

# **Professional Tool Kit PASCAL Language Reference Manual**

Order No. AA-U047A-TK

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This manual describes the Professional Developer's Tool Kit PASCAL language, which is based on the standard proposed for the PASCAL programming language by the International Organization for Standardization. This manual is designed primarily for reference.

OPERATING SYSTEM AND VERSION: VAX/VMS V3.2 or later  
RSX-11M V4.1 or later  
RSX-11M-PLUS V2.1 or later

SOFTWARE VERSION: Professional Developer's Tool Kit V1.5  
Professional Tool Kit PASCAL V1.0

DIGITAL EQUIPMENT CORPORATION  
Maynard, Massachusetts 01754

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## PREFACE

### Document Objectives

This document describes how to install the Tool Kit PASCAL compiler on RSX-11M/M-PLUS and VAX/VMS host systems and is intended to be used by system managers.

It also contains information specific to Release 1 of Tool Kit PASCAL and is intended to be used by software developers.

### Intended Audience

The installation chapters of this document are intended for system managers but can be used by any user with system privilege.

The release notes are intended for experienced programmers familiar with the PASCAL programming language and with the Professional 300 Series Developer's Tool Kit.

### Documentation Conventions

red letters                      Red letters indicate words that you type (to distinguish them from words that the computer types).

### Associated Documentation

- Professional Developer's Tool Kit PASCAL Language Reference Manual
- Professional Developer's Tool Kit PASCAL User's Guide
- Professional Developer's Tool Kit User's Guide
- PRO/Communications Manual



## CHAPTER 1

### INSTALLING TOOL KIT PASCAL ON RSX-11M/M-PLUS SYSTEMS

#### 1.1 THE DISTRIBUTION KIT

The Tool Kit PASCAL distribution volume is available on the following media:

- 800 bpi (nine-track) DOS magtape
- 1600 bpi (nine-track) DOS magtape
- RL02 disk
- RK07 disk

The distribution volume contains the following files:

PROPAS.TSK	The PASCAL compiler
PASLIB.OLB	Non-sharable portion of PASCAL OTS
PASRES.TSK	Sharable portion of PASCAL OTS
PASRES.STB	Symbol definitions for PASCAL OTS
PASERR.MSG	Message file
PROBLD.CMD	Builds command files for RSX-11M/M-PLUS host
RMSDEFS.PAS	RMS-11 interface declarations
CGLDEFS.PAS	CORE Graphics Library declarations
MAPDEFS.PAS	Memory management directive declarations
ERROR.PAS	Sample error handling routine
ELEMENTED.PAS	Installation verification program

## INSTALLING ON RSX-11M/M-PLUS

ELEMENTED.CMD    IVP Application Builder command file  
ELEMENTED.ODL    IVP Overlay Descriptor Language file  
ELEMENTED.INS    IVP Installation command file

### 1.2 REQUIREMENTS

- Tool Kit PASCAL requires approximately 900 blocks of free disk space.
- To install Tool Kit PASCAL, you must have already installed the Peripheral Interchange Program (PIP) and the File Exchange Program (FLX) to transfer files from magtape to disk.
- You must have access to a drive on which to mount the distribution volume.
- You must have access to a privileged login user identification code (UIC). If you do not have one, contact your system manager before beginning the installation.

### 1.3 INSTALLING TOOL KIT PASCAL FROM MAGTAPE

You should install Tool Kit PASCAL on the same disk that contains the Professional Developer's Tool Kit.

1. Log in to your RSX-11M/M-PLUS system, using a privileged UIC.
2. If you are using a DCL terminal, type:  
  
\$ SET TERM MCR
3. Load the Tool Kit PASCAL distribution volume into a drive, making sure that it's write-locked (make sure the the plastic ring has been removed before loading the tape).
4. Mount the Tool Kit distribution volume. For example, type:  
  
> MOU MM0:/FOR
5. It is recommended that you now back up the distribution volume. Use any of the standard RSX-11M/M-PLUS backup utilities.

## INSTALLING ON RSX-11M/M-PLUS

6. Copy the installation command file (TKIP.CMD) from the distribution volume to your default directory. If you are copying from an 800 bpi magtape, use the command:

```
>FLX /RS=MM0:[1,5]TKIP.CMD/DO
```

If you are copying from 1600 bpi magtape, use the command:

```
>FLX /RS=MM0:[1,5]TKIP.CMD/DO/DNS:1600
```

7. Execute the installation command file:

```
>@TKIP
```

8. The following will display on your screen. When the system prompts you, type in the name of the device on which the distribution volume is loaded. (If your host system does not have parent-offspring tasking, additional command lines will display.)

```
>;-----;
>;
>; P R O F E S S I O N A L   D E V E L O P E R S   T O O L   K I T   ;
>;
>;           R S X - 1 1 M / M - P L U S
>;
>;           I n s t a l l a t i o n   P r o c e d u r e
>;
>;           P A S C A L   V E R S I O N   1 . 2
>;-----;
>;
>;
>* Device containing the distribution kit? [S]:MM0:
>;
>;           Copying the Tool Kit files
>;
>INS LB:[g,m]PROPAS
>; Compiling a sample application
>; This will take a few minutes
>TKP ELEMENTED,ELEMENTED=LB:[1,5]ELEMENTED/XR/-TR/-CH
..lex
..syn
..opt
..gen
..lst
>; Successful Installation of Professional/Tool Kit PASCAL
V1.2-1
>REM TKP
>DEL ELEMENTED.OBJ;
>
```

## INSTALLING ON RSX-11M/M-PLUS

```
>DEL ELEMENTED.LST;
>;      Deleting installation files
>;
>PIP    FLXFILIDX.CMD;/DE/NM
>PIP    FILIDX.CMD;/DE/NM
>PIP    DELFILIDX.CMD;/DE/NM
>;-----;
>;                                           ;
>;      The Professional Tool Kit has been installed.      ;
>;      Please unload and store all media.                  ;
>;                                           ;
>;  NOTE:  If you have previously installed a version of the ;
>;          Professional Tool Kit, you may want to purge the ;
>;          earlier files to recover the disk space. Please ;
>;          consult your release notes for a list of the    ;
>;          affected directories.                            ;
>;                                           ;
>;      *** End of Installation Procedure ***                ;
>;-----;
>@ <EOF>
```

### NOTE

In the above message, [g,m] is the system UIC on your system.

