the source of FINGRAPH information. Among these are the powerful database programs PRO/DATATRIEVE and NPL, from which data can be extracted easily and formatted for FINGRAPH's immediate use.

The five available FINGRAPH chart formats are described below.

Component Charts. These charts describe specific sets of information as part of a whole. For example, a component chart of income would show how business revenues less expenses equal income over a specific period of time.



Item Charts. The Item Chart compares items to one another. Such a chart could show, for example, a comparison of company sales by division, product, or customer.

Variance Charts. This chart format is designed to show deviation of a set of information from any standard set of information. This could include projected versus actual budgets or a comparison of this and last year's sales figures.

Ratio Charts. The Ratio Chart shows fractional comparisons of information. Such a chart could show return on sales, inventory turnover, or other performance ratios.

Time Series Charts. These charts display data over time and might show such information as company sales over a quarter.

FINGRAPH graphics can be produced on standard dot-matrix printers and monochrome or color graphic monitors.

The system features a full menu-driven user interface, eliminating the need to learn user commands. Built-in help is always available using the Professional's help key.

FINGRAPH is also available for VAX, PDP-11, DECSYSTEM-10, and DECSYSTEM-20 systems.

Minimum System Requirements

- Professional 350 or 380 system
- 5-, 10-, or 33-Mbyte hard disk
- P/OS Hard Disk, Version 1.7 or later

System Options

- Extended Bit-Map Option (required for color output)
- RGB Color Monitor
- LA50, LA100, or LA210 dot-matrix printers
- LVP16 Six-Pen Plotter
- Hewlett-Packard 7470A and 17475A plotters

• **ATHENA/graph**

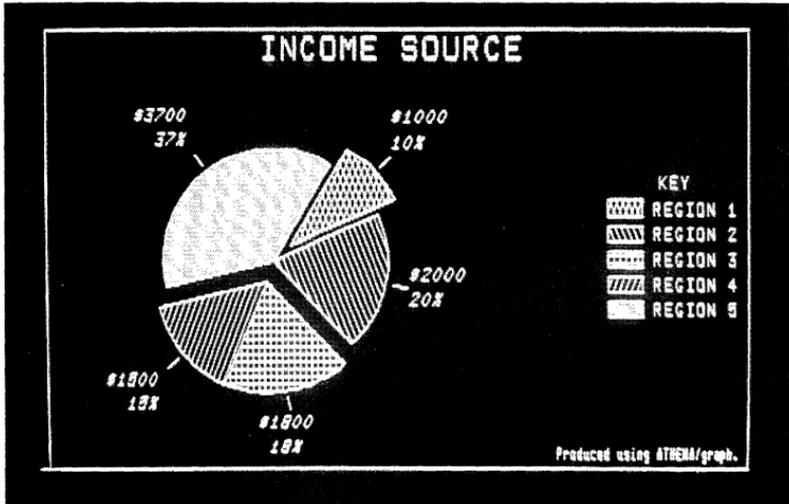
Order Code: QA550-C3

ATHENA/graph is a high-end graphics package for users who require high-quality presentation graphics. Bright colors and sharp lines convey information quickly and clearly, while a simple user interface makes the system easy to use. ATHENA/graph is designed for the quality-conscious executive and others who are looking for the best in graphics support.

Development of ATHENA/graph graphics begins with a set of 28 standard graph formats called the Product Chart Set.[™] These pregenerated graphs include pie, horizontal bar, clustered horizontal bar, vertical bar, group bar, stacked bar, line, additive line, and scatter diagram models.

To adapt the standard graph to your own unique tastes and requirements, ATHENA/graph features powerful and easy-to-use editing capabilities that allow you to manipulate virtually every graphic element. When you have designed the graph as you want it, you can produce it immediately or save it as a template for use in the future. This means you have to develop a graph format only once; from then on, your customized chart is available for immediate data entry.

A customized series of charts can be stored on Professional computers throughout the organization as Company Chart Sets.[™] This allows a company to standardize the set of graphs used in reports.



ATHENA/graph is particularly flexible in accepting data for graphs. It can accept input from the keyboard, PRO/DATATRIEVE, NPL Information Management, Supercomp-Twenty, or TK!Solver, from tables created with PROSE, or from any ASCII data files formatted for ATHENA/graph.

Hardcopies of ATHENA/graph displays can be created on Digital's LA50, LA100, or LA210 dot-matrix printers by using the Professional's Print Screen key. Full color graphics and presentation transparencies can be created on plotters including Digital's LVP16.

Minimum System Requirements

- Professional 350 or 380 system
- 5-, 10- or 33-Mbyte hard disk
- P/os Hard Disk, Version 1.7 or later

System Options

- Extended Bit-Map Option (required for color output)
- RGB Color Monitor
- LA50, LA100, or LA210 dot-matrix printers
- LVP16 Six-Pen Plotter
- Hewlett-Packard 7470A and 7475A plotters



• **CORGRAPH**

Order Code: QA185-C3

CORGRAPH is a high-end graphics package developed by Cortex Corporation specifically for the Professional. Designed for presentations, planning, and analysis, CORGRAPH allows the free integration of variable-font text and a full range of business graphics in slides, overhead transparencies, and plotted or printed documents.

CORGRAPH can generate graphics based on data from many sources. If you like, enter input data with English-language commands from the keyboard. You can also load files directly from Supercomp-Twenty spreadsheets, giving that powerful program something approaching an integrated graphics capability. Finally, CORGRAPH will accept DIF™ or ASCII files, streamlining graphics development from a broad range of sources.

Once CORGRAPH has received the input data, it can produce graphics in either a basic or custom mode. The basic mode lets you quickly create any of a number of standard graph formats, including bar charts, histograms, line and scatter charts, and pie charts. Then you add titles and select text fonts, shadings, and colors. Choose any of the 12 line and shading patterns available.

In its custom mode, CORGRAPH gives you added control over your graphic. You specify the axes and scale you want to use, then make selections from other shading, color, and design alternatives. The result is a graphic tailored specifically to your requirements.

In either mode, CORGRAPH lets you place text wherever you like in your graphic. You can create text-only graphics, or use text to accent your charts and tables. Text can be in any size from one-eighth to one-and-a-quarter inches. Then use CORGRAPH's selection of text fonts to add expression. Choices include Roman Triplex, Script Simplex, Device Hardware, Roman Complex, Italic Complex, and English Gothic.

When you output your graphic, CORGRAPH reveals other strengths. First, your output reproduces everything you see on screen, including all fonts, text sizes, fill patterns, and colors. Second, you can choose from a broad range of printers and plotters supported by the CORGRAPH system. Third, your output can be in the form of 35-mm slides, overhead transparencies, or paper copies of your graphic/text creation.

CORGRAPH also provides a quick print option, an alternative to printing or plotting a complete drawing. This gives you an opportunity to test various approaches or produce fast draft output.

To sum up, CORGRAPH allows free placement of text with a full range of business graphics, features flexible input of data from the keyboard or from other software applications, and has the output options most business users want. It is a worthy complement to the outstanding graphics capabilities of your desktop Professional.

Minimum System Requirements

- Professional 350 or 380 system
- 5-, 10-, or 33-Mbyte hard disk
- p/os Hard Disk

System Options

- LA50, LA100, or LA210 dot matrix printers
 - LVP16, HP7470-A, HP7475-A, HP7221-C, HP7221-T (automatic sheet-feed) plotters
 - VR241-A Color Monitor
 - Extended Bit-Map Option
- **DESIGN GRAPHIX/Executive (DGx/Exec)**



Order Code: QA684-C3

DESIGN GRAPHIX/Executive (DGx/Exec) is a high-performance, low-cost two-dimensional computer-aided design and drafting (CADD) package for the Professional 350 or 380. DGx/Exec helps you create a broad range of two-dimensional graphics with capabilities including geometric designs, figure and text insertion, graphic editing, display controls, and bit pad and plotter support.

DGX/Exec is a subset of the full three-dimensional DESIGN GRAPHIX CADD system. For this reason, any drawing created on a VAX/VMS, PDP-11/RSX, PDP-11/RT-11, or Professional P/OS DESIGN GRAPHICS system can be loaded into and processed by DGX/Exec.

Specially designed for those without graphics training, this easy-to-use system is menu-driven and configured for use by untrained or inexperienced users such as executives or engineering managers. DGX/Exec can also serve the general CADD training function for beginning CADD users.

One of the unusual features of the DGX/Exec package is its ability to form menus. The menus are similar to those used in the Professional's P/OS operating system, giving you a smooth transition from other applications.

With DGX/Exec, you can also call upon or create symbol libraries, allowing such specialized applications as developing your own symbols (for example, electrical or other technical symbols) and adding them to a permanent library. The symbols you create are stored in addition to the existing symbol library.

Other DGX/Exec features include the ability to move items about on the drawing, delete selected items, and insert text annotation in various font styles. A consistent and compatible database is maintained throughout the program.

The many capabilities of the DGX/Exec package underscore its flexibility and power. Its geometric functions include insertion of solid lines, broken lines, rectangles, circles or circular arcs, polygons or polygonal arcs, ellipses or elliptical arcs, and elliptical polygons and arcs. It can generate layer and pen selections, symbol or figure insertions, smooth lines, double lines, crosshatching, automatic dimensioning, automatic fillets, and rectilinear lines.

Design Graphix also gives you unusual editing capabilities. You can remove part or parts of a drawing, specify font selection for text, center, right or left justify text, and determine text height, vertical spacing, and the slant setting. In addition, you can deform (stretch) elements within drawings, providing added flexibility in working with the images you create.

Once you have created a final drawing, you can copy it, rename it, delete it from memory, save it, load it for additional refinement, and add it to a directory of drawings.

Minimum System Requirements

- Professional 350 or 380 system
- 5-, 10-, or 33-Mbyte hard disk
- P/os Hard Disk, Version 1.7 or later
- Extended Bit-Map Option

System Options

- RGB Color Monitor
- LVP16 Six-Pen Plotter
- Summagraphics “Bitpad” Digitizer
- Hewlett-Packard 7440, 7445, 7475A, 7580 or 7585 plotters.

• **DESIGN GRAPHIX**

Available from: Engineering Systems Corp.
2051 Silverside, Suite 100
Baton Rouge, LA 70808
(504) 769-2226

DESIGN GRAPHIX is the same, powerful 3-D interactive design/drafting system available on other PDP-11 and VAX systems. On the Professional, it may require an additional graphics terminal attached to the communications port to run with full functionality. The system offers a true three-dimensional database with multiple-pen support, layer drawing construction, and complete geometric construction capabilities. Graphic and text editing facilities include automatic dimensioning, user-definable symbols and figures, numerous text fonts, and support for a variety of industry standard digitizers and plotters.



• PRO/NAPLPS

Order Code: QBA24-A3

Videotex is one of the latest communications innovations ushered in by the computer age. It is an information distribution system that lets users easily access databases consisting of text and graphic information. Videotex makes it possible to convey detailed, up-to-the-minute information to unsophisticated users.

In the corporate environment, videotex is used to provide internal data inquiry and transaction processing functions such as electronic bulletin boards, scheduling, product updates, and order processing. For the general public, videotex means access to information and services. This might include making travel reservations, shopping at home, or accessing public information databases. And all the time, videotex makes information look good with the graphics capabilities of today's computers and terminals.

The Professional is particularly well-suited to videotex applications. The two qualities most crucial in videotex are among its major strengths: superior graphics and strong communications. The Professional's two videotex software products are PRO/Videotex (see following product description) and PRO/NAPLPS.

PRO/NAPLPS software lets the Professional emulate a NAPLPS videotex terminal. NAPLPS, the North American Presentation Level Protocol, is the videotex protocol approved by the American and Canadian standardization organizations (ANSI and CSA). NAPLPS includes all of the printing characters of ASCII, plus additional foreign and special symbols. It also includes the ability to draw and control various graphics objects (e.g., lines, circles, positioning, color, shading, etc.). NAPLPS is rapidly becoming the industry standard for videotex transmission in North America.

PRO/NAPLPS lets the Professional access remote videotex databases, receive NAPLPS-encoded graphics and text information, and decode and display that information on the screen. PRO/NAPLPS uses services in PRO/Communications to define the setup parameters for the communications line with the host computer. This line could be either a modem connection or a direct local connection. Extra convenience is provided by PRO/Communication's Call Services facility, which stores the phone number of the host. If used with an autodial modem or the Telephone Management System option, PRO/Communications will dial the number automatically.

PRO/NAPLPS provides videotex terminal emulation with a display of eight colors at once from a palette of 256 (or from a palette of 4,096 on the Professional 380). It features a resolution of 768 horizontal pixels by 240 lines. PRO/NAPLPS implements all NAPLPS Picture Description Instructions and virtually all NAPLPS functions.

Minimum System Requirements

- Professional 350 or 380 system
- 5-, 10-, or 33-Mbyte hard disk
- Extended Bit-Map Option
- P/OS Hard Disk, Version 1.7 or later
- PRO/Communications, Version 1.7 or later

System Options

- RGB Color Monitor (recommended)
- Telephone Management System
- Autodial modem
- Mini-Exchange



• **PRO/Videotex**

Order Code: QA569-c3

Videotex is a powerful communications tool that uses databases of text and pictures to convey virtually any kind of information. Videotex systems are used in scores of applications, including point-of-sale product displays, product databases (e.g., auto parts stores), tourist information displays, internal electronic corporate bulletin boards, and trade show presentations. A sample videotex application, a videotex catalog sales system for configuring and ordering prefabricated homes, is described in Chapter 4 (see "An Electronic Architect Sells Homes").

Digital offers two videotex software products for the Professional Computer. PRO/NAPLPS (see previous product description) lets the Professional serve as a videotex terminal, using the NAPLPS videotex protocol to decode and display videotex images from a host computer.

PRO/Videotex takes this capability an important step further. PRO/Videotex is the first local, single-user videotex display system available for a desktop computer. PRO/Videotex combines the NAPLPS videotex decoder and a videotex database on the hard disk of the Professional computer. Because information can be retrieved much faster from the hard disk than over the communications link, PRO/Videotex displays images much more quickly than videotex terminals. Besides display speed, PRO/Videotex makes it possible to operate a videotex system without having to dial into a remote database and maintain a connection. Instead, users can access and administer videotex information residing on the Professional computer without the complications and expense of constant communication with a remote host system.



PRO/Videotex produces videotex screens of exceptional quality. It supports the VR241 color monitor and uses the Professional's high-resolution bit-mapped graphics for outstanding image definition.

With its superior image quality, high speed, and often-considerable savings in communication costs, PRO/Videotex is the ideal choice for many videotex applications.

Keeping Your System Up To Date

Maintaining the PRO/Videotex system is simple. The database can be updated locally by floppy diskette without special programming instructions. The Update Pages option from the Main Menu allows new pages to be loaded into the database and old pages to be modified. Pages can also be erased, and can be moved from one location in the database to another. Because of the Professional's multitasking capabilities, the entire process is always handled as a background task, allowing your Professional to stay on the job during updating.

To update the database from a remote host, you can use PRO/Communications or DECnet to transfer files to your videotex database, using a procedure similar to the Update Pages option. This allows central database development and administration with local storage and display. In addition, PRO/Videotex has facilities to allow a remote host to update the database without any local intervention. With appropriate software, this would allow central maintenance of unattended PRO/Videotex systems. Custom software for this purpose is available from the Genesys Group (see System Options below).

Using PRO/Videotex

PRO/Videotex is designed for simple operation. Help is available at any time by pressing the Professional Help key. PRO/Videotex also uses the Professional's Cancel, Next Screen, Prev Screen, Main Screen, and Exit keys, as well as several other special function keys.

You select PRO/Videotex operations from a main PRO/Videotex menu. Options include Page Retrieval, Perform Updates, Extract Database Pages, Perform Database Compression, Produce Statistics Summary, Generate Statistics Report, and Reset Statistics Record. Simply select the option you want and press the Do key.

The most frequently requested menu operation will undoubtedly be Page Retrieval. In Page Retrieval mode, you would typically begin by looking at numbered lists of available videotex pages. Select the number of the page that contains the information you seek and it is displayed at once on the screen.

In addition to menu screen-number selections, you are free to move through the database in other ways as well. Shortcut techniques include Absolute Page Selection—going directly to a known page number—and Keyword Search—employing user-defined keywords associated with specific pages.

PRO/Videotex also includes a scrolling, automatic page-flipping feature that allows automatic stepping from one page to the next. Scrolling is a useful way of presenting information on a system that is to be left unattended. It is also effective for slide-show-like presentations on computer screens.

PRO/Videotex remembers the last seven pages displayed. This feature is extremely useful in backtracking to previously viewed pages in a heavily cross-referenced database.

PRO/Videotex can accommodate systems with a large number of menus and hundreds of videotex displays. Each menu can have up to 99 choices, and menus can be combined in trees that logically lead from one to another.

PRO/Videotex Utilities

PRO/Videotex provides a variety of database administration utilities. Two statistical reports let you keep track of how your videotex system is being used, helping you refine such applications as point-of-sales information displays. The Perform Database Compression menu option lets you periodically compress the videotex database to use disk space efficiently.

Other administrative menu selections let you extract pages, update pages, or reset your statistical record for subsequent reporting.

Minimum System Requirements

- Professional 350 or 380 system
- 10- or 33-Mbyte hard disk
- Extended Bit-Map Option
- Color Monitor (VR241) (recommended)
- P/os Hard Disk, Version 1.7 or later

System Option

- Custom software that performs unattended database updates (contact the Genesys Group, Inc., 1755 Courtwood Crescent, Ottawa, Ontario, Canada, K2C 3J2, 613-226-8740).



• **PC4014 Terminal Emulator**

Order Code: QA761-C3

The PC4014 Terminal Emulator allows the Professional to use the industry-standard Tektronix[®] 4014 protocol to complete tasks that require access to 4014 host applications. In addition to emulating most 4014 operations, PC4014 offers enhanced features, such as the ability to store graphics images from the host as files on the Professional. The emulator is easy to use and requires little input from the user.

PC4014 Terminal Emulator emulates almost all of the 4014 terminal operations that are so useful in engineering applications. These features include the 4014 12-bit Tektronix Enhanced Graphic module; vector mode (graphic plot mode); five line types (normal, dotted, dot-dashed, short-dash, and long-dash), crosshair cursor refresh (GIN) mode; 4010 10-bit graphic compatibility; point-plot mode; special point-plot mode (single intensity); copy, reset, and page keys; local/online switch; and write thru mode.

Unlike the 4014 terminal, the PC4014 Terminal Emulator separates text from graphics. This approach lets applications scroll prompts and other text off the screen without disturbing the graphics display. The scroll area is user-definable as 3, 5, 10, or 24 lines, with the remaining screen the graphic area. Maximum resolution in the graphics area correlates to the number of lines in the scroll area; a three-line scroll area corresponds to a graphic area with maximum resolution of 960-by-210 pixels and a 10-line scroll area provides a graphic area with maximum resolution of 960-by-140 pixels.

PC4014 also lets you receive graphics images from the host and store them as files on Professional. You can record all or part of an image and can later recall the image when you are offline from the host.

The PC4014 keyboard is easy to use. Several PC4014 commands are single keystrokes on the Professional keyboard. The directional arrow keys provide cursor control by simulating the crosshair position thumbwheels on the Tektronix 4014 terminal.

Minimum System Requirements

- Professional 350 or 380 system
- P/OS Version 1.7 or later
- PRO/Communications Version 1.7 or later

• **Palette**

Available from: Palette Systems, Inc.
2 Burlington Woods
Burlington, MA
(617) 273-5660

Palette is a two-dimensional computer-aided design (CAD) package that includes lines, text, circles, arcs, ellipses, polygons, fillets, tangents, french curves, dimensions, symbols, scaling, rotation,

reflections, stretching, deletion, relocation, step and repeat, layers, gridding, thickness, texture, and color. In addition, it provides built in computations and data extraction, including length, areas, centroids, bills of material, and drawing-office job costing. The software supports Summagraphics' Bit Pad One and the HP7475A plotter.

• **Office Productivity**



• **PRO/Office Workstation**

Order Code: QBA64-A3

Office automation is the process of adding computer productivity to common office functions. Digital is in the forefront of office automation technology, with VAX/ALL-IN-1 applying the power of Digital's superminicomputers to this new office imperative.

PRO/Office Workstation turns the Professional computer into a distributed ALL-IN-1 workstation, adding a vital link in office automation and communications systems. Taking advantage of the Professional computer's high degree of compatibility with VAX systems, PRO/Office Workstation allows the development of customized systems that integrate network communications and virtually any local or remote application in a simplified, transparent, menu-driven environment. No other single-user desktop system offers this level of convenience and integration in office computer networks.

The Professional/VAX connection in the ALL-IN-1 environment produces an unprecedented set of benefits. These include the power and convenience of local processing and storage; access by all PRO/Office Workstation users to DECnet communications, electronic mail, and other office automation utilities and applica-

tions; offloading of such high-overhead operations as word processing, financial analysis, scientific data analysis, or CAD from multiuser systems; local use of any P/OS software package in a customized, simplified menu environment; a consistent and transparent menu interface, whether actual processing is local or on remote VAX systems; access to applications that reside on VAX systems; and the ability to download, process, and update work using software that runs on both the VAX and the Professional (e.g., Supercomp-Twenty, DATATRIEVE, and so on).

These advantages make PRO/Office Workstation on the Professional yet another important ingredient in the Digital office automation strategy.

Creating Your Own Office Automation System

PRO/Office Workstation lets you create your own office automation system, one that integrates your most frequently used applications in a simple menu system. Using tools available in the PRO/Tool Kit, you can add any P/OS application to the main PRO/Office Workstation menu, allowing direct access to applications through this single program. Besides listing local P/OS applications, the PRO/Office Workstation menu can list software and utilities available through VAX/ALL-IN-1. Whether in local or distributed processing, the user's single menu selection can transparently invoke a series of commands to execute the required communications and access procedures.

PRO/Office Workstation also lets you tailor the way you work with your Professional. Using its flow control facility, you can select the user interface that matches your computing experience. The standard menus of the PRO/Office Workstation system provide access to functions and applications through a hierarchy of menus. If you prefer, skip the use of menus with the PRO/Office Workstation Expert Mode, which gives direct access to functions without intervening menus.

PRO/Office Workstation's flow control facility allows you to define commands and function keys. Strings of commands for any system function can be reduced to a single keystroke or a meaningful single word command. This simplifies routine operations, especially for less experienced users.

Programmers can use the Tool Kit to develop customized screens and menus for PRO/Office Workstation. Even the standard help screens in PRO/Office Workstation can be further customized to meet your particular needs.

Working With VAX/ALL-IN-1

PRO/Office Workstation lets you perform locally many of the high-overhead tasks that otherwise would run on VAX/ALL-IN-1 systems. These tasks could include financial analysis with products like Supercomp-Twenty or MAPS/PRO Financial Modeling, scientific analysis with RS/1, or database management with PRO/DATATRIEVE and its related products. The Professional minicomputer architecture and software make this distributed processing possible, actually reducing the VAX/ALL-IN-1 system's workload with each additional PRO/Office Workstation user. Besides offloading the host, local distributed processing provides fast, consistent performance and the control and security of local information storage.

Users familiar with VAX/ALL-IN-1 will feel completely at home with PRO/Office Workstation. The environment, menus, and forms look and work the same on each system. Both systems can be customized using the same FMS utilities, so your PRO/Office Workstation system can be identical to your VAX/ALL-IN-1 system.

Linking the Professional to VAX/ALL-IN-1 systems also allows access to such ALL-IN-1 capabilities as electronic mail, document processing, database access and retrieval, and graphics.

Electronic mail allows you to create, edit, send, receive, delete, print, and display electronic mail locally. Linked to the VAX, you can send mail to anyone on your ALL-IN-1 system, whether to colleagues around the office or around the world. Supported mail commands give you great flexibility in manipulating mail messages for convenient creation, storage, and reply.

Since P/OS is a multitasking operating system, mail functions can be run as a background task, allowing you to move on to other productive work. You can even perform unattended mail functions during offhours for communications savings via off-peak rates.

Other PRO/Office Workstation functions include the “dumb terminal mode” of operation, allowing direct use of other applications on the VAX or other hosts.

Local Productivity

Local PRO/Office Workstation functions include the document processing facility. This lets you create, edit, print, display, and delete documents within an electronic file cabinet system. You can create or merge documents and reports from a variety of file cabinets and folders. And you can do this with a choice of text editors: PROSE or EDT. Included with EDT is the ability to choose a default keyboard style, either standard EDT or the LK201 WPS (a DECmate-compatible subset).

For more demanding word processing requirements, you can choose to add a word processing application such as PROSE PLUS or CT*OS to your PRO/Office Workstation menu. Support for such integrated word processors is built-in.

PRO/Office Workstation also includes support for the Mini-Exchange and the Telephone Management System, adding two more attractive options to Professional office configurations.

A Powerful Desktop Link in Your Office Automation Strategy

PRO/Office Workstation delivers the benefits of minicomputer office automation in a workstation that is itself a personal mini-computer. This allows true integration of office systems and reduces the workload of multiuser systems. With such features as its multitasking operating system, DECnet support, hard-disk storage, and its minicomputer architecture, file structure, and applications, the Professional computer running PRO/Office Workstation is an office automation tool of unmatched capability.

Minimum System Requirements

- Professional 350 or 380 system
- 10- or 33-Mbyte hard disk
- P/os Hard Disk, Version 2.0

System Options

- DF03 Modem
- US and Canada Word Processing Keyboard Country Kit (PC3K1-CA)
- PRO/Tool Kit (required for forms management capability)
- TMS module option
- Mini-Exchange
- PRO/DECnet, DECNA Ethernet Controller
- PRO/Communications, Version 1.8 or later
- VAX host system must include VAX/ALL-IN-1, Version 1.3 or later (required for host ALL-IN-1 support), PRO/File Transfer (also required for host ALL-IN-1 support), and the UBUS to Ethernet Controller (required for DECnet Ethernet communications to host VAX/ALL-IN-1 system).



• Synergy

Order Code: QBA76-A3

Synergy brings the popular “windowing” environment to the Professional computer. It combines word processing, database management, a spreadsheet, graphics, communications, file services, and a calculator program all in one largely integrated system.

Synergy lets you view different applications simultaneously through windows on the Professional screen. Any single application can be active at any time. Switching from one application to another is a matter of a few keystrokes.

In addition to offering a cost-effective alternative to purchasing each application separately, Synergy features significant integration between applications. For example, information from Synergy Spreadsheet or Datamanager can be transferred easily to the Synergy Graph, and graphics can be moved into documents created with the Synergy word processing package. Data from graphics can be moved back to the Spreadsheet or Datamanager.

All such transfers are performed via a simple clipboard system. Pick up a file of information by selecting the “write to clipboard” option; insert the same file in another application by selecting “read from clipboard.”

The Synergy software packages include the following:

- *PROSE PLUS*, the Professional managerial word processing program that combines word processing and a basic drawing editor. *PROSE PLUS* lets you draw your own graphics or include business graphics created in Synergy Graph.
 - *Synergy Datamanager*, a database system that offers a full range of data management functions and sorting capabilities.
-

- *Synergy Spreadsheet*, a what-if worksheet with many built-in formulas and the standard spreadsheet recalculation and manipulation features.

- *Synergy Graph*, a statistical graphing package that creates bar, line, pie chart, and point graphics from tables of business data.

- *Synergy Calculator*, an application that displays a picture of a calculator and that functions as either a hand, mathematical, or programmable calculator. A print function lets you obtain hard-copy of your calculations.

- *Synergy Communications*, which allows data communication (terminal emulation, file transfer, and other services) within the Synergy environment.

- *Synergy File Services*, allowing printing and filing from within the Synergy environment.

- *Synergy Chess*, a sophisticated computer chess game featuring variable skill levels and playing configurations.

Synergy provides a varied set of applications in an easy-to-use, appealing window environment. It is a good selection for those seeking a broad range of software packages, integration of these basic software applications, and the easy-to-use window interface.

Minimum System Requirements

- Professional 350 or 380 system
- P/os Hard Disk, Version 2.0
- 10- or 33-Mbyte hard disk

System Options

- LA50, LA100, LA210, LQP02, or LQP03 printer
- LVP16, HP7470A, or HP7475A plotter



• Pro/DBA

Order Code: QAAB6-C3

Pro/DBA is a new office communications software product developed specifically to take advantage of the unique capabilities of the Professional computer's TMS (Telephone Management System) option.

Pro/DBA combines capabilities of a database access tool, an intelligent autodialing directory, and the TMS voice recording unit. Together, these components help you access information on remote minicomputers or mainframe computers, then add voice annotation to the document or data you have retrieved. You can even create documents locally that include voice annotation. This combination of voice annotation and written communication opens new ways to work with information.

For example, Pro/DBA would let you quickly define a command, say, "Get mail from New York office." When selected from the Pro/DBA menu, the command would direct your TMS-equipped Professional to dial and access a computer at your corporate headquarters. The command could even specify that the access take place at night, while your computer is unattended, for lower-cost data transmission. After downloading the accumulated electronic mail, Pro/DBA would store the information in a local file.

The next morning, you could read your most recent mail. At any point, you could then add voice annotation to the documents. You might specify a reply for execution by your secretary, or even add voice to the document and forward it on to a colleague. There, another Pro/DBA-equipped Professional computer would be used to play back the digitized recording of your voice annotation.

In short, Pro/DBA opens the door to more streamlined communication by allowing immediate verbal reaction in the place of the ever-increasing volume of written words and paper.

Contact and Access Remote Computers—Automatically

Using Pro/DBA often begins with accessing information on a remote computer. Possible sources of information range from electronic mail to remote or public access databases to analytical services. Pro/DBA and TMS make this particularly simple. The program provides a directory of up to 60 other computers, whether mainframes, Professionals, or other minicomputers. This directory includes all phone numbers, access codes, and communications protocols for connecting to the remote machine. Using the directory and the built-in autodialing TMS modem, calling remote computers is close to effortless.

Pro/DBA also includes an exclusive Learn Mode. Using this feature, you walk through a particular access procedure once, while your Professional memorizes it for future use. In addition to communications requirements, the procedure can include the commands needed for the required extraction of information from the remote system. You can give this stored procedure any meaningful name you like.

New Ways to Work With Information

Once your Pro/DBA-equipped Professional has downloaded the required information, you have a number of options. To add voice annotation to a document, you at any time can press a key on the TMS voice unit. As you speak in a normal tone, your notes are digitally recorded and added to the document, available for "reading" along with the document itself by any suitably equipped Professional.

You can also transfer incoming documents to PROSE for additional text editing. Pro/DBA includes built-in access to this standard Professional editor. You can even create original voice-annotated documents for storage or transfer to other systems.

Programming your Pro/DBA system for unattended accessing of remote databases is simple. Just specify the job and the time—Pro/DBA handles the rest, creating a local file for the extracted information. The file will be waiting for you to read at your convenience.

Pro/DBA is the first software product to take advantage of the more sophisticated capabilities of the Professional TMS system. It gives you a new way to streamline your communications as it reduces written mail and unnecessary memos.

Minimum System Requirements

- Professional 350 or 380 system
- TMS (Telephone Management System) option
- 5-, 10-, or 33-Mbyte hard disk
- P/OS Hard Disk, Version 1.7 or later

System Options

- TMS Voice Unit
- LA50, LA100, LA210, LQP02, or LQP03 printer
- PRO/Communications

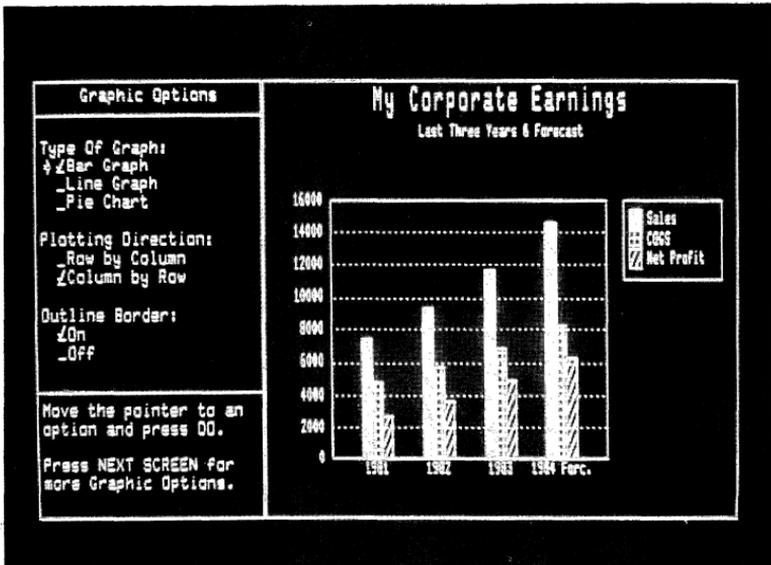
• **PRO/Applications Starter Kit**

Order Code: QBA25-A3 (Hard Disk)
QBA26-A3 (Diskette)

Getting to know a new computer can be an intimidating, difficult process. The biggest task can be simply understanding the operation and full potential of your new tool.

At the same time, users find that having made the investment in hardware, they are still faced with a series of software purchases to meet their basic office productivity functions.





The PRO/Applications Starter Kit addresses both of these problems for users of Professional systems. It consists of an integrated set of five of the most important and popular types of computer applications. It includes PRO/Spreadsheet, PRO/Graph, PRO/DataManager, PROSE (a text editor), and DECLander (a video game).

An Ideal Learning Experience

The PRO/Applications Starter Kit is the ideal way to get to know your Professional. You could start with DECLander, familiarizing yourself with the Professional while you have some fun.

Having mastered soft lunar landings, you could then proceed to the more important applications included in the PRO/Applications Starter Kit: the spreadsheet, graphics, data management, and

word processing modules. These packages do more than teach novices the basic elements of the four most vital computer applications. They allow these new computer users to start completing significant work almost immediately using their new ally in professional productivity.

A Useful, Functional Software Package

While the PRO/Applications Starter Kit is a great way to learn about your new Professional, in the long run its ongoing contribution to your professional life is more important. This set of software packages can meet many of the demands of today's business and professional users. While you can obtain many other powerful programs to perform these office functions on the Professional, the PRO/Applications Starter Kit offers an economical alternative to purchasing separate software for each office function.

The modules that make up the PRO/Applications Starter Kit offer another advantage as well. To a large extent they are integrated with each other, so spreadsheet data can be converted directly into graphs, a chart can be integrated into a word-processed memo, or text can be added to a series of spreadsheets in a report.

PRO/Spreadsheet

PRO/Spreadsheet gives you the same basic functions you would find in other electronic spreadsheet applications. The program provides such familiar features as:

- A workspace of 256 rows by 26 columns
- Cell entries of formulas, text, or numbers
- User-definable formulas
- User-definable cell formats, including integer or money
- Variable column widths
- Copy, format, define, or clear one or a range of cells

- A set of common spreadsheet functions
- Online help
- Support for the Professional special function keys: FIND, SELECT, CANCEL, PREV SCREEN, and NEXT SCREEN
- The ability to select and save data for graphing with PRO/Graph or use with PRO/DataManager
- The ability to print copies of the worksheet

PRO/Graph

With PRO/Graph, you can create graphs easily and quickly using several types of charts with data entered from the keyboard or from PRO/Spreadsheet or PRO/DataManager files. PRO/Graph lets you:

- Draw pie charts, bar charts, or line graphs; pie charts can include an exploded segment
- Automatically draw a bar graph when starting a new graph
- Obtain data from PRO/Spreadsheet, PRO/DataManager, or keyboard entry
- Define titles or axis information
- Edit (and optionally save) the data
- Change the fill patterns for the bars and pie wedges
- Choose colors or gray shades for graphs (for users with the Extended Bit-Map option)
- Plot the final graph using Digital's LVP16 six-pen plotter, or print it with the LA50, LA100, or LA210 dot-matrix printers

PRO/DataManager

PRO/DataManager is an easy-to-use personal data management system. The package is highly interactive and allows you to enter, change, display, and report information through simple forms and screens. PRO/DataManager allows you to:

- Design and edit forms
- Create new databases
- Create multiple display formats for reporting
- Choose from a variety of field data types (including money, date, text, decimal, or integer)
- Select a subset of records from your database
- Add, delete, or edit records in your database
- Sort data according to user-defined criteria with multiple sorting keys
- Select data to be saved for use by PRO/Graph
- Create a database from data saved by PRO/Spreadsheet
- Print reports according to user-defined tabular or free-form formats
- Use the extensive context-sensitive help utility

PROSE Editor

PROSE is the standard editor for the Professional 300 systems and can be used to create and update printable text such as letters, reports, and documentation. Your text is displayed on the screen as it will be printed. PROSE lets you:

- Create new documents
- Edit previously created documents
- Duplicate, move, or delete blocks of text within a document

- Set user-adjustable margins and control automatic wordwrap

- Insert and delete page breaks into a document

- Insert and delete characters into a document

- Search for characters or strings of characters

- Use the online help utility

- Create your own user-defined keys

DECLander Video Game

The DECLander video game is a version of the classic Digital Lunar Landing game. The object of the game is to safely land the lunar module before your fuel runs out. As noted above, it also is a great way for computer novices to get their feet wet—without getting in too deep—with their new Professional 300 Series computer.

Minimum System Requirements

- Professional 325, 350, or 380 system
- P/OS Diskette or P/OS Hard Disk, Version 1.7 or later

System Options

- Extended Bit-Map Option and VR241 Color Monitor (for color business graphics)
- LA50, LA100, LA210, LQP02, or LQP03 printer
- LVP16 Six-Pen Plotter (for presentation-quality business graphics)

• **Propel**

Available from: Pro Computing
One Penn Plaza
Suite 3314
New York, NY 10119
(212) 695-2885

Propel is a powerful integrated software package that works with the Professional's Telephone Management System (TMS) option.

Propel makes the corporate professional more effective at work by improving access to the information necessary for well-informed decisions.

Propel is a fully integrated collection of voice, word processing, notebook, spreadsheet, and graphics applications. Its applications are compatible, so data transfer is simple, and they have a consistent set of commands, so the user only has to learn them once.

The applications are divided into three categories.

Phone Communications provides voice messaging and the ability to include voice annotation of documents. Using the Professional's Telephone Management System (TMS) with a deskset, Phone Communications allows the Professional to store and forward voice and data. This module also includes a telephone directory with automatic dialing and a phonecall notebook. This allows innovative functions such as distributing a report with a recorded message for each recipient.

Written Communications combines word processing, electronic mail, and notebook record keeping. With these applications, you can create and distribute documents, memos, and reports. Meeting and reading notebooks are easily created using Propel's memo and report writers.

Number Processing applications include integrated spreadsheet and graphics packages that let you analyze numerical data in tables, graphs, and spreadsheets.

Propel is easy to use. Dedicated function keys, simple menu hierarchies, and single-keystroke commands provide the inexperienced user with alternate ways to access all system features.

In short, Propel combines a set of integrated office applications and the unique capabilities of the Professional TMS option to provide new ways to receive, work with, and disseminate information.

- **SATURN-CALC**
- **SATURN-GRAPH**
- **SATURN-WP**

Available from: Saturn Systems, Inc.
6875 Washington Ave. S., #218
Minneapolis, MN 55435
(612) 944-2425

SATURN-CALC,TM SATURN-GRAPH,TM and SATURN-WPTM are a set of integrated applications for the Professional computer. Together they provide a powerful electronic spreadsheet, word processing package, and graphics package specifically designed to work together. These applications are also available on VAX and PDP-11 systems.

