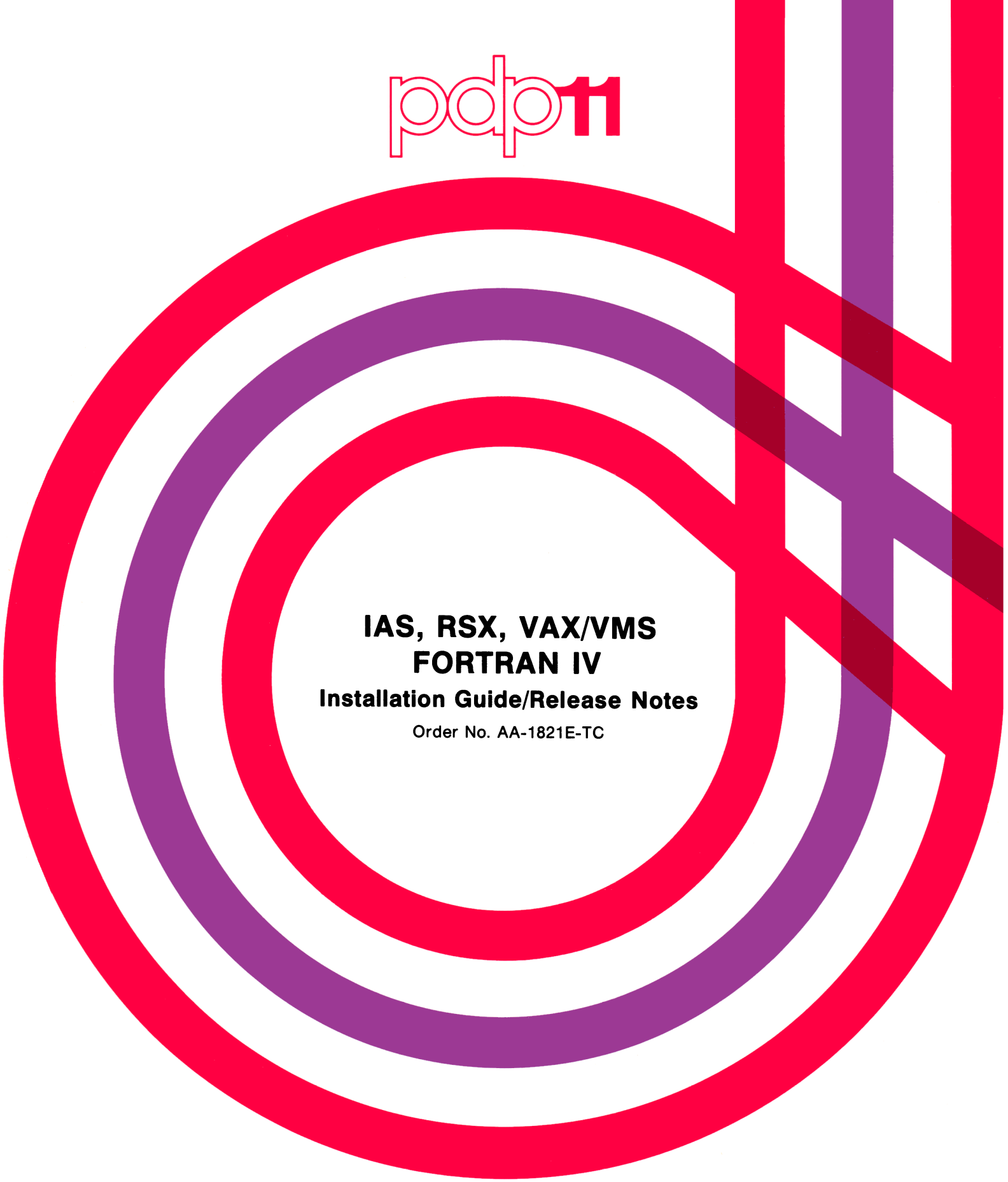

IAS, RSX, VAX/VMS FORTRAN IV

Installation Guide/Release Notes

Order No. AA-1821E-TC

June 1980

The IAS, RSX, VAX/VMS FORTRAN IV Installation Guide contains the procedures for installing the FORTRAN IV system. This document describes the minimal system requirements, the files distributed in the kits, the options available for planning and configuring the system to user needs and system build verification.

IAS, RSX, VAX/VMS FORTRAN IV

Installation Guide/Release Notes

Order No. AA-1821E-TC

SUPERSESSION/UPDATE INFORMATION: This document completely supersedes the document of the same name, Order No. AA-1821D-TC for Version 2 of PDP-11 FORTRAN IV.

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RSX-11M-PLUS V1.0
IAS V3.0

SOFTWARE VERSION: FORTRAN IV V02.5

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DATATRIEVE	TRAX	

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PREFACE

This Installation Guide provides you with the procedures for installing the FORTRAN IV system on the RSX-11M (both mapped and unmapped), RSX-11M-PLUS, IAS, and VAX/VMS (under AME) operating systems. The distribution medium is an RK05, RK06, RK07, RL01, or RL02 disk cartridge or 9-track magtape for RSX-11M, RSX-11M-PLUS, and IAS, and three RX01 floppy disks for VAX/VMS under AME. This guide describes the build procedures for each system on each distribution medium. It also covers system requirements, distribution files, installation options, and system-build verification, and includes listings of the build files and verification tests for each system.

CAUTION

READ THIS MANUAL COMPLETELY BEFORE YOU ATTEMPT TO INSTALL THE SYSTEM.

ASSOCIATED DOCUMENTS

Consult the IAS/RSX-11 FORTRAN IV User's Guide for information on using the system. Consult the PDP-11 FORTRAN Language Reference Manual for details on the FORTRAN language as implemented in FORTRAN IV.

DOCUMENTATION CONVENTIONS

This installation guide uses the following documentation conventions.

$	ALTMODE	The symbol $ represents the nonprinting ALTMODE key. When specified, this key is pressed in place of the RETURN key. Except where ALTMODE is specified, all commands terminate with a carriage return.
^Z	CNTRL Z	The notation ^Z (where Z is an alphabetic character) results from pressing the CNTRL key and the appropriate letter simultaneously.
MCR>	underline	Underlined text in examples indicates information printed by the system. All other information is typed by the user.

CHAPTER 1

INTRODUCTION

This manual provides complete instructions for installing FORTRAN IV on the RSX-11M, RSX-11M-PLUS, IAS, and VAX/VMS (under AME) operating systems.

Read all the chapters relevant to your operating system before you attempt to install FORTRAN.

1.1 SYSTEM REQUIREMENTS

System components required for a proper installation of FORTRAN IV depend on the operating system on which the distribution kit is to be installed.

The component requirements for the RSX-11M, RSX-11M-PLUS, IAS, and VAX/VMS (under AME) operating systems are given below.

1.1.1 RSX-11M

The software included in this distribution requires the following system components for normal use:

- RSX-11M operating system
- Minimum 8K word partition for compilation
- Minimum 275 blocks of contiguous on-line disk storage for the compiler task
- Minimum 175 blocks of on-line disk storage for the Object Time System Library

  (Minimum 180 blocks of on-line disk storage for the SYSLIB alone)

1.1.2 RSX-11M-PLUS

The software included in the distribution requires the following system components for normal use:

- RSX-11M-PLUS operating system
- Minimum 8K word partition for compilation

- Minimum 275 blocks of contiguous on-line disk storage for the compiler task
- Minimum 175 blocks of on-line disk storage for the Object Time System Library

  (Minimum 240 blocks of on-line disk storage for the SYSLIB alone)

1.1.3 IAS

The software included in the distribution requires the following system components for normal use:

- IAS Operating System
- Minimum 8K word partition for compilation
- Minimum 225 blocks of contiguous on-line disk storage for the compiler task
- Minimum 175 blocks of on-line disk storage for the Object Time System Library

  (Minimum 220 blocks of on-line disk storage for the SYSLIB alone)

The installation procedures for FORTRAN under IAS depend on the operator terminal command language used on your system. If your system uses the MCR command language, consult Chapter 4 for IAS installation instructions. If your system uses the DCL command language, consult Chapter 5 for IAS installation instructions.

1.1.4 VAX/VMS Under AME

The software included in this distribution requires the following system components:

- VAX/VMS Operating System with AME
- Minimum 8K word partition for compilation
- Minimum 275 blocks of contiguous on-line disk store for compiler task
- Minimum 180 blocks of on-line disk storage for the Object Time System Library

  (Minimum 370 blocks of on-line disk storage for the SYSLIB alone)

1.2 DISTRIBUTION FILES

The FORTRAN IV software kits contain files that can be used to build a FORTRAN IV system on RSX-11M, RSX-11M-PLUS, IAS, or VAX/VMS.

1.2.1 RSX-11M, RSX-11M-PLUS, or IAS

The FORTRAN IV software is supplied on one RK05, RK06, RK07, RL01, or RL02 (not IAS) disk cartridge or one 9-track magnetic tape.