#### 9. Dismount the Tool Kit PASCAL distribution volume:

```
> DMO MM0:
```

10. Unload the Tool Kit PASCAL distribution volume, and deallocate the drive if you allocated one earlier.
11. Store the Tool Kit PASCAL distribution volume in a safe place.
12. Optionally, run VMR and install the Tool Kit PASCAL compiler (LB:[g,m]PROPAS.TSK). The compiler has the task name "...TKP".
13. If you have a Professional, turn to Chapter 4 of this manual and follow the instructions for the Installation Verification Process. Otherwise, the installation of Tool Kit PASCAL is now complete.

### 1.4 INSTALLING TOOL KIT PASCAL FROM DISK

You should install Tool Kit PASCAL on the same disk that contains

## INSTALLING ON RSX-11M/M-PLUS

the Professional Developer's Tool Kit.

1. Log in to your RSX-11M/M-PLUS system, using a privileged UIC.
2. If you are using a DCL terminal, type:

```
$ SET TERM MCR
```

3. Load the Tool Kit PASCAL distribution volume into a drive, making sure that it's write-locked.
4. Mount the Tool Kit distribution volume. For example, type:

```
> MOU DL0:
```

5. It is recommended that you now back up the distribution volume. Use any of the standard RSX-11M/M-PLUS backup utilities.
6. Copy the installation command file (TKIP.CMD) from the distribution volume to your default directory.

```
> PIP SY:=DL0:[1,5]TKIP.CMD
```

7. Execute the installation command file:

```
> @TKIP
```

8. The following will display on your screen. When the system prompts you, type in the name of the device on which the distribution volume is loaded. (If your host system does not have parent-offspring tasking, additional command lines will display.)

```
>;-----;
>;
>; P R O F E S S I O N A L   D E V E L O P E R S   T O O L   K I T   ;
>;
>;           R S X - 1 1 M / M - P L U S           ;
>;
>;           I n s t a l l a t i o n   P r o c e d u r e           ;
>;
>;           P A S C A L   V E R S I O N   1 . 2           ;
>;-----;
>;
>;
>* Device containing the distribution kit? [S]:   DL0:
>;
>;           C o p y i n g   t h e   T o o l   K i t   f i l e s
```

## INSTALLING ON RSX-11M/M-PLUS

```
>;
>INS LB:[g,m]PROPAS
>; Compiling a sample application
>; This will take a few minutes
>TKP ELEMENTED,ELEMENTED=LB:[1,5]ELEMENTED/XR/-TR/-CH
..lex
..syn
..opt
..gen
..lst
>; Successful Installation of Professional/Tool Kit PASCAL
V1.2-1
>REM TKP
>DEL ELEMENTED.OBJ;
>
>DEL ELEMENTED.LST;
>;      Deleting installation files
>;
>PIP      FLXFILIDX.CMD;/DE/NM
>PIP      FILIDX.CMD;/DE/NM
>PIP      DELFILIDX.CMD;/DE/NM
>;-----;
>;
>;      The Professional Tool Kit has been installed.
>;      Please unload and store all media.
>;
>; NOTE:  If you have previously installed a version of the
>;      Professional Tool Kit, you may want to purge the
>;      earlier files to recover the disk space.  Please
>;      consult your release notes for a list of the
>;      affected directories.
>;
>;      *** End of Installation Procedure ***
>;-----;
>@ <EOF>
```

### NOTE

In the above message, [g,m] is the system UIC on your system.

9. Dismount the Tool Kit PASCAL distribution volume:

```
> DMO DL0:
```

10. Unload the Tool Kit PASCAL distribution volume, and deallocate the drive if you allocated one earlier.

## INSTALLING ON RSX-11M/M-PLUS

11. Store the Tool Kit PASCAL distribution volume in a safe place.
12. Optionally, run VMR and install the Tool Kit PASCAL compiler (LB:[g,m]PROPAS.TSK). The compiler has the task name "...TKP".
13. If you have a Professional, turn to Chapter 4 of this manual and follow the instructions for the Installation Verification Process. Otherwise, the installation of Tool Kit PASCAL is now complete.

### 1.5 IF THERE IS AN ERROR

The message "Tool Kit installation is now complete." does not necessarily mean that the installation was successful. Any appearance of system errors indicates an unsuccessful installation.

If an error occurs while the installation is in progress, all files copied from the distribution volume will be deleted. For example:

```
>;-----;
>;
>; P R O F E S S I O N A L   D E V E L O P E R S   T O O L   K I T   ;
>;
>;           R S X - 1 1 M / M - P L U S           ;
>;
>;           I n s t a l l a t i o n   P r o c e d u r e   ;
>;
>;           P A S C A L   V E R S I O N   1 . 2       ;
>;-----;
>;
>;
>* Device containing the distribution kit? [S]: MM0:
>;
>;       Copying the Tool Kit files
>;
FLX -- I/O error
MT0:[1,5]PROPAS.TSK -- I/O Error Code -13.
>;
>;       Installation Aborted - Cleanup in progress - Stand by
>;
>;       Please check the file LB:[g,m]PROPAS.TSK
>;       If it was copied during this installation, please delete
it.
>;
```

## INSTALLING ON RSX-11M/M-PLUS

```
> ;      Deleting the installation files
> ;
> PIP    FLXFILIDX.CMD;/DE/NM
> PIP    FILIDX.CMD;/DE/NM
> PIP    DELFILIDX.CMD;/DE/NM
> ;
> ;      Tool Kit installation is now complete.
> ;
> @ <EOF>
```

### NOTE

In the above message, [g,m] is the system UIC on your system.

Correct the error condition, then return to Section 1.2 of this manual and proceed with the installation again.

## CHAPTER 2

### INSTALLING TOOL KIT PASCAL ON A VAX/VMS SYSTEM

#### 2.1 THE DISTRIBUTION KIT

The Tool Kit PASCAL distribution volume consists of:

- Two RX01 diskettes for VAX-11/780 systems.
- Two TU58 cartridges for VAX-11/750 systems.