SATURN-CALC spreadsheets can be turned into SATURN-WP word processing files that can be edited, formatted, and merged into formal reports. The SATURN-GRAPH interface allows you to create dramatic charts and graphs from your spreadsheet data to further enhance written reports.

SATURN-GRAPH is a straightforward and powerful graphics program that can be used in three modes. Calc-Graphics interfaces directly with SATURN-CALC spreadsheets to create line graphs, bar charts, and pie charts from selected spreadsheet cells. Interactive

Graphics allows you to modify your charts with lines, patterns, and densities of fill. User-defined Graphics offers you a graphics command language.

SATURN-WP is an all-purpose word and list processing system that allows you to write letters, create report forms, and merge them with sorted lists of data. The full-screen editor provides a variety of formatting and filing options. Data from SATURN-CALC, SATURN-GRAPH, or ASCII files can be merged with SATURN-WP text files for creating mailing lists, personalized letters, and other applications.

- **Personal Productivity**
- **Cortex Desk Set**



Order Code: QA184-C3

The Cortex Desk Set, developed by Cortex, Inc., helps executives and their secretaries organize projects, business and personal contacts, their calendar, and paperwork to increase professional efficiency. The Desk Set helps coordinate appointments, phone calls, memos, project commitments, expense reports, and other management details, all in a single system.

With the Desk Set, you enter schedule or project information just once. The program files these details in the right places, maintaining schedules, time and charges, project lists, and telephone logs. It then displays this information for quick look-up or for reports.

Cortex modules feature simple, menu-driven operation. If you have any questions, on-screen help is always available.

The screenshot shows a terminal window titled "CORTEX Desk Set" with a date of "SAT 10/22/83" and a time of "10:38 AM". The interface displays the following information:

- Initials (1): SEC
- Name (2): Sarah E. Cunningham
- Date (3): 06/05/84
- Account (4): WWM
- Activity (5): DESIGN NEW LH
- Hours (6): 10
- Minutes (7): 0
- Hourly Rate (8): 55.00
- Multiplier (9): 1.00
- Expenses (10): 190.00
- Expense Descr (11): cab, phone, air shuttle
- Status (12): b
- Notes (13): Designed new letterhead and logo to reflect 80s image

A "Total Charge" field is visible on the right side of the screen, containing the value 190.00.

The Cortex Desk Set includes the following modules:

The Appointment Calendar. This module schedules appointments, meetings, project commitments, holidays, vacations, birthdays, and other important events. Fully integrated with the "To-Do" and "Commitment Tracker" modules described below, the Appointment Calendar maintains schedules for the day, week, or month and prints them for distribution. It also schedules regular weekly or biweekly events automatically. Finally, using date arithmetic, it determines the number of days between two dates for planning purposes.

The Telephone/Address Directory. This directory stores and organizes names, addresses, and phone numbers by individual and company. You can locate information by a name, phone number, or company. It also permits browsing forward through a selected section of the file and the printing of full or partial directories.

The Commitment Tracker. This module monitors tasks, reports, deliveries, and other owed or expected details. You can find commitments by person or by date and, if you choose, place commitments on the Appointment Calendar automatically. It also displays outstanding, completed, or overdue commitments.

The Expense Report. This organizer tracks and reports expense information. It displays or prints a standard expense report with entertainment, mileage, lodging, meals, and miscellaneous categories.

The Calculator. This built-in calculator performs standard mathematical functions like an ordinary calculator, but also features business functions, including present value, future value, and monthly payment. Five separate memories provide unusual flexibility for your desktop calculations. The Calculator also supports the Calendar module's date arithmetic function.

The Time and Charge Keeper. This module records time and charges for services rendered, including associated expenses for rebilling and time-management purposes. For a defined range of dates, it records all charges or charges by account, both by individual's name or by type of service. It also tracks and manages projects without associated charges.

The Memo Tracker. Besides letting you enter and track memos, the Memo Tracker maintains a table of contents accessible by date, date range, originator, or addressee.

The Telephone Record Book. This module allows you to enter information from ordinary phone bills and then access that information to produce a variety of useful reports. These include phone charges by person called, by person calling, or by user-defined charge categories.

The Phone Message Pad. The Message Pad replaces the secretary's phone message book. It allows the entry and maintenance of a file of phone messages by date and time.

The To-Do List. As its name implies, the To-Do List organizes your current tasks. It lists tasks by priority, functions, and status; displays past, present, and overdue activities by status and due date; and can place items on the Appointment Calendar automatically.

In short, the Cortex Desk Set helps executives and support staff manage diverse administrative and planning functions. As a result, these individuals can devote their energy to higher level tasks and higher productivity.

Minimum System Requirements

- Professional 350 or 380 system
- 5-, 10- or 33-Mbyte hard disk
- p/os Hard Disk; Version 1.7 or later



• **ProtoCall 350**

Order Code: QA527-C3

ProtoCall 350 is an intelligent autodialing telephone directory system. It was designed specifically for the Professional with the optional Telephone Management System (TMS). Developed by Software Insights, Inc., ProtoCall 350 makes your telephone a more powerful and effective tool.

ProtoCall 350 maintains a directory of information about your personal and professional contacts in a flexible and useful form. The information maintained includes names, multiple addresses and phone numbers, company name, type of company, acronym, business title, TWX/TELEX numbers, and associations.

Just as important as storing information to help you stay in touch with your personal contacts, ProtoCall 350 will dial the number of any selected person automatically and even charge calls to a credit card. The system can make international calls and will automatically dial the extra digits necessary to use long distance services other than AT&T.

Beyond the convenience of computerized number storage and autodialing, ProtoCall 350 helps you be more productive with the time you spend on the telephone. As you talk with people, you can make notes in free-form descriptions. Your notes will be stored by the system. You can also schedule calls you have to make at a later date. These lists of calls to return are automatically generated for your reference.

ProtoCall 350 also allows you to search your database/directory according to flexible criteria you define yourself. You can search by company name, type of company, name, associations, date of call, or subject of call.

On-screen help is always available to guide you through the full use of ProtoCall 350's features.

Minimum System Requirements

- Professional 350 or 380 system
- 5-, 10-, or 33-Mbyte hard disk
- p/os Hard Disk, Version 1.7 or later
- Telephone Management System Module

System Options

- Telephone Management Voice Unit



• **ProtoCall 1000**

Order Code: QA526-C3

ProtoCall 1000 does everything ProtoCall 350 does—including its intelligent directory and autodial capabilities—plus important features designed for the professional who relies heavily on the telephone. These features include an advanced database system, called the Personal Profile Data Base, and a telephone accounting and reporting system that lets you track professional phone time for billing and record-keeping.

With the Personal Profile Data Base, you can create a profile of each person or organization in your directory. In a free-form structure you design yourself, your profile can include the background information you need to make your phone contacts more effective and personal. As you talk, you can view your profile and add information as required, building a history of calls for each person contacted. The result is new efficiency in the hours you spend on the telephone. The Personal Profile system offers other important database features as well. You can designate certain fields in your profiles as keys for later database sorting and retrieval, categorizing your contacts for more effective professional communications. Event reminders can also be generated from fields of each profile you designate for this purpose. You need never forget another callback or commitment.

ProtoCall 1000 Time Accounting

ProtoCall 1000's Call Directory automatically records the date, time, duration, and subject of each call you make. You can use that duration to calculate professional charges for the call automatically. ProtoCall takes care of calculating the charges by applying any of 10 hourly rates to the duration of the call. You can also log in calls you receive for similar record-keeping functions.

Page 1

Date	Time	Name	Rate	Minutes	Charge
5/13/83	2:13 p.m.	Barton, David	\$30.00	32	\$16.00
Patent infringement opinion ready					
15/12/83	9:13 a.m.	Barton, David	\$30.00	32	\$16.00
Patent infringement opinion almost done					
5/11/83	1:14 p.m.	Butler, Roger	\$30.00	8	\$4.00
Buy utility stock when CD expires					
5/11/83	11:04 a.m.	Irman, Sam	\$30.00	6	\$3.00
Order for LED assemblies for July					

Please press NEXT SCREEN to go to the next page, PREV. SCREEN to go back a page, or EXIT to return to the Call Reports Menu.

ProtoCall 1000 offers doctors, lawyers, salespeople, consultants, and other professionals a simple way to increase phone productivity and account for phone time. With its advanced yet flexible database capabilities, it is a powerful tool for keeping the telephone under control and your professional contacts as profitable and efficient as possible.

Minimum System Requirements

- Professional 350 or 380 system
- 5-, 10-, or 33-Mbyte hard disk
- P/os Hard Disk, Version 1.7 or later
- Telephone Management System Module

System Options

- Telephone Management System Voice Unit



• FLIGHTMASTER

Order Code: QA720-C3

With today's executive spending so many hours and dollars on airline travel, a tool to maximize travel efficiency and minimize travel cost is indeed a welcome addition. FLIGHTMASTER is such a tool.

FLIGHTMASTER provides an enhanced interface to the Official Airline Guide (OAG)TM Electronic Edition, a computer database of scheduled airlines, flight times, and fares. Once you have completed the subscription procedure for obtaining the OAG Electronic Edition password (purchased separately from OAG with a subscription form provided), FLIGHTMASTER allows you to retrieve and store complete information about schedules and the constantly changing air fares offered by all major carriers.

Ideal for corporate travel departments, support staff too busy to investigate each money-saving option, or even executives themselves, FLIGHTMASTER is easy to use. All operations are menu-driven and require no computer experience. Detailed help facilities are available for each function listed on the program's menus.

When using FLIGHTMASTER for the first time, you define a login procedure that will then run automatically each time you use the system. Through this procedure, FLIGHTMASTER will automatically dial up and log into either the TYMNET[®] or TelenetTM communication networks via a 300-baud or 1200-baud autocall modem. You won't have to remember phone numbers, communication characteristics, or network selections in future use of the system.

Once you are logged in, a single keystroke brings up the Database Selection Menu. Then simply select the desired information and press the "Do" key on the Professional computer keyboard. From there the system prompts you at each step of the process.

OAG Electronic Edition features that are accessible through FLIGHTMASTER include Fare Display, Schedule Display, OAG Information and Assistance, OAG User Comment and Suggestions, User Mode (allowing for access to future OAG capabilities), Select Recording File, and Select Command File. Once you have found the information you are looking for, you can save it, again with a single keystroke. At any time you can print the resulting P/OS file directly from the P/OS Print Services menu. Another option upon entering the OAG database is to scroll through displayed text using the Professional computer's "Next Screen" and "Prev Screen" keys.

For information that you need to look up frequently, FLIGHTMASTER lets you store a string of commands, recalling the string later with a single keystroke. Almost effortlessly, you can obtain up-to-the-moment information for the flights you take most often.

In this age of unending business trips and constantly changing schedules and fares, FLIGHTMASTER saves time and saves money for professionals on the move.

Minimum System Requirements

- Professional 325, 350, or 380 system
- DF02-AC or DF03-AC Autocall Modem (DF02 or DF03 modems can be used for manual operation of this software)
- P/OS Operating System
- Official Airline Guide (OAG) account (available through Official Airline Guide, Inc., with the coupon provided)
(Note: The user is responsible for all connect and access fees for OAG and the communications network selected.)



• Wall Street Connection

Order Code: QA719-C3

The Dow Jones News/Retrieval[®] service is perhaps the foremost public-access financial database in the world. In a field in which knowledge is the most precious commodity, the service is fast becoming a necessity to investment brokers, financial and economic analysts, market researchers, and serious investors nationwide. Besides up-to-the-minute market information, the service provides information ranging from the practical to the fascinating, including worldwide weather reports, airline schedules and fares, sports headlines, and encyclopedia listings.

Digital's Wall Street Connection provides you with an enhanced user interface to Dow Jones News/Retrieval service that makes access from any Professional 300 series computer fast and simple. It augments the normal Dow Jones News/Retrieval subscription, which is purchased separately from Dow Jones[®] and Company, Inc.

Once you have subscribed to the News/Retrieval service, Wall Street Connection puts the resources of the service at your disposal with otherwise unavailable ease and flexibility. Among other things, it allows you to use your Professional to examine, retrieve, and store any part of the diverse network's offerings (see list below). It also employs the special features of the Professional to accomplish this streamlined access with a minimum of keystrokes and inconvenience.

Wall Street Connection makes the Dow Jones service friendly. All operations are menu-driven and require no computer experience. If you need assistance, press the Help key for information on the function you are using at that time.

When connected to the service, you simply choose a function from the menu of available options. You will then be prompted to enter a corporate symbol or choose a function from a submenu. Directories of the databases are available online.

When you are within a particular database, you have several options. You can scroll through the information presented, scanning for items of interest. Using your Professional computer's hard disk or floppy diskettes, you can also store any information presented in a file for later retrieval. At any time you may print the resulting P/OS file directly from the P/OS Print Services menu.

If you frequently require the same information, you can store a string of Wall Street Connection commands in a file, invoking them at any time with a single keystroke. This is ideal if you want to keep track of certain stocks, bonds, options, or other listed investments without the inconvenience of manually entering each required symbol. You get a personal market report on just the issues of interest to you in less connect time.

When using Wall Street Connection for the first time, you define a login procedure that will then run automatically each time you use the system. Through this procedure, Wall Street Connection will automatically dial up and log into either the TYMNET or Telenet communication networks via a 300-baud or 1200-baud autocall modem. You won't have to remember phone numbers, communication characteristics, or network selections in subsequent use of the system.

Wall Street Connection provides access to all of these Dow Jones News/Retrieval functions:

- Dow Jones News
- Current Dow Jones Averages
- Historical Dow Jones Quotes
- Common and Preferred Stocks and Warrants
- Corporate and Foreign Bonds
- Options
- Mutual Funds
- U.S. Treasury Notes
- Historical Quotes
- Disclosures II Financial and Descriptive Data
- Media General
- *Wall Street Journal* Highlights
- Wall Street Week Transcripts
- Corporate Earnings Estimator™
- Weekly Economic Update™
- Weekly Economic Survey
- Free-text Search
- *Forbes* Directory
- World Report
- Japan Economic Daily
- Official Airline Guide
- Comp-U-StoreSM
- MCI Mail
- Sports, Weather, Movies
- Academic American Encyclopedia

Minimum System Requirements

- Professional 325, 350, or 380 system
- DF02-AC or DF03-AC Autocall Modem (DF02 or DF03 modems can be used for manual operation of this software)
- P/os Operating System
- An active subscription to Dow Jones News/Retrieval (purchased separately, directly from Dow Jones and Company, Inc.)
(Note: The user is responsible for all connect and access fees for Wall Street Connection and the communications network selected.)

▪ **MEMO-11**

Available from: ATS Data Processing Inc.
1101 North 9th Ave.
Pensacola, FL 32501

MEMO-11 is an electronic calendar and appointment system that helps you manage your personal time by scheduling meetings, conferences, and appointments. The system also interfaces directly with the DIGITEXT word processing system. Scheduling capabilities include automatic visual or audio reminders of upcoming events at preselected times; appointment scheduling in 15-, 30-, or 60-minute increments; monthly overviews of activities; and a scratch pad for daily notes.

▪ **SATURN-DIARY**

Available from: Saturn Systems, Inc.
6875 Washington Ave. S, #218
Minneapolis MN 55435
(612) 944-2425

SATURN-DIARY™ is an electronic appointments calendar that provides up to three months of calendar display. Information of various types can be arranged in a calendar format, and one-line memos can be entered at each date. The system provides levels of security to protect sensitive information. It can be used for individual, group, or department-level scheduling.

• SIMCALC

Available from: ATS Data Processing
1101 North 9th Ave.
Pensacola, FL 32501
(904) 433-7578

SIMCALC simulates the functions of a powerful personal calculator on the screen of your Professional. It lets you invoke sophisticated calculator functions, including statistical analysis and temporary relocations. It also can be used with the DIGIText Word Processing System.

• Word Processing

• PROSE and EDT

The P/OS operating system comes with two text editors, PROSE and EDT. Both are suitable for most correspondence and other routine writing tasks. For more advanced or special-function word or list processing, consider the packages described below.



• PROSE PLUS

Order Code: QBA11-A3

PROSE PLUS is an integrated text and graphics editor for the Professional computer. PROSE PLUS lets you create, edit, combine, and format text and graphics in a single document. Now your writing can be complemented by title pages, diagrams, organization charts, schedules, and other visuals of your own creation. Ideally suited to managerial communications, PROSE PLUS adds clarity and impact to your presentations and written reports.

Graphics features in PROSE PLUS include full-screen editing; a wide variety of line types; line, circle, arc, and rectangle object generation; standard or italic text fonts; instant onscreen object duplication; and object move, place, and remove.

The PROSE PLUS text editor includes the full range of word processing functions that users have come to expect, including cut and paste, bold and underlined text, get document, top of file, bottom of file, find, remove, insert, next screen, and previous screen. Format controls let you center or fill text and specify margins, tabs, page headers, word wrap, right justification, page breaks and pagination, 80 or 132 character lines, and U.S. or metric page sizes.

In addition, PROSE PLUS lets you work on documents in five separate and easily accessible work areas, greatly simplifying the creation of closely related documents.

PROSE PLUS is easy to use. Pop-up menus guide you in all operations, while an onscreen status line always lets you know the program function and file with which you are working. To streamline program operation, PROSE PLUS also lets you define up to eight function keys, allowing the execution of an entire string of commands with a single keystroke.

Together, the text and graphics components of PROSE PLUS make it an excellent selection for managers and others whose word processing requirements call for concise, high-impact communications.

Minimum System Requirements

- Professional 350 or 380 system
- P/OS Hard Disk, Version 1.7 or later
- 5-, 10-, or 33-Mbyte hard disk

P/O S Software Comparison—Word Processing

Package

Features

Package	CT*OS	PROSE PLUS	PROSE	EDT	Lex-11
Single key editing	•			•	•
Full screen editing		•	•	•	•
DECmate Gold Key editing	•				
Integrated text and graphics		•			
Spelling checker	•				•
List processing	•				•
Optional communications package	•				•
Bold, underscore, super- and sub-scripts	•				
Supports scientific character set	•				•
Footnoting	•	•			•
Pagination, justification, tabs, and margins	•	•	•	•	•
User-defined keys		•		•	•
ASCII file format	•	•			•
Printer control within application		•		•	
Multiple open files	•				•
Main menu			•	•	
Command driven			•		
Pop-up menus	•			•	•
Also runs on VAX systems	•	•	•	•	•
DCS	•				

Notes: PROSE PLUS features bolding and underscoring (but not sub- or superscripts).

Lex-11 allows creation of simple business graphics. It also features an optional spelling checker.

PROSE and EDT are included with the P/OS operating system.

CT•OS, EDT, and Lex-11 also run on the RT-11 operating system.



• CT*OS Word Processing System

Order Code: QA767-C3

CT*OS (Compu-Tome Office System) is a full-featured word processing system emulating Digital's word processing software and featuring DECmate's familiar gold key interface and bottom-line editing. CT*OS augments its wide range of word processing functions with list processing and a host of special features.

CT*OS runs under all major Digital operating systems available for the PDP-11 family: P/OS, RSTS/E, RSX-11M, RSX-11M-PLUS, and RT-11. It also runs on VAX/VMS. Documents you create under one operating system are easily read and edited using CT*OS running under another operating system. Because it was written to take advantage of Digital product design, CT*OS has excellent performance.

A menu-driven system, CT*OS displays on the screen the types of work you can do. With just one keystroke, you can get to the specific function you want to perform. This simple format makes CT*OS easy to learn and use. The program shows you what you can do, then asks for any additional information it needs. Extensive online help displays useful information on request. Because CT*OS so closely duplicates Digital's word processing, if you are familiar with WPS-8 you will be able to get right to work with CT*OS.

The Basics

CT*OS word processing includes such useful features as global search and replace (both forward and backward), indexing, table of contents generation, pagination, cut and paste, super- and sub-

scripts, footers and headers, stored paragraphs and abbreviation libraries, prestored margin settings, right margin justification, and file merging. For letter-perfect spelling, CT*OS offers a spelling program with an 87,000-word dictionary.

As a list processor, CT*OS enables you to sort your data in a variety of ways. You can also use wild card selection and even Boolean logic to have CT*OS go through your data and select items with common characteristics.

Special Features

Besides its standard word processing capabilities, CT*OS includes the following features.

Simultaneous Printing and Editing. With CT*OS you don't have to wait for one document to finish printing before you can start editing another. Simply select the document for printing, then continue with other word processing tasks.

100 User-Defined Keys. CT*OS gives you the freedom to assign your own functions to 100 programmable keys. It supports this capability by providing an index that shows you how you have defined each key and enables you to edit your current definitions.

Scientific Character Set. CT*OS offers a scientific character set designed for the needs of engineering and scientific professionals. Using a Digital LQP02 or LQP03 with the appropriate print wheel or an LA100 or LA210 with the scientific character set, you can create a broad range of standard scientific notation for papers, reports, and other documentation.

Status Line. To help you keep track of where you are in a given document, CT*OS displays a status line on the screen. This line gives you information about your current position within the document, including the current line number and character position.

Other CT*OS features include such advanced facilities as ASCII input/output for simplified document transfer, access to PRO/DATATRIEVE, integration with the Supercomp-Twenty spreadsheet program, and laser/typeset support.

Minimum System Requirements

- Professional 350 or 380 system
- 5-, 10-, or 33-Mbyte hard disk
- P/OS Hard Disk, Version 1.7 or later

System Options

- Gold Key Keyboard (recommended)
- **LEX-11 Word Processing**

Available from: EEC Systems, Inc.
327 E. Boston Post Rd.
Sudbury, MA 01776
(617) 443-5106

LEX-11™ is an integrated word- and list-processing software package with data management capabilities. Standard components of the system include a secretarial-style word processor, a four-function calculator, a list processing/mass mailing system, a simple business graphics facility, “boilerplate” keystroke and paragraph storage, a forms creation feature, and a spelling checker.

LEX-11 is well established in the Digital product line, running on P/OS, RT-11, RSX-11M, RSX-11M-PLUS, RSTS/E, IAS, IDRIS, ULTRIX, and VMS operating systems.

As a fully prompting menu-driven system, LEX-11 is easy to learn. In most cases, one keystroke brings you directly to the function you want to perform. Online training and help are always available to give new users a hand. Because the system works the same on all operating systems, a user who has learned how to use the package on another machine will be able to get right to work on the Professional.

LEX-11 files are highly portable. Because LEX-11 stores information as simple ASCII files, you can easily and cleanly transfer files from one system to another. Files can also be easily integrated into spreadsheets and other programs.

Minimum System Requirements

- Professional 325, 350, or 380 system
- P/OS Diskette or Hard Disk, Version 1.7 or later

• **DIGIttext**

Available from: ATS Data Processing, Inc.
1101 North 9th Avenue
Pensacola, FL 32501
(904) 433-7578

DIGIttext is a powerful word processing system for the Professional and PDP-11 and VAX systems. DIGIttext is menu-driven and easy to learn, with all word processing and file management functions available to the user through keystrokes or simple commands. The system supports the following functions: creation and modification of text files using the comprehensive text editor; the creation and maintenance of address and hyphenation files; the administration of documents and standard text; list processing (including text from standard text and address files); and print modules

supporting Qume, Diablo, Olivetti, and DEC printers. The DIGispell spelling corrector and dictionary allow word-by-word correction of documents created with DIGIText and are expandable to include the user's own terminology. The system interfaces to additional program packages such as DIGImail, DIGISpread, DIGITrieve, MEMO-11, and TELTEX to support the full implementation of an office automation strategy.

• Q'TEXT

Available from: Dawn Computer Corporation
4019 Tujunga Avenue
Studio City, CA 91604
(213) 506-8088

Q'TEXT™ is a combined word processing and database management program designed for managers, professionals, and clerical users. The system works with ASCII files, offers a full-screen editor, and runs on other PDP-11 systems under RSX-11 and RT-11. The word processing facility includes such features as full list processing, headers and footers, automatic pagination, multilevel hyphenation, and global and selective search and replace. Column manipulation, calculation, bar graphics, and interactive solid-line drawing capabilities are built-in. The command-driven Q'TEXT system lets you switch between functions easily. The system includes a fully interactive, directly addressable database for mailing list and merge applications. The database stores as many as 66,000 records, with up to 155 lines per record and 50 fields per line.

• **RUNOFF**

Available from: DECUS
249 Northboro Road, BPO2
Marlboro, MA 01752
(617) 480-3422

RUNOFF is an updated and enhanced version of the RUNOFF word processing program available for other Digital systems. The program features automatic line fill, right margin justification, hyphenation, pagination, index creation, and decimal notation sectioning.

• **WORD-11**

Available from: Data Processing Design, Inc.
1400 North Brasher Street
Anaheim, CA 92807

WORD-11™ is a comprehensive word processing system with built-in list processing and spelling-correction capabilities. It is fully compatible with WORD-11 files running on other PDP-11 and VAX systems. The system uses a hierarchical menu structure and labeled keys, which makes it easy to learn. Features include automatic footnoting, table of contents and index generation, multicolumn formatting, and scientific character set support.

WORD-11 List Processing allows you to mass-produce a document but still include personalized information, such as names, addresses, and salutations. The system includes arithmetic functions to facilitate calculation of row and column totals.

- **WordMARC**

Available from: MARC Software International
260 Sheridan Avenue
Palo Alto, CA 94306
(415) 326-1971

WordMARC™ is a full function word processing system with scientific character set support and equation editing capabilities. The package is fully compatible with WordMARC running on PDP-11, VAX, and DECSYSTEM-10 and DECSYSTEM-20 systems. Features include interactive pagination, an abbreviation glossary, and document encryption. Quick-skip, cursor-controlled text and document selection offers high-performance word processing and easy operation. The system also includes sophisticated equation editing capabilities and handles multiple-language character sets, including Greek/math characters.

- **Vertical Market Software—Agricultural**

- **Grain Elevator**

- **Grade Design**

- **Budget and Planning for Grain Crops**

Available from: Applied Software Development Corporation
Route 1, Box 328
Parkin, AK 72373
(501) 755-3908

The *Grain Elevator* management system includes modules for inbound tickets, outbound tickets, purchase contracts, settlement sheets, warehouse receipts, and data position records.

The *Grade Design* package analyzes plain surfaces for lane-grade design and trapezoidal ditches.

Budget and Planning for Grain Crops is a complete crop planning and management system designed for a variety of grains.

• **Vertical Market Software—Banking**

• **The ECO Freedom System**

Available from: The ECO Companies
P.O. Box 217
San Rancheros Drive
San Marcos, CA 92069
(619) 741-5626

The ECO Freedom System is an operating system designed for the mortgage industry. Applications available include: LoanFacts, a loan-fund search program that matches borrowers to the best current source of mortgage money available (ECO host link required); ProSearch, a service that allows participating ECO loan representatives to use the ECO computers to match any borrower to different financial professionals (ECO host link required); Automated Loan Processing, a system that provides management reports, loan tracking, and inventory control pertaining to the origination of loans; and Time Management, a time-accounting system for attorneys and other professionals who are acting as originators of loans.

• **Vertical Market Software—Legal**

• **Legal Center Management System**

Available from: BETA Computer Corporation
221 Parkway North
Waterford, CT 06385
(203) 442-8775

The Legal Center Management System™ is a series of programs designed especially for small to medium-sized law firms. The complete system includes the following modules: Billing and Accounts Receivable, Time and Income Reports, Client Funds, Escrow Funds, and Docket Control.

• **Legal System Series 1**

Available from: Cognition
2160 Broadway
Boulder, CO 80302
(303) 440-3541

Legal System Series 1™ is a fully integrated set of legal accounting and management applications that is suitable for both the single practitioner and offices with up to 98 time-keepers. It is available on a variety of minicomputers, is compatible with multiuser systems, and offers full record lockout and security on the Professional workstation. The basic Law Office Accounting and Management system includes three modules: Time and Billing, Accounts Receivable, and Client and Master files. Other modules available include a Docket Diary System, Management Productivity Reporting, Trust Accounting, a Checkwriter, and integration with the MBSI Realworld General Ledger, Accounts Payable, and Payroll systems.

• **Vertical Market Software—Medical**

• **CATHCOM**

Available from: CATHCOM, Inc.
1401 South Brentwood Blvd.
St. Louis, MO 63144
(314) 962-3100

CATHCOM is a realtime data acquisition and analysis system for use in cardiac catheterization laboratories and hospitals. The system provides high-speed, multichannel catheter data acquisition with concurrent realtime color-graphics display of heart chamber pressures and EKG information.

CLIN-TEAMS/PRO

Available from: Technical Evaluation and
Management Systems, Inc.
820 Carillon Tower West
13601 Preston Road
Dallas, TX 75240
(214) 386-5764

CLIN-TEAMS/PRO[®] is an integrated system of programs for data collection in the clinical trial environment. The CLIN-TEAMS/PRO system allows the Professional to be used for direct collection of data in the investigator's office. The system is both menu-driven and protocol-driven. It also provides audit trails required by FDA guidelines and an interface to statistical analysis programs such as SPSS/PRO.

• **FASTTEST**

Available from: PSYCHSYSTEMS™
600 Reisterstown Rd.
Baltimore, MD 21208
(301) 486-2206

FASTTEST™ is a computerized human-assessment system for psychologists and personnel administrators. The system allows administration, scoring, and interpretation of a wide variety of standard tests inhouse and online. Standard tests available include the Minnesota Multiphasic Personality Inventory (MMPI), Rorschach Interpretation (ROR), and a variety of intelligence, vocational, and personality instruments.

• **Home Health Management System**

Available from: Cortron Corporation
1998 Tewkesbury Road
Columbus, OH 43221
(614) 488-2933

The Home Health Management System is a medical management system designed to speed up the collection of receivables, reduce the volume of paperwork and the turnaround time to correct errors, and increase the accuracy of patient visit controls.

• **MEDISYS**

Available from: Small Business Systems, Inc.
10030 N. 25th Drive
Phoenix, AZ 85021
(602) 997-8310

MEDISYS is a complete in-office medical management, billing, insurance, and collections management system. It allows practices of 1 to 15 doctors to keep diagnostic, service, and account information for as many as 50,000 patients on a single 10-Mbyte hard disk. It supports an optional second terminal, stores comprehensive patient data, offers rapid posting, has reception office

inquiry modes, and provides total office management reports. The system automatically produces bills and insurance forms, has absolute collections control, and accommodates all 21 of the major medical specialties.

• **MEDBILL**

Available from: Dendrite Systems, Inc.
9045 S.W. Barbur Blvd.
Portland, OR 97219
(503) 245-1200

MEDBILL is a comprehensive accounts receivable and insurance billing package for medical offices and clinics. The system maintains master files on each patient and the related responsible party, insurance companies, doctors, transactions, procedures, diagnostic codes, interest, fee schedules, facility codes, and memos. MEDBILL can function as a stand-alone system or can be integrated with Dendrite's complete accounting and office system packages, which include General Ledger, Accounts Payable, Inventory, Word Processing, a Rounding List System, and a Financial Management package (requires InterSystems' MUMPS/PRO, described below).

• **MUMPS/PRO**

Available from: InterSystems Corporation
210 Commercial Street
Boston, MA 02109
(617) 227-1555

MUMPS/PRO is an integrated set of system software running under P/OS that incorporates all the tools needed for both developing and running MUMPS application programs. The system includes a highly interactive programming language (ANSI standard MUMPS); a database system that is an integral part of the language; and a wide-ranging package of software utilities for programming efficiency, system management, and security.

• **PATS (Patient Analysis and Tracking System)**

Available from: Dendrite Systems, Inc.
9045 S.W. Barbur Blvd.
Portland, OR 97219
(503) 245-1200

PATS allows a physician to maintain an unlimited amount of information on patients and procedures, including subsequent follow-up and restudy data. It allows creation of any number of databases, each containing information for each procedure or group of patients. This information can be recalled, sorted, and statistically analyzed. PATS can operate as a stand-alone system or can be integrated into Dendrite's total office package (see MED-BILL). The system requires InterSystems' MUMPS/PRO (see above).

• **Patient Management System (PMS)**

Available from: Global Health Systems, Inc.
1701 Research Blvd.
Rockville, MD 20850
(301) 258-9212

PMS is an online, integrated package of software modules designed to provide outpatient and inpatient functions to clinics and doctors' practices. Outpatient functions include registration, scheduling, medical records, AR/billing, and report generation. Inpatient functions available for the hospital setting include ADT, OE/RR, nursing support, and other hospital functions (requires InterSystems' MUMPS/PRO, described above).

• **Practice Management System**

Available from: Cortron Corporation
1998 Tewkesbury Road
Columbus, OH 43221
(614) 488-2933

The Practice Management System is a complete billing, accounting, word processing, and medical management system for physicians. The system fully utilizes the multitasking, menu, and help features of P/OS.

• **Practice Management System**

Available from: Smith, Abbott & Company, Inc.
300 East Joppa Road
Baltimore, MD 21204
(301) 296-9032

The Smith, Abbott Practice Management System is a comprehensive accounting software package designed to meet the varied needs of many medical and dental practices. The system allows accessing and updating of both patient records and billing information, and automatically prints forms, invoices, and reports. The accounting applications included are billing, collecting, insurance reporting, and accounts receivable. The system also stores and helps organize visitation history information, recalls and appointment status, and referral sources, and produces statistics sorted by doctor, procedure, diagnosis, and patient.

• **Vertical Market Software—Peripheral Support**

• **PC-350 Bar Code Reader**

Available from: TPS Electronics
4047 Transport Street
Palo Alto, CA 94303
(415) 856-8633

The PC-350 Bar Code Reader is a system that reads bar code information into a Professional application. It is plug-connectable between the keyboard and the computer, and it is transparent to any program.

• **TEMPUS-11**

Available from: ATS Data Processing, Inc.
1101 North 9th Avenue
Pensacola, FL 32501

TEMPUS-11 is a hardware and software subsystem that is designed to provide time attendance input data to payroll systems and to support personnel management functions. It supports up to 96 TMP-21 Time Attendance card reader terminals. The TEMPUS system is also available on VAX and other PDP-11 systems.

• **Vertical Market Software—Travel**

• **Travtech**

Available from: The Steinhauer Group
14266 N.E. 21st
Bellevue, WA 98007
(206) 643-0950

Travtech is a complete, turnkey, computerized accounting system for travel agencies. The system interfaces directly to an agency's existing airline reservation system. Handposting is eliminated because Travtech reads in accounting information from the agency's airline reservation system computer. The system includes General Ledger, Accounts Receivable, and Accounts Payable modules designed especially for travel agencies. It also allows generation of a wide variety of reports.

• **Vertical Market Software—
Warehouse Management**



• **Materials Management System-1**

Order Code: QA560-C3

Materials Management System-1™ is designed to manage inventory balances in stockrooms, warehouses, or supply centers. Already a popular application on Digital's VAX superminicomputer, Materials Management System-1 is now available on the Professional 350 and 380.

Developed by RGTI Systems Software Inc., Materials Management System-1 is designed to help organize the storage and retrieval of stocked goods. It operates with conventional storage and retrieval facilities common to the typical stockroom environment. Menu-driven procedures supply the user with realtime inventory control for over 25,000 items to track material from its receipt at a warehouse or stock location to its issue.

Materials Management System-1 handles the three basic materials handling transactions—receiving stock, picking stock items, and inventory counts—with efficiency and speed. The menu-driven modules are easy to learn and use; little or no computer knowledge is needed.

Materials Management System-1 is designed for small or medium-sized manufacturing businesses, distribution centers that maintain warehouses of stocked goods, and small service centers where parts and small tools are inventoried and distributed.

Materials Management System-1 works with conventional storage facilities such as racks, bins, shelves, or pallets. With a minimum of effort you can receive incoming goods, place them into a stock location, and then pick items for issues. Audit control functions track shortages and backorders with the option of using the report facilities to request printed copies of these and other summaries. This provides management with the necessary information to maintain adequate inventories and to monitor system activity.

Due to its simplicity in design and ease of use, Materials Management System-1 lends itself to a first-time user of an automated materials management system. The more sophisticated user can create a workstation environment and interface with other hardware and software applications to close the loop for requirements planning and reordering. Both new and experienced users will find the menu-driven modules simple to use and the documentation easy to follow.

Minimum System Requirements

- Professional 350 or 380 system
- 10- or 33-Mbyte hard disk

System Options

- LA50, LA100, or LA210 dot-matrix printer

PRO/UNIX Software Library

• PRO/UNIX Applications from Unisource

Available from: Unisource Software Corp.
71 Bent Street
Cambridge, MA 02141
(617) 491-1264

Unisource Software Corporation is a major publisher and distributor of UNIX-based software for the corporate, professional, and system development markets. Current PRO/UNIX offerings include a quality portfolio of business applications and program development tools. A selection of available software is described below.

*FinalWord*TM is a comprehensive word processing system for writing letters, contracts, reports, and manuscripts. It has advanced formatting capabilities and provides a high-level language for layout control. FinalWord can divide the screen into two windows, allowing you to display and edit two files on the screen simultaneously.

*Leverage*TM is a simple-to-use list manager that can be fully integrated with other UNIX utilities and applications. Leverage lets you create a list database for use in producing form letters, labels, and reports. You can create your own customized data entry screens with up to 70 data fields per record.

*The Office Menu Tool*TM is a flexible, easy-to-use menu system that enables new users to get up and running without having to learn UNIX. Experienced users and system builders can tailor standard command menus to generate their own customized menu systems. Each menu can have its own help screen, and each entry on the menu can include descriptive text.

ViewComp[™] is a full-function spreadsheet that is integrated directly into the UNIX system. ViewComp stores its data in a text file so that other applications on the system can use the information. It provides all of the features of most current spreadsheet systems, with additional features such as advanced formatting and addressing modes, user-defined commands, function key support, and a variety of built-in mathematical functions.

VX is a communications package that includes VT52 terminal emulation and file transfer capabilities. The remote file server was written in C and its sources are included. This means that the *VX* file server can be run on any operating system that has a C compiler.

• **CALC-11**

Available from: Computer Systems Corporation
5540 Rock Hampton Court
Indianapolis, IN 46268
(317) 872-7200

CALC-11[®] is a powerful spreadsheet for financial planning and budgeting. It is file compatible with CALC-11 implementations on other PDP-11 and VAX systems. It is also available for the Professional under the P/OS Operating System. (See product description in the P/OS Decision Support/Spreadsheet listing.)

• **MDX**

Available from: Clinical Data Design
4718 West Lisbon Street
Milwaukee, WI 53208
(414) 444-9900

MDX[™] is a comprehensive Medical Office Management software system written in C. It includes four main software modules that can be used on a stand-alone basis, or integrated together in a complete office management system.

The Financial Accounting module provides for patient billing and insurance claim forms, and maintains patient records. Appointment Scheduling manages calendars and produces route slips and day sheets. The Medical History module allows physicians to create their own medical record screens for storing patient medical data. The user-controlled Report Writer allows for creating custom reports.

The system is table driven with complete menu selection for all modules. The extensive help function and on-line table inquiry makes MDX user-friendly and easy to learn.

• **UMD System**

Available from: Boston Systems Office
469 Moody Street
Waltham, MA 02154
(617) 894-7800

UMD (Universal Microprocessor Development) is a high performance, completely integrated development system for programming special-function chips for a wide range of products and processes. It is also available for the Professional under the P/OS Operating System.

