# SPD INFORMATION

# FOR PCSA V2.0

MS-DOS are referred to simply as ''DOS''.

File Services

Through the integration of Microsoft's MS-Net with DECnet, VAX/VMS Services for MS-DOS provides a remote DOS file system that appears as a transparent extension of the client system's local computing environment. Because DECnet communications protocols are used for the file service, a PCSA client can access a server in a DECnet LAN or in a DECnet WAN.

Each DOS file stored through the file service is stored as a VMS file, either an RMS Stream file or an RMS Sequential Fixed-Length Record (512K bytes) file type. The DOS files stored through the file service are accessible to VMS users and applications that can interpret the content and organization of the file written by the DOS application.

The server can read all RMS file types that can be read sequentially, allowing DOS applications to read files written by a VMS application. Each read issued by the DOS application results in the presentation to the application of the next ''n'' data bytes contained sequentially in the file.

Users can share DOS files stored on the server's disk through concurrent access, made possible through the DOS file access modes, as well as through sequential usage of files.

MS-Net's byte-range locking is supported for MS-Net applications accessing files provided through the file service.

Refer to the Server Management and Control section for further information on access control.

The DOS functions CHKDSK, FDISK, DISKCOPY, DISKCOMP and FORMAT cannot be used with file server services.

Disk Services

Through DIGITAL's Local Area Systems Transport (LAST) protocol, VAX/VMS Services for MS-DOS provides DECnet/PCSA clients with local area disk services. The local area disk service sets aside space on a VMS disk for clients to access as a virtual disk, a DOS-formatted remote disk. Because LAST is a very low-level communications protocol, overhead is low and performance high.

Local area disks are accessible through DECnet/PCSA Client software using LAST in a Local Area Network (LAN) and through the Network Device Utility (NDU) using DECnet in a Wide Area Network (WAN). DECnet/PCSA Clients can also access virtual disks created with NDU. Access to local area disks in extended LANs where bridge transfer speeds are less than 10Mb/sec is provided by NDU.

Disk management may be done from the VAX or remotely from the personal computer.

The local area disk service has the following restrictions:

^ Only one writer (and no readers) to a local area disk at a time is allowed.

^ Multiple readers (and no writers) to a local area disk are allowed.

^ The DOS files are not shareable with VMS users.

^ The local area disk service is available only in a Local Area Network configuration. However, virtual disks created with the local area disk service are available in a Wide Area Network through the Network Device Utility.

All DOS operations can be performed on the local area disk, with the following restrictions:

^ ANSI.SYS, FDISK, and PRINT should not be used with local area disks.

^ SYS, DISKCOPY, and DISKCOMP should be used only on disks no greater than 1.2 Mbytes.

The local area disk's size is established at its creation and can be 360K bytes, 1.2M bytes, 5M bytes, 10M bytes, 20M bytes, or 32M bytes.

Refer to the Server Management and Control section for further information on access control.

Print Services

VAX/VMS Services for MS-DOS lets DOS and VMS users share printers connected to a VAX server or VAXcluster in a LAN or WAN. PCSA clients can send files to the remote printer from DOS, MS-Windows, or applications.

The system administrator assigns a service name (such as LPS40_PS) to a VAX/VMS print queue and may define user access to the print service.

The DECnet/PCSA Client software redirects printer I/O from a DOS printer logical name to a defined print service.

The system administrator's utility in VAX/VMS Services for MS-DOS can create the physical and generic queues and define forms for the following printers:

^ LN03

^ LN03 PLUS

^ LA50

^ LA75 and LA75P

^ LJ250 and LJ252

Multiple queues may be set up for the same printer. For example, separate queues may be created for DIGITAL and IBM Proprinter mode for the DIGITAL LA75 and LN03 PLUS with ISO/PC cartridge. Separate queues for landscape and portrait modes may be created for the LN03 and LN03 PLUS.

Date and Time Services

DECnet/PCSA Clients can receive date and time from the server.

## Server Management and Control

When a server offers a resource (file, disk, printer) for use, an Access Control List, specifying privileges assigned to users, can be associated with the resource. Only users who provide the correct username and password can then access that service. VMS Access Control Lists are also supported for file and print services.

Service and file access is supported across a VAXcluster. In a VAXcluster, one service database may be used for the cluster, or a separate service database can be defined for each node.

The file service uses VAX/VMS Access Control Lists to determine user access to files within services.

Print service access is also controlled through username, password, and VAX/VMS Access Control Lists.

The disk service controls access through passwords, and assigning read-only or read/write privileges to users of a local area disk service. Users may be granted or denied privileges to create, mount, dismount and delete disks.

The system administrator can restrict the number of simultaneous client connections to a given resource on the server at the directory level. This capability means the system administrator can restrict access to DOS applications stored in the directory, to ensure compliance with vendor licensing agreements. Other restrictions on the use of the server can be imposed to help meet performance and security goals.

An administrator's utility is provided to allow the system administrator to add and remove services, register clients, and list resources. The server software can list current connections, current file opens, current sessions, and current services available, as well as show various counters.

The VAX/VMS server also provides for remote boot for VAXmate systems and personal computers with DIGITAL's DEPCA Ethernet controller. The administrator's utility provides facilities to add, delete, and list workstations to be booted remotely.

Network and server events, such as notices about connections being opened and closed, can be logged in a file while the server runs.

## HARDWARE REQUIREMENTS

VAX, MicroVAX, or VAXstation configuration as specified in the System Support Addendum (SSA 30.50.02-x).

## SOFTWARE REQUIREMENTS*

For VAX Systems:

VAX/VMS Operating System

For MicroVAX Systems:

MicroVMS Operating System

For VAXstation Systems:

VMS Workstation Software

For all systems (VAX, MicroVAX, and VAXstation):
DECnet-VAX (full-function or end-node)

OPTIONAL SOFTWARE*

None

* Refer to the System Support Addendum for availability and required versions of Required/Optional software (SSA 30.50.02-x).

UNIQUE PRODUCT IDENTIFIER

The unique product identifier for this software product is A93.

SOFTWARE WARRANTY

Warranty for this software product is provided by DIGITAL with the purchase of a license for the product as defined in the Software Warranty Addendum of this SPD.

INSTALLATION

DIGITAL requires that a customer's first purchase of this software product at each site include DIGITAL's PCSA DECstart (QS938-SZ), formerly titled ''MS-DOS Workstation Integration Service for VAX Servers''. This service provides implementation support for customers installing VAX/VMS Services for MS-DOS and the integration of the MS-DOS workstations into the DIGITAL network.

For subsequent purchases of this product, DIGITAL recommends that customers purchase DIGITAL's Installation Service.

SOFTWARE LICENSING

The software is furnished under the licensing provisions of DIGITAL's Standard Terms and Conditions. For more information about DIGITAL's licensing terms and policies, contact your local DIGITAL office.

The license options for DECnet-VAX include the right to use VAX/VMS Services for MS-DOS. Refer to DECnet-VAX (SPD 25.03.xx) for information regarding DECnet-VAX licenses. You will need a separate DECnet-VAX license for each server processor on which you will be using the software product (except as otherwise specified by DIGITAL).

For your first installation of this software product, you must purchase as a minimum, for each server:

^ Single-Use License Option (a DECnet-VAX license, refer to SPD 25.03.xx)

^ Distribution and Documentation Option for VAX/VMS Services for MS-DOS

In addition, you must purchase a license for each client. Refer to SPDs 55.07.xx (for PCs) and 55.10.xx (for VAXmates).

SOFTWARE PRODUCT SERVICES

A variety of service options are available from DIGITAL. For more information contact your local Digital office.

All references to MS-Windows refer to DIGITAL's adaptation of Microsoft Corporation's MS-Windows.



April 1988
BH-HD94C-TK

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SYSTEM
SUPPORT
ADDENDUM

PRODUCT NAME: VAX/VMS Services for MS-DOS, Version 2.0 SSA 30.50.02-A
(Formerly VAXmate Operating Environment)

MINIMUM HARDWARE REQUIRED

Processor Support

VAX: VAX 8200, VAX 8250, VAX 8300, VAX 8350, VAX 8500, VAX 8530, VAX 8550, VAX 8600, VAX 8650, VAX 8700, VAX 8800, VAX 8974, VAX 8978

VAX-11/725, VAX-11/730, VAX-11/750, VAX-11/780, VAX-11/785, VAX-11/782

MicroVAX: MicroVAX II, MicroVAX 2000

VAXstation: VAXstation II, VAXstation 2000

Not supported: MicroVAX I and VAXstation I

The VAX system must be connected to the same DECnet network as the client systems.

A minimum of 4MB of memory is required. Memory requirements depend on the server CPU, the number of clients using the server, and the other applications running on the server.

Block Space Requirements (Block Cluster Size = 1):

| | |
|---|---|
| Disk space required for installation: | 5000 blocks (2.5M bytes) |
| Disk space required for use (permanent): | 2500 blocks (1.25M bytes) |

These counts refer to the disk space required on the system disk. The sizes are approximate; actual sizes may vary depending on the user's system environment, configuration, and software options.

OPTIONAL HARDWARE

LA75 (serial)

LA75P (parallel)

LN03R

LN03 PLUS

LN03

LJ250 (serial)

LJ252

LA50

LA210

PrintServer 40

CLUSTER ENVIRONMENT

This layered product is fully supported when installed on any valid and licensed VAXcluster or Local Area VAXcluster configuration including VAXcluster configurations accessing a common system disk, without restrictions.

PREREQUISITE SOFTWARE

Operating System

VAX/VMS Operating System V4.6 - V4.7
MicroVMS Operating System V4.6 - V4.7
VMS Workstation Software V3.0

MicroVMS Tailoring

For MicroVMS V4.x systems, the following components of MicroVMS are required for full functionality of this layered product.

^ Base System

^ Common Utilities

^ Secure User Environment

^ Program Development

^ System Programming

DECnet-VAX (full-function or end-node), V4.6 - V4.7

## OPTIONAL SOFTWARE

None

## GROWTH CONSIDERATION

The minimum hardware and software requirements for any future version of this product may be different from the minimum hardware and software requirements for the current version.

## DISTRIBUTION MEDIA

Disk: RX33 Floppy Diskette

Tape: 9-track 1600 BPI Magtape (PE), TK50 Streaming Tape

## UNIQUE PRODUCT IDENTIFIER

A93

The above information is valid at time of release. Please contact your local DIGITAL office for the most up-to-date information.

PRODUCT NAME: VAXmate Services for MS-DOS, Version 2.0 SPD 55.09.00

DESCRIPTION

The Personal Computing Systems Architecture (PCSA) is an extension of DIGITAL'S systems and networking architecture that merges the VMS and MS (TM)-DOS environments. PCSA provides a framework for integrating personal computers into an organization's total information system so that different types of users can share information, large system resources and network services across the entire organization.

The PCSA family of software products includes:

^ VAX/VMS Services for MS-DOS - Software that allows a VAX/VMS system to act as a file, print, and disk server to personal computers (Refer to SPD 30.50.xx)

^ DECnet/PCSA Client: PC - Required software for the personal computer to use the facilities provided by VAX/VMS Services for MS-DOS or VAXmate Services for MS-DOS (Refer to SPD 55.07.xx.)

^ DECnet/PCSA Client: VAXmate - Required software for VAXmates to use the facilities provided by VAX/VMS Services for MS-DOS or VAXmate Services for MS-DOS (Refer to SPD 55.10.xx.)

^ VAXmate Services for MS-DOS - Software that allows a VAXmate with an expansion box to act as a dedicated server to personal computers, described in this document.

^ VAXmate Software for Standalone Use - Operating environment for non-networked VAXmates (Refer to SPD 55.06.xx.)

The PCSA products are based on DECnet and the right to use VAX/VMS Services for MS-DOS is included in the DECnet-VAX license. Other DECnet-VAX facilities are described in SPD 25.03.xx.

VAXmate Services for MS-DOS software, a DECnet application, implements PCSA, allowing a VAXmate with a hard disk to act as a dedicated application, data, and resource server to groups of personal computers. By using these server systems, personal computers are able to share applications, data and resources, access information from remote systems on the network, and apply that information in industry-standard applications.

VAXmate Services for MS-DOS provides the following services for personal computers running DECnet/PCSA Client software:

^ File services

^ Print services

^ Date and time services

^ Server management and control

VAXmate Services for MS-DOS also includes:

^ Operating system

^ All DECnet-VAXmate facilities

## File Services

Through the integration of Microsoft's MS-Net with DECnet, VAXmate Services for MS-DOS provides a remote MS-DOS file system that appears as a transparent extension of the client system's local computing environment. Because DECnet communications protocols are used for the file service, a PCSA client can access a server in a LAN or in a WAN.

Users can share MS-DOS files stored on the server's disk through concurrent access, made possible through the MS-DOS file access modes, as well as through sequential usage of files.

MS-Net's byte-range locking is supported for MS-Net applications accessing files provided through the file server.

Access to files can be controlled through passwords.

## Print Services

VAXmate Services for MS-DOS allows PCSA clients to share printers attached to a VAXmate server anywhere in a Local Area Network or Wide Area Network.

Supported printers are:

- LN03-PLUS
- LN03
- LA75
- LA50
- LN03R
- LA210
- LJ250
- IBM Proprinter
- IBM Graphics Printer

Note that support is provided within MS-Windows for fonts for the LN03-PLUS and LN03R; font support at the MS-DOS command level is application-dependent.

## Date and Time Services

DECnet/PCSA Clients can receive date and time from the server.

## Server Management and Control Services

The system administrator can restrict access to the server to registered users only. Access can also be controlled to a given resource on the server at the directory level. This makes it possible to restrict access to industry-standard applications stored in the directory. Access to network file and print resources can be limited by the use of passwords.

