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**TITLE**  
PATHWORKS V5 FOR DOS AND WINDOWS AT DREA

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DREA NOTE No. H/94/4

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**Pathworks V5 for DOS and Windows at DREA**

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Approved by *mmj*  
September 1994

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## **Abstract**

Digital Pathworks V5<sup>TM</sup> for DOS and Windows<sup>TM</sup> allows PCs to access network services at DREA. Pathworks applications include network disk and printer services, file transferring, and terminal emulation, including X Windows. This research note provides site-specific information about installing and using Pathworks at DREA.

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## 1 Introduction

This research note describes Digital Pathworks V5<sup>TM</sup> for DOS and Windows<sup>TM</sup> networking software at DREA. There are two principal reasons for why a special document has been written on Pathworks for DOS and Windows at DREA. First, documentation set consists of approximately 20 manuals, so that a summary of the essentials is useful for the casual user. Second, this note provides information specific to the Pathworks installation at DREA.

## 2 Pathworks Capabilities at DREA

The network node Maggie is the Pathworks server at DREA, and is currently running version 4.1 of the server software. The server software allows access to disk and printer services via DECnet transport over Ethernet.

The Pathworks V5 for DOS and Windows client software is available to PCs through a disk service PWV50 mounted on Maggie. Pathworks for DOS and Windows can be installed to a PC from this disk service. A PC running Pathworks 5 can also run most client software off this disk service; thus, the PC client does not have to install all the Pathworks software onto the local hard disk.

A PC running Pathworks 5 has access to many different resources, including the disk and printer services on Maggie previously mentioned. A useful new feature for Pathworks 5 is that both DECnet and TCP/IP transports can run simultaneously on the PC. DECnet is required to access network disk and printer services on Maggie, while TCP/IP is required to access most UNIX computers at DREA. TCP/IP is available on Maggie for terminal access via TELNET and file transfers using FTP. A possible future upgrade of the server on Maggie could allow access to network disk and printer services using TCP/IP. Table 1 gives a summary of the main Pathworks 5 programs relevant to DREA.

**Table 1:** Useful Pathworks 5 Program at DREA

USE	Access to network disk and printer services on Maggie
Network Connect	Windows version of USE
NET PRINT	Printing and printer configuration
SETHOST	DOS terminal emulator
VT320	Windows terminal emulator
DWDOS	PC DECwindows Motif X terminal
NCP	DECnet network control program
NFT	DECnet network file transfer
FTP	TCP/IP file transfer program

### 3 Licensing and Documentation

Each Pathworks 5 PC client must obtain a user license from Digital. Unlike Pathworks 4, a single Pathworks 5 license is valid for both DECnet and TCP/IP transports. A new user license (Digital number QM-0EKAA-A1) costs approximately \$280, while an upgrade license (Digital number QM-0EMAA-A1) from Pathworks 4 costs approximately \$80.

DREA has a master set of documentation for Pathworks V5 for DOS and Windows. It is recommended that each client purchase a user manual [1] at a cost of approximately \$15.

### 4 Installation to a Client

This section gives a detailed description of how to install the client software from the server to the PC.

#### 4.1 DREA Pathworks Template

The main program for installing the client software is PWSETUP. PWSETUP copies selected components from the server to the client. When running PWSETUP, the program asks which template the user would like to use for selecting software components to be transferred to the local PC. It is highly recommended that the user select the following template during the installation procedure:

McTaggart Basic - Digital Basic LAN Manager with DECNET and TCP/IP

The above template has been developed to make optimal use of networking facilities available at DREA. The user can make modifications from this template during installation. The installed files require only 3 MB of disk space on the client PC. Running the network will require approximately 200 kB of memory using this configuration. The McTaggart Basic template installs both DECnet and TCP/IP transports to the client. It also installs all components of Table 1 except PC DECwindows Motif and VT320 to the local hard disk. The user can run them off the server on Maggie, but if DECwindows or VT320 will be used frequently, then they should be installed to the client hard disk for optimal performance. PC DECwindows requires approximately 8 MB of disk space, while VT320 requires approximately 2 MB of disk space.