The FORTRAN IV distribution media contain the following compiler and Object Time System (OTS) files:

1.2.1.1 UFD [11,41]

FOR.OLB	FORTRAN compiler object module library
FORBLD.ODL	Compiler overlay description file for IAS
FOR11M.ODL	Compiler overlay description file for RSX-11M and RSX-11M-PLUS
FOR11M.CMD	Compiler build command file for RSX-11M mapped systems and RSX-11M-PLUS systems
FOR11U.CMD	Compiler build command file for RSX-11M unmapped systems
FOR11D.CMD	Compiler build command file for IAS using MCR
FORIAS.CMD	Compiler build command file for IAS using DCL

1.2.1.2 UFD [11,42]

FOROTS.OBJ	OTS concatenated object modules
FORNHD.OBJ	OTS concatenated object modules specific to no-optional hardware version
FOREAE.OBJ	OTS concatenated object modules specific to EAE version
FOREIS.OBJ	OTS concatenated object modules specific to EIS version
FORFIS.OBJ	OTS concatenated object modules specific to FIS version
FORFPU.OBJ	OTS concatenated object modules specific to FPP version
SHORT.OBJ	OTS short error text module
NOVIR.OBJ	OTS module for no virtual array support
VIRP.OBJ	OTS module for virtual array support
FORTST.FTN	FORTRAN test program for verification purposes
FORRES.MAC	OTS resident-library global name file

1.2.2 VAX/VMS

The FORTRAN IV software is supplied on three RX01 floppy diskettes. This kit contains the following compiler and Object Time System (OTS) files:

1.2.2.1 Diskette 1 - VMS11MR1

VMS11MR1.COM	Installation command file
FORVMS.CMD	Compiler build command file for VMS
FORBLD.ODL	Compiler overlay description file for VMS
EAE.OPT	Parameter file for in-line EAE option
EIS.OPT	Parameter file for in-line EIS option
FIS.OPT	Parameter file for in-line FIS option
THR.OPT	Parameter file for threaded THR option
FORRES.MAC	OTS resident library global name file
FORTST.FTN	FORTRAN test program for verification purposes

1.2.2.2 Diskette 2 - VMS11FORA

FOR.OLB	FORTRAN compiler object module library

1.2.2.3 Diskette 3 - VMS11FORB

FOROTS.OBJ	OTS concatenated object modules
FORNHD.OBJ	OTS concatenated object modules specific to no-optional hardware version
FOREAE.OBJ	OTS concatenated object modules specific to EAE version
FOREIS.OBJ	OTS concatenated object modules specific to EIS version
FORFIS.OBJ	OTS concatenated object modules specific to FIS version
FORFPU.OBJ	OTS concatenated object modules specific to FPU version
SHORT.OBJ	OTS short error text module
NOVIR.OBJ	OTS module for no virtual array support
VIRP.OBJ	OTS module for virtual array support

CHAPTER 2

INSTALLATION PLANNING

This Guide covers the various options available to you for building the FORTRAN IV system and tailoring it to the particular needs of each installation. This chapter presents some of the alternatives you must consider before you start the installation process.

2.1 SELECTING THE "DEFAULT" FORTRAN

Those installations that wish to run both FORTRAN IV (FOR) and FORTRAN IV-PLUS (F4P) on the same system must determine whether FOR or F4P is to be the "default" FORTRAN. This decision must be made for two reasons:

1. When building a task, object modules produced by the FOR compiler or from the FOR OTS must not be combined with object modules produced by the F4P compiler or from the F4P OTS.

2. The F4P OTS and the FOR OTS cannot be in the same object-module library.

Normally, "the" FORTRAN OTS is part of the system object-module library, [1,1]SYSLIB.OLB. The Task Builder searches this library automatically when linking a task. Either the FOR OTS or the F4P OTS can be in this library.

If your installation intends to use both FORTRAN systems, you must build a separate library to contain one of the Object Time Systems. A programmer must name this library explicitly in the Task Builder command line whenever it is to be used. The Task Builder searches the library specified in the command line before searching SYSLIB.

When you make this choice for a given environment, consider which FORTRAN should be slightly easier to use -- probably the one that will be used most often. The system whose OTS is in SYSLIB will not require an explicit OTS library reference at task-build time.

2.1.1 Selecting FORTRAN IV as the Default FORTRAN

If you select FORTRAN IV as the default FORTRAN, you can continue to use a previously installed FORTRAN IV-PLUS system in either of two ways. Build a separate library containing only FORTRAN IV-PLUS OTS modules (usually [1,1]F4POTS.OLB), or rename the current SYSLIB. If FORTRAN IV-PLUS has not been installed, refer to the FORTRAN IV-PLUS Installation Guide for procedures to include its OTS in a separate OTS Library.

2.1.2 Selecting FORTRAN IV-PLUS as the Default FORTRAN

If FORTRAN IV-PLUS is to be the default FORTRAN, follow the F4P installation procedures for including its OTS in SYSLIB. Then carry out the instructions to build a separate FORTRAN IV OTS library.

2.2 SELECTING FORTRAN IV COMPILER OPTIONS

The following options are available when you build the FORTRAN IV compiler:

1. Specifying listing-device lines per page for installations using non-U.S.-Standard paper stock.
2. Specifying compiler command switch default settings different from the DIGITAL-provided defaults.
3. Specifying the amount of memory used for compilation in a system-controlled partition, in order to accommodate the compilation of large program units.
4. Specifying the default type of code to be generated by the compiler (in-line or threaded).

A programmer can edit the compiler build file to select any of the above options. Documentation within the file describes the options available and any limitations on choices (see Appendix A).

2.3 SELECTING FORTRAN IV OTS OPTIONS

You can select OTS arithmetic hardware options and support for virtual arrays.

2.3.1 Selecting OTS Arithmetic Hardware Options

The FORTRAN IV system, as supplied, contains components for support of all PDP-11 arithmetic hardware options. You must generate the Object Time System to conform to the options present on the target system. Choose the appropriate file from Table 2-1 below. Use the first file in the list that is appropriate to the hardware options installed on the target system. If new hardware options are added to the system at a later date, a programmer can rebuild the OTS library to conform to the change.

2.3.2 Selecting VIRTUAL Array Support

You can select VIRTUAL array support as an option on systems that support the memory management directives.

1. If VIRTUAL array support is to be included in the OTS Library, you must include the module VIRP.OBJ when you build the library.
2. If the target system does not support the memory management directives, you must include the module NOVIR.OBJ in the OTS Library.

Table 2-1
Hardware Options Required for OTS Files

Target System	Arithmetic Hardware Options	OTS File
PDP-11/70,11/60,11/55 11/50,11/45,11/34	FP11-A,FP11-B,FP11-C floating-point processor	FORFPU.OBJ
PDP-11/40,11/35	KE11-F floating instruction set	FORFIS.OBJ
LSI-11	KEV11 extended arithmetic chip	FORFIS.OBJ
PDP-11/70,11/60,11/55 11/50,11/45,11/34; VAX/VMS (under AME)	No floating-point hardware (EIS is standard on these processors)	FOREIS.OBJ
PDP-11/40,11/35	KE11-E extended instruction set	
Any	KE11-A or KE11-B extended arithmetic element	FOREAE.OBJ
Any	No optional arithmetic hardware	FORNHD.OBJ

2.4 INSTALLATION PROCEDURES

If you are installing FORTRAN IV to replace an earlier version, take the following preliminary steps:

1. If the compiler is installed in the RSX-11M, RSX-11M-PLUS, or IAS system, remove it:

   ```
   REM ...FOR
   ```

2. Delete the following files from the system disk:

   ```
   [1,50]FOR.TSK on Unmapped RSX-11M
   [1,54]FOR.TSK on Mapped RSX-11M or RSX-11M-PLUS
   [11,1]FOR.TSK on IAS
   SYS$SYSTEM:FOR.EXE on VAX/VMS
   ```

3. If you intend to incorporate the OTS into SYSLIB.OLB, obtain a fresh copy of SYSLIB from the operating system distribution kit. OTS modules cannot be added to a library containing a previous version of the OTS.

NOTE

The FORTRAN OTS library contains 224(no VIRTUAL support)/235(VIRTUAL support) modules and 825(no VIRTUAL support)/922(VIRTUAL support) entry points. This must be taken into account if the FORTRAN OTS is going to be included in the SYSLIB).

2.4.1 RSX-11M and RSX-11M-PLUS

Use a privileged terminal for all operations you use to build the FORTRAN IV system.

You will use various RSX-11M utility programs to build the FORTRAN IV system. All the examples in this manual assume that the utilities are not installed. The RUN $xxx command is shown:

```
>RUN $PIP
```

The following directories are required for the build process on RSX-11M:

```
[1,1], [1,20], [1,30], [1,50],  for unmapped systems on RSX-11M
[1,1], [1,24], [1,34], [1,54],  for mapped systems on RSX-11M or
RSX-11M-PLUS
```

You must create any directory that is not on the system volume.

2.4.2 IAS

Log in as the system manager (UIC [1,1]) for all operations to build the FORTRAN IV system.

The following directories are required for FORTRAN IV installation:

```
[1,1], [11,1], [11,41]
```

You must create any directory that is not on the system volume.

2.4.3 VAX/VMS

Log in under the privileged system manager's account.

The following directories are required for FORTRAN IV installation: SYS$SYSTEM, SYS$LIBRARY.

CHAPTER 3

INSTALLATION ON RSX-11M AND RSX-11M-PLUS

This chapter covers the installation procedures required for RSX-11M. Section 3.1 describes the installation procedures for the 9-track magnetic tape distribution. Section 3.2 describes the installation procedures for the RK05, RK06, RK07, RL01, or RL02 disk cartridge distribution.

The basic installation procedure for FORTRAN IV consists of:

1. Building the FORTRAN compiler task from an object module library
2. Building the FORTRAN Object Time System library from object files

The following sections provide detailed procedures.

3.1 INSTALLATION FROM MAGTAPE DISTRIBUTION

3.1.1 Preparations

Mount the distribution magtape on unit 0, and position the tape at load point. If the magtape handler is not loaded, make it available by typing the following command:

```
>LOAD MT:
```

Note that the device code for some 9-track magtape units is MM:. If you are using such a unit, substitute MM: for MT: in the commands.

For RSX-11M-PLUS only, mount the magtape by typing:

```
>MOU MT0:/FOR
```

3.1.2 Building the Compiler

You build the compiler from an object module-library supplied on the distribution media.

3.1.2.1 **RSX-11M Unmapped Systems** - Type the following commands to transfer the required files:

```
>SET /UIC=[1,20]
>RUN $FLX
FLX>=MT0:[200,200]FOR.OLB,FOR11M.ODL,FOR11U.CMD/DO
FLX>^Z
```

At this point you should edit the compiler task build command file to select installation options, as described in Appendix A.

Build the compiler as follows:

```
>RUN $TKB
TKB>@FOR11U
TKB>^Z
```

You should keep the compiler object-module library on your system so that it may be patched with PAT should a patch be needed in the future.