RT-11 Software Library

- **Accounting**
- **MBSI RealWorld Accounting**

Available from: Glenn A. Barber & Associates, Inc.
15010 Ventura Blvd., Suite 304
Sherman Oaks, CA 91403
(818) 907-6622

Glenn A. Barber & Associates distributes an enhanced version of the popular RealWorld™ Accounting System for Professional systems running RT-11. The RealWorld accounting software is a market-proven set of integrated modules designed especially for the requirements of small businesses. These seven packages have been refined through the feedback of thousands of users over the last ten years. They provide ease of use without sacrificing performance. Modules available include General Ledger, Accounts Receivable, Accounts Payable, Payroll, Order Entry/Billing, Inventory Control, and Sales Analysis.

All MBSI accounting modules use standard screen formats and keyboard layout from module to module. Users manuals are clearly written and make useful training guides.

Each module includes step-by-step user installation instructions. The liberal use of “user definable parameters” throughout allows you to tailor each package to the way you do business.

In addition, modules can be modified. When altering the source code, the modular systems design, structured programming techniques, and complete and well-organized “Technical Reference Manuals” make changes relatively easy for competent COBOL programmers.

In short, MBSI is a proven set of software applications tailored to the practical requirements of small business.

Minimum System Requirements

- Professional 325, 350, or 380 system
- RT-11 operating system

- **CPA-11**
- **TCB-11**

Available from: Franklen Computer Systems, Inc.
715 Fremont Avenue
South Pasadena, CA 91030
(213) 441-3123

CPA-11™ is a flexible, multiple-entity client accounting general ledger and financial reporting system. It provides for virtually unlimited levels of consolidation.

TCB-11 (Time, Charges, and Billing for Professional Firms) is a professional practice management system designed for accounting firms. The system provides for time, cost, and cash receipts posting by client. Work-in-process reports, accounts receivable analysis, and client statistics are also provided. It is generally used in conjunction with CPA-11.

- **Pro-Accountant**

Available from: decComp
14752 Sinclair Circle
Tustin, CA 92680
(714) 730-5116

Pro-Accountant is a series of multitasking accounting modules designed to help professional accountants perform a variety of accounting services. Modules available include General Ledger,

Accounts Receivable, Accounts Payable, Inventory Control, Payroll Accumulation, and Purchase Order Entry. Pro-Accountant is also available for Professional systems under the P/OS operating system. (See product description under P/OS Accounting software.)

• **RT-11 Accounting Modules for the Professional**

Available from: Digital Perspectives Ltd.
290 Southcentre Executive Tower
11012 Macleod Trail South
Calgary, Alberta T2J 6A5
(403) 271-6860

Digital Perspectives offers a full line of accounting packages with extensive user-definable features. Modules available include General Ledger, Accounts Receivable, Accounts Payable, Canadian Payroll, Inventory, and Fixed Assets/Depreciation. The General Ledger includes a Financial Reporting system that allows you to define accounting structures and reports and include multiple entities and consolidations. The Accounts Receivable module features user-defined numbering and terms, open item or balance forward, detail and summary reports, aging, and statements. Accounts Payable supports user-defined numbering schemes, generates checks, and provides extensive management reporting.

• **TBS Accounting Packages**

Available from: Theta Business Systems
1110 Sonora Avenue, Suite 106
Glendale, CA 91201
(213) 245-0917

TBS offers integrated accounting systems written in Pascal that can be modified to meet a user's particular requirements. The systems are interactive and menu driven, simplifying training and

day-to-day operation. Modules available include General Ledger, Accounts Receivable, Accounts Payable, Payroll, Order Entry, Time Accounting for Professionals, and PDS (Pascal Development System). Theta's PDS and Oregon Software's Pascal-2 are required to modify the source code, which is included.

• **TIM: The Information Manager**

Available from: Compuflex
171 Hollis St.
Nashua, NH 03060
(603) 889-1196

TIM™ is a set of accounting packages designed for the company with an inventory-intensive business. The system's seven major programs (General Ledger, Accounts Receivable, Accounts Payable, Inventory Control, Billing, Order Processing, and Bill of Materials) and DABL provide highly sophisticated tracking and control. Compuflex is a total service company willing to include training and warranties with its software.

DABL is the Data Base Language operating system in which all of the Compuflex modules are written. DABL is required for use of any TIM module.

• **Broadcasting**

• **Radio Station Management Packages**

Available from: Radio Computing Services
177 N. Dean Street
Penthouse Level
Englewood, NJ 07631
(201) 567-3263

Radio Computing Services has a variety of radio station management packages available for the Professional, including complete systems, hardware and software, or software alone.

Barter is an accounting package for radio stations that keeps track of services bartered for on-air advertising. *Sampler* provides statistical analysis of audience research polls, yielding trends of taste and influence, artist preference, etc. *Selector* helps you choose a balance of music, features, and programming. It is currently in use by many large, well-known stations handling highly complex program demands.

• **Communications**

• **BLAST**

Available from: MIDCOM

1940 N. Tustin, Suite 101

Orange, CA 92665

(714) 998-6041

BLAST™ (Blocked Line Asynchronous Transmission) allows error-free file transfer between the Professional and other popular computers, including VAX, PDP-11, Rainbow, Data General®, Hewlett-Packard, Apple, Amdahl, IBM, TeleVideo™, Tandy, Northstar, CP/M, and MS-DOS systems.

BLAST utilizes standard serial ports and a variety of standard modems. It can transmit binary or text files in full duplex mode. It can also transfer parts of files as well as complete files. It is a powerful, low-cost solution for mixed-vendor communications.

• TSX-NET

Available from: Glenn A. Barber & Associates, Inc.
15010 Ventura Boulevard
Suite 302
Sherman Oaks, CA 91403
(818) 907-6622

TSX-NET™ allows your Professional to access files on other systems in a master-slave relationship. It incorporates a comprehensive data-validation and error-checking protocol to eliminate data transmission errors. TSX-NET can also be used to transfer files to and from the VMS and RSX operating systems, and will perform necessary file conversions in the process.

TSX-NET allows communication and ease of access when using any combination of TSX and RT-11 systems with either DL-type serial lines or DZ-type multiplexer lines. Using TSX-NET, utility programs, such as PIP, DUP, and DIR, and user-written programs can gain access to and manipulate RT-11 structured files on remote TSX or RT-11 systems that are connected via dialup or dedicated RS-232 communication lines.

The TSX-NET facilities include “virtual terminal capabilities” that permit a terminal to be software connected with a remote system and to have access to the devices and files of that system without affecting other data processing activities on the remote system. Using TSX-NET, OEMs and software houses can support remote users by running programs and inspecting and updating files directly on a remote system from a local terminal.

In addition, the remote polling and data collecting capabilities of TSX-NET allow the implementation of business and scientific applications that require distributed processing networks of TSX and RT-11 systems.

The capabilities of TSX-NET are comprehensive but not terribly complicated. You may find yourself an expert user with just a few hours of diligent study.

Minimum System Requirements

- Professional 325, 350, or 380 system
- RT-11 operating system

• **UAP-LINK**

Available from: Unique Automation Products
15401 Redhill Avenue, Suite G
Tustin, CA 92680
(714) 730-1012

UAP-LINK allows you to transfer protected binary and text files between different operating environments. It is also available on microcomputer, PDP-11, and VAX systems.

UAP-LINK opens a data pipeline to large timesharing hosts. It can also be used for media conversion and remote distributed processing of applications. A simple command language sends, receives, deletes, and renames data files. It features error-free data transfer with automatic compression.

• **XOREN IPL-11**

Available from: MIDCOM
1940 N. Tustin, Suite 101
Orange, CA 92665
(714) 998-6041

XOREN IPL-11 is a file transfer and terminal emulation facility that links many combinations of Digital products. It performs error-free file transfers even over noisy lines, transmits over telephone or direct lines, and uses standard asynchronous ports. It is also available for the Professional under the P/OS operating system. (See P/OS Communications software.)

• **Data Management**

• **RDM 300**

Available from: Interactive Technology, Inc.
1225 NW Murray Rd.
Portland, OR 97229
(503) 644-0111

RDM 300 (Responsive Data Manager) is a complete system for developing database management applications for inventory, employee, membership, and resource management. RDM 300 is also available under the P/OS operating system. (See description under P/OS Data Management applications.)

• **RTFILE**

Available from: Contel Information Systems
4330 East-West Highway
Bethesda, MD 20814
(301) 654-9120

RTFILE[®] is an interactive, fourth-generation relational database management system combined with a nonprocedural application

generator. It is also available on other PDP-11 systems. RTFILE provides a comprehensive set of menu-driven, forms-oriented utilities that enables minimally trained end-users to perform a wide range of common data processing tasks without programming. Instead of learning a command language, RTFILE users perform most database tasks by selecting menu options and completing display screens. When more complex processing is required, RTFILE provides a set of callable FORTRAN, Pascal, C, and MACRO-11 subroutines to access the database. Once the database schema has been defined using RTFILE menu options, fields can be added and modified.

• DECUS RT-11 Applications

For further information, contact:

DECUS Program Library
Order Processing
249 Northboro Road, BP02
Marlboro, MA 01752
(617) 480-3422

DECUS is the Digital Equipment Computer Users Society. In addition to hosting symposia and other information exchanges, DECUS maintains and supports the DECUS Library.

The DECUS Library reproduces user programs and documentation and distributes them essentially at cost. The Library is a clearing-house only; it does not sell, generate, or test programs. All programs and information are provided "as is."

Airplane Landing Simulation Game provides a pseudographic display of an aircraft instrument panel with realtime updates at one second intervals. It simulates a real instrument landing approach from an altitude of 25,000 feet to the runway, with instructions from ground control radar. Authors: Green, Parent, and Calhaem.

CLANGUAGE SYSTEM. The DECUS C (Binary Version) distribution contains a complete C programming system. Authors: Denny, Minnow, Conroy, and Forsythe.

COMPAG (Combine Pages) provides the ability to combine pages easily so they may be spread across a printer form rather than taking up a page each. *COMPAG* was designed to be used with *RUNOFF* output files, but will work with many other files. Author: Chester Wilson.

CVLLIB is a personal general-purpose library for the RT-11 MACRO and FORTRAN programmer. Routines include reading and writing decimal (up to triple precision) and octal (up to double precision) integers, money formats, filenames, and RAD50 formats. Author: Chester Wilson.

DECOD2 was written to decode *DISASSEMBLY.SAV* and *.LDA* files into their equivalent MACRO-11 assembly code complete with self-generated labels, absolute location, symbol table, cross-reference table, octal, ASCII and RADIX 50 equivalents. *DECOD2* is an improved version of *DECODE VO1J*, written by Michael Levine. Author: Yukoh Kobayashi.

FLECS (FORTRAN Language with Extended Control Structures) is an extension of the FORTRAN language that provides the control structures necessary to support recent concepts of structured programming. The distribution includes *.OBJ* files to avoid memory overflow. Authors: Beyer, Yarborough, and Calhaem.

FODT (FORTRAN-IV On-Line Debugging Tool for RT-11) allows the users of RT-11 FORTRAN IV to monitor the operation of their program using commands similar to *ODT*. It can be built into a task without editing or recompiling the source and does not interfere with normal operations. Authors: Beckwith and Kawasaki.

INDEX (FORTRAN Cross-Referencer) is a cross-referencing program that does for FORTRAN what CREF does for MACRO. A source program run through INDEX will be checked for all of its variable name and label usage. The operator is given many control options. Author: Michael Levine.

RENUM (FORTRAN Renumbering Program) is intended to provide two useful services for the FORTRAN programmer. First, it replaces the existing statement number in a FORTRAN program with a new (equivalent) series of sequential statement numbers; and, second, it produces a cross-referenced table of all variable names used in the source code showing the line numbers where all references to each variable name occur. Author: Eric Morton.

RUNOFF is a word processor that greatly aids document preparation. Features include automatic line fill, right-margin justification, pagination, hyphenation, index creation, and decimal notation. Author: Chester Wilson.

SORT is a general-purpose, high-speed memory/disc sort/merge utility program capable of coping with files as large as RT-11 can manage. Sorting may be ASCII or alphanumeric. Authors: Chester Wilson and Darrell Whimp.

TECO is a powerful text editor that runs under most RT-11 operating systems. It is suitable for editing almost any form of text file, including programs, manuscripts, and correspondence. Authors: Goldstein, Barnhall, and Calhaem.

TTLIB (VT100 LIBRARY) is a library of programs to control a VT100 type terminal conveniently in ANSI mode. Routines provided include those to allow drawing boxes and lines, cursor positioning, graphics facilities, and video attributes. Because TTLIB is a library, only the routines actually used are loaded into the user's programs. Author: Chester Wilson.

• **Engineering**

• **Civil and Structural Engineering Software**

Available from: Technical Information Systems Inc.
116 West Plume Street
P.O. Box 1900
Norfolk, VA 23501
(804) 622-1755

COGO is a tool for solving problems in plane coordinate geometry. It uses many subprograms to operate on a common set of 9,999 points on the coordinate table. It is suited for land surveying, bridge geometry, highway design, and right-of-way surveys.

HEC-1 performs a great variety of runoff hydrograph computations, including manipulations of station and basis rainfall and snow data, and river routing models. It also computes economic evaluations of basin modifications and structural effects.

HEC-2 Backwater Profiles performs steady, gradually varied flow profile computations for natural water channels including local obstructions. It also has routines assisting in flood plain management, and can compute several water profiles using the same data.

REWALL designs cantilevered concrete retaining walls according to ACI 318-77. Ultimate strength design is utilized.

STRESS is an engineering application program used to analyze forces, reactions, and displacements in structural designs such as building frames, bridge trusses, and transmission towers.

• **Power Distribution Engineering Software**

Available from: Scott & Scott Consultants, Inc.
P.O. Box 27476
Creve Coeur, MO 63141
(314) 576-7727

Distribution Primary Analysis (DPA) is an interactive, online family of programs for engineering studies of the planning, design, and operation of electrical distribution systems.

Distribution Transformer Management (DTM) is an online family of interactive programs consisting of a Transformer Model, an Analytical Model, a Load Model, an Energy Interface Model, and an Economic Model.

Economic Optimization of Distribution Losses (EODL) was developed to model the major components of a distribution system in a given time frame, to analyze and isolate technical losses, and to evaluate construction and loss costs for alternatives.

Micro-Area Load Forecast (MLF) provides for a definitive short-range and long-range load forecast for the planning of distribution systems. It is based upon socioeconomic parameters, such as land use, zoning, population, and income, that dictate future load levels.

Outage Reporting and Analysis System (ORS) is a package of interactive programs for establishing a database containing details about all distribution outages.

• **Symbolic Drawing Machine**

Available from: CADMATICS

21907 San Miguel St.
Woodland Hills, CA 91364
(818) 884-8957

Symbolic Drawing Machine (SDM)TM is a highly sophisticated program for interactive development of circuit diagrams, flowcharts, database structures, and other symbolic diagrams. The only graphics hardware required is a B-size interactive plotter, which is both the input and output device. SDM's many features include 90-degree rotation of all elements, 13 grid sizes and 4 character sizes (both expandable), and user-programmable function keys.

• **Medical**

• **AutoScript Pharmacy System**

Available from: AutoScript, Inc.

11 Mountain Avenue
Bloomfield, CT 06002
(203) 242-2358

Designed for automating pharmacy practices, AutoScript offers complete turnkey or networked pharmacy management systems. Applications include retail pharmacy, accounts receivable, outpatient/inpatient and nursing home pharmacy, and optional support for unit dose functions.

• **MEDISYS**

Available from: Small Business Systems, Inc.
10030 N 25th Drive
Phoenix, AZ 85021
(602) 997-8310

MEDISYS is a complete in-office medical management, billing, insurance, and collection control system designed for single practitioners and small clinics with from 1-15 doctors. It is also available for the Professional under the P/OS operating system. (See P/OS Medical applications.)

• **Practice Management System**

Available from: Smith, Abbott and Co.
300 E Joppa Road
Baltimore, MD 21204
(301) 296-9032

PMS is a comprehensive accounting package that provides instantaneous access to and updating of both patient records and billing information. It is also available for the Professional under the P/OS operating system. (See P/OS Medical applications.)

• **Personal and Office Productivity**

• **BOND-11**

Available from: KMK Enterprises, Inc.
302 W 8th Street
Plainview, TX 79072
(806) 293-4286

BOND-11 is an investment portfolio and database used to monitor bonds, notes, and securities. It features several interactive reports that list securities as they would mature on a yearly or monthly basis.

• **CT*OS**

Available from: Compu-Tome, Inc.
234 East Colorado Boulevard
Pasadena, CA 91101
(213) 796-9371

CT*OS Word/List Processing offers a full-featured word processing program that includes cut/paste, global search and replace, list processing, and alternate character set display. It interfaces with the CT*OS Spelling Corrector. Both are also available under the P/OS operating system. (See P/OS Word Processing applications.)

• **FASTEXT**

Available from: GABA
15010 Ventura Blvd.
Suite 304
Sherman Oaks, CA 91403
(818) 907-6622

FASTEXT™ is a full-screen text editor of compact size that is extremely easy to use. Files are created by typing in "FST" and the name of the file to be edited or created. SPELL™ is an interactive, high-performance (100 words per second), single-pass spelling corrector.

• **LEX-11 Word/List Processing**

Available from: EEC Systems, Inc.
327 E Boston Post Rd.
Sudbury, MA 01776
(617) 443-5106

LEX-11 Word/List Processing is a word processing software package that allows you to generate custom forms, graphics, and personalized mass mailings. It interfaces with the LEX-11 Spelling Checker that utilizes a dictionary file of over 100,000 words. LEX-11 is also available under the P/OS operating system. (See P/OS Word Processing applications.)

- **Quick Mail**

Available from: Horizon Data Systems
1901 Wildflower Terrace
Richmond, VA 23233
(804) 740-9244

Quick Mail is an electronic mail and filing system. Principal features include message exchange, bulletin boards, desk calendar, and annotated archives.

- **SATURN-CALC**
- **SATURN-GRAPH**
- **SATURN-WP**

Available from: Saturn Systems, Inc.
6875 Washington Ave. S, #218
Minneapolis, MN 55435
(612) 944-2452

The SATURN-CALC full-featured spreadsheet provides the framework for many business and scientific operations and allows direct integration with the SATURN-WP word processing, data entry, and SATURN-GRAPH graphics modules. This Saturn Systems package is also available under the P/OS operating system. (See P/OS Office Productivity applications.)

- **Alternative RT-11-based Operating System**
- **SHARE-eleven**

Available from: Contel Information Systems
4330 East-West Highway
Bethesda, MD 20814
(301) 654-9120

SHARE-eleven™ is a high-performance, efficient, multiuser operating system that can support a maximum of four concurrent users. It is faster than other multiuser implementations of RT-11 both in speed of terminal I/O and computing performance. SHARE-eleven has the same commands, programs, and features as standard RT-11. It also offers a number of new options, such as virtual disks, transparent output spooling to multiple printers, and record locking. These options are implemented so you can also use them under standard RT-11 systems.

- **Retail**

- **Retail Billing Systems**

Available from: Software Dynamics, Inc.
1000 Yale Ave.
Wallingford, CT 06492
(203) 265-2226

Billing Accounts Receivable for Retailers (BARR) is designed to aid a business in the performance of its accounts receivable function. In addition to generating aged statements and other aged accounts lists, the system provides for online inquiry into customer accounts.

Billing, Inventory Control, and Accounts Receivable (BICAR) is a menu-driven package for performing billing, inventory control, accounts receivable, and sales analysis. BICAR is highly operator-oriented and designed for small businesses.

Bill Of Material Processor (BOMP-11) organizes and maintains a central information system linking product structure records with master (inventory-type) records. It provides for full file maintenance along with audit trails of all maintenance transactions.

DTS-11 is a binary synchronous communications package enabling telecommunications with Data Terminal Systems Series 500 electronic cash registers. It operates at a line speed of 2,400 baud, or can be operated in a local mode.

Retailing Inventory Management System (RIMS) provides detailed inventory and sales analysis information for multiple locations on a daily, monthly, and year-to-date basis.

• Spreadsheets

• CALC-11

Available from: Computer Systems Corporation
5540 Rock Hampton Court
Indianapolis, IN 46268
(317) 872-7200

CALC-11 is a powerful spreadsheet program for financial planning and budgeting. It is file compatible with CALC-11 implementations on other PDP-11 and VAX systems. CALC-11 provides file encryption protection of sensitive data files, 3-D multiple level pages, variable individual column widths, infinite nesting of functions, and a full 80 or 132 column spreadsheet display. It is also available for Professional systems under the P/OS operating system. (See P/OS Decision Support/Spreadsheet applications.)

• DataCalc

Available from: Datatrend
395 Ironwood Drive
Salt Lake City, UT 84115
(801) 487-0531

DataCalc is an electronic spreadsheet designed for managers, financial analysts, budget officers, and accountants. It is also available for Professional systems under the P/OS operating system. (See P/OS Decision Support/Spreadsheet applications.)

• **Supercomp-Twenty**

Available from: Access Technology
6 Pleasant St.
South Natick, MA 01760
(617) 655-9191

Supercomp-Twenty is an enhanced spreadsheet package that offers compatibility and a standard user interface across a variety of systems. It is also available under the P/OS operating system. (See P/OS Decision Support/Spreadsheet applications.)

CTS-300 Software Library

• **GOVERNMENT-11**

Available from: KMK Enterprises, Inc.
302 West 8th
Plainview, TX 79072
(806) 293-4286

GOVERNMENT-11 is a comprehensive government reporting information system designed to meet the needs of municipal or county administrative structures. In addition to its wide range of reporting capabilities, GOVERNMENT-11 can be tailored to meet the needs of individual users in both in-house and service bureau/timesharing environments. The system may be purchased in any combination needed by the user. All packages use interactive screen entry.

The system requires CTS-300 and SUP-11 (a subroutine utility and print program available through Compu-Share).

For county governments the following seven modules are recommended: MAP-11, Municipal Accounts Payable; MGL-11, Municipal General Ledger; MPY-11, Municipal Payroll System; MAR-11, Municipal Accounts Receivable; VEH-11, Vehicle Registration Reporting System; TAX-11, Tax Assessment/Collection System; VOTER-11, Voter Registration and Reporting System.

To use GOVERNMENT-11 in city governments, substitute UTL-11 (Utility Billing/Accounts Receivable System) for MAR-11 and VEH-11.

• **GOVERNMENT PAYROLL SYSTEM**

Available from: PM Computer Services Company
630 Thirtieth St. NW
Canton, OH 44709
(216) 489-1885

The Government Payroll System provides complete realtime computerization of employee pay records, interactive entry and editing of new payroll transactions, and current and year-to-date information access. Available functions include complete tax withholding (optional), complete fund and department accounting, and display of current and year-to-date information on CRT inquiry. Also available are active and inactive employee listing; payroll register; monthly PER, SPR, STRS, and SERS reports; W-2 forms; and special reports.

• **Voter Registration System**

Available from: PM Computer Services Company
630 Thirtieth St. NW
Canton, OH 44709
(216) 489-1885

The Voter Registration System provides for complete realtime electronic recording of registered voter additions, changes, and deletions. The system offers election accountability, jury lists, and

automatic state reporting as required by law. Inquiry capability, by county ID number or by name, and automatic checking for duplication before addition ensure accuracy. On the Professional, the Voter Registration System is ideally suited for a small county. Interactive files include voter master file, state update file, precinct description, election update, and annual voter purge. The system also generates a voting history and accountability reports.

• **Dog License System**

Available from: PM Computer Services Company
630 Thirtieth St. NW
Canton, OH 44709
(216) 489-1885

This realtime online Dog License System provides for updating or adding information and accessing billing information as required. Menu-driven, the system is easy to operate. Changes and deletions are made online. Tagged dogs that have died or migrated can be deleted automatically, thus preventing ID tags from being switched among dogs. The system also features automatic handling of price differences between kennel dogs and personally owned dogs. The transfer of dog ownership is accomplished without reentering dog data. Breeds are referenced by a three-digit code, eliminating the need for names. Available reports featured by the Dog License System include the Daily Transaction Report, Delinquent Dog payment report, Printing of Dog License bills, alphabetical listing, and yearly recap.

MS-DOS Software Library

The software listed below has been converted for use on the PC-Bridge hardware/software option on the Professional. It is available on Professional-format RX50 diskettes directly from:

Virtual Microsystems, Inc.
2150 Shattuck Ave.
Suite 720
Berkeley, CA, 94704
(415) 841-9594

Artificial Intelligence

- Medical
 - Dental
-

Ashton Tate

- dBASE II™
-

Computer Innovation

- “C” Compiler
-

Condor Computer Corporation

- Condor™ I
 - Condor II
-

DISC—Digital Information Systems Corp.

- DBL™ (DIBOL Superset Language)
 - DBL (Runtime Only)
-

Fox & Geller Associates

- Quickcode™ (for dBASE II)
-

Genesis Microsystem

- Access (Intel Series—III MDS emulator)
-

Lexisoft

- Spellbinder™
-

Mark Of The Unicorn

- Final Word™
 - Mince™ (Text Editor)
 - Scribble™ (Formatter)
-

Micro Business Applications

- General Ledger with Financial Report Writer
 - Accounts Receivable with Invoicing
 - Accounts Payable with Check Writing
 - Inventory with Invoicing
 - Purchase Order/Requisitions for Inventory
 - Fixed Asset Accounting
 - Multi-Company Options (allows multiple single application data files to reside on the same virtual floppy)
 - dBASE II, Word Processor, and Programmer Interfaces (DWP)
 - General Ledger DWP Interface
 - Accounts Receivable DWP Interface
 - Accounts Payable DWP Interface
 - Payroll DWP Interface
 - Inventory DWP Interface
-

MicroPro[®]

- WordStar[®]
- MailMerge[®]
- DataStar[®]
- InfoStar[™]
- ReportStar[™]
- CalcStar[®]
- WordMaster[™]
- SuperSort[®] II
- SpellStar[®]
- Star Index[™]

MicroRIM

- R:base 4000[™]
- Extended Report Writer

Microsoft[™]

- Multiplan[™]
- BASIC Interpreter
- BASIC Compiler[™]
- Business BASIC Compiler
- PASCAL
- FORTRAN
- C
- MU LISP/MU STAR (Language)
- COBOL

Microsystems Engineering Corp.

- MASS-11™
-

North America Mica Inc.

- PMS II
-

Perfect Software

- Perfect Writer™
 - Perfect Speller™
 - Perfect Filer™
 - Perfect Calc™
-

Real-Time Computer Science Corp.

- RTCS/UDI (Universal Development Interface, allows execution of all Intel-compatible object modules: PL/M-86, ASM86, etc.)
-

Ryan-McFarland

- RM/Cobol™ (Full development system)
 - RM/Cobol (Runtime only)
-

Satellite Software International

- Word Perfect
-

Softrak Systems

- MicroTrak
-

Software Arts, Inc.

- TK!Solver
-

Sorcim Corporation

- SuperCalc[®] 3
 - SuperCalc 2
-

Star Computer Systems

- The Accounting Partner[™] (includes GL, AR, AP, PR, INV, and PO)
-

Supersoft

- Basic Compiler
 - Star Edit
-

T/Maker Inc.

- T/Maker III[™]
-

Virtual Microsystems

- PhoneLink (communications package to other minis or micros)
-

Westminster Software

- Pertmaster[™]
-

CP/M Software Library

Available from: Lifeboat Associates
1651 Third Ave.
New York, NY 10028
(212) 860-0300

The following programs are available from Lifeboat Associates for use with PRO CP/M-80:

Word Processing

- MicroSpell
 - Spellguard™
 - Textwriter III™
 - WordStar
 - WordStar French
 - WordStar Customization Notes
-

Data Management

- dBASE II
 - DMS
 - FORMULA
 - Hoe
 - InfoStar
 - MDBS
 - MAG/base 1,2, and 3
 - Micro-SEED
 - ReportStar
 - T.I.M. III
-

Numerical Problem-Solving Tools

- Multiplan
 - T/Maker III
 - PLAN80
 - Math Star
 - Microstat
 - Statpak™
 - Supercalc
-

Professional and Office Aids

- Apartment Management
 - Daisy-Aids™
 - PAS-3 Medical
 - PAS-3 Dental
 - Property Management
 - Wiremaster
-

Financial Accounting Packages

- THE BOSS™ Accounting System
 - THE BOSS Payroll
 - Univair General Ledger Accounting System
-

Educational

- Torricelli Author
 - Torricelli Studio
-

Mailing List Systems

- MailMerge
 - Postmaster
-

Languages

- BASIC-80™
 - BASIC Compiler
 - Bazic II
 - BDS 'c' Compiler
 - CBASIC®-2
 - CB-80
 - CIS Cobol™
 - COBOL-80™
 - FORTRAN-80™
 - kbasic
 - MAC-80
 - MBASIC-80
 - Pascal M™
 - Pascal MT w/SPP
 - PL/1-80™
 - Precision BASIC
 - Prospero Pascal
 - Tiny-c
-

Development Tools

- DataSafe

- DataStar

- dUTIL

- QUICKCODE™

- Forms 2 for CIS COBOL

- MAG/sam-E

- MAG/sort

- M/SORT

- Programmer's Apprentice

- PSORT

- SuperSort

- Ultrasort II

- STRING-80

- STRING-80 Source Code

- STRING BIT

- VCOM

- Vedit

- Visam

System Tools

- BUG and UBUG
 - Despool
 - Distel
 - Disilog
 - EDIT
 - EDIT-80
 - PLINK
 - PLINK II
 - PMATE
 - Reclaim
 - SID
 - Unlock
 - WordMaster
 - ZAP-80
 - ZDT
 - z80 Development Package
 - ZSID
-

• Disco-Tech

Available from: Disco-Tech
600 B Street
P.O. Box 1659
Santa Rosa, CA 95402
(707) 523-1600

Disco-Tech is a company specializing in software for engineering decision support. The following software applications run under PRO CP/M-80.

Survey 2000 is an integrated set of four programs for the management and analysis of survey field data. The programs are *LOCATOR*, a field data reduction program; *COGO 2000*, a coordinate geometry program; *MAP 2000*, a perimeter verification program; and *PLOT 2000*, a dimensional plotter.

Survey 80 is an integrated set of five programs, also for the management and analysis of survey field data. The programs are *FINDER*, Field Note Data Reduction; *COGO*, a coordinate geometry program; *EDM/Topo*, a topographic survey program; *MapCheck*, for parcel perimeter and area checking; and *Plotter*, a point-to-point coordinate plotting program.

Foundation Design Package is a set of four programs that includes *POLEM*, for pole embedment design; *FOOTING*, for isolated footing design; *PGB*, for pier and grade beam design; and *ELFAN*, for grade beam on elastic foundation analysis.

Disco-Specs is an architectural specification-writing data package (*Spellbinder*, *WordStar*, *Perfect Writer* or *Scripsit* word processing program required).

Other Disco-Tech titles include:

HCS. Horizontal curve staking.

STADIA. Stadia reduction package calculates distance to, coordinates of, and elevation at the rod station.

VERTICURVE. Vertical curve design.

WATNET. Water network analysis. Requires *MBASIC*.

DYSPON. Dynamic response module.

CUT & FILL. Calculates cut and fill based on the Matrix Grid Method.

BEAM-1. Simple beam design and analysis.

FRAME 80. Two-dimensional frame analysis.

RetWall. Retaining wall design.

TiltWall. Concrete tilt-up wall design.

THE ESTIMATOR. Construction estimating program.

THE FRAMING CALCULATOR. Prepares estimates of material quantities and labor hours for general wood frame construction.

• **MicroArt**

Available from: MicroArt Corporation
200 Market Bldg/Suite 961
Portland, OR 97201
1-800-642-7627

MicroArt™ is an integrated word/graphics processor™ that allows you to design and combine images and text within a document. Diagrams, business forms, flowcharts, signs, and letterings are all easily created online and may be printed out on the Professional's printer. MicroArt is also available on Rainbow and DECmate CP/M systems.

• **WPS-80**

Available from: Exceptional Business Solutions
11738 Moorpark St.
Studio City, CA 91604
(818) 760-8921

WPS-80™ is a word processing program that is keystroke compatible with Digital's WPS-8 word processing system. WPS-80 is available for the Professional running PRO CP/M-80, as well as for the Rainbow and DECmate II.

p-System Software Library

A catalog of UCSD p-System applications can be obtained from SofTech Microsystems, Inc., San Diego, CA 92127.

The following applications have been developed expressly for use on the Professional, and are available from their vendors on RX50 diskettes.

• **Administrative Planning System (APS)**

Available from: Learning Tools, Inc.
686 Massachusetts Ave.
Cambridge, MA 02139
(617) 864-8086

APS™ is a user-definable management system for administrators in schools, clinics, or other human service organizations. It provides capabilities for interactive access to a student/client database of up to 10,000 individuals with 100 items of information on each. It also allows for immediate report generation based on user specifications.

Files are organized in an easily modifiable hierarchy to meet a variety of local, state, and federal requirements. APS files are dynamically structured, so adding new types of information is a simple task. APS integrates with the Individualized Planning System for automatic record updates.

• **AMS RealStar**

Available from: AMS RealStar, Inc.
2260 S. Xanadu Way
Aurora, CO 80014
(303) 695-1300

AMS RealStar is a centralized management information system designed specifically for the real estate broker. It provides an in-house resource for accounting, sales management, and client follow-up. The AMS RealStar system consists of five application modules: General Ledger, Sales and Commission Accounting, Client Follow-up (with Word Processing), Farming (with Word Processing), and Investment Analysis/Amortization. Each module can be purchased separately or in integrated systems depending on the broker's needs. Modules come with a self-paced audio cassette training tape along with helpful instruction and reference manuals.

• **Curriculum Management System (CMS)**

Available from: Learning Tools, Inc.
686 Massachusetts Ave.
Cambridge, MA 02139
(617) 864-8086

CMS is a flexible, user-definable management system that centralizes and coordinates curriculum and service resources for professional planning. The user-defined curriculum and resources may include goals, objectives and related textbooks, films and audiovisual equipment, and other definable items. Information created

with CMS can be used for individualized planning with the Individualized Planning System. Any information representable in an outline or hierarchical format can be stored, modified, accessed, and printed out with single-letter commands.

• **Individualized Planning System (IPS)**

Available from: Learning Tools, Inc.
686 Massachusetts Ave.
Cambridge, MA 02139
(617) 864-8086

IPS is a user-definable student/client information management and reporting system for administrators, supervisors, counselors, and other human service workers. It provides user-defined report generation and interactive menu-driven access to individualized information. You can use IPS to create reports, including individualized diagnostics, progress, and clinical observations. Confidentiality is maintained through use of passwords and authorization levels for access to each item of information. IPS integrates with both APS and CMS for a complete Superplanner Management System.

• **LedgerCalc**

Available from: Dynamic Control Systems
P.O. Box 49
Maynard, MA 01754
(617) 562-2265

LedgerCalc is an entry-level accounting package designed specifically to ease the transition from manual accounting methods to computerized systems. LedgerCalc directly emulates traditional bookkeeping methods in its screen formats and basic setup, thus allowing the accountant to enter information in familiar forms.

Adaptations to a client's particular needs are easy to make. Dynamic Control Systems also offers contract services in the design and manufacture of various products such as data collection and retrieval devices and process control systems.

• **INTELLECT-UL**

Available from: PCD Systems, Inc.
P.O. Box 277
Penn Yann, NY 14527
(315) 536-7428

INTELLECT-ULTM is a full-range LISP interpreter for the UCSD p-System. It relates to symbols the way other languages relate to numbers. The objects it handles best are well suited to the representation of data whose structure is not known in advance. Over 80 basic functions are built in, allowing the user to write most applications without programming other support routines. Efficient memory management returns any space not in use to the program. Programs are built by function composition, while the interpretive nature of INTELLECT-UL facilitates debugging.

• **MEDOFFICE**

Available from: PCD Systems, Inc.
P.O. Box 277
Penn Yann, NY 14527
(315) 536-7428

MEDOFFICETM (Medical Office Practice Management) is an integrated software package designed to support from one to twenty physicians and up to 30,000 patients. It was developed to the standards of currently practicing physicians and designed so that no prior computer experience is needed to run it.

It offers 16 features, including Superbill preparation on patient arrival giving current status, appointment scheduling, insurance form preparation, prescription printing, ICD-9-CM disease coding, and medication profiles and diagnosis lists for each patient. Patient and financial security are provided through several levels of passwords.

MEDOFFICE can improve collections, cut overhead costs, increase cash flow, and provide financial control that can save a significant part of the practice gross every year.

The medical section stores individual diagnoses and problem lists, as well as medication records on each patient. These, or any subgroup, can be retrieved and updated in seconds. Complete support is provided to registered users along with a user hotline.

Standard Micro MUMPS 300 Software Library

• CMPS

Available from: Creative Socio-Medics
16 East 32nd Street
New York, NY 10016
(212) 696-3500

CMPS (Comprehensive Medical Practice System) is a medical office management and billing system that can support up to five users on the Professional. It is also available on other PDP-11 and VAX systems. System features include patient accounts receivable, patient registration and treatment histories, medical management reports, a password-controlled security system, computerized help functions, and support of multiple-simultaneous users of the system.

• COMET

Available from: Creative Socio-Medics
16 East 32nd Street
New York, NY 10016
(212) 696-3500

COMET (Creative Occupational Medicine and Environment Tracking) is a comprehensive, online system that enables occupational health professionals and executives to manage effectively all aspects of employee health and safety. It is ideally suited to small companies or individual plants or divisions in a distributed data processing network. COMET is also available on other PDP-11 and VAX systems.

COMET is designed to monitor and integrate employee health data for corporate and industrial medical units and environmental health and safety departments. The system tracks the medical

history of each employee, correlates specific health problems with work history and workplace environments, and identifies causal factors in work-related accidents.

• **MedRx**

Available from: MedRx
747 Main Street
Concord, MA 01742
(617) 369-3010

The MedRx System is an integrated medical record/medical financial system designed for use in practices or ambulatory care clinics. A financial-only system (which can be expanded to include medical records) is also available.

The MedRx medical record is a clinical-quality record that can be as detailed as the physician requires. It can replace the traditional paper chart completely.

The financial system automatically prepares and prints all the statements, insurance forms, and reports a medical practice needs. In addition, it prepares a fully detailed day sheet with a cash analysis and a monthly ledger. Word processing and a general ledger/accounts payable system are also available.

• **MHMIS**

Available from: Creative Socio-Medics
16 East 32nd Street
New York, NY 10016
(212) 696-3500

The MHMIS (Mental Health Management Information System) is a complete management system for Mental Health and Social Service organizations. It is interactive, menu-driven, easy to use, and easy to learn. It is also available on other PDP-11 and VAX systems.

Capabilities of the system include: basic accounting functions such as AP/AR, payroll, billing, and general ledger; insurance, Medicaid, and other third-party billing; delinquent payments; standard and adhoc reports; easy input of and access to intake, treatment, and discharge data; data security; and service quality assurance.

• **Radiology Management System**

Available from: Creative Socio-Medics
16 East 32nd Street
New York, NY 10016
(212) 696-3500

The RMS (Radiology Management System) combines conventional appointment management with "walk-in" scheduling and performance monitoring. The system tracks the patient's process from the scheduling of an appointment through the completion of the examination. It is also available on PDP-11 and VAX systems.