#### 4.2 Detailed Installation Procedure

The following sequence describes how to install Pathworks V5 for DOS and Windows on a PC Client.

##### 1) Get Required Node Information

The user must obtain DECnet and/or TCP/IP node numbers for the client. Examples are as follows:



TCP/IP client	dogfish	131.136.16.110
DECnet client	mctag	20.19

Maggie is the Pathworks server and is numbered as follows:

TCP/IP server	maggie	131.136.16.11
DECnet server	Maggie	20.503

No password is required for connecting to the server Maggie.

## 2) Make Initial Connection to Pathworks Files on Server

The initial connection to Maggie can be made using a special diskette included with Pathworks 5 or with existing Pathworks V4 software on the PC.

### Initial Connection Using Pathworks V5 SETUP

If installing Pathworks for the first time on a PC, run program SETUP from the diskette PW V5 SETUP (LAN MANAGER) which comes with Pathworks. This program makes an initial connection to the server. Chapter 3 of Reference 2 describes this procedure in more detail.

Select the Configure PC option when starting SETUP. When SETUP asks which transport to use for connection to the server, select DECnet.

### Initial Connection Using Pathworks V4

If upgrading from Pathworks V4, the following command will connect the server as drive G: (or another available drive letter can be used) while the network is running:

```
C:> USE G: \\MAGGIE\PWV50
```

## 3) Run Installation Program PWSETUP

If installing Pathworks for the first time, SETUP will automatically start PWSETUP.

If upgrading Pathworks, and the network connection described above has been successfully made, then PWSETUP should be run from the server. Start Windows and enter the following as an argument for the Windows Run command:

```
G:\PCAPP\PWSETUP
```

A suitable Pathworks destination directory is:

```
C:\PW5
```

When running PWSETUP, choose the CUSTOMIZE option. When PWSETUP asks which template to use, request the McTaggart Basic template. If you intend to use PC DECwindows or VT320 frequently, you may wish to install these files to the local hard disk.

During installation, PWSETUP asks whether PATHWORKS should request which template to use each time the network is started. It is recommended that this option not be used because it will significantly increase the startup time.

#### 4) Modify the Template File

The network startup file STARTNET.BAT calls a template file, which is most likely named C:\PW5\CFG0001.TPL. The following lines related to a license manager and logging onto the server are not required at DREA and should be commented out using the REM command:

```
{+LOADHI} {+DEST}PWLICLMT.EXE /L:{LICCOUNT} /nologo
{+DEST}PWLICLM.EXE {LICENSESERVER} /group:{LICENSEGROUP}
{+DEST}SETLOGON.EXE {username} *
```

#### 5) Set Up the Network Node Databases

For DECnet transport, the network database should be created using NCP. Run program LATCP and its command ADD to add LAT hosts for connection through DECnet transport.

For TCP/IP, the network database file HOSTS is copied from the server MAGGIE to the client during installation. The HOSTS file on MAGGIE has TCP/IP nodes at DREA, and may be updated as required.

#### 6) Remove Old Pathworks Files and Drives

Remove any old Pathworks drivers from CONFIG.SYS (Pathworks 5 does not require any network drivers in CONFIG.SYS). Delete old Pathworks files. Old directories MSWINV30, PCAPP, DECNET, LMDOS, HELP, XSERVER, and TCPIP can likely be deleted. New Pathworks files are in a user specified directory (e.g. PW5). If PC DECwindows is installed, its directory XSERVER, (which has associated subdirectories containing fonts) should be a subdirectory of the main Pathworks directory.

#### 7) Add STARTNET to DOSKEY

The network startup command should be specified as a DOSKEY alias in AUTOEXEC.BAT:

```
DOSKEY STARTNET=C:\PW5\STARTNET.BAT
```

When starting the network using STARTNET.BAT, the Pathworks directories on the client and server will be added to the path; thus, these directories should not be included in the PATH command in AUTOEXEC.BAT.

The PATH statement in AUTOEXEC.BAT, which can normally have a maximum of 127 characters, must have sufficient margin for extra characters (approximately 20) which are added when the network is started.