You should retain the edited command file and the compiler task-build map for future reference.

3.1.2.2 **RSX-11M and RSX-11M-PLUS Mapped Systems** - Type the following commands to transfer the required files:

```
>SET /UIC=[1,24]
>RUN $FLX
FLX>=MT0:[200,200]FOR.OLB,FOR11M.ODL,FOR11M.CMD/DO
FLX>^Z
```

At this point you should edit the compiler task-build command file to select installation options as described in Appendix A.

Build the compiler as follows:

FOR RSX-11M:

```
>RUN $TKB
TKB>@FOR11M
TKB>^Z
```

FOR RSX-11M-PLUS:

```
>RUN $TKBBIG
TKB>@FOR11M
TKB>^Z
```

You should keep the compiler object-module library on your system so that it may be patched with PAT should a patch be needed in the future.

You should retain the edited command file and the compiler task-build map for future reference.

3.1.3 Building the OTS

Copy the required OTS files from the magtape to the system disk.

```
>SET /UIC=[1,1]
>RUN $FLX
FLX>=MT0:[200,200]FOROTS.OBJ,FOR???.OBJ,SHORT.OBJ,FORTST.FTN/DO
FLX>=MT0:[200,200]VIRP.OBJ,NOVIR.OBJ,FORRES.MAC/DO
FLX>^Z
```

FOR???.OBJ refers to OTS arithmetic hardware options as described in Section 2.3.1 and Table 2-1.

If you have decided to include the FORTRAN OTS in SYSLIB, type the following commands to add the FORTRAN IV OTS into the system library (please read Section 2.4 first):

```
>RUN $LBR
LBR>SYSLIB/RP=SHORT
LBR>SYSLIB/DG:$ERTXT/RP=FOROTS,FOR???,VIRP
ENTRY POINTS DELETED:
$ERTXT
LBR>^Z
```

If you decide to put the FORTRAN IV OTS in a separate library, type the following commands to build a separate FORTRAN IV OTS library:

```
>RUN $LBR
LBR>FOROTS/CR::1024.=SHORT
LBR>FOROTS/DG:$ERTXT=FOROTS,FOR???,VIRP
ENTRY POINTS DELETED:
$ERTXT
.BR>^Z
```

NOTE

If your system does not support memory management directives, or if you do not want VIRTUAL array support, replace VIRP with NOVIR in the above command.

3.2 INSTALLATION FROM DISK CARTRIDGE

Use the following installation procedures for the disk cartridge distribution. If the system disk is not an RK05, RK06, RK07, RL01 or RL02, place the distribution disk in drive 0. If the system disk is an RK05, RK06, RK07, RL01, or RL02, use drive 0 for the system disk and drive 1 for the distribution disk. Procedures for the two configurations are the same; only the unit assignments are different. The designation "DKn" refers to the disk drive unit on which the distribution disk is placed. For each step, use DK0 or DK1 for the RK05 distribution. Use DM0 or DM1 for the RK06 or RK07 distribution. Use DL0 or DL1 for the RL01 or RL02 distribution.

3.2.1 Preparations

Load the disk handler if it is not already resident:

```
>LOA DK:
```

Mount the volume:

```
>MOU DK0:FOR
```

3.2.2 Building the Compiler

You build the compiler from an object-module library on the distribution disk. Copy the compiler build files from the distribution disk to the system disk as shown.

For RSX-11M unmapped systems:

```
>SET /UIC=[1,20]
>RUN $PIP
PIP>=DK0:[11,41]FOR.OLB,FOR11M.ODL,FOR11U.CMD
PIP>^Z
```

For RSX-11M and RSX-11M-PLUS mapped systems:

```
>SET /UIC=[1,24]
>RUN $PIP
PIP>=DK0:[11,41]FOR.OLB,FOR11M.ODL,FOR11M.CMD
PIP>^Z
```

At this point you should edit the compiler task build command file (FOR11M.CMD or FOR11U.CMD) to select installation options as described in Appendix A.

Build the compiler as follows:

For RSX-11M unmapped systems:

```
>RUN $TKB
TKB> @FOR11U
TKB> ^Z
```

For RSX-11M mapped systems:

```
>RUN $TKB
TKB> @FOR11M
TKB> ^Z
```

For RSX-11M-PLUS systems:

```
>RUN $TKBBIG
TKB>@FOR11M
TKB>^Z
```

Save a copy of the compiler object module library on your system for patching with PAT should a patch be needed in the future. You should retain the edited command files and the compiler task build map for future reference.

3.2.3 Building the OTS

Copy the files from the distribution disk:

```
>SET /UIC=[1,1]
>RUN $PIP
PIP>=DK0:[11,42]FOROTS.OBJ,FOR???,SHORT,FORTST.FTN,VIRP.OBJ,NOVIR.OBJ
PIP>=DK0:[11,42]FORRES.MAC
PIP> ^Z
>DMO DK0:
```

FOR???.OBJ refers to OTS arithmetic hardware options as described in Section 2.3.1 and Table 2-1.

If you have decided to include the FORTRAN IV OTS in SYSLIB, type the following commands to add the FORTRAN IV OTS into the system library (read Section 2.4 first):

```
>RUN $LBR
LBR>SYSLIB/RP=SHORT
LBR>SYSLIB/DG:$ERTXT/RP=FOROTS,FOR???,VIRP
ENTRY POINTS DELETED:
$ERTXT
LBR> ^Z
```

If you decide to put the FORTRAN IV OTS in a separate library, type the following commands to build a separate FORTRAN IV OTS library:

```
>SET /UIC=[1,1]
>RUN $LBR
LBR>FOROTS/CR::1024.=SHORT
LBR>FOROTS/DG:$ERTXT=FOROTS,FOR???,VIRP
ENTRY POINTS DELETED:
$ERTXT
LBR> ^Z
```

NOTE

If your system does not support the Memory Management Directives or if you do not want VIRTUAL array support, replace VIRP with NOVIR in the above command.

3.3 INSTALLING THE COMPILER

You install the FORTRAN compiler as follows:

RSX-11M unmapped ^^systems:

```
>INS [1,50]FOR
```

RSX-11M and RSX-11M-PLUS mapped systems:

```
>INS [1,54]FOR
```

CHAPTER 4

INSTALLATION ON IAS USING MCR

This chapter details the installation procedures required for IAS using MCR. Section 4.1 describes the installation procedures for the 9-track magnetic tape distribution. Section 4.2 describes the installation procedures for the RK05, RK06, RK07, or RL01 disk cartridge distribution.

The basic installation procedure for FORTRAN IV consists of:

1. Building the FORTRAN compiler task from an object module library (be sure SLOTKB is installed)

2. Building a FORTRAN OTS library from object modules

4.1 INSTALLATION FROM MAGTAPE DISTRIBUTION

4.1.1 Preparations

Mount the distribution magtape on unit 0, and position it at load point. If the magtape handler is not loaded, make it available by means of the following command:

```
MCR>LOAD MT
```

Note that the device code for some 9-track magtape units is MM:. If you are using such a unit, substitute MM: for MT: in the commands.

Mount the magtape:

```
MCR>MOU MT0:/CHA=[FOR]
```

4.1.2 Building the Compiler

You build the FORTRAN compiler from an object-module library supplied on the distribution medium.

Type the following commands to transfer the required files:

```
MCR>FLX [11,41]/RS=MT:[200,200]FOR.OLB,FORBLD.ODL,FOR11D.CMD/DO
```

At this point you should edit the compiler task-build command file FOR11D.CMD to select installation options as described in Section 2.2 and Appendix A.

Build the compiler:

```
MCR>STB @[11,41]FOR11D
```

You should retain the compiler object module library on your system for patching with PAT should a patch be needed in the future. You should also retain the edited command file and the compiler task build map for future reference.

4.1.3 Building the OTS

Copy the required OTS files from the magtape to the system disk:

```
MCR>FLX =MT0:[200,200]FOROTS.OBJ,FOR???.OBJ/DO
MCR>FLX =MT0:[200,200]SHORT.OBJ,FORTST.FTN,NOVIR.OBJ,FORRES.MAC/DO
```

FOR???.OBJ refers to OTS arithmetic hardware options as described in Section 2.3.1 and Table 2-1.

If you have decided to include FORTRAN IV in the system library, type the following commands to add the FORTRAN IV OTS into the system library (read Section 2.4 first):

```
MCR>LBR SYSLIB/RP=SHORT
MCR>LBR SYSLIB/DG:$ERTXT/RP=FOROTS,FOR???,VIRP
ENTRY POINTS DELETED:
$ERTXT
MCR>
```

If you decide to put the FORTRAN IV OTS into a separate library, type the following commands to build a separate FORTRAN IV OTS library:

```
MCR>LBR FOROTS/CR::1024.=SHORT
MCR>LBR FOROTS/DG:$ERTXT=FOROTS,FOR???,VIRP
ENTRY POINTS DELETED:
$ERTXT
MCR>
```

NOTE

If your system does not support memory management directives, or if you do not want VIRTUAL array support, replace VIRP with NOVIR in the above command sequence.

4.2 INSTALLATION FROM DISK CARTRIDGE DISTRIBUTION

The following sections describe the installation procedures required for the disk cartridge distribution. If the system disk is not an RK05, RK06, RK07 or RL01 , place the distribution disk in drive 0. If the system disk is an RK05, RK06, RK07, or RL01, use drive 0 for the system disk and drive 1 for the distribution disk. Procedures for these two configurations are the same; only the unit assignments are different.

In the following directions the designation DK0: refers to the unit on which the FORTRAN distribution pack is placed. For each step use DK0: or DK1: for the RK05 distribution. Use DM0: or DM1: for the RK06 or RK07 distribution. Use DL0: or DL1: for the RL01 distribution.

4.2.1 Preparations

Place the distribution disk in drive 0, write-locked. Load the disk handler task, if it is not already resident, by means of the following command:

```
MCR>LOAD DK
```

Mount the volume:

```
MCR>MOU DK0:FOR
```

4.2.2 Building the Compiler

You build the compiler from an object module library supplied on the distribution medium.