A direct output of this process is the production of bills, receipts, flash cards, and jacket labels at the time and place that they are required. The online patient file provides accounts receivable reporting, follow-up statements, and management reports. The system automates the production and tracking of diagnostic interpretations.

XENIX Software Library

Available from: The Santa Cruz Operation
500 Chestnut Street
Box 1900
Santa Cruz, CA 95061
(408) 425-7222

The following software applications are available from the Santa Cruz Operation for use with XENIX on the Professional:

*Uniplex*TM is a complete, menu-driven word processing system that can be customized to your special needs. It combines text editing, formatting capabilities, and print-time commands in a single environment. Uniplex has a built-in spelling checker and file merge capability, and its files are completely compatible with all XENIX utilities that process text.

*Informix*TM is a relational database management system that provides the greatest possible latitude in how you structure your data. It has a flexible query language that lets you explore new relationships between data elements, and a comprehensive report writer that can access and merge standard XENIX files into the reports it generates. Data access privileges down to the field level may be created to protect confidential data.

Level II COBOL is a mainframe-level COBOL implementation that has been certified by the U.S. Government as meeting the highest level of the ANSI 1974 standard. A multikeyed indexed sequential access method allows COBOL programs and Informix to share the same data, and dynamic subprogram loading allows the creation of programs that would not ordinarily fit in system memory.

COBOL Development Tools is a package that is used in the creation and debugging of COBOL programs. Forms-2 speeds the development of interactive, screen-oriented programs. It lets a programmer paint a form on a CRT screen and then automatically generates COBOL source code to handle screen data entry and display. Animator is a symbolic debugger that displays the source code for a COBOL program on the screen and then lets the user control the execution of the program line by line.

Idris Software Library

• Alpha Basic Compiler

Available from: Empirical Research Group
P.O. Box 1176
Milton, WA 98354
(206) 874-4844

The Alpha Basic Compiler is a compiler for 68 K Basic and contains several powerful extensions. No line numbers are required; they can be replaced by alphanumeric labels of any length. Variables can also be of any length with uppercase/lowercase significance. Tabs are implemented via TAB commands, providing terminal-independent screen handling. Multiple variables can be mapped over the same memory space. ISAM file structures are fully implemented and available to the programmer.

• **Horizon Spreadsheet**

Available from: Horizon Design, Inc.
220 Downey St.
San Francisco, CA 94131
(415) 543-1199

The Horizon Spreadsheet™ is a powerful spreadsheet package that provides many scientific and business functions. It ensures accuracy up to 17 digits. It features fast tabular calculation and an electronic worksheet area encompassing 256 columns x 256 rows.

• **Horizon Word Processor**

Available from: Horizon Design, Inc.
220 Downey St.
San Francisco, CA 94131
(415) 543-1199

The Horizon Word Processor™ provides “what you see is what you get” word processing and includes many powerful editing and formatting features. The results of commands are shown on the screen as they are executed. It features on-screen justification, underlining, centering, indentation, and alignment.

• **IDEAS**

Available from: The Village Systems Workshop
P.O. Box 1394
Boston, MA 02205
(617) 237-0238

IDEAS (Interactive Data Entry/Applications System) provides a user-friendly data entry system for creating uniformly structured files. It is a table-driven software package that supports screen-oriented form filling. It is ideal for managing small to medium-sized, record-oriented data files. Data files may be as large as 1,000 records.

• **Idris Plus**

Available from: The Village Systems Workshop
P.O. Box 1394
Boston, MA 02205
(617) 237-0239

Idris Plus is an enhanced Idris operating system that features added utilities for the office automation environment. It was developed for the non-technical user.

• **Legal Management System**

Available from: Kubernan, Inc.
321 West Fourth St.
P.O. Drawer 594
Winston-Salem, NC 27102
(919) 724-1915

The Kubernan Legal Management System is a comprehensive accounting and billing system that provides a unique set of prebilling, billing, and management reports. These reports present vital information regarding the law firm's unbilled time, accounts receivable, cash flow, docket control, profits, and staff time analyses in a clear, meaningful format. It features both word processing and data processing and includes a complete account system.

• **LEX-11**

Available from: EEC Systems, Inc.
Millbrook Park
327E Boston Post Rd.
Sudbury, MA 01776
(617) 443-5106/6376

LEX-11 is a menu-driven, integrated word and list processing software package that contains office automation and data management facilities. It is an exceptionally flexible system with true

full-screen editing; custom forms design; storage and recall of frequently used pieces of text on keystrokes; and no formatting codes. The text appears on the screen in the exact format in which it will be printed.

LEX-11 features multiple-column text entry, cut and paste, column swap, calculator, storage and automatic recall of sequence of commands, user-defined function keys, and features for mass mailings. It is also available under the P/OS and RT-11 operating systems. (See P/OS Word Processing applications.)

• **PHACT-dbrm**

Available from: PHACT Associates, Ltd.
231 East 11 St.
New York, NY 10003
(212) 219-3744

PHACT-dbrm is an ISAM file system containing a library of c functions that provide single-user or multiuser access to variable length records in a fully portable (except for floating point) database. It assumes knowledge of the c programming language. Data can be placed into records by assigning it to fields by name; data and key fields are maintained in a data dictionary. Five data types are allowed. Records can be accessed either directly by the ISAM key or by relative position. The library of c functions can be called from any c program. Alternate indices (up to nine) are permitted for each file. It features access on full or partial key. PHACT-dbrm has numerous optimizations.

• **PLUS Accounts Payable System**

Available from: The Village Systems Workshop
P.O. Box 1394
Boston, MA 02205
(617) 237-0238

The PLUS Accounts Payable System is a menu-oriented, completely interactive system based on an embedded DBMS command.

• **PLUS Financial Management System**

Available from: The Village Systems Workshop
P.O. Box 1394
Boston, MA 02205
(617) 237-0238

The PLUS Financial Management System is a comprehensive general ledger and budget management system for small to medium-sized organizations. It supports interactive data entry and validation, and fund accounting for nonprofit organizations. Batch processing and reporting are also available.

• **PLUS Information System**

Available from: The Village Systems Workshop
P.O. Box 1394
Boston, MA 02205
(617) 237-0238

The PLUS Information System is a full database management system. It is fully upward compatible with IDEAS, the Interactive Data Entry/Applications System from the Village Systems Workshop. The PLUS Information system is also useful as a software development tool.

• **PRO/ED**

Available from: Village Systems Workshop
P.O. Box 1394
Boston, MA 02205
(617) 237-0238

PRO/ED is a screen-oriented editor and word processor for the Professional 350 or 380.

• **VED**

Available from: Empirical Research Group
P.O. Box 1176
Milton, WA 98354
(206) 874-4844

VED is a full-screen, general-purpose editor. It is useful for both program entry and text editing.

The Professional Series offers the widest selection of mature development tools and languages available on a personal workstation. As a PDP-11, the Professional supports versions of Digital's versatile RSX, RT-11, and CTS-300 development environments, as well as PRO/BASIC. Additionally, it offers development packages under p-System, three UNIX-based systems (PRO/UNIX, XENIX, and Idris), and the medically oriented STANDARD MICRO MUMPS. These environments let you develop applications directly on the Professional and for the Professional. The Professional Host Tool Kit gives you the alternative of using a Digital VAX or PDP-11 computer to develop applications for the Professional.

The application development tools and languages described in this chapter are grouped according to the operating system under which they run. See Chapter 3 for a discussion of the development tools included with each operating system. For a description of a particular operating system, see Chapter 8.

Operating System	Supported Development Environments
P/OS Hard Disk	Professional Tool Kits MACRO-II (included with Tool Kits) Tool Kit FORTRAN-77 Tool Kit FORTRAN-77 DEBUG Tool Kit Pascal Tool Kit COBOL-81 Tool Kit DIBOL Tool Kit BASIC-PLUS-2 Tool Kit Realtime Interface Library Whitesmiths C for Tool Kits PRO/BASIC PRO-IV
P/OS Diskette	PRO/BASIC

Operating System	Supported Development Environments
p-System (layered on P/OS)	FORTRAN-77 for p-System UCSD Pascal
RT-11	MACRO-11* PRO/FORTRAN IV (RT-11) FORTRAN-77 PRO/BASIC-11 (RT-11) COBOL-PLUS Pascal-2
PRO/VENIX	C* FORTRAN-77* PASCAL* BASIC*
XENIX	Level II COBOL COBOL Development Tools
Idris	Whitesmiths C* Whitesmiths Pascal* Alpha Basic Compiler
MUMPS	SMM 300*

• PRO/Tool Kit

Order Code: QBA14-A3

The PRO/Tool Kit transforms the Professional 350 or 380 into a standalone personal PDP-11 development computer. The PRO/Tool Kit combines mature RSX-based facilities and new Professional-specific utilities to create a familiar yet innovative development environment. And all on a dedicated workstation.

*These languages are either included with the operating system or are components in a particular package that can be ordered with the operating system. Contact the vendor for a complete description of these products.

Many PRO/Tool Kit components are versions of proven RSX development facilities. Familiar resources include PRO/Record Management Services (PRO/RMS), PRO/File Control Services (PRO/FCS), and PRO/Forms Management System (PRO/FMS). These tools are highly compatible with their RSX counterparts and therefore make it easy for you to move your applications between the Professional and other RSX-based systems.

The PRO/Tool Kit is more than simply a collection of tailored RSX resources: it also contains special utilities, including the Frame Development Tool (FDT), that are designed to support the unique P/OS environment. FDT helps you implement such ease-of-use features as menus, help, and message frames. Because Digital used FDT to develop the P/OS human interface menu system, the applications you develop using FDT will blend with the P/OS menus to show end-users this consistent interface. Another point worth noting is that FDT maintains display screen text separately from code. This design greatly reduces the cost of introducing your application into new countries: simply translate the screen text.

PRO/Tool Kit Supports Industry-Standard Languages.

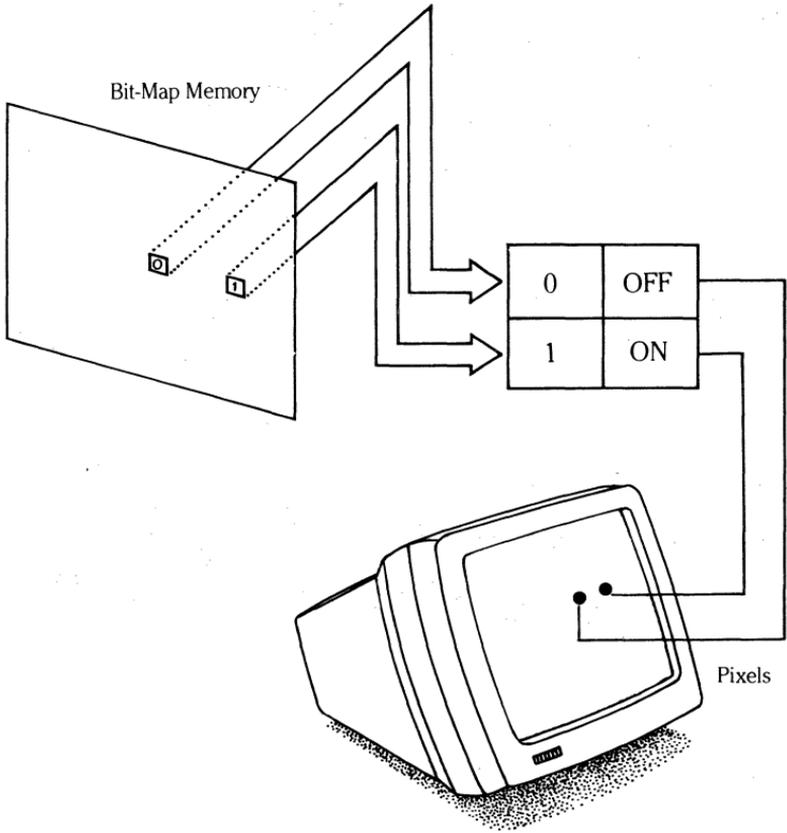
The PRO/Tool Kit supports several powerful language environments that are tailored to P/OS. The MACRO-11 assembly language is standard with the PRO/Tool Kit and need not be ordered separately. Optional PRO/Tool Kit languages include COBOL-81, DIBOL, FORTRAN-77, Pascal, and BASIC-PLUS-2. Whitesmiths C, available directly from the developer—Whitesmiths Ltd. of Concord, MA—also runs under the PRO/Tool Kit. Unlike offerings available for other single-user workstations, these compilers meet industry standards. These products are syntactically the same as RSX languages and are subset-compatible with VMS languages.

For more information on a particular language, see the appropriate language description later in this chapter.



PRO/Tool Kit Provides Access to P/OS Graphics Resources.

The PRO/Tool Kit helps you integrate impressive visual effects into your applications. So that you can take advantage of the Professional's outstanding video bit-map hardware, the PRO/Tool Kit gives you access to the CORE Graphics Library (CGL) and the Professional General Image Display Instruction Set (PRO/GIDIS). These device-independent graphics libraries contain subroutines that let you draw lines, curves, and polygons; set colors and gray shading; control viewing transformations and perform automatic scaling using windows and viewports; and display text in various font styles.



The PRO/Tool Kit provides access to the video bit-map, enabling you to control each pixel on the video display.

Each library is suited to a range of graphics projects. CGL is appropriate where industry-standard graphics and ease of programming are concerns. Specialized software such as terminal emulators and interactive graphics editors require the lower-level routines available from PRO/GIDIS. See Chapter 3 for more information on these libraries. All of the languages supported by the PRO/Tool Kit can access CGL. MACRO-11 and all PRO/Tool Kit languages except DIBOL can access PRO/GIDIS.

MACRO-11 and high-level languages that use MACRO subroutines allow direct register I/O and thus give you full access to the video bit-map. The PRO/Tool Kit documentation set includes the *Terminal Subsystem Manual*, the *CORE Graphics Library Manual*, and the *PRO/GIDIS Manual* to help you take advantage of these graphics tools.

The PRO/Tool Kit Supports the Professional's Optional Hardware.

The PRO/Tool Kit includes or supports libraries to help you develop applications for the Professional's sophisticated hardware options. Whether you decide to develop for Digital's PRO/DECnet, Realtime Interface (RTI), or Telephone Management System (TMS)—or even if you obtain the no-cost bus license and develop your own hardware—the PRO/Tool Kit can provide the resources you need to develop efficient applications quickly.

PRO/Tool Kit support for PRO/DECnet includes transparent file access to remote RSX-based DECnet systems, task-to-task communication, transparent network file access for several DCL commands, and access to the Network File Transfer Facility. It also provides direct-line access to Ethernet that bypasses the DECnet software, so you can write applications that interface with a non-Digital system on the Ethernet. For the RTI, the PRO/Tool Kit supports the optional Professional Realtime Interface Library (PRTIL) that facilitates your development of applications for device

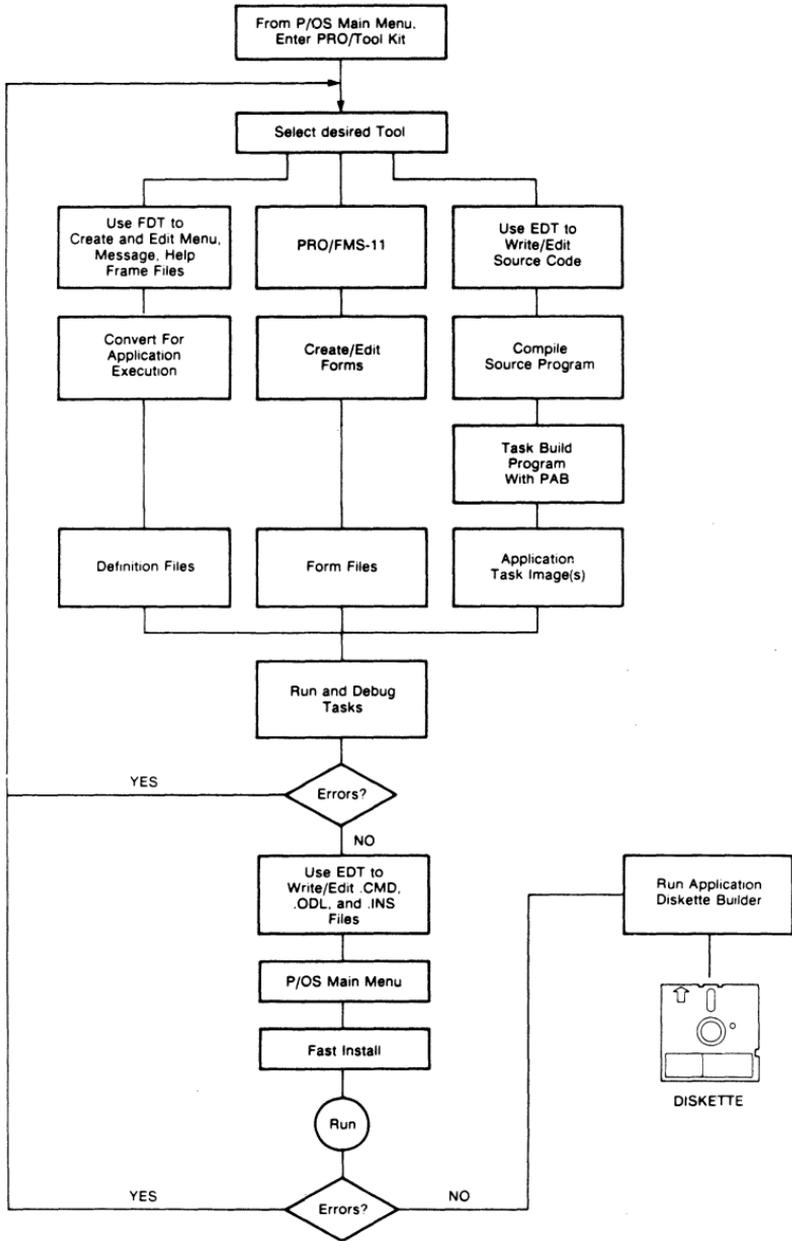
control and realtime data acquisition. The PRO/Tool Kit includes routines that help you use TMS for exciting applications that integrate voice communication with text and graphics.

The PRO/Tool Kit Development Cycle.

The PRO/Tool Kit development cycle is very similar to the development process under VMS or RSX. The PRO/Tool Kit and one or more PRO/Tool Kit languages fit on the Professional 350 or 380 hard disk. After installing the PRO/Tool Kit on a P/OS menu, you complete all of your development using an extended subset of the Digital Command Language (DCL) that is used on VMS and RSX-11M/M-PLUS systems. This subset includes such features as commands for file manipulation and logical name assignment, the SHOW command for debugging, and the new single-line editor that remembers the last several DCL commands you typed and lets you repeat or edit them without retyping. With DCL you can write, compile, taskbuild, execute, and debug applications without using menus.

Your first step in the PRO/Tool Kit development cycle is to create the source file using Digital's interactive keypad editor, EDT. Next, compile the program and use the Professional Application Builder (PAB) to collect object modules into an executable task. You can test and debug the application using DCL or you can prepare an installation file and use the Fast Install utility that lets you bypass the application diskette building process and quickly integrate the application into a menu for testing. When the application is fully tested and debugged, use the Application Diskette Builder (ADB) to build the application diskettes for distribution to end-users.

The extensive documentation set accompanying the PRO/Tool Kit explains and provides reference material for all stages of application development on the Professional.



The PRO/Tool Kit Development Cycle. All development is accomplished on the Professional.

The Tools.

The PRO/Tool Kit has everything you need—from editors to create the source files to a utility for building application diskettes for distribution to end-users. It also includes several resources to help you debug code more efficiently. The remainder of this section gives brief descriptions of the more notable components of the PRO/Tool Kit.

-
- *MACRO-11*. This PDP-11 assembly language is included with the PRO/Tool Kit: you do not order it separately. (You can order optional PRO/Tool Kit languages.) You can use this powerful assembly language to develop Professional applications that move smoothly to other PDP-11 computers. MACRO-11 is particularly important on the Professional because it gives you direct access to I/O registers and therefore to the video bit-map hardware.

 - *EDT*. This interactive, full-screen keypad editor enables you to create and modify files. The EDT in P/OS is the same EDT that is popular on the larger VMS and RSX systems. The PROSE editor can be used as an alternative to EDT.

 - *Professional Record Management Services (PRO/RMS)*. PRO/RMS is a powerful set of service routines that offer efficient and flexible data storage, retrieval, and modification. These service routines provide a file and record management interface between P/OS and application programs. PRO/RMS supports sequential, relative, and multikey indexed file organizations. All of the PRO/Tool Kit high-level languages contain PRO/RMS interfaces.

 - *Professional File Control Services (PRO/FCS)*. PRO/FCS, with named directories, is included so that existing RSX applications that use FCS will run on P/OS. (Note: FCS will not be enhanced to support full P/OS capabilities so, in general, applications should be converted to RMS.)
-

MENU DEFINITION FILE

- FRAME 1
"MAIN"
- FRAME 2
- FRAME 3
- FRAME 4
- FRAME 5
- FRAME 6
- FRAME 7
- FRAME 8
- FRAME 9
- FRAME 10
- FRAME 11

FORMS

Profile for Single Choice Menu MAIN

	Frame Description [This is the main menu for the elementary education application.]
	Global Help Frame [MENU] Default Option { 3 } Global Action String
	[DATABASE = ELEM]

Display for Single Choice Menu MAIN

	ELEMENTARY EDUCATION APPLICATION	
	[This application offers elementary education in seven fields of study. Select one of the courses listed here.]	
	BIOLOGY COMPUTER SCIENCE GEOGRAPHY GOVERNMENT HISTORY LITERATURE MATHEMATICS	
	[Make a selection and press the DO key:]	

Action Number 3 for Single Choice Menu MAIN

	Description: GEOGRAPHY
	Action Description
	[This is the description of the Geography option.]
	Option Keyword [GEO]
	Option Help Frame [HELPGEO]
	Option Action String
	[GEOG010]



MENU

	ELEMENTARY EDUCATION APPLICATION	
	This application offers elementary education in seven fields of study. Select one of the courses listed here:	
	BIOLOGY COMPUTER SCIENCE -> GEOGRAPHY GOVERNMENT HISTORY LITERATURE MATHEMATICS	
	Additional Options available	
	Make a selection and press the DO key:	

The Frame Development Tool lets you create menu, Help, and message frames. This figure shows the forms for a single-choice menu.

- *Professional Forms Management System (PRO/FMS)*. PRO/FMS is a forms-oriented video I/O system that lets you build “fill in the blanks” data entry screens into your application without having to consider the intricacies of video I/O. FMS is widely used on Digital’s systems and uses RMS for handling the data it reads. Designed to be used as an independent front-end, PRO/FMS gives you flexibility while helping you create applications that are highly compatible with other systems. Call statements are provided for the supported languages.

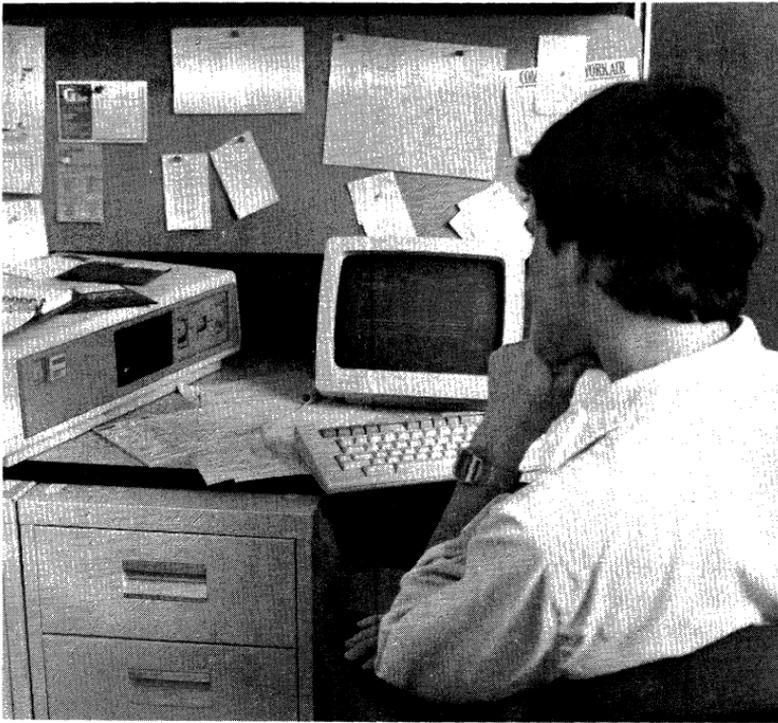
- *Frame Development Tool (FDT)*. FDT helps you create menus and help and message frames. Use of this resource ensures that your application’s user interface will be consistent with the P/OS human interface standard. Further, FDT separates menu, help, and message text from code, thus making it easier for you to support your application in an international market.

- *P/OS User Interface Services Library (POSRES)*. This cluster library contains the service routines that retrieve and display menu, help, and message frames and process function keys. Routines in POSRES enable you to display the frames you develop with FDT.

- *Callable Services*. The PRO/Tool Kit offers several callable services that are available to all of the PRO/Tool Kit languages. You can use the callable P/OS system services to include standard P/OS functions as part of your application. These callable services include Callable Print Services (CPRINT), Callable PROSE Text Editor (CET), Callable Communications Facility (COMLIB), and Callable Sorting Task (PRO/SORT).

- *Professional Application Builder (PAB)*. This utility takes compiled source code as input and produces a task image that can be executed on P/OS. PAB is derived from the RSX-11M/M-PLUS Task Builder (TKB).

- *Fast Install.* This utility provides a quick and easy way to integrate an application stored on the Professional's hard disk into a P/OS menu for testing and debugging. Your alternative to Fast Install is to create an application diskette and install the application on the hard disk using P/OS Disk/Diskette Services.
 - *Application Diskette Builder (ADB).* ADB loads newly debugged applications onto application diskettes for distribution to end-users. The utility supports multiple diskettes so that large application programs targeted for P/OS Hard Disk operating system environments can be built on more than one diskette.
-



- *Indirect Command File Processor.* An indirect Command File Processor is part of the PRO/Tool Kit so that you can automate some of the repetitive aspects of application development.

- *File Utilities.* Several RSX utilities important to application development are included in the PRO/Tool Kit. These familiar tools include:

File Compare Utility (CMP). CMP compares the contents of two ASCII files on a line-by-line basis, determining whether parallel records are identical.

File Dump Utility (DMP). DMP enables you to examine the contents of a specific file or volume of files. You can format the output in ASCII, octal, decimal, hexadecimal, or Radix-50 form, and dump it to any suitable device such as a terminal screen or disk.

Librarian (LBR). LBR enables you to create, update, modify, list, and maintain library files.

Resource Monitor Display (RMD). RMD displays information about the resources in your system, including the active tasks, their locations and sizes in memory, and the available pool space.

Task/File Patch Program (ZAP). ZAP allows you to examine and modify task image and data files directly on a Files-11 volume. Many of the functions performed by RSX Online Debugging Technique (ODT) are performed by ZAP.

Online Debugging Technique (ODT). ODT is an interactive program you can link to a user program to find and correct program errors. All addresses and data are communicated in octal notation.

Source Language Input Program (SLP). SLP enables you to maintain and audit source files.

Minimum System Requirements

- Professional 350 or 380
 - 10- or 33-Mbyte hard disk with 5,000 free blocks
 - P/OS Hard Disk, Version 2.0 or later
-

• Professional Host Tool Kit

Order Code: RSX-11M and RSX-11M-PLUS: QJ071

VAX-11/730: QC350

VAX-11/750: QD350

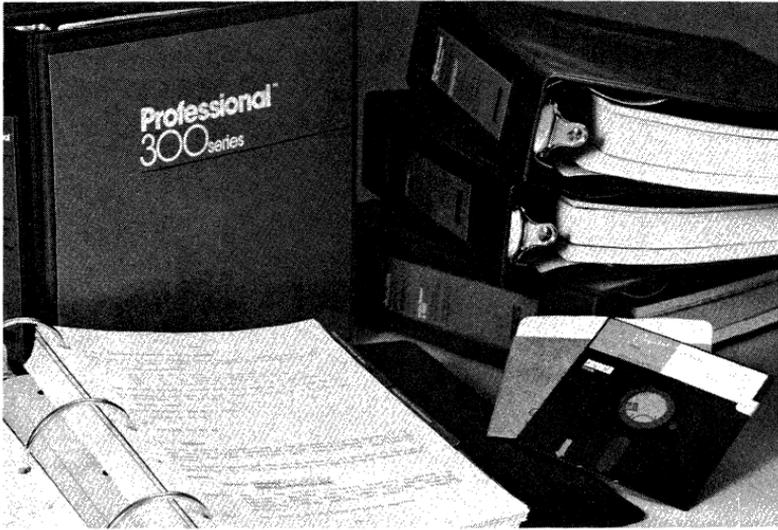
VAX-11/780: QE350

The Professional Host Tool Kit offers the special utilities and services you need to use your VMS or RSX-11M/M-PLUS system to develop applications for Professional P/OS systems. With the Host Tool Kit you can use your familiar large system to create applications that optimize P/OS system features and the Professional's hardware capabilities. But the Host Tool Kit doesn't desert you when you leave the host computer; it includes resources that run on a properly configured "development" Professional to help you debug and later distribute the application.

The Host Tool Kit is designed to supplement rather than duplicate the development resources already on your larger computer. For this reason it does not have the editors and utilities already present on the host system, but instead concentrates on utilities to tailor your applications for P/OS. The Host Communications Facility is included to move the code to the development Professional for debugging and subsequent distribution to end-users.

The Old and the New.

The full documentation set accompanying the Host Tool Kit explains the use of both its mature, familiar tools and its new, Professional-specific utilities. Retraining time is minimized for experienced RSX developers because the basic development tools—including PRO/RMS, PRO/FCS, and PRO/FMS—are simply tailored versions of those standard VMS/RSX resources. Tools specially designed to optimize the Professional's architecture and P/OS



system features include the Frame Development Tool (FDT) and the Application Diskette Builder (ADB). An overview of each of these tools is given later in this discussion.

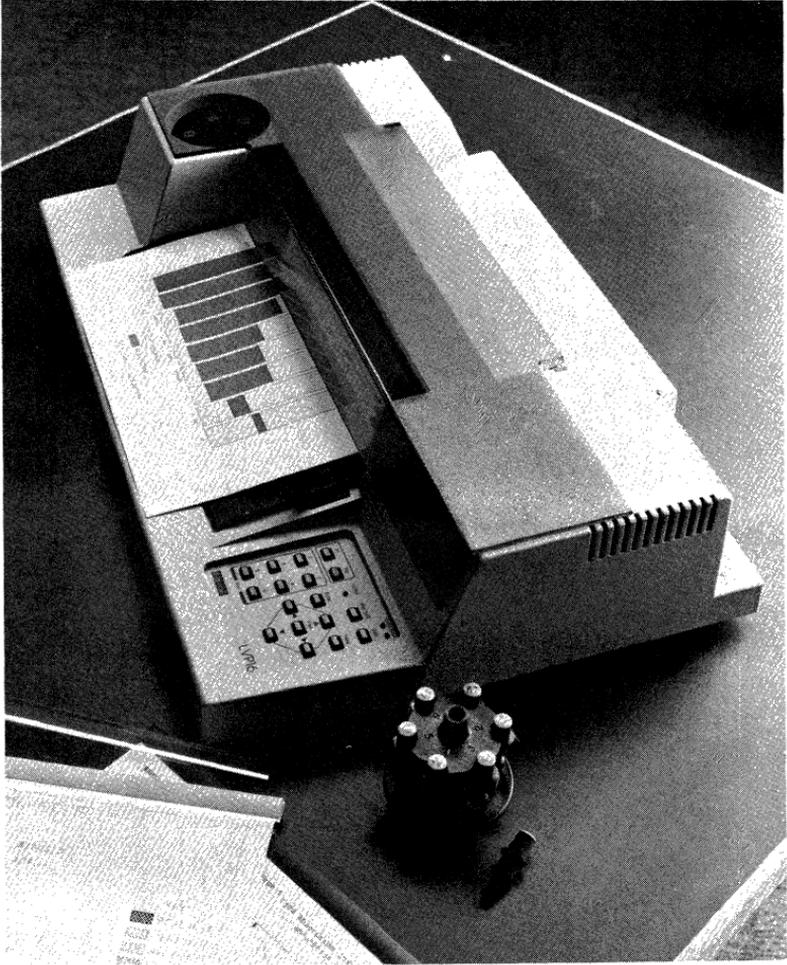
The Host Tool Kit provides utilities that help you produce user-friendly applications for end-users. With the Frame Development Tool (FDT), you can easily include menus, help, and messages in your applications to guide the user through your program. Because you are using the same facilities that were used to develop the P/OS human interface, you can easily create applications that, when installed on a P/OS system, present a consistent interface to the end-user. FDT is particularly important if you are developing for an international market because it keeps the menu, help, and message text separate from the code. Instead of having to rebuild the application each time you bring it to a different country, you can simply translate the text files.

The Host Tool Kit Supports Several Languages.

The Host Tool Kit supports several powerful language environments tailored to P/OS. The MACRO-11 assembly language comes standard with the Host Tool Kit and need not be ordered separately. Optional languages for the Host Tool Kit include Host Tool Kit versions of COBOL-81, DIBOL, FORTRAN-77, Pascal, and BASIC-PLUS-2. Unlike products offered for other single-user workstations, these compilers meet industry standards. In fact, the Host Tool Kit languages are syntactically the same as RSX languages, and are subset compatible with VMS languages. Whitesmiths C, available from the developer—Whitesmiths Ltd. of Concord, MA—also runs under the Host Tool Kit. For more information on a particular language, see the appropriate language description later in this chapter.

Graphics and the Host Tool Kit.

The Host Tool Kit lets you integrate impressive visual effects into your applications. To let you take advantage of the Professional's outstanding video bit-map hardware, the Host Tool Kit gives you access to the CORE Graphics Library (CGL) and to the Professional General Image Display Instruction Set (PRO/GIDIS). These device-independent graphics libraries contain subroutines that let you draw lines, curves, and polygons; set colors and gray shading; control viewing transformations and automatic scaling using windows and viewports; and display text in various font styles.



The same line of CGL code generates graphics on the LVP16 Six-Pen Plotter as well as on the video display.

The graphics library you select depends on the intricacy of your project. If your application needs industry-standard graphics routines, CGL is your answer. Specialized projects such as terminal emulators and interactive drawing packages require the more detailed routines available from PRO/GIDIS. For further discussion of these libraries, see the graphics discussion under the PRO/Tool Kit in Chapter 3.

All of the languages supported by the Host Tool Kit can access CGL. MACRO-11 and any Host Tool Kit language except DIBOL can access PRO/GIDIS. MACRO-11 and high-level languages that use MACRO subroutines also allow direct register I/O and thus give you full access to the video bit-map. The Host Tool Kit documentation set includes the Terminal Subsystem Manual, the CORE Graphics Library Manual, and the PRO/GIDIS Manual to help you take advantage of these graphics tools.

Host Tool Kit Supports the Professional's Optional Hardware.

The Host Tool Kit includes or supports libraries to help you develop applications for the Professional's sophisticated hardware options. Whether you decide to develop for Digital's PRO/DECnet, Realtime Interface (RTI), or Telephone Management System (TMS)—or even if you obtain the no-cost bus license and develop your own hardware—the Host Tool Kit has the resources you need to develop efficient applications quickly.

Host Tool Kit support for PRO/DECnet includes several facilities—transparent file access to remote DECnet systems, task-to-task communication, transparent network file access for several DCL commands, and access to the Network File Transfer Facility—that you can incorporate into your applications. It also provides direct-line access to Ethernet that bypasses the DECnet software, so you can write applications that interface with a non-Digital system on the Ethernet. For the RTI, the Host Tool Kit supports the optional

The Host Tool Kit Development Cycle.

The Host Tool Kit development cycle takes advantage of the resources on the host machine and on the development Professional. First, you use the editor of your choice on the host system to create the source file for the language you are using. Next, you compile the program and use the Professional Application Builder (PAB) to taskbuild the application. After creating the application installation file, you use the Host File Transfer Utility to transfer the files to the Professional 350 or 380 for testing and debugging. Fast Install on the Professional provides a quick and easy way to install the application onto a P/OS menu for debugging. If there are problems, return to the host machine to make corrections. When the application executes correctly, use the Application Diskette Builder (ADB) utility to build the application diskettes for distribution to end-users.

The Tools.

The Host Tool Kit includes all the resources you need, ranging from Professional versions of RMS, FCS, and FMS on the host to the Professional-resident utility for building the application diskette for distribution to end-users. This section provides brief descriptions of the more notable components of the Host Tool Kit.

- *MACRO-11.* This PDP-11 assembly language comes with the Tool Kit for your host system: you do not order it separately. (You can order optional Host Tool Kit languages.) You can use MACRO-11, in combination with the Host Tool Kit, to develop applications to run on the Professional. MACRO-11 is particularly important for the Professional because it gives you direct access to I/O registers and therefore to the video bit-map hardware.
- *Professional Record Management Services (PRO/RMS).* PRO/RMS is a powerful set of service routines that provide efficient and flexible data storage, retrieval, and modification. These service routines provide a file and record management interface between the Professional Operating System (P/OS) and application programs.

PRO/RMS supports sequential, relative, and multikey indexed file organizations. All of the Host Tool Kit high-level languages contain PRO/RMS interfaces.

-
- *Professional File Control Services (PRO/FCS)*. PRO/FCS, with named directories, is included so that existing RSX applications that use FCS will run on P/OS. (Note: FCS will not be enhanced to support full P/OS capabilities so, in general, applications should be converted to RMS.)

 - *Professional Forms Management System (PRO/FMS)*. PRO/FMS is a forms-oriented video I/O system that helps you build “fill in the blanks” data entry screens into your application without having to consider the intricacies of video I/O. FMS is widely used on Digital’s systems and uses RMS for handling the data it reads. Designed to be used as an independent front-end, PRO/FMS gives you flexibility while helping you build applications that are highly compatible with other systems. Call statements are included for the supported languages.

 - *Frame Development Tool (FDT)*. FDT lets you create menus, help and messages easily. Use of this resource ensures that your application will be consistent with the Professional’s human interface standard. Further, by maintaining the text separately from the code, FDT makes it easy for you to bring your application to the multinational market. To convert an application to a foreign language, you simply translate its text files: you do not have to rebuild the entire application.

 - *P/OS User Interface Services Library (POSRES)*. This library contains the service routines that retrieve and display menu, help, and message frames and process function keys. Routines in POSRES let you display the frames you developed with FDT.
-

Profile for Help Text [IDENTIFIER]

Frame Description
Frame Location [FULL] Previous Help Frame []] Next Help Frame []]

The Frame Development Tool lets you easily incorporate Help into your applications. This figure shows a profile form for a Help text frame.

- *Callable Services.* The Host Tool Kit offers several callable services that are available to all of the Host Tool Kit languages. You can use the callable P/OS system services to include standard P/OS functions as part of your application. These callable services include Callable Print Services, Callable PROSE Text Editor, Callable PRO/Communications, and Callable PRO/SORT.

- *Professional Application Builder (PAB).* This utility takes compiled source code and produces a task image that can be executed on P/OS. PAB is derived from the RSX-11M/M-PLUS Task Builder (TKB).