The system administrator can lock the server console, specifying which operator commands the server will accept.

Other restrictions can be imposed on the use of the server to help meet performance and security goals. The number of simultaneous users, connections, sessions, files open, and file locks, and NET transmit/receive buffer size can be specified by the system administrator.

Network events, such as notices about connections being opened and closed, can be recorded in a file while the server runs.

Operating System

The MS-DOS Operating System, Version 3.30, is provided to support the server environment. All facilities of MS-DOS are supplied with VAXmate Services for MS-DOS.

The following diskettes can be used:

^ RX33 (READ/WRITE/FORMAT)

^ RX50 (READ/WRITE)

^ Industry standard high density (96 TPI, 1.2M byte) (READ/WRITE/FORMAT)

^ Industry standard low density (48 TPI, 180/360K byte) (READ only)

DECnet-VAXmate Facilities

All DECnet-VAXmate, Version 2.0, facilities are included in VAXmate Services for MS-DOS, to provide transport between clients and the VAXmate server. Refer to DECnet-VAXmate (SPD 50.15.xx) for a description of all DECnet-VAXmate facilities, including network virtual terminal (SETHOST) and network management and control.

SOFTWARE WARRANTY

Warranty for this software product is provided by DIGITAL with the purchase of a license for the product as defined in the Software Warranty Addendum of this SPD.

INSTALLATION

DIGITAL requires that a customer's first purchase of this software product at each site include DIGITAL's PCSA DECstart (QS939-SZ), formerly titled ''MS-DOS Workstation Integration Service for VAXmate Server''. This service provides implementation support for customers installing VAXmate Services for MS-DOS and the integration of the MS-DOS workstations into the DIGITAL network.

MINIMUM HARDWARE REQUIRED

Any valid VAXmate configuration with one of the following hard disk drives:

^ RCD31-FC (United States) or RCD31-FA (Non-US) 20-Mbyte hard disk drive; expansion box with two industry standard option slots

^ RCD32-FC (United States) or RCD32-FA (Non-US) 42-Mbyte hard disk drive; expansion box with two industry-standard option slots

GROWTH CONSIDERATIONS

The minimum hardware requirements for any future version of this package may be different from the minimum requirements for the current version.

OPTIONAL HARDWARE

^ LA75

^ LN03 PLUS

^ LN03

^ LJ250

^ LA50

^ LN03R

^ LA210

PREREQUISITE SOFTWARE

None

OPTIONAL SOFTWARE

None

ORDERING INFORMATION

Single-Use licensed software is furnished under the licensing provisions of DIGITAL's Standard Terms and Conditions, which provide in part that the software and any part thereof may be used on only the single processor on which the software is first installed, and may be copied in whole or in part (with the proper inclusion of DIGITAL's copyright notice and any proprietary notices on the software) for use on that same proessor. THE LICENSE OPTIONS ARE DESCRIBED BELOW. IF YOU ARE NOT FAMILIAR WITH THE SERVICE OPTIONS, YOU MAY OBTAIN THE APPROPRIATE SOFTWARE PRODUCT SERVICE DESCRIPTION(S) FROM YOUR LOCAL DIGITAL OFFICE.

LICENSE OPTIONS

For your first installation of this software product, you must purchase as a minimum, for each server:

^ Single-Use License Option

^ Distribution and Documentation Option

In addition, you must purchase a license for each client. Refer to SPD 55.07.03 (for PCs) and SPD 55.10.xx (for VAXmates).

To use this product on additional server CPUs, you must purchase for each server CPU as a minimum:

^ Single-Use License Option

In addition to the right to use, the license gives you the one-time right to copy the software from your original server CPU installation to the additional server CPU. Therefore, the Distribution and Documentation Option is not required, but optional.

Distribution and Documentation Option

The Distribution and Documentation option provides the machine-readable software and the basic documentation. You must have, or order, a server Single-Use License to obtain this option. You will need this option to install this software for the first time. When revised versions of this software product become available, they may also be obtained by purchasing this option again.

Software Revision Right-To-Copy Option

The Right-To-Copy Option allows a customer with multiple server CPUs to copy a revised version of a software product from one server CPU to another. Each server CPU must be licensed for that product. You first install the revised software on one server CPU; then you can make copies for additional server CPUs by purchasing the Right-To-Copy Option for each CPU.

Software Product Services

A variety of service options are available from DIGITAL. For more information contact your local DIGITAL office.

SOFTWARE OPTIONS CHART

VAXmate Services for MS-DOS is available only on RX33 Floppy Diskette distribution media.

Note: The availability of these software product options and services may vary by country. Customers should contact their local DIGITAL office for information on availability.

| LICENSE OPTIONS: A LICENSE IS REQUIRED FOR EACH SERVER. | ORDER NUMBER |
|---|---|
| Single-Use License | Q6A93-UZ |
| Distribution and Documentation Option | Q6A93-H7 |
| Software Revision Right-to-Copy Option | Q6A93-HZ |

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All references to MS tm-Windows refer to DIGITAL's adaptation of Microsoft Corporation's MS-Windows.

The DIGITAL logo, DEC, VMS, VAX/VMS, MicroVMS, VAXstation, VAX 8200, VAX 8300, VAX 8500, VAX 8600, VAX 8700, Rainbow, Professional, VT102, VT220, VT240, VT200, LA75, LA210, LN03, LN03 PLUS, LVP16, LA50, LJ250, LJ252, VAX-11/725, VAX-11/730, VAX-11/750, VAX-11/870, VAXmate, VAX,

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PRODUCT NAME: DECnet/PCSA Client: VAXmate, Version 2.0 SPD 55.10.00

(Formerly included in ''VAXmate Operating Environment'' SPD)

## DESCRIPTION

The Personal Computing Systems Architecture (PCSA) is an extension of DIGITAL's systems and networking architecture that merges the VMS and MS-DOS environments. PCSA provides a framework for integrating personal computers into an organization's total information system so that different types of users can share information, large system resources and network services across the entire organization.

The PCSA family of software products includes:

- VAX/VMS Services for MS-DOS - software to allow a VAX/VMS system to act as a file, print, and disk server to personal computers; described in SPD 30.50.xx.
- DECnet/PCSA Client: PC - required software for the personal computer to use the facilities provided by VAX/VMS Services for MS-DOS or VAXmate Services for MS-DOS; described in SPD 55.07.xx.
- DECnet/PCSA Client: VAXmate - required software for VAXmates to use the facilities provided by VAX/VMS Services for MS-DOS or VAXmate Services for MS-DOS; described in this document.
- VAXmate Services for MS-DOS - software that allows a VAXmate with an expansion box to act as a dedicated server to personal computers; described in SPD 55.09.xx.
- VAXmate Software for Standalone Use - operating environment for non-networked VAXmates; described in SPD 55.06.xx.

The PCSA products are based on DECnet and the right to use VAX/VMS Services is included in the DECnet-VAX license. Other DECnet-VAX facilities are described in SPD 25.03.xx.

The DECnet/PCSA Client software allows selected personal computers to be connected to VAX, MicroVAX, or VAXmate computers in a DECnet network, utilize selected facilities and services of those systems, and access information and services contained on other types of DIGITAL systems in the DECnet Network.

The user interface is an adaptation of MS-Windows, and the network software is based on an adaptation of MS-NET which allows it to be integrated into a DECnet-based network.

The DECnet/PCSA Client software provides VAXmates with:

- Access to network services
- Remote boot
- Operating System

- A user interface
- Terminal emulation
- On-line user information
- Printer support
- All DECnet-DOS facilities

Access to Network Services

DECnet/PCSA Client software, in conjunction with a VAX running VAX/VMS Services for MS-DOS, provides to the client:

- File services - Through the integration of Microsoft's MS-Net with DECnet, the client is provided with a remote MS-DOS file system that appears as a transparent extension of the client's local facilities.
- Disk services - Through the use of DIGITAL's Local Area Systems Transport (LAST) protocol, PCSA clients are provided with a high performance virtual disk.
- Print services - Remote printers appear as a transparent extension of the client's facilities. This allows the redirection of local printing to a server-based printer.
- Date and time services - Clients can receive date and time from the server.

See VAX/VMS Services for MS-DOS, SPD 30.50.xx, for further information on network services with a VAX/VMS server. See VAXmate Services for MS-DOS, SPD 55.09.xx, for further information on network services with a VAXmate server.

Remote Boot

Users can remote boot a VAXmate from a network key disk available using the disk services of VAX/VMS Services for MS-DOS.

Remote boot is supported only for VAXmates and personal computers with DIGITAL's DEPCA Ethernet controller.

Operating System

The MS-DOS Operating System, Version 3.30, provides an environment that enables the user to perform operations such as program execution, file retrieval, and editing, as well as providing storage capabilities, disk utilities, and various other system-related facilities. Most MS-DOS utilities provide the user with assistance on command formats.

The following diskettes can be used:

- RX33 (READ/WRITE/FORMAT)
- RX50 (READ/WRITE)

- Industry standard high density (96 TPI, 1.2 Mbyte) (READ/WRITE/FORMAT)
- Industry standard low density (48 TPI, 180/360 Kbyte) (READ ONLY)

Key features of the operating system are:

- Loadable text and graphic fonts
- Loadable country-specific data tables and keyboard drivers
  - ISO - International standards organization character set
  - MCS - DEC Multinational Character Set
  - STD - IBM extended character set
  - ST2 - IBM Norway/Denmark extended character set
  - XX7 - Indicates a 7-bit National Character Replacement set of country XX:
    - US - United States
    - DE - German
    - SF - Swiss/French
    - DK - Denmark
    - SE - Sweden
    - UK - United Kingdom
    - IT - Italy
    - SD - Swiss/German
    - NO - Norway
    - CH - Swiss/German/French
    - FR - France
    - ES - Spain
    - CA - Canada
    - FI - Finland
  - TCS - Technical Character Set
- The ability to use the VAXmate's RAM memory as a pseudo disk
- The ability to set and reset all file attributes
- Backup and restore to local and network devices and

subdirectories

- Graphics support, supporting PRINT SCREEN in graphics mode to DIGITAL's LA75, LA50, LA210, LJ250, LN03-PLUS, IBM Graphics Printer, IBM PC Color Printer, and IBM Proprinter

User Interface

In addition to an MS-DOS command line interface, DECnet/PCSA Client provides MS-Windows, Version 1.03.

MS-Windows is a graphical extension of the MS-DOS operating system that provides the user with a visual interface to the operating system by means of pull-down menus, dialog boxes and icons instead of the traditional command structure used by MS-DOS.

MS-Windows can split the display screen into multiple windows and allow several programs to appear on the screen at the same time. The user can switch between windows and transfer data between applications.

The user can also invoke the MS-DOS Command Processor through this interface. The command processor allows the use of the traditional MS-DOS command structure.

Features that are available when running applications that have been designed and written to use MS-Windows' facilities are:

- Limited multi-tasking
- Multiple windows allowing for data transfer between windows
- Support of CGA (and EGA, with third party graphics card) graphic resolutions
- A mouse as a virtual pointer
- A displayable ''clipboard'' area to temporarily store information that is being copied or moved
- Moving, sizing or zooming of windows on the screen

Several MS-Windows applications are included in DECnet/PCSA Client: Calculator, Notepad, Clock, Paint, Cardfile, Calendar and Control Panel.

Drivers are included to support the following DIGITAL devices:

- VSXXX-AA Mouse
- LK250 Keyboard
- LA75 Printer (serial)
- LA75P Printer (parallel)
- LN03 PLUS Printer, in DEC mode and in emulation of the IBM Proprinter (with ISO/PC cartridge). The user may select up to two of the following font cartridges supported within MS Windows:

- ISO/PC
- C.G. Times 8pt, 10pt, 12pt
- C.G. Times 14pt, 18pt
- C.G. Times 24pt
- C.G. Triumvirate 8pt, 10pt, 12pt
- C.G. Triumvirate 14pt, 18pt
- C.G. Triumvirate 24pt
- I.T.C. Souvenir 8pt, 10pt, 12pt
- OCR-A, OCR-B

^ LNO3R Printer

^ PrintServer 40, a networked laser printing system

^ LA50 Printer

^ LA210 Printer, in DEC mode and in of the IBM Proprinter

Drivers are included to support the following IBM devices:

^ IBM Enhanced Graphics Adapter with monochrome display

^ IBM Enhanced Graphics Adapter with enhanced color display (Black and White)

^ IBM Enhanced Graphics Adapter with enhanced color display or personal computer color display

^ IBM Enhanced Graphics Adapter (with more than 64K memory) with enhanced color display

^ IBM Graphics printer

^ IBM Proprinter

Several industry-standard hardware drivers are supplied for use with other non-DIGITAL products. These drivers are provided on an ''AS IS'' basis without any warranty of any kind, either express or implied:

^ Microsoft Mouse

^ Mouse Systems Mouse

^ Logitech Serial Mouse

^ Kraft Joystick Mouse

^ VisiOn Mouse

- FTG Data Systems Light Pen and Single Pixel Board
- The Lite-pen Company Light Pen
- Hercules Graphics Card with monochrome display
- Intel TM AboveBoard/AT (Refer to Restrictions and Limitations section)
- C-Itoh 8510 printer
- Epson (R) FX-80 printer
- Epson LQ-1500 printer
- Epson MX-80 Graftrax printer
- HP (R) LaserJet printer
- HP LaserJet+ printer
- HP ThinkJet (2225 C-D) printer
- HP 7470A printer
- HP 7475A printer
- HP 7550A printer
- NEC P2/P3 printer
- NEC 3550 printer
- Okidata 92/93 (IBM) printer
- Okidata 92/93 (STD) printer
- Okidata 192/193 (IBM) printer
- Okidata 192/193 (STD) printer
- POSTSCRIPT TM/Laserwriter
- Star SG-10 printer
- TI (R) 850 printer
- TI 855 printer
- Toshiba P351
- Xerox (r) 4020

Program Information Files (PIFs) are supplied for MS-DOS and network commands, as well as SETHOST. These PIFs are supported by DIGITAL.