Type the following commands to transfer the required files:

```
MCR>PIP [11,41]=DK0:FOR.OLB,FORBLD.ODL,FOR11D.CMD
```

At this time you should edit the compiler task-build command file FOR11D.CMD to select installation options as described in Section 2.2 and Appendix A.

Build the compiler:

```
MCR>TKB @[11,41]FOR11D
```

You should retain the compiler object module library on your system for patching with PAT should a patch be needed in the future. You should also retain the edited command file and the compiler task build map for future reference.

4.2.3 Building the OTS

Copy the required OTS files from the FORTRAN distribution disk to the system disk:

```
MCR>PIP =DK0:[11,42]FOROTS.OBJ,FOR???,SHORT,FORTST.FTN,VIRP.OBJ
```

FOR???.OBJ refers to OTS arithemetic hardware options as described in Section 2.3.1 and Table 2-1.

If you have decided to include FORTRAN IV in the system library, type the following commands to build the FORTRAN IV OTS into the system library (read Section 2.4 first):

```
MCR>LBR SYSLIB/RP=SHORT
MCR>LBR SYSLIB/DG:$ERTXT/RP=FOROTS,FOR???,VIRP
ENTRY POINTS DELETED:
$ERTXT
MCR>
```

If you decide to put FORTRAN IV in a separate library, type the following commands to build a separate FORTRAN IV OTS library:

```
MCR>LBR FOROTS/CR::1024.=SHORT
MCR>LBR FOROTS/DG:$ERTXT=FOROTS,FOR???,VIRP
ENTRY POINTS DELETED:
$ERTXT
MCR>
```

NOTE

If your system does not support memory management directives, or if you do not want VIRTUAL array support, replace VIRP with NOVIR in the above command sequence.

4.3 INSTALLING THE COMPILER

You install the FORTRAN compiler as follows:

```
MCR>INS [11,1]FOR
```

CHAPTER 5

INSTALLATION ON IAS USING DCL

This chapter details the installation procedures required for IAS. Section 5.1 describes the installation procedures for the 9-track magnetic tape distribution. Section 5.2 describes the installation procedures for the disk cartridge distribution.

The basic installation procedure for FORTRAN IV consists of:

1. Building the FORTRAN compiler task from an object-module library (be sure SLOTKB is installed)

2. Building the FORTRAN OTS library from object modules

5.1 INSTALLATION FROM MAGTAPE DISTRIBUTION

5.1.1 Preparations

Mount the distribution magtape on unit 0, and position the tape at load point. Note that the device code for some 9-track magtape units is MM:. If you are using such a unit, replace MT0: with MM0: in the commands.

Load the magtape handler task, if it is not resident, with the command:

```
SCI>RUN/HANDLER MT
```

Mount the volume:

```
PDS> MOUNT/FOREIGN MT0: FOR
```

5.1.2 Building the Compiler

You build the FORTRAN compiler from an object-module library supplied on the distribution medium.

Copy the needed files from the magtape to the system disk:

```
PDS> SET DEFAULT [11,41]
COPY MT0:[200,200]FOR.OLB/DOS *.*
COPY MT0:[200,200]FORBLD.ODL/DOS *.*
COPY MT0:[200,200]FORIAS.CMD/DOS *.*
```

At this point you should edit the compiler task-build command file, FORIAS.CMD, to select installation options as described in Section 2.2 and Appendix A.

Build the compiler:

```
PDS> @FORIAS
```

You should retain the compiler object-module library on your system for patching with PAT should a patch be needed in the future. You should also keep the edited command file and the compiler task-build map for future reference.

5.1.3 Building the OTS

Copy the required OTS files from the magtape to the system disk:

```
PDS> SET DEFAULT [1,1]
PDS> COPY MT0:[200,200]*.OBJ/DOS *.*
PDS> COPY MT0:[200,200]FORTST.FTN/DOS *.*
PDS> COPY MT0:[200,200]FORRES.MAC/DOS *.*
```

FOR??? refers to OTS arithemetic hardware options as described in Section 2.3.1 and Table 2-1.

If you have decided to include the FORTRAN OTS in SYSLIB, type the following commands to build the FORTRAN IV OTS into the system library (read Section 2.4 first):

```
PDS> LIB INSERT SYSLIB SHORT
PDS> LIB DELETE/GLOBAL SYSLIB $ERTXT
ENTRY POINTS DELETED:
$ERTXT
PDS> LIB INSERT SYSLIB FOROTS FOR??? VIRP
```

If you decide to put FORTRAN IV in a separate library, type the following commands to build a separate FORTRAN IV OTS library:

```
PDS> LIB CREATE/EPT:1024 FOROTS SHORT
PDS> LIB DELETE/GLOBAL FOROTS $ERTXT
ENTRY POINTS DELETED:
$ERTXT
PDS> LIB INSERT FOROTS FOROTS FOR??? VIRP
```

NOTE

If your system does not support memory management directives, or if you do not want VIRTUAL array support, replace VIRP with NOVIR in the above command.

5.2 INSTALLATION FROM DISK CARTRIDGE DISTRIBUTION

The following sections describe the installation procedures required for the disk cartridge distribution. If the system disk is not an RK05, RK06, RK07, or RL01, place the distribution disk in drive 0. If the system disk is an RK05, RK06, RK07, or RL01, use drive 0 for the system disk and drive 1 for the distribution disk. Procedures for these two configurations are the same; only the unit assignments are different.

In the directions which follow, the designation DK0: refers to the unit on which the FORTRAN distribution pack is placed. For each step use DK0: or DK1: for the RK05 distribution. Use DM0: or DM1: for the RK06 or RK07 distribution. Use DL0: or DL1: for the RL01 distribution.

5.2.1 Preparations

Place the distribution disk in drive 0, write-locked. Load the disk handler task, if it is not resident, with the following command:

```
SCI> RUN/HANDLER DK
```

Mount the volume:

```
PDS> MOUNT DK0: FOR
```

5.2.2 Building the Compiler

You build the compiler from an object module library supplied on the distribution medium.

Type the following commands to transfer the required files:

```
PDS> SET DEFAULT[11,41]
PDS> COPY DK0:[11,41]*.* *.*
PDS> DEL FOR11U.CMD;*
PDS> DEL FOR11M.CMD;*
PDS> DEL FOR11D.CMD;*
```

At this time you should edit the compiler task-build command file FORIAS.CMD to select installation options as described in Section 2.2 and Appendix A.

Build the compiler:

```
PDS> @FORIAS
```

You should retain the compiler object module library on your system for patching with PAT should a patch be needed in the future. You should also keep the edited command file and the compiler task-builder map for future reference.

5.2.3 Building the OTS

Copy the required OTS files from the FORTRAN distribution disk to the system disk:

```
PDS> SET DEFAULT [1,1]
PDS> COPY DK0:[11,42]*.* *.*
```

FOR??? refers to OTS arithmetic hardware options as described in Section 2.3.1 and Table 2-1.

If you have decided to include the FORTRAN OTS in SYSLIB, type the following commands to add the FORTRAN IV OTS into the system library (read Section 2.4 first):

```
PDS> LIB INSERT SYSLIB SHORT
PDS> LIB DELETE/GLOBAL SYSLIB $ERTXT
ENTRY POINTS DELETED:
$ERTXT
PDS> LIB INSERT SYSLIB FOROTS FOR??? VIRP
```

If you decide to put FORTRAN IV into a separate library, type the following commands to build a separate FORTRAN IV OTS library:

```
PDS> LIB CREATE/EPT:1024 FOROTS SHORT
PDS> LIB DELETE/GLOBAL FOROTS $ERTXT
ENTRY POINTS DELETED:
$ERTXT
PDS> LIB INSERT FOROTS FOROTS FOR??? VIRP
```

NOTE

If your system does not support memory management directives, or if you do not want VIRTUAL array support, replace VIRP with NOVIR in the above commands.

5.3 INSTALLING THE COMPILER

You install the FORTRAN compiler as follows:

```
PDS> INSTALL [11,1]FOR
```

NOTE

You must install FORTRAN IV as task "...FOR" on IAS. If FORTRAN IV-PLUS is already installed under that name, remove it and reinstall it as task "...F4P" before proceeding.

CHAPTER 6

INSTALLATION ON VAX/VMS UNDER AME

Before beginning this installation procedure, note that some of the hardware options provided for both the compiler and the OTS library do not exist on VAX/VMS under the RSX-11M compatibility mode; see Table 2-1. You may use these particular options only for the purpose of downline loading to a PDP-11 RSX-11M target system.

To prepare for installation of FORTRAN IV on VAX/VMS (under AME), proceed as follows:

- Be sure logical name SYS$DISK is assigned to the disk that contains the current version of VAX/VMS, as distributed, containing all updates. This disk also contains the command procedure that initiates the new installation/ update procedure. Note that SYS$DISK need not be (and if possible should not be) SYS$SYSTEM.

- Set defaults as:

  UIC [1,4]

  directory [SYSUPD]

  Set these defaults in the order shown.

- At the console terminal, type

  @VMSUPDATE

You will see the following message text at the terminal:

> This command procedure performs VAX/VMS software updates and unbundled software installations.....
>
> During this sequence, the standard console floppy will not be present in the console floppy drive.
>
> Therefore, the system is vulnerable to power failure or other fatal crash. If a system crash should occur during this time the update sequence can be restarted at the beginning of the first incomplete update.
>
> Dismount the current console floppy.
>
> Please place the first floppy of the kit in the console drive.

Note that you will receive a device-not-mounted message if there is no floppy diskette mounted. Ignore this message and place your first diskette, labeled F4/VAX VMS11MR1, in the diskette drive.

As you remove the standard diskette, note the direction it is facing: diskettes from the distribution kit must be inserted in the drive so they face the same direction. (The label is on the front side of the diskette.)