- *Professional Host Communications.* This utility runs on the host VAX or PDP-11 to allow complex ASCII, binary, or RMS files to be transferred to the Professional for testing and debugging. The Professional must be running PRO/Communications.

- *Fast Install.* The Fast Install utility on the development Professional gives you a quick and easy way to install an application on the Professional hard disk into a P/OS menu for testing and debugging. Your alternative to Fast Install is to build an application diskette and use P/OS Disk/Diskette Services to install the application on the P/OS menu.

- *Application Diskette Builder (ADB)*. ADB runs on the Professional to load debugged applications onto application diskettes for distribution to end-users. The utility supports multiple diskettes so that large application programs targeted for P/OS Hard Disk environments can be built on more than one diskette.
-

Minimum System Requirements

- Host, either VAX or PDP-11
VAX: VMS, VAX-11 RSX (VAX-11 RSX runs under VMS to emulate a PDP-11 running RSX)
PDP-11: Extended Instruction Set (EIS), RSX-11M/M-PLUS
 - Any Professional configured with hard disk storage, P/OS Hard Disk, PRO/Communications
-

• **PRO/Tool Kit FORTRAN-77**

Order Code: QBA15

• **Professional Host Tool Kit FORTRAN-77**

Order Code: RSX-11M and RSX-11M-PLUS: QJ074

VAX-11/730: QC353

VAX-11/750: QD353

VAX-11/780: QE353

PRO/Tool Kit FORTRAN-77 and Host Tool Kit FORTRAN-77, extended implementations of the ANSI FORTRAN-77 standard (X3.9-1978), are specifically designed to be used for developing applications for the Professional systems. PRO/Tool Kit FORTRAN-77 runs directly on the Professional; Professional Host Tool Kit FORTRAN-77 runs on VMS or RSX-11M/M-PLUS systems.



Both versions of Tool Kit FORTRAN-77 contain a subset of the ANSI FORTRAN-77 standard, many of the full-set language features, and extensions that are not included in the ANSI FORTRAN-77 standard. Switch-selectable support is provided for use with programs based on the previous ANSI FORTRAN standard (X3.9-1966).

Both PRO/Tool Kit and Host Tool Kit FORTRAN-77 meet the Federal Information Processing Standard Publication (FIPS PUB-69) requirement for a flagger. The flagger optionally produces diagnostic messages for syntax and source form elements that do not conform to the full-level ANSI FORTRAN X3.9-1978 standard.

Major features defined by the 1978 ANSI subset-language FORTRAN standard include CHARACTER data type and the block IF construct for conditional execution of blocks of statements, including IF...THEN, ELSE IF, ELSE, and END IF statements.

The Tool Kit FORTRAN-77 products provide the following extensions to the ANSI standard: language elements for keyed and sequential access to RMS multikey ISAM files; DEFINE FILE, FIND, DELETE, REWRITE, and UNLOCK statements; TYPE and ACCEPT input/output; comments permitted at the end of source lines; INCLUDE statement; BYTE data type; ENCODE and DECODE statements; explicit specification of storage allocation units for data types (for example, INTEGER*4); hexadecimal and octal constants; O and Z format edit descriptors; and virtual array support for systems with memory management directives. Virtual arrays are memory-resident and require enough main memory to contain all elements of all arrays. In a distributed development environment, applications not requiring these extensions can be developed with PRO/Tool Kit FORTRAN-77 to run under any standard FORTRAN-77 implementation.

Both Tool Kit FORTRAN-77 compilers produce direct PDP-11 machine code optimized for execution-time efficiency on the Professional.

The Tool Kit FORTRAN-77 compiler optimizations include the following: optimizations of arithmetic and logical IF statements; common subexpression elimination; removal of invariant expressions from DO loops; and allocation of processor registers across block IF constructs and DO loops.

The Tool Kit FORTRAN-77 Object Time System (OTS) is a set of object modules that are shared by FORTRAN-77 applications from a clustered library in P/OS, the operating system on which the program will execute. The OTS is based on the Record Management System (RMS), and therefore allows access to sequential, relative, and indexed organization files.

Minimum System Requirements

PRO/Tool Kit FORTRAN-77:

- Professional 350 or 380
- 10- or 33-Mbyte hard disk with 5,000 free blocks
- 48 Kbytes of user memory
- P/OS Hard Disk
- PRO/Tool Kit

Professional Host Tool Kit FORTRAN-77

- Host, either VAX or PDP-11
VAX: 2,000 contiguous free blocks, asynchronous terminal port, VMS, VAX-11 RSX, Professional Host Tool Kit. A VAX-11/730 requires an R80/RL02 configuration.
PDP-11: 256 Kbytes of memory, 2,000 contiguous free blocks on public disk, asynchronous terminal port, Extended Instruction Set (EIS), RSX-11M/M-PLUS, Professional Host Tool Kit
- Professional 350 or 380 with hard disk storage, P/OS Hard Disk, PRO/Communications, components of the Host Tool Kit that reside on the Professional.

• PRO/Tool Kit FORTRAN-77 DEBUG

Order Code: QBA21-A3

• Professional Host Tool Kit FORTRAN-77 DEBUG

Order Code: RSX-11M and RSX-11M-PLUS: QJ079

VAX-11/730: QC421

VAX-11/750: QD421

VAX-11/780: QE421

PRO/Tool Kit FORTRAN-77 DEBUG and Professional Host Tool Kit FORTRAN-77 DEBUG are fully symbolic debuggers for Tool Kit FORTRAN-77 and MACRO-11. PRO/Tool Kit FORTRAN-77 DEBUG runs on a development Professional to help you locate logic and programming errors in PRO/Tool Kit FORTRAN-77 and MACRO-11 programs that compile successfully but do not execute correctly. Professional Host Tool Kit performs the same function on a properly configured VAX/VMS or RSX-11M/M-PLUS system. DEBUG increases your debugging efficiency by giving you tight control over program execution and by enabling you to monitor and change location contents.

PRO/Tool Kit FORTRAN-77 DEBUG and Professional Host Tool Kit FORTRAN-77 DEBUG run as two-task debuggers, with a small portion of the code linked with the user task and the major portion of the debuggers executing as a separate task. This design means low overhead added to your task size, so even large programs can be debugged.

You can use the Tool Kit FORTRAN-77 DEBUG products either interactively or in batch mode. You can drive a debugging session using indirect command files and can record the results of a debugging session by command logging. Online Help is available to give you information on the commands you can use for debugging.

Tool Kit FORTRAN-77 DEBUG includes the following features to enable you to monitor and control program execution:

- DEPOSIT and EXAMINE commands. DEBUG lets you look at and modify location contents. It supports all data types supported by Tool Kit FORTRAN-77 (except virtual array elements).
- EVALUATE command. DEBUG's EVALUATE command allows you to compute the value of source language expressions or address expressions.

- *Tracepoint and breakpoint facilities.* DEBUG includes tracepoint and breakpoint facilities that enable you to monitor program execution. You can delay activation of a tracepoint or breakpoint until after it has been encountered a specified number of times and you can specify an action to perform when DEBUG encounters a breakpoint or tracepoint.

- *Execution control.* DEBUG gives you control over the program execution with commands to STEP by LINE, STEP by INSTRUCTION, STEP INTO routines, and STEP OVER routines. When used in conjunction with the GO command, these commands let you move through a program at your own pace.

- *Support of overlaid code.* DEBUG provides full support of overlaid programs and can therefore handle large programs. DEBUG can consider and reference all elements of a FORTRAN-77 program, even those not currently residing in main memory. For example, you can set breakpoints and tracepoints in overlay segments that are not currently resident.

Minimum System Requirements

PRO/Tool Kit FORTRAN-77 DEBUG:

- Professional 350 or 380
- 10- or 33-Mbyte hard disk with 5,000 free blocks
- 48 Kbytes of user memory and 4.2 Kbytes of memory in the user's task space
- P/OS Hard Disk
- PRO/Tool Kit

Professional Host Tool Kit FORTRAN-77 DEBUG:

- Host, either VAX or PDP-11
 VAX: 2,000 free blocks, asynchronous terminal port, VMS, VAX-11 RSX, Professional Host Tool Kit. A VAX-11/730 requires an R80/RL02 configuration.

PDP-11: 256 Kbytes of memory, 2,000 free blocks on public disk, asynchronous terminal port, Extended Instruction Set (EIS), RSX-11M/M-PLUS, Professional Host Tool Kit.

- Professional 350 or 380, hard disk storage with 300 contiguous free blocks for the debugger task, 48 Kbytes of user memory, 4.2 Kbytes of memory in the user's task space, P/OS Hard Disk, components of the Professional Host Tool Kit that reside on the Professional.

• **PRO/Tool Kit Pascal**

Order Code: QBA18-A3

• **Professional Host Tool Kit Pascal**

Order Code: RSX-11M OR RSX-11M-PLUS: QJ082

VAX-11/730: QC715

VAX-11/750: QD715

VAX-11/780: QE715

PRO/Tool Kit Pascal and Professional Host Tool Kit Pascal, extended implementations of the Pascal language, are designed to take advantage of the Professional's architecture and the P/OS operating system. PRO/Tool Kit Pascal is available for the Professional 350 and 380. Professional Host Tool Kit Pascal is available for a VAX/VMS OR RSX-11M/M-PLUS system.

The Tool Kit Pascal products are true, optimizing compilers that generate PDP-11 instructions for eventual execution on the Professional Series. The generated code has full access to the graphics library, menu services, and communications services. Tool Kit Pascal is highly compatible with VAX PASCAL and the ISO and ANSI Pascal standards.



Professional Tool Kit Pascal offers several extensions to standard Pascal, including extended integer type `LONG INTEGER` representing a 32-bit real value; indexed sequential (`ISAM`) files (`P/OS` Hard Disk only); separately compiled procedures; sets of up to 256 elements; dynamic sizing of formal array parameters; identifiers that can include dollar sign (\$) and underscore (_); `OPEN` and `CLOSE` I/O procedures; nonpositional and default values for procedure parameters; `FIND` and `LOCATE` I/O procedures for direct read access of files with fixed-length records; `% INCLUDE` directive for additional input files; structured constants; `OTHERWISE` clause for `CASE` statement; global and external variables and procedures for modular

programming; binary, octal, hexadecimal, and RAD50 specification of constants; declaration “attributes” allowing greater control over a program’s execution environment; and use of runtime expressions as actual parameters to formal VAR parameters declared with the READONLY attribute.

At compile time, you have the option to generate MACRO-11 source files, generate source listings, flag statements outside the Pascal standard as syntax errors, and perform runtime checking with full execution traceback.

Minimum System Requirements

PRO/Tool Kit Pascal:

- Professional 350 or 380
- 10- or 33-Mbyte hard disk with 1,500 free blocks
- P/OS Hard Disk
- PRO/Tool Kit

Professional Host Tool Kit Pascal:

- Host, either VAX or PDP-11
 - VAX: 2,000 contiguous free blocks, asynchronous terminal port, VMS, VAX-11 RSX, Professional Host Tool Kit. A VAX-11/730 requires an R80/RL02 configuration.
 - PDP-11: 256 Kbytes of memory, 2,000 contiguous free blocks on public disk, asynchronous terminal port, Extended Instruction Set (EIS), RSX-11M/M-PLUS, Professional Host Tool Kit.
- Professional 350 or 380 with hard disk storage, P/OS Hard Disk, PRO/Communications, components of the Host Tool Kit that reside on the Professional.

• **PRO/Tool Kit COBOL-81**

Order Code: QBA19-A3

• **Professional Host Tool Kit COBOL-81**

Order Code: RSX-11M/M-PLUS: QJ081

VAX-11/730: QC714

VAX-11/750: QD714

VAX-11/780: QE714

PRO/Tool Kit COBOL-81 and Host Tool Kit COBOL-81 are Digital's versions of COBOL, the world's most widely used commercial programming language. PRO/Tool Kit COBOL-81 runs directly on a Professional running the P/OS Hard Disk operating system. Professional Host Tool Kit COBOL-81 runs on a VAX/VMS or RSX-11M/M-PLUS system. COBOL-81 for the Professional Tool Kits are fully featured compilers that bring to the personal computer user capabilities that once were available only to users of large main-frame computers.

COBOL-81 is based on the ANSI-74 standard and includes many features proposed for the next COBOL standard. It has been validated by the U.S. Government's Federal Compiler Testing Center as meeting all of the low-intermediate level requirements of the United States government, as described in FIPS PUB21-1. Many of the individual modules are designed to meet the high-level requirements, as described on the following page.

ANSI MODULE	COBOL-81	HIGH LEVEL
Nucleus	2 ^a	2
Table Handling	2	2
Sequential I/O	2	2
Relative I/O	2	2
Indexed I/O	2 (hard disk)	2
Segmentation	2 ^b	2
Library	1 ^c	2
Interprogram Communications	1	2
Debug	— ^d	2
SORT/MERGE	—	2
Communications	—	2

^aThe Nucleus module compiles at level 2, except that the ALTER statement and the ALPHABET IS literal clause are not included.

^bThe Segmentation module compiles at level 2, except that independent segments from level 1 are not included.

^cThe Library module includes full level 1 support and a partial level 2 replacing facility.

^dAn interactive symbolic debugger, which is easier to use than the standard COBOL debugger, has been substituted.

The PRO/Tool Kit COBOL-81 and Host Tool Kit COBOL-81 compilers protect your COBOL investment should you decide to move applications to a Micropdp-11, PDP-11, or VAX/VMS system. COBOL-81 for the Professional is the same fully featured product as COBOL-81 on RSTS and RSX, except that the SORT and MERGE statements are not available. It is also a strict subset of VAX COBOL. This similarity means that syntax developed for the Tool Kits can be used on RSX-11M/M-PLUS, Micro/RSX, RSTS/E, and Micro/RSTS systems. Likewise, if COBOL syntax developed for the Tool Kits passes the provided VAX COBOL flagger, the syntax can be used on all VAX/VMS systems as well.

Many tools and ease-of-use features have been added to COBOL-81, making the creation and debugging of code more interactive than many COBOL users have ever experienced. One way in which Tool Kit COBOL-81 increases your ability to develop interactive COBOL programs is by making it easy to create forms and to display reports.

Specific screen-handling extensions to the ACCEPT and DISPLAY statements allow full-screen forms for both input and output of data. Extensions for input (ACCEPT) include direct positioning of the cursor to any row or column; automatic conversion of input to any valid COBOL data type; definition of a fixed-field width; prevention of data from appearing on the screen (a password, for example); creation of default values; and definition of special-function keys and the auxiliary keypad.

Screen output (DISPLAY) supports direct positioning of the cursor to any row or column; formatted display of any COBOL data item of any data type; bolding, blinking, and automatic underlining; reverse video, erasure of the entire screen, of the entire line, from the cursor to the end of the screen, or from the cursor to the end of the line; and ringing of the terminal bell.

Minimum System Requirements

PRO/Tool Kit COBOL-81:

- Professional 350 or 380
- 10- or 33-Mbyte hard disk with 2,000 free blocks
- P/OS Hard Disk
- PRO/Tool Kit

Professional Host Tool Kit COBOL-81:

- Host, either VAX or PDP-11
VAX: 5,000 contiguous free blocks, asynchronous terminal port, VMS, VAX-11 RSX, Professional Host Tool Kit. A VAX-11/730 requires an R80/RL02 configuration.
PDP-11: 256 Kbytes of memory, 5,000 contiguous free blocks on the public disk, asynchronous terminal port, Extended Instruction Set (EIS), RSX-11M/M-PLUS, Professional Host Tool Kit.
- Professional 350 or 380 with hard disk storage, P/OS Hard Disk, PRO/Communications, components of the Host Tool Kit that reside on the Professional.

• **PRO/Tool Kit DIBOL**

Order Code: QBA16-A3

• **Professional Host Tool Kit DIBOL**

Order Code: RSX-11M or RSX-11M-PLUS: QJ369

VAX-11/730: QC356

VAX-11/750: QD356

VAX-11/780: QE356

PRO/Tool Kit DIBOL and Professional Tool Kit DIBOL are high-level languages designed for developing business data processing applications for the Professional systems. These products take extensive advantage of the Professional's architecture, allowing for the use of P/OS system services while maintaining many of the standard DIBOL features found on VMS, RSX-11M-PLUS, Micro/RSX, RSTS/E, CTS-300, and COS-310 systems.

PRO/Tool Kit DIBOL lets you develop programs directly on a Professional running P/OS Hard Disk. Professional Host Tool Kit DIBOL enables you to use a VMS or RSX-11M/M-PLUS system to develop applications for the Professional. Because the DIBOL



debugging tool is part of the runtime system, debugging is always done on the Professional. Both products produce code that can be run under P/OS on any Professional system. In a distributed development environment, DIBOL source programs that do not access Professional-specific features can be moved to other operating systems to run under any standard DIBOL implementation.

Both versions of DIBOL for the Professional consist of a compiler, a runtime system (RTS) implemented as a clusterable resident library, and the symbolic program debugging aid DDT (DIBOL Debugging Technique). DIBOL programs for the Professional can use such P/OS system services as the menu, help, graphics, SORT, FMS, and message facilities. The language also uses the Professional's Record Management System (PRO/RMS) to support a powerful, flexible file system.

Minimum System Requirements

PRO/Tool Kit DIBOL:

- Professional 350 or 380
- 10- or 33-Mbyte hard disk with 1,500 free blocks
- P/os Hard Disk
- PRO/Tool Kit

Professional Host Tool Kit DIBOL:

- Host, either VAX or PDP-11
VAX: 1,500 contiguous free blocks, asynchronous terminal port, VMS, VAX-11 RSX, Professional Host Tool Kit. A VAX-11/730 requires an R80/RL02 configuration.
PDP-11: 256 Kbytes of memory, 1,500 contiguous free blocks on the public disk, asynchronous terminal port, Extended Instruction Set (EIS), RSX-11M/M-PLUS, Professional Host Tool Kit.
- Professional 350 or 380 with hard disk storage, P/os Hard Disk, PRO/Communications, components of the Host Tool Kit that reside on the Professional.

• **PRO/Tool Kit BASIC-PLUS-2**

Order Code: QBA17-A3

• **Professional Host Tool Kit BASIC-PLUS-2**

Order Code: RSX-11M and RSX-11M-PLUS: QJ073

VAX-11/730: QC352

VAX-11/750: QD352

VAX-11/780: QE352

PRO/Tool Kit BASIC-PLUS-2 and Professional Host Tool Kit BASIC-PLUS-2 are significantly extended BASIC language compilers for developing applications to run on the Professional. PRO/Tool Kit

BASIC-PLUS-2 compiles and executes on the Professional. Professional Host Tool Kit BASIC-PLUS-2 runs on a VMS or RSX-11M/M-PLUS system, with debugging performed on the Professional.

Both PRO/Tool Kit BASIC-PLUS-2 and Professional Host Tool Kit BASIC-PLUS-2 are syntactically the same as the BASIC-PLUS-2 supported on the rest of Digital's PDP-11 family. The Tool Kit BASIC-PLUS-2 products differ from other Digital implementations only in that the Tool Kit versions do not support immediate mode or the RUN command. In a distributed development environment, programs or modules compiled on a PRO/Tool Kit BASIC-PLUS-2 system can be transported to PDP-11 operating systems and be compiled and executed there.

BASIC-PLUS-2 takes full advantage of floating-point and integer instructions, and uses call-by-reference to access P/OS services and graphics. It provides a high-performance program execution environment for applications development by generating threaded code. Using the best of both worlds, BASIC-PLUS-2 combines interactive program debugging with the power of a structured programming language.

Minimum System Requirements

PRO/Tool Kit BASIC-PLUS-2:

- Professional 350 or 380
- 10- or 33-Mbyte hard disk with 3,000 (2,500 contiguous) free blocks
- P/OS Hard Disk
- PRO/Tool Kit

Professional Host Tool Kit BASIC-PLUS-2:

- Host, either VAX or PDP-11
- VAX: 3,000 (2,500 contiguous) free blocks, asynchronous terminal port, VMS, VAX-11 RSX, Professional Host Tool Kit.

PDP-11: 64 Kbytes of memory, 3,000 (2,500 contiguous) free blocks on the public disk, asynchronous terminal port, Extended Instruction Set (EIS), RSX-11M/M-PLUS, Professional Host Tool Kit.

- Professional 350 or 380 with hard disk storage, P/OS Hard Disk, PRO/Communications, components of the Host Tool Kit that reside on the Professional.

• **PRO/Tool Kit Realtime Interface Library**

Order Code: QBA58-A3

• **Professional Host Tool Kit Realtime Interface Library**

Order Code: RSX-11M and RSX-11M-PLUS: QJ076

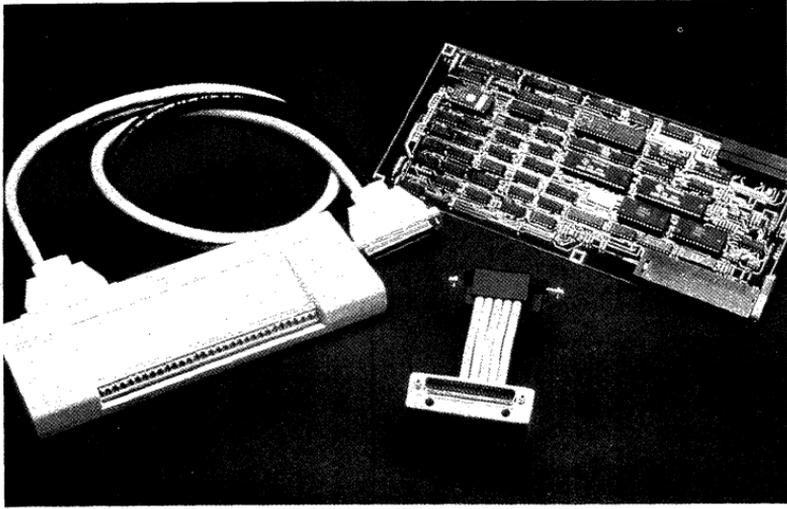
VAX-11/730: QC355

VAX-11/750: QD355

VAX-11/780: QE355

The Professional Realtime Interface Library (PRTIL) gives you high-level support for your development of programs for the Realtime Interface (RTI). An efficient alternative to working in MACRO-11, PRTIL is a set of callable subroutines that provide access to a P/OS driver for the RTI. You can call PRTIL subroutines from Tool Kit BASIC-PLUS-2, FORTRAN-77, or Pascal. PRTIL is packaged separately from the RTI hardware; applications developed using PRTIL will run on any Professional configured with P/OS Hard Disk and the RTI.

The required PRTIL subroutines are linked selectively to the calling application tasks. PRTIL supports I/O operations that are synchronous with the calling task (that is, the task waits to continue execution until the I/O is complete) as well asynchronous with the calling task (that is, task execution may proceed independent of the completion of I/O operations).



PRTEL provides four major types of operation: hardware initialization, determination of handshaking or flow control protocols, data transfers, and utility routines.

Minimum System Requirements

PRO/Tool Kit Realtime Interface Library:

- Professional 350 or 380
- 10- or 33-Mbyte hard disk with 550 free blocks
- P/OS Hard Disk
- PRO/Tool Kit

Professional Host Tool Kit Realtime Interface Library:

- Host, either VAX or PDP-11, with 550 free blocks on public disk, Professional Host Tool Kit
- Professional 350 or 380 with P/OS Hard Disk, PRO/Communications, components of the Host Tool Kit that reside on the Professional.

• **Whitesmiths C for the Professional Tool Kits**

Available from: Whitesmiths, Ltd.
97 Lowell Road
Concord, MA 01742
(617) 369—8499

Whitesmiths C is available in two versions to let you develop C programs to run on the Professional. The Whitesmiths C Compiler works with the PRO/Tool Kit; the Whitesmiths C Cross Compiler works with the Professional Host Tool Kit. Both products support the full C language and offer an extensive library of support functions. A variety of features have been added to Whitesmiths original PDP-11 C compiler to help you tailor applications to P/OS.

Both the C compiler and C cross compiler accept as input programs written in the C programming language. They make three sequential passes through the code, with each pass producing a file comparable in size to the original C source file. The final output is MACRO-11 code, which is suitable for assembly and taskbuilding on the host. In the case of the cross compiler, the program can be transferred to a Professional 350 or 380 for testing and debugging. These programs can also be used for native operation on the host system, simply by compiling and linking with different system interface libraries.

Both versions of Whitesmiths C offer an extensive library of support features including string manipulation functions, extensive I/O formatting support, test pattern matching facilities, and mathematical functions.

Special features added to Whitesmiths C to aid developers using the Professional Tool Kits include a system interface library tailored to P/OS; additional library functions that aid migration of

programs from the UNIX environment; a universal interface function for calling Professional Library subroutines; provisions to allow C and MACRO-11 files to be intermixed to compose a single program; and provisions for use of standard overlay facilities and cluster libraries.

Differences between these implementations and the C language definition are documented in the *C Programmers's Manual*, which is included with the compilers.

Minimum System Requirements

Whitesmiths C for PRO/Tool Kit:

- Professional 350 or 380
- 10- or 33-Mbyte hard disk with 1,500 free blocks
- P/OS Hard Disk
- PRO/Tool Kit

Whitesmiths C Cross Compiler:

- Host, either VAX or PDP-11
 - VAX: 1,500 contiguous free blocks, asynchronous terminal port, VMS, VAX-11 RSX, Professional Host Tool Kit. A VAX-11/730 requires an R80/RL02 configuration.
 - PDP-11: 256 Kbytes of memory, 1,500 contiguous free blocks on public disk, asynchronous terminal port, Extended Instruction Set (EIS), RSX-11M/M-PLUS, Professional Host Tool Kit.
- Professional 350 or 380 with hard disk storage, P/OS Hard Disk, PRO/Tool Kit, PRO/Communications, components of the Host Tool Kit that reside on the Professional.



• **PRO/BASIC for the Professional**

Order Code: QBA04-A3

PRO/BASIC single-use license

PRO/BASIC is a highly interactive BASIC interpreter for use on P/OS systems. Geared toward the casual or novice programmer, PRO/BASIC emphasizes ease of use while retaining a rich set of features. This interpreter is comparable in function to the microcomputer industry-standard BASIC yet is highly compatible with Digital's BASIC on larger PDP-11 and VAX systems.

PRO/BASIC is installed as an application under P/OS. It provides extensive error messages and online help. To aid in debugging, it includes the Trace and Step modes as well as the SHOW command,

which displays all the variables used, their values, the program size, the number of lines, and the amount of free memory. In immediate mode, PRO/BASIC can function as a calculator.

PRO/BASIC gives access to the Professional's graphics capabilities. Working within the PRO/BASIC user-friendly interface, you can create customized, general purpose graphics displays. Instructions in PRO/BASIC allow you to position the cursor and draw from any screen location; draw lines and curves; use different character fonts; and adjust character size, angle, and spacing. You can create your own simple graphs, charts, and designs without having to spend the time learning the details of graphics production. With the Extended Bit-Map Graphics Option and color monitor, you can choose from 256 colors and display 8 colors simultaneously.

PRO/BASIC's chaining feature allows a program to be much larger than the user workspace. You can use this feature to divide a large program into smaller segments that use the workspace as required.

Minimum System Requirements

- Professional 325, 350, or 380
- P/OS Diskette or P/OS Hard Disk

System Options

- Extended Bit-Map Graphics Option and RGB Color Monitor can be added for color graphics

• **FORTRAN-77 for p-System**

Order Code: QA114-C3

FORTRAN-77 for p-System is one of the most up-to-date FORTRAN compilers available for microcomputers. It runs on the p-System that runs under the P/OS operating system, and produces p-code

that can be executed on any microcomputer that has a p-machine emulator. FORTRAN-77 is a subset of ANSI standard FORTRAN and includes many of the full language features. To comply with p-System programming requirements, FORTRAN-77 also offers extensions to the full language standard.

FORTRAN-77 is fully compatible with UCSD Pascal. You can write a program using both languages, thus taking advantage of the strengths of both FORTRAN-77 and UCSD Pascal.

FORTRAN-77 includes several features that were removed from the ANSI-77 Standard Subset. These features allow: function calls and array element references in subscript expressions; full integer expressions in defining the limits of the DO statement; expressions in the I/O list of the WRITE statement, providing that the expressions do not begin with an initial left parenthesis; formatted and unformatted sequential and direct access files; and integer expressions for I/O unit specification.

FORTRAN-77 also includes extensions to the full language standard. These extensions include: new compiler directives and a Compiler Directive type of line; backslash edit control; an end-of-file intrinsic function; and support for input of uppercase and lowercase characters.

The FORTRAN-77 package for p-System includes the *FORTRAN Users Reference* manual.

In two areas, FORTRAN-77 for p-System diverges from the standard subset. First, procedures cannot be passed as parameters. Second, INTEGER and REAL data types do not occupy the same amount of storage. Programs written to comply with the ANSI Standard Subset that don't use these two unsupported features will compile and execute properly.

Minimum System Requirements

- Professional 325, 350, or 380
- Either:
 - p/OS Diskette with diskette version of p-System, or
 - p/OS Hard Disk with hard-disk version of p-System

- **UCSD Pascal**

Order Code: QA113-C3

UCSD Pascal provides key features of the Pascal language as defined by Niklaus Wirth, plus portability across different microcomputer environments. UCSD Pascal programs are compiled into a universal pseudocode, called p-code, that can be executed on any microcomputer with a p-machine emulator. Applications developed in UCSD Pascal on one microcomputer can run on other microcomputers without recompilation.

UCSD Pascal is fully compatible with FORTRAN-77 running under p-System. With this compatibility, you can develop a program using both languages, thus taking advantage of the most powerful features of each language.

UCSD Pascal differs from other Pascal implementations in five areas:

- *String handling.* UCSD Pascal supports the STRING type and includes a number of intrinsic functions for string manipulation.
- *I/O intrinsics.* Several intrinsics have been added to facilitate handling of files and peripheral devices. Standard Pascal I/O intrinsics have been slightly modified to make them more useful in an interactive environment.
- *Separate compilation and memory management.* Segment routines and units have been added. Segment routines are parts of the program that are swapped in and out of memory. Units allow separate compilation of Pascal routines and data structures. p-System

features dynamic memory management that permits segments to be swapped in and out of memory as needed. With dynamic memory management you can write a program of virtually any size because the entire program need not reside in memory at the same time.

- *Concurrency.* To support the use of concurrent processes, UCSD Pascal includes syntax extensions and a few additional intrinsics. The concurrency features permit asynchronous I/O processing, foreground and background processes, and more structured processing.
- *Symbolic debugger.* The Pascal Symbolic Debugger for p-System makes debugging compiled programs easier. The debugger can be invoked from the main system promptline or when a breakpoint is encountered during program execution. Using the debugger, you can single-step through p-code, display and alter memory, and display program context.

The UCSD Pascal package includes the *UCSD Pascal Handbook*, which contains a reference description of UCSD Pascal and an extensive set of annotated example programs that show how the language can be used.

Minimum System Requirements

- Professional 325, 350, or 380
- Either:
p/os Diskette and the diskette version of p-System, or
p/os Hard Disk and the hard disk version of p-System

• **PRO-IV**

Order Code: QA880-C3 (Professional 350)

QA881-C3 (Professional 380)

PRO-IV Version 1.0 for the Professional 350 and 380, developed by DTA, Inc., is an applications processor that replaces conventional



development techniques to provide a structured, efficient development environment for commercial applications. PRO-IV applications created for the Professional 350 and 380 transport easily to PRO-IV systems running on Digital's larger VAX and PDP-11 computers.

Development under PRO-IV is straightforward and efficient. The processor provides well-defined, structured development procedures that cut development time while giving developers the flexibility to create a wide range of commercial applications.

Conventional programming techniques are left behind as developers complete a series of menu-driven interactive steps that set up databases, create input screens, and define output reports. PRO-IV interactively checks for interprogram interfaces, program control logic, database structure, and application consistency.

PRO-IV applications are easy to maintain and update. PRO-IV's self-documenting feature is a primary reason for this maintainability. Developers can generate documentation for new and even existing applications at any stage in the development cycle.

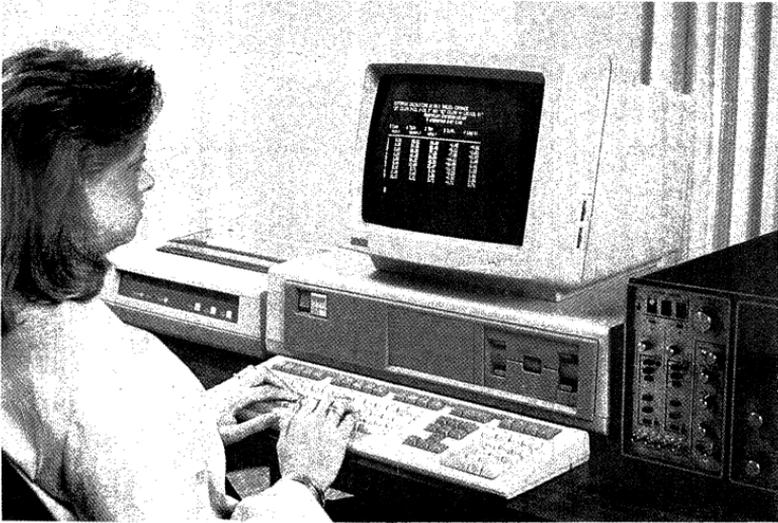
Transportability is a hallmark of PRO-IV applications. Import/Export commands on all current PRO-IV packages facilitate transferring PRO-IV applications from computer to computer and from operating system to operating system.

PRO-IV applications make efficient use of the Professional. As an applications processor, PRO-IV is an operating subsystem that processes applications by executing machine-language runtime modules based on the descriptions and parameters the developer sets up. PRO-IV offers over 100 such modules, each of which defines a basic commercial function.

PRO-IV comes in two packages: the development system and the runtime-only system. Both products contain the PRO-IV Security System that allows for the creation and maintenance of user categories, security levels, and passwords.

Minimum System Requirements

- Professional 350 or 380
- 36 Kbytes of user memory
- 2,000 free blocks of online storage
- P/OS Version 2.0



• PRO/FORTRAN IV (RT-11)

Order Code: QB813-A3

PRO/FORTRAN IV (RT-11) brings FORTRAN IV capabilities to the Professional RT-11 environment. Designed specifically for the RT-11 environment, FORTRAN IV (RT-11) enables your programs to work efficiently with and take advantage of the full RT-11 monitor. FORTRAN IV (RT-11) is the same on the Professional as it is on any RT-11 system.

The PRO/FORTRAN IV (RT-11) compiler is a fast, one-pass compiler that lets you make tradeoffs between program size and execution speed. Compiler optimizations include common subexpression elimination, local code tailoring, array vectoring, and optional in-line code generation for integer and logical operations.

PRO/FORTRAN IV (RT-11) is an extended implementation of the ANSI FORTRAN X3.9-1966 standard. Extensions to the standard include: general expressions in all meaningful contexts; comments at the end of each source line; mixed-mode arithmetic; BYTE data type for character manipulation; ENCODE and DECODE statements; PROGRAM statement; PRINT, TYPE, and ACCEPT input/output statements; list-directed input/output; direct-access unformatted input/output with the DEFINE FILE statement; and OPEN and CLOSE file access control statements.

PRO/FORTRAN IV (RT-11) includes a set of object modules, called the Object Time System (OTS), that is selectively linked with compiler-produced object modules to produce an executable program. Alternatively, programs can be output in absolute binary format for execution on a standalone PDP-11 system with minimal peripherals or for loading into ROM or PROM.

The RT-11 FORTRAN system subroutine called SYSLIB gives your PRO/FORTRAN IV (RT-11) programs access to all features of the RT-11 monitor. SYSLIB also has subroutines that support extensive character string manipulations in which characters are stored as variable length strings in BYTE arrays.

PRO/FORTRAN IV (RT-11) can optionally generate code for the BIS, FIS, EAE, and FPU arithmetic instruction sets.

Minimum System Requirements

- Professional 325, 350, or 380
- RT-11

• FORTRAN-77 for RT-11 on the Professional

Order Code: QA609-C3

FORTRAN-77 for RT-11 on the Professional is based on the FORTRAN-77/RSX available on Digital's larger PDP-11 systems. It features switch-selectable support for ANSI FORTRAN standard X3.9-1966 and X3.9-1978 program code. With FORTRAN-77 for RT-11 on your Professional, you have a compact, powerful development environment on your desktop.

Standard ANSI features offered in FORTRAN-77 for RT-11 on the Professional include CHARACTER data types; the block IF construct; double precision and complex data types; intrinsic functions; exponential forms; format edit descriptors; generalized DO loop parameters; generic function selection; lower and upper bound specifications in array declarations; optional syntax for I/O statements; and substring manipulation for both character variables and character array variables.

FORTRAN-77 for RT-11 on the Professional offers extensions to the ANSI standards. These features include DEFINE FILE, FIND, DELETE, REWRITE, UNLOCK, and INCLUDE statements; TYPE and ACCEPT I/O statements; BYTE data types; virtual array support under XM monitor; O and Z format edit descriptors; hexadecimal and octal constants; explicit allocation for data types; and ENCODE and DECODE statements.

This FORTRAN-77 compiler produces optimized code for execution time efficiency. The OTS supports sequential and random access of sequential files.

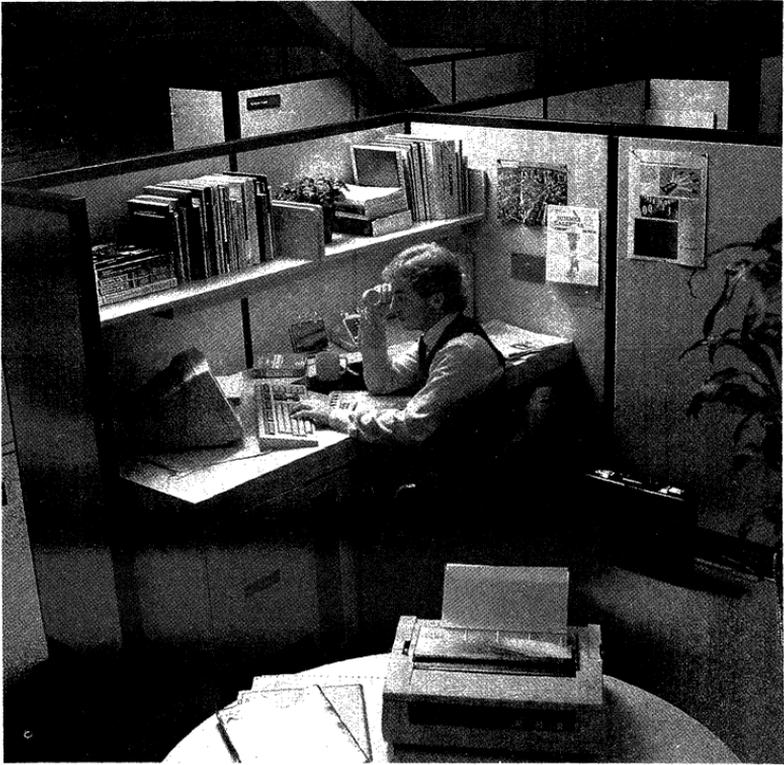
Minimum System Requirements

- Professional 325, 350, or 380
- 48 Kbytes of user memory
- 390 contiguous free blocks for compiler task
- 150—250 free blocks for the OTS library file and auxiliary support files
- **PRO/BASIC-11 (RT-11)**

Order Code: QB913-A3

PRO/BASIC-11 (RT-11) brings the popular, easy-to-use BASIC programming language to Professional computers running RT-11. An incremental, interactive, interpretive compiler, BASIC-11/RT-11 provides the fundamental features of BASIC to the Professional RT-11 user.