## 8) Add Desired Network Connections to STARTNET.BAT

A user typically wants Pathworks to connect to a printer at startup. The following command should be added to STARTNET.BAT to connect LPT2: to the Postscript printer queue on Maggie:

```
USE LPT2: \\MAGGIE\RM362_POST
```

If connecting to another DEC printer, it may have to be configured as a Postscript printer at startup. For example, the following commands are needed to set LPT3: as a Postscript printer on Maggie RM362, with McTaggart printed on the flag page and no trailer page for each print job:

```
USE LPT3: \\MAGGIE\RM362A
NET PRINT LPT3: /SET /PARAMETERS=("DATA=POST") /NAME:McTaggart /NOTRAILER
```

## 9) Configure PC DECwindows Motif

If you are going to be running PC DECwindows Motif, start DWDOS and use the configuration option. (The network must be running using STARTNET before running DWDOS). Account information (e.g. McTaggart on Maggie) should be configured first. DWDOS should then be configured to run the Motif window manager from Maggie at startup. This file is located on Maggie as follows:

```
SYS$SYSTEM:DECW$MWM
```

DECW\$MWM is generally required to successfully run other X applications such as the following:

X Terminal on Rainbow	/usr/bin/X11/xterm
X Terminal on Maggie	SOFTPACS: [XTERM]XTERM
DEC Terminal on Maggie	SYS\$SYSTEM:DECW\$TERMINAL

When running DWDOS, the configuration file must be in the current directory for DWDOS to recognize it.

Reference 3 describes PC DECwindows Motif in detail.

## 10) Remove Undesired Windows Groups Installed by Pathworks

PWSETUP creates groups "Pathworks Windows Applications" and "Pathworks DOS Applications" under Windows. The group "Pathworks DOS Applications" is not very useful and should normally be deleted.

### 4.3 Starting and Stopping the Network

The network is started using the STARTNET command, which can be called within AUTOEXEC.BAT if desired. STARTNET.BAT connects the client PC to the Pathworks service \\MAGGIE\PWV50 and adds the local and server Pathworks directories (e.g. C:\PW5 and G:\PCAPP) to the path. STOPNET.BAT stops the network, freeing memory and removing the Pathworks directories from the path.

## 5 Important User Applications

This section describes the most useful Pathworks applications at DREA. Reference 1 describes Pathworks applications in greater detail.

### 5.1 USE - Connecting to Network Printers and Disks

The USE command connects to network printers and disks. Example commands are shown below.

```
C:> USE \\MAGGIE ?           Shows network services available on Maggie
C:> USE                       Shows current network connections
C:> USE LPT3: \\MAGGIE\RM362A Connects RM362A as LPT3:
C:> USE G: \\MAGGIE\PWV50    Connects \\MAGGIE\PWV50 as drive G:
```

Reference 4 describes the USE command in detail.

### 5.2 Network Connect - Connecting to Network Printers and Disks Under Windows

Network Connect is a Windows program which performs the same tasks as USE.

### 5.3 NET PRINT - Network Printing and Printer Configuration

NET PRINT prints files and configures network printers. The following command prints file TEXT.DOC on network printer LPT2:

```
C:> NET PRINT TEXT.DOC LPT2:
```

NET PRINT can also configure network printers. The following command configures network printer LPT2: as a Postscript printer:

```
C:> NET PRINT LPT2: /SET /PARAMETERS=("DATA=POST")
```

Reference 4 describes the NET PRINT command in detail.

#### **5.4 SETHOST - DOS Terminal Emulator**

SETHOST is a DOS emulator that runs very quickly. SETHOST can use either DECnet or TCP/IP transports.

#### **5.5 VT320 - Windows Emulator**

VT320 is similar to SETHOST, but runs under Windows.

#### **5.6 DWDOS - PC DECwindows Motif**

DWDOS is a DOS program which runs a PC as an X terminal. DWDOS can run slowly on 386 computers and adds to network traffic.

Reference 3 describes PC DECwindows Motif in detail.