PIFs are also supplied for several applications written by third parties. These PIFs are provided on an "AS IS" basis without warranty of any kind, either express or implied.

## Terminal Emulation

The DECnet/PCSA Client software includes terminal emulation software that allows the user to establish terminal sessions with a host computer such as a VAX. Terminal sessions can be established using either the VAXmate's Ethernet port, a serial communications port, or via the optional integral modem.

Two terminal emulations are provided for VAXmate:

- VT220 terminal emulation, for use within the MS-Windows environment. Full modem control and replaceable character sets (DRCS) are not supported.

- SETHOST, previously known as VT240 terminal emulator, for use from the MS-Windows environment or at the MS-DOS command line. When the emulator is invoked through the MS-Windows, it will take control of the total screen, keyboard, and communications ports. SETHOST supports ReGIS, but does not support the Tektronix 4010 and 4014 modes of operation. Control of asynchronous modems and replaceable character sets are supported.

Features of the MS-Windows VT220 terminal emulator are:

- Support for serial terminal communication

- Support for the MS-Windows Clipboard to cut and paste information

- Ability to log characters received from the host into a file

- Ability to send characters to the host from a file instead of from the keyboard

- DIGITAL multinational (see OPERATING SYSTEM for list of multinational character sets provided) and ISO multilingual character sets and compose sequences

- Setup feature allows selection and saving of terminal characteristics

- Printing to a DIGITAL printer attached to the VAXmate; printing may be a screen at a time or a toggle-like function may be used to print everything from the screen until the toggle is switched off.

Features of SETHOST (VT240 terminal emulator) are:

- Ability to log characters received from the host into a file

- Ability to send characters to the host from a file instead of from the keyboard

- Support for applications which display information on a VT240, including support for ReGIS

- Two video modes: Text and ReGIS Graphics and a fast text-only video mode.

- Supports full modem control

- DIGITAL multinational (see OPERATING SYSTEM for list of multinational character sets provided) and ISO multilingual character sets and compose sequences

- Setup feature allows selection and saving of terminal characteristics

- Printing to a DIGITAL printer attached to the VAXmate; printing may be a screen at a time or a toggle-like function may be used to print everything from the screen until the toggle is switched off.

Both the MS-Windows VT220 and SETHOST provide scripting facilities. The script processing language allows the automation of frequently executed functions. For example, a script can be written to automatically log a user in to a computer or to dial in to a computer. Scripts can be written to perform a task and then exit the terminal emulator, without user intervention.

## On-Line User Information

The On-Line User Information System provides information about how to use the client system in an easy-to-use format with quick access to specific topics. It contains comprehensive user documentation and tutorials on how to use the system. The Information System runs as an MS-Windows application and uses standard MS-Windows user interface conventions.

Features of the On-Line User Information System are:

- Topic selection from menus, from a comprehensive topics list, or by typing in index terms

- Ability to maintain multiple bookmarks at topics of the user's choice

- Cross-references to related information

- Ability to return to a preceding topic, or to the main menu, in a single step

- Ability to copy material from the information base to the MS-Windows clipboard or to a printer

## Printer Support

With MS-Windows or MS-DOS, users can print files to a local printer (a printer attached directly to the personal computer) or a remote printer (a printer connected to a server). Note that support is provided within MS-Windows for fonts for the LN03 PLUS (see USER INTERFACE for list of supported fonts), the LN03R and the PrintServer 40; font support at the MS-DOS command line level is application-dependent.

| | Supported In MS-Windows | Supported From MS-DOS command line |
|---|---|---|

| | | |
|---|---|---|
| DIGITAL's LNO3-PLUS, | Yes | Yes |
| DIGITAL's LNO3 | Yes | Yes |
| DIGITAL's LA75 | Yes | Yes |
| DIGITAL's LA75P | Yes | Yes |
| DIGITAL's LA50 | Yes | Yes |
| DIGITAL's LNO3R | Yes | Yes |
| DIGITAL's PrintServer 40 | Remote only | Remote only |
| DIGITAL's LA210 | Yes | Yes |
| DIGITAL's LJ250 | No | Yes |
| DIGITAL's LJ252 | No | Yes |
| IBM Proprinter | Yes | Yes |
| IBM Graphics Printer | Yes | Yes |

In addition, MS-Windows printer drivers are provided, without DIGITAL support, for several third-party printers. See USER INTERFACE section of this document for a list of unsupported MS-Windows printer drivers.

Consult the hardware product descriptions for information on printer facilities.

See the VAX/VMS Services for MS-DOS (SPD 30.50.xx) and VAXmate Services for MS-DOS (SPD 55.09.xx) for more information on remote printer support.

DECnet-VAXmate Facilities

DECnet-VAXmate allows DIGITAL's personal computer/workstations to participate as non-routing (end) nodes in DECnet computer networks. This software is one of the DECnet-DOS family of products for personal computer systems running Microsoft Corporation's MS-DOS Operating System, and specific variants of that product. Refer to SPD 50.15.xx for information on DECnet-DOS, the member of the DECnet-DOS family for software for IBM personal computers and selected IBM compatible computer systems.

DECnet-VAXmate is a DECnet Phase IV network product and is warranted for use only with supported Phase IV products supplied by DIGITAL.

DECnet-VAXmate offers task-to-task communications, remote file access, utilities for network file operations, network virtual terminal support, and network resource-sharing capabilities using the DIGITAL Network Architecture (DNA) protocols. Access to full DECnet-VAXmate functions is supported for DOS user programs written in MACRO Assembler and the C language.

DECnet-VAXmate nodes can be connected to a network via an Ethernet or an asynchronous DECnet connection. Integral Ethernet adapters in the VAXmate provide direct connections to a baseband Ethernet Local Area Network. Operation of DECnet-VAXmate in a broadband configuration is not supported.

Asynchronous connections to the network are accomplished over the VAXmate's integral serial communications port. The adjacent system must be a DECnet Phase IV, full-function (routing) node, supporting asynchronous DDCMP (e.g. DECrouter 200, DECnet-VAX.) The Software Product Description of the DECnet product in question must be consulted to determine if asynchronous operation is supported, and to develop a supportable routing node configuration. Connections over asynchronous terminal lines, such as to a DECserver 200, are not supported.

In a two node network where a single DECnet connection is needed for both the personal computer and the adjacent node, both nodes may be DECnet end nodes.

Given proper network planning, DECnet Phase IV networks can contain a maximum of 1023 nodes per network area, and up to 63 areas per network. Phase III nodes participating in Phase III/IV networks are limited to the Phase III routing capability of 255 nodes. Phase II nodes are not supported. Phase IV end nodes not directly connected to an Ethernet Local Area Network can connect to only one node (for DECnet-VAXmate, that node must be Phase IV). In order to communicate with other nodes in the network, including Phase III nodes, that node must be a Phase IV full-function (routing) node.

The functions available to the DECnet-VAXmate system user depend largely upon the configuration of the rest of the network. Each DECnet product offers its own level of capability and its own set of features to the user. The DOS operating system is limited to a single user, and access to a DECnet-VAXmate node from a remote network terminal is not possible. Additionally, because DOS is a single-tasking operating system, access and management from remote command nodes is limited. A File Access Listener (FAL) server application is provided by DECnet-VAXmate, and similar applications may be built by the user. However, such applications must run to the exclusion of others, unless they run under MS-Windows, which provides limited multi-tasking on a MS-DOS based personal computer. Refer to SPD 55.10.xx (DECnet/PCSA Client VAXmate), SPD 55.09.xx (VAXmate Services for MS-DOS) and SPD 30.50.xx (VAX/VMS Services for MS-DOS) for information on DECnet-VAXmate based network products with additional functions, such as file services.

The DECnet products and functions available to users on mixed networks can be determined by comparison of the SPDs for the component products.

## DECnet-VAXmate User Interfaces

DECnet-VAXmate provides two user interfaces: a command line interface and a menu program. The command line interface is similar to the DOS user interface. The user types commands at the DOS prompt to run DECnet-VAXmate utilities. The menu program allows the user to choose a particular task from a number of DECnet options. The command line is then built and executed to accomplish the task selected.

Versions of NFT and FAL are provided as MS-Windows applications. See application descriptions for more details.

## Task-to-Task (TTT) Communication

Using DECnet-VAXmate, a DOS user program written in Microsoft's MACRO Assembler, or the C language, can exchange messages with other network user programs. The remote-end user program can be on a Phase III node in the same area, or on any other Phase IV node in the network. The messages sent and received by the two user programs can be in any data format.

A simple set of functions is provided by the transparent task-to-task

interface. With this interface, communication and exchange of data with a remote network program is accomplished using a limited set of DOS calls (e.g. OPEN, CLOSE, READ, and WRITE.) Remote node and program identification is supplied in a string resembling a DOS pathname. Any programming language that supports a standard DOS pathname, and which will accept the network file specification string, and uses the supported DOS function calls, may use this feature.

Full (non-transparent) user program to user program capabilities are possible in C or MACRO through a library of special network subroutine calls. The C language network interface library is a compatible subset of that provided with the DECnet-ULTRIX product (SPD 26.83.xx). This gives the network programmer access to the complete set of DECnet functions. The user may need to adapt the DECnet-VAXmate C language subroutines to the specific C compiler being used. Small, medium and large size memory models are supported, where small refers to default data and code segments (under 64K bytes) each, medium refers to a default data segment size and multiple code segment sizes, and large refers to multiple data segments and multiple code segments.

## NETBIOS Interface Support

DECnet-VAXmate supports the session level NETBIOS interface through interrupt 5Ch and 2Ah. Applications written to the NETBIOS interface as documented in the April 1987 edition of ''IBM NETBIOS Application Development Guide'', order number S68X-2270-00, can be layered on DECnet-VAXmate without modification. This allows computers running DECnet-VAXmate to communicate with other computers running DECnet and NETBIOS applications. This feature preserves customers' investments in industry standard applications. It does not allow personal computers running DECnet to communicate with other personal computers running network protocols other than DECnet. DECnet-VAXmate NETBIOS applications can also communicate with other DECnet applications, such as DECnet-VAX applications.

The NETBIOS naming service and datagram service is only supported in Ethernet LAN Configurations.

## File Transfer

Using the Network File Transfer (NFT) utility, the user can transfer sequential ASCII and binary files between the personal computer and another DECnet node. Files can be transferred in both directions between the locally supported DOS file system devices and the file systems of other DECnet nodes. Wild cards can be used in source file specifications for both local and remote nodes, subject to support on the remote system.

ASCII text files transferred to the DECnet-VAXmate system are converted into DOS stream files; such files are converted into the remote system's normal format when transferred from the DECnet-VAXmate node. On transfer of binary files to a DECnet-VAXmate system, file data is preserved, but any record attributes will be lost; record attributes can be restored on such transfers from the personal computer to a record file system through use of utility switch settings.

Additional facilities of the utility allow concatenation (APPEND), deletion (DELETE), remote spooling (PRINT), and display (TYPE) of files, as well as submission (SUBMIT) and/or execution of command files, provided the remote node supports these functions. Directory (DIRECTORY) listings are also supported.

Two versions of NFT are provided: one which can be invoked from the DOS command line and one which is an MS-Windows application running under MS-Windows V1.03. The MS-Windows version of NFT can operate concurrently with other MS-Windows tasks.

## Job Spawner

The job spawner is a utility that allows a personal computer to act as a server for performing multiple service functions. When the job spawner is enabled (it must be the only utility running), it listens for connect requests from other nodes. When the connection arrives, the spawner starts the program which will service the request. When the service is completed, the spawner waits for the next connection. In this way, the personal computer can sequentially process different requests at different times without user intervention. This feature is especially useful for the remote system user who wants to access files on an idle personal computer.

## File Access Listener

The File Access Listener (FAL) server task provides full access to the personal computer node's file resources from remote systems. User ID and password protection can be used to control access to local files. FAL receives remote file access requests from the network and translates them into calls to the DOS file system. FAL then sends or receives the resulting file data back to the accessing program. FAL runs to the exclusion of other tasks or programs, except when running under MS-Windows. FAL can, however, be invoked by the job spawner.

Two versions of FAL are provided: one which can be invoked from the DOS command line and one which is an MS-Windows application running under MS-Windows V1.03. The MS-Windows version of FAL can operate concurrently with other MS-Windows tasks.

## Remote File Access

Transparent file access (TFA) is supported to remote DECnet systems by supported DOS function calls in MACRO Assembler and C. READ, WRITE, OPEN, CLOSE, SUBMIT, DIRECTORY, and DELETE operations can be initiated by a local program for sequential files residing on the personal computer or at such remote DECnet systems. Fixed and variable length record formats are supported. Files accessed remotely can contain either ASCII or binary information.

This file access is available to a user program by adding network location information to a DOS pathname. The supported DOS file I/O operations can then be performed with that file, which will be treated as a simple, sequential DOS file. Access to remote system-specific file characteristics is not provided.

## Network Virtual Terminal

The SETHOST utility provides the user with VT240 terminal emulation via LAT, CTERM or the asynchronous serial communications port. SETHOST allows the personal computer to appear as if it were a terminal physically connected to the target system. This is particularly useful for remote program development because it allows the user of the small, application-oriented personal computer to utilize the resources of larger systems.