The distribution kit contains the following files:

PROPAS.EXE	The PASCAL compiler
PASLIB.OLB	Non-sharable portion of PASCAL OTS
PASRES.TSK	Sharable portion of PASCAL OTS
PASRES.STB	Symbol definitions for PASCAL OTS
PASERR.MSG	Message file
PROBLD.COM	Builds command files for VAX/VMS host
RMSDEFS.PAS	RMS-11 interface declarations
CGLDEFS.PAS	CORE Graphics Library declarations
MAPDEFS.PAS	Memory management directive declarations
ERROR.PAS	Sample error handling routine
ELEMENTED.PAS	Installation verification program
ELEMENTED.CMD	IVP Application Builder command file
ELEMENTED.ODL	IVP Overlay Descriptor Language file
ELEMENTED.INS	IVP Installation command file

## INSTALLING ON VAX/VMS

### 2.2 REQUIREMENTS

- Professional Tool Kit PASCAL requires approximately 900 disk blocks.
- You must have access to the console drive.
- You must have access to the privileged system manager's account SYSTEM.

### 2.3 INSTALLING TOOL KIT PASCAL

Proceed as follows at the console terminal.

#### NOTE

Some of the VMSINSTAL message lines shown in this terminal session have been folded in order to fit on a printed page. They will appear as single lines on your terminal.

1. Log in to the system manager's account SYSTEM.
2. Invoke VMSINSTAL:

```
$ @SYS$UPDATE:VMSINSTAL
```

```
VAX/VMS Software Product Installation Procedure
```

```
It is (current date/time string).  
Enter a question mark (?) at any time for help.
```

3. Several %VMSINSTAL-W-warning messages may appear, followed by:

```
* Do you want to continue anyway [NO]? YES  
* Are you satisfied with the backup of your system disk  
[YES]? YES  
* Where will the distribution volumes be mounted: CSA1:  
_ CSA1: allocated
```

```
Enter the products to be installed  
from the first distribution volume set.
```

```
*Products [EXIT]: PROPAS  
Please mount the first volume of the set on CSA1:.
```

## INSTALLING ON VAX/VMS

4. Remove the VMS console medium (if mounted) and load the first Tool Kit PASCAL distribution volume in the console drive.

Are you ready? YES

%MOUNT-I-MOUNTED, PROPAS01 mounted on CSA1:

The following products will be installed:

PROPAS V1.2

Beginning installation of PROPAS V1.2 at (time)

%VMSINSTAL-I-RESTORE, Restoring product saveset A...

%BACKUP-I-RESUME, resuming operation on volume 2

%BACKUP-I-READYREAD, mount volume 2 on CSA1: for reading

5. Remove the first Tool Kit PASCAL distribution volume and load the second distribution volume in the console drive.

Press return when ready: <RET>

\* Do you want to purge files  
replaced by this installation [YES]? NO \*

%VMSINSTAL-I-MOVEFILES,

Files will now be moved to their target directories...

Successful installation of PROPAS V1.2 at (time)

Enter the products to be installed from the next distribution volume set.

\* Products [EXIT]: <RET>

Please mount the console volume on CSA1:

Are you ready? YES

%MOUNT-I-MOUNTED, CONSOLE mounted on CSA1:

VMSINSTAL procedure done at (time)

6. If you have a Professional, turn to Chapter 4 of this manual and follow the instructions for the Installation Verification Process. Otherwise, the installation of Tool Kit PASCAL is now complete.

-----  
\* If you have Tool Kit PASCAL V1.0 or V1.1 on your system, answer "YES" here.



## CHAPTER 3

### INSTALLING TOOL KIT PASCAL ON A PROFESSIONAL 350 SYSTEM

#### 3.1 THE DISTRIBUTION KIT

The Tool Kit PASCAL distribution kit consists of two RX50 diskettes containing the following files:

PROPASCAL.TSK	The PASCAL compiler
PASLIB.OLB	Non-sharable portion of PASCAL OTS
PASRES.TSK	Sharable portion of PASCAL OTS (stub)
PASRES.STB	Symbol definitions for PASCAL OTS
PROBLD.CMD	Builds command files for PRO/Tool Kit
RMSDEFS.PAS	RMS-11 interface declarations
CGLDEFS.PAS	CORE Graphics Library declarations
MAPDEFS.PAS	Memory managment directive declarations
ERROR.PAS	Sample error handling routine
ELEMENTED.PAS	Installation verification program
ELEMENTED.CMD	IVP Application Builder command file
ELEMENTED.ODL	IVP Overlay Descriptor Language file
ELEMENTED.INS	IVP Installation command file
ELEMENTED.HLP	IVP help frame file
ELEMENTED.MNU	IVP menu frame file
ELEMENTED.MSG	IVP message file

## INSTALLING ON THE PROFESSIONAL 350

DCLPASCAL.HLP PASCAL help file

### NOTE

PASRES.TSK is only a "stub" for the Application Builder to use. The real OTS file are placed in [ZZSYS] at P/OS installation time.

### 3.2 REQUIREMENTS

- Professional Tool Kit PASCAL requires approximately 900 disk blocks.
- You must have a Professional 350 personal computer with the PRO/Tool Kit installed.

### NOTE

If your Professional 350 system has P/OS V1.5, the Tool Kit PASCAL installation verification procedure may fail. Turn to Section 5.1.1 (first note) for details.

### 3.3 INSTALLING TOOL KIT PASCAL

1. Start up your Professional 350 system.
2. If have already installed an application named "ELEMENTED", use Disk/diskette Services to remove it.
3. Invoke the PRO/Tool Kit.
4. Insert distribution diskette "PROPASCAL1" in DZ1.
5. Insert distribution diskette "PROPASCAL2" in DZ2.
6. Type:

```
$ SET DEF APPL$DIR
```

```
$ @DZ1:[INSTALL]INSTALL
```

## INSTALLING ON THE PROFESSIONAL 350

7. The following will appear on your screen:  

```
$ ;  
$ ; Pascal Language Installation Procedure  
$ ;
```
8. If you have installed a previous version, the following command will appear:  

```
$ REMOVE ...PAS
```
9. The remainder of the installation will continue with the following:  

```
$ INSTALL APPL$DIR:TKP/TASK=...PAS  
$ ; Compiling the Installation Verification Program  
$ ; This will take about 10 minutes  
$ PAS ELEMENTED  
$ ; Building the Installation Verification Program  
$ LINK @ELEMENTED  
$ INSTALL [ZZSYS]CGLFPU  
$ ; Executing the Installation Verification Program  
$ RUN ELEMENTED
```
10. Turn to Section 4.5, Step 2 of this manual and follow the instructions for running the Installation Verification Process.
11. The following will appear on your screen:  

```
$ REMOVE/REGION CGLFPU  
$ ; Installation complete  
$ @ <EOF>
```
12. Remove and store the distribution diskettes.