The PRO/BASIC-11 language offers a variety of program manipulation commands, including commands for saving, editing, running, and retrieving BASIC programs; support for real, integer, double-precision, and string data types; immediate mode statements for debugging and desk calculator use; sequential data storage using the RT-11 file system; string capability, including string arrays and functions; disk virtual arrays for string, integer,



and real data types; chaining with `COMMON` to accommodate large programs; a `CALL` facility for invoking assembly language subroutines using a PDP-11 FORTRAN-compatible call interface; and formatted output using the `PRINT USING` statement.

Minimum System Requirements

- Professional 325, 350, or 380
- RT-11

• **COBOL-PLUS for RT-11**

Available from: S&H Computer Systems, Inc.
1027 17th Ave. South
Nashville, TN 37212
(615) 327—3670

COBOL-PLUS is a high-performance, mainframe-level implementation of ANSI-74 COBOL that runs under RT-11 on the Professional. In addition to a compiler that supports programs of almost unlimited size, COBOL-PLUS includes the COBOL-PLUS Screen Layout System (CLASS), a fully symbolic interactive debugging facility, and the RTSORT disk sort utility program.

COBOL-PLUS implements various levels of the ANSI '74 COBOL standard and offers several enhancements. It supports relative, sequential, ISAM, and indexed organization files. With its automatic program segmentation feature, COBOL-PLUS can support programs of almost unlimited size.

Minimum System Requirements

- Professional 325, 350, or 380
- RT-11

• **Pascal-2 for RT-11**

Available from: Oregon Software
2340 S. W. Canyon Road
Portland, Oregon 97201
(503) 226—7760
T W X: 910-464-4779

Pascal-2 for RT-11 on the Professional is a powerful development package consisting of an optimizing Pascal compiler, an interactive

source level debugger, a Profiler that pinpoints execution bottlenecks, and other utilities to aid program development. Written in Pascal and designed with structured methods, Pascal-2 comes to the Professional as a proven, mature product.

The Pascal-2 language conforms to the draft proposed Pascal standard (International Standards Organization dp7185.1). ISO conformance is Level 2: conformant array parameters are included. All standard Pascal capabilities are supported, as are several extensions for programmer convenience, I/O flexibility, and low-level operations. A standard compilation switch disables all of the compiler's extended language features and allows only standard ISO statements to be compiled.

• **Development Tools for PRO/VENIX**

The PRO/VENIX operating system provides a complete set of application development tools. The system includes C, FORTRAN-77, and Pascal compilers, as well as a RATFOR preprocessor, a BASIC interpreter, and an assembler. It also includes the *lint* C-program checker, the *yacc* compiler-writing language, and the *lex* lexical analysis language. For more information on development opportunities under PRO/VENIX, see Chapters 3 and 8.

• **Optional Development Tools for XENIX**

Available from: The Santa Cruz Operation
500 Chestnut Street
Box 1900
Santa Cruz, CA 95061
(408) 425—7222

Level II COBOL is a mainframe-level COBOL implementation that has been certified by the U.S. Government as meeting the highest level of the ANSI 1974 standard. A multikey indexed sequential access method allows COBOL programs and Informix (see the XENIX Software Library in Chapter 9) to share the same data. The product's dynamic subprogram loading allows the creation of programs that would not ordinarily fit in system memory.

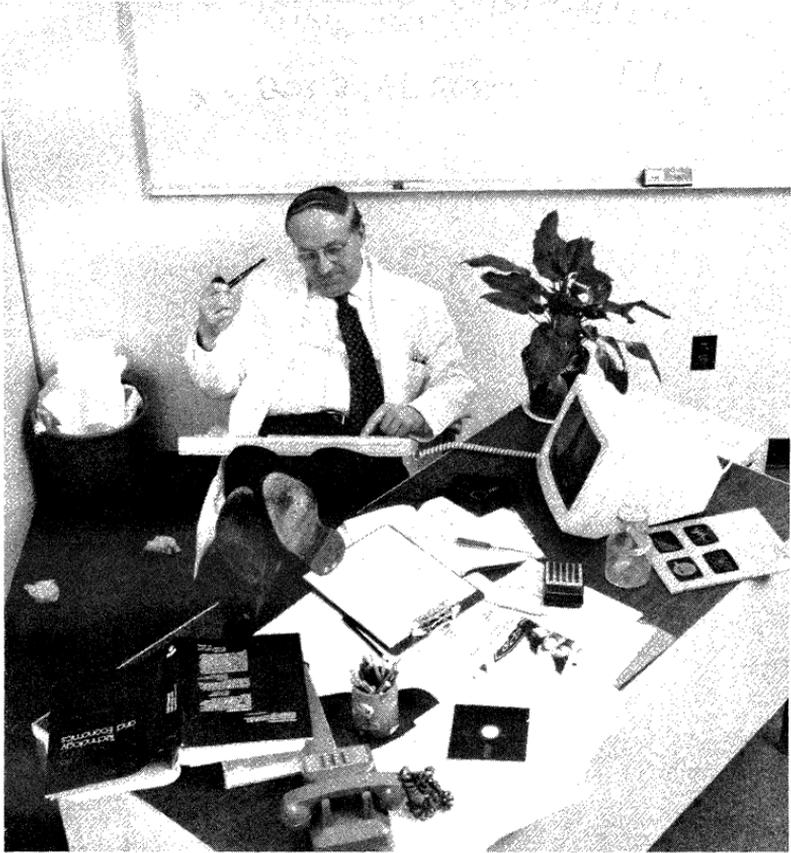
COBOL Development Tools is a two-part package that is of tremendous value in the creation and debugging of COBOL programs. The first part, Forms-2, speeds the development of interactive, screen-oriented programs. You simply paint a form on a CRT screen and Forms-2 automatically generates COBOL source code to handle the screen data entry and display. The second part of the package, Animator, is a symbolic debugger that displays the source code for a COBOL program on the screen and gives you line-by-line control over program execution.

• **Optional Development Tools for Idris**

Available from: Empirical Research Group (Developer)
P.O. Box 1176
Milton, WA 98354
(206) 874—4844

or

Logos Information Systems, Inc.
P.O. Box 500
Flemington, NJ 08822
(201) 782—1533



The Alpha Basic Compiler is a compiler for 68K Basic and contains several powerful extensions. No line numbers are required; they can be replaced by alphanumeric labels of any length. Variables can be of any length with upper/lower case significance. TAB commands handle tabs, so you have terminal-independent screen handling. Multiple variables may be mapped over the same memory space. The Alpha Basic Compiler supports the ISAM file structure.

• **Development Tools for MUMPS**

The primary development environment for STANDARD MICRO MUMPS is the SMM 300 ANSI-standard high-level language. This interpretive language streamlines your development time by giving you one tool to complete the tasks you usually do with editors, compilers, linkers, and loaders. It also includes powerful debugging routines that help you isolate and correct errors quickly.

SMM 300 is available from the vendor either separately or as part of a turnkey package. See Chapter 8 for more information on STANDARD MICRO MUMPS 300.

• **Development Tools Ordering Information**

Product	Operating System		
	P/OS	RSX-11M/M-PLUS	VAX/VMS
PRO/Tool Kit	QBA14-A3		
Professional Host Tool Kit		QJ071-AD	QC350-AG
		QJ071-AH	QD350-AG
		QJ071-AM	QE350-AY
		QJ071-AV	
Professional Tool Kit FORTRAN-77	QBA15-A3	QJ074-AD	QC353-AG
		QJ074-AH	QD353-AG
		QJ074-AM	QE353-AY
		QJ074-AV	
Professional Tool Kit FORTRAN-77 DEBUG	QBA21-A3	QJ079-AD	QC421-AG
		QJ079-AH	QD421-AG
		QJ079-AM	QE421-AY
		QJ079-AV	

Product		Operating System	
Professional Tool Kit Pascal	QBA18-A3	QJ082-AD	QC715-AG
		QJ082-AH	QD715-AG
		QJ082-AM	QE715-AY
		QJ082-AV	
Professional Tool Kit COBOL-81	QBA19-A3	QJ081-AD	QC714-AG
		QJ081-AH	QD714-AG
		QJ081-AM	QE714-AY
		QJ081-AV	
Professional Tool Kit DIBOL	QBA16-A3	QJ369-AD	QC356-AG
		QJ369-AH	QD356-AG
		QJ369-AM	QE356-AY
		QJ369-AV	
Professional Tool Kit BASIC-PLUS-2	QBA17-A3	QJ073-AD	QC352-AH
		QJ073-AH	QD352-AH
		QJ073-AM	QD352-AM
		QJ073-AV	QD352-AV
			QE352-AM
			QE252-AV
Professional Realtime Interface Libraries	QBA58-A3	QJ076-AD	QC355-AG
		QJ076-AH	QC355-AG
		QJ076-AM	QC355-AY
		QJ076-AV	

Product	Operating System
PRO/BASIC	QBA04-A3
FORTRAN-77 for p-System	QA114-C3
UCSD Pascal	QA113-C3
PRO-IV for Professional 350	QA880-C3
PRO-IV for Professional 380	QA881-C3
PRO/FORTRAN-IV (RT-11)	QB813-A3
PRO/BASIC-11 (RT-11)	QB913-A3
FORTRAN-77 (RT-11)	QA609-C3
Key:	
AD	9-Track Magtape
AH	RI02 Disk Cartridge
AM	1600 BPI Magtape
AV	RK07 Disk Cartridge
AG	TU58 Kit
AY	RX01 Kit
QC	Products run on VAX-11/730
QD	Products run on VAX-11/750
QE	Products run on VAX-11/780

Appendix I • IVIS—Digital's Interactive Video Information System



• **PRO IVIS/Videodisc System**

Order Code: PC35V-VC

• **PRO IVIS/Videodisc System with Touch Screen**

Order Code: PC35V-VC

Training programs are vital in today's climate of rapid technological and manufacturing change. There is more to learn—and less time to spend learning—than ever before. It's no surprise that consistent, cost-effective education and training is one of the most pressing needs in business, manufacturing, and government.

As the demand for training and education increases, so does the need for more efficient teaching systems. One solution is Digital's IVIS—the Interactive Video Information System.

Digital has combined an interactive computer, live video, two-channel audio, and high-resolution text and graphics to create one of today's most advanced system-based education (SBE) tools. IVIS is designed primarily for corporations, institutions, and government agencies with large requirements for training and presentations in fields such as electronics, computer programming and maintenance, auto sales and repair, robotics, and aeronautics.

IVIS is particularly effective in situations where large numbers of people will receive the same training, or where the same training program takes place on a continuing basis. Digital, for example, uses IVIS to train and update Field Service technicians throughout the U.S.

A Complete System with Complete Support.

IVIS capitalizes on the Professional's power and graphics to create a versatile, multimedia training system. IVIS comes as a complete,

user-installable learning station. The basic hardware includes a Professional 350 with a 10-Mbyte hard disk storage system, an audio/videodisc player, supporting hardware and software, and your choice of conventional or touch screen color monitors. Digital's remarkable DECTouch screen allows you to completely eliminate the traditional keyboard interface.

But IVIS is more than a sophisticated collection of hardware. It is a complete training solution. In addition to the IVIS system itself, Digital provides worldwide technical support, a library of off-the-shelf training courses, course development tools, even consulting and custom course development services.

IVIS Makes Learning More Interesting.

As a standalone training station, IVIS actually approximates a "live teaching" environment. Students are able to interact with lesson material as it is being presented. They can choose the specific material they wish to cover and the speed at which they cover it. Any given lesson might include video segments, text or graphic overlays, a voice-over narrative, question and answer situations, reviews or examinations.

The experience is dynamic. Live video segments can demonstrate real situations. The student can stop, back up, even zoom in for additional detail. Since IVIS uses a laser videodisc system, any portion of the program can be accessed almost instantaneously. And the video image is five to six times sharper than a conventional color television picture.

As the video segments present realistic demonstration, text and computer generated graphics add clarity and detail to the lesson. Words, graphs, tables, symbols, drawings or diagrams can be superimposed over live video segments without obscuring the video. In addition to the full-color video segments, the monitor can display eight additional colors simultaneously, from a range of 256.

The visual message is reinforced by an audio message. Through either a stereo headset or amplified speakers, one or both of two audio channels provide synchronized accompanying sound: narrative, instructions, sound effects, music, or several in combination.

DECTouch Makes IVIS More Accessible Than Ever Before.

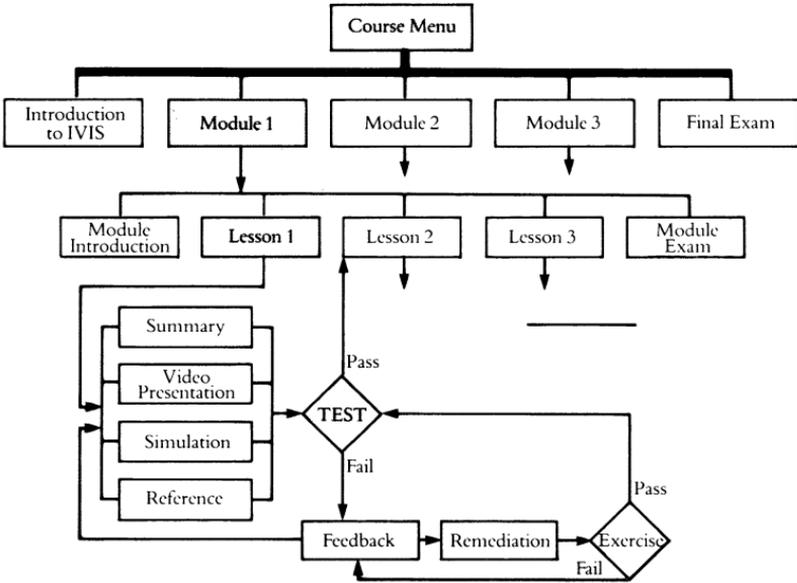
Touch screen technology is the simplest way for people to communicate with computers. There are no control commands, no cursors, no arrow keys—not even a keyboard. A simple point of the finger—a touch of the screen, actually—and the computer responds immediately.

Using the DECTouch Touch Screen system, inexperienced computer users can take full advantage of IVIS courseware without first learning the fundamentals of using a computer keyboard. DECTouch makes the user interface virtually transparent.

Digital uses resistive membrane technology to create DECTouch. This membrane, mounted over the CRT screen itself, translates a touch to input commands that the application software can understand. The DECTouch monitor also allows the use of other input devices such as joysticks, a mouse or a graphics tablet.

VAX Producer—A Breakthrough in Interactive Courseware Development.

Digital has created a powerful, easy-to-use courseware development system for organizations ready to produce their own interactive training programs. Using a VAX/VMS host, VAX Producer provides a new approach to creating IVIS interactive courseware, computer-based instruction programs and other visually-based, interactive applications.



IVIS offers a highly interactive combination of video, audio, and computer-generated text and graphics.

The most unique feature of VAX Producer is that it separates the process of creating the visuals from the process of programming the interactive logic and branching. So graphic designers and programmers can each concentrate on their own jobs.

The two major components of VAX Producer are VAX Design and VAX Draw. VAX Producer uses streamlined programming routines to generate both interactivity and computer graphics within a course. VAX Design is a highly structured language with special features to support visually-based, highly-interactive programs. VAX Draw is a graphics editor used to create computer-generated color graphics, animated graphics sequences, text, and menus.

A computer-based instruction (CBI) program, included with VAX Producer, teaches the use of the VAX Design language and the VAX Draw graphics editor. Users can begin creating simple lessons very quickly, and will master all of the basics of using VAX Producer by the end of the two-day CBI course.

The IVIS Educational Courseware Library.

Digital's Educational Services Courseware Group publishes and supports an ever-growing library of IVIS courseware. The IVIS Educational Courseware Library includes a list of introductory, conceptual, and general interest educational subjects from electronics and computer-related offerings to factory and office automation. All are subjects that lend themselves to IVIS course treatment.

An IVIS courseware package consists of a videodisc or series of videodiscs, diskettes containing the course's interactive logic and computer-generated graphics software, a trainer's guide, a learner's guide, and a variety of course-specific training materials, depending on the courseware design and subject material.

Digital Supports IVIS with Everything from Consulting to Custom Courseware Development.

Digital offers a variety of consulting and courseware development services to U.S. customers looking for systems-based solutions to specific needs.

Consulting services typically fall into the categories of planning and design. Planning services assist the customer in assessing the economic, technical and operational feasibility of large-scale SBE programs before a major investment is made. Design services offer advice on the development, implementation, and maintenance of SBE projects. This could range from needs analysis and preliminary design studies to programming, production, and project management.

Custom courseware development services offer four levels of support. At the highest level, Digital supplies all services, management, and resources required to produce a finished, turnkey training solution. All the customer supplies is the subject-matter expertise.

The second level calls for a collaborative effort by Digital and the customer, allowing the customer to learn ivis courseware production and personnel training procedures during the development process.

At the third level, Digital furnishes courseware warranty services for ongoing maintenance and updates of custom courseware developed at either of the two preceding levels.

Finally, a selection of SBE training programs on courseware production for ivis and other delivery systems will become part of Digital's Educational Services standard customer training program.

IVIS Specifications

• Analog “Backpack”

Dimensions

Height	63 cm (24 $\frac{7}{8}$ in)
Width	19.9 cm (7 $\frac{7}{8}$ in)
Depth	10.8 cm (4 $\frac{1}{4}$ in)
Weight	6.3 kg (13 lbs, 14 oz)

Environment

Operating	15° to 40° C (54° to 104° F)
Relative Humidity	20% to 80%

Electrical

AC Input	120 V nominal
	Single phase, 3-wire, 87-128 V rms at 47-63 Hz
	220-240V nominal
	Single phase, 3-wire, 174-256 V rms at 47-63 Hz
Input Current	120 V _{AC} .5A rms
	220 V _{AC} .25A rms
Serial Port	EIA asynchronous
	RS232C
	50 to 19,200 baud

IVIS Video Mode

Refresh Rate	60 Hz interlaced
Scan Lines	525 lines interlaced
Displayed Resolution	960 horizontal by 240 vertical pixels (interlaced)
Dot Pitch	0.31 mm

Video Signals	
Output Video Signal	RGB analog video signal with rs170 composite sync on green
Output Video Signal	RB video .7 V p-p positive
Detail	G video .7 V p-p positive, plus 0.34V sync
Output Load	75 ohm termination
Video Input Voltage	1.0V p-p nominal with 0.3 V negative sync tip
Voltage Variation	0.47 V to 1.21 V p-p
External Sync Output	rs170 composite sync with negative sync tip. 4.0 V p-p into 75 ohms
External Subcarrier	Frequency, 3.579545 MHz Voltage, 1.0 V p-p continuous into 75 ohms
Black Burst Output	Voltage, 286 mV composite sync + 286 mV p-p subcarrier burst into 75 ohms
Audio Signals	
Stereo Inputs	50K ohms input impedance
Auxiliary Audio Output	1000 ohm output impedance
Audio Output	1 watt/channel into 8 ohm load, 1 amp current limit
Overlay Enhancement	
Drop Shadow Width	1 to 15 pixels (programmable)

• Videodisc Player

Dimensions

Width	54.2 cm (21 $\frac{3}{8}$ in)
Height	16.0 cm (6 $\frac{1}{4}$ in)
Depth	41.5 cm (16 $\frac{3}{8}$ in)
Weight	19.6 kg (43 lb, 3 oz)

Operation

Pick-up Method	Laser beam (reflective)
Maximum Playing Time	CAV: 30 min/side
Spindle Revolution	CAV: 1800 rpm
Power Consumption	110 W
Operating Temperature	10° to 35° C (40° to 95° F)

Video

Signal	EIA standards, NTSC color
Output	1.0V (p-p), 75 ohms unbalanced, sync negative
Resolution	Color: 360 lines
Signal-to-Noise Ratio	42 dB
VHF Output	Channel 3 or 4, 75 ohms, unbalanced
Input Signals	Sync 4 V (p-p) \pm 1 V (p-p), 75 ohms SC 2 V (p-p) \pm 0.5 V (p-p), 75 ohms

Audio

Output	Line out: less than 2k ohms 0 \pm 2 dB V (100% MOD, 47 k ohms load), unbalanced Phones: 8 ohms, -19 \pm 2 dB V
Signal-to-Noise Ratio	More than 50 dB
Frequency Response	40 Hz to 20 kHz (\pm 3 dB)

• DECtouch Touch Screen

Activation Force	28 to 56 grams (1-2 oz) nominal
Resolution	1.0 mm (.04 in)
Sampling Rate	10-400 samples/second (programmable) 100 ms—2.5 ms/sample corresponds nominally to 10 in/sec drawing speed
Ports	2 serial positional device attachment ports with graphics tablet and serial mouse support 2 parallel positional device attach- ment ports with joystick or single quadrature mouse support 1 keyboard port Baud rate (programmable) of 5 to 19.2K
Software support	DECTouch requires P/OS Version 1.7 or later. A special I/O positional device driver is included with the DECTouch Control module to inter- face the applications software to the keyboard.

PRO IVIS/Videodisc System (PC35VVB) and PRO IVIS/Videodisc Touch screen System (PC35VVC) include:

- *IVIS Interactive Video Option, including: Analog "Backpack" Box, IVIS Extended Bit-map Module, IVIS Bit-map Single Plane Video Module, IVIS System Module, universal power control, cable set, software device drivers and subroutine libraries, headphones, IVIS installation, and verification videodisc*
- *Professional 350 system unit*
- *Keyboard Country Kit*
- *VDP40 Videodisc Player**
- *10-Mbyte Hard Disk*
- *Professional Operating System (P/OS)*
- *PRO Interpreter, including binaries, documentation, and license*
- *Vertical Floor Stand*
- *13-inch RGB Color Monitor (for PRO IVIS/Videodisc System) or*
- *DEctouch Color Monitor, including DEctouch alternate input device cable (for PRO IVIS/Videodisc Touch System)*

**Certain other videodisc players are plug-compatible with IVIS, but are not supported by Digital service agreements.*

Appendix II • The Professional as a Technical and Commercial OEM Computer



The Professional 300 Series of computers lend themselves well to the Original Equipment Manufacturer (OEM) marketplace. The Professionals offer you, the OEM, the advantages of a full-scale PDP-11 computer, including easy migration of your existing products to this lower-cost PDP-11. At the same time, these systems offer your end-user all the appeal of an approachable personal computer.

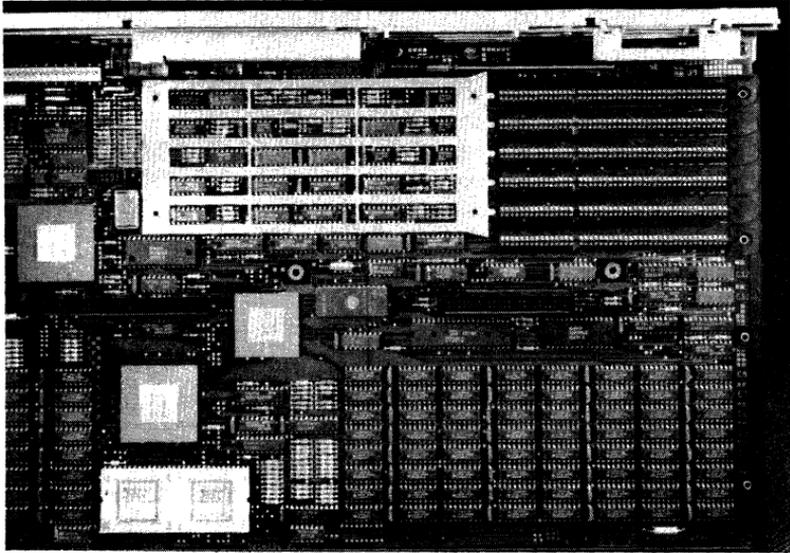
The Professional can put your products within financial reach of a whole new market segment. Many companies that previously could not invest in a minicomputer can afford a Professional personal workstation. What's more, the Professional will attract many prospects who shied away from the additional expense of the special environment controls that are necessary for larger computers. This desktop PDP-11 fits comfortably into almost any environment, from business office to laboratory.

With a choice of the Professional 325, 350, and 380 you can design a package to meet a range of processing, expansion, and price requirements. The Professional 300 Series also provides a simple migration path, both within the series and to larger PDP-11's and VAXes, to keep pace with the growth your product can stimulate.

A PDP-11 at a Personal Computer Price.

Digital's PDP-11 family has long been a favorite among OEMs. The thousands of PDP-11-based products testify to the flexibility and reliability of this proven computer line. The Professional 300 Series now extends the line by offering mature PDP-11 capabilities for the price of a personal computer.

Like other PDP-11s, the Professional supports 22-bit addressing. The floating-point processor is standard equipment to assure you efficient processing. Professional 325 and 350 systems are based on the F-11 chip set which features PDP-11/23 capabilities and a subset of PDP-11/70 memory management. At the heart of Professional 380 systems is the J-11 chip set, with its PDP-11/70 Extended Instruction Set capabilities and even faster processor operation.



↑
The Professional 380's J-11 chip set implements the PDP-11/70 instruction set.

For a complete discussion of the Professional 300 Series system units, see Chapter 6.

Digital offers several powerful system options for the Professional 300 Series, including the Realtime Interface (RTI) and DECnet support. These user-installable options fit easily into the Professional's option slots. The Professional 325 has one slot available for a customer's choice of options or an OEM's custom-designed option; the 350 offers three open slots. With its higher degree of system integration, the 380 makes five option slots available. In the family tradition, the Professional also offers a no-cost license to let you integrate your own options into its Computer Terminal Interconnect (CTI) bus.

Your Choice of Operating Systems.

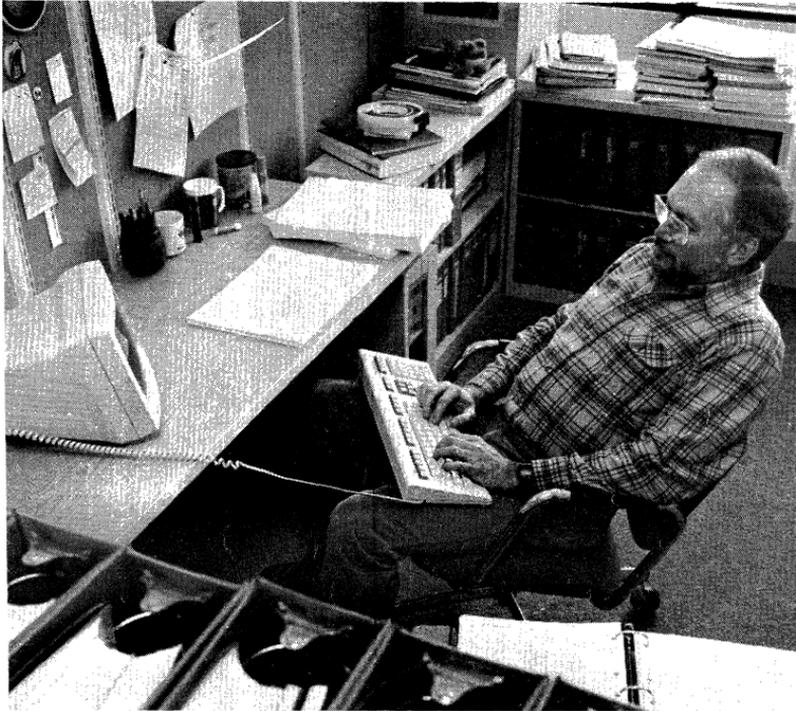
The Professional leaves the choice of operating system up to you. If your products currently run under RSX, the RSX-based P/OS is the natural selection. For RT-11 devotees, Good Old RT is there to provide a familiar home for your applications. If you prefer a UNIX-based operating system, select from PRO/VENIX, XENIX, and Idris. MUMPS is available for medical and general database management products, and p-System provides the “universal micro” environment on the Professional.

For industry-standard business applications, use the CP/M option module. And the PC-Bridge is available for customers who want to run your product but also need to run an MS-DOS application.

P/OS—For You, For Your Users.

The P/OS operating system was designed for both you and your customers. For you, there's the familiar PDP-11 working environment, complete with powerful utilities and a subset of the Digital Command Language (DCL). For your computer-naive customers, there's the easy-to-use, helpful P/OS menu interface that guides users through the system. Using the Forms Development Tool in the Professional Tool Kits, you can tailor your product to this friendly environment, so your users see a consistent interface from the moment they turn on the system until they finish their work for the day.

You can easily move your existing RSX-based applications to the P/OS environment, in some cases with little or no modification. The *Differences Between RSX/VMS and P/OS* manual is available to help you use either the PRO/Tool Kit or the Professional Host Tool Kit to optimize your RSX or VMS code to run under P/OS.



P/OS is a general purpose operating system and therefore may not be optimized for your more specific uses. So, Digital offers P/OS as an open system. The *P/OS Internals Manual*, with its microfiche of the P/OS executive, gives you all the information you need to optimize the executive to your requirements. This information is particularly important if you are developing device drivers for options to install on the CTI bus.

Good Old RT-11 At Home on the Professional.

The compact, versatile RT-11 operating system is particularly well-suited to the smaller Professional environment. Your interface to the system is the familiar Digital Command Language (DCL) available on other RT-11 systems. Many RT-11-based applications will move directly to the Professional with no modifications required.

Applications that ran under RT-11 in a nonextended memory environment can easily be converted to use memory above 32 Kwords. The *Programmer's Reference* and *System Utilities* manuals give you all the help you need to optimize your product to the Professional RT-11 environment.

PRO/UNIX Supports a Multiuser Realtime Product.

The Professional running PRO/UNIX can support both multiple users and realtime data acquisition. A second user can be connected directly through the Professional's communications port or remotely using a modem. VenturCom's realtime enhancements, including shared data segments, preemptive priorities, and "clock-tick" process timing, handle high-speed data throughput without substantial hardware support. Add its strong communication capabilities, and PRO/UNIX is one of the most powerful, most versatile UNIX systems on the market.

Impress Your Customers with the Professional's Graphics.

Graphics are becoming an increasingly important prerequisite in many computer purchases. The Professional makes it easy for you to integrate memorable graphics into your product—and all with graphics facilities that are standard system components. The Professional's video bit-map, with a standard display of 960 by 240 pixels, will support virtually any graphics package you design. In interlaced mode, the Professional 380 doubles your vertical resolution with its 960 by 480 display, to provide the heightened resolution so important in the engineering and graphic arts fields.



The Professional's video bit-map allows you to produce sophisticated graphics—even natural images.

The Extended Bit-Map option adds two additional layers to your video display. On the monochrome monitor, the EBO gives you eight distinct shades of gray. The optional color monitor displays up to eight colors simultaneously from a palette of 256 for the Professional 325 and 350, or eight from a palette of 4096 for the Professional 380. You can even integrate text with graphics on the screen.

The PRO/Tool Kit and the Professional Host Tool Kit provide access to the CORE Graphics Library (CGL) and the Professional General Image Display Instruction Set (PRO/GIDIS) that supply the graphics routines you need to develop applications for the Professional's hardware. Full explanations of these graphics features are

included with the Professional Tool Kit documentation set. For even greater control over the graphics performance, the MACRO assembly language that comes with the Professional Tool Kits and with RT-11 gives you direct access to the video bit-map. The *System Reference Manual* explains how to approach graphics programming at the hardware level.

Offer Your Customers Ethernet-Based Networking.

Customers are increasingly aware of networking and the importance of having computer systems capable of working together. The Professional fills this need with its DECNA Ethernet controller and PRO/DECnet software. This hardware/software combination allows you to create Local Area Networks (using the DELNI) or tap into existing DECnet networks (using the H4000 Ethernet Transceiver).

PRO/DECnet support in the Tool Kits lets you develop fully distributed applications that communicate transparently with other network members. Your customers can have all the benefits of network processing without having to learn about networking. And you can offer networking capabilities without having to invest the time and money in developing specific networking solutions for each customer. See Chapters 2 and 6 for more detailed information on the Professional's networking options.

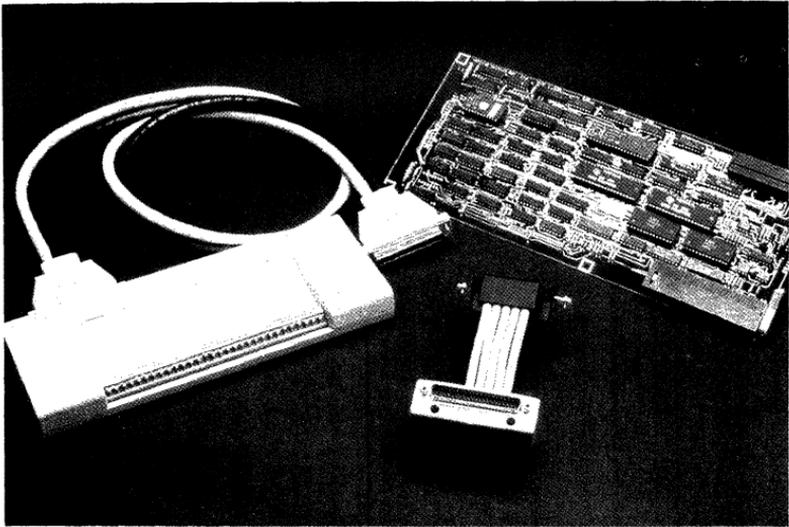
Provide Data Acquisition Systems with the RTI.

The Professional configured with the RTI is a low-cost realtime processor. Connect laboratory or test instruments for data acquisition. Or connect sensors, motors, and actuators for process control.

With its 1978 Standard IEEE-488 General Purpose Instrument Bus, two EIA RS232/423 serial asynchronous ports (50 to 9600 baud, selectable), and 24 bidirectional parallel I/O lines, the Realtime Interface gives you the freedom to select from a wide variety of

industry-standard devices. Each RTI function can be used separately, in combination, or simultaneously. See Chapter 6 for a complete description of the RTI and its cables.

The Professional Realtime Interface Library (PRTIL) is available for the PRO/Tool Kit and the Professional Host Tool Kit to let you develop your own software for the RTI. This optional set of subroutines provide access to a P/OS driver for the RTI and are callable from Tool Kit FORTRAN-77 and BASIC-PLUS-2. Applications developed with PRTIL under either of the Tool Kits will run on any Professional system configured with P/OS Hard Disk and the RTI. An alternative to PRTIL is to program the RTI using Tool Kit MACRO-11. RT-11 also supports development for the RTI.



The Professional's Realtime Interface opens the door to many realtime data collection products.

Develop for Digital's Innovative Communications Options.

Digital realizes that the traditional combination of keyboard and terminal is not always the most effective way for people to communicate using computers. With this awareness, we've developed several innovative devices that you can integrate into exciting new products for the Professional.

The Telephone Management System (TMS) with its voice recording and playback capabilities gives you the opportunity to experiment with new forms of voice and data communication. Exciting possibilities include voice annotation of text and simultaneous transmission of voice and data. The Professional Tool Kits provide routines to support development for TMS.

DECTalk is a voice synthesis unit that translates ASCII text into words then speaks those words in the user's choice of voices and speeds. The unit accepts a text string from either the keyboard or a program. DECTalk is an ideal tool for communicating operating and control information in production environments, for providing emergency instructions and warnings, and for audio reinforcement in learning situations.

The Professionals also offer you the opportunity to develop products based on state-of-the-art touch screen technology: DECTouch. DECTouch is a modified VR241 color monitor that uses resistive membrane technology to translate the precise position at which you touch the monitor screen into input commands that the application software can understand. DECTouch's Positional Device Library (PDL) includes alternate positional input device commands that let you integrate DECTouch and your own options, such as a joystick, mouse, or graphics tablet, into your applications. DECTouch features are supported by IVIS (Interactive Video Information System), which is described in detail in Appendix I.



Integrate Your Own Options into the CTI Bus.

Digital offers a no-cost license for the Professional's Computer Terminal Interconnect (CTI) bus. This licensed-bus policy means that third-parties and OEMs can obtain a license to design, manufacture, and sell add-on options that plug into the option slots on the CTI bus on Professional 300 Series units. The end-user does not have to purchase a separate license to use the optional equipment.

The Professional's option cardcage is designed with zero-insertion force connectors, so nontechnical users can easily install options with a minimal chance of damage or error. No special tools are required for installation. And third-party options are slot-independent, so the user does not need special configuration information.

To be able to sell options for the Professional, all you have to do is sign and execute a no-cost license. Licensed customers can order a documentation package for complete information on CTI bus specifications, CTI bus architecture for the Professional 300 Series, design guidelines for Professional 300 Series options, connector and cable availability, terms and conditions for third-parties and end-users, and Digital's Service policies regarding third-party options.

Digital also offers telephone support for all aspects of licensing, for technical questions, and for parts procurement. The number for this support is (617) 493-3567. Personnel at this support center route detailed technical questions on such topics as timing and architecture to appropriate support engineers who will contact you directly, if necessary. Technical questions are limited to explaining the meaning or intent of the CTI bus specifications and architecture documents.

The Professional—Designed for You and Your Users.

The Professional would be a good candidate for an OEM computer even if it were simply a smaller, lower-cost PDP-11. But in fact it is even more. By combining the processing power of the PDP-11 family with personal computer friendliness and ergonomics, the Professional makes your product attractive to a whole new market segment. Minicomputer processing with a personal computer package and price tag: the Professional offers the best of both worlds.