A maximum of 4 SETHOST sessions, can be enabled simultaneously, via LAT or CTERM. With a single keystroke, the user can switch among active SETHOST sessions. Only one session can be enabled when SETHOST uses the asynchronous communication port for an asynchronous terminal connection. With a single keystroke, the user can leave an active SETHOST session and return to the DOS environment. To return to the SETHOST session, the user simply types exit. Multiple CTERM and LAT terminal sessions (to the same or different hosts) can be established, suspended and resumed.

Terminal characteristics can be selected and saved by use of the utility's setup feature. The following list of character sets are supported with SETHOST: ISO Latin-1 (ISO), DEC multinational (MCS) and National Replacement (NRCS). Down-line replaceable character sets (DRCS) are not supported.

Full local printer support is provided under SETHOST (i.e. printing within ALL-IN-1.) SETHOST sessions can also be logged to a file for future examination. SETHOST supports control of an asynchronous modem.

SETHOST provides a script processing language, which allows the automation of frequently executed functions. For example, a script can be written to automatically log a user in to a computer or to dial in to a computer and establish a DDCMP connection. Scripts can be written which perform a task and then exit SETHOST, without user intervention.

CTERM, DIGITAL's Terminal Services Architecture Command protocol, is used by SETHOST to give the personal computer the ability to establish a virtual connection to remote multi-user Phase IV DECnet systems which provide this support. The maximum number of CTERM sessions is limited by the maximum number of network links defined during the configuration of the DECnet-VAXmate node.

In local area Ethernet network configurations, DIGITAL's Local Area Transport protocol (LAT) is used for virtual terminal connections to DIGITAL systems which offer this support. This is the same protocol used between DIGITAL terminal servers and LAT hosts.

The interface to the CTERM and LAT interfaces are documented in order to allow users to write their own applications which take advantage of these protocols.

## Remote Network Devices

DECnet-VAXmate provides the capability to use disk space on a remote DECnet node as though it were an additional disk local to the DECnet-VAXmate system. This can be useful for providing extra storage capacity to the personal computer user, or for backing up local files using the DOS COPY utility.

The Network Device Utility (NDU) creates a file on the remote system (using the standard DECnet file access interface) representing a local device. This file is then opened and assigned a local DOS device name (such as G:). User programs or DOS utilities which then perform I/O to this pseudo-device will actually be affecting the remote file. Up to four network disks can be opened simultaneously. Sizes can be 1.2M, 10M, 20M, or 32M bytes in any combination.

Multiple DECnet-VAXmate nodes may access the same network disk simultaneously, for read only operations.

The Network Device Utility also permits assignment of a local printer device identifier to the default system printer of a remote DECnet system. The user can direct output to the network printer device identifier, NPRN:, causing the data to be sent to a file located at the remote node. That file will be queued to the remote system's printer when the connection is closed by NDU. This is a limited facility, and does not allow the use of print job switches or the setting of printer characteristics.

DOS MAIL utility

DECnet-VAXmate MAIL allows transmission of text messages and documents to users of MAIL software (e.g., VAX/VMS MAIL, MAIL-11) on systems that operate within the same DECnet network. The user can specify a text editor such as EDLIN to be invoked when creating a message, as well as a remote nodename::username to be used by respondents and for ''carbon copies'' of all MAIL sent. A MAIL receiver task is not supported.

Network Management

The Network Control Program (NCP) performs three primary functions: displaying statistical and error information, controlling the node's network components and testing local network components. The output resulting from a command can be directed to a local file or to the personal computer console.

The user can display the status of the local node's DECnet activity. Statistics related to both the node and the communication line can be displayed, including data on traffic and errors. Network parameters such as line speed, timer values, and buffer sizes can be modified. Control functions are limited to starting and stopping the line, and activating the local node. In order to test hardware components, test messages can be sent and received over the line either between the personal computer and adjacent node, or through controller or modem loopback arrangements.

DECnet-VAXmate provides for limited local network event logging. Network management requests from remote command nodes are not responded to by the DECnet-VAXmate system, unless NML, the network management listener task, is running in the DECnet-VAXmate System. However, the NCP program can act as a loopback mirror to which remote nodes can send test messages for diagnostic purposes.

The Network Management Listener task is an optional background task which allows DECnet nodes to monitor NCP parameters on DECnet-VAXmate nodes. This allows network managers to know whether or not remote

DECnet-VAXmate nodes are functioning correctly on the network. Remote alteration of any network parameters is not supported.

## Communications

The DECnet-VAXmate products support both wide area network (WAN) and local area network (LAN) connections. However, the maximum number of physical communication lines that can be attached and driven by the DECnet-VAXmate system is one (1). The product is designed as, and its operation is limited to, a DNA Phase IV end node.

## LAN Communications

DECnet-VAXmate supports direct connection to baseband Ethernet local area networks via its integral Ethernet adapter. This interface, when used in conjunction with DIGITAL's baseband Ethernet components allows DECnet-VAXmate to utilize Ethernet as its datalink transmission medium.

DECnet-VAXmate does not support connection to broadband Ethernet networks.

## WAN Communications

DECnet-VAXmate supports the DIGITAL Data Communications Message Protocol, Version 4.1 (DDCMP) for full-duplex transmission in point-to-point operation using the VAXmate's integral serial communications port. DDCMP provides error detection/correction and physical link management facilities. Neither half-duplex mode nor multipoint tributary operation is supported. Maximum line speed for full-duplex operation is 9600 baud.

## Performance Characteristics

The performance of a PCSA client-server system is dependent on:

- Type of client system
- Type and usage of the client's local mass storage
- Type of CPU running the server software
- Number of active clients connected to the server
- Other processing activity (terminals, for instance) on a server CPU
- Network activity caused by other stations on the network
- The type and speed of the communications line(s) between the client and server system (Ethernet LAN or serial communication links)
- How well the client's server is tuned to that client's type of activity

- Number of device interrupts per unit time
- Number and size of buffers
- Message size and frequency of transmission
- Local application

Note that the rate at which user data can be transmitted (throughput) over a communications line may sometimes approach, but will never equal or exceed, the actual line speed. The reason is that the actual throughput is a function of many factors, including the network application(s), topology, protocol overhead, and line quality, as well as the factors cited above.

Restrictions and Limitations

Any application which does not properly mask and unmask interrupts is incompatible with this product. For example, applications which use IBM BASICA, Version 1.0 interpreter or compiler, or GW-BASIC, Version 1.0 do not unmask the interrupts when they exit. In these cases, a BASIC program must be interpreted or recompiled using a version of BASIC that would unmask the interrupts.

## MINIMUM HARDWARE REQUIRED

Any valid VAXmate configuration connected to the same DECnet network to which the VAX or VAXmate server is connected. Connections may be to ThinWire Ethernet or asynchronous serial lines.

DECnet/PCSA Client software may be stored either on the personal computer's local storage device or on the server system. Maximum disk space required for the installation of all DECnet/PCSA Client software is 10 Mb (or 20,000 blocks on a VAX/VMS server). Other configurations, using selected components, may require less disk space.

For VAXmates using asynchronous DECnet connections, all client functionality and network services are supported, with the following exceptions:

- NETBIOS naming service and datagrams
- Remote boot (supported with DEPCA only)
- Disk services provided through the Local Area Systems Transport protocol. DECnet-VAXmate remote network devices are supported with asynchronous connections.
- LAT

Ethernet connections are recommended, for their higher speed.

## GROWTH CONSIDERATIONS

The minimum hardware requirements for any future version of this package may be different from the minimum hardware requirements for the current version.

## OPTIONAL HARDWARE

DIGITAL printers:

- LA75 Companion Printer
- LN03-PLUS
- LN03
- LA50
- LN03R
- PrintServer 40
- LA210
- LJ250

The following hardware options from DIGITAL may be added to the VAXmate:

- PC50x-AA 2-Mbyte Memory Upgrade Option
- FP287 Intel 80287 Math Coprocessor
- PC50x-MA Integral Modem Option (for North America)
- RCD31-FC (United States) or RCD31-FA (Non-US) 20-Mbyte hard disk drive; expansion box with two industry-standard option slots
- RCD32-FC (United States) or RCD32-FA (Non-US) 42-Mbyte hard disk drive; expansion box with two industry-standard option slots

## PREREQUISITE SOFTWARE

VAX/VMS Services for MS-DOS, Version 2.0 (see SPD 30.50.xx) or VAXmate Services for MS-DOS, Version 2.0 (see SPD 55.09.xx)

## OPTIONAL SOFTWARE

None

## SOFTWARE WARRANTY

Warranty for this software product is provided by DIGITAL with the purchase of a license for the product as defined in the Software Warranty Addendum of this SPD.

## INSTALLATION

This software product can be installed by the customer using the step-by-step documentation available for this product. Optionally, you can purchase DIGITAL Installation Services which provide for the installation of the software product by an experienced DIGITAL Software Specialist.

If the customer has purchased Installation Services, before installation of the software, the customer must:

- Previously have installed all requisite software and hardware.
- Obtain, install and demonstrate as operational any modems and other equipment and facilities necessary to interface to DIGITAL's communication equipment.
- Make available for a reasonable period of time, as mutually agreed by DIGITAL and the customer, all hardware and communication facilities that are to be used during installation.

Delays caused by any failure to meet the responsibilities will be charged at the then prevailing rate for time and materials.

DECnet/PCSA client software is comprised of device drivers, resident tasks, utilities, and DOS applications. The software installation procedure allows the installer to choose to omit installation of selected components. The procedure will insure that the system configuration files, CONFIG.SYS and AUTOEXEC.BAT, cause the network processes (and optional network device drivers) to be loaded at system startup (boot) time.

## ORDERING INFORMATION

Single-Use licensed software is furnished under the licensing provisions of DIGITAL's Standard Terms and Conditions, which provide in part that the software and any part thereof may be used on only the single CPU on which the software is first installed, and may be copied in whole or in part (with the proper inclusion of DIGITAL's copyright notice and any proprietary notices on the software) for use on that same CPU.

You will need a separate license for each CPU on which you will be using the software product (except as otherwise specified by DIGITAL). Then, Materials and Service Options are selected to utilize the product effectively. THE LICENSE OPTIONS ARE DESCRIBED BELOW. IF YOU ARE NOT FAMILIAR WITH THE SERVICE OPTIONS, YOU MAY OBTAIN THE APPROPRIATE SOFTWARE PRODUCT SERVICE DESCRIPTION(S) FROM YOUR LOCAL DIGITAL OFFICE. If you are already familiar with these options, you may obtain the ordering information directly from the Software Options Chart.

## LICENSE OPTIONS

### Single-Use License Option

The Single-Use License is your right to use the software product on a single client CPU. If the software is first read from the media to a storage device associated with a server, and subsequently down-line

loaded to a client CPU, a license must be obtained in advance for each client CPU to which the software is down-line loaded. The client CPUs will be considered the CPU on which the software is ''first installed'' under the terms of the license agreement.

For your first installation of this software product you must purchase, as a minimum, one of the following for each VAXmate:

- Single-Use License Option
- Upgrade from DECnet-VAXmate to DECnet/PCSA Client

Either of these licenses give you the right to use the DECnet/PCSA Client Software on a single client CPU and the Distribution and Documentation Option provides the machine-readable software and related documentation.

To use this product on additional client CPUs, you must purchase for each client CPU, as a minimum, one of the following:

- Single-Use License Option
- Upgrade from DECnet-VAXmate to DECnet/PCSA Client

In addition to the right to use, the license gives you the one-time right to copy the software from your original CPU installation to the additional CPU. Therefore, the Distribution and Documentation Option is not required, but optional.

### Distribution and Documentation Option

The Distribution and Documentation Option provides the machine-readable software and the basic documentation. You must have a Single-Use License to obtain this option. You will need this option to install this software for the first time. When revised versions of this software product become available, they may also be obtained by purchasing this option again.

### Software Revision Right-to-Copy Option

The Right-to-Copy Option allows a customer with multiple CPUs to copy a revised version of a software product from one CPU to another. Each CPU must be licensed for that product. You first install the revised software on one CPU; then you can make copies for additional CPUs by purchasing the Right-to-Copy Option for each additional CPU.

### Documentation-Only Option

The Documentation-Only Option provides one copy of the basic documentation.

## SOFTWARE PRODUCT SERVICES

For information on services, please contact your local DIGITAL office.

## SOFTWARE OPTIONS CHART

The distribution Media Codes used in the Software Options Chart are described below. You specify the desired Media Code at the end of the Order Number, e.g., Q6ZP3-H5 - binaries on a TK50 Tape Cartridge.

5 = TK50 (cartridge for VAX/VMS systems) with RX33 Floppy Diskette for installation on a VAX running VAX/VMS Services for MS-DOS and down-line loading to a VAXmate
7 = RX33 (5 1/4-inch high-density) Floppy Diskette

Z = No hardware dependency

| OPTIONS | ORDER NUMBER |
|---|---|
| LICENSE OPTIONS: A LICENSE IS REQUIRED FOR EACH CPU. | |
| Single-Use License Option | Q6ZP3-UZ* |
| Upgrade from DECnet-VAXmate to DECnet/PCSA Client | Q6ZP5-UZ |
| Software Revision Right-to-Copy Option | Q6ZP3-HZ |
| MATERIALS AND SERVICE OPTIONS: | |
| Distribution and Documentation Option | Q6ZP3-H5<br>Q6ZP3-H7 |
| Documentation-Only Option | Q6ZP3-GZ |

*Volume pricing available for this option. See US Price List for details.