## CHAPTER 4

### INSTALLATION VERIFICATION PROCESS (IVP)

The Installation Verification Process (IVP) verifies the successful installation of Tool Kit PASCAL. The process consists of successfully compiling, building, installing, and running a sample PASCAL application. The sample is a partially-developed Elementary Education Application that is intended only to exercise specific features of the Tool Kit.

If you are using the Professional Developer's Tool Kit on a host RSX-11M/M-PLUS system, proceed to Section 4.1.

If you are using the Professional Developer's Tool Kit on a host VAX/VMS system, proceed to Section 4.2.

If you are using the PRO/Tool Kit on a Professional 350 system, proceed to Section 4.3.

#### 4.1 BUILDING THE IVP WITH AN RSX-11M/M-PLUS HOST TOOL KIT

The Installation Verification Process assumes that the Professional Developer's Tool Kit and Tool Kit PASCAL have been installed on your host RSX-11M/M-PLUS system and that the PRO/Communications application and the Fast Install program have been installed on your Professional.

Proceed as follows:

1. Start your Professional 300 Series system.
2. Use Disk/diskette Services to create a directory named ELEMENTED on BIGVOLUME.
3. Insert the Tool Kit RX50 diskette, volume label PRO/ APP DSKT BLDR V1.7 RX50 (the diskette that contains Fast Install and the Application Diskette Builder).

## INSTALLATION VERIFICATION PROCESS

4. Use File Services to copy the following files from TOOLKIT:[ELEMENTED] to BIGVOLUME:[ELEMENTED]:

```
ELEMENTED.MSG  
ELEMENTED.MNU  
ELEMENTED.HLP
```

5. Using the instructions in the PRO/Communications Manual, invoke the terminal emulator.
6. Log onto your host RSX-11M/M-PLUS system.
7. Compile the source file ELEMENTED.PAS. This file is provided with Tool Kit PASCAL and is automatically copied to LB:[1,5] when you install Tool Kit PASCAL on your host system. Type:

```
> RUN $PROPAS  
PAS> ELEMENTED=LB:[1,5]ELEMENTED
```

The file ELEMENTED.OBJ is produced by the compiler.

8. To build the IVP, you must have the ODL file in your directory. Type:

```
> PIP =LB:[1,5]ELEMENTED.ODL
```

9. Invoke the Professional Application Builder. Type:

```
> RUN $PROTKB  
PAB> @LB:[1,5]ELEMENTED
```

The file ELEMENTED.TSK is produced by the Application Builder.

10. Using the instructions in the PRO/Communications Manual, transfer ELEMENTED.TSK and LB:[1,5]ELEMENTED.INS to BIGVOLUME:[ELEMENTED] on your Professional.
11. Log off your host system.
12. Using the instructions in the PRO/Communications Manual, exit from the terminal emulator.
13. Proceed to Section 4.4.

### 4.2 BUILDING THE IVP WITH A VAX/VMS HOST TOOL KIT

The Installation Verification Process assumes that the

## INSTALLATION VERIFICATION PROCESS

Professional Developer's Tool Kit and Tool Kit PASCAL have been installed on your host VAX/VMS system and that the PRO/Communications application and the Fast Install program have been installed on your Professional.

Proceed as follows:

1. Start your Professional 300 Series system.
2. Use Disk/diskette Services to create a directory named ELEMENTED on BIGVOLUME.
3. Insert the Tool Kit RX50 diskette, volume label PRO/ APP DSKT BLDR V1.7 RX50 (the diskette that contains Fast Install and the Application Diskette Builder).
4. Use File Services to copy the following files from TOOLKIT:[ELEMENTED] to BIGVOLUME:[ELEMENTED]:

```
ELEMENTED.MSG  
ELEMENTED.MNU  
ELEMENTED.HLP
```

5. Using the instructions in the PRO/Communications Manual, invoke the terminal emulator.
6. Log onto your host VAX/VMS system.
7. Compile the source file ELEMENTED.PAS. This file is provided with Tool Kit PASCAL and is automatically copied to LB:[1,5] when you install Tool Kit PASCAL on your host system. Type:

```
$ RUN SYS$SYSTEM:PROPAS  
PAS> SY:ELEMENTED=LB:[1,5]ELEMENTED
```

The file ELEMENTED.OBJ is produced by the compiler.

8. To build the IVP, you must have the ODL file in your directory. Type:

```
$ COPY LB:[1,5]ELEMENTED.ODL *
```

9. Invoke the Professional Application Builder.

```
$ RUN SYS$SYSTEM:PROTKB  
PAB> @LB:[1,5]ELEMENTED
```

The file ELEMENTED.TSK is produced by the Application Builder.

## INSTALLATION VERIFICATION PROCESS

10. Using the instructions in the PRO/Communications Manual, transfer ELEMENTED.TSK and LB:[1,5]ELEMENTED.INS to BIGVOLUME:[ELEMENTED] on your Professional.
11. Log off your host system.
12. Using the instructions in the PRO/Communications Manual, exit from the terminal emulator.
13. Proceed to Section 4.4.