Next you will receive the following query:

ARE YOU READY TO CONTINUE?

If you type N, the request to put the first kit diskette in the console floppy drive and the query are repeated. If you type Y, the installation proceeds to copy the compiler-build command files and to select compiler code options:

What kind of code generation is desired?

Enter one of the codes shown below:

Code Option

THR Threaded - hardware independent

EAE Inline (Extended Arithmetic Element)

EIS Inline (Extended Instruction Set)

FIS Inline (Floating Instruction Set)

In VAX-11 compatibility mode, the only form of in-line code support is EIS.

Any other response causes the following message to appear:

Invalid value for this option, please reenter one of (THR, EAE, EIS, FIS).

After this phase is completed, you receive the message:

Please put the second floppy disk (VMS11FORA) in the drive.

Are you ready to continue?

Place diskette VMS11FORA in the drive. When you are ready to proceed, type Y. The following message appears:

The compiler object library must be copied and the compiler task-built. This will take approximately 20 minutes.

Completion of these procedures is indicated by the message:

Please put the third floppy disk (VMS11FORB) in the drive.

Are you ready to continue?

Place diskette VMS11FORB in the drive. When you are ready to continue, type Y. You will now be queried about OTS options.

OTS options include:

1. OTS Listing - The FORTRAN IV OTS can either be generated as a separate library:

   [SYSLIB]FOROTS.OLB

   or be included in the standard VAX/VMS RSX-11M system library:

   [SYSLIB]SYSLIB.OLB

   If you intend to incorporate the OTS into SYSLIB.OLB, obtain a fresh copy of SYSLIB from the operating system distribution kit. OTS modules cannot be added to a library containing a previous version of the OTS.

   NOTE

   The FORTRAN OTS library contains 224 (no VIRTUAL support) /235(VIRTUAL support) modules and 825 (no VIRTUAL support) /922 (VIRTUAL support) entry points.

   Do you want the OTS included in SYSLIB.OLB?

   If you want the OTS to be in the standard library, type Y; if you want it to be a separate library, type N.

   Installations that wish to conserve main memory, and that have many FORTRAN programs, will find it useful to build a FORTRAN IV OTS resident library. A MACRO-11 source file (FORRES.MAC) is included as part of the distribution kit to help in this regard. FORRES.MAC is located on diskette VMS11MR1, in directory [SYSUPD]. This file contains global references to all modules of the OTS and documentation on logical groups of OTS modules.

   Refer to the RSX-11M Task Builder Reference Manual (Order No. AA-2588D-TC) for information on building a FORTRAN OTS shareable library.

2. Hardware Configuration - The following messages indicate that you must choose a hardware configuration from among those listed:

   The FORTRAN IV OTS can be configured for any of the following hardware options:

   HND - No specific hardware

   EAE - EAE hardware

   EIS - EIS hardware

   FIS - FIS hardware

   FPU - FP11 hardware

   Please enter the three-character mnemonic for the desired hardware. What OTS hardware option do you want?

If you respond with anything except one of these codes you will receive the message:

Invalid value for this option, please re-enter one of (NHD, EAE, EIS, FIS, FPU).

VAX-11 compatibility mode supports NHD, EIS, or FPU configurations. Please refer to Table 2-1 for selection.

As the OTS is being configured, you will receive the message:

The entry point $ERTXT will be deleted as part of the OTS build.

This message requires no response. It is informational only.

3. VIRTUAL array option - VIRTUAL arrays are supported on systems that support memory management directives--that is, on target RSX-11M systems. You can include VIRTUAL array support by responding Y to the query:

Do you want VIRTUAL array support in the OTS?

Respond N if you do not want this option.

Finally, you are asked, as follows, to indicate whether you want to delete any previous versions of FORTRAN IV:

This procedure created new versions of the FORTRAN IV compiler and OTS.

You can keep or delete older versions.

Do you want to delete older versions?

To retain previous versions, type N; to delete them, type Y. This completes the installation of FORTRAN IV. You will receive:

ARE THERE MORE KITS TO PROCESS? [Y/N]

Your reply should be N; the following message will then appear:

Please place the system console floppy in the console drive.

You should immediately restore the standard console diskette to the console drive. Next, you will receive the following query:

ARE YOU READY TO CONTINUE?

If you type Y, the console floppy diskette is automatically mounted and you receive the following message:

Requested update sequence is complete.

Finally, after installing, you should back up the volume SYS$DISK and save the original for future updates.

CHAPTER 7

SYSTEM BUILD VERIFICATION

The FORTRAN IV kit includes a test program (FORTST.FTN) to verify proper operation of the installed system. The execution of this program is self-explanatory.

7.1 RSX-11M AND RSX-11M-PLUS SYSTEMS

If the FORTRAN IV OTS is part of SYSLIB, type the following commands:

```
>SET /UIC=[1,1]
>FOR FORTST=FORTST
>RUN $TKB
TKB>FORTST=FORTST
TKB>//
>RUN FORTST
```

If the EAE version is used with FORTRAN IV as the default, replace the command TKB>FORTST=FORTST with the command TKB>FORTST/EA=FORTST.

If the FPP version is used with FORTRAN IV as the default, replace the command TKB>FORTST=FORTST with the command TKB>FORTST/FP=FORTST.

If the FORTRAN IV OTS is in a separate library, type the following commands:

```
>SET /UIC=[1,1]
>FOR FORTST=FORTST
>RUN $TKB
TKB>FORTST=FORTST,FOROTS/LB
TKB>//
>RUN FORTST
```

If the EAE version is used with a separate OTS library, replace the command TKB>FORTST=FORTST,FOROTS/LB with the command TKB>FORTST/EA=FORTST,FOROTS/LB.

If the FPP version is used with a separate OTS library, replace the command TKB>FORTST=FORTST,FOROTS/LB with the command TKB>FORTST/FP=FORTST,FOROTS/LB.

If the test does not execute successfully, check for an error in the installation. Correct the error by rebuilding the compiler or OTS as necessary.

7.2 IAS USING MCR

If the FORTRAN IV OTS is part of SYSLIB, type the following commands to run the verification test ($ represents the altmode or escape key):

```
MCR>SET /UIC=[1,1]
MCR>FOR FORTST=FORTST
MCR>TKB FORTST=FORTST
MCR>RUN FORTST $
```

If the FORTRAN IV OTS is a separate library, type the following commands to perform the verification:

```
MCR>SET /UIC=[1,1]
MCR>FOR FORTST=FORTST
MCR>TKB FORTST=FORTST,FOROTS/LB
MCR>RUN FORTST $
```

If the test does not compile and execute correctly, check for a possible installation error. Correct the problem by rebuilding the compiler or OTS as necessary.

7.3 IAS USING DCL

If the FORTRAN IV OTS is part of SYSLIB, type the following commands to run the verification test:

```
PDS> FORTRAN/FOR/NOLIST FORTST
PDS> LINK FORTST
PDS> RUN FORTST
```

If the FORTRAN IV OTS is a separate library, type the following commands to perform the verification:

```
PDS> FORTRAN/FOR/NOLIST FORTST
PDS> LINK FORTST FOROTS/LIB
PDS> RUN FORTST
```

If the test does not execute successfully, check for an installation error. Correct the error by rebuilding the compiler or OTS as required.

7.4 VAX/VMS UNDER AME

The FORTRAN IV kit includes a test program, FORTST.FTN, to verify proper operation of the installed system. The execution of this program is self-explanatory.

If the FORTRAN IV OTS is part of SYSLIB, type the following commands:

```
$ MCR FOR FORTST=FORTST
$ MCR TKB FORTST=FORTST
$ RUN FORTST
```

If the FORTRAN IV OTS is in a separate library, type the following commands:

```
$ MCR FOR FORTST=FORTST
$ MCR TKB FORTST=FORTST,[SYSLIB]FOROTS/LB
$ RUN FORTST
```

If the test does not execute successfully, check for an error in the installation. Correct the error by rebuilding the compiler or OTS as necessary.

APPENDIX A

COMPILER BUILD FILE LISTINGS

This appendix presents sample listings of the compiler-build files for the following systems: RSX-11M (mapped and unmapped), RSX-11M-PLUS, IAS (using MCR and DCL), and VAX/VMS under AME. These listings are useful in the selection of compiler options and for editing purposes.