All references to MS tm-Windows refer to DIGITAL's adaption of Microsoft Corporation's MS-Windows.

PRODUCT NAME: DECnet/PCSA Client: PC, Version 2.0 (Formerly ''PCSA/PC Client'') SPD 55.07.03

DESCRIPTION

The Personal Computing Systems Architecture (PCSA) is an extension of DIGITAL's systems and networking architecture that merges the VMS and MS-DOS environments. PCSA provides a framework for integrating personal computers into an organization's total information system so that different types of users can share information, large system resources and network services across the entire organization.

The PCSA family of software products includes:

- VAX/VMS Services for MS-DOS - software to allow a VAX/VMS system to act as a file, print, and disk server to personal computers; described in SPD 30.50.xx.
- DECnet/PCSA Client: PC - required software for the personal computer to use the facilities provided by VAX/VMS Services for MS-DOS or VAXmate Services for MS-DOS; described in this document.
- DECnet/PCSA Client: VAXmate - required software for VAXmates to use the facilities provided by VAX/VMS Services for MS-DOS or VAXmate Services for MS-DOS; described in SPD 55.10.xx.
- VAXmate Services for MS-DOS - software that allows a VAXmate with an expansion box to act as a dedicated server to personal computers; described in SPD 55.09.xx.
- VAXmate Software for Stand-alone Use - operating environment for non-networked VAXmates; described in SPD 55.06.xx.

The PCSA products are based on DECnet and the right to use VAX/VMS Services is included in the DECnet-VAX license. Other DECnet-VAX facilities are described in SPD 25.03.xx.

The DECnet/PCSA Client software allows selected personal computers to be connected to VAX, MicroVAX, or VAXmate computers in a DECnet network, utilize selected facilities and services of those systems, and access information and services contained on other types of DIGITAL systems in the DECnet Network.

The user interface is an adaptation of MS-Windows, and the network software is based on an adaptation of MS-NET which allows it to be integrated into a DECnet-based network.

The DECnet/PCSA Client software provides:

- Access to network services
- Remote boot
- Support for IBM DOS and MS-DOS
- A user interface
- Terminal emulation

- On-line user information
- Printer support
- All DECnet-DOS facilities

## Access to Network Services

DECnet/PCSA Client software, in conjunction with a VAX running VAX/VMS Services for MS-DOS, provides to the client:

- File services - Through the integration of Microsoft's MS-Net with DECnet, the client is provided with a remote DOS file system that appears as a transparent extension of the client's local facilities.
- Disk services - Through the use of DIGITAL's Local Area Systems Transport (LAST) protocol, PCSA clients are provided with a high performance virtual disk.
- Print services - Remote printers appear as a transparent extension of the client's facilities. This allows the redirection of local printing to a server-based printer.
- Date and time services - Clients can receive date and time from the server.

See VAX/VMS Services for MS-DOS, SPD 30.50.xx, for further information on network services with a VAX/VMS server. See VAXmate Services for MS-DOS, SPD 55.09.xx, for further information on network services with a VAXmate server.

## Remote Boot

Users can remote boot a personal computer from a network key disk available using the disk services of VAX/VMS Services for MS-DOS.

Remote boot is supported only for VAXmates and personal computers with DIGITAL's DEPCA Ethernet controller.

## Support For IBM DOS and MS-DOS

Note: For the purposes of this Software Product Description, IBM's Personal Computer Disk Operating System, Microsoft Corporation's MS-DOS, and Compaq Computer Corporation's Compaq MS-DOS are referred to simply as ''DOS''.

DOS Versions 3.2 and 3.3 are supported. Additional and enhanced DOS utilities are provided:

- APPEND, allowing extension of current working directory (for DOS V3.2 only)
- BACKUP, for backup to local and network drives and to subdirectories
- DECKEYB, to map a specific character set to any keyboard,

including international versions of DIGITAL's LK250 keyboard

- DECMODE, to set printer types, keyboard buffer size, and bypass modem control

- GRAPHICS, supporting PRINT SCREEN in graphics mode to DIGITAL's LN03-PLUS with ISO/PC cartridge, LA75, LA75P, LA50, LA210, LJ250, and LJ252, IBM Graphics Printer, IBM PC Color Printer, and IBM Proprinter

- KEYBRD, supporting the DIGITAL LK250 keyboard

- MOUSE, to allow the DIGITAL mouse to emulate a Microsoft mouse

- RESTORE, to restore files to a local or network drive and to a subdirectory

- SHARE, for file sharing and locking in the PCSA environment (for DOS V3.2 only)

- XONXOFF.COM, supporting XON/XOFF communications protocol for printers

- *.PIF, Program Information Files to allow DOS commands to be used more easily within MS-Windows

- International keyboard and character set support:

  - STD - IBM extended character set

  - ST2 - IBM Norway/Denmark extended character set

User Interface

In addition to a DOS command line interface, DECnet/PCSA Client provides MS-Windows, Version 1.03, which is supported with the DIGITAL LK250 keyboard and several industry-standard keyboards. (See MINIMUM HARDWARE section of this document.)

MS-Windows is a graphical extension of the DOS operating system that provides the user with a visual interface to the operating system by means of pull-down menus, dialog boxes and icons instead of the traditional command structure used by DOS.

MS-Windows can split the display screen into multiple windows and allow several programs to appear on the screen at the same time. The user can switch between windows and transfer data between applications.

The user can also invoke the DOS Command Processor through this interface. The command processor allows the use of the traditional DOS command structure.

Features that are available when running applications that have been designed and written to use MS-Windows' facilities are:

- Limited multi-tasking

- Multiple windows allowing for data transfer between windows

- Support of CGA, EGA, VGA, ECGA, and MCGA graphic resolutions
- A mouse as a virtual pointer
- A displayable ''clipboard'' area to temporarily store information that is being copied or moved
- Moving, sizing or zooming of windows on the screen

Several MS-Windows applications are included in DECnet/PCSA Client: Calculator, Notepad, Clock, Paint, Cardfile, Calendar and Control Panel.

Drivers are included to support the following DIGITAL devices:

- VSXXX-AA Mouse
- LK250 Keyboard
- LA75 Printer (serial)
- LA75P Printer (parallel)
- LN03 PLUS Printer, in DEC mode and in emulation of the IBM Proprinter (with ISO/PC cartridge). The user may select up to two of the following font cartridges supported within MS Windows:
  - ISO/PC
  - C.G. Times 8pt, 10pt, 12pt
  - C.G. Times 14pt, 18pt
  - C.G. Times 24pt
  - C.G. Triumvirate 8pt, 10pt, 12pt
  - C.G. Triumvirate 14pt, 18pt
  - C.G. Triumvirate 24pt
  - I.T.C. Souvenir 8pt, 10pt, 12pt
  - OCR-A, OCR-B
- LNO3R Printer
- PrintServer 40, a networked laser printing system
- LA50 Printer
- LA210 Printer, in DEC mode and in emulation of the IBM Proprinter

Drivers are included to support the following IBM devices:

- IBM keyboards - AT, XT, Enhanced, and PS/2

- IBM Color Graphics Adapter
- IBM Enhanced Graphics Adapter with monochrome display
- IBM Enhanced Graphics Adapter with enhanced color display (Black and White)
- IBM Enhanced Graphics Adapter with enhanced color display or personal computer color display
- IBM Enhanced Graphics Adapter (with more than 64K memory) with enhanced color display
- IBM VGA video hardware for IBM PS/2 Models 50, 60 and 80
- IBM MCGA video hardware for IBM PS/2 Model 30
- IBM Graphics printer
- IBM Proprinter

These drivers also support compatible Compaq devices. See OPTIONAL HARDWARE for supported Compaq devices.

Several industry-standard hardware drivers are supplied for use with other non-DIGITAL products. These drivers are provided on an ''AS IS'' basis without any warranty of any kind, either express or implied:

- Microsoft Mouse
- Mouse Systems Mouse
- Logitech Serial Mouse
- Kraft Joystick Mouse
- VisiOn Mouse
- FTG Data Systems Light Pen and Single Pixel Board
- The Lite-pen Company Light Pen
- Hercules Graphics Card with monochrome display
- Intel TM AboveBoard/AT (Refer to Restrictions and Limitations section)
- C-Itoh 8510 printer
- Epson (R) FX-80 printer
- Epson LQ-1500 printer
- Epson MX-80 Graftrax printer
- HP (R) LaserJet printer
- HP LaserJet+ printer

- HP ThinkJet (2225 C-D) printer
- HP 7470A printer
- HP 7475A printer
- HP 7550A printer
- NEC P2/P3 printer
- NEC 3550 printer
- Okidata 92/93 (IBM) printer
- Okidata 92/93 (STD) printer
- Okidata 192/193 (IBM) printer
- Okidata 192/193 (STD) printer
- POSTSCRIPT TM/Laserwriter
- Star SG-10 printer
- TI (R) 850 printer
- TI 855 printer
- Toshiba P351
- Xerox (r) 4020

Program Information Files (PIFs) are supplied for DOS and network commands, as well as SETHOST. These PIFs are supported by DIGITAL.

PIFs are also supplied for several applications written by third parties. These PIFs are provided on an ''AS IS'' basis without warranty of any kind, either express or implied.

Terminal Emulation

The DECnet/PCSA Client software includes terminal emulation software that allows the user to establish terminal sessions with a host computer such as a VAX. Terminal sessions can be established using either a serial communications port, or via an Ethernet port on a supported Ethernet controller on the client.

The VT220 terminal emulator can be used in two environments:

- MS-Windows - The MS-Windows version does not support full modem control or replaceable character sets (DRCS).
- Outside of MS-Windows - This version of the VT220 terminal emulator is called SETHOST. SETHOST does support control of asynchronous modems. It does not support replaceable character sets (DRCS). See description of SETHOST functionality within ''DECnet-DOS FACILITIES'' section of this document.

Features of the MS-Windows VT220 terminal emulator are:

- Support for network (LAT) and serial terminal communication
- Support for the MS-Windows Clipboard to cut and paste information
- Ability to log characters received from the host into a file
- Ability to send characters to the host from a file instead of from the keyboard
- DIGITAL multinational and ISO multilingual character sets and compose sequences:
  - ISO - International standards organization character set
  - MCS - DEC Multinational Character Set
  - STD - IBM extended character set
  - ST2 - IBM Norway/Denmark Extended character set
  - XX7 - Indicates a 7-bit National Character Replacement set of country XX:
    - US - United States
    - DE - German
    - SF - Swiss/French
    - DK - Denmark
    - SE - Sweden
    - UK - United Kingdom
    - IT - Italy
    - SD - Swiss/German
    - NO - Norway
    - CH - Swiss/German/French
    - FR - France
    - ES - Spain
    - CA - Canada
    - FI - Finland
  - TCS - Technical Character Set
- Setup feature allows selection and saving of terminal characteristics

- Printing to a DIGITAL printer attached to the PC; printing may be a screen at a time or a toggle-like function may be used to print everything from the screen until the toggle is switched off.

Both the MS-Windows VT220 and SETHOST provide scripting facilities. The script processing language allows the automation of frequently executed functions. For example, a script can be written to automatically log a user in to a computer or to dial in to a computer and establish a DDCMP connection. Scripts can be written to perform a task and then exit the terminal emulator, without user intervention.

On-Line User Information

The On-Line User Information System provides information about how to use the client system in an easy-to-use format with quick access to specific topics. It contains comprehensive user documentation and tutorials on how to use the system. The Information System runs as an MS-Windows application and uses standard MS-Windows user interface conventions.

Features of the On-Line User Information System are:

- Topic selection from menus, from a comprehensive topics list, or by typing in index terms
- Ability to maintain multiple bookmarks at topics of the user's choice
- Cross-references to related information
- Ability to return to a preceding topic, or to the main menu, in a single step
- Ability to copy material from the information base to the MS-Windows clipboard or to a printer

Printer Support

With MS-Windows or DOS, users can print files to a local printer (a printer attached directly to the personal computer) or a remote printer (a printer connected to a server). Note that support is provided within MS-Windows for fonts for the LN03 PLUS (see USER INTERFACE for list of supported fonts), the LN03R and the PrintServer 40; font support at the DOS command line level is application-dependent.

| | Supported In MS-Windows | Supported From DOS command line |
|---|---|---|
| DIGITAL's LN03-PLUS, | Yes | Yes |
| DIGITAL's LN03 | Yes | Yes |
| DIGITAL's LA75 | Yes | Yes |
| DIGITAL's LA75P | Yes | Yes |
| DIGITAL's LA50 | Yes | Yes |
| DIGITAL's LN03R | Yes | Yes |
| DIGITAL's PrintServer 40 | Remote only | Remote only |
| DIGITAL's LA210 | Yes | Yes |
| DIGITAL's LJ250 | No | Yes |
| DIGITAL's LJ252 | No | Yes |

| | | |
|---|---|---|
| IBM Proprinter | Yes | Yes |
| IBM Graphics Printer | Yes | Yes |

In addition, MS-Windows printer drivers are provided, without DIGITAL support, for several third-party printers. See USER INTERFACE section of this document for a list of unsupported MS-Windows printer drivers.

Consult the hardware product descriptions for information on printer facilities.

See the VAX/VMS Services for MS-DOS SPD 30.50.xx and VAXmate Services for MS-DOS SPD 55.09.xx for more information on remote printer support.