### 4.3 BUILDING THE IVP WITH A PRO/TOOL KIT

If you are using a Professional 350 system, the Tool Kit PASCAL installation procedure compiles, builds, and runs the IVP for you. If you want to perform the process yourself, proceed as follows:

1. Start your Professional 300 Series system and run the PRO/Tool Kit.
2. Type these commands in the order shown:

```
$ SET DEFAULT [ELEMENTED]
$ PASCAL ELEMENTED/XRAY
..lex
..syn
..opt
..gen
$ LINK @ELEMENTED
$ EXIT
```

3. Proceed to Section 4.4.

### 4.4 INSTALLING THE IVP

1. Select Fast Install from the appropriate menu. When Fast Install prompts for the disk directory name in which the application resides, type:

```
ELEMENTED
```

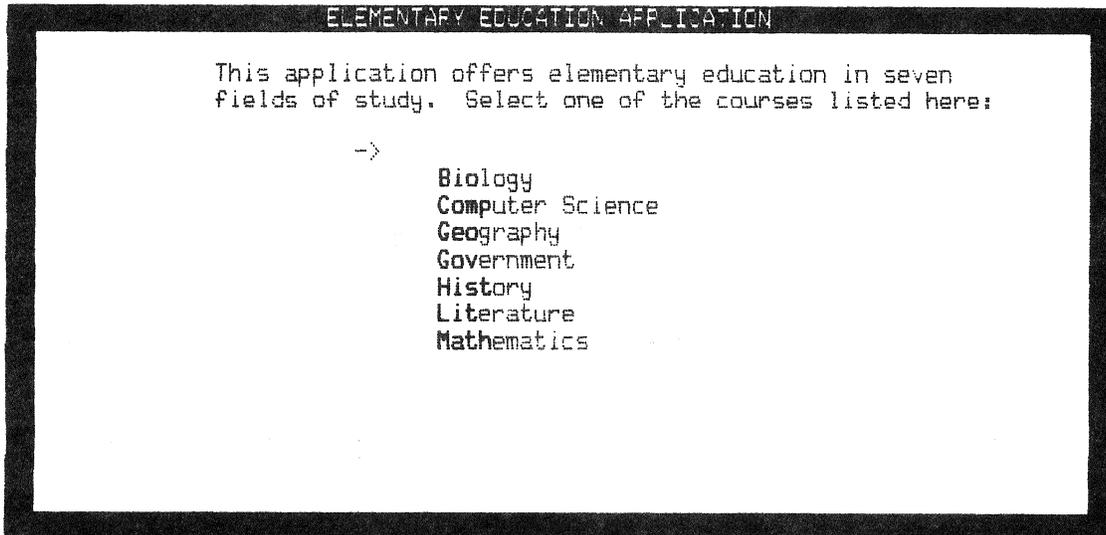
## INSTALLATION VERIFICATION PROCESS

2. When the Application Group Menu appears, select a group and press DO.
3. A form will appear displaying the name of the application, and the name of the group. Follow the instructions on the form and press DO.
4. Proceed to Section 4.5.

### 4.5 RUNNING THE IVP

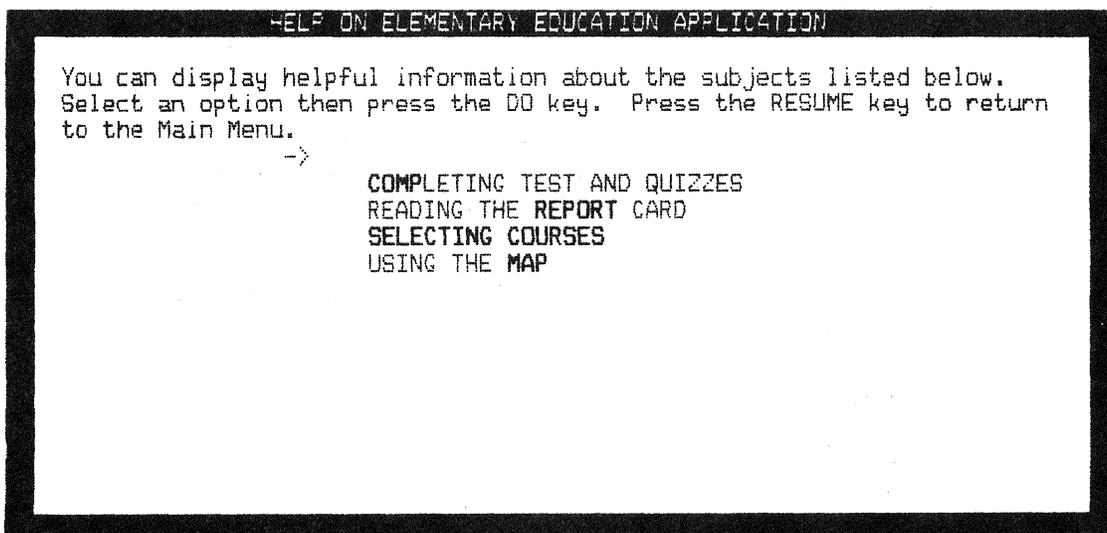
1. Select **ELEMENTED - PASCAL IVP** from the menu where you installed it.
2. A static, single-choice menu titled "Elementary Education Application" will appear (see Figure 4-1).
3. Press **HELP**. A help menu titled "Help on Elementary Education Application" will appear (see Figure 4-2).
4. Select **Reading the Report Card**. A help text frame will appear (see Figure 4-3).
5. Press **RESUME** to return to the first menu.
6. Select **Geography**. A multiple-choice menu titled "Course: Geography of North America" will appear (see Figure 4-4).
7. Using the **SELECT** key, select all of the options (including the incorrect ones) and press DO. An error message will appear and, after a few seconds, the multiple-choice menu will reappear.
8. Select **Mt. Rushmore, Mt. Washington, Mt. Hood, Grand Teton, Mt. Rainier, Mt. St. Helens, Mt. McKinley**, and press DO. A message indicating you have supplied the correct answer will appear.
9. After a few seconds, a map of the Northeastern United States will appear on your screen (see Figure 4-5). This completes the Installation Verification Process. Tool Kit PASCAL has been successfully installed.
10. Proceed to Chapter 5 for information on using Tool Kit PASCAL with the PRO/Tool Kit.