#### **5.7 NCP - DECnet Network Control Program**

NCP configures node information which is required for using NFT.

#### **5.8 NFT - DECnet Network File Transfer**

NFT uses DECnet transport for file transfer. NFT can only transfer files to other computers running DECnet transport, and is thus limited primarily to VAX computers at DREA. FTP is generally easier to use and accessible to more computers than NFT.

#### **5.9 FTP - TCP/IP File Transfer Program**

FTP can transfer files to most networked computers at DREA, including SGI and other UNIX workstations. FTP is generally more useful than NFT, which is limited to computers running DECnet. Pathworks includes both DOS and Windows versions of FTP.

### **6 Disk Services and Backups on Maggie**

Maggie currently has the following Pathworks disk services available to PCs:

\\MAGGIE\PWV50	Pathworks V5 for DOS and Windows Software
\\MAGGIE\PWSERVICE	General disk service

The disk service PWSERVICE is a convenient location for backing up PC disks. Because of limited disk space, backups to PWSERVICE should be limited to user generated files and should not include entire system backups.

A connection to the disk service PWSERVICE can be made as follows:

```
C:> USE \\MAGGIE\PWSERVICE H:
```

The user should create his own directory on network drive H: as follows:

```
C:> MKDIR H:\MCTAGGAR
```

Backup to network drive H: from a local drive (D: for example) can then be made using the DOS commands MSBACKUP or XCOPY. The XCOPY command for copying all files from D: to H: is:

```
C:> XCOPY D: H:\MCTAGGAR /E/S/V
```

Once a full backup has been performed using the above command, incremental backups can be using the XCOPY options /M or /A.

MSBACKUP creates a single backup file, which has two advantages relative to XCOPY. First, other users cannot routinely browse the contents of the MSBACKUP file without running the RESTORE command of MSBACKUP. Second, the single backup file can easily be transferred between machines using FTP.

## 7 System Requirements and Potential Problems

Running Pathworks at DREA using the McTaggart Basic template requires relatively modest system resources and generally causes few problems. The files in the McTaggart Basic template require 3 MB of disk space, which will increase to 11 MB if VT320 and DECwindows are installed on the PC hard drive. Running the PC network requires 206 kB of computer memory, of which approximately 165 kB must run in lower DOS memory.

Most installation problems observed to date have been due to Ethernet cards which have not been properly configured prior to installing the Pathworks software. Improper IRQ settings and PROTOCOL.INI files are common problems with Ethernet cards. Documentation provided with the Ethernet card can normally resolve such problems.

The Pathworks V5 software appears to work well with other PC software, and integrates well with Microsoft Windows. While the network is running, the editor MEMACS gives the following error message upon startup:

```
NET803: Network path not found
Abort, Retry, Fail?
```

Surprisingly, striking the "F" key for Fail will allow MEMACS to finish its startup.

When the the server Maggie is down, Pathworks disk and printer services are not available; however, file transfer using FTP and terminal access using SETHOST, VT320, and DWDOS are available if these program are installed on the PC hard disk.

## 8 Conclusions

Pathworks V5 for DOS and Windows provides networking capabilities to PCs at DREA. Pathworks 5 allows PC clients to use both DECnet and TCP/IP network transports simultaneously. Useful Pathworks features include network disk and printer services, file transfer programs, and terminal emulation, including X Windows. This note has provided a summary on installing and running Pathworks on PCs at DREA. Pathworks appears to satisfy PC networking requirements at DREA.

## References

1. Digital Equipment Corporation, "Pathworks V5 for DOS and Windows - User's Handbook," Order number AA-PAF7D-TK, December 1993.
2. Digital Equipment Corporation, "Pathworks V5 for DOS and Windows - Client Installation and Configuration," Order number AA-PAR9D-TK, December 1993.
3. Digital Equipment Corporation, "Pathworks V5 for DOS and Windows - PC DECwindows Motif Guide," Order number AA-PAFBD-TK, December 1993.
4. Digital Equipment Corporation, "Pathworks V5 for DOS and Windows - Client Commands Reference," Order number AA-PAFED-TK, December 1993.

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