DECnet-DOS Facilities

DECnet-DOS allows selected IBM personal computer systems and and selected IBM compatible personal computer systems to participate as non-routing (end) nodes in DECnet computer networks. This software is one of the DECnet-DOS family of products for personal computer systems running Microsoft Corporation's MS-DOS Operating System, and specific variants of that product. Refer to the CONFIGURATION CHART in this SPD for detailed configuration information. Refer to SPD 50.05.xx for information on DECnet-VAXmate, the member of the DECnet-DOS family of software for DIGITAL's VAXmate personal computers.

DECnet-DOS is a DECnet Phase IV network product and is warranted for use only with supported Phase IV products supplied by DIGITAL.

DECnet-DOS offers task-to-task communications, remote file access, utilities for network file operations, network virtual terminal support, and network resource-sharing capabilities using the DIGITAL Network Architecture (DNA) protocols. Access to full DECnet-DOS functions is supported for DOS user programs written in MACRO Assembler and the C language.

DECnet-DOS nodes can be connected to a network via an Ethernet or an asynchronous DECnet connection. Ethernet adapters for the personal computers are supported for connections to a baseband Ethernet Local Area Network. Operation of DECnet-DOS in limited broadband configurations is also supported. See the OPTIONAL HARDWARE portion of this SPD for details on supported Ethernet configurations.

Asynchronous connections to the network are accomplished over a serial line, using the personal computer's asynchronous communications adapter as the physical link. The adjacent system must be a DECnet Phase IV, full-function (routing) node, supporting asynchronous DDCMP (e.g. DECrouter 200, DECnet-VAX.) The Software Product Description of the DECnet product in question must be consulted to determine if asynchronous operation is supported, and to develop a supportable routing node configuration. Connections over asynchronous terminal lines, such as to a DECserver 200, are not supported.

Note: In a two node network where a single DECnet connection is needed for both the personal computer and the adjacent node, both nodes may be DECnet end nodes.

Given proper network planning, DECnet Phase IV networks can contain a maximum of 1023 nodes per network area, and up to 63 areas per network. Phase III nodes participating in Phase III/IV networks are

limited to the Phase III routing capability of 255 nodes. Phase II nodes are not supported. Phase IV end nodes not directly connected to an Ethernet Local Area Network can connect to only one node (for DECnet-DOS, that node must be Phase IV). In order to communicate with other nodes in the network, including Phase III nodes, that node must be a Phase IV full-function (routing) node.

The functions available to the DECnet-DOS system user depend largely upon the configuration of the rest of the network. Each DECnet product offers its own level of capability and its own set of features to the user. The DOS operating system is limited to a single user, and access to a DECnet-DOS node from a remote network terminal is not possible. Additionally, because DOS is a single-tasking operating system, access and management from remote command nodes is limited. A File Access Listener (FAL) server application is provided by DECnet-DOS, and similar applications may be built by the user. However, such applications must run to the exclusion of others, unless they run under MS-Windows, which provides limited multi-tasking on a MS-DOS based personal computer.

The DECnet products and functions available to users on mixed networks can be determined by comparison of the SPDs for the component products.

## DECnet-DOS User Interfaces

DECnet-DOS provides two user interfaces: a command line interface and a menu program. The command line interface is similar to the DOS user interface. Users type commands at the DOS prompt to run DECnet-DOS utilities. The menu program allows the user to choose a particular DECnet task from a number of DECnet options. The command line is then built and executed to accomplish the task selected.

Versions of NFT and FAL are provided as MS-Windows applications. See application descriptions for more details.

## Task-to-Task (TTT) Communication

Using DECnet-DOS, a DOS user program written in Microsoft's MACRO Assembler, or the C language, can exchange messages with other network user programs. The remote-end user program can be on a Phase III node in the same area, or on any other Phase IV node in the network. The messages sent and received by the two user programs can be in any data format.

A simple set of functions is provided by the transparent task-to-task interface. With this interface, communication and exchange of data with a remote network program is accomplished using a limited set of DOS calls (e.g. OPEN, CLOSE, READ, and WRITE.) Remote node and program identification is supplied in a string resembling a DOS pathname. Any programming language that supports a standard DOS pathname, and which will accept the network file specification string, and uses the supported DOS function calls, may use this feature.

Full (non-transparent) user program to user program capabilities are possible in C or MACRO through a library of special network subroutine calls. The C language network interface library is a compatible subset of that provided with the DECnet-ULTRIX product (SPD

26.83.xx). This gives the network programmer access to the complete set of DECnet functions. The user may need to adapt the DECnet-DOS C language subroutines to the specific C compiler being used. Small, medium and large size memory models are supported, where small refers to default data and code segments (under 64K bytes each), medium refers to a default data segment size and multiple code segment sizes, and large refers to multiple data segments and multiple code segments.

## NETBIOS Interface Support

DECnet-DOS supports the session level NETBIOS interface through interrupts 5Ch and 2Ah. Applications written to the NETBIOS interface as documented in the April 1987 edition of ''IBM NETBIOS Application Development Guide'', order number S68X-2270-00, can be layered on DECnet-DOS without modification. This allows computers running DECnet-DOS to communicate with other computers running DECnet-DOS and NETBIOS applications. This feature preserves customers' investments in industry standard applications. It does not allow personal computers running DECnet-DOS to communicate with personal computers running network protocols other than DECnet. DECnet-DOS NETBIOS applications can also communicate with other DECnet applications, such as DECnet-VAX applications.

The NETBIOS naming service and datagram service is supported only in Ethernet LAN configurations.

## File Transfer

Using the Network File Transfer (NFT) utility, the user can transfer sequential ASCII and binary files between the personal computer and another DECnet node. Files can be transferred in both directions between the locally supported DOS file system devices and the file systems of other DECnet nodes. Wild cards can be used in source file specifications for both local and remote nodes, subject to support on the remote system.

ASCII text files transferred to the DECnet-DOS system are converted into DOS stream files; such files are converted into the remote system's normal format when transferred from the DECnet-DOS node. On transfer of binary files to a DECnet-DOS system, file data is preserved, but any record attributes will be lost; record attributes can be restored on such transfers from the personal computer to a record file system through use of utility switch settings.

Additional facilities of the utility allow concatenation (APPEND), deletion (DELETE), remote spooling (PRINT), and display (TYPE) of files, as well as submission (SUBMIT) and/or execution of command files, provided the remote node supports these functions. Directory (DIRECTORY) listings are also supported.

Two versions of NFT are provided: one which can be invoked from the DOS command line and one which is an MS-Windows application running under MS-Windows. The MS-Windows version of NFT can operate concurrently with other MS-Windows tasks.

## Job Spawner

The job spawner is a utility that allows a personal computer to act as

a server for performing multiple service functions. When the job spawner is enabled (it must be the only utility running), it listens for connect requests from other nodes. When the connection arrives, the spawner starts the program which will service the request. When the service is completed, the spawner waits for the next connection. In this way, the personal computer can sequentially process different requests at different times without user intervention. This feature is especially useful for the remote system user who wants to access files on an idle personal computer.

## File Access Listener

The File Access Listener (FAL) server task provides full access to the personal computer node's file resources from remote systems. User ID and password protection can be used to control access to local files. FAL receives remote file access requests from the network and translates them into calls to the DOS file system. FAL then sends or receives the resulting file data back to the accessing program. FAL runs to the exclusion of other tasks or programs, except when running under MS-Windows. FAL can, however, be invoked by the job spawner.

Two versions of FAL are provided: one which can be invoked from the DOS command line and one which is an MS-Windows application running under MS-Windows. The MS-Windows version of FAL can operate concurrently with other MS-Windows tasks.

## Remote File Access

Transparent file access (TFA) is supported to remote DECnet systems by supported DOS function calls in MACRO Assembler and C. READ, WRITE, OPEN, CLOSE, SUBMIT, DIRECTORY, and DELETE operations can be initiated by a local program for sequential files residing on the personal computer or at such remote DECnet systems. Fixed and variable length record formats are supported. Files accessed remotely can contain either ASCII or binary information.

This file access is available to a user program by adding network location information to a DOS pathname. The supported DOS file I/O operations can then be performed with that file, which will be treated as a simple, sequential DOS file. Access to remote system-specific file characteristics is not provided.

## Network Virtual Terminal

The SETHOST utility provides the user with VT220-like terminal emulation via LAT, CTERM or the asynchronous serial communications port. SETHOST allows the personal computer to appear as if it were a terminal physically connected to the target system. This is particularly useful for remote program development because it allows the user of the small, application-oriented personal computer to utilize the resources of larger systems.

A maximum of 4 SETHOST sessions, can be enabled simultaneously, via LAT or CTERM. With a single keystroke, the user can switch among active SETHOST sessions. Only one session can be enabled when SETHOST uses the asynchronous communication port for an asynchronous terminal connection. With a single keystroke, the user can leave an active SETHOST session and return to the DOS environment. To return to the

SETHOST session, the user simply types EXIT at the DOS prompt. Multiple CTERM and LAT terminal sessions (to the same or different hosts) can be established, suspended and resumed.

Terminal characteristics can be selected and saved by use of the utility's setup feature. The following list of character sets are supported with SETHOST: ISO Latin-1 (ISO), DEC multinational (MCS) and National Replacement (NRCS).

Down-line replaceable character sets (DRCS) are not supported.

Support for printing to a DIGITAL printer is provided under SETHOST (i.e. printing within ALL-IN-1.) SETHOST sessions can also be logged to a file for future examination. SETHOST supports control of an asynchronous modem.

SETHOST provides a script processing language that allows the automation of frequently executed functions. For example, a script can be written to automatically log a user in to a computer or to dial in to a computer and establish a DDCMP connection. Scripts can be written which perform a task and then exit SETHOST, without user intervention.

CTERM, DIGITAL's Terminal Services Architecture Command protocol, is used by SETHOST to give the personal computer the ability to establish a virtual connection to remote multi-user Phase IV DECnet systems which provide this support. The maximum number of CTERM sessions is limited by the maximum number of network links defined during the configuration of the DECnet-DOS node.

In local area Ethernet network configurations, DIGITAL's Local Area Transport protocol (LAT) is used for virtual terminal connections to DIGITAL systems which offer this support. This is the same protocol used between DIGITAL terminal servers and LAT hosts.

The interface to the CTERM and LAT drivers are documented in order to allow users to write their own applications which take advantage of these protocols.

## Remote Network Devices

DECnet-DOS provides the capability to use disk space on a remote DECnet node as though it were an additional disk local to the DECnet-DOS system. This can be useful for providing extra storage capacity to the personal computer user, or for backing up local files using the DOS COPY utility.

The Network Device Utility (NDU) creates a file on the remote system (using the standard DECnet file access interface) representing a local device. This file is then opened and assigned a local DOS device name (such as G:). User programs or DOS utilities which then perform I/O to this pseudo-device will actually be affecting the remote file. Up to four network disks can be opened simultaneously. Sizes can be 1.2M, 10M, 20M, or 32M bytes in any combination.

Multiple DECnet-DOS nodes may access the same network disk simultaneously, for read only operations.

The Network Device Utility also permits assignment of a local printer

device identifier to the default system printer of a remote DECnet system. The user can direct output to the network printer device identifier, NPRN:, causing the data to be sent to a file located at the remote node. That file will be queued to the remote system's printer when the connection is closed by NDU. This is a limited facility, and does not allow the use of print job switches or the setting of printer characteristics.

## DOS MAIL Utility

DECnet-DOS MAIL allows transmission of text messages and documents to users of MAIL software (e.g., VAX/VMS MAIL, MAIL-11) on systems that operate within the same DECnet network. The user can specify a text editor such as EDLIN to be invoked when creating a message, as well as a remote nodename::username to be used by respondents and for ''carbon copies'' of all MAIL sent. A MAIL receiver task is not supported.

## Network Management

The Network Control Program (NCP) performs three primary functions: displaying statistical and error information, controlling the node's network components and testing local network components. The output resulting from a command can be directed to a local file or to the personal computer console.

The user can display the status of the local node's DECnet activity. Statistics related to both the node and the communication line can be displayed, including data on traffic and errors. Network parameters such as line speed, timer values, and buffer sizes can be modified. Control functions are limited to starting and stopping the line, and activating the local node. In order to test hardware components, test messages can be sent and received over the line either between the personal computer and adjacent node, or through controller or modem loopback arrangements.

DECnet-DOS provides for limited local network event logging. Network management requests from remote command nodes are not responded to by the DECnet-DOS system, unless NML, the network management listener task, is running in the DECnet-DOS System. However, the NCP program can act as a loopback mirror to which remote nodes can send test messages for diagnostic purposes.

The Network Management Listener task is an optional background task which allows DECnet nodes to monitor NCP parameters on DECnet-DOS nodes. This allows network managers to know whether or not remote DECnet-DOS nodes are functioning correctly on the network. Remote alteration of any network parameters is not supported.

## Communications

The DECnet-DOS products support both wide area network (WAN) and local area network (LAN) connections. However, the maximum number of physical communication lines that can be attached and driven by the DECnet-DOS system is one. The product is designed as, and its operation is limited to, a DNA Phase IV end node.

## LAN Communications

DECnet-DOS supports direct connection to baseband Ethernet local area networks via Ethernet adapters (See OPTIONAL HARDWARE). These interfaces, when used in conjunction with DIGITAL's baseband Ethernet components allow DECnet-DOS to utilize Ethernet as its datalink transmission medium.

DECnet-DOS supports connection to broadband Ethernet networks in limited configurations described in the OPTIONAL HARDWARE section.

Note: The IBM PS/2 Models 50,60 and 80 are not supported in a LAN environment. Only asynchronous DDCMP is supported on these machines.