## INSTALLATION VERIFICATION PROCESS



Make a selection and press the DO key:

Figure 4-1: Elementary Education Application



Make a selection and press the DO key:

Figure 4-2: Help on Elementary Education Application

## INSTALLATION VERIFICATION PROCESS

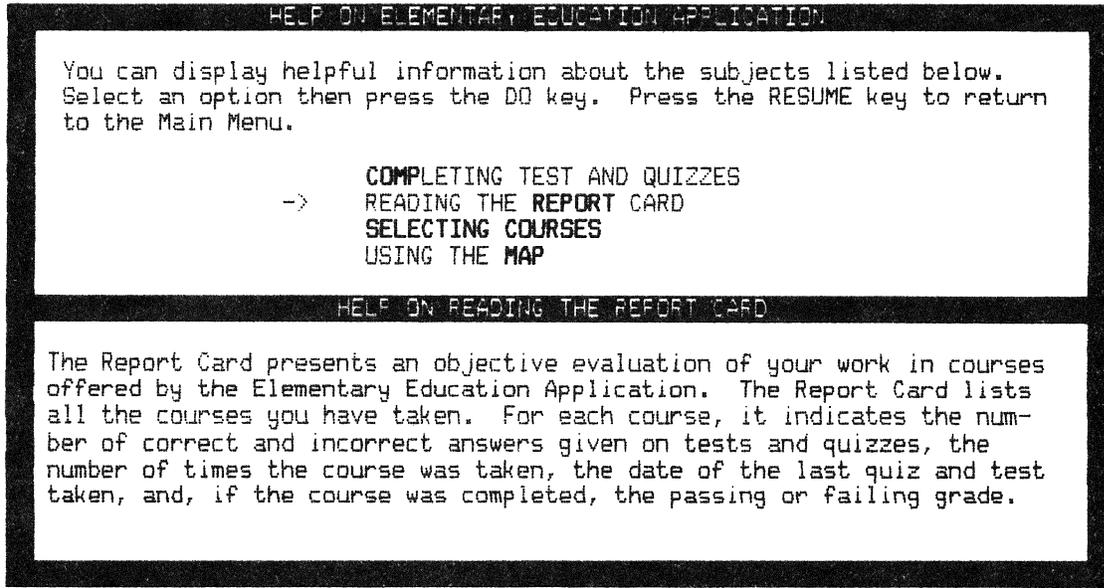


Figure 4-3: Reading the Report Card

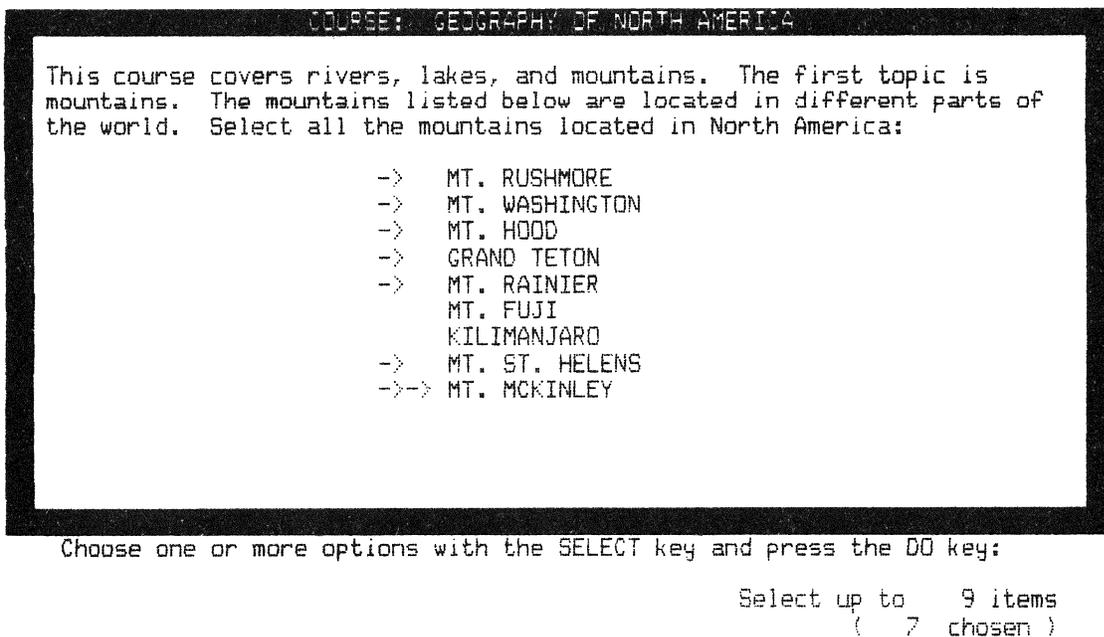


Figure 4-4: Course: Geography of North America

INSTALLATION VERIFICATION PROCESS

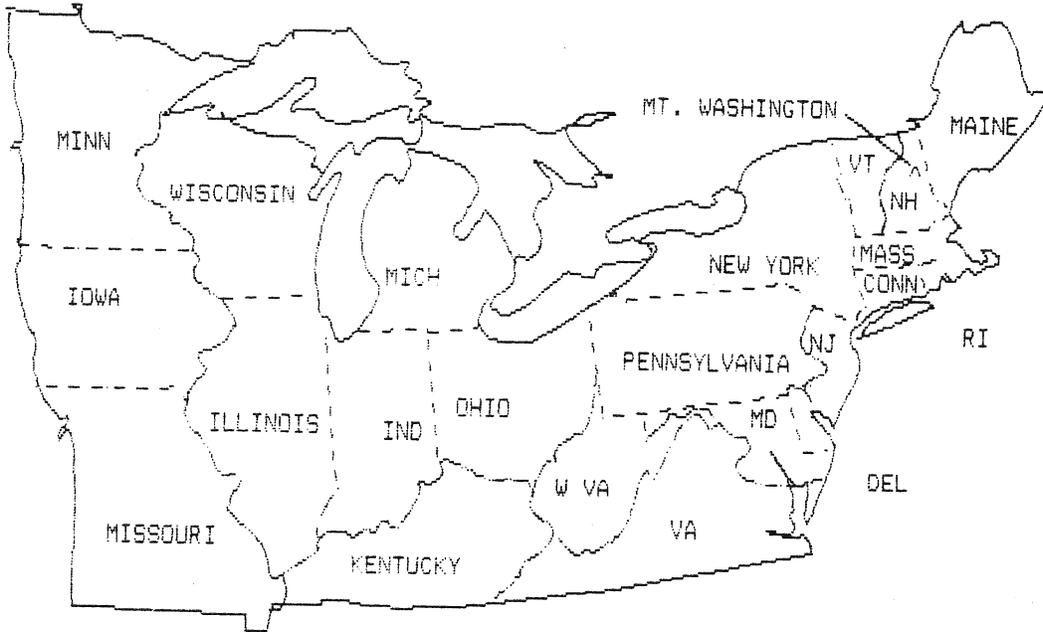


Figure 4-5: Map of Northeastern United States

CHAPTER 5  
RELEASE NOTES

5.1 USING TOOL KIT PASCAL WITH THE PRO/TOOL KIT

Using Tool Kit PASCAL with the PRO/Tool Kit is similar to using Tool Kit PASCAL with RSX-11M/M-PLUS or VAX/VMS DCL without the file transfer step. This section describes the differences.