A.1 RSX-11M - UNMAPPED

```
[1,50]FOR/-CP/-MM,[1,30]FOR/-SP=[1,20]FOR11M/MP
;
; FORTRAN IV COMPILER TASK BUILD FILE
;
; FOR V02.5, RSX-11M UNMAPPED SYSTEMS
;
; TASK NAME
;
TASK=...FOR
;
; BUILD FOR PARTITION GEN, WHICH MUST BE AT LEAST 8K
;
PAR=GEN
;
; SP STACK SIZE
; STACK MUST BE AT LEAST 150 WORDS
;
STACK=150
;
; COMPILER LOGICAL UNIT ASSIGNMENTS
;
;       1 - COMMAND INPUT
;       2 - COMMAND OUTPUT
;       3 - .OBJ OUTPUT
;       4 - .LST OUTPUT
;       5 - .FTN INPUT
;
UNITS=5
ASG=TI:1:2
;
; TASK SIZE FOR SYSTEM CONTROLLED PARTITIONS
;
; THE FOLLOWING EXTTSK SETS THE COMPILER DEFAULT SIZE TO 8K WORDS.
; IF A LARGER COMPILER IS REQUIRED, THE EXTTSK MAY BE INCREASED,
; OR THE COMPILER MAY BE INSTALLED WITH THE /EXTEND SWITCH.
;
EXTTSK=1000
;
; NUMBER OF LINES PER LISTING PAGE
;
; THE FOLLOWING GBLPAT CONTROLS THE NUMBER OF LINES PER LISTING PAGE.
; THE VALUE SPECIFIED FOR THE PATCH IS THE NUMBER OF LINES
; PER PAGE DESIRED, MINUS 1.
; DEFAULT VALUE IS 000070(8) = 56. = 57. LINES PER PAGE.
;
GBLPAT=FROOT:$LNMAX:000070
;
; DEFAULT SWITCH SETTINGS (SWITCH WORD 1)
;
; THE GLBPAT WHICH FOLLOWS ALLOWS THE DEFAULT SWITCH SETTINGS FOR
; THE COMPILER TO BE SET.  THE VALUE SPECIFIED FOR THE PATCH IS
; THE LOGICAL OR OF THE INDIVIDUAL SWITCH SETTINGS DESIRED.
;
```

```
;
; SWITCH          SWITCH
;  NAME           SETTING              VALUE TO "OR" INTO PATCH
; ------          -------              ------------------------
;
;   LI            /LI:SRC (/LI:1)      000001  LISTING OF SOURCE PROGRAM
;                 /LI:MAP (/LI:2)      000002  LISTING OF STORAGE MAP
;                 /LI:COD (/LI:4)      000004  LISTING OF GENERATED CODE
;                 /LI:ALL (/LI:7)      000007
;                 /-LI                 000000
;
;   RO            /RO                  000020  GENERATE READ-ONLY PSECTS
;                 /-RO                 000000
;
;
;   SN            /SN                  000000  STATEMENT TRACE ON ERRORS
;                 /-SN                 000200
;
;   EX            /EX                  000400  ACCEPT 80 COLS. OF INPUT
;                 /-EX                 000000   (RATHER THAN 72 + SEQ FIELD)
;
;   SP            /SP                  001000  SPOOL LISTING OUTPUT
;                 /-SP                 000000
;
;   DI            /DI                  002000  ENABLE DIAGNOSTIC MODE FOR
;                                      000000   COMPILER CRASHES
;
;   I4            /I4                  004000  ALLOCATE 2 WORDS TO INTEGER
;                 /-I4                 000000   VARS BY DEFAULT
;
;   DE            /DE                  020000  COMPILE DEBUG LINES
;                 /-DE                 000000
;
;   VA            /VA                  000000  VECTOR ARRAYS
;                 /-VA                 040000
;
;   WR            /WR                  000000  PRINT WARNING DIAGNOSTICS
;                 /-WR                 100000
;
; THE VALUE CALCULATED FOR THE OPTIONS DESIRED MUST BE "OR"ED WITH
; 000040(8) TO YIELD THE VALUE FOR THE PATCH (I.E., THE 40(8) BIT
; MUST BE SET IN THE $S1DEF WORD).
;
; THE DEFAULT VALUE, 001043(8), IS THE EQUIVALENT OF:
;       /LI:3/-RO/SN/-EX/SP/-DI/-I4/-DE/VA/WR
;
GBLPAT=FROOT:$S1DEF:001043
;
; DEFAULT SWITCH SETTINGS (SWITCH WORD 2)
;
; THE GLBPAT WHICH FOLLOWS ALLOWS THE DEFAULT SWITCH SETTINGS FOR
; THE COMPILER TO BE SET.  THE VALUE SPECIFIED FOR THE PATCH IS
; THE LOGICAL OR OF THE INDIVIDUAL SWITCH SETTINGS DESIRED.
;
```

```
;  SWITCH          SWITCH
;   NAME           SETTING          VALUE TO "OR" INTO PATCH
;  ------          -------          ------------------------
;
;    CD            /CD:THR          000000  GENERATE THREADED CODE
;                  /CD:EAE          000002  GENERATE EAE INLINE CODE
;                  /CD:EIS          000004  GENERATE EIS INLINE CODE
;                  /CD:FIS          000014  GENERATE FIS+EIS INLINE CODE
;
;
;    LO            /LO              000000  LOG PROGRAM UNIT NAMES ON TERMINAL
;                  /-LO             040000  DO NOT LOG PROG NAMES ON TERMINAL
;
;  THE VALUE CALCULATED FOR THE OPTIONS DESIRED MUST BE "OR"ED WITH
;  017700(8) TO YIELD THE VALUE FOR THE PATCH (I.E., THE 017700(8) BITS
;  MUST BE SET IN THE $S2DEF WORD).
;
;  THE DEFAULT VALUE, 017700(8), IS THE EQUIVALENT OF:
;        /CD:THR/LO
;
GBLPAT=FROOT:$S2DEF:017700
//
```

A.2 RSX-11M AND RSX-11M-PLUS - MAPPED

```
[1,54]FOR/-CP/MM,[1,34]FOR/MA/CR/-SP=[1,24]FOR11M/MP
;
; FORTRAN IV COMPILER TASK BUILD FILE
;
; FOR V02.5, MAPPED RSX-11M AND RSX-11M PLUS SYSTEMS
;
;
; TASK NAME
;
TASK=...FOR
;
; BUILD FOR PARTITION GEN, WHICH MUST BE AT LEAST 8K
;
PAR=GEN
;
; SP STACK SIZE
; STACK MUST BE AT LEAST 150 WORDS
;
STACK=150
;
; COMPILER LOGICAL UNIT ASSIGNMENTS
;
;       1 - COMMAND INPUT
;       2 - COMMAND OUTPUT
;       3 - .OBJ OUTPUT
;       4 - .LST OUTPUT
;       5 - .FTN INPUT
;
UNITS=5
ASG=TI:1:2
;
; TASK SIZE FOR SYSTEM CONTROLLED PARTITIONS
;
; THE FOLLOWING EXTTSK SETS THE COMPILER DEFAULT SIZE TO 8K WORDS.
; IF A LARGER COMPILER IS REQUIRED, THE EXTTSK MAY BE INCREASED,
; OR THE COMPILER MAY BE INSTALLED WITH THE /INC SWITCH.
;
EXTTSK=1000
;
; NUMBER OF LINES PER LISTING PAGE
;
; THE FOLLOWING GBLPAT CONTROLS THE NUMBER OF LINES PER LISTING PAGE.
; THE VALUE SPECIFIED FOR THE PATCH IS THE NUMBER OF LINES
; PER PAGE DESIRED, MINUS 1.
; DEFAULT VALUE IS 000070(8) = 56. = 57. LINES PER PAGE.
;
GBLPAT=FROOT:$LNMAX:000070
;
; DEFAULT SWITCH SETTINGS (SWITCH WORD 1)
;
; THE GLBPAT WHICH FOLLOWS ALLOWS THE DEFAULT SWITCH SETTINGS FOR
; THE COMPILER TO BE SET.  THE VALUE SPECIFIED FOR THE PATCH IS
; THE LOGICAL OR OF THE INDIVIDUAL SWITCH SETTINGS DESIRED.
;
```

```
; SWITCH          SWITCH
;  NAME           SETTING                VALUE TO "OR" INTO PATCH
; ------          -------                ------------------------
;
;   LI            /LI:SRC (/LI:1)  000001  LISTING OF SOURCE PROGRAM
;                 /LI:MAP (/LI:2)  000002  LISTING OF STORAGE MAP
;                 /LI:COD (/LI:4)  000004  LISTING OF GENERATED CODE
;                 /LI:ALL (/LI:7)  000007
;                 /-LI             000000
;
;
;
;
;   RO            /RO              000020  GENERATE READ-ONLY PSECTS
;                 /-RO             000000
;
;   SN            /SN              000000  STATEMENT TRACE ON ERRORS
;                 /-SN             000200
;
;   EX            /EX              000400  ACCEPT 80 COLS. OF INPUT
;                 /-EX             000000   (RATHER THAN 72 + SEQ FIELD)
;
;   SP            /SP              001000  SPOOL LISTING OUTPUT
;                 /-SP             000000
;
;   DI            /DI              002000  ENABLE DIAGNOSTIC MODE FOR
;                                  000000   COMPILER CRASHES
;
;   I4            /I4              004000  ALLOCATE 2 WORDS TO INTEGER
;                 /-I4             000000   VARS BY DEFAULT
;
;   DE            /DE              020000  COMPILE DEBUG LINES
;                 /-DE             000000
;
;   VA            /VA              000000  VECTOR ARRAYS
;                 /-VA             040000
;
;   WR            /WR              000000  PRINT WARNING DIAGNOSTICS
;                 /-WR             100000
;
; THE VALUE CALCULATED FOR THE OPTIONS DESIRED MUST BE "OR"ED WITH
; 000040(8) TO YIELD THE VALUE FOR THE PATCH (I.E., THE 40(8) BIT
; MUST BE SET IN THE $S1DEF WORD).
;
; THE DEFAULT VALUE, 001043(8), IS THE EQUIVALENT OF:
;       /LI:3/-RO/SN/-EX/SP/-DI/-I4/-DE/VA/WR
;
GBLPAT=FROOT:$S1DEF:001043
;
; DEFAULT SWITCH SETTINGS (SWITCH WORD 2)
;
; THE GLBPAT WHICH FOLLOWS ALLOWS THE DEFAULT SWITCH SETTINGS FOR
; THE COMPILER TO BE SET.  THE VALUE SPECIFIED FOR THE PATCH IS
; THE LOGICAL OR OF THE INDIVIDUAL SWITCH SETTINGS DESIRED.
;
```

```
; SWITCH          SWITCH
;  NAME           SETTING          VALUE TO "OR" INTO PATCH
; -------         --------         ------------------------
;
;   CD            /CD:THR          000000  GENERATE THREADED CODE
;                 /CD:EAE          000002  GENERATE EAE INLINE CODE
;                 /CD:EIS          000004  GENERATE EIS INLINE CODE
;                 /CD:FIS          000014  GENERATE FIS+EIS INLINE CODE
;
;
;   LO            /LO              000000  LOG PROGRAM UNIT NAMES ON TERMINAL
;                 /-LO             040000  DO NOT LOG PROG NAMES ON TERMINAL
;
; THE VALUE CALCULATED FOR THE OPTIONS DESIRED MUST BE "OR"ED WITH
; 017700(8) TO YIELD THE VALUE FOR THE PATCH (I.E., THE 017700(8) BITS
; MUST BE SET IN THE $S2DEF WORD).
;
; THE DEFAULT VALUE, 017700(8), IS THE EQUIVALENT OF:
;       /CD:THR/LO
;
GBLPAT=FROOT:$S2DEF:017700
//
```