WAN Communications

DECnet-DOS supports the DIGITAL Data Communications Message Protocol, Version 4.1 (DDCMP) for full-duplex transmission in point-to-point operation using the serial asynchronous facility provided by (or available as an option for) one of the supported IBM personal computer systems or compatibles. DDCMP provides error detection/correction and physical link management facilities. Neither half-duplex mode nor multi-point tributary operation is supported.

Maximum line speed for full-duplex operation is 9600 baud for the IBM PC, IBM PC/XT, IBM Personal Computer AT, IBM PS/2 Model 30, COMPAQ DESKPRO 286 Model 40 and COMPAQ DESKPRO Model 2. The IBM PS/2 Models 50, 60 and 80 are supported at full-duplex operation up to 19.2 baud.

Performance Characteristics

The performance of a PCSA client-server system is dependent on:

- Type of client system
- Type and usage of the client's local mass storage
- Type of CPU running the server software
- Number of active clients connected to the server
- Other processing activity (terminals, for instance) on a server CPU
- Network activity caused by other stations on the network
- The type and speed of the communications line(s) between the client and server system (Ethernet LAN or serial communication links)
- How well the client's server is tuned to that client's type of activity
- Number of device interrupts per unit time
- Number and size of buffers
- Message size and frequency of transmission
- Local application

Note that the rate at which user data can be transmitted (throughput)

over a communications line may sometimes approach, but will never equal or exceed, the actual line speed. The reason is that the actual throughput is a function of many factors, including the network application(s), topology, protocol overhead, and line quality, as well as the factors cited above.

Restrictions and Limitations

Any application which does not properly mask and unmask interrupts is incompatible with this product. For example, applications which use IBM BASICA, Version 1.0 interpreter or compiler, or GW-BASIC, Version 1.0 do not unmask the interrupts when they exit. In these cases, a BASIC program must be interpreted or recompiled using a version of BASIC that would unmask the interrupts.

An expanded memory system (such as the INTEL AboveBoard/AT) requires the use of a high memory segment. In an IBM PC/AT system there remains one available memory segment. This memory segment is also utilized by the EGA graphics adapter. Both of these options cannot be configured together in the same system with a DEPCA.

Some VGA video cards and the drivers for Ethernet cards use the same software interrupt. Therefor, VGA video is supported only on systems with asynchronous DECnet connections.

MINIMUM HARDWARE REQUIRED

Only systems, components, and peripherals, as identified below, which were available from IBM or Compaq as of 2/1/88 are supported.

- A base system from the CONFIGURATION CHART

- A minimum of 640 KB system memory

- One network connection chosen from the asynchronous or Ethernet column associated with a base system in the CONFIGURATION CHART. Only one DECnet line can be configured under DECnet-DOS.

  More than one communications device may be installed in a system subject to system limitations. If use of another device is required, the system may need a reboot. A device cannot typically be shared with other communications products.

- All base systems must have at least one diskette drive capable of reading 5.25 inch 360Kb diskettes or 3.50 inch 720Kb diskettes.

- A system power supply that provides at least 130 watts

- The IBM PC Model 5150 system unit must have a system ROM BIOS dated 10-27-82 or later.

Standard keyboards that come with the base systems listed in the CONFIGURATION CHART are supported.

DECnet/PCSA Client software may be stored either on the personal computer's local storage device or on the server system. Maximum disk space required for the installation of all DECnet/PCSA Client software

is 10 Mb (or 20,000 blocks on a VAX/VMS server). Other configurations, using selected components, may require less disk space.

GROWTH CONSIDERATIONS

The minimum hardware requirements for any future version of this package may be different from the minimum hardware requirements for the current version.

OPTIONAL HARDWARE

DIGITAL printers:

- LA75
- LA75P
- LNO3-PLUS
- LNO3
- LNO3R
- PrintServer 40
- LA50
- LA210
- LJ250
- LJ252

The following hardware options from DIGITAL may be added to the IBM PC, XT, and AT systems described under MINIMUM HARDWARE:

- DIGITAL LK250 keyboard
- BCC37-06 Keyboard Cable - required to connect LK250 keyboard to IBM PC
- DIGITAL VSXXX-AA 3-button mouse

Note that the DEPCA Ethernet Controller Module, VSXXX-AA 3-button mouse, LK250 keyboard, and BCC37-06 keyboard cable are available in DEPCA Network Integration packages and are also sold separately.

The following hardware options from IBM and COMPAQ may be added to the configurations (subject to the limitations of the system chosen) described under MINIMUM HARDWARE: Enhanced Keyboard, Diskette Drives and Adapters, Fixed Disks and Adapters, Memory Expansion Options, Memory Module Kits, Color Display, Color/Graphics Monitor Adapter, and Printer Adapter.

Broadband Ethernet connection requirement:

- DIGITAL DEPCA-xx Ethernet controller boards with the DEPCA-AU Attachment Unit Interface in the personal computer

- CHIPCOM 2-port Ethermodem broadband models for connection to the broadband cable plant

  Note: The modem frequency must match the frequency of the broadband plant.

DECnet/PCSA Client software supports the following video adapters (subject to vendor support of the adapters in base systems):

- MDA- IBM Monochrome Display Adapter
- CGA- IBM Color Graphics Adapter
- EGA- IBM Enhanced Graphics Adapter
- MCGA- IBM PS/2 Model 30 video hardware
- VGA- Only on IBM PS/2 Model 50,60,80 video hardware
- Hercules Monochrome- Hercules Graphic Card
- COMPAQ Video Graphics Controller Board
- COMPAQ Enhanced Color Graphics Board
- COMPAQ Video Display Controller Board

Supported Configuration Chart

IBM PS/2 Models 50, 60 and 80 are supported with asynchronous DECnet connections only (no Ethernet support). All other personal computers listed in the CONFIGURATION CHART are supported with Ethernet and with asynchronous DECnet connections.

For clients with asynchronous DECnet connections, all client functionality and network services are supported, with the following exceptions:

- NETBIOS naming service and datagrams
- Remote boot (supported with DEPCA only)
- Local area disk services provided through the Local Area Systems Transport protocol. DECnet-DOS remote network devices are supported with asynchronous connections.
- LAT

Ethernet connections are recommended, for their higher speed.

For purposes of this Software Product Description, the terms 3COM, MICOM and DEC refer to the definitions below:

- DEC(tm): DIGITAL's DEPCA-xx Ethernet multi-buffered controller for personal computers. The use of the DEPCA-AU transceiver adapter is also supported.
- 3COM(tm): 3C500B Etherlink(tm)/IBM PC Ethernet Network Interface (IE2), 3C501 Etherlink(tm)/IBM PC Ethernet Network

Interface (IE4)

- MICOM(tm)-Interlan: N15010-1 Ethernet controller (ThinWire or standard Ethernet), NI5010-2 Ethernet controller (standard Ethernet)

DIGITAL recommends the use of the multi-buffered DEPCA Ethernet controller in networks which carry heavy traffic.

SUPPORTED CONFIGURATIONS

| Base System | Asynch | Ethernet | Operating System |
|---|---|---|---|
| IBM 5150 Personal Computer | IBM 5150-2074 asynch. comm. adapter | DEC 3COM MICOM | IBM DOS V3.20, V3.30 |
| IBM 5160 Personal Computer XT | IBM 5150-2074 asynch. comm. adapter(standard) | DEC 3COM MICOM | IBM DOS V3.20, V3.30 |
| IBM 5162 Personal Computer XT Model 286 | IBM 5170-0215 serial/parallel adapter(standard) | DEC 3COM MICOM | IBM DOS V3.20, V3.30 |
| IBM 5170 Personal Computer AT | IBM 5170-0215 serial/parallel adapter | DEC 3COM MICOM | IBM DOS V3.20, V3.30 |
| IBM 8530 Personal System/2 Model 30 | IBM PS/2 Serial System Port(standard) | DEC 3COM MICOM | IBM DOS V3.30 |
| IBM 8550 Personal System/2 Model 50 | IBM PS/2 Serial System Port (standard) | N/A | IBM DOS V3.30 |
| IBM 8560 Personal System/2 Model 60 | IBM PS/2 Serial System Port (standard) | N/A | IBM DOS V3.30 |
| IBM 8580 Personal System/2 Model 80 | IBM PS/2 Serial System Port (standard) | N/A | IBM DOS V3.30 |
| COMPAQ DESKPRO 286 PERSONAL COMPUTER Model 40 (Model 2551 on UL label) | Asynchronous Communications Interface (standard) | DEC 3COM | COMPAQ MS-DOS V3.20 Rev. A, V3.30 |
| COMPAQ DESKPRO Model 2 | Asynchronous Clockboard option | DEC 3COM | COMPAQ MS-DOS V3.20 Rev. A, V3.30 |

PREREQUISITE SOFTWARE

VAX/VMS Services for MS-DOS, Version 2.0 (see SPD 30.50.xx) or VAXmate

Services for MS-DOS, Version 2.0 (see SPD 55.09.xx)

IBM PC Disk Operating System, Verison 3.3, COMPAQ MS-DOS, Version 3.30

Note that this release is also supported when used with Version 3.20 of IBM PC DOS and Version 3.20 Rev. A of COMPAQ MS-DOS. This support may be dropped in any future version of DECnet/PCSA Client software.

OPTIONAL SOFTWARE

None

SOFTWARE WARRANTY

Warranty for this software product is provided by DIGITAL with the purchase of a license for the product as defined in the Software Warranty Addendum of this SPD.

INSTALLATION

This software product can be installed by the customer using the step-by-step documentation available for this product. Optionally, you can purchase DIGITAL Installation Services which provide for the installation of the software product by an experienced DIGITAL Software Specialist.

If the customer has purchased Installation Services, before installation of the software, the customer must:

- Previously have installed all requisite software and hardware.
- Obtain, install and demonstrate as operational any modems and other equipment and facilities necessary to interface to DIGITAL's communication equipment.
- Make available for a reasonable period of time, as mutually agreed by DIGITAL and the customer, all hardware and communication facilities that are to be used during installation.

Delays caused by any failure to meet the responsibilities will be charged at the then prevailing rate for time and materials.

DECnet/PCSA client software is comprised of device drivers, resident tasks, utilities, and DOS applications. The software installation procedure allows the installer to choose to omit installation of selected components. The procedure will insure that the system configuration files, CONFIG.SYS and AUTOEXEC.BAT, cause the network processes (and optional network device drivers) to be loaded at system startup (boot) time.

ORDERING INFORMATION

Single-Use licensed software is furnished under the licensing provisions of DIGITAL's Standard Terms and Conditions, which provide in part that the software and any part thereof may be used on only the single CPU on which the software is first installed, and may be copied in whole or in part (with the proper inclusion of DIGITAL's copyright notice and any proprietary notices on the software) for use

on that same CPU.

You will need a separate license for each CPU on which you will be using the software product (except as otherwise specified by DIGITAL). Then, Materials and Service Options are selected to utilize the product effectively. THE LICENSE OPTIONS ARE DESCRIBED BELOW. IF YOU ARE NOT FAMILIAR WITH THE SERVICE OPTIONS, YOU MAY OBTAIN THE APPROPRIATE SOFTWARE PRODUCT SERVICE DESCRIPTION(S) FROM YOUR LOCAL DIGITAL OFFICE. If you are already familiar with these options, you may obtain the ordering information directly from the Software Options Chart.

LICENSE OPTIONS

Single-Use License Option

The Single-Use License is your right to use the software product on a single client CPU. If the software is first read from the media to a storage device associated with a server, and subsequently down-line loaded to a client CPU, a license must be obtained in advance for each client CPU to which the software is down-line loaded. The client CPUs will be considered the CPU on which the software is ''first installed'' under the terms of the license agreement.

For your first installation of this software product you must purchase, as a minimum, one of the following for each personal computer:

- Single-Use License Option

  This license is also available in DEPCA Network Integration Packages.

- Upgrade from DECnet-DOS to DECnet/PCSA Client

The license gives you the right to use the DECnet/PCSA Client Software on a single client CPU and the Distribution and Documentation Option provides the machine-readable software and related documentation.

To use this product on additional client CPUs, you must purchase for each client CPU, as a minimum, one of the following:

- Single-Use License Option

  Note that this license is also available in DEPCA Network Integration Packages.

- Upgrade from DECnet-DOS to DECnet/PCSA Client

In addition to the right to use, the license gives you the one-time right to copy the software from your original CPU installation to the additional CPU. Therefore, the Distribution and Documentation Option is not required, but optional.

Distribution and Documentation Option

The Distribution and Documentation Option provides the machine-readable software and the basic documentation. You must have a Single-Use License to obtain this option. You will need this option to install this software for the first time. When revised versions of this software product become available, they may also be obtained by

purchasing this option again.

Software Revision Right-to-Copy Option

The Right-to-Copy Option allows a customer with multiple CPUs to copy a revised version of a software product from one CPU to another. Each CPU must be licensed for that product. You first install the revised software on one CPU; then you can make copies for additional CPUs by purchasing the Right-to-Copy Option for each additional CPU.

Documentation-Only Option

The Documentation-Only Option provides one copy of the basic documentation.

SOFTWARE PRODUCT SERVICES

For information on services, please contact your local DIGITAL office.

## SOFTWARE OPTIONS CHART

The distribution Media Codes used in the Software Options Chart are described below. You specify the desired Media Code at the end of the Order Number, e.g., QBZP3-HB = binaries on a RX24 Floppy Diskette.