Index

A

- Access Technology, Inc., 9-64, 9-197
- accounting applications
 for CP/M operating system, 9-206
 for P/OS operating system, 9-3—9-19
 for RT-11 operating system, 9-178—9-181
 see also database management, decision support, spreadsheets
- ACIBEAM, 9-93—9-94
- ACM SIGGRAPH CORE, 3-8
- Administrative Planning System (APS), 9-212—9-213
- ADMPC-AA (Analog Data Module), 6-71, 6-73
- ADR/DATA, 9-59—9-61
- Advanced Interactive Systems, Inc., 9-86
- Advanced Systems Concepts, 9-32
- aerospace design applications, 4-19—4-24
- agricultural applications, 9-164—9-165
- Airplane Landing Simulation Game, 9-186
- airtravel program,
 FLIGHTMASTER,
 9-148—9-149
- ALL-IN-1, *see* VAX ALL-IN-1
- Alpha Basic Compiler (Idris), 9-221, 10-59
- amber monochrome video monitor, 6-10, 6-28, 6-37
- AMS Realstar, 9-213
- Analog Data Module, 6-71—6-73
- antiglare coating on screen, 6-29, 6-32
- Application Design Tool (ADT), 9-45
- application development,
 1-14—1-15, 3-2—3-22, 10-1—10-62
 for CP/M operating system, 9-208
 distributed, 3-12—3-13
 under Idris operating system, 3-19—3-20
 under MUMPS operating system, 3-20—3-21
 for P/OS operating system, 3-13—3-15
 under P/OS operating system, 3-4—3-12
 under PRO/VENIX operating system, 3-17—3-19
 under p-System, 3-15
- Robinson Nugent Designer's Kit for Professional 300 Series CTI Bus for, 6-76—6-78
- under RT-11 operating system, 3-15—3-17
- services for, 5-5—5-6
- tools and languages for, 10-2—10-3

using host computers,
3-13—3-15
under XENIX operating
system, 3-19
see also development tools,
languages

Application Diskette Builder
(ADB)
in Professional Host Tool Kit,
10-21, 10-24
in PRO/Tool Kit, 10-8, 10-13
applications, 2-12—2-13
warranty for, 5-2
see also accounting,
broadcasting,
communications, database
management, decision
support, educational,
government, graphics, legal,
medical, office productivity,
personal productivity, retail,
spreadsheets, statistical,
word processing, vertical
market

Applied Information Systems,
Inc., 9-38, 9-56

Applied Software Development
Corporation, 9-18, 9-164

assembly language (MACRO-11),
see MACRO-11

asynchronous communications
Mini-Exchange for, 6-53
poly-XFR for, 9-39
port for, 6-14
see also communications

ATHENA/graph, 4-30,
9-109—9-111 in
FASTPRO1, 9-69

ATS Data Processing, Inc., 9-39
Australia, keyboard country kit
for, 6-27
AutoScript Pharmacy System,
9-191
AVID, 9-86

B

backplane module slots,
6-14—6-15

banking applications, 9-165

bar code reader, 9-171

BASIC
Alpha Basic Compiler (Idris),
9-221, 10-59
BASIC-PLUS-2 for Professional
Tool Kits, 3-7, 10-38—10-40
PRO/BASIC, 3-3, 3-15,
10-44—10-45
PRO/BASIC-11 (RT-11),
10-54—10-55

Basic System Support, 5-5

battery for clock, 6-9

BCC10-03 (Y-cable for serial I/O
for RTI), 6-68—6-71

BCC11-03 (IEEE standard
connector for RTI),
6-68—6-71

BCC12-03 (parallel I/O cable
RTI), 6-68—6-71

Belgium, keyboard country kit
for, 6-27

bell, 6-24

BETA Computer Corporation,
9-18, 9-166

Billing Accounts Receivable for
Retailers (BARR), 9-195

Billing, Inventory Control, and Accounts Receivable, 9-195
Bill of Material Processor (BOMP-11), 9-195
Binary Synchronous Data Link (BSC) protocol, 2-21, 9-29, 9-31, 9-32
bit-mapped graphics, 2-21, 2-23
 see also graphics
bit-mapped video controller, 6-10
BLAST (Blocked Line Asynchronous Transmission), 9-182
bootstrapping ROM, 6-9
Boston Systems Office, 9-92, 9-177
broadcasting applications, for RT-11 operating system, 9-181—9-182
Budget and Planning for Grain Crops, 9-165
BURCOM-11, 9-38
Burroughs computers, BURCOM-11 for communications with, 9-38
bus
 CTI, 6-14
 CTI, Robinson Nugent Designer's Kit for, 6-76—6-78
 open policy on, 2-28—2-30, II-11—II-12
 original equipment manufacturers (OEMs) and, II-11—II-12

business applications, *see* database management, decision support, financial analysis, personal productivity, and spreadsheets
Business Modeller, 9-71

C

C (language)
 applications of, 4-9—4-10
 C LANGUAGE SYSTEM (DECUS), 9-187
 in Idris operating system, 3-20
 PHACT-dbrum for, 9-224
 in PRO/VENIX operating system, 3-19, 10-57
 Whitesmiths, for Professional Tool Kits, 10-42—10-43
 in XENIX operating system, 8-43
cables, 6-68—6-71
CADMATICS, 9-191
CALC-11, 9-71, 9-176, 9-196
calculator programs, 2-11, 9-130, 9-143, 9-154
calendar and appointment programs, 9-53, 9-142, 9-153
callable services
 in Professional Host Tool Kit, 10-23
 in PRO/Tool Kit, 10-12
Canada, keyboard country kits for, 6-25, 6-27
Canberra Industries, Inc., 9-98—9-99

- CANCEL key, 2-6
- carry-in system support, 5-4
- CATHCOM, 9-167
- C-CALC (spreadsheet),
9-69—9-70
- central processing units (CPUs),
6-6
 - F-11, 2-2, 6-2, 6-6
 - J-11, 2-3, 6-3, 6-6
- character cell graphics, 2-22
- characters
 - foreign language keyboard
country
 - kits for, 6-27
 - scientific, in CT*OS, 9-159
 - video display of, 6-28—6-29
- chemical analysis applications,
4-2—4-7
- chess program, Synergy Chess,
9-130
- Civil and Structural Engineering
Software, 9-189
- C LANGUAGE SYSTEM
(DECUS), 9-187
- Clinical Data Design,
9-176—9-177
- CLIN-TEAMS/PRO, 9-167
- clocks
 - in Analog Data Module, 6-72
 - nonvolatile, 6-9
- CMP (File Compare Utility),
10-14
- CMPS (Creative Medical Practice
System), 9-217
- COBOL
 - COBOL-81 for Professional
Tool Kits, 10-33—10-36
 - COBOL-PLUS for RT-11
operating system, 10-56
 - under XENIX operating
system, 9-220—9-221
- Cognition, 9-166
- COGO (Engineering Systems,
Corp.), 9-94
- COGO (Technical Information
Systems, Inc.), 9-189
- Collage Module, 6-77
- college computer centers,
4-7—4-13
- color graphics, 1-13, 2-23
 - in IVIS, I-3
 - see also graphics
- color monitors
 - Extended Bit-Map Graphics
Module for, 6-35—6-37
 - for Professional 380, 6-10,
6-37—6-38
 - RGB, 6-31—6-34
- COM624, 9-93—9-94
- COMET (Creative Occupational
Medicine and Environmental
Tracking), 9-217—9-218
- commands
 - in Digital Command
Language, 8-8, 8-10
 - in RT-11 operating system,
8-20
 - in TSX-Plus, 8-40
- communications, 1-5, 1-10—1-11

- DECNA Ethernet Controller
 - for, 6-55—6-57
- DELNI for, 6-58—6-60
- H4000 Ethernet Transceivers
 - for, 6-61—6-62
- with IBM systems, 2-21, 4-28
- Mini-Exchange for,
 - 2-16—2-18, 6-51—6-54
- original equipment manufacturers (OEMs) and,
 - II-10
- in P/OS Operating System,
 - 8-9—8-10
- in RT-11, 8-21
- Telephone Management System
 - for, 2-14—2-16, 6-45—6-51
- UNIX-to-UNIX, in
 - PRO/VENIX, 8-15
- communications port, 6-14
- communications applications for
 - P/OS operating system,
 - 9-20—9-40
 - for PRO/VENIX operating system, 9-176
 - for RT-11 operating system,
 - 3-17, 9-182—9-185
 - with Telephone Management System, 6-49
- COMPAG, 9-187
- compatibility, 3-2
 - application compatibility under
 - P/OS, 8-8—8-9
 - CP/M option module for,
 - 6-63—6-64
 - with MS-DOS, PC-Bridge for,
 - 6-65—6-68, 8-27—8-32
 - of operating systems, 8-3
- COMPOSBM, 9-93
- COMPOSE CHARACTER
 - key, 6-24
- COMPOSE indicator light, 6-24
- Compuflex, 9-181
- Compu-Share General
 - Accounting, 9-3—9-8
- computer-aided design (CAD),
 - 4-19—4-24
- DESIGN GRAPHIX for,
 - 2-24
- DGX/Exec for, 9-113—9-115
- Palette for, 9-123—9-124
- Symbolic Drawing Machine
 - for, 9-191
 - see also* graphics applications
- Computer-Based Instruction (CBI), 2-8—2-9, 5-8—5-9
 - AVID for, 9-86
 - for IVIS, I-6
 - for PRO/Communications,
 - 9-28
 - for PRO/DATATRIEVE, 9-50
 - for Supercomp-Twenty, 9-68
 - for TK!Solver, 9-80
- Computer-On Accounting System, 9-19
- Computer Systems Corporation,
 - 9-71, 9-176, 9-196
- Computing Terminal Interconnect (CTI) bus, *see* CTI Bus
- Compu-Tome, Inc., 9-193
- connector pod for RTI,
 - 6-68—6-71
- Contel Information Systems,
 - 9-185, 9-194

CONTROL (CTRL) key, 6-21
controllers
 bit-mapped video, 6-10
 DECNA Ethernet, 6-55—6-57
 Ethernet Controller Modules,
 9-22
CORE Graphics Library (CGL),
 2-28, 3-8, 6-32, 8-12, II-7
 LVP16 Six-Pen Graphics Plotter
 supported by, 7-32
 Professional Tool Kit support
 for, 10-5, 10-17—10-19
CORGRAPH, 9-111—9-113
Cortex Desk Set, 9-141—9-144
Cortron Corporation, 9-168;
 9-170
country kits (keyboards), 6-27
courses
 from Educational Services,
 5-8—5-12
 IVIS for, 2-26, I-2—I-12
CPA-11, 9-179
CPA Time and Billing System,
 9-18
CP/M operating system, 1-4,
 1-10
 applications for, 9-205—9-212,
 see also word processing
 CP/M-80, 1-4
 layered onto Professional
 Operating System, 8-12
 option module for, 6-63—6-64
 PRO/CP/M-80, 8-33—8-35
Creative Socio-Medics, Inc., 8-38,
 9-217—9-219

CTI bus, 6-14
 open policy on, 2-28—2-30
 original equipment
 manufacturers (OEMs),
 II-11—II-12
 Robinson Nugent Designer's
 Kit for, 6-76—6-78
CTI Bus Extender Board, 6-77
CT*OS Word Processing System,
 4-24, 9-158—9-160, 9-193
CTS-300 operating system
 (Professional CTS-300),
 8-24—8-27
 applications for, 9-197—199,
 see also government
Curriculum Management System
 (CMS), 9-213—9-214
cursor control keys, 6-22
Customer Return Centers
 (CRCs), 5-5
Customer Services, 1-16, 5-2—5-5
CVLLIB, 9-187

D

DABL (Data Base Language),
 9-181
daisywheel printers
 LQP02, 7-13—7-18
 LQP03 Letter-Quality Printer,
 7-24—7-30
daisywheels (printwheels), 7-19,
 7-21, 7-25, 7-28

- database management applications
 - for CP/M operating system, 9-205
 - for P/OS operating system, 9-41—9-63
 - for RT-11 operating system, 9-185—9-188
 - in Standard MICRO MUMPS-300, 8-35—8-39
- databases, 4-5
 - airline schedules, FLIGHTMASTER for, 9-148—9-149
 - Dow Jones News/Retrieval, 9-150, 9-152
 - PRO/Communications for access to, 9-24
 - in PRO/Videotex, 9-118—9-122
- DataCalc, 9-72, 9-196
- data communications
 - Mini-Exchange for, 6-51—6-54
 - Telephone Management System for, 6-46—6-47
 - see also* communications
- data dictionary, 9-46—9-47
- datamanagers, *see* database management applications
- Data Processing Design, Inc., 9-163
- Data Trend, 9-72, 9-196
- DATATRIEVE
 - PRO/DATATRIEVE, 4-30, 9-41—9-50
 - PRO/RDT used with, 9-50—9-52
- Dawn Computer Corporation, 9-162
- DEBUG (PRO/Tool Kit FORTRAN-77 DEBUG), 10-27—10-30
- debugging
 - FORTRAN-77 DEBUG for Professional Tool Kits, 10-27—10-30
 - Online Debugging Technique (ODT) for, 10-14
 - in Professional Host Tool Kit, 10-21, 10-37
 - in PRO/Tool Kit, 10-8
- decComp, 9-13, 9-179
- decision support applications, for P/OS operating system, 9-72—9-85, *see also* spreadsheets
- DEClander, 9-138
- DECmailer service, 5-5
- DECNA Ethernet Controller, 6-55—6-57
 - network interconnect port for, 6-14
 - original equipment manufacturers (OEMs) and, II-8
 - P/OS operating system and, 8-9
- DECNA-K (DECNA Ethernet Controller), 6-55, 6-57
- DECnet, 1-10
 - DECNA Ethernet Controller for, 6-58—6-60
 - original equipment manufacturers (OEMs), II-8

- PRO/DECnet for, 2-19,
9-20—9-23
- P/OS operating system and,
8-9—8-10
- DECOD2, 9-187
- DECservice, 5-4
- DECstart Services, 5-5
- DECsupport Service, 5-5
- DECtalk, II-10
- DECtouch Touch Screen system,
I-3, I-4, I-11, II-5
- DECUS (Digital Equipment
Computer Users Society),
5-14, 9-139, 9-163
 - RT-11 Applications from,
9-186—9-188
- DELNI Local Network
 - Interconnect, 2-19,
6-58—6-60, 9-22, *see also*
networks
- Dendrite Systems, Inc., 9-169,
9-170
- Denmark, keyboard country kit
for, 6-27
- design applications, 4-19—4-24
- DESIGN GRAPHIX, 2-24,
9-115
- DESIGN GRAPHIX/Executive
(DGx/Exec), 4-24, 4-32,
9-113—9-115
- Design Professional Management
Systems, 9-93, 9-94
- DeskTop Software Corporation,
9-52
- development, *see* application
development
 - development cycle
 - in Professional Host Tool Kit,
10-21
 - in PRO/Tool Kit, 10-9
 - development tools, 1-14—1-15,
10-2—10-3
 - for CP/M operating system,
9-208
 - for Idris operating system,
10-59
 - for MUMPS operating system,
10-60
 - for P/OS operating system,
10-3—10-50
 - for PRO/VENIX operating
system, 9-177, 10-57
 - Robinson Nugent Designer's
Kit for Professional 300
Series CTI Bus, 6-76—6-78
 - for XENIX operating system,
9-220—9-221,
10-58—10-59
 - see also* application
development, languages,
PRO/Tool Kit, Professional
Host Tool Kit
- DFMSA-AA (Mini-Exchange),
6-51, 6-54
- diagnostics
 - in LA210 Letterprinter, 7-13
 - in LA50 Personal Printer, 7-6
 - in ROM, 6-9
 - self-test, 2-7—2-8
- DIBOL, 3-7
- DIBOL for Professional Tool
Kits, 10-36—10-38

- DIBOL-83, 8-24—8-25
- Extended Memory Time
Shared DIBOL (XMTSD),
8-25—8-26
- DIGImail, 9-38
- DIGIsread, 9-72
- Digital Classified Software (DCS),
5-7—5-8, 9-2
- Digital Command Language
(DCL), 8-8, 8-20
PRO/Tool Kit and, 3-6, 10-8
- Digital Equipment Computer
Users Society, *see* DECUS
- Digital Network Architecture
(DNA), 2-19, 9-20
- Digital Perspectives Ltd., 9-180
- Digitec Corporation, 9-69
- DIGItext, 9-161—9-162
 - DIGIsread used with, 9-72
 - DIGItrieve used with, 9-63
 - SIMCALC used with, 9-154
- DIGItrieve, 9-63
- Disco-Specs, 9-210
- Disco-Tech, 9-209—9-211
- disk drives, 2-2, 2-7
 - 5-Mbyte hard, 6-39
 - hard, 6-42
 - 10-Mbyte hard, 6-40
 - 33-Mbyte hard, 3-8, 6-41
- diskette drive, RX50, 6-16—6-17
- diskettes
 - in CP/M format, 6-64, 8-35
 - dual-density, 6-16—6-17
 - in MS-DOS format, 6-67, 8-30
- display screens
 - bit-mapped video controller
for, 6-10
 - in IVIS, I-3
 - touch screens, I-4, I-11, II-10
- distributed data processing
systems, 1-6—1-7
 - computer-aided design (CAD)
applications of, 4-21—4-22
 - educational applications of,
4-10—4-12
 - P/OS operating system for,
8-8—8-9
 - PRO/Tool Kit for application
development for, 3-12—3-13
- Distribution Primary Analysis
(DPA), 9-190
- Distribution Transformer
Management (DTM), 9-190
- DMP (File Dump Utility), 10-14
- DO key, 6-24
- documentation, 2-9
 - available to third-party
hardware developers, 6-78
 - for Digital Classified Software,
5-7
 - updates and support for, 5-6
- Dog License System, 9-199
- dot-matrix printers, 7-2—7-3
 - LA210 Letterprinter 100,
7-10—7-17
 - LA50 Personal Printer,
7-4—7-9
- Dow Jones News/Retrieval,
9-150, 9-152
- DTA, Inc., 10-49

DTC11-A (Telephone Management Module), 6-45, 6-50
DTC11-B (Telephone Management Voice Unit), 6-45, 6-50, 6-51
DTS-11, 9-196
dual-diskette drives, 6-16—6-17
DX protocols, 9-26
Dynamic Control Systems, 9-214

E

EasyEntry, 9-56—9-59
ECO Freedom System (banking application), 9-165
Economic Optimization of Distribution Losses (EODL), 9-190
editors
EDT, 9-154, 10-10
FASTEXT, 9-193
PRO/ED, 9-226
in PRO/Office Workstation, 9-127
PROSE, 9-137—9-138, 9-154
PROSE PLUS, 2-11
TECO, 9-188
VED, 9-226
EDT (text editor), 9-154
in PRO/Tool Kit, 10-8, 10-10
educational applications
AVID for, 9-86
in college computer centers, 4-7—4-13
for CP/M operating system, 9-206

IVIS for, 2-26, I-2—I-12
for p-System, 9-213—9-214
see also Computer-Based Instruction
Educational Services, 1-16, 5-8—5-12
IVIS courses from, I-6
EEC Systems, Inc., 9-160, 9-193, 9-223
80-column displays, 6-29, 6-32
electronic mail
applications of, 4-22
DIGImail for, 9-39
PRO/DECnet MAIL for, 2-19
PRO/Office Workstation for, 4-24
Empirical Research Group, 9-221, 9-226, 10-59
enclosures, for system unit, 6-18
engineering applications
for P/OS operating system, 9-87—9-99
for RT-11 operating system, 9-189—9-191
Engineering Systems Corp., 9-94, 9-115
equation-solving applications
TK!Solver, 9-76—9-80
TK!SolverPacks, 9-80—9-85
Ethernet, 2-2
DECNA Controller for, 6-55—6-57
DELNI for, 6-58
H4000 Ethernet Transceivers for, 6-61—6-62
network interconnect port for, 6-14

original equipment
 manufacturers (OEMs) and,
 II-8
PRO/DECnet and, 2-19, 9-20,
 9-22
supported by Professional Host
 Tool Kit, 10-19
supported by PRO/Tool Kit,
 3-10, 10-7
Ethernet Controller Modules,
 9-22
Exceptional Business Solutions,
 9-212
Extended Bit-Map Graphics
 Option (EBO), 1-13, 6-10,
 6-35—6-36
 applications of, 4-17, 4-24
 for color display, 2-23, 6-33
 for monochrome display, 6-29
 original equipment
 manufacturers (OEMs) and,
 II-7
 for Professional 380,
 6-36—6-38
Extended Memory Time Shared
 DIBOL (XMTSD),
 8-25—8-26

F

F-11 microprocessor, 2-2, 6-2, 6-6
FASTEXT, 9-193
Fast Install utility
 in Professional Host Tool Kit,
 10-21, 10-23
 in PRO/Tool Kit, 10-8, 10-13
FASTPRO2, 9-75—9-76
FASTTEST, 9-168

FEADAM, 9-94—9-95
Field Service, 1-16
File Access Listener (FAL), 9-21
File Compare Utility (CMP), 10-
 14
file conversion services, 9-26
File Dump Utility (DMP), 10-14
FileLink utility, 6-66
File Transfer Facility, 3-13
file transfers, 2-14
 BLAST (Blocked Line Asyn-
 chronous Transmission) for,
 9-182
 from MS-DOS, 6-66
 PhoneLink for, 9-39
 in PRO/Communications, 9-
 25—9-26
 in RT-11, 8-22
 UAP-LINK for, 9-184
 VX for, 9-176
 XOREN IPL-11 for, 9-185
 XOREN IPL-11 File Transfer
 Package for, 9-40
 see also communications appli-
 cations file utilities, 10-14
FinalWord, 9-175
financial analysis applications
 for Idris operating system, 9-
 221
 for P/OS operating system, 9-
 69—9-70, 9-72—9-76, 9-
 81—9-83, 9-85
Financial Management
 TK!SolverPack, 9-81—9-83
FINAR (Financial Analysis and
 Reporting System), 9-85

FINGRAPH, 9-106—9-108
Finland, keyboard country kit for,
6-27
5-Mbyte hard disk drive, 6-39, 6-
42
512-Kbyte Memory Option, 6-44
flaggers, 10-25
FLECS, 9-187
FLIGHTMASTER, 9-148—9-
149
floating-point processor, 2-2, 6-6
floorstands, 6-5, 6-75—6-76
floppy disk drives, 6-16—6-17
FLOW, 4-10
FODT, 9-187
fonts, *see* characters
foreign language keyboard coun-
try kits, 6-27
Forms Management System
(FMS), 3-5
in Professional Host Tool Kit,
10-12
in PRO/Tool Kit, 10-22
FORTRAN
applications of, 4-23, 4-24
DECUS RT-11 Applications
for, 9-187—9-188
FORTRAN-77 for Profes-
sional Tool Kits, 10-24—
10-27
FORTRAN-77 DEBUG for
Professional Tool Kits, 10-
27—10-30
FORTRAN-77 for p-System,
10-45—10-47
FORTRAN-77 for RT-11,
10-53—10-54

FORTRAN IV for RT-11,
10-51—10-52
PRO/FORTRAN IV (RT-
11), 10-51—10-52
PRO/Tool Kit and, 3-7
Foundation Design Package, 9-
210
Frame Development Tool (FDT),
3-5
in Professional Host Tool Kit,
10-16, 10-22
in PRO/Tool Kit, 10-4, 10-12
France, keyboard country kit for,
6-27
Franklen Computer Systems, Inc.,
9-179
function keys, 1-13, 2-5—2-6, 6-
24

G

GABA, 9-193
games
Airplane Landing Simulation
Game, 9-186
DEClander, 9-138
Synergy Chess, 9-130
general ledger programs
in Compu-Share General
Accounting, 9-7
in Multi-Journal Accounting,
9-10
in PRO-Accountant, 9-13—9-
15
geometry programs
COGO (Engineering Systems
Corp.), 9-94

- COGO (Technical Information Systems, Inc.), 9-189
in Henderson and Bodwell Civil Engineering Applications, 9-96
- GeoTrak IMS, 9-95
- Germany, keyboard country kit for, 6-27
- GIDIS, *see* PRO/GIDIS
- Glenn A. Barber & Associates, Inc., 9-178, 9-183
- Global Health Systems, Inc., 9-170
- Gold Key Keyboard Country Kit, 6-25—6-27
- government applications, for P/OS operating system, 9-197—9-199
- Grade Design, 9-165
- Grain Elevator, 9-164
- graphic information systems, 2-26—2-27
- graphics, 2-21—2-23
applications for, 2-23—2-27
in applications, 2-27—2-28
color, 1-13
displayed on monochrome monitor, 6-29
displayed on RGB color monitor, 6-31, 6-32
Extended Bit-Map Graphics Module for, 6-35—6-37
in IVIS, I-3
interlaced, 2-22, 6-36—6-37
LVP16 Six-Pen Graphics Plotter for, 7-30—7-36
original equipment manufacturers (OEMs) and, II-6—II-8
on Professional 380, 6-3
P/OS operating system and, 8-12
in PRO/Tool Kit, 3-8
support in Professional Tool Kits, 3-8, 10-5—10-7, 10-17—10-18
PRO/VENIX operating system and, 8-15—8-16
ReGIS emulation for, 9-24
videotex applications of, 4-18
- graphics applications for P/OS operating system, 9-100—9-123, 9-140—9-141
for RT-11 operating system, 9-194
see also computer-aided design
- Graphics Kernel Systems (GKS), 3-9
- Graphics Plotter (LVP16), 7-3, 7-30—7-36
- green monochrome video monitor, 6-28
-
- ## H
-
- H4000 Ethernet Transceivers, 6-61—6-62
- hard-disk drives, 1-4, 2-2, 6-42
5-Mbyte, 6-39
as option for Professional 350, 6-2
10-Mbyte, 6-40
33-Mbyte, 3-8, 6-41

hardware

Analog Data Module, 6-71—6-73
Bar Code Reader, 9-171
color monitors, 6-31—6-34
in comparison of Professional 300 series, 6-3—6-4
CP/M option module, 6-63—6-64
DECNA Ethernet Controller, 6-55—6-57
DELNI, 6-58—6-60
dual-diskette drives, 6-16—6-17
Extended Bit-Map Graphics Option, 6-35—6-37
512-Kbyte Memory Option, 6-44
H4000 Ethernet Transceivers, 6-61—6-62
hard-disk drives, 6-39—6-42
in IVIS, I-3, I-8—I-12
keyboards, 6-20—6-27
Mini-Exchange, 6-51—6-54
monochrome monitors, 6-28—6-30
options, 1-4
original equipment manufacturers (OEMs) development of, II-2—II-12
PC-Bridge, 6-65—6-68, 8-27—8-32
power supply, 6-17—6-18
printers, 7-2—7-36
Professional 325 to 350 upgrade kit, 6-74

Professional 350 to 380 upgrade kit, 6-74
PRO/Tool Kit for application development for, 3-10
Realtime Interface, 6-68—6-71
Robinson Nugent Designer's Kit for Professional 300 Series CTI Bus, 6-76—6-78
supported on Professional Host Tool Kit, 10-19—10-20
supported on PRO/Tool Kit, 10-7—10-8
system enclosure, 6-18
system units, 6-3, 6-5—6-15
Telephone Management System, 6-45—6-51
TEMPUS-11, 9-172
256-Kbyte option, 6-43
warranty and service for, 5-2—5-5
HEC-1, 9-95—9-96, 9-189
HEC-2, 9-189
HELP key, 2-6, 6-24
Henderson and Bodwell Civil Engineering Applications, 9-96—9-97
HOLD SCREEN indicator light, 6-24
Hollis Geosystems Corp., 9-95
Home Health Management System, 9-168

Horizon Data Systems, 9-194
Horizon Design, Inc., 9-222
Horizon Spreadsheet, 9-222
Horizon Word Processor, 9-222
Host Communications Facility,
10-15
Host File Transfer Facility, 3-14,
10-21
Host Tool Kit, *see* Professional
Host Tool Kit

I

IBM systems
communications with, 2-21
LA210 Letterprinter
compatibility with, 7-12
PC-Bridge for MS-DOS
compatibility with,
6-65—6-68, 8-27—8-32
PRISM for communications
with, 4-28, 9-32—9-34
PRO 2780/3780 for
communications with,
9-29—9-32
PRO/SNA Remote Job Entry
for communications with,
9-37—9-38
PRO/SNA Terminal and
Printer Emulator for
communications with,
9-35—9-36
IDEAS (Interactive Data
Entry/Applications System),
9-222

Idris operating system,
8-43—8-44
applications for, 9-221—9-226,
see also legal development
packages for, 3-19—3-20
Idris Plus, 9-223
IEEE standard connector for RTI,
6-68—6-71
INDEX (FORTRAN
Cross-Referencer), 9-188
indicator lights, 6-24
Indirect Command File Processor,
10-14
Individualized Planning System
(IPS), 9-214
Informix, 9-220
installation, 2-3
of Digital Classified Software,
5-7
of PC-Bridge control trip, 6-67
of RT-11, 8-20
integrated application packages,
see office productivity
applications
Intel 8086 microprocessor, 6-66,
8-29
Intel 8087 floating point
processor, 8-29
INTELLECT-UL (LISP
interpreter), 9-215
Intelligent Industrial Systems,
9-92
Interactive Technology, Inc.,
9-185
Interactive Video Information
System
(IVIS), 2-26, I-2—I-12, II-10
interfaces

Analog Data Module,
6-71—6-73
ports for, in system unit, 6-14
Realtime Interface (RTI)
option, 1-12—1-13,
6-68—6-71, 10-7—10-8,
10-20, 10-40—10-43
user, in P/OS operating
system, 8-6—8-8
InterSystems Corporations, 9-169
Inter-task Communication
Facility, 9-34
inventory and order entry
applications
for P/OS operating system,
9-12, 9-16—9-17,
9-172—9-174
for RT-11 operating system,
9-181, 9-195—9-196
Italy, keyboard country kit for,
6-27
IVIS (Interactive Video
Information System), 2-26,
I-2—I-12, II-10

J

J-11 chip set, 2-3, 6-3, 6-6
Jeppson, Ronald W., 9-97

K

Kermit (PRO-Kermit),
9-39—9-40
keyboards, 2-5—2-7, 6-4,
6-20—6-27

keyclick, 6-24
keypad, 2-5, 6-21
KMK Enterprises, Inc., 9-197
Kuberman, Inc., 9-226

L

LA50 Personal Printer, 7-2—7-9
LA50-RA (Personal Printer), 7-4,
7-9
LA50-RB (Personal Printer), 7-4
LA50-RC (Personal Printer), 7-4
LA50-RD (Personal Printer), 7-4
LA210-AA (LA210
Letterprinter), 7-10
LA210 Letterprinter, 7-2—7-3,
7-10—7-17
laboratory applications, 4-2—4-7
laboratory data analysis package
(RS/1), 2-24, 9-87—9-90
languages, 1-15, 10-2—10-3
for CP/M operating system,
9-207
for Idris operating system,
3-20, 9-221, 10-59
for MUMPS operating system,
3-21, 10-60
for P/OS operating system,
3-7, 3-15, 10-24—10-50
for PRO/VENIX operating
system, 3-19, 8-16, 10-57
for p-System operating system,
10-45—10-49
for RT-11 operating system,
3-16, 8-21, 9-187—9-188,
10-51—10-57

- for TSX-Plus operating system, 8-41
- for XENIX operating system, 10-58—10-59
- see also* BASIC, COBOL, DABL, DIBOL, FORTRAN, LISP, Pascal, PRO-IV, RPL
- laser videodisc system, in IVIS, I-3
- Learning Tools, Inc., 9-212—9-214
- LedgerCalc, 9-214—9-215
- legal applications, 9-166, 9-223
- letter-quality printers, 7-3
 - LQP02, 7-18—7-23
 - LQP03 Letter-Quality Printer, 7-24—7-30
- Level II COBOL, 9-220
- Leverage, 9-175
- LEX-11 Word Processing, 9-160—9-161, 9-193, 9-223—9-224
- Librarian (LBR), 10-14
- libraries
 - CORE Graphics Library, 10-5
 - Operating System Specific Library, 8-25
 - in P/OS operating system, 8-11, 10-12, 10-22
 - Professional Realtime Interface, 10-40—10-41
- licensing policy, 6-78, II-3, II-11—II-12
- Lifeboat Associates, 9-205—9-209
- lights, indicator, 6-24
- LISP (language), INTELLECT-UL interpreter for, 9-215
- list manager, Leverage, 9-175
- local area networks (LANs), 2-2, 2-3
 - applications of, 4-3—4-4
 - DECNA Ethernet Controller for, 6-55—6-57
 - DELNI for, 6-58—6-60
 - H4000 Ethernet Transceivers for, 6-61—6-62
 - network interconnect port for, 6-14
 - original equipment manufacturers (OEMs) and, II-8
 - PRO/DECnet for, 2-18—2-19, 9-20
 - P/OS operating system and, 8-9—8-10
- Local Network Interconnect (DELNI) star couplers, 6-56
- LOCK indicator light, 6-24
- Logos Information Systems, Inc., 10-59
- Logsys (USA) Inc., 9-71
- LQP02-AA (letter-quality printer), 7-18, 7-23
- LQP02-HD (letter-quality printer), 7-18
- LQP02 Letter-Quality Printer, 7-3, 7-18—7-23
- LQP03-A (LQP03 Letter-Quality Printer), 7-24
- LQP03-B (LQP03 Letter-Quality Printer), 7-24

- LQP03 Letter-Quality Printer,
7-3, 7-24—7-30
- LVP16-AA (Six-Pen Graphics
Plotter), 7-30
- LVP16 Six-Pen Graphics Plotter,
7-4, 7-30—7-36

M

- MACRO-11 (assembly language)
 - in Professional Host Tool Kit,
10-17, 10-21
 - PRO/GIDIS and, 3-9
 - in PRO/Tool Kit, 3-10, 3-7,
10-4, 10-10
 - PRO/Tool Kit FORTRAN-77
DEBUG for, 10-28
- mailing list applications,
9-61—9-63, 9-194, 9-207
- MAIL utility (PRO/DECnet),
2-19
- main logic module, 6-6—6-15
- main memory, 6-7—6-8
- MAIN SCREEN key, 2-6
- maintenance, Customer Service
for, 5-2—5-5
- management information system
(AMS Realstar), 9-213
- management seminars, 5-12
- manufacturing applications,
4-25—4-32
- Manufacturing Resource Planning
(MRP II), 4-28—4-32
- MAPS/PRO Financial Modeling,
9-72—9-75
- MAPS/PRO Graphics, 9-75,
9-104—9-105
- MicroMAGIC, 9-92—9-93
- microprocessors, 6-6
 - F-11, 2-2, 6-2
 - Intel 8086, 6-66, 8-29
 - J-11, 2-3, 6-3
 - in Mini-Exchange, 6-52
 - UMD (Universal
Microprocessor
Development Systems) for,
9-92, 9-177
 - Z-80A, 8-34
- Midcom Corporation, 9-40,
9-182, 9-185
- migration
 - of applications to P/OS
operating system, 3-11
 - of RT-11 applications, 8-19
 - using PRO/Tool Kit, 3-11
- Mini-Exchange, 2-16—2-18,
4-30, 6-51—6-54, 8-10
- modems
 - Mini-Exchange connected to,
6-52
 - in Telephone Management
System, 6-46
- modular design, 6-6
- monitors, 1-4
 - Extended Bit-Map Graphics
Option for, 6-35—6-37
 - graphics on, 2-23
 - long-persistence, 6-37—6-38
 - monochrome, 2-5, 6-4,
6-28—6-30
 - for Professional 380, 6-10,
6-37—6-38

- MARC Software International, 9-164
- Materials Management System-1, 9-172—9-174
- MBSI RealWorld Accounting, 9-178—9-179
- MDX, 9-176—9-177
- Mechanical Engineering
 - TK!SolverPack, 9-83—9-85
- medical applications
 - in MUMPS, 3-20—3-21
 - MUMPS/PRO, 9-169
 - for P/OS operating system, 9-167—9-171
 - for PRO/VENIX operating system, 9-176—9-177
 - for RT-11 operating system, 9-191—9-192
- MEMO-11, 9-153
- memory
 - in Analog Data Module, 6-72
 - in DECNA Ethernet Controller, 6-57
 - 512-Kbyte option, 6-44
 - main, 6-7—6-8
 - options for, 1-4
 - 256-Kbyte option, 6-43
- memory management unit, 6-7
- menu systems, 8-8
 - Office Menu Tool, The, 9-175
- MHMIS (Mental Health Management Information System), 9-218—9-219
- Micro-Area Load Forecast (MLF), 9-190
- MicroArt, 9-211
- RGB color, 6-31—6-34
- slow phosphor, 6-37—6-38
- monochrome monitors, 1-4, 2-5, 6-4, 6-28—6-30
 - Extended Bit-Map Graphics Option for, 6-35—6-37
 - for Professional 380, 6-10
- MSC11-B (512-Kbyte Memory Option), 6-44
- MSC11-CK (256-Kbyte memory option), 6-43
- MS-DOS operating system, 1-4, 1-10
 - applications for, 9-200—9-204
 - layered onto P/OS operating system, 8-12
 - PC-Bridge for, 6-65—6-68, 8-27—8-32
- Multi-Journal Accounting (MJA), 9-9—9-12
- multitasking
 - during communications, 2-13
 - in Idris operating system, 8-43
 - in CTS-300 operating system, 8-24
 - in P/OS operating system, 1-5, 8-6
 - in PRO/VENIX, 8-15
 - in RT-11 operating system, 8-21
 - in STANDARD MICRO MUMPS 300, 8-39
 - in TSX-Plus, 8-40—8-41
 - in XENIX operating system, 8-42

multiterminal operations
 in Idris operating system, 8-43
 in PRO/VENIX, 8-14, 8-15
 in STANDARD MICRO
 MUMPS 300, 8-39
 in XENIX operating system,
 8-17

multiuser operations
 applications of, 4-9
 under Idris, 8-43
 on Professional 380, 6-3
 under Professional CTS-300,
 8-25—8-26
 under PRO/VENIX, 3-18,
 8-14, 8-15
 SHARE-eleven for, 9-195
 under STANDARD MICRO
 MUMPS-300, 8-38—8-39
 under TSX-Plus, 8-40—8-41
 under XENIX, 8-42, 8-43

MUMPS operating system, *see*
 STANDARD MICRO
 MUMPS 300

MUMPS/PRO, 9-169

N

NAPLPS (North American
 Presentation Level Protocol),
 9-116

Netherlands, keyboard country
 kit for, 6-27

NETWK, 9-97

Network File Transfer Facility,
 10-7, 10-19

network interconnect port, 6-14

Network Management Listener
 (NML), 9-21

networks
 DECNA Ethernet Controller
 for, 6-55—6-57
 DELNI for, 6-58—6-60
 H4000 Ethernet Transceivers
 for, 6-61—6-62
 interconnect port for, 6-14
 Mini-Exchange for, 2-16—2-18
 original equipment
 manufacturers (OEMs) and,
 II-8
 PRO/DECnet for, 1-10,
 2-18—2-19, 9-20—9-23
 P/OS operating system and,
 8-9—8-10

nonvolatile RAM, 6-9

Norway, keyboard country kit
 for, 6-27

NPL Information Management
 System, 9-52—9-55

numeric control program,
 UCC/CAM-100, 9-99

numeric keypad, 2-5, 6-21

O

Object Time System (OTS)
 in PRO/FORTRAN IV
 (RT-11), 10-52
 in PRO/Tool Kit
 FORTRAN-77, 10-26

Office Menu Tool, The, 9-175
office productivity applications
 for P/OS operating system,
 9-124—9-141
 for RT-11 operating system,
 9-192—9-194
 see also personal productivity
Official Airline Guide (OAG),
 9-148—9-149
132-column displays, 6-29, 6-32
On-Line Accounting, 9-18—9-19
Online Debugging Technique
 (ODT), 10-14
on-site warranty, 5-2, 5-3
open bus policy, 2-29—2-30,
 II-6—II-7
operating systems, 1-3,
 1-9—1-10, 6-2, 8-2—8-5
 see also CP/M, CTS-300, Idris,
 MS/DOS, MUMPS,
 Professional Operating
 System, PRO/VENIX,
 p-System, RT-11,
 SHARE-Eleven, TSX-Plus,
 UNIX, XENIX
Operating System Specific Library
 (Professional CTS-300), 8-25
options
 open bus policy on,
 II-11—II-12
 services, 5-6
 slots for, 6-14—6-15
 warranty for, 5-3
 see also hardware
order entry programs, *see*
 inventory and order entry
 applications

Oregon Software, 10-56
original equipment manufacturers
 (OEMs), 2-28—2-30,
 II-1—II-12
Outage Reporting and Analysis
 System
 (ORS), 9-190