5.1.1 Compiling Programs

Before invoking the PRO/Tool Kit PASCAL compiler, type:

```
$ INSTALL APPL$DIR:PROPASCAL
```

The PASCAL command format is described in the PRO/Tool Kit Command Language/Utilities Manual. The defaults are:

```
    /CHECK=ALL  
    /CODE=FPP  
    /DEBUG=TRACEBACK  
    /NOLIST  
    /NOMACHINE_CODE  
    /OBJECT  
    /NOSTANDARD  
    /NOXRAY
```

If you omit a file name, the PAS> prompt will appear and you can enter a command in the format described in the Tool Kit PASCAL User's Guide. For example:

```
$ PASCAL  
PAS> ELEMENTED=ELEMENTED/XR
```

## RELEASE NOTES

### Notes

- If your Professional 350 system has P/OS V1.5, the Tool Kit PASCAL compiler may produce apparently invalid error messages because of inadequate memory. If that happens, you can obtain more memory by following these steps:

1. Start the PRO/Tool Kit and set your default directory to APPL\$DIR.
2. Edit START.CMD and comment out any tasks that are not essential to your program development cycle. For example, if you do not use the DIFFERENCES command, add semicolons as shown in bold:

```
;      Install the Compare Utility - DIFFERENCES command
;
;      .DISABLE QUIET
;      .IFNINS ...CMP  INSTALL APPL$DIR:CMP
;      .ENABLE QUIET
```

Do not comment out the Professional Application Builder.

3. Return to the Main Menu (use the EXIT command) and restart the PRO/Tool Kit.
  4. If you find that you need one of the DCL commands that no longer work, type "RUN \$program", where "program" is the name of the task you commented out. For example, you could say "RUN \$CMP".
- Because of a slight DCL incompatibility, /MACHINE\_CODE=file results in an error. To use this option, specify /MACHINE\_CODE and allow the output (.MAC) file to default to the same name as the input file.
  - You cannot use /OBJECT and /MACHINE\_CODE at the same time. If you want /MACHINE\_CODE, specify /NOOBJECT.

### 5.1.2 Installing Applications

The following information is also present in the Tool Kit User's Guide. To install a Tool Kit PASCAL application, you can use Disk/diskette Services, Fast Install (as demonstrated in the IVP), or PRO/Tool Kit DCL. Ultimately, end users will use Disk/diskette Services to install your application.

It is recommended that you use Fast Install during the

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development process because your application's run-time context will be similar to that produced by Disk/diskette Services users. This is particularly important if your application opens files: your application can use PROLOG to translate APPL\$DIR in order to specify the location of its files. Also, your installation command file can use ASSIGN MENU and ASSIGN HELP to open menu and help files and RDMSG will work as documented.

If you use the DCL INSTALL command, APPL\$DIR will refer to the PRO/Tool Kit directory, rather than your application directory, because the PRO/Tool Kit is itself an application. Thus, you must use one of the following methods to specify the locations of files:

- Write your source code with exact file specifications. You will have to change it and recompile when you test your application with Fast Install or Disk/diskette Services.
- Copy the application files into the PRO/Tool Kit directory so that APPL\$DIR will "point" to the right place. This solution will not require any code change when you test your application with Fast Install or Disk/diskette Services: you simply copy the files to a different directory.

### NOTE

Do not reassign the logical name APPL\$DIR. To do so can cause the PRO/Tool Kit to stop working.

The first method is preferable because it is undesirable to change the contents of the PRO/Tool Kit directory. If you remove the PRO/Tool Kit (to install a new version or whatever), extraneous files can cause the removal to fail.

## 5.2 NEW FEATURES

1. A routine can be declared as EXTERNAL in the same module that contains the routine definition (heading and body). The formal parameter lists must be identical.

This occurs primarily when using an include file to declare external routines. For example, the include file EXTERNALS.PAS declares, among other things:

```
procedure foo (a,b,c : integer); external;
```

The module that actually contains the procedure is:

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```
module five;

%include 'EXTERNALS/nolist'

  [GLOBAL] procedure foo (a,b,c : integer);
  begin
    .
    .
    .
  end { foo };

end { five }.
```

This module is valid, even though the procedure heading appears twice. In Tool Kit PASCAL V1.0, if a routine is declared as external and defined in the same module, the routine definition heading cannot have a formal parameter list.

### NOTE

Although the external declaration and the global definition of a procedure can occur in one compilation unit, the same is NOT true of variables. An external declaration and a global definition of a variable in the same unit will result in an error.

2. The compiler now supports RAD50 string constants which are useful when calling P/OS executive directives. The syntax is similar to that for octal, hexadecimal, and binary constants. The flag character is "R".

A RAD50 string constant of fewer than three characters returns an integer constant (one word). A RAD50 string constant of four to six characters returns a long integer constant (two words). For example:

```
var
  i : integer; l : long_integer;

begin
  i := %R'GEN';      { %O'26226' }
  l := %R'GENPAR';  { %O'26226' %O'62072' }
end;
```

3. The compiler now allows expression results (including function calls and elements of packed structures) to be passed as actual parameters to formal VAR parameters declared with the READONLY attribute. This feature will make CORE Graphics Library programming easier because you no

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longer have to declare and use an explicit temporary variable for expression results. When you pass an expression to a [READONLY] VAR parameter, PASCAL pushes the expression value onto the stack and creates a pointer to that location.

4. The compiler now supports default parameters for SEQ11 procedures to facilitate the use of P/OS services directly from Pascal.

If a SEQ11 procedure call fails to specify actual parameters for any of the formal parameters declared with the procedure header, PASCAL will pass minus one (-1) as the address of the missing parameter.

### 5.3 COMPILER NOTES

1. On VAX/VMS systems, compiler command lines behave incorrectly when your default device is a rooted directory such as SYS\$SYSROOT. To avoid the problem, include "SY:" in each file specification that does not already contain a device name.
2. The default floating point option for Tool Kit PASCAL V1.1 or later is /FP (/CODE=FPP), rather than /-FP, as in V1.0.
3. The include file RMSDEFS.PAS contains type declarations for PRO/RMS-11 data structures well as the PRO/RMS-11 completion and fatal error codes. Unless you intend to use the data structures, it is recommended that you create a new file containing only the PRO/RMS-11 completion and fatal error codes and use it instead. This will improve compiler performance.
4. On a VAX/VMS system, if your disk usage is close to your quota, the compiler may hang or generate spurious error messages. To avoid this problem, keep at least 1500 available blocks. Large compiles may require more.
5. If you get the compiler diagnostic message:

"Register <n> not saved during actual parameter list."

where <n> is the register which was not saved, you should simplify the surrounding environment. Several registers are required to push large structures onto the stack so if the problem is a large value param, it may help to use a VAR param instead as this will only push the address of the item. Another heavy register user is intermediate level

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data references. That is, accessing data declared in procedures enclosing the one giving the problem. Accessing data at the outer most level (PROGRAM or MODULE level) is not a problem as the stack does not have to be walked to locate the data. Use of the /CHECK option also uses extra registers.

### 5.4 GENERAL DOCUMENTATION NOTES

1. The Professional Application Builder requires that all identifiers declared with the GLOBAL attribute be unique within the first six characters.
2. All Tool Kit PASCAL programs contain a GLOBAL procedure named ERROR that receives control when a run-time error occurs. By default, the Professional Application Builder extracts your program's ERROR procedure from the Tool Kit PASCAL object module library (PASLIB.OLB). That ERROR procedure displays information useful for debugging your application. The source code for that procedure (ERROR.PAS) is included in the distribution kit.

When you supply your own GLOBAL procedure named ERROR, it will receive control when a run-time error occurs. It is recommended that you use your own ERROR procedure. If an unanticipated run-time error occurs, your application can display useful information and instructions for the user.

#### NOTE

When you declare your own ERROR procedure, compile /NOCHECK and /NODEBUG (/CH/-TR).

3. Input/output on a relative file cannot cause the EOF function to return TRUE. Thus, when working with relative files, you must use some other means to detect end-of-file. Alternatives are:
  - Put a sentinal record in the file. This is the simplest solution.
  - Write a user-action OPEN routine that sets a maximum cell number. The default maximum cell number is  $2^{31}$  which, for all intents and purposes, is infinity.

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- Store the number of the last record written to the file somewhere.
  - If you know that the valid portion of the file does not contain deleted records, you can check the UFB function for TRUE or the STATUS function for a "record not found" error.
4. If the Professional Application Builder returns an undefined symbol error for a symbol such as "\$B81" or "\$B83", edit your .ODL file and add an explicit OTS reference to the appropriate segment. For example, if segment FOO2 had an undefined symbol error, you would add the characters shown in bold:

```
          .ROOT    FOO-PASLB-RMSROT-OVRLY
OVRLY:   .FCTR    *(OV1,OV2,OV3)
OV1:     .FCTR    FOOL
OV2:     .FCTR    FOO2-PASLB
OV3:     .FCTR    FOO3
PASLB:   .FCTR    LB:[1,5]PASLIB/LB
@LB:[1,5]RMSRLX
          .END
```

### 5.5 LANGUAGE REFERENCE MANUAL NOTES

1. Page 2-18, paragraph two: replace "Sections 7.5.2 and 7.5.3" with "Sections 7.17 and 7.9".
2. Page 3-8, paragraph one: replace "Section 10.21" with "Section 10.13".
3. Page 6-19, Section 6.6.4, paragraph two: replace "Section 10.7" with "Section 10.9".
4. Page 6-19, Section 6.6.4, paragraph three: replace "Section 10.8" with "Section 10.11".
5. Page 7-9, Section 7.17, example program: replace "Ptr = Node;" with "Ptr = ^Node;".
6. Page 7-10, example program in first note: replace "Ptr = Node;" with "Ptr = ^Node;".
7. Page 8-10, Section 8.10, Positional format: replace "default\_file\_name" with "default\_file\_spec".

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8. Page 8-10, Section 8.10, Non-positional format: replace "FILE\_SHARING" with "SHARING".
9. Page 8-10, Section 8.10, Non-positional format: replace "default\_file\_name" with "default\_file\_spec".
10. Page 8-11, Table 8-1: replace "FILE\_SHARING" with "SHARING".
11. Page 8-15, Section 8.10.10: replace "FILE\_SHARING" with "SHARING".
12. The OPEN procedure has several parameters that are shown in Section 8.10 (syntax diagram) and Table 8-1 (Summary of OPEN Procedure Parameters) but not described in detail. They are:

- **DEFAULT**

The DEFAULT parameter provides a default file specification for the FILE\_NAME parameter. When RMS-11 parses the FILE\_NAME, it uses the DEFAULT value to fill in any missing fields. If the DEFAULT parameter is not present, RMS-11 uses the P/OS current file specification. Refer to the Tool Kit User's Guide for detailed information on file specifications.

- **FILE\_SIZE**

The FILE\_SIZE parameter specifies an initial file allocation in 512-byte blocks. The default FILE\_SIZE value is three blocks. Use this parameter whenever you have a reasonable idea of how much space a file will require. It is much more efficient to specify a large initial allocation than to allocate additional blocks as needed.

- **FILE\_EXTENSION**

The FILE\_EXTENSION parameter specifies the number of 512-byte blocks to allocate when PASCAL must obtain additional space for a file. The default FILE\_EXTENSION value is five blocks.

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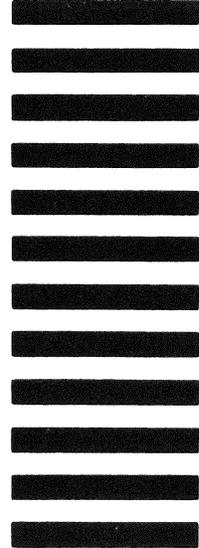
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