5 = TK50 (cartridge for VAX/VMS systems) with RX31 and RX24 floppy diskettes for installation on a VAX running VAX/VMS Services and down-line loading to a personal computer

I = RX31 (5 1/4-inch low density) Floppy Diskette

B = RX24 (3 1/2-inch) Floppy Diskette

Z = No hardware dependency

| OPTIONS | ORDER NUMBER |
|---|---|
| LICENSE OPTIONS: A LICENSE IS REQUIRED FOR EACH CPU. | |
| Single-Use License Option<br>This license is also available in DEPCA Network Integration Packages. | QBZP3-UZ* |
| Upgrade from DECnet-DOS to DECnet/PCSA Client | QBZP5-UZ |
| Software Revision Right-to-Copy Option | QBZP3-HZ |
| MATERIALS AND SERVICE OPTIONS: | |
| Distribution and Documentation Option | QBZP3-H5<br>QBZP3-HI<br>QBZP3-HB |
| Documentation-Only Option | QBZP3-GZ |

*Volume pricing is available for this option. See US Price List for details.

All references to MS tm-Windows refer to DIGITAL's adaption of Microsoft Corporation's MS-Windows.

PRODUCT NAME: VAXmate Software for Standalone Use, Version 2.0 SPD 55.06.02

DESCRIPTION

The Personal Computing Systems Architecture (PCSA) is an extension of DIGITAL's systems and networking architecture that merges the VMS and MS (tm)-DOS environments. PCSA provides a framework for integrating personal computers into an organization's total information system so that different types of users can share information, large system resources and network services across the entire organization.

The PCSA family of software products includes:

^ VAX/VMS Services for MS-DOS - Software that allows a VAX/VMS system to act as a file, print, and disk server to personal computers (Refer to SPD 30.50.xx.)

^ DECnet/PCSA Client: PC - Required software for the personal computer to use the facilities provided by VAX/VMS Services for MS-DOS or VAXmate Services for MS-DOS (Refer to SPD 55.07.xx)

^ DECnet/PCSA Client: VAXmate - Required software for VAXmates to use the facilities provided by VAX/VMS Services for MS-DOS or VAXmate Services for MS-DOS (Refer to SPD 55.10.xx.)

^ VAXmate Services for MS-DOS - Software that allows a VAXmate with an expansion box to act as a dedicated server to personal computers (Refer to SPD 55.09.xx.)

^ VAXmate Software for Standalone Use - Operating environment for non-network VAXmates, described in this document.

The PCSA products are based on DECnet and the right to use VAX/VMS Services for MS-DOS is included in the DECnet-VAX license. Other DECnet-VAX facilities are described in SPD 25.03.xx.

The VAXmate is an industry-standard personal computer that can be used either standalone or connected to a network. The VAXmate hardware, with the addition of VAXmate Software for Standalone Use, provides the user with the ability to use industry-standard applications in a non-networked environment.

VAXmate Software for Standalone Use provides:

^ Operating system

^ User interface

^ Terminal emulation

^ On-line user information

^ Printer support

No network software is provided with VAXmate Software for Standalone Use.

Operating System

The MS-DOS Operating System, Version 3.30, provides an environment that enables the user to perform operations such as program execution, file retrieval, and editing, as well as providing storage capabilities, disk utilities, and various other system-related operations. Most MS-DOS utilities provide the user with assistance on command formats.

The following diskettes can be used:

^ RX33 (READ/WRITE/FORMAT)

^ RX50 (READ/WRITE)

^ Industry-standard high density (96 TPI, 1.2M byte) (READ/WRITE/FORMAT)

^ Industry-standard low density (48 TPI, 180/360K byte) (READ only)

Key features of the operating system are:

^ Loadable text and graphic fonts

^ Loadable country-specific data tables and keyboard drivers:

- ISO - International Standards Organization character set
- MCS - DEC Multinational Character Set
- STD - IBM (r) extended character set
- ST2 - IBM Norway/Denmark extended character set
- XX7 - Indicates a 7-bit National Character Replacement set of country XX

  US - United States
  DE - German
  SF - Swiss/French
  DK - Denmark
  SE - Sweden
  UK - United Kingdom
  IT - Italy
  SD - Swiss/German
  NO - Norway
  CH - Swiss/German/French
  FR - France
  ES - Spain
  CA - Canada
  FI - Finland

- TCS - Technical Character Set

^ The ability to use the VAXmate's RAM memory as a pseudo disk

^ The ability to set and reset all file attributes

^ Backup and restore, including to subdirectories

^ Graphics support for LA75, LA50, LA210, LJ250, LN03-PLUS, IBM Graphics Printer, IBM PC Color Printer, and IBM Proprinter

User Interface

In addition to a MS-DOS command line interface, VAXmate Software for Standalone Use provides MS-Windows, Version 1.03.

MS-Windows is a graphical extension of the MS-DOS Operating System that provides the user with a visual interface to the operating system by means of pull-down menus, dialog boxes and icons instead of the traditional command structure used by MS-DOS.

MS-Windows can split the display screen into multiple windows and allow several programs to appear on the screen at the same time. The user can switch between windows and transfer data between applications.

The user can also invoke the MS-DOS Command Processor through this interface. The command processor allows the use of the traditional MS-DOS command structure.

Features that are available when running applications that have been designed and written to use MS-Windows' facilities are:

^ Limited multi-tasking

^ Multiple windows allowing for data transfer between windows

^ Support of CGA (and EGA, with third-party graphics card) graphic resolution

^ A mouse as a virtual pointer

^ A displayable ''clipboard'' area to temporarily store information that is being copied or moved

^ Moving, sizing or zooming of windows on the screen

Several MS-Windows applications are included: Calculator, Notepad, Clock, Paint, Cardfile, Calendar and Control Panel.

Drivers are included to support the following DIGITAL devices:

^ VSXXX-AA Mouse

^ LK250 Keyboard

^ LA75 Printer (serial), in DEC mode and in emulation of the IBM Proprinter

^ LN03 PLUS Printer, in DEC mode and in emulation of the IBM Proprinter (with ISO/PC cartridge). The user may select up to two of the following font cartridges supported within MS-Windows:

- ISO/PC
- C.G. Times 8pt, 10pt, 12pt
- C.G. Times 14pt, 18pt
- C.G. Times 24pt
- C.G. Triumvirate 8pt, 10pt, 12pt
- C.G. Triumvirate 14pt, 18pt

- C.G. Triumvirate 24pt
- I.T.C. Souvenir 8pt, 10pt, 12pt
- OCR-A, OCR-B

^ LN03R Printer

^ LA50 Printer

^ LA210 Printer, in DEC mode and in emulation of the IBM Proprinter

In addition, the drivers are provided to support the following IBM printers:

^ IBM Graphics Printer

^ IBM Proprinter

Several industry-standard hardware drivers are supplied for use with other non-DIGITAL products. These drivers are provided on an ''AS IS'' basis without any warranty of any kind, either express or implied.

These unsupported drivers allow the use of the following products:

^ Microsoft Mouse

^ Mouse Systems Mouse

^ Logitech Serial Mouse

^ Kraft Joystick Mouse

^ VisiOn Mouse

^ FTG Data Systems Light Pen and Single Pixel Board

^ The Lite-pen Company Light Pen

^ Hercules Graphics Card with monochrome display

^ Intel TM AboveBoard/AT

^ C-Itoh 8510 printer

^ Epson (R) FX-80 printer

^ Epson LQ-1500 printer

^ Epson MX-80 Graftrax printer

^ HP (R) LaserJet printer

^ HP LaserJet+ printer

^ HP ThinkJet (2225 C-D) printer

^ HP 7470A printer

^ HP 7475A printer

^ HP 7550A printer

^ NEC P2/P3 printer

^ NEC 3550 printer

^ Okidata 92/93 (IBM) printer

^ Okidata 92/93 (STD) printer

^ Okidata 192/193 (IBM) printer

^ Okidata 192/193 (STD) printer

^ POSTSCRIPT (TM)/Laserwriter

^ Star SG-10 printer

^ TI (R) 850 printer

^ TI 855 printer

^ Toshiba P351

^ Xerox (r) 4020

Program Information Files (PIFs) are supplied for MS-DOS commands and SETHOST. These PIFs are supported by DIGITAL.

PIFs are also supplied for several applications written by third parties. These PIFs are provided on an ''AS IS'' basis without warranty of any kind, either express or implied.

Terminal Emulation

VAXmate Software for Standalone Use includes terminal emulation software that allows the user to establish terminal sessions with a host computer such as a VAX. Terminal sessions can be established using the VAXmate's serial communications port or the optional integral modem.

Two terminal emulations are provided for VAXmate:

^ VT220 terminal emulation, for use within the MS-Windows environment. Full modem control and replaceable character sets (DRCS) are not supported

^ SETHOST, previously known as VT240 terminal emulator, for use from the MS-Windows environment or at the MS-DOS command line. When the emulator is invoked through the MS-Windows, it will take control of the total screen, keyboard, and communications ports. SETHOST supports ReGIS, but does not support the Tektronix 4010 and 4014 modes of operation. Full modem control and replaceable character sets are supported.

Features of the MS-Windows VT220 terminal emulator are:

^ Support for serial terminal communication

^ Support for the MS-Windows Clipboard to cut and paste information

- Ability to log characters received from the host into a file
- Ability to send characters to the host from a file instead of from the keyboard
- DIGITAL multinational and ISO multilingual character sets and compose sequences (Refer to Operating Systems section above for list of multinational character sets provided)
- Setup feature allows selection and saving of terminal characteristics
- Printing to a DIGITAL printer attached to the VAXmate; printing may be a screen at a time or a toggle-like function may be used to print everything from the screen until the toggle is switched off.

Features of SETHOST (VT240 terminal emulator) are:

- Ability to log characters received from the host into a file
- Ability to send characters to the host from a file instead of from the keyboard
- Support for applications that display information on a VT240, including ReGIS support
- Two video modes: Text and ReGIS Graphics and a fast text-only video mode.
- Supports full modem control
- DIGITAL multinational and ISO multilingual character sets and compose sequences (Refer to Operating System section for a list of multinational character sets provided)
- Setup feature allows selection and saving of terminal characteristics
- Printing to a DIGITAL printer attached to the VAXmate; printing may be a screen at a time or a toggle-like function may be used to print everything from the screen until the toggle is switched off.

Both the MS-Windows VT220 and SETHOST provide scripting facilities. The script processing language allows the automation of frequently executed functions. For example, a script can be written to automatically log a user in to a computer or to dial in to a computer. Scripts can be written to perform a task and then exit the terminal emulator, without user intervention.

On-Line User Information

The On-Line User Information System provides information about how to use the VAXmate system in an easy-to-use format with quick access to specific topics. It contains comprehensive user documentation and tutorials on how to use the system. The Information System runs as an MS-Windows application and uses standard MS-Windows user interface conventions.

Features of the On-Line User Information System are:

- Topic selection from menus, from a comprehensive topics list, or by typing in index terms

- Ability to maintain multiple bookmarks at topics of the user's choice

- Cross-references to related information

- Ability to return to a preceding topic, or to the main menu, in a single step

- Ability to copy material from the information base to the MS-Windows clipboard or to a printer

Printer Support

With MS-Windows or MS-DOS, users can print files to a local printer (a printer attached directly to the VAXmate). Note that support is provided within MS-Windows for fonts for the LN03 PLUS (Refer to User Interface section for a list of supported fonts) and the LN03R; font support at the MS-DOS command line level is application-dependent.

Supported local printers, from MS-Windows and from MS-DOS command line, are:

- LN03-PLUS

- LN03

- LA75, in DEC mode and in emulation of the IBM Proprinter

- LA50

- LN03R

- LA210, in DEC mode and in emulation of the IBM Proprinter

- LJ250 (LJ250 supported from MS-DOS command line only)

- IBM Proprinter

- IBM Graphics Printer

In addition, MS-Windows printer drivers are provided, without DIGITAL support, for several third-party printers. Refer to the User Interface section of this document for a list of unsupported MS-Windows printer drivers

MINIMUM HARDWARE REQUIRED

Any valid VAXmate configuration with one of the following hard disk drives:

- RCD31-FC (United States) or RCD31-FA (Non-US) 20M byte hard disk drive; expansion box with two industry-standard option slots

- RCD32-FC (United States) or RCD32-FA (Non-US) 42M byte hard disk drive; expansion box with two industry-standard option slots

OPTIONAL HARDWARE

DIGITAL Printers

^ LA75

^ LN03-PLUS

^ LN03

^ LA50

^ LN03R

^ LA210

^ LJ250

The following hardware options from DIGITAL may be added to the VAXmate:

^ PC50X-AA 2-Mbyte Memory Upgrade Option

^ P287 Intel 80287 Math Coprocessor

^ PC50X-MA Integral Modem Option (for North America)

PREREQUISITE SOFTWARE

None

OPTIONAL SOFTWARE

DECnet-VAXmate, Version 2.0

SOFTWARE WARRANTY

Warranty for this software product is provided by DIGITAL with the purchase of a license for the product as defined in the Software Warranty Addendum of this SPD.

INSTALLATION

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You will need a separate license for each CPU on which you will be using the software product except as otherwise specified by DIGITAL.

VAXmate Software for Standalone Use is available only on RX33 diskettes.

Q6005-A7 Single-Use License, binaries, documentation, warranty

Software Product Services

A variety of service options are available. For more information on these and other services, please contact your local DIGITAL office.

All references to MS tm-Windows refer to DIGITAL's adaption of Microsoft Corporation's MS-Windows.



April 1988
BH-JE61C-TH

# SPD INFORMATION

# FOR PCSA V2.0

# SPD CORRECTION

The Software Product Description (SPD 30.50.02) for VAX/VMS Services for MS-DOS contains an error. In the discussion of Disk Services, the following restriction is listed:

- o ANSI.SYS, FDISK, and PRINT should not be used with local area disks.

This is false - all of these can be used with local area disks. This error will be corrected in the SPD as soon as possible.