A.3 IAS USING MCR

```
[11,1]FOR/CP,[11,41]FOR/-SP=[11,41]FORBLD/MP
;
; FORTRAN IV COMPILER TASK BUILD FILE
;
; FOR V02.5, IAS SYSTEMS USING MCR
;
; TASK NAME
;
TASK=...FOR
;
; LINK TO SYSTEM RESIDENT LIBRARY
;
LIBR=SYSRES:RO
;
; BUILD FOR PARTITION GEN, WHICH MUST BE AT LEAST 8K
;
PAR=GEN
;
; SP STACK SIZE
; STACK MUST BE AT LEAST 150 WORDS
;
STACK=150
;
; COMPILER LOGICAL UNIT ASSIGNMENTS
;
;       1 - COMMAND INPUT
;       2 - COMMAND OUTPUT
;       3 - .OBJ OUTPUT
;       4 - .LST OUTPUT
;       5 - .FTN INPUT
;
UNITS=5
ASG=TI:1:2
;
; TASK SIZE FOR SYSTEM CONTROLLED PARTITIONS
;
; THE FOLLOWING EXTTSK SETS THE COMPILER DEFAULT SIZE TO 8K WORDS.
; IF A LARGER COMPILER IS REQUIRED, THE EXTTSK MAY BE INCREASED,
; OR THE COMPILER MAY BE INSTALLED WITH THE /INC SWITCH.
;
EXTTSK=4500
;
; NUMBER OF LINES PER LISTING PAGE
;
; THE FOLLOWING GBLPAT CONTROLS THE NUMBER OF LINES PER LISTING PAGE.
; THE VALUE SPECIFIED FOR THE PATCH IS THE NUMBER OF LINES
; PER PAGE DESIRED, MINUS 1.
; DEFAULT VALUE IS 000070(8) = 56. = 57. LINES PER PAGE.
;
GBLPAT=FROOT:$LNMAX:000070
;
; DEFAULT SWITCH SETTINGS (SWITCH WORD 1)
;
; THE GLBPAT WHICH FOLLOWS ALLOWS THE DEFAULT SWITCH SETTINGS FOR
; THE COMPILER TO BE SET.  THE VALUE SPECIFIED FOR THE PATCH IS
; THE LOGICAL OR OF THE INDIVIDUAL SWITCH SETTINGS DESIRED.
;
```

```
; SWITCH        SWITCH
;  NAME         SETTING          VALUE TO "OR" INTO PATCH
; ------        -------          ------------------------
;
;   LI          /LI:SRC (/LI:1) 000001  LISTING OF SOURCE PROGRAM
;               /LI:MAP (/LI:2) 000002  LISTING OF STORAGE MAP
;               /LI:COD (/LI:4) 000004  LISTING OF GENERATED CODE
;               /LI:ALL (/LI:7) 000007
;
;               /-LI            000000
;
;   RO          /RO             000020  GENERATE READ-ONLY PSECTS
;               /-RO            000000
;
;   SN          /SN             000000  STATEMENT TRACE ON ERRORS
;               /-SN            000200
;
;   EX          /EX             000400  ACCEPT 80 COLS. OF INPUT
;               /-EX            000000   (RATHER THAN 72 + SEQ FIELD)
;
;   SP          /SP             001000  SPOOL LISTING OUTPUT
;               /-SP            000000
;
;   DI          /DI             002000  ENABLE DIAGNOSTIC MODE FOR
;                               000000   COMPILER CRASHES
;
;   I4          /I4             004000  ALLOCATE 2 WORDS TO INTEGER
;               /-I4            000000   VARS BY DEFAULT
;
;   DE          /DE             020000  COMPILE DEBUG LINES
;               /-DE            000000
;
;   VA          /VA             000000  VECTOR ARRAYS
;               /-VA            040000
;
;   WR          /WR             000000  PRINT WARNING DIAGNOSTICS
;               /-WR            100000
;
; THE VALUE CALCULATED FOR THE OPTIONS DESIRED MUST BE "OR"ED WITH
; 000040(8) TO YIELD THE VALUE FOR THE PATCH (I.E., THE 40(8) BIT
; MUST BE SET IN THE $S1DEF WORD).
;
; THE DEFAULT VALUE, 001043(8), IS THE EQUIVALENT OF:
;       /LI:3/-RO/SN/-EX/SP/-DI/-I4/-DE/VA/WR
;
GBLPAT=FROOT:$S1DEF:001043
;
; DEFAULT SWITCH SETTINGS (SWITCH WORD 2)
;
; THE GLBPAT WHICH FOLLOWS ALLOWS THE DEFAULT SWITCH SETTINGS FOR
; THE COMPILER TO BE SET.  THE VALUE SPECIFIED FOR THE PATCH IS
; THE LOGICAL OR OF THE INDIVIDUAL SWITCH SETTINGS DESIRED.
;
```

```
; SWITCH          SWITCH
;  NAME          SETTING          VALUE TO "OR" INTO PATCH
; ------         -------          ------------------------
;
;   CD           /CD:THR          000000  GENERATE THREADED CODE
;                /CD:EAE          000002  GENERATE EAE INLINE CODE
;                /CD:EIS          000004  GENERATE EIS INLINE CODE
;                /CD:FIS          000014  GENERATE FIS+EIS INLINE CODE
;
;
;   LO           /LO              000000  LOG PROGRAM UNIT NAMES ON TERMINAL
;                /-LO             040000  DO NOT LOG PROG NAMES ON TERMINAL
;
; THE VALUE CALCULATED FOR THE OPTIONS DESIRED MUST BE "OR"ED WITH
; 017700(8) TO YIELD THE VALUE FOR THE PATCH (I.E., THE 17700(8) BITS
; MUST BE SET IN THE $S2DEF WORD).
;
; THE DEFAULT VALUE, 017700(8), IS THE EQUIVALENT OF:
;       /CD:THR/LO
;
GBLPAT=FROOT:$S2DEF:017700
/
```

A.4 IAS USING DCL

```
LINK/MU/LARGE/OVE:[11,41]FORBLD/OPT/TASK:[11,1]FOR/MAP:[11,41]FOR/NOFLO
;
; FORTRAN IV COMPILER TASK BUILD FILE
;
; FOR V02.5, IAS SYSTEMS USING DCL
;
; TASK NAME
;
TASK=...FOR
;
; LINK TO SYSTEM RESIDENT LIBRARY
;
LIBR=SYSRES:RO
;
; BUILD FOR PARTITION GEN, WHICH MUST BE AT LEAST 8K
;
PAR=GEN
;
; SP STACK SIZE
; STACK MUST BE AT LEAST 150 WORDS
;
STACK=150
;
; COMPILER LOGICAL UNIT ASSIGNMENTS
;
;       1 - COMMAND INPUT
;       2 - COMMAND OUTPUT
;       3 - .OBJ OUTPUT
;       4 - .LST OUTPUT
;       5 - .FTN INPUT
;
UNITS=5
ASG=TI:1:2
;
; TASK SIZE FOR SYSTEM CONTROLLED PARTITIONS
;
; THE FOLLOWING EXTTSK SETS THE COMPILER DEFAULT SIZE TO 8K WORDS.
; IF A LARGER COMPILER IS REQUIRED, THE EXTTSK MAY BE INCREASED,
; OR THE COMPILER MAY BE INSTALLED WITH THE /INC SWITCH.
;
EXTTSK=4500
;
; NUMBER OF LINES PER LISTING PAGE
;
; THE FOLLOWING GBLPAT CONTROLS THE NUMBER OF LINES PER LISTING PAGE.
; THE VALUE SPECIFIED FOR THE PATCH IS THE NUMBER OF LINES
; PER PAGE DESIRED, MINUS 1.
; DEFAULT VALUE IS 000070(8) = 56. = 57. LINES PER PAGE.
;
GBLPAT=FROOT:$LNMAX:000070
;
; DEFAULT SWITCH SETTINGS (SWITCH WORD 1)
;
; THE GLBPAT WHICH FOLLOWS ALLOWS THE DEFAULT SWITCH SETTINGS FOR
; THE COMPILER TO BE SET.  THE VALUE SPECIFIED FOR THE PATCH IS
; THE LOGICAL OR OF THE INDIVIDUAL SWITCH SETTINGS DESIRED.
;
```

```
;  SWITCH          SWITCH
;   NAME           SETTING              VALUE TO "OR" INTO PATCH
;  ------          -------              ------------------------
;
;    LI            /LI:SRC (/LI:1)  000001  LISTING OF SOURCE PROGRAM
;                  /LI:MAP (/LI:2)  000002  LISTING OF STORAGE MAP
;                  /LI:COD (/LI:4)  000004  LISTING OF GENERATED CODE
;                  /LI:ALL (/LI:7)  000007
;
;                  /-LI             000000
;
;    RO            /RO              000020  GENERATE READ-ONLY PSECTS
;                  /-RO             000000
;
;    SN            /SN              000000  STATEMENT TRACE ON ERRORS
;                  /-SN             000200
;
;    EX            /EX              000400  ACCEPT 80 COLS. OF INPUT
;                  /-EX             000000   (RATHER THAN 72 + SEQ FIELD)
;
;    SP            /SP              001000  SPOOL LISTING OUTPUT
;                  /-SP             000000
;
;    DI            /DI              002000  ENABLE DIAGNOSTIC MODE FOR
;                                   000000   COMPILER CRASHES
;
;    I4            /I4              004000  ALLOCATE 2 WORDS TO INTEGER
;                  /-I4             000000   VARS BY DEFAULT
;
;    DE            /DE              020000  COMPILE DEBUG LINES
;                  /-DE             000000
;
;    VA            /VA              000000  VECTOR ARRAYS
;                  /-VA             040000
;
;    WR            /WR              000000  PRINT WARNING DIAGNOSTICS
;                  /-WR             100000
;
; THE VALUE CALCULATED FOR THE OPTIONS DESIRED MUST BE "OR"ED WITH
; 000040(8) TO YIELD THE VALUE FOR THE PATCH (I.E., THE 40(8) BIT
; MUST BE SET IN THE $S1DEF WORD).
;
; THE DEFAULT VALUE, 001043(8), IS THE EQUIVALENT OF:
;       /LI:3/-RO/SN/-EX/SP/-DI/-I4/-DE/VA/WR
;
GBLPAT=FROOT:$S1DEF:001043
;
; DEFAULT SWITCH SETTINGS (SWITCH WORD 2)
;
; THE GLBPAT WHICH FOLLOWS ALLOWS THE DEFAULT SWITCH SETTINGS FOR
; THE COMPILER TO BE SET.  THE VALUE SPECIFIED FOR THE PATCH IS
; THE LOGICAL OR OF THE INDIVIDUAL SWITCH SETTINGS DESIRED.
;
```

```
; SWITCH          SWITCH
;  NAME          SETTING          VALUE TO "OR" INTO PATCH
; ------         -------          ------------------------
;
;   CD           /CD:THR          000000  GENERATE THREADED CODE
;                /CD:EAE          000002  GENERATE EAE INLINE CODE
;                /CD:EIS          000004  GENERATE EIS INLINE CODE
;                /CD:FIS          000014  GENERATE FIS+EIS INLINE CODE
;
;
;   LO           /LO              000000  LOG PROGRAM UNIT NAMES ON TERMINAL
;                /-LO             040000  DO NOT LOG PROG NAMES ON TERMINAL
;
; THE VALUE CALCULATED FOR THE OPTIONS DESIRED MUST BE "OR"ED WITH
; 017700(8) TO YIELD THE VALUE FOR THE PATCH (I.E., THE 17700(8) BITS
; MUST BE SET IN THE $S2DEF WORD).
;
; THE DEFAULT VALUE, 017700(8), IS THE EQUIVALENT OF:
;       /CD:THR/LO
;
GBLPAT=FROOT:$S2DEF:017700
/
```