P

Packet Assembler and
 Disassembler (PAD), 9-24
Palette, 9-123—9-124
parallel I/O cable for RTI,
 6-68—6-71
Pascal, 8-37
 in Idris, 3-20
 Pascal for the Professional Tool
 Kits, 10-30—10-32
 Pascal-2 for RT-11,
 10-56—10-57
 UCSD Pascal, 10-40—10-49
Patient Management System
 (PMS), 9-170
PATS (Patient Analysis and
 Tracking System), 9-170
payroll programs, 9-8,
 9-11—9-12, 9-198
PC35V-VB (PRO IVIS/Videodisc
 System), I-2, I-12
PC35V-VC (PRO IVIS/Videodisc
 System with Touch Screen),
 I-2, I-12
PC325-AA (Professional 380
 system unit), 6-5
PC325-D2 (Professional 325
 system unit), 6-5

- PC325-UG (Professional 325 to 350 Upgrade Kit), 6-74
- PC-350 Bar Code Reader, 9-171
- PC350-D2 (Professional 350 system unit), 6-5
- PC350-UG (Professional 350 to 380 Upgrade Kit), 6-74
- PC3K1-BA (USA and Canada keyboard country kit), 6-20
- PC3K1-BB (Belgium keyboard country kit), 6-27
- PC3K1-BC (Canada [French] keyboard country kit), 6-27
- PC3K1-BD (Denmark keyboard country kit), 6-27
- PC3K1-BE (United Kingdom keyboard country kit), 6-27
- PC3K1-BF (Finland keyboard country kit), 6-27
- PC3K1-BG (Germany keyboard country kit), 6-27
- PC3K1-BH (Netherlands keyboard country kit), 6-27
- PC3K1-BI (Italy keyboard country kit), 6-27
- PC3K1-BK (Switzerland [French] keyboard country kit), 6-27
- PC3K1-BL (Switzerland [German] keyboard country kit), 6-27
- PC3K1-BM (Sweden keyboard country kit), 6-27
- PC3K1-BN (Norway keyboard country kit), 6-27
- PC3K1-BP (France keyboard country kit), 6-27
- PC3K1-BS (Spain keyboard country kit), 6-27
- PC3K1-BZ (Australia keyboard country kit), 6-27
- PC3K1-EA (USA and Canada Gold Key Keyboard), 6-25—6-27
- PC3XS-AA (CP/M-80 Option Module), 6-63, 6-64, 8-33
- PC3XX-AA (Realtime Interface Module), 6-68, 6-70
- PC3XX-AB (connector pod for RTI), 6-68
- PC4014 Terminal Emulator, 2-25, 9-122—9-123
- PC-Bridge (MS-DOS), 6-65—6-68, 8-27—8-32
- PCD Systems, Inc., 9-215, 216
- PCXXF-AA (floorstand), 6-5, 6-75, 6-76
- PDP-11 systems, 1-5—1-6
 - application development for Professional series on larger, 3-2
 - developing P/OS applications using, 3-13—3-15
 - migration of applications from larger, 3-11, II-2
- pens, in graphics plotter, 7-31
- per call support, 5-4
- peripherals *see* hardware, options
- personal productivity applications
 - for P/OS operating system, 9-141—9-154
 - for RT-11 operating system, 9-192—9-194
 - see also* office productivity applications

- Personal Profile Data Base, 9-146
- personnel programs, in
 - Multi-Journal Accounting, 9-11—9-12
- Perspective, 5-3
- PETRO-PC, 9-98
- PHACT-dbrm, 9-224
- pharmacy program, AutoScript Pharmacy System, 9-191
- Phase IV Ethernet, 9-22
- PhoneLink, 6-67, 9-39
- PHONE utility (PRO/DECnet), 2-19
- pixels, 2-21—2-22, 10-6
- planning
 - Individualized Planning System (IPS) for, 9-214
 - Manufacturing Resource Planning for, 4-28—4-30
- plotter (LVP16 Six-Pen Graphics Plotter), 7-4, 7-30—7-36
- PLUS Accounts Payable System, 9-225
- PLUS Financial Management System, 9-225
- PLUS Information System, 9-225
- PM Computer Services Company, 9-198, 9-199
- Polygon Associates, 9-39
- poly-XFR, 9-39
- ports, in system unit, 2-7, 6-14
- P/OS, *see* Professional Operating System
- Positional Device Library (PDL), II-10
- POSRES, 10-12—10-22
- post-warranty service, 5-3—5-5
- P/OS User Interface Services Library (POSRES), 10-12, 10-22
- Power Distribution Engineering Software, 9-190
- power supply, 6-17—6-18
- Practice Management System (PMS; Cortron Corporation), 9-170—9-171
- Practice Management System (Smith, Abbott and Company, Inc.), 9-171, 9-192
- printer port, 6-14
- printers, 7-2—7-4
 - emulation of, 9-35—9-36
 - graphics printed on, 2-23
 - spooling of output from, 8-22
 - see also* LA210, LA50, LQP02, LQP03, LVP16
- printwheels (daisywheels), 7-19, 7-21, 7-25, 7-28
- PRISM, 2-21, 4-28, 9-32—9-34
- PRO 2780/3780, 2-21, 9-29—9-32
- PRO-Accountant, 9-13—9-18, 9-179—9-180
- PRO/Applications Starter Kit, 9-133—9-138
- PRO/BASIC, 3-3, 3-15, 10-44—10-45
- PRO/BASIC-11 (RT-11), 10-54—10-55

- PRO-CEBAS, 9-98—9-99
- processors, 6-6
 - F-11, 2-2, 6-2
 - Intel 8086, 6-66, 8-29
 - J-11, 2-3, 6-3
 - in Mini-Exchange, 6-52
 - UMD (Universal Microprocessor Development Systems) for, 9-92, 9-177
 - Z-80A, 8-34
- PRO/Communications,
 - 2-13—2-14, 6-48,
 - 9-23—9-28
 - applications of, 4-24, 4-30, 4-32
 - P/OS operating system and, 8-10
 - PRO/Tool Kit and, 3-13
 - used with PRO/NAPLPS, 9-117
- Pro Computing, 9-138
- PRO/CP/M-80, 8-33—8-35
- PRO/DataManager, 9-137
- PRO/DATATRIEVE, 4-30, 9-41—9-50
- Pro/DBA, 9-131—9-133
- PRO/DECnet, 1-10, 2-18—2-19, 8-6, 9-20—9-23
 - DECNA Ethernet Controller used with, 6-55
 - original equipment manufacturers (OEMs) and, II-8
 - P/OS operating system and, 8-9
 - supported by Professional Tool Kits, 3-10, 10-7, 10-19
- PRO/DECnet MAIL utility, 2-19
- PRO/DECnet PHONE utility, 2-19
- PRO/DIGICALC (spreadsheet), 9-70—9-71
- production applications, 4-25—4-32
- productivity applications, *see* office productivity; personal productivity
- PRO/ED, 9-226
- Professional 300 Series, 1-3, 2-2—2-3, 6-2—6-4
 - see also* applications, hardware, options, operating systems
- Professional 325 computers, 2-2, 6-2—6-4
 - upgrading to Professional 350, 6-74
 - see also* Professional 300 Series
- Professional 325 to 350 Upgrade Kit, 6-74
- Professional 350 computers, 1-3, 2-2—2-3, 6-2—6-4
 - upgrading Professional 325 to, 6-74
 - upgrading to Professional 380 from, 6-74
 - see also* Professional 300 Series
- Professional 350 to 380 Upgrade Kit, 6-74

Index

- Professional 380 computers, 1-3, 2-3, 6-3—6-4
 - see also* Professional 300 Series
- Professional Application Builder (PAB), 3-5
 - in Professional Host Tool Kit, 10-21, 10-23
 - in PRO/Tool Kit, 10-8, 10-12
- Professional Communications Phonebook, 9-26
- Professional CTS-300 operating system, 8-24—8-27
 - applications for, 9-197—9-199
- Professional File Control Services (PRO/FCS), 10-10, 10-22
- Professional File Transfer utility, 3-13, 9-25
- Professional Forms Management System (PRO/FMS), 10-12, 10-22
- Professional General Image Display Instruction Set,
 - see* PRO/GIDIS
- Professional Host Communications, 10-23
- Professional Host Tool Kit, 1-14, 3-3, 10-2, 10-15—10-24
 - graphics in, 10-17—10-19, II-7—II-8
 - languages supported by, 10-17, 10-24—10-43
 - menus available for, 8-8
 - required for Analog Data Module, 6-73
 - services for, 5-5—5-6
 - see also* application development, PRO/Tool Kit
- Professional Host Tool Kit BASIC-PLUS-2, 10-38—10-40
- Professional Host Tool Kit COBOL-81, 10-33—10-36
- Professional Host Tool Kit DIBOL, 10-36—10-38
- Professional Host Tool Kit FORTRAN-77, 10-24—10-27
- Professional Host Tool Kit FORTRAN-77 DEBUG, 10-27—10-30
- Professional Host Tool Kit Pascal, 10-30—10-32
- Professional Host Tool Kit Realtime Interface Library, 10-40—10-43
- Professional Operating System (P/OS), 1-3, 1-9, 8-3—8-12
 - applications for, 9-3—9-175,
 - see also* accounting, communications, database management, decision support, engineering, graphics, legal, medical, office productivity, personal productivity, statistical, vertical market, word processing
 - application development tools under, 3-4—3-15, 10-3—10-50
 - communications under, 2-13
 - CP/M option module used with, 6-63—6-64, 8-34

- menu tree in, 1-13
- migration to, 3-11
- multitasking on, 1-5
- PC-Bridge for MS-DOS
 - compatibility with, 6-65—6-68, 8-27—8-32
 - p-System running under, 3-15
- Professional Presentation System, 8-10
- Professional Realtime Interface
 - Library (PRTIL), 3-10, 10-7—10-8, 10-20, 10-40—10-43
 - Analog Data Module and, 6-72, 6-73
 - original equipment manufacturers (OEMs) and, II-9
- Professional Record Management System (PRO/RMS), 10-10, 10-21—10-22
- PRO/FORTRAN IV (RT-11), 10-51—10-52
- PRO/GIDIS (General Image Display Instruction Set), 2-28, 8-12, II-7
 - Professional Tool Kit support for, 3-8—3-10, 10-5—10-7, 10-17—10-19
- programming, *see* application development
- programming languages, *see* languages
- programs, *see* applications
- PRO/Graph, 9-136
- PRO-IV, 10-49—10-50
- PRO IVIS/Videodisc System, I-2—I-12
- PRO IVIS/Videodisc Touch System, I-2—I-12
- PRO-Kermit, 9-39—9-40
- PRO/NAPLPS, 2-25, 9-116—9-117
- PRO/Office Workstation, 9-124—9-128
 - applications of, 4-24, 4-28, 4-30, 4-32
- Propel, 9-138—9-140
- PRO/RDT, 9-41, 9-50—9-52
- PROSE, 9-137—9-138, 9-154
- PROSE PLUS, 2-11, 9-129, 9-154—9-155
- PRO/SIGHT, 2-24, 9-100—9-101
- PRO/Smart Mailer, 9-61—9-63
- PRO/SNA Remote Job Entry (PRO/SNA/RJE), 2-21, 9-37—9-38
- PRO/SNA Terminal and Printer Emulator (PRO/SNA/TE), 2-21, 9-35—9-36
- PRO/Spreadsheet, 9-135—9-136
- ProtoCall 350, 6-48, 9-144—9-145
- ProtoCall 1000, 6-48, 9-146—9-147
- protocols
 - for graphics and videotex, 2-25
 - for IBM systems, 2-19
 - North American Presentation Level Protocol (NAPLPS), 9-116

- PRO/Tool Kit, 1-14, 3-4—3-13,
10-3—10-14
graphics support in, 3-8—3-10,
10-5—10-7, II-7—II-8
languages supported by, 10-14,
10-24—10-43
menus available for, 8-8
required for Analog Data
Module, 6-73
services for, 5-5—5-6
used with Professional
Operating System, 8-10,
8-12
used with PRO/Office
Workstation, 9-126
see also Professional Host Tool
Kit
- PRO/Tool Kit BASIC-PLUS-2,
10-38—10-40
- PRO/Tool Kit COBOL-81,
10-33—10-36
- PRO/Tool Kit DIBOL,
10-36—10-38
- PRO/Tool Kit FORTRAN-77,
10-24—10-27
- PRO/Tool Kit FORTRAN-77
DEBUG, 10-27—10-30
- PRO/Tool Kit Pascal,
10-30—10-32
- PRO/Tool Kit Realtime Interface
Library, 10-40—10-43
- PRO/UNIX operating system,
1-3, 1-9—1-10, 3-17—3-19,
8-13—8-17
applications for, 9-175—9-177,
see also communications,
decision support, medical,
spreadsheet, word processing
development tools for, .
original equipment
manufacturers (OEMs) and,
II-6
on Professional 380, 6-3
- PRO/Videotex, 2-26—2-27
- PRTIL, *see* Professional Realtime
Interface Library
- PSYCHOSYSTEMS, 168
- p-System (operating system),
8-35—8-37
applications for, 9-212—9-216,
see also educational
developing applications
using, 3-15
- FORTRAN-77 for,
10-45—10-47
- purchasing applications,
4-25—4-32
-
- Q**
-
- QA111-C3 (UCSD p-System),
8-35
- QA112-C3 (UCSD p-System),
8-35
- QA113-C3 (UCSD Pascal), 10-47
- QA114-C3 (FORTRAN-77 for
p-System), 10-45
- QA117-C3 (NPL Information
Management System), 9-52
- QA176-C3 (PRISM), 9-32
- QA180-C3 (TK!Solver), 9-76
- QA184-C3 (Cortex Desk Set),
9-141
- QA185-C3 (CORGRAPH),
9-111

- QA384-C3 (MJA General Ledger), 9-9
- QA385-C3 (MJA Payroll and Personnel), 9-9
- QA386-C3 (MJA Accounts Receivable), 9-9
- QA387-C3 (MJA Accounts Payable), 9-9
- QA388-C3 (MJA Order Entry/Inventory), 9-9
- QA431-C3 (MAPS/PRO Financial Modeling), 9-72
- QA432-C3 (MAPS/PRO Graphics), 9-104
- QA434-C3 (Financial Management TK!SolverPack), 9-81
- QA435-C3 (FINGRAPH), 9-106
- QA442-C3 (Mechanical Engineering TK!SolverPack), 9-83
- QA476-C3 (Supercomp-Twenty), 9-64
- QA497-C3 (RS/1), 9-87
- QA526-C3 (ProtoCall 1000), 9-146
- QA527-C3 (ProtoCall 350), 9-144
- QA538-C3 (Compu-Share General Accounting General Ledger), 9-3
- QA550-C3 (ATHENA/graph), 9-109
- QA560-C3 (Materials Management System-1), 9-172
- QA564-C3 (ADR/DATA), 9-59
- QA566-C3 (Compu-Share General Accounting Accounts Receivable), 9-3
- QA567-C3 (Compu-Share General Accounting Accounts Payable), 9-3
- QA569-C3 (PRO/Videotex), 9-118
- QA579-C3 (UCSD p-System), 8-35
- QA585-C3 (EasyEntry), 9-56
- QA609-C3 (FORTRAN-77 for RT-11), 10-53
- QA-684-C3 (DESIGN GRAPHIX/Executive [DGx/Exec]), 9-113
- QA700-C3 (RDM 300), 9-55
- QA718-C3 (PRO/VENIX), 8-13
- QA719-C3 (Wall Street Connection), 9-150
- QA720-C3 (FLIGHTMASTER), 9-148
- QA753-C3 (PRISM), 9-32
- QA761-C3 (PC4014 Terminal Emulator), 9-122
- QA765-C3 (FASTPRO1), 9-69
- QA766-C3 (FASTPRO2), 9-75
- QA767-C3 (CT*OS Word Processing System), 9-158
- QA880-C3 (PRO-IV), 10-49
- QA881-C3 (PRO-IV), 10-49

- QAAB6-C3 (Pro/DBA), 9-131
- QB354-H3 (Professional CTS-300 operating system), 8-24
- QB813-A3 (PRO/FORTRAN IV [RT-11]), 10-51
- QB913-A3 (PRO/BASIC-11 [RT-11]), 10-54
- QBA02-H3 (Professional Operating System), 8-3
- QBA04-A3 (PRO/BASIC), 10-44
- QBA05 (PRO/Communications), 9-23
- QBA11-A3 (PROSE PLUS), 9-154
- QBA13-H3 (Professional Operating System), 8-3
- QBA14-A3 (PRO/Tool Kit), 10-3
- QBA15 (PRO/Tool Kit FORTRAN-77), 10-24
- QBA16-A3 (PRO/Tool Kit DIBOL), 10-36
- QBA17-A3 (PRO/Tool Kit BASIC-PLUS-2), 10-38
- QBA18-A3 (PRO/Tool Kit Pascal), 10-30
- QBA19-A3 (PRO/Tool Kit COBOL-81), 10-33
- QBA21-A3 (PRO/Tool Kit FORTRAN-77 DEBUG), 10-27
- QBA24-A3 (PRO/NAPLPS), 9-116
- QBA25-A3 (PRO/Applications Starter Kit), 9-133
- QBA26-A3 (PRO/Applications Starter Kit), 9-133
- QBA35-A3 (PRO/SIGHT), 9-100
- QBA39-H3 (RT-11), 8-18
- QBA42-A3 (PRO/Smart Mailer), 9-61
- QBA43-A3 (PRO/DATA-TRIEVE), 9-41
- QBA44-H3 (PRO/DECnet), 9-20
- QBA45 (PRO/Communications), 9-23
- QBA47-A3 (PRO 2780/3780), 9-29
- QBA48-A3 (PRO/SNA Remote Job Entry [PRO/SNA/RJE]), 9-37
- QBA49-A3 (PRO/SNA Terminal and Printer Emulator [PRO/SNA/TE]), 9-35
- QBA58-A3 (PRO/Tool Kit Realtime Interface Library), 10-40
- QBA64-A3 (PRO/Office Workstation), 9-124
- QBA71-A3 (PRO/RDT), 9-50
- QBA76-A3 (Synergy), 9-129
- QBE05 (PRO/Communications), 9-23
- QBE45 (PRO/Communications), 9-23
- Q-bus, 6-14
- QC350 (Professional Host Tool Kit), 10-15
- QC352 (Professional Host Tool Kit BASIC-PLUS-2), 10-38
- QC353 (Professional Host Tool Kit FORTRAN-77), 10-24

- QC355 (Professional Host Tool Kit Realtime Interface), 10-40
- QC356 (Professional Host Tool Kit DIBOL), 10-36
- QC421 (Professional Host Tool Kit FORTRAN-11 DEBUG), 10-27
- QC714 (Professional Host Tool Kit COBOL-81), 10-33
- QC715 (Professional Host Tool Kit Pascal), 10-30
- QD350 (Professional Host Tool Kit), 10-15
- QD352 (Professional Host Tool Kit BASIC-PLUS-2), 10-38
- QD353 (Professional Host Tool Kit FORTRAN-77), 10-24
- QD355 (Professional Host Tool Kit Realtime Interface), 10-40
- QD356 (Professional Host Tool Kit DIBOL), 10-36
- QD421 (Professional Host Tool Kit FORTRAN-11 DEBUG), 10-27
- QD714 (Professional Host Tool Kit COBOL-81), 10-33
- QD715 (Professional Host Tool Kit Pascal), 10-30
- QE350 (Professional Host Tool Kit), 10-15
- QE352 (Professional Host Tool Kit BASIC-PLUS-2), 10-38
- QE353 (Professional Host Tool Kit FORTRAN-77), 10-24
- QE355 (Professional Host Tool Kit Realtime Interface), 10-40
- QE356 (Professional Host Tool Kit DIBOL), 10-36
- QE421 (Professional Host Tool Kit FORTRAN-11 DEBUG), 10-27
- QE714 (Professional Host Tool Kit COBOL-81), 10-33
- QE715 (Professional Host Tool Kit Pascal), 10-30
- QJ071 (Professional Host Tool Kit), 10-15
- QJ073 (Professional Host Tool Kit BASIC-PLUS-2), 10-38
- QJ074 (Professional Host Tool Kit FORTRAN-77), 10-24
- QJ076 (Professional Host Tool Kit Realtime Interface), 10-40
- QJ079 (Professional Host Tool Kit FORTRAN-11 DEBUG), 10-27
- QJ081 (Professional Host Tool Kit COBOL-81), 10-33
- QJ082 (Professional Host Tool Kit Pascal), 10-30
- QJ369 (Professional Host Tool Kit DIBOL), 10-36
- Q'TEST, 9-162
- quality control applications, 4-25—4-32
- QUEUE, 8-22
- Quick/Connect wiring system, 6-77
- Quick Mail, 9-194

R

- Radio Computing Services, 9-181
- Radiology Management System, 9-219
- Radio Station Management Packages, 9-181—9-182
- random-access memory (RAM), 6-7—6-8
 - 512-Kbyte option, 6-44
 - nonvolatile, for clock, 6-9
 - in PC-Bridge, 6-66, 8-29
 - 256-Kbyte option, 6-43
- RCD50-A (5-Mbyte hard disk drive), 6-39, 6-42
- RCD51-A (10-Mbyte hard disk drive), 6-40, 6-42
- RCD52-A (33-Mbyte hard disk drive), 6-41, 6-42
- RDM 300, 9-55—9-56, 9-185
- read-only memory (ROM)
 - character sets and fonts in, 7-12, 7-14
 - on-board diagnostics in, 6-9
- real estate applications, AMS Realstar for, 9-213
- realtime applications, 4-3
 - under P/OS, 3-10, 10-40—10-43
 - under PRO/VENIX, 8-17
 - under RT-11, 8-18—8-23
- Realtime Interface (RTI) option, 1-12—1-13, 6-68—6-71
 - Analog Data Module connected to, 6-71
 - original equipment manufacturers (OEMs) and, II-8—II-9
 - Professional Realtime Interface Library (PRTIL) for, 10-7—10-8, 10-20, 10-40—10-43
- Record Management System (RMS), 3-5
- ReGIS (Remote Graphics Instruction Set), 2-25, 9-24
- Remote Job Entry, 2-21, 9-37—9-38
- RENUM, 9-188
- report generation
 - in MAPS/PRO Financial Modeling, 9-75
 - in NPL Information Management System, 9-54
 - in PRO/DATATRIEVE, 9-46
 - in Supercomp-Twenty, 9-66—9-67
- Research Programming Language (RPL), 9-89
- Resource Monitor Display (RMD), 10-14
- RESUME key, 2-6
- Retail Billing Systems, 9-195—9-196
- Retailing Inventory Management System (RIMS), 9-196
- REWALL, 9-189
- RGB color monitors, 6-31—6-34
 - Extended Bit-Map Graphics Option for, 6-35—6-37
 - for Professional 380, 6-37—6-38
- RGTI Systems Software, Inc., 9-173

Robinson Nugent Designer's Kit
for Professional 300 Series
CTI Bus, 6-76—6-78

ROM (read-only memory), 6-9

RS/1 laboratory data analysis
package, 1-9, 2-24,
9-87—9-90

RS232C interface, 6-14

RS423C interface, 6-14

RSX-11M operating system, 3-14
Professional Host Tool Kit for
development on, 10-15

RSX-11M-PLUS operating
system, 1-9, 3-14, 8-6, 8-11
Professional Host Tool Kit for
development on, 10-15

RSX-11 operating system, 1-9
utilities for, in PRO/Tool Kit,
10-4

RT-11 Accounting Modules for
the Professional, 9-180

RT-11 operating system, 1-3,
1-10, 3-4, 8-18—8-23
application development under,
3-15—3-17
applications for, 9-178—9-197,
see also accounting,
broadcasting,
communications, database
management, decision
support, engineering,
graphics, medical, office
productivity, personal
productivity, retail,
spreadsheets, word
processing

included in Professional CTS-
300, 8-24—8-25
languages supported by, 10-3
TSX-Plus running under, 8-40

RT-11 Virtual Communications
Package (VTCOM), 3-17,
8-21

RTEM-11 (RT-11 emulator),
8-22

RTFILE, 9-185—9-186

RUNOFF, 9-163, 9-188

runtime systems, in Professional
CTS-300, 8-25—8-26

RX50 dual-diskette drive,
6-16—6-17

S

S & H Computer Systems, Inc.,
8-40, 10-56

Santa Cruz Operation, Inc., 8-42,
9-220, 10-58

SATURN-CALC, 9-140, 9-194

SATURN-DIARY, 9-153

SATURN-GRAPH,
9-140—9-141, 9-194

Saturn Systems, Inc., 9-140,
9-153, 9-194

SATURN-WP, 9-141, 9-194

scientific applications, *see*
engineering

Scott & Scott Consultants, Inc.,
9-190

screen/cursor control keys, 6-22

screens
antiglare coating on, 6-29, 6-32
bit-mapped video controller
for, 6-10

- Frame Development Tool for, 3-5
- in IVIS, I-3
- touch screens, I-4, I-11, II-10
- scrolling, 6-29
- self-maintenance service, 5-5
- self-test diagnostics, 2-7—2-8
- serial ports, 6-14
- serial Y-cable for Realtime Interface, 6-68—6-71
- services
 - Customer Service, 5-2—5-6
 - DECUS, 5-14
 - Digital Classified Software, 5-5—5-8
 - Educational Services, 5-8—5-12
 - support, 1-16
- SETUP program, 8-22
- shadow bolding, 7-19
- SHAKE, 9-94—9-95
- SHARE-eleven (operating system), 9-194—9-195
- SHOW command, 10-8
- SIMCALC, 9-154
- Six-Pen Graphics Plotter (LVP16), 7-4, 7-30—7-36
- slots, 6-14—6-15
- Small Business Systems, Inc., 9-168, 9-192
- Smith, Abbott and Company, Inc., 9-171, 9-192
- SNA (Systems Network Architecture) protocol, 2-21
- PRO/SNA Remote Job Entry (PRO/SNA/RJE) for, 9-37—9-38
- PRO/SNA Terminal and Printer Emulator (PRO/SNA/TE) for, 9-35—9-36
- SofTech Microsystems, Inc., 9-212
- software, *see* applications
- Software Insights, Inc., 9-144
- Software Services, 4-17
- SORT, 9-188
- Source Code Control System (SCCS), 3-19
- Source Language Input Program (SLP), 10-14
- Spain, keyboard country kit for, 6-27
- speaker, 6-24
- special characters
 - COMPOSE CHARACTER key for, 6-24
 - foreign language keyboard country kits for, 6-27
 - scientific, in CT*OS, 9-159
- special command and function keys, 2-5—2-6, 6-24
- SPOOL (Transparent Spooling Package), 8-22
- spreadsheets
 - for P/OS operating system, 9-64—9-72
 - for PRO/VENIX operating system, 9-176
 - for RT-11 operating system, 9-196—9-197
 - see also* decision support

- SPSS/Pro, 9-90—9-92
- STADIA, 9-210
- STANDARD MICRO MUMPS
 - 300, 1-3, 3-4, 8-38—8-40
 - applications for, 9-217—9-219,
see also database management, medical
 - application development using, 3-20—3-21
 - MUMPS/PRO for, 9-169
- statistical applications
 - for quality control, 4-31
 - SPSS/Pro for, 9-90—9-92
- Statistical Package for Social Sciences (SPSS), 9-90—9-92
- Steinhauer Group, The, 9-172
- storage
 - dual-diskette drive, 6-16—6-17
 - hard disk drives, 6-39—6-42
- STRESS, 9-189
- Structured Data Systems, Inc., 8-38
- SUD (Single User DIBOL), 8-26
- Supercomp-Twenty (spreadsheet), 4-18, 4-24, 9-64—9-68
 - in FASTPRO1, 9-69
 - for RT-11 operating system, 9-197
- support, 1-16
 - Customer Service, 5-2—5-6
 - DECUS, 5-14
 - Digital Classified Software, 5-6—5-8
 - Educational Services, 5-8—5-12
 - for IVIS, I-3, I-6—I-7
- Survey 80, 9-210
- Survey 2000, 9-210
- survey application programs
 - for CP/M operating system, 9-210
 - PETRO-PC, 9-98
- Sweden, keyboard country kit for, 6-27
- Switzerland, keyboard country kits for, 6-27
- Symbolic Drawing Machine (SDM), 9-191
- synchronous communications
 - DTS-11 for, 9-196
 - port for, 6-14
- Synergy, 2-10—2-11, 9-129—9-130
 - Calculator, 2-11, 9-130
 - Chess, 9-130
 - Communications, 9-130
 - Datamanager, 2-11, 9-129
 - File Services, 9-130
 - Graph, 2-11, 9-130
 - Spreadsheet, 2-11, 9-130
- system enclosure, 6-18
- system services, 8-10
- Systems Network Architecture (SNA), 2-21
 - PRO/SNA Remote Job Entry (PRO/SNA/RJE) for, 9-37—9-38
 - PRO/SNA Terminal and Printer Emulator (PRO/SNA/TE) for, 9-35—9-36
- system units, 2-7, 6-3, 6-5—6-19

T

- Task/File Patch Program (ZAP),
10-14
- TBS Accounting Packages,
9-180—9-181
- TCB-11, 9-179
- Technical Information Systems
Inc., 9-189
- TECO, 9-188
- Tektronix 4014 Terminal
Emulator, 2-25,
9-122—9-123
- Telephone Advisory Service, 5-8
- telephone call handling, 6-47
- telephone directory systems
in PRO/Communications,
9-26—9-27
- ProtoCall 350, 9-144—9-145
- ProtoCall 1000, 9-146—9-147
- Telephone Management System
(TMS), 2-14—2-16,
6-45—6-51, II-10
- PRO/Communications used
with, 9-27
- Pro/DBA used with, 9-131
- Propel used with,
9-138—9-139
- ProtoCall 350 used with, 9-144
- PRO/Tool Kit routines for,
3-10
- telephone support, 5-6
- TELEX-11, 9-40
- 10-Mbyte hard-disk drive, 6-40,
6-42
- terminal emulation, 2-14, 2-21
for graphics, 2-25
- PC4014 Terminal Emulator
for, 9-122—9-123
- PRISM for, 9-32—9-33
- PRO 2780/3780 for,
9-29—9-32
- in PRO/Communications,
9-24
- PRO/DECnet for, 9-21
- PRO/NAPLPS for, 9-116
- PRO/SNA Remote Job Entry
for, 9-37—9-38
- PRO/SNA Terminal and
Printer Emulator for,
9-35—9-36
- in RT-11, 8-19
- VX for, 9-176
- XOREN IPL-11 for, 9-185
- text editors, *see* editors
- Theta Business Systems, 9-180
- third-party developers, 2-28—2-30
- Digital Classified Software
from, 5-7—5-8
- documentation available to,
6-78
- original equipment
manufacturers
(OEMs), II-2—II-12
- 33-Mbyte hard disk, 3-8, 6-41
- TIM: The Information Manager,
9-181
- time and billing programs, 9-18,
9-179
- time attendance system,
TEMPUS-11, 9-172

timesharing
 Extended Memory Time
 Shared DIBOL (XMTDS)
 for, 8-25—8-26
 RT-11 for, 8-18—8-23
 TSX-Plus for, 8-40—8-41
 see also multiuser operations
TK!Solver, 9-76—9-80
 Financial Management
 TK!SolverPack, 9-81—9-83
 Mechanical Engineering
 TK!SolverPack, 9-83—9-85
 TK!SolverPacks, 9-80—9-81
TMS, *see* Telephone Management System
Tool Kit PRO/DATATRIEVE,
 9-47—9-48
tool kits, *see* Professional Host
 Tool Kit, PRO/Tool Kit
touch screens, I-3, I-4, I-11, II-10
TPS Electronics, 9-171
training applications
 AVID, 9-86
 IVIS, I-2—I-12
 see also Computer-Based
 Instruction
transceivers
 in DELNI, 6-58
 H4000 Ethernet, 6-61—6-62
TRANSF utility, 3-17
Transparent Spooling Package
 (SPOOL), 8-22
travel applications, 9-148—9-149,
 9-172
TSLOPE/TSTAB, 9-183—9-184
TSX-NET, 9-183—9-184

TSX-Plus operating system,
 8-40—8-42
TTLIB, 9-188
tutorial, 2-8
2780/3780 terminal emulation
 PRO 2780/3780 for,
 9-29—9-32
 in PRO/Communications,
 9-24
 PRO/SNA Terminal and
 Printer Emulator for,
 9-35—9-36
256-Kbyte memory option, 6-43
typing keys, 2-5, 6-14

U

UAP-LINK, 9-184
UCC/CAM-100, 9-99
UCSD Pascal, 10-47—10-49
UCSD p-System, 1-3, 8-35—8-37
 developing applications using,
 3-15
 layered onto Professional
 Operating System, 8-12
ULTRIX environment,
 8-14—8-16
ULTSCOL, 9-50—9-93
UMD (Universal Microprocessor
 Development Systems), 9-92
 for PRO/UNIX, 9-177
Uniplex, 9-220
Unique Automation Products,
 9-184
Unisource Software Corp., 9-175

United Kingdom, keyboard
country kit for, 6-27

United States, keyboard country
kit for, 6-25—6-27

Universal External Subroutine
Library (Professional CTS-
300), 8-25

University Computing Company,
9-99

UNIX-based operating systems,
1-9—1-10

 applications development using,
 3-17—3-20

 as development environments,
 10-3

 educational applications of,
 4-7—4-13

 Idris, 8-43—8-44

 PRO/VENIX, 6-3,
 8-13—8-17

 XENIX, 8-42—8-43

see also Idris; PRO/VENIX;
 XENIX

updates for documentation, 5-6

upgrade kits

 of Professional 325 to 350, 6-74

 of Professional 350 to 380, 6-74

user interfaces, 8-6—8-8

users' groups, *see* DECUS

utilities

 for CP/M operating system,
 9-209

 Frame Development Tool, 3-5

 in PRO/DECnet, 2-19

 in Professional CTS-300,
 8-26—8-27

Professional File Transfer, 9-25

in Professional Host Tool Kit,
10-22—10-24

in PRO/Tool Kit, 3-6—3-7,
10-4, 10-14

in PRO/Videotex,
9-121—9-122

WPS file conversion, 9-26

V

VAX-11/750 systems, 4-12

VAX-11/780 systems, 4-17, 4-24,
4-30

VAX ALL-IN-1, 4-24, 4-28, 4-32,
9-9—9-127

VAX Producer, I-4—I-6

VAX systems

 application development for
 Professional series on, 3-2

 as host computers for
 Professional workstations,
 4-12

 PRO/Tool Kit and, 3-13—3-15

VAX/ULTRIX environment,
8-14—8-15

VC241-A (Extended Bit-Map
Graphics Option), 6-29,
6-33, 6-35—6-36

VC241-B (Extended Bit-Map
Graphics Option), 6-29,
6-33, 6-36—6-38

VED, 9-226

VENIX operating system, *see*
PRO/VENIX

VenturCom, 8-13

vertical market applications, *see*
agricultural, banking, legal,
medical

video controller, 6-10

videodiscs, IVIS on, I-2—I-12

videotex, 2-25—2-26
applications of, 4-17—4-19
PRO/NAPLPS for,
9-116—9-117
PRO/Videotex for,
2-26—2-27, 9-118—9-122

ViewComp, 9-176

Village Systems Workshop, The,
9-222, 9-223, 9-225, 9-226

Virtual Communications Package
(VTCOM; RT-11), 3-17

Virtual Device Metafile (VDM)
Interpreter, 8-12, 9-101

virtual floppy disks, 8-29

Virtual Microsystems, Inc.
MS-DOS applications from,
9-200—9-203
PC-Bridge from, 6-65, 8-27,
8-28
PhoneLink from, 9-39

Virtual Terminal Communications
Package (VTCOM; RT-11),
3-17, 8-21

Virtual Terminal Emulator (VTE),
9-32—9-33

VMS operating system, 3-14,
10-15

voice communications, 6-46, 6-47

voice recognition, 2-16

voice synthesis, DECTalk for, II-10

Voter Registration System,
9-198—9-199

VR201-A (white monochrome
video monitor), 6-28

VR201-B (green monochrome
video monitor), 6-28

VR201-C (amber monochrome
video monitor), 6-10, 6-28,
6-37

VR241-AA (RGB color video
monitor), 6-31, 6-34

VT100 terminal emulation, 8-19

VT125 terminal emulation, 9-24

VTCOM (RT-11 Virtual
Terminal Communications
Package), 3-17, 8-21

VX, 9-176

W

WAIT indicator light, 6-24

Wall Street Connection,
9-150—9-153

warehouse applications, Materials
Management System-1 for,
9-172—9-174

warranties, 1-16, 5-2—5-3
service after, 5-3—5-5

white monochrome video
monitor, 6-28

Whitesmiths, Ltd., 8-43, 10-42

Whitesmiths C
for Professional Tool Kits,
10-42—10-43
for PRO/Tool Kit, 3-7

WHY Systems, Inc., 9-70

windows, *see* Synergy

Wirth, Niklaus, 10-47

WORD-11, 9-163

WordMARC, 9-164
word processing applications
 for CP/M operating system,
 9-205
 for P/OS operating system,
 9-154—9-164
 for PRO/VENIX operating
 system, 9-175
 for RT-11 operating system,
 9-193
workstations
 architectural applications of,
 4-15—4-19
 in college computer centers,
 4-7—4-13
 computer-aided design
 applications of, 4-19—4-24
 laboratory applications of,
 4-2—4-7
 manufacturing applications of,
 4-25—4-32
 PRO/Tool Kit and, 3-12—3-13
 PRO/Workstation for,
 9-124—9-128
 Realtime Interface option for,
 1-12
 UNIX, PRO/VENIX for,
 8-14—8-15, 8-17
WPS-80, 9-212
WPS conversion utilities, 9-26

X

X.25 protocol, 9-24
XENIX operating system, 3-19,
 8-42—8-43
 applications for, 9-220—9-221

 development tools for,
 10-58—10-59
XMTSD (Extended Memory
 Time Shared DIBOL),
 8-25—8-26
XNET (communications
 package), 4-18
XOREN IPL-11, 9-185
XOREN IPL-11 File Transfer
 Package, 9-40

Y

Y-cable for serial I/O for RTI,
 6-68—6-71

Z

Z-80A processor, 8-34
ZAP (Task/File Patch Program),
 10-14

Reader Comments

We welcome your comments and suggestions, as they provide essential feedback to help us improve the quality and usefulness of this handbook. Please take a moment to fill out this questionnaire. Thanks for your help.

What is your general reaction to this handbook (organization, format, accuracy, completeness, etc.)? _____

What features are most useful? _____

What features are least useful? _____

Does this publication meet your need? And if not, why? _____

What would make this handbook more useful? How could it be improved? _____

Additional comments: _____

Name: _____ Title: _____

Company: _____

Address: _____

City: _____ State: _____ Zip: _____

Telephone: _____



Digital Equipment Corporation

(staple here)

(please fold here)



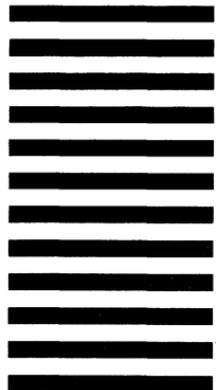
No Postage
Necessary
if Mailed in the
United States

BUSINESS REPLY CARD

FIRST CLASS PERMIT NO. 33 MAYNARD, MASS.

POSTAGE WILL BE PAID BY ADDRESSEE

DIGITAL EQUIPMENT CORPORATION
200 BAKER AVENUE
ATTENTION: MEDIA RESPONSE MANAGER
CF01-1/M94
CONCORD, MASS. 01742



digital