A.5 VAX/VMS UNDER AME

```
[SYSEXE]FOR.EXE/-CP=FORBLD/MP
;
; FORTRAN IV COMPILER TASK BUILD FILE
;
; FOR V02.5, VAX/VMS SYSTEMS
;
;
; TASK NAME
;
TASK=...FOR
;
; BUILD FOR PARTITION GEN, WHICH MUST BE AT LEAST 8K
;
PAR=GEN
;
; SP STACK SIZE
; STACK MUST BE AT LEAST 150 WORDS
;
STACK=150
;
; COMPILER LOGICAL UNIT ASSIGNMENTS
;
;       1 - COMMAND INPUT
;       2 - COMMAND OUTPUT
;       3 - .OBJ OUTPUT
;       4 - .LST OUTPUT
;       5 - .FTN INPUT
;
UNITS=5
ASG=TI:1:2
;
; TASK SIZE
;
; THE FOLLOWING EXTTSK SETS THE COMPILER DEFAULT SIZE TO 28K WORDS.
; IF A LARGER COMPILER IS REQUIRED, THE EXTTSK MAY BE INCREASED.
;
EXTTSK=18208
;
; NUMBER OF LINES PER LISTING PAGE
;
; THE FOLLOWING GBLPAT CONTROLS THE NUMBER OF LINES PER LISTING PAGE.
; THE VALUE SPECIFIED FOR THE PATCH IS THE NUMBER OF LINES
; PER PAGE DESIRED, MINUS 1.
; DEFAULT VALUE IS 000070(8) = 56. = 57. LINES PER PAGE.
;
GBLPAT=FROOT:$LNMAX:000070
;
; DEFAULT SWITCH SETTINGS (SWITCH WORD 1)
;
; THE GLBPAT WHICH FOLLOWS ALLOWS THE DEFAULT SWITCH SETTINGS FOR
; THE COMPILER TO BE SET.  THE VALUE SPECIFIED FOR THE PATCH IS
; THE LOGICAL OR OF THE INDIVIDUAL SWITCH SETTINGS DESIRED.
;
```

```
; SWITCH        SWITCH
;  NAME         SETTING          VALUE TO "OR" INTO PATCH
; ------        -------          ------------------------
;
;   LI          /LI:SRC (/LI:1) 000001  LISTING OF SOURCE PROGRAM
;               /LI:MAP (/LI:2) 000002  LISTING OF STORAGE MAP
;               /LI:COD (/LI:4) 000004  LISTING OF GENERATED CODE
;               /LI:ALL (/LI:7) 000007
;               /-LI            000000
;
;   RO          /RO             000020  GENERATE READ-ONLY PSECTS
;               /-RO            000000
;
;   SN          /SN             000000  STATEMENT TRACE ON ERRORS
;               /-SN            000200
;
;   EX          /EX             000400  ACCEPT 80 COLS. OF INPUT
;               /-EX            000000   (RATHER THAN 72 + SEQ FIELD)
;
;   SP          /SP             001000  SPOOL LISTING OUTPUT
;               /-SP            000000
;
;   DI          /DI             002000  ENABLE DIAGNOSTIC MODE FOR
;                               000000   COMPILER CRASHES
;
;   I4          /I4             004000  ALLOCATE 2 WORDS TO INTEGER
;               /-I4            000000   VARS BY DEFAULT
;
;   DE          /DE             020000  COMPILE DEBUG LINES
;               /-DE            000000
;
;   VA          /VA             000000  VECTOR ARRAYS
;               /-VA            040000
;
;   WR          /WR             000000  PRINT WARNING DIAGNOSTICS
;               /-WR            100000
;
; THE VALUE CALCULATED FOR THE OPTIONS DESIRED MUST BE "OR"ED WITH
; 000040(8) TO YIELD THE VALUE FOR THE PATCH (I.E., THE 40(8) BIT
; MUST BE SET IN THE $S1DEF WORD).
;
; THE DEFAULT VALUE, 000043(8), IS THE EQUIVALENT OF:
;       /LI:3/-RO/SN/-EX/-SP/-DI/-I4/-DE/VA/WR
;
GBLPAT=FROOT:$S1DEF:000043
```

APPENDIX B

FORTRAN IV V2.5 RELEASE NOTES

I. COMPILER RESTRICTIONS

The FORTRAN IV V2.5 compiler has the following restrictions; these restrictions represent highly contextual problems, illustrated here by specific examples. Where feasible, patches and autopatches will be supplied in the future to lift these restrictions. A workaround is suggested for each restriction.

1. Problem statement: the compiler will generate incorrect in-line code for the following program:

```
BYTE L
I=L/10
J=L-I*10
END
```

   Cause: the register-allocation phase of the compiler assigns the wrong register for the division.

   Workaround:

```
BYTE L
J=L-L/10*10
END
```

2. Problem statement: the compiler will generate incorrect in-line code for the following program:

```
      DIMENSION A(10),K(10),L(10),M(10)
      COMMON A,K,L,M
      DO 10 I=1,N
      J=I+K1
      A(I)=A(J)
      K(I)=K(J)
      L(I)=L(J)
      M(I)=M(J)
   10 CONTINUE
      END
```

   Cause: the code-generation phase of the compiler assigns to a compiler temporary a register already in use, without saving the register's contents.

   Workaround:

```
      DIMENSION A(10),K(10),L(10),M(10)
      COMMON A,K,L,M
      DO 10 I=1,N
      J=I+K1
```

```
      K(I)=K(J)
      L(I)=L(J)
      M(I)=M(J)
      A(I)=A(J)
   10 CONTINUE
      END
```

3. Problem statement: the compiler will abort if the in-line FIS code option is selected for the following program:

```
      SUBROUTINE X(D)
      COMMON C(5),S(5)
      DIMENSION D(5)
      DO 10 I=1,N
      C(I)=S(I)
      DO 20 J=1,I
   20 D(K)=D(J)
   10 CONTINUE
      K=K/2
      D(1)=D(2)
      RETURN
      END
```

Cause: there is a problem in the register-allocation phase of the compiler.

Workaround: put array D in COMMON.

4. Problem statement: the compiler will abort if the following program is entered:

```
      DO 10 I=1,3000*1000
   10 CONTINUE
      END
```

Cause: the loop-optimization phase of the compiler tries to evaluate the trip count but fails due to overflow.

Workaround: avoid using illegal values as DO parameters.

5. Problem statement: the compiler will issue the error "MISSING DELIMITER IN EXPRESSION" for the following program:

```
      WRITE(5,100) ((I-N)/N)*2
  100 FORMAT(I2)
      END
```

Cause: the I/O expression analyzer parses the expression incorrectly.

Workaround:

```
      WRITE(5,100) 2*((I-N)/N)
  100 FORMAT(I2)
      END
```

6. Problem statement: inconsistency in a logical operation: the value of I will be "177600 and the value of J will be "200 in the following program:

```
BYTE B
DATA B/"200/
I=B.AND."377
J="376.AND.B
END
```

Cause: in FORTRAN IV, if the second operand of an operation is an octal constant, the data type of the operand is decided by the data type of the first operand of the operation. Since B is a BYTE variable, "377 is entered into the symbol table as a BYTE constant and the operation is carried out at byte level, and when the result of the operation is assigned to I, it is sign-extended. However, "376 is entered into the symbol table as an integer constant; therefore, B is sign-extended when loaded into a register before the operation.

Workaround: assign "377 to an integer variable.

II. OTS RESTRICTION

Library subroutine ERRSNS returns zero values for the last three parameters if the error is not an file open error.

III. MISCELLANEOUS

Calling the FORTRAN compiler using MCR in the following example will cause a null-length object file to be created:

```
MCR FOR ABC.FTN

      or

MCR> FOR ABC.FTN
```

Using an equal sign in front of the source file will avoid this:

```
MCR FOR =ABC.FTN

      or

MCR> FOR =ABC.FTN
```

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